



## Applications

- Cellular macro basestations
- Cellular and PCS mode femto basestations
- Cellular pico basestations
- WiMAX and LTE basestations
- Mobile and streaming television

# RF Solutions for 700 MHz Infrastructure and Mobile/Streaming TV

With the completion of two auctions of the 700 MHz frequency band, new opportunities exist for LTE, WiMAX, and wireless TV applications. Skyworks' combination of market-leading discrete and integrated RF, analog and mixed signal devices, superior, high-volume module technology, and Si and GaAs engineering experience makes us uniquely positioned to provide high-performance RF solutions for the infrastructure systems to be built in the 698–806 MHz band.

As a supplier to all the tier-one infrastructure OEMs and to component and subsystem manufacturers, Skyworks has developed the knowledge and expertise to service the wireless infrastructure market. In an ongoing effort to improve quality, Skyworks has successfully targeted high quality standards and received ISO/TS 16949 certification for our Linear Products business unit.

## Wireless Infrastructure RFIC Product Offering

### Discrete Devices

- Switches
- Diodes
- Passives
- Amplifiers
- BAW filters

### Integrated Devices

- Transmitters
- Demodulators
- Receivers
- Mixers
- VCO synthesizers
- Transceivers

### IF Stage Devices

- Variable gain amplifiers
- Programmable amplifiers
- Programmable filters

## Manufacturing Technologies

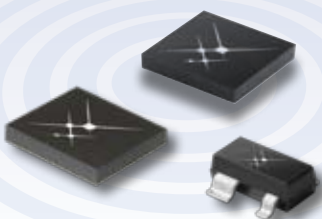
Using both internal and external fabrication facilities, Skyworks is able to select from pHEMT and HBT GaAs, CMOS, RFCMOS, BiCMOS, SiGe, and BAW process technology. Skyworks works with external suppliers and internal manufacturing to deliver die in a variety of packages, including RoHS-compliant and Green versions to address environmental concerns. By combining our market-leading discrete devices, superior, high-volume module technology, and engineering experience, Skyworks is uniquely positioned to provide high-performance RF solutions for all infrastructure architectures.

Through our Green Initiative™, we are committed to manufacturing products that comply with global government directives and industry requirements.



Skyworks is continuously innovating RF, analog and mixed-signal ICs. For the latest product introductions and information about Skyworks, visit our Web site at [www.skyworksinc.com](http://www.skyworksinc.com).

For additional information on our broad overall product portfolio, please contact your local sales office or email us at [sales@skyworksinc.com](mailto:sales@skyworksinc.com).



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## Mixers

### **SKY73073, SKY73032, SKY73020, SKY73022**

Skyworks has developed an expansive offering of high linearity mixers to meet the demanding performance requirements for today's 2G and 3G base stations. Using silicon BiCMOS processes, Skyworks can provide high levels of integration without sacrificing performance when compared to discrete solutions. Skyworks line of infrastructure mixers provides the following features:

- RF frequency up to 3.5 GHz
- IF bands ranging from 40 MHz to 500 MHz
- High linearity, low noise figure, and high dynamic range
- Integrated LO driver and low loss RF balun
- Small footprint MCM and plastic packages

### **SKY42068**

Our low-cost GaAs silicon mixer provides the highest dynamic range in the market. Its high integration also makes it a significant space saver.

#### **Main specifications:**

- Frequency: 400–1000 MHz
- Gain: 2.5 dB
- Noise Figure: 9.0 dB
- OIP3: 38.5 dBm

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## Passives

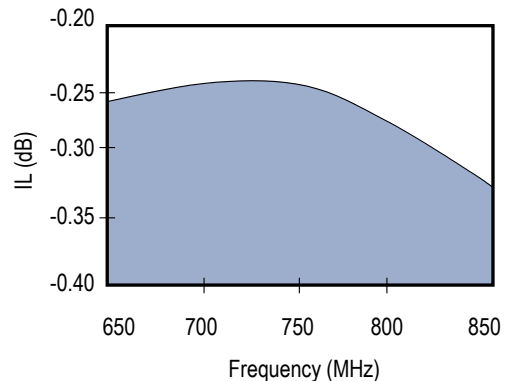
### **DD02-999LF**

Skyworks provides a variety of passive products geared toward infrastructure applications.

- Power dividers/combiners
- Directional couplers
- Detectors
- 90° hybrids
- Phase shifters

### **SKY16401-73LF**

Skyworks offers the first power divider designed specifically for the 700 MHz band. Operating between 698–806 MHz, the SKY16401-73LF has low insertion loss, excellent amplitude and phase balance, and class 1 ESD.



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## Amplifiers

### **SKY65113-84LF, SKY65009-70LF**

Our wide selection of industry-recognized amplifier products, includes low current, ultralinear, and general purpose amplifiers.

Skyworks' family of linear power amplifiers, fabricated in our HBT process, have excellent efficiency with a PAE of 48%. The SKY65009 has a gain of 19 dB at 750 MHz, a output  $P_{1\text{dB}}$  of 25 dBm, and an output IP3 of 42 dBm.

### **SKY65013 thru SKY65017 Series**

Skyworks gain blocks are fabricated in our InGaP HBT process. Their features include:

- High output 3rd order intercepts
- Excellent linearity
- Matched for 50\_ at the input and output.
- Wide operating frequency (250–12000 MHz)
- Packages: SOT-89, SC-70, Micro-X
- Single + 5 V or +3 V supply
- Gains at 750 MHz
  - SKY65013: 12 dB
  - SKY65014: 14–16 dB
  - SKY65015: 17–19 dB
  - SKY65016: 22 dB

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## Switches

**SKY13277-355LF, SKY13286-359LF, SKY13290-313LF, SKY13299-321LF**

Skyworks has over 60 catalog switches including SPST, SPDT, SP3T, SP4T, and DPDT. Many are developed to meet the critical features required for the infrastructure market:

- High isolation
- Non-reflective
- Integrated drivers

## Attenuators

**SKY12328-350LF, SKY12325-350LF, SKY12324-73LF, SKY12145-315**

Skyworks offers digital, variable, and fixed attenuators. Our 1-bit to 6-bit digital attenuators ranging from 0.5 dB to 32 dB LSB leverage our switch capabilities, while our variable attenuators and fixed attenuator pads are based on our silicon diode technology.

## Demodulators

**SKY73009-11, SKY73012-11**

The Skyworks line of ultralinear demodulators offers infrastructure designers an excellent combination of integration and high performance. Skyworks demodulator solutions cover from 400 MHz to 5.925 GHz, and provide designers with a one-stop solution for most 2G and 3G standards. This line of infrastructure demodulators provide the following benefits and features:

- High IIP2 and IIP3
- Wideband RF input frequency range
- Single +3.0 V supply
- Integrated LO balun
- Differential IF output supports direct interface to A/D circuitry

## Diodes

**SMP1345 Series, SMP1340 Series, SMP1321 Series, SMV1247 Series**

With over 450 diode products, Skyworks has limiter, PIN, Schottky, and varactor diodes for applications covering switches, attenuators, mixers, VCOs, and more. Our diodes are available in a variety of configurations and packages. Some special features include a series of PIN diodes with low distortion, high isolation, and low insertion loss and a series of varactor diodes with high Q and low phase noise.

## Schottky Mixer and Detector Diodes

**DMF3926, DME3927, DMJ3928, SMS3926, SMS3928, SMS7630**

Skyworks has developed low-cost Schottky diodes specifically configured for mixer and detector applications. The mixer diodes provide a high-performance solution for transmit upconversion while the detector diodes offer high sensitivity for excellent detection.

## Programmable Filters

**SKY73201-364LF, SKY73202-364LF**

Dual and single low pass filters configured as 6th order Butterworth.

- Programmable in 1 MHz steps from 1–28 MHz
- High stop-band isolation
- Flat pass-band
- 3-wire serial peripheral interface (SPI)
- Temperature compensation via internal calibration circuit

## Programmable Gain Amplifiers

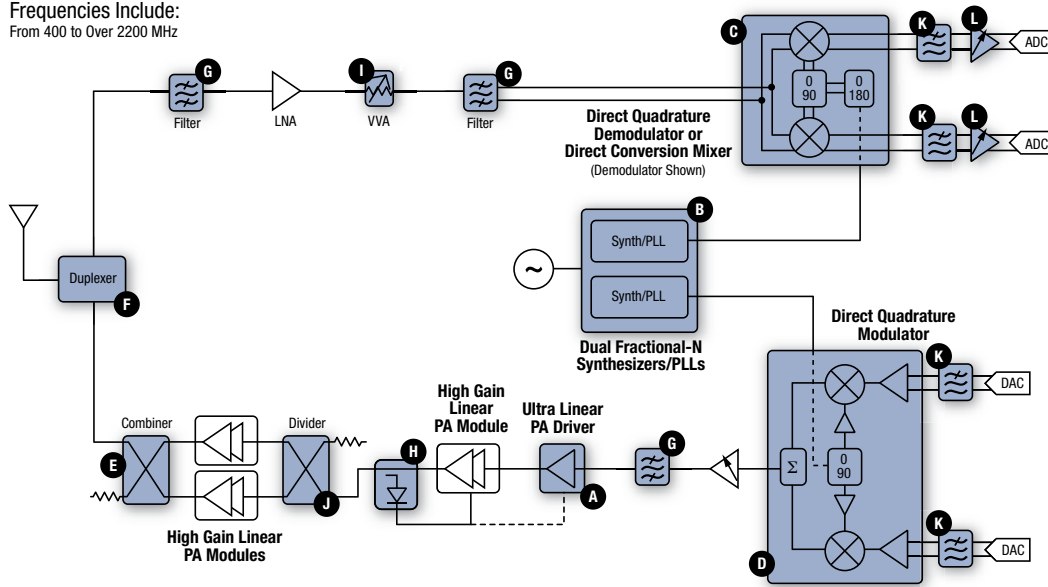
**SKY65321-364LF**

To complement our new line of programmable filters, Skyworks now offers its first programmable gain amplifier.

- Programmable in 1 dB steps from -6 to 50 dB gain
- Automatic DC offset cancellation circuitry
- 3-wire Serial Peripheral Interface (SPI)
- Wide 3 dB bandwidth to 100 MHz
- Differential output supports direct interface to baseband ADC

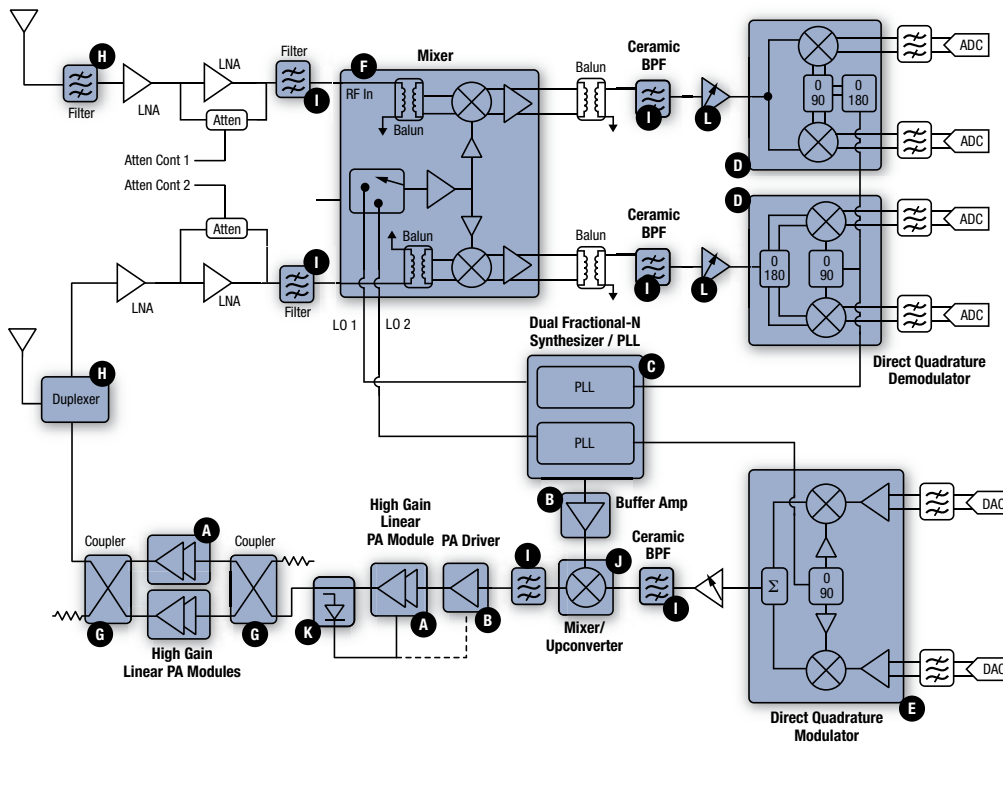
# Direct Conversion Base Station Transceiver Block Diagram

Frequencies Include:  
From 400 to Over 2200 MHz



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|--|---|--|--|---|--|---|---|
| <b>PA Drivers</b><br><b>A</b> SKY65008<br>SKY65009-70LF<br>SKY65013<br>SKY65014<br><br>SKY65015<br>SKY65016<br>SKY65017<br>SKY65028-70LF<br>SKY65112-84LF<br>SKY65113-84LF | <b>Synthesizers</b><br><b>B</b> SKY72300-21<br>SKY72302-21<br>SKY72310<br>SKY73100<br>SKY73101<br>SKY73103<br>SKY73112<br>SKY74038-21 | <b>Direct Quadrature Demodulators or Direct Conversion Mixer</b><br><b>C</b> SKY73001-11<br>SKY73009-11<br>SKY73012-11<br><br><b>Direct Quadrature Modulator</b><br><b>D</b> SKY73010-11 | <b>Couplers</b><br><b>E</b> DC08-73LF<br>DC09-73LF<br>DC18-73LF<br>DC25-73LF | <b>F</b> Dielectric Resonators<br><b>G</b> Ceramic Band Pass Filters<br><br><b>H</b> DD02-999LF | <b>VVAs/PIN Diodes</b><br><b>I</b> AV101-12LF<br>AV102-12LF<br>AV111-12LF<br>AV113-12LF<br>SMP1304 Series<br>SMP1307-011LF | <b>Dividers</b><br><b>J</b> PD09-73LF<br>PD18-73LF<br>PD19-73LF<br>PD22-73LF<br>SKY78401-73LF | <b>Programmable Filters</b><br><b>K</b> SKY73201-364LF<br>SKY73202-364LF<br><br><b>PGA</b><br><b>L</b> SKY65321-364LF |
|--|---|--|--|---|--|---|---|

# Superhetrodyne Base Station Transceiver Block Diagram



- |   |  |   |   |  |   |  |  |   |   |  |  |
|---|--|---|---|--|---|--|--|---|---|--|--|
| <b>High Gain PA Module</b><br><b>A</b> SKY65120<br>SKY65124 | <b>PA Drivers</b><br><b>B</b> SKY65028-70LF<br>SKY65008<br>SKY65015<br>SKY65009-70LF<br>SKY65016<br>SKY65013<br>SKY65017 | <b>Synthesizers</b><br><b>C</b> SKY72300-21<br>SKY72302-21<br>SKY74038-21<br>SKY73100<br>SKY73101<br>SKY73103<br>SKY72310 | <b>Direct Quadrature Demodulator</b><br><b>D</b> SKY73009-11<br>SKY73012-11 | <b>Direct Quadrature Modulator</b><br><b>E</b> SKY73010-11 | <b>Mixers</b><br><b>F</b> SKY73020-11 (dual)<br>SKY42068-11 (single)<br>SKY73021-11<br>SKY73022<br>SKY73023<br>SKY73032 (single)<br>SKY73033 (single) | <b>Couplers</b><br><b>G</b> DC08-73LF<br>DC09-73LF<br>DC18-73LF<br>DC25-73LF | <b>Dielectric Resonators</b><br><b>H</b> Dielectric Resonators<br><b>I</b> Ceramic Band Pass Filters | <b>Schottky Diodes</b><br><b>J</b> DME3927-100<br>DMJ3928-100 | <b>Directional Detectors</b><br><b>K</b> DD02-999LF | <b>Attenuators</b><br><b>L</b> SKY12322-86LF<br>SKY12323-303LF<br>SKY12328-350LF | <b>Programmable Filters</b><br><b>M</b> SKY73201-364LF<br>SKY73202-364LF |
|---|--|---|---|--|---|--|--|---|---|--|--|