

Double-Balanced Mixer

5 - 1000 MHz



MD-159 / MDS-159

Rev. V2

Features

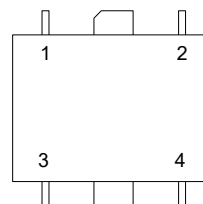
- Fully Hermetic Package (MDS-159)
- Guaranteed VSWR
- 45 dB Isolation
- 6 dB Conversion Loss

Applications

- Aerospace & Defense
- ISM

Description

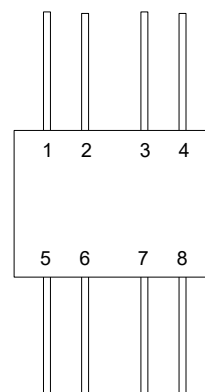
Transformers convert the LO and RF paths to balanced lines connecting to a medium barrier, Schottky diode ring quad. These transformers help provide excellent isolation between ports. Conversion loss is low. The direct connection of the IF port to the diode quad allows these mixers to be used as phase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

Pin Configuration (MD-159)

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

Ordering Information

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

Double-Balanced Mixer

5 - 1000 MHz



MD-159 / MDS-159

Rev. V2

Electrical Specifications¹: $T_A = -55^\circ\text{C}$ to $+85^\circ\text{C}$, $Z_0 = 50 \Omega$

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	dB	35 30	—	—
	LO to IF 5 - 500 MHz 500 - 1000 MHz				
	RF to IF 5 - 500 MHz 500 - 1000 MHz				
VSWR (LO, RF)	LO Port 10 - 500 MHz 5 - 1000 MHz	Ratio	—	—	1.8:1 2.0:1
	RF Port ² 10 - 500 MHz 5 - 1000 MHz				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	—

- All specifications apply when operated @ 7 dBm available LO power with 50 Ω source and load impedance.
- 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

Double-Balanced Mixer

5 - 1000 MHz

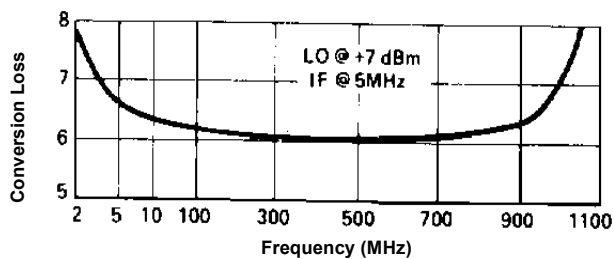


MD-159 / MDS-159

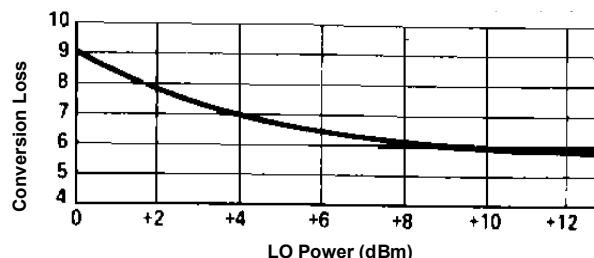
Rev. V2

Typical Performance Curves

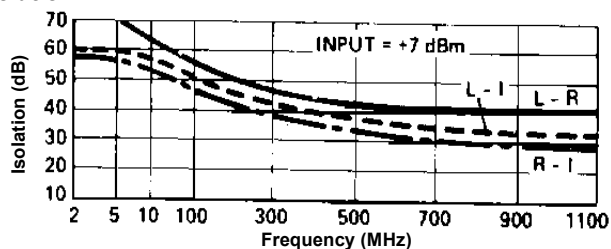
Conversion Loss



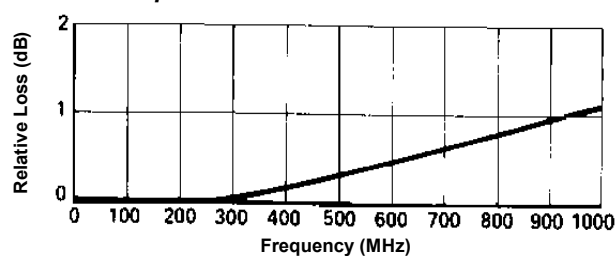
Conversion Loss vs. LO Power



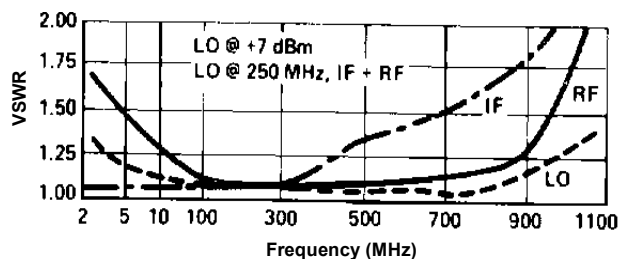
Isolation



IF Port Response



VSWR



Double-Balanced Mixer

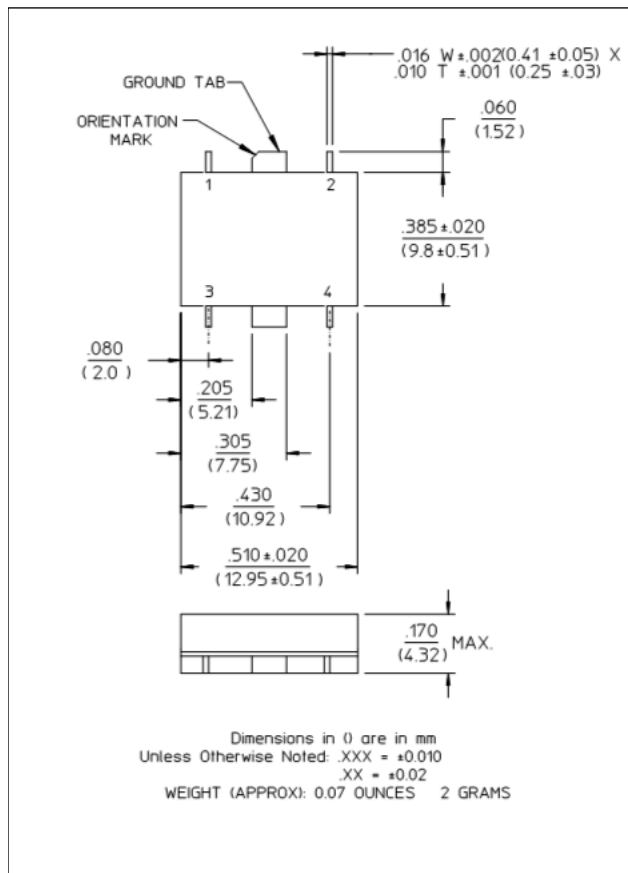
5 - 1000 MHz



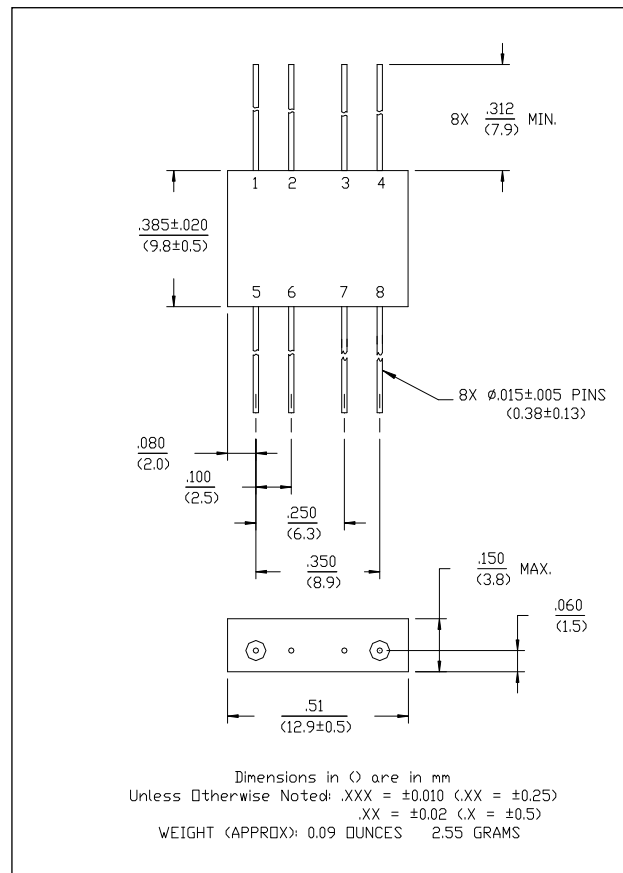
MD-159 / MDS-159

Rev. V2

SF-1 (MDS-149)



FP-2 (MD-149)



Double-Balanced Mixer

5 - 1000 MHz



MD-159 / MDS-159

Rev. V2

MACOM Technology Solutions Inc. ("MACOM"). All rights reserved.

These materials are provided in connection with MACOM's products as a service to its customers and may be used for informational purposes only. Except as provided in its Terms and Conditions of Sale or any separate agreement, MACOM assumes no liability or responsibility whatsoever, including for (i) errors or omissions in these materials; (ii) failure to update these materials; or (iii) conflicts or incompatibilities arising from future changes to specifications and product descriptions, which MACOM may make at any time, without notice. These materials grant no license, express or implied, to any intellectual property rights.

THESE MATERIALS ARE PROVIDED "AS IS" WITH NO WARRANTY OR LIABILITY, EXPRESS OR IMPLIED, RELATING TO SALE AND/OR USE OF MACOM PRODUCTS INCLUDING FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHT, ACCURACY OR COMPLETENESS, OR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM USE OF THESE MATERIALS.

MACOM products are not intended for use in medical, lifesaving or life sustaining applications. MACOM customers using or selling MACOM products for use in such applications do so at their own risk and agree to fully indemnify MACOM for any damages resulting from such improper use or sale.