

11.0-20.0 GHz GaAs MMIC Packaged Driver Amplifier

March 2010 - Rev 13-Mar-10

Mimix
BROADBAND™

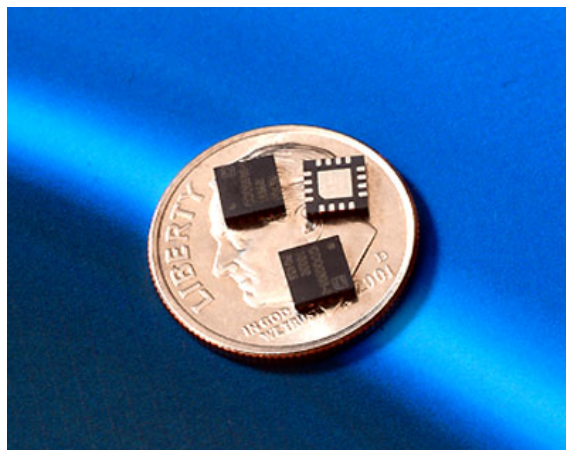
CMM1118-QT
RoHS

Features

- ✕ 20 dB Gain
- ✕ 14 dBm P1dB
- ✕ 3x3 QFN Package
- ✕ Single Power Supply
- ✕ 5-7 V, 110 mA Self Bias
- ✕ On-Chip ESD Protection

Circuit Description

Mimix Broadband's 3 stage 11.0 to 20.0 GHz driver amplifier is packaged in surface mount 3x3 QFN package. The device is a self-biased, single supply design with 20 dB gain and 14 dBm P1dB. This MMIC uses Mimix Broadband's optical pHEMT process.



Absolute Maximum Ratings

Supply Voltage	+8 V
RF Input Power	+10 dBm
Storage Temperature (Tstg)	-55 °C to +125 °C
Junction Temperature	175 °C
Operating Temperature	-40 °C to +85°C

Electrical Characteristics (T=25°C)

Parameter	Units	Min.	Typ.	Max.
Frequency Range	GHz	11		20
Gain	dB	17	20	
Gain Delta	dB		3	
Output P1dB	dBm	10	14	
Output IP3	dBm		22	
Input Return Loss	dB		-8	
Current	mA			130
Supply Voltage	V		5	7

Typical Parameters (5V)

Parameter	Units	Typical			
Frequency	GHz	11	14	17	20
Gain	dB	21	20	18	20
IP Return Loss	dB	-20	-12	-8	-5
Op Return Loss	dB	-11	-15	-6	-12
P1dB	dBm	11	12	14	16
OIP3	dBm	22	22	22	20

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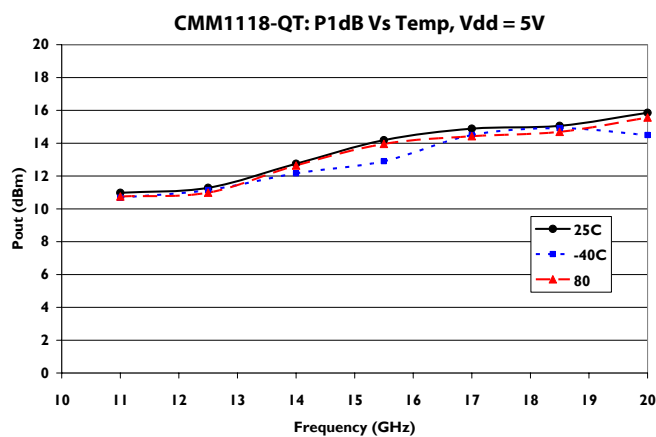
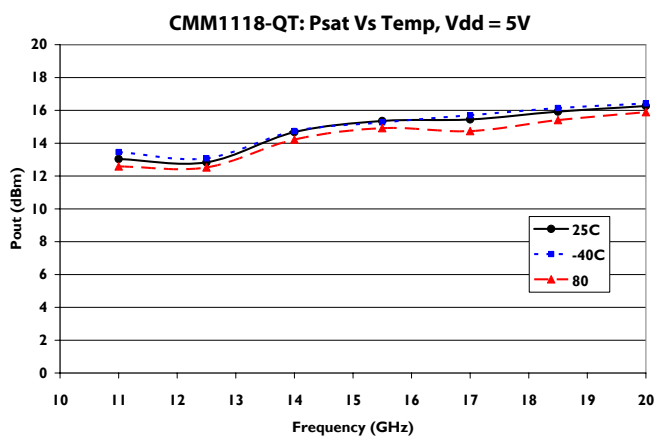
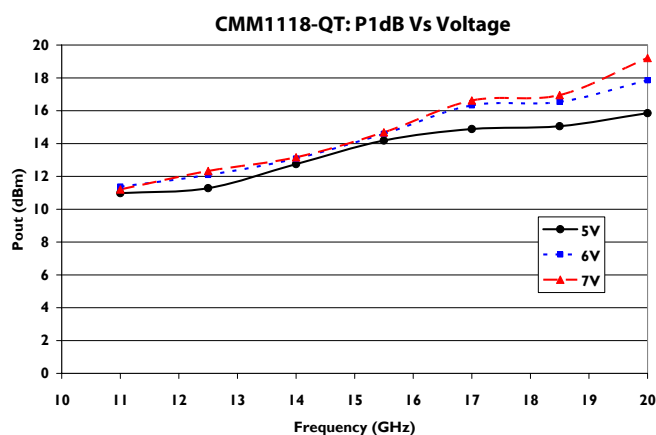
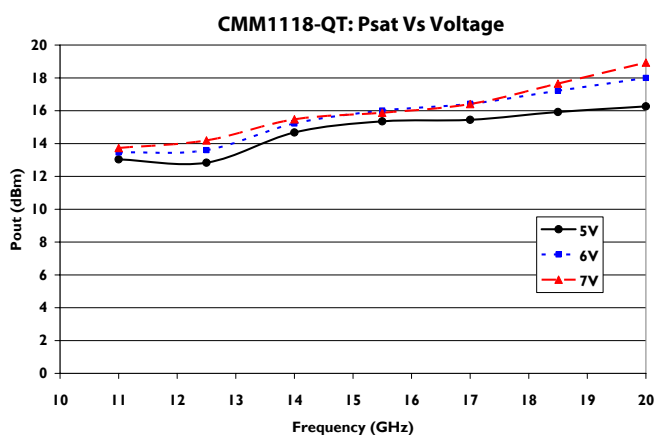
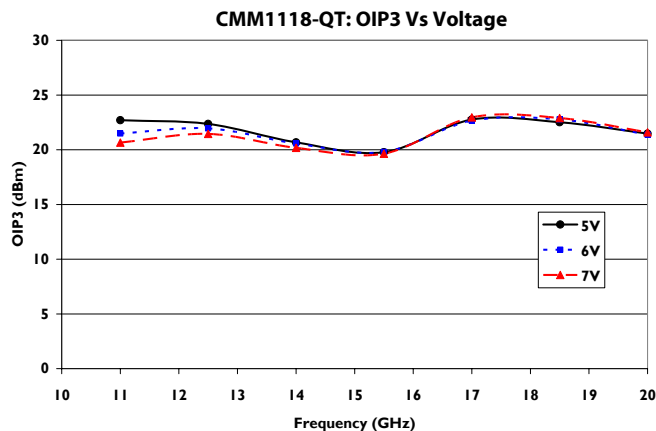
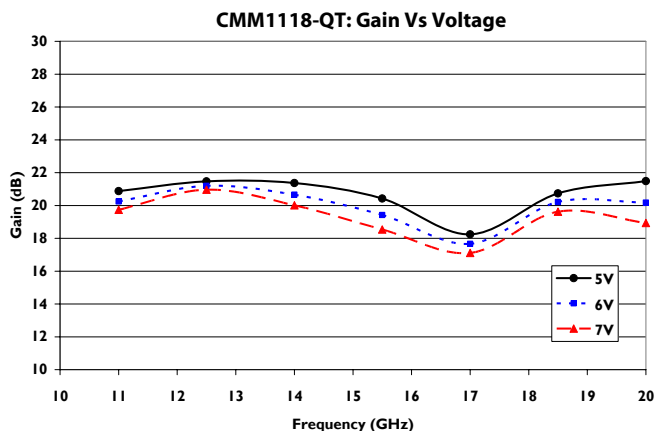
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Driver Amplifier Measurements



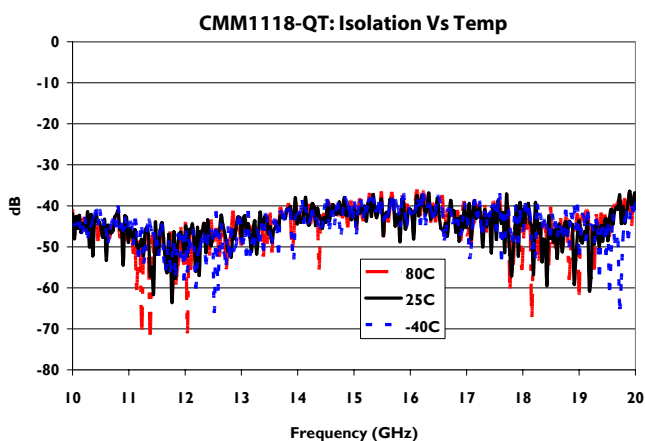
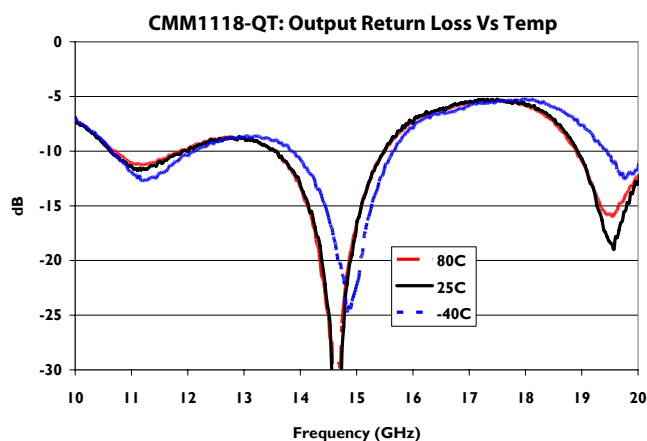
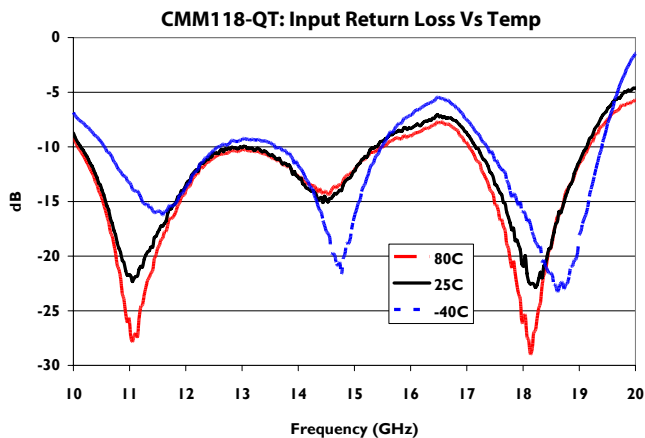
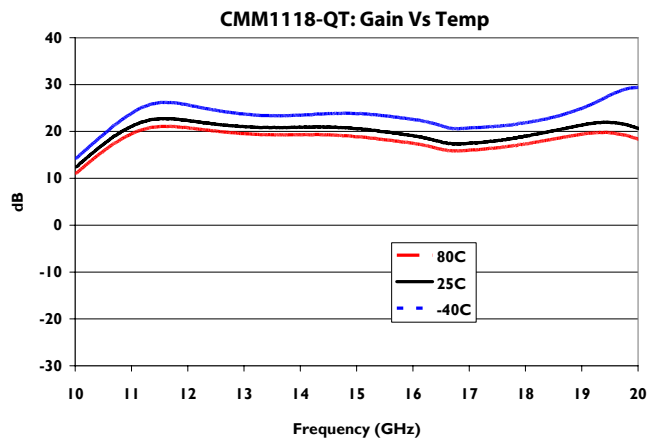
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Driver Amplifier Measurements



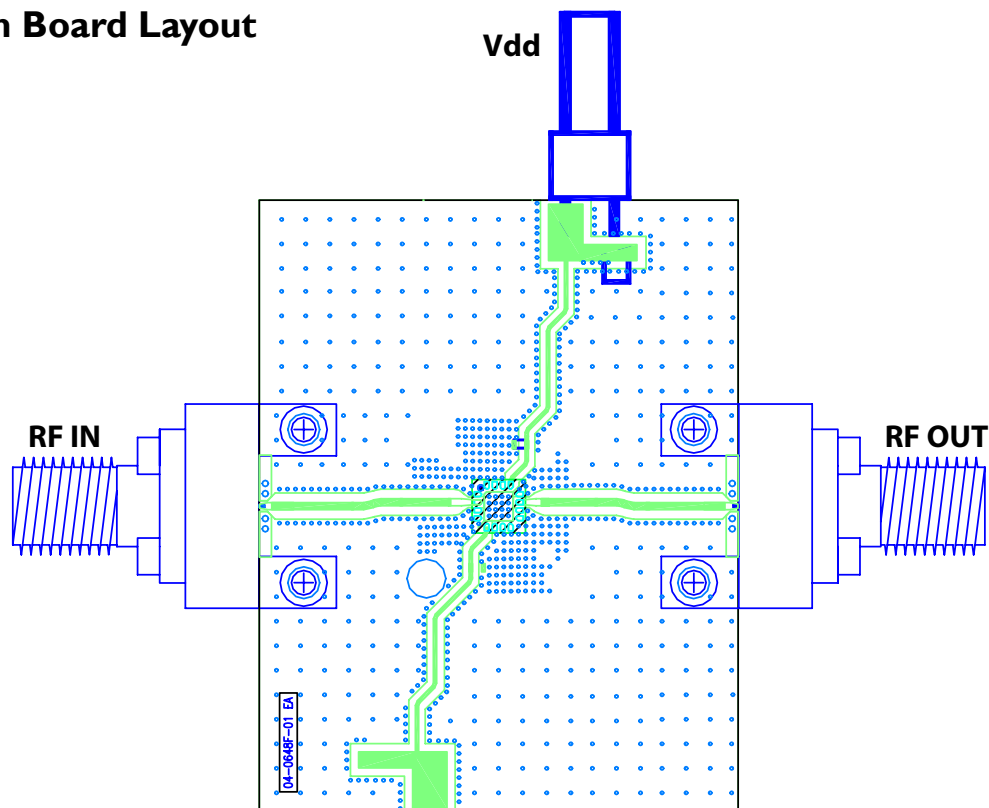
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Evaluation Board Layout



Pin Assignment and Description

Pin #	Function	Description
Pin 1	NC	No connection pin. It is recommended to RF ground this pin
Pin 2	RF INPUT	DC coupled. If voltage is present at the input line then a DC blocking capacitor is required
Pin 3	NC	No connection pin. It is recommended to RF ground this pin
Pin 4	NC	No connection pin. It is recommended to RF ground this pin
Pin 5	NC	No connection pin. It is recommended to RF ground this pin
Pin 6	NC	No connection pin. It is recommended to RF ground this pin
Pin 7	NC	No connection pin. It is recommended to RF ground this pin
Pin 8	NC	No connection pin. It is recommended to RF ground this pin
Pin 9	NC	No connection pin. It is recommended to RF ground this pin
Pin 10	NC	No connection pin. It is recommended to RF ground this pin
Pin 11	RF OUTPUT	DC coupled. If voltage is present at the input line then a DC blocking capacitor is required
Pin 12	NC	No connection pin. It is recommended to RF ground this pin
Pin 13	Vdd	Positive voltage supply. External bypass capacitors are required
Pin 14	NC	No connection pin. It is recommended to RF ground this pin
Pin 15	NC	No connection pin. It is recommended to RF ground this pin
Pin 16	NC	No connection pin. It is recommended to RF ground this pin

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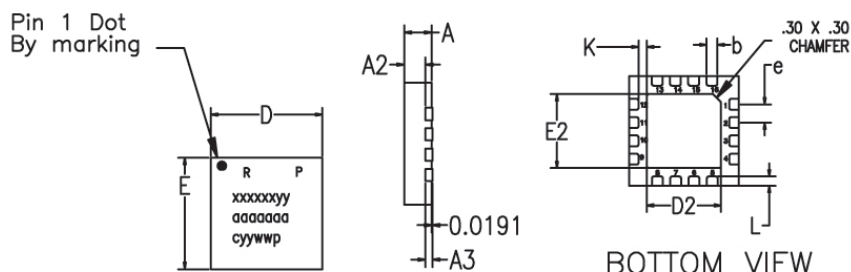
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Package Outline and Assembly

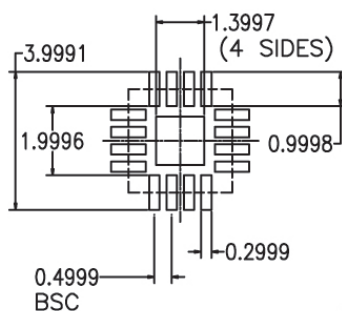
QT (3x3 mm)



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

TOP VIEW

RECOMMENDED SOLDER PAD PITCH AND DIMENSIONS



Note:

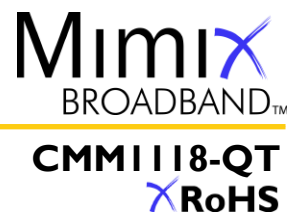
1. ALL DIMENSIONS ARE IN mm.

	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.

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Handling and Assembly Information

CAUTION! - Mimix Broadband MMIC Products contain gallium arsenide (GaAs) which can be hazardous to the human body and the environment. For safety, observe the following procedures:

- Do not ingest.
- Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.
- Observe government laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures.

Life Support Policy - Mimix Broadband's products are not authorized for use as critical components in life support devices or systems without the express written approval of the President and General Counsel of Mimix Broadband. As used herein: (1) Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user. (2) A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

Package Attachment - This packaged product from Mimix Broadband is provided as a rugged surface mount package compatible with high volume solder installation. Vacuum tools or other suitable pick and place equipment may be used to pick and place this part. Care should be taken to ensure that there are no voids or gaps in the solder connection so that good RF, DC and ground connections are maintained. Voids or gaps can eventually lead not only to RF performance degradation, but reduced reliability and life of the product due to thermal stress.

Typical Reflow Profiles

Reflow Profile	SnPb	Pb Free
Ramp Up Rate	3-4 °C/sec	3-4 °C/sec
Activation Time and Temperature	60-120 sec @ 140-160 °C	60-180 sec @ 170-200 °C
Time Above Melting Point	60-150 sec	60-150 sec
Max Peak Temperature	240 °C	265 °C
Time Within 5 °C of Peak	10-20 sec	10-20 sec
Ramp Down Rate	4-6 °C/sec	4-6 °C/sec

Factory Automation and Identification

Mimix Designator	Package Type	Number of leads offered	W Tape Width	P ₁ Component Pitch	P ₀ Hole Pitch	Reel Diameter	Units per Reel
-QT	QFN (3x3mm)	16	12mm	8mm	4mm	329mm (13in)	2000

Component Orientation: Parts are to be oriented with the PIN 1 closest to the tape's round sprocket holes on the tape's trailing edge.

Note: Tape and Reel packaging is ordered with a -000T suffix. Package is available in 500 unit reels through designated sales channels. Minimum order quantities should be discussed with your local sales representative.

Mimix Lead-Free RoHS Compliant Program - Mimix has an active program in place to meet customer and governmental requirements for eliminating lead (Pb) and other environmentally hazardous materials from our products. All Mimix RoHS compliant components are form, fit and functional replacements for their non-RoHS equivalents. Lead plating of our RoHS compliant parts is 100% matte tin (Sn) over copper alloy and is backwards compatible with current standard SnPb low-temperature reflow processes as well as higher temperature (260°C reflow) "Pb Free" processes.

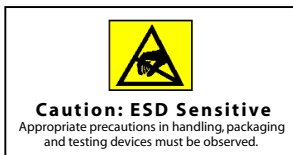
Ordering Information

Part Number for Ordering

CMM1118-QT-0G00
CMM1118-QT-0G0T
PB-CMM1118-0000

Description

Matte Tin finished RoHS compliant 3x3 QFN in bulk quantity
Matte Tin finished RoHS compliant 3x3 QFN in tape and reel
Evaluation Board



Proper ESD procedures should be followed when handling this device.

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