AGLNA070140

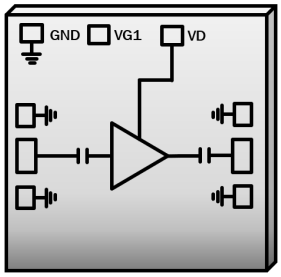
GaAs MMIC
8.0 – 12.0GHz Low Noise Amplifier

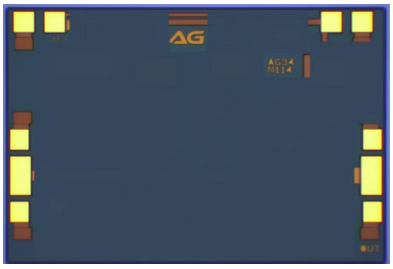
Typical Applications

- X-band Comms
- Military EW Systems
- SATCOM
- Telecom Infrastructure

Features

- Frequency Range: 8.0 – 12.0 GHz
- Noise Figure: 0.9dB
- Gain: 24dB
- P1dB: + 13dBm
- Pdiss: 90mW
- Self-Biased: +2V @ 45mA Single Supply
- 50Ω Matched Input/Output DC blocked
- Chip Size: 1.9 x 1.3 x 0.1 mm
- Package: 4x4 20L QFN





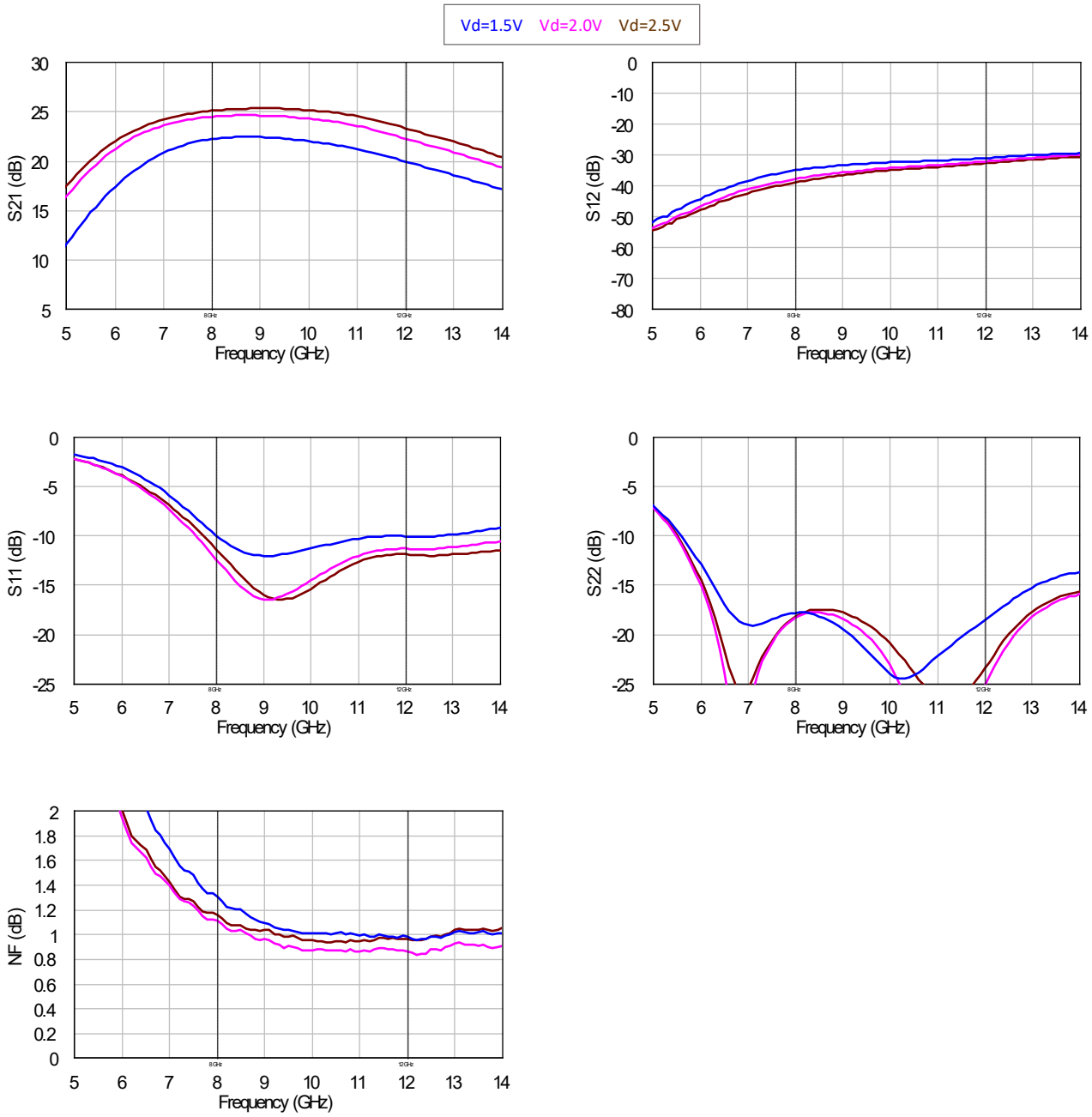
Electrical Specifications (TA = +25°C, VD = +2V, IDD = 45mA)

Parameter	Units	Minimum	Typical	Maximum
Frequency	GHz	8		12
Gain	dB		23	
Noise Figure	dB		0.9	
Input Return Loss	dB		12	
Output Return Loss	dB		16	
P1dB	dBm		13	
Psat	dBm		14	
Supply Voltage (Vdq)	V		+2	
Supply Current	mA		45	
DC Dissipated Power	mW		90	
Package Type			20L4x4	

Low Noise Amplifiers

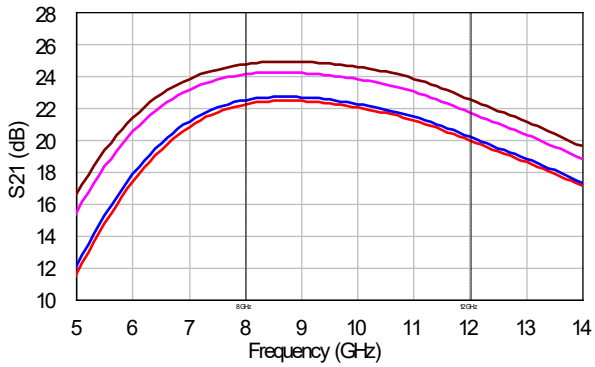
Performance Graphs

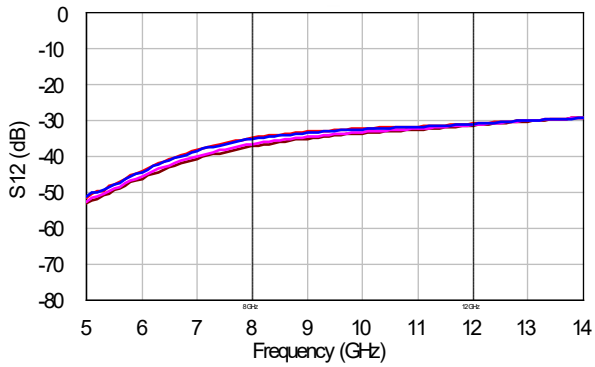
S-Parameters and Noise Figure vs. Vd, single-supply @ 25°C

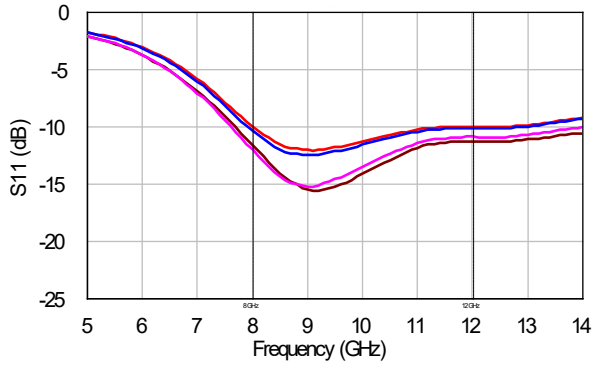


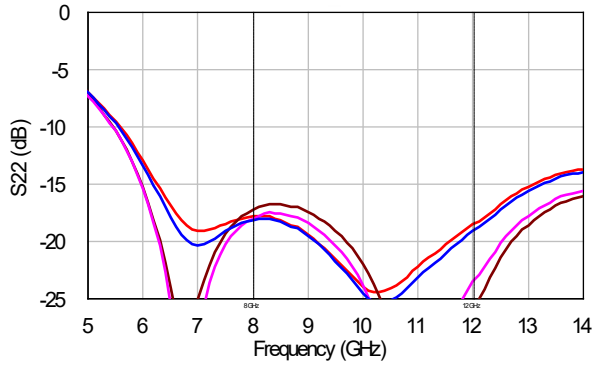
S-Parameters and Noise Figure vs. Idq, Vd=1.5V @ 25°C

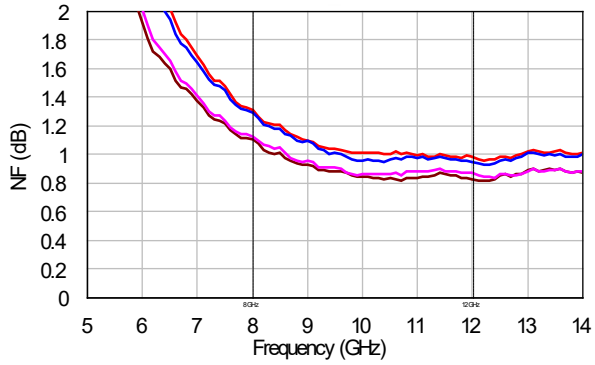
Idq=16mA (Vg=0.36V) Idq=32mA (Vg=0.43V) Idq=48mA (Vg=0.49V) Single-Supply





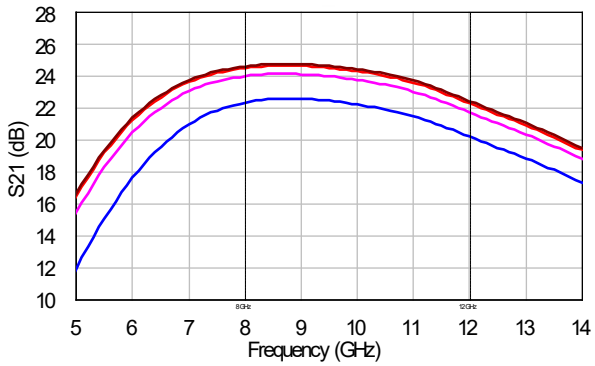


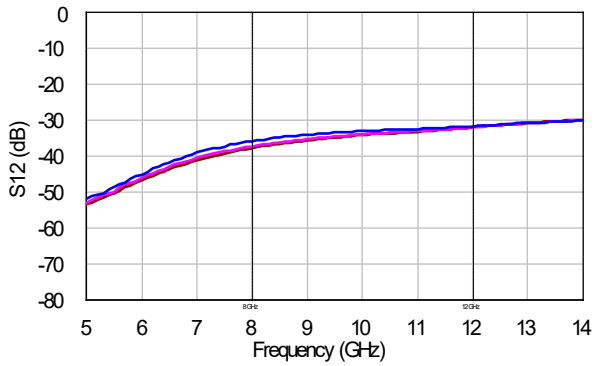


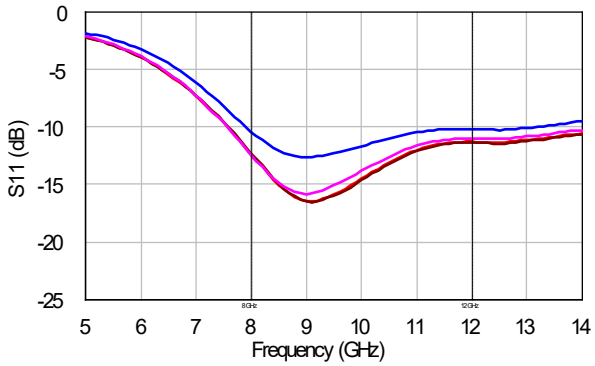


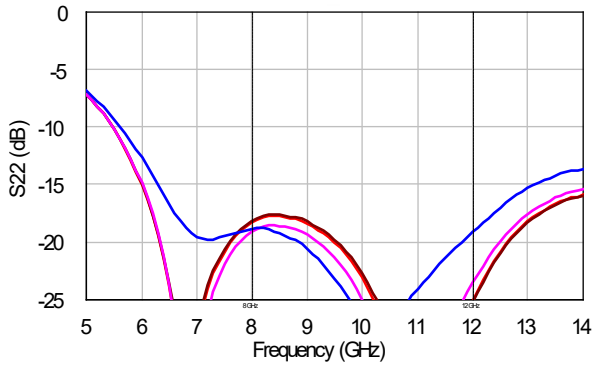
S-Parameters and Noise Figure vs. Idq, Vd=2.0V @ 25°C

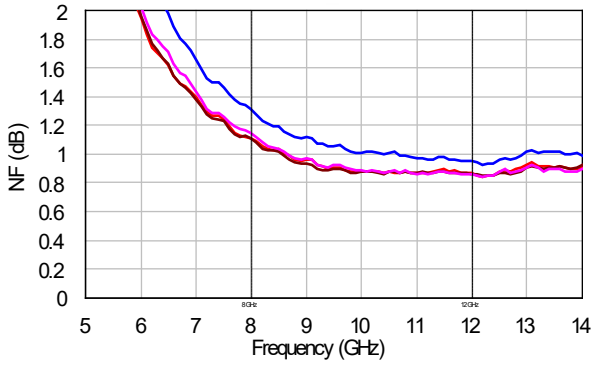
Idq=16mA (Vg=0.34V) Idq=32mA (Vg=0.41V) Idq=48mA (Vg=0.47V) Single-Supply



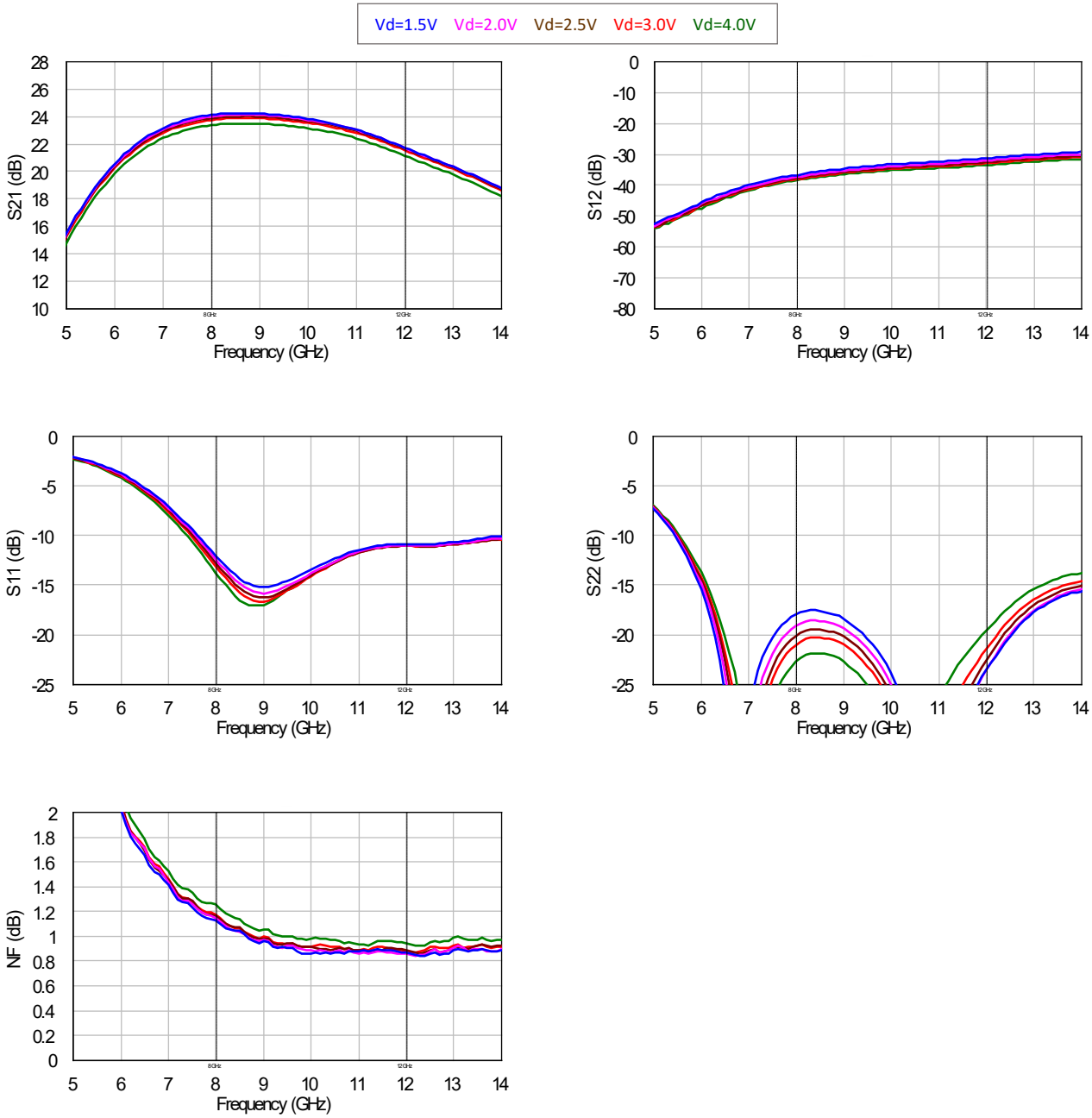




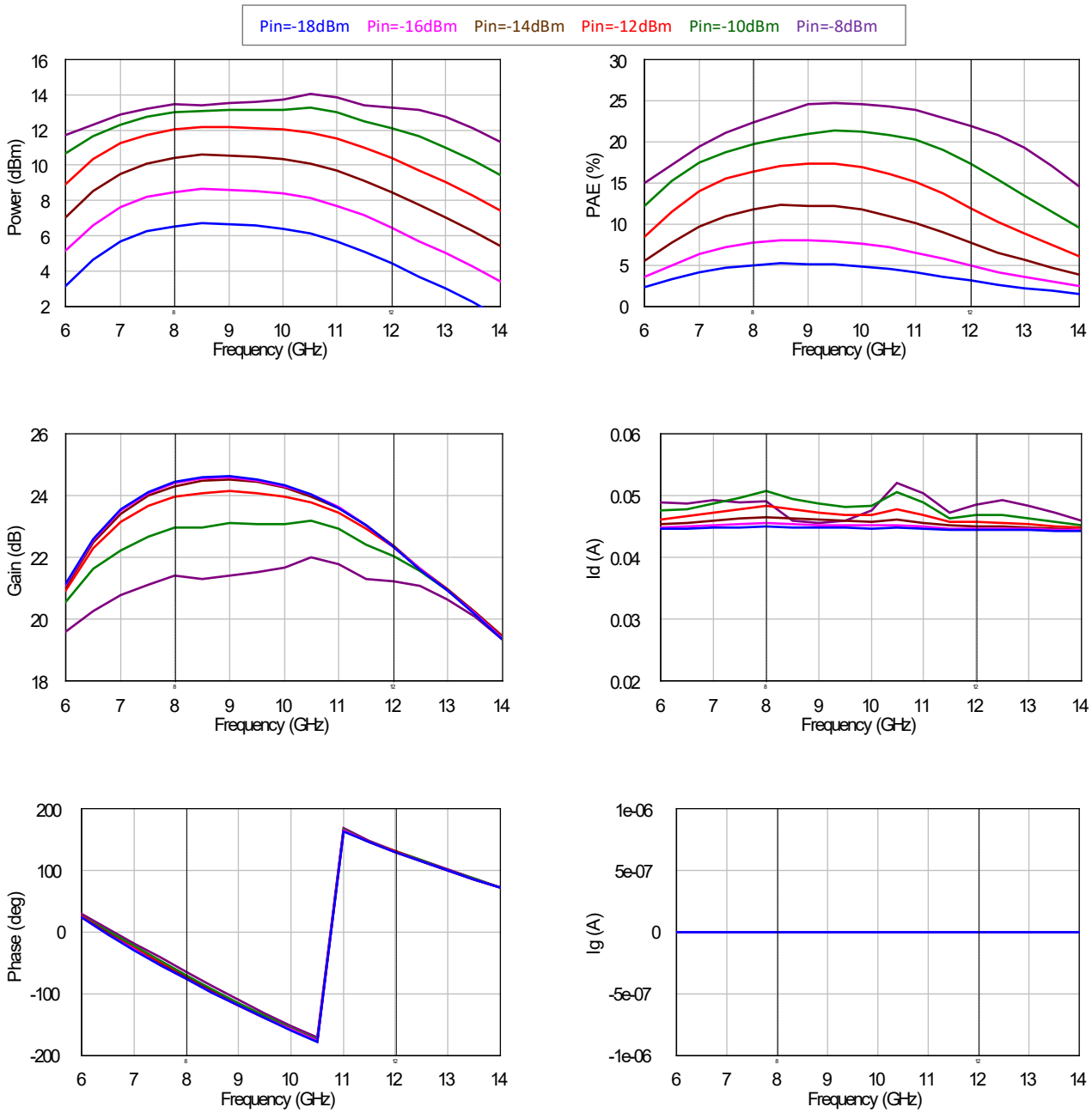




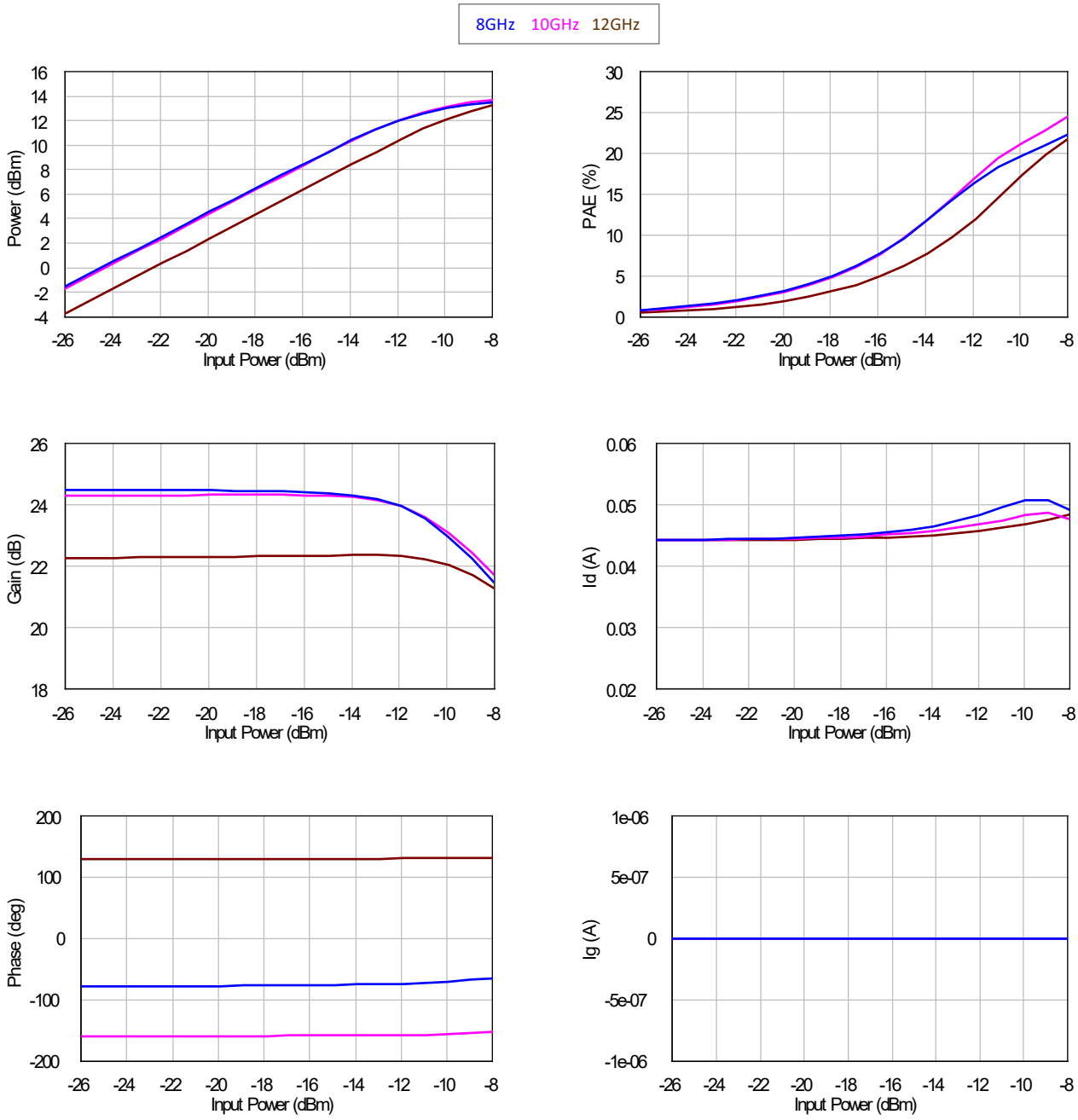
S-Parameters and Noise Figure vs. Vd, Idq=32mA @ 25°C



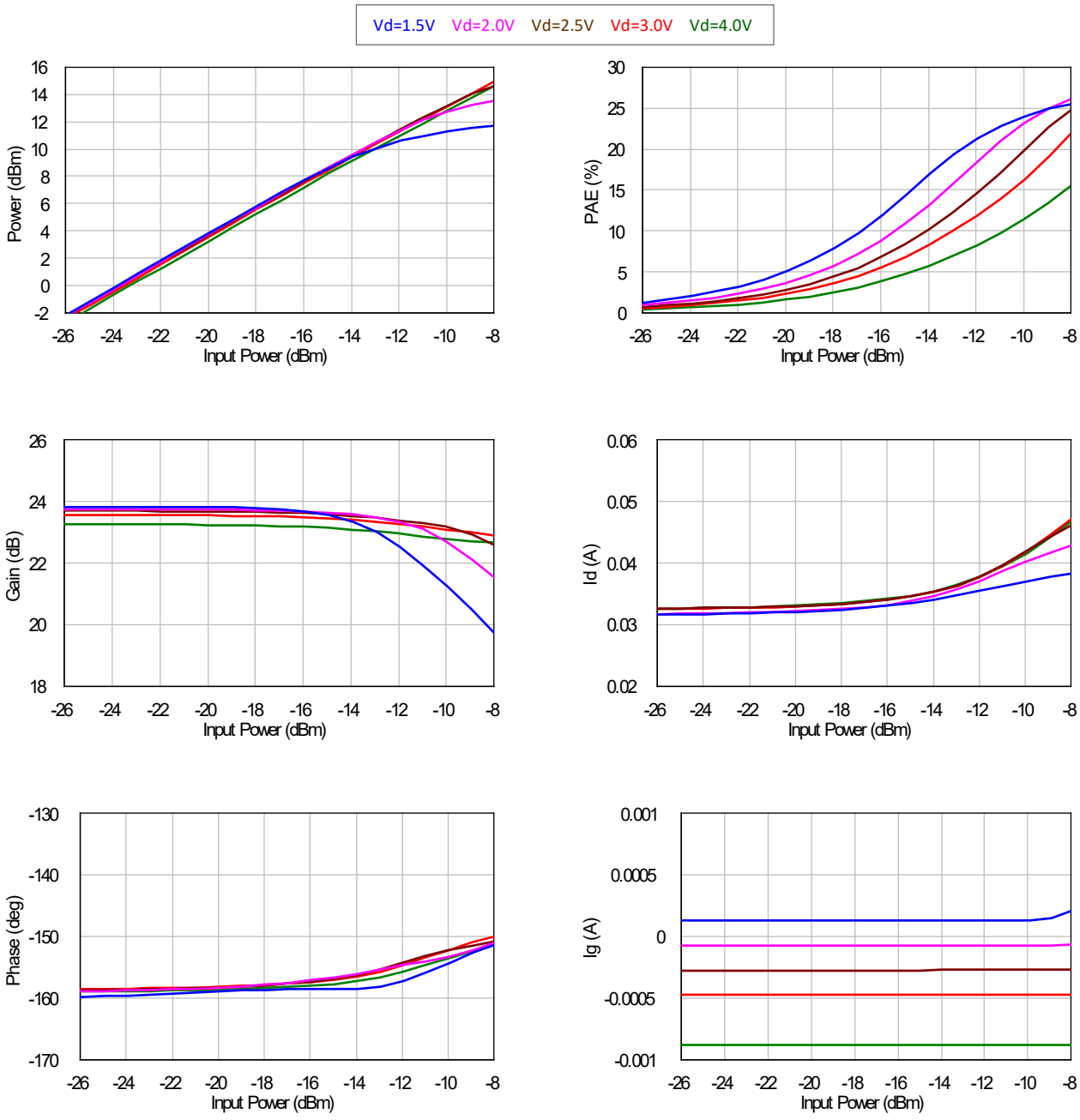
Frequency Response vs. Input Power, Vd=2V @25°C



Power Sweep vs. Frequency, Vd=2V @25˚C



Power Sweep vs. Vd, Idq=32mA & 10GHz @25°C



Outline Drawing

Pad Descriptions

Pad	Function	Pad Size	Description
1	RFIN	110x200µm	AC coupled 50Ω Matched
2	VG1	110x110µm	(Optional) Gate Power Supply voltage, bypass capacitors needed
3	VD	110x110µm	Drain Power Supply voltage, bypass capacitors needed*
4	RFOUT	110x200µm	AC coupled 50Ω Matched
Die Bottom	GND	Backside	Epoxy/Solder to Baseplate

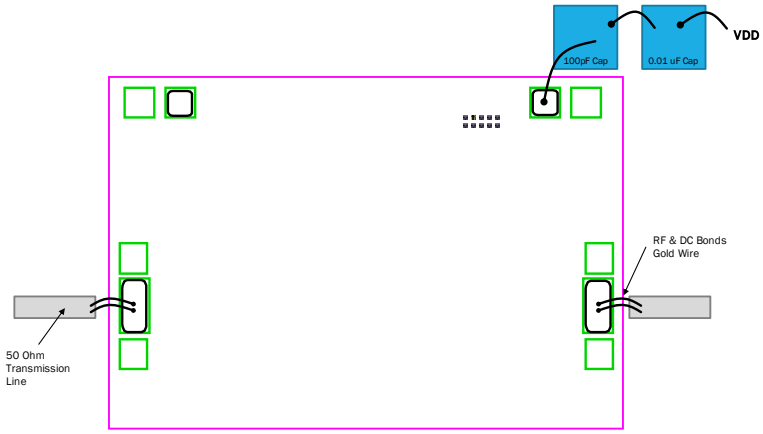
*See Assembly Diagram

Absolute Maximum Ratings

Parameter	Rating
Drain Bias Voltage (VDD)	+4V DC
RF Input Power (RFIN)	+10dBm*
Channel Temperature	150°C
Storage Temperature	-65 to 150°C
Operating Temperature	-55 to 85°C

*To be tested

Assembly Diagram



Assembly Notes:

1. Die Thickness is 100µm
2. Backside and Bondpad metallization: 4µm gold
3. Silver Epoxy or AuSn Eutectic attach MMIC

Die Packaging Information

- GP-4 (Gel-Pak)

Biasing and Operation

The amplifier is biased with a positive drain supply. The preferred biasing procedure is as follows:

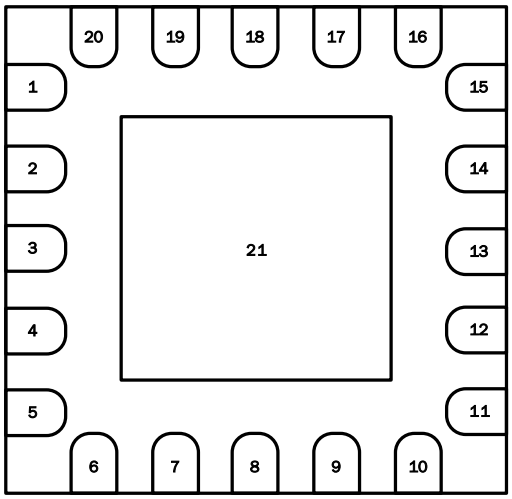
Turn ON procedure:
1. Set VD to Vdq.
2. Apply RF signal.

Turn OFF procedure:
1. Turn off RF signal.
2. Turn off VD.

Important Notice

The information contained in this Data Sheet and any associated documents is believed to be reliable; however, AmpliTech makes no warranties regarding the Data Sheet Information and assumes no responsibility of liability whatsoever for the use of the said information. All Data Sheet information is subject to change without notice.

QFN Package Information

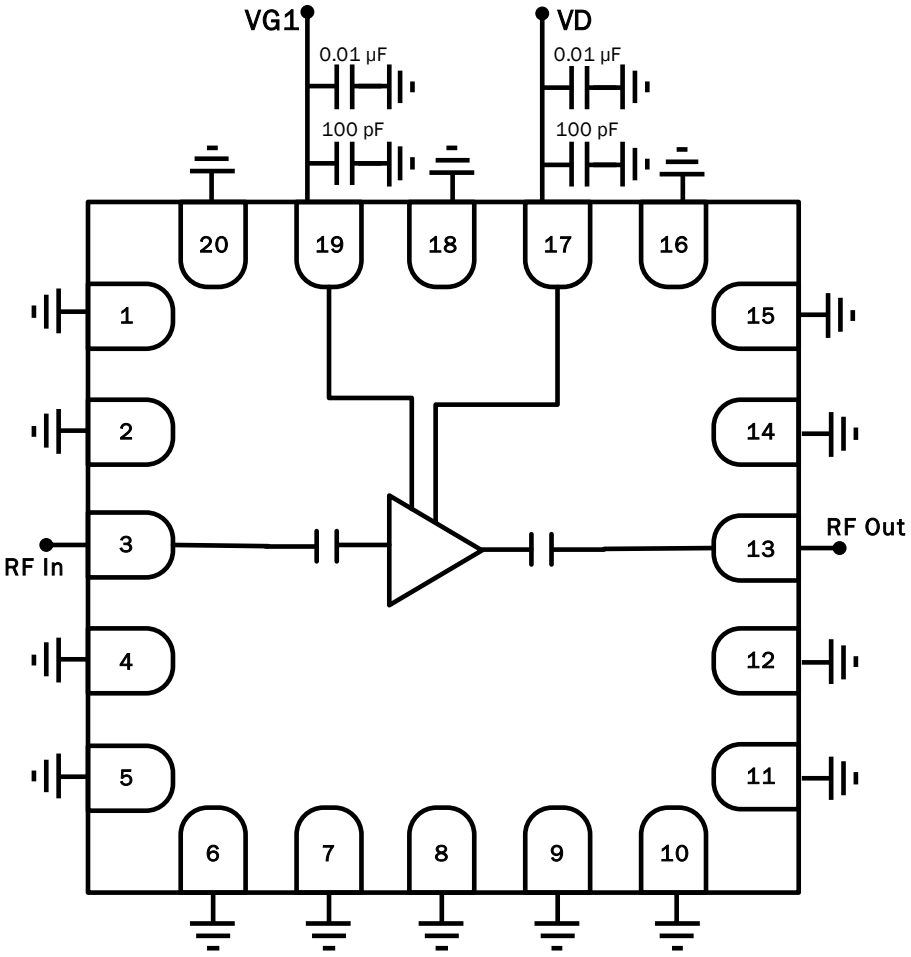


QFN top view

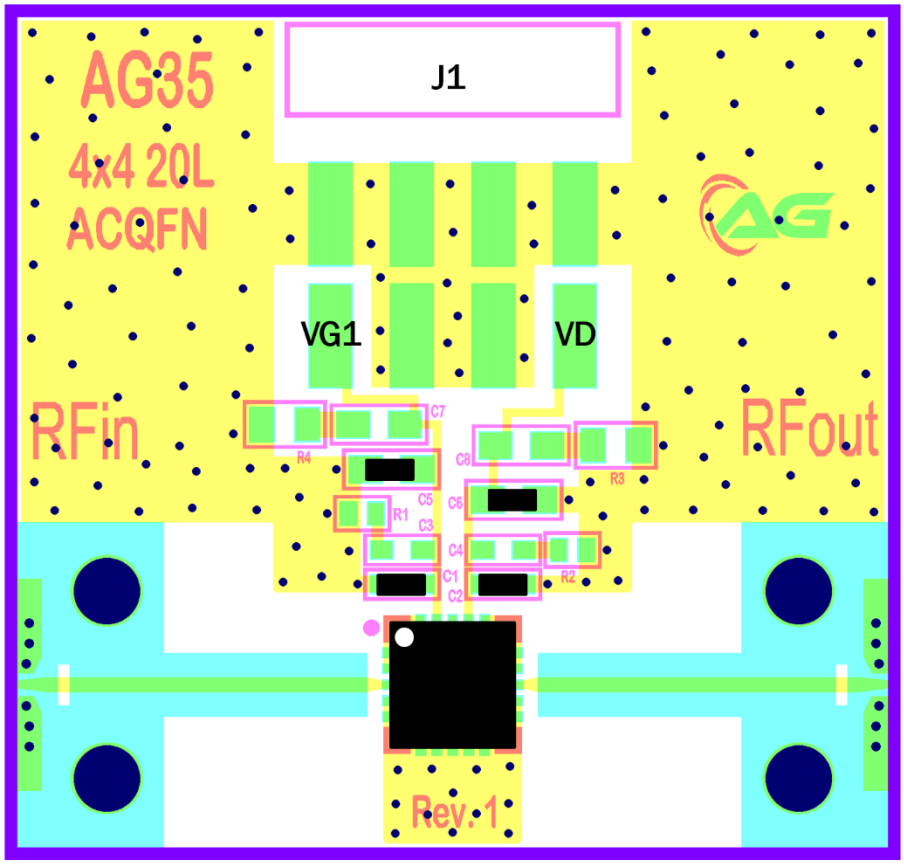
Pad Descriptions

Pad	Function	Description
1,2,4-12,14-16,18,20	NC	No Connect. These leads should be grounded on PCB.
3	RFIN	AC coupled 50Ω Matched
13	RFOUT	AC coupled 50Ω Matched
17	VD	Drain Power Supply voltage, bypass capacitors needed*
19	VG1	(Optional) Gate Power Supply voltage, bypass capacitors needed
21	GND	Ground Paddle

Application Circuit



Test PCB



Component	Value	Size
4x4 20L QFN	-	
C1	100pF	0402
C2	100pF	0402
C5	.01uF	0603
C6	.01uF	0603
J1	-	