

GaAs MMIC Mixer Chip, 6GHz-14GHz

Performance characteristics

- RF/LO frequency range: 6 - 14 GHz
- IF frequency range : DC-7GHz
- Conversion loss : 7.0 dB@+15dBm LO input
- LO-RF isolation: 56dB
- LO-IF isolation : 34dB
- RF-IF isolation : 18 dB
- Local oscillator power: +11dBm~+15dBm
- Chip size: 1.11 x 0.86 x 0.1mm

Product Introduction

GMX-0614A/AM is a GaAs MMIC double-balanced mixer with a frequency range of 6 GHz to 14 GHz , an IF range of DC to 7 GHz , a conversion loss of 7.0 dB , LO/RF isolation of 48 dB , LO /IF isolation of 41 dB , RF/IF isolation of 24 dB , and a typical LO input power of +15 dBm. 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-0614A and GMX-0614AM 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 = + 15dBm)

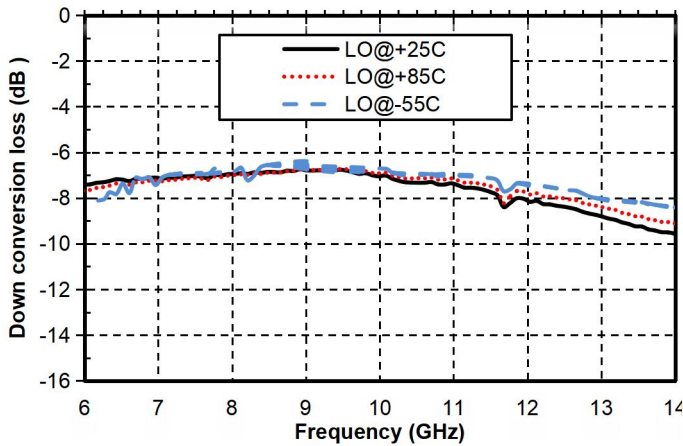
index	Minimum	Typical Value	Maximum	unit
RF frequency range	6-14			GHz
LO frequency range	6-14			GHz
IF frequency	DC-7			GHz
Frequency conversion loss	-	7.0	-	dB
LO-RF Isolation	-	56	-	dB
LO-IF isolation	-	34	-	dB
RF-IF isolation	-	18	-	dB
RF input P-1dB		11		dB m
IIP3		19		dBm

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

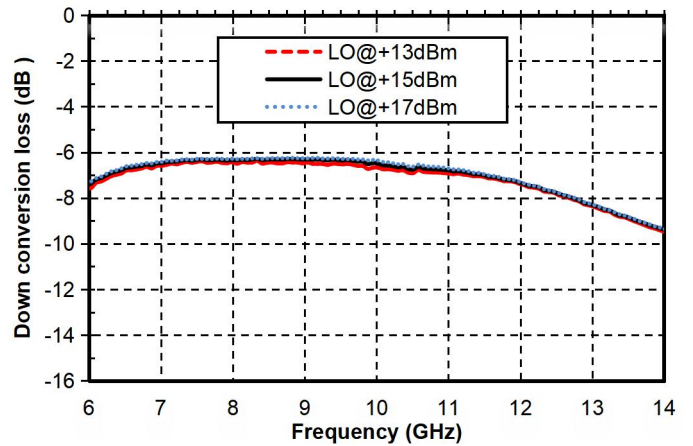
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Main index test curve

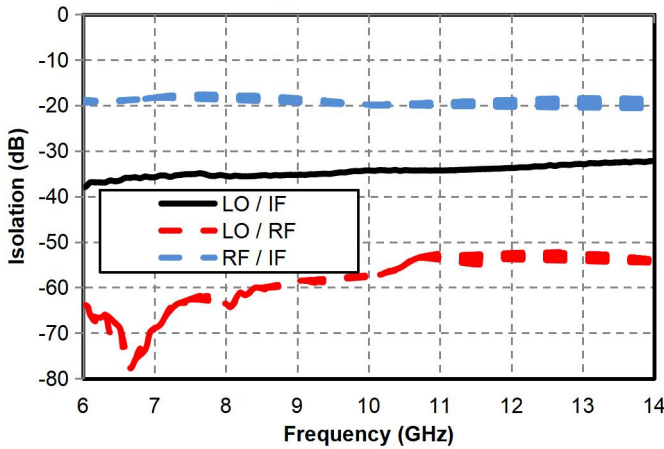
Downconversion loss vs. temperature @ LO = +15dBm



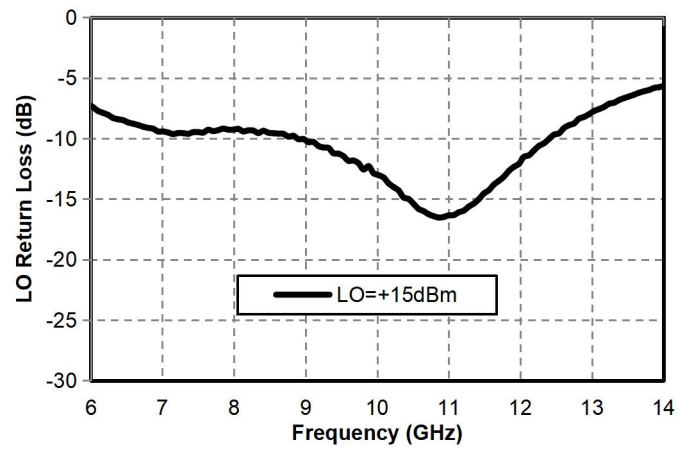
Downconversion Loss vs. LO Power



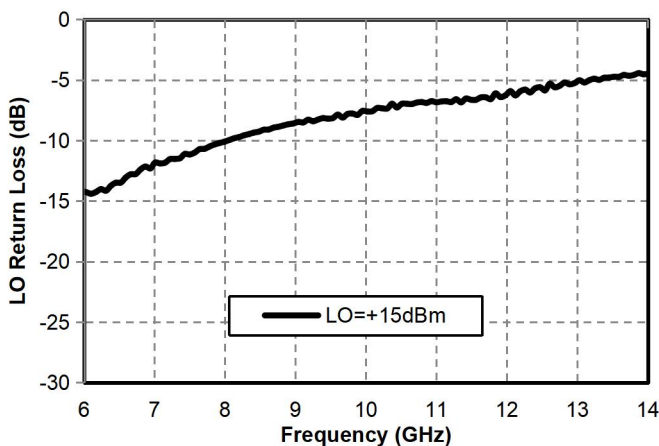
Isolation @ LO = +15dBm



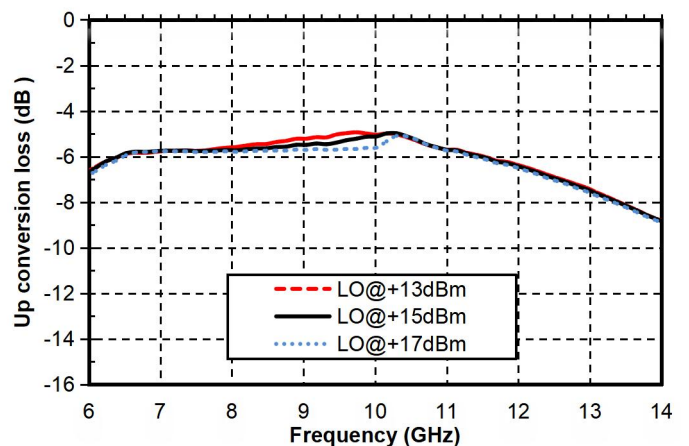
RF Return Loss Vs. Frequency



LO Return Loss Vs. Frequency

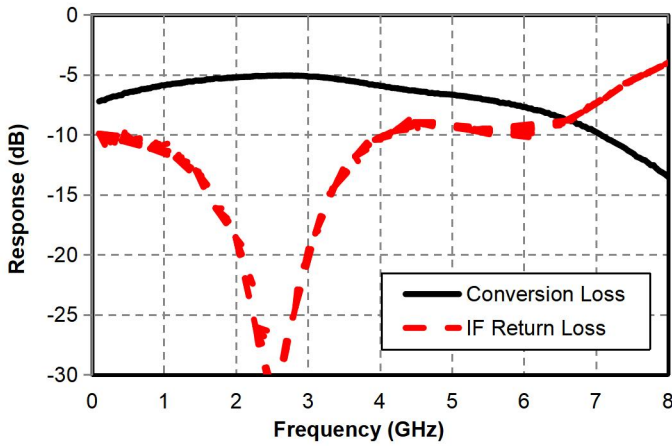


Upconversion Loss vs. LO Power

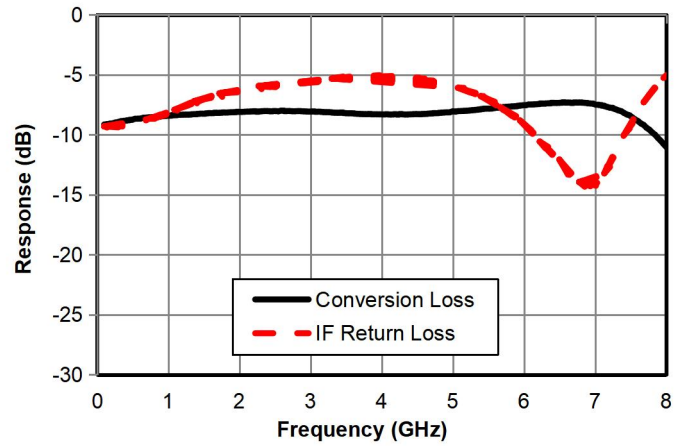


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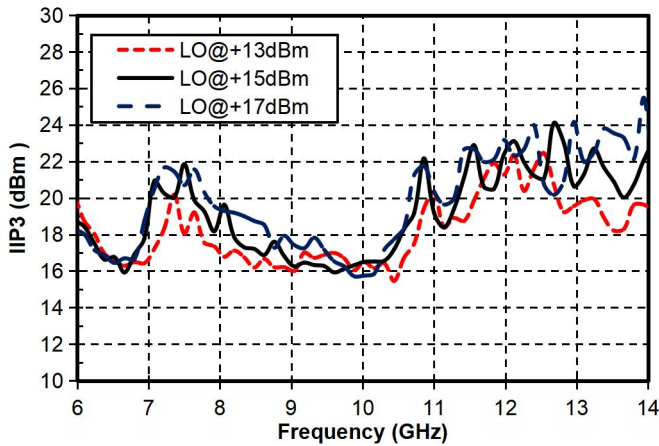
Down-converter IF bandwidth, return loss
@LO=6G, 15dBm



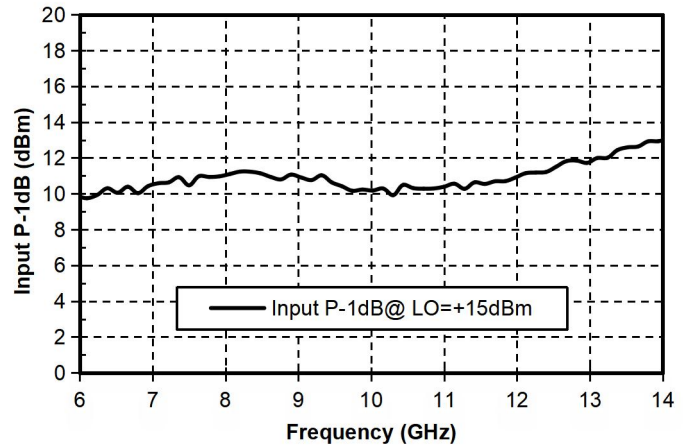
Down-converter IF bandwidth, return loss
@LO=14G, 15dBm



IIP3



P-1 vs. Frequency



LO harmonic RF leakage

LO(GHz) 15dBm	nLO (measured at RF port) dBc		
	1	2	3
6.0	\	55	67
7.0	\	52	81
8.0	\	53	66
9.0	\	58	65
10.0	\	55	57
11.0	\	60	58
12.0	\	62	60
13.0	\	58	57
14.0	\	54	57

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LO harmonic IF leakage

LO(GHz)15dBm	nLO (measured at IF port) dBc		
	1	2	3
6.0	\	60	50
7.0	\	60	53
8.0	\	61	42
9.0	\	61	46
10.0	\	60	46
11.0	\	54	48
12.0	\	52	50
13.0	\	63	51
14.0	\	61	53

Down-conversion combined spurious suppression

mRF	nLO				
	0	1	2	3	4
0	xxx	3	26	15	32
1	13	0	31	35	67
2	93	65	71	65	89
3	\	80	78	66	76
4	\	\	\	107	106

Test conditions : RF = 10.4 GHz @ -10 dBm , LO = 10.5 GHz @ 1.5 dBm

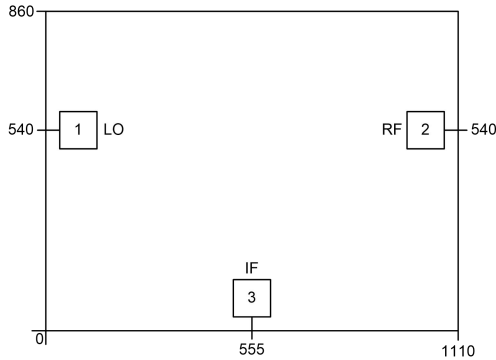
Up-conversion combined spurious suppression

iF	nLO				
	0	1	2	3	4
0	xxx	25	30	26	twenty four
1	88	0	43	34	61
2	\	51	79	74	81
3	\	65	90	84	\
4	\	93	\	\	\

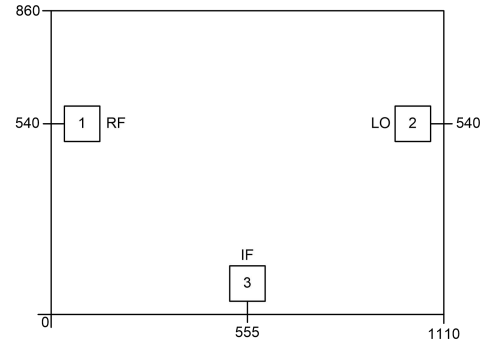
Test conditions: IF = 0.1 GHz @ -10dBm , LO = 10.5 GHz @ 1 5 dBm

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Appearance structure ²



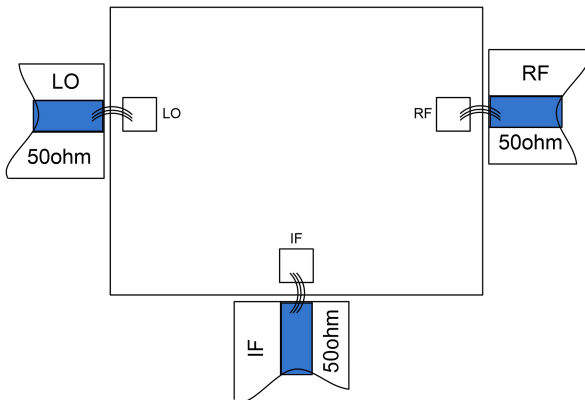
GX-0614A



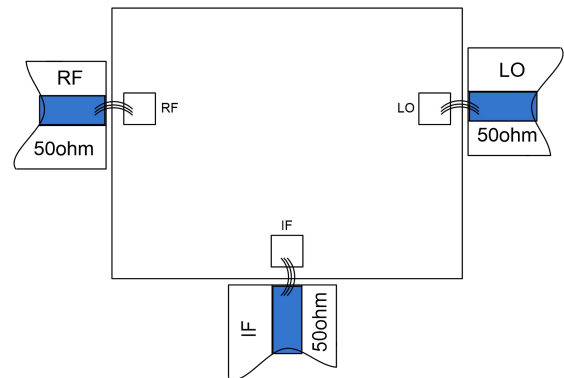
GX-0614AM

【2】 The units in the figure are all micrometers, and the dimensional tolerance is $\pm 50\mu\text{m}$.

Recommended assembly drawing



GX-0614A



GX-0614AM

Bonding point definition

Bonding point number	Function Symbol	Functional Description
1	RF/LO	The local oscillator signal terminal has internal DC isolation , so no external DC isolation capacitor is required
2	LO/RF	RF signal end, with internal DC isolation , no external DC isolation capacitor required
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.