

Active Doubler 2.5-6.0/5.0-12.0 GHz

Rev. V1
MimiX Broadband

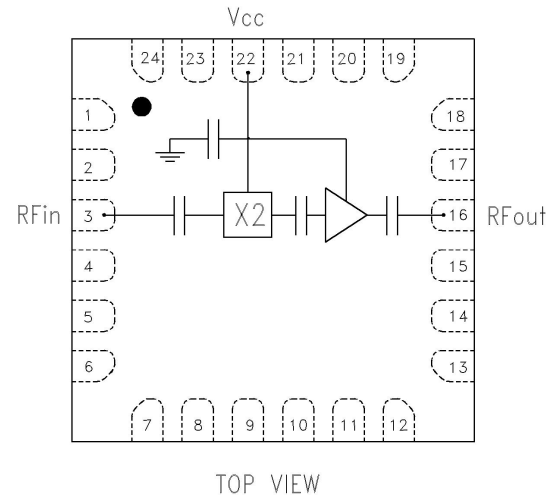
Features

- 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.

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) ¹	+150 °C
Moisture Sensitivity Level	MSL3

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

Ordering Information

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

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

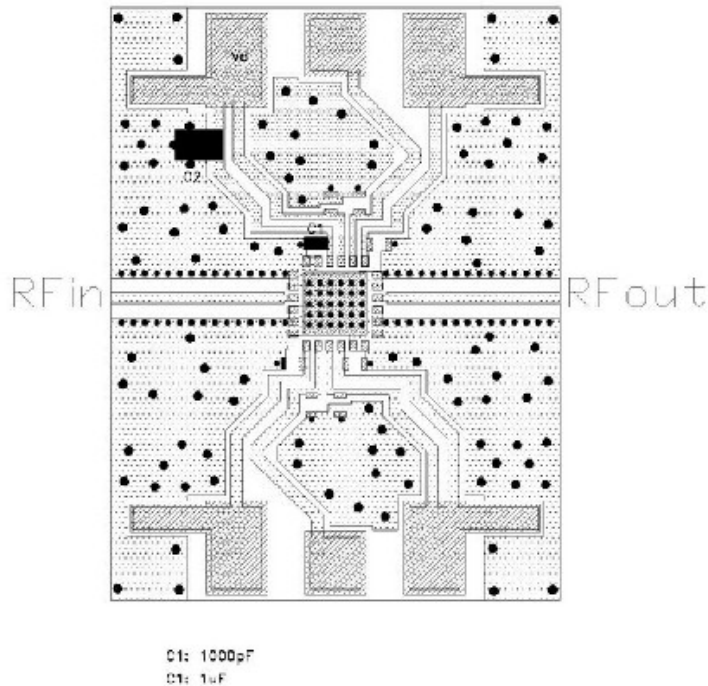
Parameter	Units	Min.	Typ.	Max.
Output Frequency Range (fout)	GHz	5.0	-	12.0
Input Return Loss (S11)	dB	-	-15	-
Output Return Loss (S22)	dB	-	-7	-
Saturated Output Power (Psat)	dBm	+14	+16.0	-
RF Input Power (RF Pin)	dBm	-3.0	-	+3.0
Fundamental Leakage (fin)	dBc	-	-35	-
Third Harmonic Leakage (3xfin)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

XX1002-QH

Active Doubler
2.5-6.0/5.0-12.0 GHz

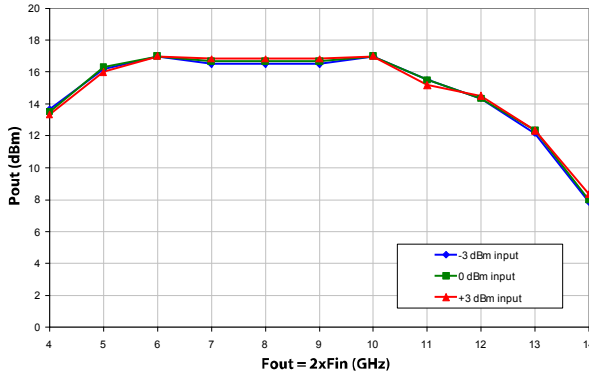
Rev. V1
MimiX Broadband

PCB Layout

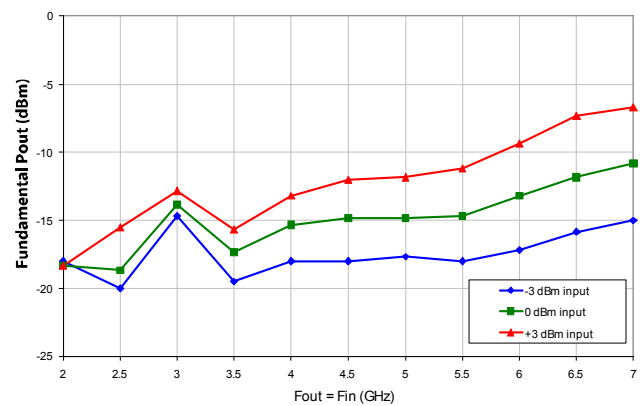


Typical Performance Curves

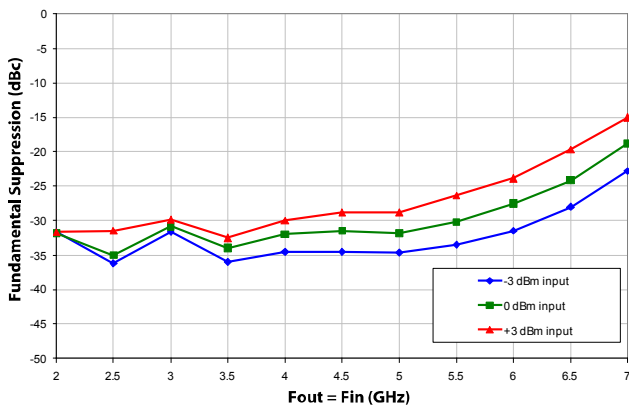
(x2) Output Power vs Output Frequency



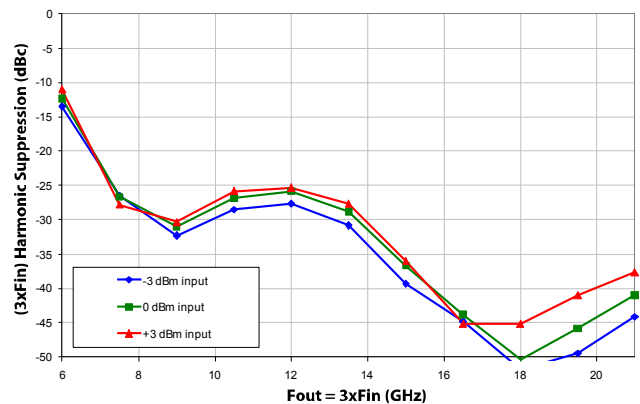
Fundamental Leakage (dBm)



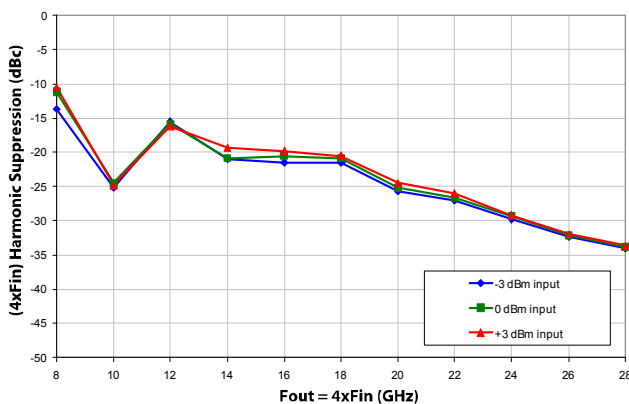
Fundamental Suppression (dBc) wrt Output Level



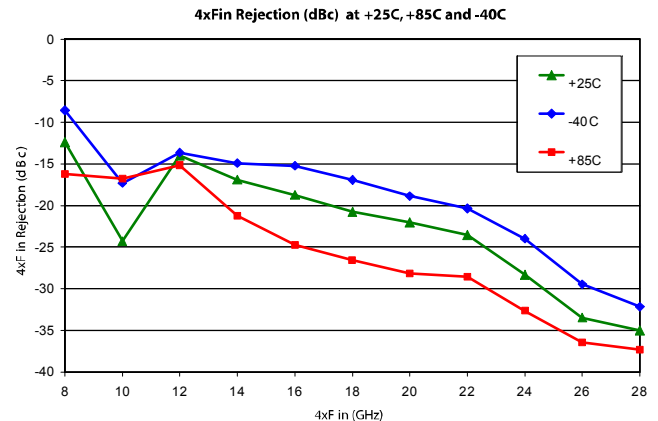
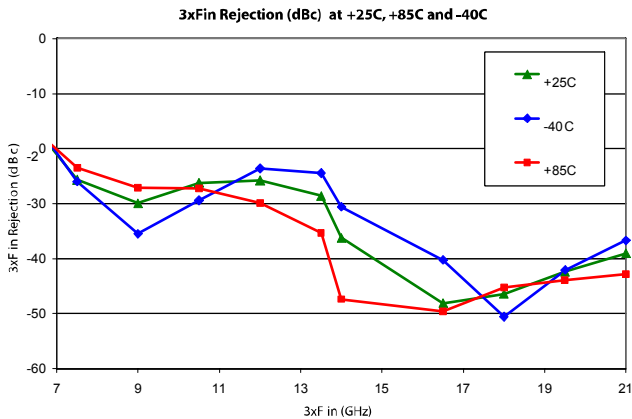
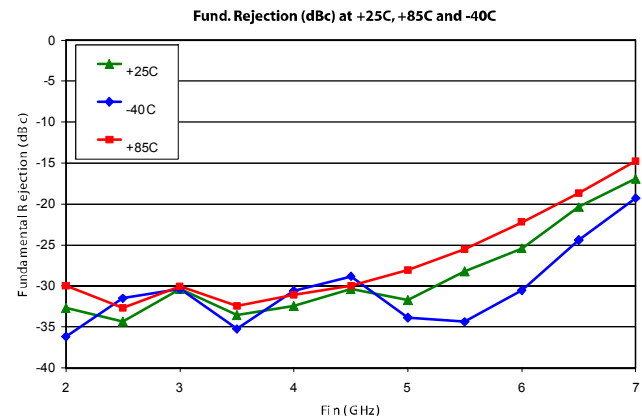
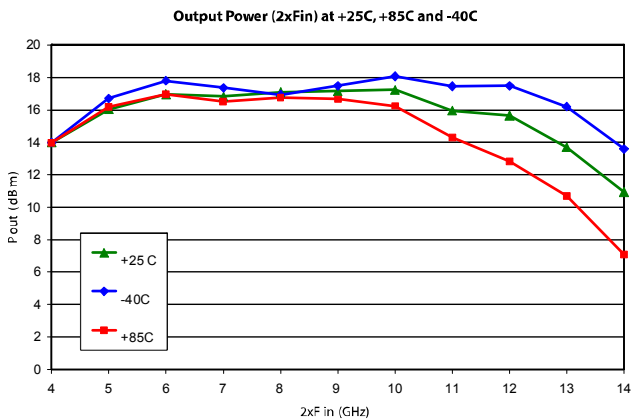
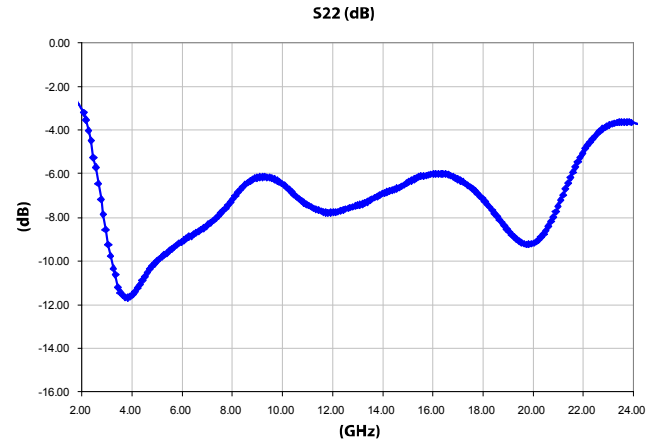
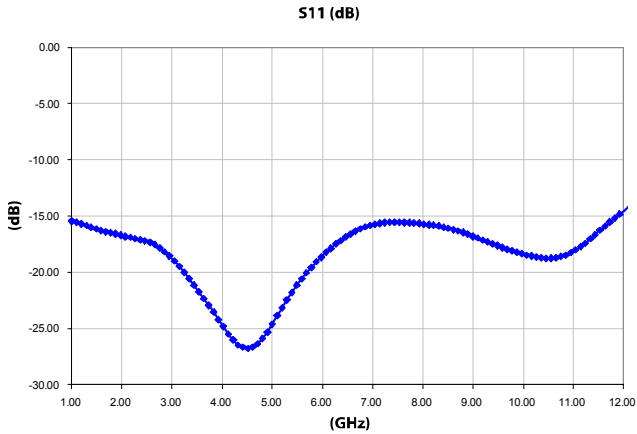
(3xFin) Harmonic Suppression (dBc) wrt Output Level



(4xFin) Harmonic Suppression wrt Output Level



Typical Performance Curves (cont.)



XX1002-QH

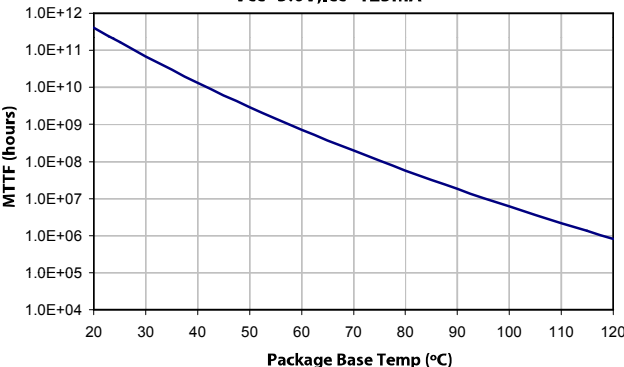


Active Doubler
2.5-6.0/5.0-12.0 GHz

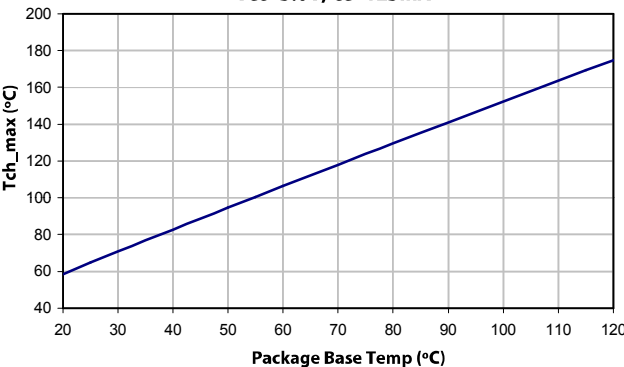
Rev. V1
MimiX Broadband

MTTF

XX1002-QH: MTTF hours vs. Package Base Temperature
Vcc=5.0V,Icc=125mA



XX1002-QH: Tch (max) vs. Package Base Temperature
Vcc=5.0V,Icc=125mA



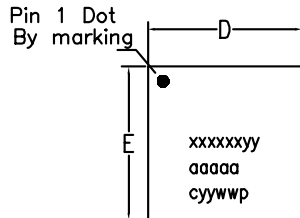
ADVANCED: Data Sheets contain information regarding a product M/A-COM Technology Solutions is considering for development. Performance is based on target specifications, simulated results, and/or prototype measurements. Commitment to develop is not guaranteed.
PRELIMINARY: Data Sheets contain information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

• **North America** Tel: 800.366.2266 • **Europe** Tel: +353.21.244.6400
• **India** Tel: +91.80.43537383 • **China** Tel: +86.21.2407.1588
Visit www.macomtech.com for additional data sheets and product information.

M/A-COM Technology Solutions Inc. and its affiliates reserve the right to make changes to the product(s) or information contained herein without notice.

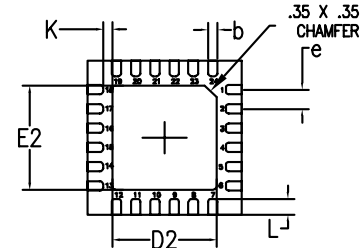
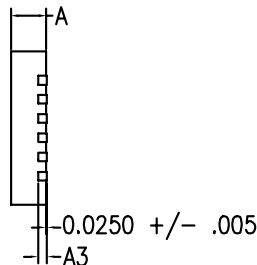
App Note [1] Biasing - The device is operated by biasing $V_{cc}=5.0$ V which will draw typically 125mA and a maximum of 140mA. The device requires by-passing as shown in the recommended layout with $C1=1$ nF and $C2=1$ μ F.

Lead-Free Package Dimensions/Layout



TOP VIEW

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

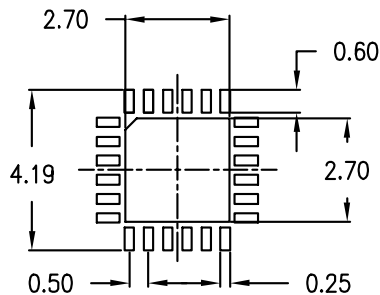


BOTTOM VIEW

NOTES:

1. DIMENSIONS ARE IN MM.

RECOMMENDED SOLDER PAD PITCH AND DIMENSIONS



	MIN	TYP	MAX
A	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		
e	0.50		
D2	2.45	2.60	2.75
E2	2.45	2.60	2.75
L	0.20	0.30	0.40

1. 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.