AGMPA165215B

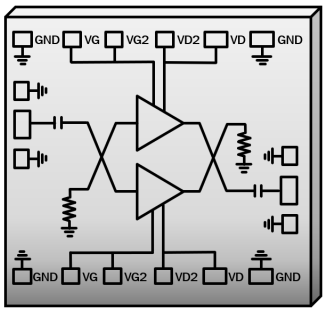
GaN on SiC HEMT MMIC
17 – 20GHz 2W Balanced Power Amplifier

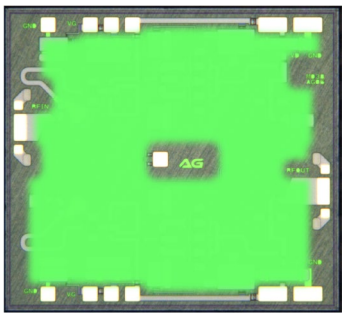
Typical Applications

- Point-to-Point Radio
- K-Band SATCOM

Features

- Frequency Range: 17.3 – 20.2 GHz
- Gain: 21 dB
- PAE: 30% @ 35 dBm Pout
- Psat: + 35dBm
- Bias: VD = +28V, IDQ = 100mA, VG = -1.56
- 50Ω Matched Input/Output DC blocked
- Chip Size: 2.4 x 2.2 x 0.1 mm





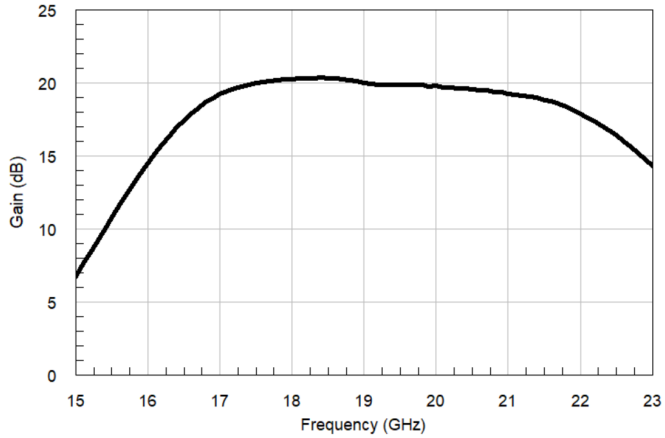
Electrical Specifications (TA = +25°C, VD = +28V, IDQ = 100mA, VG = -1.72)

Parameter	Units	Minimum	Typical	Maximum
Frequency	GHz	17.3		20.2
Gain	dB		20	
Gain Flatness	dB		± 1	
Input Return Loss	dB		26	
Output Return Loss	dB		21	
PAE	%		26	
Psat	dBm		35	
Supply Voltage (Vdq)	V		+28	
Supply Current (Idq)	mA		100	
DC Dissipated Power	W		2.8	
Package Type			Die	

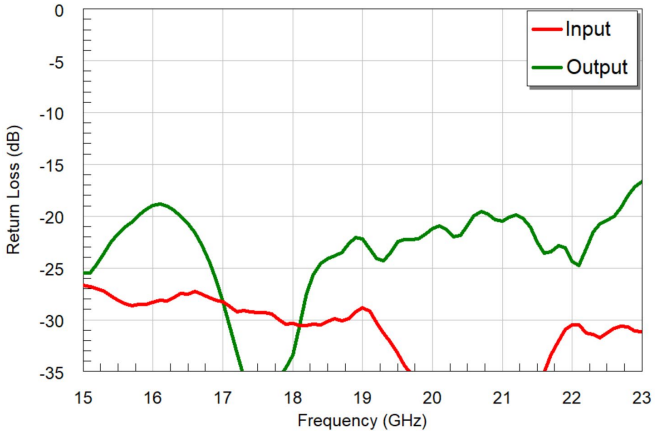
Power Amplifiers - Die

Performance Graphs

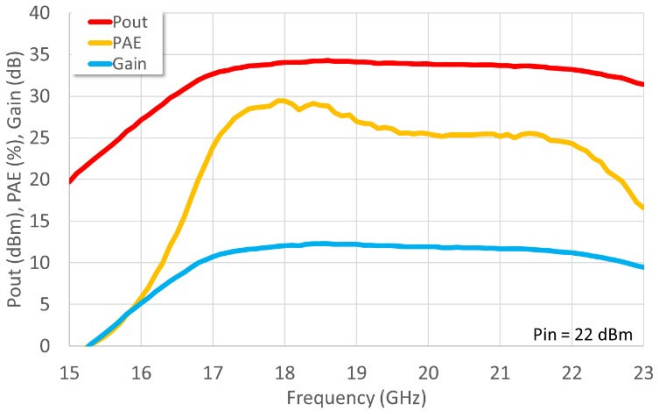
Gain



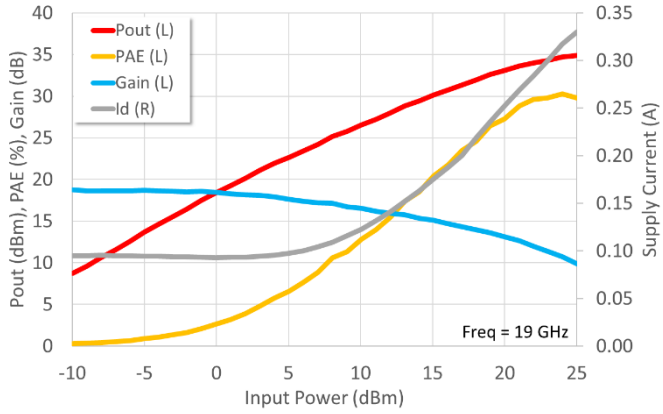
Return Losses



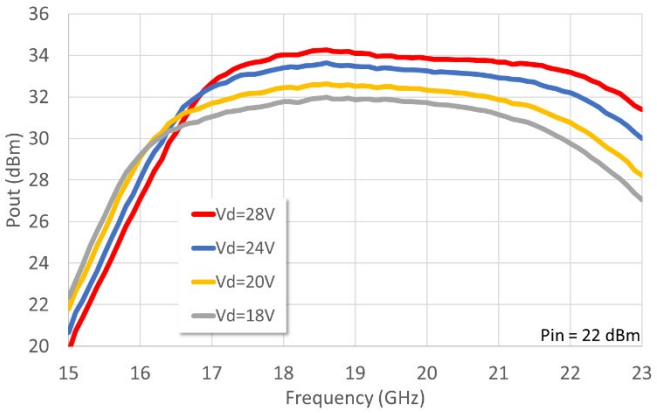
Frequency Response



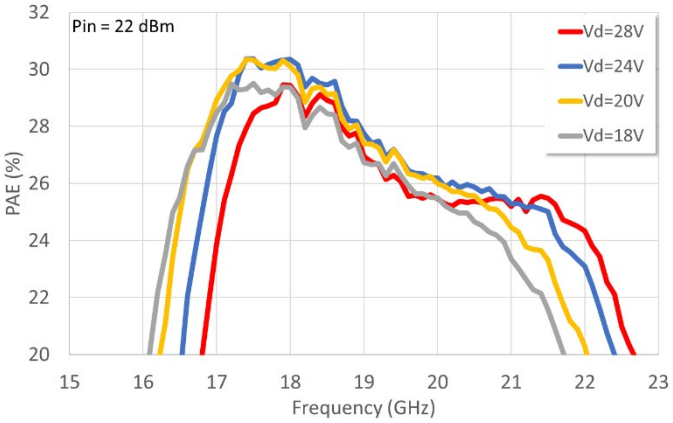
Power Sweep



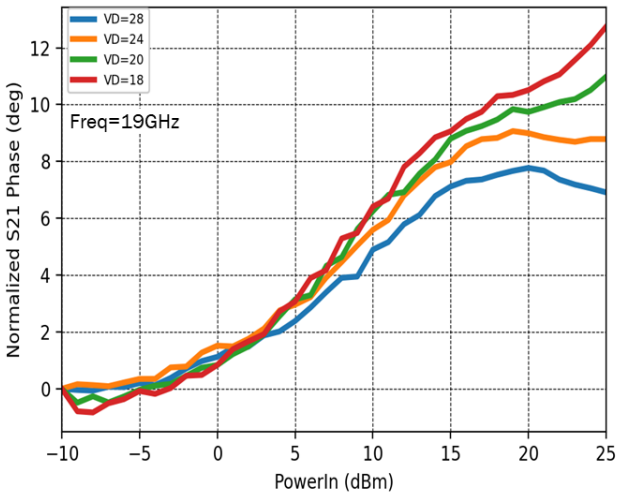
Power vs Supply Voltage



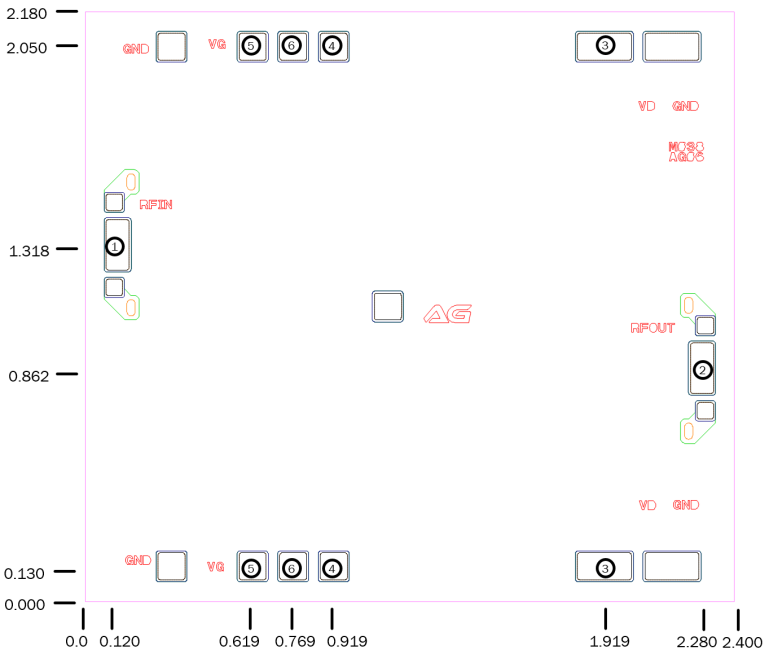
PAE vs Supply Voltage



AM TO PM



Outline Drawing (dimensions in mm)



Pad Descriptions

Pad	Function	Pad Size	Description
1	RFIN	100x200µm	AC coupled 50Ω Matched
2	RFOUT	100x200µm	AC coupled 50Ω Matched
3	VD	214x114µm	Drain Power Supply voltage, bypass capacitors needed*
4	VD2	114x114µm	No connect, Alternate Drain Power Supply voltage
5	VG	114x114µm	Gate Power Supply voltage, bypass capacitors needed*
6	VG2	114x114µm	No connect, Alternate Gate Power Supply voltage
Die Bottom	GND	Backside	Epoxy/Solder to Baseplate

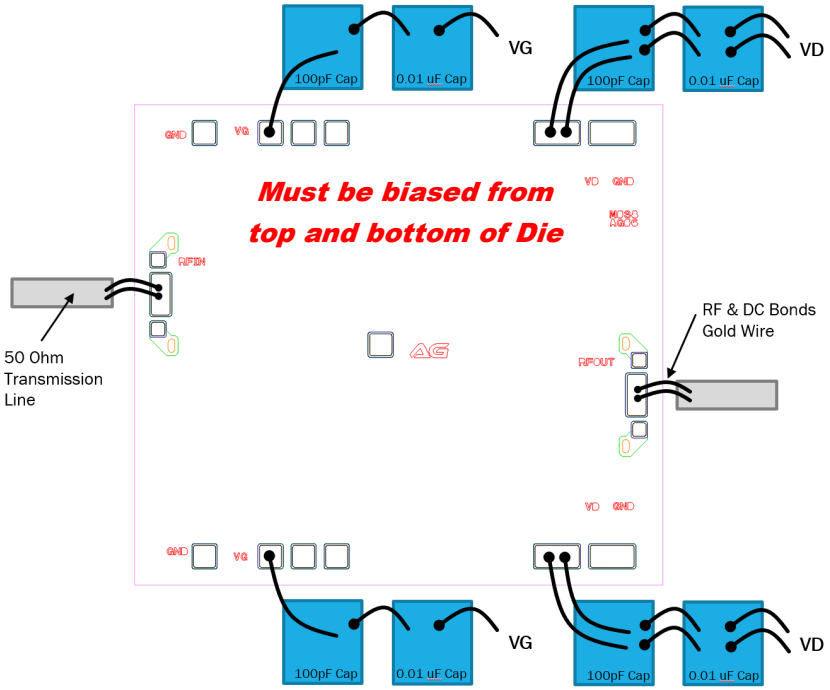
*See Assembly Diagram—Biasing is required on both sides of die

Absolute Maximum Ratings

Drain Bias Voltage (VDD)	+28V DC
RF Input Power (RFIN)	+36dBm*
Channel Temperature	200°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: 5µm gold
3. High thermal conductivity Silver Epoxy or AuSn Eutectic attach MMIC

Die Packaging Information

- GP-4 (Gel-Pak)

Biasing and Operation

The AGM-038 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:

<u>Turn ON procedure:</u>

1. Set VG to -3.0V.
2. Set VD to Vdq.
3. Adjust VG more positive until Id = Idq.
4. Apply RF signal.

<u>Turn OFF procedure:</u>

1. Turn off RF signal.
2. Reduce VG to -3.0V. Id should be 0mA.
3. Turn off VD.
4. Turn off VG.