

### Performance Characteristics

RF/LO frequency range: 20GHz~55GHz

IF frequency range: DC~16GHz

Conversion loss: 9dB (typical value)

LO-RF isolation: 30dB (typical value)

RF input P1dB: -3dB

Local oscillator driving power: 8dBm

DC power supply:  $V_g = -0.5V$

Chip size: 1.60 mm x 2.00 mm x 0.07 mm

### Product Introduction

The Q-band broadband mixer chip covers a frequency range of 20GHz~55GHz, with a typical frequency conversion loss of 9dB, a typical local oscillator RF isolation of 30dB, and an RF input P1dB of -3dBm. Can achieve up and down mixing.

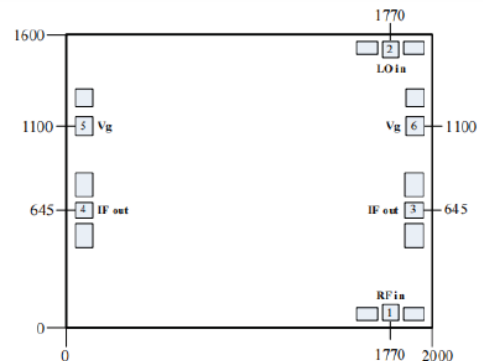
Electrical Performance ( $T_A = +25^\circ C$ ,  $L_O = 8dBm$ ,  $V_g = -0.5V$ )

Index	Min	Typ	Max	Unit
RF frequency range	20		55	GHz
Local oscillator frequency range	20		55	GHz
Intermediate frequency range	DC		16	GHz
SSB frequency conversion loss	8		10	dB
Local oscillator/ RF isolation	20	30	50	dB
RF IN P1dB		-3		dBm
Local oscillator power	6	8	13	dBm
RF port standing wave	12	2	35	-
Standing wave at IF	1	15	2	-

### Use Restriction Parameters

RF Input Power	10dBm
Local Oscillator Input Power	15dBm
Negative Gate Voltage	-1V
Storage Temperature	-65°C~150°C
Operating Temperature	-55°C~85°C

### External Dimensions



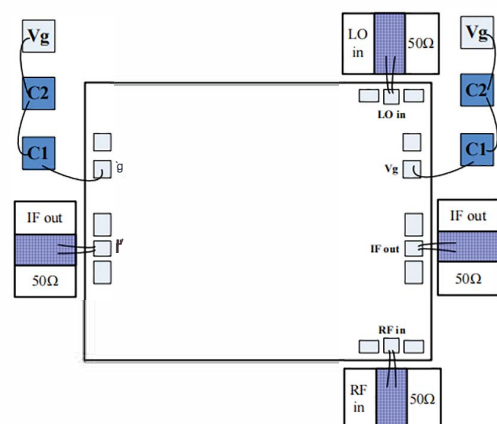
Note:

- 1) All dimensions marked are in micrometers ( $\mu m$ );
- 2) Dimensional tolerance for external dimensions:  $\pm 50\mu m$ ;
- 3) The chip thickness is  $70\mu m$ .

### Bonding Pressure Point Definition

No.	Symbol	Function	Size( $\mu m^2$ )
1	RF in	RF signal input terminal, external 50 ohm system, no need for DC isolation capacitor.	86X72
2	LO in	The local oscillator signal input terminal is connected to an external 50 ohm system and does not require a DC isolation capacitor.	86X86
3,4	IF out	Intermediate frequency signal output terminal, externally connected to a 50 ohm system, with no DC blocking capacitor on the chip.	100X100
5,6	$V_g$	The gate voltage feeding terminal requires external 100F and 10000pF bypass capacitors.	100X100

### Suggested Assembly Diagram

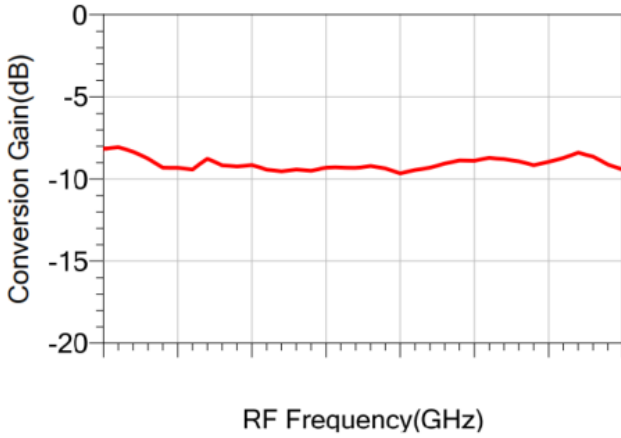
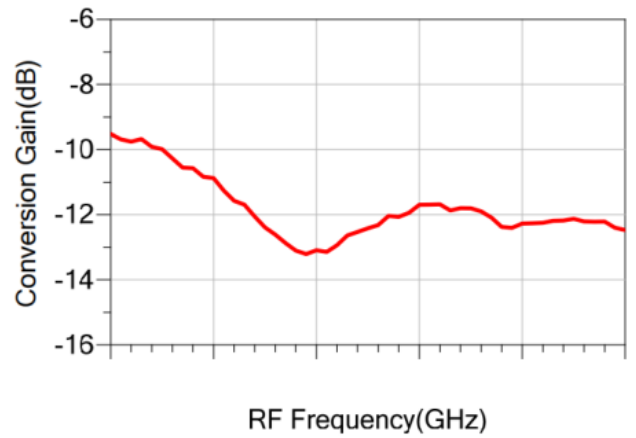
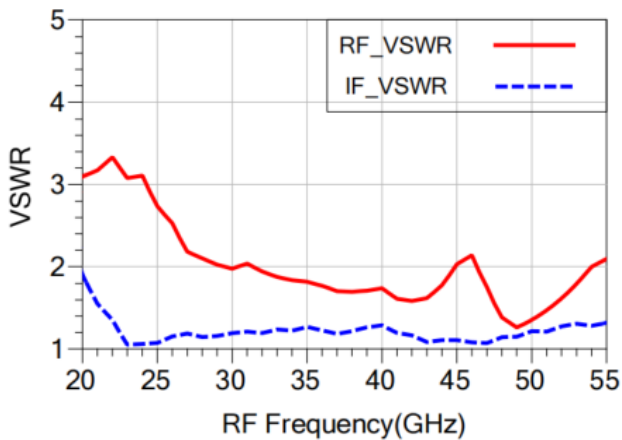
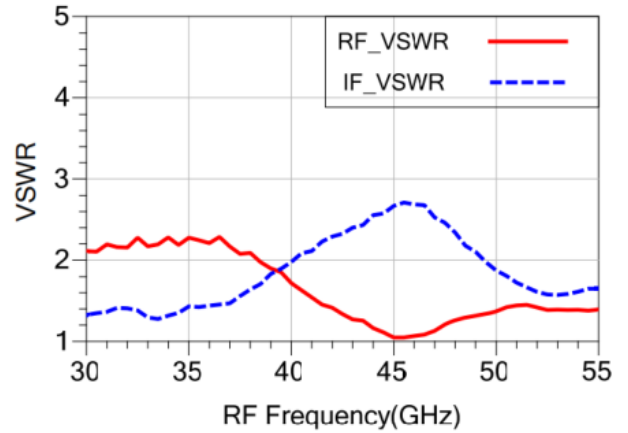
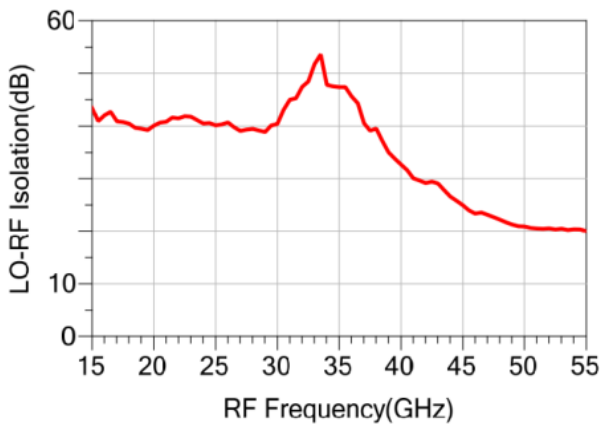


**On Chip Testing Curve**  $C_{T_A} = +2s \cdot c$  )

Freq\_IF= 1GHz, Freq\_IF= Freq\_RF-Freq\_LO;  
Pwr\_RF=-15dBm, Pwr\_LO=8dBm, Vg=-0.5V

**On Chip Testing Curve**  $<T_A = +2s \cdot c$  )

Freq\_L0=29.6GHz, Freq\_IF= Freq\_RF-Freq\_LO;  
Pwr\_RF=-15dBm, Pwr\_LO=8dBm, Vg=-0.5V

**SSB frequency conversion loss VS RF frequency  
(single IF port)**

**SSB frequency conversion loss VS RF frequency  
(single IF port)**

**RF/IF standing wave vs RF frequency**

**RF/IF standing wave vs RF frequency**

**Local oscillator RF isolation vs RF frequency**


**Note:**

- 1) Storage: The chip must be placed in a container with electrostatic protection and stored in a nitrogen environment.
- 2) Cleaning treatment: Bare chips must be operated and used in a purified environment, and it is prohibited to use liquid cleaning agents to clean the chips.
- 3) Electrostatic protection: Please strictly comply with ESD protection requirements to avoid electrostatic damage.
- 4) Conventional operation: To retrieve the chip, please use a vacuum chuck or precision pointed tweezers. During the operation, avoid touching the chip surface with tools or fingers.
- 5) Power on sequence: When powering on, apply gate voltage first, then drain voltage; When powering off, first remove the leakage voltage, then remove the gate voltage.
- 6) Mounting operation: Chip installation can use AuSn solder eutectic sintering or conductive adhesive bonding process. The mounting surface must be clean and flat, and the gap between the chip and the input/output RF connection substrate should be minimized as much as possible.  
**Sintering process:** Use 80/20 AuSn for sintering, the sintering temperature should not exceed 300 °C, the sintering time should be as short as possible, not exceeding 20 seconds, and the friction time should not exceed 3 seconds  
**Adhesive process:** When bonding conductive adhesive, try to minimize the amount of glue applied, and refer to the information provided by the conductive adhesive manufacturer for curing conditions.
- 7) Keying operation:  
Unless otherwise specified, use 2 bonding wires (with a diameter of 25um) for RF input and output, and keep the bonding wires as short as possible.  
Hot ultrasonic bonding temperature is 150 °C, using the smallest possible ultrasonic energy.
- 8) Please contact the supplier if you have any questions.