

Termination Insensitive Mixer, 5 MHz - 1500 MHz

Rev. V5

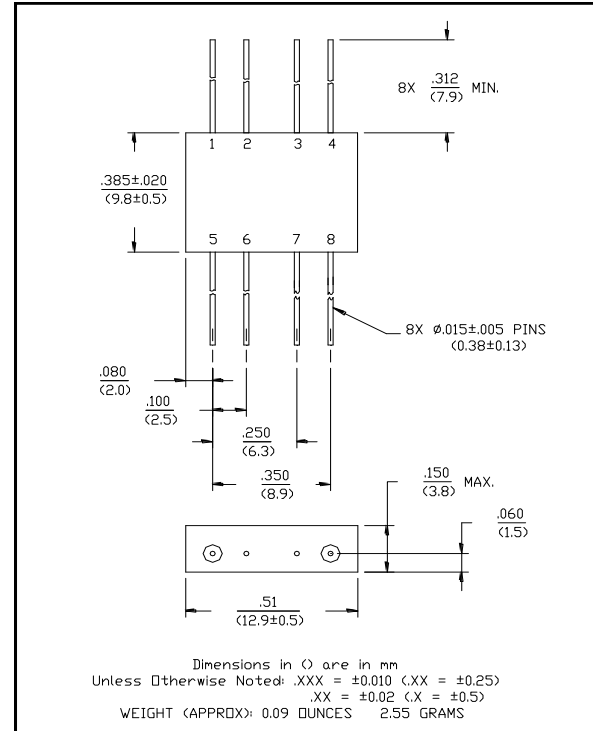
Features

- Low VSWR
- Conversion Loss: 6 dB Typical Midband
- LO-RF Isolation: 35 dB Typical Midband
- Conversion Loss Flatness: 1.5 dB Typical
- Impedance: 50 Ohms Nominal
- Maximum Input Power: 300 mW max. @ 25°C,
Derated linearly to 85°C @ 3.2 mW/°C
- IF Port Current: 50 mA Max.
- MIL-STD-883 Screening Available

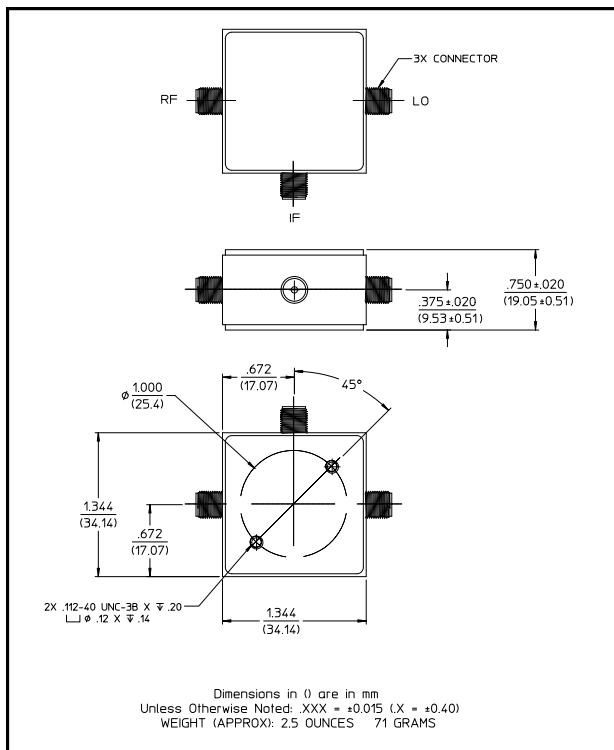
Description

Transformers convert the LO and RF paths to balanced lines connecting to a low 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. Advanced transformer design yields improved VSWR.

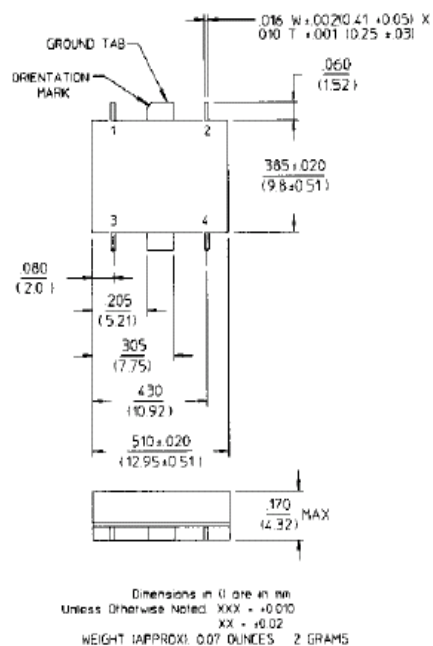
FP-2 (MD-158)



C-7 (MDC-158)



SF-1 (MDS-158)



Electrical Specifications¹: T_A = -55°C to +85°C

Parameter	Test Conditions	Frequency	Units	Min	Typ	Max
Frequency Range	RF, LO Ports IF Port	5 - 1500 DC - 1000	MHz MHz	— —	— —	— —
Conversion Loss		5 - 1000 MHz 5 - 1300 MHz 5 - 1500MHz	dB dB dB	— — —	— — —	7.0 9.0 10.0
Isolation	LO to RF	5 – 1500 MHz 5 - 1000 MHz 5 - 600 MHz	dB dB dB	20 25 30	— — —	— — —
	LO to IF	5 – 1500 MHz 5 - 1000 MHz	dB dB	17 20	— —	— —
	RF to IF	5 – 1500 MHz 5 - 1000 MHz 5 - 600 MHz	dB dB dB	8 18 20	— — —	— — —
DC Polarity	Negative	—	—	—	—	—
DC Offset			mV	—	≤1	—
RF Input	1 dB Compression 1 dB Desensitization		dBm dBm	— —	+1 -1	— —
SSB Noise Figure	Within 1 dB of Conversion Loss Max.	—	—	—	—	—
Typical Two Tone IM Ratio	With -10 dBm input, each input 60 MHz and 70 MHz IF	300 MHz 1000 MHz	dB dB	— —	50 48	— —

1. All specifications apply when operated at +7 dBm available LO power with 50 Ohm source and load impedance.
2. For MDC-158 add 1.0 dB to conversion loss.

Pin Configuration (MD-158)

Pin No.	Function	Pin No.	Function
1	GND	5	LO
2	GND	6	GND
3	GND	7	GND
4	IF	8	RF

Pin Configuration (MDS-158)

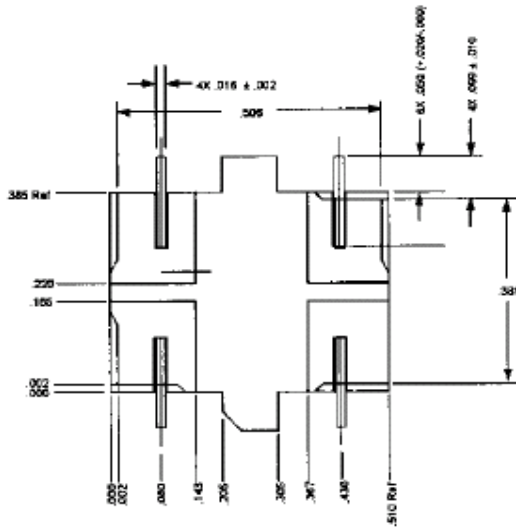
Pin No.	Function	Pin No.	Function
1	GND	3	LO
2	IF	4	RF

Absolute Maximum Ratings (MDS-158)⁴

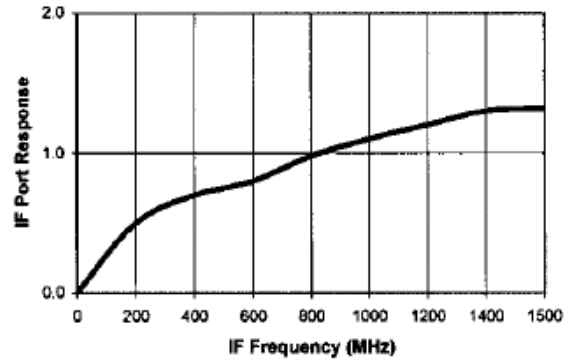
Parameter	Absolute Maximum
Max Input Power ⁵	300mW
Total Power	350 mW Derated at 85°C @ 3.2 mW/°C
LO Power	+24 dBm

4. Operation of this device above any one of these parameters may cause permanent damage.
5. Ambient Temperature (T_A) = +25°C

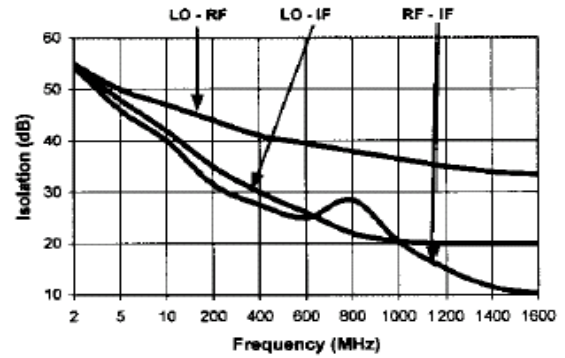
Bottom View of SF-1



IF Port Response

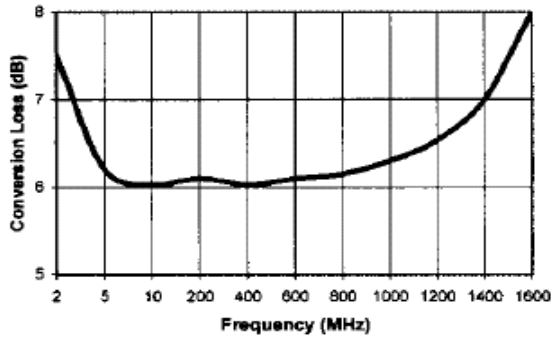


Isolation

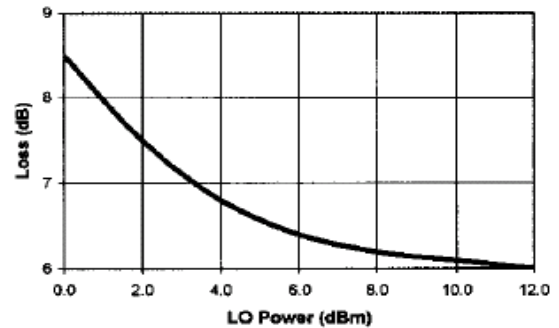


Typical Performance Curves

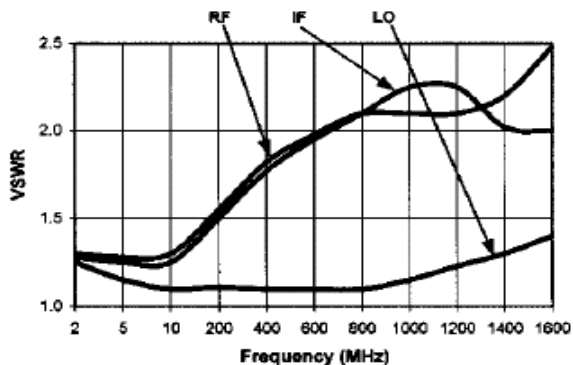
Conversion Loss



Conversion Loss vs. LO Power (RF @ 1000 MHz—10 dBm, IF = 50 MHz)



VSWR



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