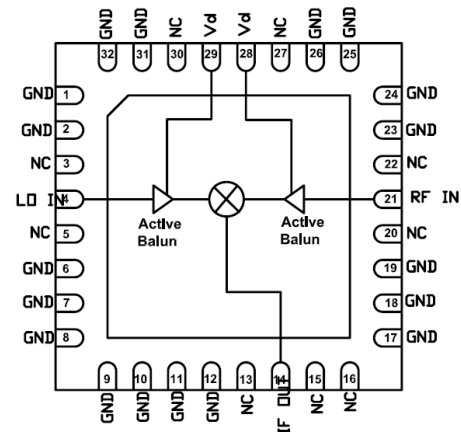


2.0 – 8.0 GHz Double Balanced Ring Mixer

Features

- ◆ RF/LO Frequency : 2.0 – 8.0 GHz
- ◆ IF Bandwidth : DC – 1.0 GHz
- ◆ Nominal LO drive of 7 – 13 dBm
- ◆ Low Conversion Loss
- ◆ High Port to Port Isolation
- ◆ Input P_{1dB} of 2 dBm
- ◆ High IIP3
- ◆ Nominal Bias : 5V @ 85mA
- ◆ 0.15- μ m InGaAs pHEMT Technology
- ◆ QFN Plastic Package : 5mm x 5mm x 0.8 mm

Functional Diagram


Typical Applications

- ◆ Military & Space Systems
- ◆ Microwave Point to Point Radio
- ◆ Automotive Radars & EW
- ◆ Test Equipment

Description

ASL7001P5 is a double balanced ring mixer available in a low cost QFN package. It exhibits down conversion capabilities for RF, LO frequencies ranging from 2–8GHz and an IF bandwidth of DC–1GHz. RF & LO Baluns are realized using differential amplifier topology. Each of these active baluns biased at 5V, consumes a current of around 40mA. The mixer has been designed to operate in a high side rejection mode i.e., LO frequency is kept above the RF frequency band. However, it can be used in low side rejection mode for low IF frequency applications. Nominal LO drive level for the mixer is 7–13dBm and the RF power level is -20dBm.

Absolute Maximum Ratings ⁽¹⁾

Parameter	Absolute Maximum	Units
RF input power	+10	dBm
LO input power	+20	dBm
Drain bias	6	V
Operating Temperature	-55 to +85	°C
Storage Temperature	-65 to +150	°C

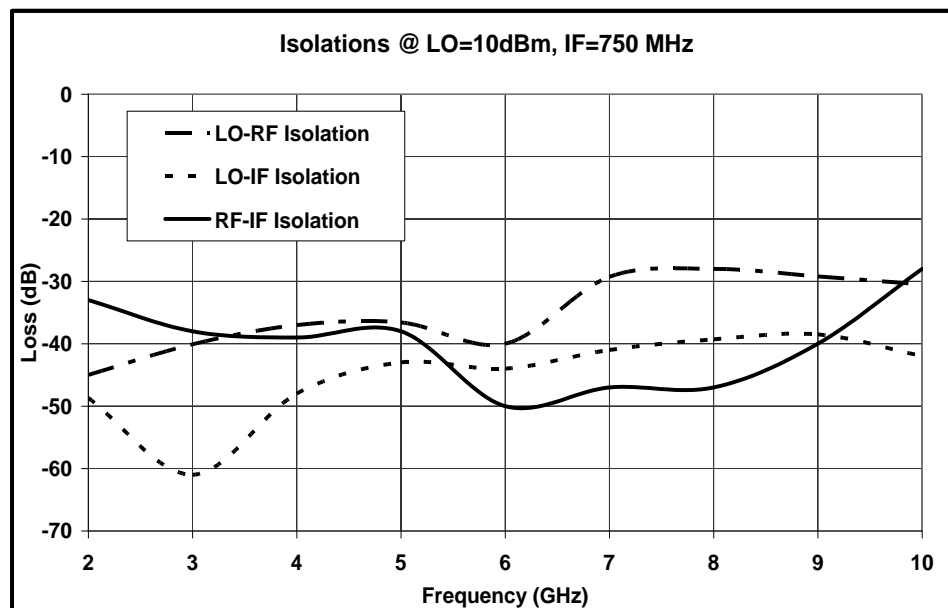
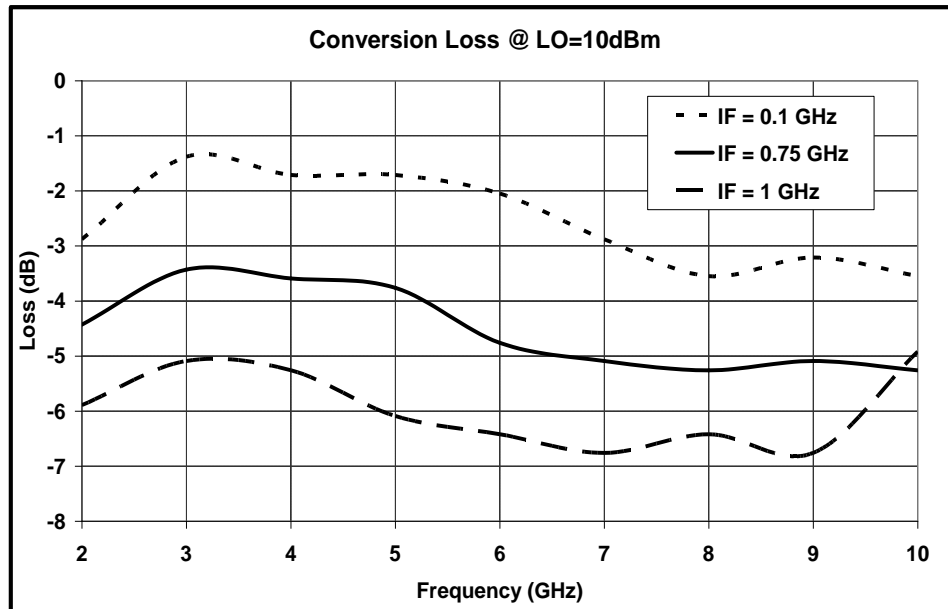
1. Operation beyond these limits may cause permanent damage to the component

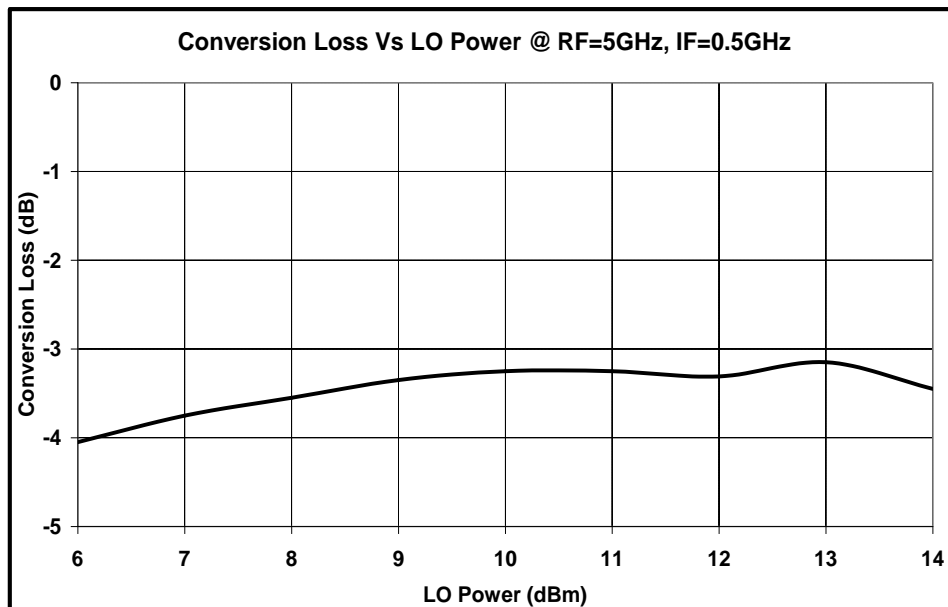
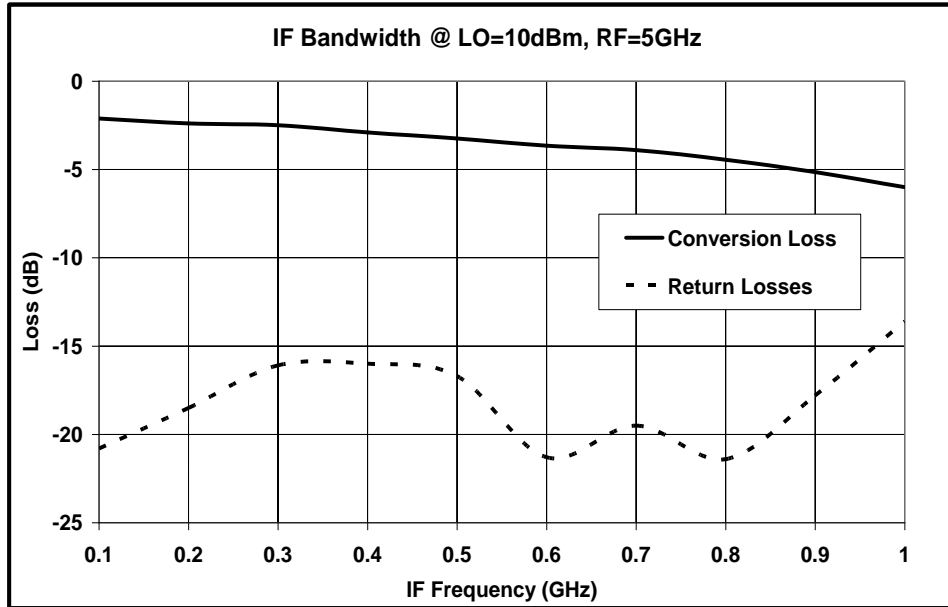
Electrical Specifications ^{(1), (2)} @ T_A = 25°C, Z_o =50Ω, V_d=5V

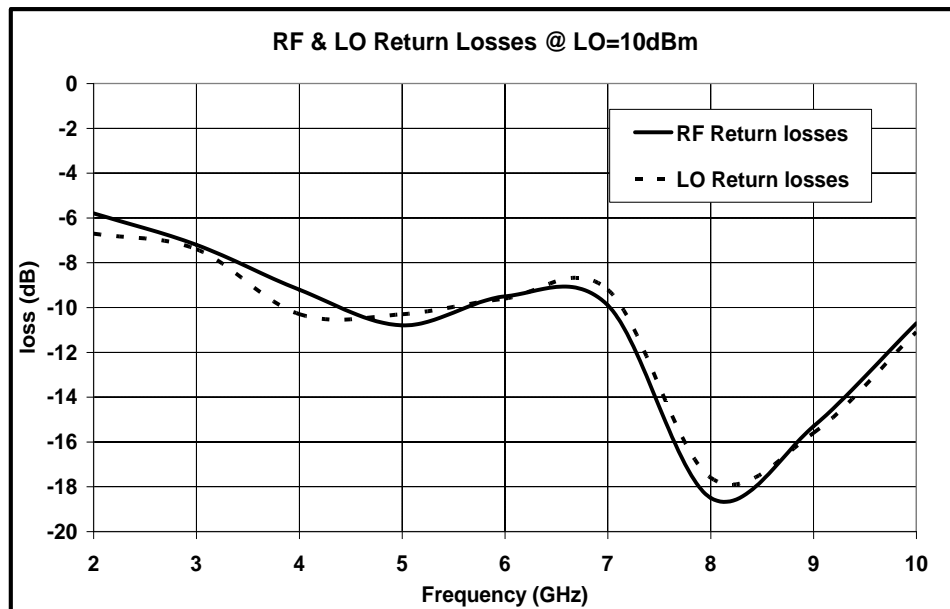
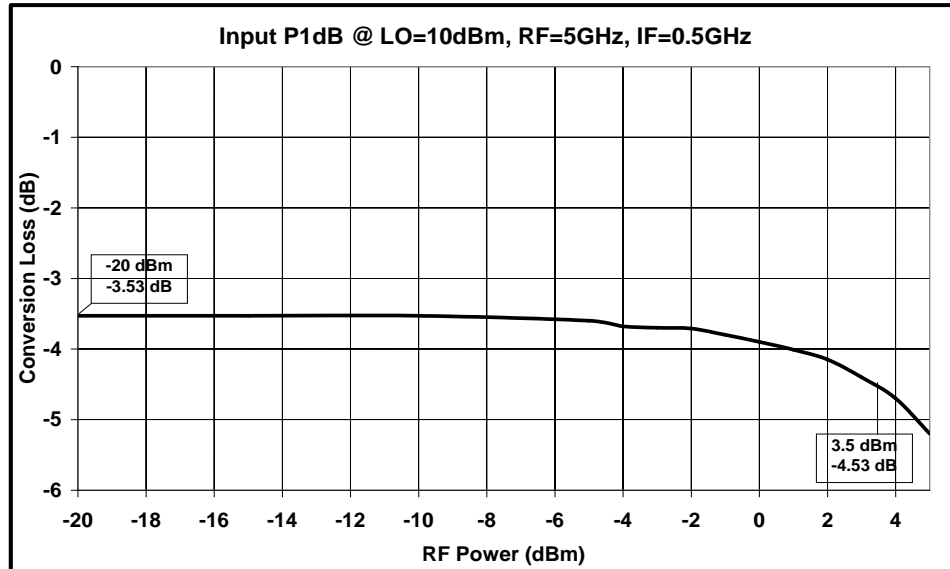
Parameter	Min.	Typ.	Max.	Units
Frequency Range, RF & LO	2.0		8.0	GHz
Frequency Range, IF	DC		1.0	GHz
LO Power	7		13	dBm
Conversion loss		3		dB
LO-RF Isolation		30		dB
RF-IF Isolation		30		dB
LO-IF Isolation		40		dB
Input P _{1dB} @ RF=5GHz		3		dBm
Input IP ₃ ⁽³⁾		10		dBm
RF & LO Return losses		10		dB
IF Return losses		15		dB
Current		85		mA

Note:

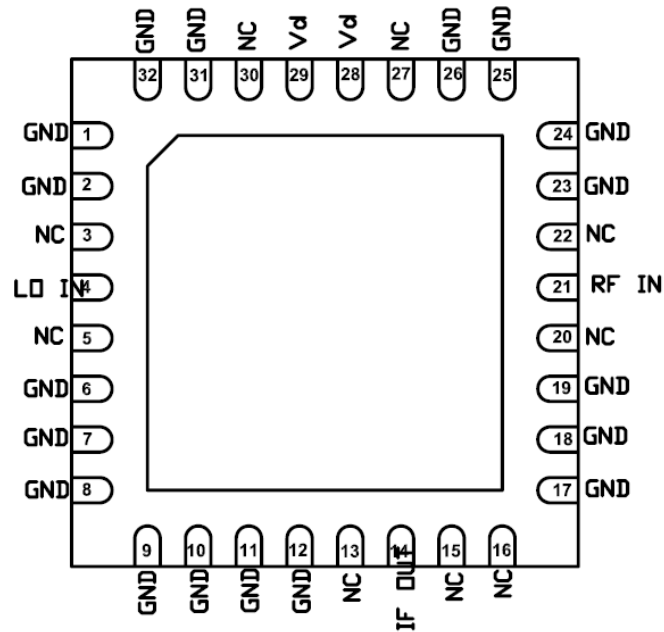
1. Electrical specifications as measured in a test fixture.
2. Specifications measured at an RF Power level of -20dBm, LO Power level of 10dBm and IF frequency of 100MHz.
3. Input IP₃ is simulated value.

Test fixture data
 $V_d = 5V$, Total Current = 85mA, $T_A = 25^\circ C$


Test fixture data
 $V_d = 5V$, Total Current = 85 mA , $T_A = 25^\circ C$


Test fixture data
 $V_{dd} = 5V$, Total Current = 85 mA, $T_A = 25^\circ C$


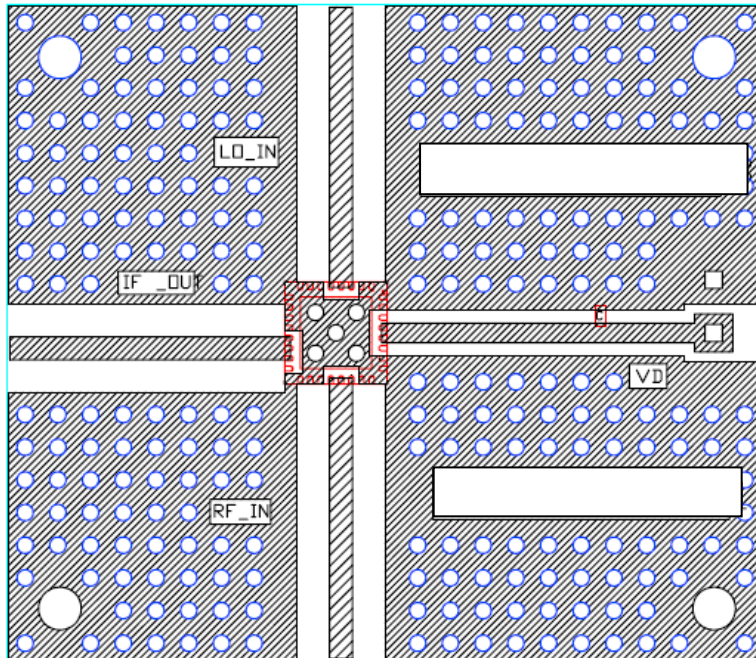
Pin Configuration



Pin Designations

Symbol	Pin No.	Description
GND	1,2,6,7,8,9,10,11,12,17,18,19,23,24,25,26,31,32	Grounded
RF IN	21	RF Input
LO IN	4	LO Input
IF OUT	14	IF Output
Vd	28, 29	Drain Voltage
NC	3,5,13,15,16,20,22,27,30	No Connection

Test Board Pattern



QFN mounted on test pattern

List of components

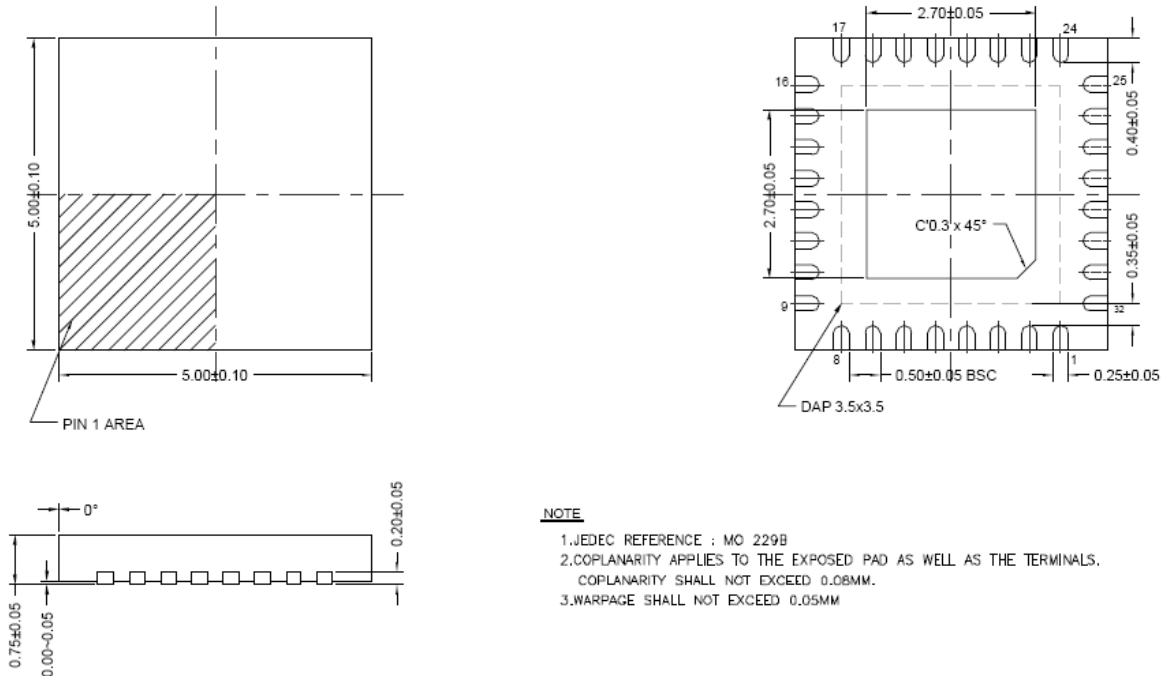
Capacitor value	Reference
0.1 μ F	0402 / 0603

Note:

1. Input and output 50 ohm lines are on 20 mil RO4350 substrate

Package Outline

All units are in millimeters



NOTE

1. JEDEC REFERENCE : MO 229B
2. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
COPLANARITY SHALL NOT EXCEED 0.08MM.
3. WARPAGE SHALL NOT EXCEED 0.05MM



GaAs MMIC devices are susceptible to Electrostatic discharge. Proper precautions should be observed during handling, assembly & testing

All information and Specifications are subject to change without prior notice