

MGA-22003

2.3-2.7 GHz 3x3mm WiMAX and WiFi Power Amplifier



Preliminary Data Sheet

Description

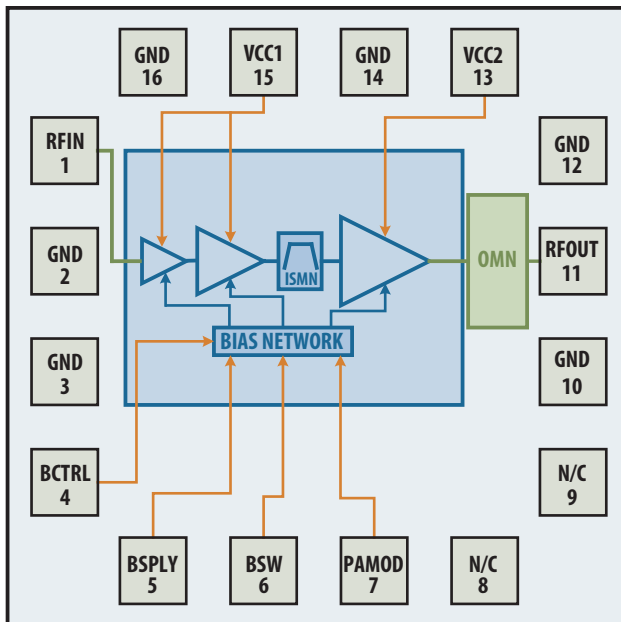
Avago Technologies MGA-22003 linear power amplifier is designed for mobile and fixed wireless data applications in the 2.3 to 2.7 GHz frequency range. The PA is optimized for IEEE 802.16 WiMAX modulation but can be used for any high linearity applications. The PA exhibits flat gain and good match while providing linear power efficiency to meet stringent mask conditions. It utilizes Avago Technologies proprietary GaAs Enhancement-mode pHEMT technology for superior performance across voltage and temperature levels.

The MGA-22003 is packaged in a 3x3x1 mm package for space-constrained applications.

Applications

- Portable WiMAX and WiFi applications
- WiMAX and WiFi Access points

Functional Block Diagram



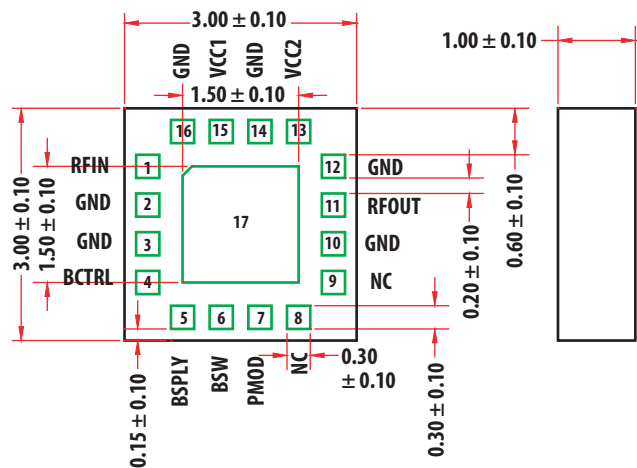
Features

- Advanced GaAs E-pHEMT
- 50 Ω all RF ports
- 8dB gain attenuation in low power mode with I_{dsq} reduction
- Integrated CMOS compatible pins for shutdown and low power mode
- 3 to 5V supply
- ESD protection all ports above 1000V HBM
- Small size: 3 x 3 x 1 mm
- Stable under all loads or conditions
- -40°C to +85°C operation

At 2.5GHz

- Gain of 35dB
- PAE of 21%
- Meets ETSI/802.16 masks at 25 dBm P_{out} , 16QAM WiMAX with 3.3V and 485mA
- 16QAM WiMAX EVM < -32dB (2.5%) at 25dBm
- Low power I_{dd}, 200mA, 27dB gain at 12dBm P_{out}
- Low Power I_{dsq} of 110mA

Package Diagram



TOP VIEW THROUGH PACKAGE

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WiMAX Electrical Specifications

All data measured on an FR4 demo board at $V_{cc1} = V_{cc2} = 3.3V$, $T_c = 25^{\circ}C$, 50Ω at all ports. Unless otherwise specified, all data is taken with OFDM 16-QAM $\frac{3}{4}$ convolutional coding modulated signal per IEEE 802.16e with 10MHz BW at 2.5GHz.

Parameter	Typical Performance	Minimum	Maximum	Unit
Input Return Loss	-10			dB
Pass-Band Gain	35	32	37	dB
Gain Flatness	1			dB
PAE	21			%
Gain Variation over VCC	1	-1	1	dB
Variation over Temp	1	-1.5	1.5	dB
EVM@2.5Ghz	-32		-28	dB
Pout (High Power mode)	+25			dBm
Current	485		510	mA
EVM@2.5Ghz	-36			dB
Pout (Low Power mode)	+5			dBm
Current	120			mA
PA NF	2.9			dB
SEM@11MHz	-26			dBm
P1dB	31			dBm
Psat	32			dBm
2Fo	-12		-10	dBm/Mhz
3Fo	-45		-35	dBm/Mhz
Settling Time	.2		.5	uS
Icc leakage current	10		15	uA
Idq LP mode	80		125	mA

Selected performance plots

3.3V Data

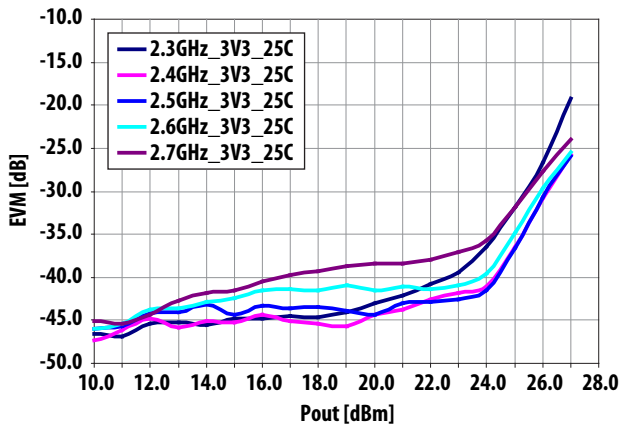


Figure 3. EVM vs. Pout at 3.3V

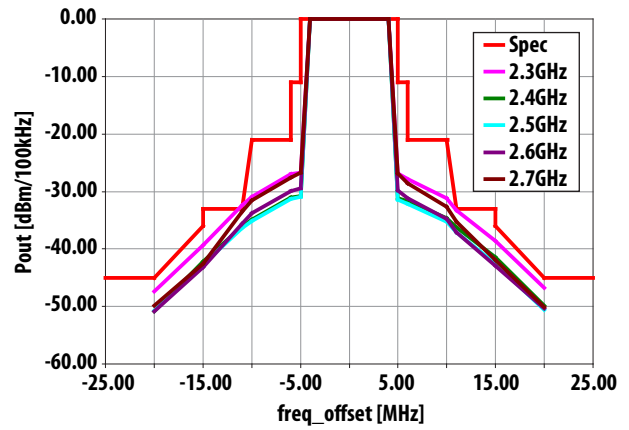


Figure 4. WiMAX SEM at 25dBm Pout and 3.3V

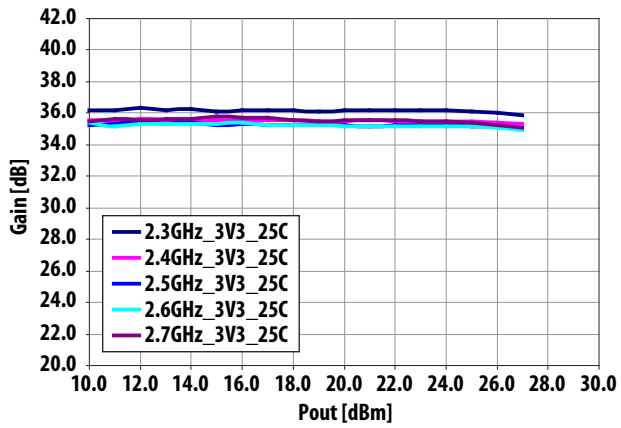


Figure 5. Gain vs. Pout at 3.3V

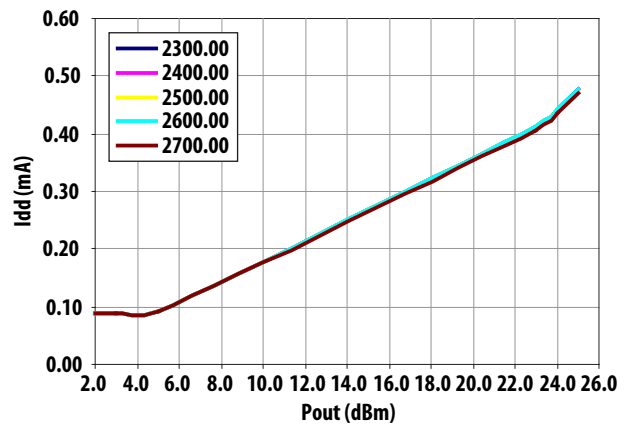


Figure 6. Idd vs. Pout at 3.3V

5V Data

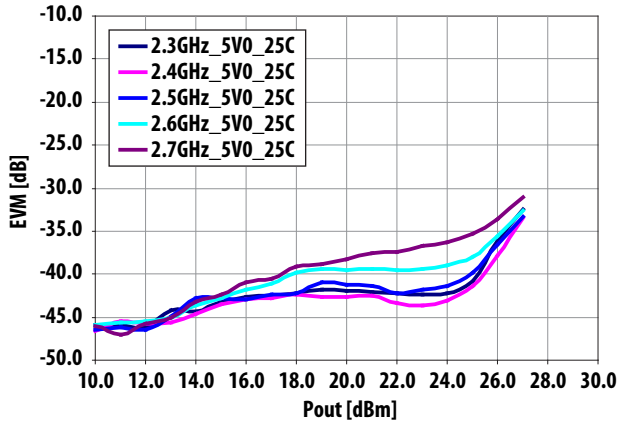


Figure 7. EVM vs Pout at 5V

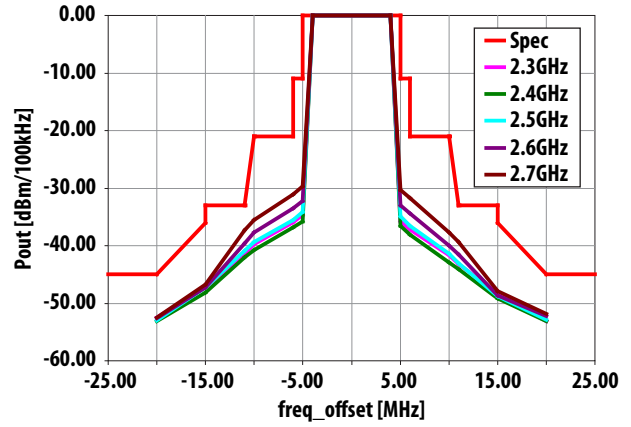


Figure 8. WiMAX SEM at 25dBm Pout and 5V

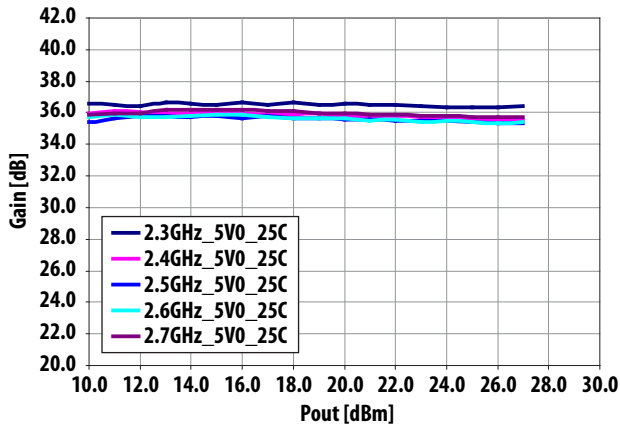


Figure 9. Gain vs Pout at 5V

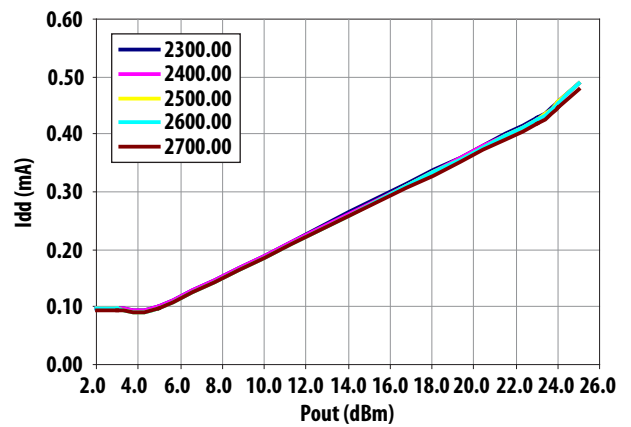


Figure 10. Idd vs Pout at 5V

Evaluation Board Description

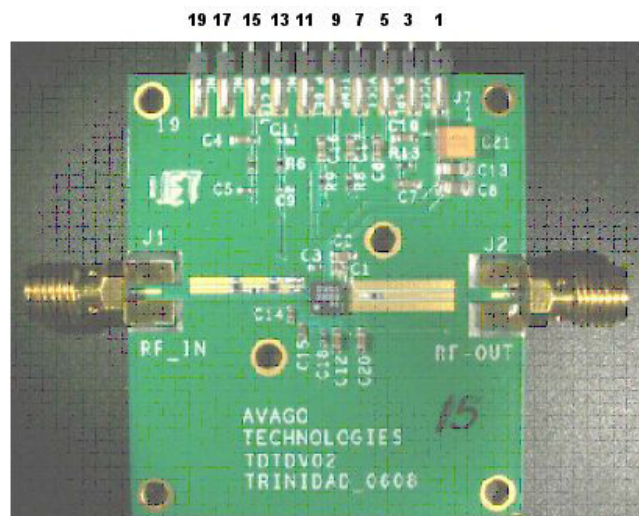
Pin Description:

Top Pin No.	Function	Bottom Pin No.	Function
1	VCC2	2	VCC2_S
3	B_SPLY	4	GND
5	VCC1	6	GND
7	NC	8	GND
9	PAMOD	10	GND
11	NC	12	GND
13	NC	14	B_SW
15	B_CTRL	16	GND
17	NC	18	GND
19	NC	20	GND

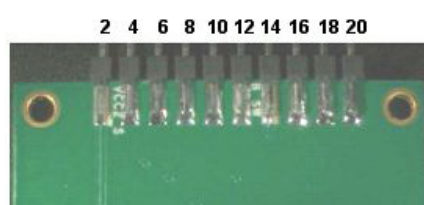
Recommended turn on sequence

- Apply VCC1 and VCC2 3.3V
- Apply BSPLY 3.3V
- Apply BCTRL 2.8V
- Apply BSW 1.8V
- For HPM Apply PAMOD 1.8V for LPM Apply PAMOD 0V
- Apply RF In not to exceed 10dBm

Demoboard Top Pins:



Demoboard Bottom Pins:

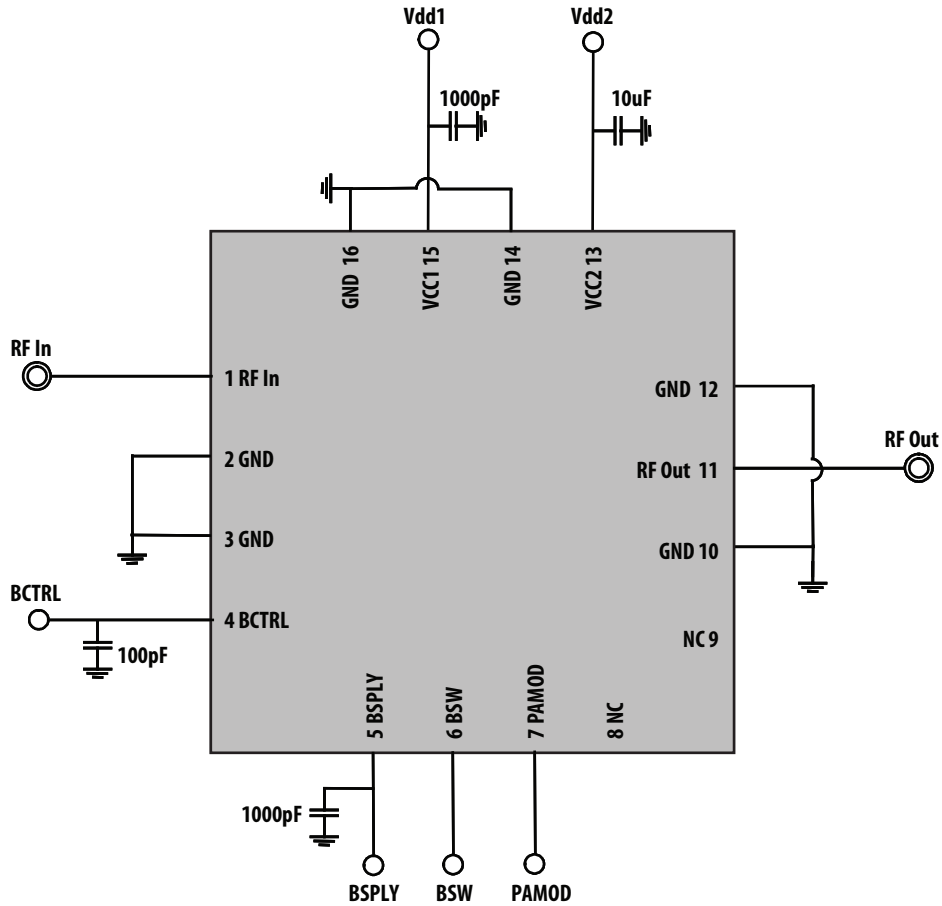


Typical Test Conditions:

	HPM	LPM	
VCC1,2	3.3V	3.3V	Supply Voltage
PAMOD	1.8V	0V	Low Power Mode
B_SPLY	3.3V	3.3V	Bias Voltage
B_CTRL	2.8V	2.8V	Bias Control
B_SW	1.8V	1.8V	PA Enable

Note2: VCC1, VCC2 and B_SPLY can be tied together to reduce supply voltages, but B_CTRL needs to be a regulated voltage which is optimized for 2.8V.

Application Circuit MGA-22003



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