

Rev. V1

**Active Doubler** 2.5-6.0/5.0-12.0 GHz Mimix Broadband

#### **Features**

- Octave Bandwidth Operation
- +16.0 dBm Output Power
- -35 dBc Fundamental Leakage
- +5.0V, 125mA Bias Supply
- 4x4 mm QFN Package
- 100% RF, DC and Output Power Testing
- RoHS\* Compliant and 260°C Reflow Compatible

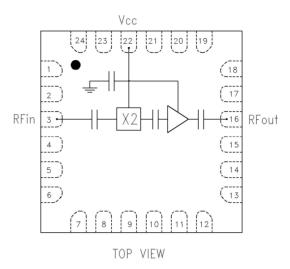
### **Description**

M/A-COM Tech's 2.5-6.0/5.0-12.0 GHz QFN active doubler delivers + 16 dBm of output power. The device combines an active doubler with an output buffer amplifier that delivers constant power over a range of input powers. The device has excellent rejection of the fundamental and harmonic products and requires a single positive bias supply. This device uses M/A-COM Tech's GaAs HBT device technology to ensure high reliability and uniformity. The device comes in a low-cost 4x4 mm QFN Surface Mount Plastic Package offering excellent RF and thermal properties and is RoHS compliant. This device is well suited for Point-to-Point Radio, LMDS. SATCOM and VSAT applications.

### **Ordering Information**

Part Number	Package
XX1002-QH-0G00	bulk quantity
XX1002-QH-0G0T	tape and reel
XX1002-QH-EV1	evaluation module

## **Functional Block Diagram**



## **Pin Configuration**

Pin No.	Function	Pin No.	Function
3	RF In	22	Vcc
16	RF Out		

### Absolute Maximum Ratings

Parameter	Absolute Max.		
Supply Voltage (Vcc)	+6.0 V		
Supply Current (Id)	200 mA		
Input Power (RF Pin)	+10.0 dBm		
Storage Temperature (Tstg)	-65 °C to +165 °C		
Operating Temperature (Ta)	-55 °C to +85 °C		
Junction Temperature (Tj) <sup>1</sup>	+150 °C		
Moisture Sensitivity Level	MSL3		

Junction temperature directly affects a device's MTTF. It is recommended to keep junction temperature as low as possible to maximize lifetime.



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### Electrical Specifications: 2.5-6.0 GHz (fin) (Ambient Temperature T = 25°C)

Parameter	Units	Min.	Тур.	Max.
Output Frequency Range (fout)	GHz	5.0	-	12.0
Input Return Loss (S11)	dB	-	-15	-
Output Return Loss (S22)	dB	-	-7	-
Saturated Output Power (Psat)	dBm	+14	+16.0	-
RF Input Power (RF Pin)	dBm	-3.0	-	+3.0
Fundamental Leakage (fin)	dBc	-	-35	-
Third Harmonic Leakage (3xfin)	dBc	-	-30	-
Fourth Harmonic Leakage (4xfin)	dBc	-	-20	-
Bias Voltage (Vcc)	VDC	-	+5.0	+5.5
Supply Current	mA	-	125	140

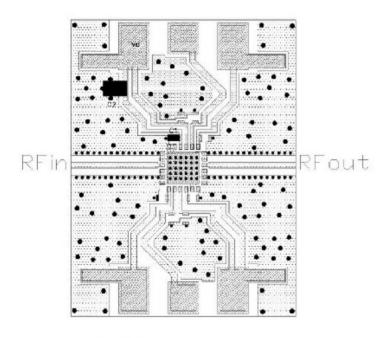
typical. Mechanical outline has been fixed. Engineering samples Commitment to produce in volume is not guarditeed.



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### **PCB Layout**



01: 1000pF

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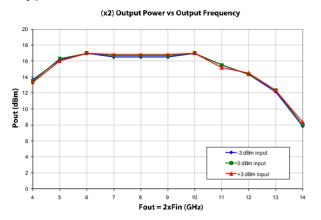
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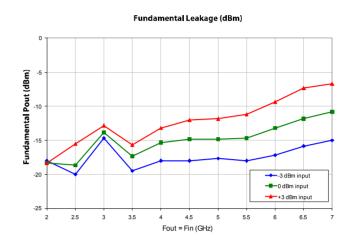


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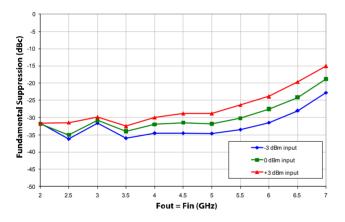
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## **Typical Performance Curves**

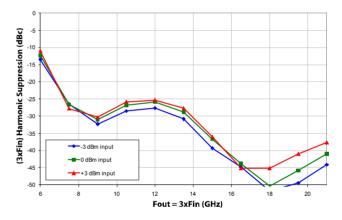




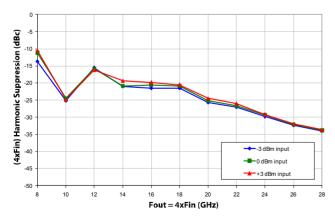
#### Fundamental Suppression (dBc) wrt Output Level



#### (3xFin) Harmonic Suppression (dBc) wrt Output Level



#### (4xFin) Harmonic Suppression wrt Output Level



is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed. PRELIMINARY: Data Sheets contain information regarding a product MIA-COM Technology Solutions has under development. Performance is based on engineering tests. Specifications are typical. Mechanical outline has been fixed. Engineering samples Commitment to produce in volume is not guar

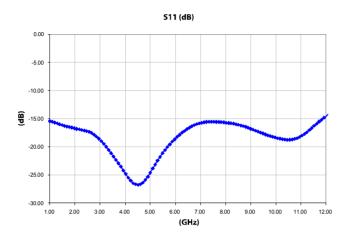
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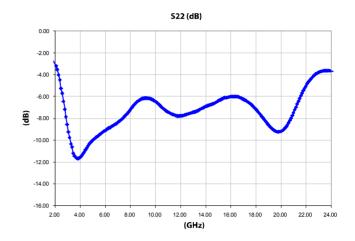


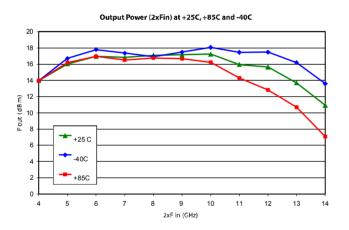
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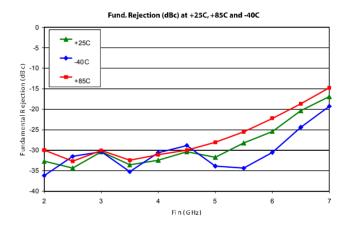
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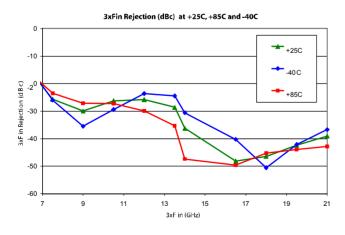
## **Typical Performance Curves (cont.)**

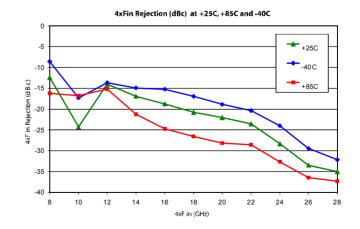












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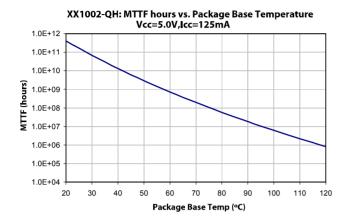
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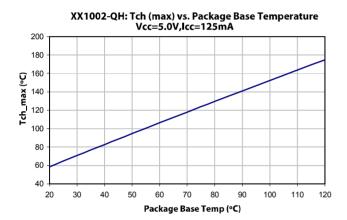
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### **MTTF**





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App Note [1] Biasing - The device is operated by biasing Vcc=5.0 V which will draw typically 125mA and a maximum of 140mA. The device requires by-passing as shown in the recommended layout with C1=1nF and C2=1µF.

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M/A-COM Technology Solutions income to a fiftiliates reserve the right to make changes for the product is on information contained herein without notice.

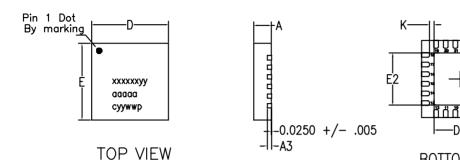
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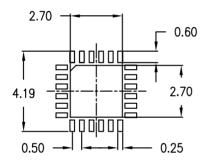
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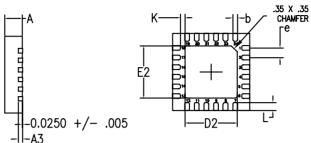
## Lead-Free Package Dimensions/Layout



PIN 1/BOM REV/Pb FREE SYM MIMIX PART/MODEL NO. WAFER LOT NUMBER DATE CODE

RECOMMENDED SOLDER PAD PITCH AND DIMENSIONS





**BOTTOM VIEW** 

#### NOTES:

1. DIMENSIONS ARE IN MM.

	MIN	TYP	MAX
Α	0.80	0.90	1.00
A3	0.20 REF		
b	0.20	0.25	0.30
K	0.20	_	-
D	4.00 BSC		
E	4.00 BSC		
е	0.50		
D2	2.45	2.60	2.75
E2	2.45	2.60	2.75
L	0.20	0.30	0.40

VIEWS ARE NOT TO SCALE: USE DIMENSIONS AND TABLE.

### **Handling Procedures**

Please observe the following precautions to avoid damage:

### **Static Sensitivity**

Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these class 2 devices.

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