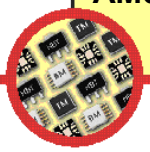
AMCOM COMMUNICATIONS
The RF Power House

GaAs MMIC Power Amplifier

AM009023WM-BM-R
AM009023WM-EM-R
AM009023WM-FM-R
July 2019
Rev 5



DESCRIPTION

AMCOM's AM009023WM-BM/EM/FM-R is an ultra broadband GaAs MMIC power amplifier. It has 21dB gain, and 23dBm output power over the 0.05 to 9GHz band. The noise figure is 4.5dB up to 4GHz. This MMIC is in a ceramic package with both RF and DC leads at the bottom level of the package to facilitate low-cost SMT assembly to the PC board. The AM009023WM-FM-R is a AM009023WM-BM-R assembled on a gold plated copper flange carrier for screwing on to a metal heat sink. 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

- Ultra wide bandwidth from 50MHz to 9GHz
- Output power, P1dB = 21dBm
- High gain, 21dB
- Input /Output matched to 50 Ohms

APPLICATIONS

- Software Radio
- Instrumentation
- Gain block
- Low Noise applications

TYPICAL PERFORMANCE * (Bias Conditions**: V_{dd} = +12V, I_{dq} = 250mA, V_{gs1}, V_{gs2}=-0.92V)

Parameters	Minimum	Typical **	Maximum
Frequency	0.1 – 8GHz	0.05 – 9GHz	
Small Signal Gain	17dB	21dB	25dB
Gain Ripple		± 3dB	± 4.0dB
P1dB from 0.1 to 8GHz	18dBm	21dBm	
Psat from 0.1 to 8.0GHz	20dBm	23dBm	
IP3 @ 1GHz		30dBm	
Input Return Loss	3dB	5dB	
Output Return Loss	7dB	10dB	
Thermal Resistance		20°C/W	

* Specifications subject to change without notice.

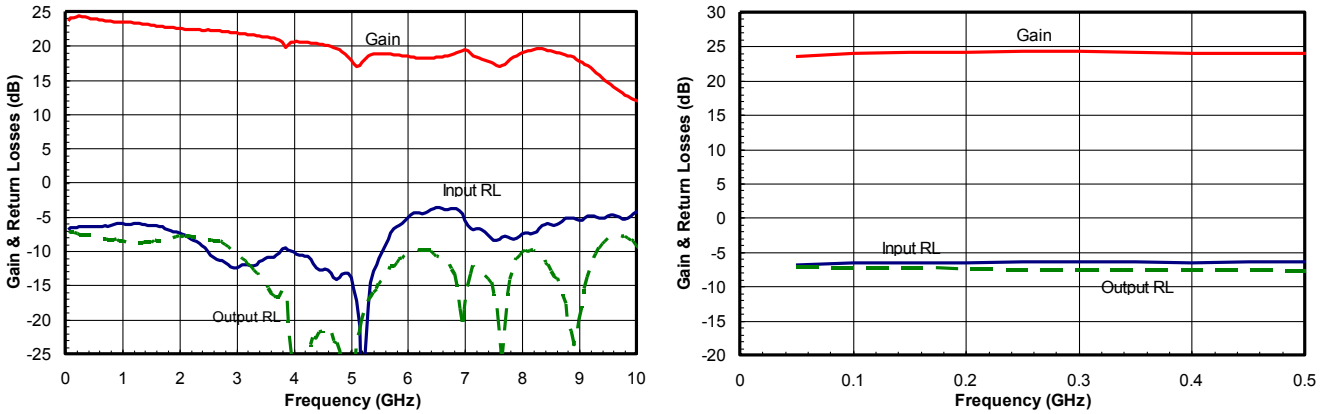
** Gate biases corresponding to above currents are V_{gs1}=-0.92V, I_{gs1} < 0.25mA, V_{gs2}=-0.92V, I_{gs2} < 0.5mA and may vary from lot to lot. Gate currents could reach above limits only near power saturation.

Email: info@amcomusa.com
Website: www.amcomusa.com
Tel. (301) 353-8400 Fax. (301) 353-8401
401 Professional Drive, Gaithersburg, MD 20879

ABSOLUTE MAXIMUM RATING

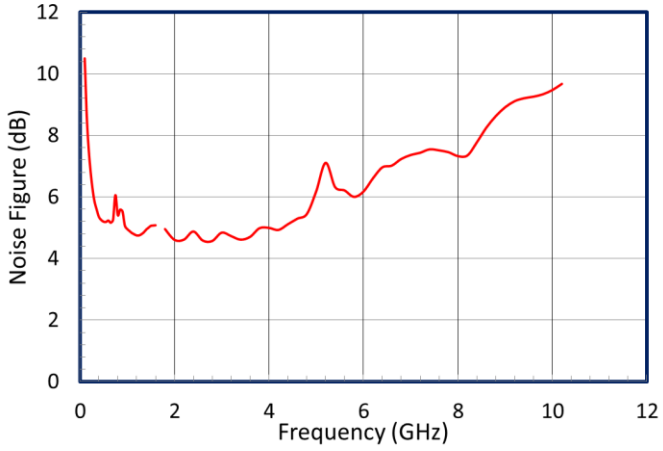
Parameters	Symbol	Rating
Drain source voltage	V_{dd}	13V
Gate source voltage	V_{gs1} & V_{gs2}	-3V
Drain source current	I_{dq1}	0.1A
Drain source current	I_{dq2}	0.20A
Continuous dissipation at 25ºC	P_t	4.2W
Channel temperature	T_{ch}	175°C
Operating temperature	T_{op}	-55°C to +85°C
Storage temperature	T_{sto}	-55°C to +135°C

SMALL SIGNAL DATA*



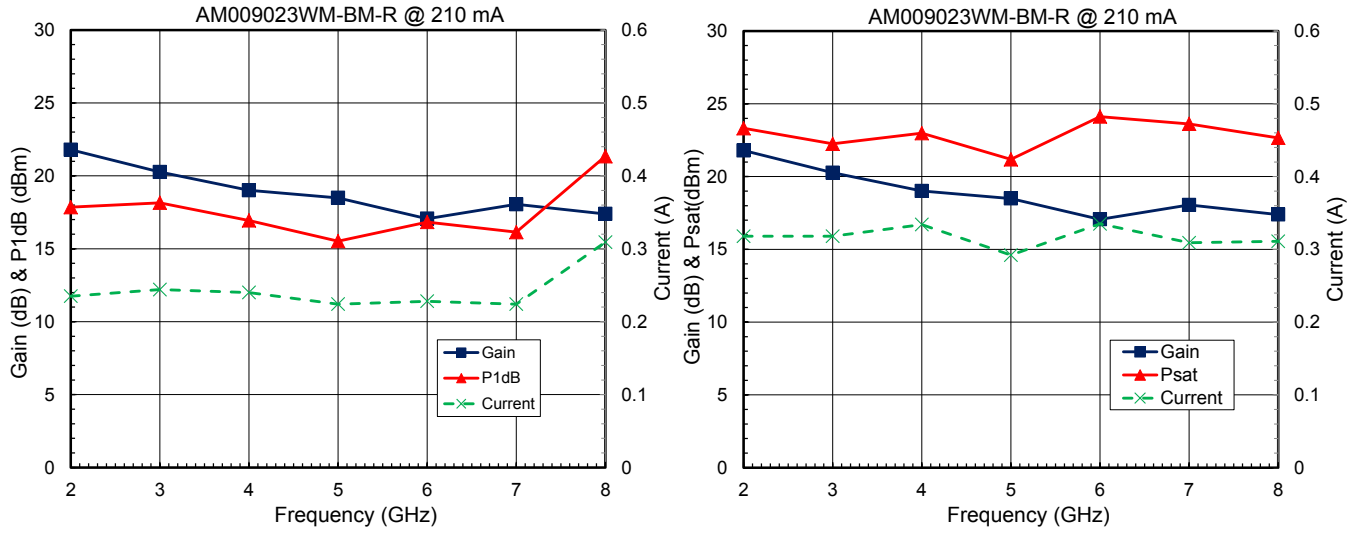
* S-Parameters measured using bias tee at the output for DC block. MMIC could be operated at lower than V_{dd}=+12V with almost same small signal parameters.

NOISE FIGURE

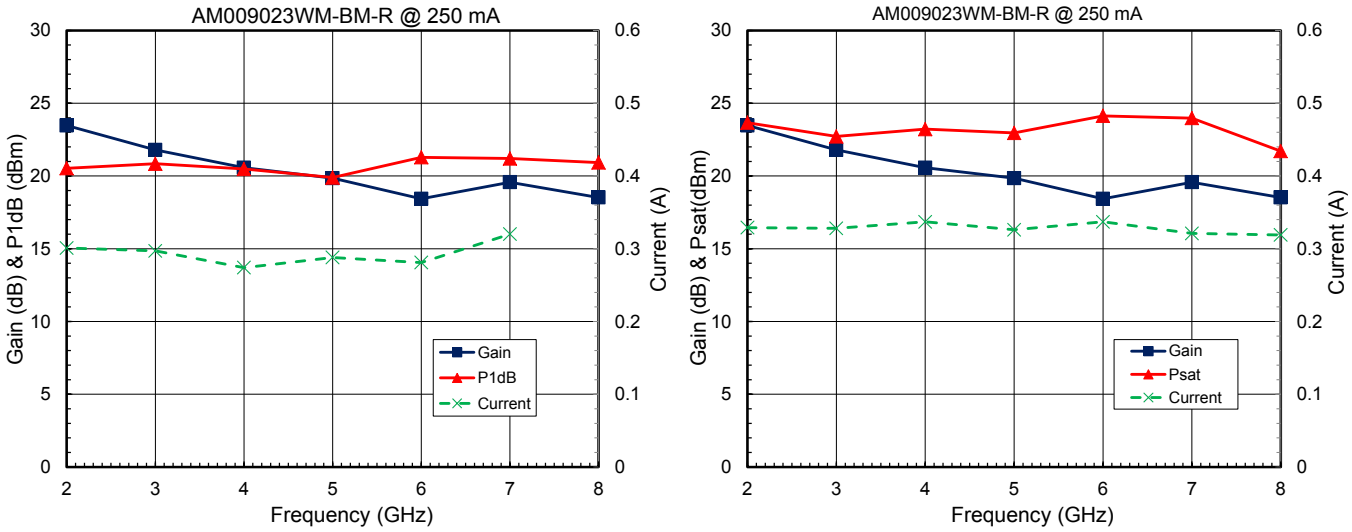


POWER DATA*

A) Power at V_{dd} = +12V & I_{dq} = 210mA

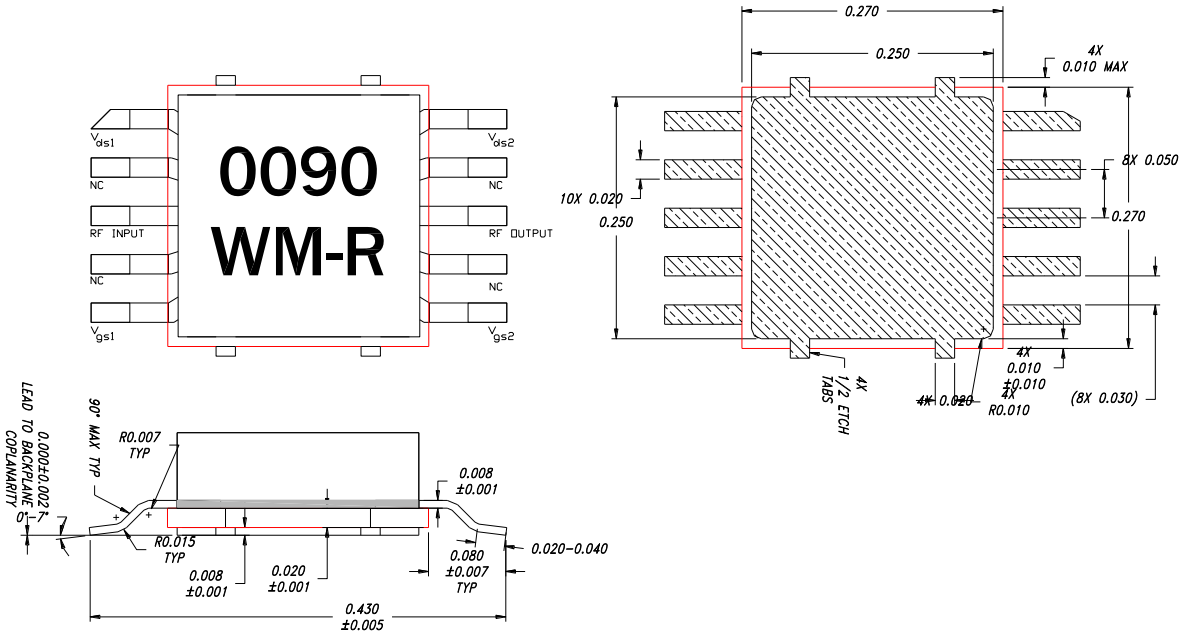


B) Power at V_{dd} = +12V & I_{dq} = 250mA



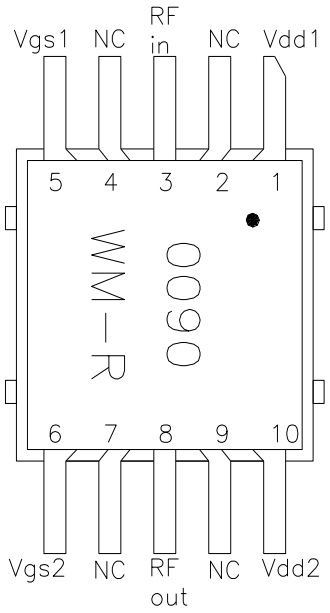
* Power measured using bias tee at the output for DC block. MMIC could be operated at lower than V_{dd}=+12V or & I_{dq} = 210mA with reduced power output.

PACKAGE OUTLINE (BM)



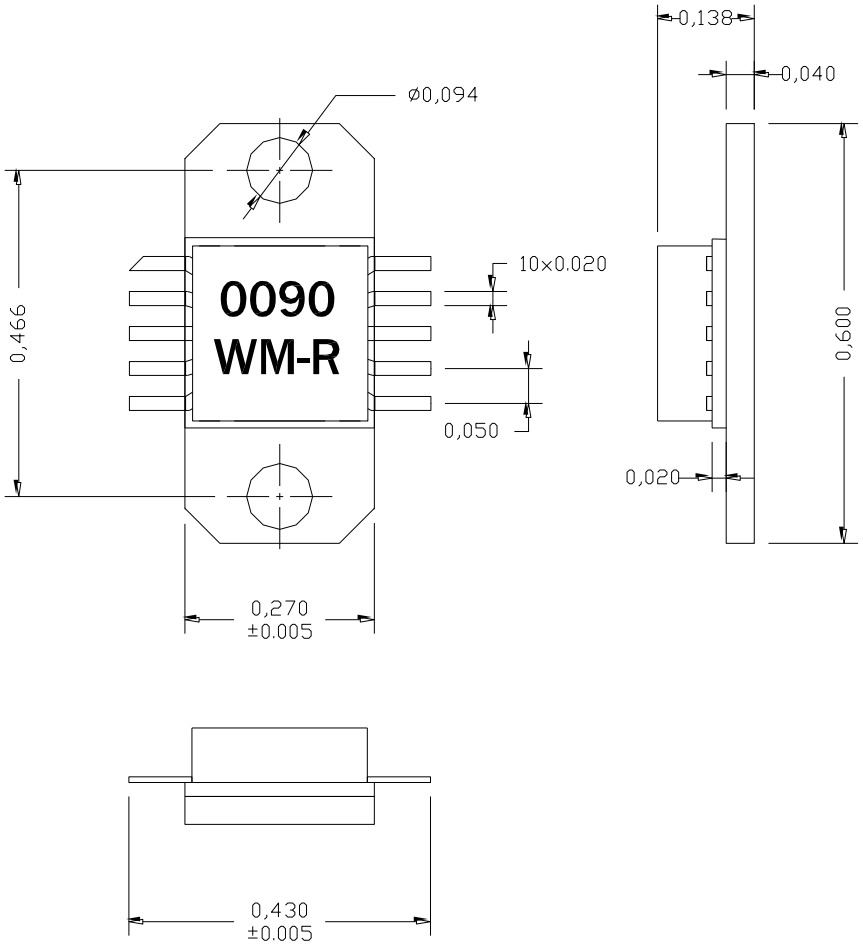
- Gate biases are for reference only and may vary from lot to lot

Pin Layout

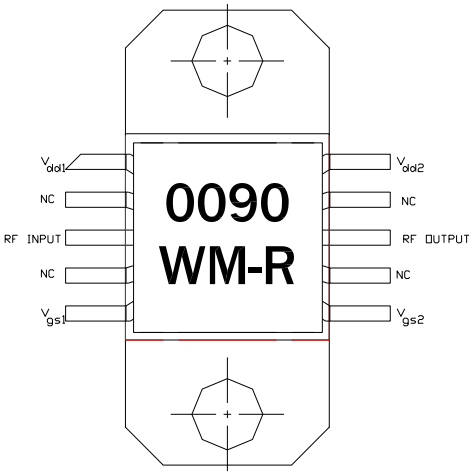


Pin No.	Function	Bias
1	Vdd1	+12V
2	NC	
3	RF in	
4	NC	
5	Vgs1	-0.92V
6	Vgs2	-0.92V
7	NC	
8	RF out	
9	NC	
10	Vdd2	+12V

PACKAGE OUTLINE (EM)*



Pin Layout

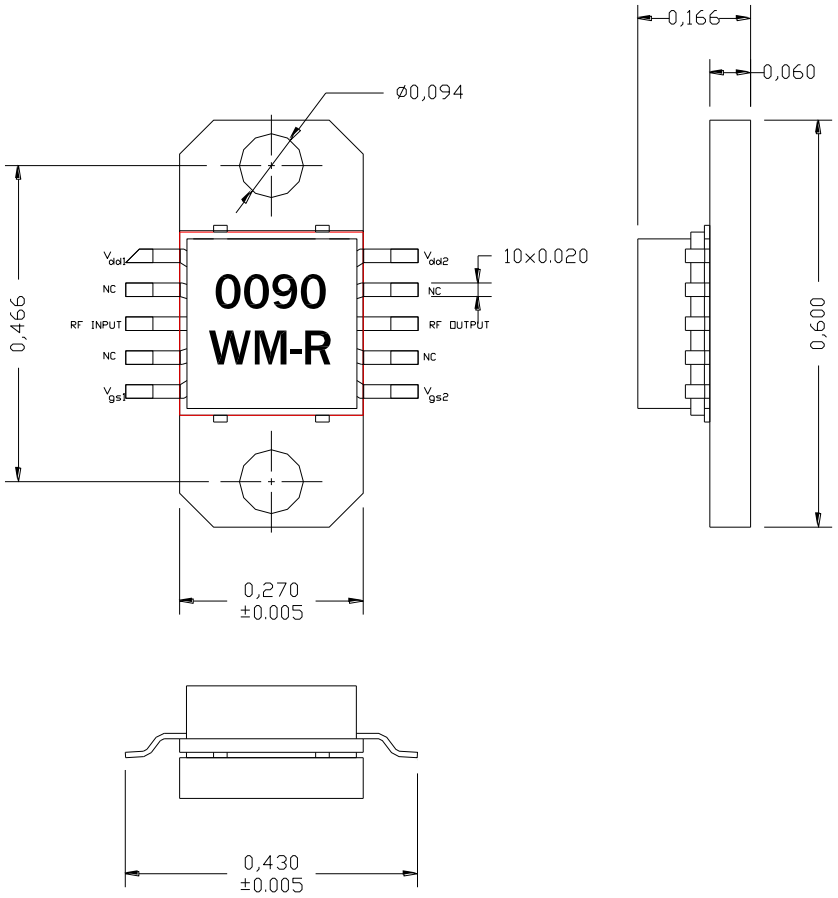


Pin No.	Function	Bias**
1	Vdd1	+12V
2	NC	
3	RF in	
4	NC	
5	Vgs1	-0.92V
6	Vdd2	-0.92V
7	NC	
8	RF out	
9	NC	
10	Vgs2	+12V

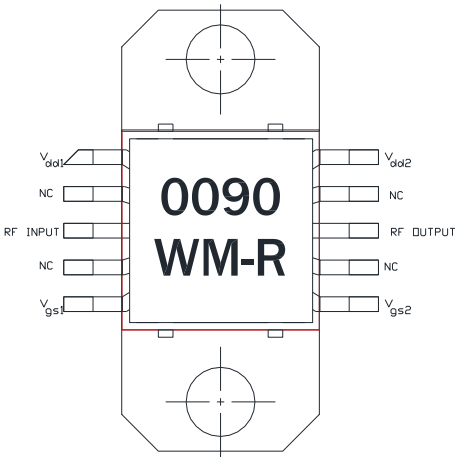
* EM version flange is made of CuW

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

PACKAGE OUTLINE (FM)*



Pin Layout

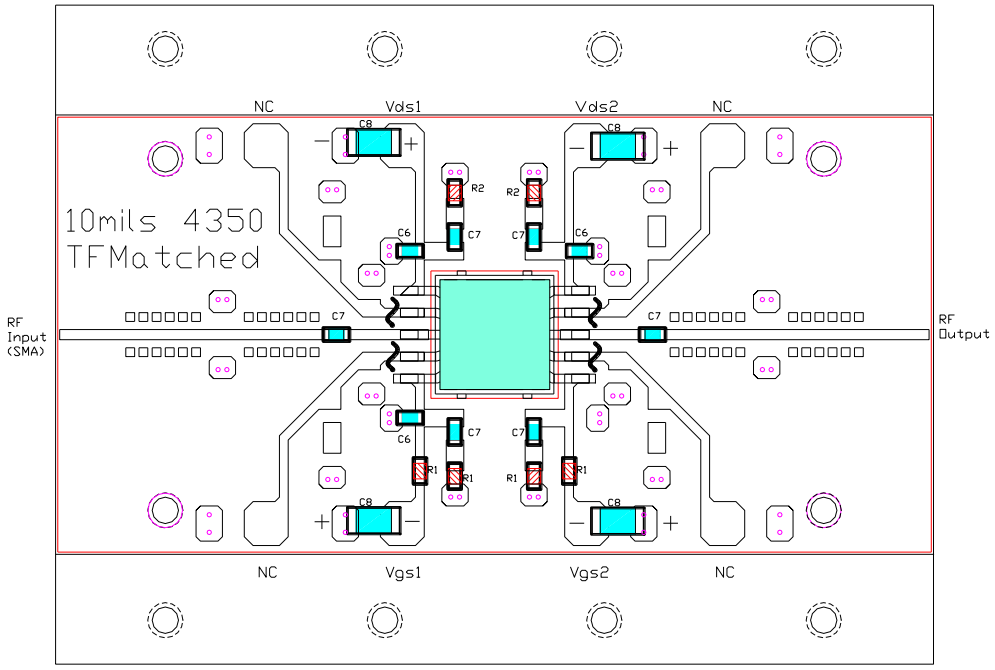


Pin No.	Function	Bias**
1	Vdd1	+12V
2	NC	
3	RF in	
4	NC	
5	Vgs1	-0.92V
6	Vdd2	-0.92V
7	NC	
8	RF out	
9	NC	
10	Vgs2	+12V

* FM version flange is made of Copper

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

TEST CIRCUIT for BM Package



Notes:
1- 10mils Rogers 4350 Material epoxied
2- Ckt is for matched MMICs
3- C6=20pf, C7=1000pF, C8=10uF, R1=50 Ohms, R2=10 Ohms, R3=5 Ohms
4- All Caps & Resistors are 0603 size except for C8: 1206 size

Important Notes:

1- Recommended current biases are 70mA and 140mA for the first stage and second stage respectively. Gate biases of -0.92V are for reference only. 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.

2- Do not apply V_{dd1} & V_{dd2} without proper negative voltages on V_{gs1} & V_{gs2}.

3- The currents flowing out of the V_{gs1} & V_{gs2} pins are less than 0.25mA & 0.5mA respectively at P_{1dB}.