

## GaAs MMIC Mixer Chip, 1.5GHz-4.5GHz

### Performance characteristics

- RF/LO frequency range: 1.5 - 4.5 GHz
- IF frequency range : DC-1.6GHz
- Conversion loss : 7.0 dB@+13dBm LO input
- LO-RF isolation: 65dB
- LO-IF isolation : 46dB
- RF-IF isolation : 29 dB
- Local oscillator power: +11dBm~+15dBm
- Chip size: 1.66 x 1.46 x 0.1mm

### Product Introduction

GMX-015045A/AM is a GaAs MMIC double - balanced mixer with a frequency range of 1.5 GHz to 4.5 GHz , an IF range of DC to 1.6 GHz , a conversion loss of 7.0 dB , LO /RF isolation of 65 dB , LO/IF isolation of 46 dB , RF/IF isolation of 29 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 .GX -015045A and GX - 015045AM are mirror images of each other.

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

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 )

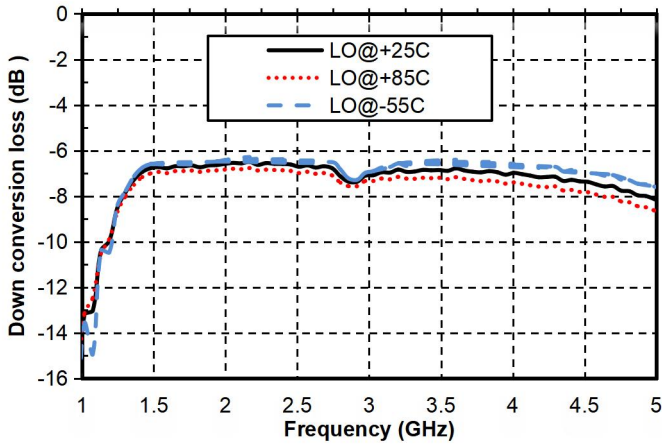
index	Minimum	Typical Value	Maximum	unit
RF frequency range	1.5-4.5			GHz
LO frequency range	1.5-4.5			GHz
IF frequency	DC-1.6			GHz
Frequency conversion loss	-	7.0	-	dB
LO-RF Isolation	-	65	-	dB
LO-IF isolation	-	46	-	dB
RF-IF isolation	-	29	-	dB
RF input P-1dB		8		dB m
IIP3		17		dBm

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

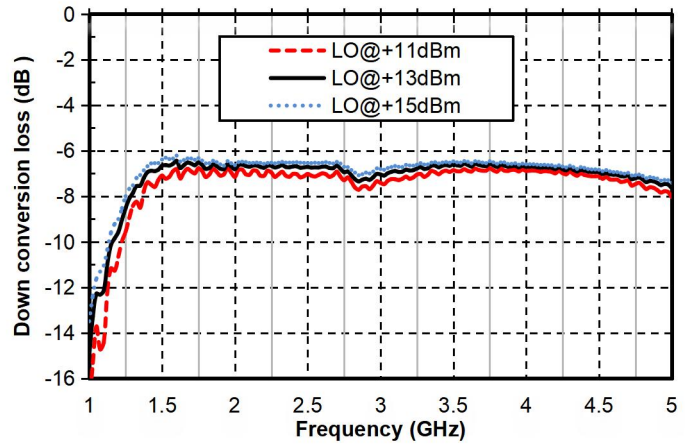
## GaAs MMIC Mixer Chip, 1.5GHz-4.5GHz

### Main index test curve

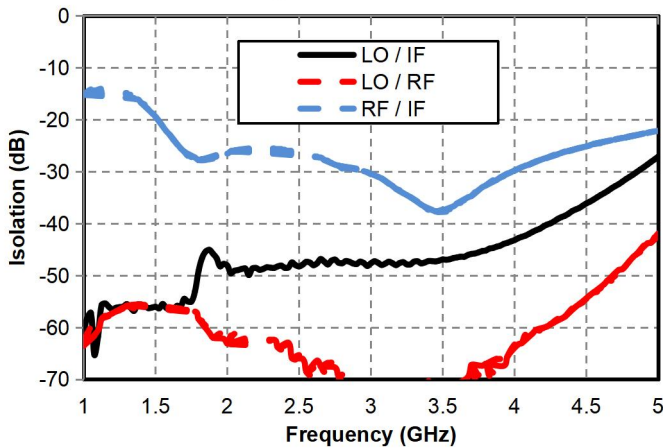
Downconversion loss vs. temperature @ LO = +13dBm



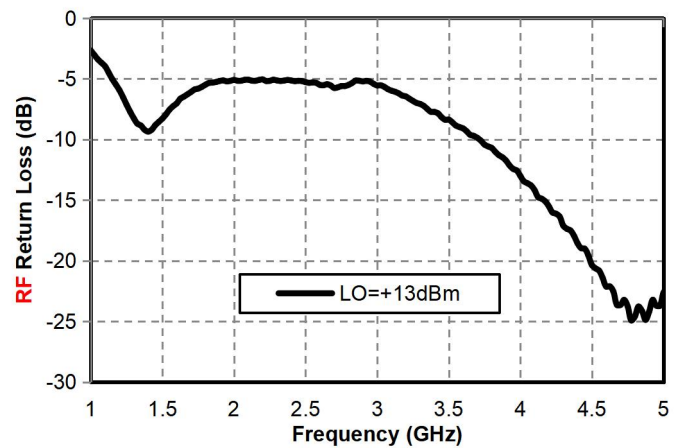
Downconversion Loss vs. LO Power



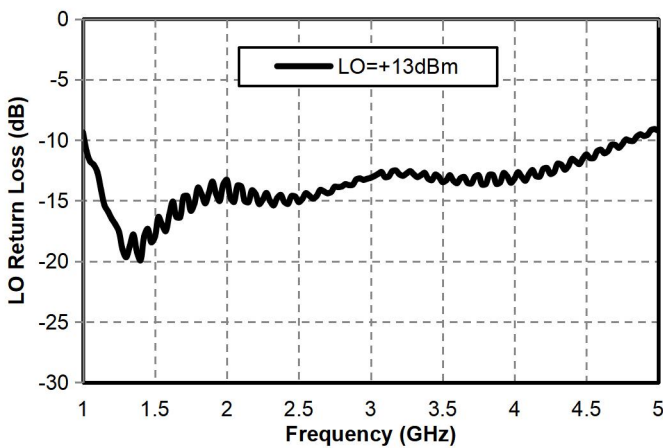
Isolation @ LO = +13dBm



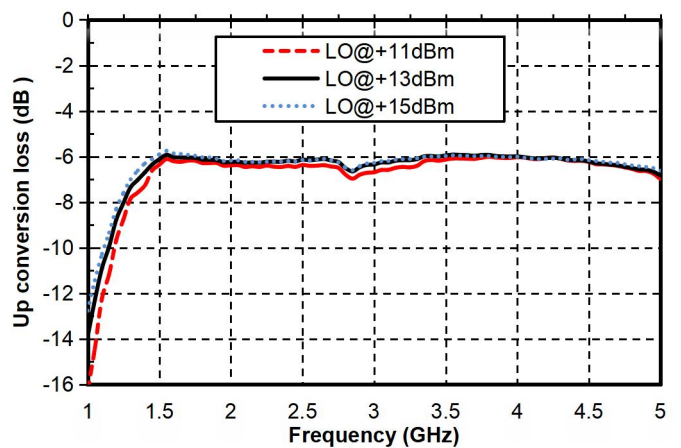
RF Return Loss Vs. Frequency



LO Return Loss Vs. Frequency

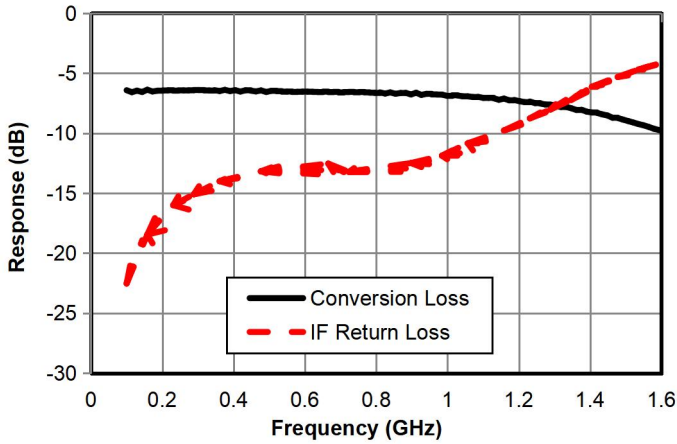


Upconversion Loss vs. LO Power

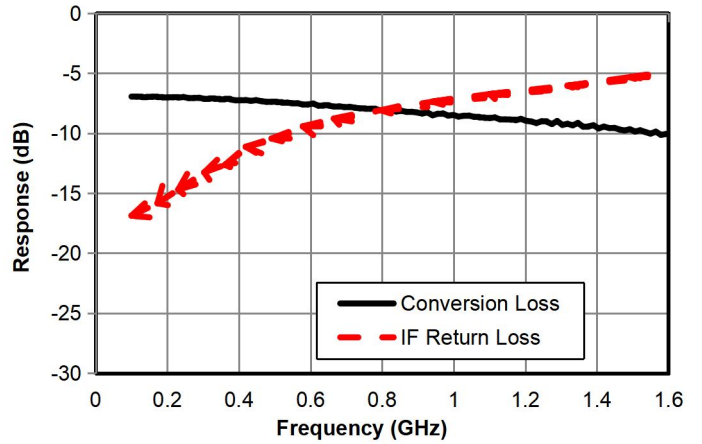


## GaAs MMIC Mixer Chip, 1.5GHz-4.5GHz

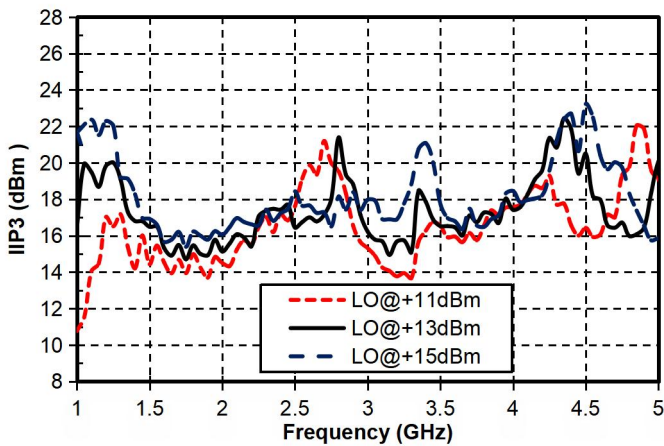
Down-converter IF bandwidth, return loss  
@LO=1.5G, 13dBm



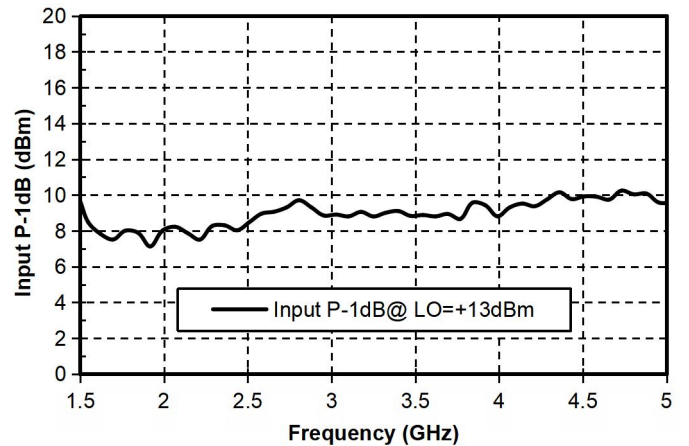
Down-converter IF bandwidth, return loss  
@LO=4.5G, 13dBm



IIP3



P-1 vs. Frequency



### LO harmonic RF leakage

LO(GHz) 13dBm	nLO (measured at RF port) dBc		
	1	2	3
1.5	\	45	68
2.0	\	44	55
2.5	\	41	49
3.0	\	42	47
3.5	\	44	50
4.0	\	49	59
4.5	\	46	69

## GaAs MMIC Mixer Chip, 1.5GHz-4.5GHz

### LO harmonic IF leakage

LO(GHz)13dBm	nLO (measured at IF port) dBc		
	1	2	3
1.5	\	64	57
2.0	\	65	50
2.5	\	59	53
3.0	\	53	52
3.5	\	50	54
4.0	\	49	63
4.5	\	47	72

### Down-conversion combined spurious suppression

mRF	nLO				
	0	1	2	3	4
0	xxx	17	31	21	42
1	19	0	43	49	32
2	77	65	72	64	84
3	72	91	80	68	81
4	/	/	/	/	/

Test conditions : RF = 2.5 GHz @ -10 dBm , LO = 2.4 GHz @ 13 dBm

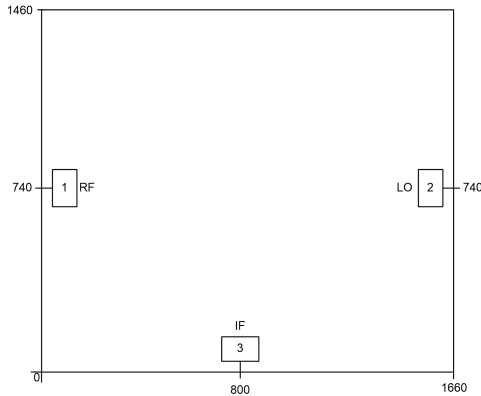
### Up-conversion combined spurious suppression

iF	nLO				
	0	1	2	3	4
0	xxx	37	11	19	33
1	18	0	33	16	54
2	60	47	53	59	74
3	78	65	84	71	97
4	92	86	96	97	\

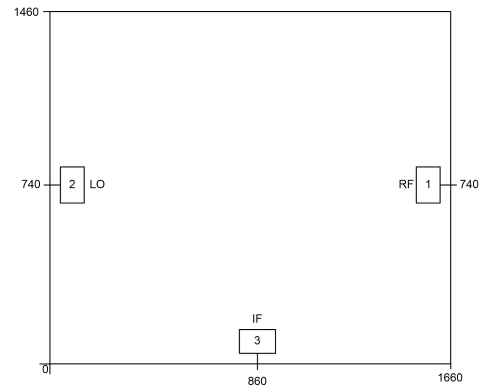
Test conditions: IF=0.3GHz@-10dBm , LO=2.5GHz@1 3 dBm

## GaAs MMIC Mixer Chip, 1.5GHz-4.5GHz

### Appearance structure <sup>2</sup>



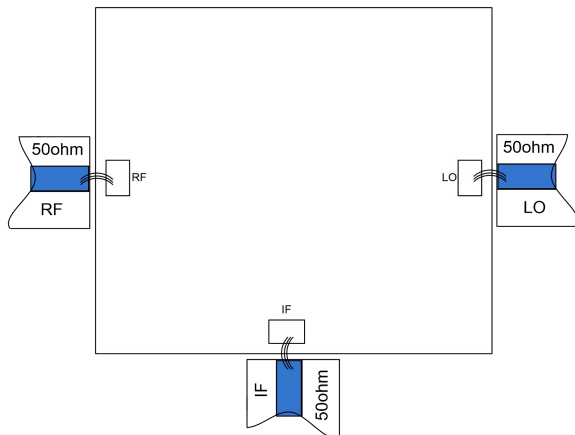
IMX - 01 5 04 5 A



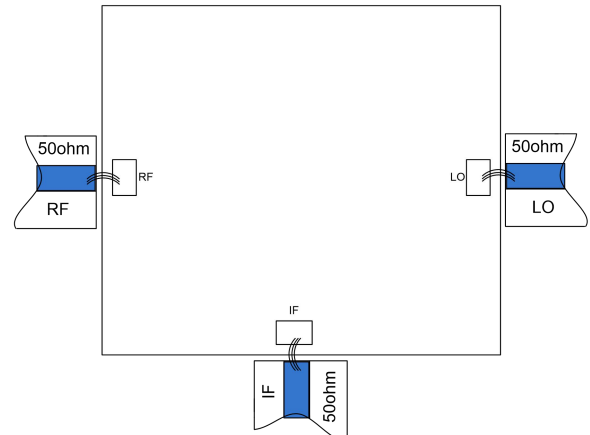
IMX - 01 5 04 5 AM

【2】 The units in the figure are all micrometers (dimensional tolerance:  $\pm 50\mu\text{m}$ .)

### Recommended assembly drawing



IMX - 01 5 04 5 A



IMX - 01 5 04 5 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.