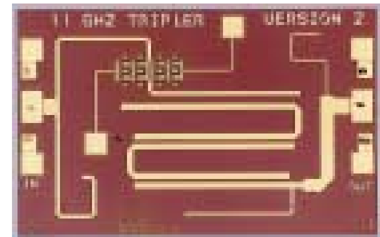
RMWT11001
11 to 33 GHz Tripler MMIC

Description

The RMWT11001 is an 11 to 33 GHz Tripler designed to be used in the LO chain of point to point radios, point to multi-point communications, LMDS, and other millimeter wave applications. In conjunction with other Raytheon amplifiers, multipliers and mixers it forms part of a complete 38 GHz transmit/receive chipset. The RMWT11001 utilizes Raytheon's 0.25 µm power PHEMT process and is sufficiently versatile to serve in a variety of multiplier applications.

Features

- 4 mil substrate
- Conversion loss 14.5 dB (typ.)
- No DC bias required
- Chip size 1.6 mm x 1.05 mm



Maximum Ratings

Parameter	Symbol	Value	Unit
RF Input Power (from 50 Ω source)	P_{IN}	+22	dBm
Operating Baseplate Temperature	T_C	-30 to +85	°C
Storage Temperature Range	T_{stg}	-55 to +125	°C

Electrical Characteristics (At 25°C), 50 Ω system, Pin=+18 dBm

Parameter	Min	Typ	Max	Unit
Input Frequency Range	10.6		11.7	GHz
Output Frequency Range	31.8		35.1	GHz
Input Drive Power	+17	+19		dBm
Conversion Loss		14.5	17.5	dB
Conversion Loss Variation vs Freq		1		dB
Fundamental Rejection		-20		dBc
2nd Harmonic Rejection		-30		dBc
4th Harmonic Rejection		-25		dBc
Input Return Loss (Pin=+18 dBm)		11		dB

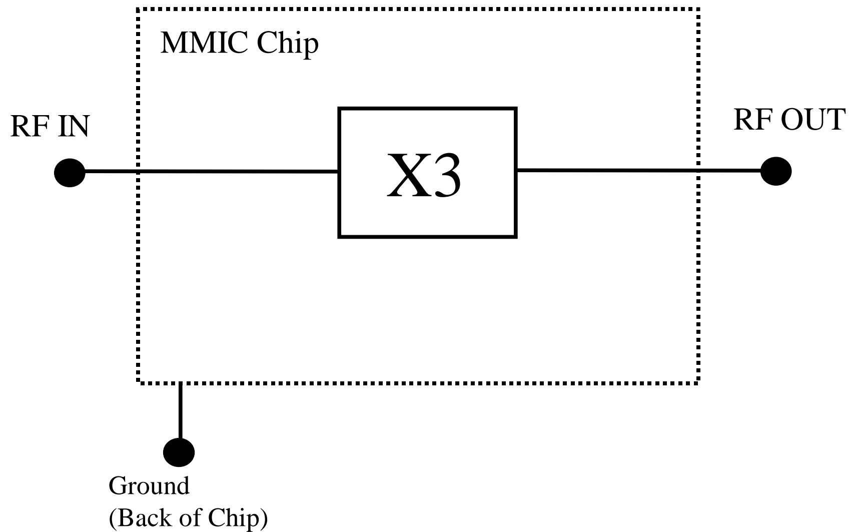
Raytheon reserves the right to update or change specifications without notice.

Tel: 978-684-8663
Fax: 978-684-8646
www.raytheon.com/micro

Raytheon RF Components
362 Lowell Street
Andover, MA 01810

RMWT11001
11 to 33 GHz Tripler MMIC

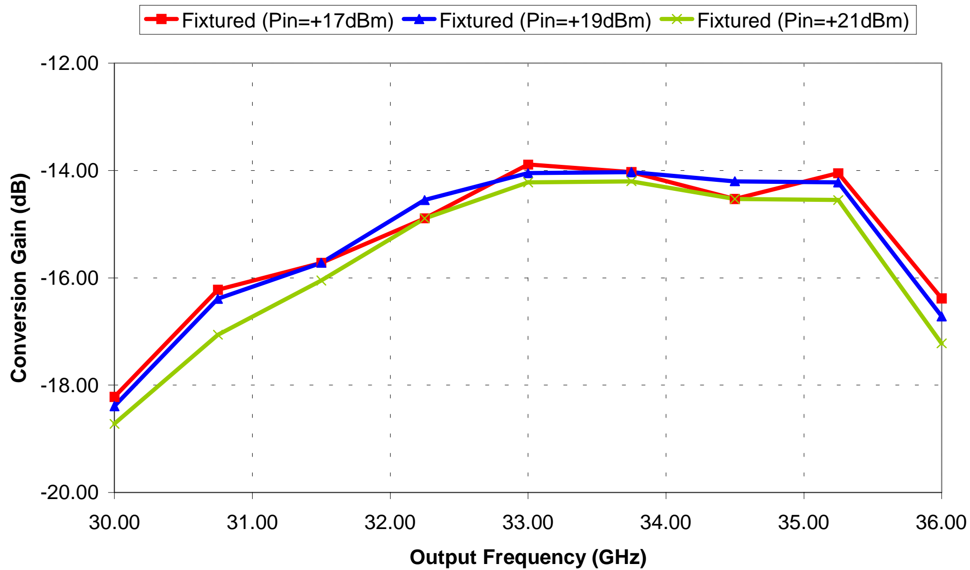
Functional Block Diagram

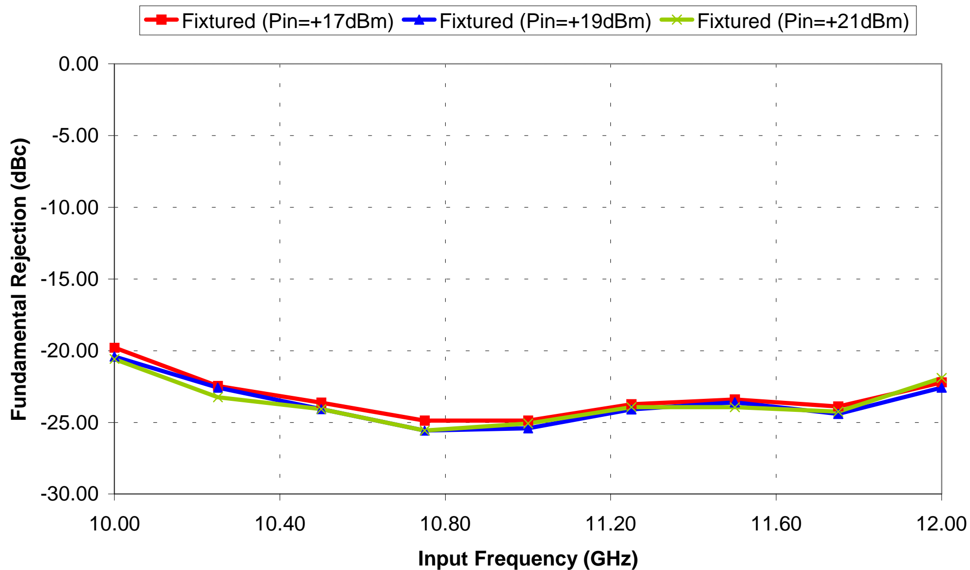


Raytheon reserves the right to update or change specifications without notice.

RMWT11001
11 to 33 GHz Tripler MMIC

Performance Data

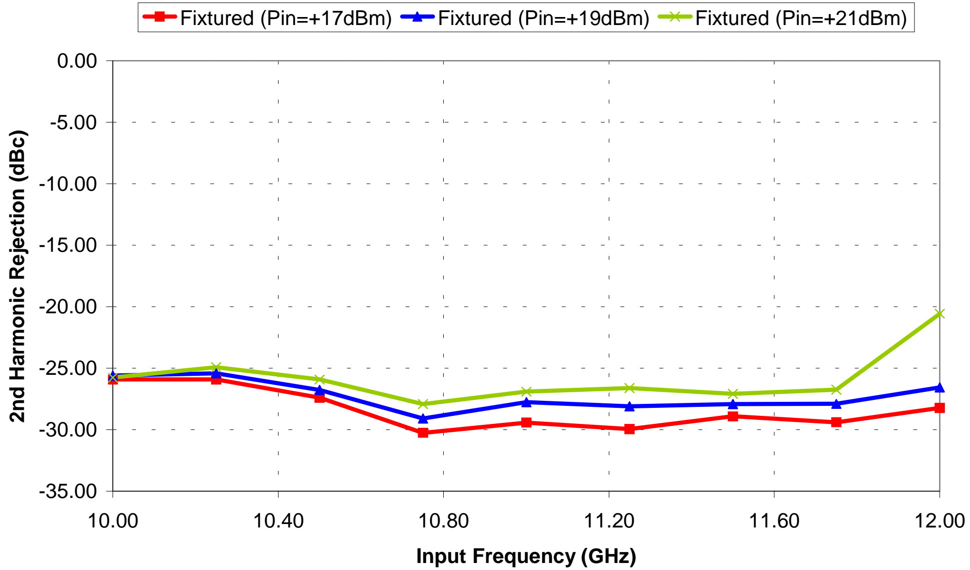


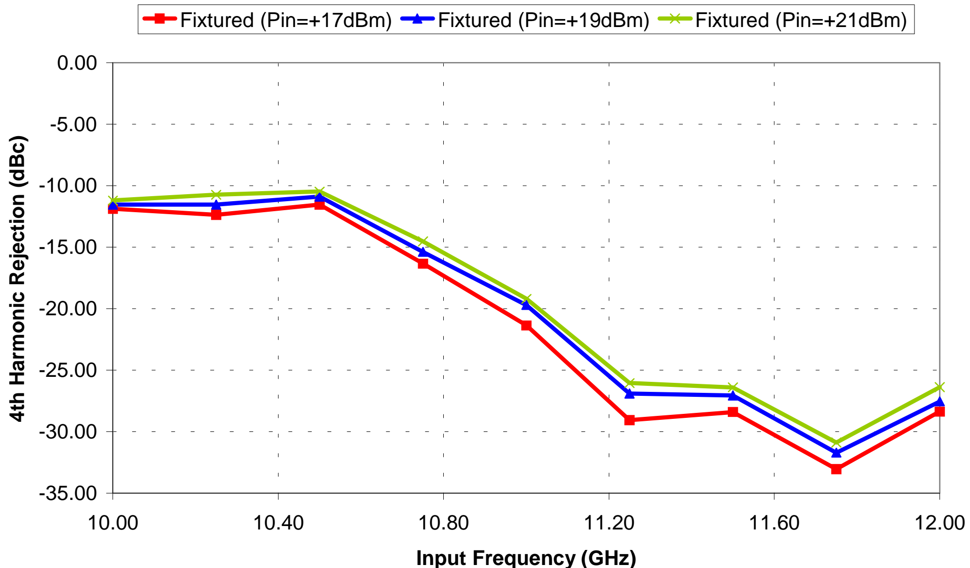


Raytheon reserves the right to update or change specifications without notice.

RMWT11001
11 to 33 GHz Tripler MMIC

Performance Data

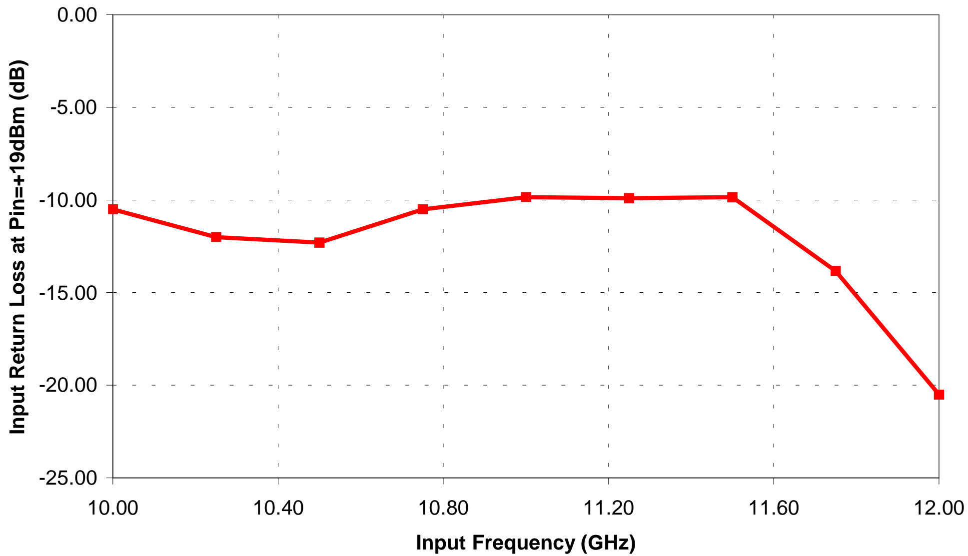


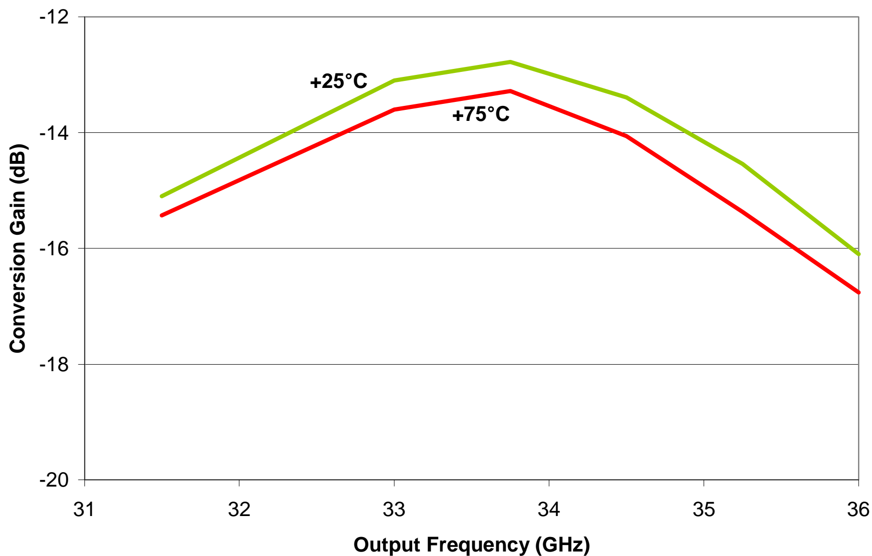


Raytheon reserves the right to update or change specifications without notice.

RMWT11001
11 to 33 GHz Tripler MMIC

Performance Data





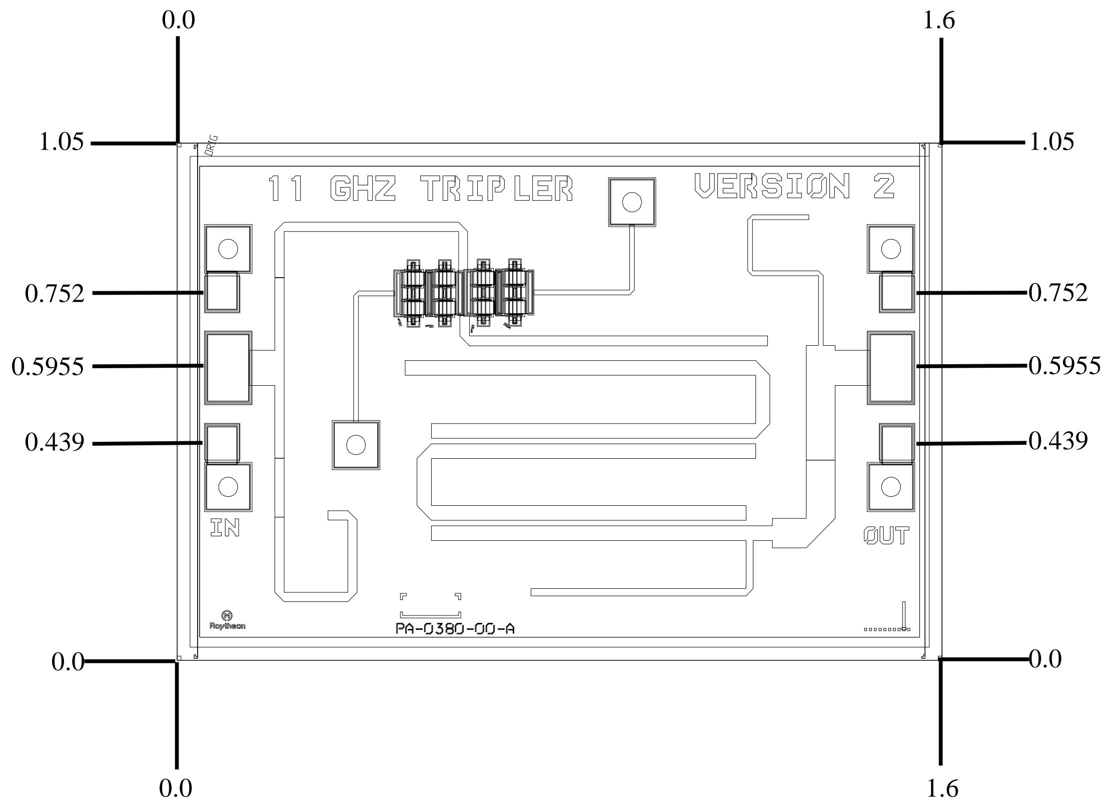
Raytheon reserves the right to update or change specifications without notice.

RMWT11001
11 to 33 GHz Tripler MMIC

Application Information

Caution: **This is an ESD sensitive device**

Chip Layout and Bond Pad Locations
Chip Size is 1.6 mm x 1.05 mm Typical. Back of chip is RF ground



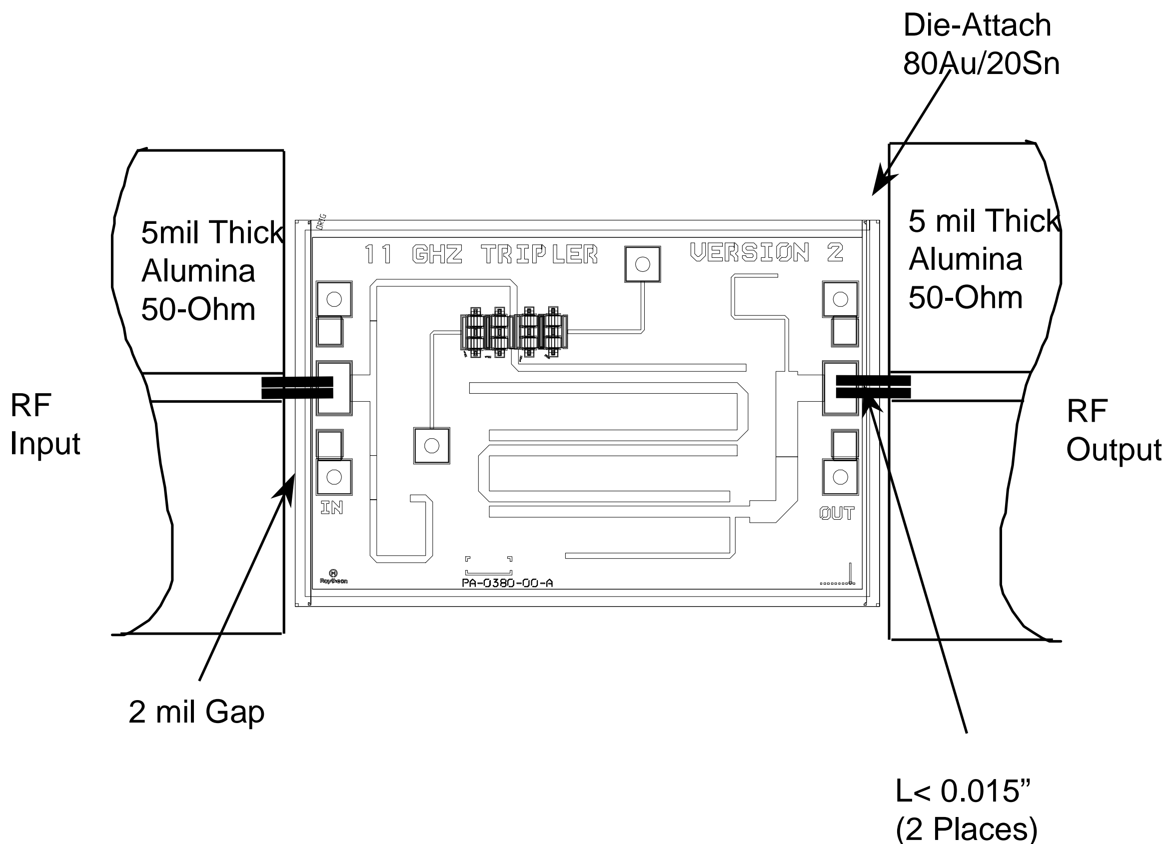
Dimensions in mm

Raytheon reserves the right to update or change specifications without notice.

RMWT11001
11 to 33 GHz Tripler MMIC

Application Information

Recommended Assembly Diagram



Note: Use 0.003” by 0.0005” Gold Ribbon for bonding. RF input and output bonds should be less than 0.015” long with stress relief.

Raytheon reserves the right to update or change specifications without notice.

RMWT11001
11 to 33 GHz Tripler MMIC

Application Information

CAUTION: THIS IS AN ESD SENSITIVE DEVICE.

Chip carrier material should be selected to have GaAs compatible thermal coefficient of expansion and high thermal conductivity such as copper molybdenum or copper tungsten. The chip carrier should be machined, finished flat, plated with gold over nickel and should be capable of withstanding 325°C for 15 minutes.

Die attachment should utilize Gold/Tin (80/20) eutectic alloy solder and should avoid hydrogen environment for PHEMT devices. Note that the backside of the chip is gold plated and is used as RF ground.

These GaAs devices should be handled with care and stored in dry nitrogen environment to prevent contamination of bonding surfaces. These are ESD sensitive devices and should be handled with appropriate precaution including the use of wrist grounding straps. All die attach and wire/ribbon bond equipment must be well grounded to prevent static discharges through the device.

Recommended wire bonding uses 3 mils wide and 0.5 mil thick gold ribbon with lengths as short as practical allowing for appropriate stress relief. The RF input and output bonds should be typically 0.012" long corresponding to a typically 2 mil between the chip and the substrate material.

Raytheon reserves the right to update or change specifications without notice.

RMWT11001
11 to 33 GHz Tripler MMIC

Application Information

Recommended Procedure for Operation

Caution: This is an ESD sensitive device

The following sequence of steps must be followed to properly test the amplifier:

Step 1: The RMWT11001 does not require DC bias. Apply RF input signal at the appropriate frequency band and input drive level.

Step 2: Follow turn-off sequence of:
Turn off RF input power.

Raytheon reserves the right to update or change specifications without notice.