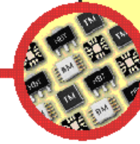
AMCOM COMMUNICATIONS
The RF Power House

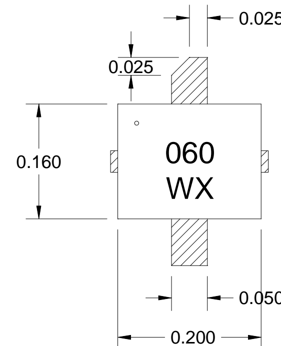
Ceramic Package GaAs Power pHEMT
DC-10 GHz

AM060WX-BI-R
Aug 2010
Rev 1



DESCRIPTION

AMCOM's AM060WX-BI-R is part of the BI series of GaAs pHEMTs. This part has a total gate width of 6mm. The AM060WX-BI-R is designed for high power microwave applications, operating up to 10GHz. The BI series is in a ceramic package with leads bent in a surface mounting style on PC Board. The bottom of the package serves simultaneously as DC ground, RF ground, and thermal path. For frequencies above 5GHz, we recommend to mount the device directly on a metal heat sink, which is also RF ground, to avoid the inductance of via holes on PCB. This part is RoHS Compliant.



FEATURES

- High Frequency Operation up to 10GHz
- High Gain & High Power, P_{1dB}=35.5dBm @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 @ 3.5GHz, (V_{ds} = 8V, I_{ds} = 0.6A)

Parameters	MIN	TYP
P_{1dB}^{*} (dBm)	34	35.5
Eff @ P_{1dB}	40%	50%
Small Signal Gain (dB)	10.5	12
IP3 (dBm)	45	47

* Power typically remains the same as frequency changes.

ABSOLUTE MAXIMUM RATING

Parameters	Sym	Rating
Drain-Source Voltage (V)	V_{ds}	10
Gate-Source Voltage (V)	V_{gs}	-5
Drain Current (A)	I_{ds}	1.8
Continuous Dissipation At Room Temp. (W)	P_t	11.5
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}=3V, Vgs=0V	1.2	1.8	2.4
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	15	20	
Thermal Resistance (°C/W)			13	

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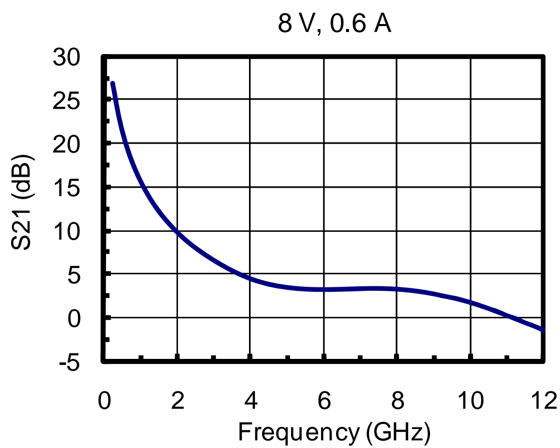
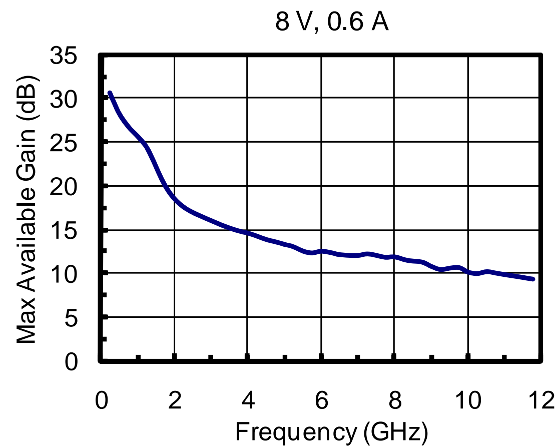
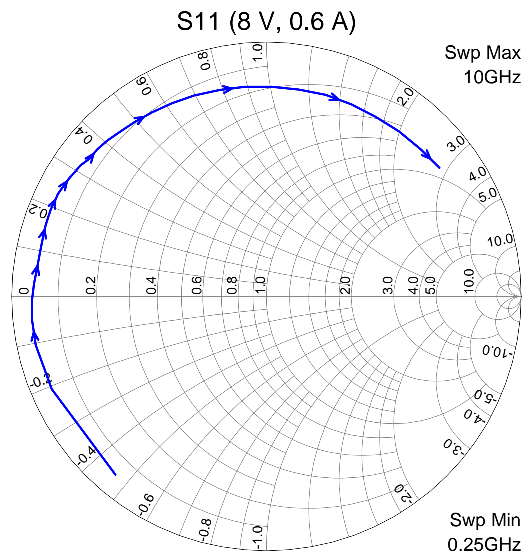
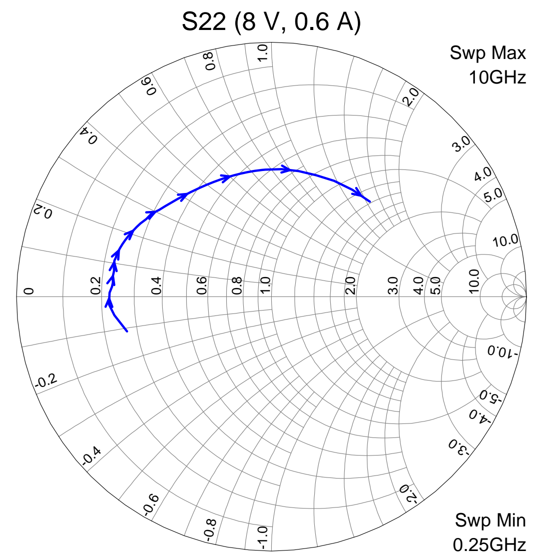
S-Parameters for AM060WX-BI-R @ 8V, 0.6A (S2P file downloadable from the Web)

Freq (GHz)	MAG (S11)	ANG (S11)	MAG (S21)	ANG (S21)	MAG (S12)	ANG (S12)	MAG (S22)	ANG (S22)
1.00	0.92	-174.54	6.15	79.97	0.01	19.32	0.64	178.56
2.00	0.91	171.10	3.11	61.00	0.02	40.68	0.63	171.96
3.00	0.91	162.12	2.14	44.55	0.03	45.45	0.63	167.03
4.00	0.91	154.72	1.68	29.38	0.03	40.04	0.62	162.27
5.00	0.90	149.13	1.50	14.25	0.04	35.35	0.60	153.32
6.00	0.88	139.04	1.45	-3.20	0.06	26.44	0.56	142.25
7.00	0.85	121.74	1.47	-24.70	0.08	11.50	0.52	127.21
8.00	0.83	95.96	1.46	-50.96	0.09	-9.20	0.50	105.99
9.00	0.83	66.18	1.37	-79.99	0.10	-33.62	0.51	77.87
10.00	0.85	36.65	1.23	-109.85	0.11	-59.17	0.54	44.11





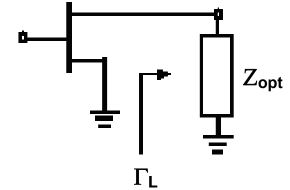


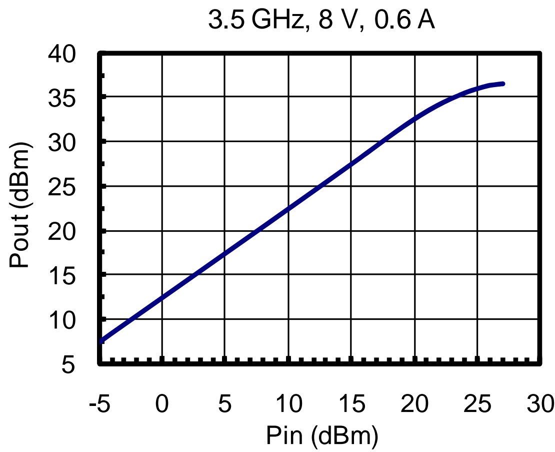


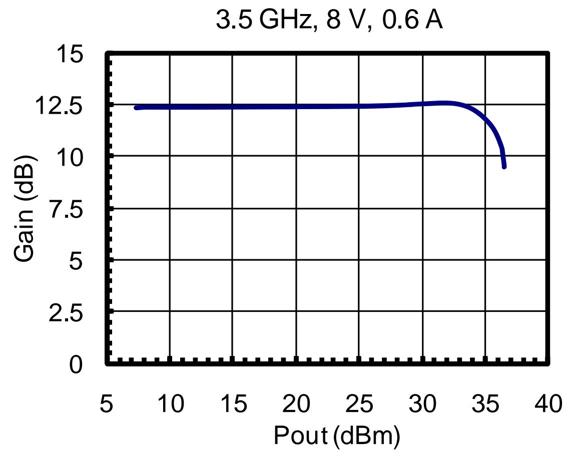
POWER DATA

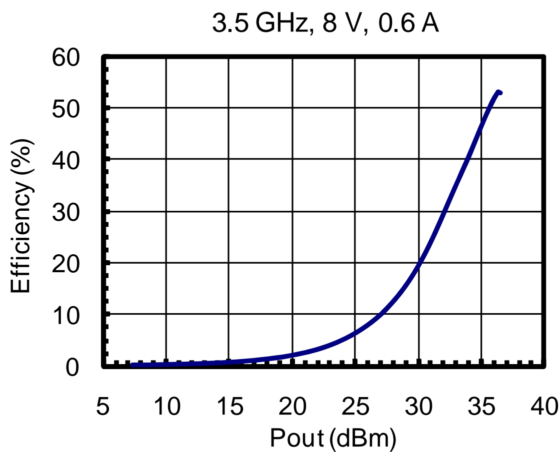
Optimum Load

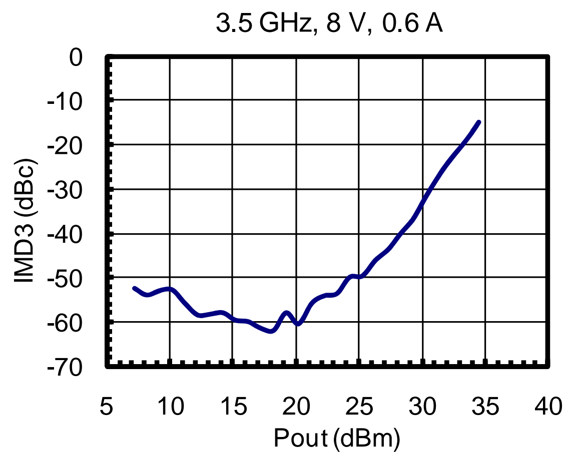
Freq (GHz)	MAG(Γ$_L$)	ANG(Γ$_L$)
1.00	0.76	-171.91
2.00	0.75	-163.26
3.00	0.76	-154.49
4.00	0.75	-146.34
5.00	0.73	-134.67
6.00	0.71	-118.40
7.00	0.69	-105.91
8.00	0.68	-89.90
9.00	0.67	-61.62
10.00	0.65	-31.37



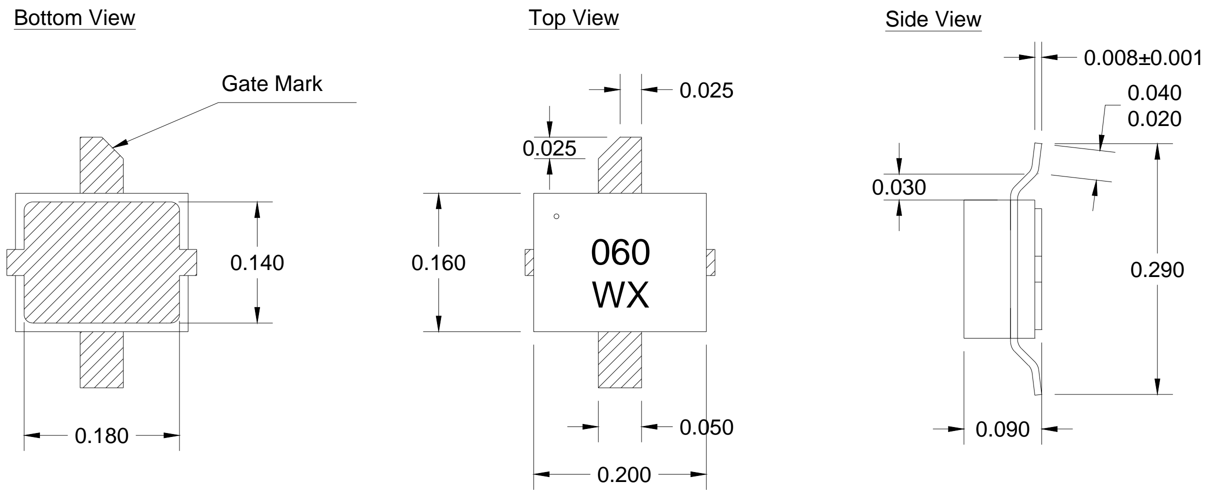








PACKAGE OUTLINE



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.