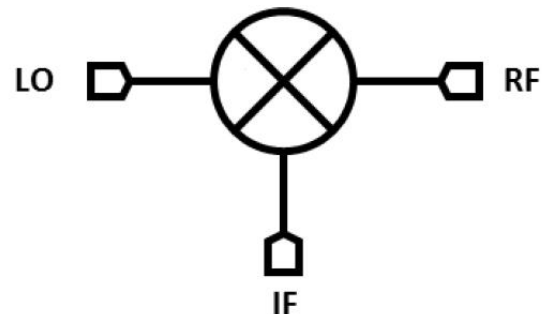


GaAs MMIC Mixer Chip, 7GHz-43GHz

Performance characteristics

- RF/LO frequency range: 7 - 43 GHz
- IF frequency range : DC-11GHz
- Conversion loss : 8 dB@+15dBm LO input
- LO-RF isolation: 49dB
- LO-IF isolation : 24dB
- RF-IF isolation : 32 dB
- Local oscillator power: +13dBm~+17dBm
- Chip size: 1.1 x 0.85 x 0.1mm

Block Diagram



Product Introduction

GMX-0743A is a GaAs MMIC double balanced mixer, covering 7 GHz~ 43 GHz , IF frequency coverage DC~ 11 GHz , conversion loss 8 dB , LO/RF isolation 49 dB , LO/IF isolation 24 dB , RF/IF isolation 32 dB , typical LO input power +15dBm. The chip uses on-chip through-hole metallization technology to ensure good grounding, and no additional grounding measures are required. Easy to use. The back of the chip is metallized, suitable for eutectic sintering or conductive adhesive bonding. There is no DC blocking capacitor at the RF , LO, and IF ports .

Use restriction parameter ¹

Maximum RF input power	+22dBm
Maximum LO input power	+22dBm
Maximum IF input power	+22dBm
Operating temperature	-55 ~ +85°C
storage temperature	-65 ~ +150°C

【1】 Exceeding any of these maximum limits may cause permanent damage.

Electrical performance parameters ($T_A = +25^\circ\text{C}$, IF = 100MHz , LO = + 15dBm)

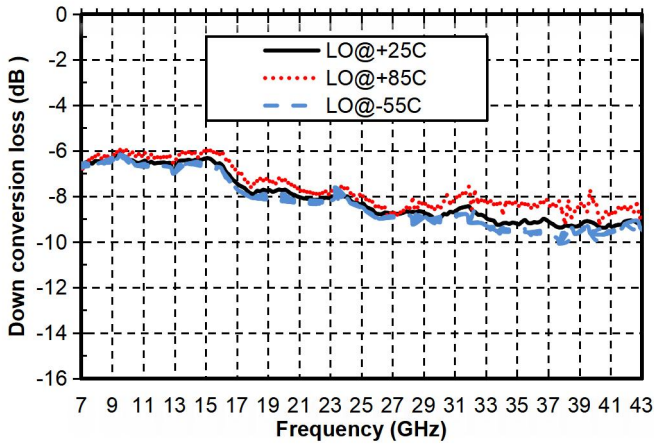
index	Minimum	Typical Value	Maximum	unit
RF frequency range	7-43			GHz
LO frequency range	7-43			GHz
IF frequency	DC-11			GHz
Frequency conversion loss	-	8	-	dB
LO-RF Isolation	-	49	-	dB
LO-IF isolation	-	twenty four	-	dB
RF-IF isolation	-	32	-	dB
RF input P-1dB	12			dB m
IIP3	twenty one			dBm

The above parameters are all tested in down-conversion mode, with intermediate frequency 0.1GHz and local oscillator power + 15dBm.

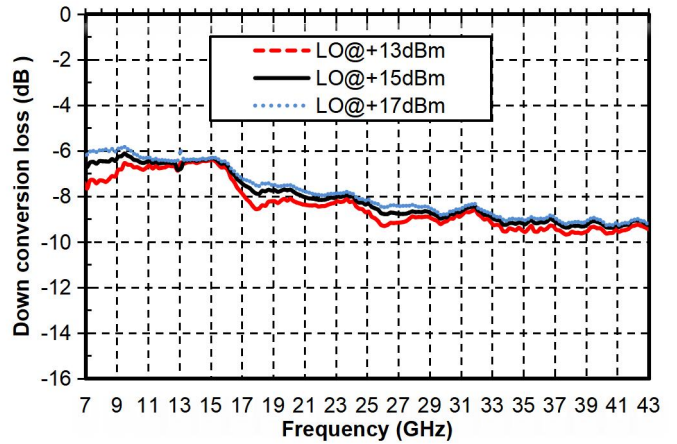
GaAs MMIC Mixer Chip, 7GHz-43GHz

Main index test curve

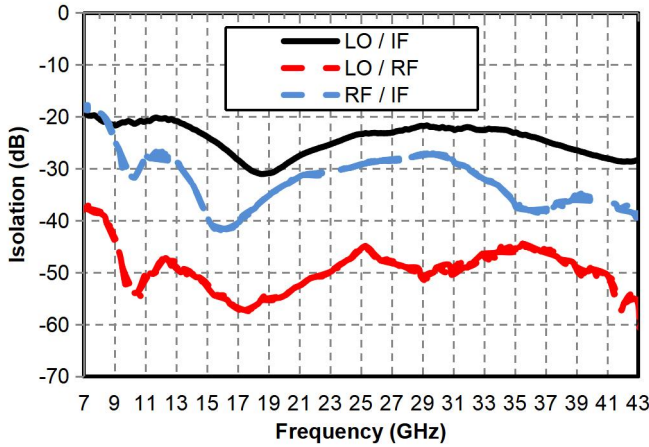
Downconversion loss vs. temperature @ LO = +15dBm



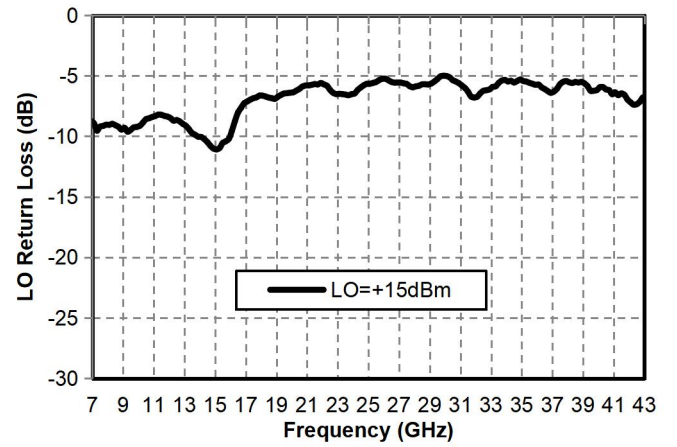
Downconversion Loss vs. LO Power



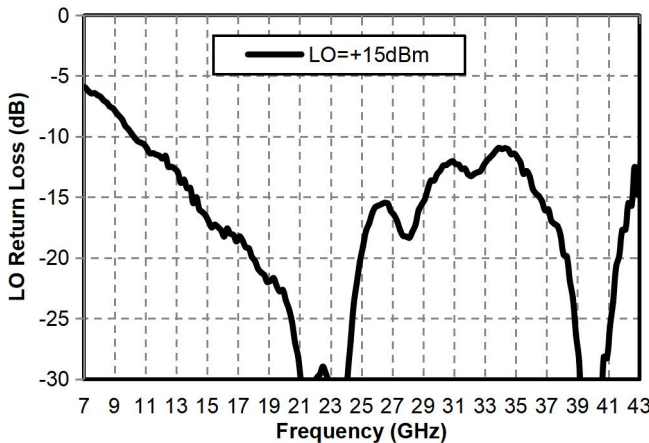
Isolation @ LO = +15dBm



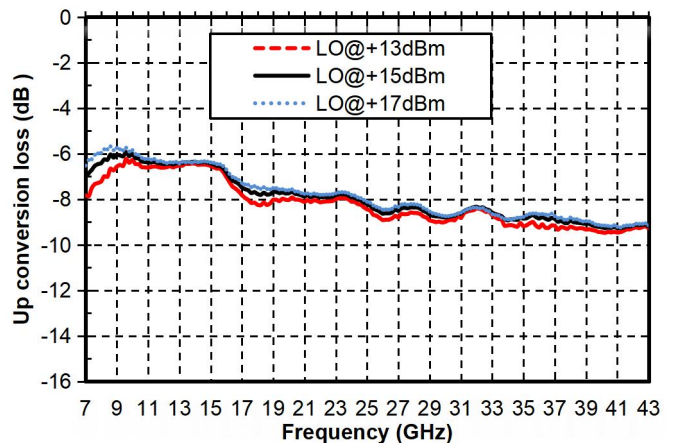
RF Return Loss Vs. Frequency



LO Return Loss Vs. Frequency

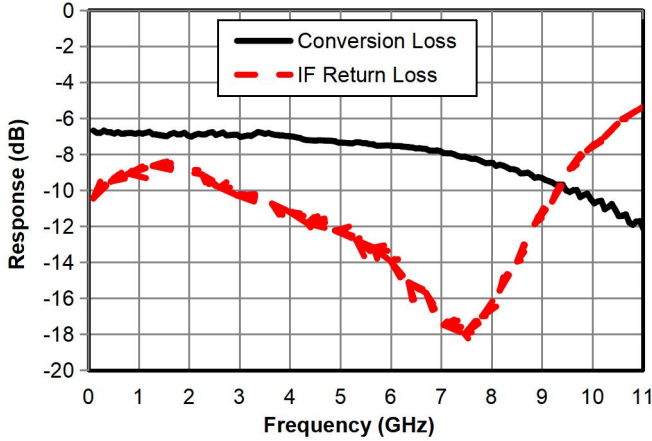


Upconversion Loss vs. LO Power

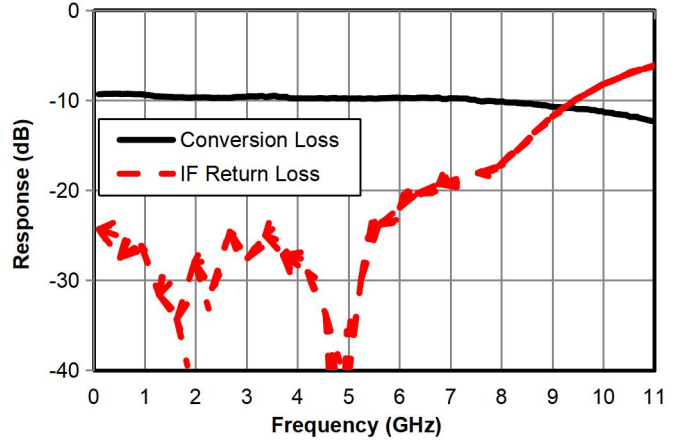


GaAs MMIC Mixer Chip, 7GHz-43GHz

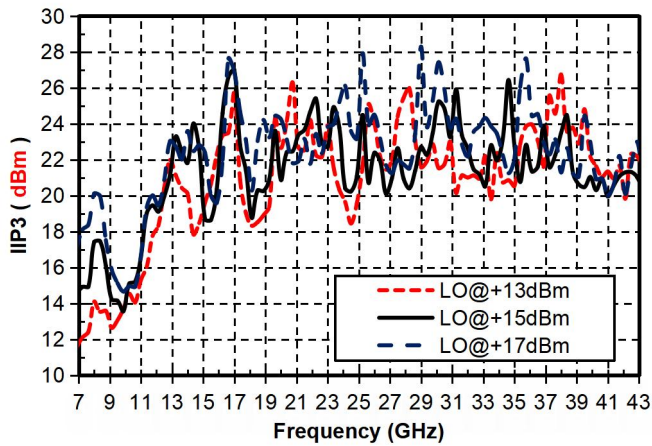
Down-converter IF bandwidth, return loss
@LO=7G, 15dBm



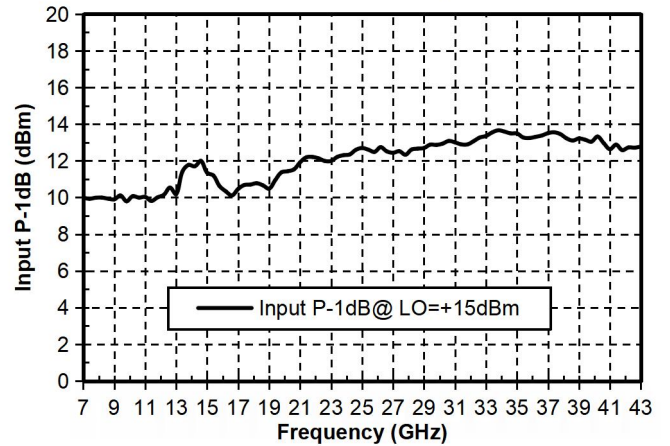
Down-converter IF bandwidth, return loss
@LO=43G, 15dBm



IIP3



P-1 vs. Frequency



GaAs MMIC Mixer Chip, 7GHz-43GHz

LO harmonic leakage

LO(GHz) 15dBm	nLO (measured at RF port) dBc		
	1	2	3
7	39	29	47
9	44	29	50
11	48	31	49
13	47	34	50
15	49	42	56
17	57	50	/
19	54	64	/
twenty one	53	58	/
twenty three	51	53	/
25	46	52	/
27	46	/	/
29	51	/	/
31	48	/	/
33	45	/	/
35	42	/	/
37	42	/	/
39	46	/	/
41	52	/	/
43	51	/	/

GaAs MMIC Mixer Chip, 7GHz-43GHz

Down-conversion combined spurious suppression

mRF	nLO				
	0	1	2	3	4
0	xxx	-10	30	9	28
1	27	0	31	39	33
2	74	43	51	42	75
3	74	81	66	60	74
4	/	89	/	81	83

Test conditions: RF=10.1GHz@-10dBm, LO=10GHz@15dBm, all values are relative values of $1*RF-1*LO$ (P_IF,dBm), unit: dBc .

mRF	nLO				
	0	1	2	3	4
0	xxx	-11	29	/	/
1	twenty one	0	35	twenty three	/
2	/	64	76	64	77
3	/	/	86	74	86
4	/	/	/	/	100

Test conditions: RF=25.1GHz@-10dBm, LO=25GHz@15dBm, all values are relative values of $1*RF-1*LO$ (P_IF,dBm), unit: dBc .

mRF	nLO				
	0	1	2	3	4
0	xxx	-8	/	/	/
1	26	0	44	/	/
2	/	65	66	71	/
3	/	/	/	72	/
4	/	/	/	/	79

Test conditions: RF=40.1GHz@-10dBm, LO=40GHz@15dBm, all values are relative values of $1*RF-1*LO$ (P_IF,dBm), unit: dBc .

GaAs MMIC Mixer Chip, 7GHz-43GHz

Up-conversion combined spurious suppression

iF	nLO				
	0	1	2	3	4
0	xxx	16	0	16	7
1	12	0	twenty three	14	32
2	54	58	55	77	51
3	83	73	86	79	79
4	92	96	94	87	95

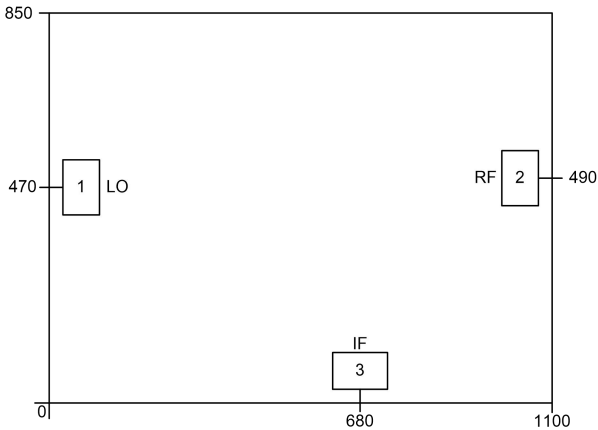
Test conditions: IF=4.3GHz @ -10dBm, LO=12GHz@15dBm, all values are relative values of 1* LO -1* IF (P_RF , dBm), unit: dBc .

iF	nLO				
	0	1	2	3	4
0	xxx	twenty four	27	/	/
1	33	0	25	13	/
2	53	75	54	73	/
3	75	62	78	72	83
4	/	/	98	/	/

Test conditions: IF=8.3GHz @ -10dBm, LO=18GHz @ 15dBm, all values are relative values of 1* LO -1* IF (P_RF , dBm), unit: dBc .

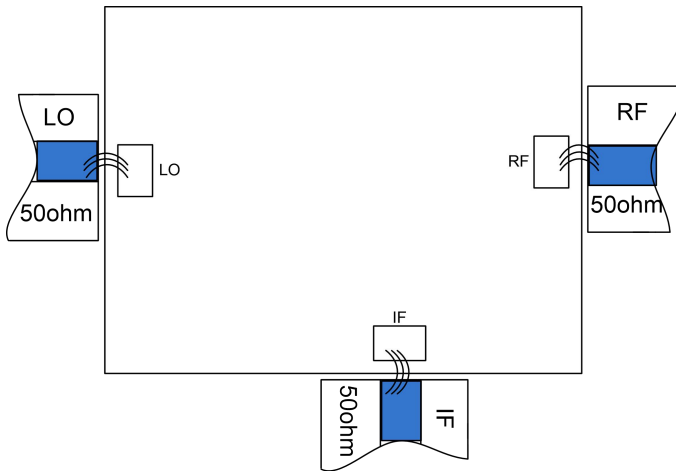
GaAs MMIC Mixer Chip, 7GHz-43GHz

Appearance structure ²



【2】 The units in the figure are all micrometers (dimensional tolerance: $\pm 50\mu\text{m}$.)

Recommended assembly drawing



Bonding point definition		
Bonding point number	Function Symbol	Functional Description
1	LO	The local oscillator signal terminal requires an external DC blocking capacitor
2	RF	RF signal end, requires external DC blocking capacitor
3	IF	Intermediate frequency signal end, requires external DC blocking capacitor
Chip bottom	GND	The bottom of the chip needs to be well grounded to RF and DC
Note 1: LO and RF ports can be used interchangeably, but the electrical performance indicators may vary.		
Note 2: It is recommended to solder three gold bonding wires to the pad.		