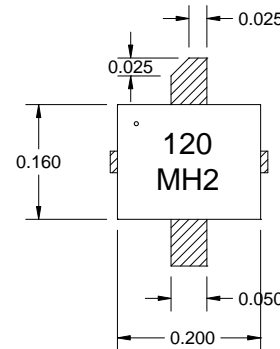


## DESCRIPTION

AMCOM's AM120MH2-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 24mm. The AM120MH2-BI-R is designed for high power microwave applications, operating up to 6GHz. 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. This HiFET is RoHS compliant.



## FEATURES

- 14 Volt Drain Bias
- High Frequency Operation up to 6 GHz
- High Gain:  $G = 14\text{dB}$  @ 2GHz
- High Power:  $P_{1\text{dB}} = 39\text{dBm}$  @ 2GHz
- High Linearity:  $IP_3 = 49\text{dBm}$  @ 2GHz
- Ceramic Package for Effective Heat Removal

## APPLICATIONS

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

## RF PERFORMANCE @ 2GHz, ( $V_{\text{dd}} = 14\text{V}$ , $V_{\text{gs}} = -0.95\text{V}$ )

Parameters	MIN	TYP
$P_{1\text{dB}}$ * (dBm)	38	39
Eff @ $P_{1\text{dB}}$	25%	30%
Small Signal Gain (dB)	12	14
$IP_3$ (dBm)	48	50

\* Power typically remains the same as frequency changes.

## ABSOLUTE MAXIMUM RATING

Parameters	Sym	Rating
Drain Voltage (V)	$V_{\text{dd}}$	18
Gate-Source Voltage (V)	$V_{\text{gs}}$	-5
Drain Current (mA)	$I_{\text{ds}}$	2000
Continuous Dissipation At Room Temp. (W)	$P_t$	28
Operating Temp. ( $^{\circ}\text{C}$ )	$T_A$	-55 to +85
Max. Channel Temp. ( $^{\circ}\text{C}$ )	$T_{\text{ch}}$	+175

## DC PARAMETERS

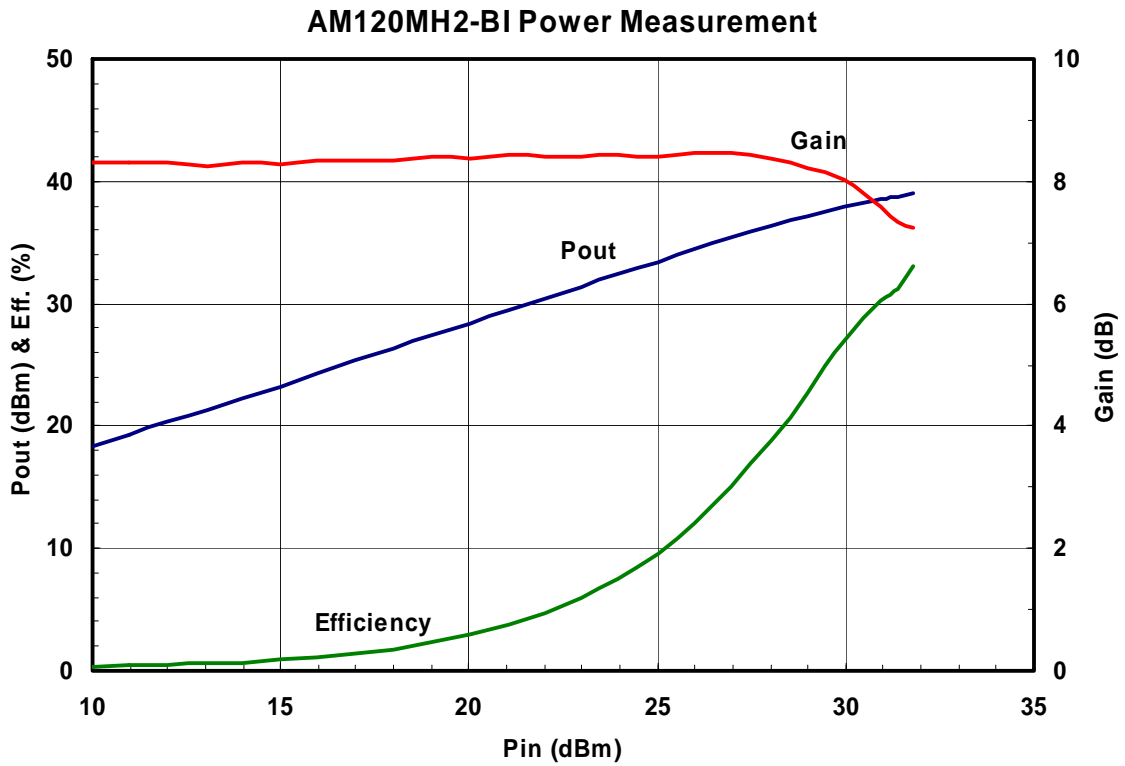
Parameters	Conditions	MIN	TYP	MAX
Saturation Current $I_{\text{dss}}$ (mA)	$V_{\text{dd}} = 14\text{V}$ & $V_{\text{gs}} = 0\text{V}$	2000	2400	3000
Pinch-off Voltage $V_p$ (V)	$V_{\text{dd}} = 3\text{V}$ & $I_{\text{dd}} = 18\text{mA}$	-2.6	-2	-1.2
Negative Voltage Current (mA)		120	160	200
Drain Breakdown Voltage $BV_{\text{gd}}$ (V)		22	30	
Drain Voltage $V_{\text{dd}}$ (V)	Mounted on Heat Sink	8	14	16
Thermal Resistance ( $^{\circ}\text{C}/\text{W}$ )		4.9		

**S-Parameters for AM120MH2-BI-R @ 14V / 1.5A (S2P file downloadable from the Web)**

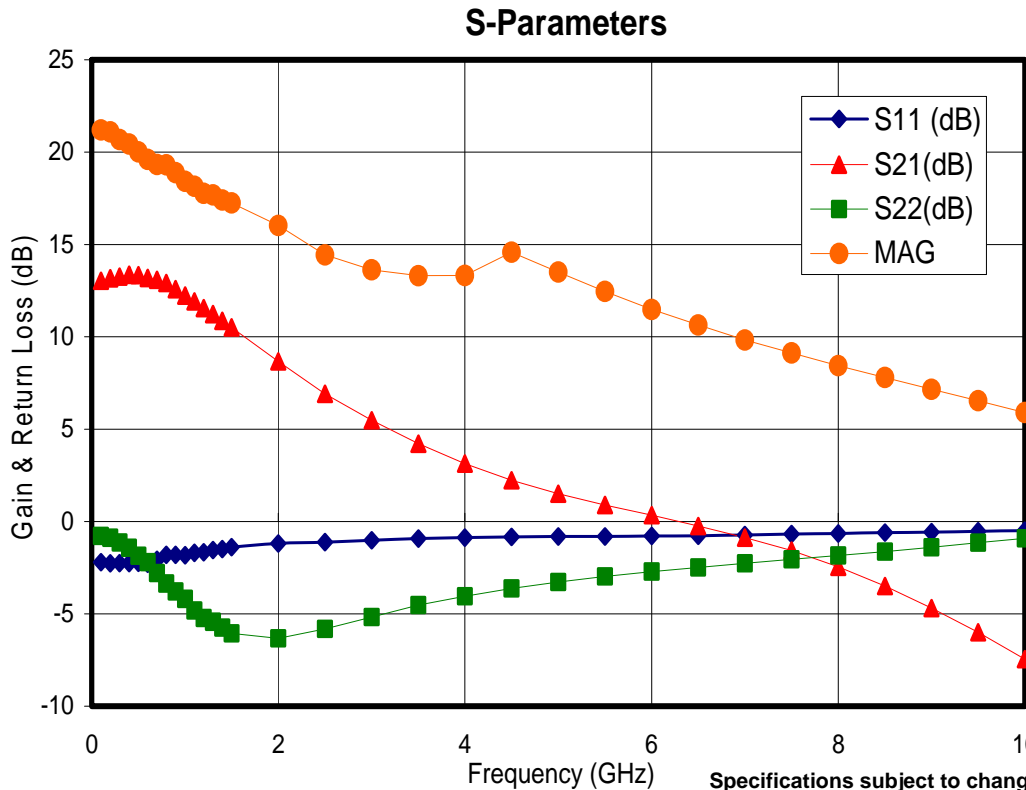
Freq (MHz)	MAG (S11)	ANG (S11)	MAG (S21)	ANG (S21)	MAG (S12)	ANG (S12)	MAG (S22)	ANG (S22)
100	0.776	178.5	4.489	175.0	0.023	-1.8	0.914	176.9
200	0.771	179	4.557	168.9	0.022	-3.8	0.903	172.6
300	0.772	178.9	4.604	162.6	0.022	-6.3	0.877	169.2
400	0.772	178.6	4.658	155.7	0.021	-8.2	0.849	166.0
500	0.773	178.6	4.646	148.7	0.020	-9.8	0.808	163.2
600	0.769	178.9	4.565	141.6	0.019	-10.5	0.776	160.5
700	0.788	179.9	4.515	134.7	0.019	-10.2	0.725	158.4
800	0.812	179.0	4.423	127.1	0.018	-11.4	0.679	157.0
900	0.812	177.7	4.258	120.5	0.017	-10.6	0.647	157.7
1000	0.810	177.4	4.092	113.9	0.016	-10.2	0.617	157.1
1500	0.852	174.7	3.353	86.6	0.014	-0.6	0.498	161.4
2000	0.872	169.3	2.714	63.9	0.012	13.8	0.483	168.1
2500	0.879	163.2	2.216	44.7	0.011	51.3	0.512	170.8
3000	0.890	157.1	1.881	27.7	0.022	56.4	0.551	170.6
3500	0.899	150.2	1.625	11.9	0.028	51.5	0.594	166.6
4000	0.905	142.7	1.435	-3.2	0.036	48.5	0.627	161.7
4500	0.909	138.3	1.293	-17.7	0.045	42.2	0.659	151.3
5000	0.911	129.7	1.189	-32.3	0.053	35.1	0.686	143.0
5500	0.911	119.3	1.109	-47.1	0.063	26.9	0.71	134.1
6000	0.914	107.2	1.041	-62.5	0.074	17.1	0.732	124.8
6500	0.915	94.1	0.973	-78.6	0.084	6.2	0.751	114.6
7000	0.919	80.2	0.905	-95.2	0.094	-5.8	0.771	102.4
7500	0.925	66.1	0.834	-112.6	0.102	-18.9	0.79	88.4
8000	0.928	51.3	0.754	-130.7	0.108	-32.6	0.809	72.6
8500	0.933	37.7	0.669	-149.0	0.111	-46.8	0.829	56.1
9000	0.936	23.7	0.583	-167.1	0.112	-60.9	0.851	39.7
9500	0.941	9.6	0.501	174.9	0.111	-74.9	0.876	24.1
10000	0.945	-4.7	0.424	156.9	0.109	-89.0	0.900	9.1

Specifications subject to change without notice

POWER DATA

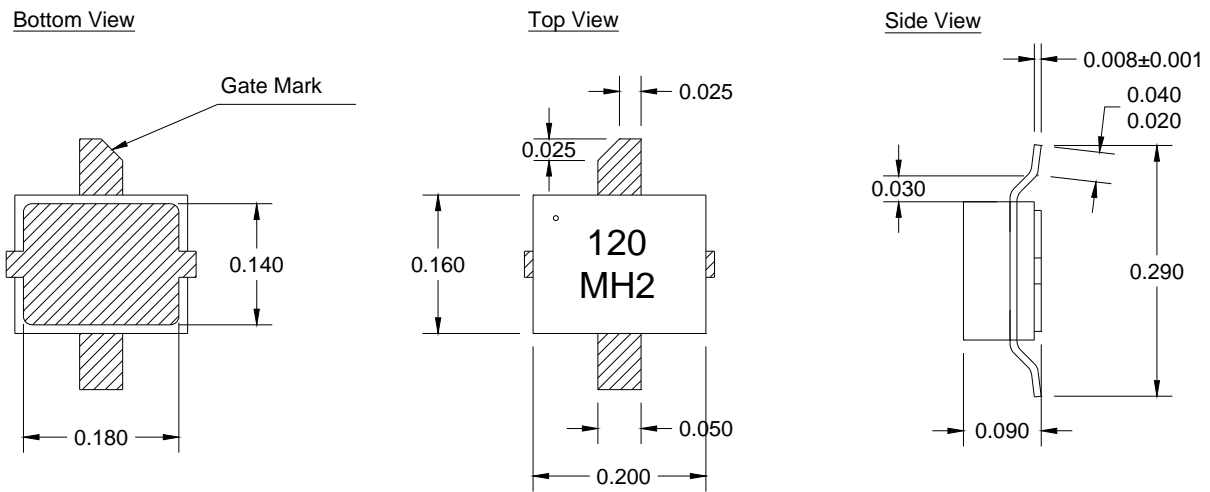


**P<sub>out</sub> versus P<sub>in</sub> @ 2GHz**  
 (Input not Matched, V<sub>dd</sub>=14V, V<sub>oaq</sub>= -1V, I<sub>d</sub>=1.5A, G=8dB, IP3=50dBm)



Specifications subject to change without notice

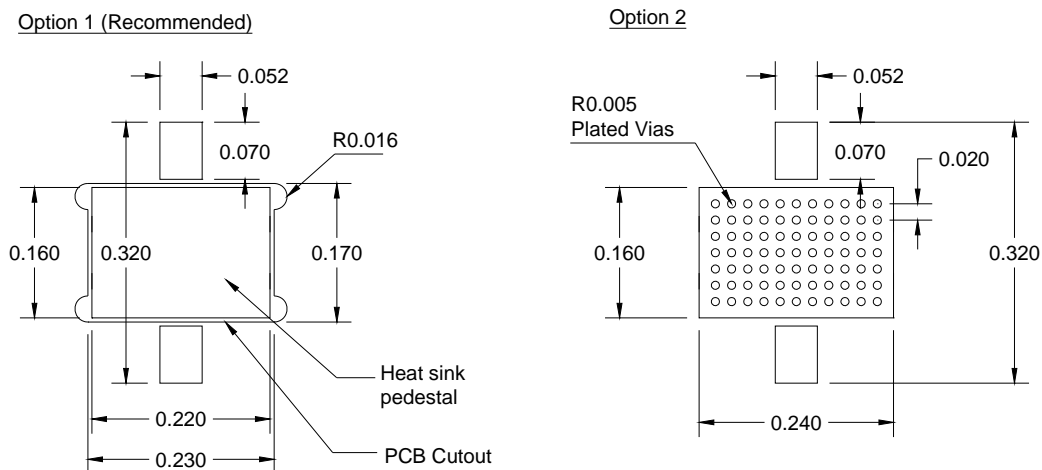
**PACKAGE OUTLINE**



\* 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.



\* All Dimensions are in inch