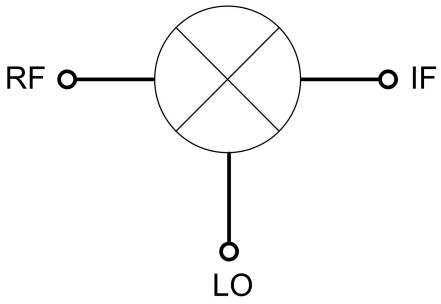
GMX-1246A

GaAs MMIC Mixer Chip, 12GHz-46GHz

Performance characteristics

- RF/LO frequency range: 12 - 46 GHz
- IF frequency range : DC-16GHz
- Conversion loss : 8 dB@+15dBm LO input
- LO-RF isolation: 46dB
- LO-IF isolation : 22dB
- RF-IF isolation : 33 dB
- Local oscillator power: +13dBm~+17dBm
- Chip size: 1.0 x 0.95 x 0.1mm

Block Diagram



Product Introduction

GMX-1246A is a GaAs MMIC double balanced mixer, covering 12 GHz~ 46 GHz , IF frequency coverage DC~ 16 GHz , conversion loss 8 dB , LO/RF isolation 46d B , LO/IF isolation 22 dB , RF/IF isolation 33 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°C , IF = 100MHz , LO = + 15dBm)

index	Minimum	Typical Value	Maximum	unit
RF frequency range		12-46		GHz
LO frequency range		12-46		GHz
IF frequency		DC-16		GHz
Frequency conversion loss	-	8	-	dB
LO-RF Isolation	-	46	-	dB
LO-IF isolation	-	twenty two	-	dB
RF-IF isolation	-	33	-	dB
RF input P-1dB		11		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.				

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Standard Circuit

GMX-1246A

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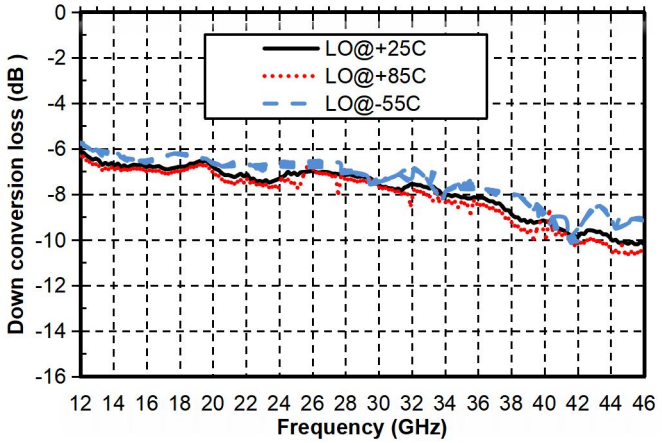
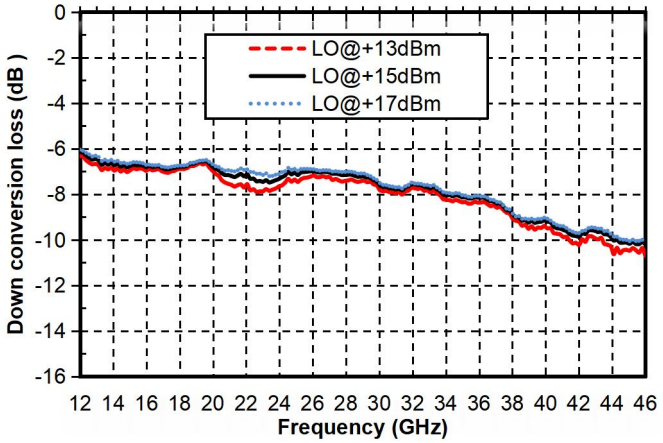
Main index test curve

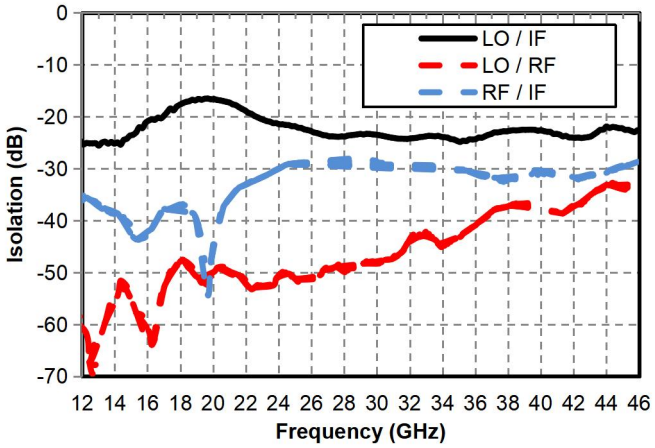
Downconversion loss vs. temperature @ LO = +15dBm



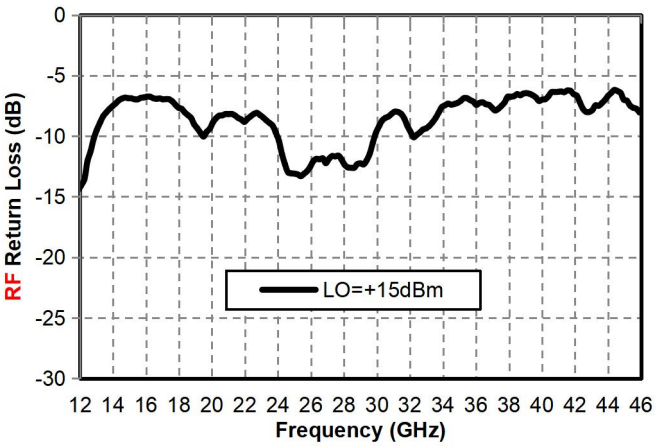
Downconversion Loss vs. LO Power



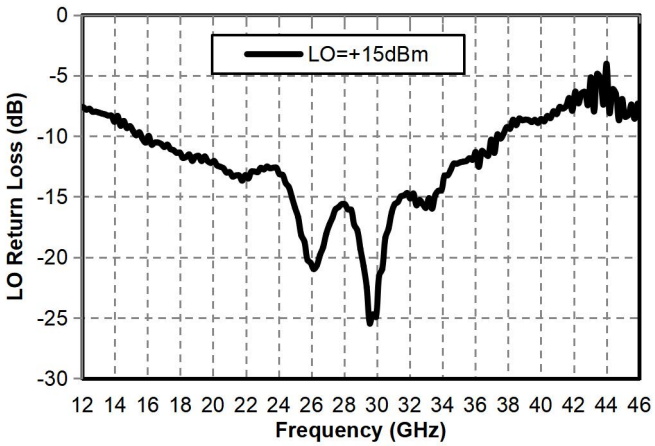
Isolation @ LO = +15dBm



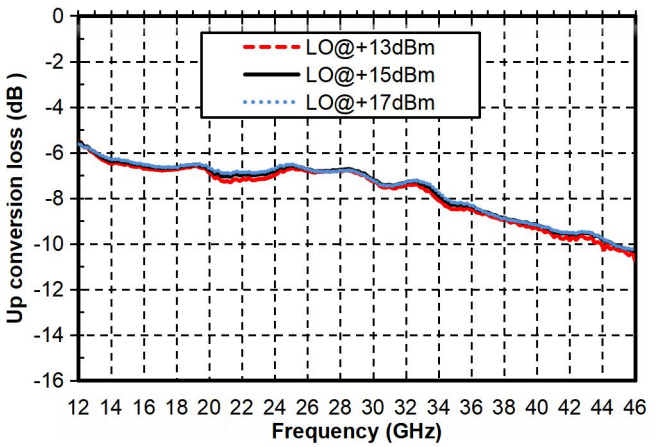
RF Return Loss Vs. Frequency



LO Return Loss Vs. Frequency



Upconversion Loss vs. LO Power



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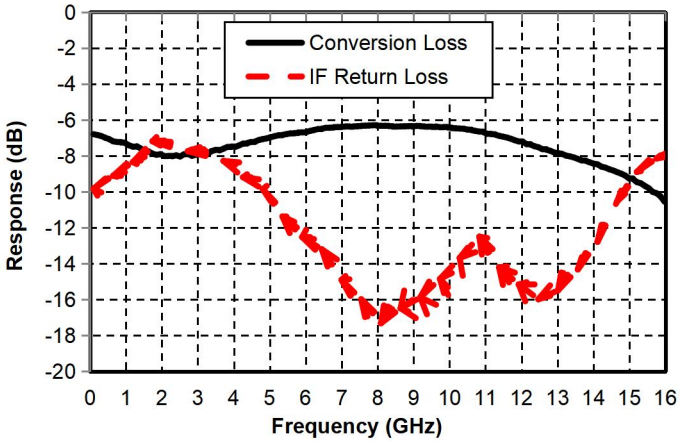
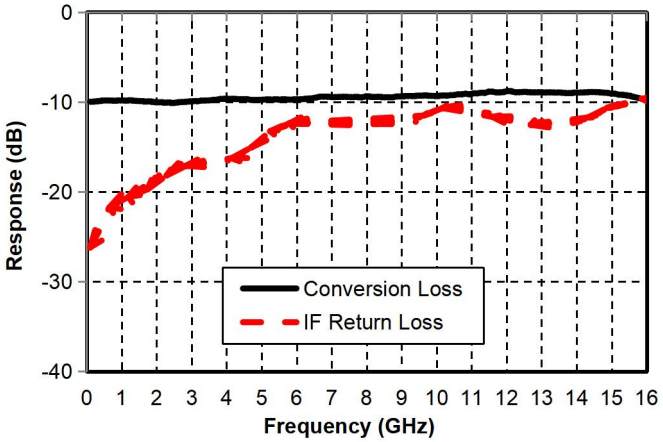
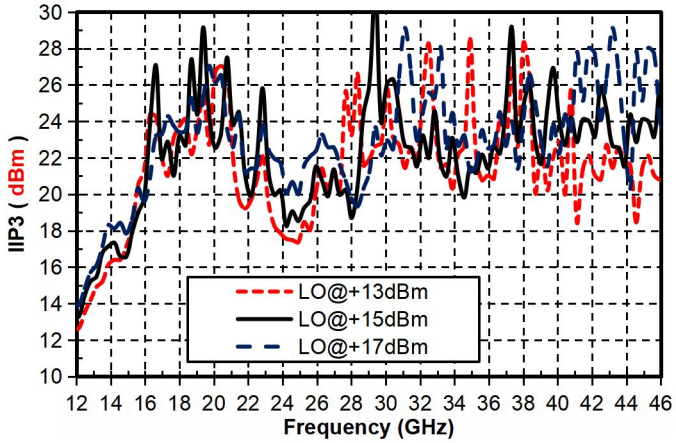
Down -conversion IF bandwidth, return loss @LO=14G, 15dBm



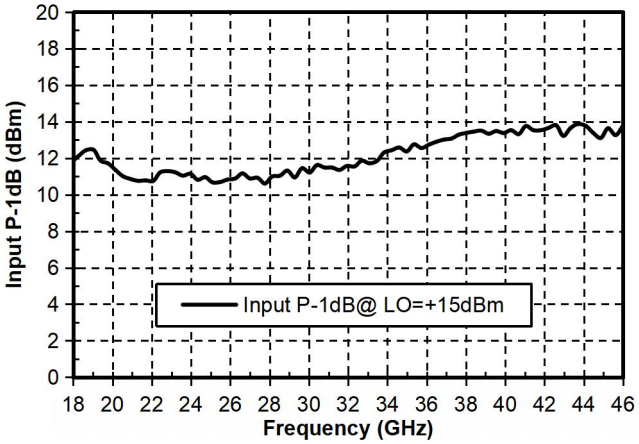
Down-conversion IF bandwidth, return loss @LO=46G, 15dBm



IIP3



P-1 vs. Frequency



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LO harmonic leakage

	nLO (measured at RF port) dBc		
LO(GHz) 15dBm	1	2	3
10	58	29	52
12	56	29	52
14	55	28	50
16	65	27	53
18	46	27	/
20	47	34	/
twenty two	50	45	/
twenty four	50	49	/
26	50	/	/
28	49	/	/
30	47	/	/
32	42	/	/
34	43	/	/
36	40	/	/
38	38	/	/
40	37	/	/
42	35	/	/
44	33	/	/

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Down-conversion combined spurious suppression

	nLO				
mRF	0	1	2	3	4
0	xxx	-7	29	twenty three	/
1	29	0	36	47	45
2	86	41	58	41	80
3	88	93	81	65	87
4	/	/	/	85	97
Test conditions: RF = 14.1GHz @ -10dBm , LO = 14GHz @ 15dBm , all values are relative values of 1*RF - 1*LO(P_IF , dBm) , unit is dBc .					
	nLO				
mRF	0	1	2	3	4
0	xxx	-10	/	/	/
1	twenty one	0	46	/	/
2	/	61	75	61	/
3	/	/	/	73	/
4	/	/	/	/	102
Test conditions: RF = 27.1GHz@-10dBm , LO = 27GHz @ 15dBm , all values are relative values of 1*RF-1*LO(P_IF, dBm), unit is dBc .					

Up-conversion combined spurious suppression

	nLO				
iF	0	1	2	3	4
0	xxx	3	-twenty two	1	-5
1	twenty one	0	20	-11	14
2	26	85	26	40	32
3	50	68	60	39	50
4	68	76	/	68	63
Test conditions: RF = 5.3 GHz @-10 dBm, LO = 12 GHz @ 15 dBm , all values are relative values of 1 * LO -1 * IF (P_RF , dBm) , unit: dBc .					
	nLO				
iF	0	1	2	3	4
0	xxx	13	-9	/	/
1	twenty four	0	20	15	/
2	45	106	45	49	/
3	64	67	63	54	71
4	83	85	/	89	87

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

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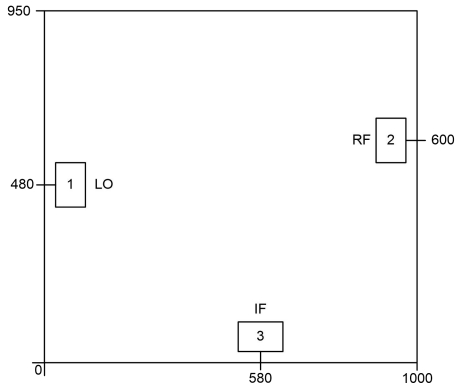
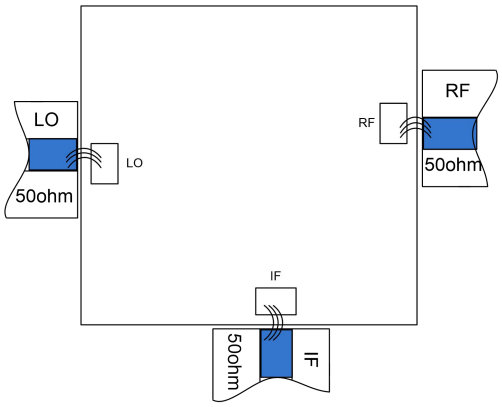
Appearance structure [2]



【2】The units in the figure are all micrometers (dimensional tolerance: ±50um.)

Recommended assembly drawing



Bonding point definition

Bonding point number	Function Symbol	Functional Description
1	RF	RF signal end, requires external DC blocking capacitor
2	IF	Intermediate frequency signal end, requires external DC blocking capacitor
3	LO	The local oscillator signal terminal requires an 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.