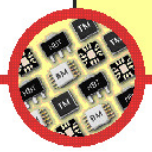
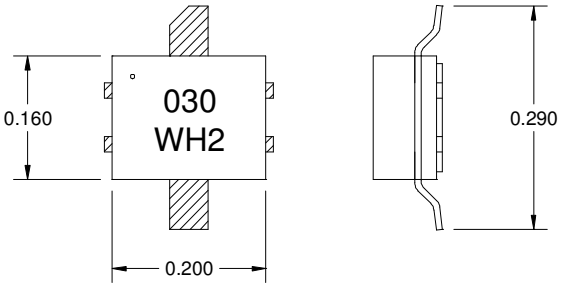
HiFET
High Voltage GaAs FET
DC-12 GHz

AM030WH2-BI-R
July 2011
Rev 0



DESCRIPTION

AMCOM's AM030WH2-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 6mm. The AM030WH2-BI-R is designed for high power microwave applications, operating up to 12 GHz. It is also an ideal driver for larger power devices. The BI series uses a specially designed ceramic package with bent or 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 part is RoHS compliant.



* All Dimensions are in inch

FEATURES

- High Frequency Operation up to 12 GHz
- High Gain & High Power, P_{1dB}=35 dBm @3.5GHz
- Surface Mountable
- Bottom ground for Effective Heat Removal

APPLICATIONS

- Wireless Local Loop Network
- Cellular Radio Communications
- WLAN, Repeaters & HYPERLAN
- C-Band VSAT
- Radar

RF PERFORMANCE @ 3.5 GHz, (V_{ds} = 16V, I_{ds} = 0.45A)

Parameters	MIN	TYP
P_{1dB}* (dBm)	34	35
Eff @ P_{1dB}	40%	50%
Small Signal Gain (dB)	15	16.7
IP3 (dBm)	43	46

* Power typically remains the same as frequency changes.

ABSOLUTE MAXIMUM RATING

Parameters	Symbol	Rating
Drain-Source Voltage (V)	V_{ds}	18
Gate-Source Voltage (V)	V_{gs}	-5
Drain Current (A)	I_{ds}	1.2
Continuous Dissipation At Room Temp. (W)	P_t	8.3
Operating Temp. (°C)	T_A	-55 to +85
Max. Channel Temp. (°C)	T_{ch}	+175

DC PARAMETERS

Parameters	Conditions	MIN	TYP	MAX
Saturation Current I_{dss} (A)	V_{ds}=16V, Vgs=0V	0.6	0.9	1.2
Pinch-off Voltage V_p (V)	V_{ds}=3V, Ids=2.5% Idss	-2.2	-1.7	-1.2
Drain to Gate Breakdown Voltage BV_{gd} (V)	I_{dg} = 1mA/mm	22	30	
Thermal Resistance (°C/W)			17	

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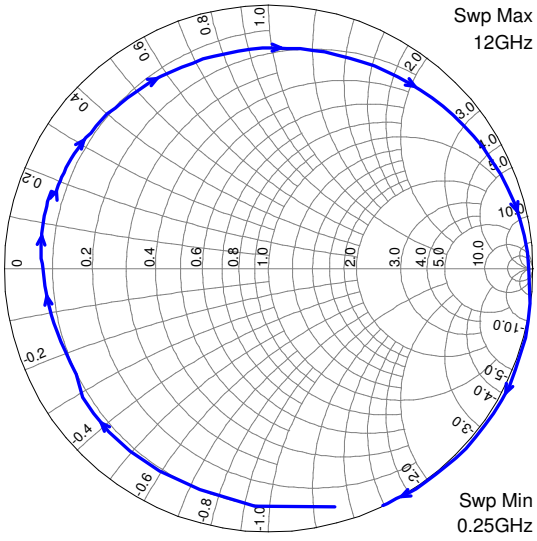
S-parameters

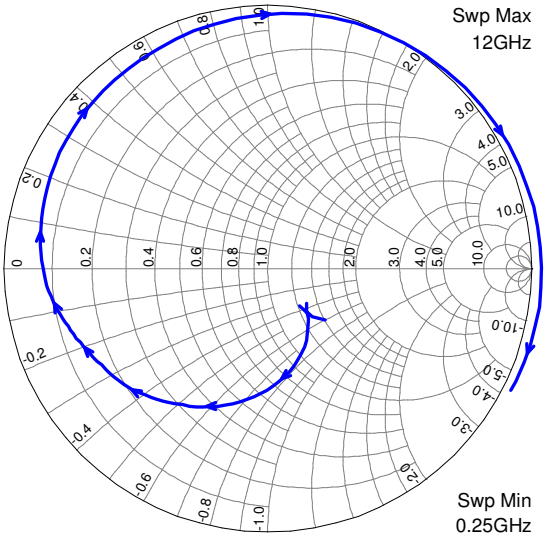
S-parameters at 16 V, 0.3 A

Freq(GHz)	MagS11	AngS11	MagS21	AngS21	MagS12	AngS12	MagS22	AngS22
1.00	0.84	-148.11	14.44	86.52	0.01	9.30	0.26	-53.63
2.00	0.85	-174.68	7.69	51.17	0.01	34.72	0.44	-85.82
3.00	0.87	171.85	5.09	23.60	0.01	67.43	0.57	-113.74
4.00	0.86	160.37	3.78	-0.11	0.02	70.47	0.68	-135.77
5.00	0.85	148.40	3.17	-22.31	0.04	64.95	0.75	-153.74
6.00	0.84	128.14	2.87	-45.89	0.06	52.26	0.80	-166.96
7.00	0.83	99.59	2.74	-72.78	0.08	33.73	0.86	178.73
8.00	0.86	67.40	2.67	-104.55	0.11	8.90	0.90	155.36
9.00	0.92	34.56	2.60	-142.24	0.14	-22.43	0.93	118.52
10.00	0.99	-1.97	2.32	171.77	0.15	-62.04	0.99	67.46
11.00	1.01	-37.66	1.65	125.32	0.13	-102.61	1.03	15.38
12.00	1.00	-64.32	1.06	86.21	0.10	-135.79	1.03	-26.58

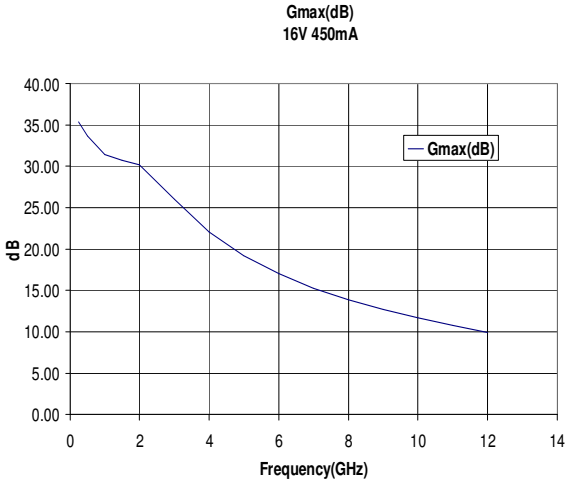
S11 (16 V, 0.3 A)

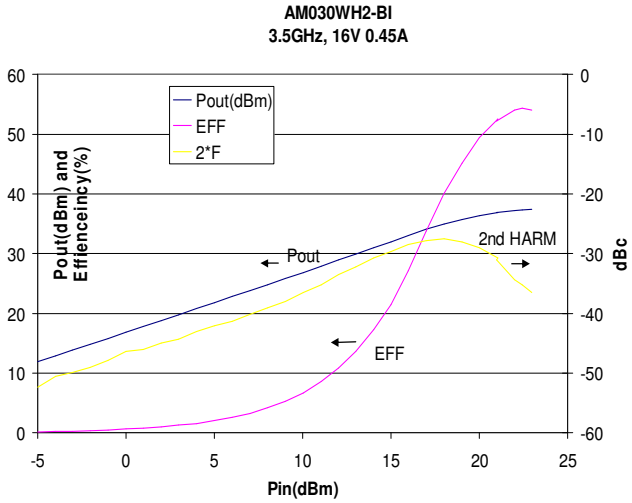


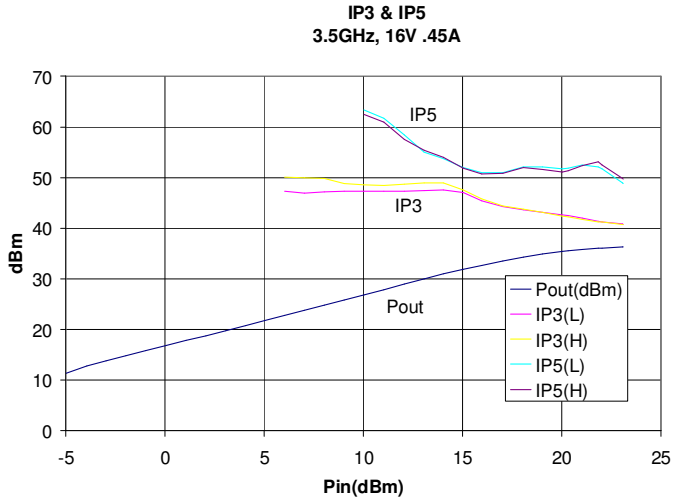
S22 (16 V, 0.3 A)



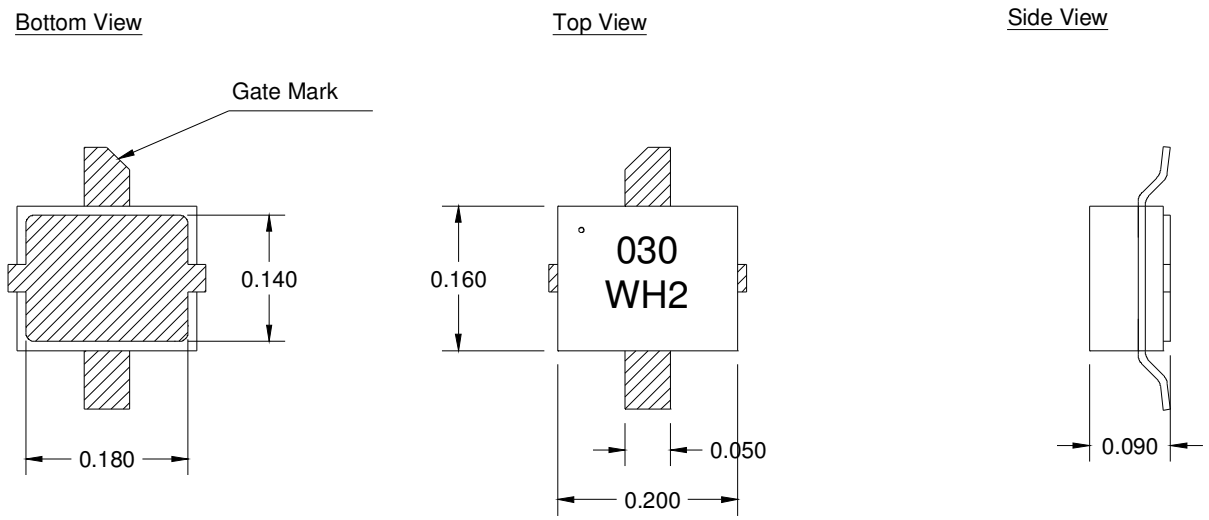
Note: The device is conditional stable at high frequencies. Please pay attentation to the amplifier design to insure stability.


Gmax(dB)
16V 450mA
Gmax(dB)
dB
Frequency(GHz)
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
0
2
4
6
8
10
12
14


AM030WH2-BI
3.5GHz, 16V 0.45A
Pout(dBm)
EFF
2*F
Pout(dBm) and Effienceincy(%)
dBc
Pout
2nd HARM
EFF
Pin(dBm)
60
50
40
30
20
10
0
0
-10
-20
-30
-40
-50
-60
-5
0
5
10
15
20
25


IP3 & IP5
3.5GHz, 16V .45A
IP5
IP3
Pout
Pout(dBm)
IP3(L)
IP3(H)
IP5(L)
IP5(H)
dBm
Pin(dBm)
70
60
50
40
30
20
10
0
-5
0
5
10
15
20
25

PACKAGE OUTLINE



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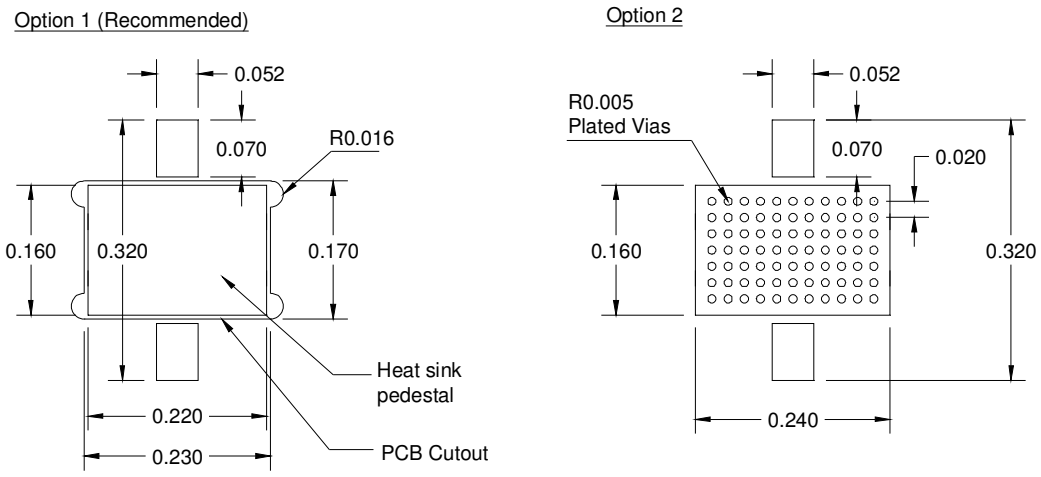
MOUNTING INSTRUCTIONS

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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