

# 35.0-42.0 GHz GaAs MMIC Transmitter

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Mimix  
BROADBAND™

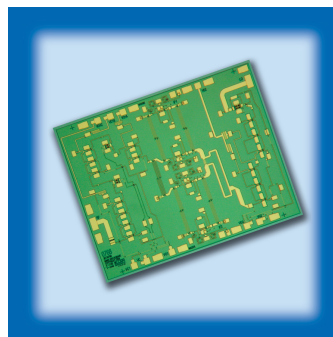
UI006-BD  
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## Features

- ✕ Sub-harmonic Transmitter
- ✕ Integrated Mixer, LO Doubler/Buffer & Output Amplifier
- ✕ +17.0 dBm Output Third Order Intercept (OIP3)
- ✕ 4.0 dBm LO Drive Level
- ✕ 3.0 dB Conversion Gain
- ✕ 100% On-Wafer RF and DC Testing
- ✕ 100% Visual Inspection to MIL-STD-883 Method 2010

## General Description

Mimix Broadband's 35.0-42.0 GHz GaAs transmitter is an integrated multifunction chip which provides 25 dB of linear gain control across the band. The MMIC has a +17.0 dBm output third order intercept across the band. This device is a balanced, resistive pHEMT mixer followed by a series of cascaded gain and attenuator stages. The device also includes an integrated LO doubler and LO buffer amplifier which make the provision of the LO easier than for fundamental mixers at these frequencies. I and Q mixer inputs are provided and an external 90 degree hybrid is required to select the desired sideband. This MMIC uses Mimix Broadband's 0.15  $\mu$ m GaAs PHEMT device model technology, and is based upon electron beam lithography to ensure high repeatability and uniformity. The chip has surface passivation to protect and provide a rugged part with backside via holes and gold metallization to allow either a conductive epoxy or eutectic solder die attach process. This device is well suited for Millimeter-wave Point-to-Point Radio, LMDS, SATCOM and VSAT applications.



## Absolute Maximum Ratings

Supply Voltage (Vd)	+6.0 VDC
Supply Current (Id1, Id2)	300, 200 mA
Gate Bias Voltage (Vg)	+0.3 VDC
Input Power (IF Pin)	+10.0 dBm
Storage Temperature (Tstg)	-65 to +165 °C
Operating Temperature (Ta)	-55 to MTTF Table <sup>3</sup>
Channel Temperature (Tch)	MTTF Table <sup>3</sup>

(3) 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.
Frequency Range (RF) Upper Side Band	GHz	35.0	-	42.0
Frequency Range (LO)	GHz	16.0	-	23.0
Frequency Range (IF)	GHz	DC	-	4.0
Output Return Loss RF (S22)	dB	-	10.0	-
Small Signal Conversion Gain IF/RF (S21)	dB	-	3.0	-
LO Input Drive (P <sub>LO</sub> )	dBm	-	4.0	-
Leakage @ RF	dBm	-	-11.0	-
Output Third Order Intercept (OIP3)	dBm	-	+17.0	-
Drain Bias Voltage (Vd1,2)	VDC	-	+4.0	+5.5
Gate Bias Voltage (Vg1,2)	VDC	-1.2	-0.3	+0.1
Gate Bias Voltage (Vg3) Mixer, Doubler	VDC	-0.6	-0.5	-0
Dynamic Range Control	Vc	-2.0	-	0.0
Supply Current (Id1) (Vd1=4.0V, Vg=-0.3V Typical)	mA	-	150	180
Supply Current (Id2) (Vd2=4.0V, Vg=-0.3V Typical)	mA	-	100	165