

## GaAs MMIC Mixer Chip, 1GHz-4GHz

### Performance characteristics

- RF/LO frequency range: 1-4GHz
- IF frequency range: DC-1GHz
- Conversion Loss: 8.0dB@13dBm Input
- LO-RF isolation degree: 58dB
- LO-IF isolation degree: 45dB
- RF-IF isolation degree: 25dB
- Local oscillator power:+11dBm~+15dBm
- Chip size: QFN4x4mm

### Product Introduction

GMX-0104-CQ4 is a GaAs MMIC dual balanced mixer with a frequency range of 1GHz~4GHz and an intermediate frequency range of DC~1GHz. The frequency conversion loss is 8.0dB, and the local oscillator/radio frequency isolation is 58dB, 45dB, and 25dB, respectively. The typical local oscillator input power is +13dBm. RF, LO, and IF ports have no DC blocking capacitors. This mixer adopts a 4X4mm surface mount lead-free ceramic tube shell, and the surface of the pin solder pads is treated with a gold plating process, suitable for reflow soldering installation process.

#### Use restriction parameters<sup>1</sup>

Maximum RF input power	+22dBm
Maximum local oscillator input power	+22dBm
Maximum intermediate frequency input power	+22dBm
Working temperature	-55 ~ +85°C
Storage temperature	-65 ~ +150°C

【1】 Exceeding any of the above maximum limits may result in permanent damage.

#### Electrical performance parameters (TA=+25 ° C, IF=100MHz, LO=+13dBm)

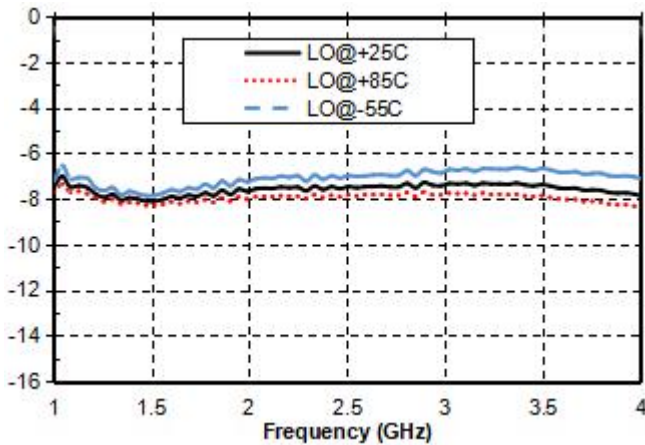
Index	Minimum value	Typical value	Maximum value	Unit
RF frequency range	1-4			GHz
Local oscillator frequency range	1-4			GHz
Intermediate frequency	DC-1			GHz
Variable frequency loss	-	8.0	-	dB
LO-RF isolation degree	-	58	-	dB
LO-IF isolation degree	-	45	-	dB

RF-IF isolation degree	-	25	-	dB
RF input P-1dB		9		dBm
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.				

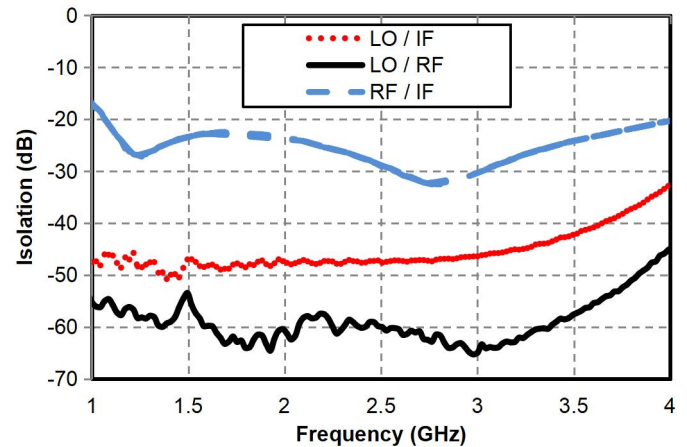
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### Main indicator testing curve

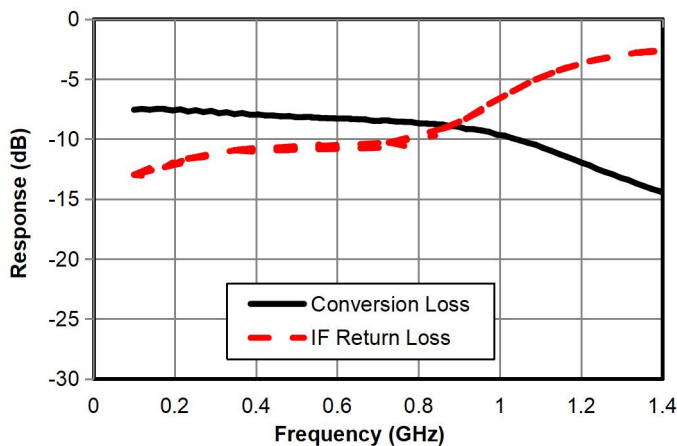
Downconversion loss vs. temperature @  
LO=+13dBm



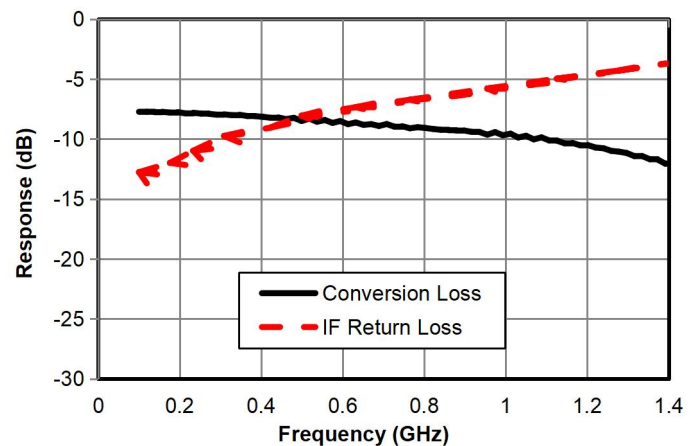
Isolation degree @ LO=+13dBm



Intermediate frequency bandwidth @  
LO=1G/+13dBm

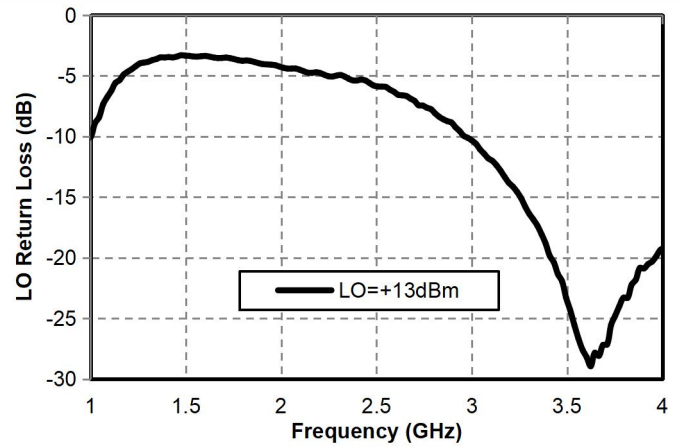
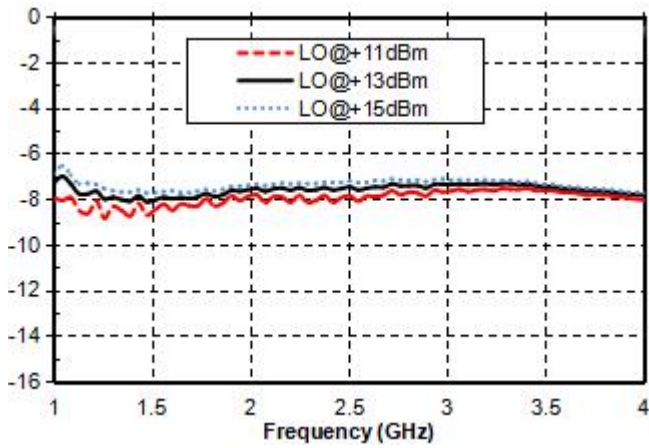


Intermediate frequency bandwidth @  
LO=4G/+13dBm



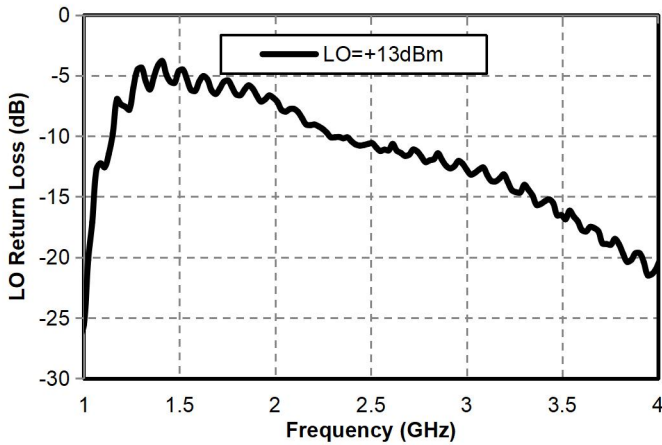
Downconversion frequency conversion loss vs.  
LO power

Downconversion RF return loss vs. frequency  
LO=+13dBm

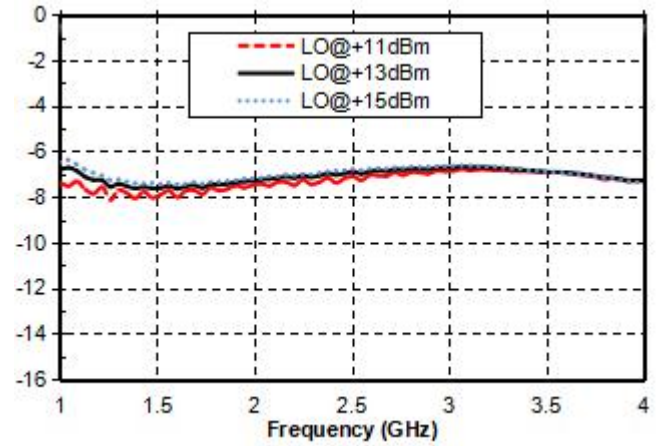


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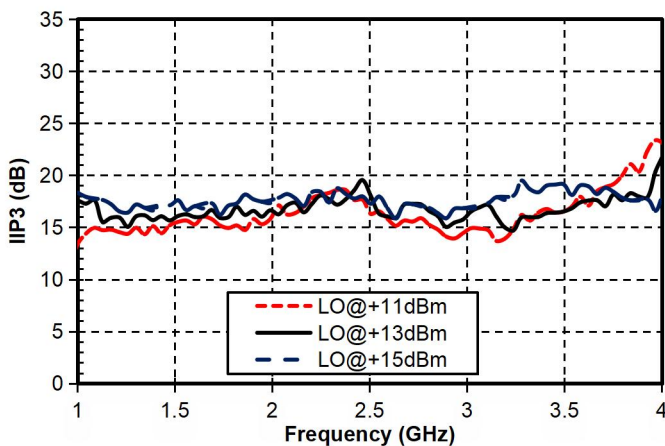
Downconversion local oscillator standing wave vs. frequency



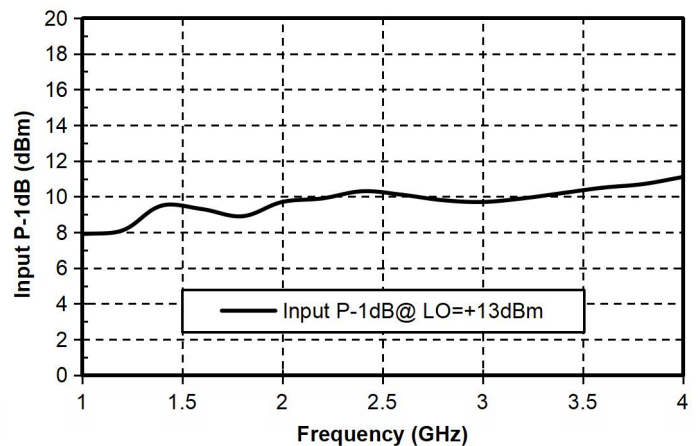
Upconversion loss vs. LO power



IIP3



Input P-1dB vs. frequency



## Local oscillator harmonic leakage

LO(GHz)13dBm	nLO (Tested at RF port) dBc	
	2	3
1	47	62
1.5	45	60
2	44	58
2.5	47	54
3	53	54
3.5	53	53
4	43	48

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### Downconversion combination spurious suppression

Combined Stray Testing	nLO					
	mRF	0	1	2	3	4
0	0	xxx	20	31	25	38
1	1	16	0	45	40	34
2	2	90	80	73	72	105
3	3	72	92	86	65	86
4	4	/	/	/	/	/

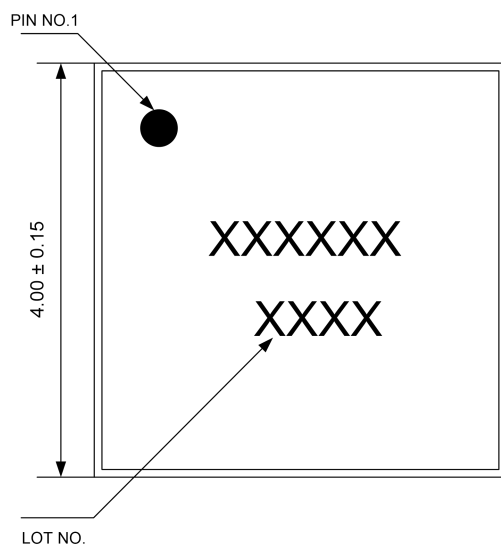
IF=2GHZ@-10dBm, LO=1.9GHZ@13dBm, The relative value of 1 \* RF-1 \* LO (P\_IF, dBm), in dBc.

### Upconversion combination stray suppression

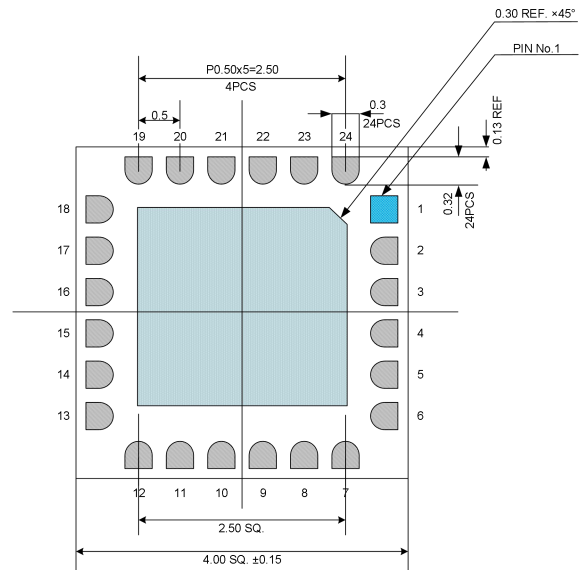
Combined Stray Testing	nLO					
	mIF	0	1	2	3	4
0	0	xxx	30	17	24	25
1	1	13	0	37	25	40
2	2	55	48	55	66	87
3	3	78	65	82	81	88
4	4	96	85	91	/	/

IF=0.3GHZ@-10dBm, LO=2.5GHZ@13dBm, The relative value of 1 \* RF-1 \* LO (P\_IF, dBm), in dBc.

## External structure



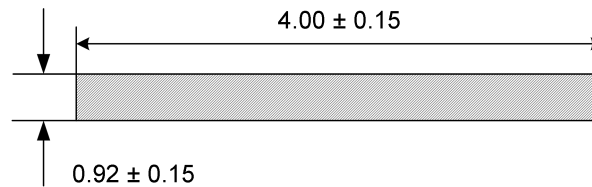
vertical view



Top view

## GaAs MMIC Mixer Chip, 1GHz-4GHz

## External structure



Side view

The units in the figure are all millimeters, with an unspecified tolerance of  $\pm 0.15\text{mm}$

## Pin Definition

Solder joint serial number	Functional symbols	Function Description
3	LO	The local oscillator signal terminal requires an additional DC isolation capacitor
10	IF	Intermediate frequency signal terminal requires an additional DC isolation capacitor
16	RF	RF signal terminal requires an additional DC isolation capacitor
2、4、9、11、15、17	GND	The pins should have sufficient and good contact with the RF and DC ground
Chip bottom	GND	The bottom of the chip needs to be well grounded with RF and DC
other	NC	No welding required

## Application Block Diagram

