GMX-005020A-CQ4

GaAs MMIC Mixer Chip, 0.5GHz-2GHz

Performance characteristics

- RF/LO frequency range: 0.5-2GHz
- IF frequency range: DC-0.6GHz
- Conversion loss: 8.0dB@13dBm Input
- LO-RF isolation degree: 48dB
- LO-IF isolation degree: 39dB
- RF-IF isolation degree: 18dB
- Local oscillator power:+11dBm~+15dBm
- Chip size: QFN4x4mm

Product Introduction

GMX-005020A-CQ4 is a GaAs MMIC dual balanced mixer with a frequency range of 0.5GHz~2GHz and an intermediate frequency range of DC~0.6GHz. The frequency conversion loss is 8.0dB, and the local oscillator/radio frequency isolation is 48dB, 39dB, and 18dB, 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, which can achieve airtight packaging. The pin solder pads can climb tin, and the surface of the pin solder pads is treated with gold plating technology, suitable for reflow soldering installation process.

Use restriction parameters[1]	
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_A= +25°C，IF=100MHz，LO=+13dBm)				
Index	Minimum value	Typical value	Maximum value	Unit
RF frequency range	0.5-2			GHz
Local oscillator frequency range	0.5-2			GHz
Intermediate frequency	DC-0.6			GHz
Variable frequency loss	-	8.0	-	dB
LO-RF isolation degree	-	48	-	dB
LO-IF isolation	-	39	-	dB

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degree				
RF-IF isolation degree	-	18	-	dB
RF input P-1dB		9		dBm
IIP3		14		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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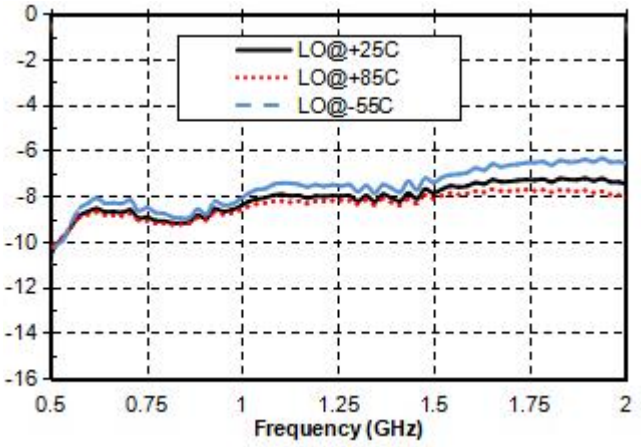
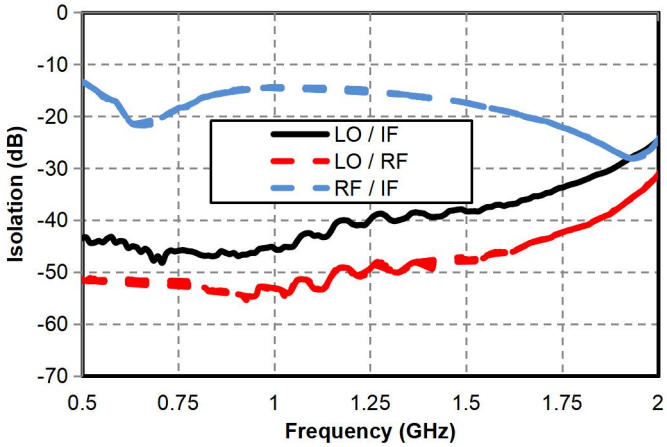
Main indicator testing curve

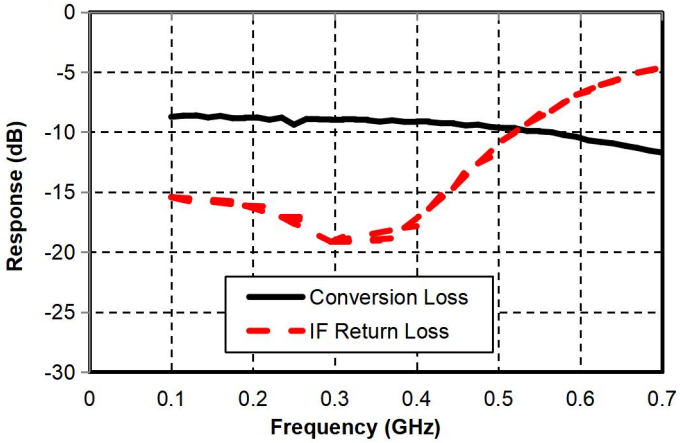
Downconversion loss vs. Temperature @ LO=+13dBm



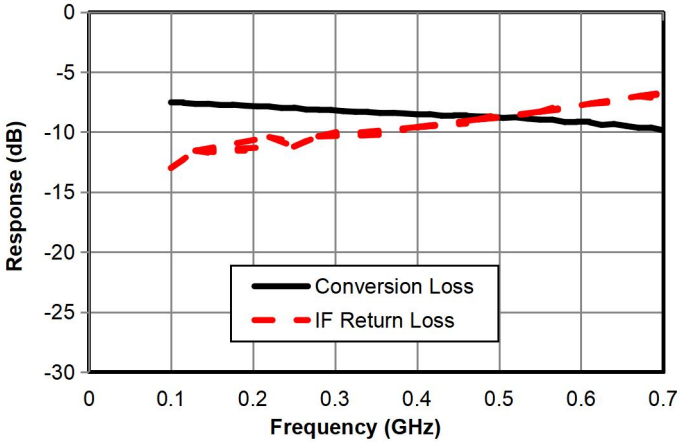
Isolation degree @ LO=+13dBm



Intermediate frequency bandwidth @ LO=0.5G/+13dBm

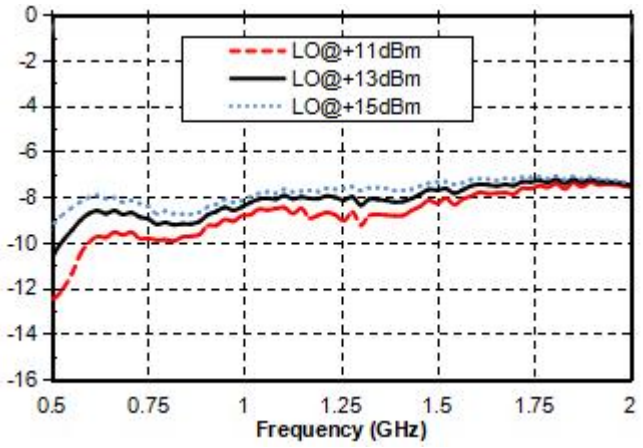


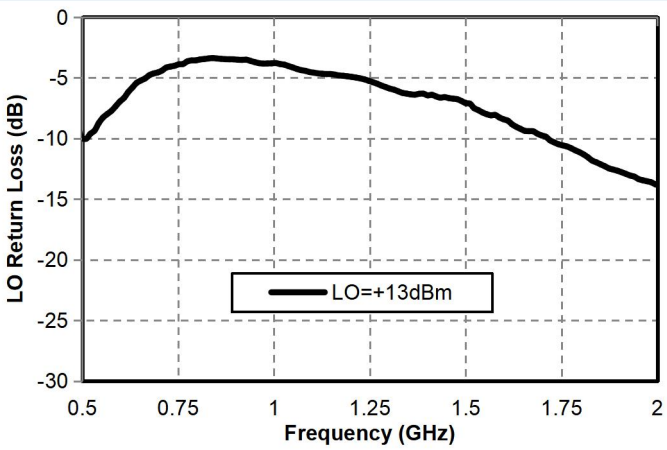
Intermediate frequency bandwidth @ LO=2G/+13dBm



Downconversion frequency conversion loss vs. LO power

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





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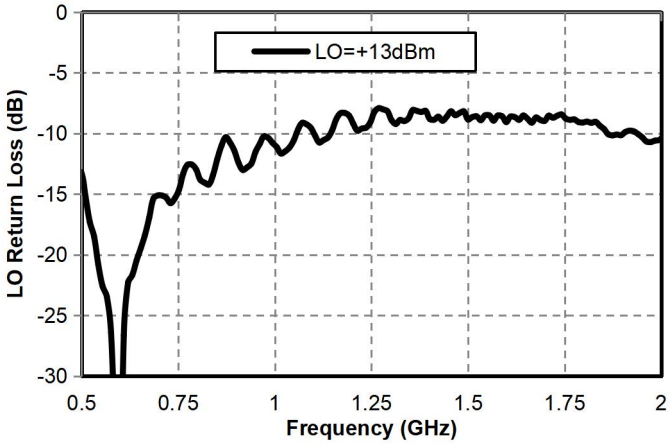
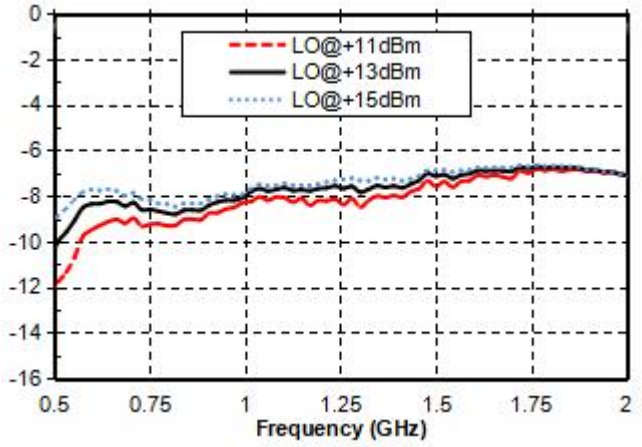
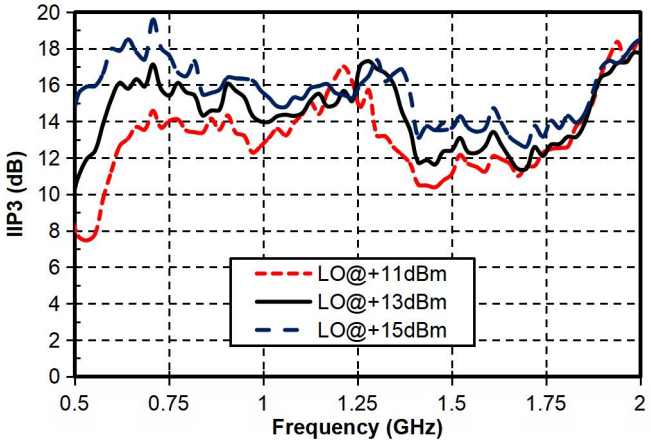
Downconversion local oscillator standing wave vs. frequency



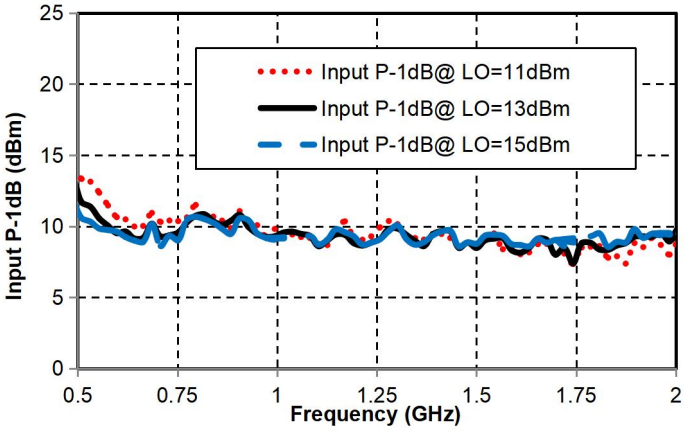
Upconversion loss vs. LO power



IIP3



Input P-1dB vs. RF frequency



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Local oscillator harmonic leakage

LO(GHz)13dBm	nLO（Tested on RF port）dBc	
	2	3
0.5	52	56
0.7	47	51
0.9	48	62
1.1	46	55
1.3	43	58
1.5	46	61
1.7	53	60
2.0	42	47

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Local oscillator harmonic leakage

LO(GHz)13dBm	nLO（Tested on IF port）dBc	
	2	3
0.5	64	54
0.7	65	42
0.9	65	57
1.1	55	59
1.3	62	56
1.5	64	52
1.7	61	48
2.0	59	54

Lower combination spurious suppression

Upconversion loss vs. LO power	nLO				
mRF	0	1	2	3	4
0	×××	14	29	40	44
1	7	0	30	42	46
2	45	48	66	51	81
3	70	77	76	61	68
4	/	/	106	100	94
RF= 1.1GHz@-10dBm , LO= 1GHz@13dBm The relative value of 1 * RF-1 * LO (P_IF, dBm) is expressed in dBc.					

Upper combination spurious suppression

Combined Stray Testing	nLO				
mIF	0	1	2	3	4
0	×××	23	16	35	31
1	6	0	22	9	35
2	59	51	61	52	70
3	67	100	72	58	68
4	81	101	96	91	97
IF= 0.3GHz@-10dBm , LO= 1GHz@13dBm The relative value of 1 * RF-1 * LO (P_IF, dBm) is expressed in dBc.					

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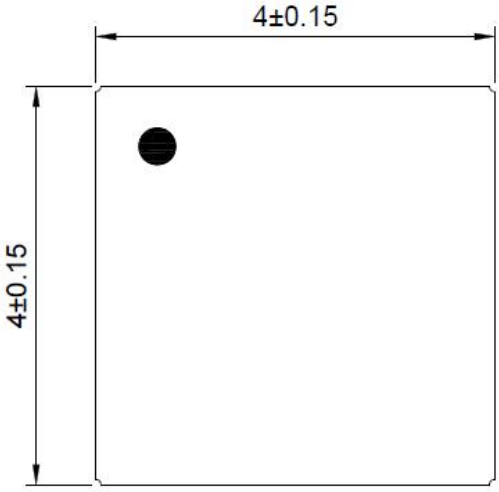
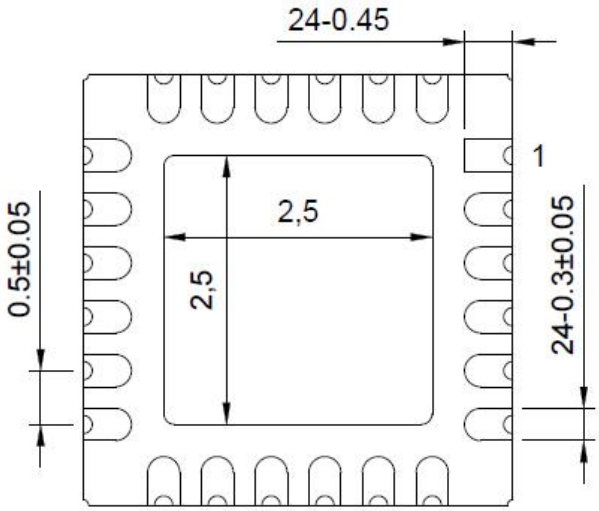
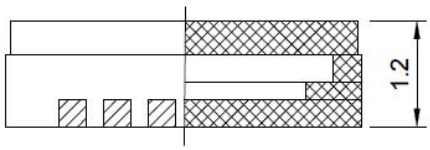
External structure



vertical view



Top view



Side view

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

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

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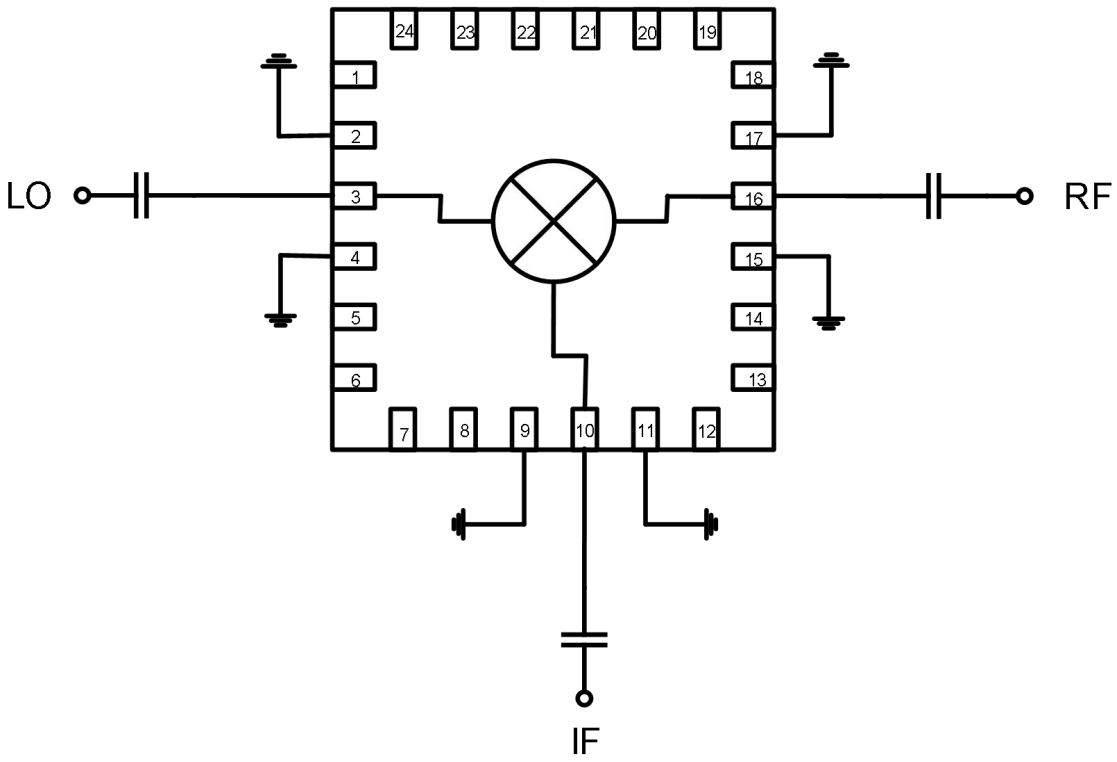
Application Block Diagram



Precautions for use

- Sealing material: Ceramic material that meets ROSH specifications
- Lead surface coating: nickel gold, gold layer thickness (1.3-5.7) um
- Maximum reflow soldering peak temperature: 260 ℃