Double-Balanced Mixer
5 - 1000 MHz

MD-159 / MDS-159
Rev. V2

Features

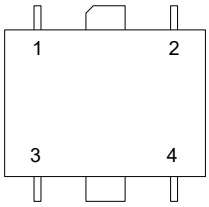
- Fully Hermetic Package (MDS-159)
- Guaranteed VSWR
- 45 dB Isolation
- 6 dB Conversion Loss

Applications

- Aerospace & Defense
- ISM

Description

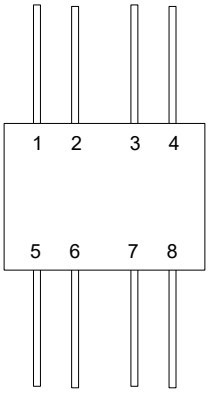
Transformers convert the LO and RF paths to balanced lines connecting to a medium barrier, Schottky diode ring quad. These transformers help provide excellent isolation between ports. Conversion loss is low. The direct connection of the IF port to the diode quad allows these mixers to be used as phase detectors and bi-phase modulators.



SF-1 (MDS-159)

Pin Configuration (MDS-159)

Pin #	Function	Pin #	Function
1	GND	3	LO
2	IF	4	RF



FP-2 (MD-159)

Ordering Information

Part Number	Package
MDS-159-PIN	surface mount
MD-159-PIN	flatpack

Pin Configuration (MD-159)

Pin #	Function	Pin #	Function
1	GND	5	LO
2	GND	6	GND
3	GND	7	GND
4	IF	8	RF

Electrical Specifications[1]: T_A = -55°C to +85°C, Z_0 = 50 Ω

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Frequency Range	RF, LO Ports IF Port	MHz	5 DC	—	1000
Conversion Loss	10 - 500 MHz 5 - 900 MHz 900MHz-1000MHz	dB	—	—	7.5 8.5 10.5
Isolation	LO to RF 5 - 500 MHz 500 - 1000 MHz LO to IF 5 - 500 MHz 500 - 1000 MHz RF to IF 5 - 500 MHz 500 - 1000 MHz	dB	 35 30 30 22 23 20	—	—
VSWR (LO, RF)	LO Port 10 - 500 MHz 5 - 1000 MHz RF Port[2] 10 - 500 MHz 5 - 1000 MHz	Ratio	—	—	 1.8:1 2.0:1 1.7:1 3.0:1
VSWR (IF)[2]	DC - 100 MHz DC - 500 MHz DC - 1000 MHz	Ratio	—	—	1.5:1 2.0:1 2.5:1
DC Polarity	—	Positive			
DC Offset	—	mV	—	<1	—
RF Input	1 dB Compression 1 dB Desensitization	dBm	—	+1.5 -1.5	—
SSB Noise Figure	—	Within 1 dB of Conversion Loss Max.			
Typical Two-Tone IM Ratio	-10 dBm input per tone, 10 MHz separation 10 MHz 100 MHz 500 MHz	dB	—	 50 50 45	—

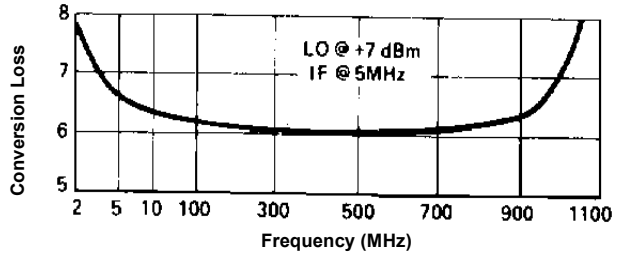
1. All specifications apply when operated @ 7 dBm available LO power with 50 Ω source and load impedance.
2. Specified for LO power @ 7 dBm, 250 MHz test port power @ -10 dBm.

Absolute Maximum Ratings

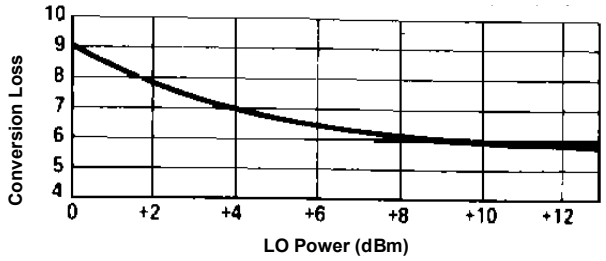
Parameter	Absolute Maximum
Input Power	300 mW @ 25°C Derated to 85°C @ 3.2 mW/°C
IF Port Current	50 mA

Typical Performance Curves

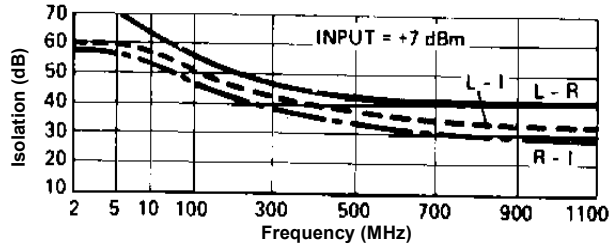
Conversion Loss



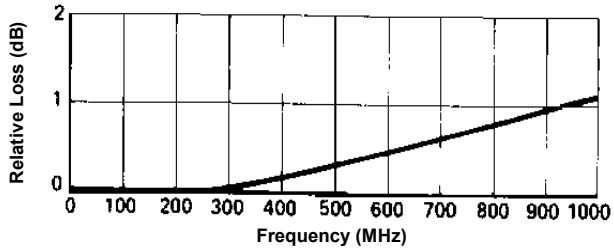
Conversion Loss vs. LO Power



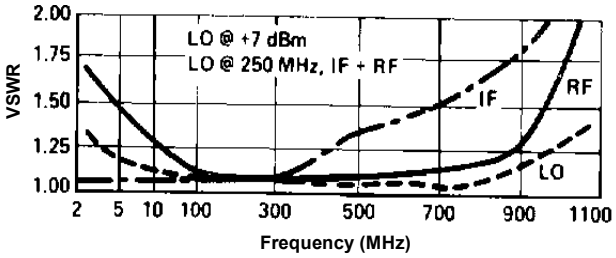
Isolation



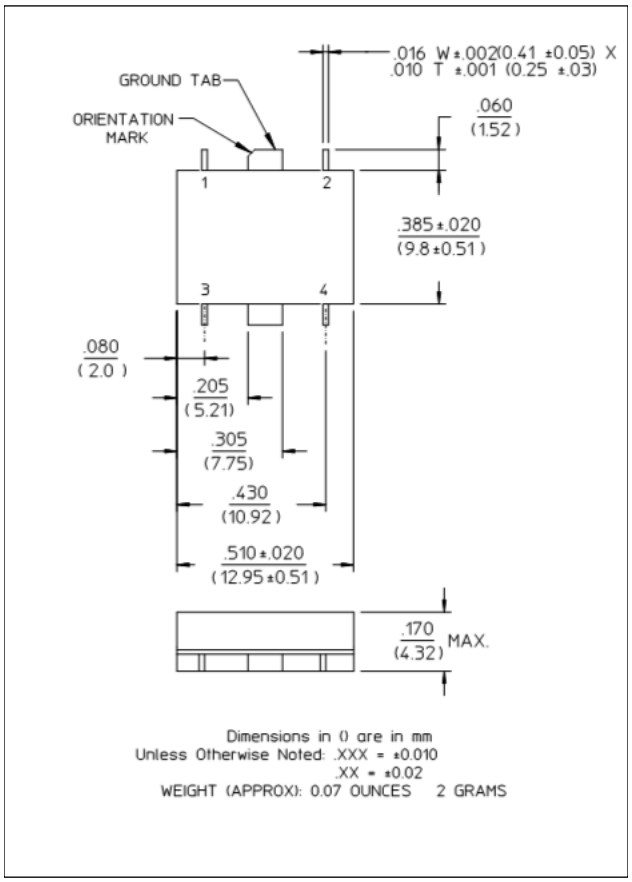
IF Port Response



VSWR



SF-1 (MDS-149)



FP-2 (MD-149)