

DESCRIPTION

AMCOM's AM132740MM-BM/EM/FM-R is part of the GaAs HIFET MMIC power amplifier series. It is a 2-stage GaAs HIFET MESFET MMIC power amplifier biased at 14V. The input and inter-stage matching networks cover 1.3 to 2.7GHz. The MMIC output requires partial external matching to cover 1.3GHz to 2.7GHz. It has 26dB gain and 38dBm output power at 14V. 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. When mounting directly to PCB, please see application note AN700 for instructions. Because of high DC power dissipation, we strongly recommend to mount these devices directly on a metal heat sink. The AM132740MM-FM-R is the AM132740MM-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

- Frequency applications from 1.3 to 2.7GHz
- High output power, P1dB = 38dBm
- High gain > 22dB
- Input matched from 1.3GHz to 2.7GHz
- Can cover the entire 1.3GHz to 2.7GHz band by adjusting output matching

APPLICATIONS

- PCS Base Station
- GPS Applications
- MMDS
- WLAN Repeaters
- 14V Applications

TYPICAL PERFORMANCE OF A TEST BOARD FOR 1.3 to 2.7GHz*

Performance at $V_{dd} = +14V$, $V_{gs} = -0.63V$, $I_{dq} = 1700mA$, $T_a = 25^\circ C$

Parameters	Minimum	Typical	Maximum
Frequency		1.5 – 2.5GHz	
Small Signal Gain	20dB	26dB	
Gain Ripple		± 2.5dB	± 4.0dB
P1dB	36.5dBm	38dBm	
Psat	37.0dBm	39dBm	
IP3		51dBm	
Efficiency @ P1dB		30%	
Input Return Loss		10dB	
Output Return Loss		10dB	
Thermal Resistance		5°C/W	

*Specifications subject to change without notice.

** V_{gs} is for reference only and may vary from lot to lot

ABSOLUTE MAXIMUM RATING

Parameters	Symbol	Rating
Drain source voltage	V_{dd}	17V
Gate source voltage	V_{gs}	-5V
Drain source current	I_{dd}	2.0A
Continuous dissipation at room temperature	P_t	30W
Channel temperature	T_{ch}	175°C
Storage temperature	T_{sto}	-55°C to +135°C

NEGATIVE CURRENT REQUIREMENT

In order to maximize the bandwidth and linearity, this product has built-in feedback resistors on-chip. The product will draw negative current in the V_{gs} circuit through these resistors. The Table below shows the negative current values.

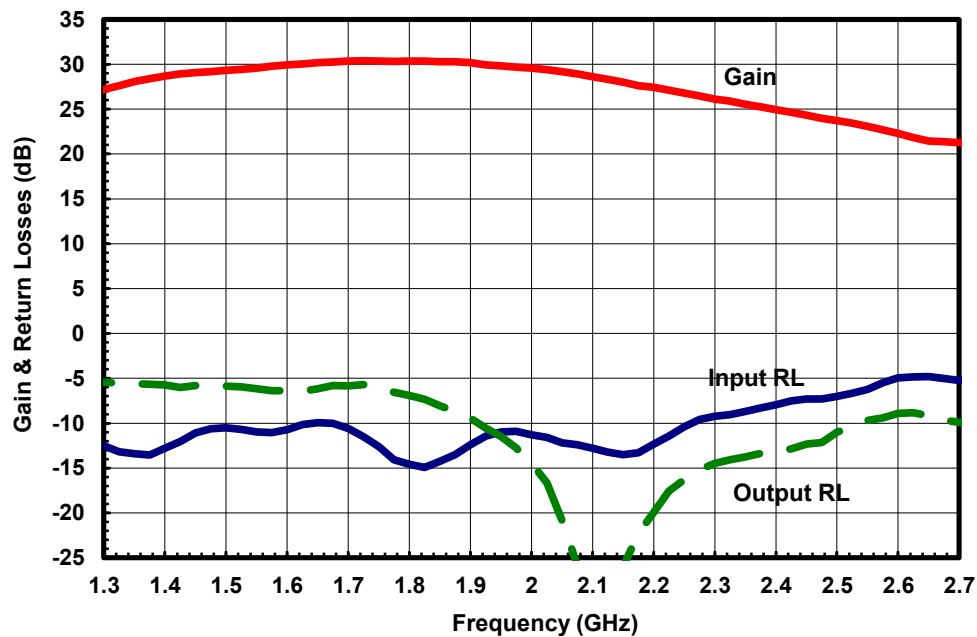
The typical negative currents for different V_{dd} are shown in the table below. The actual V_{gs} should be adjusted to have an I_{dd} of about 1.5A. The actual negative current value varies depending on V_{gs} and may also vary due to MMIC process variation.

Typical Negative Currents Variation vs Positive Bias

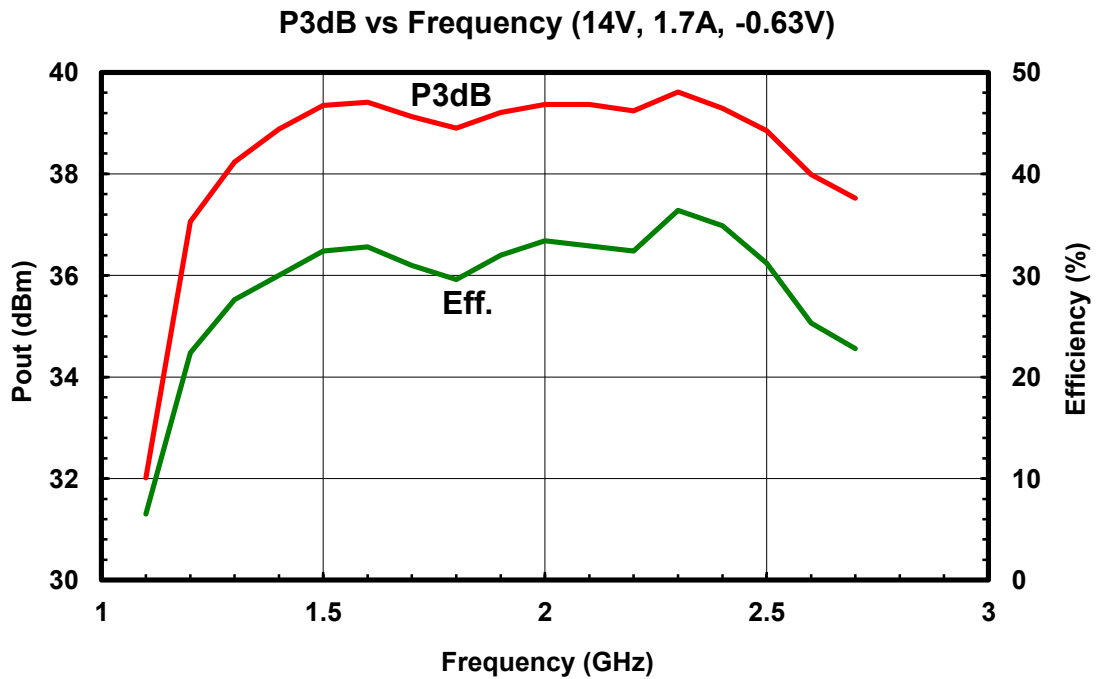
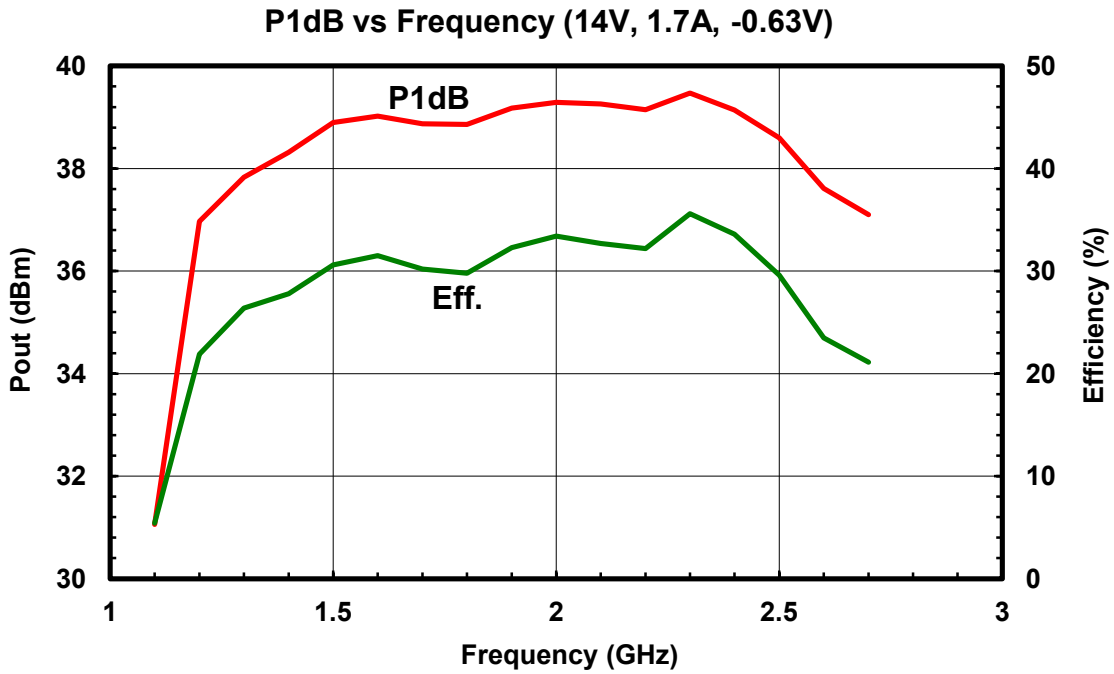
Parameter	$V_{dd} = 10V$	$V_{dd} = 12V$	$V_{dd} = 14V$
V_{gs}	- 1V	- 1V	- 1V
I_{qs1} (mA)	7.0	8.25	9.5
I_{qs2} (mA)	14.0	16.5	19.0
Total I_{qs} (mA)	21mA	24.75mA	28.5mA

SMALL SIGNAL DATA

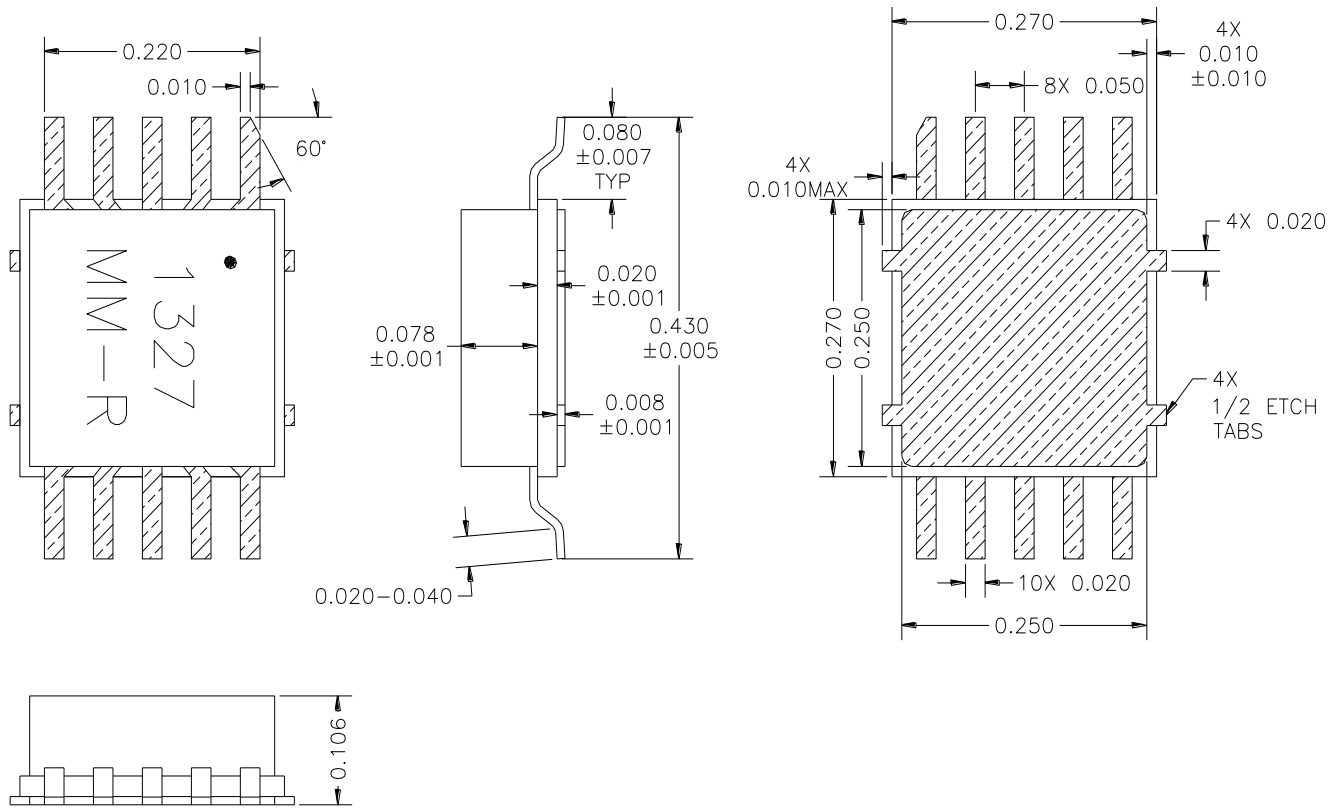
1.3 to 2.7GHz Test Circuit



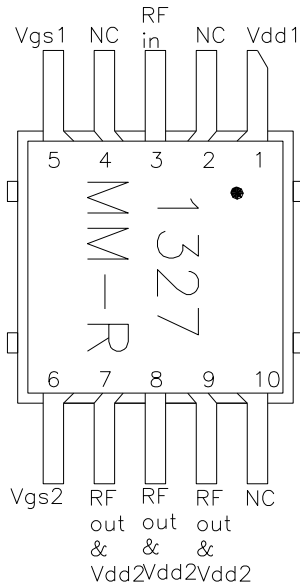
POWER DATA of 1.3 to 2.7GHz TEST BOARD



PACKAGE OUTLINE (BM)



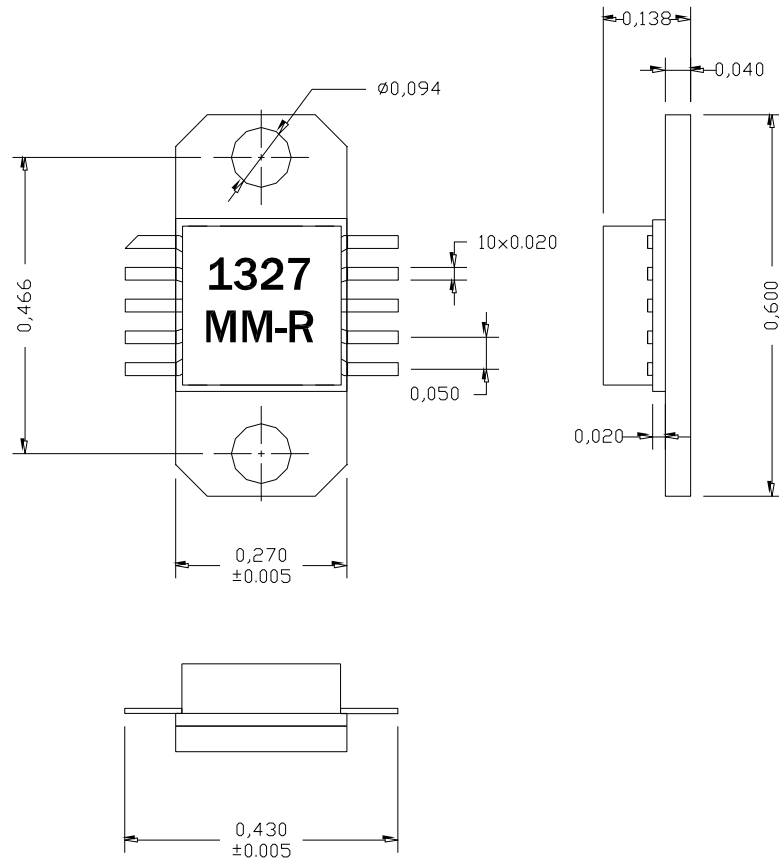
PIN LAYOUT



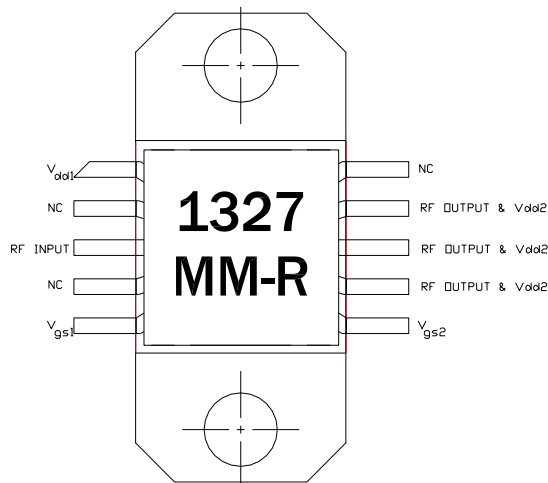
Pin No.	Function	Bias*
1	Vdd1	+14V
2	NC	
3	RF in	
4	NC	
5	Vgs1	-0.7V
6	Vgs2	-0.7V
7	RF out & Vdd2	+14V
8	RF out & Vdd2	+14V
9	RF out & Vdd2	+14V
10	NC	

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

PACKAGE OUTLINE (EM)*



PIN LAYOUT

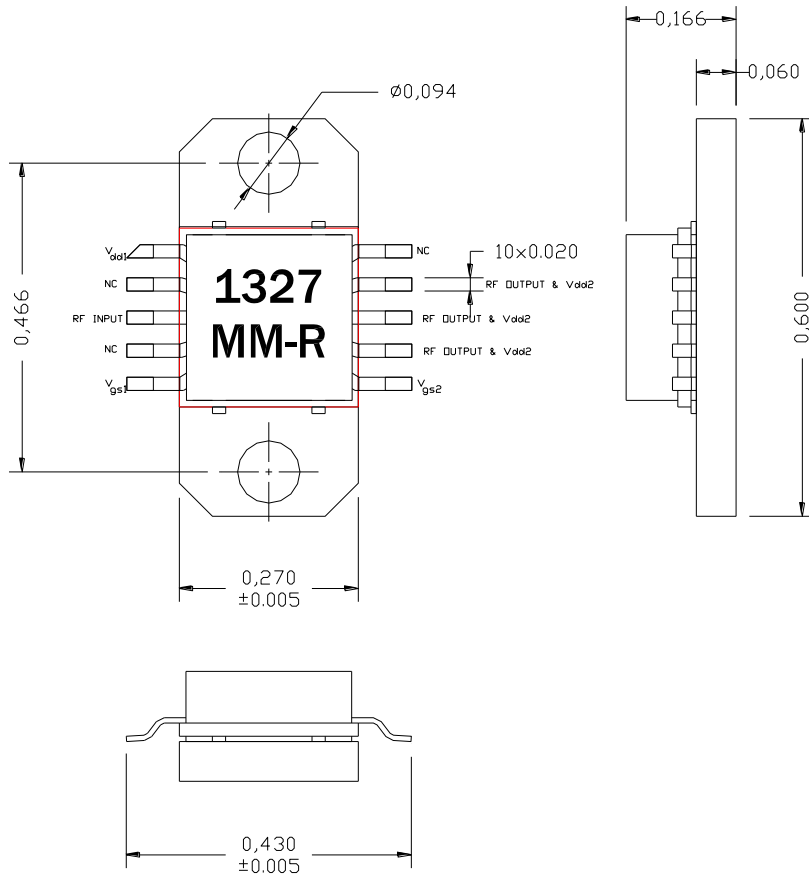


Pin No.	Function	Bias**
1	Vdd1	+14V
2	NC	
3	RF in	
4	NC	
5	Vgs1	-0.7V
6	Vgs2	-0.7 V
7	RF out & Vdd2	+14V
8	RF out & Vdd2	+14V
9	RF out & Vdd2	+14V
10	NC	

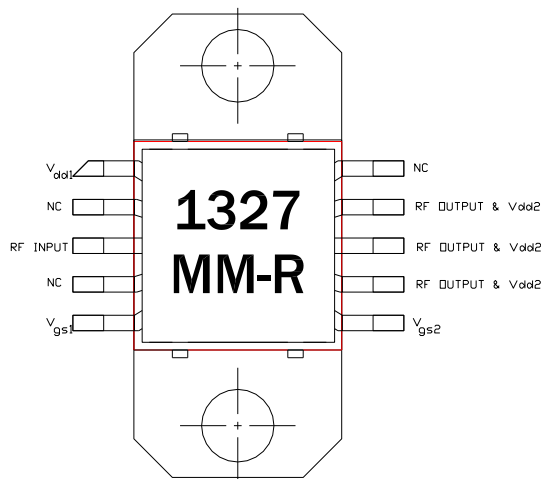
* EM version flange is made of CuW

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

PACKAGE OUTLINE (FM)*



PIN LAYOUT

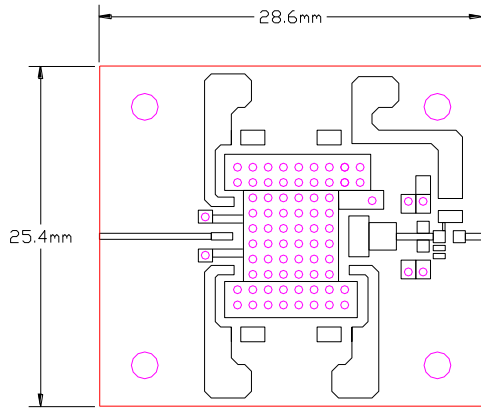


Pin No.	Function	Bias**
1	Vdd1	+14V
2	NC	
3	RF in	
4	NC	
5	Vgs1	-0.7V
6	Vgs2	-0.7 V
7	RF out & Vdd2	+14V
8	RF out & Vdd2	+14V
9	RF out & Vdd2	+14V
10	NC	

* FM version flange is made of Copper

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

1.3 to 2.7GHz TEST CIRCUIT (BM Package)



- Notes:
- 1- Material is 10mils FR4 with 1oz Copper
 - 2- All vias are plated thru
 - 3- Min. via thickness = 25um
 - 4- R1=500ohms, C1=1000pF, C2=100pF, b C3=20pF, C4=1pF
 - 5- All capacitors & resistors are 0603 size
 - 6- Inductors are 1206 size
 - 7- This PCB is for 1.3 to 2.7GHz applications
 - 8- Dimensions are in mm
 - 9- External 1 μ F dipped tantalum capacitor should be attached to Vd and Vg to decouple external bias leads.

