

**Field Replaceable SMA IQ Mixer From 6 GHz to 10 GHz With an IF Range From DC to 3.5 GHz And LO Power of +19 dBm**

FMMX9001 is an I/Q double balanced millimeter-wave mixer module that operates across an RF and LO frequency range from 6 GHz to 10 GHz with an IF frequency range of DC to 3.5 GHz. The design utilizes leading edge GaAs MESFET MMIC technology that offers high linearity with reliable and consistent performance. This I/Q mixer design incorporates 2 double balanced mixer cells and a 90° hybrid and can operate as a single sideband upconverter, or an image reject mixer (IRM). For downconversion applications, an external quadrature IF hybrid can be used to select the desired sideband while rejecting image signals. Typical performance is impressive with 35 dB image rejection, 45 dB LO to RF isolation, and +25 dBm input IP3. The LO drive level is +19 dBm with typical conversion loss of 7.5 dB.

The drop-in package is hermetically sealed with field replaceable SMA connectors. 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.

This I/Q 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= 100 MHz, LO = +19 dBm

Description	Min	Typ	Max	Units
RF Frequency Range	6		10	GHz
LO Frequency Range	6		10	GHz
IF Frequency Range	DC		3.5	GHz
Impedance		50		Ohms
Conversion Loss		7.5	10	dB
Image Rejection	20	35		dB
LO to RF Isolation	35	45		dB
LO to IF Isolation	20	25		dB
Input at P1dB		+17		dBm
Input at IP3		+25		dBm
Amplitude Balance		0.5		dB
Phase Balance		5		Degrees
RF Input Power			+20	dBm
LO Input Power		+19	+27	dBm
IF Input Power			+20	dBm



**Features:**

- I/Q Double Balanced Mixer Module
- IRM or Single Sideband Upconverter Functionality
- RF/LO mm-wave frequency 6 GHz to 10 GHz
- Wide IF Bandwidth DC to 3.5 GHz
- GaAs MESFET MMIC Technology
- High image rejection 35 dB
- High LO/RF Isolation 45 dB
- High input IP3 +25 dBm
- LO drive level +19 dBm
- 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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**Performance by Frequency**

**Harmonics of LO**

LO Freq. (GHz)	nLO Spur at RF Port			
	1	2	3	4
3.5	39	40	52	51
6.5	43	49	51	70
7.5	51	65	53	62
8.5	56	61	56	50
9.5	47	57	65	63
10.5	45	55	59	46

LO = +19 dBm  
 Values in dBc below input LO level measured at RF Port.

**MxN Spurious Outputs**

mRF	nLO				
	0	1	2	3	4
0	xx	-10	29	18	51
1	33	0	46	77	68
2	99	71	75	70	99
3	97	101	100	86	101
4	99	98	98	102	107

RF = 7.6 GHz @ -10 dBm  
 LO = 7.5 GHz @ +19 dBm  
 Data taken without IF hybrid  
 All values in dBc below IF power level

**Absolute Maximum Ratings**

RF / IF Input	+20 dBm
LO Drive	+27 dBm
Channel Temperature	150°C
Continuous Pdiss (T=85°C) (derate 7.8 mW/°C above 85°C)	507 mW
Thermal Resistance (R <sub>TH</sub> ) (junction to die bottom)	128 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

**Electrical Specification Notes:**

All measurements performed as downconverter unless otherwise noted.

**Mechanical Specifications**

**Size**

Length	0.89 in [22.61 mm]
Width	0.68 in [17.27 mm]
Height	0.36 in [9.14 mm]
Weight	0.0818 lbs [37.1 g]

**Configuration**

Design	IQ
Connector Option	Field Replaceable
RF Connector	SMA Female
LO Connector	SMA 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<sup>-8</sup> atm cc

ESD Sensitive

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



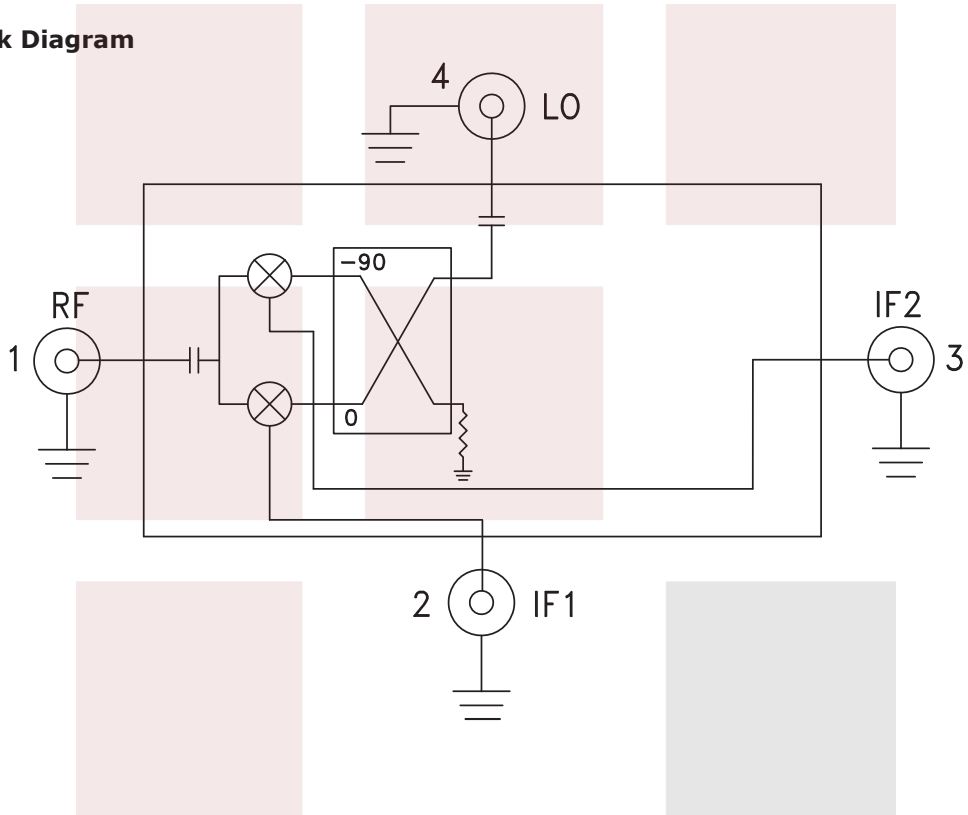
**Compliance Certifications** (see [product page](#) for current document)

**Plotted and Other Data**

Notes:

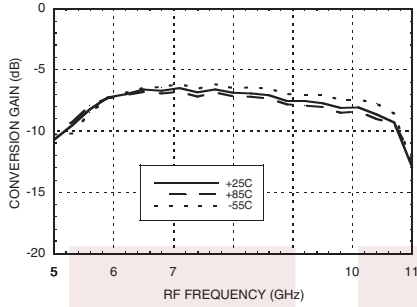
- \*Conversion gain data taken with external IF 90° hybrid.

**Functional Block Diagram**

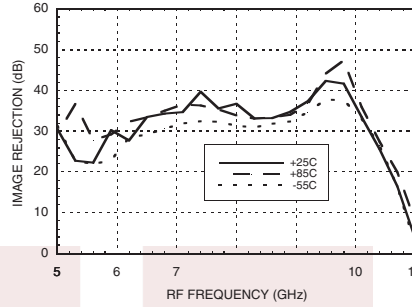


**Typical Performance Data**

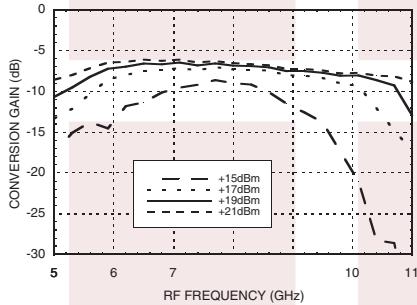
*Data taken As IRM With External IF Hybrid*  
**Conversion Gain vs. Temperature**



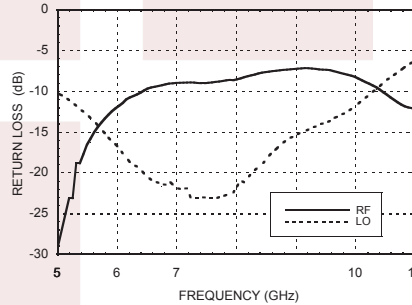
**Image Rejection vs. Temperature**



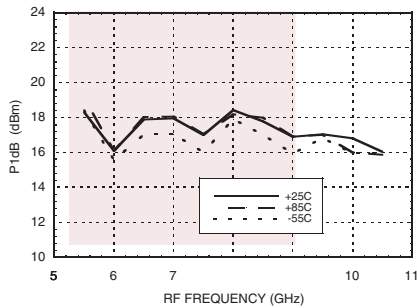
**Conversion Gain vs. LO Drive**



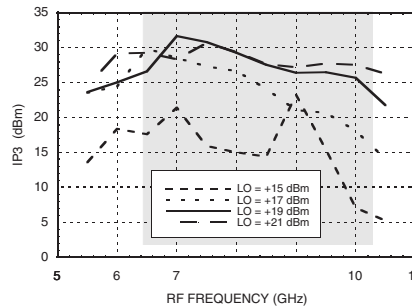
**Return Loss**



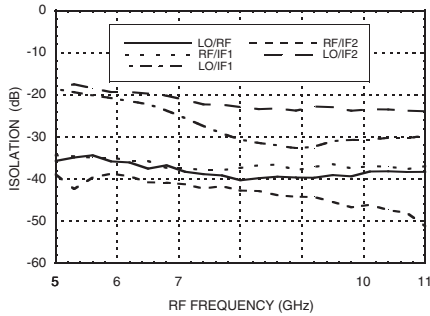
**Input P1dB vs. Temperature**



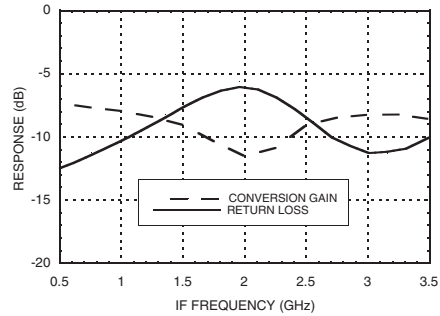
**Input IP3 vs. LO Drive**



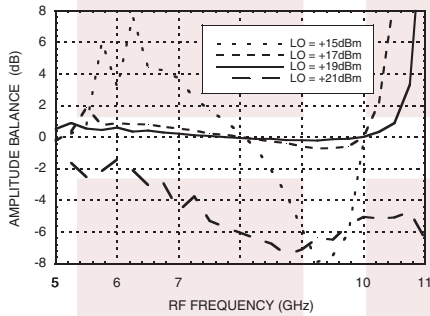
**Isolations**



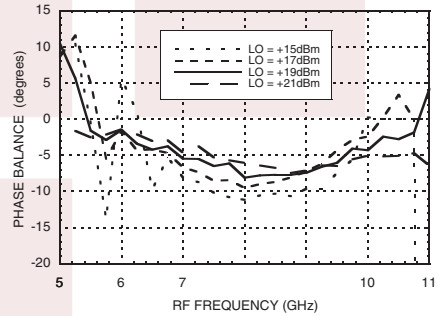
**IF Bandwidth\***



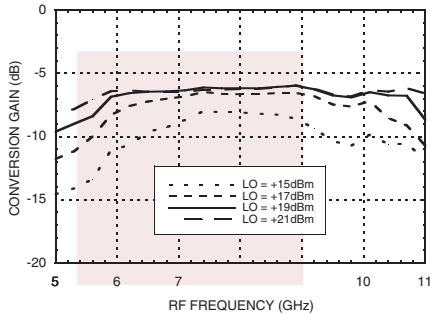
**Amplitude Balance vs. LO Drive**



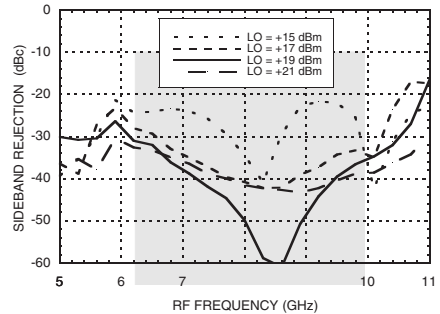
**Phase Balance vs. LO Drive**



**Upconverter Performance Conversion Gain vs. LO Drive\***



**Upconverter Performance Sideband Rejection vs. LO Drive\***

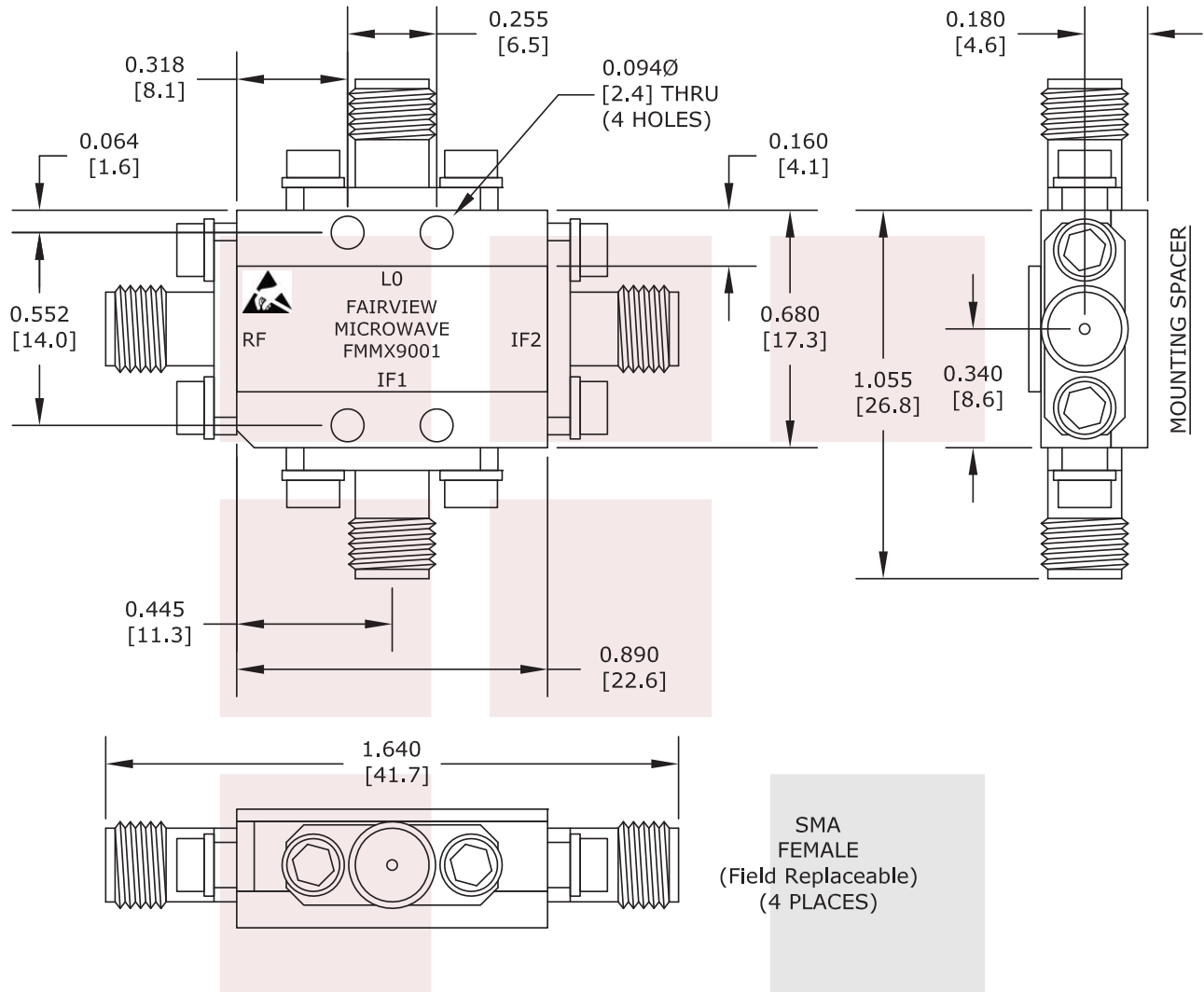


Field Replaceable SMA IQ Mixer From 6 GHz to 10 GHz With an IF Range From DC to 3.5 GHz And LO Power of +19 dBm from Fairview Microwave is in-stock and available to ship same-day. All of our RF/microwave products are available off-the-shelf from our ISO 9001:2008 certified facilities in Allen, Texas. Fairview Microwave is RF on-demand.

For additional information on this product, please click the following link: [Field Replaceable SMA IQ Mixer From 6 GHz to 10 GHz With an IF Range From DC to 3.5 GHz And LO Power of +19 dBm FMMX9001](https://www.fairviewmicrowave.com/field-replaceable-sma-iq-mixer-19-dbm-fmmx9001-p.aspx)

URL: <https://www.fairviewmicrowave.com/field-replaceable-sma-mixer-19-dbm-fmmx9001-p.aspx>

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TITLE Field Replaceable SMA IQ Mixer From 6 GHz to 10 GHz With an IF Range From DC to 3.5 GHz And LO Power of +19 dBm		DWG NO <b>FMMX9001</b>		CAGE CODE <b>3FKR5</b>	
CAD FILE	050316	SHEET	SCALE	N/A	SIZE A 2233