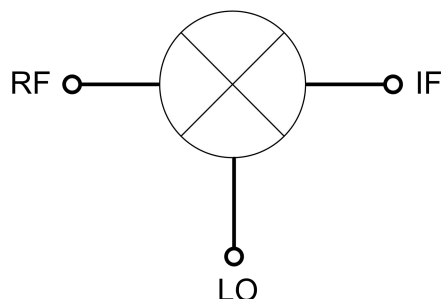


GaAs MMIC Mixer Chip, 18GHz-50GHz

Performance characteristics

- RF/LO frequency range: 18 - 50 GHz
- IF frequency range : DC-22GHz
- Conversion loss : 6.5 dB@+15dBm LO input
- LO-RF isolation: 42dB
- LO-IF isolation : 37dB
- RF-IF isolation : 39 dB
- Local oscillator power: +13dBm~+17dBm
- Chip size: 1.4 x 1.45 x 0.1mm

Block Diagram



Product Introduction

GMX-1850A is a GaAs MMIC double balanced mixer, covering 18 GHz~ 50 GHz , IF frequency coverage DC~ 22 GHz , conversion loss 6.5 dB , LO/RF isolation 42 dB , LO/IF isolation 37 dB , RF /IF isolation 39 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)

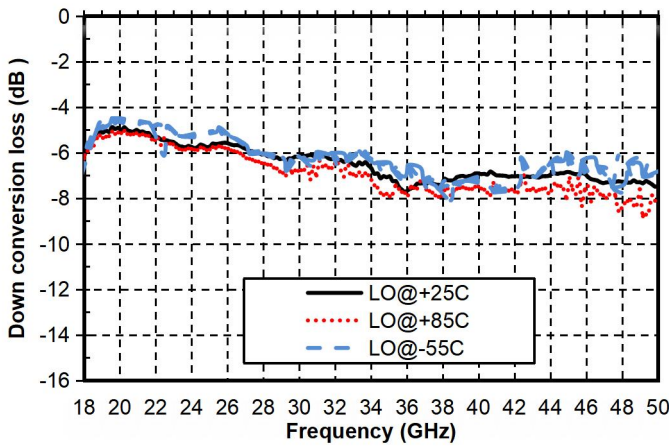
index	Minimum	Typical Value	Maximum	unit
RF frequency range	18-50			GHz
LO frequency range	18-50			GHz
IF frequency	DC-22			GHz
Frequency conversion loss	-	6.5	-	dB
LO-RF Isolation	-	42	-	dB
LO-IF isolation	-	37	-	dB
RF-IF isolation	-	39	-	dB
RF input P-1dB		12		dB m
IIP3		19		dBm

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

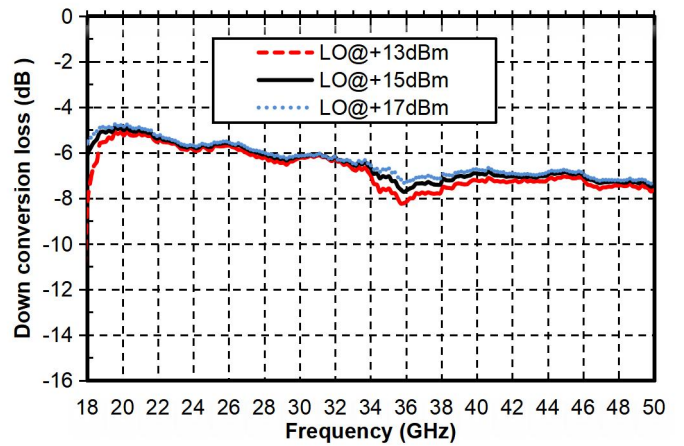
GaAs MMIC Mixer Chip, 18GHz-50GHz

Main index test curve

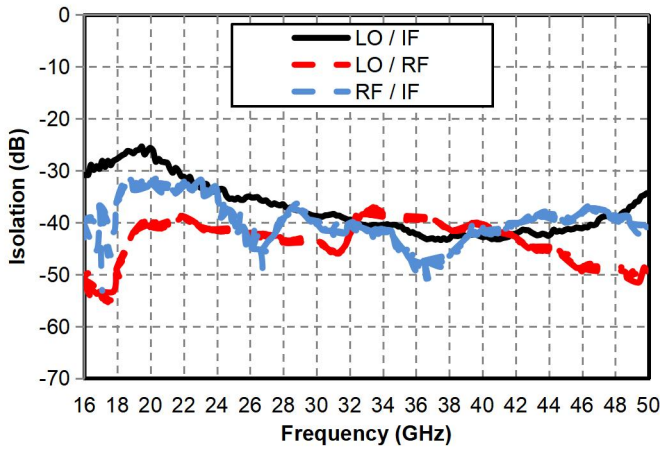
Downconversion loss vs. temperature @ LO = +15dBm



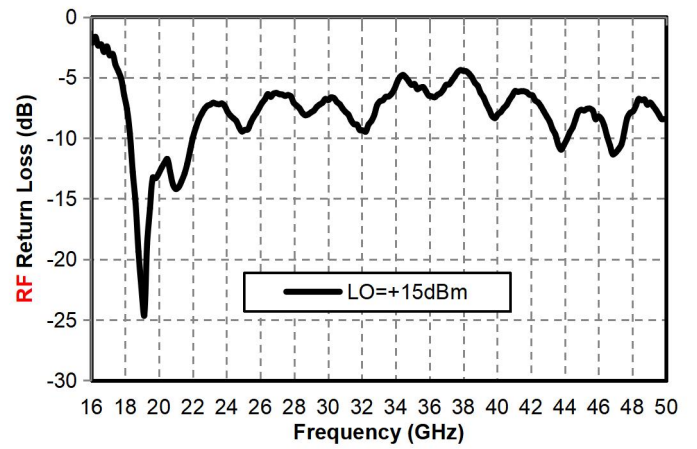
Downconversion Loss vs. LO Power



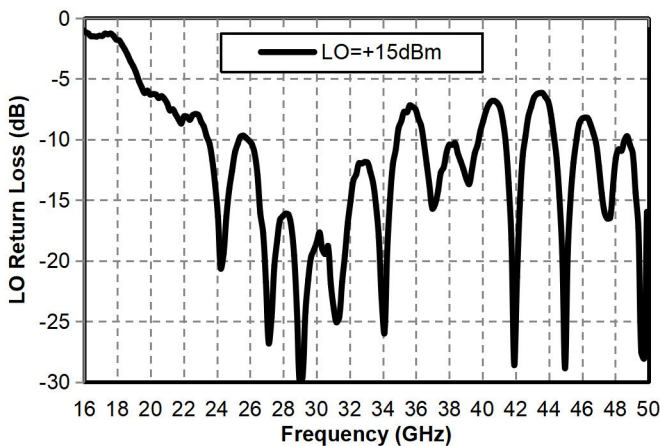
Isolation @ LO = +15dBm



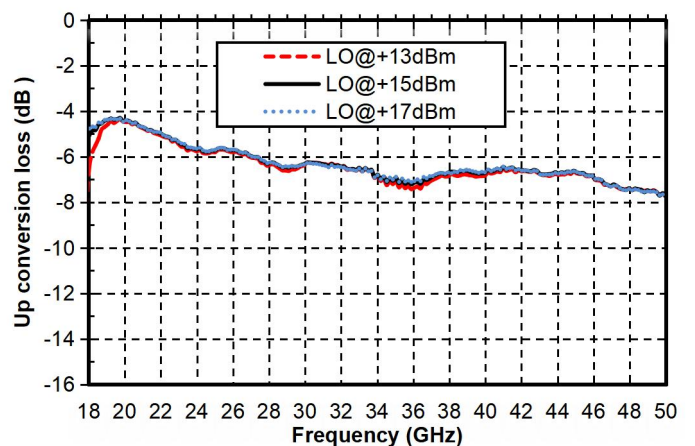
RF Return Loss Vs. Frequency



LO Return Loss Vs. Frequency

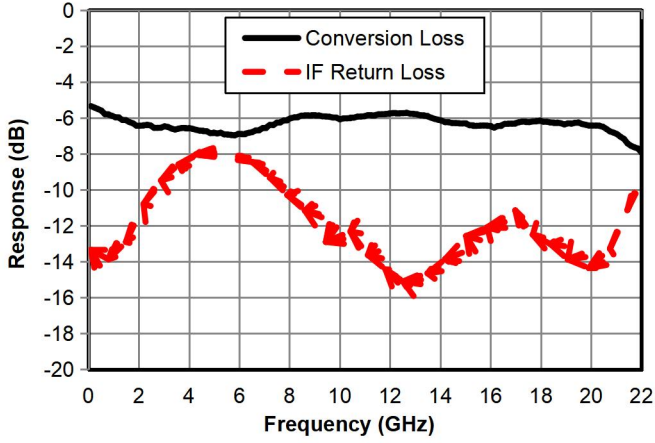


Upconversion Loss vs. LO Power

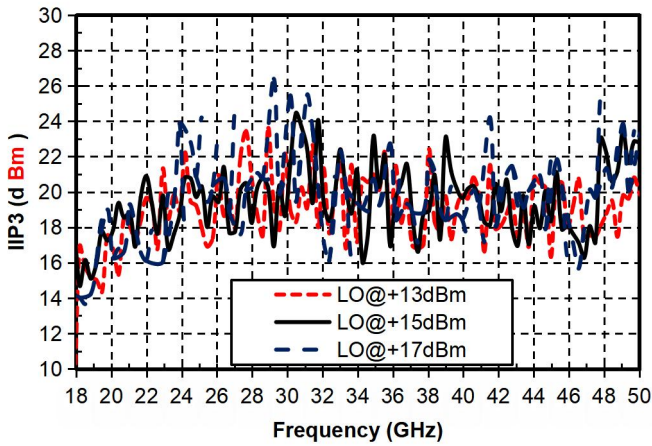


GaAs MMIC Mixer Chip, 18GHz-50GHz

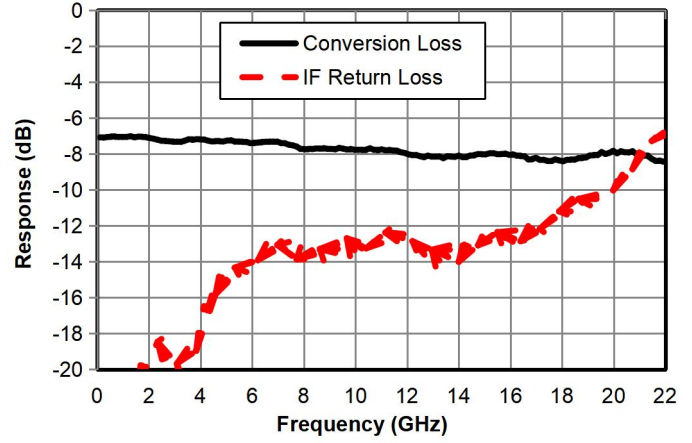
Down-conversion IF bandwidth, return loss
@LO=22G, 15dBm



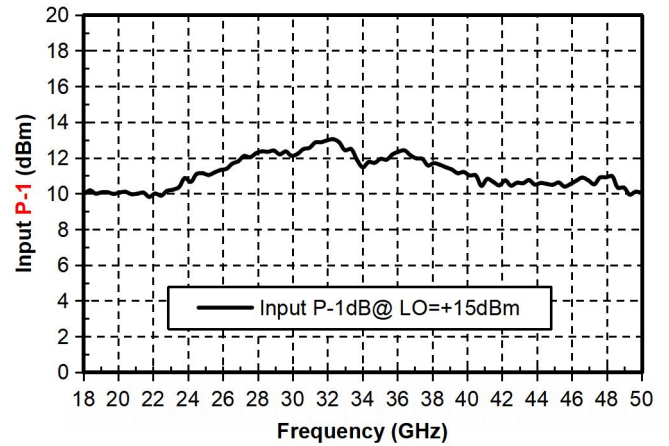
IIP3



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



P-1 vs. Frequency



GaAs MMIC Mixer Chip, 18GHz-50GHz

LO harmonic leakage

LO(GHz) 15dBm	nLO (measured at RF port) dBc		
	1	2	3
18	43	35	/
20	43	33	/
twenty two	47	37	/
twenty four	50	41	/
26	49	/	/
28	50	/	/
30	46	/	/
32	43	/	/
34	41	/	/
36	43	/	/
38	43	/	/
40	43	/	/
42	44	/	/
44	49	/	/
46	50	/	/
48	50	/	/
50	59	/	/

GaAs MMIC Mixer Chip, 18GHz-50GHz

Down-conversion combined spurious suppression

mRF	nLO				
	0	1	2	3	4
0	xxx	-1	26	/	/
1	32	0	29	45	/
2	86	51	55	50	90
3	/	86	64	58	65
4	/	/	/	89	104

Test conditions: RF = 20.1GHz @ -10dBm , LO = 20GHz @ 15dBm , all values are relative values of 1*RF - 1*LO(P_IF , dBm) , unit is dBc .

mRF	nLO				
	0	1	2	3	4
0	xxx	8	/	/	/
1	36	0	42	/	/
2	/	81	99	75	/
3	/	/	93	75	89
4	/	/	/	/	101

Test conditions: RF = 34.1GHz@-10dBm , LO = 34GHz @ 15dBm , all values are relative values of 1*RF-1*LO(P_IF,dBm) , unit is dBc .

Up-conversion combined spurious suppression

iF	nLO				
	0	1	2	3	4
0	xxx	6	-4	/	/
1	48	0	20	/	/
2	52	63	50	50	/
3	67	74	65	42	/
4	64	/	63	71	/

Test conditions: RF = 5.3 GHz @-10 dBm, LO = 20 GHz @ 1.5 dBm , all values are relative values of 1 * LO -1 * IF (P_RF , dBm) , unit : dBc .

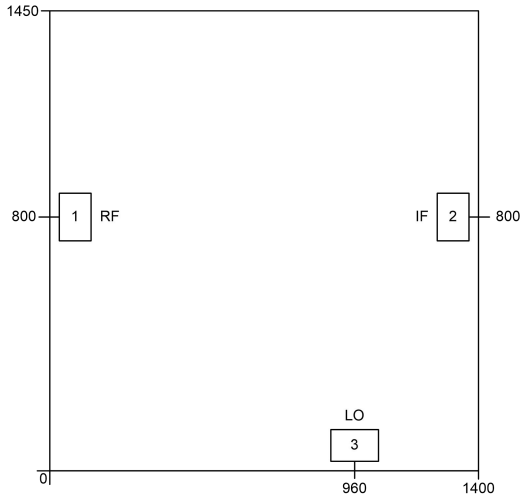
iF	nLO				
	0	1	2	3	4
0	xxx	13	/	/	/
1	31	-3	26	/	/
2	72	86	76	/	/
3	89	95	87	/	/
4	/	/	/	/	/

Test conditions: RF = 12.3 GHz @-10dBm, LO = 30 GHz@1.5 dBm , all values are relative values of 1* LO -1*

IF (P_RF , dBm), unit: dBc .

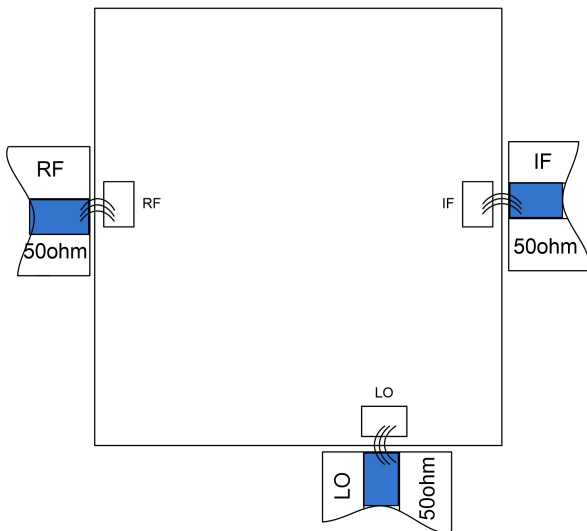
GaAs MMIC Mixer Chip, 18GHz-50GHz

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	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.		