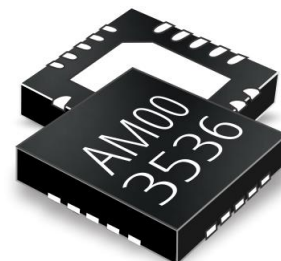


DESCRIPTION

AMCOM's AM003536WM-QN5-R is an ultra-broadband GaAs MMIC power amplifier. It has 22 dB gain and 36dBm output power over the 0.01 to 3.5 GHz band. 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. Given the relatively high DC power dissipation, it is necessary to mount the MMIC ground directly on multiple vias to dissipate the heat and for good RF ground. This MMIC is RoHS compliant.



FEATURES

- Wide bandwidth from 10MHz to 3.5 GHz
- High output power, P1dB = 36dBm
- High gain, 22dB
- Input /Output matched to 50 Ohms

APPLICATIONS

- Software Radio
- Instrumentation
- Gain block

TYPICAL PERFORMANCE * (Bias Conditions**: $V_{dd} = +20V$, $I_{dq1} = 125mA$, $I_{dq2} = 550mA$)

Parameters	Minimum	Typical **	Maximum
Frequency	0.02 – 2.5GHz	0.01 – 3.5GHz	-
Small Signal Gain	19 dB	22 dB	26 dB
Gain Ripple	-	± 1.5 dB	± 3.0 dB
P1dB @ 1 GHz	32.0 dBm	34.0 dBm	-
Psat	34.0 dBm	36.0 dBm	-
Efficiency @ P1dB	-	25 %	
IP3 @ 1GHz	-	45 dBm	
Input Return Loss	15 dB	20dB	
Output Return Loss	7 dB	10dB	
Thermal Resistance		4.5 °C/W	

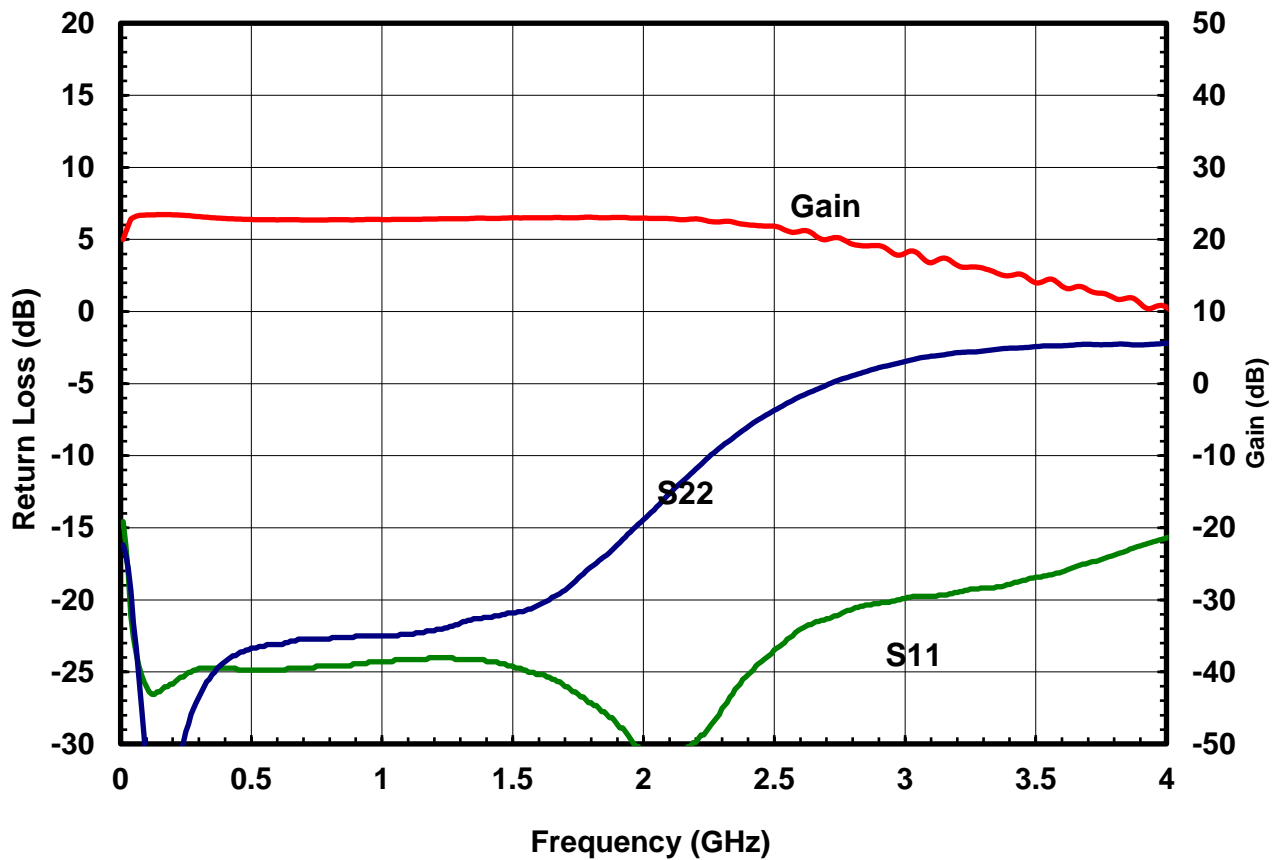
* Specifications subject to change without notice.

** Gate biases corresponding to above currents are $V_{gs1} = -1.2V$, $I_{gs1} < 2mA$, $V_{gs2} = -0.8V$, $I_{gs2} < 5mA$ and may vary from lot to lot. Gate currents could reach above limits only near power saturation

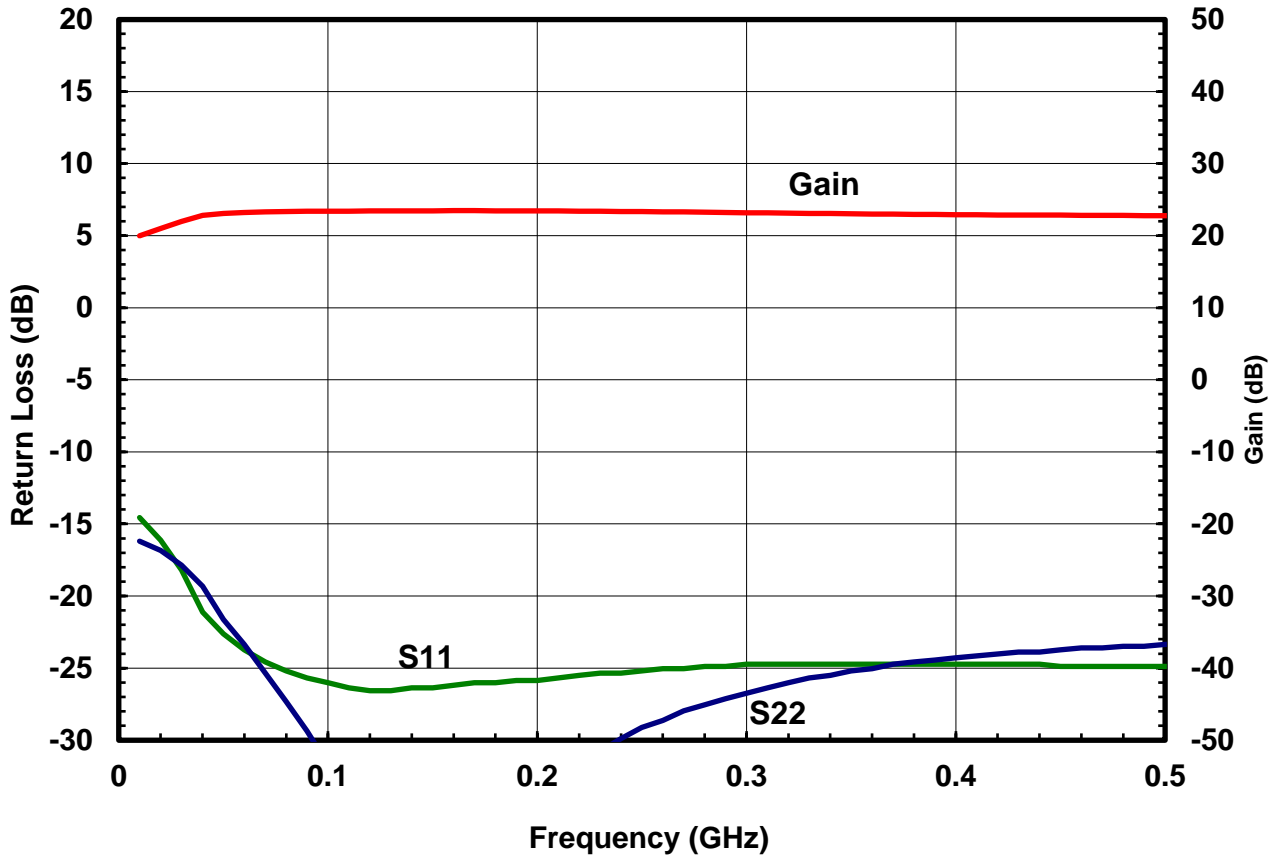
ABSOLUTE MAXIMUM RATING

Parameter	Symbol	Rating
Drain source voltage	V_{dd}	24 V
Gate source voltage	V_{gs1} & V_{gs2}	-3 V
Drain source current	I_{dq1}	150 mA
Drain source current	I_{dq2}	600 mA
Continuous dissipation at 25°C	P_t	18 W
Channel temperature	T_{ch}	175 °C
Operating temperature	T_{op}	-55°C to +85°C
Storage temperature	T_{sto}	-55°C to +135°C
Input power	P_{in}	18dBm

SMALL SIGNAL DATA*

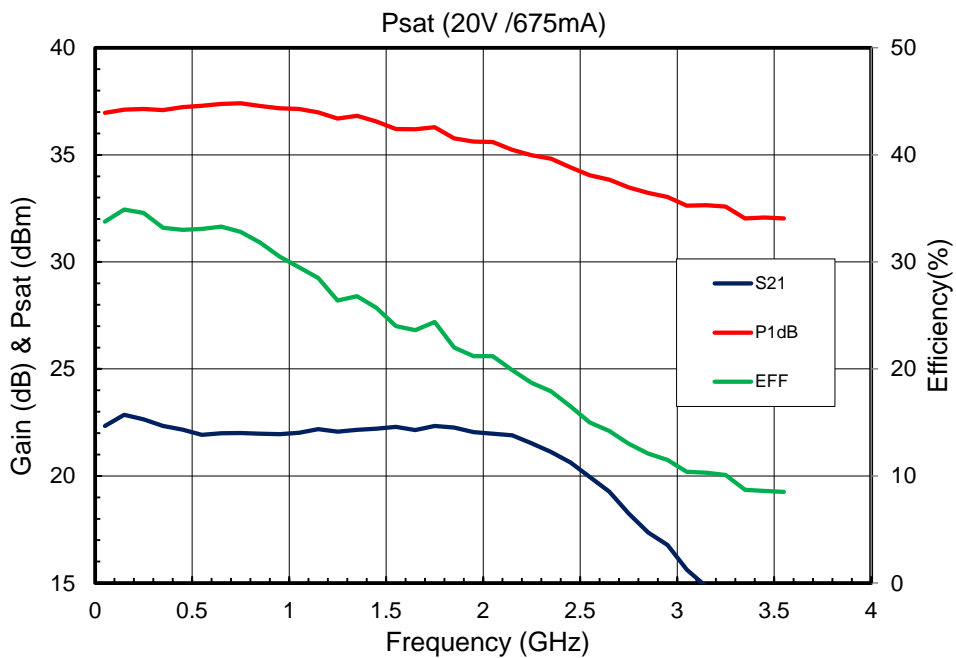
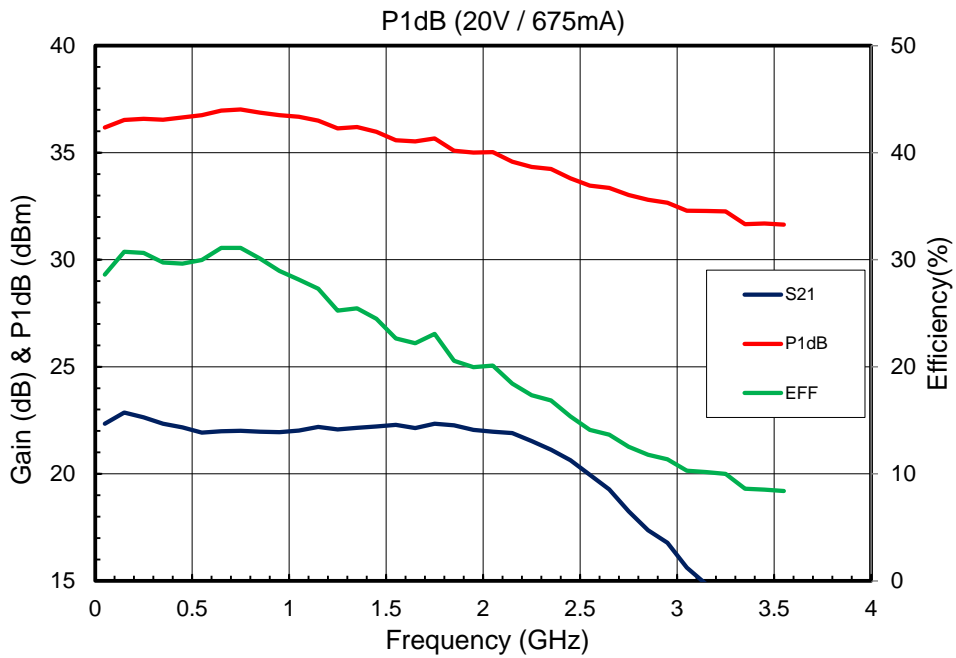


EXTENDED LOW FREQUENCY SCALE



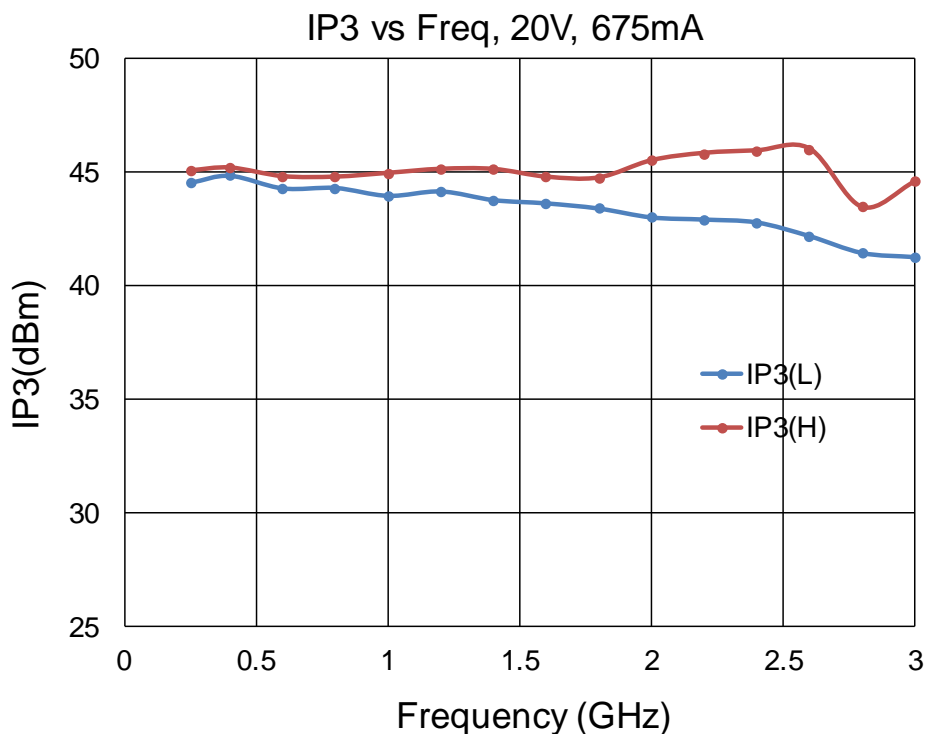
* S-Parameters measured using bias tee at the output. MMIC could be operated at lower than $V_{dd}=+20V$ with almost same small signal parameters. V_{gs1} & V_{gs2} vary with V_{dd} and may need slight adjustments

POWER DATA*

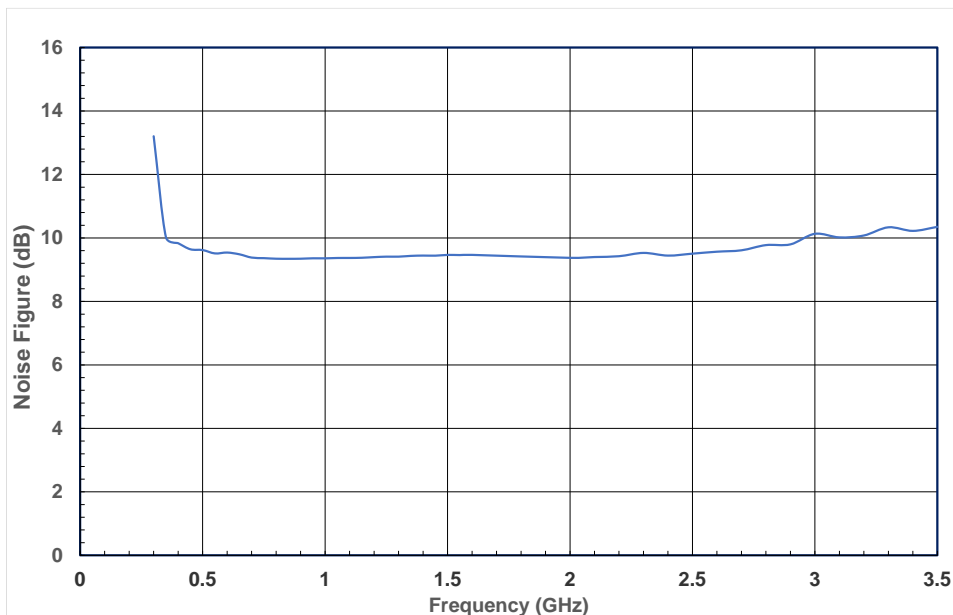


* Power measured using bias tee at the output. MMIC could be operated at lower than $V_{dd}=+20V$ with reduced power output. V_{gs1} & V_{gs2} vary with V_{dd} and may need slight adjustments

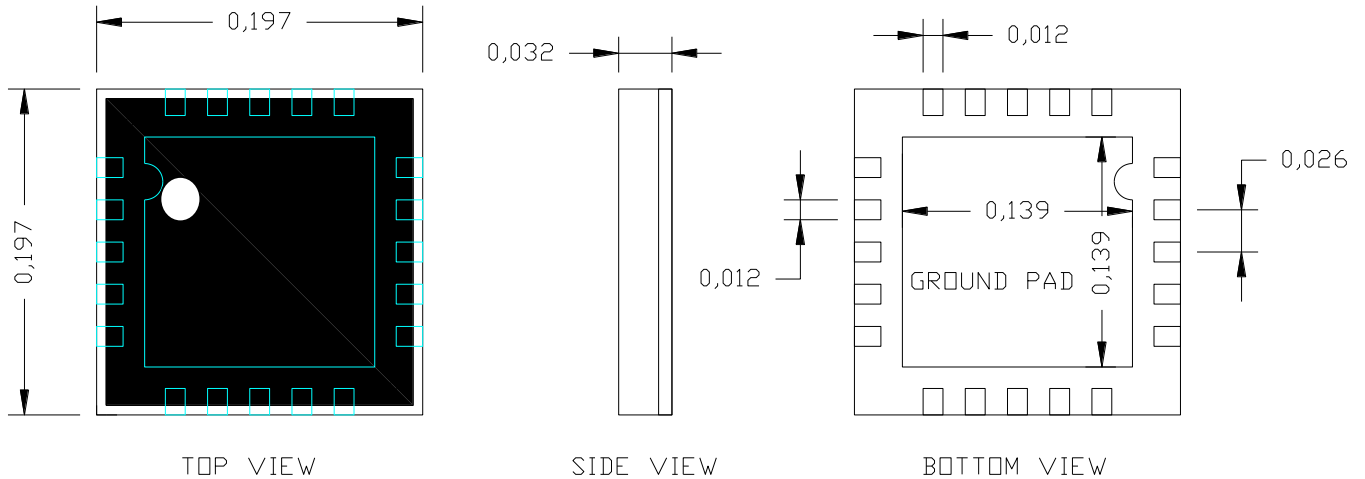
THIRD ORDER INTERCEPT



NOISE FIGURE

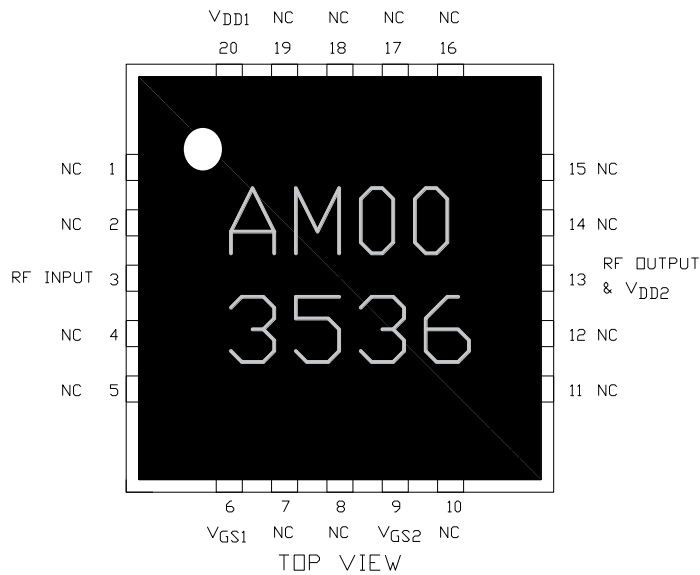


PACKAGE OUTLINE (QFN 5x5mm)



*Dimensions in inch

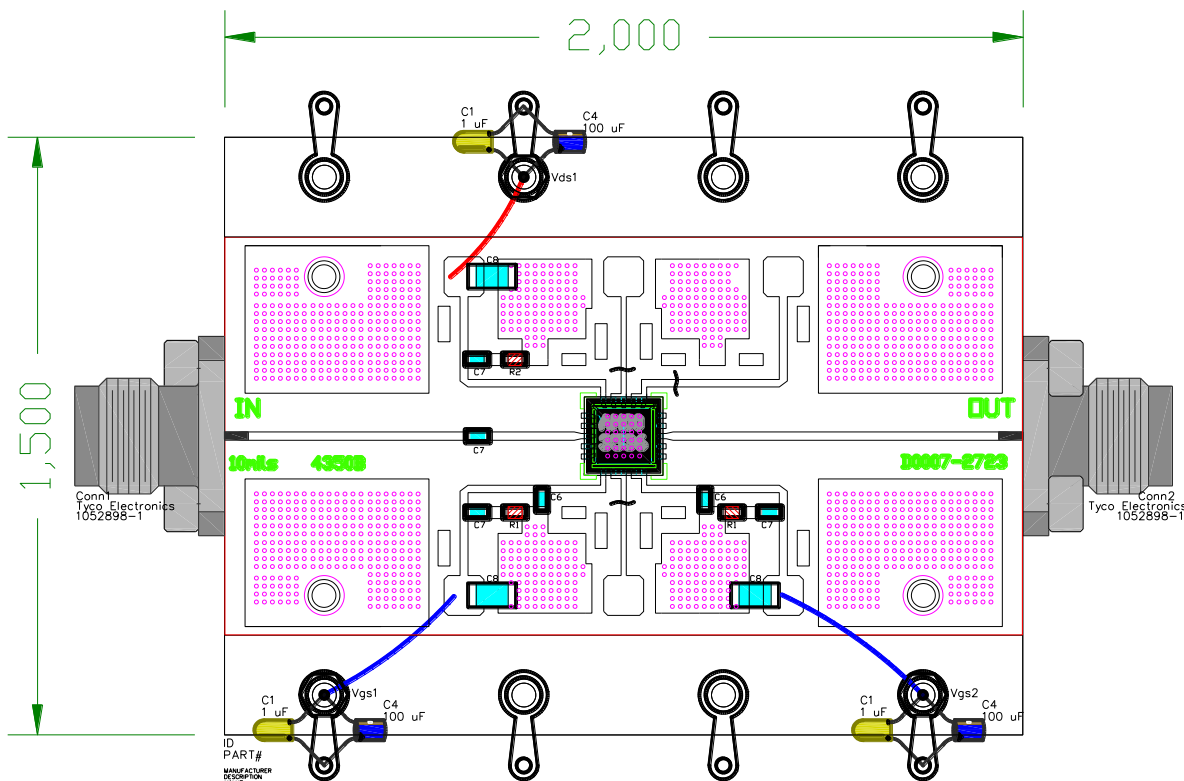
PIN LAYOUT



Pin No.	Function	Bias*
1 & 2	NC	
3	RF input	
4 & 5	NC	
6	Vgs1	-1.2V
7 & 8	NC	
9	Vgs2	-0.59V
10, 11 & 12	NC	
13	RF out & Vdd2	+20V
14 thru 19	NC	
20	Vdd1	+20V

* Gate biases are for reference only and may vary from lot to lot

TEST CIRCUIT for BM Package



- 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- Bias tee should be used at output.
 - 6- Unused bias lines should be cut to avoid ripples and resonance
 - 7- Test Block is D0007-2004

*Dimensions in inch

Important Notes:

- 1- The +20V Bias to the output port could be provided via a bias tee or suitable chokes to be soldered on the board. Inductance of choke should be large enough to have high impedance at lowest frequency of operation (300nH is adequate).
- 2- Recommended current biases are 125mA and 500mA for the first stage and second stage, respectively. At V_{dd1} & $V_{dd2} = +20V$, V_{gs1} & V_{gs2} values are -1.2V and -0.80V 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.
- 3- Do not apply V_{dd1} & V_{dd2} without proper negative voltages on V_{gs1} & V_{gs2} .
- 4- The currents flowing out of the V_{gs1} & V_{gs2} pins are less than 2mA & 5mA respectively at P_{1dB} .
- 5- DC blocking capacitors must be used at input and output.