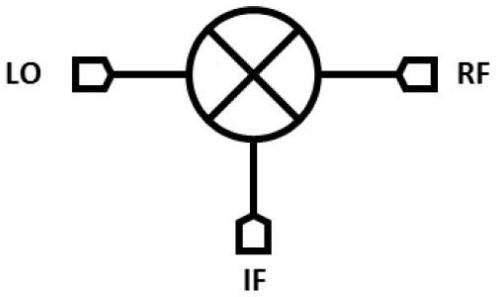
GMX-0222A

GaAs MMIC Mixer Chip, 2GHz-22GHz

Performance characteristics:

- RF/LO frequency range: 2 - 22 GHz
- IF frequency range : DC-3.5GHz
- Conversion loss : 8.0 dB@+13dBm LO input
- LO-RF isolation: 50dB
- LO-IF isolation : 30dB
- RF-IF isolation : 32 dB
- Local oscillator power: +13dBm~+15dBm
- Chip size: 1.45 x 1.25 x 0.1mm

Block Diagram



Product Introduction:

GMX-0222A is a GaAs MMIC double-balanced mixer with frequency coverage of 2 GHz~ 22 GHz , IF frequency coverage of DC~ 3.5 GHz , conversion loss of 8.0 dB , LO/RF isolation of 50 dB , LO /IF isolation of 30 dB , RF/IF isolation of 32 dB , and typical LO input power of +13dBm.

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 = +13dBm)				
index	Minimum	Typical Value	Maximum	unit
RF frequency range	2-22			GHz
LO frequency range	2-22			GHz
IF frequency	DC-3.5			GHz
Frequency conversion loss	-	8	-	dB
LO-RF Isolation	-	50	-	dB
LO-IF isolation	-	30	-	dB
RF-IF isolation	-	32	-	dB
RF input P-1dB		11		dB m
IIP3		18		dBm
The above parameters are all tested in down-conversion mode, with an intermediate frequency of 0.1GHz and a local oscillator power of + 13dBm.				

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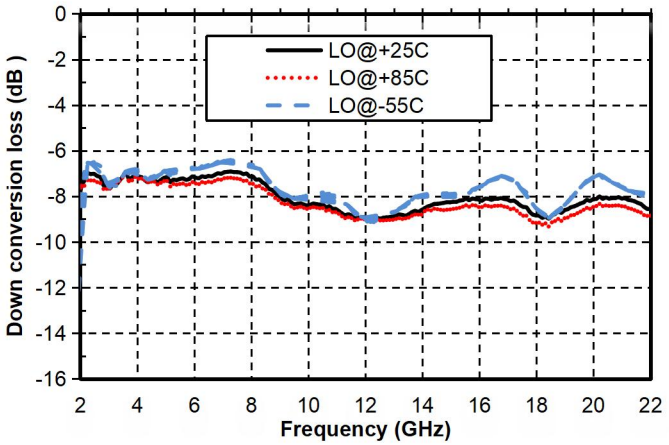
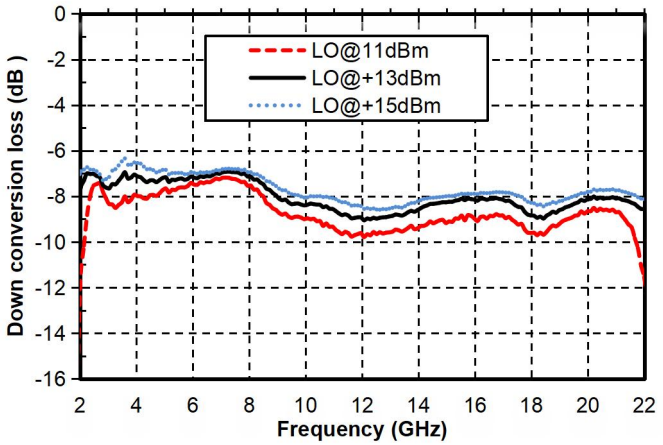
Main index test curve

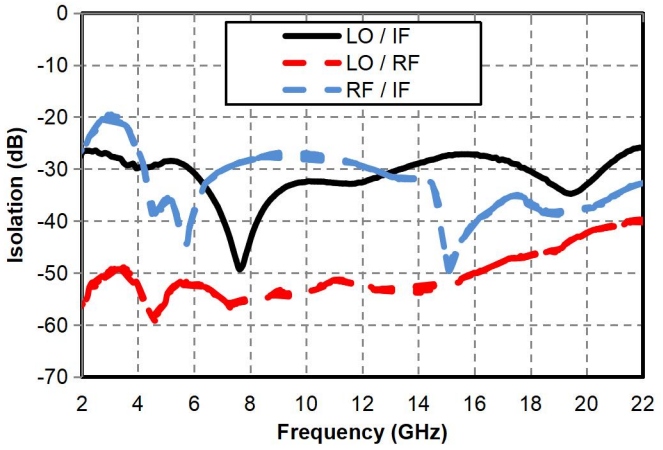
Downconversion loss vs. temperature @ LO = +13dBm



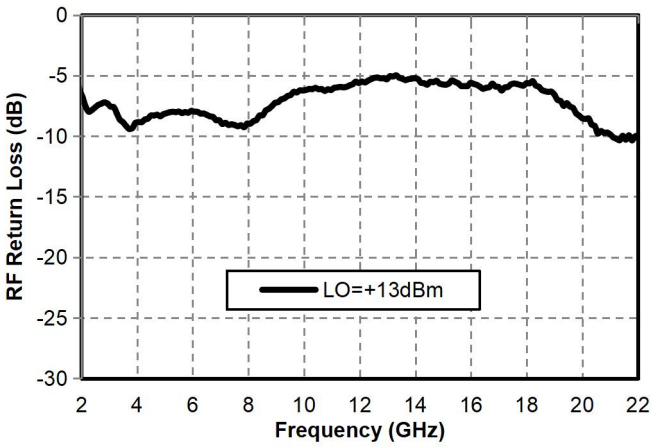
Downconversion Loss vs. LO Power



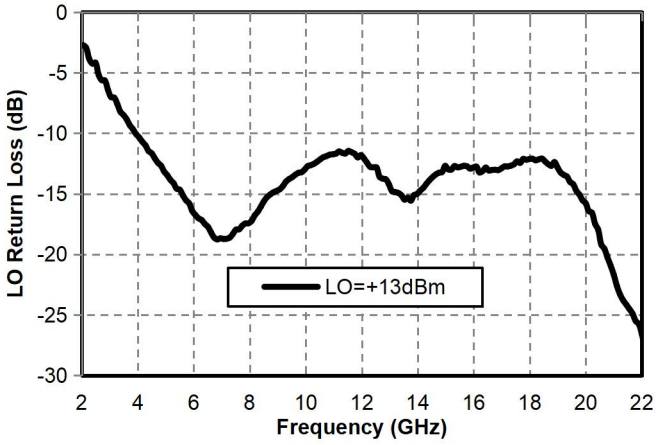
Isolation @ LO = +13dBm



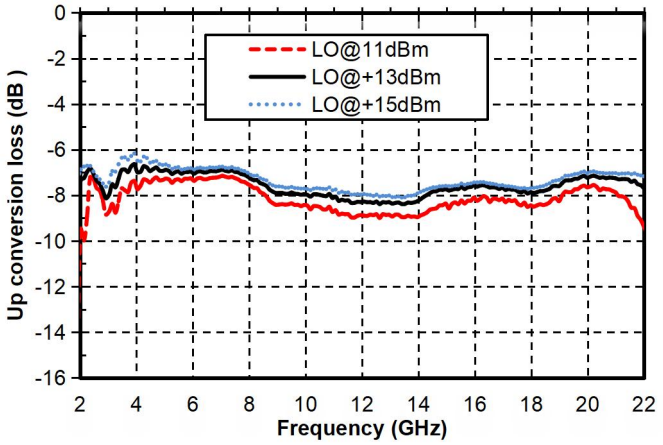
RF Return Loss Vs. Frequency



LO Return Loss Vs. Frequency



Upconversion Loss vs. LO Power



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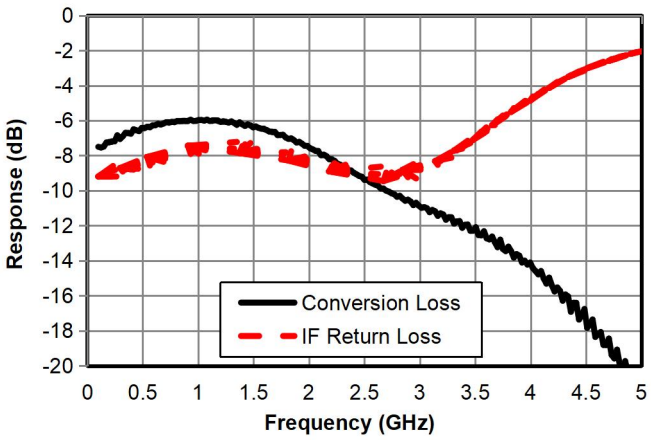
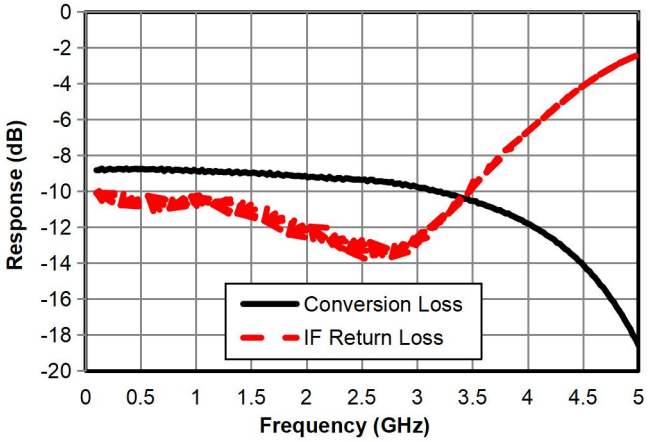
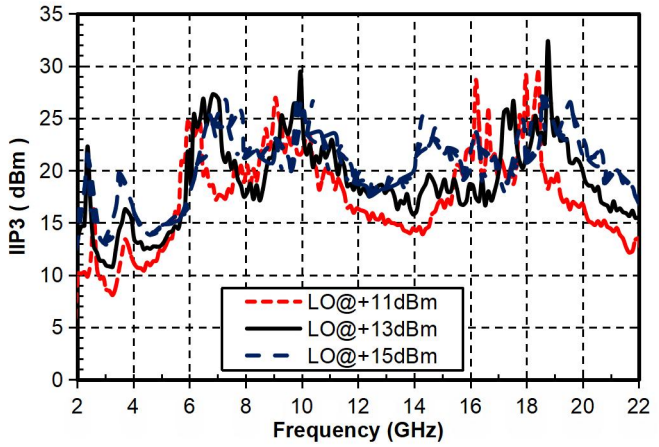
Down-converter IF bandwidth, return loss @LO=2G, 13dBm



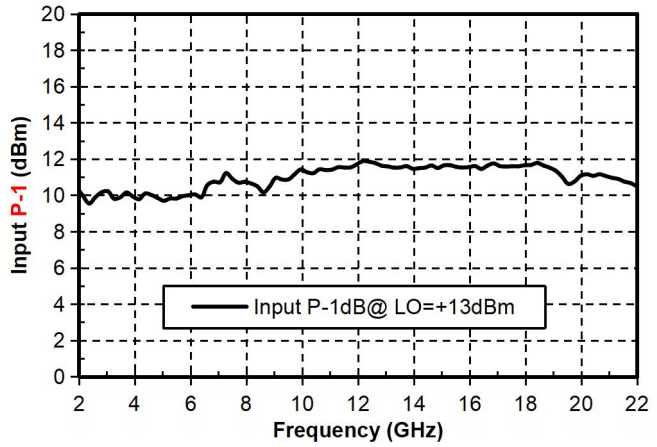
Down-converter IF bandwidth, return loss @LO=22G, 13dBm



IIP3



P-1 vs. Frequency



LO harmonic leakage

	n LO (measured at RF port) dBc		
LO(GHz) 13dbm	1	2	3
2	55	42	61
4	53	39	58
6	52	42	54
8	57	61	58
10	56	65	66
12	56	58	66
14	56	62	55
16	51	51	67
18	48	50	-
20	44	54	-
twenty two	42	50	-

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GaAs MMIC Mixer Chip, 2 GHz - 22 GHz

Down-conversion combined spurious suppression

	nLO				
mRF	0	1	2	3	4
0	×××	-2	39	13	41
1	29	0	34	35	35
2	74	50	54	47	75
3	66	70	75	54	66
4	89	82	104	87	83
Test conditions: RF=5.1GHz @ -10dBm , LO=5GHz @ 13dBm , all values are relative values of 1*RF-1*LO(P_IF,dBm) , unit: dBc .					
	nLO				
mRF	0	1	2	3	4
0	×××	2	35	13	45
1	18	0	36	26	31
2	69	67	73	65	75
3	76	72	82	68	87
4	/	/	/	110	101
Test conditions: RF = 10.1GHz@-10dBm, LO = 10 GHz@13dBm, all values are relative values of 1*RF-1*LO(P_IF,dBm), unit: dBc .					
	nLO				
mRF	0	1	2	3	4
0	×××	-4	30	17	/
1	38	0	41	34	50
2	71	66	68	64	85
3	87	85	80	63	100
4	/	/	/	104	101
Test conditions: RF = 15.1GHz@-10dBm, LO = 1.5GHz@13dBm , all values are relative values of 1*RF-1*LO(P_IF,dBm), unit is dBc .					

GaAs MMIC Mixer Chip, 2 GHz - 22 GHz

Up-conversion combined spurious suppression

	nLO				
iF	0	1	2	3	4
0	×××	twenty one	6	twenty four	19
1	17	0	27	13	38
2	51	40	61	50	49
3	69	59	75	65	71
4	84	95	82	85	82
Test conditions: RF = 1.3 GHz@-10dBm, LO = 5GHz@13dBm, all values are relative values of 1* LO -1* IF (P_ R F,dBm), unit: dBc .					
	nLO				
iF	0	1	2	3	4
0	×××	25	31	33	41
1	12	0	24	19	25
2	52	62	71	64	76
3	76	57	66	64	73
4	92	108	95	/	/
Test conditions: RF = 2.3 GHz @-10dBm, LO = 10GHz@13dBm, all values are relative values of 1* LO -1* IF (P_RF , dBm), unit: dBc .					

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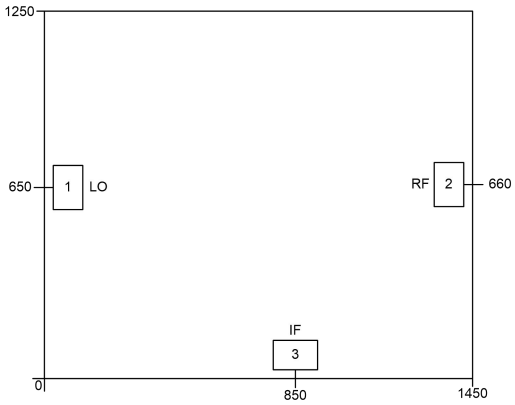
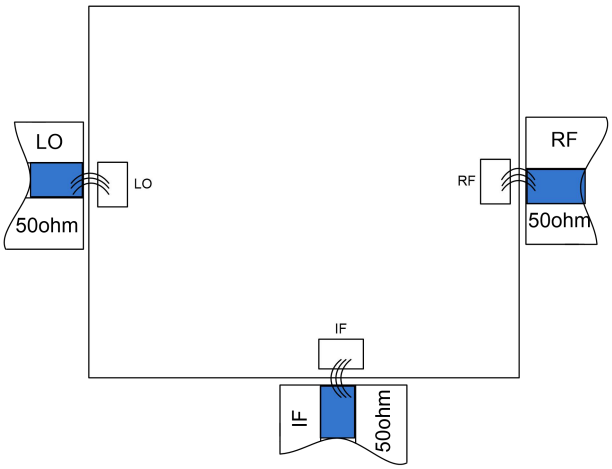
Appearance structure [2]



【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	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.		