MHA-054020-89

50 - 4000 MHz Cascadable InGaP HBT MMIC Amplifier
Preliminary Data Sheet
June 2008

Features:

- **Wideband: 50 to 4000 MHz**
- **Medium Output Power: 20 dBm P1dB up to 2200 MHz**
- **Excellent Linearity: 40 dBm OIP3**
- **Gain: 18 dB up to 2700 MHz**
- **Excellent Gain Flatness: +/- 0.2 up to 3500 MHz**
- **Single +5V Supply With On-Chip Active-Bias For Ease Of Operation**
- **Lead Free RoHS Compliant Surface-Mount SOT-89 Package**

Applications:

- **WiMax**
- **Wireless IPTV**
- **Cellular/PCS/3G Base Stations**
- **Microwave Radios**
- **CATV/Cable Modem**
- **Instrumentations**
- **Homeland Security**
- **General Purpose Gain Block**

Description:

The MHA-054020-89 is a broadband cascadable MMIC amplifier utilizing high-reliability InGaP/GaAs HBT technology. Packaged in low cost SOT-89 lead-free Green Package, the MMIC is ideally suited for driver amplifier or gain block in wireless applications such as Cellular, PCS, GSM and UMTS base stations as well as CATV, wireless IPTV, microwave radio, instrumentation, homeland security systems etc. It has excellent linearity and gain flatness over a broad frequency range. The third order intercept point performance is excellent, typically 19 dB above P-1dB below 500 MHz and 18 dB above P-1dB @ 900 MHz. It has on-chip bias circuit to provide bias stability and ease of use.

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Electrical Specifications: *@ Vcc=+5.0V, Icc=100mA, Ta=25 ℃ Z0=50 ohm* (1)

Parameter	Units	Typical	
Frequency Range	MHz	50-4000	
Gain	dB	18	50-2700 MHz
		17	2800 - 4000 MHz
Gain Flatness	+/-dB	0.75	
Input Return Loss	dB	18	900 MHz
		13	1950 MHz
		12	2700 MHz
Output Return Loss	dB	15	
Output P-1dB	dBm	20	<= 2200 MHz
		18.5	2700 MHz
		16.5	3500 MHz
		15.0	4000 MHz
Output IP3	dBm		
@ 5 dBm/tone,		40	< = 500 MHz
1 MHz separation < 2 GHz		38	900 MHz
		32	1950 MHz
@ 0 dBm/tone,		29	2500 MHz
1 MHz separation > 2 GHz		26	3500 MHz
Noise Figure	dB	4.5	< 1000 MHz
Operating Bias Conditions: Vcc	V	+ 5	
Icc	mA	100	

(1) All Data is measured on Evaluation PCB optimized for wideband (50-4000 MHz) performance referenced to RF connectors

Absolute Maximum Ratings:

SYMBOL	PARAMETERS	UNITS	ABSOLUTE MAXIMUM
Vcc	Collector Voltage	V	6
Icc	Collector Current	mA	125
Pdiss	DC Power Dissipation	W	TBD
Pin max	RF Input Power	dBm	TBD
Toper	Operating Case/Lead Temperature Range	°C	- 40 to + 85
Tch	Channel Temperature	°C	150
Tstg	Storage Temperature	°C	-60 to +150

*****Operation of this device above any one of these parameters may cause permanent damage.

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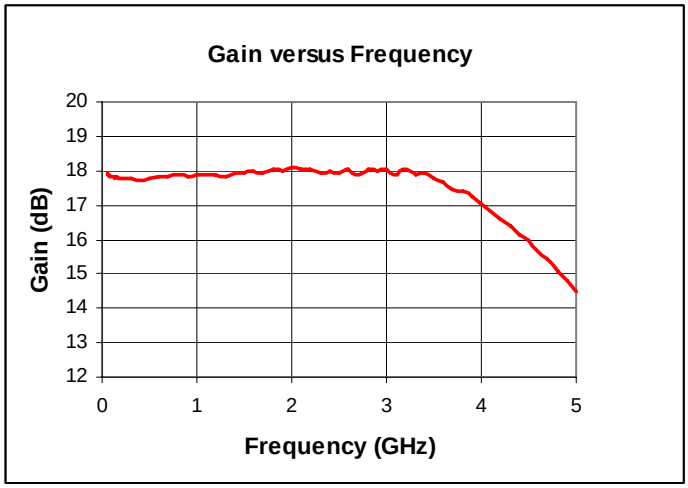
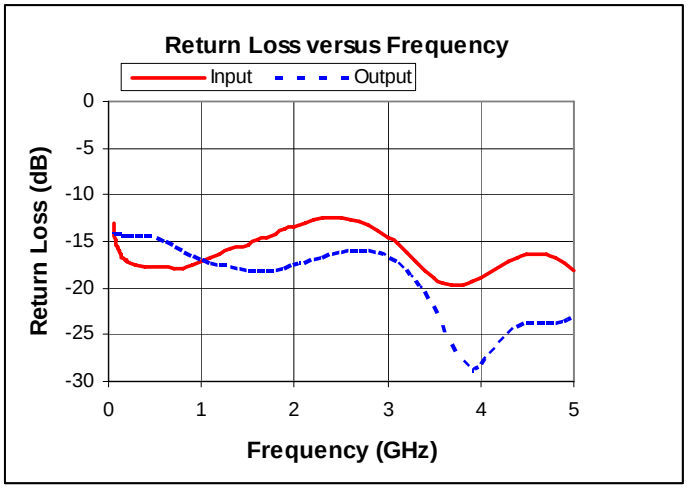
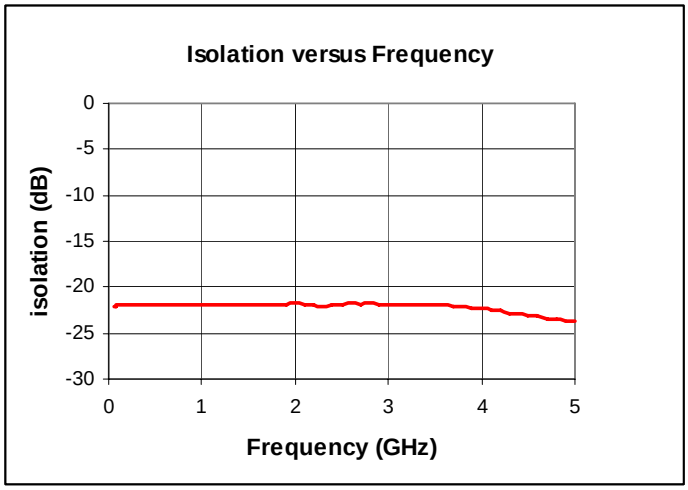
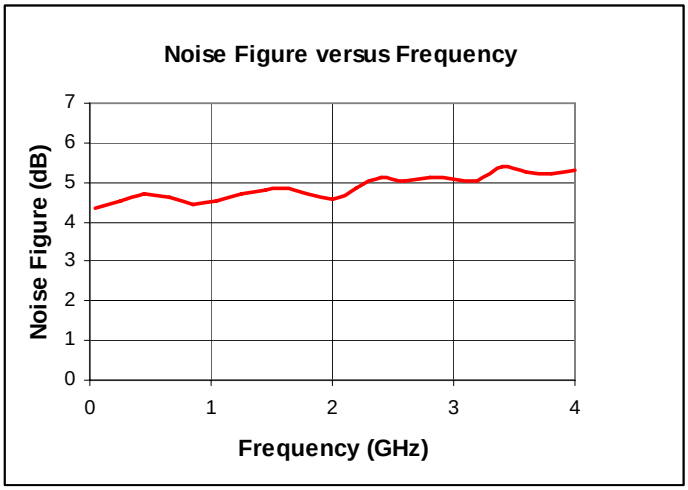
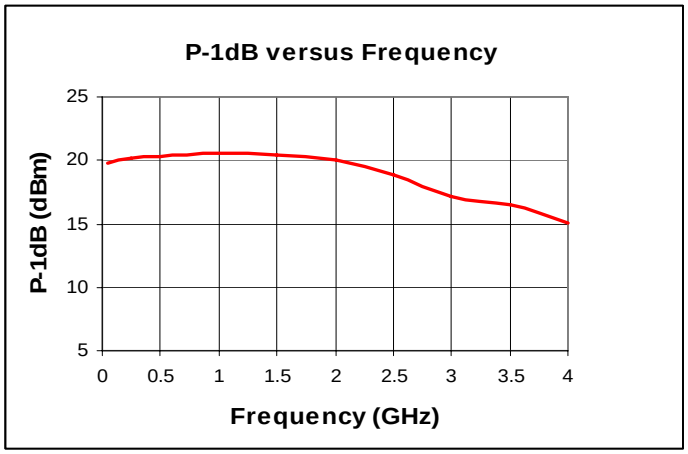
Typical RF Performance: *Vcc=5V, Icc=100mA, Ta=25 ℃ Z0 = 50 Ohm system on Evaluation PCB*

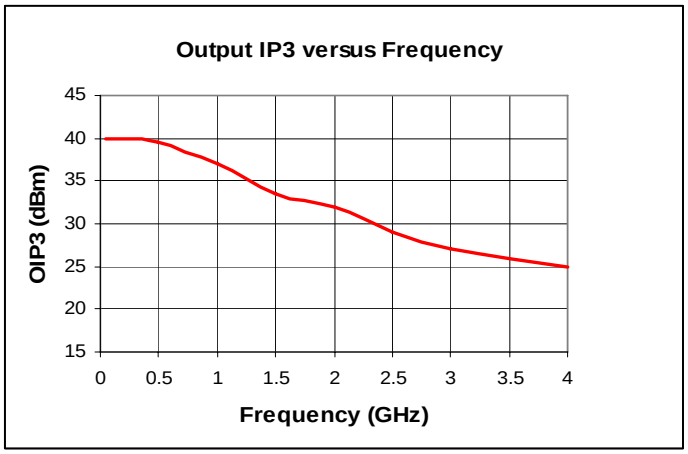












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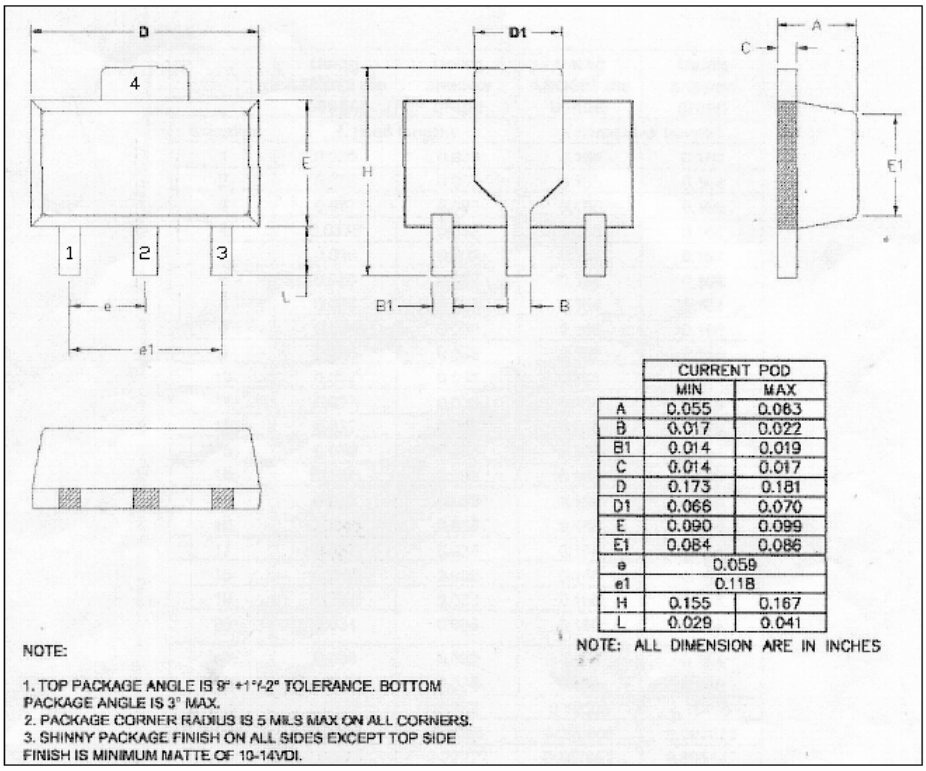
Mechanical Information:

This Package is RoHs-compliant lead free Green Package: SOT-89

Pin1: RF input, Needs DC blocking capacitor
Pin2/Pin4: RF/DC Ground, Must be Grounded Properly for Best Performance
Pin3: RF Output/ DC Bias Input, External DC blocking Capacitor required



	CURRENT POD	
	MIN	MAX
A	0.055	0.063
B	0.017	0.022
B1	0.014	0.019
C	0.014	0.017
D	0.173	0.181
D1	0.066	0.070
E	0.090	0.099
E1	0.084	0.086
e	0.059	
e1	0.118	
H	0.155	0.167
L	0.029	0.041

NOTE: ALL DIMENSION ARE IN INCHES

NOTE:

1. TOP PACKAGE ANGLE IS 9° +1°/-2° TOLERANCE. BOTTOM PACKAGE ANGLE IS 3° MAX.
2. PACKAGE CORNER RADIUS IS 5 MILS MAX ON ALL CORNERS.
3. SHINNY PACKAGE FINISH ON ALL SIDES EXCEPT TOP SIDE FINISH IS MINIMUM MATTE OF 10-14VDI.