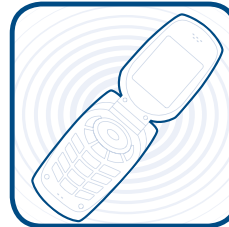


# Product Selection Guide

Spring 2007



## Skyworks Solutions

Skyworks Solutions, Inc. is an innovator of high performance analog and mixed signal semiconductors enabling mobile connectivity. The company's power amplifiers, front-end modules and direct conversion radios are at the heart of many of today's leading-edge multimedia handsets. Leveraging core technologies, Skyworks also offers a diverse portfolio of linear products that support automotive, broadband, cellular infrastructure, industrial and medical applications.

Headquartered in Woburn, Massachusetts, USA, Skyworks is worldwide with engineering, manufacturing, sales and service facilities throughout Asia, Europe and North America.

New products are continually being introduced at Skyworks. For the latest information, visit our Web site at [www.skyworksinc.com](http://www.skyworksinc.com). For additional information, please contact your local sales office or email us at [sales@skyworksinc.com](mailto:sales@skyworksinc.com).

## The Skyworks Advantage

- Broad multimode radio and precision analog product portfolio
- Market leadership in key product segments
- Solutions for all air interface standards, including CDMA2000, GSM/GPRS/EDGE, WCDMA, WLAN and WiMAX
- Engagements with a diverse set of top-tier customers
- Analog, RF and mixed signal design capabilities
- Access to all key process technologies: GaAs HBT, PHEMT, BiCMOS, SiGe, CMOS and RF CMOS
- World-class manufacturing capabilities and scale
- Unparalleled level of customer service and technical support
- Commitment to technology innovation





## INDEX

### Mobile Platforms

|                                         |    |
|-----------------------------------------|----|
| DCR™ Transceivers .....                 | 5  |
| GPRS RF Subsystems .....                | 6  |
| GSM/GPRS/EDGE Power Amplifiers .....    | 7  |
| Helios™ DigRF Subsystem .....           | 8  |
| Helios™ EDGE RF Subsystem .....         | 9  |
| Helios™ Mini EDGE RF Subsystem .....    | 10 |
| Helios™ II EDGE RF Subsystem .....      | 11 |
| Helios™ II-Plus EDGE RF Subsystem ..... | 12 |
| Intera™ Front-End Modules .....         | 13 |
| TD-SCDMA Power Amplifiers .....         | 16 |
| WCDMA/CDMA Power Amplifiers .....       | 16 |

### Linear Products

|                                                                                                      |     |
|------------------------------------------------------------------------------------------------------|-----|
| Amplifiers .....                                                                                     | 20  |
| Attenuators .....                                                                                    | 23  |
| Chip Capacitors .....                                                                                | 26  |
| Diodes .....                                                                                         | 27  |
| Directional Couplers/Detectors .....                                                                 | 55  |
| Hybrids .....                                                                                        | 55  |
| Infrastructure RF Subsystems .....                                                                   | 56  |
| Mixers/Demodulators .....                                                                            | 60  |
| Modulators .....                                                                                     | 61  |
| Power Dividers/Combiners .....                                                                       | 61  |
| Phase Shifters .....                                                                                 | 62  |
| Receivers .....                                                                                      | 63  |
| Switches .....                                                                                       | 64  |
| Synthesizers/PLLs .....                                                                              | 67  |
| Technical Ceramics .....                                                                             | 68  |
| These products are produced by Trans-Tech<br>(a wholly owned subsidiary of Skyworks Solutions, Inc.) |     |
| WiMAX RF Subsystems .....                                                                            | 78  |
| WLAN Front-End Modules .....                                                                         | 81  |
| Reference Material .....                                                                             | 82  |
| Skyworks Sales Representatives .....                                                                 | 108 |
| Skyworks Distributors .....                                                                          | 109 |
| Skyworks Sales Offices .....                                                                         | 115 |



**Innovation to Go™** Select products (indicated in blue/bold) are now available for purchase online.



Skyworks Green products are lead (Pb)-free, Restriction of Hazardous Substances (RoHS)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, and are free from antimony trioxide, and brominated flame retardants.



The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.  
Tin/lead (SnPb) packaging is not recommended for new designs.



## **MOBILE PLATFORMS**

### **Mobile Platforms**

|                                         |    |
|-----------------------------------------|----|
| DCR™ Transceivers .....                 | 5  |
| GPRS RF Subsystems.....                 | 6  |
| GSM/GPRS/EDGE Power Amplifiers .....    | 7  |
| Helios™ DigRF Subsystem .....           | 8  |
| Helios™ EDGE RF Subsystem.....          | 9  |
| Helios™ Mini EDGE RF Subsystem .....    | 10 |
| Helios™ II EDGE RF Subsystem .....      | 11 |
| Helios™ II-Plus EDGE RF Subsystem ..... | 12 |
| Intera™ Front-End Modules.....          | 13 |
| TD-SCDMA Power Amplifiers.....          | 16 |
| WCDMA/CDMA Power Amplifiers.....        | 16 |

## DCR™ TRANSCEIVERS

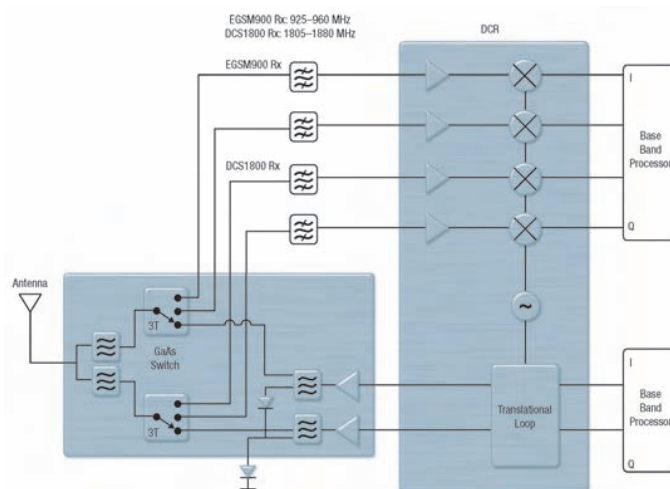
Skyworks has shipped over 30 million direct conversion radio transceivers since it launched the world's first single-chip DCR™ transceiver over two years ago. Now used by over 20 of the world's leading manufacturers in more than 100 models, Skyworks single-chip DCR™ transceiver radically simplifies cellular phone architectures, reduces cost, improves handset power efficiency, and enables key features such as built-in cameras and large color screens. Skyworks family of DCR™ transceivers stands alone in the industry and is at the heart of Skyworks multiband GSM/GPRS/EDGE RF subsystems.

### The DCR™ Transceiver family features:

- Direct downconversion receiver eliminates IF stage
- Integrated quad-band LNAs, transmit VCOs, and loop filters
- Single integrated, fully programmable fractional-N synthesizer
- Digital crystal oscillator reference frequency control
- Low external component count

### The DCR™ Transceiver family consists of:

-  SKY74117 RF Transceiver—direct conversion transceiver that can be combined with virtually any standard GSM/EGPRS baseband without requiring special processing interfaces
-  SKY74963 RF Transceiver—direct conversion transceiver with a power ramping controller and integrated crystal oscillator
-  CX74063 RF Transceiver—direct conversion transceiver eliminates the need for external IF components, an integrated power ramping controller, and crystal oscillator (-36 option lead (Pb)-free)
-  CX74017 RF Transceiver—direct conversion transceiver eliminates the need for external IF components (-17 option lead (Pb)-free)



Quad-Band GSM/GPRS RF Subsystem with DCR™ Transceiver Block Diagram

 The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## GPRS RF SUBSYSTEMS

Skyworks GPRS RF subsystem family consists of Skyworks GPRS transceiver and power amplifier products. GPRS RF subsystem products offer a high level of integration in a small form factor.

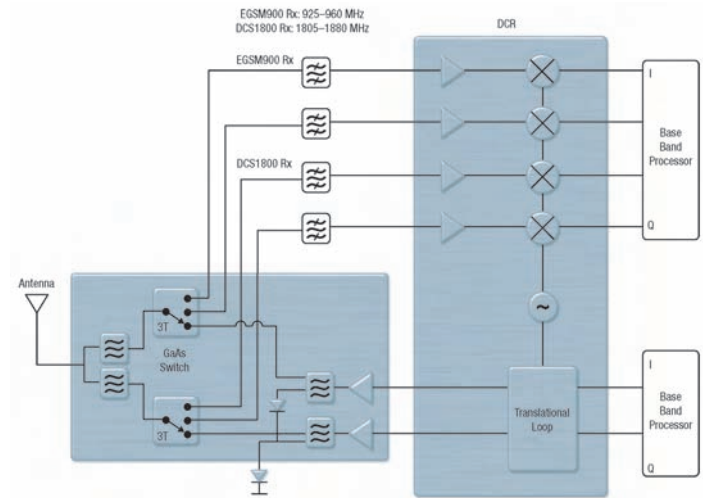
This high-performance, field-proven RF subsystem allows wireless terminal manufacturers worldwide to significantly reduce the RF footprint and minimize power consumption for next-generation multiband GPRS handsets.

### The GPRS RF Subsystem features:

- Direct downconversion receiver that eliminates IF filters
- Integrated quad-band LNAs, transmit VCOs, and loop filters
- Single integrated, fully programmable fractional-N synthesizer
- Integrated digital crystal oscillator
- Quad-band, multislot GPRS Class 12 operation
- Support for GPRS and downlink EDGE standards
- Direct conversion architectures that eliminate IF conversion stages
- Compatible with Skyworks baseband devices and numerous 3rd party baseband devices

### GPRS RF Subsystems:

-  SKY74400 Power Transceiver—a highly integrated GSM/GPRS transceiver and power amplifier in a compact 6 x 11 package. Add SAW filters and antenna switch for a complete radio solution
-  SKY74117 Transceiver and SKY77500 Front-End Module—direct conversion radio device is combined with a transmit and receive front-end module and is compatible with any GSM/EGPRS baseband



Quad-Band GSM/GPRS RF Subsystem with DCR™ Transceiver Block Diagram

## GSM/GPRS/EDGE POWER AMPLIFIERS

### PA Modules for GSM/GPRS/EDGE Handsets

| Part Number                                                                                   | Frequency (MHz) | Description                                          | Typical Output Power (dBm) | Typical PAE (%) | Typical Gain (dB) | Supply Voltage (V) | Package (mm)              |
|-----------------------------------------------------------------------------------------------|-----------------|------------------------------------------------------|----------------------------|-----------------|-------------------|--------------------|---------------------------|
| SKY77329<br> | 824–849         | Tx–Rx iPAC™ PAM for Quad-Band GSM/EDGE<br>GSM850     | 34.6                       | 55              | –                 | 2.9–4.8            | 22-pin MCM<br>6 x 8 x 1.2 |
|                                                                                               | 880–915         | GSM900                                               | 34.5                       | 55              | –                 |                    |                           |
|                                                                                               | 1710–1785       | DCS1800                                              | 32.4                       | 53              | –                 |                    |                           |
|                                                                                               | 1850–1910       | PCS1900                                              | 32.2                       | 53              | –                 |                    |                           |
|                                                                                               |                 |                                                      |                            |                 |                   |                    |                           |
| SKY77328<br> | 824–849         | Tx–Rx iPAC™ PAM for Quad-Band<br>GSM850              | 35.4                       | 56              | –                 | 2.9–4.8            | 20-pin MCM<br>6 x 6 x 1.2 |
|                                                                                               | 880–915         | GSM900                                               | 35.1                       | 56              | –                 |                    |                           |
|                                                                                               | 1710–1785       | DCS1800                                              | 33.2                       | 54              | –                 |                    |                           |
|                                                                                               | 1850–1910       | PCS1900                                              | 32.9                       | 53              | –                 |                    |                           |
|                                                                                               |                 |                                                      |                            |                 |                   |                    |                           |
| SKY77318<br> | 824–849         | iPAC™ Module for Tri-Band EGSM/GPRS<br>GSM850DCS1800 | 35.2                       | 58              | –                 | 2.9–4.8            | 20-pin MCM<br>6 x 6 x 1.2 |
|                                                                                               | 880–915         | PCS1900                                              | 35.2                       | 56              | –                 |                    |                           |
|                                                                                               | 1710–1785       |                                                      | 33.5                       | 52              | –                 |                    |                           |
|                                                                                               | 1850–1910       |                                                      | 33.5                       | 52              | –                 |                    |                           |
|                                                                                               |                 |                                                      |                            |                 |                   |                    |                           |
| SKY77340<br> | 824–849         | PAM Quad-Band GSM/EDGE<br>GSM850                     | 35.0                       | 54              | 33.0              | 2.9–4.8            | 16-pin MCM<br>6 x 8 x 1.2 |
|                                                                                               | 880–915         | GSM900                                               | 34.9                       | 53              | 33.0              |                    |                           |
|                                                                                               | 1710–1785       | DCS1800                                              | 33.5                       | 52              | 34.5              |                    |                           |
|                                                                                               | 1850–1910       | PCS1900                                              | 33.2                       | 52              | 34.5              |                    |                           |
|                                                                                               |                 |                                                      |                            |                 |                   |                    |                           |

 The (Pb)-free symbol or “LF” in the part number denotes lead (Pb)-free, RoHS-compliant package.

## HELIOS™ EDGE RF SUBSYSTEMS

*Complete Helios™ EDGE-based subsystems for quad-band (GSM850, EGSM900, DCS1800, PCS1900) cellular handsets*

Skyworks Helios™ EDGE RF subsystems combine a direct conversion transceiver, PA, and a PA controller/modulator into a radio solution that saves significant space, cost, and design cycle time while providing improved performance.

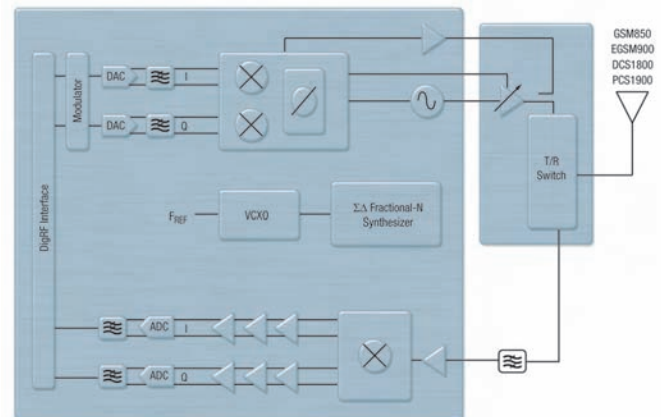


## HELIOS™ DigRF SUBSYSTEM

*Complete two-chip, Helios™ DigRF subsystem for quad-band (GSM850, EGSM900, DCS1800, PCS1900) cellular handsets*

Skyworks Helios™ DigRF EDGE RF Subsystem combines a direct conversion transceiver, PA, and a T/R switch into a dual-chip radio solution that saves significant space, cost, and design cycle time while providing world-class GSM/GPRS/EDGE performance.

At the heart of the radio subsystem is Skyworks advanced Polar Loop™ transmit modulation architecture, which enables the radio to transmit both constant and nonconstant envelope signals through the same transmit path to minimize the number of external components required to build a mobile handset. This significantly reduces the complexity, size, cost, and power requirements of next-generation EDGE platforms.



Helios™ DigRF Subsystem Block Diagram

The Helios™ DigRF Subsystem features:

- Direct connection to single-cell lithium-ion battery
- Polar Loop™ transmit modulation architecture
- Integrated noise filtering; no pre-PA filters required
- Closed loop phase and amplitude modulation (GMSK,  $\pi/8$  8-PSK) via control of nonlinear GSM PA
- PA inside control loop provides excellent EVM and phase error performance with up to 6:1 VSWR without external isolator
- Compliant with V1.12 of the DigRF standard

The Helios™ DigRF Subsystem consists of:

- SKY74200 RF Transceiver—direct conversion transceiver eliminates the need for special baseband processing requirements and external image reject/IF filtering with DigRF interface
- SKY77520 T/R Front-End Module—a highly integrated front-end module with separate GSM850/EGSM900 and DCS1800/PCS1900 PA blocks, a PAC block, impedance matching, an integrated coupler, a PHEMT switch, and a diplexer for excellent EVM and phase error performance

The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## HELIOS™ EDGE RF SUBSYSTEM

*Complete three-chip, Helios™ EDGE-based subsystem for quad-band (GSM850, EGSM900, DCS1800, PCS1900) cellular handsets*

Skyworks Helios™ EDGE RF Subsystem combines a direct conversion transceiver, PA, and a PA controller/modulator into a three-chip radio solution that saves significant space, cost, and design cycle time while providing improved performance.

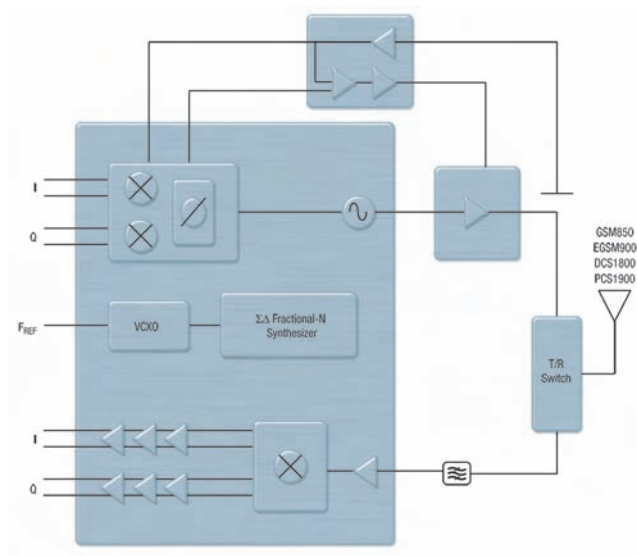
At the heart of the radio subsystem is Skyworks advanced Polar Loop™ transmit modulation architecture, which enables the radio to transmit both constant as well as non-constant envelope signals through the same transmit path to minimize the number of external components required to build a mobile handset. This significantly reduces the complexity, size, cost, and power requirements of next-generation EDGE platforms.

### The Helios™ EDGE RF Subsystem features:

- Polar Loop™ transmit modulation architecture
- Integrated noise filtering; no pre-PA filters required
- Closed loop phase and amplitude modulation (GMSK,  $\pi/8$  8-PSK) via control of nonlinear GSM PA
- PA inside control loop provides excellent EVM and phase error performance with up to 6:1 VSWR without external isolator
- Transmitter with integrated VCOs
- Fully integrated fractional-N synthesizer and UHF VCO
- Impedance matching circuitry

### The Helios EDGE RF Subsystem consists of:

-  SKY74045 RF Transceiver or SKY74945 RF Transceiver—Direct conversion transceiver eliminates the need for special baseband processing requirements and external image reject/IF filtering
-  SKY74046 Power Amplifier Controller—A highly integrated device that enables constant and non-constant envelope signals to be transmitted when combined with the SKY74045
-  SKY77316 Power Amplifier—Incorporates separate GSM850/900 and DCS1800/PCS1900 PA control blocks, impedance matching circuitry for 50  $\Omega$  input and output, and bias control



Helios™ EDGE Subsystem Block Diagram

 The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## HELIOS™ MINI EDGE RF SUBSYSTEM

*Complete two-chip, Helios EDGE-based subsystem for quad-band (GSM850, EGSM900, DCS1800, PCS1900) cellular handsets*

Skyworks Helios™ Mini EDGE RF Subsystem combines a direct conversion transceiver, PA, and a PA controller/modulator into a dual-chip radio solution that saves significant space, cost, and design cycle time while providing world-class GSM/GPRS/EDGE performance.

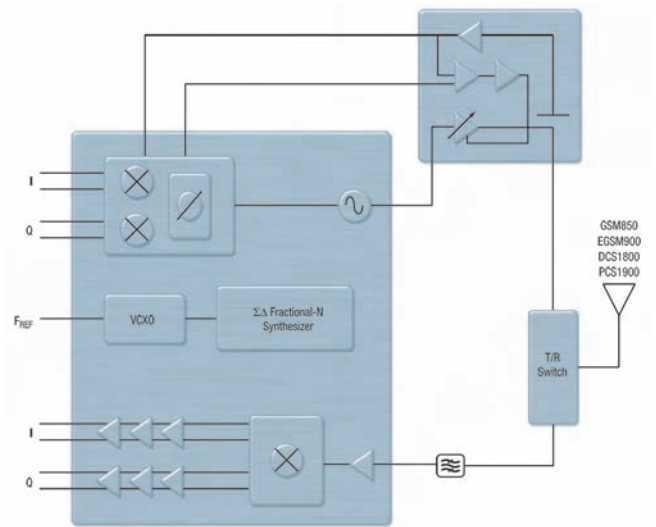
At the heart of the radio subsystem is Skyworks advanced Polar Loop™ transmit modulation architecture, which enables the radio to transmit both constant and non-constant envelope signals through the same transmit path to minimize the number of external components required to build a mobile handset. This significantly reduces the complexity, size, cost, and power requirements of next-generation EDGE platforms.

The Helios™ Mini EDGE RF Subsystem features:

- Polar Loop™ transmit modulation architecture
- Integrated noise filtering; no pre-PA filters required
- Closed loop phase and amplitude modulation (GMSK,  $\pi/8$  8-PSK) via control of nonlinear GSM PA
- PA inside control loop provides excellent EVM and phase error performance with up to 6:1 VSWR without external isolator
- Transmitter with integrated VCOs
- Fully integrated fractional-N synthesizer and UHF VCO
- Impedance matching circuitry

The Helios EDGE RF Subsystem consists of:

-  SKY74945 RF Transceiver—Direct conversion transceiver eliminates the need for special baseband processing requirements and external image reject/IF filtering
-  SKY77332 Power Amplifier with Controller and Coupler—A highly integrated PA and PAC with separate GSM850/EGSM900 and DCS1800/PCS1900 control blocks, envelope amplitude control, 50 Ohm I/O matching circuitry, and excellent EVM and phase error performance



Helios™ Mini EDGE RF Subsystem Block Diagram

## HELIOS™ II EDGE RF SUBSYSTEM

*Complete two-chip, Helios EDGE-based subsystem for quad-band (GSM850, EGSM900, DCS1800, PCS1900) cellular handsets*

Skyworks Helios™ II EDGE RF Subsystem combines a direct conversion transceiver, PA, and a PA controller/modulator into a dual-chip radio solution that saves significant space, cost, and design cycle time while providing world-class GSM/GPRS/EDGE performance.

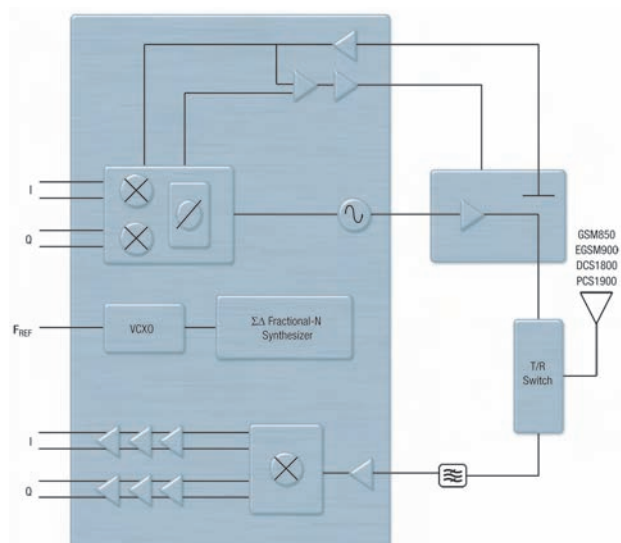
At the heart of the radio subsystem is Skyworks advanced Polar Loop™ transmit modulation architecture, which enables the radio to transmit both constant and non-constant envelope signals through the same transmit path to minimize the number of external components required to build a mobile handset. This significantly reduces the complexity, size, cost, and power requirements of next-generation EDGE platforms.

The Helios™ II EDGE RF Subsystem features:

- Polar Loop™ transmit modulation architecture
- Four integrated differential LNAs
- Integrated noise filtering; no pre-PA filters required
- Closed loop phase and amplitude modulation (GMSK,  $\pi/8$  8-PSK) via control of nonlinear GSM PA
- PA inside control loop provides excellent EVM and phase error performance with up to 6:1 VSWR without external isolator
- Transmitter with integrated VCOs
- Fully integrated fractional-N synthesizer and UHF VCO
- Impedance matching circuitry

The Helios™ II EDGE RF Subsystem consists of:

-  SKY74137 RF Transceiver—Direct conversion transceiver eliminates the need for special baseband processing interfaces. The device also includes Skyworks Polar Loop™ transmit modulation architecture
-  SKY77331 Power Amplifier With Integrated Coupler—A highly integrated PA and PAC with separate GSM850/EGSM900 and DCS1800/PCS1900 control blocks, envelope amplitude control, 50 Ohm I/O matching circuitry, and excellent EVM and phase error performance



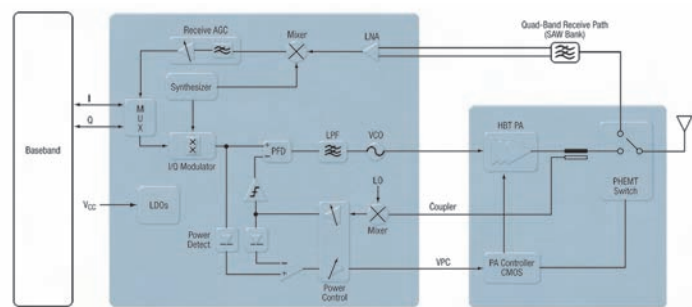
Helios™ II EDGE RF Subsystem Block Diagram

## HELIOS™ II-PLUS EDGE RF SUBSYSTEM

*Complete two-chip, Helios™ EDGE-based subsystem for quad-band (GSM850, EGSM900, DCS1800, PCS1900) cellular handsets*

Skyworks Helios™ II-Plus EDGE RF Subsystem combines a direct conversion transceiver and a transmit/receive Front-End Module into a dual-chip radio solution that saves significant space, cost, and design cycle time while providing world-class GSM/GPRS/EDGE performance.

At the heart of the radio subsystem is Skyworks advanced Polar Loop™ transmit modulation architecture, which enables the radio to transmit both constant and non-constant envelope signals through the same transmit path to minimize the number of external components required to build a mobile handset. This significantly reduces the complexity, size, cost, and power requirements of next-generation EDGE platforms.



Helios™ II-Plus EDGE RF Subsystem Block Diagram

The Helios II-Plus EDGE RF Subsystem features:

- Polar Loop transmit modulation architecture
- Four integrated differential LNAs
- Integrated noise filtering; no pre-PA filters required
- Closed loop phase and amplitude modulation (GMSK, 8-PSK) via control of nonlinear GSM PA
- PA inside control loop provides excellent EVM and phase error performance with up to 6:1 VSWR without external isolator
- Transmitter with integrated VCOs
- Fully integrated fractional-N synthesizer and UHF VCO
- Impedance matching circuitry

The Helios II-Plus EDGE RF Subsystem consists of:

-  SKY74138 RF Transceiver—Direct conversion transceiver eliminates the need for special baseband processing interfaces. The device also includes Skyworks Polar Loop™ transmit modulation architecture
-  SKY77523 Transmit/Receive Front-End Module with Integrated Coupler—A highly integrated Front-End Module with separate GSM850/EGSM900 and DCS1800/PCS1900 control blocks, a PAC Block, impedance-matching circuitry, an integrated coupler, a PHEMP switch, and a diplexer for excellent EVM and phase error performance

 The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## INTERA™ FRONT-END MODULES

Designed with cost and space savings in mind, Skyworks Interatm Front-End Modules combine the company's industry-leading Power Amplifier (PA) module and switch functions into single, low-cost, laminate-based, Multichip Modules (MCMs), 40 percent smaller than alternative solutions. Key features of the transmit front-end modules include multiband/multimode power amplifiers, current sensing power control, high linearity transmit/receive switches, and all associated filtering, duplexing, and control functions. Further, the new module requires no external matching components, accelerating time to market.

Manufactured using Skyworks proprietary Heterojunction Bipolar Transistor (HBT) power amplifier process and low-loss Pseudomorphic High Electron Mobility Transistor (PHEMT) switch technologies, Interatm FEMs deliver superior handset talk and standby time.

The Interatm Front-End Modules feature:

- Multiband/multimode power amplifiers
- High linearity Tx/Rx switches
- Single multichip module design
- Reduced handset design time
- Superior handset talk and standby times



### Front-End Module for WCDMA/CDMA Handsets—Band 2/U.S. PCS (Tx =1850–1910 MHz), (Rx =1930–1990 MHz)

| Part Number                                                                                     | Description                 | Typical Output Power (dBm) | Typical PAE (%) | Typical Gain (dB) | Supply Voltage (V) | Package (mm)              |
|-------------------------------------------------------------------------------------------------|-----------------------------|----------------------------|-----------------|-------------------|--------------------|---------------------------|
| SKY77409<br> | AutoSmart™ FEM for CDMA/PCS | 25.5                       | —               | 23                | 3.2–4.4            | 22-pin MCM<br>5 x 8 x 1.5 |
| SKY77414<br> | Front-End Module for WCDMA  | 23.9                       | —               | 23                | 3.2–4.2            | 22-pin MCM<br>5 x 8 x 1.5 |

 The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## INTERA™ FRONT-END MODULES

Front-End Module for WCDMA/CDMA Handsets—Band 5 & 6/Cellular  
(Tx = 824–849 MHz), (Rx = 869–894 MHz)

| Part Number                                                                                   | Description                  | Typical Output Power (dBm) | Typical PAE (%) | Typical Gain (dB) | Supply Voltage (V) | Package (mm)              |
|-----------------------------------------------------------------------------------------------|------------------------------|----------------------------|-----------------|-------------------|--------------------|---------------------------|
| SKY77408<br> | AutoSmart™ FEM for CDMA/AMPS | 25.5                       | –               | 24                | 3.2–4.4            | 22-pin MCM<br>5 x 8 x 1.5 |
| SKY77413<br> | Front-End Module for WCDMA   | 24.9                       | –               | 25                | 3.2–4.2            | 22-pin MCM<br>5 x 8 x 1.5 |

### Front-End Modules for GSM/EDGE/GPRS

| Part Number                                                                                   | Frequency (MHz)                              | Description                                                                             | Typical Output Power (dBm)                       | Typical PAE (%)                    | Typical Gain (dB) | Supply Voltage (V) | Package (mm)              |
|-----------------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------|------------------------------------|-------------------|--------------------|---------------------------|
| SKY77520<br> | 824–849<br>880–915<br>1710–1785<br>1850–1910 | Tx–Rx FEM Quad-Band GSM EDGE w/<br>Integrated Coupler—Helios System 2.5                 | 33.5<br>33.5<br>30.5<br>32.5                     | 45<br>45<br>38<br>38               | –<br>–<br>–<br>–  | 2.8–4.6            | 28-pin MCM<br>8 x 8 x 1.5 |
| SKY77519<br> | 824–849<br>880–915<br>1710–1785<br>1850–1910 | Tx–Rx FEM Quad-Band GSM GPRS EDGE—<br>Antenna Switch Support for UMTS (WCDMA)<br>Band 1 | 33.5/31.5<br>33.5/31.5<br>31.0/30.5<br>31.0/30.5 | 40/TBD<br>40/TBD<br>35/20<br>35/20 | –<br>–<br>–<br>–  | 2.9–4.6            | 28-pin MCM<br>6 x 6 x 1.1 |

### Front-End Modules for GSM/GPRS

| Part Number                                                                                     | Frequency (MHz)                              | Description                                                                      | Typical Output Power (dBm)   | Typical PAE (%)      | Typical Gain (dB) | Supply Voltage (V) | Package (mm)               |
|-------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------------|------------------------------|----------------------|-------------------|--------------------|----------------------------|
| SKY77518<br> | 880–915<br>1710–1785                         | Tx–Rx iPAC™ FEM Dual-Band GSM/GPRS<br>GSM900<br>DCS1800                          | 33.5<br>32.0                 | 48<br>41             | –<br>–            | 2.7–4.8            | 20-pin MCM<br>6 x 8 x 1.2  |
| SKY77517<br> | 824–849<br>1850–1910                         | Tx–Rx iPAC™ FEM Dual-Band GSM/GPRS<br>GSM850<br>PCS1900                          | 33.7<br>32.0                 | 48<br>41             | –<br>–            | 2.7–4.8            | 20-pin MCM<br>6 x 8 x 1.2  |
| SKY77506<br> | 824–849<br>880–915<br>1710–1785<br>1850–1910 | Tx–Rx iPAC™ FEM for Quad-Band GSM/GPRS<br>GSM850<br>GSM900<br>DCS1800<br>PCS1900 | 34.0<br>34.0<br>31.0<br>31.0 | 48<br>46<br>43<br>42 | –<br>–<br>–<br>–  | 2.9–4.8            | 28-pin MCM<br>8 x 8 x 1.25 |
| SKY77500<br> | 824–849<br>880–915<br>1710–1785<br>1850–1910 | Tx–Rx iPAC™ FEM for Quad-Band<br>GSM850<br>GSM900<br>DCS1800<br>PCS1900          | 34.0<br>33.7<br>31.0<br>31.0 | 43<br>43<br>40<br>40 | –<br>–<br>–<br>–  | 2.9–4.8            | 32-pin MCM<br>8 x 10 x 1.2 |

 The (Pb)-free symbol or “LF” in the part number denotes lead (Pb)-free, RoHS-compliant package.

## INTERA™ FRONT-END MODULES

### Front-End Modules for WLAN

| Part Number                                                                                        | Frequency (GHz)     | Description                                          | 802.11 WLAN Standard | Typ. P <sub>OUT</sub> @ 2.5 % EVM (dBm) | Typ. Current @ V <sub>CC</sub> = 3.3 V (mA) | Typ. Tx Gain (dB) | Architecture                                              | Antenna Ports | Package (mm)            |
|----------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------|----------------------|-----------------------------------------|---------------------------------------------|-------------------|-----------------------------------------------------------|---------------|-------------------------|
| SKY65206-13<br>   | 2.4–2.5             | WLAN 802.11b,g Front-End Module                      | b<br>g               | 19.5<br>16.5                            | 230<br>180                                  | 25<br>25          | One Single-Band Tx/Rx Chain                               | 2             | Laminate<br>8 x 7 x 1.4 |
| SKY65225-11<br>   | 2.4–2.5<br>4.9–5.85 | WLAN 802.11n 2 x 2 MIMO Front-End Module             | b,g,n<br>a,n         | 19<br>16                                | 190<br>180                                  | 24<br>25          | Two Full Dual-Band Tx/Rx Chains                           | 2             | MCM<br>10 x 14 x 0.9    |
| SKY65227-11<br>   | 2.4–2.5             | WLAN 802.11n 2 x 2 MIMO Single-Band Front-End Module | b,g,n                | 19                                      | 190                                         | 25                | Two Full 2 GHz Tx/Rx Chains                               | 2             | MCM<br>10 x 14 x 0.9    |
| SKY65228-11<br>   | 4.9–5.85            | WLAN 802.11n 2 x 2 MIMO Single-Band Front-End Module | a,n                  | 16                                      | 180                                         | 25                | Two Full 5 GHz Tx/Rx Chains                               | 2             | MCM<br>10 x 14 x 0.9    |
| SKY65229-11<br>   | 2.4–2.5<br>4.9–5.85 | WLAN 802.11a,b,g Dual-Band Front-End Module          | b,g,n<br>a,n         | 19<br>16                                | 200<br>185                                  | 26<br>25          | One Full Dual-Band Tx/Rx Chain                            | 2             | Laminate<br>8 x 7 x 0.9 |
| SKY65230-11<br>   | 2.4–2.5<br>4.9–5.85 | WLAN 802.11n 3 x 3 MIMO Front-End Module             | b,g,n<br>a,n         | 18.5<br>15.5                            | 190<br>180                                  | 25<br>24          | Two Full Dual-Band Tx/Rx Chains                           | 3             | MCM<br>10 x 14 x 0.9    |
| SKY65233-11<br>   | 2.4–2.5             | WLAN 802.11n 3 x 3 MIMO Front-End Module             | b,g,n                | 18.5                                    | 190                                         | 25                | Two Full 2 GHz Tx/Rx Chains                               | 3             | MCM<br>10 x 14 x 0.9    |
| SKY65234-11<br>  | 4.9–5.85            | WLAN 802.11n 3 x 3 MIMO Front-End Module             | a,n                  | 15.5                                    | 180                                         | 25                | Two Full 5 GHz Tx/Rx Chains                               | 3             | MCM<br>10 x 14 x 0.9    |
| SKY65240-11<br> | 2.4–2.5<br>4.9–5.85 | WLAN 802.11n 1 x 2 SIMO Front-End Module             | b,g,n<br>a,n         | 19<br>16                                | 190<br>180                                  | 25<br>25          | One Full Dual-Band Tx Chain, Two Full Dual-Band Rx chains | 2             | MCM<br>10 x 14 x 0.9    |

 The (Pb)-free symbol or “LF” in the part number denotes lead (Pb)-free, RoHS-compliant package.

## TD-SCDMA POWER AMPLIFIERS

### PA Modules for SCDMA Handsets

| Part Number                                                                                   | Frequency (MHz) | Description      | Typical Output Power (dBm) | Typical PAE (%) | Typical Gain (dB) | Supply Voltage (V) | Package (mm)              |
|-----------------------------------------------------------------------------------------------|-----------------|------------------|----------------------------|-----------------|-------------------|--------------------|---------------------------|
| SKY77161<br> | 2010–2025       | PAM for TD-SCDMA | 27.5                       | 38              | 27.5              | 3.2–4.2            | 10-pin MCM<br>4 x 4 x 1.2 |

## WCDMA/CDMA POWER AMPLIFIERS

### PA Modules for WCDMA/CDMA Handsets—Band 1

| Part Number                                                                                     | Frequency (MHz) | Description              | Typical Output Power (dBm) | Typical PAE (%) | Typical Gain (dB) | Supply Voltage (V) | Package (mm)              |
|-------------------------------------------------------------------------------------------------|-----------------|--------------------------|----------------------------|-----------------|-------------------|--------------------|---------------------------|
| SKY77173<br>   | 1920–1980       | AutoSmart™ PAM for WCDMA | 28.0                       | 41.0            | 28.0              | 3.2–4.2            | 8-pin MCM<br>3 x 3 x 1.15 |
| SKY77410<br>   | 1850–1980       | LIPA® Module for WCDMA   | 27.5                       | 40.5            | 27.5              | 3.2–4.2            | 16-pin MCM<br>4 x 4 x 1.5 |
| SKY77171<br>   | 1920–1980       | AutoSmart™ PAM for WCDMA | 28.0                       | 41.0            | 28.0              | 3.2–4.2            | 10-pin MCM<br>4 x 4 x 1.5 |
| SKY77152<br> | 1920–1980       | PAM for WCDMA            | 28.0                       | 40.0            | 28.5              | 3.2–4.2            | 10-pin MCM<br>4 x 4 x 1.5 |
| SKY77420<br> | 1920–1980       | LIPA® Module for WCDMA   | 28.0                       | 38.0            | 29.0              | 3.2–4.2            | 16-pin MCM<br>4 x 4 x 1.2 |
| SKY77178<br> | 1850–1910       | AutoSmart™ PAM for HSDPA | 28.0                       | 40.0            | 27.5              | 3.2–4.2            | 8-pin MCM<br>3 x 3 x 1.2  |
| SKY77179<br> | 824–849         | AutoSmart™ PAM for HSDPA | 28.0                       | 40.0            | 28.0              | 3.2–4.2            | 8-pin MCM<br>3 x 3 x 1.2  |

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## WCDMA/CDMA POWER AMPLIFIERS

### PA Modules for WCDMA/CDMA Handsets—Band 2/U.S. PCS

| Part Number                                                                                   | Frequency (MHz) | Description                    | Typical Output Power (dBm) | Typical PAE (%) | Typical Gain (dB) | Supply Voltage (V) | Package (mm)              |
|-----------------------------------------------------------------------------------------------|-----------------|--------------------------------|----------------------------|-----------------|-------------------|--------------------|---------------------------|
| SKY77418<br> | 1850–1910       | LIPA® PAM for CDMA/PCS         | 28                         | 38              | 28.0              | 3.2–4.2            | 16-pin MCM<br>4 x 4 x 1.2 |
| SKY77164<br> | 1850–1910       | AutoSmart™ PAM for CDMA/PCS    | 28                         | 40              | 28.0              | 3.2–4.2            | 8-pin MCM<br>3 x 3 x 1.2  |
| SKY77149<br> | 1850–1910       | System Smart® PAM for CDMA PCS | 28                         | 40              | 28.0              | 3.2–4.2            | 8-pin MCM<br>3 x 3 x 1.2  |
| CX77112<br>  | 1850–1910       | PAM for CDMA PCS               | 29                         | 40              | 28.5              | 3.2–4.2            | 10-pin MCM<br>4 x 4 x 1.5 |
| CX77107<br>  | 1850–1910       | PAM for CDMA PCS               | 28                         | 39              | 28.0              | 3.2–4.2            | 10-pin MCM<br>4 x 4 x 1.5 |

### PA Modules for CDMA Handsets—Bands 5 and 6/Cellular

| Part Number                                                                                     | Frequency (MHz) | Description                     | Typical Output Power (dBm) | Typical PAE (%) | Typical Gain (dB) | Supply Voltage (V) | Package (mm)              |
|-------------------------------------------------------------------------------------------------|-----------------|---------------------------------|----------------------------|-----------------|-------------------|--------------------|---------------------------|
| SKY77163<br> | 824–849         | AutoSmart™ PAM for CDMA AMPS    | 28<br>31                   | 40.0<br>55.0    | 28.0<br>27.0      | 3.2–4.2            | 8-pin MCM<br>3 x 3 x 1.2  |
| SKY77162<br> | 824–849         | System Smart® PAM for CDMA AMPS | 28<br>31                   | 40.5<br>55.0    | 28.5<br>28.5      | 3.2–4.2            | 8-pin MCM<br>3 x 3 x 1.2  |
| SKY77156<br> | 824–849         | System Smart® PAM for CDMA AMPS | 28<br>31                   | 39.0<br>55.0    | 29.0<br>29.0      | 3.2–4.2            | 10-pin MCM<br>4 x 4 x 1.5 |
| SKY77154<br> | 824–849         | System Smart® PAM for CDMA AMPS | 28<br>31                   | 39.0<br>54.0    | 29.0<br>29.0      | 3.2–4.2            | 8-pin MCM<br>3 x 3 x 1.2  |
| CX77140<br>  | 824–849         | PAM for Dual-Mode CDMA AMPS     | 28<br>31                   | 40.0<br>54.0    | 29.0<br>28.0      | 3.2–4.2            | 10-pin MCM<br>4 x 4 x 1.5 |
| CX77105<br>  | 824–849         | PAM for Dual-Mode CDMA AMPS     | 28<br>31                   | 40.0<br>55.0    | 29.0<br>29.0      | 3.2–4.2            | 10-pin MCM<br>4 x 4 x 1.5 |

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## WCDMA/CDMA POWER AMPLIFIERS

### PA Modules for CDMA Handsets—Other Bands

| Part Number                                                                                   | Frequency (MHz)        | Description                                 | Typical Output Power (dBm) | Typical PAE (%) | Typical Gain (dB) | Supply Voltage (V) | Package (mm)              |
|-----------------------------------------------------------------------------------------------|------------------------|---------------------------------------------|----------------------------|-----------------|-------------------|--------------------|---------------------------|
| SKY77155<br> | 1750–1780<br>1710–1785 | System Smart® PAM for CDMA PCS WCDMA        | 28<br>28                   | 40.0<br>38.0    | 29.0<br>29.0      | 3.2–4.2            | 8-pin MCM<br>3 x 3 x 1.2  |
| SKY77148<br> | 450–460                | PAM for CDMA2000                            | 29                         | 38.0            | 31.0              | 3.2–4.2            | 7-pin MCM<br>6 x 6 x 1.5  |
| SKY77147<br> | 1750–1805              | System Smart® PAM for CDMA PCS (Korea Band) | 28                         | 42.5            | 28.0              | 3.2–4.2            | 10-pin MCM<br>4 x 4 x 1.5 |
| CX77144<br>  | 887–925                | PAM for J-CDMA                              | 27                         | 40.0            | 27.5              | 3.2–4.2            | 10-pin MCM<br>4 x 4 x 1.5 |
| CX77106<br>  | 1750–1805              | PAM for CDMA, Korea PCS, China TD-SCDMA     | 28                         | 40.0            | 29.0              | 3.2–4.2            | 10-pin MCM<br>4 x 4 x 1.5 |
| SKY77177<br> | 1710–1755              | AutoSmart™ PAM for WCDMA                    | 28                         | 40.0            | 29.0              | 3.2–4.2            | 8-pin MCM<br>3 x 3 x 1.2  |

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## LINEAR PRODUCTS

### Linear Products

|                                             |           |
|---------------------------------------------|-----------|
| <b>Amplifiers</b> .....                     | <b>20</b> |
| <b>Attenuators</b> .....                    | <b>23</b> |
| <b>Chip Capacitors</b> .....                | <b>26</b> |
| <b>Diodes</b> .....                         | <b>27</b> |
| <b>Directional Couplers/Detectors</b> ..... | <b>55</b> |
| <b>Hybrids</b> .....                        | <b>55</b> |
| <b>Infrastructure RF Subsystems</b> .....   | <b>56</b> |
| <b>Mixers/Demodulators</b> .....            | <b>60</b> |
| <b>Modulators</b> .....                     | <b>61</b> |
| <b>Power Dividers/Combiners</b> .....       | <b>61</b> |
| <b>Phase Shifters</b> .....                 | <b>62</b> |
| <b>Receivers</b> .....                      | <b>63</b> |

|                                                                                                      |            |
|------------------------------------------------------------------------------------------------------|------------|
| <b>Switches</b> .....                                                                                | <b>64</b>  |
| <b>Synthesizers/PLLs</b> .....                                                                       | <b>67</b>  |
| <b>Technical Ceramics</b> .....                                                                      | <b>68</b>  |
| These products are produced by Trans-Tech<br>(a wholly owned subsidiary of Skyworks Solutions, Inc.) |            |
| <b>WiMAX RF Subsystems</b> .....                                                                     | <b>78</b>  |
| <b>WLAN Front-End Modules</b> .....                                                                  | <b>81</b>  |
| <b>Reference Material</b> .....                                                                      | <b>82</b>  |
| <b>Skyworks Sales Representatives</b> .....                                                          | <b>108</b> |
| <b>Skyworks Distributors</b> .....                                                                   | <b>109</b> |
| <b>Skyworks Sales Offices</b> .....                                                                  | <b>115</b> |



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Tin/lead (SnPb) packaging is not recommended for new designs.

## WIRELESS INFRASTRUCTURE POWER AMPLIFIERS

### Low Current Power Amplifier Drivers

| Part Number                                                                                | Test Frequency (MHz) | RF Frequency (MHz) | P <sub>1</sub> dB (dBm) | Gain (dB) | Power-Added Efficiency (%) | Quiescent Current (mA) | Noise Figure (dB) | Package (mm) |
|--------------------------------------------------------------------------------------------|----------------------|--------------------|-------------------------|-----------|----------------------------|------------------------|-------------------|--------------|
|  SKY65008 | 900                  | 250–2700           | 19.5                    | 28.5      | –                          | –                      | 3.3               | 4 x 4 MCM    |
|                                                                                            | 1960                 |                    | 21.0                    | 20.0      | 42                         | 76                     | 3.0               |              |
|                                                                                            | 2140                 |                    | 21.0                    | 20.0      | –                          | –                      | 3.0               |              |
|                                                                                            | 2450                 |                    | 20.0                    | 18.5      | –                          | –                      | 3.0               |              |
|                                                                                            | 2650                 |                    | 19.0                    | 18.0      | –                          | –                      | 3.0               |              |
|  SKY65009 | 450                  | 250–2500           | 24.0                    | 22.0      | –                          | –                      | –                 | 4 x 4 MCM    |
|                                                                                            | 900                  |                    | 27.0                    | 17.5      | –                          | –                      | –                 |              |
|                                                                                            | 1960                 |                    | 25.0                    | 12.0      | 41                         | 116                    | 4.5               |              |
|                                                                                            | 2140                 |                    | 28.0                    | 11.5      | –                          | –                      | –                 |              |
|                                                                                            | 2450                 |                    | 28.0                    | 10.0      | 42                         | –                      | –                 |              |

| Part Number                                                                                     | RF Frequency (MHz) | P <sub>1</sub> dB (dBm) | Gain (dB) | Output IP3 (dBm) | Supply Voltage (V) | Power-Added Efficiency (%) | Quiescent Current (mA) | Noise Figure (dB) | Test Frequency (MHz) | Package (mm)              |
|-------------------------------------------------------------------------------------------------|--------------------|-------------------------|-----------|------------------|--------------------|----------------------------|------------------------|-------------------|----------------------|---------------------------|
|  SKY65028-70LF | 250–2700           | 25                      | 15.5      | 42               | 5/3.3              | 48                         | 125                    | 5.5               | 1960                 | 4-pin SOT-89<br>4.5 x 2.4 |
|  SKY65119      | 700–800            | –                       | 30.0      | 42               | –                  | 35                         | 220                    | 4.5               | 750                  | 12-pin MCM 8 x 8          |

### Linear Power Amplifier Modules (50 Ω Input/Output)

| Part Number | RF Frequency (MHz) | P <sub>OUT</sub> (dBm) | Gain (dB) | Output IP3 (dBm) | Supply Voltage (V) | Power-Added Efficiency (%) | Quiescent Current (mA) | Noise Figure (dB) | Test Frequency (MHz) | Package (mm)       |
|-------------|--------------------|------------------------|-----------|------------------|--------------------|----------------------------|------------------------|-------------------|----------------------|--------------------|
| CX65100     | 700–1000           | 30.0                   | 30        | 39               | 3.4                | 45                         | 110                    | 4.0               | 900                  | 8-pin LCC<br>8 x 8 |
| CX65101     | 1700–2200          | 30.0                   | 23        | 39               | 3.4                | 35                         | 125                    | 4.5               | 1900                 | 8-pin LCC<br>8 x 8 |
| CX65104     | 700–1000           | 31.0                   | 29        | 42               | 5.0                | 39                         | 75                     | 4.0               | 900                  | 8-pin LCC<br>8 x 8 |
| CX65105     | 1700–2200          | 28.5                   | 25        | 40               | 5.0                | 30                         | 143                    | 6.0               | 1900                 | 8-pin LCC<br>8 x 8 |

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## WIRELESS INFRASTRUCTURE POWER AMPLIFIERS

### Ultralinear PA Drivers

| Part Number                                                                                   | RF Frequency (MHz) | P <sub>1</sub> dB (dBm) | Gain (dB) | Output IP3 (dBm) | Supply Voltage (V) | Power-Added Efficiency (%) | Quiescent Current (mA) | Noise Figure (dB) | Test Frequency (MHz) | Package (mm)                |
|-----------------------------------------------------------------------------------------------|--------------------|-------------------------|-----------|------------------|--------------------|----------------------------|------------------------|-------------------|----------------------|-----------------------------|
| CX65001                                                                                       | 160–700            | 24.0                    | 22.0      | 45               | 5                  | 42                         | 120                    | 5.0               | 450                  | 8-pin SOIC<br>4.928 x 3.937 |
| CX65002                                                                                       | 700–1400           | 24.0                    | 18.0      | 44               | 5                  | 38                         | 120                    | 5.0               | 900                  | 8-pin SOIC<br>4.928 x 3.937 |
| CX65003                                                                                       | 1400–2500          | 24.5                    | 11.5      | 48               | 5                  | 38                         | 120                    | 5.0               | 1960                 | 8-pin SOIC<br>4.928 x 3.937 |
|  SKY65004-11 | 250–2700           | 25.0                    | 16.0      | 42               | 3/5                | 48                         | 125                    | 5.5               | 1960                 | 4-pin SOT-89<br>4.5 x 2.4   |
|  SKY65004-21 | 250–2700           | 25.0                    | 16.0      | 42               | 3/5                | 48                         | 125                    | 5.5               | 1960                 | 3-pin 4 x 4 MCM             |
| SKY65112-84LF                                                                                 | 400–2300           | 27.0                    | 18/14.5   | 42               | 5.0                | –                          | 260                    | –                 | 960/1960             | 8-pin SOIC                  |
| SKY65113-84LF                                                                                 | 400–2300           | 30.0                    | 18/13.5   | 46               | 5.0                | –                          | 450                    | –                 | 960/1960             | 8-pin SOIC                  |

### WLAN AND ISM POWER AMPLIFIERS

| Part Number                                                                                  | Frequency (GHz) | 802.11 WLAN Standard | P <sub>OUT</sub> (dBm) | Saturated P <sub>OUT</sub> (dBm) Max. | Gain (dB) | Power-Added Efficiency | Current Consumption (mA) | Supply Voltage (V) | Package (mm)                      |
|----------------------------------------------------------------------------------------------|-----------------|----------------------|------------------------|---------------------------------------|-----------|------------------------|--------------------------|--------------------|-----------------------------------|
| AP147-320                                                                                    | 0.902–0.928     | ISM                  | 33                     | 35                                    | 35        | 53                     | 1400                     | 2.7–4.2            | QFN-16 3 x 3<br>Surface Mount     |
| <b>SKY65111-348LF</b>                                                                        | 0.800–1.000     | ISM                  | 33                     | 35                                    | 37        | 58                     | 1200                     | 2.7–4.2            | QFN-16 3 x 3<br>Surface Mount     |
| AP172-317LF                                                                                  | 1.800–2.500     | b                    | 24                     | 27                                    | 33        | –                      | 240                      | 2.5–4.5            | QFN-16 4 x 4<br>Surface Mount     |
| AP163-317LF                                                                                  | 1.800–2.500     | b                    | 23                     | 27                                    | 20        | –                      | 170                      | 2.5–4.5            | QFN-16 4 x 4<br>Surface Mount     |
| SKY65006                                                                                     | 2.400–2.500     | b, g                 | 21 (b)<br>18 (g)       | 24                                    | 27        | –                      | 190 (b)<br>129 (g)       | 3.0–3.6            | QFN-16 3 x 3<br>Surface Mount     |
|  SKY65131 | 2.300–2.700     | b, g                 | 28 (b)<br>26 (g)       | 30                                    | 26        | 41 (b)<br>33 (g)       | 490 (b)<br>400 (g)       | 3.0–3.6            | 16-pin 4 x 4 MCM<br>Surface Mount |
|  SKY65132 | 2.300–2.700     | b, g                 | 29 (b)<br>27 (g)       | 33                                    | 34        | 20 (b)<br>18 (g)       | 950 (b)<br>930 (g)       | 3.0–3.6            | 20-pin 6 x 6 MCM<br>Surface Mount |
|  SKY65135 | 2.300–2.700     | b, g                 | 31 (b)<br>30 (g)       | 30                                    | 33        | 25                     | 1150                     | 3.3–5.0            | 20-pin 6 x 6 MCM<br>Surface Mount |

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## GENERAL-PURPOSE POWER AMPLIFIERS

| Part Number                                                                                     | Frequency Band (GHz) | 3 dB Band | V <sub>CC</sub> (V) Typ. | I <sub>CC</sub> (mA) | Gain @ 2 GHz (dB) | NF @ 2 GHz | Output IP3 @ 2 GHz (dBm) | P <sub>1</sub> dB @ 2 GHz | Package |
|-------------------------------------------------------------------------------------------------|----------------------|-----------|--------------------------|----------------------|-------------------|------------|--------------------------|---------------------------|---------|
|  SKY65013-70LF | DC-8                 | DC-7      | 3.5                      | 40                   | 14.0              | 5.5        | 29                       | 14 dBm                    | SOT-89  |
|  SKY65014-70LF | DC-7                 | DC-6      | 4.6                      | 65                   | 15.5              | 4.8        | 37                       | 18 dBm @ 3 GHz            | SOT-89  |
|  SKY65015-70LF | DC-7                 | DC-6      | 4.5                      | 65/85                | 18.0              | 4.2        | 35                       | 18/19 dBm @ 4 GHz         | SOT-89  |
|  SKY65016-70LF | DC-3                 | DC-2.5    | 3.5                      | 35                   | 22.0              | 4.8        | 30                       | 14 dBm                    | SOT-89  |
|  SKY65017-70LF | DC-6                 | DC-5      | 5.0                      | 100                  | 20.0              | 4.5        | 38                       | 20 dBm @ 3 GHz            | SOT-89  |
| SKY65013-92LF                                                                                   | DC-12                | DC-10     | 3.5                      | 40                   | 14.0              | 5.8        | 29                       | 14 dBm                    | SC-88   |
| SKY65014-92LF                                                                                   | DC-9                 | DC-8      | 4.6                      | 65                   | 15.5              | 5.4        | 37                       | 18 dBm @ 3 GHz            | SC-88   |
| SKY65015-92LF                                                                                   | DC-6                 | DC-6      | 4.5                      | 65/85                | 18.0              | 4.8        | 35                       | 18/19 dBm @ 4 GHz         | SC-88   |
| SKY65016-92LF                                                                                   | DC-3                 | DC-2.5    | 3.5                      | 35                   | 22.0              | 5.7        | 30                       | 14 dBm                    | SC-88   |
| SKY65013-214LF                                                                                  | DC-6                 | DC-4      | 3.5                      | 40                   | 14.0              | 5.4        | 29                       | 14 dBm                    | Micro-X |
| SKY65014-214LF                                                                                  | DC-6                 | DC-3      | 4.6                      | 65                   | 15.5              | 4.6        | 37                       | 18 dBm @ 3 GHz            | Micro-X |
| SKY65015-214LF                                                                                  | DC-6                 | DC-3      | 4.5                      | 65/85                | 18.0              | 5.2        | 35                       | 18/19 dBm @ 4 GHz         | Micro-X |
| SKY65016-214LF                                                                                  | DC-3                 | DC-2.5    | 3.5                      | 35                   | 22.0              | 6.5        | 30                       | 14 dBm                    | Micro-X |

| Part Number | Frequency Band (GHz) | V <sub>CC</sub> (V) Typ. | I <sub>CC</sub> (mA) | Gain @ 900 MHz (dB) | NF @ 1 GHz | Input IP3 @ 900 MHz (dBm) | P <sub>1</sub> dB @ 2 GHz (dBm) | Package            |
|-------------|----------------------|--------------------------|----------------------|---------------------|------------|---------------------------|---------------------------------|--------------------|
| AL106-84LF  | 700-1000             | 5                        | 80                   | 14                  | 1.8        | 18.5                      | 7                               | SOIC-8 Exposed Pad |

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## DC–6 GHz PLASTIC PACKAGED ATTENUATORS

### Digital Attenuators

| Part Number           | Frequency (GHz) | Description                                    | Insertion Loss Range (dB) Typ. | Attenuation Range (dB) Typ. | IP3 > 0.5 GHz (dBm) Typ. | Package (mm)      |
|-----------------------|-----------------|------------------------------------------------|--------------------------------|-----------------------------|--------------------------|-------------------|
| AA103-72LF            | DC–2.5          | 1 Bit, 10 dB                                   | 0.30–0.70                      | 10.0                        | 45                       | SOT-5             |
| AA116-72LF            | DC–2.5          | 1 Bit, 15 dB                                   | 0.35–0.50                      | 15.0                        | 45                       | SOT-5             |
| AA104-73LF            | 300 kHz–2.5 GHz | 1 Bit, 32 dB                                   | 0.80–1.20                      | 32.0                        | 44                       | SOT-6             |
| <b>SKY12324-73LF</b>  | 0.5–3.0         | 2 Bit, LSB 4 dB, Single Pos. CTL               | 0.90–1.30                      | 12.0                        | 45                       | SOT-6             |
| SKY12325-350LF        | 0.5–6.0         | 3 Bit, LSB 1 dB, Single Pos. CTL               | 0.70–1.30                      | 7                           | 45                       | QFN 3 x 3         |
| AA100-59LF            | 0.75–2.0        | 3 Bit, LSB 4 dB                                | 1.80–2.10                      | 28.0                        | 45                       | MSOP-8            |
| AA210-25LF            | DC–2.0          | 4 Bit, LSB 1 dB                                | 0.90–2.00                      | 15.0                        | 48                       | SOIC-16           |
| AA226-87LF            | 0.5–2.5         | 4 Bit, LSB 1 dB, Single Pos. CTL               | 1.30–2.00                      | 15.0                        | 48                       | TSSOP-16          |
| AA105-86LF            | 0.5–3.0         | 4 Bit, LSB 1 dB, Single Pos. CTL               | 1.30–2.00                      | 15.0                        | 48                       | MSOP-10           |
| <b>AA264-87LF</b>     | 0.5–2.0         | 4 Bit, LSB 2 dB, Single Pos. CTL               | 1.60–2.00                      | 30.0                        | 45                       | TSSOP-16          |
| AT001D6-25            | 300 kHz–1.0 GHz | 4 Bit, LSB 3 dB                                | 1.50–3.60                      | 45.0                        | 43                       | SOIC-16           |
| AA107-310LF           | DC–2.0          | 5 Bit, LSB 0.5 dB, w/Serial-to-Parallel Driver | 1.40–1.70                      | 15.5                        | 50                       | QFN 5 x 5 32-lead |
| <b>AA106-86LF</b>     | 0.5–2.0         | 5 Bit, LSB 0.5 dB, Single Pos. CTL             | 1.70–2.60                      | 15.5                        | 48                       | MSOP-10           |
| <b>SKY12322-86LF</b>  | 0.5–4.0         | 5 Bit, LSB 0.5 dB, Single Pos. CTL             | 1.30–3.00                      | 15.5                        | 45                       | MSOP-10           |
| AA102-80LF            | 0.5–2.5         | 5 Bit, LSB 0.5 dB, Single Pos. CTL             | 1.70–2.90                      | 15.5                        | 48                       | SSOP-16           |
| AA280-25LF            | 300 kHz–2.0 GHz | 5 Bit, LSB 0.5 dB                              | 1.10–2.20                      | 15.5                        | 48                       | SOIC-16           |
| AA260-85LF            | 300 kHz–2.0 GHz | 5 Bit, LSB 1 dB                                | 1.30–2.50                      | 31.0                        | 48                       | SSOP-20           |
| AA110-85LF            | DC–2.0          | 5 Bit, LSB 1 dB, w/Driver                      | 1.40–2.20                      | 31.0                        | 48                       | SSOP-20           |
| AA117-85LF            | DC–2.0          | 5 Bit, LSB 1 dB, w/Driver                      | 1.40–2.20                      | 31.0                        | 48                       | SSOP-20           |
| <b>AA101-80LF</b>     | 0.5–2.5         | 5 Bit, LSB 1 dB, Single Pos. CTL               | 1.80–2.90                      | 31.0                        | 45                       | SSOP-16           |
| <b>SKY12323-303LF</b> | 0.5–3.0         | 5 Bit, LSB 1 dB, Single Pos. CTL               | 1.40–2.30                      | 31                          | 45                       | MSOP-10EP         |
| AA109-310LF           | 0.5–2.5         | 5 Bit, LSB 1 dB, w/Serial-to-Parallel Driver   | 2.00–3.10                      | 31.0                        | 45                       | QFN 5 x 5         |
| AA113-310LF           | DC–1.0          | 6 Bit, LSB 0.5 dB, w/Driver                    | 1.50–1.80                      | 31.5                        | 48                       | QFN 5 x 5 32-lead |
| SKY12332-310LF        | DC–1.0          | 6 Bit, LSB 0.5 dB, Low Noise Floor, w/Driver   | 1.50–1.80                      | 31.5                        | 48                       | QFN 5 x 5 32-lead |

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## DC–6 GHz PLASTIC PACKAGED ATTENUATORS

### IC Voltage Variable — FET Based Attenuators

| Part Number       | Frequency (GHz) | Description                                     | Insertion Loss Range (dB) Typ. | Attenuation Range (dB) Typ. | IP3 > 0.5 GHz (dBm) Typ. | Package (mm)               |
|-------------------|-----------------|-------------------------------------------------|--------------------------------|-----------------------------|--------------------------|----------------------------|
| AF002N2-32LF      | 300 kHz–2.0 GHz | 15 dB, Single CTL                               | 3.1–3.8                        | 15–7                        | 18                       | SOT-143                    |
| AV103-12LF        | 0.5–2.5         | Single, 5 V CTL High Speed                      | 2.5–3.2                        | 35                          | 12                       | SOIC-8                     |
| AV104-12LF        | 0.5–2.5         | Single, 5 V CTL High IP3                        | 2.5–3.5                        | 25                          | 20                       | SOIC-8                     |
| <b>AV105-12LF</b> | 0.5–2.5         | Single, 5 V CTL                                 | 2.7–3.5                        | 35                          | 15                       | SOIC-8                     |
| AV108-59LF        | 0.5–2.5         | Single, 3 V CTL Rev. Transfer (AV106 in MSOP-8) | 3.4–3.8                        | 35                          | 10                       | MSOP-8                     |
| AV109-73LF        | 0.8–1.0         | Single, 3 V CTL Rev. Transfer                   | 3.3–3.5                        | 32                          | 15                       | SOT-6                      |
| AV110-73LF        | 1.7–2.5         | Single, 3 V CTL Rev. Transfer                   | 3.5–3.8                        | 32–27                       | 12                       | SOT-6                      |
| SKY12146-321LF    | 2.7–4.0         | 25 dB Single CTL                                | 1.5–1.6                        | 32–25                       | 20                       | QFN-12 3 x 3 Surface Mount |

### IC Voltage Variable — PIN Based Attenuators

| Part Number       | Frequency (GHz) | Description               | Insertion Loss Range (dB) Typ. | Attenuation Range (dB) Typ. | IP3 > 0.5 GHz (dBm) Typ. | Package (mm) |
|-------------------|-----------------|---------------------------|--------------------------------|-----------------------------|--------------------------|--------------|
| <b>AV101-12LF</b> | 0.8–1.0         | HIP3™ Variable Attenuator | 1                              | 20                          | 50                       | SOIC-8       |
| <b>AV102-12LF</b> | 1.7–2.0         | HIP3™ Variable Attenuator | 1                              | 20                          | 50                       | SOIC-8       |
| AV111-12LF        | 0.8–1.0         | HIP3™ Variable Attenuator | 1                              | 30                          | 40                       | SOIC-8       |
| AV112-12LF        | 1.7–2.0         | HIP3™ Variable Attenuator | 1                              | 30                          | 40                       | SOIC-8       |
| <b>AV113-12LF</b> | 2.1–2.3         | HIP3™ Variable Attenuator | 1                              | 21                          | 40                       | SOIC-8       |

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## DC–6 GHz PLASTIC PACKAGED ATTENUATORS

### IC Voltage Variable — PIN Based Attenuators (Continued)

| Part Number                                                                                    | Frequency (MHz)        | Description                 | Insertion Loss Range (dB) Max. | Attenuation Range @ 10 V (dB) Min. | Attenuation Range @ 12 V (dB) Min. | IP3 (dBm) Typ. | Control Voltage Range (V) Typ. | Package              |
|------------------------------------------------------------------------------------------------|------------------------|-----------------------------|--------------------------------|------------------------------------|------------------------------------|----------------|--------------------------------|----------------------|
|  SKY12143-315 | 869–894<br>925–960     | Voltage Variable Attenuator | 1.5                            | 18–22                              | 23                                 | 43             | 0–12                           | LGA<br>Surface Mount |
|  SKY12144-315 | 1805–1870<br>1930–1990 | Voltage Variable Attenuator | 1.5                            | 18–22                              | 23                                 | 32             | 0–12                           | LGA<br>Surface Mount |
|  SKY12145-315 | 2110–2170              | Voltage Variable Attenuator | 1.5                            | 18–22                              | 23                                 | 43             | 0–12                           | LGA<br>Surface Mount |

## DC–40 GHz ATTENUATORS

### Fixed Attenuator Pads

| Part Number                                                                                    | Nominal Attenuation IL (dB) | Tolerance @ DC (dB) | Maximum Flatness |                  |                | Outline Drawing Number | Package |
|------------------------------------------------------------------------------------------------|-----------------------------|---------------------|------------------|------------------|----------------|------------------------|---------|
|                                                                                                |                             |                     | DC–12 GHz (dB)   | DC–26.5 GHz (dB) | DC–40 GHz (dB) |                        |         |
|  ATN3580-01   | 1                           | ±0.15               | 0.2              | 0.5              | 1              | 516-060                | Chip    |
|  ATN3580-02   | 2                           | ±0.15               | 0.2              | 0.5              | 1              | 516-060                | Chip    |
|  ATN3580-03  | 3                           | ±0.25               | 0.2              | 0.5              | 1              | 516-060                | Chip    |
|  ATN3580-04 | 4                           | ±0.25               | 0.2              | 0.5              | 1              | 516-060                | Chip    |
|  ATN3580-05 | 5                           | ±0.25               | 0.2              | 0.5              | 1              | 516-060                | Chip    |
|  ATN3580-06 | 6                           | ±0.25               | 0.4              | 0.6              | 1              | 518-060                | Chip    |
|  ATN3580-07 | 7                           | ±0.25               | 0.4              | 0.6              | 1              | 518-060                | Chip    |
|  ATN3580-08 | 8                           | ±0.35               | 0.4              | 0.6              | 1              | 518-060                | Chip    |
|  ATN3580-09 | 9                           | ±0.35               | 0.4              | 0.6              | 1              | 518-060                | Chip    |
|  ATN3580-10 | 10                          | ±0.35               | 0.4              | 0.6              | 1              | 518-060                | Chip    |
|  ATN3580-12 | 12                          | ±0.50               | 0.4              | 0.6              | 1              | 518-060                | Chip    |
|  ATN3580-15 | 15                          | ±0.50               | 0.4              | 0.6              | 1              | 518-060                | Chip    |
|  ATN3580-20 | 20                          | ±1.10               | 1.0              | 2.0              | 4              | 518-060                | Chip    |
|  ATN3580-30 | 30                          | ±1.60               | 1.0              | 2.0              | 4              | 518-060                | Chip    |
|  ATN3580-40 | 40                          | ±1.60               | 1.0              | 2.0              | 4              | 518-060                | Chip    |

 Skyworks Green products are lead (Pb)-free, Restriction of Hazardous Substances (RoHS)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, and are free from antimony trioxide, and brominated flame retardants.

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## MIS SILICON CHIP CAPACITORS

| Part Number                                                                                    | Capacitance Value<br>(pF) $\pm$ 20% | Size (mils) |
|------------------------------------------------------------------------------------------------|-------------------------------------|-------------|
|  SC00080912   | 0.8                                 | 12 x 12     |
|  SC00120912   | 1.2                                 | 12 x 12     |
|  SC00180912   | 1.8                                 | 12 x 12     |
|  SC00260912   | 2.6                                 | 12 x 12     |
|  SC00380912   | 3.8                                 | 12 x 12     |
|  SC00560912   | 5.6                                 | 12 x 12     |
|  SC00680912   | 6.8                                 | 12 x 12     |
|  SC00820710   | 8.2                                 | 10 x 10     |
|  SC00821518   | 8.2                                 | 18 x 18     |
|  SC01000710   | 10                                  | 10 x 10     |
|  SC01000912   | 10                                  | 12 x 12     |
|  SC01001518   | 10                                  | 18 x 18     |
|  SC01500912   | 15                                  | 12 x 12     |
|  SC01501518   | 15                                  | 18 x 18     |
|  SC02201518   | 22                                  | 18 x 18     |
|  SC03301518   | 33                                  | 18 x 18     |
|  SC04701518  | 47                                  | 18 x 18     |
|  SC06801518 | 68                                  | 18 x 18     |
|  SC10002430 | 100                                 | 30 x 30     |
|  SC33303440 | 333                                 | 40 x 40     |
|  SC50004450 | 500                                 | 50 x 50     |
|  SC99906068 | 1000                                | 68 x 68     |



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## LIMITER DIODES

### Plastic Packaged Silicon Limiter Diodes

| Part Number    | $V_B$<br>$I_R = 10 \mu A$ (V) | $C_T$ (pF) 0 V,<br>F = 1 MHz | $C_T$ (pF) 0 V<br>F = 1 GHz | $R_S$ $I_F = 10$ mA<br>F = 100 MHz ( $\Omega$ ) | Carrier Lifetime<br>$T_L$ (ns)<br>$I_F = 10$ mA | Package            |
|----------------|-------------------------------|------------------------------|-----------------------------|-------------------------------------------------|-------------------------------------------------|--------------------|
| SMP1330 Series | 20–50                         | 0.7 Typ., 1.0 Max.           | 0.7 Typ.                    | 1.25 Typ., 1.5 Max.                             | 4.0 Typ.                                        | SOT-23 Series Pair |

|                               |                                  |
|-------------------------------|----------------------------------|
|                               |                                  |
| <b>Series Pair<br/>SOT-23</b> | <b>Low Inductance<br/>SOT-23</b> |
| SMP1330-005LF<br>Marking: RQ2 | SMP1330-007LF<br>Marking: RQB    |

### Silicon Limiter Diode Chips

| Part Number | $V_B$<br>$I_R = 10 \mu A$ (V) | I Region<br>Thickness<br>( $\mu m$ ) Nominal | $C_J$ @ 0 V (pF)<br>Typ. | $C_J$ @ 6 V (pF)<br>Max. | $T_L$ @<br>10 mA (ns) | Typ. Input<br>Power for 1 dB<br>Loss (dBm) | Typ. Maximum<br>Pulsed Input<br>Power (dBm) | Typ.<br>Maximum CW<br>Input Power (W) |
|-------------|-------------------------------|----------------------------------------------|--------------------------|--------------------------|-----------------------|--------------------------------------------|---------------------------------------------|---------------------------------------|
| CLA4601-000 | 15–30                         | 1.0                                          | 0.12                     | 0.10                     | 5                     | 7                                          | 47                                          | 2                                     |
| CLA4602-000 | 15–30                         | 1.0                                          | 0.20                     | 0.15                     | 5                     | 7                                          | 50                                          | 3                                     |
| CLA4603-000 | 20–45                         | 1.5                                          | 0.20                     | 0.15                     | 5                     | 10                                         | 50                                          | 2                                     |
| CLA4604-000 | 30–60                         | 2.0                                          | 0.12                     | 0.10                     | 7                     | 12                                         | 47                                          | 3                                     |
| CLA4605-000 | 30–60                         | 2.0                                          | 0.20                     | 0.15                     | 7                     | 12                                         | 50                                          | 4                                     |
| CLA4606-000 | 45–75                         | 2.5                                          | 0.20                     | 0.15                     | 10                    | 15                                         | 53                                          | 3                                     |
| CLA4607-000 | 120–180                       | 7.0                                          | 0.20                     | 0.15 @ 50 V              | 50                    | 20                                         | 60                                          | 6                                     |
| CLA4608-000 | 120–180                       | 7.0                                          | 0.80                     | 0.50 @ 50 V              | 100                   | 20                                         | 66                                          | 15                                    |

### Hermetic Ceramic Packaged Silicon Limiter Diodes

| Part Number | Breakdown<br>Voltage (V)<br>Min. - Max. | Basewidth<br>( $\mu m$ ) Nominal | $C_J$ @ 6 V (pF)<br>Max. | $T_L$ @ 10 mA<br>(ns) | Max. $R_S$<br>$I_F = 10$ mA<br>F = 100 MHz ( $\Omega$ ) | Typ. Input<br>Power for 1 dB<br>Loss (dBm) | Typ. Maximum<br>Pulsed Input<br>Power (dBm) | Typ. Maximum<br>CW Input<br>Power (W) |
|-------------|-----------------------------------------|----------------------------------|--------------------------|-----------------------|---------------------------------------------------------|--------------------------------------------|---------------------------------------------|---------------------------------------|
| CLA4607-107 | 120                                     | 7                                | 0.25                     | 50                    | 2.5                                                     | 20                                         | 60                                          | 6                                     |

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## SWITCHING PIN DIODES

### Lowest Capacitance Switching PIN Diodes for High Isolation

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Max. $C_T$<br>$V_R = 20 V$<br>$F = 1 MHz$<br>(pF) | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(V) | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Typical Carrier<br>Lifetime<br>$I_F = 10 mA$<br>(ns) |
|----------------|---------------------------------------|---------------------------------------------------|--------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
| SMP1345 Series | 50                                    | 0.2                                               | 0.89                                 | 3.5 Typ.                                                    | 2                                                            | 100                                                  |

|                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                                                         |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
|  |  |  |  |                                      |
| <b>Common Anode SOT-23</b>                                                        | <b>Common Cathode SOT-23</b>                                                      | <b>Series Pair SOT-23</b>                                                         | <b>Single SC-79<sup>(1)</sup></b>                                                   | <b>Ring LGA Lead (Pb)-Free</b>                                                                                          |
| SMP1345-003LF<br>Marking: RU9                                                     | SMP1345-004LF<br>Marking: RU3                                                     | SMP1345-005LF<br>Marking: RU2                                                     | SMP1345-079LF<br>Marking: Cathode                                                   | <b>SMP1345-518</b><br>Marking: 0<br> |

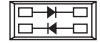
1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

### Hermetic Ceramic Packaged Lowest Capacitance Switching PIN Diodes for High Isolation

| Part Number                                                                                     | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Max. $C_T$<br>$V_R = 5 V$<br>$F = 1 MHz$<br>(pF) | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(V) | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Typical Carrier<br>Lifetime<br>$I_F = 10 mA$<br>(ns) |
|-------------------------------------------------------------------------------------------------|---------------------------------------|--------------------------------------------------|--------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
|  SMP1345-107 | 50                                    | 0.2                                              | 0.89                                 | 3.5 Typ.                                                    | 2                                                            | 100                                                  |

### Low Capacitance, Fast Switching PIN Diodes

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Max. $C_T$<br>$V_R = 5 V$<br>$F = 1 MHz$<br>(pF) | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(V) | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Typical Carrier<br>Lifetime<br>$I_F = 10 mA$<br>(ns) |
|----------------|---------------------------------------|--------------------------------------------------|--------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
| SMP1340 Series | 50                                    | 0.3                                              | 0.88                                 | 1.7 Typ.                                                    | 1.2                                                          | 100                                                  |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                                                    |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
|  |  |  |  |  |                               |
| <b>Common Anode SOT-23</b>                                                          | <b>Common Cathode SOT-23</b>                                                        | <b>Series Pair SOT-23</b>                                                           | <b>Anti-Parallel Single SOD-323</b>                                                 | <b>Single SC-79<sup>(1)</sup></b>                                                     | <b>LGA Lead (Pb)-Free</b>                                                                                          |
| SMP1340-003LF<br>Marking: RS9                                                       | <b>SMP1340-004LF</b><br>Marking: RS3                                                | SMP1340-005LF<br>Marking: RS2                                                       | SMP1340-011LF<br>Marking: RS                                                        | <b>SMP1340-079LF</b><br>Marking: Cathode                                              | SMP1340-508<br>Marking: X<br> |
|                                                                                     | <b>SC-70</b>                                                                        | <b>SC-70</b>                                                                        |                                                                                     |                                                                                       |                                                                                                                    |
|                                                                                     | SMP1340-074LF<br>Marking: RS3                                                       | SMP1340-075LF<br>Marking: RS2                                                       |                                                                                     |                                                                                       |                                                                                                                    |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

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## SWITCHING PIN DIODES

### Hermetic Ceramic Packaged Low Capacitance, Fast Switching PIN Diodes

| Part Number                                                                                   | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Max. $C_J$<br>$V_R = 30 V$ ,<br>$F = 1 MHz$<br>(pF) | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(V) | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Typical Carrier<br>Lifetime<br>$I_F = 10 mA$<br>(ns) |
|-----------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------------------------|--------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
|  SMP1340-107 | 50                                    | 0.25                                                | 0.88                                 | 1.7 Typ.                                                    | 1.2                                                          | 100                                                  |

### Low Capacitance, Low Current Switching PIN Diodes

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Max. $C_T$<br>$V_R = 30 V$<br>$F = 1 MHz$<br>(pF) | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(V) | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Typical Carrier<br>Lifetime<br>$I_F = 10 mA$<br>(ns) |
|----------------|---------------------------------------|---------------------------------------------------|--------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
| SMP1320 Series | 50                                    | 0.3                                               | 0.85                                 | 2 Typ.                                                      | 0.9                                                          | 400                                                  |

|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |
| <b>Single<br/>SOT-23</b>                                                          | <b>Common<br/>Anode<br/>SOT-23</b>                                                | <b>Common<br/>Cathode<br/>SOT-23</b>                                              | <b>Series Pair<br/>SOT-23</b>                                                     | <b>Low<br/>Inductance<br/>SOT-23</b>                                              | <b>Single<br/>SOD-323</b>                                                           | <b>Ultralow<br/>Inductance<br/>SOT-143</b>                                          | <b>Single<br/>SC-79<sup>(1)</sup></b>                                               |
| SMP1320-001LF<br>Marking: RL1                                                     | SMP1320-003LF<br>Marking: RL9                                                     | SMP1320-004LF<br>Marking: RL3                                                     | SMP1320-005LF<br>Marking: RL2                                                     | SMP1320-007LF<br>Marking: RLB                                                     | SMP1320-011LF<br>Marking: RL                                                        | SMP1320-017LF<br>Marking: RLF                                                       | <b>SMP1320-079LF</b><br>Marking: Cathode                                            |
|                                                                                   |                                                                                   | <b>SC-70</b>                                                                      | <b>SC-70</b>                                                                      | <b>SC-70</b>                                                                      |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   | SMP1320-074LF<br>Marking: RL3                                                     | SMP1320-075LF<br>Marking: RL2                                                     | SMP1320-077LF<br>Marking: RL8                                                     |                                                                                     |                                                                                     |                                                                                     |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

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## SWITCHING PIN DIODES

## Low Capacitance Switching PIN Diodes

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Max. $C_T$<br>$V_R = 30 V$<br>$F = 1 MHz$<br>(pF) | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(V) | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Typical Carrier<br>Lifetime<br>$I_F = 10 mA$<br>(ns) |
|----------------|---------------------------------------|---------------------------------------------------|--------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
| SMP1321 Series | 100                                   | 0.25                                              | 0.85                                 | 3 Typ.                                                      | 2                                                            | 400                                                  |

|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                                                  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |                               |
| <b>Single SOT-23</b>                                                              | <b>Common Anode SOT-23</b>                                                        | <b>Common Cathode SOT-23</b>                                                      | <b>Series Pair SOT-23</b>                                                         | <b>Low Inductance SOT-23</b>                                                      | <b>Single SOD-323</b>                                                               | <b>Anti-Parallel Single SC-79<sup>(1)</sup></b>                                     | <b>LGA Lead (Pb)-Free</b>                                                                                        |
| SMP1321-001LF<br>Marking: RM1                                                     | SMP1321-003LF<br>Marking: RM9                                                     | SMP1321-004LF<br>Marking: RM3                                                     | <b>SMP1321-005LF</b><br>Marking: RM2                                              | SMP1321-007LF<br>Marking: RMB                                                     | SMP1321-011LF<br>Marking: RM                                                        | SMP1321-079LF<br>Marking: Cathode                                                   | SMP1321-508<br>Marking: H<br> |
|                                                                                   | <b>SC-70</b>                                                                      | <b>SC-70</b>                                                                      | <b>SC-70</b>                                                                      |                                                                                   |                                                                                     |                                                                                     |                                                                                                                  |
|                                                                                   | SMP1321-073LF<br>Marking: RM9                                                     | SMP1321-074LF<br>Marking: RM3                                                     | SMP1321-075LF<br>Marking: RM2                                                     |                                                                                   |                                                                                     |                                                                                     |                                                                                                                  |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

## Lowest Series Resistance Switching PIN Diodes

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Max. $C_T$<br>$V_R = 30 V$<br>$F = 1 MHz$<br>(pF) | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(V) | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Typical Carrier<br>Lifetime<br>$I_F = 10 mA$<br>(ns) |
|----------------|---------------------------------------|---------------------------------------------------|--------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
| SMP1322 Series | 50                                    | 1                                                 | 0.825                                | 1.5                                                         | 0.45 Typ.                                                    | 400                                                  |

|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |
| <b>Single SOT-23</b>                                                                | <b>Common Anode SOT-23</b>                                                          | <b>Common Cathode SOT-23</b>                                                        | <b>Series Pair SOT-23</b>                                                           | <b>Single SOD-323</b>                                                               | <b>T/R Switch SOT-143</b>                                                             | <b>Ultralow Inductance SOT-143</b>                                                    | <b>Single SC-79<sup>(1)</sup></b>                                                     |
| SMP1322-001LF<br>Marking: RN1                                                       | SMP1322-003LF<br>Marking: RN9                                                       | SMP1322-004LF<br>Marking: RN3                                                       | SMP1322-005LF<br>Marking: RN2                                                       | SMP1322-011LF<br>Marking: RN                                                        | SMP1322-016LF<br>Marking: RN6                                                         | <b>SMP1322-017LF</b><br>Marking: RNF                                                  | SMP1322-079LF<br>Marking: Cathode                                                     |
|                                                                                     |                                                                                     | <b>SC-70</b>                                                                        |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |
|                                                                                     |                                                                                     | SMP1322-074LF<br>Marking: RN3                                                       |                                                                                     |                                                                                     |                                                                                       |                                                                                       |                                                                                       |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

**Innovation to Go™** Select products (indicated in blue/bold) are now available for purchase online.



The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## SWITCHING PIN DIODES

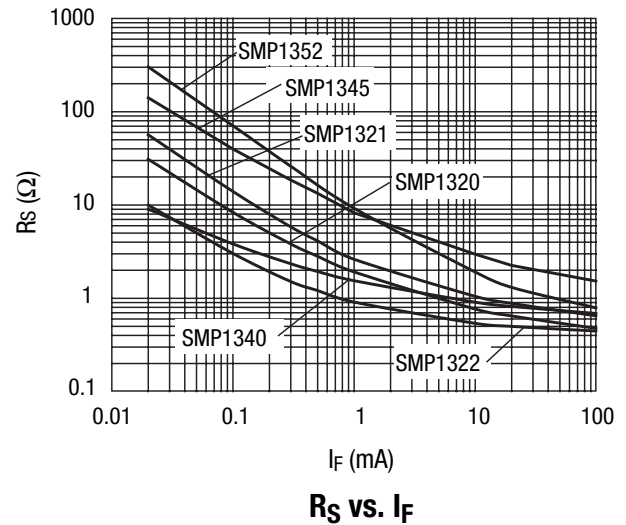
### Large Signal Switching PIN Diodes

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Max. $C_T$<br>$V_R = 20 V$<br>$F = 1 MHz$<br>(pF) | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(V) | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Typical Carrier<br>Lifetime<br>$I_F = 10 mA$<br>(ns) |
|----------------|---------------------------------------|---------------------------------------------------|--------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
| SMP1352 Series | 200                                   | 0.35                                              | 0.8                                  | 15                                                          | 2.8                                                          | 1000                                                 |

|                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |
| <b>Single<br/>SOD-323</b>                                                         | <b>Single<br/>SC-79<sup>(1)</sup></b>                                             |
| SMP1352-011LF<br>Marking: RR                                                      | <b>SMP1352-079LF</b><br>Marking: Cathode                                          |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

### Typical Performance Characteristics



### Hermetic Ceramic Packaged Large Signal Switching PIN Diodes

| Part Number                                                                                     | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Max. $C_T$<br>$V_R = 20 V$<br>$F = 1 MHz$<br>(pF) | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(V) | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Typical Carrier<br>Lifetime<br>$I_F = 10 mA$<br>(ns) |
|-------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------|--------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------|
|  SMP1352-107 | 200                                   | 0.35                                              | 0.825                                | 15                                                          | 2.8                                                          | 1000                                                 |

**Innovation to Go™** Select products (indicated in blue/bold) are now available for purchase online.



Skyworks Green products are lead (Pb)-free, Restriction of Hazardous Substances (RoHS)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, and are free from antimony trioxide, and brominated flame retardants.



The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## ATTENUATOR PIN DIODES

### Low-Distortion Switch/Attenuator PIN Diodes

| Part Number                                                                       | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V)                                             | Max. $C_T$<br>$V_R = 30 V$<br>$F = 1 MHz$<br>(pF)                                 | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(V)                                              | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ )                       | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ )                        | Max. $R_S$<br>$I_F = 100 mA$<br>$F = 100 MHz$<br>( $\Omega$ )                       | Typ. Carrier<br>Lifetime<br>$I_F = 10 mA$<br>( $\mu s$ )                            |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| SMP1302 Series                                                                    | 200                                                                               | 0.3                                                                               | 0.8                                                                               | 20                                                                                | 3                                                                                   | 1.5                                                                                 | 0.7                                                                                 |
|  |  |  |  |  |  |  |  |
| <b>Single SOT-23</b>                                                              | <b>Common Anode SOT-23</b>                                                        | <b>Common Cathode SOT-23</b>                                                      | <b>Series Pair SOT-23</b>                                                         | <b>Single SOD-323</b>                                                             | <b>Ultralow Inductance SOT-143</b>                                                  | <b>PI SOT-5</b>                                                                     | <b>Single SC-79<sup>(1)</sup></b>                                                   |
| SMP1302-001LF<br>Marking: RF1                                                     | SMP1302-003LF<br>Marking: RF9                                                     | SMP1302-004LF<br>Marking: RF3                                                     | SMP1302-005LF<br>Marking: RF2                                                     | SMP1302-011LF<br>Marking: RF                                                      | SMP1302-017LF<br>Marking: RFF                                                       | SMP1302-027LF<br>Marking: RFM                                                       | <b>SMP1302-079LF</b><br>Marking: Cathode                                            |
|                                                                                   |                                                                                   | <b>SC-70</b>                                                                      | <b>SC-70</b>                                                                      |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   | SMP1302-074LF<br>Marking: RF3                                                     | SMP1302-075LF<br>Marking: RF2                                                     |                                                                                   |                                                                                     |                                                                                     |                                                                                     |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

### Hermetic Ceramic Packaged Low-Distortion Attenuator PIN Diodes

| Part Number                                                                                     | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Max. $C_T$<br>$V_R = 30 V$<br>$F = 1 MHz$<br>(pF) | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(V) | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 100 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Typical Carrier<br>Lifetime<br>$I_F = 10 mA$<br>(ns) |
|-------------------------------------------------------------------------------------------------|---------------------------------------|---------------------------------------------------|--------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------|
|  SMP1302-107 | 200                                   | 0.3                                               | 0.8                                  | 20                                                          | 3                                                            | 1.5                                                           | 0.7                                                  |

### Low-Distortion Attenuator PIN Diodes

| Part Number                                                                         | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V)                                               | Max. $C_T$<br>$V_R = 30 V$<br>$F = 1 MHz$<br>(pF)                                   | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(V)                                                | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ )                          | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ )                          | Max. $R_S$<br>$I_F = 100 mA$<br>$F = 100 MHz$<br>( $\Omega$ )                         | Typ. Carrier<br>Lifetime<br>$I_F = 10 mA$<br>( $\mu s$ ) |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------------------------------------|
| SMP1304 Series                                                                      | 200                                                                                 | 0.3                                                                                 | 0.8                                                                                 | 50                                                                                   | 7                                                                                     | 2                                                                                     | 1                                                        |
|  |  |  |  |  |  |  |                                                          |
| <b>Single SOT-23</b>                                                                | <b>Common Cathode SOT-23</b>                                                        | <b>Series Pair SOT-23</b>                                                           | <b>Low Inductance SOT-23</b>                                                        | <b>Single SOD-323</b>                                                                | <b>PI SOT-143</b>                                                                     | <b>PI SOT-5</b>                                                                       |                                                          |
| SMP1304-001LF<br>Marking: RG1                                                       | SMP1304-004LF<br>Marking: RG3                                                       | SMP1304-005LF<br>Marking: RG2                                                       | SMP1304-007LF<br>Marking: RGB                                                       | <b>SMP1304-011LF</b><br>Marking: RG                                                  | SMP1304-019LF<br>Marking: RGJ                                                         | SMP1304-027LF<br>Marking: RGM                                                         |                                                          |

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The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

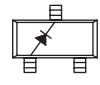
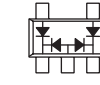
## ATTENUATOR PIN DIODES

### Hermetic Ceramic Packaged Low-Distortion Attenuator PIN Diodes

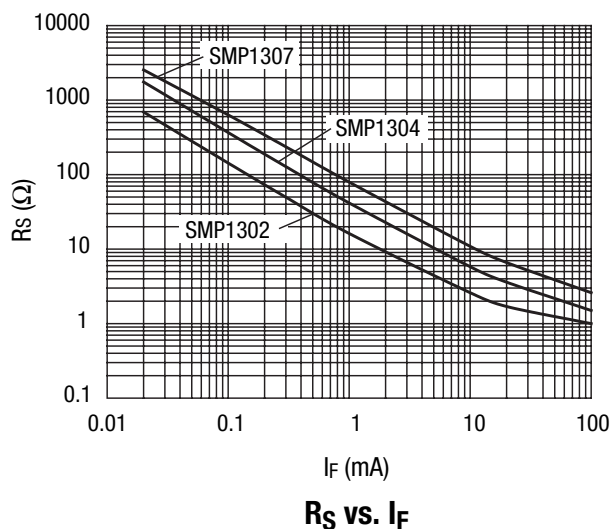
| Part Number                                                                                   | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Max. $C_T$<br>$V_R = 30 V$ ,<br>$F = 1 MHz$<br>(pF) | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(V) | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 100 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Typical Carrier<br>Lifetime<br>$I_F = 10 mA$<br>(ns) |
|-----------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------------------------|--------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------|
|  SMP1304-107 | 200                                   | 0.3                                                 | 0.8                                  | 50                                                          | 7                                                            | 2                                                             | 1                                                    |

### Lowest Distortion, High IP3 Attenuator PIN Diodes

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Max. $C_T$<br>$V_R = 30 V$ ,<br>$F = 1 MHz$<br>(pF) | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(V) | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 100 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Typ. Carrier<br>Lifetime<br>$I_F = 10 mA$<br>( $\mu s$ ) |
|----------------|---------------------------------------|-----------------------------------------------------|--------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------|
| SMP1307 Series | 200                                   | 0.30                                                | 0.85                                 | 100                                                         | 15                                                           | 3.0                                                           | 1.5                                                      |

|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |
| <b>Single<br/>SOT-23</b>                                                          | <b>Common<br/>Anode<br/>SOT-23</b>                                                | <b>Common<br/>Cathode<br/>SOT-23</b>                                              | <b>Series<br/>Pair<br/>SOT-23</b>                                                 | <b>Single<br/>SOD-323</b>                                                           | <b>PI<br/>SOT-5</b>                                                                 |
| <b>SMP1307-001LF</b><br>Marking: RJ1                                              | SMP1307-003LF<br>Marking: RJ9                                                     | SMP1307-004LF<br>Marking: RJ3                                                     | SMP1307-005LF<br>Marking: RJ2                                                     | SMP1307-011LF<br>Marking: RJ                                                        | SMP1307-027LF<br>Marking: RJM                                                       |

### Typical Performance Characteristics



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PIN DIODE CHIPS SUPPLIED ON FILM FRAME

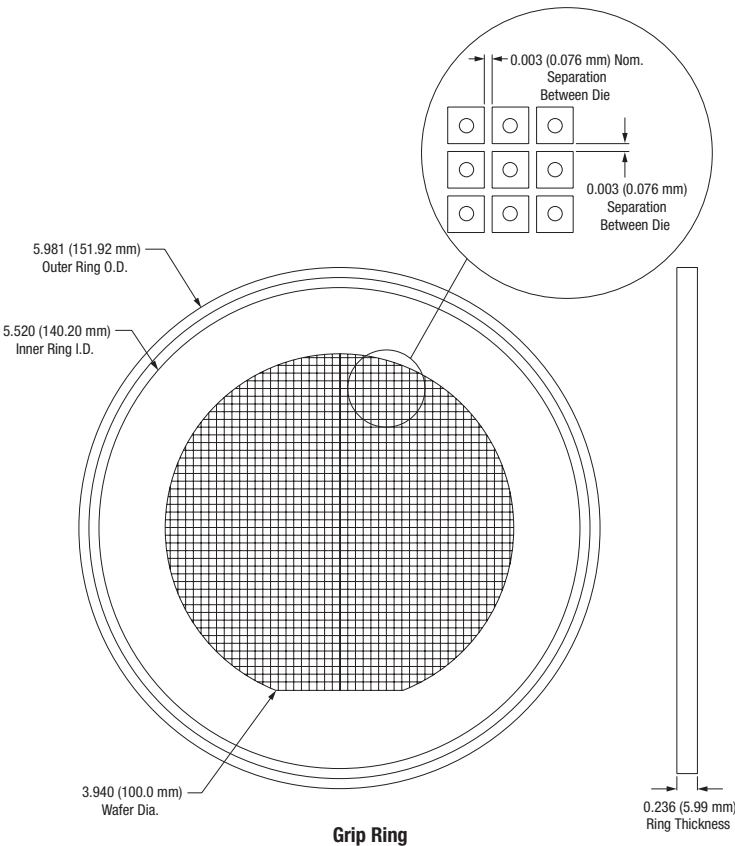
Switching Applications

| Part Number                                                                                   | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Typ. $C_J$<br>$V_R = 0 V$<br>$F = 1 MHz$<br>(pF) | Max. $C_J$<br>$V_R = 10 V$<br>$F = 1 MHz$<br>(pF) | Typ. $V_F$<br>@ $I_F = 10 mA$<br>(mV) | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Typ. Carrier<br>Lifetime<br>$I_F = 10 mA$<br>(ns) | Nominal<br>Chip<br>Dimensions |
|-----------------------------------------------------------------------------------------------|---------------------------------------|--------------------------------------------------|---------------------------------------------------|---------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------|-------------------------------|
|  SMP1320-099 | 50                                    | 0.23                                             | 0.175                                             | 850                                   | 2.0 Typ.                                                    | 0.9                                                          | 400                                               | 0.0135"                       |
|  SMP1322-099 | 50                                    | 1.10                                             | 0.850                                             | 825                                   | 1.5                                                         | 0.45 Typ.                                                    | 400                                               | 0.0135"                       |
|  SMP1340-099 | 50                                    | 0.20                                             | 0.150                                             | 880                                   | 1.7 Typ.                                                    | 1.2                                                          | 100                                               | 0.0105"                       |
|  SMP1353-099 | 100                                   | 0.35                                             | 0.150                                             | 825                                   | 15                                                          | 2.8                                                          | 1000                                              | 0.0105"                       |

Attenuator Applications

| Part Number                                                                                   | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Typ. $C_J$<br>$V_R = 0 V$<br>$F = 1 MHz$<br>(pF) | Max. $C_J$<br>$V_R = 30 V$<br>$F = 1 MHz$<br>(pF) | Typ. $V_F$ @<br>$I_F = 10 mA$<br>(mV) | Max. $R_S$<br>$I_F = 1 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Max. $R_S$<br>$I_F = 10 mA$<br>$F = 100 MHz$<br>( $\Omega$ ) | Typ. Carrier<br>Lifetime<br>$I_F = 10 mA$<br>(ns) | Nominal<br>Chip<br>Dimensions |
|-----------------------------------------------------------------------------------------------|---------------------------------------|--------------------------------------------------|---------------------------------------------------|---------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------|-------------------------------|
|  SMP1302-099 | 200                                   | 0.27                                             | 0.15                                              | 800                                   | 20                                                          | 3                                                            | 700                                               | 0.0135"                       |
|  SMP1304-099 | 200                                   | 0.18                                             | 0.15                                              | 800                                   | 50                                                          | 7                                                            | 1000                                              | 0.0135"                       |

The above PIN diode chips are processed on 100 mm silicon wafers, 100% DC tested, sawn and shipped on 6" film frame hoops.  
Electrical rejects are identified with black ink.



 Skyworks Green products are lead (Pb)-free, Restriction of Hazardous Substances (RoHS)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, and are free from antimony trioxide, and brominated flame retardants.

 The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## GENERAL-PURPOSE PIN DIODE CHIPS FOR SWITCHING APPLICATIONS

| Part Number                                                                                   | Nom. I Region ( $\mu\text{m}$ ) | Min. Voltage Rating (V) | Max. $C_J$ @ 50 V (pF) | Max. $R_S$ @ 10 mA ( $\Omega$ ) | Typ. $T_L$ (ns) | Package |
|-----------------------------------------------------------------------------------------------|---------------------------------|-------------------------|------------------------|---------------------------------|-----------------|---------|
|  APD0505-000 | 5                               | 50                      | 0.05                   | 2.0                             | 30              | Chip    |
|  APD0510-000 | 5                               | 50                      | 0.10                   | 1.5                             | 60              | Chip    |
|  APD0520-000 | 5                               | 50                      | 0.20                   | 1.0                             | 80              | Chip    |
|  APD0805-000 | 8                               | 100                     | 0.05                   | 2.0                             | 80              | Chip    |
|  APD0810-000 | 8                               | 100                     | 0.10                   | 1.5                             | 100             | Chip    |

## PIN DIODE CHIPS FOR ATTENUATOR APPLICATIONS

| Part Number                                                                                   | Nom. I Region ( $\mu\text{m}$ ) | Min. Voltage Rating (V) | Max. $C_J$ @ 50 V (pF) | Max. $R_S$ @ 10 mA ( $\Omega$ ) | Typ. $T_L$ (ns) | Package |
|-----------------------------------------------------------------------------------------------|---------------------------------|-------------------------|------------------------|---------------------------------|-----------------|---------|
|  APD2220-000 | 50                              | 100                     | 0.2                    | 3                               | 750             | Chip    |

## PIN BEAM-LEAD DIODES

Lowest Capacitance, Very Fast Switching for Applications Up To 30 GHz

| Part Number                                                                                     | $V_B$<br>$I_R = 10 \mu\text{A}$<br>(V) Min. | $C_T$<br>$V_R = 10 \text{ V}$<br>$F = 1 \text{ MHz}$<br>(pF) Max. | $C_T$<br>$V_R = 50 \text{ V}$<br>$F = 1 \text{ MHz}$<br>(pF) Max. | $R_S$<br>$I_F = 10 \text{ mA}$<br>$F = 100 \text{ MHz}$<br>( $\Omega$ ) Max. | $R_S$ [From Ins. Loss @ 3 GHz 50 mA]<br>( $\Omega$ ) Max. | $T_L$ (ns)<br>Typ. | Package          |
|-------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------|--------------------|------------------|
|  DSM8100-000 | 60                                          | 0.025                                                             | —                                                                 | 3.5                                                                          | —                                                         | 25                 | Beam-Lead (Mesa) |

Planar, Low Capacitance, Low Distortion for Switching Applications Up To 30 GHz

| Part Number                                                                                     | $V_B$<br>$I_R = 10 \mu\text{A}$<br>(V) Min. | $C_T$<br>$V_R = 10 \text{ V}$<br>$F = 1 \text{ MHz}$<br>(pF) Max. | $C_T$<br>$V_R = 50 \text{ V}$<br>$F = 1 \text{ MHz}$<br>(pF) Max. | $R_S$<br>$I_F = 10 \text{ mA}$<br>$F = 100 \text{ MHz}$<br>( $\Omega$ ) Max. | $R_S$ [From Ins. Loss @ 3 GHz 50 mA]<br>( $\Omega$ ) Max. | $T_L$ (ns)<br>Typ. | Package            |
|-------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------|--------------------|--------------------|
|  DSG9500-000 | 200                                         | —                                                                 | 0.02                                                              | —                                                                            | 4.0                                                       | 250                | Beam-Lead (Planar) |

 Skyworks Green products are lead (Pb)-free, Restriction of Hazardous Substances (RoHS)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, and are free from antimony trioxide, and brominated flame retardants.

 The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## GENERAL-PURPOSE SCHOTTKY DIODES

### Plastic Packaged General-Purpose Silicon Schottky Diodes

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Typ. $I_R$<br>$V_R = 1 V$<br>(nA) | Max. $V_F$<br>$I_F = 1 mA$<br>(mV) | Max. $V_F$<br>@ Spec. $I_F$<br>(mV) | Max. $C_T$<br>$V_R = 0 V$<br>(pF) | Max. $R_T$<br>$I_F = 10 mA$<br>( $\Omega$ ) |
|----------------|---------------------------------------|-----------------------------------|------------------------------------|-------------------------------------|-----------------------------------|---------------------------------------------|
| SMS3922 Series | 8                                     | 100 Max.                          | 340                                | 450 @ 10 mA                         | 1.03                              | 7 Typ.                                      |
| SMS3923 Series | 20                                    | 500 @ 15 V Max.                   | 370                                | 1000 @ 35 mA                        | 1.23                              | 11 Typ.                                     |
| SMS3924 Series | 70                                    | 200 @ 50 V Max.                   | 550                                | 1000 @ 15 mA                        | 1.83                              | 7 Typ.                                      |
| SMS3925-079LF  | 40                                    | –                                 | 670                                | –                                   | 0.60                              | 7 Typ.                                      |

Delta  $V_F$  for pairs and quads is 10 mV maximum at 1 mA.

Breakdown voltage and reverse leakage cannot be measured directly on ring configurations.

|  |  |  |  |  |  |                               |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Single<br>SC-79 <sup>(1)</sup>                                                    | Single<br>SOD-323                                                                 | Single<br>SOT-23                                                                  | Common<br>Cathode<br>SOT-23                                                       | Series Pair<br>SOT-23                                                              | Unconnected<br>Pair<br>SOT-143                                                      | Unconnected<br>Pair<br>LGA<br>Lead (Pb)-Free                                                                     |
| SMS3922-079LF<br>Marking: Cathode                                                 | SMS3922-011LF<br>Marking: XA                                                      | SMS3922-001LF<br>Marking: XA1                                                     | SMS3922-004LF<br>Marking: XA3                                                     | SMS3922-005LF<br>Marking: XA2                                                      | SMS3922-015LF<br>Marking: XA7                                                       |                                                                                                                  |
| SMS3923-079LF<br>Marking: Cathode                                                 | <b>SMS3923-011LF</b><br>Marking: XB                                               | SMS3923-001LF<br>Marking: XB1                                                     |                                                                                   | SMS3923-005LF<br>Marking: XB2                                                      | SMS3923-015LF<br>Marking: XB7                                                       | SMS3923-517<br>Marking: B<br> |
| <b>SMS3924-079LF</b><br>Marking: Cathode                                          |                                                                                   |                                                                                   |                                                                                   | SMS3924-005LF<br>Marking: XC2                                                      | SMS3924-015LF<br>Marking: XC7                                                       |                                                                                                                  |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   | <b>SC-70</b>                                                                       |                                                                                     |                                                                                                                  |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   | SMS3924-075LF<br>Marking: XC2                                                      |                                                                                     |                                                                                                                  |
| SMS3925-079LF<br>Marking: Cathode                                                 |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                                                  |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

### Hermetic Ceramic Packaged General Purpose Schottky Diodes

| Part Number                                                                                     | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Typ. $I_R$<br>$V_R = 1 V$<br>(nA) | Max. $V_F$<br>$I_F = 1 mA$<br>(mV) | Max. $V_F$<br>@ Spec. $I_F$<br>(mV) | Max. $C_T$<br>$V_R = 0 V$<br>(pF) |
|-------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------|------------------------------------|-------------------------------------|-----------------------------------|
|  SMS3922-107 | 8                                     | 100 Max.                          | 340                                | 450 @ 10 mA                         | 1.5                               |
|  SMS3923-107 | 20                                    | 500 @ 15 V Max.                   | 370                                | 1000 @ 35 mA                        | 1.23                              |

**Innovation to Go™** Select products (indicated in blue/bold) are now available for purchase online.



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The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

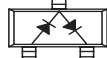
## SILICON MIXER AND DETECTOR SCHOTTKY DIODES

### Plastic Packaged Silicon Mixer and Detector Schottky Diodes

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Typ. $I_R$<br>$V_R = 1 V$<br>(nA) | Max. $V_F$<br>$I_F = 1 mA$<br>(mV) | Max. $C_T$<br>$V_R = 0 V$<br>(pF) | Max. $R_T$<br>$I_F = 10 mA$<br>( $\Omega$ ) |
|----------------|---------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|---------------------------------------------|
| SMS1546-005LF  | 2                                     | 300                               | 270                                | 0.63                              | 8                                           |
| SMS7621 Series | 2                                     | 80                                | 320                                | 0.28                              | 18                                          |

Delta  $V_F$  for pairs and quads is 10 mV maximum at 1 mA.

Breakdown voltage and reverse leakage cannot be measured directly on ring configurations.

|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                                                  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
|  |  |  |  |  |  |                               |
| <b>Single<br/>SC-79<sup>(1)</sup></b>                                             | <b>Single<br/>SOT-23</b>                                                          | <b>Common<br/>Cathode<br/>SOT-23</b>                                              | <b>Series Pair<br/>SOT-23</b>                                                     | <b>Reverse<br/>Series Pair<br/>SOT-23</b>                                          | <b>Unconnected<br/>Pair<br/>SOT-143</b>                                             | <b>Unconnected<br/>Pair<br/>LGA<br/>Lead (Pb)-Free</b>                                                           |
|                                                                                   |                                                                                   |                                                                                   | SMS1546-005LF<br>Marking: SG2                                                     |                                                                                    |                                                                                     |                                                                                                                  |
| <b>SMS7621-079LF</b><br>Marking: Cathode                                          | SMS7621-001LF<br>Marking: XH1                                                     |                                                                                   | <b>SMS7621-005LF</b><br>Marking: XH2                                              | <b>SMS7621-006LF</b><br>Marking: XH8                                               | SMS7621-015LF<br>Marking: XH7                                                       | SMS7621-517<br>Marking: H<br> |
|                                                                                   |                                                                                   | <b>SC-70</b>                                                                      | <b>SC-70</b>                                                                      |                                                                                    |                                                                                     |                                                                                                                  |
|                                                                                   |                                                                                   | SMS7621-074LF<br>Marking: XH3                                                     | SMS7621-075LF<br>Marking: XH2                                                     |                                                                                    |                                                                                     |                                                                                                                  |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

### Hermetic Ceramic Packaged Silicon Mixer and Detector Schottky Diodes

| Part Number                                                                                     | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Min. $V_B$<br>$V_R = 1 V$<br>(nA) | Max. $V_F$<br>$I_F = 1 mA$<br>(mV) | Max. $C_T$<br>$V_R = 0 V$<br>(pF) | Max. $R_T$<br>$I_F = 5 mA$<br>( $\Omega$ ) |
|-------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|--------------------------------------------|
|  SMS7621-107 | 2                                     | 80                                | 320                                | 0.26                              | 18                                         |

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The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## SILICON MIXER AND DETECTOR SCHOTTKY DIODES

### Plastic Packaged Silicon Mixer and Detector Schottky Diodes

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Max. $V_F$<br>$I_F = 1 mA$<br>(mV) | Max. $C_T$<br>$V_R = 0 V$<br>(pF) | Max. $R_T$<br>$I_F = 10 mA$<br>( $\Omega$ ) |
|----------------|---------------------------------------|------------------------------------|-----------------------------------|---------------------------------------------|
| SMS7630 Series | 1*                                    | 240                                | 0.35                              | 22 Typ.                                     |

\*  $V_B$  is measured at 100  $\mu A$  (avalanche breakdown is typically 6 V).

Delta  $V_F$  for pairs and quads is 10 mV maximum at 1 mA.

Breakdown voltage and reverse leakage cannot be measured directly on ring configurations.

|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                                                  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
|  |  |  |  |  |  |                               |
| <b>Single<br/>SC-79<sup>(1)</sup></b>                                             | <b>Single<br/>SOD-323</b>                                                         | <b>Single<br/>SOT-23</b>                                                          | <b>Series Pair<br/>SOT-23</b>                                                     | <b>Reverse<br/>Series Pair<br/>SOT-23</b>                                          | <b>Reverse<br/>Unconnected<br/>Pair<br/>SOT-143</b>                                 | <b>Unconnected<br/>Pair<br/>LGA<br/>Lead (Pb)-Free</b>                                                           |
| <b>SMS7630-079LF</b><br>Marking: Anode                                            | SMS7630-011LF<br>Marking: XD                                                      | SMS7630-001LF<br>Marking: XD1                                                     | SMS7630-005LF<br>Marking: XD2                                                     | <b>SMS7630-006LF</b><br>Marking: XD8                                               | <b>SMS7630-020LF</b><br>Marking: XD0                                                | SMS7630-517<br>Marking: D<br> |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

### Hermetic Ceramic Packaged Silicon Mixer and Detector Schottky Diodes

| Part Number                                                                                     | Min. $V_B$<br>$I_R = 100 \mu A$<br>(V) | Max. $V_F$<br>$I_F = 1 mA$<br>(mV) | Max. $C_T$<br>$V_R = 0.15 V$<br>(pF) | Max. $R_T$<br>$I_F = 10 mA$<br>( $\Omega$ ) |
|-------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------------|--------------------------------------|---------------------------------------------|
|  SMS7630-107 | 1                                      | 240                                | 0.5                                  | 22 Typ.                                     |

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The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## SILICON SCHOTTKY MIXER QUADS

### Chip On Board Schottky Mixer Quads

| Part Number                | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Typ. $I_R$<br>$V_R = 1 V$<br>(nA) | Max. $V_F$<br>$I_F = 1 mA$<br>(mV) | Max. $C_T$<br>$V_R = 0 V$<br>(pF) | Max. $R_T$<br>$I_F = 10 mA$<br>( $\Omega$ ) |
|----------------------------|---------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|---------------------------------------------|
| DMF3926 Series/DMF3945-103 | 2                                     | 300                               | 270                                | 0.5 Typ.                          | 8                                           |
| DME3927 Series/DME3946-103 | 2                                     | 50                                | 370                                | 0.5 Typ.                          | 8                                           |
| DMJ3928 Series/DMJ3947-103 | 4                                     | 5                                 | 580                                | 0.5 Typ.                          | 8                                           |

Delta  $V_F$  for pairs and quads is 10 mV maximum at 1 mA.

Breakdown voltage and reverse leakage cannot be measured directly on ring configurations.

|                                    |                                    |                                    |
|------------------------------------|------------------------------------|------------------------------------|
|                                    |                                    |                                    |
| <b>Ring Quad</b>                   | <b>Crossover Quad</b>              | <b>Back-to-Back Crossover Quad</b> |
| DMF3926-101<br>Marking: Red Dot    | DMF3926-100<br>Marking: Red Dot    | DMF3945-103<br>Marking: Red Dot    |
| DME3927-101<br>Marking: Blue Dot   | DME3927-100<br>Marking: Blue Dot   | DME3946-103<br>Marking: Blue Dot   |
| DMJ3928-101<br>Marking: Yellow Dot | DMJ3928-100<br>Marking: Yellow Dot | DMJ3947-103<br>Marking: Yellow Dot |



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## SILICON SCHOTTKY MIXER QUADS

### Surface Mount Schottky Mixer Quads

| Part Number                | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Typ. $I_R$<br>$V_R = 1 V$<br>(nA) | Max. $V_F$<br>$I_F = 1 mA$<br>(mV) | Max. $C_T$<br>$V_R = 0 V$<br>(pF) | Max. $R_T$<br>$I_F = 10 mA$<br>( $\Omega$ ) |
|----------------------------|---------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|---------------------------------------------|
| SMS3926 Series/SMS3929-021 | 2                                     | 300                               | 270                                | 0.5 Typ.                          | 8                                           |
| SMS3927 Series/SMS3930-021 | 2                                     | 50                                | 370                                | 0.5 Typ.                          | 8                                           |
| SMS3928-023/SMS3931-021    | 4                                     | 5                                 | 580                                | 0.5 Typ.                          | 8                                           |
| SMS3940-026*               | 8                                     | 10                                | 1160                               | 0.3 Typ.                          | 16                                          |

\* SMS3940-026 and DMJ3952-020 consist of two diodes in series in each leg.

Delta  $V_F$  for pairs and quads is 10 mV maximum at 1 mA.

Breakdown voltage and reverse leakage can not be measured directly on ring configurations.

|                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |
| <b>Ring Quad<br/>SOT-143</b>                                                      | <b>Crossover Quad<br/>SOT-143</b>                                                 | <b>Bridge Quad<br/>SOT-143</b>                                                    | <b>Octoquad<br/>SOT-143</b>                                                         | <b>Crossover Octoquad<br/>SOT-143</b>                                               |
| SMS3926-022LF<br>Marking: XE4                                                     | <b>SMS3926-023LF</b><br>Marking: XE5                                              | SMS3929-021LF<br>Marking: XQE                                                     |                                                                                     |                                                                                     |
|                                                                                   | SMS3927-023LF<br>Marking: XJ5                                                     | SMS3930-021LF<br>Marking: XRE                                                     |                                                                                     |                                                                                     |
|                                                                                   | <b>SMS3928-023LF</b><br>Marking: XK5                                              | SMS3931-021LF<br>Marking: XSE                                                     | SMS3940-026LF<br>Marking: XTG                                                       | SMS3940-029LF<br>Marking: XTN                                                       |

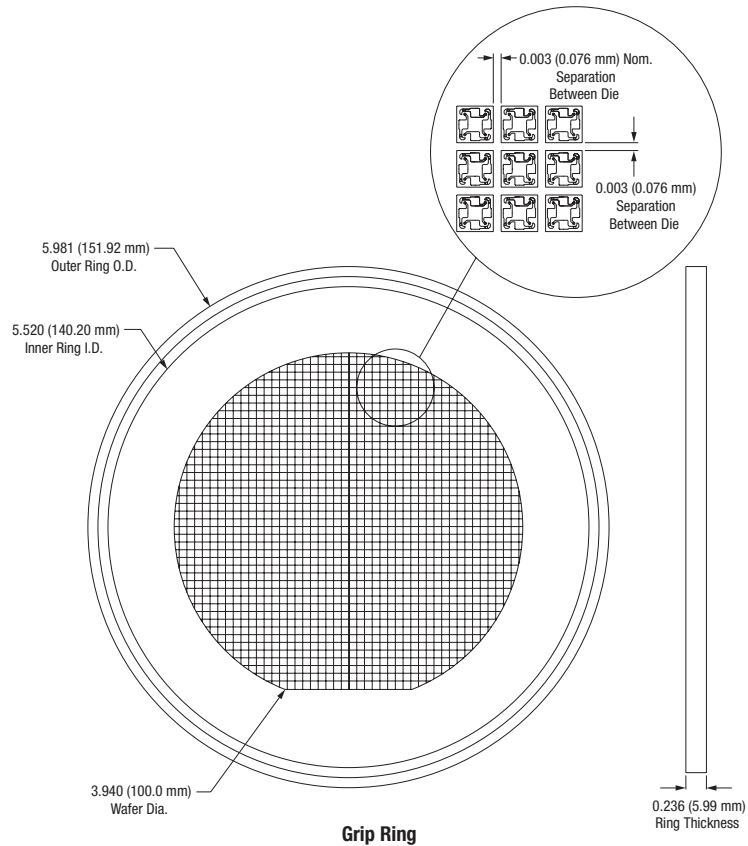
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The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## SILICON SCHOTTKY MIXER DIODE CHIPS SUPPLIED ON FILM FRAME

| Part Number                                                                                   | Barrier | Junction Type | Configuration | Nominal Chip Dimensions |
|-----------------------------------------------------------------------------------------------|---------|---------------|---------------|-------------------------|
|  SMS3926-099 | Low     | N             | Ring Quad     | 0.015"                  |
|  SMS3927-099 | Medium  | N             | Ring Quad     | 0.015"                  |
|  SMS3928-099 | Low     | N             | Ring Quad     | 0.015"                  |



## SILICON SCHOTTKY CHIPS

| Part Number                                                                                     | Barrier | Junction Type | Max. $C_J$ (pF) | Max. $R_T$ ( $\Omega$ ) | Min.-Max. $V_F$ @ 1 mA (mV) | Min. $V_B$ (V) | Typ. $R_V$ @ 0 Bias ( $\Omega$ ) |
|-------------------------------------------------------------------------------------------------|---------|---------------|-----------------|-------------------------|-----------------------------|----------------|----------------------------------|
|  CDB7619-000 | Low     | P             | 0.10            | 40                      | 275–375                     | 2              | 735                              |
|  CDB7620-000 | Low     | P             | 0.15            | 30                      | 250–350                     | 2              | 537                              |
|  CDC7630-000 | ZBD     | P             | 0.25            | 30                      | 135–240                     | 1              | 5.5                              |
|  CDC7631-000 | ZBD     | P             | 0.15            | 80                      | 150–300                     | 2              | 7.2                              |
|  CDF7621-000 | Low     | N             | 0.10            | 20                      | 270–350                     | 2              | 680                              |
|  CDF7623-000 | Low     | N             | 0.30            | 10                      | 240–300                     | 2              | 245                              |

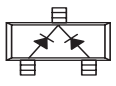
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## VARACTOR DIODES

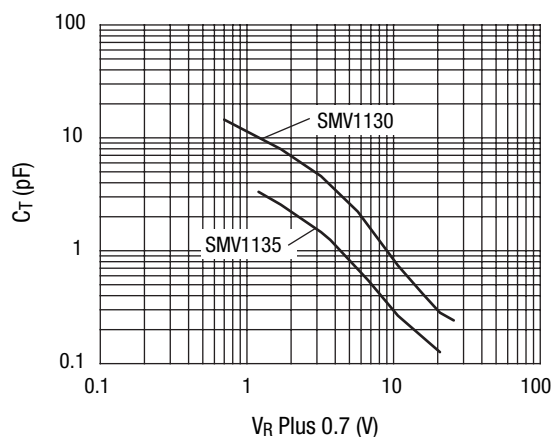
### High Voltage, Large Bandwidth Hyperabrupt Varactor Diodes

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | $C_T$<br>$V_R = 1 V$<br>(pF) | $C_R$<br>1 V/3 V | $C_R$<br>1 V/9 V | $R_S$<br>500 MHz<br>( $\Omega$ ) |
|----------------|---------------------------------------|------------------------------|------------------|------------------|----------------------------------|
| SMV1130 Series | 26                                    | 17.4–21.2                    | 1.47–1.76        | 3.7–4.5          | 0.8 Max. @ 1 V                   |
| SMV1135 Series | 28                                    | 8.2–10.0                     | 1.47–1.76        | 3.7–4.5          | 1.2 Max. @ 1 V                   |

|                                                                                   |                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |  |
| <b>Common Cathode<br/>SOT-23</b>                                                  | <b>Single<br/>SC-79<sup>(1)</sup></b>                                             | <b>Single<br/>SOT-23</b>                                                          |
|                                                                                   | SMV1130-079LF<br>Marking: Cathode                                                 | SMV1130-001LF<br>Marking: HW1                                                     |
| SMV1135-004LF<br>Marking: EG3                                                     |                                                                                   |                                                                                   |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

### Typical Performance Characteristics



### Hermetic Ceramic Packaged High Voltage, Large Bandwidth Hyperabrupt Varactor Diodes

| Part Number                                                                                     | $C_T$ @ 3 V<br>(pF) | $C_T$ @ 20 V<br>(pF) | Min. $C_R$<br>3 V/20 V | Typ. Q<br>$V_R = 3 V$<br>$F = 50 MHz$ | Max. $I_R$<br>$V_R = 16 V$<br>(nA) | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) |
|-------------------------------------------------------------------------------------------------|---------------------|----------------------|------------------------|---------------------------------------|------------------------------------|---------------------------------------|
|  SMV1206-107 | 10.5–12.5           | 2.1–2.5              | 4.6                    | 400                                   | 50                                 | 20                                    |



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The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## VARACTOR DIODES

### Large Bandwidth Hyperabrupt Varactor Diodes

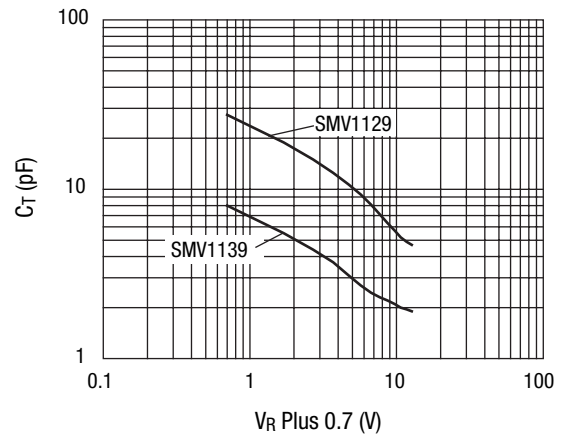
| Part Number    | $C_T$ @ 1 V (pF) | Min. $C_R$ @ 1 V/3 V | Min. $C_R$ @ 1 V/6 V | Max. $R_S$ 500 MHz @ 1 V ( $\Omega$ ) |
|----------------|------------------|----------------------|----------------------|---------------------------------------|
| SMV1129 Series | 17.5–20.5        | 1.4                  | 2.0                  | 0.4                                   |
| SMV1139 Series | 4.95–5.85        | 1.4                  | 2.0                  | 0.6                                   |

Minimum breakdown voltage 12 V @  $I_R = 10 \mu A$ .  
Reverse leakage 20 nA max. @  $V_R = 10$  V.

|                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |
| <b>Single SOD-323</b>                                                             | <b>Single SC-79<sup>(1)</sup></b>                                                 |
|                                                                                   | SMV1129-079LF<br>Marking: Cathode                                                 |
| SMV1139-011LF<br>Marking: HG                                                      |                                                                                   |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

### Typical Performance Characteristics



The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## VARACTOR DIODES

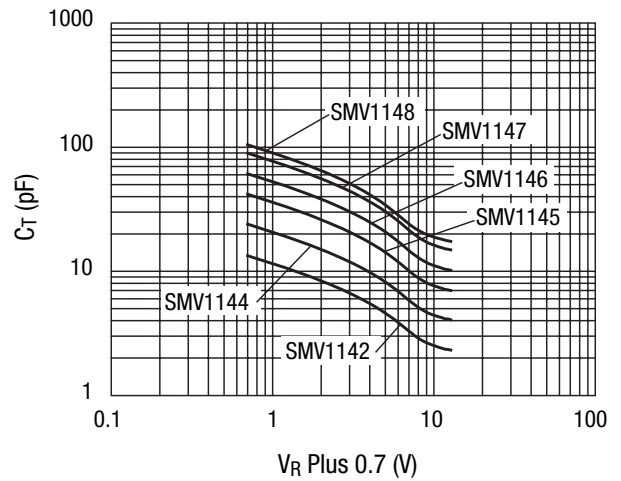
### Large Bandwidth Hyperabrupt Varactor Diodes (Continued)

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | $C_T$<br>$V_R = 1 V$<br>(pF) | Typ. $C_T$<br>$V_R = 3 V$<br>(pF) | Typ. $C_T$<br>$V_R = 6 V$<br>(pF) | $C_R$<br>1 V/3 V | $C_R$<br>1 V/6 V | Max. $R_S$<br>500 MHz<br>( $\Omega$ ) | Typ. Q<br>50 MHz |
|----------------|---------------------------------------|------------------------------|-----------------------------------|-----------------------------------|------------------|------------------|---------------------------------------|------------------|
| SMV1142 Series | 12                                    | 8.20–10.00                   | 5.8                               | 3.5                               | 1.50–1.65        | 2.43–2.93        | 0.70 @ 3 V                            | 800 @ 3 V        |
| SMV1144 Series | 12                                    | 14.65–17.95                  | 10.4                              | 6.1                               | 1.50–1.65        | 2.46–2.96        | 0.65 @ 3 V                            | 500 @ 3 V        |
| SMV1145 Series | 12                                    | 25.50–31.20                  | 18.1                              | 10.6                              | 1.50–1.65        | 2.50–3.00        | 0.60 @ 3 V                            | 200 @ 3 V        |
| SMV1147 Series | 12                                    | 54.60–66.70                  | 38.6                              | 22.6                              | 1.50–1.65        | 2.50–3.00        | 0.55 @ 3 V                            | 150 @ 3 V        |
| SMV1148 Series | 12                                    | 62.00–76.00                  | 44.1                              | 25.2                              | 1.50–1.65        | 2.50–3.00        | 0.50 @ 3 V                            | 150 @ 3 V        |

|                                                                                   |                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
|  |  |
| <b>Single SOD-323</b>                                                             | <b>Single SC-79<sup>(1)</sup></b>                                                 |
| SMV1142-011LF<br>Marking: GU                                                      |                                                                                   |
| SMV1143-011LF<br>Marking: GV                                                      |                                                                                   |
| SMV1144-011LF<br>Marking: GW                                                      |                                                                                   |
| SMV1145-011LF<br>Marking: GA                                                      | SMV1145-079LF<br>Marking: Cathode                                                 |
| SMV1147-011LF<br>Marking: GY                                                      | SMV1147-079LF<br>Marking: Cathode                                                 |
| SMV1148-011LF<br>Marking: GZ                                                      |                                                                                   |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

### Typical Performance Characteristics



## VARACTOR DIODES

### Large Bandwidth Hyperabrupt Varactor Diodes (Continued)

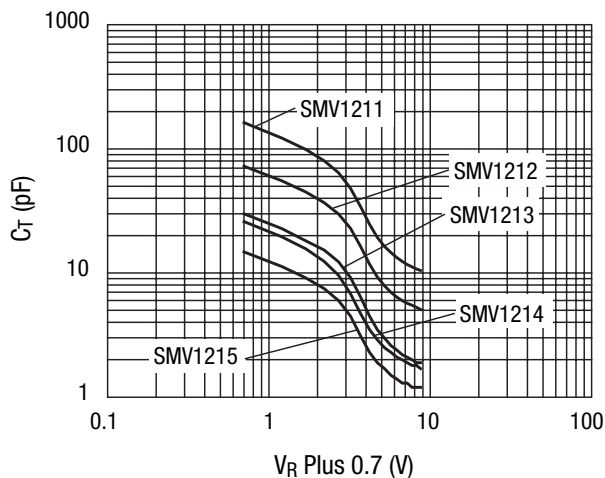
| Part Number    | Typ. $C_T$<br>$V_R = 1\text{ V}$<br>(pF) | $C_T$<br>$V_R = 2.5\text{ V}$<br>(pF) | Max. $C_T$<br>$V_R = 4\text{ V}$<br>(pF) | Typ. $C_R$<br>1 V/2.5 V | Typ. $C_R$<br>1 V/4 V | Typ. $R_S$<br>500 MHz<br>@ 4 V ( $\Omega$ ) | Min. Q<br>50 MHz<br>@ 4 V |
|----------------|------------------------------------------|---------------------------------------|------------------------------------------|-------------------------|-----------------------|---------------------------------------------|---------------------------|
| SMV1211 Series | 100                                      | 40–65                                 | 25.0                                     | 2                       | 5                     | 0.4                                         | 80                        |
| SMV1212 Series | 50                                       | 18–27                                 | 12.0                                     | 2                       | 5                     | 0.8                                         | 150                       |
| SMV1213 Series | 22                                       | 8.5–10.5                              | 5.5                                      | 2                       | 5                     | 1.4                                         | 200                       |
| SMV1214 Series | 16                                       | 6.5–7.8                               | 4.8                                      | 2                       | 5                     | 1.7                                         | 300                       |
| SMV1215 Series | 9.5                                      | 4.3–5.5                               | 2.9                                      | 2                       | 5                     | 2.8                                         | 350                       |

Minimum breakdown voltage 12 V @  $I_R = 10\text{ }\mu\text{A}$ .  
Reverse leakage 20 nA max. @  $V_R = 8\text{ V}$ .

|                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |
| <b>Single<br/>SOT-23</b>                                                          | <b>Common Cathode<br/>SOT-23</b>                                                  | <b>Common Cathode<br/>SC-70</b>                                                   | <b>Single<br/>SOD-323</b>                                                           | <b>Single<br/>SC-79<sup>(1)</sup></b>                                               |
| SMV1211-001LF<br>Marking: EA1                                                     |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| SMV1212-001LF<br>Marking: EB1                                                     | SMV1212-004LF<br>Marking: EB3                                                     |                                                                                   |                                                                                     | SMV1212-079LF<br>Marking: Cathode                                                   |
| <b>SMV1213-001LF</b><br>Marking: D86                                              | SMV1213-004LF<br>Marking: GD3                                                     | SMV1213-074LF<br>Marking: GD3                                                     | SMV1213-011LF<br>Marking: GD                                                        | SMV1213-079LF<br>Marking: Cathode                                                   |
| SMV1214-001LF<br>Marking: DL1                                                     |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| SMV1215-001LF<br>Marking: DM1                                                     |                                                                                   |                                                                                   | SMV1215-011LF<br>Marking: DM                                                        |                                                                                     |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

### Typical Performance Characteristics



**Innovation to Go™** Select products (indicated in blue/bold) are now available for purchase online.



The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## VARACTOR DIODES

### Large Bandwidth Hyperabrupt Varactor Diodes (Continued)

| Part Number    | $C_T$<br>$V_R = 1\text{ V}$<br>(pF) | Typ. $C_T$<br>$V_R = 3\text{ V}$<br>(pF) | Typ. $C_T$<br>$V_R = 6\text{ V}$<br>(pF) | $C_R$<br>1 V/3 V | $C_R$<br>1 V/6 V | Max. $R_S$<br>500 MHz<br>@ 3 V ( $\Omega$ ) | Typ. Q<br>50 MHz<br>@ 3 V |
|----------------|-------------------------------------|------------------------------------------|------------------------------------------|------------------|------------------|---------------------------------------------|---------------------------|
| SMV1231 Series | 1.43–1.72                           | 0.97                                     | 0.61                                     | 1.5–1.8          | 2.5–2.8          | 2.90                                        | 1500                      |
| SMV1232 Series | 2.34–2.86                           | 1.50                                     | 0.94                                     | 1.5–1.9          | 2.6–3.3          | 1.50                                        | 1400                      |
| SMV1233 Series | 3.00–3.60                           | 1.80                                     | 1.10                                     | 1.5–1.9          | 2.6–3.3          | 1.20                                        | 1200                      |
| SMV1234 Series | 5.85–7.15                           | 3.60                                     | 2.00                                     | 1.6–2.0          | 2.8–3.4          | 0.80                                        | 1000                      |
| SMV1235 Series | 10.35–12.65                         | 6.40                                     | 3.60                                     | 1.6–2.0          | 2.9–3.4          | 0.60                                        | 750                       |
| SMV1236 Series | 15.50–18.50                         | 9.20                                     | 5.30                                     | 1.6–2.0          | 3.0–3.5          | 0.50                                        | 700                       |
| SMV1237 Series | 45–54                               | 26.90                                    | 14.40                                    | 1.6–2.0          | 3.0–3.5          | 0.25                                        | 500                       |

Minimum breakdown voltage 15 V @  $I_R = 10\text{ }\mu\text{A}$ .  
Reverse leakage 20 nA max. @  $V_R = 8\text{ V}$ .



The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

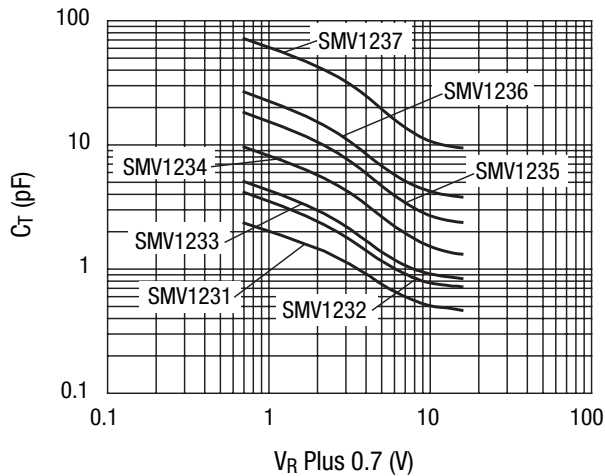
## VARACTOR DIODES

### Large Bandwidth Hyperabrupt Varactor Diodes (Continued)

|  |  |  |  |  |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Single<br>SOT-23                                                                  | Common Cathode<br>SOT-23                                                          | Common Cathode<br>SC-70                                                           | Common Anode<br>SC-70                                                             | Single<br>SOD-323                                                                   | Single<br>SC-79 <sup>(1)</sup>                                                      |
|                                                                                   |                                                                                   | SMV1231-074LF<br>Marking: KA3                                                     |                                                                                   | SMV1231-011LF<br>Marking: KA                                                        | SMV1231-079LF<br>Marking: Cathode                                                   |
|                                                                                   |                                                                                   | SMV1232-074LF<br>Marking: HC3                                                     |                                                                                   | SMV1232-011LF<br>Marking: HC                                                        | SMV1232-079LF<br>Marking: Cathode                                                   |
| SMV1233-001LF<br>Marking: DP1                                                     | SMV1233-004LF<br>Marking: DP3                                                     | SMV1233-074LF<br>Marking: DP3                                                     |                                                                                   | <b>SMV1233-011LF</b><br>Marking: DP                                                 | SMV1233-079LF<br>Marking: Cathode                                                   |
| SMV1234-001LF<br>Marking: DQ1                                                     | SMV1234-004LF<br>Marking: DQ3                                                     |                                                                                   | SMV1234-073LF<br>Marking: DQ9                                                     | <b>SMV1234-011LF</b><br>Marking: DQ                                                 | SMV1234-079LF<br>Marking: Cathode                                                   |
| SMV1235-001LF<br>Marking: DR1                                                     | SMV1235-004LF<br>Marking: DR3                                                     | SMV1235-074LF<br>Marking: DR3                                                     |                                                                                   | SMV1235-011LF<br>Marking: DR                                                        | SMV1235-079LF<br>Marking: Cathode                                                   |
| SMV1236-001LF<br>Marking: EQ1                                                     | SMV1236-004LF<br>Marking: EQ3                                                     | SMV1236-074LF<br>Marking: EQ3                                                     |                                                                                   | SMV1236-011LF<br>Marking: EQ1                                                       | <b>SMV1236-079LF</b><br>Marking: Cathode                                            |
| SMV1237-001LF<br>Marking: DT1                                                     |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

### Typical Performance Characteristics



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## VARACTOR DIODES

### Large Bandwidth Hyperabrupt Varactor Diodes (Continued)

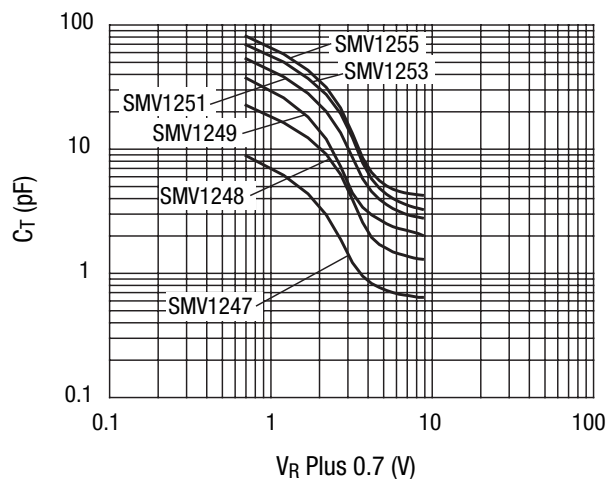
| Part Number    | Min. $C_T$<br>$V_R = 0.3 \text{ V}$<br>(pF) | $C_T$<br>$V_R = 1 \text{ V}$<br>(pF) | Typ. $C_T$<br>$V_R = 3 \text{ V}$<br>(pF) | Typ. $C_T$<br>$V_R = 4.7 \text{ V}$<br>(pF) | $C_R$<br>0.3 V/4.7 V | $C_R$<br>1 V/3 V | Max. $R_S$<br>500 MHz<br>@ 3 V ( $\Omega$ ) | Typ. Q<br>50 MHz<br>@ 3 V |
|----------------|---------------------------------------------|--------------------------------------|-------------------------------------------|---------------------------------------------|----------------------|------------------|---------------------------------------------|---------------------------|
| SMV1247 Series | 7                                           | 4.4 Typ.                             | 0.95                                      | 0.7                                         | 9.5–10.0             | 4.6 Typ.         | 2.00                                        | 1500                      |
| SMV1248 Series | 17                                          | 12.3 Typ.                            | 2.60                                      | 1.5                                         | 10.8–12.0            | 4.7 Typ.         | 1.80                                        | 700                       |
| SMV1249 Series | 31                                          | 18.2 Typ.                            | 3.40                                      | 2.6                                         | 11.0–12.1            | 5.3 Typ.         | 1.50                                        | 600                       |
| SMV1251 Series | 42                                          | 28.1 Typ.                            | 5.80                                      | 3.4                                         | 11.0–12.2            | 4.8 Typ.         | 1.30                                        | 400                       |
| SMV1253 Series | 53                                          | 37.0 Typ.                            | 7.77                                      | 4.3                                         | 11.0–12.3            | 4.7 Typ.         | 1.20                                        | 350                       |
| SMV1255 Series | 64                                          | 43.3 Typ.                            | 8.50                                      | 5.2                                         | 11.0–12.3            | 5.1 Typ.         | 1.00                                        | 350                       |

Minimum breakdown voltage 15 V @  $I_R = 10 \mu\text{A}$ .  
Reverse leakage 20 nA max. @  $V_R = 8 \text{ V}$ .

|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |
| <b>Single SOT-23</b>                                                              | <b>Common Anode SOT-23</b>                                                        | <b>Common Cathode SOT-23</b>                                                      | <b>Common Cathode SC-70</b>                                                       | <b>Single SOD-323</b>                                                               | <b>Single SC-79<sup>(1)</sup></b>                                                   |
|                                                                                   |                                                                                   |                                                                                   | <b>SMV1247-074LF</b><br>Marking: GF3                                              | SMV1247-011LF<br>Marking: GF                                                        | <b>SMV1247-079LF</b><br>Marking: Cathode                                            |
| SMV1248-001LF<br>Marking: GG1                                                     |                                                                                   |                                                                                   | SMV1248-074LF<br>Marking: GG3                                                     |                                                                                     | SMV1248-079LF<br>Marking: Cathode                                                   |
| SMV1249-001LF<br>Marking: EF1                                                     | SMV1249-003LF<br>Marking: EF9                                                     | SMV1249-004LF<br>Marking: EF3                                                     | SMV1249-074LF<br>Marking: EF3                                                     | SMV1249-011LF<br>Marking: EF                                                        | <b>SMV1249-079LF</b><br>Marking: Cathode                                            |
| SMV1251-001LF<br>Marking: EH                                                      |                                                                                   | SMV1251-004LF<br>Marking: EH3                                                     | SMV1251-074LF<br>Marking: EH3                                                     | SMV1251-011LF<br>Marking: EK                                                        | SMV1251-079LF<br>Marking: Cathode                                                   |
|                                                                                   |                                                                                   | SMV1253-004LF<br>Marking: EJ3                                                     |                                                                                   |                                                                                     | SMV1253-079LF<br>Marking: Cathode                                                   |
| SMV1255-001LF<br>Marking: EK1                                                     |                                                                                   | SMV1255-004LF<br>Marking: EK3                                                     |                                                                                   | SMV1255-011LF<br>Marking: EK                                                        | <b>SMV1255-079LF</b><br>Marking: Cathode                                            |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

### Typical Performance Characteristics



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The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

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## VARACTOR DIODES

### Large Bandwidth Hyperabrupt Varactor Diodes (Continued)

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | $C_T$<br>$V_R = 1 V$<br>(pF) | $C_T$<br>$V_R = 20 V$<br>(pF) | $C_T$<br>$V_R = 26 V$<br>(pF) | $C_R$<br>1 V/3 V | $C_R$<br>1 V/9 V | $C_R$<br>1 V/20 V | $C_R$<br>1 V/26 V | $R_S$<br>500 MHz<br>( $\Omega$ ) |
|----------------|---------------------------------------|------------------------------|-------------------------------|-------------------------------|------------------|------------------|-------------------|-------------------|----------------------------------|
| SMV1245 Series | 26                                    | 4.4–5.4                      | –                             | –                             | 1.47–1.76        | 3.5–4.2          | –                 | –                 | 2.0 Max. @ 1 V                   |
| SMV1265 Series | 28                                    | 12.5–14.7                    | –                             | 0.58–0.83                     | –                | –                | –                 | 17.7 Min.         | 2.4 Typ. @ 1 V                   |
| SMV1281 Series | 24                                    | 7.8–9.5                      | 0.6–0.8                       | –                             | –                | –                | 12.0 Typ.         | –                 | 1.7 Typ. @ 1 V                   |
| SMV1283 Series | 28                                    | 8.5–9.7                      | –                             | 0.50–0.75                     | –                | –                | –                 | 14.7 Typ.         | 2.4 Typ. @ 1 V                   |



**Single  
SOD-323**

SMV1245-011LF  
Marking: HL

SMV1265-011LF  
Marking: HM

SMV1281-011LF  
Marking: HP

SMV1283-011LF  
Marking: HQ

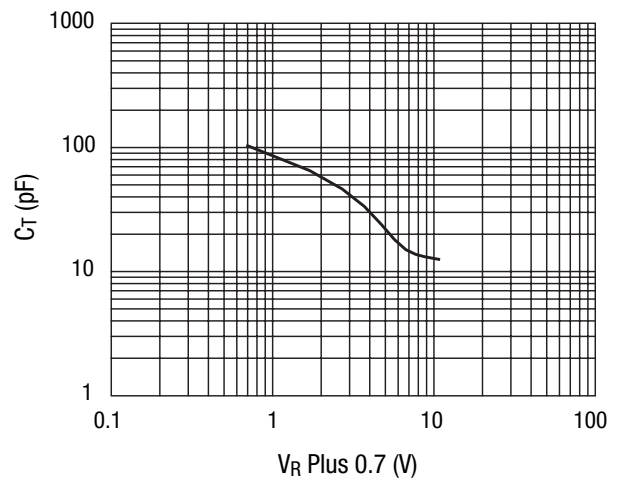
| Part Number    | Min.<br>$V_B$ @ 10 $\mu A$<br>(V) | $C_T$<br>$V_R = 0.1 V$<br>(pF) | $C_T$<br>$V_R = 2 V$<br>(pF) | $C_T$<br>$V_R = 4 V$<br>(pF) | Min. $C_R$<br>0.1 V/4 V | Max. $R_S$<br>470 MHz<br>( $\Omega$ ) @ 5 V |
|----------------|-----------------------------------|--------------------------------|------------------------------|------------------------------|-------------------------|---------------------------------------------|
| SMV1702 Series | 10                                | 90–110                         | 41–50                        | 22–29                        | 3.6                     | 1.25                                        |



**Single  
SOD-23**

SMV1702-011LF  
Marking: HJ

### Typical Performance Characteristics



The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## VARACTOR DIODES

### Large Bandwidth Hyperabrupt Varactor Diodes (Continued)

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | $C_T$<br>$V_R = 4 V$<br>(pF) | $C_T$<br>$V_R = 20 V$<br>(pF) | Min. $C_R$<br>4 V/20 V | Q<br>50 MHz    |
|----------------|---------------------------------------|------------------------------|-------------------------------|------------------------|----------------|
| SMV2022 Series | 22                                    | 2.50–3.30                    | 0.60–0.85                     | 3.0                    | 500 Typ. @ 4 V |
| SMV2023 Series | 22                                    | 4.40–5.40                    | 0.90–1.20                     | 4.2                    | 500 Typ. @ 4 V |

|                                                                                   |                                                                                   |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
| Single<br>SOT-23                                                                  | Common Cathode<br>SOT-23                                                          | Single<br>SOD-323                                                                   |
|                                                                                   | SMV2022-004LF<br>Marking: DJ3                                                     |                                                                                     |
| SMV2023-001LF<br>Marking: DK1                                                     | SMV2023-004LF<br>Marking: DK3                                                     | SMV2023-011LF<br>Marking: DK1                                                       |

### Hermetic Ceramic Packaged Large Bandwidth Hyperabrupt Varactor Diodes

| Part Number                                                                                   | $C_T$ @ 4 V<br>(pF) | $C_T$ @ 20 V<br>(pF) | Typ. Q<br>$V_R = 4 V$<br>F = 50 MHz | Max. $I_R$<br>$V_R = 17.6 V$<br>(nA) | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) |
|-----------------------------------------------------------------------------------------------|---------------------|----------------------|-------------------------------------|--------------------------------------|---------------------------------------|
|  SMV2019-107 | 0.78–1.08           | 0.25–0.39            | 500                                 | 50                                   | 22                                    |



Skyworks Green products are lead (Pb)-free, Restriction of Hazardous Substances (RoHS)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, and are free from antimony trioxide, and brominated flame retardants.



The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## VARACTOR DIODES

### Large Bandwidth Hyperabrupt Varactor Diodes (Continued)

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | $C_T$<br>$V_R = 0.5 V$<br>(pF) | $C_T$<br>$V_R = 1 V$<br>(pF) | $C_T$<br>$V_R = 2.5 V$<br>(pF) | $C_T$<br>$V_R = 4 V$<br>(pF) | Min. $C_R$<br>0.5 V/<br>2.5 V | Typ.<br>$C_R$<br>1 V/4 V | $R_S$<br>500 MHz<br>( $\Omega$ ) | Max. $R_S$<br>900 MHz<br>( $\Omega$ ) |
|----------------|---------------------------------------|--------------------------------|------------------------------|--------------------------------|------------------------------|-------------------------------|--------------------------|----------------------------------|---------------------------------------|
| SMV1263 Series | 20                                    | 6.2–7.2                        | –                            | 2.3–2.9                        | –                            | 2.3                           | –                        | –                                | 1.2 @ 1 V                             |
| SMV1269 Series | 10                                    | 19.2–21.8                      | –                            | 6.5–8.1                        | –                            | 2.5                           | –                        | –                                | 0.8 @ 1 V                             |
| SMV1270 Series | 20                                    | 22.1–25.1                      | –                            | 7.7–9.8                        | –                            | 2.3                           | –                        | 0.7 Typ. @ 1 V                   | –                                     |
| SMV1705 Series | 12                                    | –                              | 17.3–19.3                    | –                              | 5.3–6.6                      | 3                             | 0.32 Typ.                | –                                | –                                     |
| SMV1763 Series | 10                                    | 6.2–7.2                        | –                            | 2.3–2.9                        | –                            | 2.3                           | –                        | –                                | 0.7 @ 1 V                             |
| SMV1770 Series | 12                                    | 22.1–25.1                      | –                            | 7.7–9.8                        | –                            | 2.3                           | –                        | 0.5 Max. @ 1 V                   | –                                     |
| SMV1771 Series | 12                                    | 22.0–24.0                      | –                            | 9.25–12.5                      | –                            | 2.3                           | –                        | 0.5 Max. @ 1 V                   | –                                     |

Reverse leakage 20 nA max. @  $V_R = 8 V$ .

|                                                                                   |                                                                                   |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |
| <b>Common Cathode<br/>SOT-23</b>                                                  | <b>Common Cathode<br/>SC-70</b>                                                   | <b>Single<br/>SC-79<sup>(1)</sup></b>                                               |
|                                                                                   | SMV1263-074LF<br>Marking: EN3                                                     | <b>SMV1263-079LF</b><br>Marking: Cathode                                            |
|                                                                                   | SMV1269-074LF<br>Marking: EE3                                                     |                                                                                     |
|                                                                                   |                                                                                   | SMV1270-079LF<br>Marking: Cathode                                                   |
| SMV1705-004LF<br>Marking: HY3                                                     | SMV1705-074LF<br>Marking: HY3                                                     | SMV1705-079LF<br>Marking: Cathode                                                   |
|                                                                                   |                                                                                   | <b>SMV1763-079LF</b><br>Marking: Cathode                                            |
|                                                                                   |                                                                                   | SMV1770-079LF<br>Marking: Cathode                                                   |
|                                                                                   |                                                                                   | SMV1771-079LF<br>Marking: Cathode                                                   |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

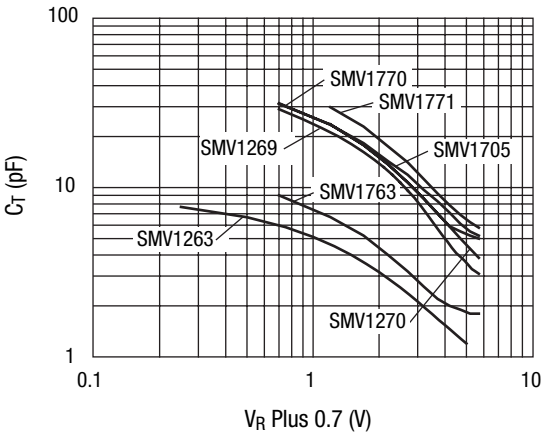
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VARACTOR DIODES

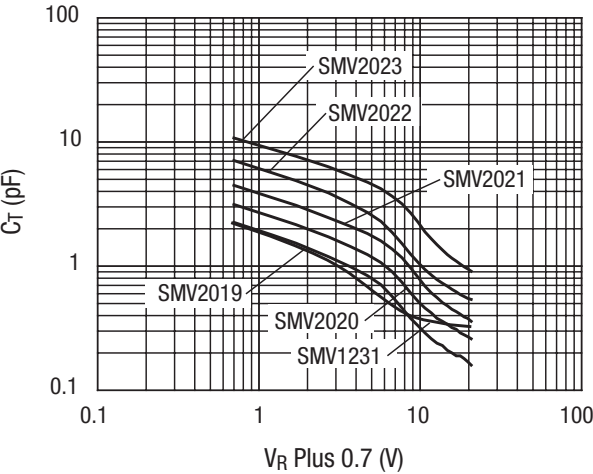
Typical Performance Characteristics



Silicon Hyperabrupt Varactor Diode Chips

| Part Number                                                                                     | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Min.<br>$C_J @ 0 V$<br>(pF) | Max.<br>$C_J @ 4 V$<br>(pF) | Min.<br>$C_J @ 20 V$<br>(pF) | Max.<br>$C_J @ 20 V$<br>(pF) | Typ.<br>$R_S @ 4 V$<br>1 GHz | Package |
|-------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------|-----------------------------|------------------------------|------------------------------|------------------------------|---------|
|  SMV2019-000   | 22                                    | 2.3                         | 0.88                        | 0.13                         | 0.23                         | 4.8                          | Chip    |
|  SMV2020-000  | 22                                    | 3.1                         | 1.43                        | 0.23                         | 0.33                         | 4.1                          | Chip    |
|  SMV2021-000 | 22                                    | 4.5                         | 1.98                        | 0.32                         | 0.44                         | 2.8                          | Chip    |
|  SMV2022-000 | 22                                    | 7.1                         | 3.08                        | 0.48                         | 0.68                         | 2.2                          | Chip    |
|  SMV2023-000 | 22                                    | 10.8                        | 5.28                        | 0.78                         | 1.08                         | 1.4                          | Chip    |

Typical Performance Characteristics



 Skyworks Green products are lead (Pb)-free, Restriction of Hazardous Substances (RoHS)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, and are free from antimony trioxide, and brominated flame retardants.

 The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## VARACTOR DIODES

### High Q Abrupt Diodes

| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Typ. $C_T$<br>$V_R = 0.5 V$<br>(pF) | Typ. $C_T$<br>$V_R = 1 V$<br>(pF) | $C_T$<br>$V_R = 4 V$<br>(pF) | Min. $C_R$<br>0 V/30 V | Max. $R_S$<br>500 MHz<br>( $\Omega$ ) | Max.<br>$R_S @ 1 V$<br>500 MHz<br>( $\Omega$ ) | Q<br>50 MHz |
|----------------|---------------------------------------|-------------------------------------|-----------------------------------|------------------------------|------------------------|---------------------------------------|------------------------------------------------|-------------|
| SMV1405 Series | 30                                    | 2.1                                 | 1.8                               | 1.21–1.45                    | 4.1                    | 0.80                                  | –                                              | 3200        |
| SMV1408 Series | 30                                    | 3.4                                 | 2.9                               | 1.75–2.11                    | 4.1                    | 0.60                                  | –                                              | 2900        |
| SMV1413 Series | 30                                    | 7.4                                 | 6.4                               | 3.64–4.42                    | 4.2                    | 0.35                                  | –                                              | 2400        |
| SMV1493 Series | –                                     | –                                   | 17.4–20.0                         | 10.0–12.1                    | –                      | –                                     | 0.50                                           | –           |
| SMV1494 Series | –                                     | –                                   | 36.3–41.7                         | 20.7–25.3                    | –                      | –                                     | 0.45                                           | –           |

|                                                                                   |                                                                                   |                                                                                    |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |
| <b>Single<br/>SOT-23</b>                                                          | <b>Common Cathode<br/>SOT-23</b>                                                  | <b>Common Cathode<br/>SC-70</b>                                                    | <b>Single<br/>SC-79<sup>(1)</sup></b>                                               |
|                                                                                   |                                                                                   | SMV1405-074LF<br>Marking: GE3                                                      | SMV1405-079LF<br>Marking: Cathode                                                   |
| SMV1408-001LF<br>Marking: DV1                                                     |                                                                                   |                                                                                    |                                                                                     |
| SMV1413-001LF<br>Marking: ER1                                                     | SMV1413-004LF<br>Marking: ER3                                                     |                                                                                    | SMV1413-079LF<br>Marking: Cathode                                                   |
|                                                                                   |                                                                                   |                                                                                    | SMV1493-079LF<br>Marking: Cathode                                                   |
|                                                                                   |                                                                                   |                                                                                    | SMV1494-079LF<br>Marking: Cathode                                                   |

1. A lower profile (< 0.65 mm) SC-79 package is available; please contact sales.

### Hermetic Ceramic Packaged High Q Abrupt Junction Silicon Varactors

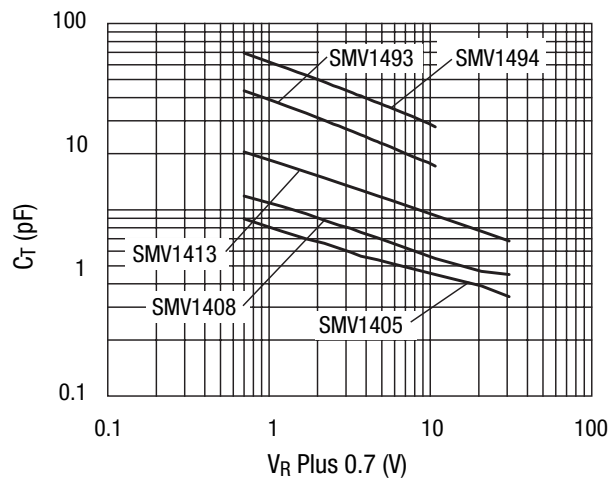
| Part Number                                                                                     | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Max. $I_R$<br>$V_R = 24 V$<br>(nA) | $C_T$<br>$V_R = 4 V$<br>(pF) | Min. $C_R$<br>0 V/30 V | Max. $R_S$<br>$V_R = 4 V$ ,<br>$F = 500 MHz$<br>( $\Omega$ ) | Typ. Q<br>$V_R = 4 V$<br>$F = 500 MHz$ |
|-------------------------------------------------------------------------------------------------|---------------------------------------|------------------------------------|------------------------------|------------------------|--------------------------------------------------------------|----------------------------------------|
|  SMV1405-107 | 30                                    | 20                                 | 1.28–1.53                    | 4.1                    | 0.8                                                          | 3200                                   |

 Skyworks Green products are lead (Pb)-free, Restriction of Hazardous Substances (RoHS)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, and are free from antimony trioxide, and brominated flame retardants.

 The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

VARACTOR DIODES

Typical Performance Characteristics



High Q Abrupt Diodes

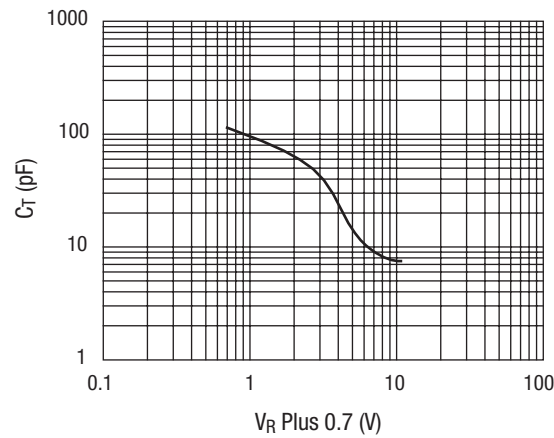
| Part Number    | Min. $V_B$<br>$I_R = 10 \mu A$<br>(V) | Typ. $C_T$<br>$V_R = 0.5 V$<br>(pF) | Typ. $C_T$<br>$V_R = 1 V$<br>(pF) | $C_T$<br>$V_R = 4.5 V$<br>(pF) | Typ. $C_R$<br>1 V/5 V | $R_S$<br>900 MHz<br>( $\Omega$ ) |
|----------------|---------------------------------------|-------------------------------------|-----------------------------------|--------------------------------|-----------------------|----------------------------------|
| SMV1470 Series | 10                                    | –                                   | 65.8–74.2                         | 12–14.8                        | 6                     | 0.8 @ 1.5 V                      |



Common Cathode  
SOT-23

SMV1470-004LF  
Marking: ET3

Typical Performance Characteristics



 The (Pb)-free symbol or “LF” in the part number denotes lead (Pb)-free, RoHS-compliant package.

## DIRECTIONAL COUPLERS

| Part Number      | Frequency (GHz) | Insertion Loss (dB) Typ. | Isolation (dB) Typ. | Input VSWR Typ. | Output VSWR Typ. | Coupling (dB) Typ. | Coupled Port VSWR Typ. | Package |
|------------------|-----------------|--------------------------|---------------------|-----------------|------------------|--------------------|------------------------|---------|
| DC08-73LF        | 0.81–0.96       | 0.45                     | 22                  | 1.05:1          | 1.05:1           | 15.0               | 1.2:1                  | SOT-6   |
| <b>DC09-73LF</b> | 0.81–0.96       | 0.20                     | 30                  | 1.1:1           | 1.1:1            | 19.8               | 1.1:1                  | SOT-6   |
| DC15-73LF        | 1.42–1.66       | 0.20                     | 34                  | 1.1:1           | 1.1:1            | 18.4               | 1.1:1                  | SOT-6   |
| DC16-73LF        | 1.42–1.99       | 0.30                     | 24                  | 1.1:1           | 1.1:1            | 15.0               | 1.1:1                  | SOT-6   |
| DC18-73LF        | 1.71–1.99       | 0.20                     | 38                  | 1.1:1           | 1.1:1            | 18.8               | 1.2:1                  | SOT-6   |
| <b>DC25-73LF</b> | 2.30–2.60       | 0.20                     | 33                  | 1.1:1           | 1.1:1            | 17.2               | 1.3:1                  | SOT-6   |

## DIRECTIONAL DETECTORS

| Part Number       | Frequency (GHz) | Insertion Loss (dB) Typ. | Directivity (dB) | Input VSWR Typ. | Output VSWR Typ. | Directed Output Voltage (dBm)        | Package |
|-------------------|-----------------|--------------------------|------------------|-----------------|------------------|--------------------------------------|---------|
| <b>DD02-999LF</b> | 0.65–3.0        | 0.2                      | 2                | 1.1:1           | 1.1:1            | 80 mV @ 900 MHz<br>160 mV @ 1800 MHz | SC-88   |

## SAMPLING PHASE DETECTORS

| Part Number                                                                                     | Microwave Signal Drive Level (dBm) Typ. | Schottky Diode |                                | Capacitor C <sub>C</sub> (pF) Typ. | Step Recovery Diode            |                          |              |
|-------------------------------------------------------------------------------------------------|-----------------------------------------|----------------|--------------------------------|------------------------------------|--------------------------------|--------------------------|--------------|
|                                                                                                 |                                         | Barrier        | C <sub>J</sub> @ 0 V (pF) Max. |                                    | C <sub>J</sub> @ 6 V (pF) Max. | T <sub>L</sub> (ns) Typ. | TT (ps) Typ. |
|  SPD1102-111 | 0 to 3                                  | Medium         | 0.1                            | 0.5                                | 0.25                           | 10                       | 70           |
|  SPD1103-111 | 0 to 13                                 | High           | 0.1                            | 0.5                                | 0.25                           | 10                       | 70           |
|  SPD1101-111 | -3 to 0                                 | Low            | 0.1                            | 0.5                                | 0.25                           | 10                       | 70           |

## HYBRIDS

### 90° Hybrids

| Part Number | Frequency (GHz) | Insertion Loss (dB) Typ. | Input Isolation (dB) Typ. | Output VSWR Typ. | Amplitude VSWR Typ. | Phase Balance (Degrees) Typ. | Balance (dB) Typ. | Package |
|-------------|-----------------|--------------------------|---------------------------|------------------|---------------------|------------------------------|-------------------|---------|
| HY86-12LF   | 0.82–0.90       | 0.40                     | 30                        | 1.15:1           | 1.15:1              | ±0.5                         | ±1                | SOIC-8  |
| HY92-12LF   | 0.88–0.96       | 0.40                     | 25                        | 1.1:1            | 1.1:1               | ±0.5                         | ±1                | SOIC-8  |
| HY17-12LF   | 1.71–1.88       | 0.50                     | 20                        | 1.2:1            | 1.2:1               | ±0.5                         | ±1                | SOIC-8  |
| HY19-12LF   | 1.85–1.99       | 0.50                     | 20                        | 1.3:1            | 1.3:1               | ±0.5                         | ±1                | SOIC-8  |
| HY22-73LF   | 2.10–2.30       | 0.55                     | 23                        | 1.2:1            | 1.2:1               | ±0.4                         | ±2                | SOT-6   |

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## INFRASTRUCTURE RF SUBSYSTEMS

*Designed for current and next-generation cellular PCS/GSM, 2.5G and 3G base stations and other wireless applications*

Our comprehensive wireless infrastructure offering includes high-performance receiver front-ends, downconverters, linear PAs, and drivers, as well as all the necessary RF microwave discrete and passive components.

The components cover a wide range of frequencies, making them ideal for base stations, satellite transceivers, wireless routers, wireless local loop, ISM, telemetry, RFID, and other global wireless applications.

### Infrastructure RF Subsystem features:

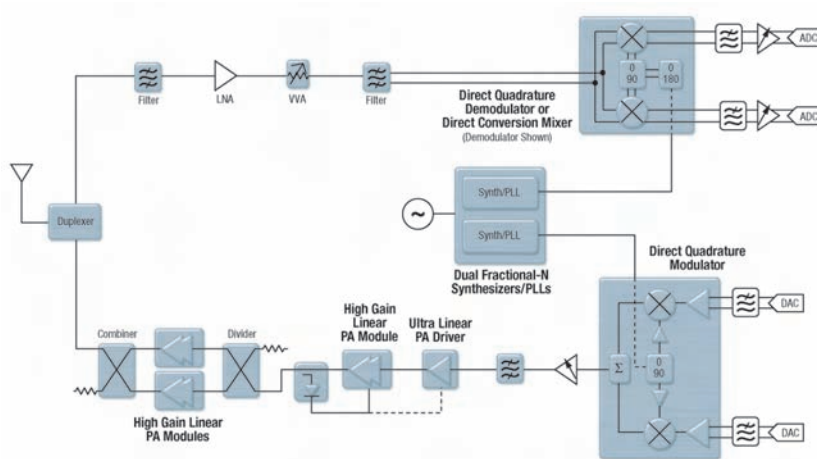
- Wideband linear transceiver “building blocks”
- Multiband and multistandard functionality
- Low cost and flexible integrated solutions
- RFICs for superheterodyne and zero IF architectures
- Power amplifiers with best-in-class linearity
- Custom, quick turn, multichip module capability

### Direct Conversion Base Station Subsystem

Skyworks offers high-performance RFIC and PA solutions that address the critical RF and IF functions in direct conversion base station transceivers. These components offer the unique combination of high linearity, high  $P_1$  dB, low noise and low cost, making them ideal for new designs and cost reduction of existing transceivers. Each component covers a wide range of frequencies for compatibility with 2.5G and 3G base stations, satellite transceivers, wireless routers, wireless local loop, ISM, telemetry, RFID, and other global wireless applications.

### Direct Conversion Base Station Subsystem Components features:

- Wide frequency coverage
- Multistandard capability—GSM/EDGE/CDMA/WCDMA
- Excellent IIP2 and IIP3
- Industry-leading active and passive components for all major RF and IF functions
- Reduced board size, component count, and manufacturing costs
- Custom multichip module and ASIC capabilities for even higher integration



Direct Conversion Base Station Transceiver Block Diagram

## INFRASTRUCTURE RF SUBSYSTEMS

### Direct Conversion Base Station Subsystem (Continued)

The Direct Conversion Base Station Subsystem consists of:

#### High Gain Linear PA Modules

- CX65105-11: 1700–2200 MHz, 5 V,  $P_{OUT} = 28.5$  dBm, Gain = 25 dB, 8 x 8 mm LCC
- CX65104-11: 700–1000 MHz, 5 V,  $P_{OUT} = 31$  dBm, Gain = 29 dB, 8 x 8 mm LCC
- CX65101-11: 1700–2200 MHz, 3.4 V,  $P_{OUT} = 30$  dBm, Gain = 23 dB, 8 x 8 mm LCC
- CX65100-11: 700–1000 MHz, 3.4 V,  $P_{OUT} = 30$  dBm, Gain = 30 dB, 8-pin, 8 x 8 mm LCC

#### Ultralinear PA Drivers

- SKY65004-11: 250–2700 MHz, 5 V,  $P_{OUT} = 25$  dBm, Gain = 15.5 dB, 4.5 x 2.4 mm SOT-89
- CX65003-12: 1400–2500 MHz, 5 V,  $P_{OUT} = 24.5$  dBm, Gain = 11.5 dB, 5.99 x 4.93 mm SOIC
- CX65002-12: 700–1400 MHz, 5 V,  $P_{OUT} = 24$  dBm, Gain = 18 dB, 5.99 x 4.93 mm SOIC
-  SKY65028-70LF: 250–2700 MHz, 5 V,  $P_{OUT} = 25$  dBm, Gain = 15.5 dB, 4.5 x 2.4 mm SOT-89

#### Dual Fractional-N Synthesizers

-  SKY74038-21: 100–2600 MHz, -89 dBc/Hz Phase Noise, 6.5 x 4.4 mm, 20-pin TSSOP
-  SKY72300-21: 100–2100 MHz, -89 dBc/Hz Phase Noise, 9.7 x 6.4 mm, 28-pin EP-TSSOP
-  SKY72301-21: 100–1000 MHz, -95 dBc/Hz Phase Noise, 9.7 x 6.4 mm, 28-pin EP-TSSOP
-  SKY72302-21: 400–6100 MHz, -80 dBc/Hz Phase Noise, 9.7 x 6.4 mm, 28-pin EP-TSSOP

#### Direct Quadrature Demodulator and Direct Conversion Mixer

-  SKY73009-11: 400–3000 MHz, 3 V, IIP2 = 60 dBm, IIP3 = 27 dBm, 5 x 5 mm, 32-pin RFLGA
-  SKY73001-11: 2–3500 MHz, 3 V, IIP2 = 67 dBm, IIP3 = 27 dBm, 5 x 5 mm, 32-pin RFLGA

#### Direct Quadrature Modulator

-  SKY73010-11: 300–2500 MHz, Noise Floor  $\leq -153$  dBm/Hz, ACPR = 72 dBc, 4 x 4 mm, 16-pin RFLGA



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## INFRASTRUCTURE RF SUBSYSTEMS

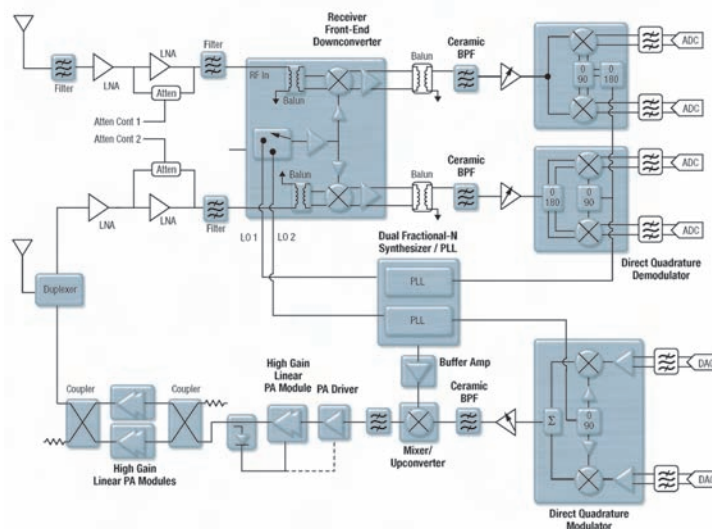
### Superheterodyne Base Station Subsystem

Skyworks offers a variety of RFIC “building blocks” for superheterodyne base station transceivers. The components feature wideband, linear performance, making them suitable for TDMA/GSM/GPRS/EDGE/CDMA and WCDMA base stations.

Our RFICs feature such on-chip functionality as two-channel diversity, LO buffer amplifiers, drivers, and low noise amplifiers. All power amplifiers and RFICs are designed to meet the stringent requirements of next-generation base stations with exceptional IIP3, high  $P_{1\text{ dB}}$ , and low noise.

#### Superheterodyne Base Station Subsystem features:

- Wide range of operating frequencies (700–2200 MHz)
- Multistandard capability—TDMA/GSM/EDGE/ CDMA/ WCDMA
- Industry-leading linearity
- Industry-leading active and passive components for all major RF and IF functions
- Reduced board size, component count, and manufacturing costs
- Custom multichip module and ASIC capabilities for even higher integration



Superheterodyne Base Station Transceiver Block Diagram



The (Pb)-free symbol or “LF” in the part number denotes lead (Pb)-free, RoHS-compliant package.

## INFRASTRUCTURE RF SUBSYSTEMS

### Superheterodyne Base Station Subsystem (Continued)

The Superheterodyne Base Station Subsystem consists of:

#### High Gain Linear PA Modules

- CX65100-11: 700–1000 MHz, 3.4 V,  $P_{OUT}$  = 30 dBm, Gain = 30 dB, 8 x 8 mm LCC
- CX65101-11: 1700–2200 MHz, 3.4 V,  $P_{OUT}$  = 30 dBm, Gain = 23 dB, 8 x 8 mm LCC
- CX65104-11: 700–1000 MHz, 5 V,  $P_{OUT}$  = 31 dBm, Gain = 29 dB, 8 x 8 mm LCC
- CX65105-11: 1700–2200 MHz, 5 V,  $P_{OUT}$  = 28.5 dBm, Gain = 25 dB, 8 x 8 mm LCC

#### Ultralinear PA Drivers

- CX65001-12: 160–700 MHz, 5 V,  $P_{OUT}$  = 24 dBm, Gain = 22 dB, 5.99 x 4.93 mm SOIC
- CX65002-12: 700–1400 MHz, 5 V,  $P_{OUT}$  = 24 dBm, Gain = 18 dB, 5.99 x 4.93 mm SOIC
- CX65003-12: 1400–2500 MHz, 5 V,  $P_{OUT}$  = 24.5 dBm, Gain = 11.5 dB, 5.99 x 4.93 mm SOIC
- SKY65004-11: 250–2700 MHz, 5 V,  $P_{OUT}$  = 25 dBm, Gain = 15.5 dB, 4.5 x 2.4 mm SOT-89
-  SKY65028-70LF: 250–2700 MHz, 5 V,  $P_{OUT}$  = 25 dBm, Gain = 15.5 dB, 4.5 x 2.4 mm SOT-89

#### Dual Fractional-N Synthesizers

-  SKY72300-21: 100–2100 MHz, -89 dBc/Hz Phase Noise, 9.7 x 6.4 mm, 28-pin EP-TSSOP
-  SKY72301-21: 100–1000 MHz, -95 dBc/Hz Phase Noise, 9.7 x 6.4 mm, 28-pin EP-TSSOP
-  SKY72302-21: 400–6100 MHz, -80 dBc/Hz Phase Noise, 9.7 x 6.4 mm, 28-pin EP-TSSOP
-  SKY74038-21: 100–2600 MHz, -89 dBc/Hz Phase Noise, 6.5 x 4.4 mm, 20-pin TSSOP

#### Direct Quadrature Demodulator

-  SKY73009-11: 400–3000 MHz, IIP2 = 60 dBm, IIP3 = 27 dBm, 5 x 5 mm, 32-pin RFLGA
-  SKY73012-11: 400–3600 MHz, IIP2 = 60 dBm, IIP3 = 27 dBm, 5 x 5 mm, 32-pin RFLGA

#### Direct Quadrature Modulator

-  SKY73010-11: 300–2500 MHz, Noise Floor  $\leq$  -153 dBm/Hz, ACPR = 72 dBc, 4 x 4 mm, 16-pin RFLGA

#### High Gain Diversity Mixers (RF Baluns, LO Switch, LO Buffer Amplifiers, Mixers, and IF Amplifiers)

-  SKY73020-11: RF = 700–1000 MHz, IF = 50–300 MHz, Gain = 7.5 dB, IIP3/OIP3 = 26.5/34 dBm, NF = 10.2 dB
-  SKY73021-11: RF = 1700–2200 MHz, IF = 50–300 MHz, Gain = 6 dB, IIP3/OIP3 = 26/32 dBm, NF = 9 dB

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 The (Pb)-free symbol or "LF" in the part number denotes lead (Pb)-free, RoHS-compliant package.

## MIXERS/DEMODULATORS

### Active Mixers

| Part Number                                                                                   | RF Input Freq Range (MHz) | Input IP3 (dBm) | Noise Figure (dB) | Conversion Gain (dB) | IP <sub>1</sub> dB (dBm) | IF Frequency Range (MHz) | Package (mm)     |
|-----------------------------------------------------------------------------------------------|---------------------------|-----------------|-------------------|----------------------|--------------------------|--------------------------|------------------|
| SKY42068<br> | 400–1000                  | 36              | 9.5               | 2.5                  | 17                       | 50–250                   | 20-pin QFN 5 x 5 |
| SKY42070<br> | 1700–2200                 | 33              | 9                 | 2.5                  | 17                       | 50–250                   | 20-pin QFN 5 x 5 |

### Direct Quadrature Demodulators

| Part Number                                                                                      | RF Input Frequency Range (MHz) | Input IP3 (dBm) | Input IP2 (dBm) | Voltage Conver. Gain (dB) | P <sub>1</sub> dB (dBm) | Supply Voltage (V) | I/Q Amplitude Imbalance (dB) | I/Q Phase Error (Degrees) | LO Frequency Range (MHz) | Process Technology | Evaluation Kit Part Number                                                                                                             | Package (mm)       |
|--------------------------------------------------------------------------------------------------|--------------------------------|-----------------|-----------------|---------------------------|-------------------------|--------------------|------------------------------|---------------------------|--------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| SKY73009<br>    | 400–3000                       | 27              | 60              | 2                         | 12                      | 3                  | ±0.3                         | <1                        | 400–3000                 | Si BiCMOS          | TW11-D982 (800–1000 MHz), TW12-D992 (1800–2000 MHz), TW12-D275 (Custom)                                                                | 32-pin RFLGA 5 x 5 |
| SKY73012-11<br> | 300–3900                       | 27              | 60              | 2                         | 12                      | 3                  | ±0.3                         | <1                        | 300–3900                 | Si BiCMOS          | TW16-D150-001 (900 MHz), TW16-D160-003 (1900 MHz), TW16-D161-001 (2600 MHz), TW16-D162-001 (3600 and 3800 MHz), TW16-D170-001 (Custom) | 32-pin RFLGA 5 x 5 |

| Part Number                                                                                         | RF Input Freq Range (MHz) | Input IP3 (dBm) | Input IP2 (dBm) | Conversion Gain (dB) | P <sub>1</sub> dB (dBm) | I/Q Amplitude Imbalance (dB) | Package (mm)     |
|-----------------------------------------------------------------------------------------------------|---------------------------|-----------------|-----------------|----------------------|-------------------------|------------------------------|------------------|
| SKY73013-306<br> | 4.9–5.925                 | 0/3             | 28/32           | 2/26                 | -15/-14                 | 0.15                         | 16-pin QFN 4 x 4 |

### Direct Conversion Mixer

| Part Number                                                                                     | RF Input Frequency Range (MHz) | Input IP3 (dBm) | Input IP2 (dBm) | Conver. Gain (dB) | P <sub>1</sub> dB (dBm) | Supply Voltage (V) | IF Frequency Range (MHz) | IF Output Impedance (Ω) | LO Frequency Range (MHz) | Process Technology | Evaluation Kit Part Number                                                 | Package (mm)       |
|-------------------------------------------------------------------------------------------------|--------------------------------|-----------------|-----------------|-------------------|-------------------------|--------------------|--------------------------|-------------------------|--------------------------|--------------------|----------------------------------------------------------------------------|--------------------|
| SKY73001<br> | 2–3500                         | 27              | 67              | -3.5              | 15                      | 3                  | 0–100                    | 500                     | 2–3500                   | Si BiCMOS          | TW10-D913 (2–500 MHz), TW10-D912 (500–2500 MHz), TW12-D342 (3200–3500 MHz) | 32-pin RFLGA 5 x 5 |

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## MIXERS/DEMODULATORS

### High Gain Diversity Mixer

| Part Number                                                                                      | RF Frequency (MHz) | IF Frequency (MHz) | Gain (dB) | IIP3/OIP3 (dBm) | NF (dB) | Supply Voltage (V) | LO Input (dBm) | LO-RF Leakage (dBm) | Isolation Ch/Ch (dB) | Process Technology | Package (mm)     |
|--------------------------------------------------------------------------------------------------|--------------------|--------------------|-----------|-----------------|---------|--------------------|----------------|---------------------|----------------------|--------------------|------------------|
| SKY73020<br>    | 700–1000           | 40–300             | 7.5       | 26.5/34.0       | 10.2    | 5                  | -3 to +3       | -38                 | 75                   | Si BiCMOS          | 36-pin MCM 6 x 6 |
| SKY73021-11<br> | 1700–2200          | 40–300             | 6.0       | 26.0/32.0       | 9.0     | 5                  | -3 to 0        | -36                 | 55                   | Si BiCMOS          | 36-pin MCM 6 x 6 |

## MODULATORS

### Direct Quadrature Modulator

| Part Number                                                                                   | RF Output Frequency Range (MHz) | ACPR (dBc) | CDMA Channel Power (dBm) | Broadband Noise Floor (dBm/Hz) | Carrier Suppression (dBc) | Supply Voltage (V) | Sideband Suppression (dBc) | Sat. Output Power (dBm) | LO Frequency Range (MHz) | Process Technology | Evaluation Kit Part Number | Package (mm)       |
|-----------------------------------------------------------------------------------------------|---------------------------------|------------|--------------------------|--------------------------------|---------------------------|--------------------|----------------------------|-------------------------|--------------------------|--------------------|----------------------------|--------------------|
| SKY73010<br> | 300–2500                        | 72         | -12                      | -153                           | 35                        | 5                  | 45                         | 1.8                     | 300–2500                 | SiGe BiCMOS        | TW12-D692                  | 16-pin RFLGA 4 x 4 |

## POWER DIVIDER/COMBINERS

### Two-Way

| Part Number      | Frequency (GHz) | Insertion Loss Less 3 dB Split Typ. | Isolation (dB) Typ. | Input VSWR Typ. | Output VSWR Typ. | Amplitude Balance (dB) | Phase Balance (Deg.) Typ. | Total Max. Power w/2.0:1 All Ports | Package |
|------------------|-----------------|-------------------------------------|---------------------|-----------------|------------------|------------------------|---------------------------|------------------------------------|---------|
| <b>PD09-73LF</b> | 0.81–0.96       | 0.40                                | 25                  | 1.2:1           | 1.3:1            | ±0.1                   | ±1.0                      | 1.5 W                              | SOT-6   |
| PD15-73LF        | 1.42–1.66       | 0.40                                | 23                  | 1.2:1           | 1.2:1            | ±0.1                   | ±1.0                      | 1.5 W                              | SOT-6   |
| PD16-73LF        | 1.42–1.66       | 0.40                                | 23                  | 1.2:1           | 1.2:1            | ±0.1                   | ±1.0                      | 1.5 W                              | SOT-6   |
| <b>PD18-73LF</b> | 1.71–1.99       | 0.40                                | 23                  | 1.3:1           | 1.2:1            | ±0.1                   | ±1.0                      | 1.5 W                              | SOT-6   |
| PD19-73LF        | 1.71–1.99       | 0.55                                | 25                  | 1.3:1           | 1.2:1            | ±0.1                   | ±1.0                      | 1.5 W                              | SOT-6   |
| PD22-73LF        | 2.10–2.30       | 0.55                                | 18                  | 1.5:1           | 1.1:1            | ±0.1                   | ±1.0                      | 1.5 W                              | SOT-6   |

### Four-Way

| Part Number | Frequency (GHz) | Insertion Loss Less 6 dB Split Typ. | Isolation (dB) Typ. | Input VSWR Typ. | Output VSWR Typ. | Amplitude Balance (dB) | Phase Balance (Deg.) Typ. | Total Max. Power w/2.0:1 All Ports | Package |
|-------------|-----------------|-------------------------------------|---------------------|-----------------|------------------|------------------------|---------------------------|------------------------------------|---------|
| PD4W09-12LF | 0.81–0.96       | 1.3                                 | 23                  | 1.2:1           | 1.2:1            | ±0.4                   | ±6                        | 1.5 W                              | SOIC-8  |
| PD4W09-59LF | 0.81–0.96       | 1.3                                 | 23                  | 1.2:1           | 1.2:1            | ±0.4                   | ±6                        | 1.5 W                              | MSOP-8  |
| PD4W18-12LF | 1.71–1.99       | 0.7                                 | 25                  | 1.6:1           | 1.2:1            | ±0.3                   | ±5                        | 1.5 W                              | SOIC-8  |
| PD4W18-59LF | 1.71–1.99       | 0.7                                 | 25                  | 1.3:1           | 1.3:1            | ±0.3                   | ±5                        | 1.5 W                              | MSOP-8  |

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## PHASE SHIFTERS

| Part Number                                                                                    | Frequency (MHz) | Description                      | Insertion Loss (dB) Max. | Phase Shift (Deg.) Min. | IP3 (dBm) Min. | Control Voltage Range (V) | Package |
|------------------------------------------------------------------------------------------------|-----------------|----------------------------------|--------------------------|-------------------------|----------------|---------------------------|---------|
| PS088-315<br> | 700–1100        | Voltage Controlled Phase Shifter | 2.3                      | 100                     | 33             | 0–12                      | LGA     |
| PS094-315<br> | 700–1250        | Voltage Controlled Phase Shifter | 2.3                      | 100                     | 33             | 0–12                      | LGA     |
| PS196-315<br> | 1800–3000       | Voltage Controlled Phase Shifter | 2.3                      | 100                     | 33             | 0–12                      | LGA     |
| PS214-315<br> | 1700–2800       | Voltage Controlled Phase Shifter | 2.3                      | 100                     | 33             | 0–12                      | LGA     |

 The (Pb)-free symbol or “LF” in the part number denotes lead (Pb)-free, RoHS-compliant package.

## RECEIVERS

## CDMA

| Part Number                                                                                   | Description                           | Package (mm)       |
|-----------------------------------------------------------------------------------------------|---------------------------------------|--------------------|
| SKY74076<br> | Receiver for CDMA and GPS             | 40-pin RFLGA 6 x 6 |
| SKY74693<br> | Receiver for CDMA, AMPS, PCS, and GPS | 48-pin RFLGA 7 x 7 |

## Direct Quadrature Demodulator

| Part Number                                                                                   | RF Input Frequency Range (MHz) | Input IP3 (dBm) | Input IP2 (dBm) | Conver. Gain (dB) | P <sub>1</sub> dB (dBm) | Supply Voltage (V) | I/Q Amplitude Imbalance (dB) | I/Q Phase Error (Degrees) | LO Frequency Range (MHz) | Process Technology | Evaluation Kit Part Number                                             | Package (mm)       |
|-----------------------------------------------------------------------------------------------|--------------------------------|-----------------|-----------------|-------------------|-------------------------|--------------------|------------------------------|---------------------------|--------------------------|--------------------|------------------------------------------------------------------------|--------------------|
| SKY73009<br> | 400–3000                       | 27              | 60              | 2                 | 12                      | 3                  | ±0.3                         | <1                        | 400–3000                 | Si BiCMOS          | TW11-D982 (800–1000 MHz), TW12-D992 (1800–2000 MHz) TW12-D275 (Custom) | 32-pin RFLGA 5 x 5 |

## High Gain Diversity Mixer

| Part Number                                                                                     | RF Frequency (MHz) | IF Frequency (MHz) | Gain (dB) | IIP3/OIP3 (dBm) | NF (dB) | Supply Voltage (V) | LO Input (dBm) | LO–RF Leakage (dBm) | Isolation Ch/Ch (dB) | Process Technology | Package (mm)     |
|-------------------------------------------------------------------------------------------------|--------------------|--------------------|-----------|-----------------|---------|--------------------|----------------|---------------------|----------------------|--------------------|------------------|
| SKY73020<br> | 700–1000           | 40–300             | 7.5       | 26.5/34.0       | 10.2    | 5                  | -3 to 0        | -38                 | 75                   | Si BiCMOS          | 36-pin MCM 6 x 6 |

## Direct Conversion Mixer

| Part Number                                                                                     | RF Input Frequency Range (MHz) | Input IP3 (dBm) | Input IP2 (dBm) | Conver. Gain (dB) | P <sub>1</sub> dB (dBm) | Supply Voltage (V) | IF Frequency Range (MHz) | IF Output Impedance (Ω) | LO Frequency Range (MHz) | Process Technology | Evaluation Kit Part Number                                               | Package (mm)       |
|-------------------------------------------------------------------------------------------------|--------------------------------|-----------------|-----------------|-------------------|-------------------------|--------------------|--------------------------|-------------------------|--------------------------|--------------------|--------------------------------------------------------------------------|--------------------|
| SKY73001<br> | 2–3500                         | 27              | 67              | -3.5              | 15                      | 3                  | 0–100                    | 500                     | 2–3500                   | Si BiCMOS          | TW10-D913 (2–500 MHz) TW10-D912 (500–2500 MHz) TW12-D342 (3200–3500 MHz) | 32-pin RFLGA 5 x 5 |

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## SWITCHES

## DC–6 GHz Plastic Packaged and Chip — Control FET and SPST

| Part Number                                                                                       | Frequency (GHz) | Description     | Insertion Loss Range (dB) Typ. | Isolation Range (dB) Typ. | IP3 > 0.5 GHz (dBm) Typ. | Package (mm)      |
|---------------------------------------------------------------------------------------------------|-----------------|-----------------|--------------------------------|---------------------------|--------------------------|-------------------|
| <b>Control FET</b>                                                                                |                 |                 |                                |                           |                          |                   |
| SKY13282-334<br> | 300 kHz–1.0 GHz | High Power      | 0.20–0.30                      | 30–7                      | 60                       | LGA-6 (1.5 x 1.2) |
| AF002C4-39LF                                                                                      | 300 kHz–1.0 GHz | High Power      | 0.20–0.30                      | 30–7                      | 60                       | SOT-23            |
| AF002C1-39LF                                                                                      | 300 kHz–2.5 GHz | General Purpose | 0.50–0.70                      | 50–10                     | 43                       | SOT-23            |

## SPST

|                   |                 |                                        |           |       |    |        |
|-------------------|-----------------|----------------------------------------|-----------|-------|----|--------|
| AS130-73LF        | 300 kHz–2.5 GHz | Low Cost, General Purpose, Dual CTL    | 0.70–1.00 | 48–20 | 44 | SOT-6  |
| AS156-73LF        | 0.5–2.5         | PHEMT Single Pos. CTL Refl. LNA Bypass | 0.65–0.75 | 47–30 | 43 | SOT-6  |
| <b>AS165-59LF</b> | 0.5–2.5         | PHEMT High ISO, Single Pos. CTL        | 0.70–1.10 | 50–40 | 45 | MSOP-8 |

## DC–6 GHz Plastic Packaged and Chip — SPDT

| Part Number                                          | Frequency (GHz) | Description                                                       | Insertion Loss Range (dB) Typ. | Isolation Range (dB) Typ. | IP3 > 0.5 GHz (dBm) Typ. | Package (mm) |
|------------------------------------------------------|-----------------|-------------------------------------------------------------------|--------------------------------|---------------------------|--------------------------|--------------|
| <b>Typical Power Rating 27 dBm — General Purpose</b> |                 |                                                                   |                                |                           |                          |              |
| AS338-12LF                                           | 300 kHz–2.5 GHz | General Purpose (Matched), Dual CTL                               | 0.50–1.20                      | 50–26                     | 46                       | SOIC-8       |
| AS002R2-12LF                                         | 300 kHz–3.0 GHz | General Purpose, Dual CTL                                         | 0.40–1.20                      | 60–18                     | 46                       | SOIC-8       |
| AS176-59LF                                           | 300 kHz–3.0 GHz | PHEMT Dual Pos. CTL                                               | 0.70–0.80                      | 65–30                     | 45                       | MSOP-8       |
| <b>AS177-86LF</b>                                    | 300 kHz–3.0 GHz | PHEMT Dual Pos. CTL                                               | 0.70–0.90                      | 60–40                     | 45                       | MSOP-10      |
| AS213-92LF                                           | 0.10–3.0        | PHEMT Dual 3 V CTL                                                | 0.25–0.50                      | 35–19                     | 40                       | SC-70 6-lead |
| AS214-92LF                                           | 0.10–3.0        | PHEMT Dual 3 V CTL                                                | 0.25–0.40                      | 33–25                     | 40                       | SC-70 6-lead |
| <b>AS222-92LF</b>                                    | 0.10–3.0        | PHEMT Dual 3 V CTL (AS213-92 with AS179-92 Logic)                 | 0.25–0.50                      | 35–19                     | 40                       | SC-70 6-lead |
| AS215-92LF                                           | 0.50–3.0        | PHEMT Single 3 V CTL                                              | 0.90–0.50                      | 35–20                     | 40                       | SC-70 6-lead |
| <b>AS186-302LF</b>                                   | DC–4.0          | PHEMT 55 dB ISO @ 0.5–2.5 GHz, Dual Pos. CTL (Matched)            | 0.80–1.25                      | 70–40                     | 46                       | MSOP-8EP     |
| <b>AS196-307LF</b>                                   | DC–6.0          | PHEMT 55 dB ISO @ 0.5–2.0 GHz, Single Pos. CTL w/Driver (Matched) | 0.90–2.00                      | 70–30                     | 46                       | LPCC-16      |
| SKY13286-359LF                                       | 0.1–6 GHz       | PHEMT High ISO 3 V or 5 V CTL w/Driver (Absorptive)               | 0.80–1.50                      | 42–62                     | 49                       | LPCC-16      |
| SKY13274-349LF                                       | DC–6.0 GHz      | UWB T/R Switch                                                    | 0.50–0.80                      | 25–17                     | 46                       | MLP-8        |
| AS229-350LF                                          | 300 kHz–6.0 GHz | PHEMT General Purpose Matched Dual CTL                            | 0.80–1.90                      | 54–28                     | 46                       | QFN 3 x 3    |

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## SWITCHES

## DC–6 GHz Plastic Packaged and Chip — SPDT (Continued)

| Part Number                                                                                             | Frequency (GHz) | Description                          | Insertion Loss Range (dB) Typ. | Isolation Range (dB) Typ. | IP3 > 0.5 GHz (dBm) Typ. | Package (mm)        |
|---------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------|--------------------------------|---------------------------|--------------------------|---------------------|
| <b>Typical Power Rating 30 dBm</b>                                                                      |                 |                                      |                                |                           |                          |                     |
| <b>AS169-73LF</b>                                                                                       | 300 kHz–2.5 GHz | PHEMT Dual 3 V CTL                   | 0.30–0.50                      | 30–24                     | 43                       | SOT-6               |
| AS183-92LF                                                                                              | 300 kHz–2.5 GHz | PHEMT Dual 3 V CTL (AS182-73 in -92) | 0.30–0.60                      | 20–13                     | 43                       | SC-70 6-lead        |
| <b>AS179-92LF</b>                                                                                       | 300 kHz–3.0 GHz | PHEMT Dual 3 V CTL (AS169-73 in -92) | 0.30–0.55                      | 30–24                     | 43                       | SC-70 6-lead        |
|  AS179-000             | DC–3.0          | PHEMT Dual 3 V CTL                   | 0.30–0.55                      | 30–24                     | 43                       | Chip                |
|  <b>SKY13268-344LF</b> | 300 kHz–3.0 GHz | PHEMT Dual 3 V CTL                   | 0.30–0.55                      | 30–24                     | 43                       | SOT-666 (1.6 x 1.6) |
| AS211-334                                                                                               | DC–4.0          | PHEMT Dual 3 V CTL                   | 0.30–0.50                      | 27–22                     | 43                       | LGA-6 (1.5 x 1.2)   |
|  <b>AS225-313LF</b>    | 0.1–6.0         | PHEMT (WLAN) Dual 3 V CTL            | 0.55                           | 23                        | 48                       | QFN-6               |

**Typical Power Rating 33 dBm and Greater**

|                                                                                             |                 |                              |           |       |    |                   |
|---------------------------------------------------------------------------------------------|-----------------|------------------------------|-----------|-------|----|-------------------|
| AS188-92LF                                                                                  | 300 kHz–2.0 GHz | PHEMT Dual 3 V CTL           | 0.30–0.55 | 40–18 | 50 | SC-70 6-lead      |
|  AS217-000 | 0.1–2.5         | T/R PHEMT Dual 3 V CTL       | 0.20–0.70 | 35–15 | 60 | Chip              |
| <b>AS193-73LF</b>                                                                           | 0.1–2.5         | PHEMT Dual 3 V CTL           | 0.30–0.50 | 30–19 | 60 | SOT-6             |
|  AS193-000 | 0.1–2.5         | PHEMT Dual 3 V CTL           | 0.30–0.50 | 30–19 | 60 | Chip              |
| SKY13270-92LF                                                                               | 0.1–2.5         | PHEMT Dual 3 V CTL           | 0.30–0.50 | 30–19 | 60 | SC-88             |
| AS216-339LF                                                                                 | 300 kHz–3.0 GHz | 7 W T/R, High IP3, Dual CTL  | 0.60–1.10 | 50–20 | 63 | SOIC-8EP          |
| AW002R2-12LF                                                                                | 300 kHz–3.0 GHz | 5 W T/R, High IP3, Dual CTL  | 0.60–1.10 | 50–20 | 63 | SOIC-8            |
| SKY13278-313LF                                                                              | 300 kHz–3.0 GHz | GSM/UMTS Mode Switch         | 0.40–0.55 | 32–18 | 63 | QFN-6             |
| SKY13290-313LF                                                                              | 300 kHz–3.0 GHz | 10 W T/R, High IP3, Dual CTL | 0.40–0.55 | 32–18 | 63 | QFN-6             |
| AS191-73LF                                                                                  | 0.1–4.0         | PHEMT Dual 3 V CTL           | 0.50–0.50 | 33–21 | 60 | SOT-6             |
| <b>AS230-348LF</b>                                                                          | DC–6.0          | PHEMT 7 W, Dual CTL          | 0.80–1.20 | 30–15 | 63 | QFN 3 x 3 16-lead |
| <b>AS200-313LF</b>                                                                          | 5.0–6.0         | PHEMT (WLAN) Dual 3 V CTL    | 1.20      | 25    | 50 | QFN-6             |



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## SWITCHES

## DC–6 GHz Plastic Packaged and Chip — Multiport

| Part Number | Frequency (GHz) | Description | Insertion Loss Range (dB) Typ. | Isolation Range (dB) Typ. | IP3 > 0.5 GHz (dBm) Typ. | Package (mm) |
|-------------|-----------------|-------------|--------------------------------|---------------------------|--------------------------|--------------|
|-------------|-----------------|-------------|--------------------------------|---------------------------|--------------------------|--------------|

*Typical Power Rating 27 dBm*

|                       |                 |                                            |           |       |    |         |
|-----------------------|-----------------|--------------------------------------------|-----------|-------|----|---------|
| AS115-61              | 300 kHz–2.0 GHz | High ISO, 3 V CTL (Absorptive) SP4T        | 0.40–1.10 | 65–40 | 43 | LQFP-32 |
| <b>AS204-80LF</b>     | 300 kHz–3.0 GHz | PHEMT Low Loss, SP4T w/Driver (Absorptive) | 0.50–1.00 | 45–25 | 40 | SSOP-16 |
| <b>SKY13267-321LF</b> | 300 kHz–6.0 GHz | PHEMT Diversity Switch                     | 0.70–0.90 | 32–23 | 49 | QFN-12  |

*Typical Power Rating 33 dBm and Greater*

|                                                                                               |         |                                                |           |       |    |        |
|-----------------------------------------------------------------------------------------------|---------|------------------------------------------------|-----------|-------|----|--------|
| AS202-321LF                                                                                   | DC–2.0  | PHEMT SP3T                                     | 0.40–0.70 | 33–19 | 60 | QFN-12 |
| AS227-321LF                                                                                   | DC–2.0  | PHEMT SP3T                                     | 0.50–0.70 | 34–20 | 65 | QFN-12 |
| AS197-306LF                                                                                   | 0.1–2.5 | SP2T, SP3T w/Logic                             | 0.80      | 25    | 55 | QFN-16 |
| AS219-321LF                                                                                   | 0.1–2.6 | PHEMT SP3T T/R                                 | 0.40–0.80 | 27–17 | 60 | QFN-12 |
|  AS219-000   | 0.1–2.6 | PHEMT SP3T T/R                                 | 0.40–0.50 | 27–17 | 60 | Chip   |
| SKY13251-349LF                                                                                | DC–3.0  | PHEMT Asymmetric SP3T 3 V or 5 V CTL           | 0.40–0.50 | 18–27 | 46 | QFN-12 |
| AS172-73LF                                                                                    | DC–2.0  | PHEMT 4 Port T/R and Ant. Switch @ 5 V CTL     | 0.40–0.80 | 25–15 | 45 | SOT-6  |
| AS221-306LF                                                                                   | 0.1–2.5 | PHEMT SP4T, 2.6 V                              | 0.90–1.10 | 34–23 | 55 | QFN-16 |
|  AS192-000  | 0.2–2.5 | PHEMT SP4T, 4.75 V CTL                         | 0.90–1.10 | 34–23 | 55 | Chip   |
| AS195-306LF                                                                                   | 0.1–2.0 | PHEMT SP5T, 3 V CTL                            | 0.80–1.00 | 30–20 | 55 | QFN-16 |
| AS218-321LF                                                                                   | DC–6.0  | PHEMT Transfer Switch                          | 1.00–1.25 | 45–24 | 50 | QFN-12 |
|  AS218-000 | DC–6.0  | PHEMT Transfer Switch                          | 1.00–1.25 | 40–24 | 50 | Chip   |
| AS236-321LF                                                                                   | DC–6.0  | PHEMT Transfer Switch (AS218-321 w/4 Line CTL) | 0.80–1.20 | 40–24 | 50 | QFN-12 |

## DC–2.5 GHz Plastic Packaged 4 x 2 — LNB/DBS Switch Matrix

| Part Number    | Frequency Band   | Description                      | Insertion Loss (dB) Typ. | Isolation (dB) Typ. | Input Power for 1 dB Compression (dBm) Typ. | Package (mm) |
|----------------|------------------|----------------------------------|--------------------------|---------------------|---------------------------------------------|--------------|
| SKY13264-340LF | 250 MHz–2.15 GHz | Silicon CMOS 4 x 2 Switch Matrix | 7.5–8.5                  | 40–33               | 15                                          | QFN-20 4 x 4 |
| SKY13272-340LF | 250 MHz–2.15 GHz | Silicon CMOS 4 x 2 Switch Matrix | 7.5–8.5                  | 40–31               | 11                                          | QFN-20 4 x 4 |
| AS212-93       | 0.7–3.0 GHz      | PHEMT 4 x 2 Switch Matrix        | 6.50                     | 35–30               | 12                                          | TSSOP-16     |



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## SYNTHESIZERS/PLLs

## Dual Fractional-N Synthesizers/PLLs

| Part Number | Main/RF Frequency (MHz) | Aux/IF Frequency (MHz) | Phase Noise @ 10 kHz Offset (dBc/Hz) | Large Freq. Step Set Time (μs) | Main/RF Step Size (Hz) | Current @ 3 V (mA) | Integer-N Boundary Spur (dBc) | Charge Pump Supply Voltage (V) | Supply Voltage (V) | Process Technology | Evaluation Kit Part Number | Package (mm) |
|-------------|-------------------------|------------------------|--------------------------------------|--------------------------------|------------------------|--------------------|-------------------------------|--------------------------------|--------------------|--------------------|----------------------------|--------------|
|-------------|-------------------------|------------------------|--------------------------------------|--------------------------------|------------------------|--------------------|-------------------------------|--------------------------------|--------------------|--------------------|----------------------------|--------------|

## Dual Fractional-N Frequency Synthesizers/PLLs

|                                                                                            |          |      |                      |            |      |    |            |         |         |             |           |                              |
|--------------------------------------------------------------------------------------------|----------|------|----------------------|------------|------|----|------------|---------|---------|-------------|-----------|------------------------------|
|  SKY72302 | 400–6100 | 1000 | -80 @ 6 GHz Inband   | 10/Loop BW | <400 | 17 | -55 to -65 | 2.7–5.0 | 2.7–3.3 | SiGe BiCMOS | PH00-D122 | 28-pin EP TSSOP<br>9.7 x 4.4 |
|  SKY72301 | 100–1000 | 500  | -95 @ 850 MHz Inband | 10/Loop BW | <100 | 11 | -55 to -65 | 2.7–5.0 | 2.7–3.3 | SiGe BiCMOS | PH00-D102 | 28-pin EP TSSOP<br>9.7 x 4.4 |
|  SKY72300 | 100–2100 | 500  | -89 @ 2 GHz Inband   | 10/Loop BW | <100 | 13 | -55 to -65 | 2.7–5.0 | 2.7–3.3 | SiGe BiCMOS | PH00-D112 | 28-pin EP TSSOP<br>9.7 x 4.4 |

## Dual Fractional-N/Integer-N Frequency Synthesizers/PLLs

|                                                                                            |          |     |                      |            |     |   |     |         |         |           |           |                           |
|--------------------------------------------------------------------------------------------|----------|-----|----------------------|------------|-----|---|-----|---------|---------|-----------|-----------|---------------------------|
|  SKY74038 | 100–2600 | 800 | -85 @ 2.4 GHz Inband | 10/Loop BW | <10 | 7 | -30 | 2.6–3.6 | 2.6–3.6 | Si BiCMOS | PH00-D222 | 20-pin TSSOP<br>6.5 x 4.4 |
|--------------------------------------------------------------------------------------------|----------|-----|----------------------|------------|-----|---|-----|---------|---------|-----------|-----------|---------------------------|

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## TECHNICAL CERAMICS

### Ceramic Coaxial Resonators\*

The various profiles, materials, and types available for the Skyworks coaxial TEM mode resonators are summarized in the following charts. You have a choice of two types, four materials, and seven profiles. This range of component variables should meet most circuit design requirements. While the component is manufactured to frequency, a formula is given so that the approximate length can be determined. The selected resonant frequency is available with two standard frequency

tolerances of  $\pm 0.5\%$  and  $\pm 1.0\%$ . The minimum tolerance is  $\pm 2$  MHz. Please note that the ordered value of  $f_0$  will be set according to our measurement procedure. The  $f_0$  in your circuit may vary due to stray reactance. This offset can be corrected by changing the ordered value of  $f_0$ .



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#### Recommended Frequencies 1000 Series ( $\epsilon_r = 10.5 \pm 0.5$ , $T_F = 0 \pm 10$ )

| Type                            | Profile | Recommended Range f (MHz) | Nominal Length (in.) $\pm 0.030$ in. | Nominal Length Range (in.) | Characteristic Impedance ( $\Omega$ ) |
|---------------------------------|---------|---------------------------|--------------------------------------|----------------------------|---------------------------------------|
| $\lambda/4$ Quarter Wave Length | HP      | 1150–800                  | $L = 911/f_0$ (MHz)                  | 0.506–0.792                | 25.3                                  |
|                                 | EP      | 1150–2500                 |                                      | 0.364–0.792                | 22.5                                  |
|                                 | SP      | 1150–3100                 |                                      | 0.294–0.792                | 18.3                                  |
|                                 | LS      | 1150–4600                 |                                      | 0.198–0.792                | 18.4                                  |
|                                 | LP      | 1150–4100                 |                                      | 0.222–0.792                | 27.4                                  |
|                                 | MP      | 1150–5100                 |                                      | 0.179–0.792                | 25.7                                  |
|                                 | SM      | 1150–5100                 |                                      | 0.179–0.792                | 18.4                                  |
| $\lambda/2$ Half Wave Length    | HP      | 2300–3400                 | $L = 1821/f_0$ (MHz)                 | 0.536–0.792                | 25.3                                  |
|                                 | EP      | 2300–5000                 |                                      | 0.364–0.792                | 22.5                                  |
|                                 | SP      | 2300–6000                 |                                      | 0.304–0.792                | 18.3                                  |
|                                 | LS      | 2300–6000                 |                                      | 0.304–0.792                | 18.4                                  |
|                                 | LP      | 2300–6000                 |                                      | 0.304–0.792                | 27.4                                  |
|                                 | MP      | 2300–6000                 |                                      | 0.304–0.792                | 25.7                                  |
|                                 | SM      | 2300–6000                 |                                      | 0.304–0.792                | 18.4                                  |

#### Recommended Frequencies 2000 Series ( $\epsilon_r = 20.6 \pm 1$ , $T_F = 0 \pm 10$ )

| Type                            | Profile | Recommended Range f (MHz) | Nominal Length (in.) $\pm 0.030$ in. | Nominal Length Range (in.) | Characteristic Impedance ( $\Omega$ ) |
|---------------------------------|---------|---------------------------|--------------------------------------|----------------------------|---------------------------------------|
| $\lambda/4$ Quarter Wave Length | HP      | 800–1200                  | $L = 650/f_0$ (MHz)                  | 0.542–0.813                | 18.1                                  |
|                                 | EP      | 800–1700                  |                                      | 0.382–0.813                | 16.1                                  |
|                                 | SP      | 800–2200                  |                                      | 0.296–0.813                | 13.1                                  |
|                                 | LS      | 800–3200                  |                                      | 0.203–0.813                | 13.1                                  |
|                                 | LP      | 800–2900                  |                                      | 0.224–0.813                | 19.6                                  |
|                                 | MP      | 800–3600                  |                                      | 0.181–0.813                | 18.4                                  |
|                                 | SM      | 800–3600                  |                                      | 0.181–0.813                | 13.1                                  |
| $\lambda/2$ Half Wave Length    | HP      | 1600–2500                 | $L = 1300/f_0$ (MHz)                 | 0.520–0.813                | 18.1                                  |
|                                 | EP      | 1600–3500                 |                                      | 0.372–0.813                | 16.1                                  |
|                                 | SP      | 1600–4500                 |                                      | 0.289–0.813                | 13.1                                  |
|                                 | LS      | 1600–6000                 |                                      | 0.217–0.813                | 13.1                                  |
|                                 | LP      | 1600–6000                 |                                      | 0.217–0.813                | 19.6                                  |
|                                 | MP      | 1600–6000                 |                                      | 0.217–0.813                | 18.4                                  |
|                                 | SM      | 1600–6000                 |                                      | 0.217–0.813                | 13.1                                  |

\*These products are produced by Trans-Tech (a wholly owned subsidiary of Skyworks Solutions, Inc.)

## TECHNICAL CERAMICS

### Ceramic Coaxial Resonators (Continued)

### Recommended Frequencies 8800 Series ( $\epsilon_r = 39 \pm 1.5$ , $T_F = 4 \pm 2$ )

| Type                            | Profile | Recommended Range f (MHz) | Nominal Length (in.) $\pm 0.030$ in. | Nominal Length Range (in.) | Characteristic Impedance ( $\Omega$ ) |
|---------------------------------|---------|---------------------------|--------------------------------------|----------------------------|---------------------------------------|
| $\lambda/4$ Quarter Wave Length | HP      | 600–900                   | $L = 472/f_0$ (MHz)                  | 0.525–0.787                | 13.1                                  |
|                                 | EP      | 600–1200                  |                                      | 0.394–0.787                | 11.7                                  |
|                                 | SP      | 600–1600                  |                                      | 0.295–0.787                | 9.5                                   |
|                                 | LS      | 600–2300                  |                                      | 0.205–0.787                | 9.5                                   |
|                                 | LP      | 600–2100                  |                                      | 0.225–0.787                | 14.2                                  |
|                                 | MP      | 600–2600                  |                                      | 0.182–0.787                | 13.3                                  |
|                                 | SM      | 600–2600                  |                                      | 0.182–0.787                | 9.5                                   |
| $\lambda/2$ Half Wave Length    | HP      | 1200–1900                 | $L = 945/f_0$ (MHz)                  | 0.497–0.787                | 13.1                                  |
|                                 | EP      | 1200–2500                 |                                      | 0.378–0.787                | 11.7                                  |
|                                 | SP      | 1200–3200                 |                                      | 0.295–0.787                | 9.5                                   |
|                                 | LS      | 1200–4700                 |                                      | 0.201–0.787                | 9.5                                   |
|                                 | LP      | 1200–4300                 |                                      | 0.220–0.787                | 14.2                                  |
|                                 | MP      | 1200–5200                 |                                      | 0.182–0.787                | 13.3                                  |
|                                 | SM      | 1200–5200                 |                                      | 0.182–0.787                | 9.5                                   |

### Recommended Frequencies 9000 Series ( $\epsilon_r = 90 \pm 3$ , $T_F = 0 \pm 10$ )

| Type                            | Profile | Recommended Range f (MHz) | Nominal Length (in.) $\pm 0.030$ in. | Nominal Length Range (in.) | Characteristic Impedance ( $\Omega$ ) |
|---------------------------------|---------|---------------------------|--------------------------------------|----------------------------|---------------------------------------|
| $\lambda/4$ Quarter Wave Length | HP      | 400–600                   | $L = 311/f_0$ (MHz)                  | 0.518–0.778                | 8.6                                   |
|                                 | EP      | 300–800                   |                                      | 0.389–1.037                | 7.7                                   |
|                                 | SP      | 300–1000                  |                                      | 0.311–1.037                | 6.3                                   |
|                                 | LS      | 300–1500                  |                                      | 0.207–1.037                | 6.3                                   |
|                                 | LP      | 300–1400                  |                                      | 0.222–1.037                | 9.4                                   |
|                                 | MP      | 400–1700                  |                                      | 0.183–0.778                | 8.8                                   |
|                                 | SM      | 400–1700                  |                                      | 0.183–0.778                | 6.3                                   |
| $\lambda/2$ Half Wave Length    | HP      | 800–1200                  | $L = 622/f_0$ (MHz)                  | 0.518–0.778                | 8.6                                   |
|                                 | EP      | 800–1700                  |                                      | 0.366–0.778                | 7.7                                   |
|                                 | SP      | 800–2100                  |                                      | 0.296–0.778                | 6.3                                   |
|                                 | LS      | 800–3100                  |                                      | 0.201–0.778                | 6.3                                   |
|                                 | LP      | 800–2800                  |                                      | 0.222–0.778                | 9.4                                   |
|                                 | MP      | 800–3400                  |                                      | 0.183–0.778                | 8.8                                   |
|                                 | SM      | 800–3400                  |                                      | 0.183–0.778                | 6.3                                   |

## COAXIAL RESONATOR ORDER INFORMATION

## An Order Example

|    |      |    |   |      |   |   |   |
|----|------|----|---|------|---|---|---|
| SR | 8800 | SP | Q | 1300 | B | Y | E |
|----|------|----|---|------|---|---|---|

**Green, lead (Pb)-free, RoHS-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, and are free from antimony trioxide and brominated flame retardants.**

**Tab:** Y = Yes, N = No

**Frequency Tolerance: B = +1.0%, A = 0.5%**

Resonant Frequency: State in MHz

**Type:** Q for  $\lambda/4$ , H for  $\lambda/2$

**Profile:** HP, EP, SP, LP, LS, MP, SM

**Material:** 8800, 9000, 1000, 2000

**Product Code:** SR - square coaxial resonator

TECHNICAL CERAMICS  
Ceramic Coaxial Inductors\*

Skyworks coaxial inductors are most frequently used in the resonant circuit of voltage-controlled oscillators (VCOs), where a varactor provides the tuning capability. The designer is usually confronted with trade-offs between high Q for best phase noise and component size versus circuit board real estate. An algorithm for selecting the correct Skyworks part follows. In addition, Skyworks COAX Program can provide valuable assistance for determining the correct Skyworks part. Application notes and references give example circuits, basic principles and some helpful hints.

While there is no physical distinction between a coaxial resonator and a coaxial inductor, the selection of an inductor for a VCO begins by first knowing (from analysis or experiment) the equivalent inductance that the active circuit, including the varactor, must see. In general, the VCO active circuit loads the “resonator,” lowering the resonator’s self-resonant frequency (SRF). The situation is analogous to externally capacitively loading a discrete parallel resonant L-C circuit.

While there is an approximate equivalent L-C circuit for the coaxial resonator close to resonance, this model has limited application.

The coaxial resonators and inductors are more accurately modeled as a transmission line. Our application notes and references delve further into this topic.

Values of inductance that can be achieved depend upon the separation between the VCO frequency and the SRF of the coaxial line element. Values less than 1 nH are not practical, since the metal connection tab itself has an equivalent inductance of this order.

In our experience, equivalent inductances in the range of 3–20 nH have been popular among designers of VCOs for wireless equipment.

Call for availability, utilize the Inductor Selection Guide, use the COAX Program, or refer to the application notes for assistance with ordering the correct part.



Skyworks Green products are lead (Pb)-free, RoHS (Restriction of Hazardous Substances)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, and are free from antimony trioxide and brominated flame retardants.

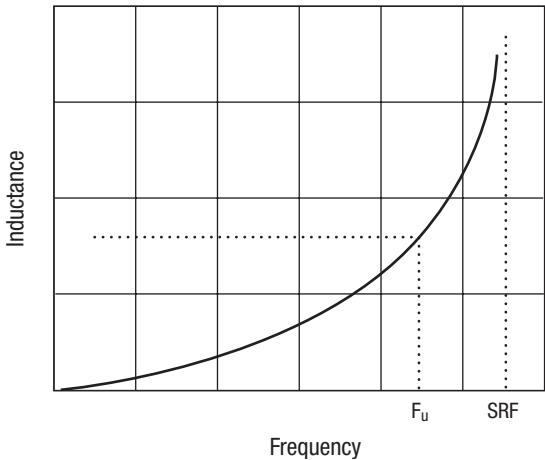


Figure 1. Frequency of Use vs. Inductance

COAXIAL INDUCTOR ORDER INFORMATION

An Order Example

SI 8800 LP Q 0450 Y 6.3 E

- Green, lead (Pb)-free, RoHS-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, and are free from antimony trioxide and brominated flame retardants.
- Inductance: (see Figure 1) Available in 0.01 nH increments
- Tab: Y = Yes, N = No
- Frequency of Use ( $F_u$ ): (see Figure 1 for definition)
- Type: Q for  $\lambda/4$  standard
- Profile: HP, EP, SP, LP, LS, MP, SM
- Material: 1000, 2000, 8800, 9000
- Product Code: SI - square coaxial inductor

\*These products are produced by Trans-Tech (a wholly owned subsidiary of Skyworks Solutions, Inc.)

## TECHNICAL CERAMICS

### Ceramic Coaxial Inductors (Continued)

#### Coax Line Properties vs. Profile and Material

| Profile | 1000   | 2000   | 8800   | 9000  | Tab Inductors |
|---------|--------|--------|--------|-------|---------------|
| HP      | 25.3 Ω | 18.1 Ω | 13.1 Ω | 8.6 Ω | 1.8 nH        |
| EP      | 22.5 Ω | 16.1 Ω | 11.7 Ω | 7.7 Ω | 1.0 nH        |
| SP      | 18.3 Ω | 13.1 Ω | 9.5 Ω  | 6.3 Ω | 1.0 nH        |
| LS      | 18.4 Ω | 13.1 Ω | 9.5 Ω  | 6.3 Ω | 0.9 nH        |
| LP      | 27.4 Ω | 19.6 Ω | 14.2 Ω | 9.4 Ω | 1.0 nH        |
| SP      | 25.7 Ω | 18.4 Ω | 13.3 Ω | 8.8 Ω | 0.6 nH        |
| SM      | 18.4 Ω | 13.1 Ω | 9.5 Ω  | 6.3 Ω | 0.6 nH        |

#### Wavelength ( $\lambda_g$ ) in Dielectric

| Material | $\epsilon_r$ | Wavelength Formula for $\lambda_g$ (inches) |
|----------|--------------|---------------------------------------------|
| 1000     | 10.5 ± 0.5   | 3642/ $f_0$                                 |
| 2000     | 20.6 ± 1.0   | 2601/ $f_0$                                 |
| 8800     | 39.0 ± 1.5   | 1890/ $f_0$                                 |
| 9000     | 90.0 ± 3.0   | 1244/ $f_0$                                 |

Figure 2.

#### Inductor Selection Guide

- 1) Select one of Skyworks four dielectric materials.
- 2) Determine the VCO's operating frequency ( $f_{vco}$ ).
- 3) Determine the desired inductance or circuit impedance ( $Z_{in}$ ).  
Note: Convert inductances to impedances by using:  
 $Z_{in} = 2\pi \cdot f_{vco} \cdot L_{in} \Omega$
- 4) Calculate the effect of the tab. Tab inductances are given in Figure 9. Use the formula  
( $Z_{in} = 2\pi \cdot f_{vco} \cdot L_{tab} \Omega$ )  
to convert the tab inductances to impedances.
- 5) Determine the input impedance by subtracting the effect of the tab using:  $Z_{input} = Z_{in} - Z_{tab}$
- 6) Calculate the wavelength ( $\lambda_g$ ) of the part in the dielectric (see Figure 2 for appropriate formula).
- 7) Determine the characteristic impedance ( $Z_0$ ) of the part (see Figure 3)
- 8) Calculate the physical length of the part using the formula:  $1 = (\lambda_g / 2 \cdot \pi) \tan^{-1} (Z_{input} / Z_0)$  inches
- 9) Determine the SRF of this part using:  
 $SRF = (\lambda_g \cdot f_{vco}) / (4 \cdot 1) \text{ MHz}$
- 10) Check the Recommended Frequency Chart for the appropriate material to ensure a valid part.

#### Measurement Description of Q, $f_0$ and L

Evaluation of Q (quality factor) and  $f_0$  (resonant frequency) of coaxial components is made with a one-port reflection measurement on a network analyzer. The probe is moved into the inner diameter (ID) of the device until the input resistance of the device matches the terminal resistance of the network analyzer. This is indicated by a 50 Ω circle on the Smith Chart display and is known as "critical" coupling. The point on this circle where the response is purely resistive (capacitance reactance equals inductive reactance) is the point of resonance and will be defined by a complex impedance of  $Z = 50 + j \Omega$ . The Q is computed by observing the frequency span between VSWR-2.616 ( $Z = 50 \pm j50 \Omega$ ) on either side of  $f_0$ . The Q is defined as  $f_0/\Delta f$ .

The inductance parameter (L) is measured with an APC-7 mm connector mounted flush with a conducting plane and a full one-port calibration (open, short, broadband 50 Ω load) is performed. The inductor is then clamped into place with the tab touching the inner conductor and the metallized body touching the grounding plane. The inductance (L) is measured at the frequency of use. The impedance vector on the Smith Chart of an ANA gives the necessary information where  $Z = R + j\omega L$ .

#### Characteristic Impedance

As shown in Figure 3, the characteristic impedance ( $Z_0$ ) of the coaxial TEM mode components is a function of the profile dimensions and the dielectric constant of the material.  $Z_0$  is reduced over its air line value by the square root of the dielectric constant of the material. At one-eighth wavelength, the short-circuit line exhibits an inductive reactance while the open-circuit line exhibits a capacitive reactance equal in magnitude to  $Z_0$ .

$$Z_0 = \text{characteristic impedance} = \frac{60}{\sqrt{\epsilon_r}} \ln \left( 1.079 \frac{w}{d} \right)$$

where:

w = width of resonator

d = diameter of inner conductor

$\epsilon_r$  = dielectric constant

| Profile | 1000   | 2000   | 8800   | 9000  |
|---------|--------|--------|--------|-------|
| HP      | 25.3 Ω | 18.1 Ω | 13.1 Ω | 8.6 Ω |
| EP      | 22.5 Ω | 16.1 Ω | 11.7 Ω | 7.7 Ω |
| SP      | 18.3 Ω | 13.1 Ω | 9.5 Ω  | 6.3 Ω |
| LS      | 18.4 Ω | 13.1 Ω | 9.5 Ω  | 6.3 Ω |
| LP      | 27.4 Ω | 19.6 Ω | 14.2 Ω | 9.4 Ω |
| MP      | 25.7 Ω | 18.4 Ω | 13.3 Ω | 8.8 Ω |
| SM      | 18.4 Ω | 13.1 Ω | 9.5 Ω  | 6.3 Ω |

Figure 3.

Skyworks coaxial components are compatible with standard surface mount reflow and wave soldering methods. The HP profile components may require mechanical support mounting because of the larger size. Consult the factory for details.

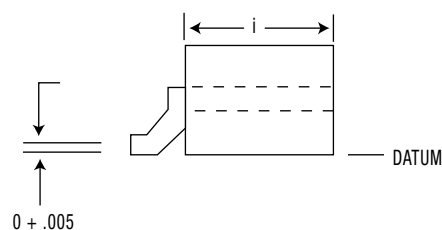
Figure 5 indicates the maximum tolerance of the component planarity with respect to the datum plane.

$$Z_{\text{input}} = fZ_0 \tan\left(\frac{2f_0}{4\text{SRF}}\right)$$

### Equation (2) Resonant Frequency

$$l = \frac{c}{4 \text{ SRF} \sqrt{\epsilon_r}}$$

where:  $c$  = speed of light  $\epsilon_r = 39.08800$  material  
 $90.09000$  material  
 $10.51000$  material  
 $20.62000$  material



### Figure 5. Surface Mount Tolerance for Components with Tabs

## TECHNICAL CERAMICS

### Ceramic Coaxial Inductors (Continued)

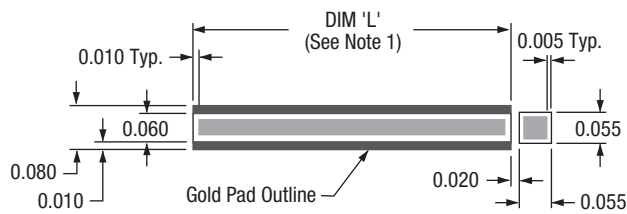
#### Packaging

Tape and reel packaging is available. Consult the factory for details.

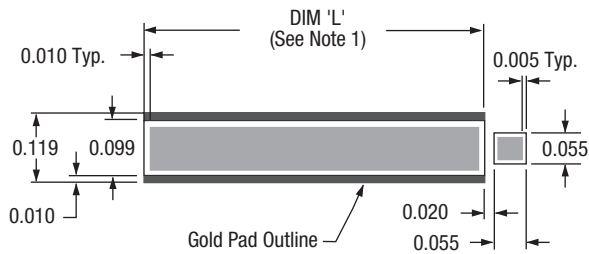
Notes: 1. Dimension "L" is length which depends on frequency.

Key:

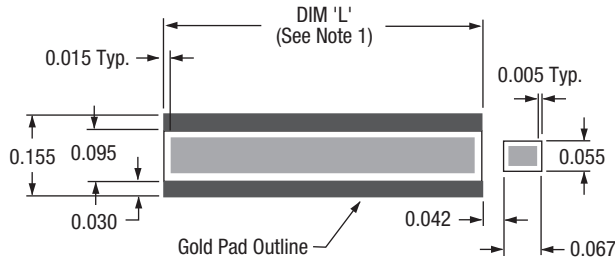
-  = Solder over metallic mounting pad
-  = Solder mask over metallic mounting pad
-  = Exposed metallic mounting pad



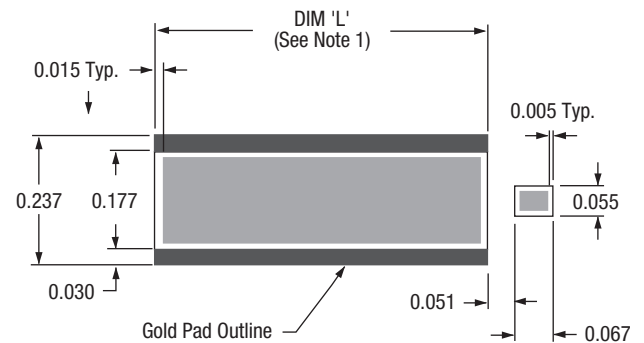
2 mm (5 m) Coaxial Resonator Footpad Dimensions



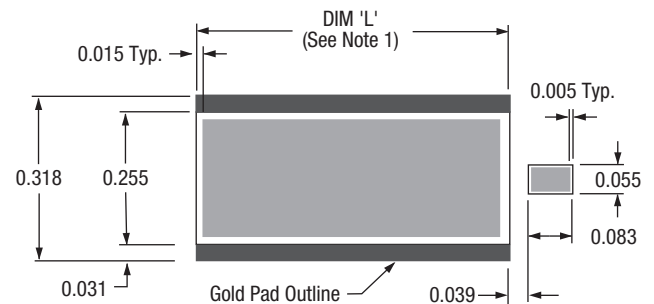
3 mm (MP) Coaxial Resonator Footpad Dimensions



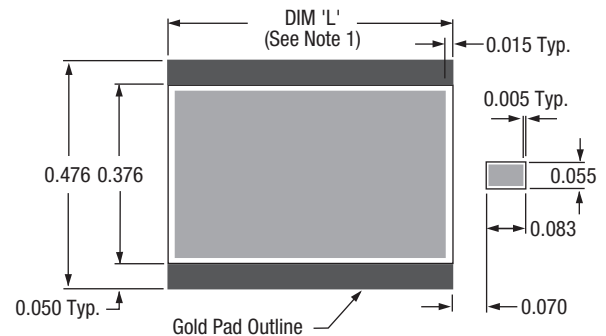
4 mm (LP/LS) Coaxial Resonator Footpad Dimensions



6 mm (SP) Coaxial Resonator Footpad Dimensions



8 mm (EP) Coaxial Resonator Footpad Dimensions



12 mm (HP) Coaxial Resonator Footpad Dimensions

TECHNICAL CERAMICS  
Ceramic Coaxial Resonators

Introduction

Skyworks Coaxial Resonator Design Kits offer design assistance for Voltage Controlled Oscillators (VCOs) and filter applications. There are numerous mechanical and material options, allowing engineers design flexibility over the frequency range of 300 MHz to 6 GHz.

Additional benefits such as high Q, excellent temperature stability, and a wide frequency range enable Skyworks to assure performance once a design is established. For packaging ease, Skyworks provides a multitude of styles including tape and reel for high-volume applications.

- Profiles included are 2 mm, 4 mm and 6 mm
- 5 Resonators at each frequency selection
- Up to 150 resonators per kit
- Rapid turnaround, fast delivery
- Selection and tuning application notes included

| Kit Number | Frequency (MHz) |
|------------|-----------------|
| 48888-1    | 300–750         |
| 48888-2    | 800–1300        |
| 48888-3    | 1400–2300       |
| 48888-4    | 2300–3000       |
| 48888-5    | 3000–5000       |

\*These products are produced by Trans-Tech (a wholly owned subsidiary of Skyworks Solutions, Inc.)

## TECHNICAL CERAMICS

### Standard Filters/Diplexers\*

This list contains Skyworks most popular filter and diplexer designs. A variety of footprints and configurations are available for application-specific needs. Please contact the factory or your local representative with your specifications or for more information on any of these

designs. Skyworks maintains a list of over 700 active filters and diplexers. We welcome every opportunity to assist in the selection or creation of a filter or diplexer that will meet your specifications.

### CATV

| Part Number         | Filter Type | Size/Poles  | Center Frequency (MHz) | Bandwidth (MHz) | Insertion Loss (dB) | Package |
|---------------------|-------------|-------------|------------------------|-----------------|---------------------|---------|
| TT3P2-1068P0-3507   | Band Pass   | 3 mm/2 pole | 1068                   | 35              | 0.7                 | PCB SMT |
| TT4P2-1013P2-2020   | Band Pass   | 4 mm/2 pole | 1013                   | 20              | 2.0                 | PCB SMT |
| TT4P2-1082.5P2-0720 | Band Pass   | 4 mm/2 pole | 1082.5                 | 07              | 2.0                 | PCB SMT |
| TT4P2-1082P2-0620   | Band Pass   | 4 mm/2 pole | 1082                   | 06              | 2.0                 | PCB SMT |
| TT4P2-1090P2-0610   | Band Pass   | 4 mm/2 pole | 1090                   | 06              | 1.0                 | PCB SMT |
| TT4P3-1030P2-1535   | Band Pass   | 4 mm/3 pole | 1030                   | 15              | 3.5                 | PCB SMT |
| TT4P3-1067P2-4420   | Band Pass   | 4 mm/3 pole | 1067                   | 44              | 2.0                 | PCB SMT |
| TT6P4-1080P4-7015   | Band Pass   | 6 mm/4 pole | 1080                   | 70              | 1.5                 | PCB SMT |
| TT6P4-1090P2-1036   | Band Pass   | 6 mm/4 pole | 1090                   | 10              | 3.6                 | PCB SMT |

### WCS

| Part Number        | Filter Type | Size/Poles  | Center Frequency (MHz) | Bandwidth (MHz) | Insertion Loss (dB) | Package |
|--------------------|-------------|-------------|------------------------|-----------------|---------------------|---------|
| TT6P6-0750P0-5017  | Band Pass   | 6 mm/4 pole | 0750                   | 50              | 1.7                 | PCB SMT |
| TT6P5-0765P0-11225 | Band Pass   | 6 mm/5 pole | 0765                   | 112             | 2.5                 | PCB SMT |
| TT6P2-0770T-1215   | Band Pass   | 6 mm/2 pole | 0770                   | 12              | 1.5                 | PCB SMT |
| TT6P3-0770T-1225   | Band Pass   | 6 mm/3 pole | 0770                   | 12              | 2.5                 | PCB SMT |
| TT6P3-0770T-2020   | Band Pass   | 6 mm/3 pole | 0770                   | 20              | 2.0                 | PCB SMT |

### MDS

| Part Number        | Filter Type | Size/Poles  | Center Frequency (MHz) | Bandwidth (MHz) | Insertion Loss (dB) | Package |
|--------------------|-------------|-------------|------------------------|-----------------|---------------------|---------|
| TT4P3-2120P2-6020  | Band Pass   | 4 mm/3 pole | 2120                   | 60              | 2.0                 | PCB SMT |
| TT4P6-2122P0-2835  | Band Pass   | 4 mm/6 pole | 2122                   | 28              | 3.5                 | PCB SMT |
| TT6P4-2158P2-14220 | Band Pass   | 4 mm/4 pole | 2158                   | 14              | 2.0                 | PCB SMT |
| TT6P6-2500P3-3635  | Band Pass   | 6 mm/6 pole | 2500                   | 36              | 3.5                 | PCB SMT |

\*These products are produced by Trans-Tech (a wholly owned subsidiary of Skyworks Solutions, Inc.)

## TECHNICAL CERAMICS

## Standard Filters/Diplexers\* (Continued)

## ISM

| Part Number       | Filter Type | Size/Poles  | Center Frequency (MHz) | Bandwidth (MHz) | Insertion Loss (dB) | Package |
|-------------------|-------------|-------------|------------------------|-----------------|---------------------|---------|
| TT4P2-0915P2-2620 | Band Pass   | 4 mm/2 pole | 0915                   | 26              | 2.0                 | PCB SMT |
| TT6P2-0902F-2518  | Band Pass   | 6 mm/2 pole | 0902                   | 25              | 1.8                 | PCB SMT |
| TT6P2-0915T-2518  | Band Pass   | 6 mm/2 pole | 0915                   | 25              | 1.8                 | PCB SMT |
| TT6P3-0902T-2520  | Band Pass   | 6 mm/3 pole | 0902                   | 25              | 2.0                 | PCB SMT |
| TT6P3-0915T-2520  | Band Pass   | 6 mm/3 pole | 0915                   | 25              | 2.0                 | PCB SMT |
| TT6P3-0917F-1425  | Band Pass   | 6 mm/3 pole | 0917                   | 14              | 2.5                 | PCB SMT |
| TT3P3-2400P1-1030 | Band Pass   | 3 mm/3 pole | 2400                   | 10              | 3.0                 | PCB SMT |
| TT3P3-2450P1-1445 | Band Pass   | 3 mm/3 pole | 2450                   | 14              | 4.5                 | PCB SMT |
| TT6P3-2467P0-3330 | Band Pass   | 6 mm/3 pole | 2467                   | 33              | 3.0                 | PCB SMT |

## Cell, PCS, DCS, UMTS

| Part Number         | Filter Type | Size/Poles   | Center Frequency (MHz) | Bandwidth (MHz) | Insertion Loss (dB) | Package |
|---------------------|-------------|--------------|------------------------|-----------------|---------------------|---------|
| TT3P2-1880P0-6010   | Band Pass   | 3 mm/2 pole  | 1880                   | 60              | 1.0                 | PCB SMT |
| TT3P3-0881.5P2-2530 | Band Pass   | 3 mm/3 pole  | 0881.5                 | 25              | 3.0                 | PCB SMT |
| TT3P3-1880P0-6022   | Band Pass   | 3 mm/3 pole  | 1880                   | 60              | 2.2                 | PCB SMT |
| TT3P3-1960P0-6022   | Band Pass   | 3 mm/3 pole  | 1960                   | 60              | 2.2                 | PCB SMT |
| TT3P3-1960P2-6030   | Band Pass   | 3 mm/3 pole  | 1960                   | 60              | 3.0                 | PCB SMT |
| TT3P4-0836.5P2-2525 | Band Pass   | 3 mm/4 pole  | 0836.5                 | 25              | 2.5                 | PCB SMT |
| TT3P4-0881.5P2-2525 | Band Pass   | 3 mm/4 pole  | 0881.5                 | 25              | 2.5                 | PCB SMT |
| TT3P4-1880P2-6020   | Band Pass   | 3 mm/4 pole  | 1880                   | 60              | 2.0                 | PCB SMT |
| TT3P4-1880P2-6030   | Band Pass   | 3 mm/4 pole  | 1880                   | 60              | 3.0                 | PCB SMT |
| TT4P3-0863P0-0585   | Band Pass   | 4 mm/3 pole  | 0863                   | 05              | 8.5                 | PCB SMT |
| TT4P3-2180P1-2540   | Band Pass   | 4 mm/3 pole  | 2180                   | 25              | 4.0                 | PCB SMT |
| TT4P4-1880P0-6216   | Band Pass   | 4 mm/4 pole  | 1880                   | 62              | 1.6                 | PCB SMT |
| TT4P4-1960P0-6216   | Band Pass   | 4 mm/4 pole  | 1960                   | 62              | 1.6                 | PCB SMT |
| TT4P5-2240P2-1032   | Band Pass   | 4 mm/5 pole  | 2240                   | 10              | 3.2                 | PCB SMT |
| TT4P6-0860.5P0-1937 | Band Pass   | 4 mm/6 pole  | 0860.5                 | 19              | 3.7                 | PCB SMT |
| TT6P3-0836T-2520    | Band Pass   | 6 mm/3 pole  | 0836                   | 25              | 2.0                 | PCB SMT |
| TT6P3-0860P3-2020   | Band Pass   | 6 mm/3 pole  | 0860                   | 20              | 2.0                 | PCB SMT |
| TT6P3-0860T-2020    | Band Pass   | 6 mm/3 pole  | 0860                   | 20              | 2.0                 | PCB SMT |
| TT6P3-0881F-2520    | Band Pass   | 6 mm/3 pole  | 0881                   | 25              | 2.0                 | PCB SMT |
| TT6P5-1960P0-6025   | Band Pass   | 6 mm/5 pole  | 1960                   | 60              | 2.5                 | PCB SMT |
| TT6P5-2280P1-7032   | Band Pass   | 6 mm/5 pole  | 2280                   | 70              | 3.2                 | PCB SMT |
| TT6P6-1900P3-8035   | Band Pass   | 6 mm/6 pole  | 1900                   | 80              | 3.5                 | PCB SMT |
| TT6P3-2140P2-6011   | Band Pass   | 6 mm/3 pole  | 2140                   | 60              | 1.1                 | PCB SMT |
| TT6P10-R1950-T2140  | Diplexer    | 6 mm/10 pole | 1950                   | -               | -                   | PCB SMT |

\*These products are produced by Trans-Tech (a wholly owned subsidiary of Skyworks Solutions, Inc.)

## TECHNICAL CERAMICS

### Standard Filters/Diplexers\* (Continued)

#### GPS

| Part Number            | Filter Type | Size/Poles  | Center Frequency (MHz) | Bandwidth (MHz) | Insertion Loss (dB) | Package |
|------------------------|-------------|-------------|------------------------|-----------------|---------------------|---------|
| TT4P4-R1227.6-T1575.42 | Diplexer    | 6 mm/3 pole | 1227.6                 | -               | -                   | PCB SMT |
| TT4P3-1227.6P1-2030    | Band Pass   | 6 mm/3 pole | 1227.6                 | 20              | 3.0                 | PCB SMT |
| TT4P3-1575.42P2-2040   | Band Pass   | 6 mm/3 pole | 1575.42                | 20              | 4.0                 | PCB SMT |
| TT3P3-1227.6P1-1030    | Band Pass   | 6 mm/3 pole | 1227.6                 | 10              | 3.0                 | PCB SMT |
| TT3P3-1575.42P2-1030   | Band Pass   | 6 mm/3 pole | 1575.42                | 10              | 3.0                 | PCB SMT |

#### Other

| Part Number          | Filter Type | Size/Poles  | Center Frequency (MHz) | Bandwidth (MHz) | Insertion Loss (dB) | Package |
|----------------------|-------------|-------------|------------------------|-----------------|---------------------|---------|
| TT3P4-2513P2-5055    | Band Pass   | 6 mm/3 pole | 2513                   | 50              | 5.5                 | PCB SMT |
| TT3P5-3687P1-7466    | Band Pass   | 6 mm/3 pole | 3687                   | 74              | 6.6                 | PCB SMT |
| TT4P3-3417P2-0220    | Band Pass   | 6 mm/3 pole | 3417                   | 02              | 2.0                 | PCB SMT |
| TT4P5-1090P0-1050    | Band Pass   | 6 mm/3 pole | 1090                   | 10              | 5.0                 | PCB SMT |
| TT6P5-0810P3-5030    | Band Pass   | 6 mm/3 pole | 0810                   | 50              | 3.0                 | PCB SMT |
| TT6P4-0509P7-0148    | Band Pass   | 6 mm/3 pole | 0509                   | 01              | 4.8                 | PCB SMT |
| TT4P4-1000P2-1030    | Band Pass   | 6 mm/3 pole | 1000                   | 10              | 3.0                 | PCB SMT |
| TT6P3-0826.5P3-0520  | Band Pass   | 6 mm/3 pole | 0826.5                 | 05              | 2.0                 | PCB SMT |
| TT6P3-0827P3-0620    | Band Pass   | 6 mm/3 pole | 0825                   | 06              | 2.0                 | PCB SMT |
| TT6P6-1000P5-8530    | Band Pass   | 6 mm/3 pole | 1000                   | 85              | 3.0                 | PCB SMT |
| TT6P6-0545P6-3022    | Band Pass   | 6 mm/3 pole | 0545                   | 30              | 2.2                 | PCB SMT |
| TT4P3-3500P2-10020   | Band Pass   | 6 mm/3 pole | 3500                   | 10              | 2.0                 | PCB SMT |
| TT6P6-0889P3-4029    | Band Pass   | 6 mm/3 pole | 0889                   | 40              | 2.9                 | PCB SMT |
| TT6P4-0722P4-4817    | Band Pass   | 6 mm/3 pole | 0722                   | 48              | 1.7                 | PCB SMT |
| TT3P3-1088P2-9015    | Band Pass   | 6 mm/3 pole | 1088                   | 90              | 1.5                 | PCB SMT |
| TT6P3-0740P3-2020    | Band Pass   | 6 mm/3 pole | 0740                   | 20              | 2.0                 | PCB SMT |
| TT6P5-1950P3-6040    | Band Pass   | 6 mm/3 pole | 1950                   | 60              | 4.0                 | PCB SMT |
| TT3P4-0917P2-4524    | Band Pass   | 6 mm/3 pole | 0917                   | 45              | 2.4                 | PCB SMT |
| TT6P3-1090P2-1029    | Band Pass   | 6 mm/3 pole | 1090                   | 10              | 2.9                 | PCB SMT |
| TT6P4-0770P0-1240    | Band Pass   | 6 mm/3 pole | 0770                   | 12              | 4.0                 | PCB SMT |
| TT6P3-1030P2-1029    | Band Pass   | 6 mm/3 pole | 1030                   | 10              | 2.9                 | PCB SMT |
| TT6P5-0881.5P0-2530  | Band Pass   | 6 mm/3 pole | 0881.5                 | 25              | 3.0                 | PCB SMT |
| TT6P3-0730P3-1213    | Band Pass   | 6 mm/3 pole | 0730                   | 12              | 1.3                 | PCB SMT |
| TT6P3-0445.25T-0145  | Band Pass   | 6 mm/3 pole | 0445.25                | 01              | 4.5                 | PCB SMT |
| TT4P3-2400P1-20015   | Band Pass   | 6 mm/3 pole | 2400                   | 20              | 1.5                 | PCB SMT |
| TT6P3-1080P2-0650    | Band Pass   | 6 mm/3 pole | 1080                   | 06              | 5.0                 | PCB SMT |
| TT6P3-0745.3P3-1920  | Band Pass   | 6 mm/3 pole | 0745.3                 | 19              | 2.0                 | PCB SMT |
| TT6P4-0435P0-3019-NS | Band Pass   | 6 mm/3 pole | 0435                   | 30              | 1.9                 | PCB SMT |
| TT3P4-0895.5P2-3926  | Band Pass   | 6 mm/3 pole | 0895.5                 | 39              | 2.6                 | PCB SMT |

\*These products are produced by Trans-Tech (a wholly owned subsidiary of Skyworks Solutions, Inc.)

## WIMAX RF SUBSYSTEMS

## 5–6 GHz Transceiver Components

| Part Number | Main/RF Frequency (MHz) | Aux/IF Frequency (MHz) | Phase Noise @ 10 kHz Offset (dBc/Hz) | Large Freq. Step Set Time (μs) | Main/RF Step Size (Hz) | Current @ 3 V (mA) | Integer-N Boundary Spur (dBc) | Charge Pump Supply Voltage (V) | Supply Voltage (V) | Process Technology | Evaluation Kit Part Number | Package (mm) |
|-------------|-------------------------|------------------------|--------------------------------------|--------------------------------|------------------------|--------------------|-------------------------------|--------------------------------|--------------------|--------------------|----------------------------|--------------|
|-------------|-------------------------|------------------------|--------------------------------------|--------------------------------|------------------------|--------------------|-------------------------------|--------------------------------|--------------------|--------------------|----------------------------|--------------|

## Dual Fractional-N Frequency Synthesizers/PLLs

|                                                                                            |          |      |                    |            |      |    |            |         |         |             |           |                           |
|--------------------------------------------------------------------------------------------|----------|------|--------------------|------------|------|----|------------|---------|---------|-------------|-----------|---------------------------|
|  SKY72302 | 400–6100 | 1000 | -80 @ 6 GHz Inband | 10/Loop BW | <400 | 17 | -55 to -65 | 2.7–5.0 | 2.7–3.3 | SiGe BiCMOS | PH00-D122 | 28-pin EP TSSOP 9.7 x 4.4 |
|--------------------------------------------------------------------------------------------|----------|------|--------------------|------------|------|----|------------|---------|---------|-------------|-----------|---------------------------|

| Part Number | RF Input Freq Range (MHz) | Input IP3 (dBm) | Input IP2 (dBm) | Conversion Gain (dB) | P <sub>1</sub> dB (dBm) | I/Q Amplitude Imbalance (dB) | Package (mm) |
|-------------|---------------------------|-----------------|-----------------|----------------------|-------------------------|------------------------------|--------------|
|-------------|---------------------------|-----------------|-----------------|----------------------|-------------------------|------------------------------|--------------|

## Direct Quadrature Demodulator

|                                                                                                |           |     |       |      |         |      |                  |
|------------------------------------------------------------------------------------------------|-----------|-----|-------|------|---------|------|------------------|
|  SKY73013-306 | 4.9–5.925 | 0/3 | 28/32 | 2/26 | -15/-14 | 0.15 | 16-pin QFN 4 x 4 |
|------------------------------------------------------------------------------------------------|-----------|-----|-------|------|---------|------|------------------|

| Part Number | Frequency (GHz) | Description | Insertion Loss Range (dB) Typ. | Isolation Range (dB) Typ. | IP3 > 0.5 GHz (dBm) Typ. | Package (mm) |
|-------------|-----------------|-------------|--------------------------------|---------------------------|--------------------------|--------------|
|-------------|-----------------|-------------|--------------------------------|---------------------------|--------------------------|--------------|

## Switch—Typical Power Rating 30 dBm

|                    |         |                           |      |    |    |       |
|--------------------|---------|---------------------------|------|----|----|-------|
| <b>AS225-313LF</b> | 0.1–6.0 | PHEMT (WLAN) Dual 3 V CTL | 0.55 | 23 | 48 | QFN-6 |
|--------------------|---------|---------------------------|------|----|----|-------|

## 3.4–3.8 GHz Transceiver Components

| Part Number | Main/RF Frequency (MHz) | Aux/IF Frequency (MHz) | Phase Noise @ 10 kHz Offset (dBc/Hz) | Large Freq. Step Set Time (μs) | Main/RF Step Size (Hz) | Current @ 3 V (mA) | Integer-N Boundary Spur (dBc) | Charge Pump Supply Voltage (V) | Supply Voltage (V) | Process Technology | Evaluation Kit Part Number | Package (mm) |
|-------------|-------------------------|------------------------|--------------------------------------|--------------------------------|------------------------|--------------------|-------------------------------|--------------------------------|--------------------|--------------------|----------------------------|--------------|
|-------------|-------------------------|------------------------|--------------------------------------|--------------------------------|------------------------|--------------------|-------------------------------|--------------------------------|--------------------|--------------------|----------------------------|--------------|

## Dual Fractional-N Frequency Synthesizers/PLLs

|                                                                                              |          |     |                      |            |      |    |            |         |         |             |           |                           |
|----------------------------------------------------------------------------------------------|----------|-----|----------------------|------------|------|----|------------|---------|---------|-------------|-----------|---------------------------|
|  SKY72301 | 100–1000 | 500 | -95 @ 850 MHz Inband | 10/Loop BW | <100 | 11 | -55 to -65 | 2.7–5.0 | 2.7–3.3 | SiGe BiCMOS | PH00-D102 | 28-pin EP TSSOP 9.7 x 4.4 |
|----------------------------------------------------------------------------------------------|----------|-----|----------------------|------------|------|----|------------|---------|---------|-------------|-----------|---------------------------|

| Part Number | Frequency (GHz) | Description | Insertion Loss Range (dB) Typ. | Isolation Range (dB) Typ. | IP3 > 0.5 GHz (dBm) Typ. | Package (mm) |
|-------------|-----------------|-------------|--------------------------------|---------------------------|--------------------------|--------------|
|-------------|-----------------|-------------|--------------------------------|---------------------------|--------------------------|--------------|

## Switch—Typical Power Rating 27 dBm

|                       |             |                        |           |       |    |        |
|-----------------------|-------------|------------------------|-----------|-------|----|--------|
| <b>SKY13267-321LF</b> | 300 kHz–6.0 | PHEMT Diversity Switch | 0.70–0.90 | 32–23 | 49 | QFN-12 |
|-----------------------|-------------|------------------------|-----------|-------|----|--------|

## Switch—Typical Power Rating 33 dBm and Greater

|             |        |                       |           |       |    |        |
|-------------|--------|-----------------------|-----------|-------|----|--------|
| AS218-321LF | DC–6.0 | PHEMT Transfer Switch | 1.00–1.25 | 45–24 | 50 | QFN-12 |
|-------------|--------|-----------------------|-----------|-------|----|--------|

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## WIMAX RF SUBSYSTEMS

### 3.4–3.8 GHz Transceiver Components (Continued)

| Part Number                                                                                          | RF Input Frequency Range (MHz) | Input IP3 (dBm) | Input IP2 (dBm) | Conver. Gain (dB) | P <sub>1</sub> dB (dBm) | Supply Voltage (V) | IF Frequency Range (MHz) | IF Output Impedance (Ω) | LO Frequency Range (MHz) | Process Technology | Evaluation Kit Part Number                                                     | Package (mm)       |
|------------------------------------------------------------------------------------------------------|--------------------------------|-----------------|-----------------|-------------------|-------------------------|--------------------|--------------------------|-------------------------|--------------------------|--------------------|--------------------------------------------------------------------------------|--------------------|
| <b>Direct Conversion Mixer</b>                                                                       |                                |                 |                 |                   |                         |                    |                          |                         |                          |                    |                                                                                |                    |
| <b>SKY73001</b><br> | 2–3500                         | 27              | 67              | -3.5              | 15                      | 3                  | 0–100                    | 500                     | 2–3500                   | Si BiCMOS          | TW10-D913 (2–500 MHz)<br>TW10-D912 (500–2500 MHz)<br>TW12-D342 (3200–3500 MHz) | 32-pin RFLGA 5 x 5 |

### Direct Quadrature Demodulators

| Part Number                                                                                             | RF Input Frequency Range (MHz) | Input IP3 (dBm) | Input IP2 (dBm) | Voltage Conver. Gain (dB) | P <sub>1</sub> dB (dBm) | Supply Voltage (V) | I/Q Amplitude Imbalance (dB) | I/Q Phase Error (Degrees) | LO Frequency Range (MHz) | Process Technology | Evaluation Kit Part Number                                                                                                                         | Package (mm)       |
|---------------------------------------------------------------------------------------------------------|--------------------------------|-----------------|-----------------|---------------------------|-------------------------|--------------------|------------------------------|---------------------------|--------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>SKY73012-11</b><br> | 300–3900                       | 27              | 60              | 2                         | 12                      | 3                  | ±0.3                         | <1                        | 300–3900                 | Si BiCMOS          | TW16-D150-001 (900 MHz),<br>TW16-D160-003 (1900 MHz),<br>TW16-D161-001 (2600 MHz),<br>TW16-D162-001 (3600 and 3800 MHz),<br>TW16-D170-001 (Custom) | 32-pin RFLGA 5 x 5 |

### 2.1–2.7 GHz Transceiver Components

| Part Number                                                                                            | Main/RF Frequency (MHz) | Aux/IF Frequency (MHz) | Phase Noise @ 10 kHz Offset (dBc/Hz) | Large Freq. Step Set Time (μs) | Main/RF Step Size (Hz) | Current @ 3 V (mA) | Integer-N Boundary Spur (dBc) | Charge Pump Supply Voltage (V) | Supply Voltage (V) | Process Technology | Evaluation Kit Part Number | Package (mm)              |
|--------------------------------------------------------------------------------------------------------|-------------------------|------------------------|--------------------------------------|--------------------------------|------------------------|--------------------|-------------------------------|--------------------------------|--------------------|--------------------|----------------------------|---------------------------|
| <b>Dual Fractional-N Frequency Synthesizers/PLLs</b>                                                   |                         |                        |                                      |                                |                        |                    |                               |                                |                    |                    |                            |                           |
| <b>SKY72301</b><br> | 100–1000                | 500                    | -95 @ 850 MHz Inband                 | 10/Loop BW                     | <100                   | 11                 | -55 to -65                    | 2.7–5.0                        | 2.7–3.3            | SiGe BiCMOS        | PH00-D102                  | 28-pin EP TSSOP 9.7 x 4.4 |

| Part Number                                                                                            | RF Output Frequency Range (MHz) | ACPR (dBc) | CDMA Channel Power (dBm) | Broadband Noise Floor (dBm/Hz) | Carrier Suppression (dBc) | Supply Voltage (V) | Sideband Suppression (dBc) | Sat. Output Power (dBm) | LO Frequency Range (MHz) | Process Technology | Evaluation Kit Part Number | Package (mm)       |
|--------------------------------------------------------------------------------------------------------|---------------------------------|------------|--------------------------|--------------------------------|---------------------------|--------------------|----------------------------|-------------------------|--------------------------|--------------------|----------------------------|--------------------|
| <b>Direct Quadrature Modulators</b>                                                                    |                                 |            |                          |                                |                           |                    |                            |                         |                          |                    |                            |                    |
| <b>SKY73010</b><br> | 300–2500                        | 72         | -12                      | -153                           | 35                        | 5                  | 45                         | 1.8                     | 300–2500                 | SiGe BiCMOS        | TW12-D692                  | 16-pin RFLGA 4 x 4 |

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## WIMAX RF SUBSYSTEMS

## 2.1–2.7 GHz Transceiver Components (Continued)

| Part Number | RF Input Frequency Range (MHz) | Input IP3 (dBm) | Input IP2 (dBm) | Voltage Conver. Gain (dB) | P <sub>1</sub> dB (dBm) | Supply Voltage (V) | I/Q Amplitude Imbalance (dB) | I/Q Phase Error (Degrees) | LO Frequency Range (MHz) | Process Technology | Evaluation Kit Part Number | Package (mm) |
|-------------|--------------------------------|-----------------|-----------------|---------------------------|-------------------------|--------------------|------------------------------|---------------------------|--------------------------|--------------------|----------------------------|--------------|
|-------------|--------------------------------|-----------------|-----------------|---------------------------|-------------------------|--------------------|------------------------------|---------------------------|--------------------------|--------------------|----------------------------|--------------|

## Direct Quadrature Modulators (Continued)

|                                                                                                  |          |    |    |   |    |   |      |    |          |           |                                                                                                                                                    |                    |
|--------------------------------------------------------------------------------------------------|----------|----|----|---|----|---|------|----|----------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| SKY73012-11<br> | 300–3900 | 27 | 60 | 2 | 12 | 3 | ±0.3 | <1 | 300–3900 | Si BiCMOS | TW16-D150-001 (900 MHz),<br>TW16-D160-003 (1900 MHz),<br>TW16-D161-001 (2600 MHz),<br>TW16-D162-001 (3600 and 3800 MHz),<br>TW16-D170-001 (Custom) | 32-pin RFLGA 5 x 5 |
|--------------------------------------------------------------------------------------------------|----------|----|----|---|----|---|------|----|----------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|

| Part Number | Frequency (GHz) | Description | Insertion Loss Range (dB) Typ. | Isolation Range (dB) Typ. | IP3 > 0.5 GHz (dBm) Typ. | Package (mm) |
|-------------|-----------------|-------------|--------------------------------|---------------------------|--------------------------|--------------|
|-------------|-----------------|-------------|--------------------------------|---------------------------|--------------------------|--------------|

## Switch—Typical Power Rating 27 dBm

|                |             |                        |           |       |    |        |
|----------------|-------------|------------------------|-----------|-------|----|--------|
| SKY13267-321LF | 300 kHz–6.0 | PHEMT Diversity Switch | 0.70–0.90 | 32–23 | 49 | QFN-12 |
|----------------|-------------|------------------------|-----------|-------|----|--------|

| Part Number | Frequency (GHz) | 802.11 WLAN Standard | P <sub>OUT</sub> (dBm) | Saturated P <sub>OUT</sub> (dBm) Max. | Gain (dB) | Power Added Efficiency | Current Consumption (mA) | Supply Voltage (V) | Package (mm) |
|-------------|-----------------|----------------------|------------------------|---------------------------------------|-----------|------------------------|--------------------------|--------------------|--------------|
|-------------|-----------------|----------------------|------------------------|---------------------------------------|-----------|------------------------|--------------------------|--------------------|--------------|

## Power Amplifiers for WLAN and ISM

|                                                                                                 |             |      |                  |    |    |                  |                    |         |                                |
|-------------------------------------------------------------------------------------------------|-------------|------|------------------|----|----|------------------|--------------------|---------|--------------------------------|
| SKY65131<br> | 2.300–2.700 | b, g | 28 (b)<br>26 (g) | 30 | 26 | 41 (b)<br>33 (g) | 490 (b)<br>400 (g) | 3.0–3.6 | 16-pin 4 x 4 MCM Surface Mount |
| SKY65132<br> | 2.300–2.700 | b, g | 29 (b)<br>27 (g) | 33 | 34 | 20 (b)<br>18 (g) | 950 (b)<br>930 (g) | 3.0–3.6 | 20-pin 6 x 6 MCM Surface Mount |
| SKY65135<br> | 2.300–2.700 | b, g | 31 (b)<br>30 (g) | 30 | 33 | 25               | 1150               | 3.3–5.0 | 20-pin 6 x 6 MCM Surface Mount |

| Part Number | Frequency (GHz) | Description | Insertion Loss Range (dB) Typ. | Isolation Range (dB) Typ. | IP3 > 0.5 GHz (dBm) Typ. | Package (mm) |
|-------------|-----------------|-------------|--------------------------------|---------------------------|--------------------------|--------------|
|-------------|-----------------|-------------|--------------------------------|---------------------------|--------------------------|--------------|

## Switch—Typical Power Rating 33 dBm and Greater

|             |        |                       |           |       |    |        |
|-------------|--------|-----------------------|-----------|-------|----|--------|
| AS218-321LF | DC–6.0 | PHEMT Transfer Switch | 1.00–1.25 | 45–24 | 50 | QFN-12 |
|-------------|--------|-----------------------|-----------|-------|----|--------|

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## WIMAX RF SUBSYSTEMS

## 2.1–2.7 GHz Transceiver Components (Continued)

| Part Number                                                                                          | RF Input Frequency Range (MHz) | Input IP3 (dBm) | Input IP2 (dBm) | Conver. Gain (dB) | P <sub>1</sub> dB (dBm) | Supply Voltage (V) | I/Q Amplitude Imbalance (dB) | I/Q Phase Error (Degrees) | LO Frequency Range (MHz) | Process Technology | Evaluation Kit Part Number                                             | Package (mm)       |
|------------------------------------------------------------------------------------------------------|--------------------------------|-----------------|-----------------|-------------------|-------------------------|--------------------|------------------------------|---------------------------|--------------------------|--------------------|------------------------------------------------------------------------|--------------------|
| <b>SKY73009</b><br> | 400–3000                       | 27              | 60              | 2                 | 12                      | 3                  | ±0.3                         | <1                        | 400–3000                 | Si BiCMOS          | TW11-D982 (800–1000 MHz), TW12-D992 (1800–2000 MHz) TW12-D275 (Custom) | 32-pin RFLGA 5 x 5 |

## Direct Quadrature Demodulators

## WLAN FRONT-END MODULES

| Part Number                                                                                               | Frequency (GHz)     | Description                                          | 802.11 WLAN Standard | Typ. P <sub>OUT</sub> @ 2.5 % EVM (dBm) | Typ. Current @ V <sub>CC</sub> = 3.3 V (mA) | Typ. Tx Gain (dB) | Architecture                                              | Antenna Ports | Package (mm)         |
|-----------------------------------------------------------------------------------------------------------|---------------------|------------------------------------------------------|----------------------|-----------------------------------------|---------------------------------------------|-------------------|-----------------------------------------------------------|---------------|----------------------|
| <b>SKY65206-13</b><br>   | 2.4–2.5             | WLAN 802.11b,g Front-End Module                      | b<br>g               | 19.5<br>16.5                            | 230<br>180                                  | 25<br>25          | One Single-Band Tx/Rx Chain                               | 2             | Laminate 8 x 7 x 1.4 |
| <b>SKY65225-11</b><br>   | 2.4–2.5<br>4.9–5.85 | WLAN 802.11n 2 x 2 MIMO Front-End Module             | b,g,n<br>a,n         | 19<br>16                                | 190<br>180                                  | 24<br>25          | Two Full Dual-Band Tx/Rx Chains                           | 2             | MCM 10 x 14 x 0.9    |
| <b>SKY65227-11</b><br>  | 2.4–2.5             | WLAN 802.11n 2 x 2 MIMO Single-Band Front-End Module | b,g,n                | 19                                      | 190                                         | 25                | Two Full 2 GHz Tx/Rx Chains                               | 2             | MCM 10 x 14 x 0.9    |
| <b>SKY65228-11</b><br> | 4.9–5.85            | WLAN 802.11n 2 x 2 MIMO Single-Band Front-End Module | a,n                  | 16                                      | 180                                         | 25                | Two Full 5 GHz Tx/Rx Chains                               | 2             | MCM 10 x 14 x 0.9    |
| <b>SKY65229-11</b><br> | 2.4–2.5<br>4.9–5.85 | WLAN 802.11a,b,g Dual-Band Front-End Module          | b,g,n<br>a,n         | 19<br>16                                | 200<br>185                                  | 26<br>25          | One Full Dual-Band Tx/Rx Chain                            | 2             | Laminate 8 x 7 x 0.9 |
| <b>SKY65230-11</b><br> | 2.4–2.5<br>4.9–5.85 | WLAN 802.11n 3 x 3 MIMO Front-End Module             | b,g,n<br>a,n         | 18.5<br>15.5                            | 190<br>180                                  | 25<br>24          | Two Full Dual-Band Tx/Rx Chains                           | 3             | MCM 10 x 14 x 0.9    |
| <b>SKY65233-11</b><br> | 2.4–2.5             | WLAN 802.11n 3 x 3 MIMO Front-End Module             | b,g,n                | 18.5                                    | 190                                         | 25                | Two Full 2 GHz Tx/Rx Chains                               | 3             | MCM 10 x 14 x 0.9    |
| <b>SKY65234-11</b><br> | 4.9–5.85            | WLAN 802.11n 3 x 3 MIMO Front-End Module             | a,n                  | 15.5                                    | 180                                         | 25                | Two Full 5 GHz Tx/Rx Chains                               | 3             | MCM 10 x 14 x 0.9    |
| <b>SKY65240-11</b><br> | 2.4–2.5<br>4.9–5.85 | WLAN 802.11n 1 x 2 SIMO Front-End Module             | b,g,n<br>a,n         | 19<br>16                                | 190<br>180                                  | 25<br>25          | One Full Dual-Band Tx Chain, Two Full Dual-Band Rx chains | 2             | MCM 10 x 14 x 0.9    |

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**REFERENCE MATERIAL**

Block Diagrams .....83

Package Selection Guide .....100

Warranty/Order Information .....103

Part Number Index .....104

Skyworks Sales Representatives .....107

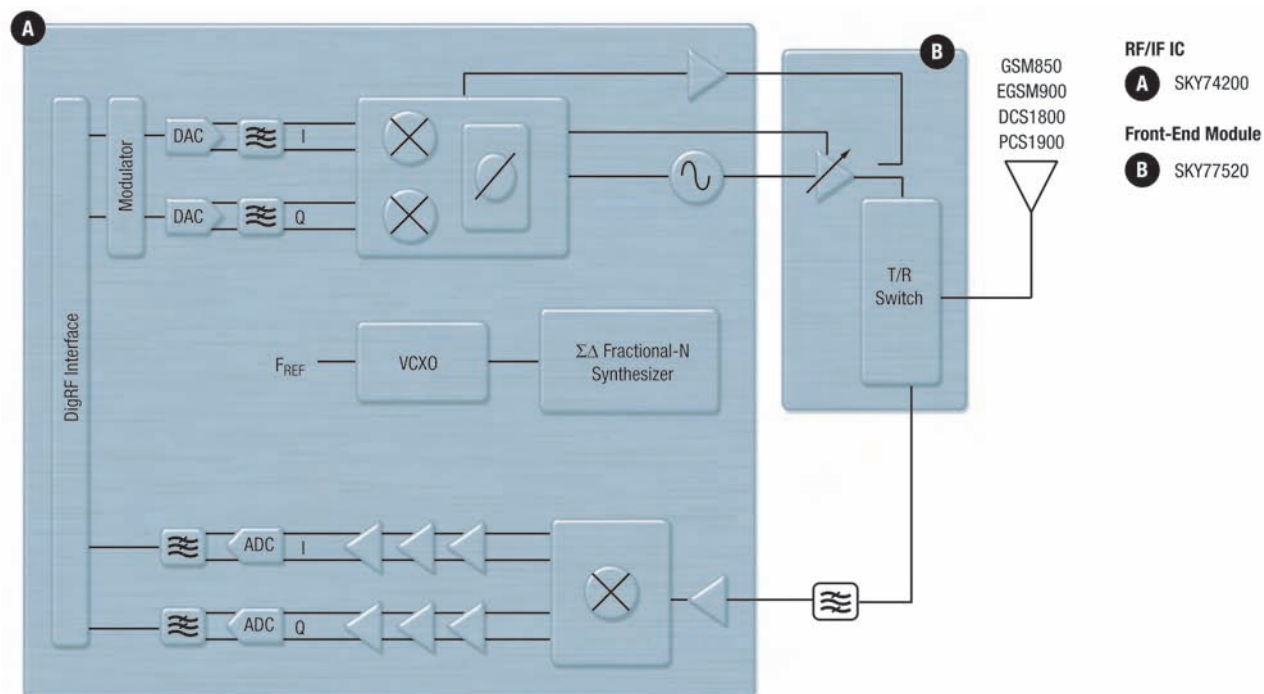
Skyworks Distributors .....109

Skyworks Sales Offices.....115

## BLOCK DIAGRAMS

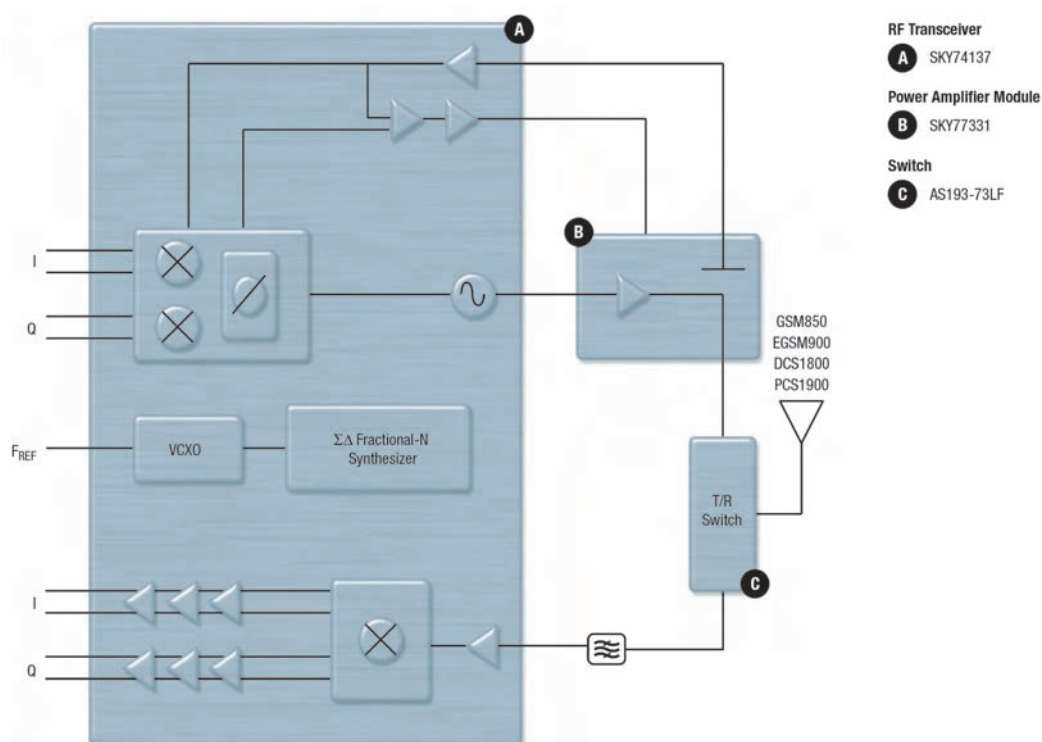
### Handsets

#### Helios™ DigRF Subsystem

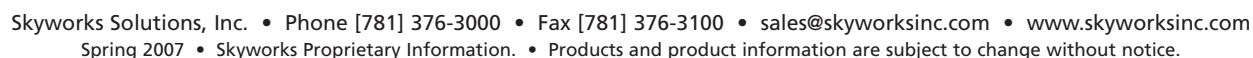


### Handsets

#### Complete Helios™ II EDGE RF Subsystem



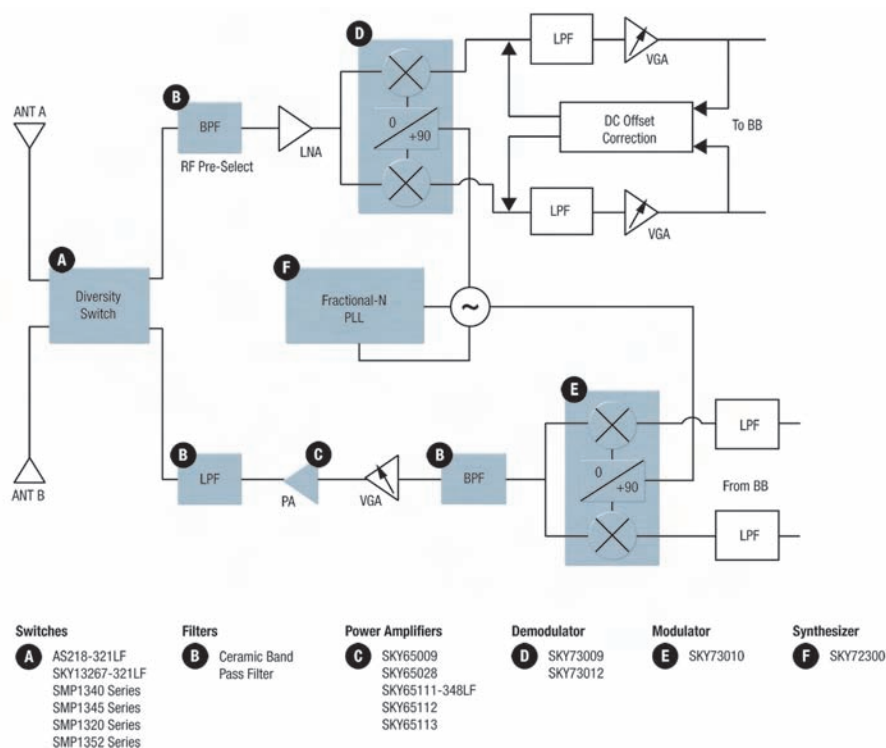
*Complete Helios™ II-Plus EDGE RF Subsystem*



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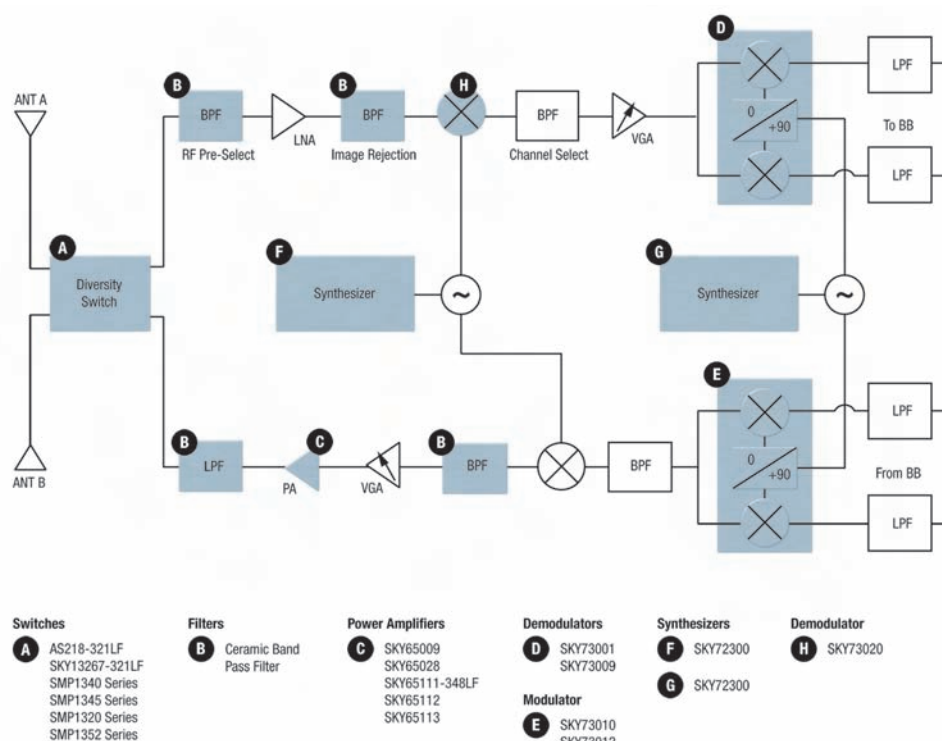
### WiMAX

#### 700 MHz Direct Conversion Architecture



### WiMAX

#### 700 MHz Superheterodyne Architecture



### 1500 MHz Direct Conversion Architecture

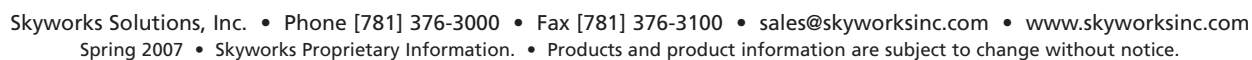




### 3.5 GHz Direct Conversion Architecture



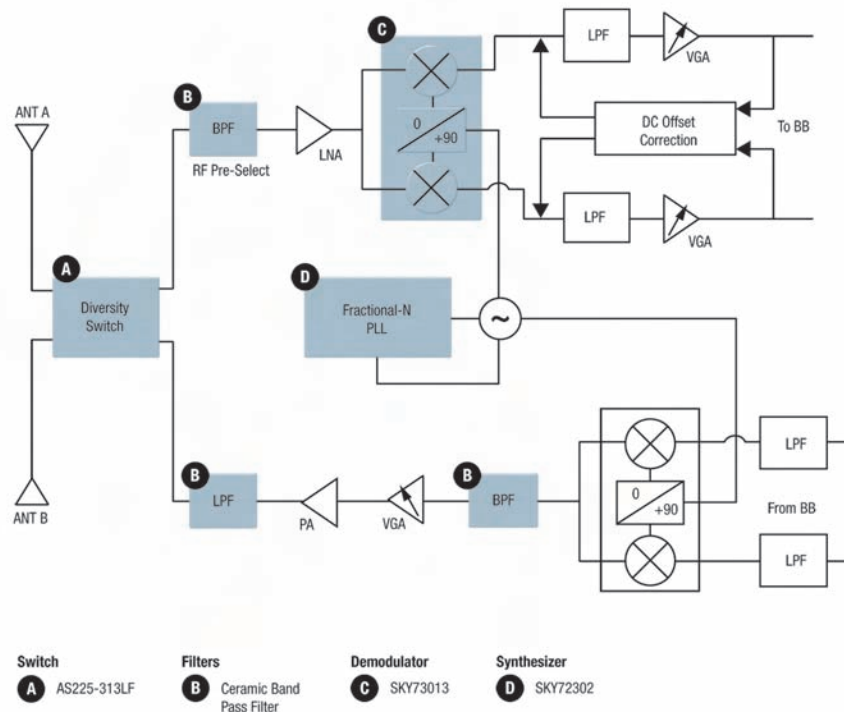
### 3.5 GHz Superheterodyne Architecture



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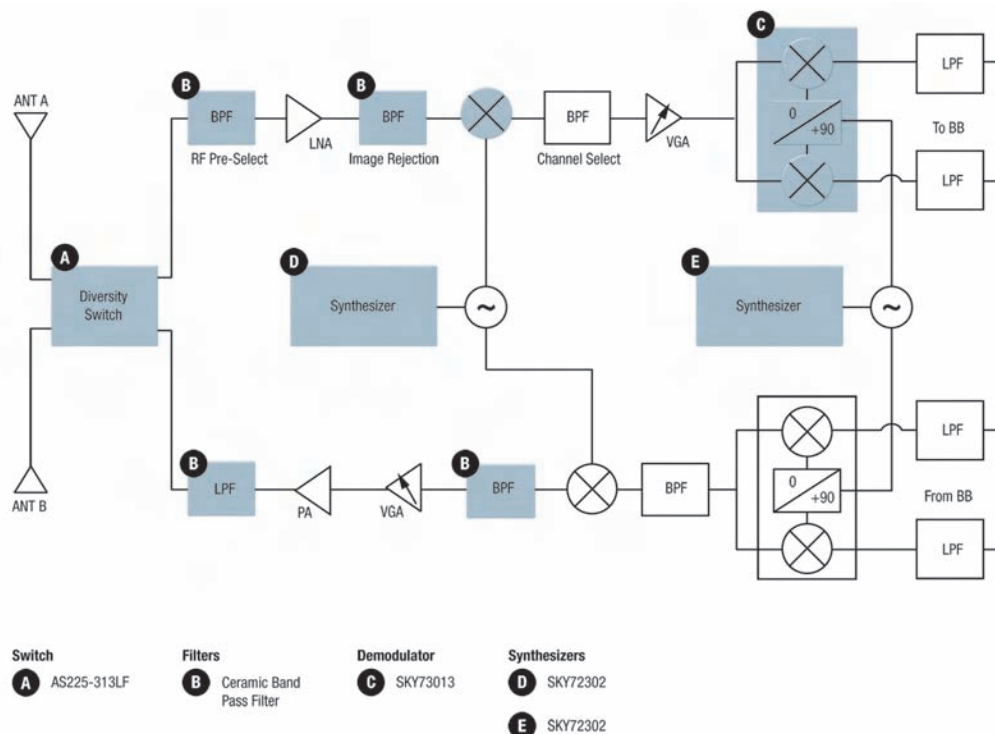
### WiMAX

#### 5.8 GHz Direct Conversion Architecture



### WiMAX

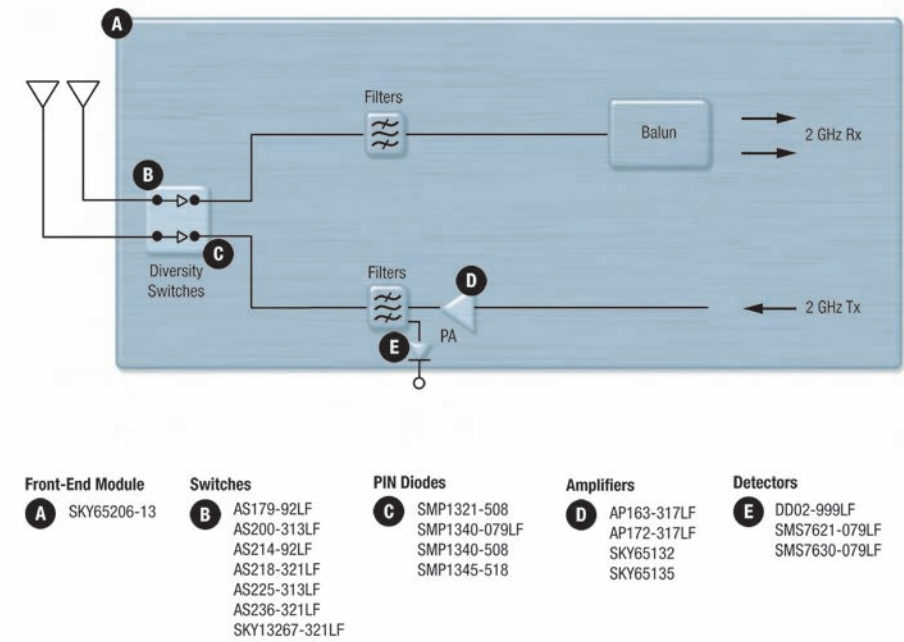
#### 5.8 GHz Superheterodyne Architecture



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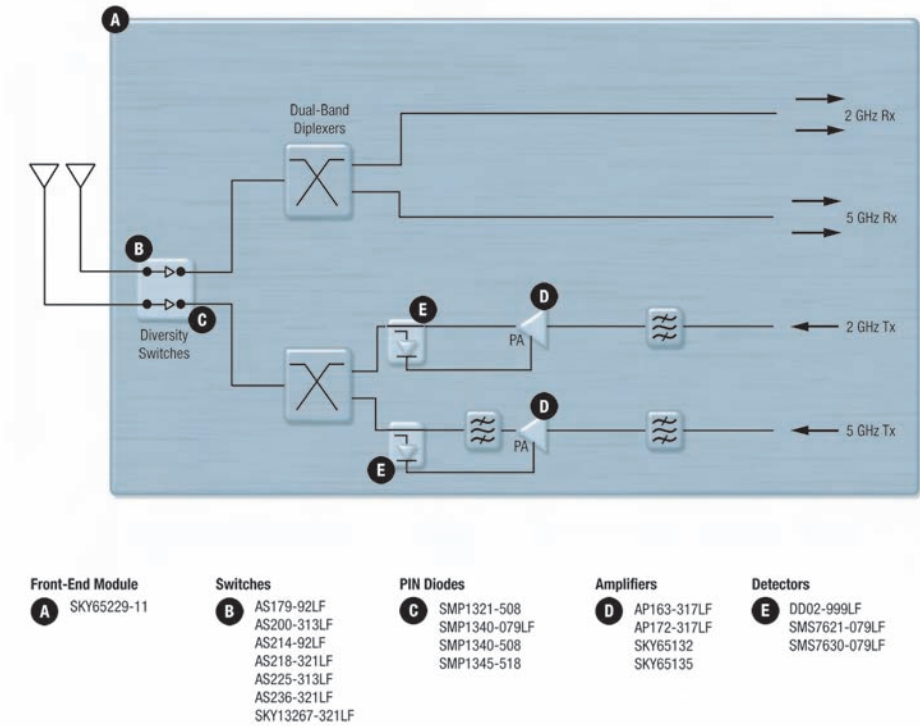
WLAN

Wireless LAN Front-End—Single-Band



WLAN

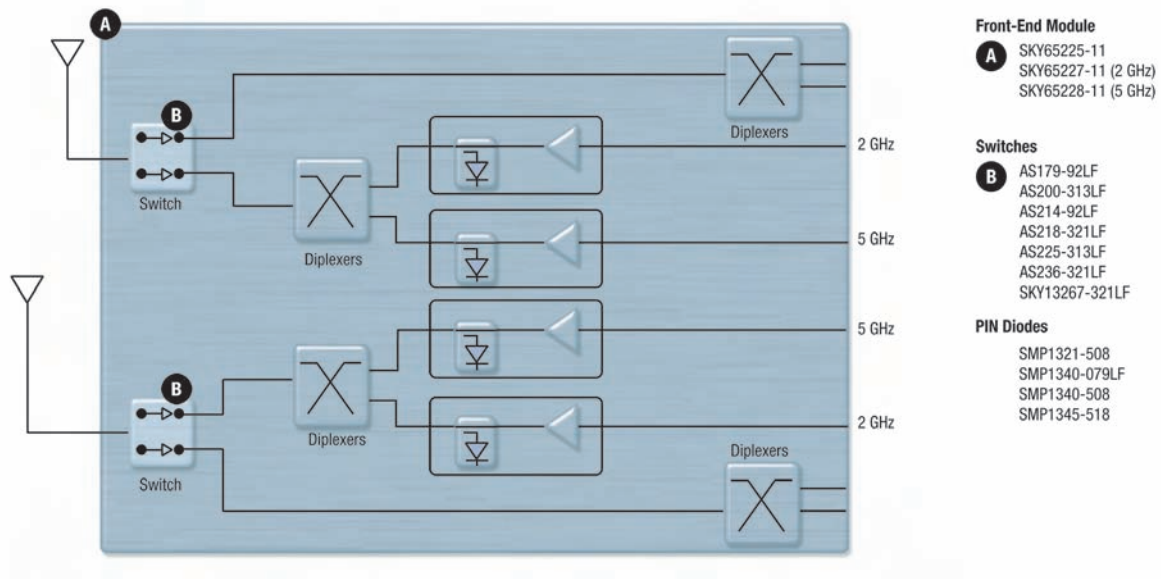
Wireless LAN Front-End—Dual-Band



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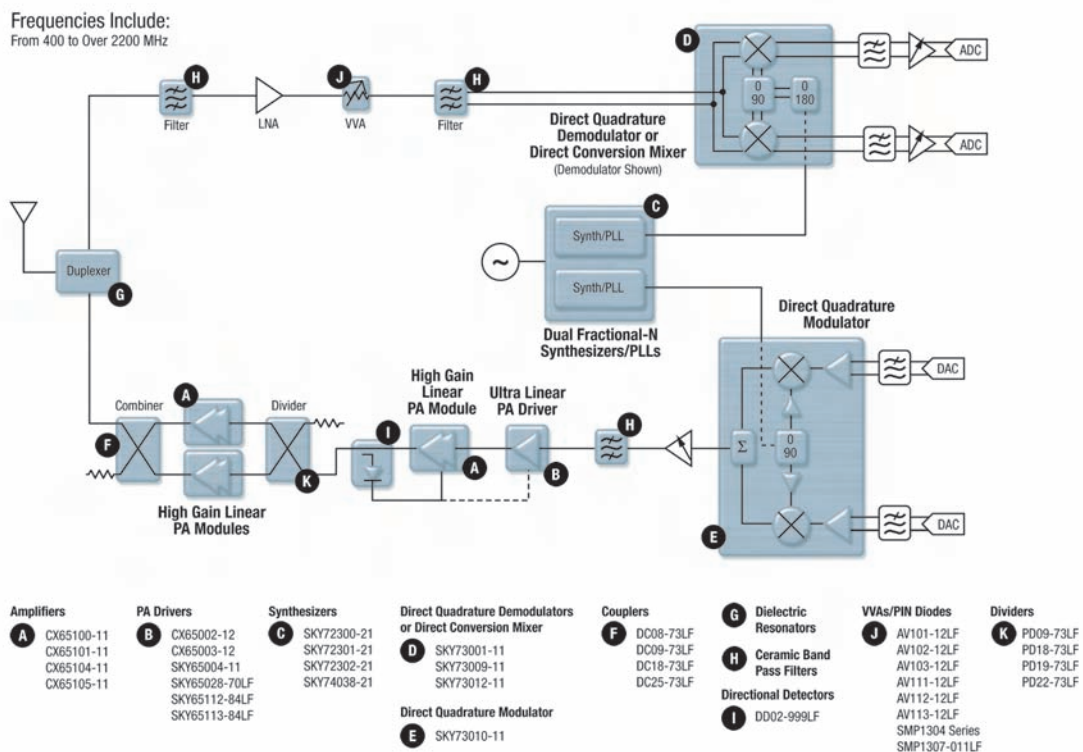
### Infrastructure

#### Wireless LAN Front-End—Single-/Dual-Band MIMO



### Infrastructure

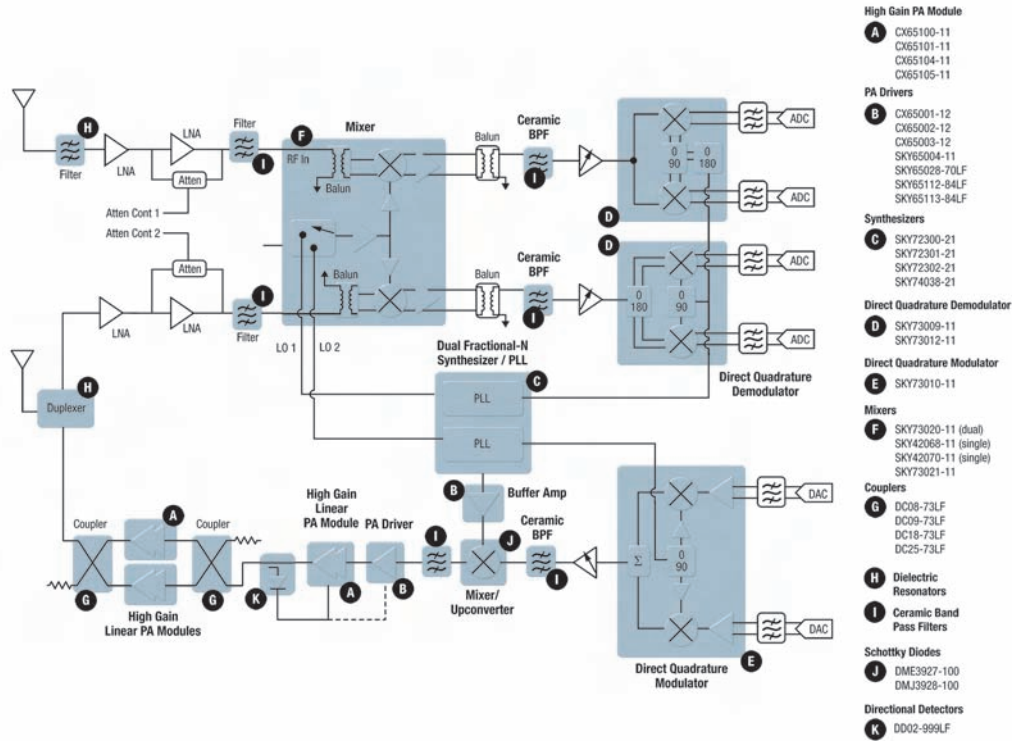
#### Direct Conversion Base Station Transceiver



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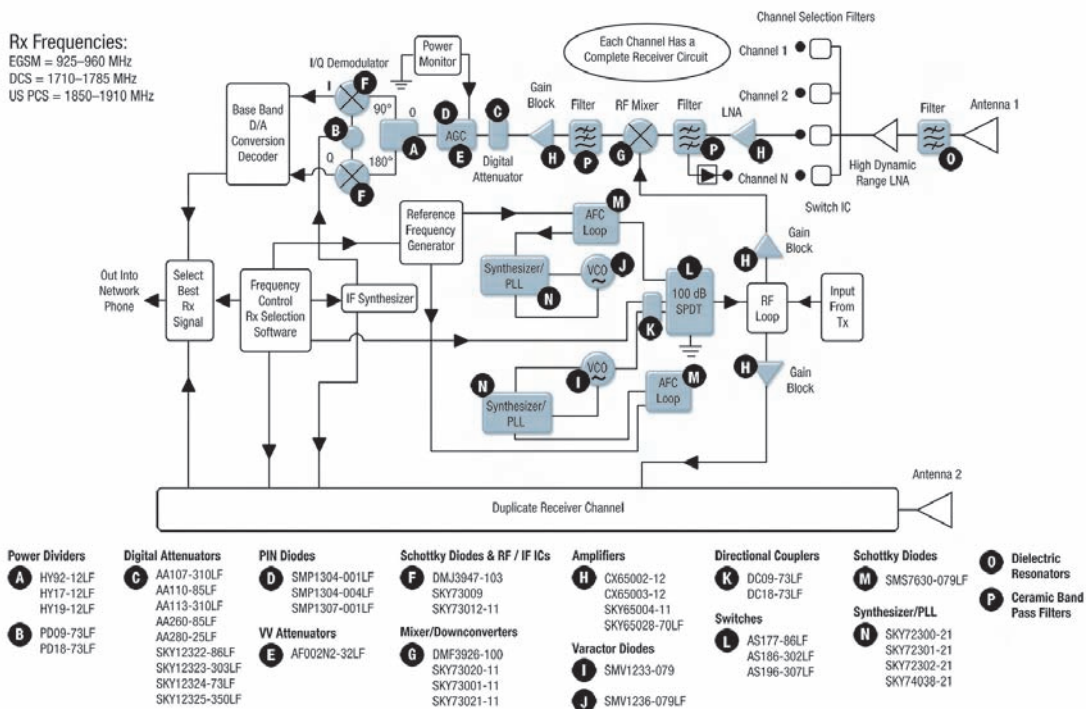
## Infrastructure

## Superheterodyne Base Station Transceiver



## Infrastructure

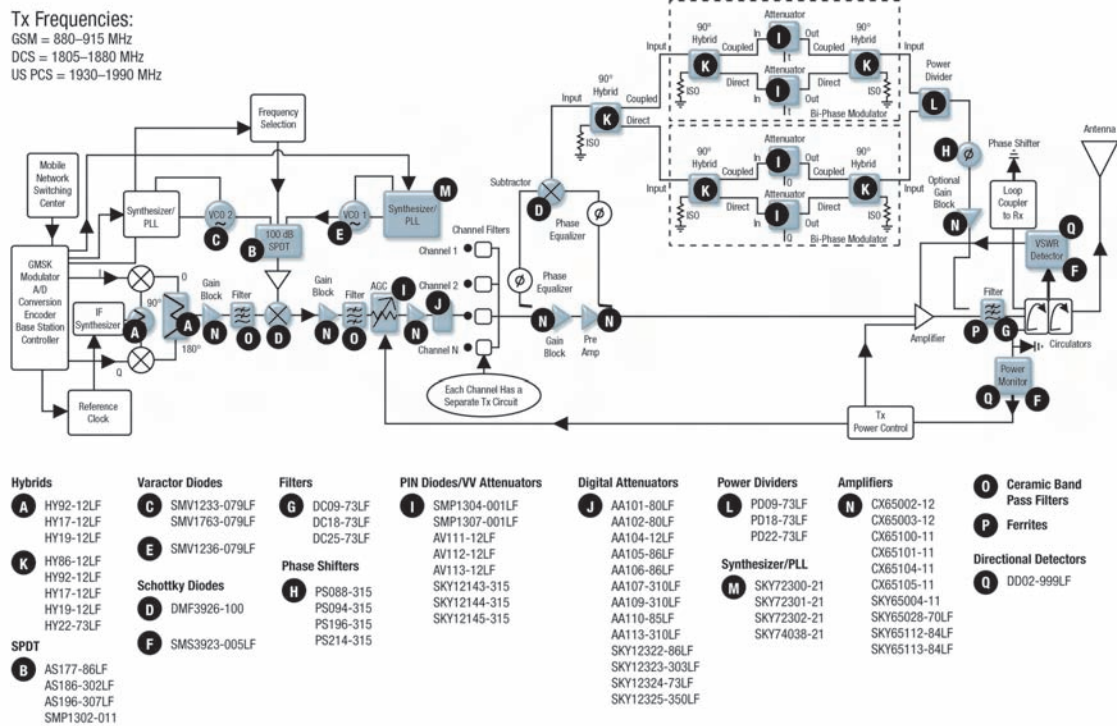
## Base Station Receiver System Using Antenna Diversity



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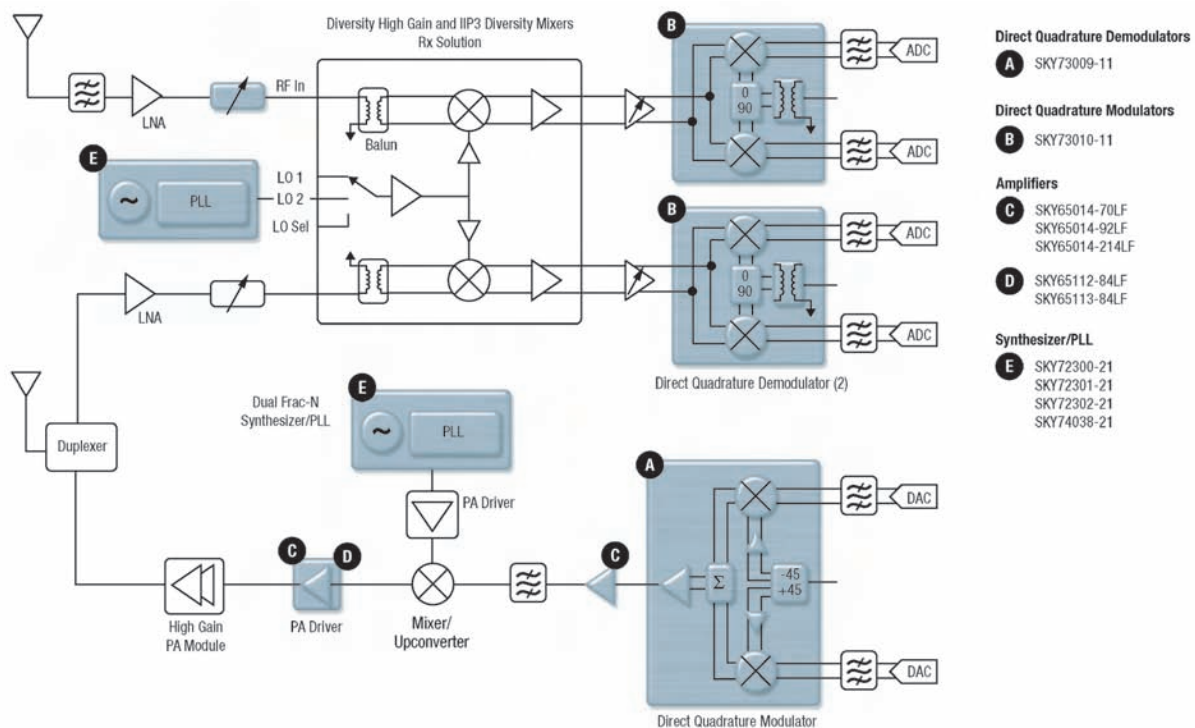
### Infrastructure

#### Base Station Transmitter With Combining Amplifier



### Infrastructure

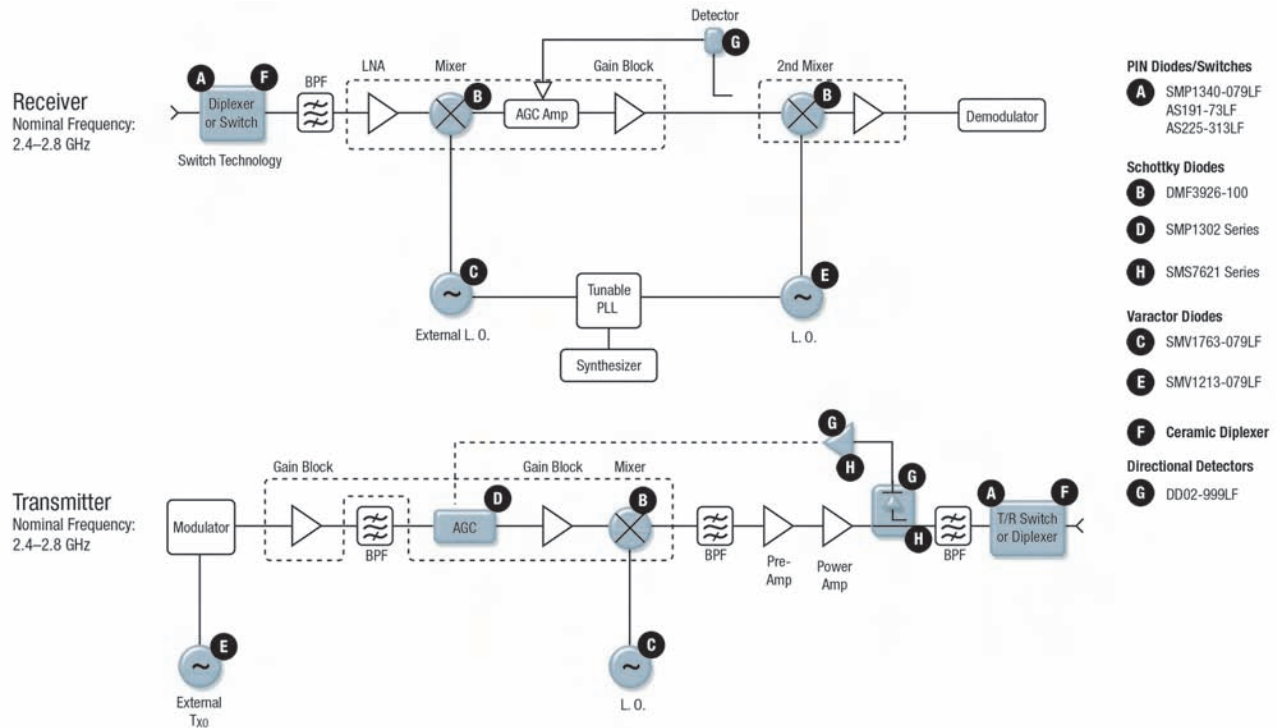
#### Transceiver



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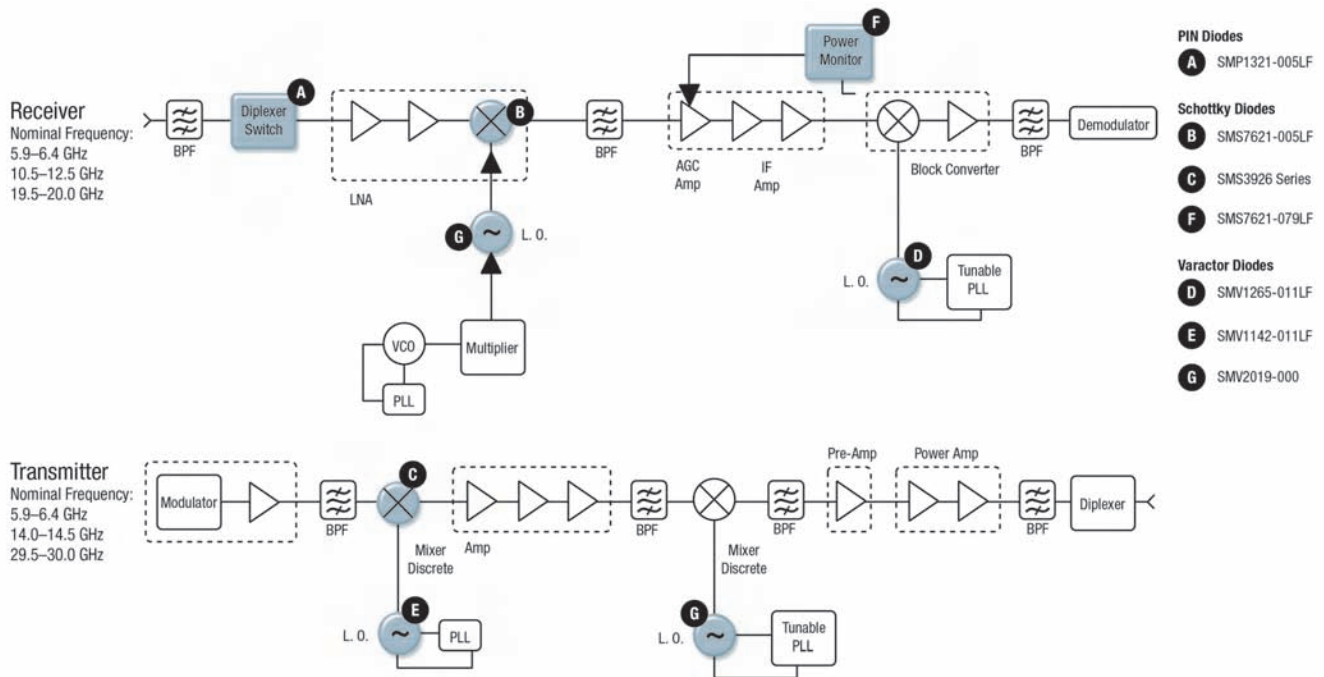
### Broadband Access Systems

#### MMDS Link



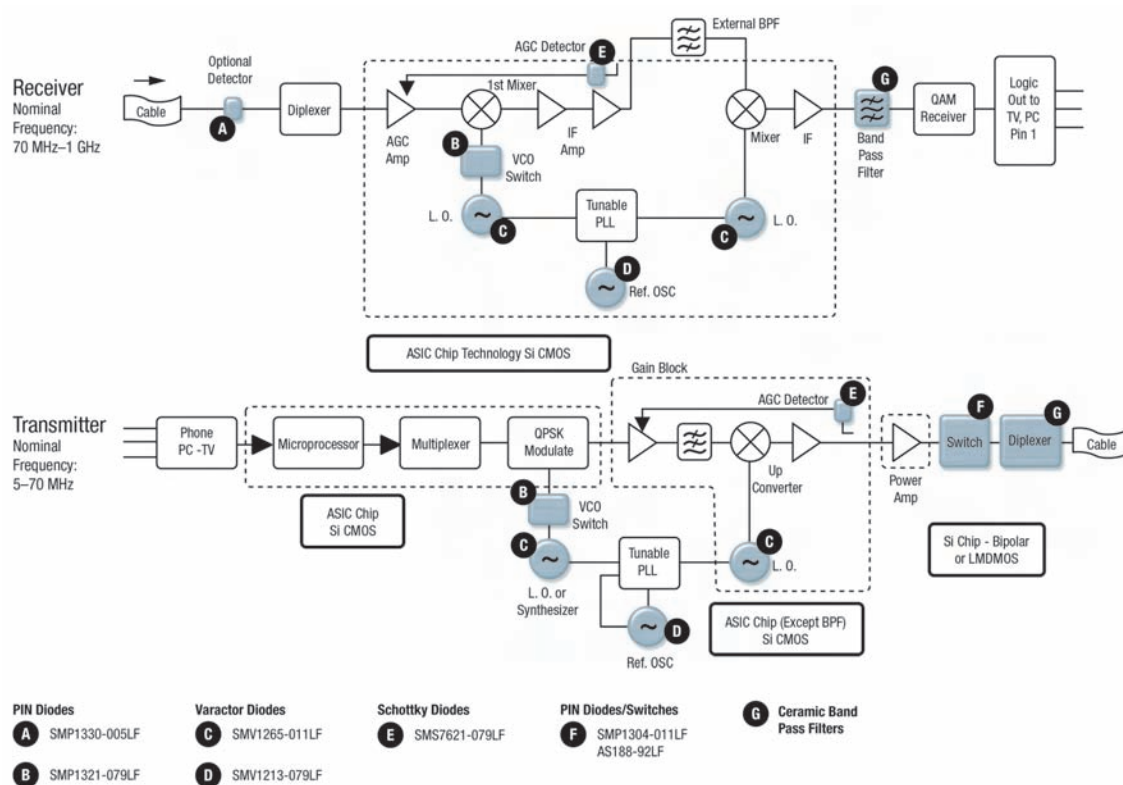
### Broadband Access Systems

#### Satellite Systems

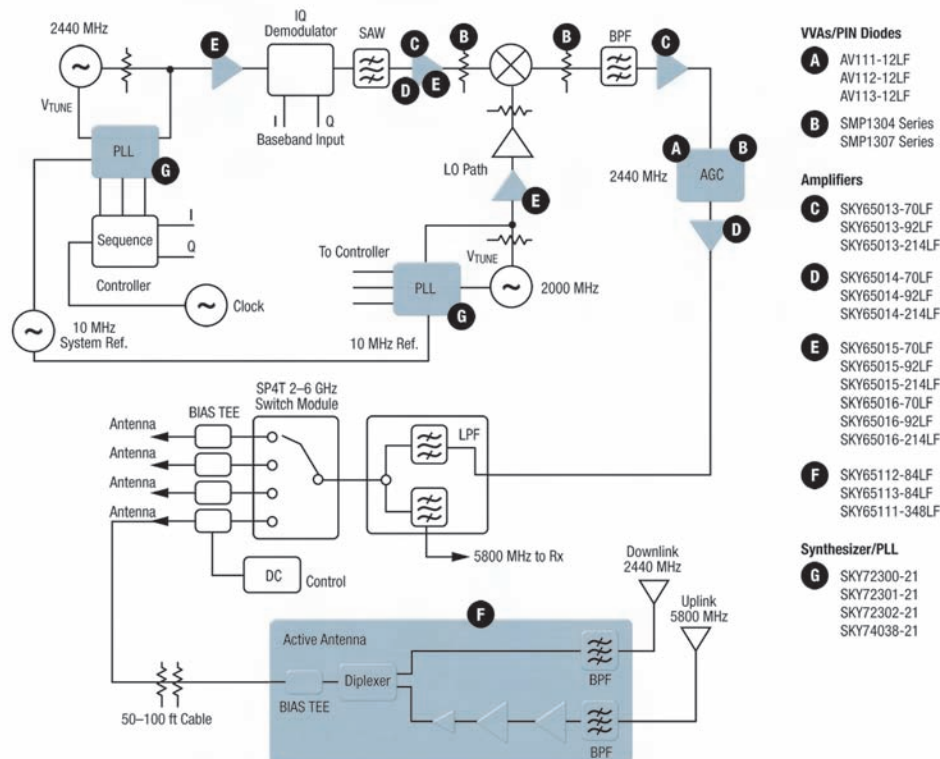


## BLOCK DIAGRAMS

## CATV Modem

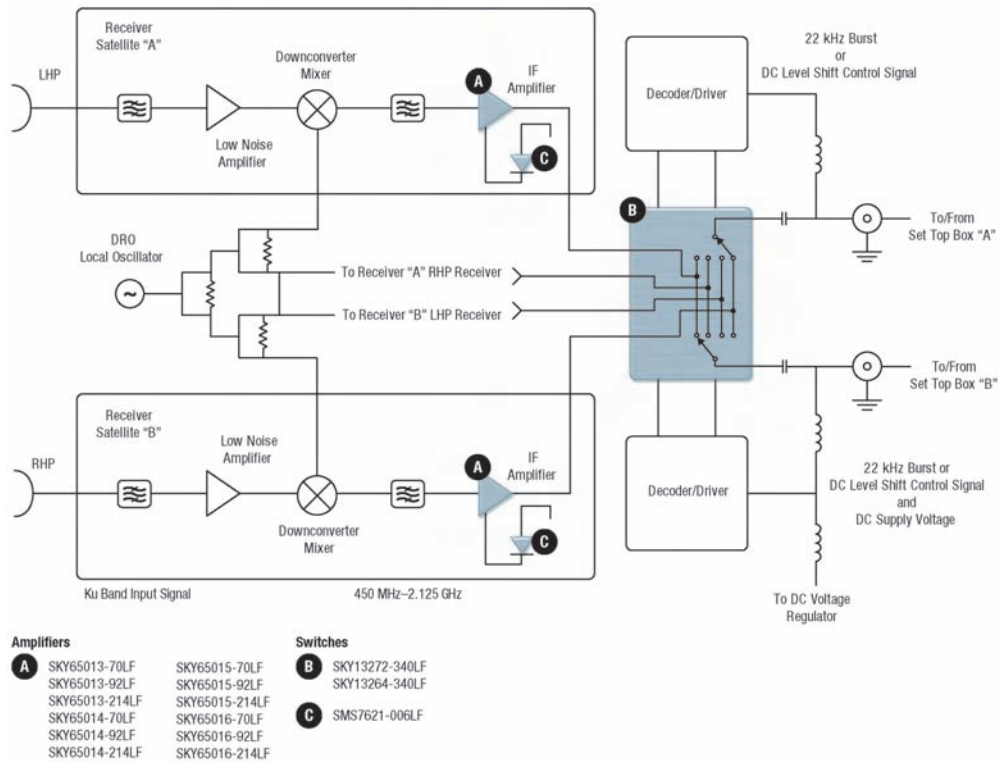


## Reader/Active Antennas/Transmitter, Full Duplex 2440

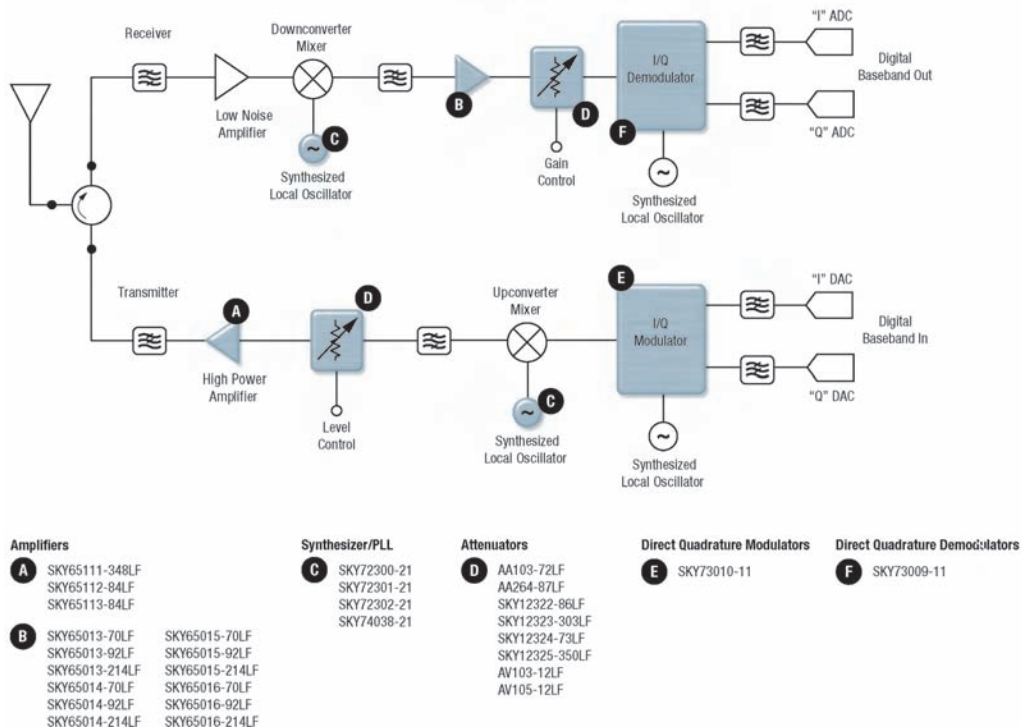


## BLOCK DIAGRAMS

## LNB

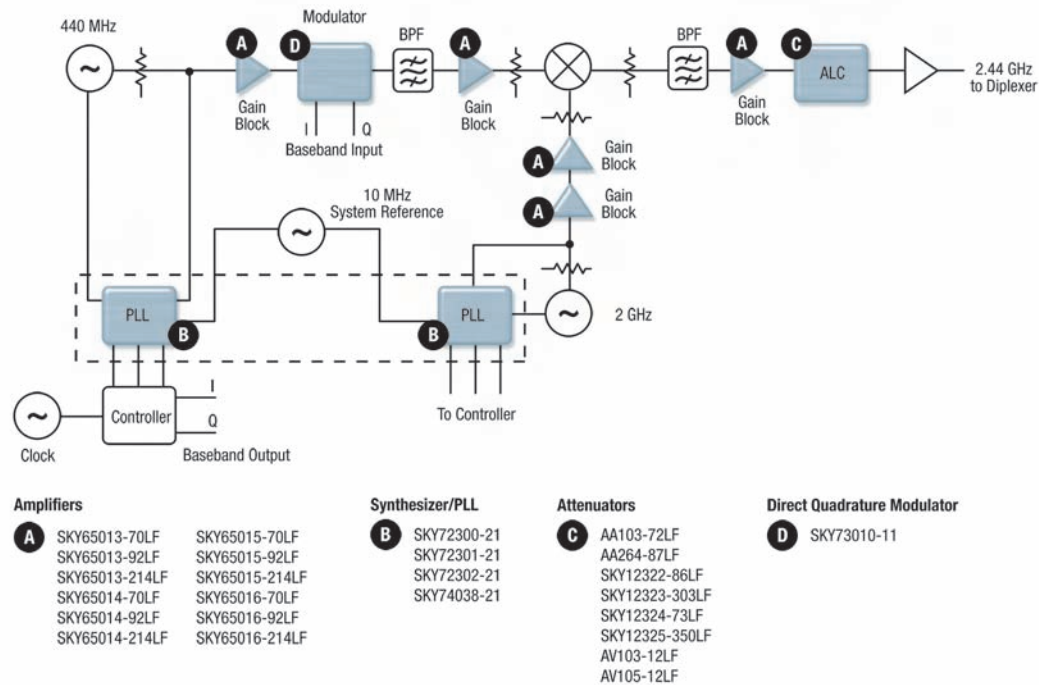


## Transceiver (Simplified)

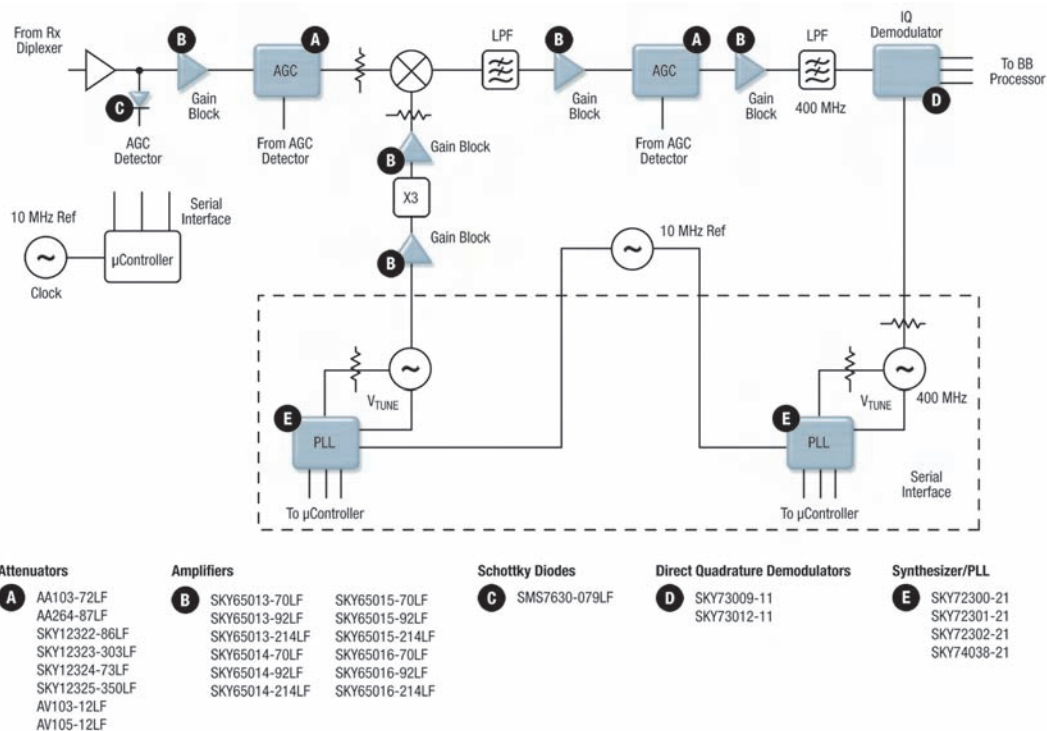


## BLOCK DIAGRAMS

### RF ID Transmitter



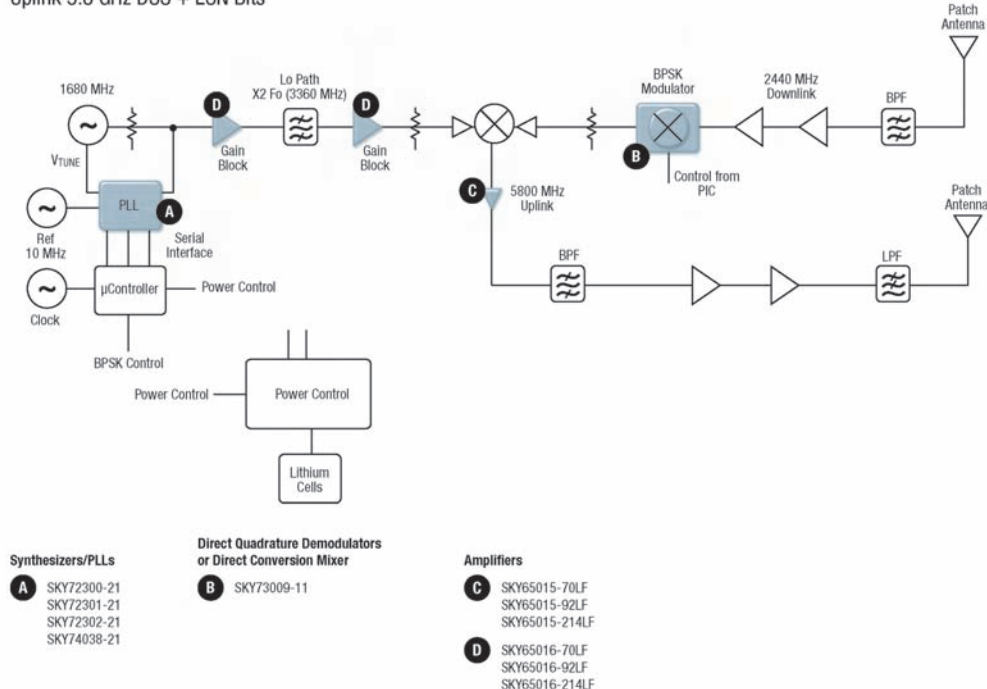
### RF ID Receiver



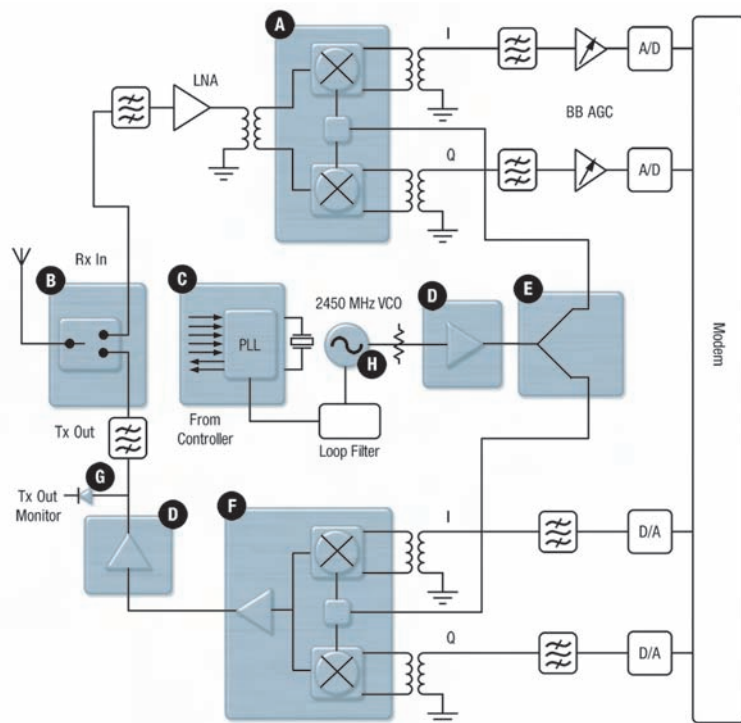
## BLOCK DIAGRAMS

## RF ID Full Duplex Tag

Downlink 2.44 GHz DSS  
Uplink 5.8 GHz DSS + ESN Bits

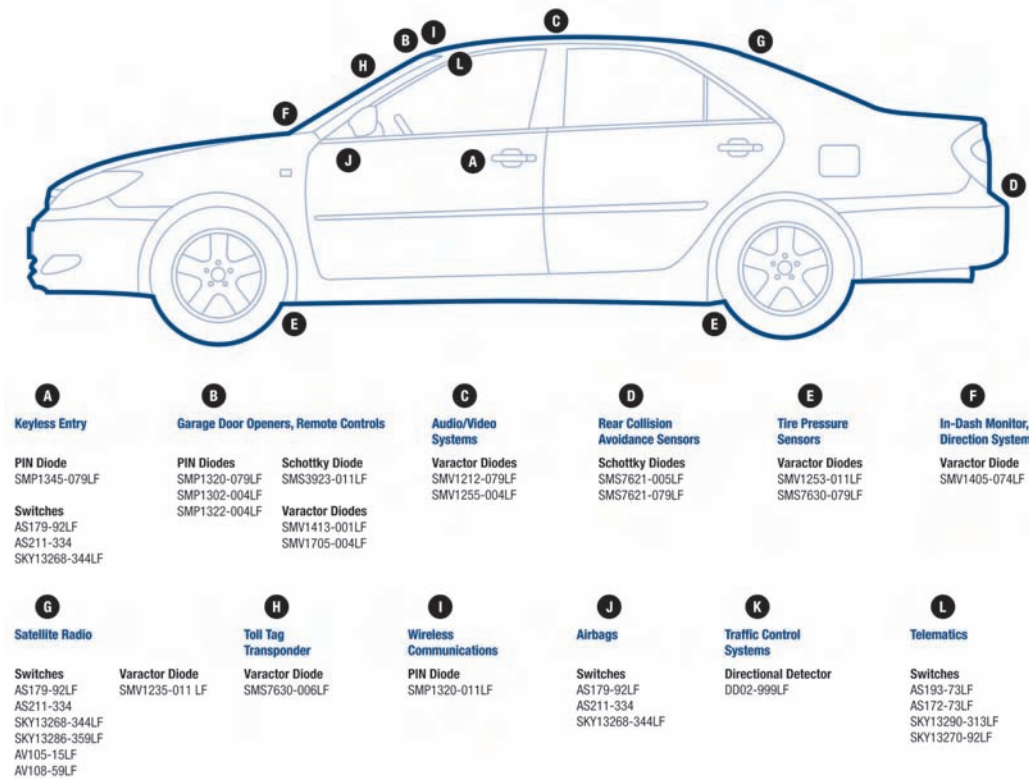


## 2.45 GHz DSS Wireless Reader (Simplified)



## BLOCK DIAGRAMS

### Automotive



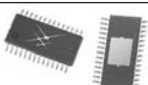
## PACKAGE SELECTION GUIDE

### Front-End Module Products

Front-End Modules, Power Amplifier Modules

| Part Number<br>Suffix     | Package Type                     | Actual Size                                                                         | Package<br>Dimensions (mm)<br>(Lead Inclusive)* |
|---------------------------|----------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------|
| -321, -348,<br>-350, -356 | QFN (3 x 3)                      |    | 3.00 x 3.00 x 0.75                              |
| N/A                       | Multichip Module<br>(MCM)        |    | 3.00 x 3.00                                     |
| N/A                       | Multichip Module<br>(MCM)        |    | 4.00 x 4.00                                     |
| -317                      | QFN-16 (4 x 4)<br>1.47 mm Paddle |    | 4.00 x 4.00 x 1.00                              |
| -70                       | SOT-89 3L<br>with Tab            |    | 4.57 x 4.24 x 1.60                              |
| -214                      | Micro-X                          |    | 5.08 x 5.08 x 1.52                              |
| -12                       | SOIC-8                           |    | 6.00 x 4.90 x 1.60                              |
| N/A                       | Multichip Module<br>(MCM)        |    | 6.00 x 6.00                                     |
| N/A                       | RF WLAN Module                   |    | 6.00 x 6.00 x 1.70                              |
| N/A                       | LCC                              |   | 8.00 x 8.00                                     |
| N/A                       | Multichip Module<br>(MCM)        |  | 9.10 x 11.60                                    |
| N/A                       | RF WLAN Module                   |  | 10.00 x 14.00 x 1.70                            |
| N/A                       | Multichip Module<br>(MCM)        |  | 10.00 x 14.00                                   |
| N/A                       | Multichip Module<br>(MCM)        |  | 13.00 x 13.00                                   |

### RF Subsystems

| Part Number<br>Suffix | Package Type                | Actual Size                                                                           | Package<br>Dimensions (mm)<br>(Lead Inclusive)* |
|-----------------------|-----------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------|
| N/A                   | CSP                         |    | 3.50 x 4.50                                     |
| N/A                   | LGA                         |    | 4.00 x 4.00                                     |
| N/A                   | ESQIC 8L                    |    | 4.90 x 3.90                                     |
| N/A                   | LGA                         |    | 5.00 x 5.00                                     |
| N/A                   | RFLGA                       |    | 5.00 x 5.00                                     |
| N/A                   | RFLGA                       |    | 6.00 x 6.00                                     |
| N/A                   | EP-SSOP 28L                 |    | 6.40 x 9.70                                     |
| N/A                   | RFLGA                       |    | 7.00 x 7.00                                     |
| N/A                   | TQFP                        |    | 7.00 x 7.00                                     |
| N/A                   | RFLGA                       |  | 8.00 x 8.00                                     |
| N/A                   | RFLGA                       |  | 9.00 x 9.00                                     |
| N/A                   | RFLGA FPBGA,<br>FPBGA 100L, |  | 10.00 x 10.00                                   |

\*Dimensions indicated: lead tip to lead tip x body width x total thickness.

## PACKAGE SELECTION GUIDE

### Discrete and Passive Components

| Part Number<br>Suffix                                                 | Package Type                    | Actual Size                                                                         | Package<br>Dimensions (mm)<br>(Lead Inclusive)* |
|-----------------------------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------|
| -508, -517,<br>-518                                                   | LGA                             |    | 1.47 x 1.23 x 0.70                              |
| -334                                                                  | LGA-6                           |    | 1.50 x 1.20 x 0.80                              |
| -079                                                                  | SC-79                           |    | 1.60 x 0.80 x 0.60                              |
| -344                                                                  | SOT-666                         |    | 1.65 x 1.65 x 0.60                              |
| -322                                                                  | QFN-5                           |    | 2.00 x 1.00 x 0.40                              |
| -107                                                                  | Ceramic LTCC                    |    | 1.83 x 1.43 x 1.0                               |
| -335                                                                  | QFN-6 (2 x 2)                   |    | 2.00 x 2.00 x 0.90                              |
| -349                                                                  | MLP-8 (2 x 2)                   |    | 2.00 x 2.00 x 0.90                              |
| -313                                                                  | QFN-6                           |    | 2.00 x 3.00 x 1.00                              |
| -92                                                                   | SC-88 (SC-70 6L)                |    | 2.10 x 2.00 x 0.95                              |
| -073, -074,<br>-075, -076                                             | SC-70                           |    | 2.10 x 2.00 x 0.95                              |
| -001, -003,<br>-004, -005,<br>-006, -007,<br>-39                      | SOT-23 3L                       |    | 2.37 x 2.92 x 1.00                              |
| -015, -016,<br>-017, -019,<br>-020, -021,<br>-022, -023,<br>-026, -32 | SOT-143                         |  | 2.37 x 2.92 x 1.00                              |
| -011                                                                  | SOD-323                         |  | 2.52 x 1.25 x 1.04                              |
| -100, -101,<br>-102                                                   | Chip On Board                   |  | 2.54 x 3.05 x 1.02                              |
| -111                                                                  | SPD Surface<br>Mount Package    |  | 2.79 x 2.28 x 1.01                              |
| -027, -72                                                             | SOT-23 5L                       |  | 2.80 x 2.90 x 1.18                              |
| -73                                                                   | SOT-23 6L                       |  | 2.80 x 2.90 x 1.18                              |
| -321, -348,<br>-350, -356                                             | QFN (3 x 3)                     |  | 3.00 x 3.00 x 0.75                              |
| N/A                                                                   | LGA 24L                         |  | 3.50 x 4.50                                     |
| N/A                                                                   | LGA                             |  | 4.00 x 4.00                                     |
| -340                                                                  | QFN-20 (4 x 4) 2.1<br>mm Paddle |  | 4.00 x 4.00 x 0.75                              |
| -300, -306,<br>-307                                                   | QFN-16 (4 x 4)                  |  | 4.00 x 4.00 x 0.90                              |
| -308                                                                  | QFN-20 (4 x 4)<br>2.1 mm Paddle |  | 4.00 x 4.00 x 0.90                              |

| Part Number<br>Suffix | Package Type                    | Actual Size                                                                           | Package<br>Dimensions (mm)<br>(Lead Inclusive)* |
|-----------------------|---------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------|
| -59                   | MSOP-8                          |    | 4.90 x 3.00 x 0.96                              |
| -86                   | MSOP-10                         |    | 4.90 x 3.00 x 0.96                              |
| -302                  | MSOP-8<br>Exposed Pad<br>(Max.) |    | 4.90 x 3.00 x 1.10                              |
| -303                  | MSOP-8<br>Exposed Pad           |    | 4.90 x 3.00 x 1.10                              |
| -315                  | LGA Surface<br>Mount Package    |    | 4.90 x 3.20 x 2.32                              |
| -310                  | QFN-32 (5 x 5)<br>3.3 mm Paddle |    | 5.00 x 5.00 x 0.90                              |
| -339                  | SOIC-8<br>Exposed Pad           |    | 5.99 x 4.93 x 1.55                              |
| -12                   | SOIC-8                          |    | 6.00 x 4.90 x 1.60                              |
| -80                   | SSOP-16                         |    | 6.00 x 4.90 x 1.60                              |
| -93                   | TSSOP-16<br>Exposed Pad         |   | 6.40 x 6.40 x 1.00                              |
| -87                   | TSSOP-16                        |  | 6.40 x 5.00 x 1.00                              |
| -85                   | SSOP-20                         |  | 7.80 x 7.20 x 1.90                              |
| -24                   | SOIC-14                         |  | 6.00 x 8.70 x 1.55                              |
| N/A                   | Multichip Module<br>(MCM)       |  | 8.00 x 8.00                                     |
| N/A                   | PQFP 24L                        |  | 8.00 x 8.00                                     |
| -345, -501,<br>N/A    | Multichip Module<br>(MCM)       |  | 8.00 x 10.00                                    |
| N/A                   | CLCC 8L                         |  | 8.30 x 8.30                                     |
| N/A                   | Multichip Module<br>(MCM)       |  | 9.10 x 11.60 x 1.50                             |
| -25                   | SOIC-16                         |  | 10.00 x 6.00 x 1.70                             |
| N/A                   | Multichip Module<br>(MCM)       |  | 13.00 x 13.00                                   |

\*Dimensions indicated: lead tip to lead tip x body width x total thickness.

## PACKAGE SELECTION GUIDE

### Discrete and Passive Components (Continued)

Skyworks offers filters in a number of standard packages. In addition to SMT, Skyworks offers a flatpack and through-hole configuration. In addition to our standard offering, Skyworks has the capability and experience to meet many unique footprint layouts and custom packages. For each of our 2-to 6-pole packages, Skyworks can offer profiles ranging from 2 mm to 6 mm. Dimension "L" will vary in length, dependent upon filter's frequency.

| Part Number**<br>Suffix | Package Type | Not Actual Size                                                                     | Package Dimensions (mm)<br>(Lead Inclusive)* |
|-------------------------|--------------|-------------------------------------------------------------------------------------|----------------------------------------------|
| TT2P2-P                 | SMT          |    | 5.33 x L x 3.01                              |
| TT2P3-P                 | SMT          |    | 7.42 x L x 3.01                              |
| TT2P4-P                 | SMT          |    | 9.50 x L x 3.01                              |
| TT2P5-P                 | SMT          |    | 11.58 x L x 3.01                             |
| TT2P6-P                 | SMT          |    | 13.67 x L x 3.01                             |
| TT3P2-P                 | SMT          |    | 7.80 x L x 4.01                              |
| TT3P3-P                 | SMT          |    | 11.18 x L x 4.01                             |
| TT3P4-P                 | SMT          |   | 13.72 x L x 4.01                             |
| TT3P5-P                 | SMT          |  | 16.81 x L x 4.01                             |
| TT3P6-P                 | SMT          |  | 19.91 x L x 4.01                             |
| TT4P2-P                 | SMT          |  | 9.16 x L x 4.99                              |
| TT4P3-P                 | SMT          |  | 13.16 x L x 4.99                             |
| TT4P4-P                 | SMT          |  | 17.48 x L x 4.98                             |
| TT4P5-P                 | SMT          |  | 21.08 x L x 4.98                             |
| TT4P6-P                 | SMT          |  | 25.40 x L x 4.98                             |
| TT6P2-P                 | SMT          |  | 13.14 x L x 7.01                             |
| TT6P3-P                 | SMT          |  | 19.14 x L x 7.01                             |
| TT6P4-P                 | SMT          |  | 25.85 x L x 7.01                             |

\*Dimensions indicated: lead tip to lead tip x body width x total thickness.

| Part Number**<br>Suffix             | Package Type | Not Actual Size                                                                       | Package Dimensions (mm)<br>(Lead Inclusive)* |
|-------------------------------------|--------------|---------------------------------------------------------------------------------------|----------------------------------------------|
| TT6P5-P                             | SMT          |    | 31.14 x L x 7.01                             |
| TT6P6-P                             | SMT          |    | 37.16 x L x 7.01                             |
| TT4P2-F                             | Flatpack     |    | 12.50 x L x 4.50                             |
| TT4P3-F                             | Flatpack     |    | 17.50 x L x 4.50                             |
| TT6P2-F                             | Flatpack     |    | 17.00 x L x 6.50                             |
| TT6P3-F                             | Flatpack     |   | 24.00 x L x 6.50                             |
| TT6P2-T                             | Through Hole |  | 13.00 x L x 6.50                             |
| TT6P3-T                             | Through Hole |  | 20.00 x L x 6.50                             |
| TT4P4-T-R                           | SMT          |  | 16.10 x 19.30 x 4.98                         |
| TT6P10-T-R                          | SMT          |  | 62.79 x 21.23 x 7.01                         |
| Notch Filter<br>Connecterized       | SMA          |  | 57.79 x 55.75 x 20.62                        |
| Connecterized<br>Filter<br>Assembly | SMA          |  | 31.12 x 55.50 x 144.27                       |

\*\*These products are produced by Trans-Tech (a wholly owned subsidiary of Skyworks Solutions Inc.)

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## PART NUMBER INDEX

| Part No.     | Page No.   | Part No.     | Page No. | Part No.         | Page No.   | Part No.       | Page No.       |
|--------------|------------|--------------|----------|------------------|------------|----------------|----------------|
| AA100-59LF   | 23         | AS230-348LF  | 65       | DC15-73LF        | 55         | SKY13270-92LF  | 65             |
| AA101-80LF   | 23         | AS236-321LF  | 66       | DC16-73LF        | 55         | SKY13272-340LF | 66             |
| AA102-80LF   | 23         | AS338-12LF   | 64       | DC18-73LF        | 55         | SKY13274-349LF | 64             |
| AA103-72LF   | 23         | AT001D6-25   | 23       | DC25-73LF        | 55         | SKY13278-313LF | 65             |
| AA104-73LF   | 23         | ATN3580-01   | 25       | DD02-999LF       | 55         | SKY13282-334   | 64             |
| AA105-86LF   | 23         | ATN3580-02   | 25       | DME3927-100      | 39         | SKY13286-359LF | 64             |
| AA106-86LF   | 23         | ATN3580-03   | 25       | DME3927-101      | 39         | SKY13290-313LF | 65             |
| AA107-310LF  | 23         | ATN3580-04   | 25       | DME3946-103      | 39         | SKY42068       | 60             |
| AA109-310LF  | 23         | ATN3580-05   | 25       | DMF3926-100      | 39         | SKY42070       | 60             |
| AA110-85LF   | 23         | ATN3580-06   | 25       | DMF3926-101      | 39         | SKY65004-11    | 21, 57, 59     |
| AA113-310LF  | 23         | ATN3580-07   | 25       | DMF3945-103      | 39         | SKY65004-54    | 21             |
| AA116-72LF   | 23         | ATN3580-08   | 25       | DMJ3928-100      | 39         | SKY65006       | 21             |
| AA117-85LF   | 23         | ATN3580-09   | 25       | DMJ3928-101      | 39         | SKY65008       | 20             |
| AA210-25LF   | 23         | ATN3580-10   | 25       | DMJ3947-103      | 39         | SKY65009       | 20             |
| AA226-87LF   | 23         | ATN3580-12   | 25       | DSG9500-000      | 35         | SKY65013-214LF | 22             |
| AA260-85LF   | 23         | ATN3580-15   | 25       | DSM8100-000      | 35         | SKY65013-70LF  | 22             |
| AA264-87LF   | 23         | ATN3580-20   | 25       | HY17-12LF        | 55         | SKY65013-92LF  | 22             |
| AA280-25LF   | 23         | ATN3580-30   | 25       | HY19-12LF        | 55         | SKY65014-214LF | 22             |
| AF002C1-39LF | 64         | ATN3580-40   | 25       | HY22-73LF        | 55         | SKY65014-70LF  | 22             |
| AF002C4-39LF | 64         | AV101-12LF   | 24       | HY86-12LF        | 55         | SKY65014-92LF  | 22             |
| AF002N2-32LF | 24         | AV102-12LF   | 24       | HY92-12LF        | 55         | SKY65015-214LF | 22             |
| AL106-84LF   | 22         | AV103-12LF   | 24       | PD09-73LF        | 61         | SKY65015-70LF  | 22             |
| AP147-320    | 21         | AV104-12LF   | 24       | PD15-73LF        | 61         | SKY65015-92LF  | 22             |
| AP163-317LF  | 21         | AV105-12LF   | 24       | PD16-73LF        | 61         | SKY65016-214LF | 22             |
| AP172-317LF  | 21         | AV108-59LF   | 24       | PD18-73LF        | 61         | SKY65016-70LF  | 22             |
| APD0505-000  | 35         | AV109-73LF   | 24       | PD19-73LF        | 61         | SKY65016-92LF  | 22             |
| APD0510-000  | 35         | AV110-73LF   | 24       | PD22-73LF        | 61         | SKY65017-70LF  | 22             |
| APD0520-000  | 35         | AV111-12LF   | 24       | PD4W09-12LF      | 61         | SKY65028-70LF  | 20, 57, 59     |
| APD0805-000  | 35         | AV112-12LF   | 24       | PD4W09-59LF      | 61         | SKY65111-348LF | 21             |
| APD0810-000  | 35         | AV113-12LF   | 24       | PD4W18-12LF      | 61         | SKY65112-84LF  | 21             |
| APD2220-000  | 35         | AW002R2-12LF | 65       | PD4W18-59LF      | 61         | SKY65113-84LF  | 21             |
| AS002R2-12LF | 64         | CDB7619-000  | 41       | PS088-315        | 62         | SKY65119       | 20             |
| AS115-61     | 66         | CDB7620-000  | 41       | PS094-315        | 62         | SKY65131       | 21, 80         |
| AS130-73LF   | 64         | CDC7630-000  | 41       | PS196-315        | 62         | SKY65132       | 21, 80         |
| AS156-73LF   | 64         | CDC7631-000  | 41       | PS214-315        | 62         | SKY65135       | 21, 80         |
| AS165-59LF   | 64         | CD7621-000   | 41       | SC00080912       | 26         | SKY65206-13    | 15, 81         |
| AS169-73LF   | 65         | CD7623-000   | 41       | SC00120912       | 26         | SKY65225-11    | 15, 81         |
| AS172-73LF   | 66         | CLA4601-000  | 27       | SC00180912       | 26         | SKY65227-11    | 15, 81         |
| AS176-59LF   | 64         | CLA4602-000  | 27       | SC00260912       | 26         | SKY65228-11    | 15, 81         |
| AS177-86LF   | 64         | CLA4603-000  | 27       | SC00380912       | 26         | SKY65229-11    | 15, 81         |
| AS179-000    | 65         | CLA4604-000  | 27       | SC00560912       | 26         | SKY65230-11    | 15, 81         |
| AS179-92LF   | 65         | CLA4605-000  | 27       | SC00680912       | 26         | SKY65233-11    | 15, 81         |
| AS183-92LF   | 65         | CLA4606-000  | 27       | SC00820710       | 26         | SKY65234-11    | 15, 81         |
| AS186-302LF  | 64         | CLA4607-000  | 27       | SC00821518       | 26         | SKY65240-11    | 15, 81         |
| AS188-92LF   | 65         | CLA4607-107  | 27       | SC01000710       | 26         | SKY72300       | 67             |
| AS191-73LF   | 65         | CLA4608-000  | 27       | SC01000912       | 26         | SKY72300-21    | 57, 59         |
| AS192-000    | 66         | CX65001      | 21       | SC01001518       | 26         | SKY72301       | 67, 78, 79     |
| AS193-000    | 65         | CX65001-12   | 59       | SC01500912       | 26         | SKY72301-21    | 57, 59         |
| AS193-73LF   | 65         | CX65002      | 21       | SC01501518       | 26         | SKY72302       | 67, 78         |
| AS195-306LF  | 66         | CX65002-12   | 57       | SC02201518       | 26         | SKY72302-21    | 57, 59         |
| AS196-307LF  | 64         | CX65002-12   | 59       | SC03301518       | 26         | SKY73001       | 61, 63, 79     |
| AS197-306LF  | 66         | CX65003      | 21       | SC04701518       | 26         | SKY73001-11    | 57             |
| AS200-313LF  | 65         | CX65003-12   | 57, 59   | SC06801518       | 26         | SKY73009       | 60, 63, 81     |
| AS202-321LF  | 66         | CX65100      | 20       | SC10002430       | 26         | SKY73009-11    | 57, 59         |
| AS204-80LF   | 66         | CX65100-11   | 57, 59   | SC33303440       | 26         | SKY73010       | 61, 79         |
| AS211-334    | 65         | CX65101      | 20       | SC50004450       | 26         | SKY73010-11    | 57, 59         |
| AS212-93     | 66         | CX65101-11   | 57, 59   | SC99906068       | 26         | SKY73012-11    | 59, 60, 79, 80 |
| AS213-92LF   | 64         | CX65104      | 20       | SIXXXXXXXXXXXXXX | 70         | SKY73013-306   | 60, 78         |
| AS214-92LF   | 64         | CX65104-11   | 57, 59   | SKY12143-315     | 25         | SKY73020       | 61, 63         |
| AS215-92LF   | 64         | CX65105      | 20       | SKY12144-315     | 25         | SKY73020-11    | 59             |
| AS216-339LF  | 65         | CX65105-11   | 57, 59   | SKY12145-315     | 25         | SKY73021-11    | 59, 61         |
| AS217-000    | 65         | CX74017      | 5        | SKY12146-321LF   | 24         | SKY74038       | 67             |
| AS218-000    | 66         | CX74063      | 5        | SKY12322-86LF    | 23         | SKY74038-21    | 57, 59         |
| AS218-321LF  | 66, 78, 80 | CX77105      | 18       | SKY12323-303LF   | 23         | SKY74045       | 9              |
| AS219-000    | 66         | CX77106      | 18       | SKY12324-73LF    | 23         | SKY74046       | 9              |
| AS219-321LF  | 66         | CX77107      | 17       | SKY12325-350LF   | 23         | SKY74076       | 63             |
| AS221-306LF  | 66         | CX77112      | 17       | SKY12332-310LF   | 23         | SKY74117       | 5, 6           |
| AS222-92LF   | 64         | CX77140      | 17       | SKY13251-349LF   | 66         | SKY74137       | 11             |
| AS225-313LF  | 65, 78     | CX77144      | 18       | SKY13264-340LF   | 66         | SKY74138       | 12             |
| AS227-321LF  | 66         | DC08-73LF    | 55       | SKY13267-321LF   | 66, 78, 80 | SKY74200       | 8              |
| AS229-350LF  | 64         | DC09-73LF    | 55       | SKY13268-344LF   | 65         | SKY74400       | 6              |

## PART NUMBER INDEX

| Part No.      | Page No. | Part No.      | Page No. | Part No.      | Page No. | Part No.      | Page No. |
|---------------|----------|---------------|----------|---------------|----------|---------------|----------|
| SKY74693      | 63       | SMP1320-007LF | 29       | SMS3925-079LF | 36       | SMV1234-079LF | 47       |
| SKY74945      | 9, 10    | SMP1320-011LF | 29       | SMS3926-022LF | 40       | SMV1235-001LF | 47       |
| SKY74963      | 5        | SMP1320-017LF | 29       | SMS3926-023LF | 40       | SMV1235-004LF | 47       |
| SKY77147      | 18       | SMP1320-074LF | 29       | SMS3926-099   | 41       | SMV1235-011LF | 47       |
| SKY77148      | 18       | SMP1320-075LF | 29       | SMS3927-023LF | 40       | SMV1235-074LF | 47       |
| SKY77149      | 17       | SMP1320-077LF | 29       | SMS3927-099   | 41       | SMV1235-079LF | 47       |
| SKY77152      | 16       | SMP1320-079LF | 29       | SMS3928-023LF | 40       | SMV1236-001LF | 47       |
| SKY77154      | 17       | SMP1320-099   | 34       | SMS3928-099   | 41       | SMV1236-004LF | 47       |
| SKY77155      | 18       | SMP1321-001LF | 30       | SMS3929-021LF | 40       | SMV1236-011LF | 47       |
| SKY77156      | 17       | SMP1321-003LF | 30       | SMS3930-021LF | 40       | SMV1236-074LF | 47       |
| SKY77161      | 16       | SMP1321-004LF | 30       | SMS3931-021LF | 40       | SMV1236-079LF | 47       |
| SKY77162      | 17       | SMP1321-005LF | 30       | SMS3940-026LF | 40       | SMV1237-001LF | 47       |
| SKY77163      | 17       | SMP1321-007LF | 30       | SMS3940-029LF | 40       | SMV1245-011LF | 49       |
| SKY77164      | 17       | SMP1321-011LF | 30       | SMS7621-001LF | 37       | SMV1247-011LF | 48       |
| SKY77171      | 16       | SMP1321-073LF | 30       | SMS7621-005LF | 37       | SMV1247-074LF | 48       |
| SKY77173      | 16       | SMP1321-074LF | 30       | SMS7621-006LF | 37       | SMV1247-079LF | 48       |
| SKY77177      | 18       | SMP1321-075LF | 30       | SMS7621-015LF | 37       | SMV1248-001LF | 48       |
| SKY77178      | 16       | SMP1321-079LF | 30       | SMS7621-074LF | 37       | SMV1248-074LF | 48       |
| SKY77179      | 16       | SMP1321-508   | 30       | SMS7621-075LF | 37       | SMV1248-079LF | 48       |
| SKY77316      | 9        | SMP1322-001LF | 30       | SMS7621-079LF | 37       | SMV1249-001LF | 48       |
| SKY77318      | 7        | SMP1322-003LF | 30       | SMS7621-107   | 37       | SMV1249-003LF | 48       |
| SKY77328      | 7        | SMP1322-004LF | 30       | SMS7621-517   | 37       | SMV1249-004LF | 48       |
| SKY77329      | 7        | SMP1322-005LF | 30       | SMS7630-001LF | 38       | SMV1249-011LF | 48       |
| SKY77331      | 11       | SMP1322-011LF | 30       | SMS7630-005LF | 38       | SMV1249-074LF | 48       |
| SKY77332      | 10       | SMP1322-016LF | 30       | SMS7630-006LF | 38       | SMV1249-079LF | 48       |
| SKY77340      | 7        | SMP1322-017LF | 30       | SMS7630-011LF | 38       | SMV1251-001LF | 48       |
| SKY77408      | 14       | SMP1322-074LF | 30       | SMS7630-020LF | 38       | SMV1251-004LF | 48       |
| SKY77409      | 13       | SMP1322-079LF | 30       | SMS7630-079LF | 38       | SMV1251-011LF | 48       |
| SKY77410      | 16       | SMP1322-099   | 34       | SMS7630-107   | 38       | SMV1251-074LF | 48       |
| SKY77413      | 14       | SMP1330-005LF | 27       | SMS7630-517   | 38       | SMV1251-079LF | 48       |
| SKY77414      | 13       | SMP1330-007LF | 27       | SMV1129-079LF | 43       | SMV1253-004LF | 48       |
| SKY77418      | 17       | SMP1340-003LF | 28       | SMV1130-001LF | 42       | SMV1253-079LF | 48       |
| SKY77420      | 16       | SMP1340-004LF | 28       | SMV1130-079LF | 42       | SMV1255-001LF | 48       |
| SKY77500      | 14       | SMP1340-005LF | 28       | SMV1135-004LF | 42       | SMV1255-004LF | 48       |
| SKY77506      | 14       | SMP1340-011LF | 28       | SMV1139-011LF | 43       | SMV1255-011LF | 48       |
| SKY77517      | 14       | SMP1340-074LF | 28       | SMV1142-011LF | 44       | SMV1255-079LF | 48       |
| SKY77518      | 14       | SMP1340-075LF | 28       | SMV1143-011LF | 44       | SMV1263-074LF | 51       |
| SKY77519      | 14       | SMP1340-079LF | 28       | SMV1144-011LF | 44       | SMV1263-079LF | 51       |
| SKY77520      | 8, 14    | SMP1340-099   | 34       | SMV1145-011LF | 44       | SMV1265-011LF | 49       |
| SKY77523      | 12       | SMP1340-107   | 29       | SMV1145-079LF | 44       | SMV1269-074LF | 51       |
| SMP1302-001LF | 32       | SMP1340-508   | 28       | SMV1147-011LF | 44       | SMV1270-079LF | 51       |
| SMP1302-003LF | 32       | SMP1345-003LF | 28       | SMV1147-079LF | 44       | SMV1281-011LF | 49       |
| SMP1302-004LF | 32       | SMP1345-004LF | 28       | SMV1148-011LF | 44       | SMV1283-011LF | 49       |
| SMP1302-005LF | 32       | SMP1345-005LF | 28       | SMV1206-107   | 42       | SMV1405-074LF | 53       |
| SMP1302-011LF | 32       | SMP1345-079LF | 28       | SMV1211-001LF | 45       | SMV1405-079LF | 53       |
| SMP1302-017LF | 32       | SMP1345-107   | 28       | SMV1212-001LF | 45       | SMV1405-107   | 53       |
| SMP1302-027LF | 32       | SMP1345-518   | 28       | SMV1212-004LF | 45       | SMV1408-001LF | 53       |
| SMP1302-074LF | 32       | SMP1352-011LF | 31       | SMV1212-079LF | 45       | SMV1413-001LF | 53       |
| SMP1302-075LF | 32       | SMP1352-079LF | 31       | SMV1213-001LF | 45       | SMV1413-004LF | 53       |
| SMP1302-079LF | 32       | SMP1352-107   | 31       | SMV1213-004LF | 45       | SMV1413-079LF | 53       |
| SMP1302-099   | 34       | SMP1353-099   | 34       | SMV1213-011LF | 45       | SMV1470-004LF | 54       |
| SMP1302-107   | 32       | SMS1546-005   | 37       | SMV1213-074LF | 45       | SMV1493-079LF | 53       |
| SMP1304-001LF | 32       | SMS1546-005LF | 37       | SMV1213-079LF | 45       | SMV1494-079LF | 53       |
| SMP1304-004LF | 32       | SMS3922-001LF | 36       | SMV1214-001LF | 45       | SMV1702-011LF | 49       |
| SMP1304-005LF | 32       | SMS3922-004LF | 36       | SMV1215-001LF | 45       | SMV1705-004LF | 51       |
| SMP1304-007LF | 32       | SMS3922-005LF | 36       | SMV1215-011LF | 45       | SMV1705-074LF | 51       |
| SMP1304-011LF | 32       | SMS3922-011LF | 36       | SMV1231-011LF | 47       | SMV1705-079LF | 51       |
| SMP1304-019LF | 32       | SMS3922-015LF | 36       | SMV1231-074LF | 47       | SMV1763-079LF | 51       |
| SMP1304-027LF | 32       | SMS3922-079LF | 36       | SMV1231-079LF | 47       | SMV1770-079LF | 51       |
| SMP1304-099   | 34       | SMS3922-107   | 36       | SMV1232-011LF | 47       | SMV1771-079LF | 51       |
| SMP1304-107   | 33       | SMS3923-001LF | 36       | SMV1232-074LF | 47       | SMV2019-000   | 52       |
| SMP1307-001LF | 33       | SMS3923-005LF | 36       | SMV1232-079LF | 47       | SMV2019-107   | 50       |
| SMP1307-003LF | 33       | SMS3923-011LF | 36       | SMV1233-001LF | 47       | SMV2020-000   | 52       |
| SMP1307-004LF | 33       | SMS3923-015LF | 36       | SMV1233-004LF | 47       | SMV2021-000   | 52       |
| SMP1307-005LF | 33       | SMS3923-079LF | 36       | SMV1233-011LF | 47       | SMV2022-000   | 52       |
| SMP1307-011LF | 33       | SMS3923-107   | 36       | SMV1233-074LF | 47       | SMV2022-004LF | 50       |
| SMP1307-027LF | 33       | SMS3923-517   | 36       | SMV1233-079LF | 47       | SMV2023-000   | 52       |
| SMP1320-001LF | 29       | SMS3924-005LF | 36       | SMV1234-001LF | 47       | SMV2023-001LF | 50       |
| SMP1320-003LF | 29       | SMS3924-015LF | 36       | SMV1234-004LF | 47       | SMV2023-004LF | 50       |
| SMP1320-004LF | 29       | SMS3924-075LF | 36       | SMV1234-011LF | 47       | SMV2023-011LF | 50       |
| SMP1320-005LF | 29       | SMS3924-079LF | 36       | SMV1234-073LF | 47       | SPD1101-111   | 55       |

## PART NUMBER INDEX

| Part No.                   | Page No. | Part No.                     | Page No. | Part No.                  | Page No. | Part No.                   | Page No. |
|----------------------------|----------|------------------------------|----------|---------------------------|----------|----------------------------|----------|
| SPD1102-111 .....          | 55       | TT4P2-1013P2-2020 .....      | 75       | TT6P2-0770T-1215 .....    | 75       | TT6P4-0435P0-3019-NS ..... | 77       |
| SPD1103-111 .....          | 55       | TT4P2-1082.5P2-0720 .....    | 75       | TT6P2-0902F-2518 .....    | 76       | TT6P4-0509P7-0148 .....    | 77       |
| SRXXXXXXXXXXXXX .....      | 69       | TT4P2-1082P2-0620 .....      | 75       | TT6P2-0915T-2518 .....    | 76       | TT6P4-0722P4-4817 .....    | 77       |
| TT3P2-1068P0-3507 .....    | 75       | TT4P2-1090P2-0610 .....      | 75       | TT6P3-0445.25T-0145 ..... | 77       | TT6P4-0770P0-1240 .....    | 77       |
| TT3P2-1880P0-6010 .....    | 76       | TT4P3-0863P0-0585 .....      | 76       | TT6P3-0730P3-1213 .....   | 77       | TT6P4-1080P4-7015 .....    | 75       |
| TT3P3-0881.5P2-2530 .....  | 76       | TT4P3-1030P2-1535 .....      | 75       | TT6P3-0740P3-2020 .....   | 77       | TT6P4-1090P2-1036 .....    | 75       |
| TT3P3-1088P2-9015 .....    | 77       | TT4P3-1067P2-4420 .....      | 75       | TT6P3-0745.3P3-1920 ..... | 77       | TT6P4-2158P2-14220 .....   | 75       |
| TT3P3-1227.6P1-1030 .....  | 77       | TT4P3-1227.6P1-2030 .....    | 77       | TT6P3-0770T-1225 .....    | 75       | TT6P5-0765P0-11225 .....   | 75       |
| TT3P3-1575.42P2-1030 ..... | 77       | TT4P3-1575.42P2-2040 .....   | 77       | TT6P3-0770T-2020 .....    | 75       | TT6P5-0810P3-5030 .....    | 77       |
| TT3P3-1880P0-6022 .....    | 76       | TT4P3-2120P2-6020 .....      | 75       | TT6P3-0826.5P3-0520 ..... | 77       | TT6P5-0881.5P0-2530 .....  | 77       |
| TT3P3-1960P0-6022 .....    | 76       | TT4P3-2180P1-2540 .....      | 76       | TT6P3-0827P3-0620 .....   | 77       | TT6P5-1950P3-6040 .....    | 77       |
| TT3P3-1960P2-6030 .....    | 76       | TT4P3-2400P1-20015 .....     | 77       | TT6P3-0836T-2520 .....    | 76       | TT6P5-1960P0-6025 .....    | 76       |
| TT3P3-2400P1-1030 .....    | 76       | TT4P3-3417P2-0220 .....      | 77       | TT6P3-0860P3-2020 .....   | 76       | TT6P5-2280P1-7032 .....    | 76       |
| TT3P3-2450P1-1445 .....    | 76       | TT4P3-3500P2-10020 .....     | 77       | TT6P3-0860T-2020 .....    | 76       | TT6P6-0545P6-3022 .....    | 77       |
| TT3P4-0836.5P2-2525 .....  | 76       | TT4P4-1000P2-1030 .....      | 77       | TT6P3-0881F-2520 .....    | 76       | TT6P6-0750P0-5017 .....    | 75       |
| TT3P4-0881.5P2-2525 .....  | 76       | TT4P4-1880P0-6216 .....      | 76       | TT6P3-0902T-2520 .....    | 76       | TT6P6-0889P3-4029 .....    | 77       |
| TT3P4-0895.5P2-3926 .....  | 77       | TT4P4-1960P0-6216 .....      | 76       | TT6P3-0915T-2520 .....    | 76       | TT6P6-1000P5-8530 .....    | 77       |
| TT3P4-0917P2-4524 .....    | 77       | TT4P4-R1227.6-T1575.42 ..... | 77       | TT6P3-0917F-1425 .....    | 76       | TT6P6-1900P3-8035 .....    | 76       |
| TT3P4-1880P2-6020 .....    | 76       | TT4P5-1090P0-1050 .....      | 77       | TT6P3-1030P2-1029 .....   | 77       | TT6P6-2500P3-3635 .....    | 75       |
| TT3P4-1880P2-6030 .....    | 76       | TT4P5-2240P2-1032 .....      | 76       | TT6P3-1080P2-0650 .....   | 77       |                            |          |
| TT3P4-2513P2-5055 .....    | 77       | TT4P6-0860.5P0-1937 .....    | 76       | TT6P3-1090P2-1029 .....   | 77       |                            |          |
| TT3P5-3687P1-7466 .....    | 77       | TT4P6-2122P0-2835 .....      | 75       | TT6P3-2140P2-6011 .....   | 76       |                            |          |
| TT4P2-0915P2-2620 .....    | 76       | TT6P10-R1950-T2140 .....     | 76       | TT6P3-2467P0-3330 .....   | 76       |                            |          |

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www.em.avnet.com/semi



Component Distributors, Inc.  
800 777-7334  
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RFMW, Ltd.  
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## NOTES

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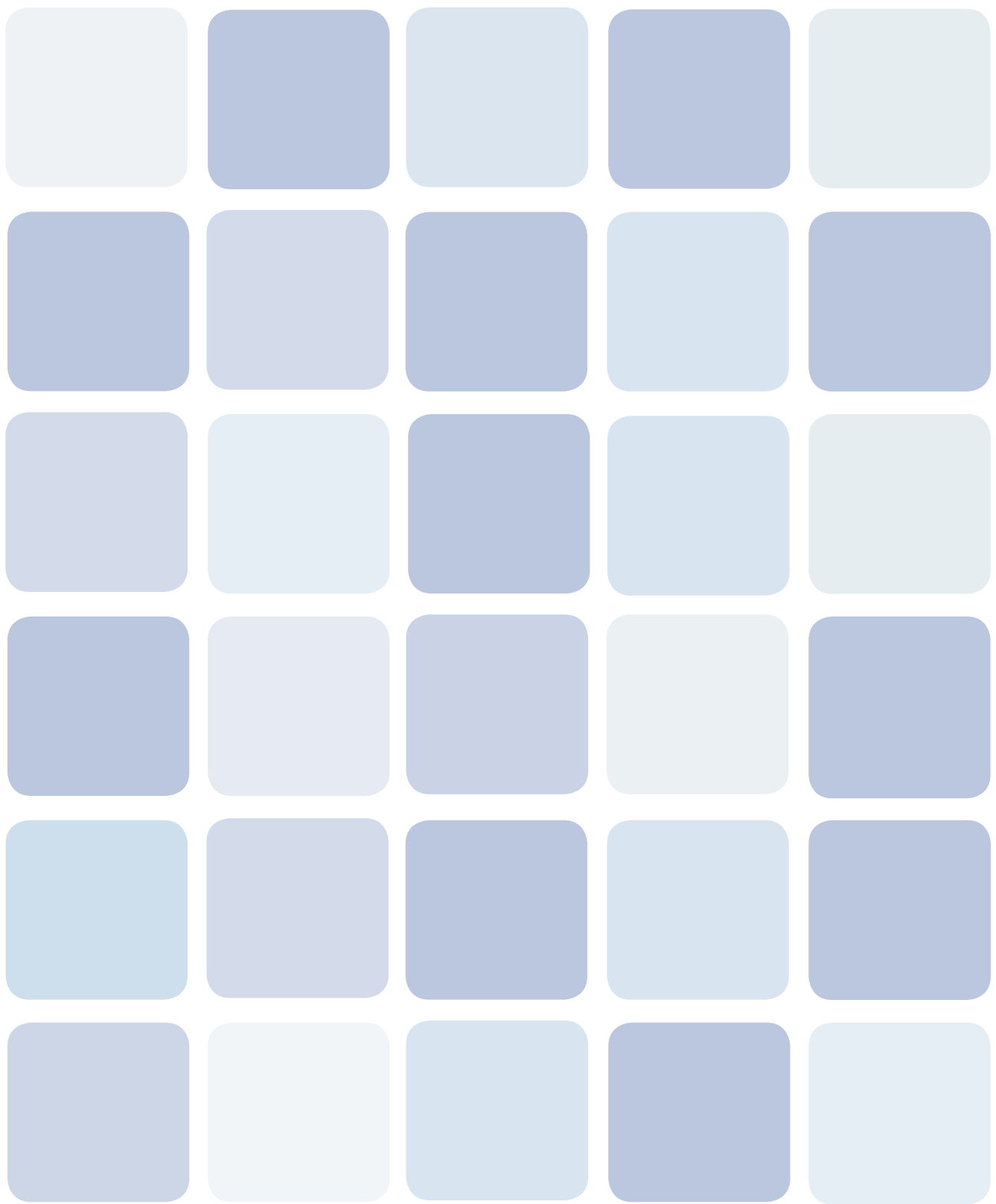
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