

EWM4401ZZ

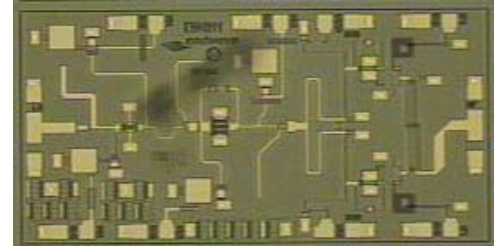
Features

- Integrated I/Q Mixer with LO Driver Amp
- RF & LO Frequency: 34 - 44 GHz
- IF Bandwidth: 0 - 4.5 GHz
- Both Direct Modulation & CW IF
- Conversion Loss: 11 dB, typical
- LO Drive Level: 0 dBm, typical
- Input IP3: +27 dBm, typical
- LO/RF Isolation: 11 dB, typical
- Image Rejection: 20 dB, typical
- ESD Protection Bias Circuitry
- 100% RF and DC tested
- Die size: 2.7 x 1.5 x 0.1 mm
- RoHS Compliant

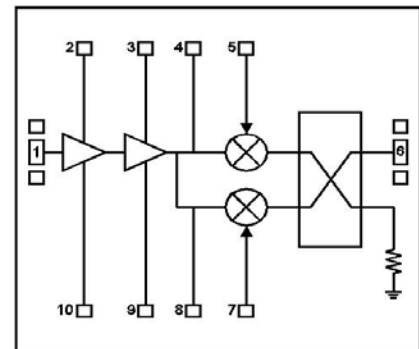
Description

The Endwave *EWM4401ZZ* is a GaAs pHEMT active mixer MMIC that can be used as a 38 GHz up or downconverter. With only 0 dBm of LO drive, the mixer typically provides 11 dB of conversion loss in either application. The mixer provides better than +27 dBm input IP3 in either application and LO/IF isolation of 11 dB as an upconverter. This device has integrated ESD protection bias circuitry and can be used for a wide range of applications from defense electronics to commercial communication systems. All die are 100% DC and RF tested and visually inspected to Mil-Std-883 Method 2010.

Device Photo



Block Diagram

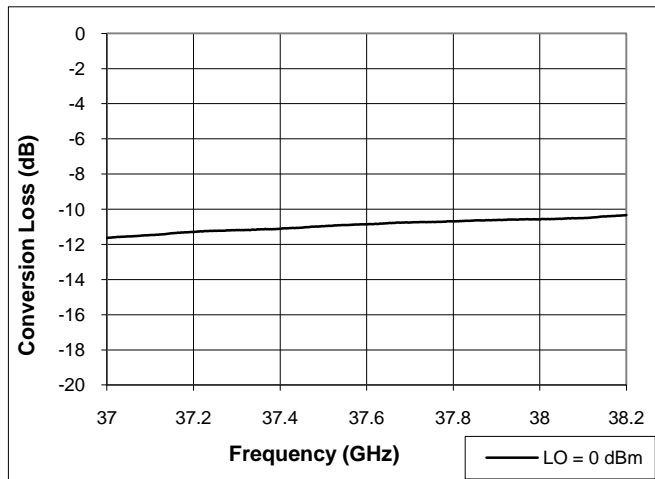


Electrical Characteristics (Temperature = +25 °C)

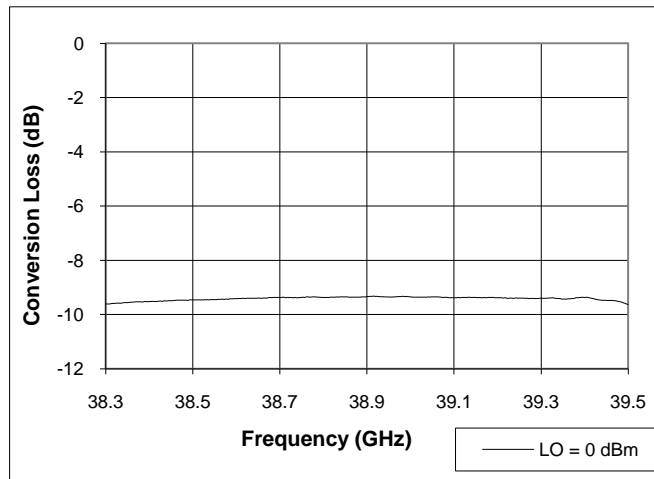
Parameter	Min.	Typ.	Max.	Units
Frequency Range, IF	0		4.5	GHz
Frequency Range, RF/LO	34		44	GHz
Conversion Loss		11		dB
LO to RF Isolation		11		dB
LO to IF Isolation		30		dB
Input IP3		+27		dBm
Amplitude Balance		+/- 0.8		dB
Phase Balance		+/- 8		°
Image Rejection		20		dB
IF Return Loss		10		dB
LO Return Loss		10		dB
RF Return Loss		10		dB
Drain Bias Voltages (Vd1,2)		+4.4		V
Drain Bias Currents (Id1+1d2) @ 4.4V		120		mA
Gate Bias Voltages (Vg3)		-1.1		V

Mixers – I/Q Downconverter – Bare Die

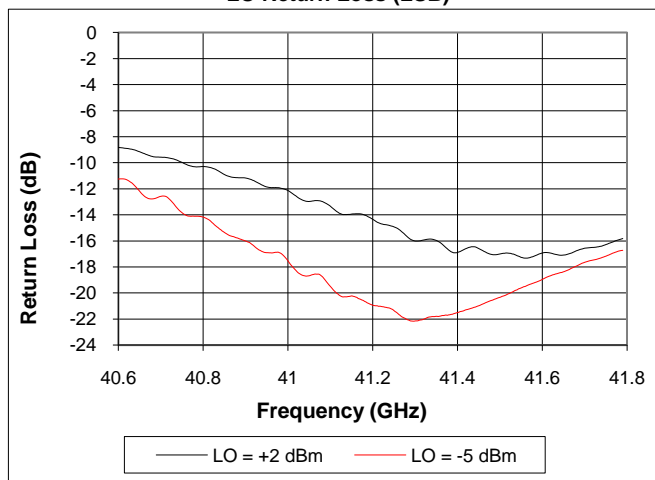
USB Conversion Loss



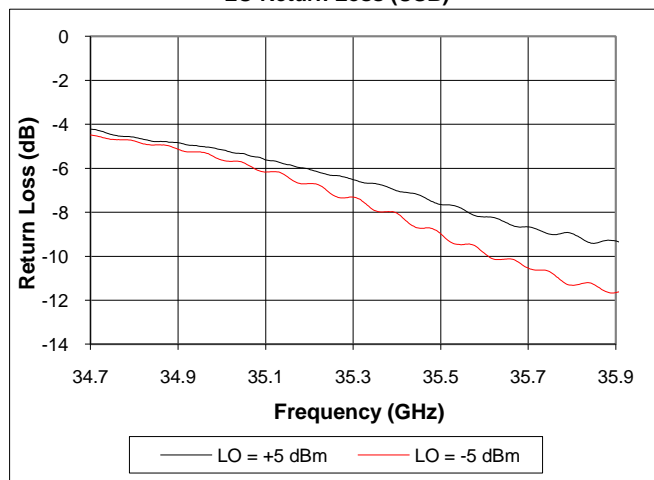
LSB Conversion Loss



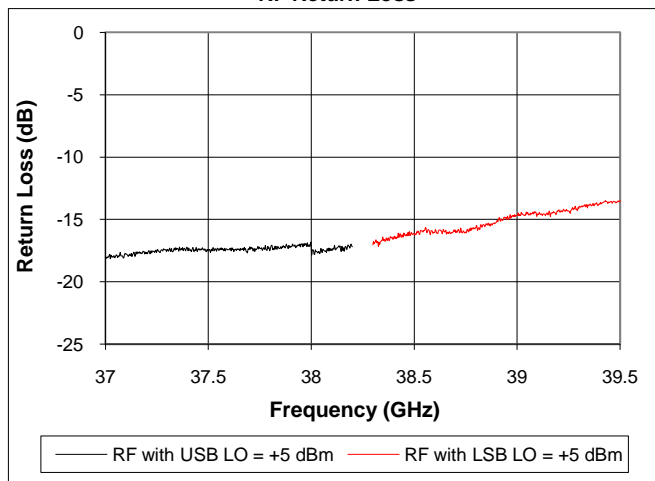
LO Return Loss (LSB)



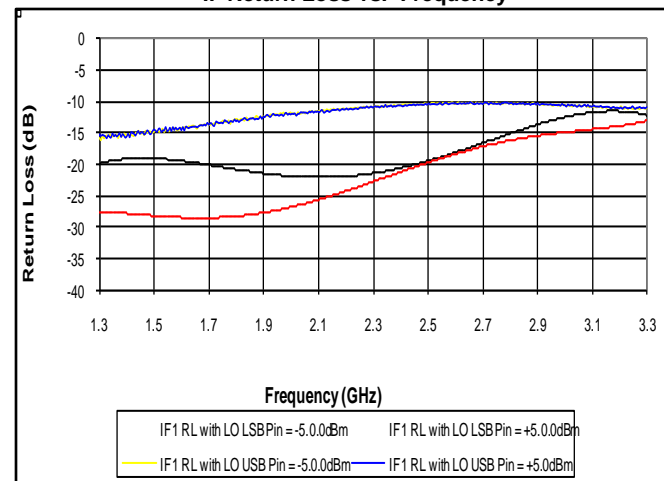
LO Return Loss (USB)



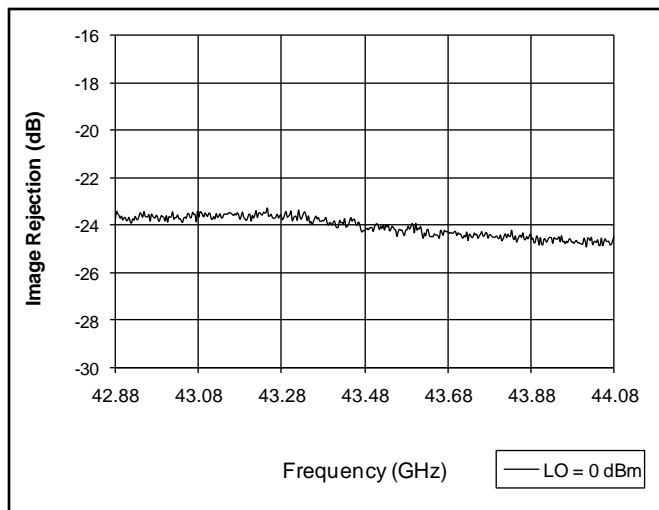
RF Return Loss



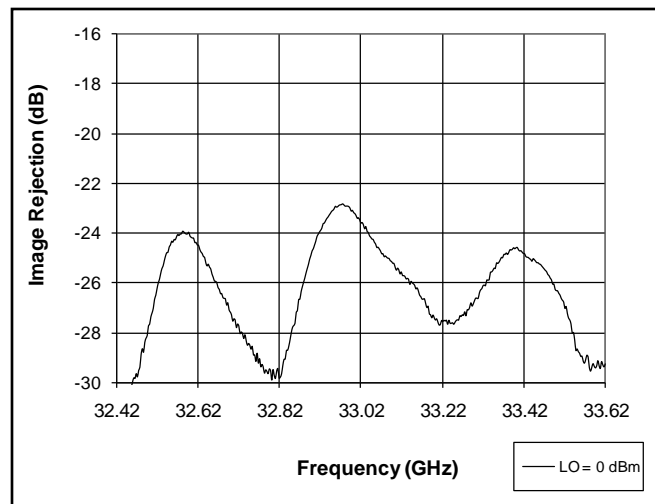
IF Return Loss vs. Frequency



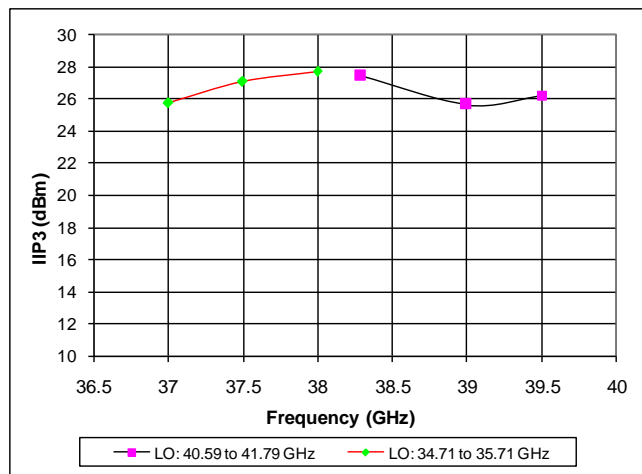
LSB Image Rejection



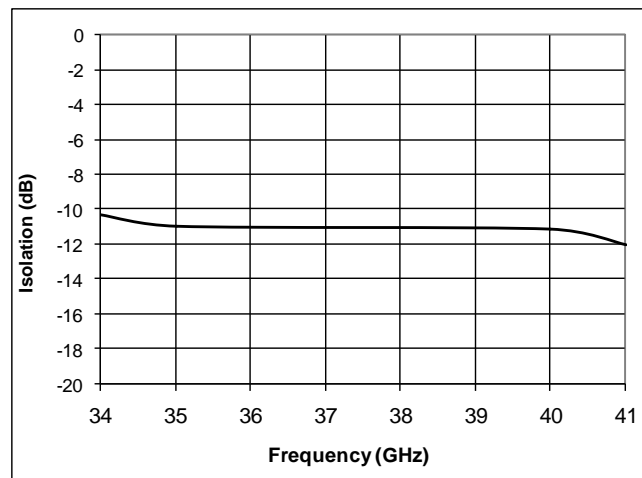
USB Image Rejection



IIP3 vs. Frequency
(RF @ -20 dBm per tone; LO @ +5 dBm)



LO to RF Isolation (LO drive = +5 dBm)

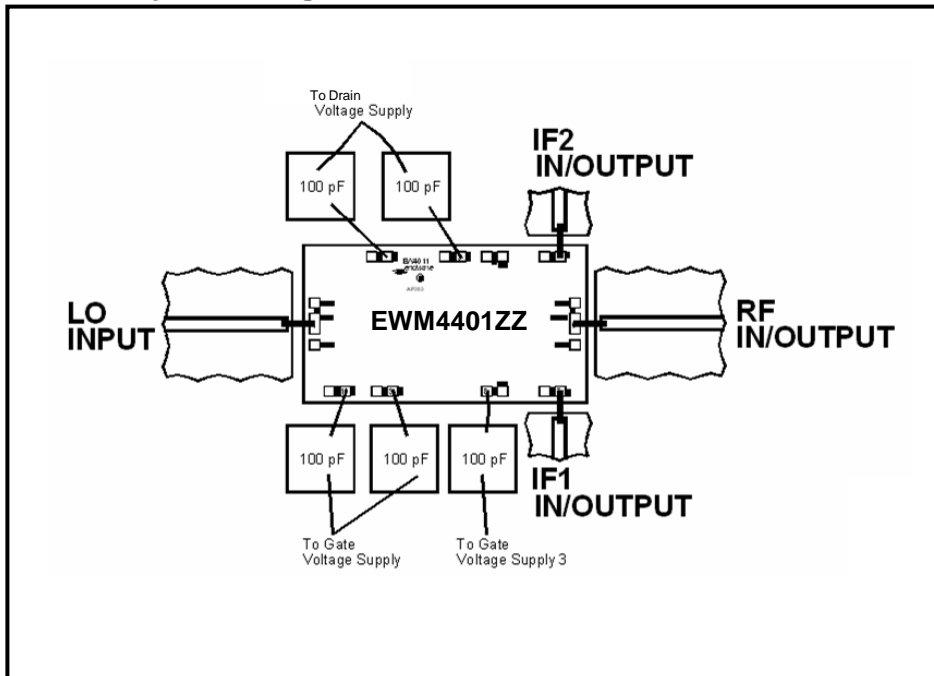


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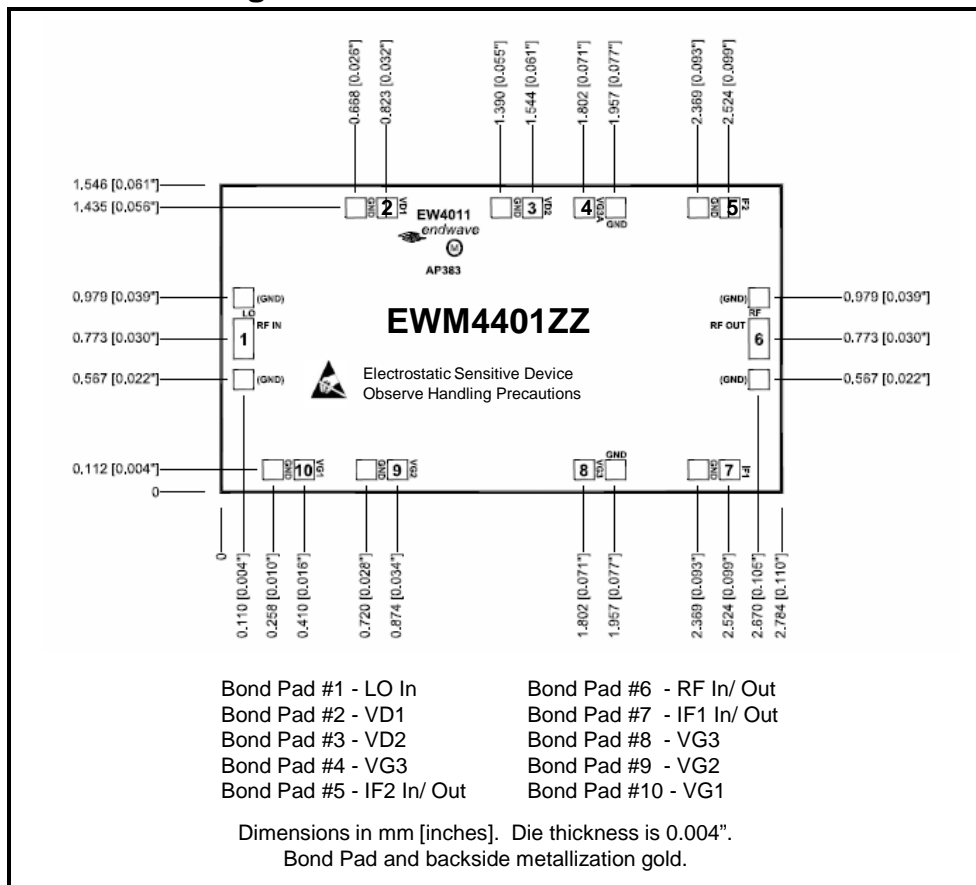
September 2009 – Rev 5

Production

Assembly Drawing



Outline Drawing

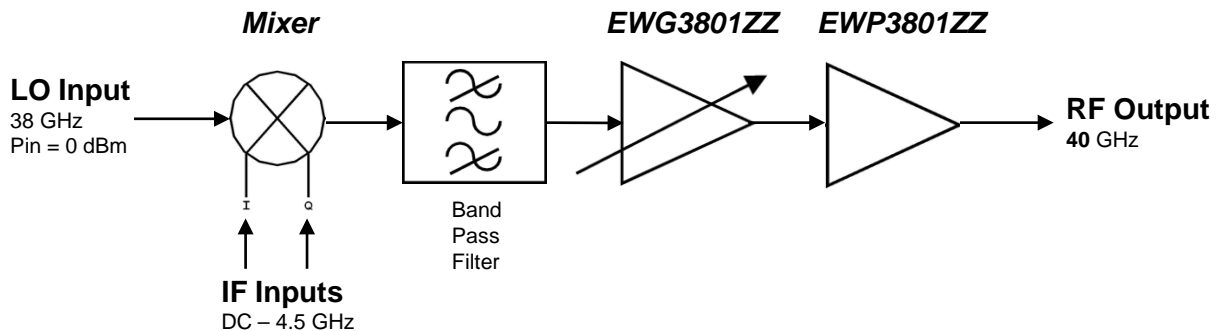


Mixers – I/Q Downconverter – Bare Die

Absolute Maximum Ratings

IF Input Power	+5 dBm per each Input
LO Input Power	+15 dBm
Supply Voltage (Vd1, 2)	+5.5 V
Supply Current (Id1, 2)	200 mA
Supply Gate Voltage	-2.5V to 0V
Storage Temperature	-65 to +150°C
Operating Temperature	-40 to +85°C
Channel Temperature	175°C

Typical Application



Support Documentation

Support documentation including Assembly Notes, Application Notes and Qualification Procedures can be found on our website at www.endwave.com.

Ordering Information

Part Number	Description
EWM4401ZZ	RoHS compliant bare die in wafer or gel packs
EWM4401ZZ-EV	EWM4401ZZ in a connectorized test fixture