

BSTMX34-0624C

6-24GHz Passive Double-Balanced Mixer Chip

Data Sheet

I. Product Introduction

BSTMX34-0624C is an ultra-wideband millimeter-wave GaAs MMIC passive double-balanced mixer. Its local oscillator and RF operating frequencies cover 6 to 24 GHz, and its intermediate frequency (IF) covers 0.1 to 6 GHz. It offers 8 dB conversion loss, 20 dB RF-IF isolation, 37 dB LO-RF isolation, 42 dB LO-IF isolation, and a 1 dB input compression power rating of +10 dBm. The mixer chip adopts 3×3mm surface mount leadless ceramic tube shell, and the pin pad surface is gold-plated, which is suitable for reflow soldering.

II. Key Technical Indicators

- | | |
|---------------------------------|-----------------------|
| • LO and RF frequency range: | 6-24GHz |
| • IF operating frequency: | 0.1-6GHz |
| • Conversion loss: | 8dB |
| • RF/IF isolation: | 20dB |
| • LO/RF isolation: | 37dB |
| • LO/IF isolation: | 42dB |
| • Input 1dB compression power: | +10dBm |
| • Local oscillator input power: | +13dBm |
| • Chip size: | 3.0mm × 3.0mm × 1.2mm |

III. Functional Block Diagram

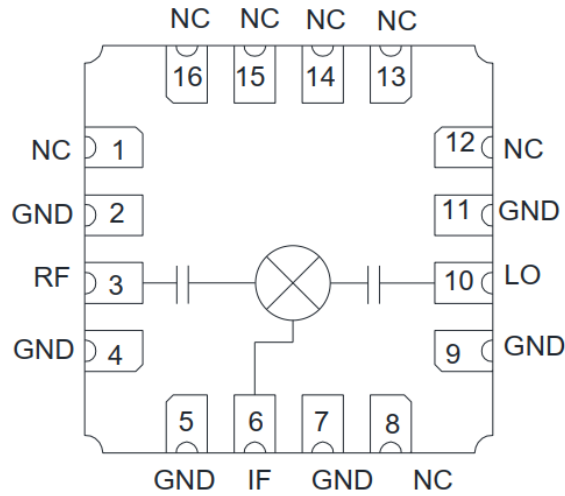


Figure 1.

IV. Electrical Performance Table ($T_A = +25\text{ }^{\circ}\text{C}$, $LO_{pwr} = +13\text{dBm}$)

Table 1.

PARAMETER NAME	SYMBOL	MINIMUM	TYPICAL VALUES	MAXIMUM	UNIT
LO and RF operating frequency bands	LO&RF Freq	6	—	24	GHz
IF operating frequency band	IF Freq	0.1	—	6	GHz
Frequency conversion loss	CL	—	8	13	dB
RF-IF isolation	RF-IF ISO	8	20	—	dB
LO-RF isolation	LO-RF ISO	30	37	—	dB
LO-IF isolation	LO-IF ISO	38	42	—	dB
Input 1dB compression power	IP1dB	—	10	—	dBm
RF return loss	RL_RF	—	10	—	dB
IF return loss	RL_IF	—	20	—	dB

V. Absolute Maximum Ratings

Table 2.

PARAMETER	LIMIT VALUE
Maximum input power	+20dBm
Storage temperature	-65 $^{\circ}\text{C}$ ~+150 $^{\circ}\text{C}$
Operating temperature	-55 $^{\circ}\text{C}$ ~+125 $^{\circ}\text{C}$

VI. Test Curve ($T_A = +25\text{ }^{\circ}\text{C}$, $LO_pwr = +13\text{dBm}$)

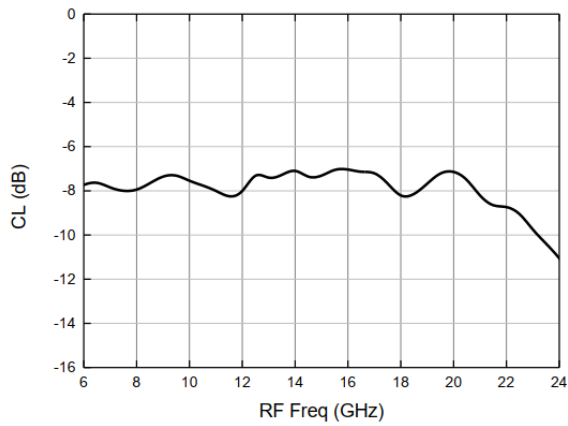


Figure 2. Down-conversion loss ($I_F=0.1\text{GHz}$ LLO)

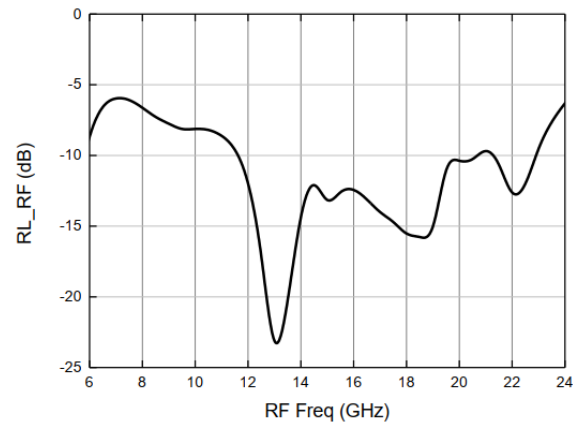


Figure 3. RF return loss ($I_F=0.1\text{GHz}$ LLO)

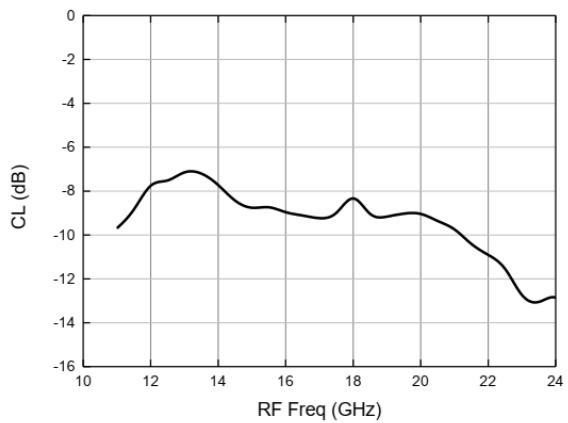


Figure 4. Down-conversion loss ($I_F=6\text{GHz}$ LLO)

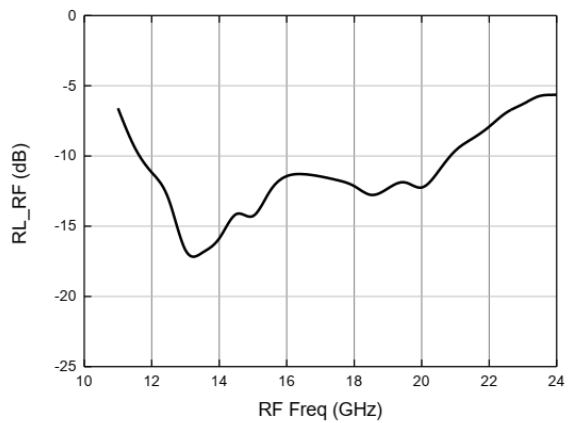


Figure 5. RF return loss ($I_F=6\text{GHz}$ LLO)

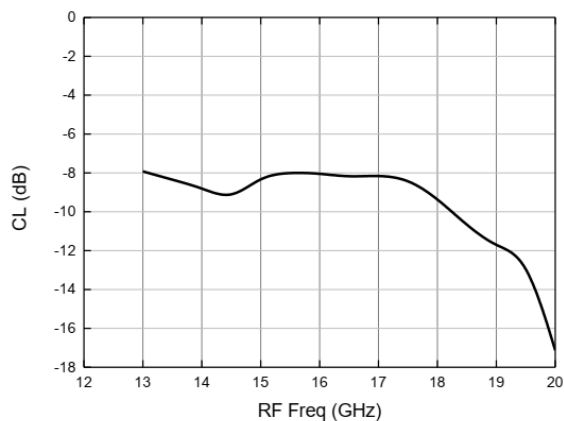


Figure 6. Down-conversion loss ($I_F=6\text{GHz}$ LLO)

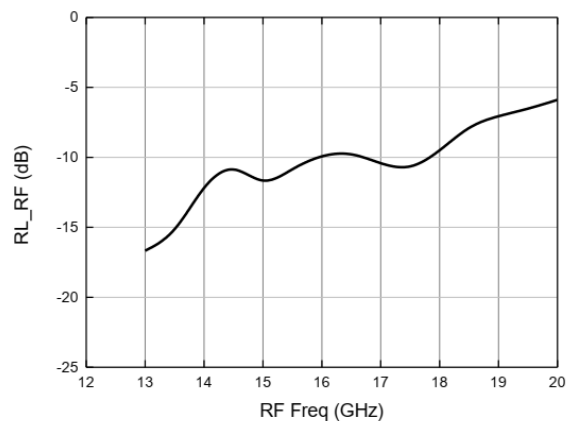


Figure 7. RF return loss ($I_F=6\text{GHz}$ LLO)

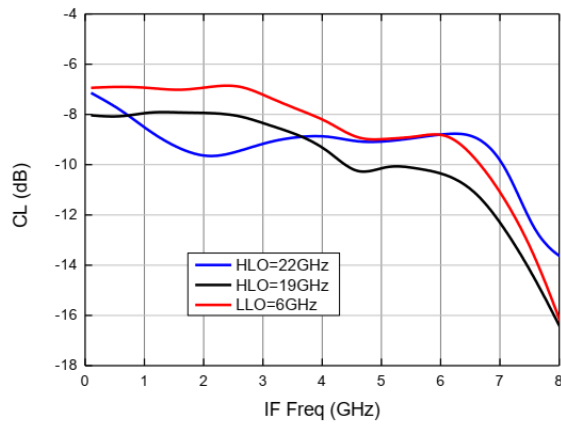


Figure 8. Up-conversion loss

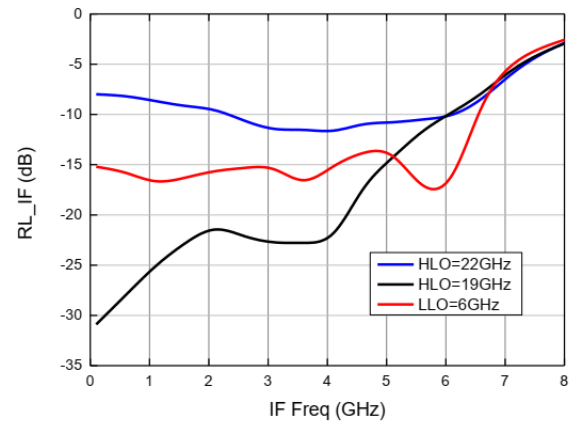


Figure 9. IF return loss

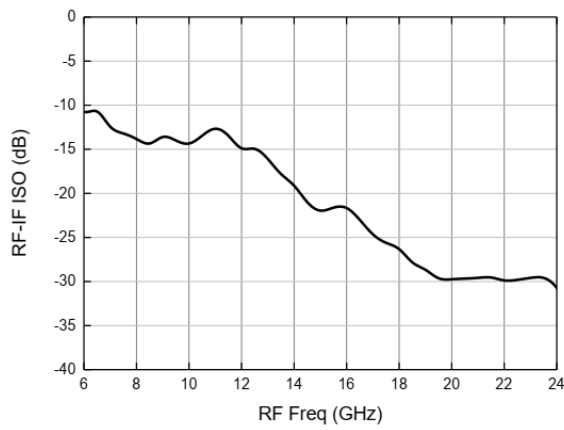


Figure 10. RF-IF isolation

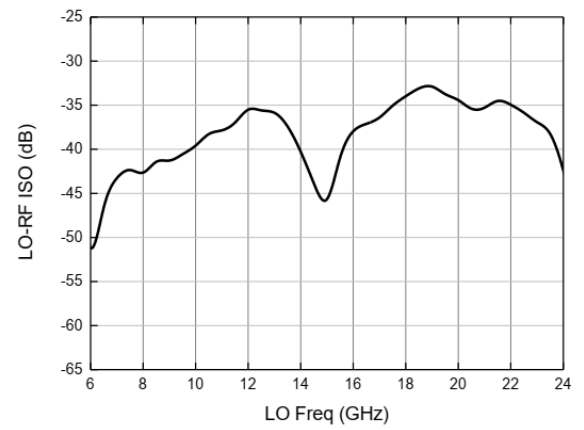


Figure 11. LO-RF isolation

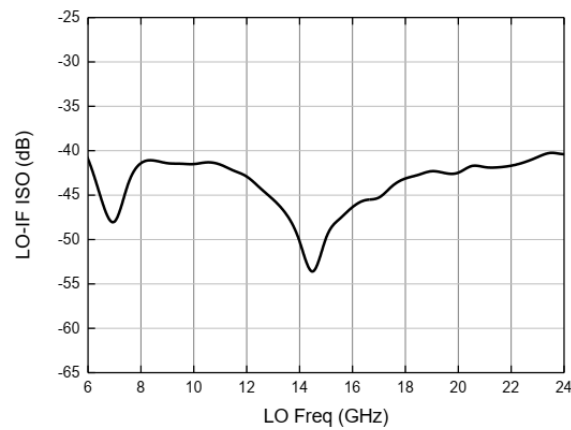


Figure 12. LO-IF isolation

VII. Appearance Structure Diagram (unit: mm)

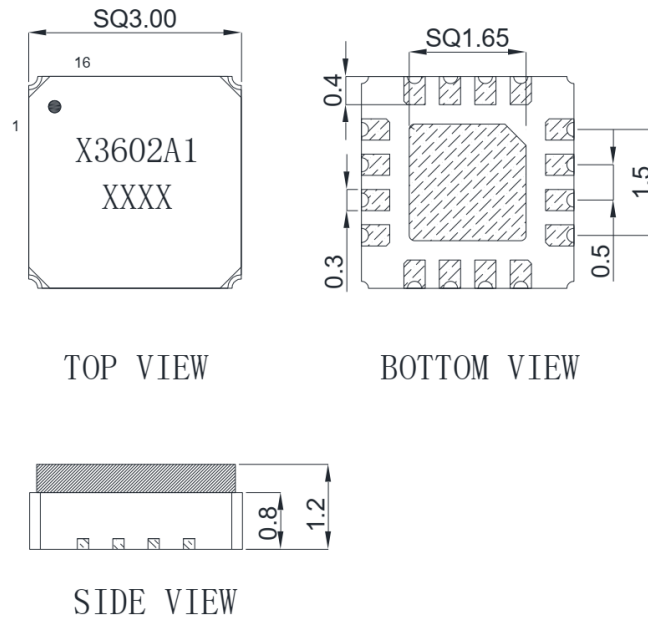


Figure 13.

Table 3.

PORT NUMBER	PORT NAME	DEFINITION	SIGNAL
3	RF	RF port with DC isolation function	RF
10	LO	LO port, with DC isolation function	RF
6	IF	IF port, no DC isolation function	RF
2, 4, 5, 7, 9, 11	GND	Ground	GND
Other	NC	Suspended, recommended to be grounded	/

IX. Precautions

- Assemble and use in a clean environment;
- Sealing material: ceramic material compliant with RoHS standards;
- Lead frame material: copper alloy;
- Lead surface plating: gold, the thickness of the gold layer is greater than 1.5 μ m;
- Maximum reflow peak temperature: 260 °C;
- This product is an electrostatic sensitive device, please be careful to prevent static electricity during storage and use;
- Store in a dry, nitrogen environment;
- Do not attempt to clean the chip surface with dry or wet chemical methods.