

DESCRIPTION

AMCOM's AM020WH2-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 4mm (Two 2mm FETs in series). The AM020WH2-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, $P_{1dB}=33$ dBm @ 4 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 @ 4 GHz, ($V_{dd} = 14V$, $I_{ds} = 0.3A$)

Parameters	MIN	TYP
P_{1dB}^* (dBm)	32	33
Eff @ P_{1dB}	-	43%
P_{3dB}^* (dBm)	33	34
Eff @ P_{3dB}	-	48%
Small Signal Gain (dB)	16	18
IP3 (dBm)	-	43

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}	0.8
Continuous Dissipation At Room Temp. (W)	P_t	5.5
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)	$V_{dd}=6V$, $V_{gs}=0V$	0.4	0.6	0.8
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)	$I_{dg} = 2mA$	22	30	
Thermal Resistance ($^{\circ}C/W$)			26	

*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, 0.2 A *

Freq(GHz)	MAG(S11)	ANG(S11)	MAG(S21)	ANG(S21)	MAG(S12)	ANG(S12)	MAG(S22)	ANG(S22)
0.1	0.992	-23.69	34.162	164.34	0.004	73.52	0.511	-12.37
0.2	0.957	-43.82	31.161	151.89	0.007	60.82	0.474	-18.91
0.3	0.927	-61.78	28.379	140.64	0.009	49.40	0.443	-24.41
0.4	0.903	-77.57	25.816	130.61	0.011	39.27	0.420	-28.94
0.5	0.884	-91.19	23.471	121.78	0.012	30.41	0.404	-32.42
0.6	0.871	-102.64	21.345	114.16	0.013	22.85	0.394	-34.87
0.7	0.862	-112.12	19.467	107.38	0.013	16.87	0.391	-37.08
0.8	0.855	-120.52	17.797	101.11	0.013	12.05	0.390	-39.68
0.9	0.850	-127.64	16.33	95.43	0.013	7.05	0.393	-42.73
1	0.846	-133.99	15.046	90.04	0.012	4.83	0.402	-45.81
1.5	0.837	-156.59	10.575	67.82	0.011	-4.57	0.468	-63.65
2	0.831	-168.8	8.166	51.25	0.009	-4.84	0.534	-78.53
2.5	0.828	179.94	6.616	35.74	0.008	2.11	0.576	-92.27
3	0.823	169.11	5.629	21.65	0.008	16.37	0.613	-104.03
3.5	0.816	158.94	4.913	7.76	0.009	34.32	0.647	-115.27
4	0.812	148.41	4.380	-5.93	0.012	43.45	0.679	-126.09
4.5	0.804	138.06	3.979	-19.21	0.016	45.36	0.708	-136
5	0.797	127.5	3.669	-32.61	0.021	42.40	0.737	-145.9
5.5	0.786	116.38	3.452	-46.04	0.027	36.48	0.760	-154.95
6	0.768	104.27	3.328	-59.86	0.035	30.36	0.783	-163.45
6.5	0.748	89.72	3.278	-74.55	0.045	21.02	0.804	-172.23
7	0.730	72.22	3.285	-90.35	0.058	10.28	0.826	178.41
7.5	0.719	52.35	3.305	-107.59	0.073	-2.34	0.853	167.56
8	0.729	30.07	3.329	-126.08	0.090	-16.44	0.886	154.79
8.5	0.768	8.38	3.345	-145.51	0.111	-32.17	0.923	139.39
9	0.827	-11.82	3.370	-166.45	0.134	-50.66	0.968	119.75
9.5	0.905	-30.76	3.367	170.48	0.156	-70.99	1.005	94.71
10	0.992	-50.23	3.260	144.21	0.176	-93.89	1.038	63.71
10.5	1.050	-70.26	2.947	115.19	0.182	-119.14	1.053	27.31
11	1.060	-89.55	2.413	86.35	0.170	-144.96	1.050	-10.03
11.5	1.040	-106.04	1.832	60.65	0.145	-167.79	1.030	-42.54
12	1.005	-119.32	1.347	39.25	0.120	175.1	1.018	-68.52

* 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.

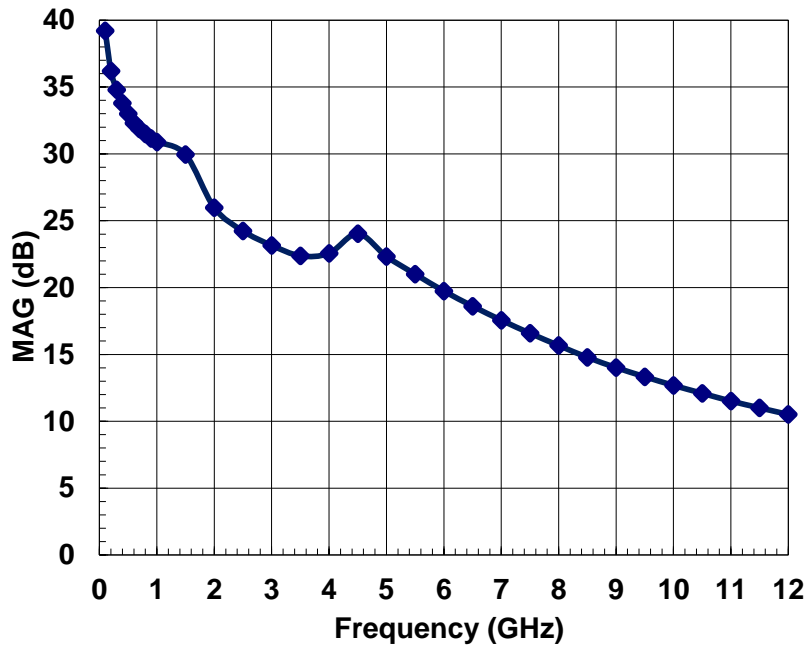
S-parameters at 14 V, 0.3A *

Freq(GHz)	MAG(S11)	ANG(S11)	MAG(S21)	ANG(S21)	MAG(S12)	ANG(S12)	MAG(S22)	ANG(S22)
0.1	0.992	-23.48	34.149	164.91	0.004	80.57	0.516	-10.95
0.2	0.958	-43.48	31.179	152.43	0.007	64.78	0.483	-17.32
0.3	0.928	-61.34	28.425	141.14	0.009	51.07	0.457	-22.74
0.4	0.905	-77.05	25.887	131.06	0.011	39.44	0.437	-27.22
0.5	0.886	-90.62	23.565	122.17	0.011	29.89	0.423	-30.76
0.6	0.873	-102.05	21.459	114.48	0.012	22.41	0.416	-33.35
0.7	0.862	-111.49	19.576	107.63	0.012	16.73	0.414	-35.62
0.8	0.857	-119.97	17.909	101.25	0.012	12.7	0.414	-38.34
0.9	0.851	-127.09	16.43	95.54	0.012	7.66	0.416	-41.55
1	0.847	-133.5	15.142	90.12	0.012	4.68	0.426	-44.69
1.5	0.836	-156.12	10.633	67.68	0.01	-6.39	0.488	-62.7
2	0.833	-168.46	8.205	50.99	0.009	-3.3	0.55	-77.84
2.5	0.83	-179.78	6.646	35.43	0.007	5.49	0.593	-91.52
3	0.824	169.42	5.651	21.22	0.007	21.34	0.63	-103.49
3.5	0.817	159.18	4.931	7.32	0.008	39.33	0.663	-114.68
4	0.813	148.68	4.393	-6.37	0.012	47.04	0.693	-125.51
4.5	0.806	138.36	3.988	-19.77	0.016	48.64	0.724	-135.5
5	0.799	127.81	3.675	-33.2	0.021	44.9	0.754	-145.46
5.5	0.786	116.74	3.456	-46.71	0.028	38.79	0.777	-154.49
6	0.771	104.54	3.334	-60.51	0.036	32.23	0.802	-163.04
6.5	0.75	90	3.284	-75.26	0.046	22.89	0.824	-171.85
7	0.732	72.67	3.291	-91.01	0.058	11.77	0.85	178.72
7.5	0.724	52.67	3.317	-108.28	0.074	-0.47	0.88	167.86
8	0.733	30.49	3.346	-126.83	0.092	-14.7	0.917	155.11
8.5	0.771	8.68	3.371	-146.37	0.114	-30.59	0.962	139.6
9	0.831	-11.4	3.406	-167.4	0.138	-49.1	1.018	120.05
9.5	0.918	-30.53	3.426	169.15	0.162	-69.83	1.068	94.86
10	0.999	-50.26	3.322	142.32	0.183	-93.12	1.114	63.64
10.5	1.061	-70.53	3	112.54	0.19	-119.41	1.131	27.02
11	1.071	-90.09	2.433	82.96	0.177	-145.98	1.113	-10.82
11.5	1.043	-106.62	1.822	56.97	0.149	-168.91	1.081	-43.29
12	1.004	-119.7	1.328	35.47	0.122	173.9	1.054	-68.95

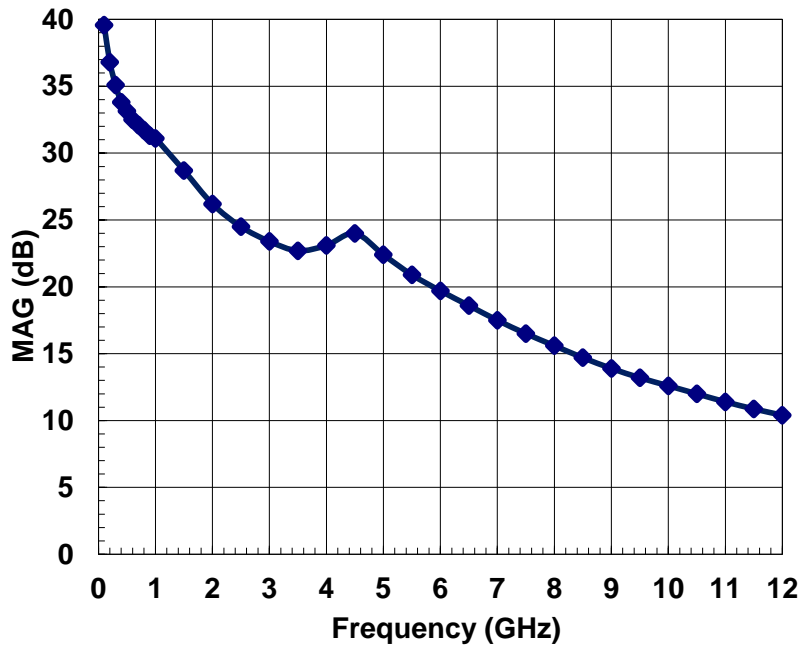
* S2P file downloadable from the web : <http://www.amcomusa.com/products/rftrans.html>

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

MAXIMUM AVAILABLE GAIN (14V,0.2A)



MAXIMUM AVAILABLE GAIN (14V,0.3A)

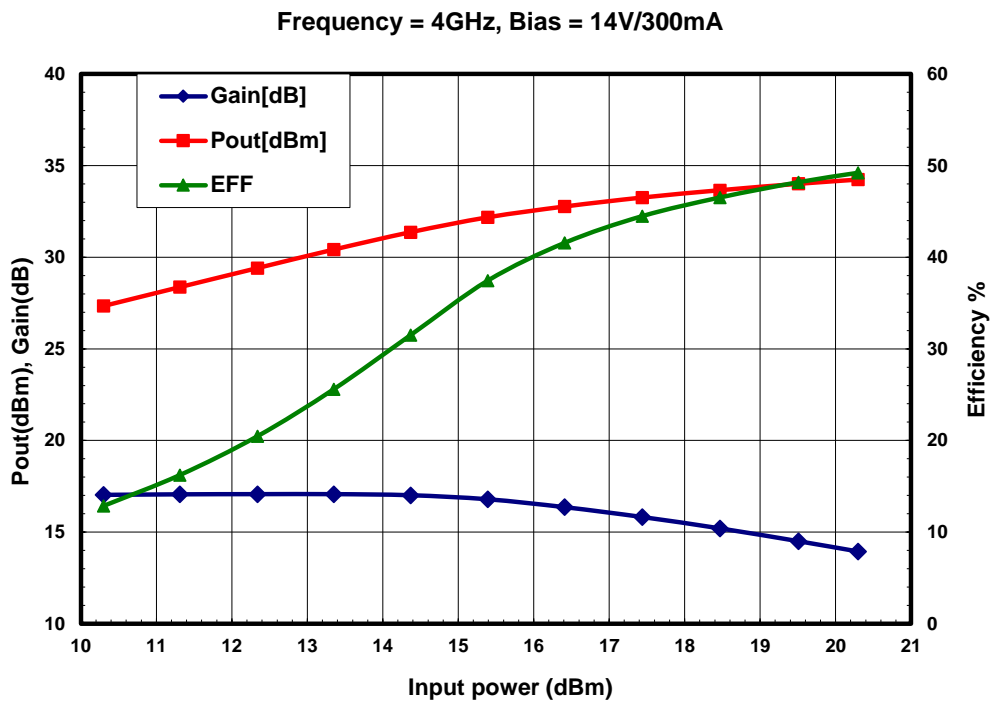


AMCOM Communications, Inc.

POWER MEASUREMENTS

OPTIMUM LOAD TEST (14V/300mA)

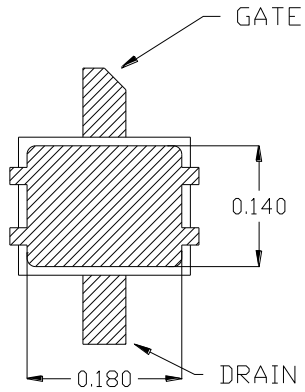
Frequency	MAG(Γ_L)	ANG(Γ_L)	Gain (dB)	P _{1dB} (dBm)	Eff @ P _{1dB}	P _{3dB} (dBm)	Eff @ P _{3dB}
2 GHz	0.24	127	22	33.2	44%	33.7	50%
3.5 GHz	0.28	123	19	33.4	45%	34.5	51%
4 GHz	0.29	148	18	33	43%	34.2	48%
6 GHz	0.25	169	15	33	40%	34.1	43%
8 GHz	0.34	-124	11	32.5	37%	33	38%
10 GHz	0.15	-40	10	31.4	30%	32.2	31%



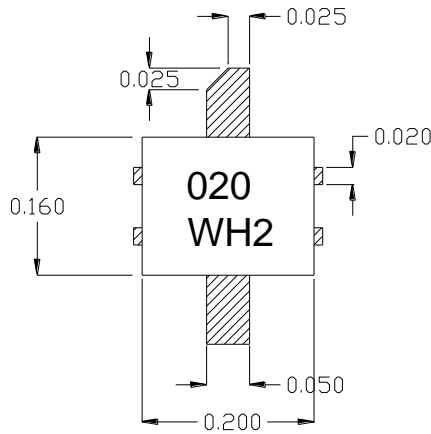
AMCOM Communications, Inc.

PACKAGE OUTLINE

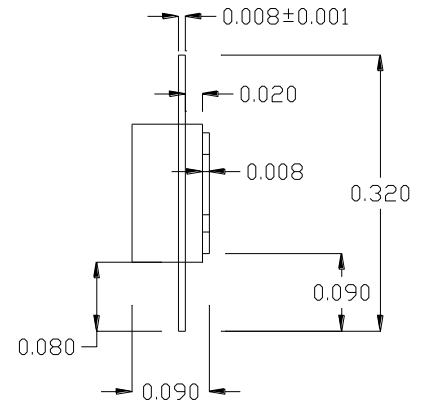
Bottom View



Top View



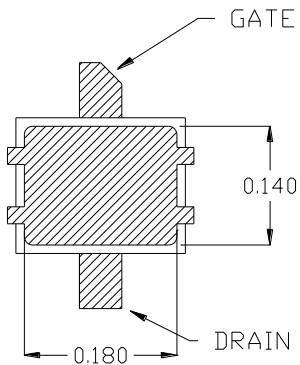
Side View



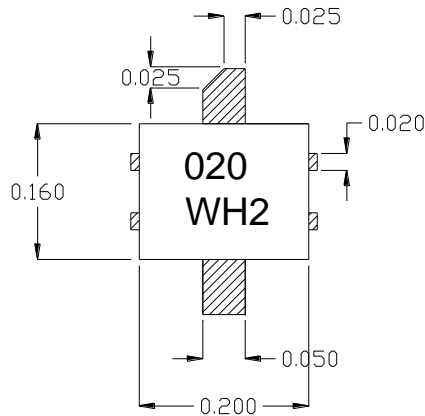
* All Dimensions are in inch

AM020WH2-BI-R (Straight Leads)

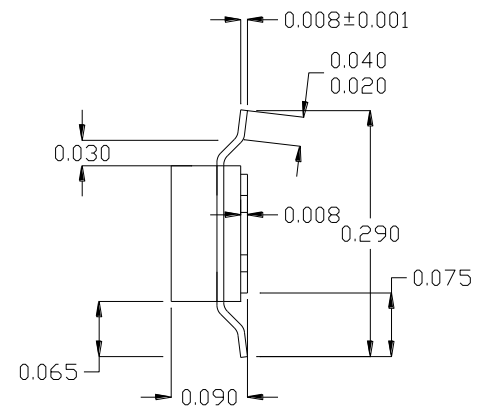
Bottom View



Top View



Side View



* All Dimensions are in inch

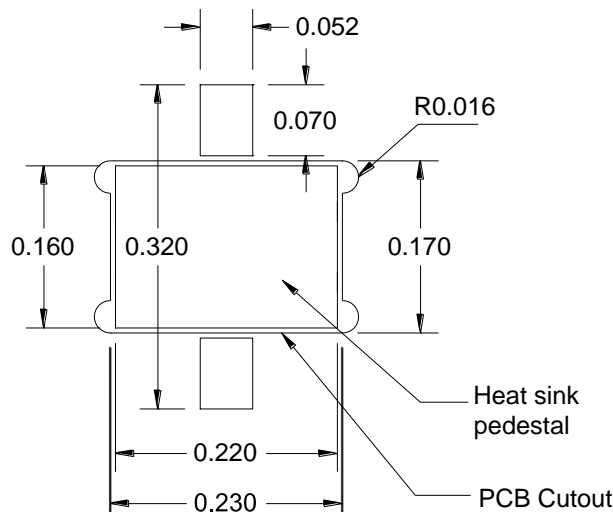
AM020WH2-BI-G-R (Bent Leads)

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

