

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.

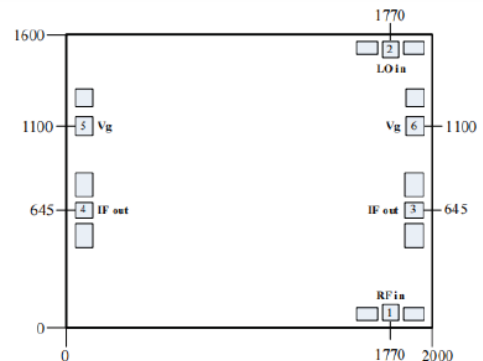
Electrical Performance (TA = +25 °C, LO = 8dBm, Vg = -0.5V)

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 port	13	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



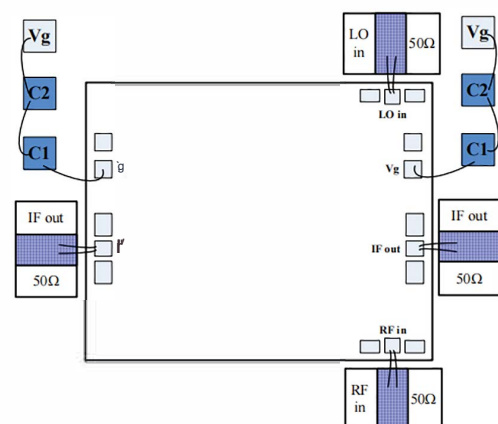
Note:

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

Bonding Pressure Point Definition

No.	Symbol	Function	Size(μm^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	Vg	The gate voltage feeding terminal requires external 100F and 10000pF bypass capacitors.	100X100

Suggested Assembly Diagram



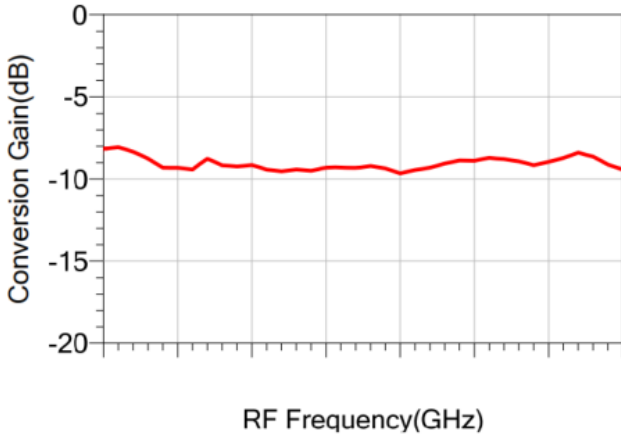
On Chip Testing Curve $C_{T_A} = +2s \cdot c$)

Freq_IF= 1GHz, Freq_IF= Freq_RF-Freq_LO;
Pwr_RF=-15dBm, Pwr_LO=8dBm, Vg=-0.5V

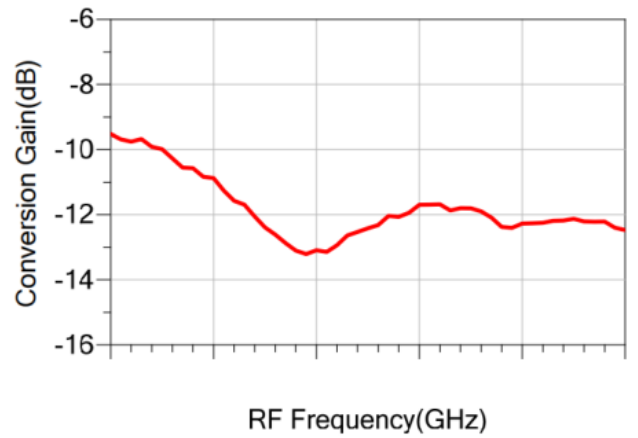
On Chip Testing Curve $<T_A = +2s \cdot c$)

Freq_L0=29.6GHz, Freq_IF= Freq_RF-Freq_LO;
Pwr_RF=-15dBm, Pwr_LO=8dBm, Vg=-0.5V

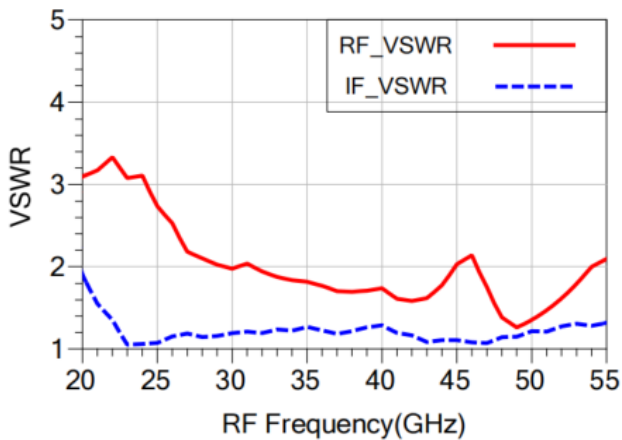
**SSB frequency conversion loss VS RF frequency
(single IF port)**



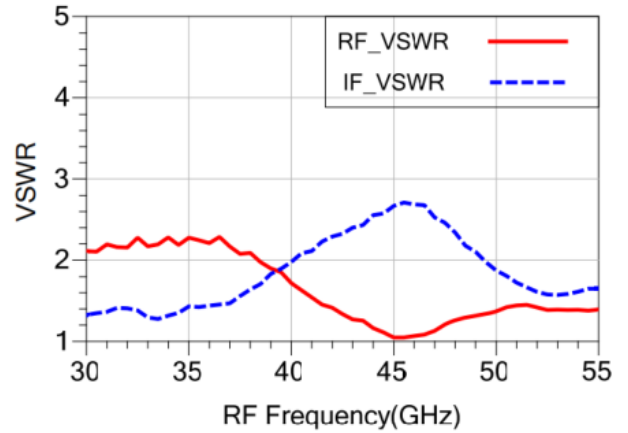
**SSB frequency conversion loss VS RF frequency
(single IF port)**



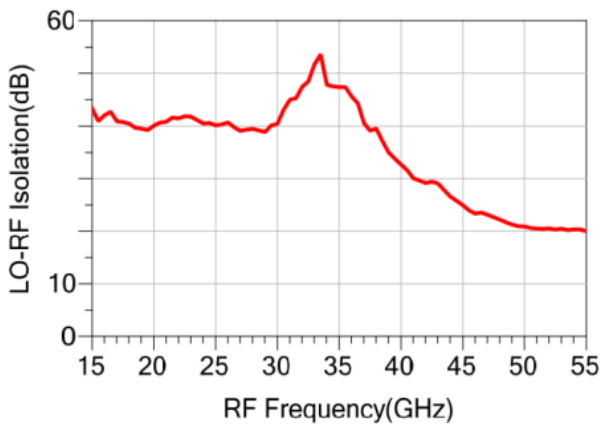
RF/IF standing wave vs RF frequency



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.