XL1010-QT

Low Noise Amplifier
20.0-38.0 GHz

Rev. V1
Mimix Broadband

Features

- 17.0 dB Small Signal Gain
- 3.0 dB Noise Figure
- Single, Positive Bias Supply
- 3x3mm QFN Package
- 100% RF Tested
- RoHS* Compliant and 260°C Reflow Compatible

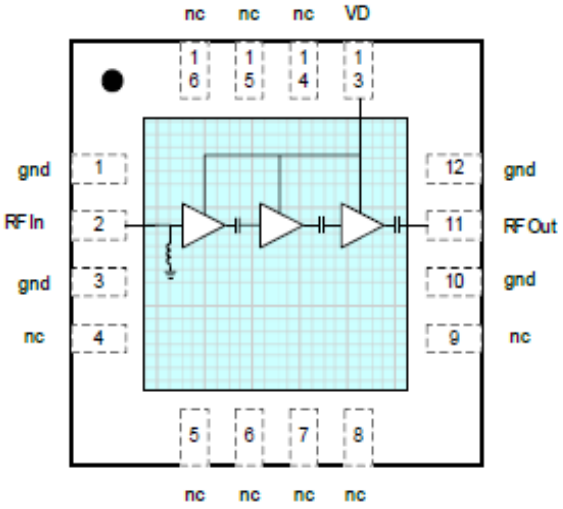
Description

M/A-COM Tech's three stage 20.0-38.0 GHz GaAs MMIC low noise amplifier has a small signal gain of 17.0 dB with a noise figure of 3.0 dB. The device comes in a RoHS compliant, 3x3mm QFN package and requires only a single positive bias supply. The devices uses M/A-COM Tech's GaAs PHEMT device model technology, and is based upon electron beam lithography to ensure high repeatability and uniformity. The device is well suited to multiple receiver applications which require broadband performance with simple bias requirements and the ease of volume manufacturing with 3x3mm QFN packaging.

Ordering Information

Part Number	Package
XL1010-QT-0G00	bulk quantity
XL1010-QT-0G0T	tape and reel
XL1010-QT-EV1	evaluation board

Functional Block Diagram/Board Layout



Pin Configuration

Pin No.	Function	Pin No.	Function
1	Ground	11	RF Output
2	RF Input	12	Ground
3	Ground	13	Drain Bias
4-9	Not Connected	14-16	Not Connected
10	Ground		

Absolute Maximum Ratings

Parameter	Absolute Max.
Supply Voltage (Vd)	+7.0 VDC
Supply Current (Id1,2,3)	70 mA
Input Power (Pin)	+12.0 dBm
Storage Temperature (Tstg)	-65 to +165 °C
Operating Temperature (Ta)	MTTF Graph[1]
Channel Temperature (Tch)	MTTF Graph[1]

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

• **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.

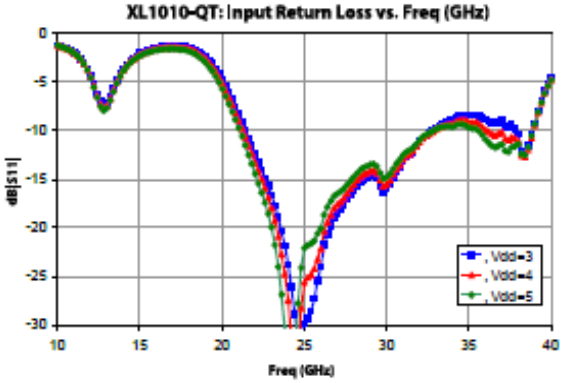
Electrical Specifications: 20-38 GHz (Ambient Temperature T = 25°C)

Parameter	Units	Min.	Typ.	Max.
Input Return Loss (S11)	dB	-	12.0	-
Output Return Loss (S22)	dB	-	15.0	-
Small Signal Gain (S21)	dB	15.0[1]	17.0	-
Gain Flatness (ΔS21)	dB	-	+/-2.0	-
Reverse isolation (S12)	dB	-	45.0	-
Noise Figure (NF)	dB	-	3.0	-
Average Output Power for 1dB Compression (P1dB)	dBm	-	6.0	-
Drain Bias Voltage (Vd)	VDC	3.0	4.0	5.0
Supply Current (Id)	mA	-	45	60

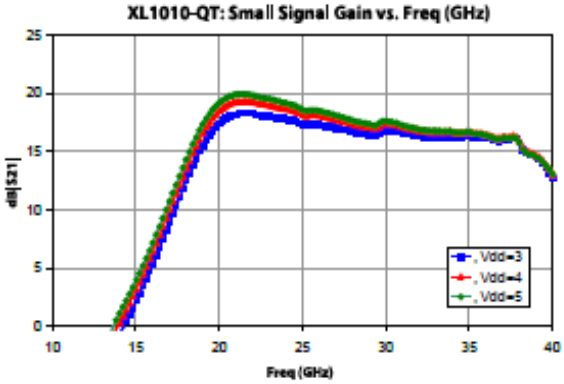
(1) Specified over 24-36.5 GHz

Typical Performance Curves

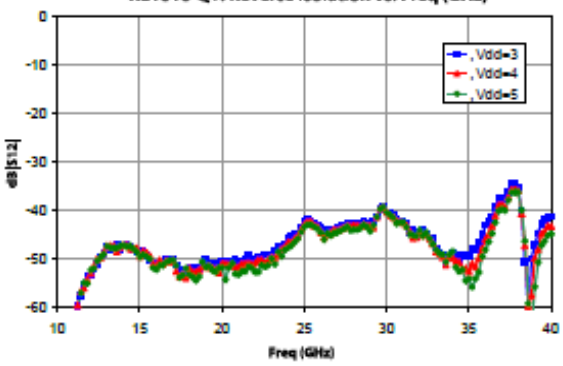
XL1010-QT: Input Return Loss vs. Freq (GHz)



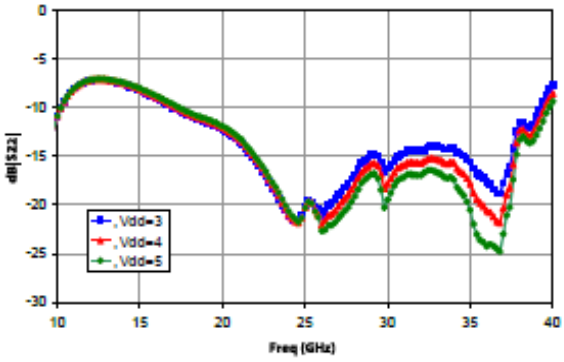
XL1010-QT: Small Signal Gain vs. Freq (GHz)



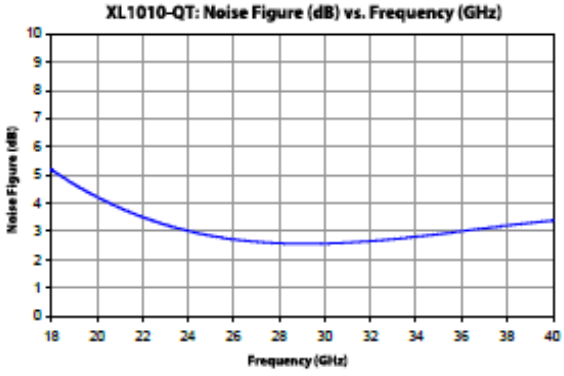
XL1010-QT: Reverse Isolation vs. Freq (GHz)



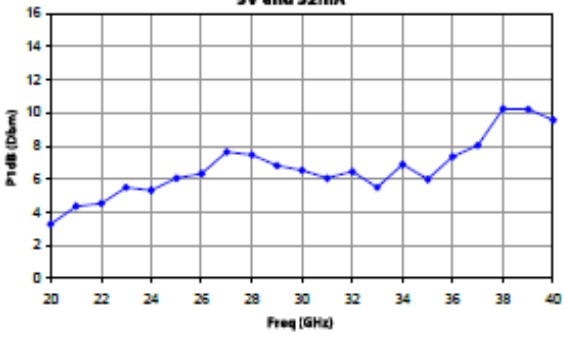
XL1010-QT: Output Return Loss vs. Freq (GHz)



XL1010-QT: Noise Figure (dB) vs. Frequency (GHz)



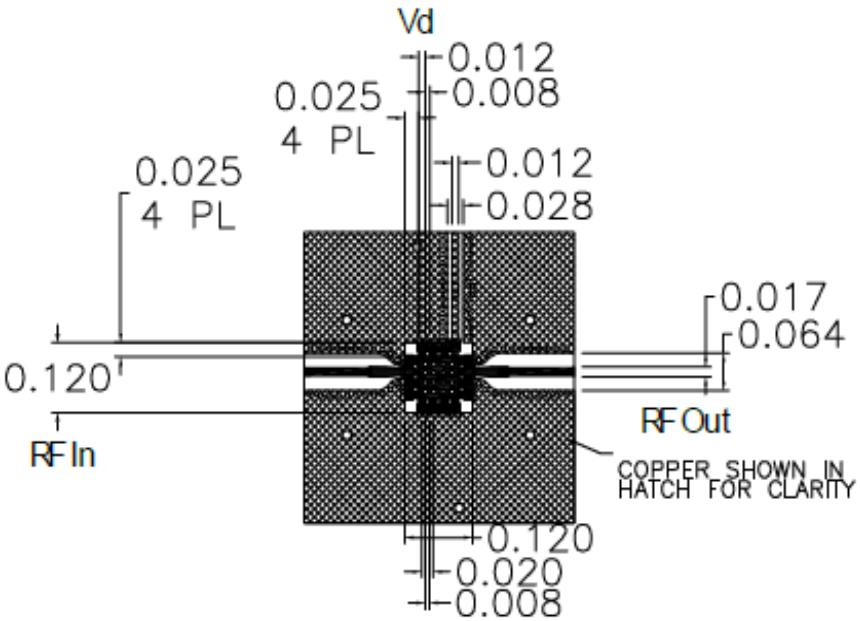
XL1010-QT: P1dB vs Freq
5V and 52mA

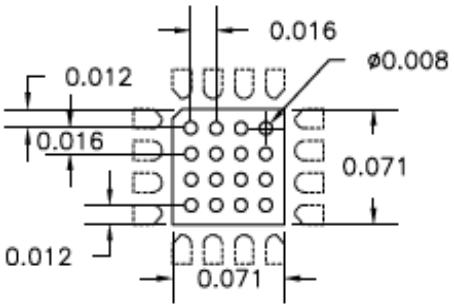


App Note [1] Biasing - The device is operated with a single, positive bias supply. The device performance is insensitive to changes in bias condition; however, gain and power handling can be slightly improved with higher bias conditions without significantly affecting the noise figure performance. Typical biasing conditions within the specified performance ranges are Vd=3 V, 35 mA, Vd=4 V, 45 mA, Vd=5 V, 55 mA.

Recommended Board Layout

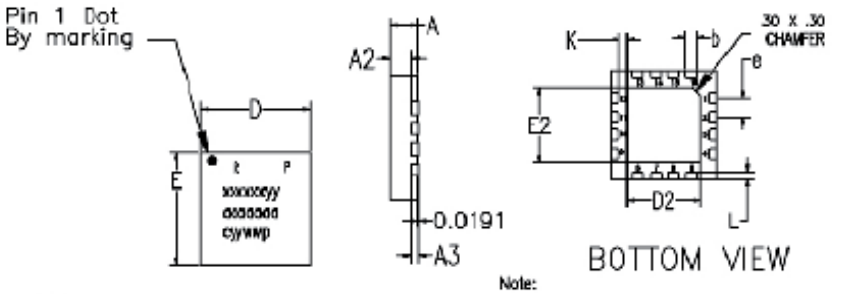
(DXF file available from website)





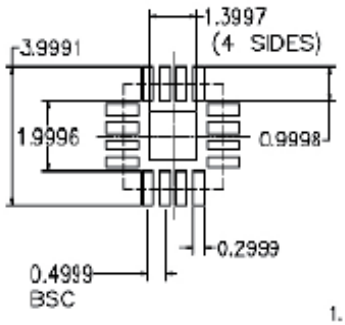
Lead-Free Package Dimensions/Layout

QT (3x3 mm)



Note:
1. ALL DIMENSIONS ARE IN mm.

RECOMMENDED SOLDER PAD PITCH AND DIMENSIONS



	MIN	TYP	MAX
A	0.80	0.90	1.00
A3		0.20 REF	
A2	0.00	0.65	1.00
b	0.20	0.25	0.30
K	0.20	–	–
D		3.00 BSC	
E		3.00 BSC	
e		0.50	
D2	1.50	1.65	1.80
E2	1.50	1.65	1.80
L	0.16	0.26	0.36

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.