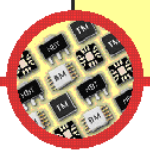
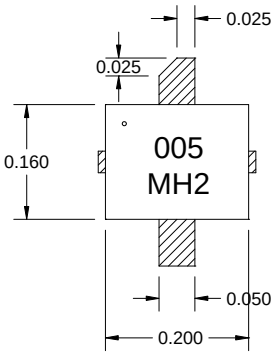
HiFET
High Voltage GaAs FET

AM005MH2-BI-R
Aug 2010
Rev 4



DESCRIPTION

AMCOM's AM005MH2-BI-R is a part of the BI series of GaAs HiFETs. The HiFET is a partially matched patented device configuration for high voltage, high power and broadband applications. This part has a total device periphery of 1mm. The AM005MH2-BI-R is designed for high power microwave applications, operating up to 6 GHz. It is also an ideal driver for larger power devices. The BI series uses a specially designed ceramic package with straight leads in a drop-in mounting style. The flange at the bottom of the package serves simultaneously as DC ground, RF ground, and thermal path. A bent-lead version of the package is also available for SMT applications. This part is RoHS compliant.



FEATURES

- 14 Volt Drain Bias
- Broadband Partial Matching: DC – 2.4GHz
- High Frequency Operation up to 6 GHz
- High Gain: G = 15dB @ 3.5GHz
- High Power: P_{1dB}= 25dBm @ 3.5GHz
- High Linearity: IP3 = 40dBm @ 3.5GHz

APPLICATIONS

- Broadband Applications
- High Voltage 10 to 14V
- Wireless Local Loop Network
- PCS Base Stations
- WLAN, Repeaters & HYPERLAN
- C-Band VSAT
- Avionics Communications

RF PERFORMANCE @ 3.5 GHz,(V_{dd} = 14V, V_{gs} =-0.78V)

Parameters	MIN	TYP
P_{1dB}* (dBm)	24	25
Eff @ P_{1dB}	35%	40%
Small Signal Gain (dB)	12	15
IP3 (dBm)	37	40

* Power typically remains the same as frequency changes.

ABSOLUTE MAXIMUM RATING

Parameters	Sym	Rating
Drain Voltage (V)	V_{dd}	18
Gate-Source Voltage (V)	V_{gs}	-5
Drain Current (mA)	I_{ds}	130
Continuous Dissipation At Room Temp. (W)	P_t	1.4
Operating Temp. (^oC)	T_A	-55 to +85
Max. Channel Temp. (^oC)	T_{ch}	+175

DC PARAMETERS

Parameters	Conditions	MIN	TYP	MAX
Saturation Current I_{dss} (mA)	Vdd = 14V Vgs = 0V	90	125	160
Pinch-off Voltage V_p (V)	Vdd = 3V Idd = 18mA	-2.6	-2	-1.2
Negative Voltage Current (mA)		3	7	10
Drain to Gate Breakdown Voltage BV_{gd} (V)		22	30	
Drain Voltage V_{dd} (V)	Mounted on Heat Sink		14	16
Thermal Resistance (^oC/W)	102			

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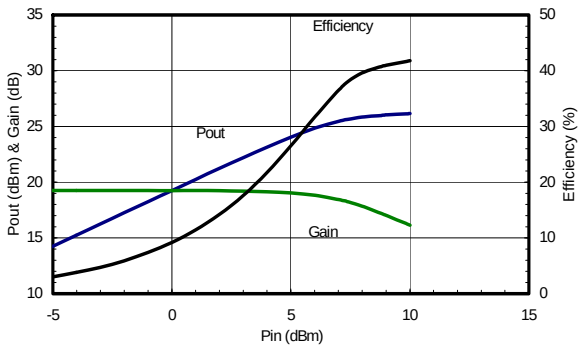
SMALL SIGNAL MEASUREMENTS

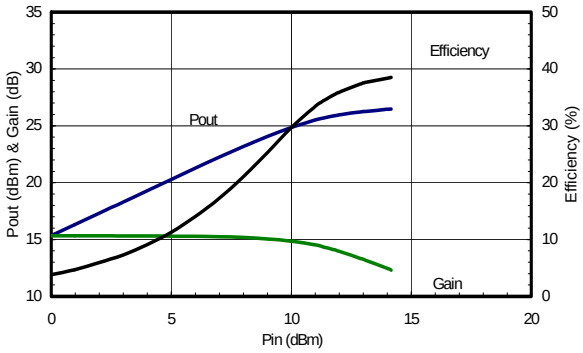
S-Parameters for AM005MH2-BI-R @ 14V / 50mA **(S2P file downloadable from the Web)**

Freq (MHz)	MAG (S11)	ANG (S11)	MAG (S21)	ANG (S21)	MAG (S12)	ANG (S12)	MAG (S22)	ANG (S22)
200	0.481	-29.272	8.839	164.266	0.052	-11.923	0.209	11.85
500	0.533	-65.543	8.258	141.148	0.042	-18.724	0.317	-7.485
1000	0.605	-111.043	6.752	107.801	0.038	-20.805	0.38	-40.727
1500	0.68	-136.227	5.423	82.121	0.036	-24.595	0.418	-64.191
2000	0.701	-157.711	4.405	59.65	0.033	-30.939	0.454	-83.754
3000	0.733	169.453	3.105	21.596	0.025	-42.115	0.534	-115.277
4000	0.748	143.914	2.405	-10.992	0.016	-41.086	0.613	-139.508
5000	0.742	119.484	2.057	-41.439	0.015	24.665	0.645	-157.25
6000	0.718	88.695	2.001	-74.047	0.041	10.448	0.68	-176.25
7000	0.684	46.451	1.979	-113.594	0.069	-19.216	0.666	155.195
8000	0.697	-0.482	1.834	-158.32	0.097	-54.625	0.616	113.008
9000	0.848	-41.207	1.632	152.992	0.127	-94.867	0.59	51.316
10000	0.95	-80.27	1.192	98.602	0.129	-142.867	0.671	-22.695

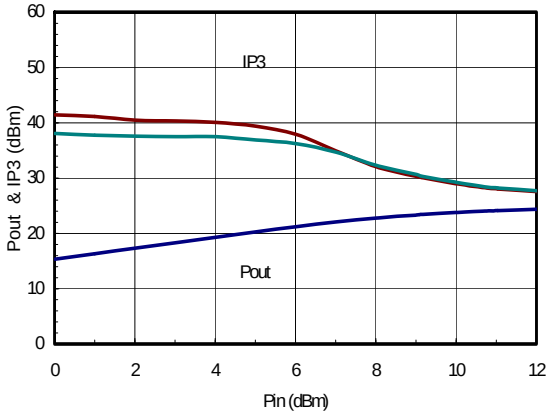
Pout vs Pin with Tuners at Input & Output
(F= 1.0GHz, Bias: 14V, 50mA)



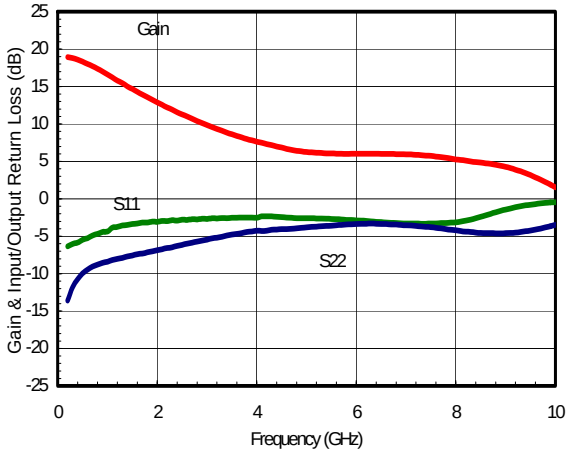
Pout vs Pin with Tuners at Input & Output
(F= 3.5GHz, Bias: 14V, 50mA)



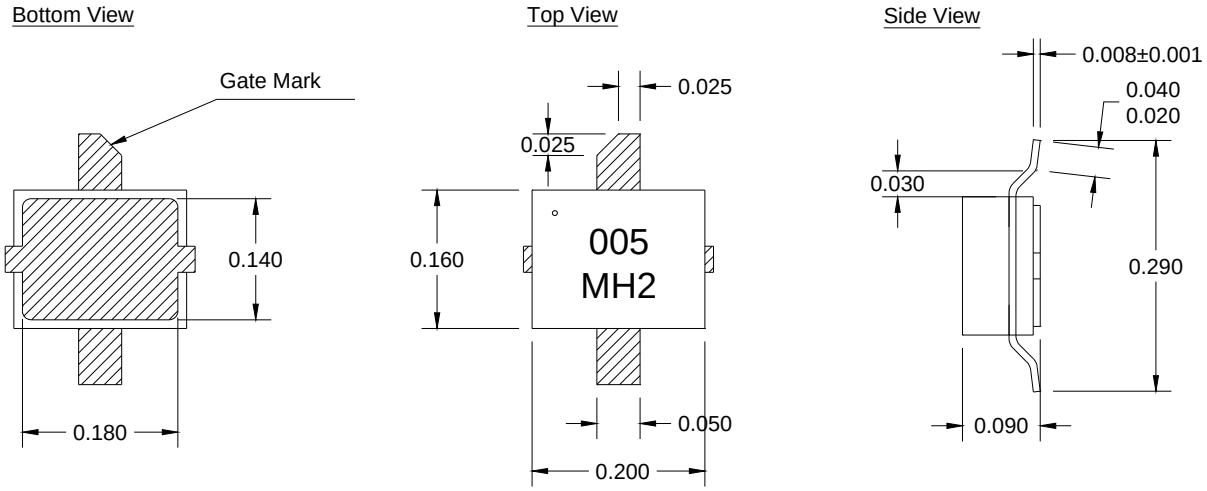
IP3 with Tuners
(F = 3.5GHz, Bias: 14V, 50mA)



(S-Parameters, Bias: 14V, 50mA)



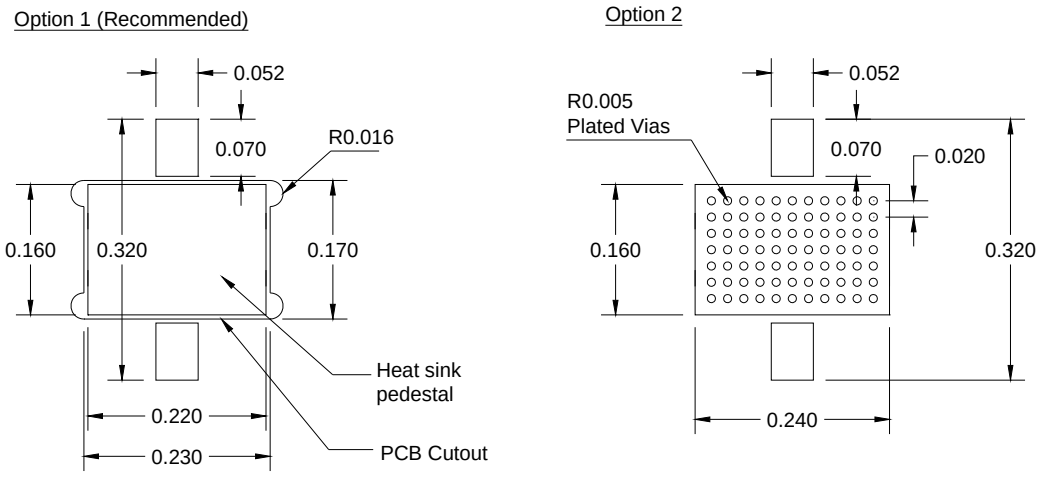
PACKAGE OUTLINE



* All Dimensions are in inches

MOUNTING INSTRUCTIONS

The device may dissipate several watts of power. It is important to provide a good heat sink to dissipate the heat. There are two options of mounting the device, as shown below. The most effective way is to mount the device to a heat sink pedestal (Option 1). We strongly recommend this way for high power device. The other option, which is mounted directly on PCB, is to add sufficient number of plated through via holes to the PCB. The base of the device is soldered to the PCB (Option 2). The via hole wall should be plated by at least 1 oz thick (1.5 mil) of high thermal conductivity copper to conduct the heat from the top of PCB to the bottom of PCB. Also fill the via holes with solder to help conducting the heat.



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