

## DESCRIPTION

AMCOM's AM012020WM-BM/EM/FM-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 ceramic package with both RF and DC leads at the lower level of the package to facilitate low-cost SMT assembly to the PC board. Because of high DC power dissipation, we strongly recommend to mount these devices directly on a metal heat sink. When mounting directly on PCB, please use Application Note AN700 for proper mounting procedures. The AM012020WM-FM-R is the AM012020WM-BM-R mounted on a gold plated copper flange carrier. The EM package has the same footprint as the FM package with straight leads and a Copper/Tungsten flange instead of the Copper flange. There are two screw holes on the flange to facilitate screwing on to a metal heat sink. 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
- C-Band VSAT

## PERFORMANCE\* ( $V_{d1\&2}=8V$ , $I_{d1\&2} = 30mA, 50mA$ , $V_{g1\&2}^{**} = -1.3, -1.15 V$ $T_a = 25^{\circ}C$ )

Parameters	Minimum	Typical	Maximum
Frequency	0.2 – 1.8GHz	0.1 – 2.0GHz	
Gain (Small signal)	28dB	30dB	
Gain Ripple		± 1.0dB	± 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	

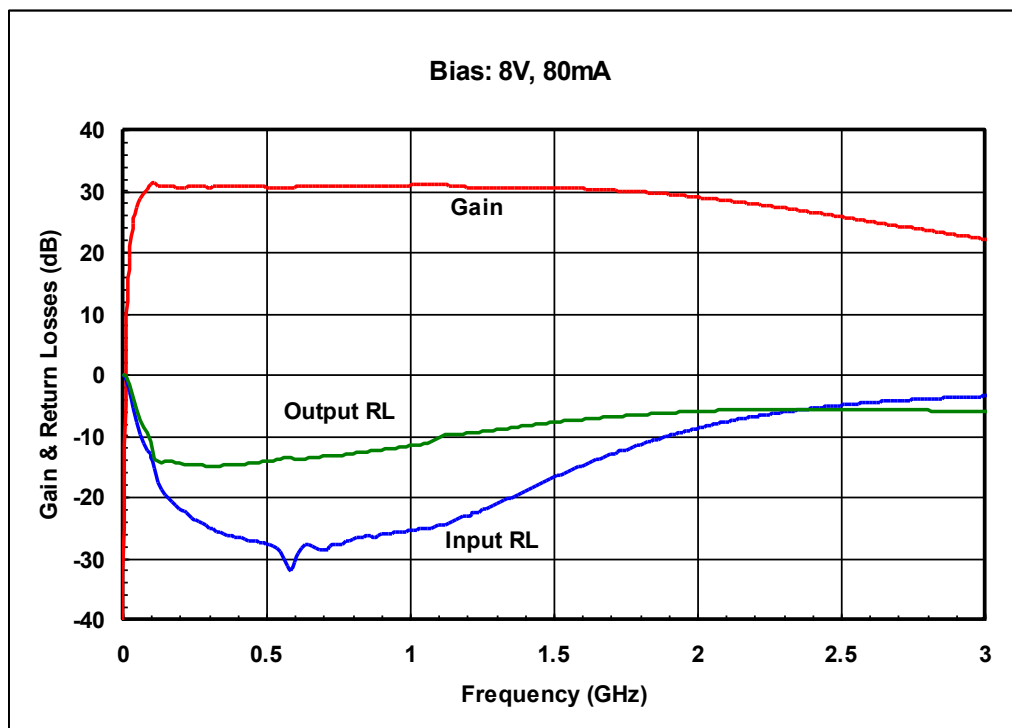
\* Specifications subject to change without notice

\*\* 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

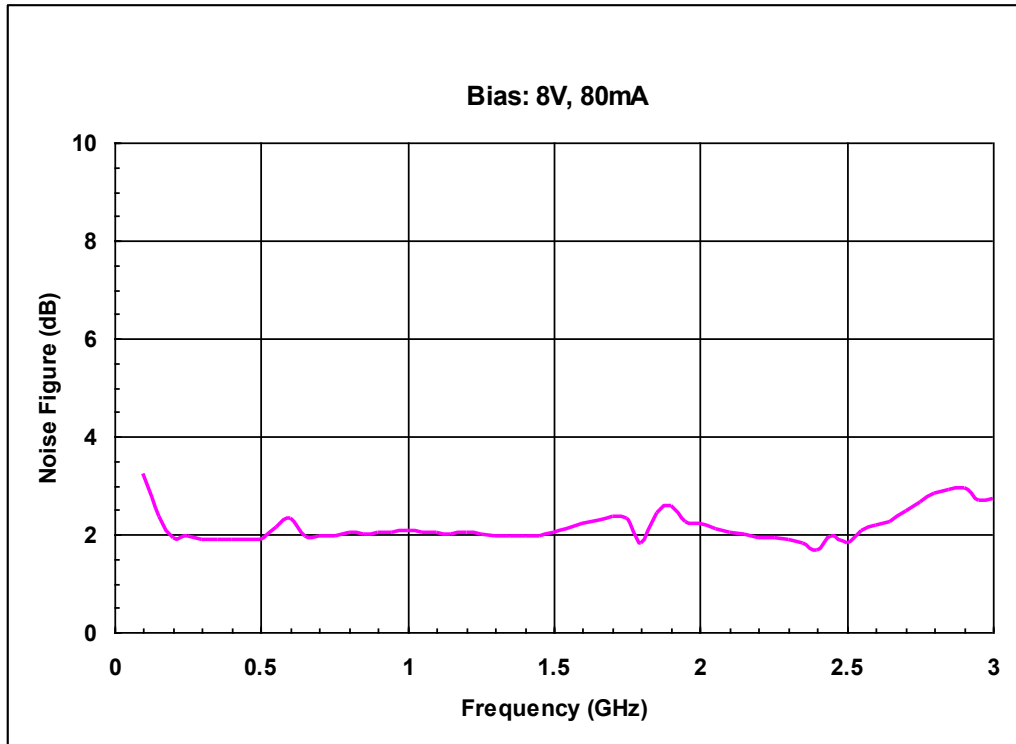


Figure 2: Noise Figure vs. Frequency

POWER DATA

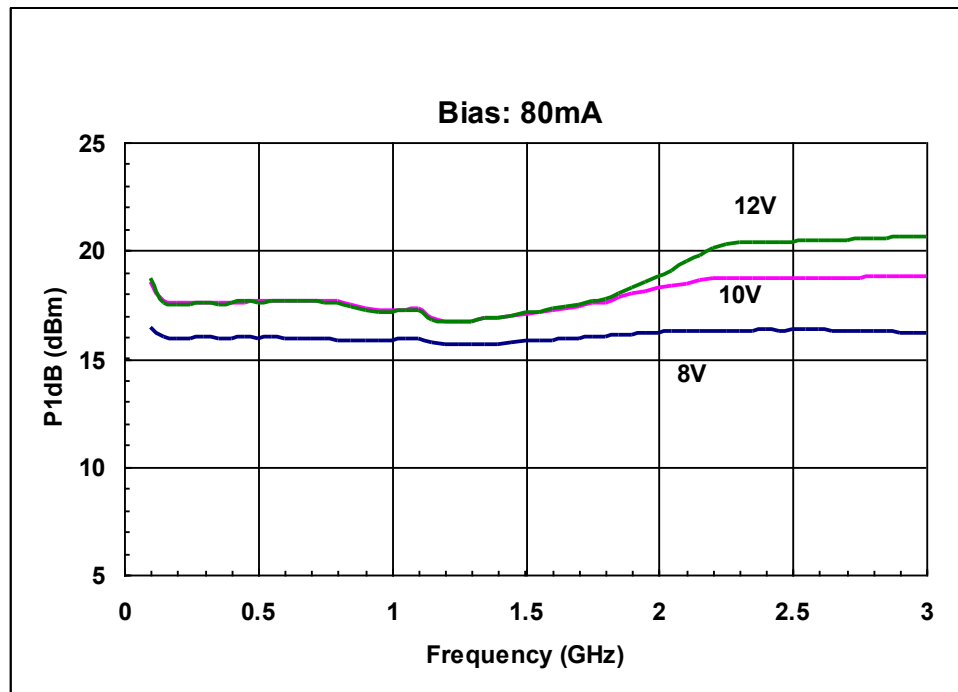


Figure 3: P1dB vs. Frequency at different drain voltages

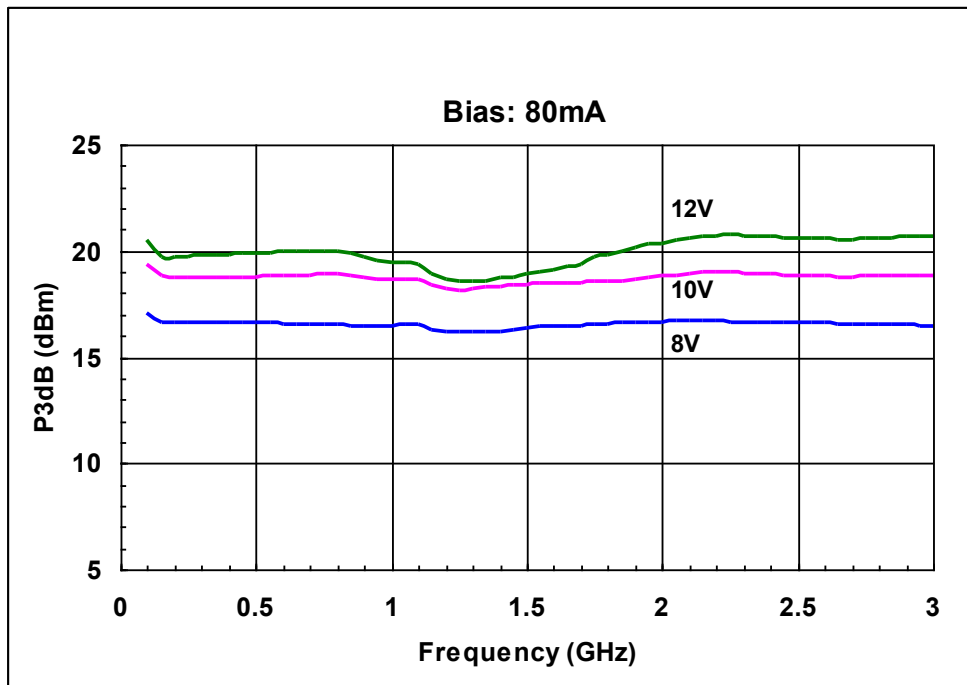


Figure 4: P3dB vs. Frequency at different drain voltages

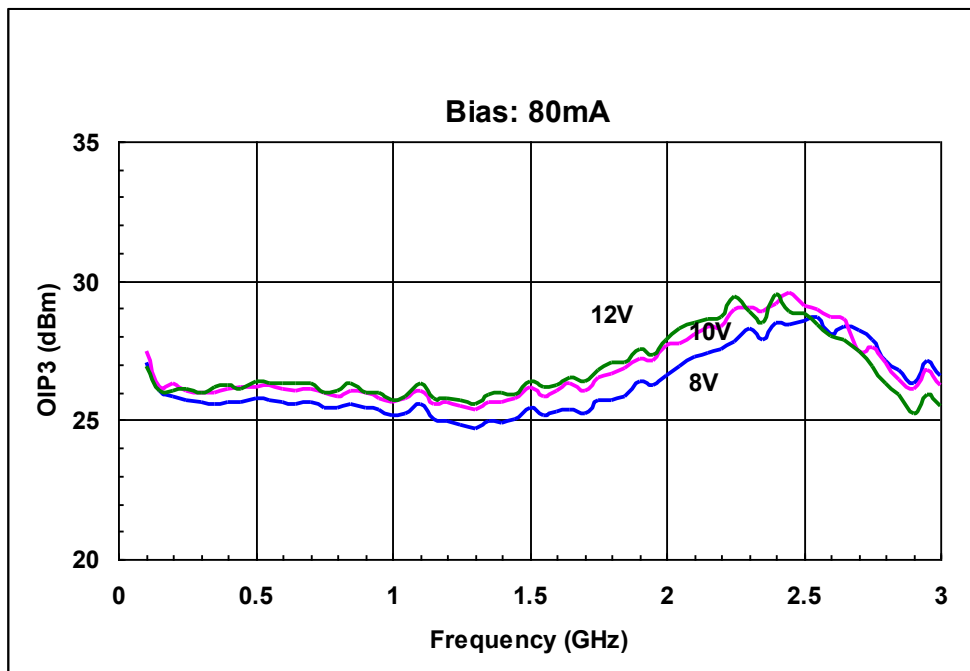
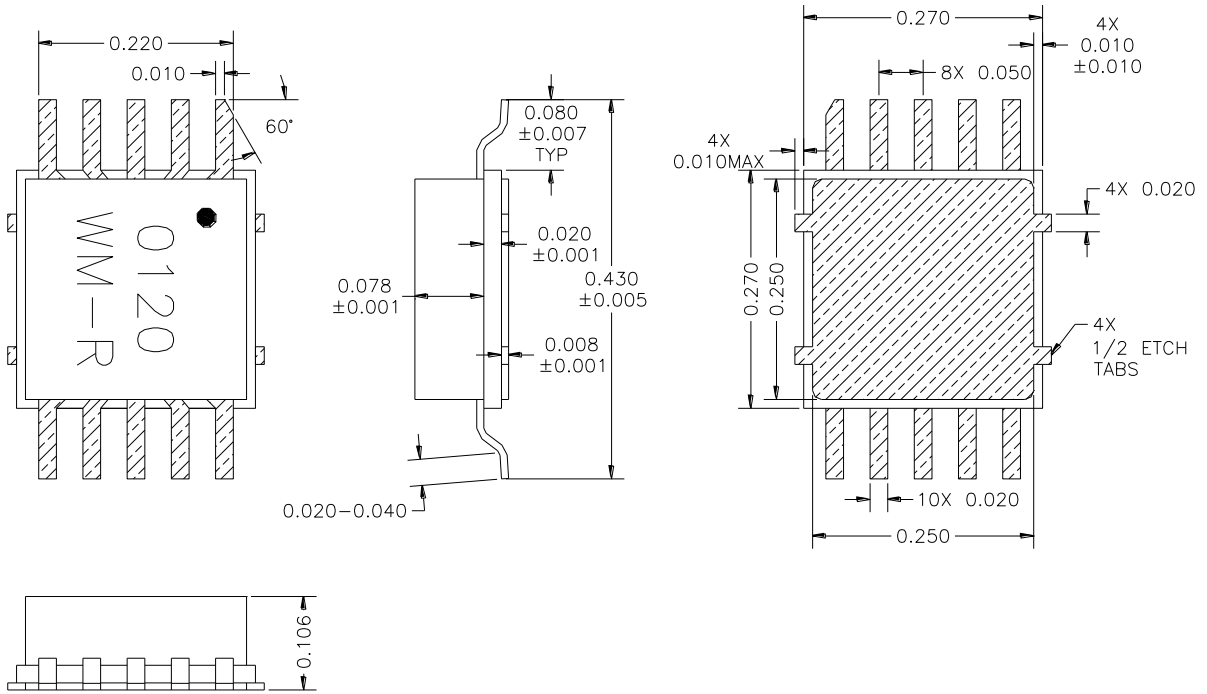
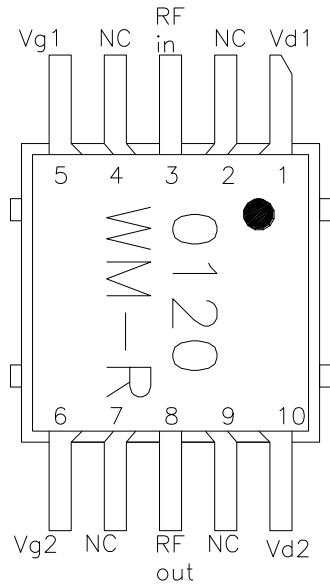


Figure 5: Output IP3 vs. Frequency at different drain voltages

PACKAGE OUTLINE (BM)



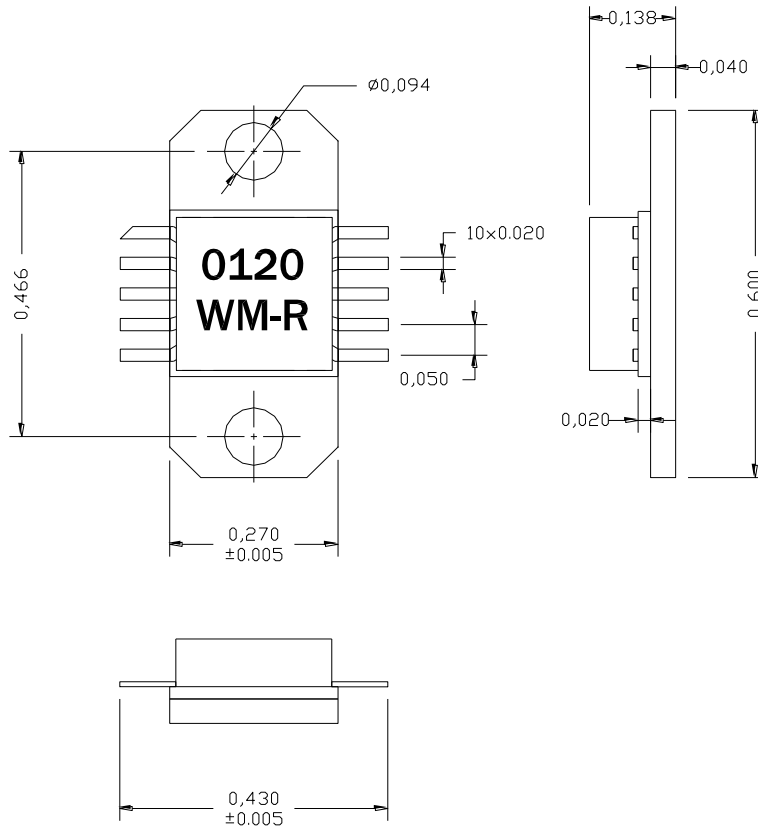
PIN LAYOUT



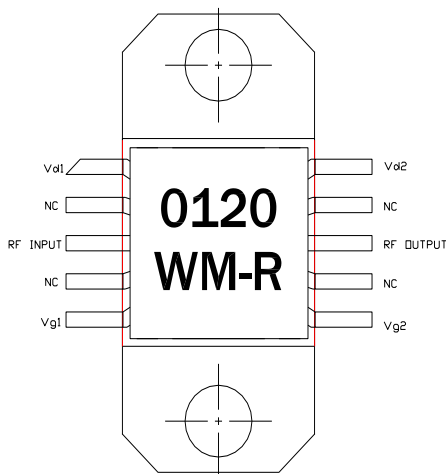
Pin No.	Function	Bias*
1	Vd1	+8V
2	NC	
3	RF In	
4	NC	
5	Vg1	-1.3V
6	Vg2	-1.15V
7	NC	
8	RF Out	
9	NC	
10	Vd2	+8V

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

PACKAGE OUTLINE (EM)\*



PIN LAYOUT

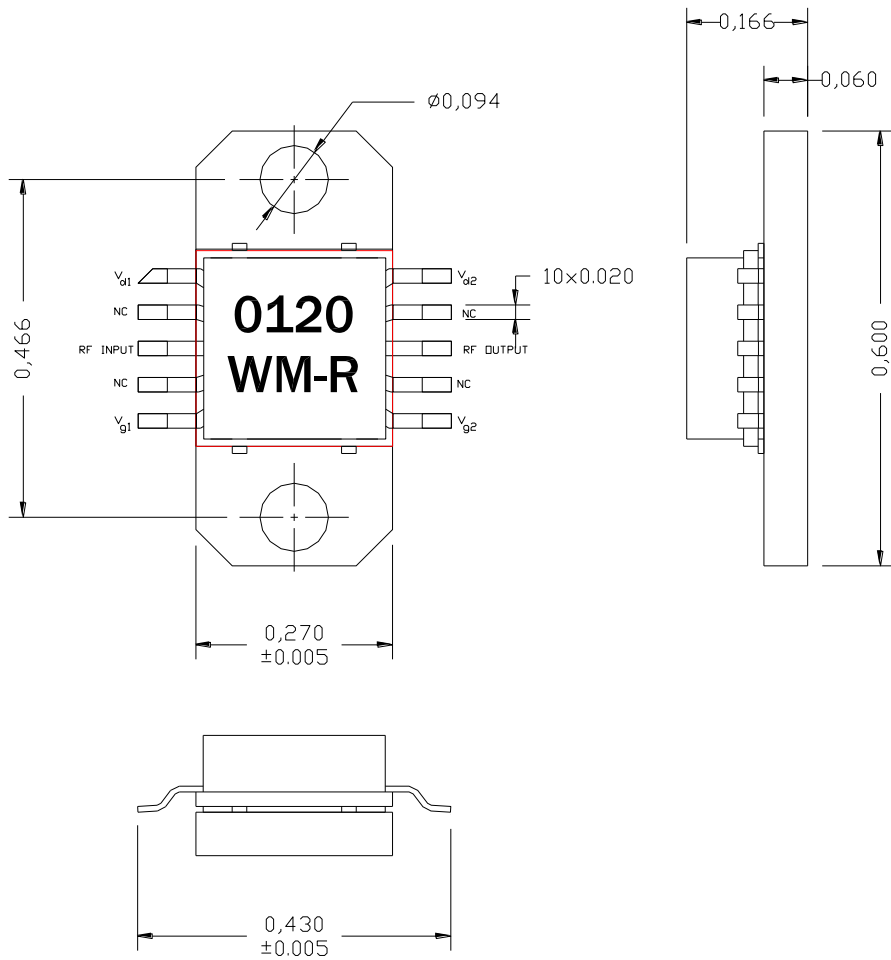


Pin No.	Function	Bias**
1	Vd1	+8V
2	NC	
3	RF In	
4	NC	
5	Vg1	-1.3V
6	Vg2	-1.15V
7	NC	
8	RF Out	
9	NC	
10	Vd2	+8V

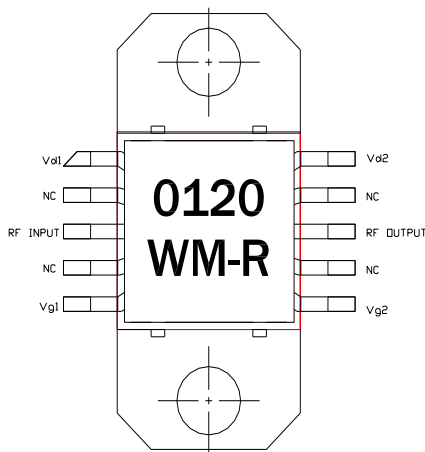
\* EM version flange is made of CuW

\*\*  $V_{GS1}$ ,  $V_{GS2}$  may vary from lot to lot

PACKAGE OUTLINE (FM)\*



PIN LAYOUT

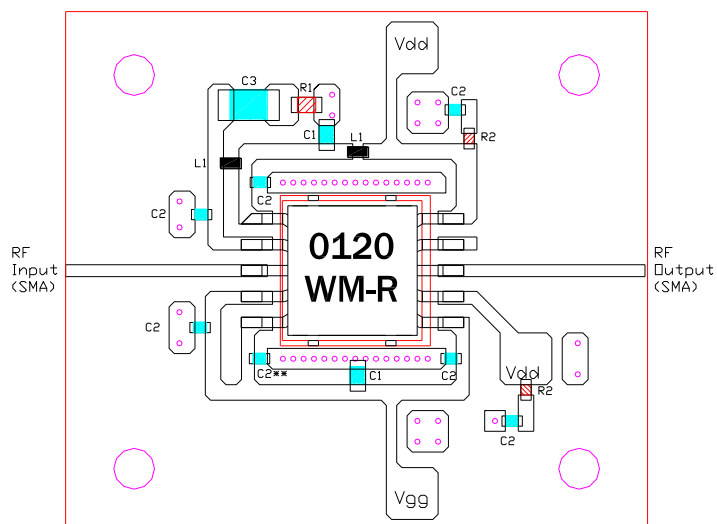


Pin No.	Function	Bias**
1	V <sub>d1</sub>	+8V
2	NC	
3	RF In	
4	NC	
5	V <sub>g1</sub>	-1.3V
6	V <sub>g2</sub>	-1.15V
7	NC	
8	RF Out	
9	NC	
10	V <sub>d2</sub>	+8V

\* FM version flange is made of Copper

\*\* V<sub>gs1</sub>, V<sub>gs2</sub> may vary from lot to lot

TEST CIRCUIT OUTLINE



Notes:

- 1- 10mils Rogers 4350 Material epoxied to test fixture
- 2- Ckt is for matched MMICs
- 3- C1=0.56uF (0603), C2=1000pF (0402),  
 C3=10uF (1206), R1=3 ohms (0603), R2=5.1 ohms (0603)  
 L1=1nH (0402 or 0603), \*\* May be omitted and replaced by 0Ohm resistor
- 4- External 1uF dipped tantalum capacitors should be attached to Vd and Vg to decouple external bias leads