

DESCRIPTION

AMCOM's AM005WH2-BI-R is a part of the BI series of GaAs HiFETs. The HiFET is a partially matched device configuration for high voltage, high power and broadband applications. This part has a total device periphery of 1mm (Two 0.5mm FETs in series). The AM005WH2-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 (BI-G) or straight (BI) 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.



FEATURES

- High Frequency Operation up to 12 GHz
- High Gain & High Power, $P_{1dB}=26$ dBm @3.5 GHz
- 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, ($V_{dd} = 14V$, $I_{dq} = 75mA$)

Parameters	MIN	TYP
P_{1dB}^* (dBm)	25	26
Eff @ P_{1dB}	-	37%
P_{3dB}^* (dBm)	26	27
Eff @ P_{3dB}	-	42%
Small Signal Gain (dB)	17.5	20
IP3 (dBm)	-	36

ABSOLUTE MAXIMUM RATING

Parameters	Symbol	Rating
Drain-Source Voltage (V)	V_{dd}	18
Gate-Source Voltage (V)	V_{gs}	-5
Drain Current (A)	I_{ds}	0.18
Continuous Dissipation At Room Temp. (W)	P_t	2.0
Operating Temp. ($^{\circ}C$)	T_A	-55 to +85
Max. Channel Temp. ($^{\circ}C$)	T_{ch}	+175

DC PARAMETERS

Parameters	Conditions	MIN	TYP	MAX
Saturation Current I_{dss} (A)	$V_{dd}=6V$, $V_{gs}=0V$	0.12	0.15	0.18
Pinch-off Voltage V_p (V)	$V_{dd}=6V$, $I_{ds}=2.5\% I_{dss}$	-2.2	-1.7	-1.2
Drain to Gate Breakdown Voltage BV_{gd} (V)	$I_{dg} = 0.5mA$	22	30	
Thermal Resistance ($^{\circ}C/W$)			100	

*Note: There is an internal DC resistor from output to ground, therefore leakage gate current should be measured only at input lead.

AMCOM Communications, Inc.

LINEAR DATA *

S-parameters at 14 V, 50mA *

Freq(GHz)	MAG(S11)	ANG(S11)	MAG(S21)	ANG(S21)	MAG(S12)	ANG(S12)	MAG(S22)	ANG(S22)
0.1	0.999	-7.67	10.63	173.55	0.001	75.4	0.852	-3.81
0.2	0.995	-14.41	10.393	167.4	0.004	71.66	0.849	-7.27
0.3	0.99	-21.14	10.175	161.37	0.006	67.48	0.846	-10.73
0.4	0.985	-27.85	9.975	155.44	0.007	62.87	0.844	-14.16
0.5	0.979	-34.55	9.793	149.62	0.008	57.81	0.843	-17.59
0.6	0.973	-41.23	9.629	143.91	0.009	52.32	0.842	-21
0.7	0.966	-47.57	9.431	138.36	0.01	46.41	0.84	-24.43
0.8	0.959	-54.15	9.22	132.7	0.011	42.39	0.835	-28
0.9	0.95	-60.39	8.976	127.2	0.011	36.94	0.83	-31.5
1	0.942	-66.69	8.727	121.73	0.012	31.8	0.827	-34.87
1.5	0.896	-94.69	7.404	96.89	0.014	15.82	0.823	-51.1
2	0.862	-112.61	6.233	77.46	0.014	1.61	0.835	-65.43
2.5	0.833	-129.93	5.391	59.86	0.014	-8.4	0.831	-77.23
3	0.8	-145.75	4.853	44.44	0.013	-15.62	0.835	-86.46
3.5	0.767	-160.81	4.407	29.39	0.012	-21.66	0.84	-95.26
4	0.737	-176.18	4.093	14.47	0.011	-22.13	0.846	-103.82
4.5	0.699	168.76	3.837	-0.3	0.009	-21.05	0.853	-112.27
5	0.659	153	3.63	-15.53	0.009	-5.77	0.863	-121.22
5.5	0.607	135.61	3.462	-31.29	0.01	4.6	0.874	-130.06
6	0.547	115.36	3.31	-47.51	0.013	10.44	0.892	-138.11
6.5	0.487	90.33	3.159	-64.37	0.018	7.89	0.908	-145.79
7	0.441	60.02	2.997	-81.34	0.023	0.12	0.923	-152.6
7.5	0.432	26.75	2.821	-98.37	0.029	-7.83	0.936	-159.01
8	0.463	-4.6	2.649	-114.83	0.036	-16.52	0.95	-165.27
8.5	0.52	-31.96	2.496	-131.11	0.044	-28.34	0.967	-172.13
9	0.588	-55.02	2.343	-147.25	0.051	-40.7	0.98	179.77
9.5	0.658	-74.49	2.199	-163.27	0.059	-52.87	0.992	170.59
10	0.723	-92.06	2.039	-179.12	0.066	-66.04	1	160.37
10.5	0.778	-106.48	1.892	165.56	0.072	-76.98	1.009	149.63
11	0.823	-118.71	1.764	151.17	0.08	-88.36	1.014	138.59
11.5	0.859	-129.15	1.694	137.28	0.088	-100.94	1.019	126.88
12	0.883	-138.6	1.678	123.14	0.097	-113.79	1.028	113.49

* S2P file downloadable from the web : <http://www.amcomusa.com/products/rftrans.html>

Note: The device is conditional stable at high frequencies, please pay attention to amplifier design.

AMCOM Communications, Inc.

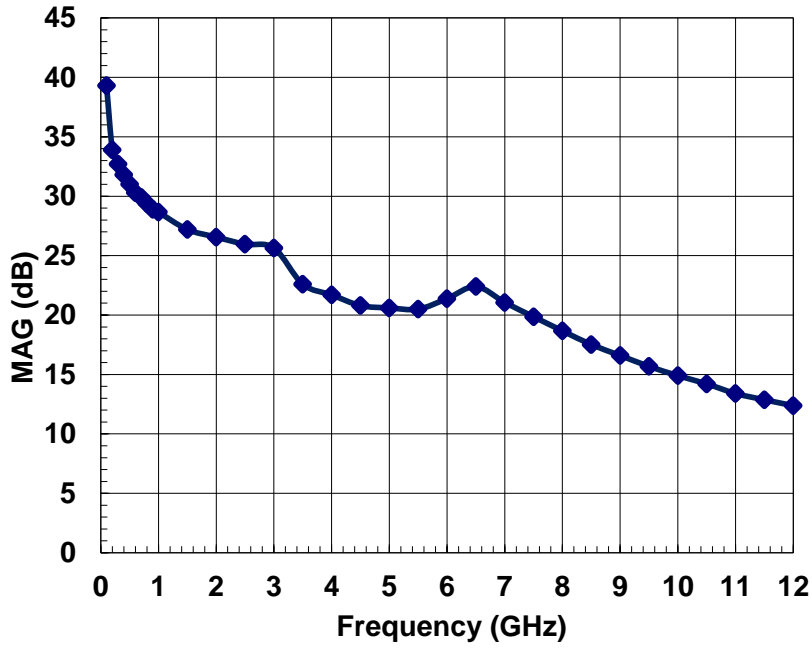
S-parameters at 14 V, 75mA *

Freq(GHz)	MAG(S11)	ANG(S11)	MAG(S21)	ANG(S21)	MAG(S12)	ANG(S12)	MAG(S22)	ANG(S22)
0.1	0.999	-7.62	10.599	173.58	0.002	75.40	0.854	-3.81
0.2	0.994	-14.39	10.358	167.43	0.004	71.68	0.849	-7.25
0.3	0.989	-21.07	10.114	161.43	0.006	67.40	0.846	-10.67
0.4	0.983	-27.71	9.899	155.54	0.007	62.58	0.845	-14.07
0.5	0.978	-34.31	9.710	149.76	0.007	57.20	0.845	-17.46
0.6	0.973	-40.87	9.550	144.1	0.009	51.28	0.845	-20.85
0.7	0.967	-47.24	9.364	138.58	0.010	45.66	0.845	-24.22
0.8	0.960	-53.77	9.157	132.92	0.010	42.82	0.839	-27.79
0.9	0.951	-59.89	8.915	127.47	0.011	36.76	0.835	-31.24
1	0.944	-66.16	8.674	121.99	0.012	32.35	0.832	-34.63
1.5	0.897	-94.18	7.376	97.19	0.013	15.25	0.829	-50.77
2	0.864	-112.17	6.257	77.76	0.014	3.82	0.837	-65.22
2.5	0.835	-129.45	5.416	60.14	0.014	-8.11	0.834	-77.01
3	0.804	-145.18	4.872	44.68	0.013	-16.01	0.840	-86.37
3.5	0.772	-160.17	4.432	29.59	0.011	-21.25	0.845	-95.02
4	0.741	-175.51	4.119	14.77	0.010	-21	0.850	-103.52
4.5	0.703	169.48	3.865	0.04	0.009	-20.50	0.856	-111.96
5	0.664	153.77	3.657	-15.19	0.008	-3.73	0.867	-120.93
5.5	0.613	136.52	3.487	-30.93	0.010	7.04	0.880	-129.83
6	0.553	116.43	3.337	-47.11	0.013	12.47	0.897	-137.86
6.5	0.492	91.63	3.188	-63.98	0.018	9.77	0.913	-145.48
7	0.445	61.45	3.029	-80.94	0.023	2.85	0.928	-152.26
7.5	0.435	28.35	2.853	-97.99	0.029	-5.4	0.943	-158.66
8	0.463	-3.17	2.680	-114.48	0.036	-14.53	0.957	-164.91
8.5	0.519	-30.81	2.529	-130.76	0.044	-26.63	0.975	-171.75
9	0.586	-54.29	2.372	-146.95	0.052	-39.09	0.991	-179.83
9.5	0.658	-73.67	2.230	-162.95	0.060	-51.22	1.005	171.04
10	0.722	-91.51	2.065	-178.78	0.067	-64.62	1.015	160.85
10.5	0.778	-106.08	1.915	165.92	0.072	-75.81	1.025	150.16
11	0.822	-118.41	1.788	151.66	0.081	-86.86	1.033	139.14
11.5	0.858	-128.85	1.717	137.87	0.089	-99.42	1.044	127.56
12	0.882	-138.31	1.701	123.93	0.098	-112.3	1.06	114.33

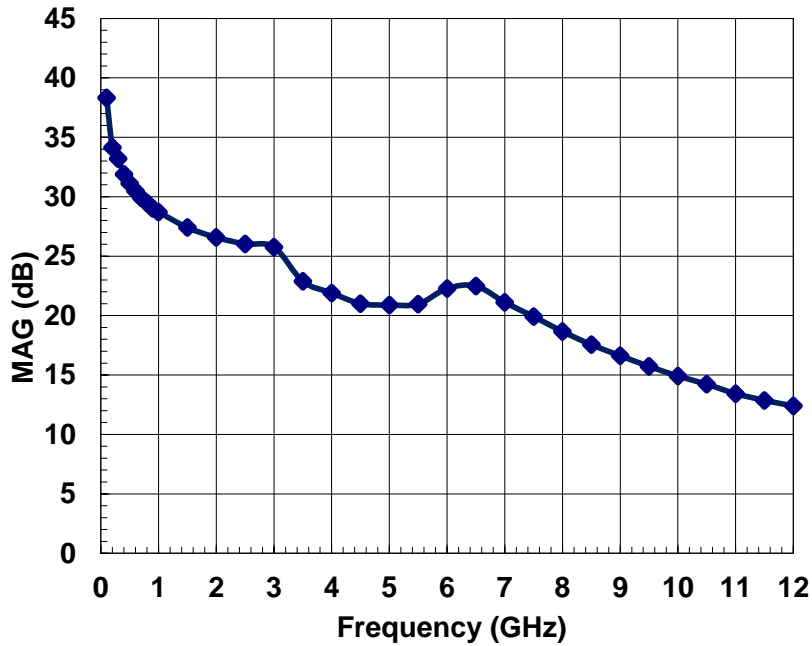
* S2P file downloadable from the web : <http://www.amcomusa.com/products/rftrans.html>

Note: The device is conditional stable at high frequencies, please pay attention to amplifier design.

MAXIMUM AVAILABLE GAIN (14V,75mA)



MAXIMUM AVAILABLE GAIN (14V,75mA)

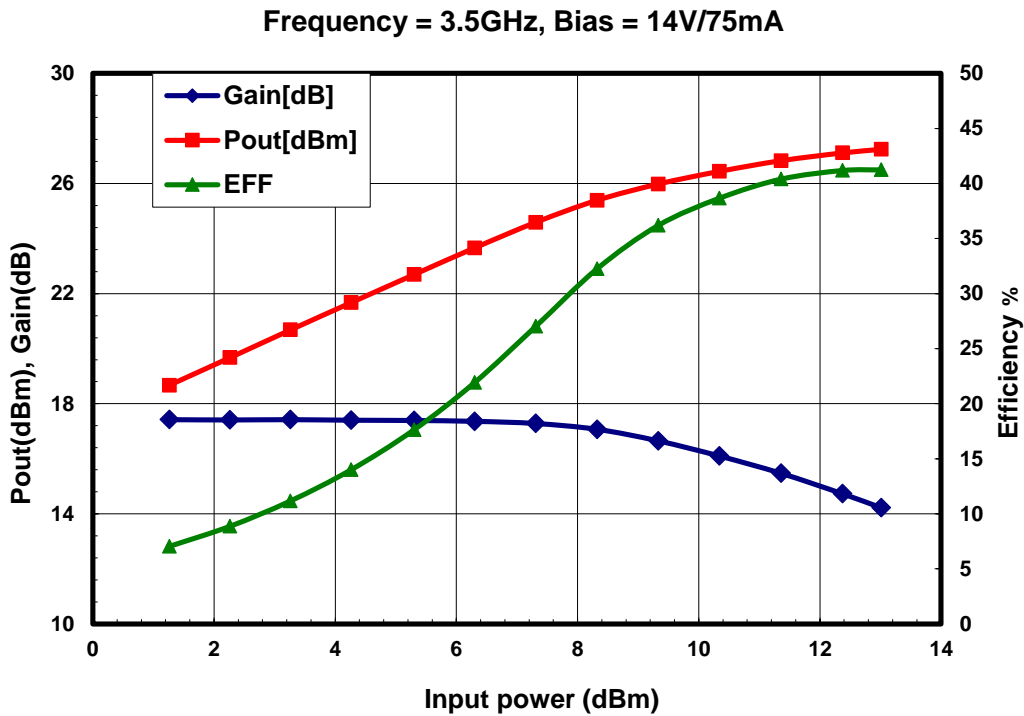


AMCOM Communications, Inc.

POWER MEASUREMENTS

OPTIMUM LOAD TEST (14V/75mA)

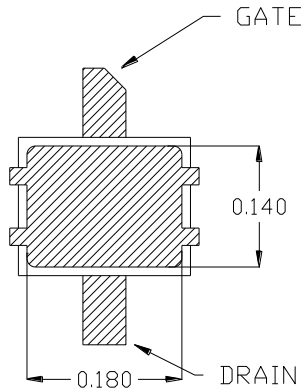
Frequency	MAG(Γ_L)	ANG(Γ_L)	Gain (dB)	P _{1dB} (dBm)	Eff @ P _{1dB}	P _{3dB} (dBm)	Eff @ P _{3dB}
2 GHz	0.54	59	23	26.3	39%	27.6	50%
3.5 GHz	0.64	99	20	26	37%	27	42%
4 GHz	0.67	101	19	25.9	36%	26.8	40%
6 GHz	0.71	130	17	26.5	38%	28	44%
8 GHz	0.75	169	12	26.9	40%	28	45%
10 GHz	0.66	-160	10	25.8	33%	26.3	34%



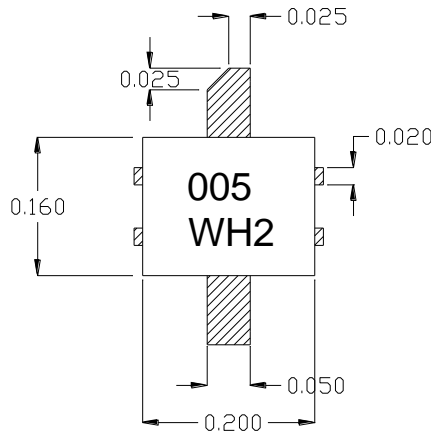
AMCOM Communications, Inc.

PACKAGE OUTLINE

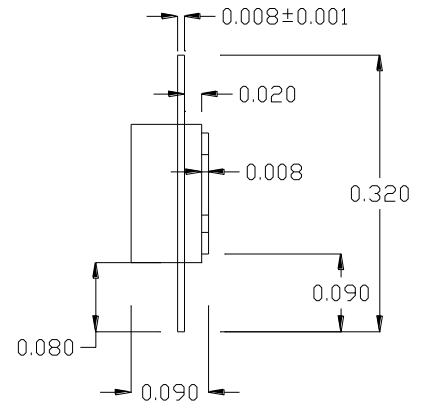
Bottom View



Top View



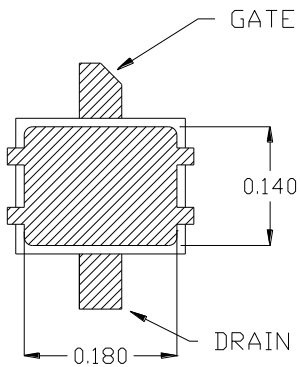
Side View



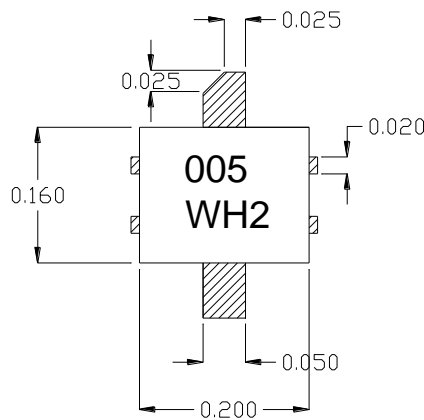
* All Dimensions are in inch

AM005WH2-BI-R (Straight leads)

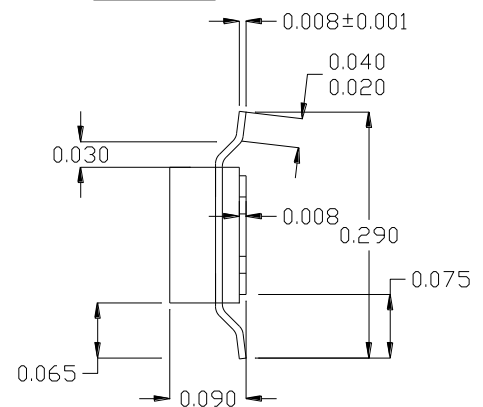
Bottom View



Top View



Side View



* All Dimensions are in inch

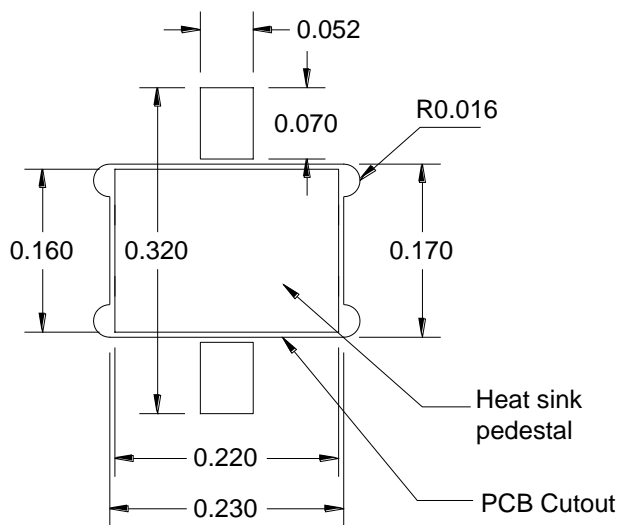
AM005WH2-BI-G-R (Bent leads)

AMCOM Communications, Inc.

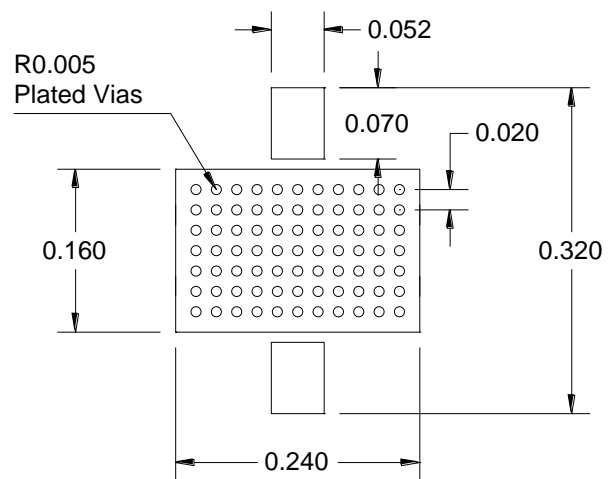
MOUNTING INSTRUCTIONS

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.

Option 1 for Straight Leads (Recommended)



Option 2 for Bent Leads



* All Dimensions are in inch