

GaAs MMIC Mixer Chip, 1-4GHz

Performance characteristics

- RF/LO frequency range: 1 - 4 GHz
- IF frequency range : DC-1GHz
- Conversion loss : 8.0 dB@+13dBm LO input
- LO-RF isolation: 60dB
- LO-IF isolation : 47dB
- RF-IF isolation : 25 dB
- Local oscillator power: +11dBm~+15dBm
- Chip size: 1.76 x 1.51 x 0.1mm

Product Introduction

GMX0104A/AM is a GaAs MMIC double-balanced mixer with a frequency range of 1 GHz to 4 GHz , an IF range of DC to 1 GHz , a conversion loss of 8.0 dB , a LO/RF isolation of 60 dB , a LO/IF isolation of 47 dB , an RF/IF isolation of 25 dB , and a typical LO input power of +13dBm. The back of the chip is metallized for eutectic sintering or conductive adhesive bonding. There are no DC blocking capacitors on the RF, LO, and IF ports . GMX-0104A and GMX-0104 AM are mirror images of each other.

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 = +13 dBm)

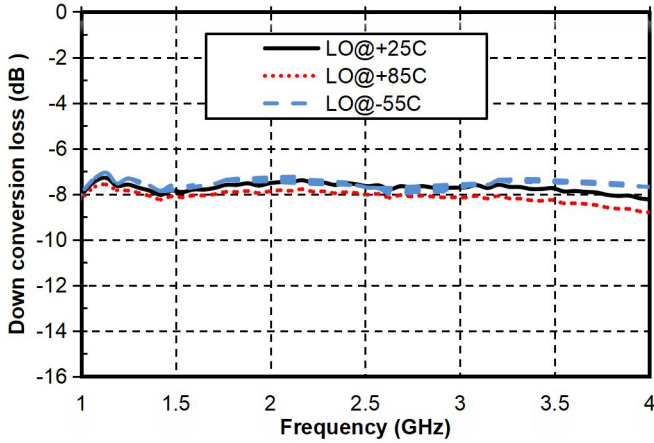
index	Minimum	Typical Value	Maximum	unit
RF frequency range	1-4			GHz
LO frequency range	1-4			GHz
IF frequency	DC-1			GHz
Frequency conversion loss	-	8.0	-	dB
LO-RF Isolation	-	60	-	dB
LO-IF isolation	-	47	-	dB
RF-IF isolation	-	25	-	dB
RF input P-1dB		9		dB m
IIP3		16		dBm

The above parameters are all tested in down-conversion mode, with an intermediate frequency of 0.1GHz and a local oscillator power of + 13dBm.

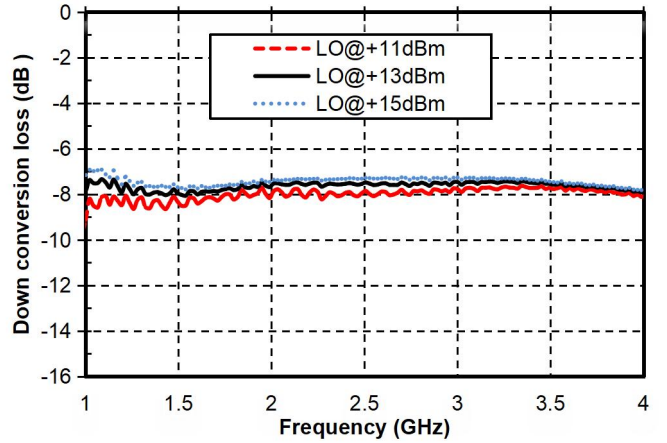
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Main index test curve

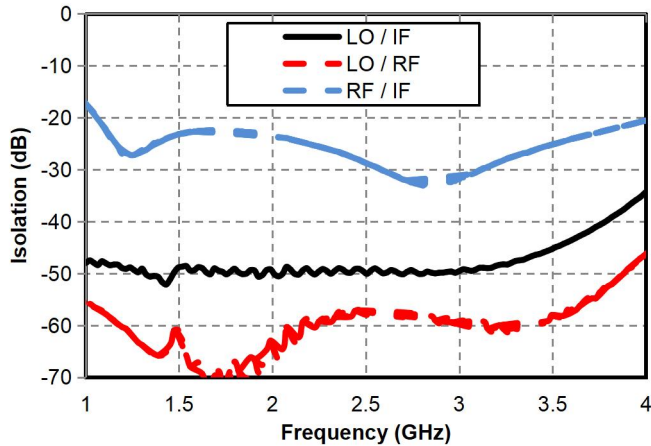
Downconversion loss vs. temperature @ LO = +13dBm



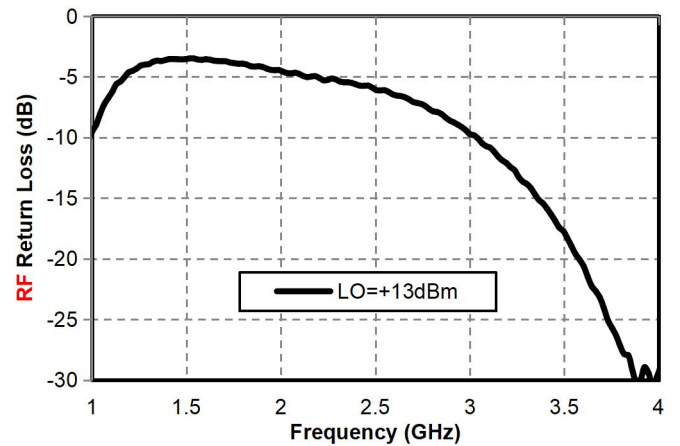
Downconversion Loss vs. LO Power



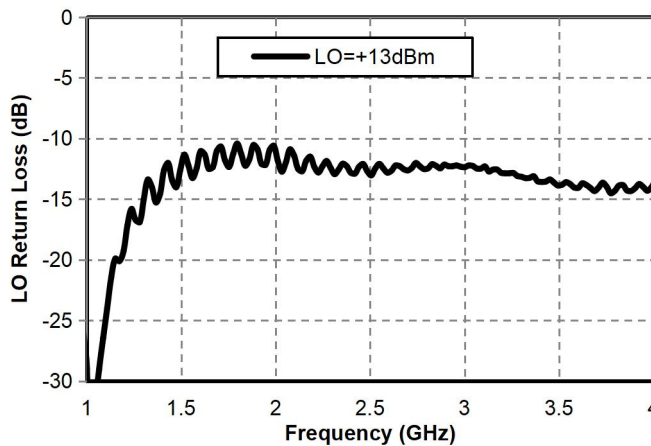
Isolation @ LO = +13dBm



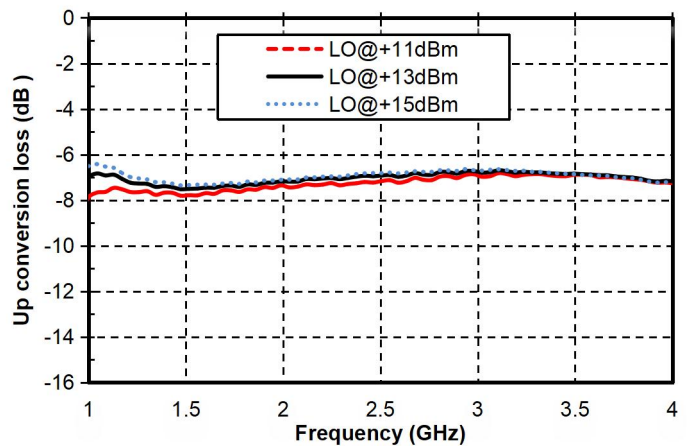
RF Return Loss Vs. Frequency



LO Return Loss Vs. Frequency

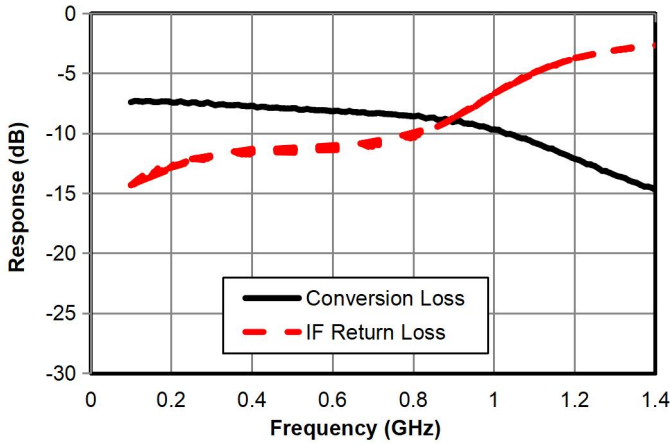


Upconversion Loss vs. LO Power

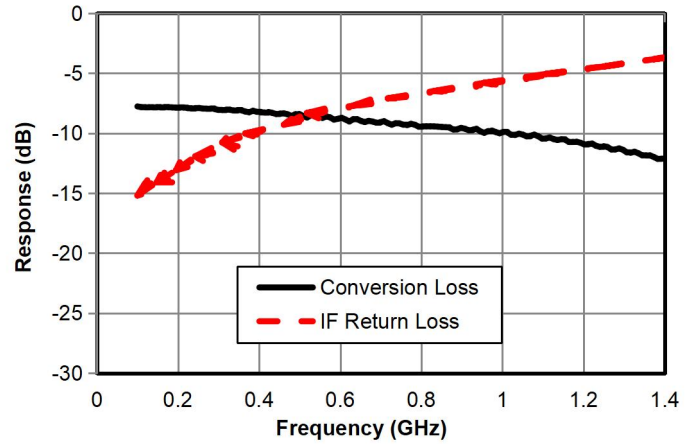


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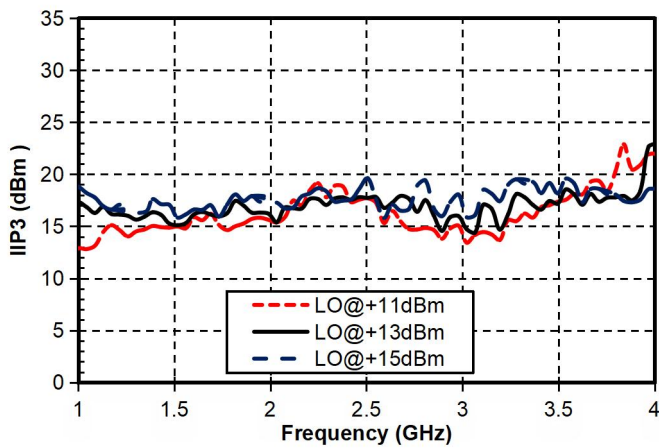
Down-converter IF bandwidth, return loss
@LO=1, 13dBm



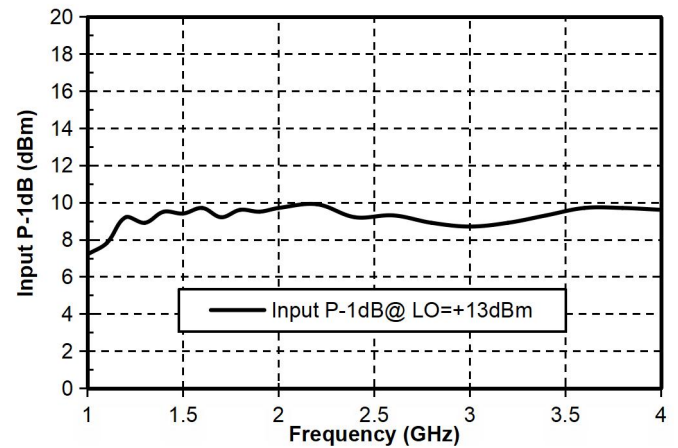
Down-converter IF bandwidth, return loss
@LO=4, 13dBm



IIP3



P-1 vs. Frequency



LO harmonic RF leakage

LO(GHz) 13dBm	nLO (measured at RF port) dBc		
	1	2	3
1.0	\	48	62
1.5	\	46	57
2.0	\	45	59
2.5	\	46	55
3.0	\	57	55
3.5	\	52	52
4.0	\	48	49

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LO harmonic IF leakage

LO(GHz)13dBm	nLO (measured at IF port) dBc		
	1	2	3
1.0	\	76	60
1.5	\	69	40
2.0	\	61	61
2.5	\	52	60
3.0	\	52	55
3.5	\	53	54
4.0	\	54	55

Down-conversion combined spurious suppression

mRF	nLO				
	0	1	2	3	4
0	xxx	19	32	24	40
1	16	0	42	40	33
2	88	80	72	73	105
3	72	91	84	62	83
4	/	/	/	/	/

Test conditions : RF=2GHz @-10 dBm , LO=1.9GHz @13 dBm

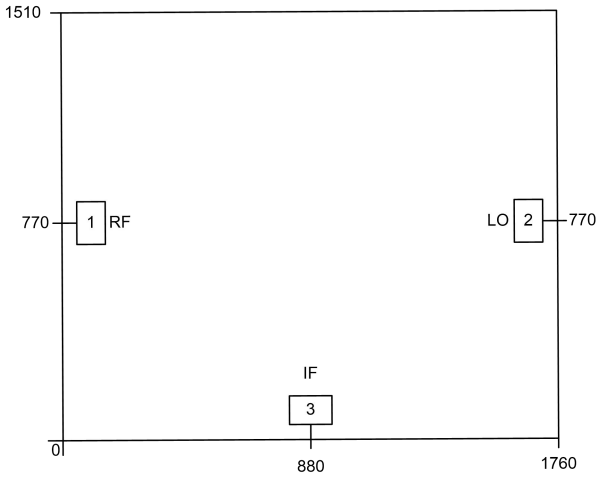
Up-conversion combined spurious suppression

iF	nLO				
	0	1	2	3	4
0	xxx	25	16	25	29
1	13	0	36	24	41
2	55	48	54	64	80
3	74	62	82	79	87
4	xxx	25	16	25	29

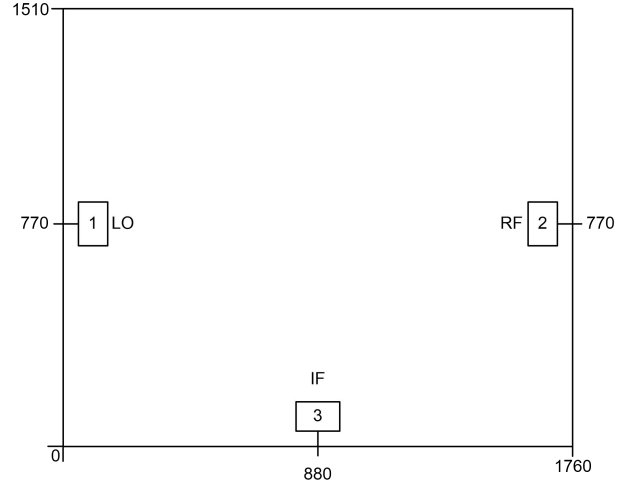
Test conditions: IF=0.3GHz@-10dBm , LO=2.5GHz@13 dBm

GaAs MMIC Mixer Chip, 1- 4GHz

Appearance structure ²



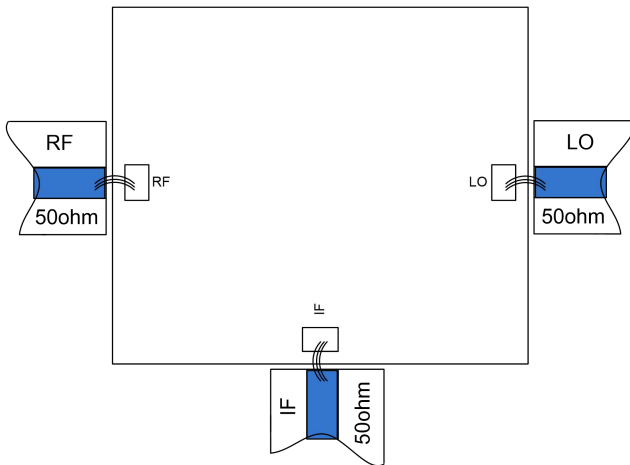
IMX-0104A



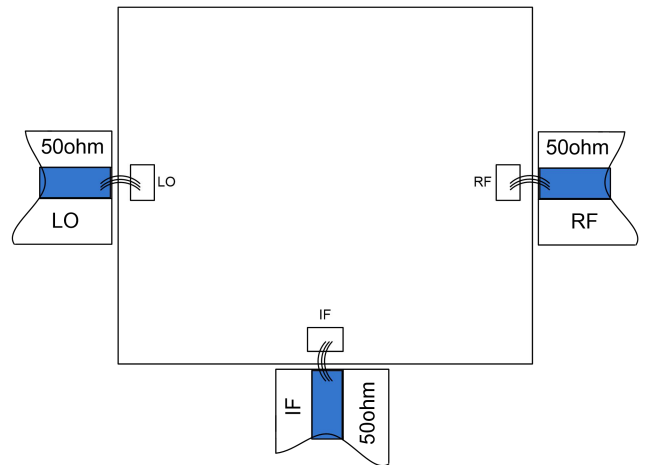
IMX-0104 AM

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

Recommended assembly drawing



IMX-0104A



IMX-0104 AM

Bonding point definition

Bonding point number	Function Symbol	Functional Description
1	RF/LO	The local oscillator signal terminal requires an external DC blocking capacitor
2	LO/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.		