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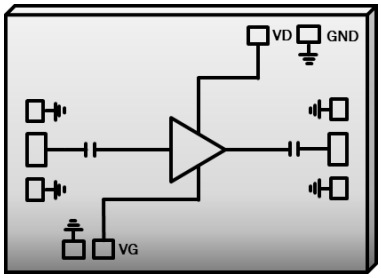
GaAs MMIC
18-40GHz Low Noise Amplifier

Typical Applications

- Test Instrumentation
- EW Systems
- Telecom Infrastructure
- EW/ECM Comm Systems

Features

- Frequency Range: 18 – 40 GHz
- Gain: 25dB
- Noise Figure: 2.1dB
- P1dB: + 20dBm
- PAE: 25%
- VD=+4V & IDQ=90mA
- 50Ω Matched Input / Output DC blocked
- Size: 2.90 mm x 1.00 mm x 0.10 mm





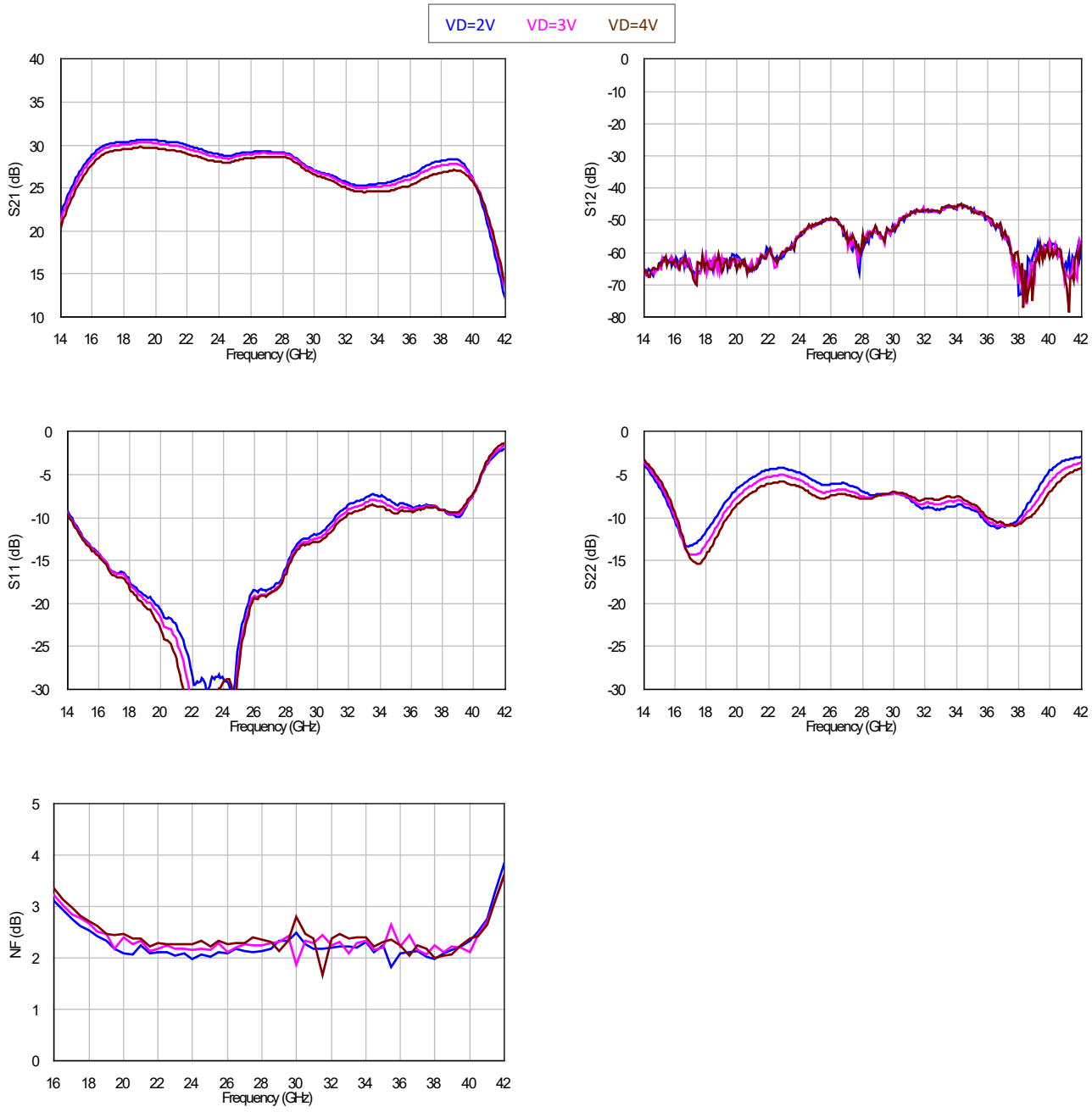
Electrical Specifications (TA = +25°C, VD = +4V, IDD = 90mA)

Parameter	Units	Minimum	Typical	Maximum
Frequency	GHz	18		40
Gain	dB		27	
Gain Flatness	dB		± 2.5	
Noise Figure	dB		2.1	
Input Return Loss	dB		10	
Output Return Loss	dB		6	
P1dB	dBm		20	
Psat	dBm		22	
PAE	%		25	
Supply Voltage	V		+4	
Supply Current	mA		90	
DC Dissipated Power	mW		360	
Package Type			Die	

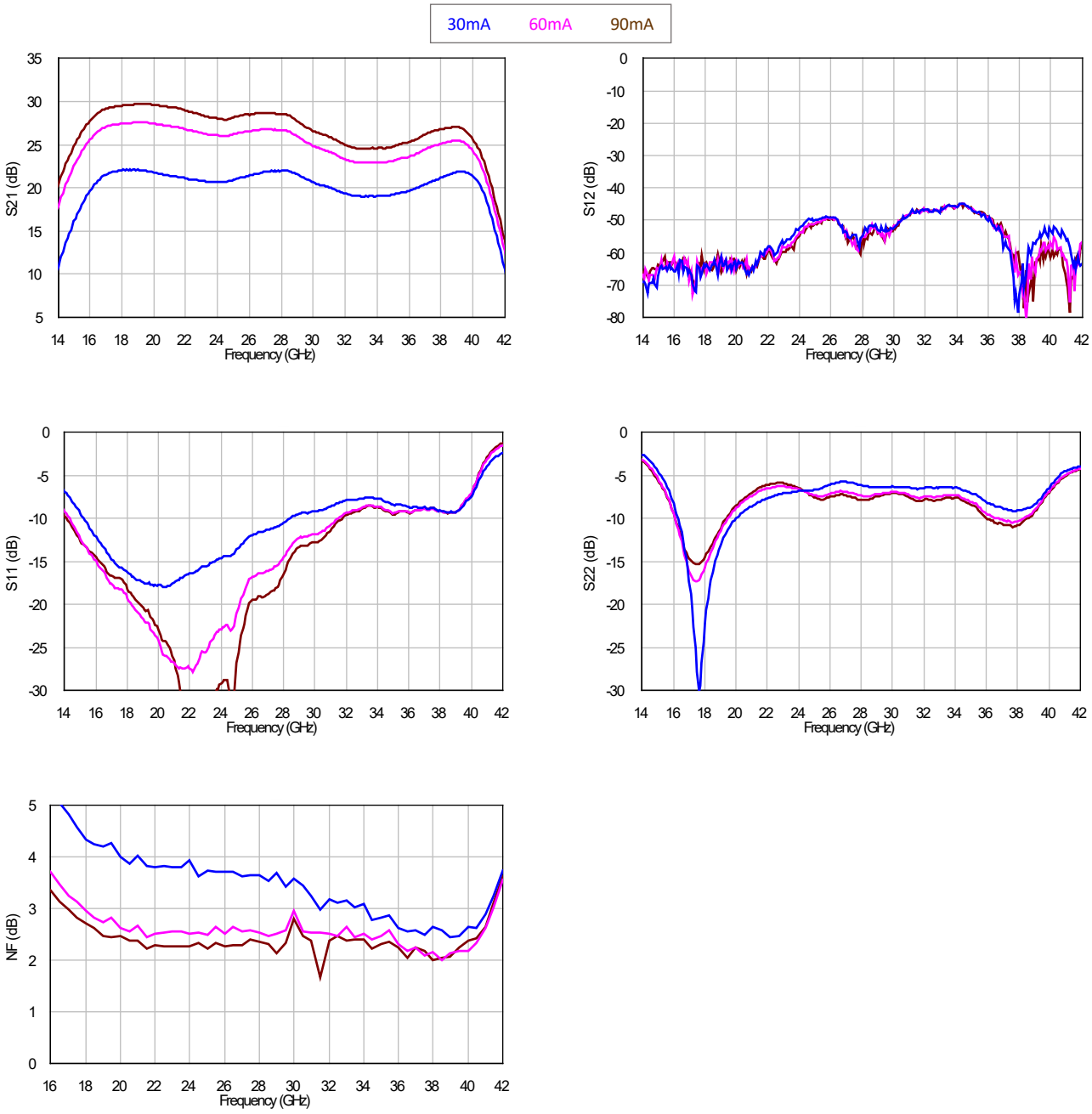
Low Noise Amplifiers

Performance Graphs

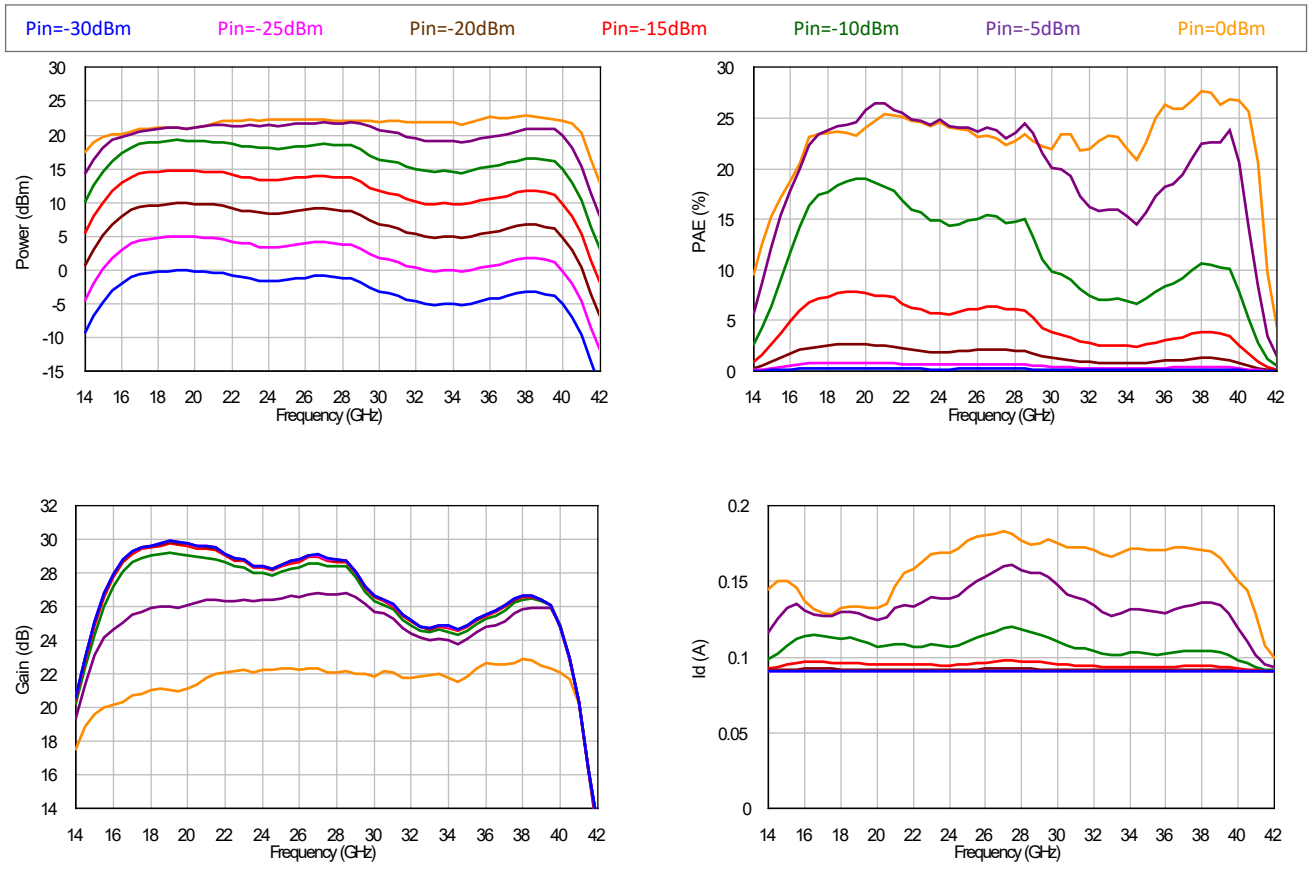
S-Parameters and Noise Figure vs. VD @ IDQ=90mA (25°C, VG~+0.4V)



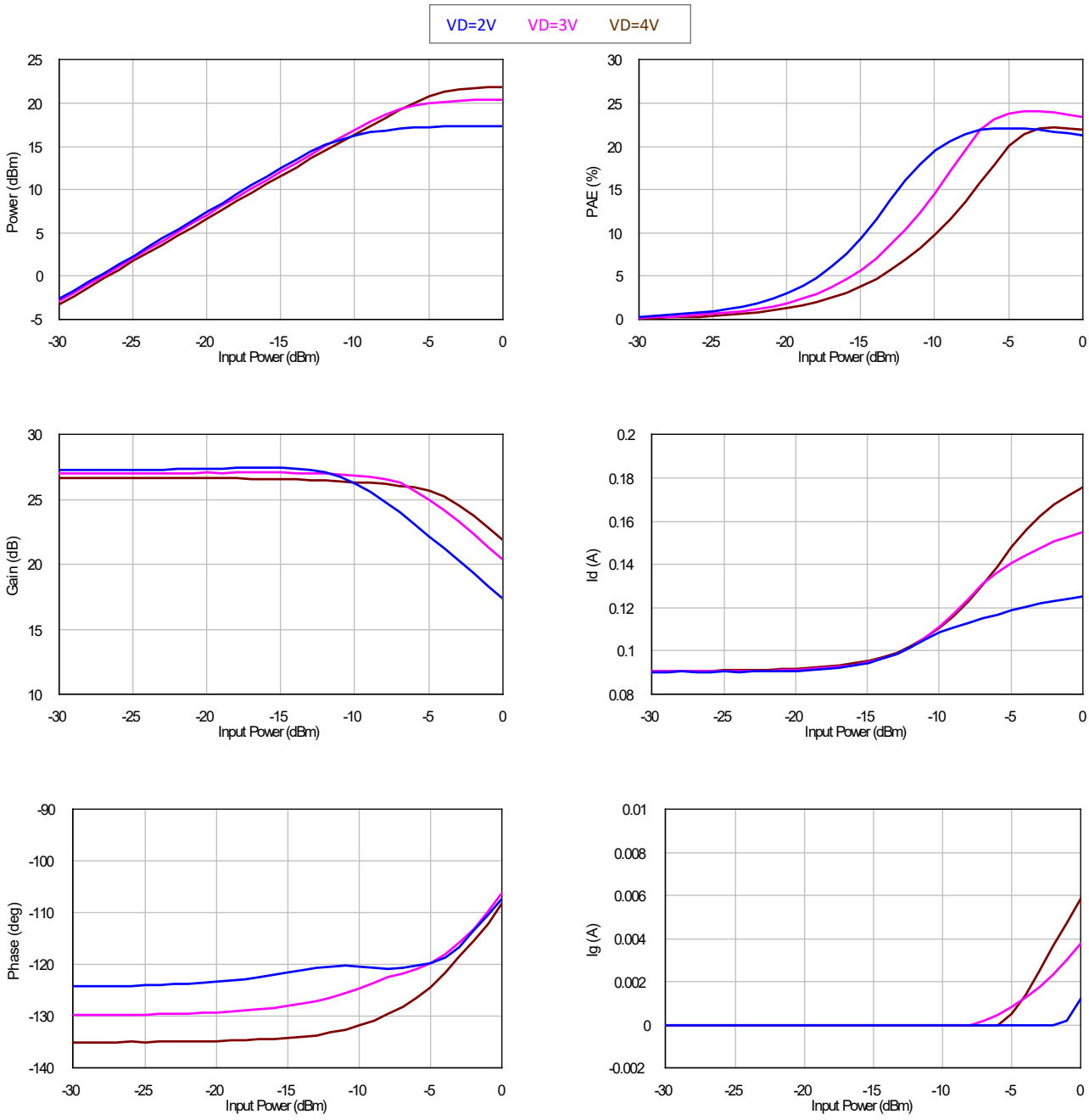
S-Parameters and Noise Figure vs. IDQ @ VD=4V (25°C, VG~+0.4V)



Frequency Response vs. Input Power (25°C, VD=4V, IDQ=90mA, VG=+0.4V)



Power Sweep vs. VD (25°C, Frequency=30GHz, IDQ=90mA, VG~0.4V)



Die Outline Drawing



Die Pad Descriptions

Pad	Function	Pad Size	Description
1	RFIN	100x189µm	AC coupled 50Ω Matched
2	RFOUT	100x189µm	AC coupled 50Ω Matched
3	VD	100x100µm	Drain Power Supply voltage, bypass capacitors needed*
4	VG	100x100µm	Gate Power Supply voltage, bypass capacitors needed*
Die Bottom	GND	Backside	Epoxy/Solder to Baseplate

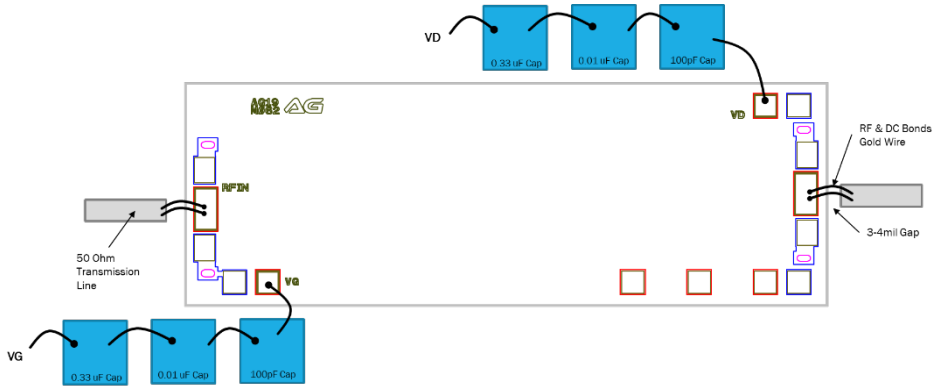
*See Assembly Diagram

Absolute Maximum Ratings

Parameter	Rating
Drain Bias Voltage (VDD)	+4V DC
RF Input Power (RFIN)	+20dBm*
Channel Temperature	150°C
Storage Temperature	-65 to 150°C
Operating Temperature	-55 to 85°C

*To be tested

Die Assembly Diagrams



Die Assembly Notes:

1. Die Thickness is 100µm
2. Backside and Bondpad metallization: 3µm gold
3. Silver Epoxy or AuSn Eutectic attach MMIC
4. Gap between MMIC and 50 Ohm lines should be 3-4mils
5. Off-Chip bypass capacitor values are approximate



Die Packaging Information

- GP-4 (Gel-Pak)

Biasing and Operation

The amplifier is biased with a positive drain supply and negative gate supply. Performance is optimized when the drain voltage is set to Vdq. The preferred biasing procedure is as follows:

Turn ON procedure:

1. Set VG to 0.0V.
2. Set VD to Vdq.
3. Adjust VG more positive until Id = Idq.
4. Apply RF signal.

Turn OFF procedure:

1. Turn off RF signal.
2. Reduce VG to 0.0V. Id should be 0mA.
3. Turn off VD.
4. Turn off VG.

Important Notice

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