14.0-17.0/28.0-34.0 GHz Active Doubler QFN, 5x5mm

April 2006 - Rev 10-Apr-06

30DBL0537-QC
RoHS

Features

- Integrated Gain, Doubler and Driver Stages
- Self-biased Architecture
- +21.0 dBm Output Power
- 35.0 dBc Fundamental Suppression
- RoHS Compliant
- 100% On-Wafer RF, DC and Output Power Testing

General Description

Mimix Broadband's 14.0-17.0/28.0-34.0 GHz SMD Active Doubler delivers +21dBm of output power. The device integrates a gain stage, passive doubler and driver amplifier into a single device. The device provides better than +21dBm of saturated output power and has over 20dB of doubled gain with excellent harmonic rejection. The part is designed with a self-biased architecture which requires a single 5V supply. The device comes in a 5x5 mm QFN surface mount package offering excellent RF and thermal properties and is RoHS compliant. This device is well suited for Millimeter-Wave Point-to-Point, LMDS, SATCOM and VSAT applications.

Absolute Maximum Ratings

Supply Voltage (Vd)	+6.0 VDC
Supply Current (Id)	300 mA
Gate Bias Voltage (Vg)	+0.3 VDC
Input Power (RF Pin)	TBD
Storage Temperature (Tstg)	-65 to +165 °C
Operating Temperature (Ta)	-55 to MTTF Table[1]
Channel Temperature (Tch)	MTTF Table[1]

(1) Channel temperature affects a device's MTTF. It is recommended to keep channel temperature as low as possible for maximum life.

Electrical Characteristics (Ambient Temperature T = 25 °C)

Parameter	Units	Min.	Typ.	Max.
Input Frequency Range (fin)	GHz	14.0	-	17.0
Output Frequency Range (fout)	GHz	28.0	-	34.0
Input Return Loss (S11)	dB	-	TBD	-
Output Return Loss (S22)	dB	-	TBD	-
Fundamental Leakage (fin)	dBc	-	-35.0	-
Third Harmonic Leakage (3 x fin)	dBc	-	-30.0	-
RF Input Power (RF Pin)	dBm	-	+4.0	-
Output Power at +4.0 dBm Pin (Pout)	dBm	-	+21.0	-
Drain Bias Voltage (Vd)	VDC	-	+5.0	+5.5
Supply Current (Id) (Vd=5.0V Typical)	mA	-	200	240

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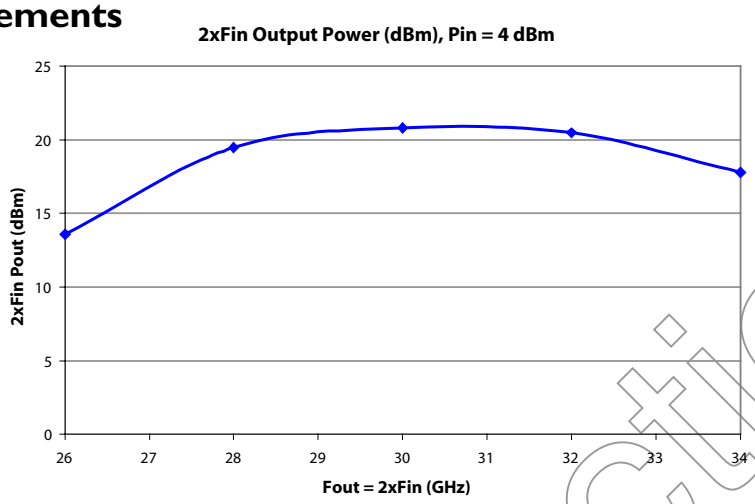
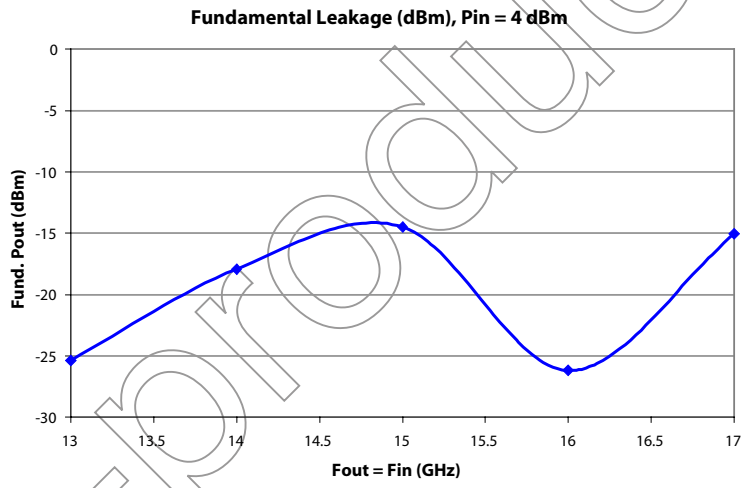
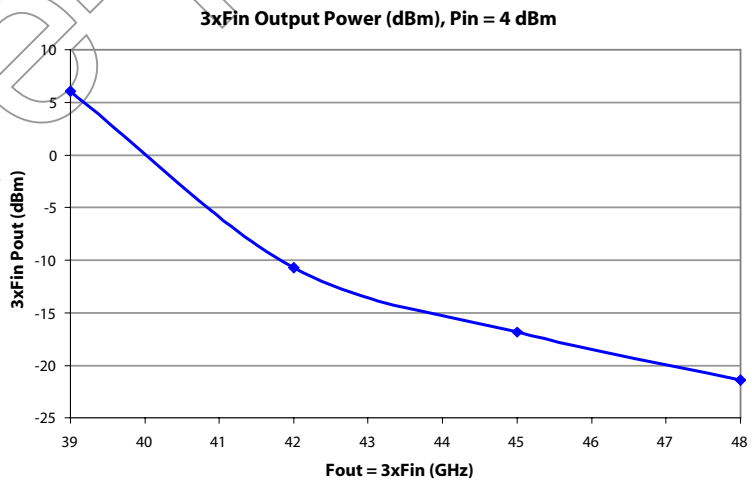
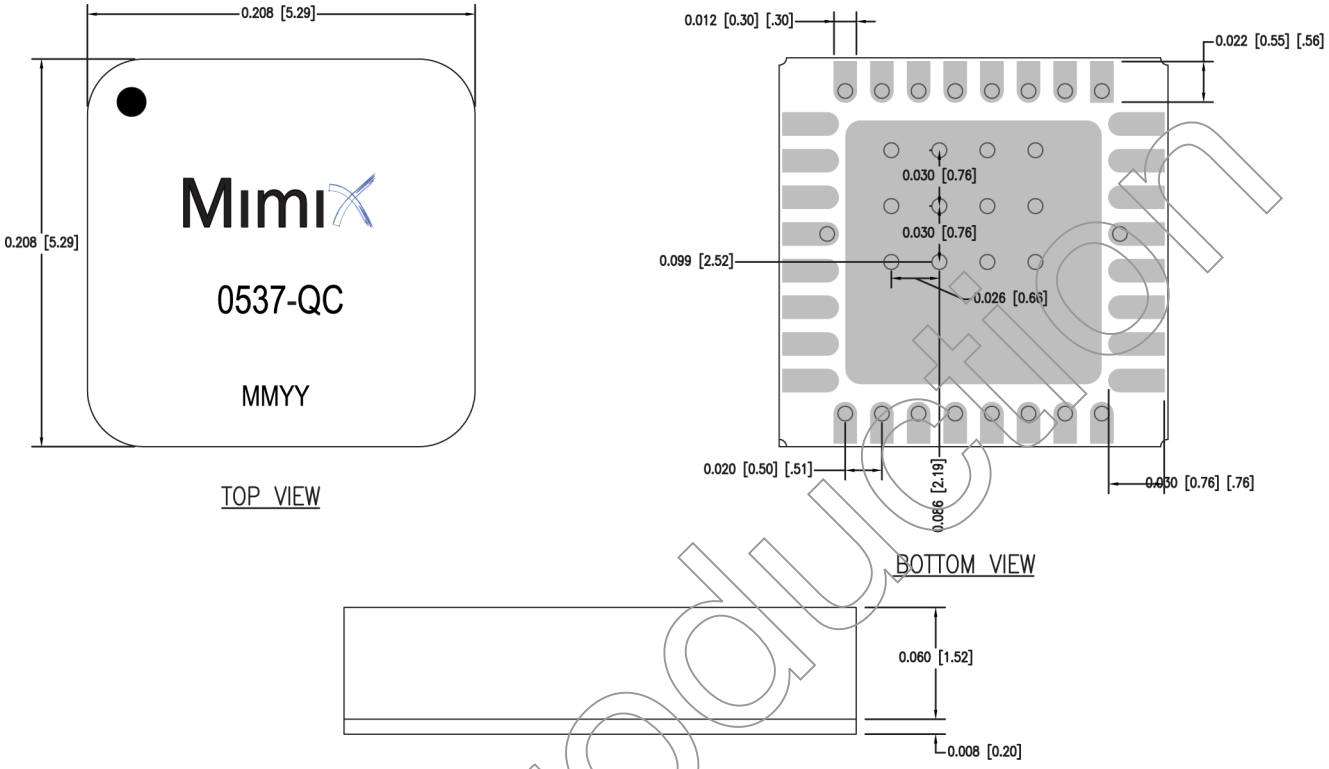
Doubler Measurements



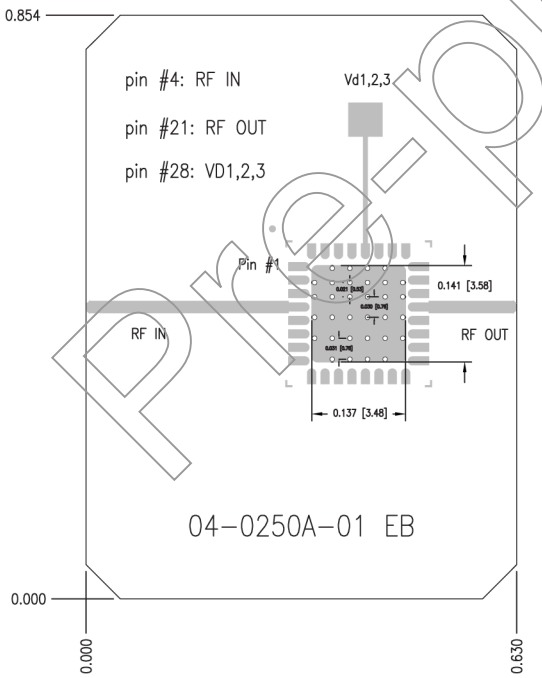




Package Outline



PCB Layout



Pin Designation

Pin	Description
4	RF In
21	RF Out
28	Bias

App Note [1] Biasing - This device is operated by biasing Vd with +5.0 V and Id=200mA.

MTTF Tables (TBD)

These numbers were calculated based on accelerated life test information and thermal model analysis received from the fabricating foundry.

Backplate Temperature	Channel Temperature	Rth	MTTF Hours	FITs
55 deg Celsius	deg Celsius	C/W	E+	E+
75 deg Celsius	deg Celsius	C/W	E+	E+
95 deg Celsius	deg Celsius	C/W	E+	E+

Bias Conditions: Vd=5.0V, Id=200mA

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.

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% matt 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.

Part Number for Ordering	Description
30DBL0537-QC-0N00	Ni/Cu plated RoHS compliant QFN 5x5 32L surface mount package in bulk quantity
30DBL0537-QC-0N0T	Ni/Cu plated RoHS compliant QFN 5x5 32L surface mount package in tape and reel
PB- 30DBL0537-QC	30DBL0537-QC Evaluation Board

We also offer this part with alternative plating options. Please contact your regional sales manager for more information regarding different plating types.