

## GaAs MMIC Mixer Chip, 6GHz-30GHz

### Performance characteristics

- RF/LO frequency range: 6-30GHz
- IF frequency range: DC-7GHz
- Conversion loss: 8.0dB
- LO-RF isolation degree: 50dB
- LO-IF isolation degree: 27dB
- RF-IF isolation degree: 37dB
- Local oscillator power: +13dBm~+17dBm
- Chip size: QFN 3x3mm

### Product Introduction

GMX-0630A-CQ3 is a GaAs MMIC dual balanced mixer with a frequency range of 6GHz~30GHz and an intermediate frequency range of DC~7GHz. The frequency conversion loss is 8.0dB, and the local oscillator/radio frequency isolation is 50dB, 27dB, and 37dB, respectively. The typical local oscillator input power is +15dBm. RF, LO, and IF ports have no DC blocking capacitors. The mixer adopts a 3X3mm 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 (T<sub>A</sub> = +25°C, IF=100MHz, LO=+15dBm)

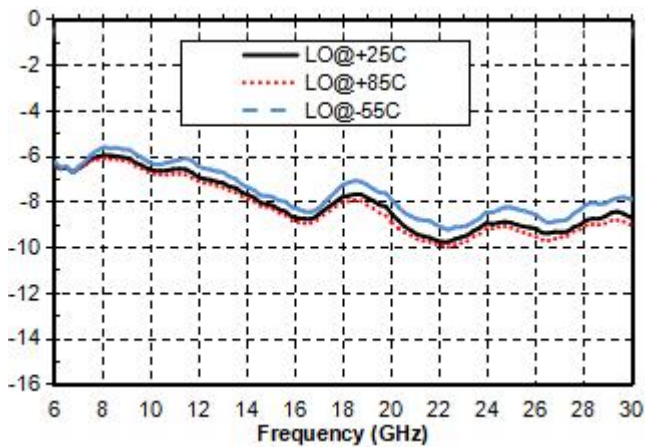
Index	Minimum value	Typical value	Maximum value	Unit
RF frequency range	6-30			GHz
Local oscillator frequency range	6-30			GHz
Intermediate frequency	DC-7			GHz
Variable frequency loss	-	8.0	-	dB
LO-RF isolation degree	-	50	-	dB
LO-IF isolation degree	-	27	-	dB

RF-IF isolation degree	-	37	-	dB
RF input P-1dB		11		dBm
IIP3	-	22		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.				

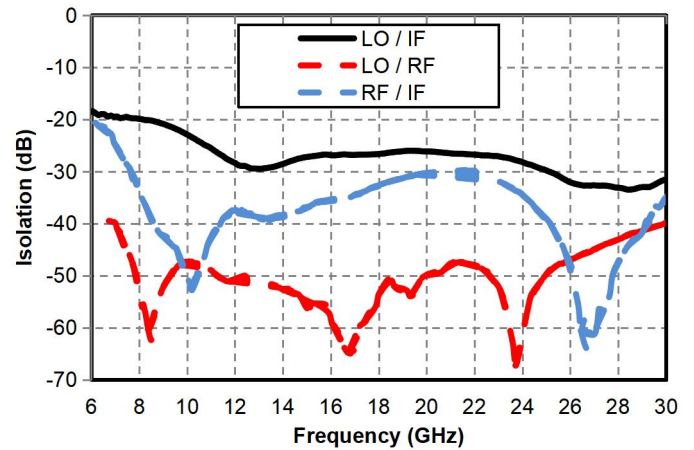
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### Main indicator testing curve

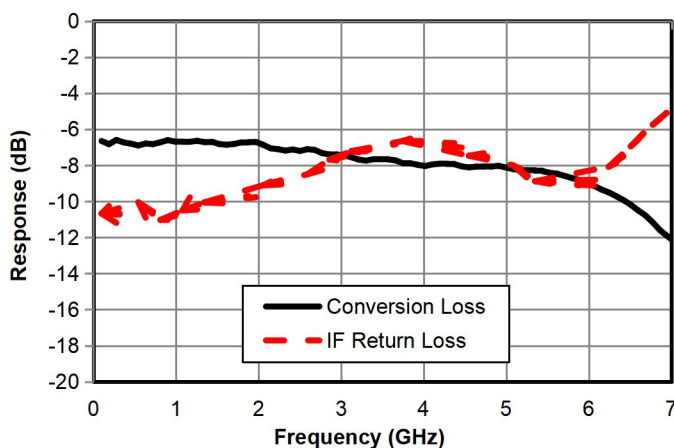
Downconversion loss vs. Temperature @  
LO=+15dBm



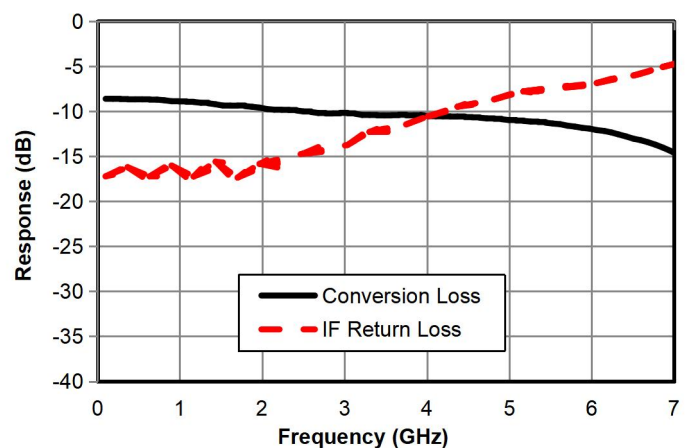
Isolation degree @ LO=+15dBm



Intermediate frequency bandwidth @  
LO=6G/+15dBm

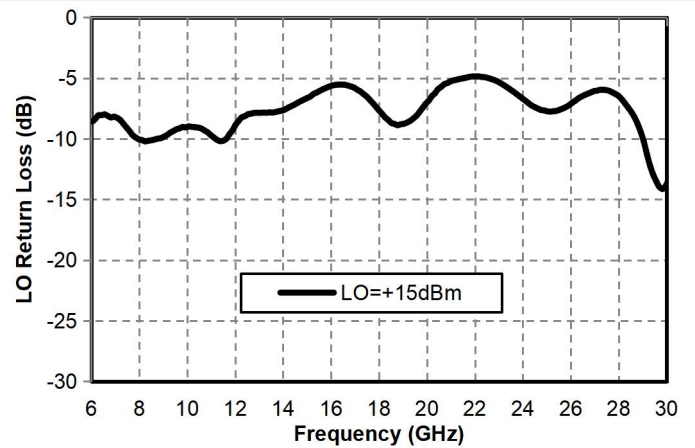
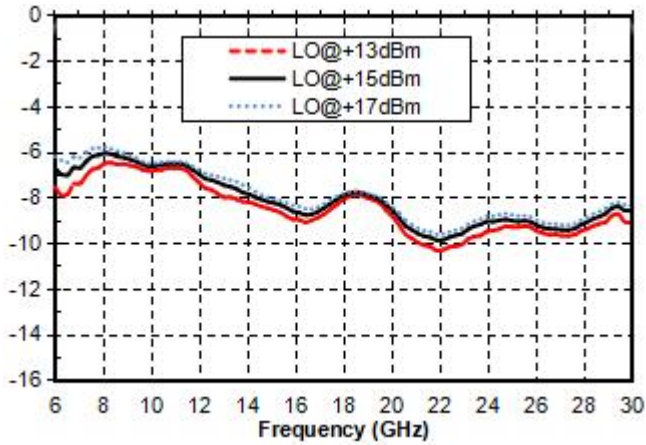


Intermediate frequency bandwidth @  
LO=30G/+15dBm



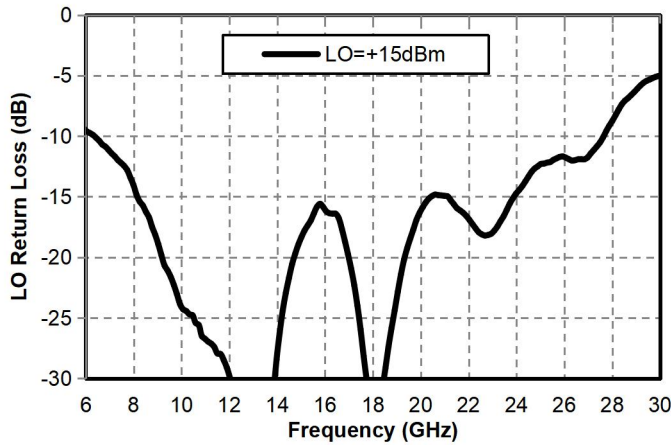
Downconversion frequency conversion loss vs.  
LO power

Downconversion RF return loss vs. Frequency  
LO=+15dBm

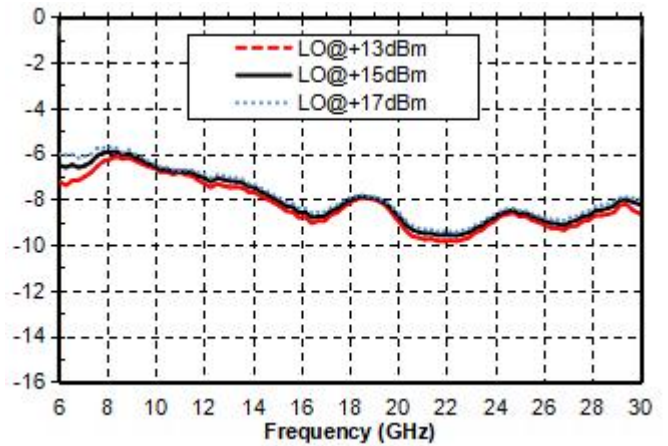


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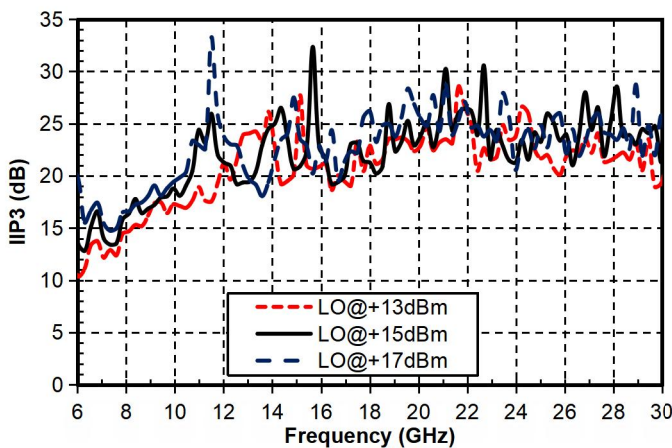
Downconversion local oscillator return loss vs. Frequency LO=+15dBm



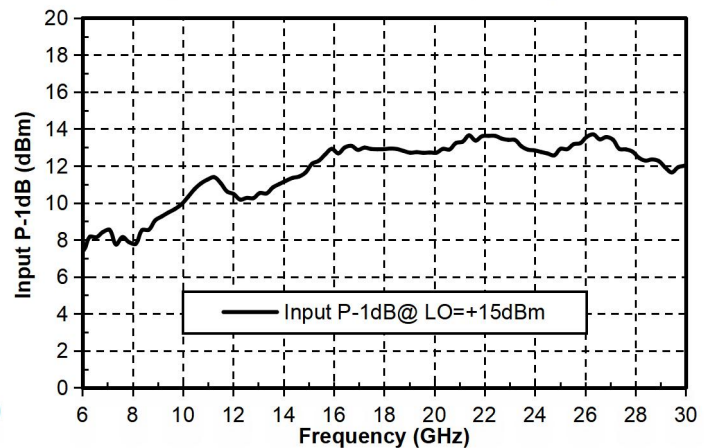
Upconversion loss vs. LO 功率



IIP3



Input P-1dB vs. RF frequency



## Local oscillator harmonic leakage

LO(GHz)15dBm	nLO (Tested on RF port) dBc		
	1	2	3
6	39	28	48
8	51	31	53
10	49	35	53
12	54	44	60
14	52	60	64
16	55	74	/
18	56	71	/
20	50	59	/
22	47	44	/
24	59	/	/
26	49	/	/
28	43	/	/
30	41	/	/

## GaAs MMIC Mixer Chip, 6GHz-30GHz

### Lower combination spurious suppression

mRF	nLO				
	0	1	2	3	4
0	xxx	-9	31	16	28
1	42	0	42	31	46
2	84	56	70	63	73
3	90	79	83	64	79
4	/	/	/	98	103

Test conditions: RF= 10.1GHz@-10dBm , LO= 10GHz@15dBm All relative values of 1 \* RF-1 \* LO (P\_IF, dBm), in dBc.

mRF	nLO				
	0	1	2	3	4
0	xxx	-6	41	/	/
1	24	0	52	25	/
2	77	56	68	57	81
3	/	78	99	68	/
4	/	/	/	/	102

Test conditions: RF= 18.1GHz@-10dBm , LO= 18GHz@15dBm All relative values of 1 \* RF-1 \* LO (P\_IF, dBm), in dBc.

## Upper combination spurious suppression

mIF	nLO				
	0	1	2	3	4
0	xxx	17	3	22	15
1	17	0	23	13	33
2	51	58	53	59	57
3	72	66	72	75	79
4	97	113	96	103	99

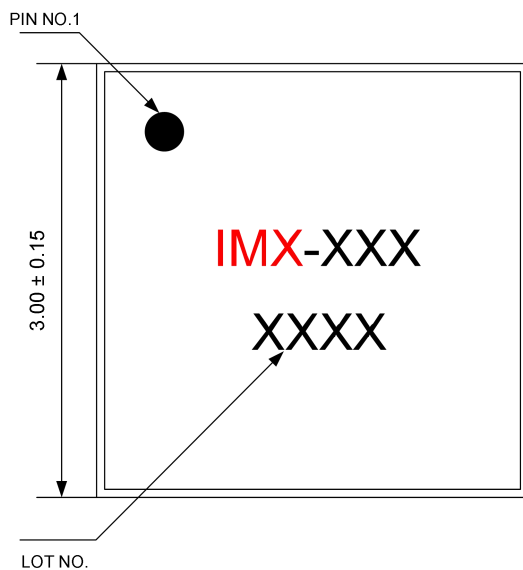
Test conditions: IF= 2.3GHz@-10dBm , LO= 10GHz@15dBm All relative values of 1 \* RF-1 \* LO (P\_IF, dBm), in dBc.

mIF	nLO				
	0	1	2	3	4
0	xxx	23	39	/	/
1	14	0	31	/	/
2	50	60	56	/	/
3	73	63	73	71	/
4	98	108	97	/	/

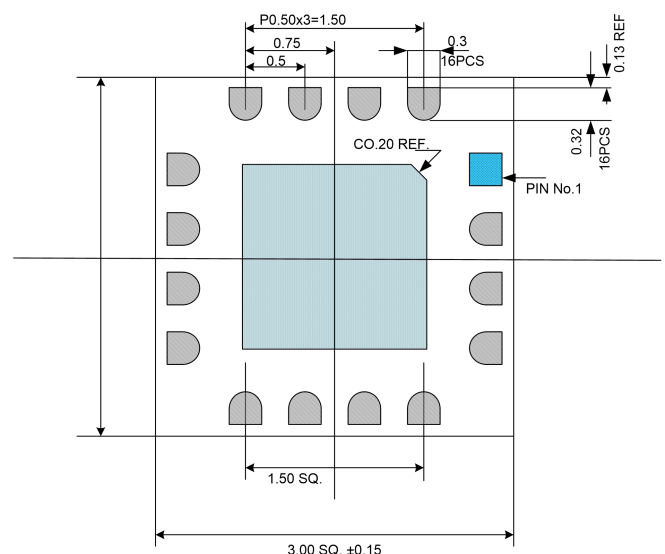
Test conditions: IF= 4.3GHz@-10dBm , LO= 18GHz@15dBm All relative values of 1 \* RF-1 \* LO (P\_IF, dBm), in dBc.

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### External structure

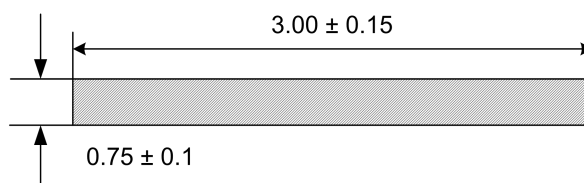


vertical view



Top view

## External structure



Side view

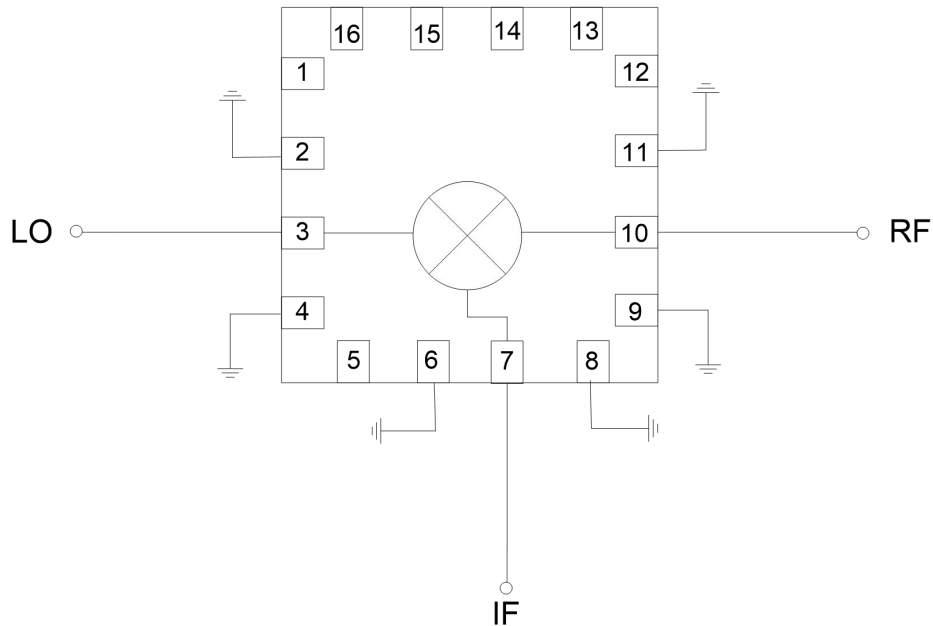
The units in the figure are all millimeters, with an unspecified tolerance of  $\pm 0.15$ mm

## Pin Definition

Solder joint serial number	Functional symbols	Function Description
3	LO	The local oscillator signal terminal requires an additional DC isolation capacitor
7	IF	Intermediate frequency signal terminal requires an additional DC isolation capacitor
10	RF	RF signal terminal requires an additional DC isolation capacitor
2、4、6、8、9、11	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

## GaAs MMIC Mixer Chip, 6GHz-30GHz

### Application Block Diagram



### Precautions for use

- Sealing material: Ceramic material that meets ROHS specifications
- Lead frame material: copper alloy
- Surface coating of lead wire: gold, with a gold layer thickness of 0.3um min
- Maximum reflow soldering peak temperature: 260 °C