

**Field Replaceable 2.92mm Double Balanced Mixer
From 23 GHz to 37 GHz With an IF Range From DC to
13 GHz And LO Power of +13 dBm**

The FMMX1002 is a double balanced mixer module that operates across an RF and LO frequency range from 23 GHz to 37 GHz with a wide IF frequency range of DC to 13 GHz. The design utilizes GaAs MESFET MMIC technology and requires no external components or matching circuitry. Excellent LO to RF and LO to IF Isolation levels of 35 dB that are the result of using optimized balun structures. The LO drive level is +13 dBm with typical conversion loss of 9 dB and an input IP3 level up to +19 dBm.

The drop-in package is hermetically sealed with field replaceable 2.92mm connectors for the RF and LO ports, and an SMA connector for the IF port. Operating temperature range is -55°C to +85°C. And for added confidence, this rugged package assembly is designed to meet MIL-STD-883 test conditions for Hermeticity and Temperature Cycle, and the design exhibits a robust 1000V ESD, Class IC rating.

This double balanced Mixer module is part of Fairview Microwave's expanding line of Mixers. These Mixers are high performance modules that offer excellent performance. The family of mixers has a variety of mixer types including Double Balanced Mixers, I/Q Double Balanced Mixer Modules, and others that cover up to Millimeter-Wave Frequencies.

Electrical Specifications TA = +25° C, IF= 1 GHz, LO = +13 dBm

Description	Min	Typ	Max	Units
RF Frequency Range	23		37	GHz
LO Frequency Range	23		37	GHz
IF Frequency Range	DC		13	GHz
Impedance		50		Ohms
Conversion Loss		9	12	dB
Noise Figure		9	12	dB
LO to RF Isolation	20	35		dB
LO to IF Isolation	20	35		dB
RF to IF Isolation	13	25		dB
Input at P1dB	+12			dBm
Input at IP2		+50		dBm
Input at IP3		+19		dBm
RF Input Power			+23	dBm
LO Input Power	+11	+13	+23	dBm
IF Input Power			+25	dBm

Electrical Specification Notes:

All measurements performed as downconverter unless otherwise noted.

Conversion loss measured as IRM.

Mechanical Specifications

Size	
Length	0.89 in [22.61 mm]
Width	0.68 in [17.27 mm]



Features:

- Double Balanced Mixer Module
- RF/LO Frequency 23 to 37 GHz
- Wide IF Bandwidth DC to 13 GHz
- GaAs MESFET MMIC Technology
- No external components or matching circuitry
- LO Drive level +13 dBm
- Low Conversion loss 9 dB
- High LO/RF Isolation 35 dB
- Hermetically Sealed Module
- Mil Spec Compliant
- Field Replaceable Connectors
- -55°C to +85°C Operating Temperature

Applications:

- Electronic Warfare
- Point-to-Point Radios
- Point-to-Multipoint Radios
- VSAT
- Radar
- Space Systems
- Test Instrumentation
- Sensors
- Telecom Infrastructure
- Military End-Use

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Height 0.36 in [9.14 mm]
 Weight 0.0785 lbs [35.61 g]

Configuration

Design Double Balanced
 Connector Option Field Replaceable
 RF Connector 2.92mm Female
 LO Connector 2.92mm Female
 IF Connector SMA Female

Environmental Specifications

Temperature

Operating Range -55 to +85 deg C
 Storage Range -65 to +150 deg C

Temperature Cycle
 Hermetic Seal

MIL-STD-883, Method 101C, Cond B
 Gross Leak MIL-STD-883 Method 1014C1/Fine Leak MIL-STD-883, Method 1014A2, 5 x 10⁻⁸ atm cc

ESD Sensitive

ESD Sensitive Material, Transport material in Approved ESD bags. Handle only in ESD Workstation.

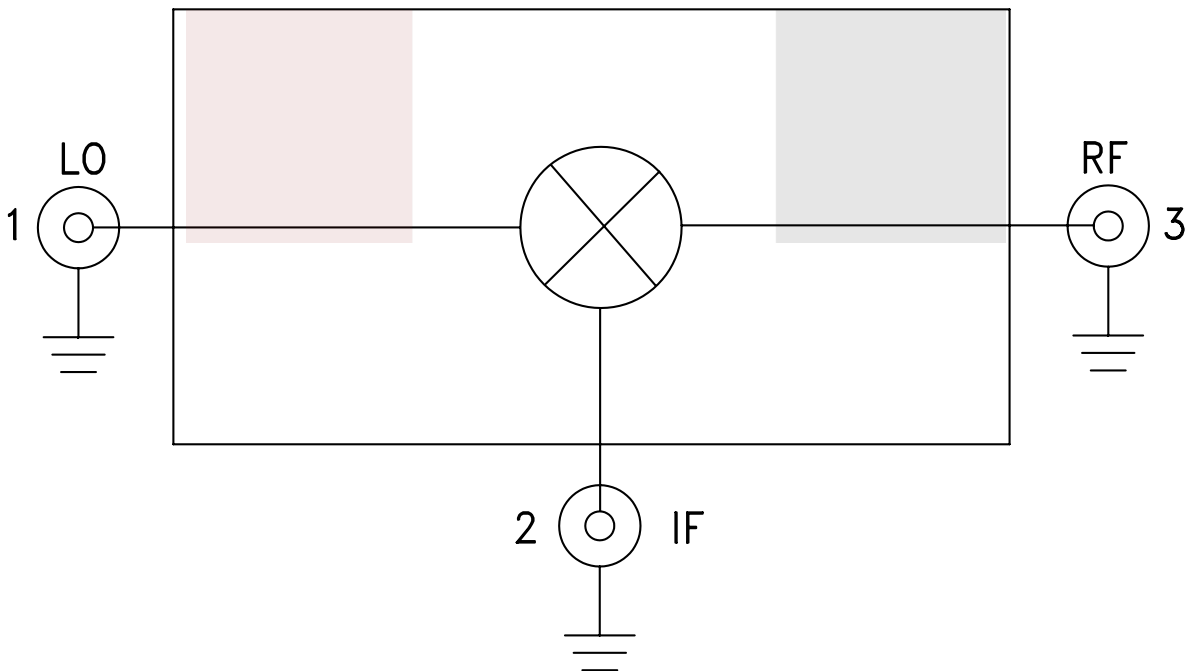


Compliance Certifications (see [product page](#) for current document)

Plotted and Other Data

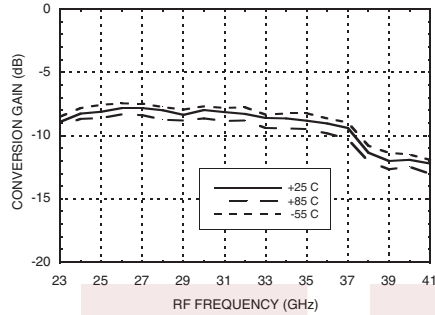
Notes:

Functional Block Diagram

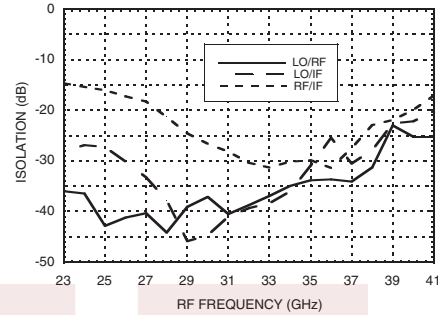


Typical Performance Data

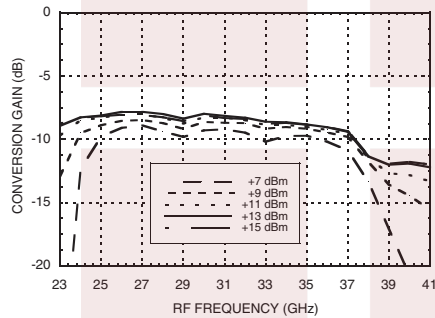
Conversion Gain vs. Temperature



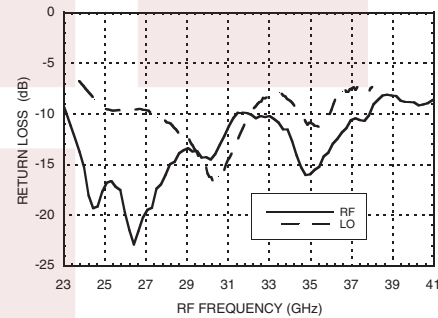
Isolation



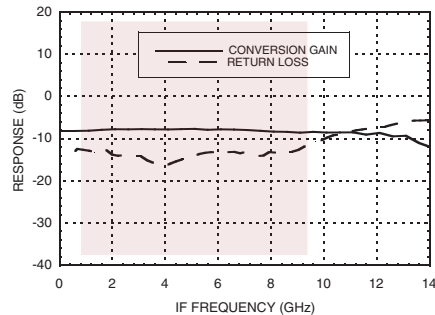
Conversion Gain vs. LO Drive



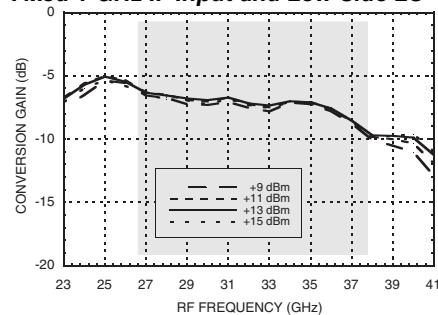
Return Loss



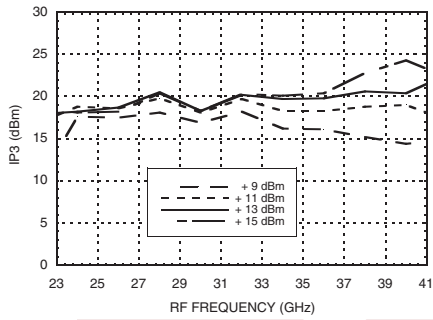
IF Bandwidth Downconversion with Low Side LO = 24 GHz @ +13 dBm



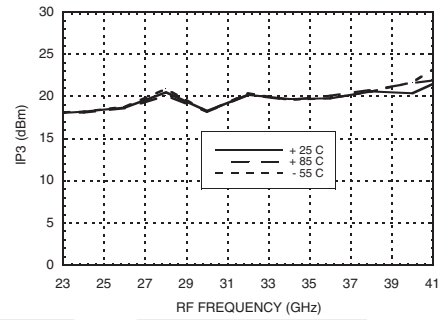
Upconverter Performance, Conversion Gain vs. LO Drive for Fixed 1 GHz IF Input and Low Side LO



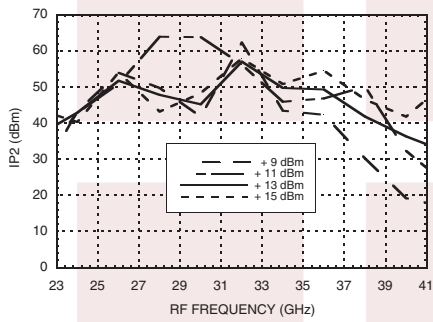
Input IP3 vs. LO Drive *



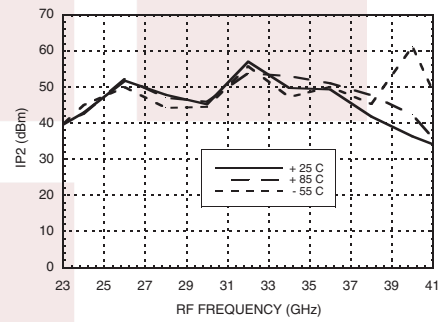
Input IP3 vs. Temperature*



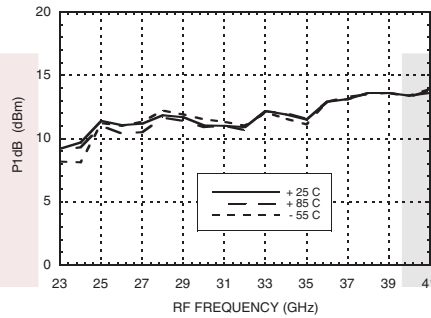
Input IP2 vs. LO Drive *



Input IP2 vs. Temperature *



Input P1dB vs. Temperature



MxN Spurious Outputs

mRF	nLO				
	0	1	2	3	4
0	xx	0	13	xx	xx
1	8	0	29	xx	xx
2	69	53	50	64	xx
3	xx	78	80	67	86
4	xx	xx	87	92	94

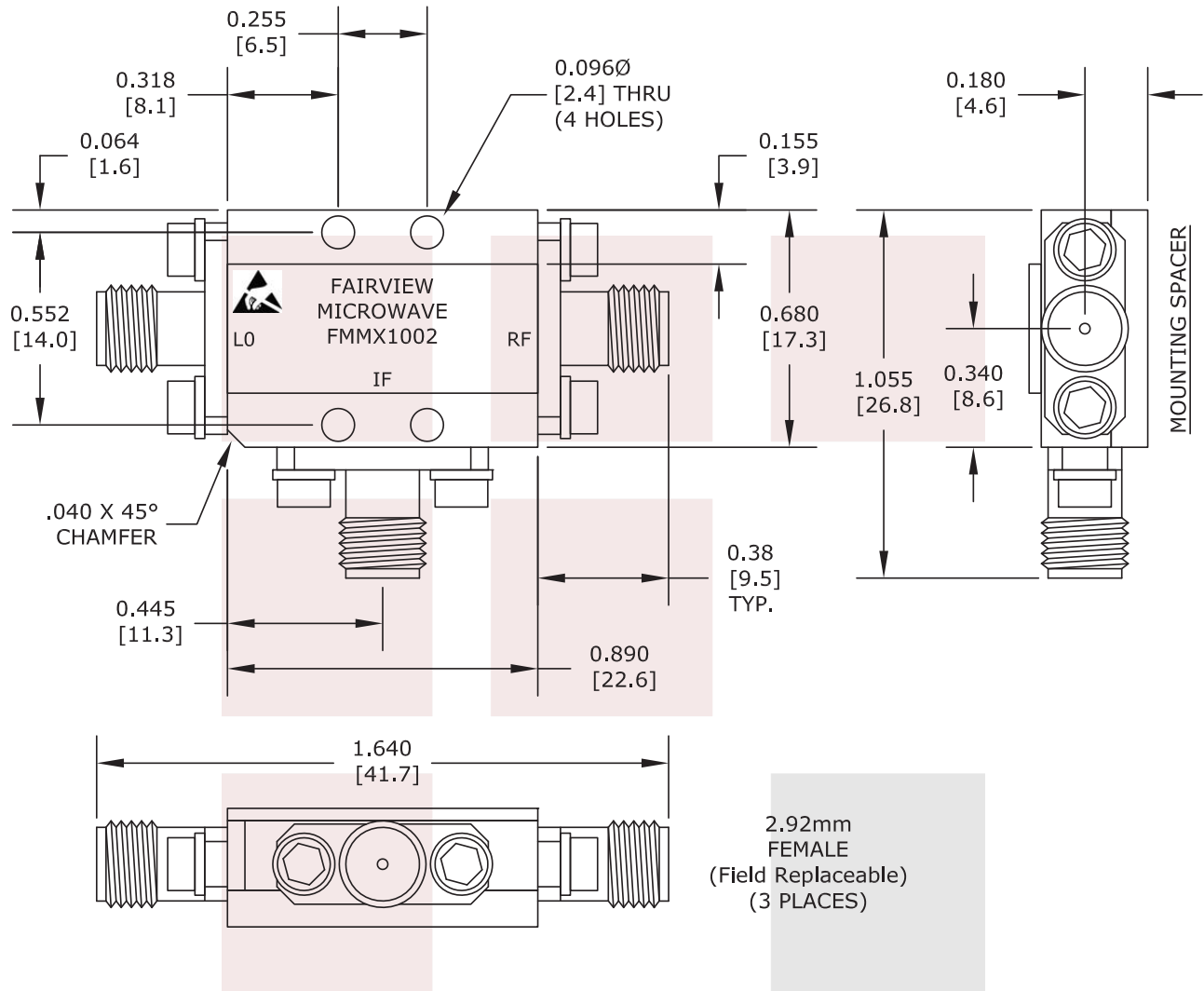
RF = 24 GHz @ -10 dBm
 LO = 25 GHz @ +13 dBm
 All values in dBc below the IF output power level (-1 RF + 1 LO).

Field Replaceable 2.92mm Double Balanced Mixer From 23 GHz to 37 GHz With an IF Range From DC to 13 GHz And LO Power of +13 dBm from Fairview Microwave is in-stock and available to ship same-day. All of our RF/microwave products are available off-the-shelf from our ISO 9001:2008 certified facilities in Allen, Texas. Fairview Microwave is RF on-demand.

For additional information on this product, please click the following link: [Field Replaceable 2.92mm Double Balanced Mixer From 23 GHz to 37 GHz With an IF Range From DC to 13 GHz And LO Power of +13 dBm FMMX1002](#)

URL: <https://www.fairviewmicrowave.com/field-replaceable-2.92mm-mixer-13-dbm-fmmx1002-p.aspx>

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TITLE Field Replaceable 2.92mm Double Balanced Mixer From 23 GHz to 37 GHz With an IF Range From DC to 13 GHz And LO Power of +13 dBm		DWG NO FMMX1002		CAGE CODE 3FKR5	
CAD FILE	050316	SHEET	SCALE	N/A	SIZE A 2233