

# DBM-143

## Subminiature Flatpack Double Balanced Mixer 10MHz to 1500MHz

RFMD Model DBM-143 is a high performance subminiature double balanced mixer utilizing precision matched beam-lead Schottky barrier diodes. The L and R ports have a bandwidth of 10MHz to 1500MHz while the X port covers a bandwidth of DC to 1000MHz. Inputs to any two ports within their specified frequency range will produce the sum and difference frequency at the third port, with a minimum of undesired harmonic modulation products. The double balanced mixer may be used as an up convertor, down convertor, spectrum inverter or for any other frequency changing application. Other uses are as phase detector, double sideband suppressed carrier modulator, bi-phase modulator, pulse modulator or a frequency doubler. The combination of RFMD broadband transformer techniques plus the use of beam-lead Schottky barrier diodes achieve consistent low mixer noise figures and stable isolations. Precise transformer and diode balance provide two-tone third order IM ratios of better than 80dB with -30 dBm input signals. Unique transformer design allows almost constant intermodulation suppression over the mixer's entire operating frequency range.

The subminiature package is sealed, RFI shielded and internally constructed to withstand severe environments. The device configuration allows convenient microstrip or printed circuit board mounting and the leads are easily soldered or welded.



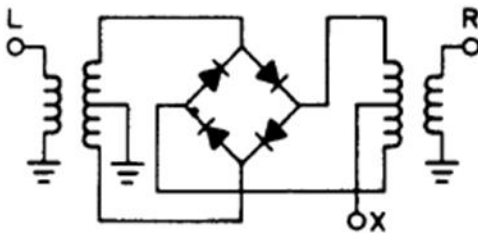
Package: Flatpack

### Features

- L and R Ports: 10MHz to 1500MHz Operation
- X Port: DC to 1000MHz
- Consistent Low Mixer Noise Figures and Stable Isolations
- Subminiature Package is
  - RFI Shielded and Internally Constructed to Withstand Severe Environments

### Applications

- Milcom
- Electronic Warfare
- Industrial, Scientific, Medical
- Aerospace Avionics
- Military and Civilian Radar
- Satellite Communications



Functional Schematic

## Absolute Maximum Ratings

Parameter	Rating	Unit
Operating Temperature Range	-54 to +100	°C
X Port Input Current	50	mA
Total Input Power at 25°C	200	mW
Total Input Power (Derated Linearly) at 100°C	50	mW

Specifications guaranteed with IF from DC to 1000MHz. For higher IF frequencies, consult IF response curve for typical roll-off.

Environmental conditions: All units are designed to meet their specifications between -54°C and +100°C and after exposure to any or all of the following tests per MIL-STD-202E.

- Thermal Shock: Method 107D, Test Condition B
- Altitude: Method 105C, Test Condition G
- H.F. Vibration: Method 204C, Test Condition D
- Mechanical Shock: Method 213B, Test Condition C
- Random Vibration (15 minutes per axis): Method 214, Test Condition IIF
- Solderability: Method 208C
- Terminal Strength: Method 211A, Test Condition C
- Resistance to Soldering Heat: Method 210A, Test Condition B

Sealed units meet the requirements of Method 106D of MIL-STD-202E when exposed to humidity.



**Caution!** ESD sensitive device.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

## Nominal Operating Parameters

Parameter	Specification			Unit	Condition
	Min	Typ	Max		
<b>General Performance</b>					<b>LO +7dBm (High side LO), RF -10dBm, IF 100MHz</b>
Operating Frequency Range					
L Port	10		1500	MHz	
R Port	10		1500	MHz	
X Port	DC		1000	MHz	

Specifications guaranteed with IF from DC to 1000MHz. For higher IF frequencies, consult IF response curve for typical roll-off.

## Frequency Bands

	10MHz to 600MHz (dB)	600MHz to 1200MHz (dB)	1200MHz to 1500MHz (dB)
Conversion Loss	8.5	7.5	9.5
L-R Isolation	30	25	25
L-X Isolation	30	20	18
R-X Isolation	25	15	10

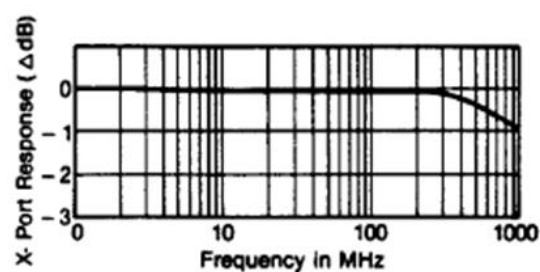
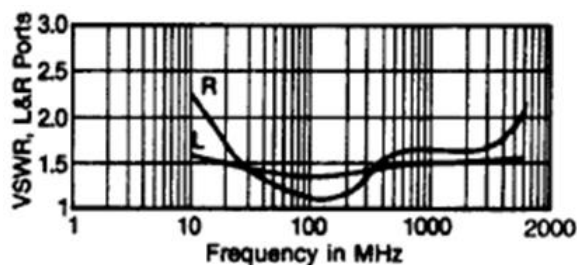
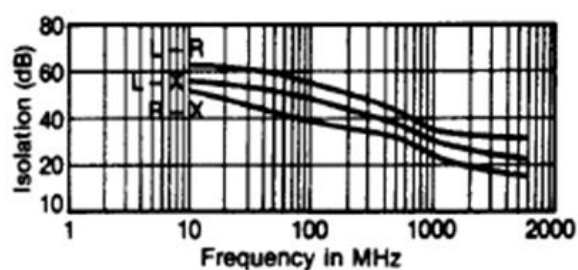
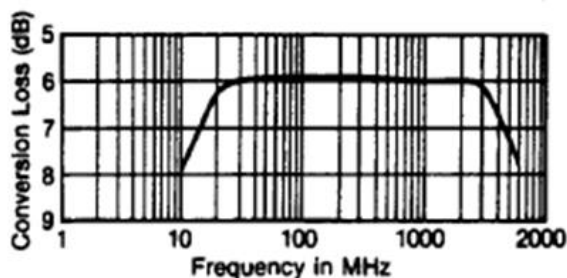
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## DC Polarity

Positive with L and R port signals in-phase.

## Typical Performance

Impedance: All ports 50Ω; 1dB compression point: 0dBm; 1dB desensitization point: -2dBm; 3rd order Intercept point: +10dBm; noise figure is within 1dB of conversion loss; LO power range: +4dBm to +13dBm



### Package Drawing (Dimensions in millimeters)

Material: F15 Kovar per ASTM Standard F-15-68 (chemical composition per MIL-STD-1276, type K)

Finish: plating: all metal parts, gold per MIL-G-45204, type 1, grade A, class 1, over nickel per MIL-C-26074, class 1

Leads: Kovar per MIL-STD-1276, type K

