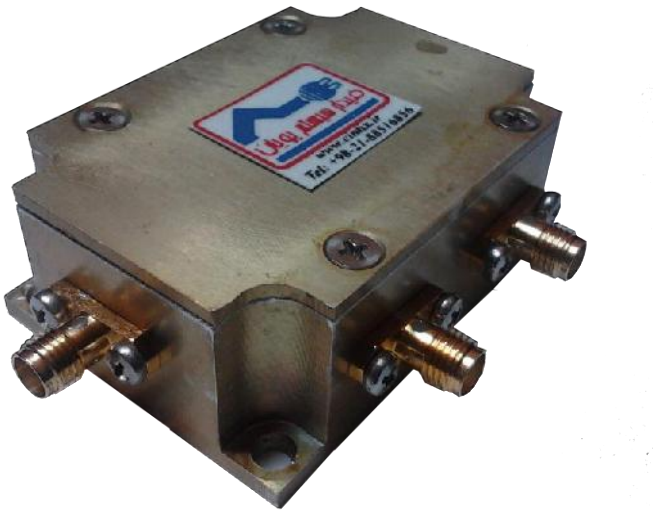
FSP-Mixer-XBand

I/Q MIXER
8.5 - 13.5 GHz

Typical Applications

The FSP-Mixer-XBand is ideal for:

- Point-to-Point and Point-to-Multi-Point Radio
- Military Radar



Features

Wide IF Bandwidth: DC - 3.5 GHz

Image Rejection: 38 dB

LO to RF Isolation: 50 dB

High Input IP3: +23 dBm

General Description

The FSP-Mixer-XBand is a compact I/Q MMIC mixer in a leadless “Pb free” RoHS compliant module package, which can be used as either an Image Reject Mixer or a Single Sideband Upconverter. The mixer utilizes two standard double balanced mixer cells and a 90 degree hybrid fabricated in a GaAs MESFET process. A low frequency quadrature hybrid was used to produce a 100 MHz USB IF output. This product is a much smaller alternative to hybrid style Image Reject Mixers and Single Sideband Upconverter assemblies. The FSP-Mixer-XBand eliminates the need for wire bonding allowing use of surface mount manufacturing techniques.

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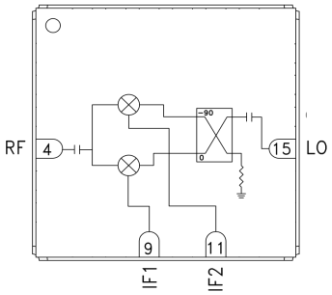
Functional Diagram



*Electrical Specifications, T_A = +25° C, IF= 100 MHz, LO = +15 dBm**

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range, RF/LO		8.5 - 13.5			7.1 - 8.5		GHz
Frequency Range, IF		DC - 3.5			DC - 3.5		GHz
Conversion Loss (As IRM)		8	10		7.5	9.5	dB
Image Rejection	20	30		30	38		dB
1 dB Compression (Input)		+14			+15		dBm
LO to RF Isolation	35	45		45	55		dB
LO to IF Isolation	18	22		20	24		dB
IP3 (Input)		+23			+24		dBm
Amplitude Balance		0.3			0.1		dB
Phase Balance		4			4		Deg

** Unless otherwise noted, all measurements performed as downconverter.*

Data Taken As IRM With External IF Hybrid

Conversion Gain vs. Temperature

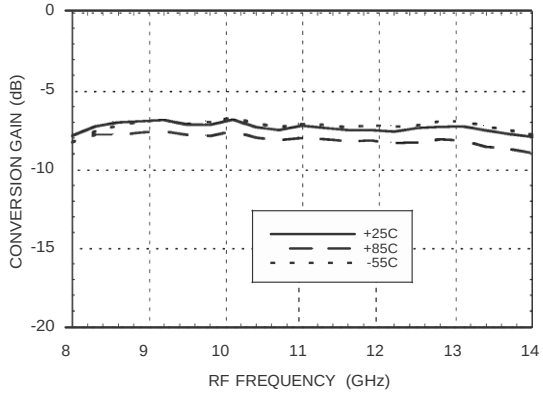
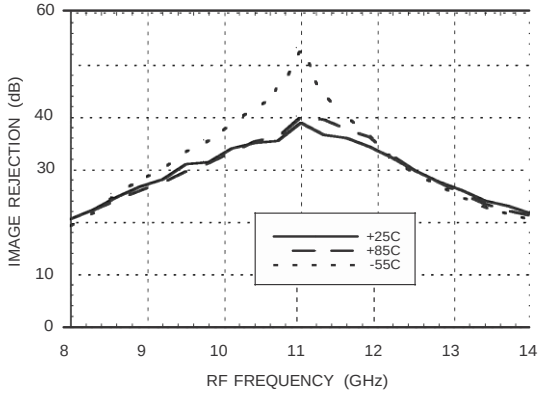
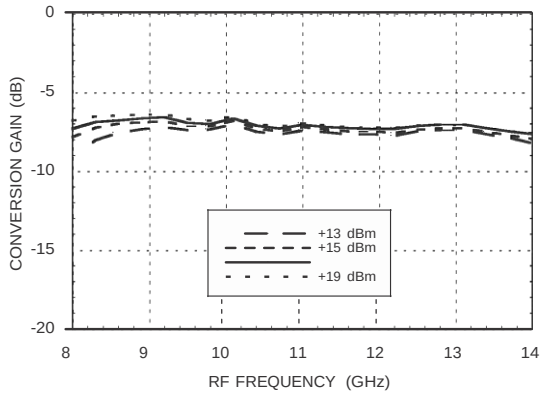


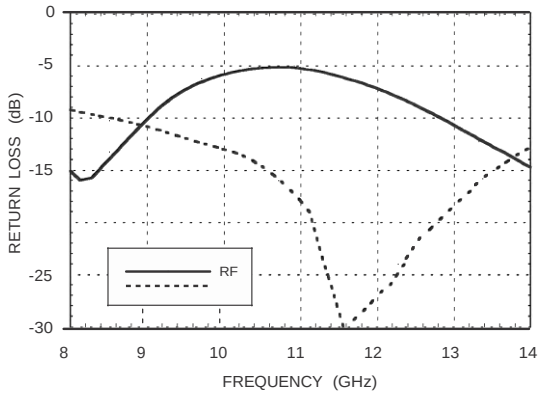
Image Rejection vs. Temperature



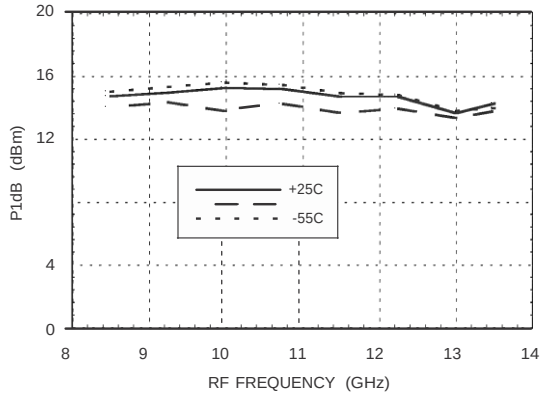
Conversion Gain vs. LO Drive



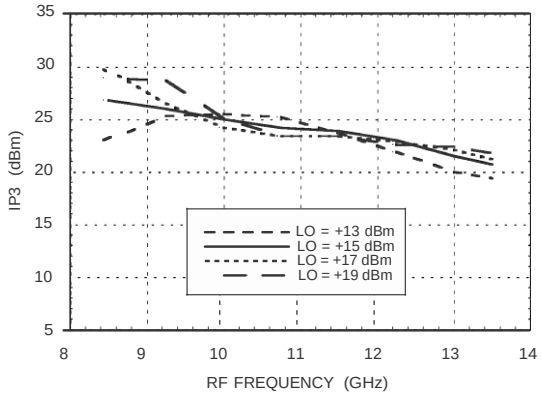
Return Loss



Input P1dB vs. Temperature



Input IP3 vs. LO Drive



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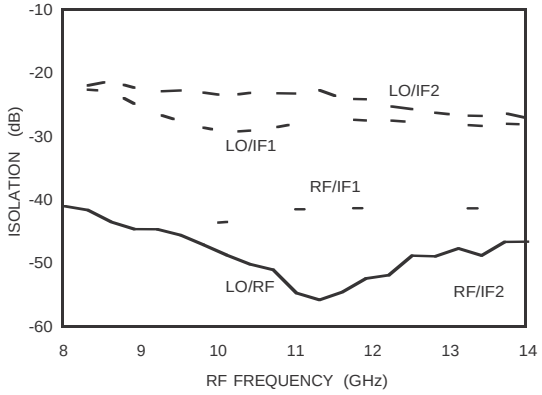
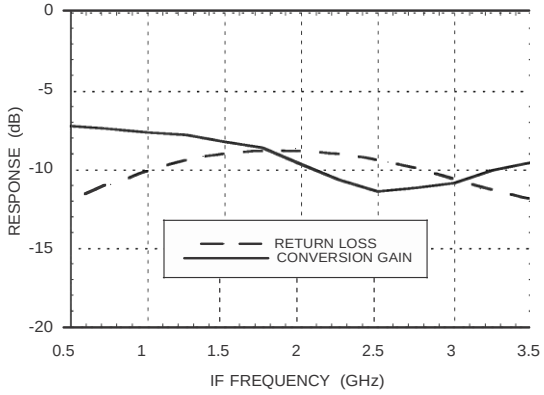
Quadrature Channel Data Taken Without IF Hybrid

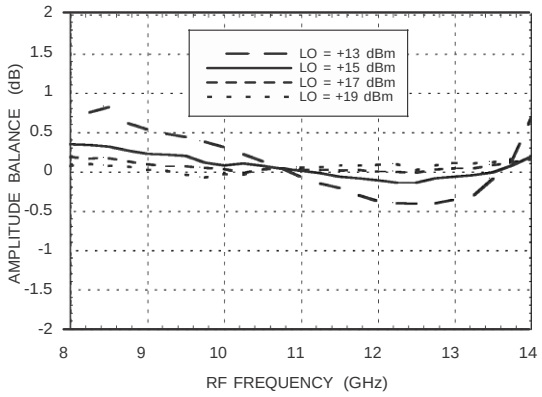
Isolations



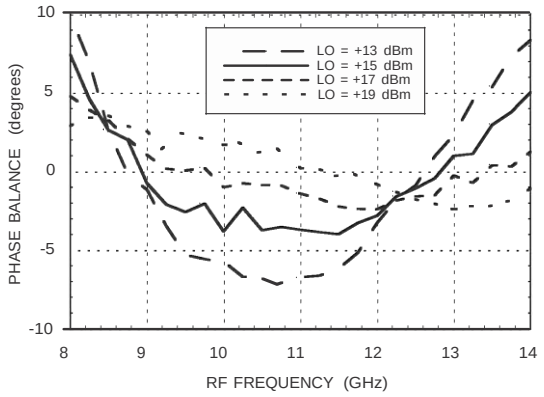
*IF Bandwidth**



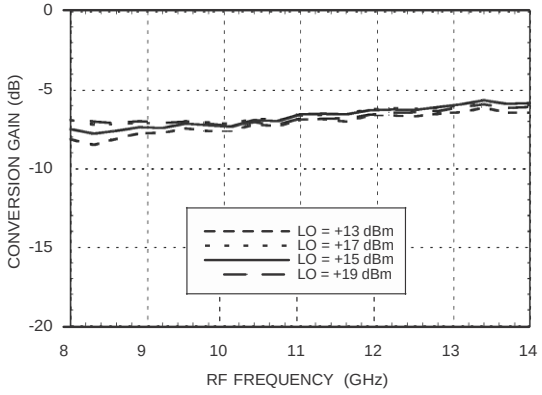
Amplitude Balance vs. LO Drive



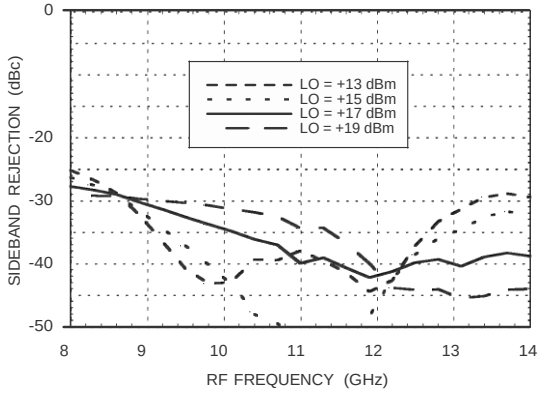
Phase Balance vs. LO Drive



Upconverter Performance Conversion Gain vs. LO Drive



Upconverter Performance Sideband Rejection vs. LO Drive



** Conversion gain data taken with external IF hybrid*

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Harmonics of LO

LO Freq. (GHz)	nLO Spur at RF Port			
	1	2	3	4
8.5	42	44	44	70
9.5	50	53	59	77
10.5	51	54	63	xx
11.5	47	58	66	xx
12.5	45	59	70	xx
13.5	45	57	xx	xx

LO = + 15 dBm
Values in dBc below input LO level measured at RF Port.

MxN Spurious Outputs

	nLO				
mRF	0	1	2	3	4
0	xx	-5	29	23	52
1	27	0	51	59	81
2	92	85	76	82	92
3	92	92	92	92	92
4	92	92	92	92	92

RF = 10.6 GHz @ -10 dBm
LO = 10.5 GHz @ +15 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 6.9 mW/°C above 85°C)	460 mW
Thermal Resistance (R_{TH}) (junction to package bottom)	141.4 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing

[All Dimensions are in mm]