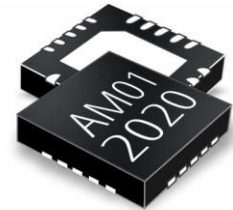


DESCRIPTION

AMCOM's AM012020WM-QN5-R is a broadband low noise power amplifier. It has 2dB Noise Figure, 30dB gain, and 17dBm output P1dB over a broadband of 0.1 to 2GHz. This MMIC is in a QFN (5x5 mm) package with coplanar RF, ground, and DC connection at the bottom level of the package for low-cost SMT assembly. It is necessary to mount the MMIC ground directly on multiple vias to get good RF ground and to dissipate the heat. This MMIC is RoHS compliant.



FEATURES

- Wide bandwidth 0.1 to 2GHz
- Low noise performance
- 20dBm of saturated output power
- High gain, 30dB
- Fully matched; 50-ohm input/output impedance

APPLICATIONS

- Instrumentation
- Cellular Bands
- Two-way radio
- Broadband Receivers

PERFORMANCE* ($V_{dd1\&2}=8V$, $I_{dd1\&2} = 30mA, 50mA$, $V_{gs1\&2}^{**} = -1.3V, -1.15V$ $T_a = 25^{\circ}C$)

Parameters	Minimum	Typical	Maximum
Frequency	0.2 – 1.8GHz	0.1 – 2.0GHz	
Gain (Small signal)	28dB	30dB	
Gain Ripple		$\pm 1.0dB$	$\pm 3.0dB$
P_{1dB}	15.0dBm	16.0dBm	
P_{sat}		17.0dBm	
Noise Figure @Pin=-20dBm		2.0dB	3.0dB
Input Return Loss	-10dB	-15dB	
Output Return Loss	-8dB	-10dB	
Thermal Resistance		4.9°C/W	

* Specifications subject to change without notice

** Gate bias is for reference only and may vary from lot to lot

ABSOLUTE MAXIMUM RATING

Parameters	Symbol	Rating
Drain source voltage	V_{ds}	15V
Gate source voltage	V_{gs}	-5V or +0.5V
Drain source current	I_{ds}	0.2A
Continuous dissipation at room temperature	P_t	3W
Channel temperature	T_{ch}	175°C
Operating temperature	T_{op}	-55°C to +100°C
Storage temperature	T_{sto}	-55°C to +135°C

SMALL SIGNAL DATA

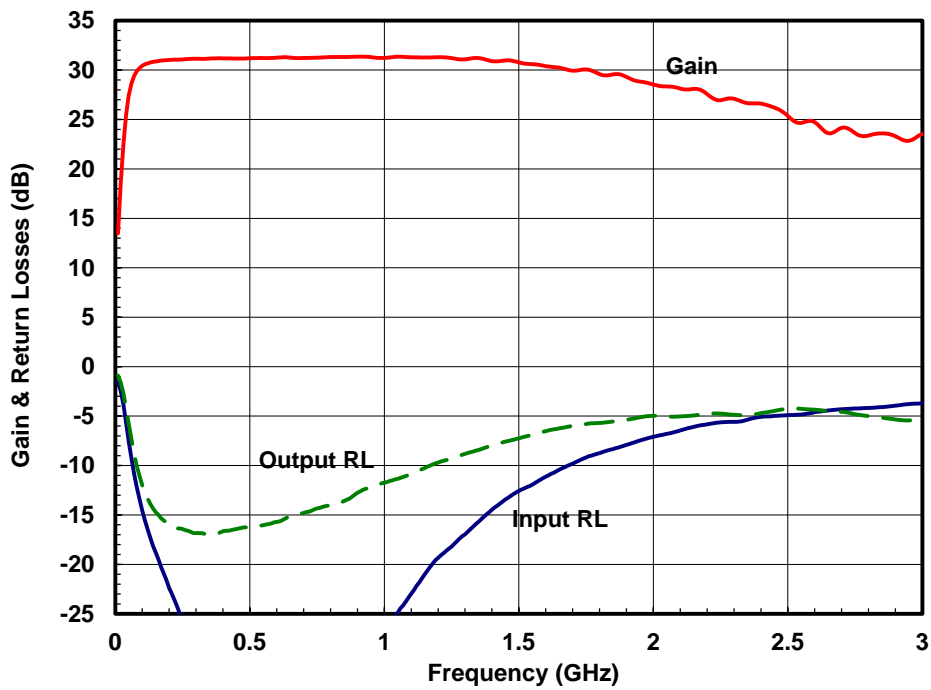


Figure 1: Gain & Return Losses vs. Frequency

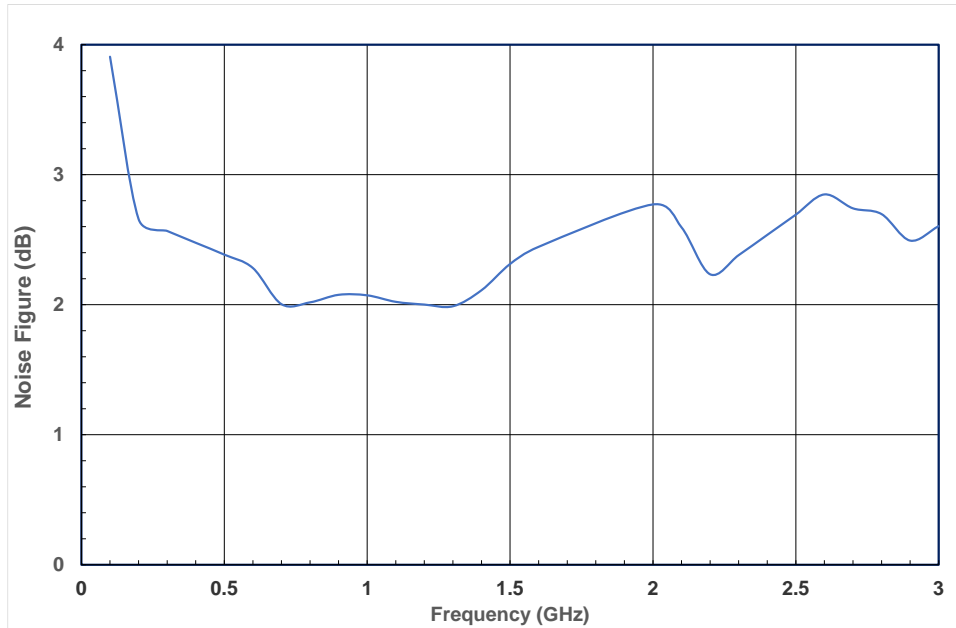


Figure 2: Noise Figure vs. Frequency

POWER DATA

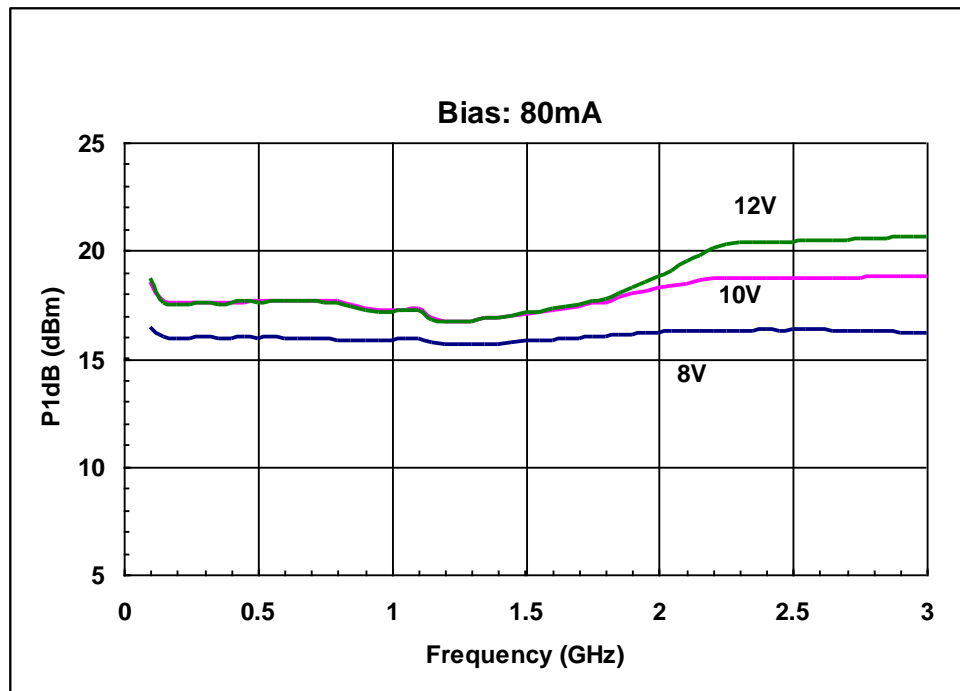


Figure 3: P1dB vs. Frequency at different drain voltages

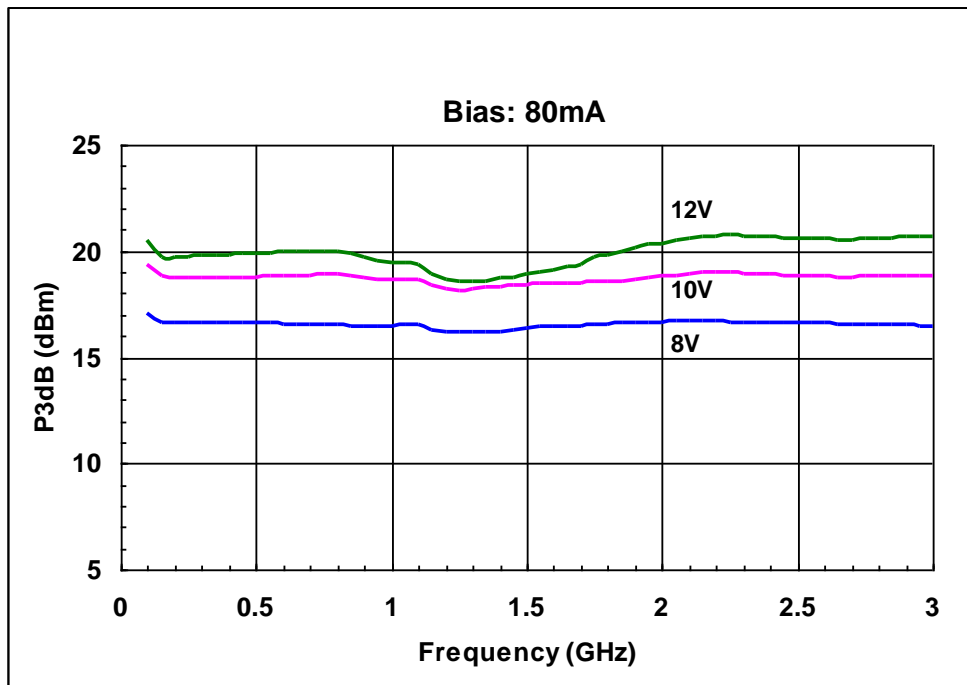


Figure 4: P3dB vs. Frequency at different drain voltages

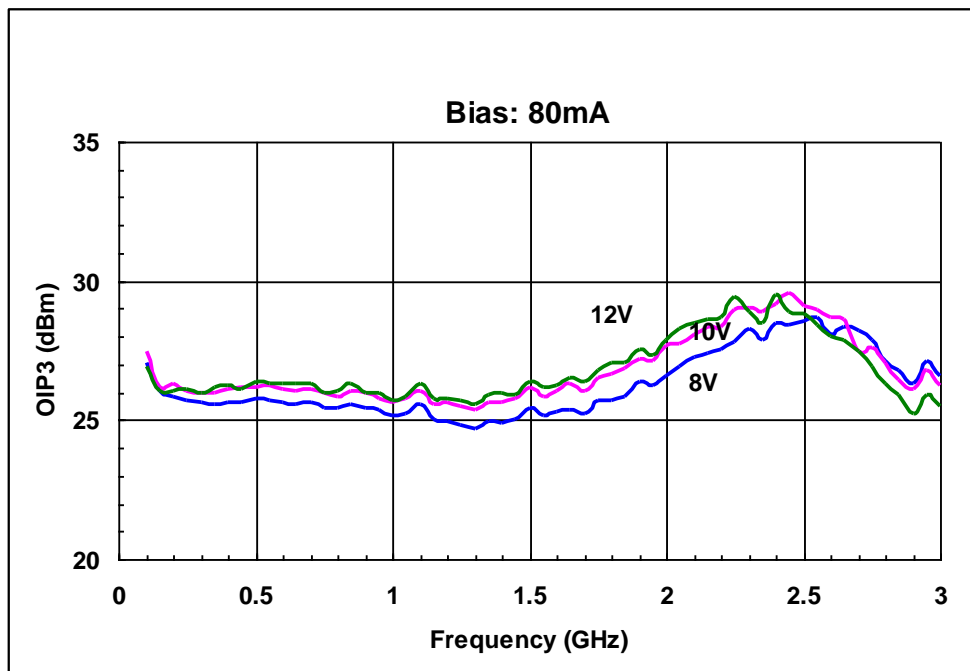
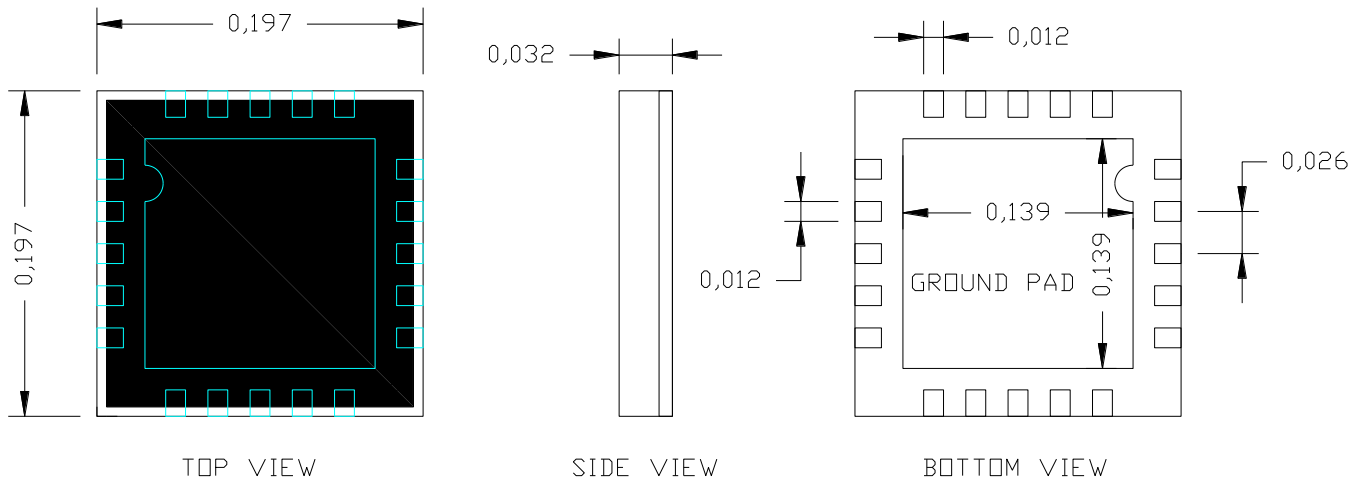


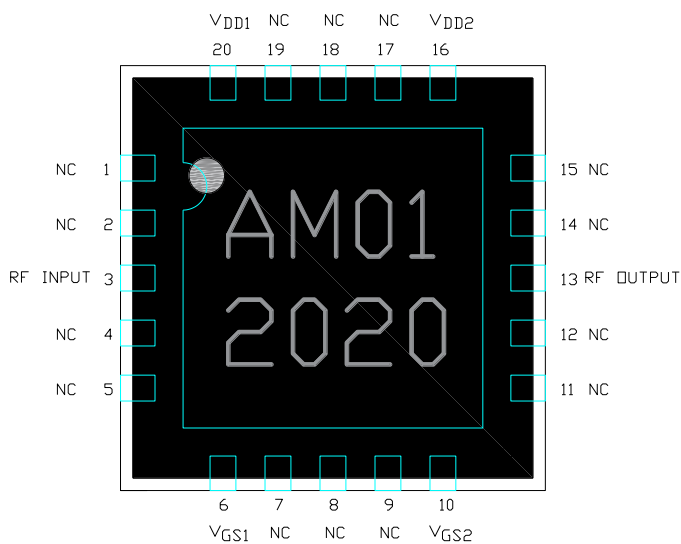
Figure 5: Output IP3 vs. Frequency at different drain voltages

PACKAGE OUTLINE (QFN 5x5mm)



*Dimensions in inch

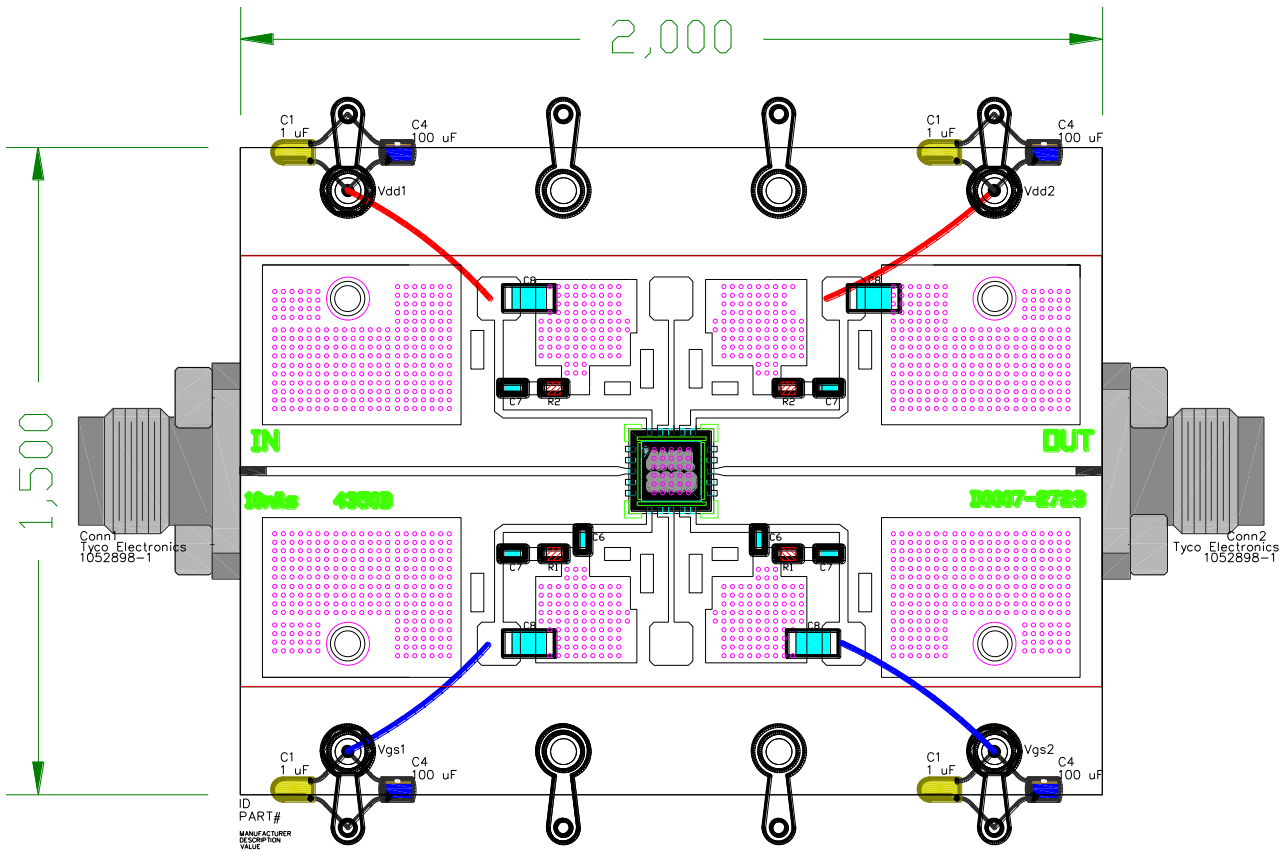
PIN LAYOUT



Pin No.	Function	Bias*
1 & 2	NC	+8V
2	RF Input	
4 & 5	NC	
6	Vgs1	-1.3V
7	NC	
8	NC	
9	NC	
10	Vgs2	-1.15V
11 & 12	NC	
13	RF Output	
14 & 15	NC	
16	Vdd2	+8V
17	NC	
18	NC	
19	NC	
20	Vdd1	+8V

* V_{gs1}, V_{gs2} may vary from lot to lot

TEST CIRCUIT OUTLINE



- Notes:
- 1- 10mils Rogers 4350B Material epoxied
 - 2- Ckt is for matched MMICs
 - 3- C6=20pf, C7=1000pF, C8=10uF
R1=50 Ohms, R2=10 Ohms
 - 4- All Caps & Resistors are 0603 size except for C8: 1206 size
 - 5- Unused bias lines should be cut to avoid ripples and resonance
 - 6- Test Block is D0007-2004

*Dimensions in inch

Important Notes:

- 1- Recommended current biases are 30mA and 50mA for the first stage and second stage, respectively. At V_{dd1} & $V_{dd2} = +8V$, V_{gs1} & V_{gs2} values are -1.3V and -1.15V respectively to obtain these desired currents. V_{gs1} & V_{gs2} could be adjusted to vary the currents going thru the first stage (V_{dd1} pin) and the second stage (V_{dd2} pin) respectively. Gate biases are for reference only.
- 2- Do not apply V_{dd1} & V_{dd2} without proper negative voltages on V_{gs1} & V_{gs2} .