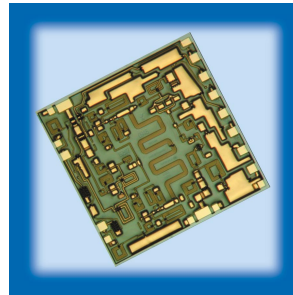


4.5-10.5 GHz GaAs MMIC Receiver

Features

- ✕ Integrated LNA, Mixer and LO Buffer Amp
- ✕ 1.6 dB Noise Figure
- ✕ 14.0 dB Conversion Gain
- ✕ BCB Coated Die
- ✕ 100% RF, DC and NF Testing



General Description

Mimix Broadband's 4.5-10.5 GHz receiver has a noise figure of 1.6 dB and 14.0 dB conversion gain across the band. The device integrates an LNA, image reject mixer and LO buffer amplifier within a single, compact MMIC. The image reject mixer eliminates the need for a bandpass filter after the LNA to remove thermal noise at the image frequency. I and Q mixer outputs are provided and an external 90 degree hybrid is required to select the desired sideband. This device uses Mimix Broadband's 0.15 μm GaAs PHEMT device model technology, and is based upon electron beam lithography to ensure high repeatability and uniformity. This device is well suited for Point-to-Point Radio, LMDS, SATCOM and VSAT applications.

Absolute Maximum Ratings¹

Supply Voltage (Vdd)	+5.0 VDC
Supply Current (Idd)	180 mA
Gate Voltage (Vgg)	-3 V
Max Power Dissipation (Pdiss)	750 mW
RF Input Power (Pin)	+14 dBm
LO Input Power (Pin)	+15 dBm
Operating Temperature (Ta)	-55 to +85 °C
Storage Temperature (Tstg)	-65 to +150 °C
Channel Temperature (Tch)	-40 to MTF Graph ²

(1) Operation of this device above any one of these parameters may cause permanent damage

(2) Channel temperature directly affects a device's MTF. Channel temperature should be kept as low as possible to maximize lifetime

Electrical Characteristics (Ambient Temperature T = 25 °C)

Parameter	Units	Min.	Typ.	Max.
Frequency Range (RF/LO)	GHz	4.5	-	10.5
Frequency Range (IF)	GHz	DC	-	3.5
Conversion Gain (CG)	dB		14.0	
Noise Figure (NF)	dB		1.6	
Input Third Order Intercept (IIP3)	dBm		2.0	
Image Rejection	dBc	15.0	20.0	
LO Input Drive	dBm		5.0	
LO/RF Isolation	dB		50.0	
RF Input Return Loss	dB		10.0	
LO Input Return Loss	dB		10.0	
IF Input Return Loss	dB		10.0	
Drain Bias Voltage (Vd1,2,3)	VDC		4.0	4.5
Gate Bias Voltage (Vg1,2,3)*	VDC	-1.2	-0.3	0.2
Gate Bias Voltage (Vg4)**	VDC		-2.0	
Supply Current (Id1)	mA		25.0	
Supply Current (Id2)	mA		45.0	
Supply Current (Id3)	mA		60.0	
Supply Current (Ig4)	mA		2.0	

*Vg1,2 and 3 are adjusted to achieve constant drain current regulation.

**Vg4 provides mixer bias and is fixed at -2.0V.