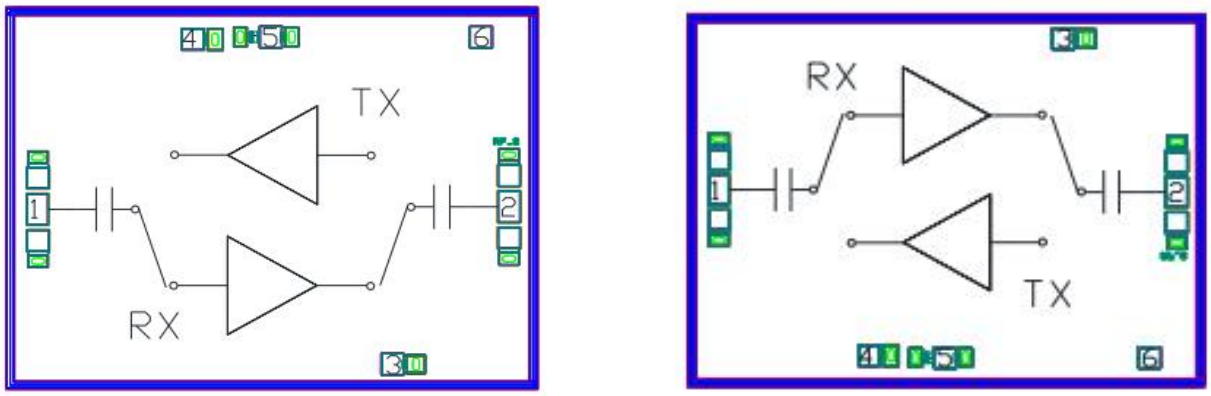
★1.Product Features

- Frequency range: 21 ~ 23 GHz
- Receive noise figure: 2.5 dB
- Receive gain: 21 dB
- Receive output P-1dB: 5 dBm
- Transmit gain: 21 dB
- Transmit output P-1dB: 21 dBm
- Transmit saturated output power: 21.5 dBm
- Receive DC bias: 15 mA @ +5 V
- Transmit DC bias: 67 mA @ +5 V
- Chip size: 2.4 mm × 1.8 mm × 0.1 mm

Functional Block Diagram



★2.Product Introduction

The TFBA016A-H/TFBA016B-H is a K-band bilateral amplifier chip. Together with its mirror image TFBA016B-H, it is intended for satellite communication. The chip covers the 21~23 GHz frequency range and integrates a switch, a low noise amplifier and a power amplifier. The receive channel provides 21 dB gain and 5 dBm output power at 1 dB gain compression, with a typical noise figure of 2.5 dB; the transmit channel provides 21 dB gain and 21 dBm output power at 1 dB gain compression, with a typical saturated output power of 21.5 dBm and a typical power added efficiency at saturation of 30%.

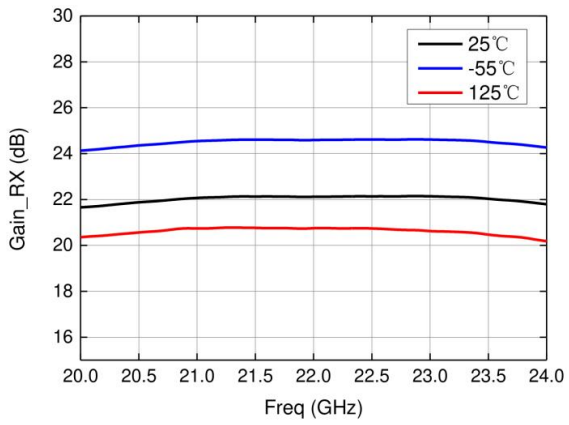
The chip backside is metallized and is suitable for conductive adhesive bonding or eutectic soldering. The chip uses an on-chip metallized via process to ensure good grounding, is simple to use, and requires no additional grounding measures.

★3.Electrical Characteristics (TA=+25℃, 50Ω system, on-wafer test)

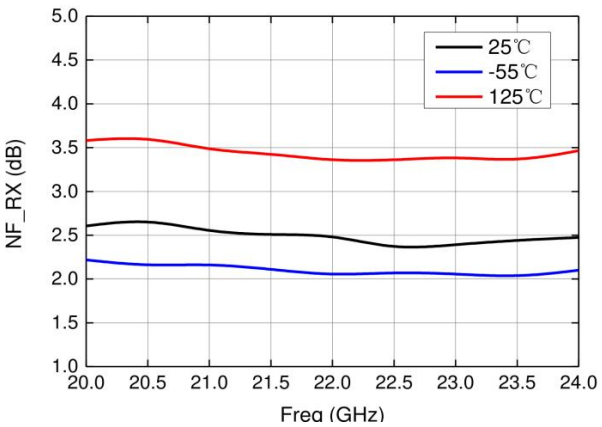
Parameter	Symbol	Min	Typ	Max	Unit
Operating Frequency	Freq	21	—	23	GHz
Receive Gain	Gain_RX	—	21	—	dB
Receive Output P1dB	OP1dB_RX	—	5	—	dBm
Receive Input Return Loss	RLin_RX	—	-9.5	—	dB
Receive Output Return Loss	RLout_RX	—	-9.5	—	dB
Receive Noise Figure	NF_RX	—	2.5	—	dB
Receive Quiescent Current	IDQ_RX	—	15	—	mA
Transmit Gain	Gain_TX	—	21	—	dB
Transmit Output P1dB	OP1dB_TX	—	21	—	dBm
Transmit Saturated Output Power	Psat_TX	—	21.5	—	dBm
Transmit Input Return Loss	RLin_TX	—	-9.5	—	dB
Transmit Output Return Loss	RLout_TX	—	-14	—	dB
Transmit PAE at Saturation	PAE_TX	—	30	—	%
Transmit Quiescent Current	IDQ_TX	—	67	—	mA

★4.Typical Test Curve

Receive Gain vs. Frequency

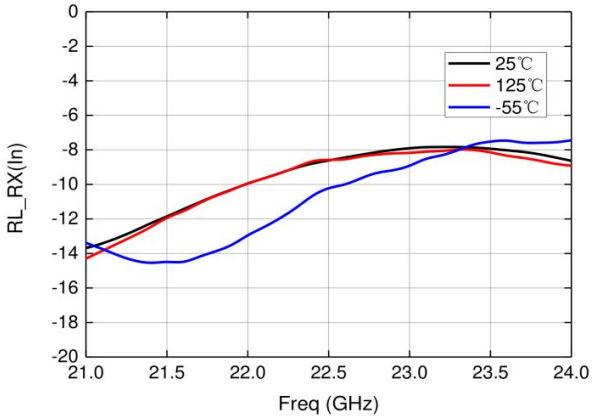


Noise Figure vs. Frequency

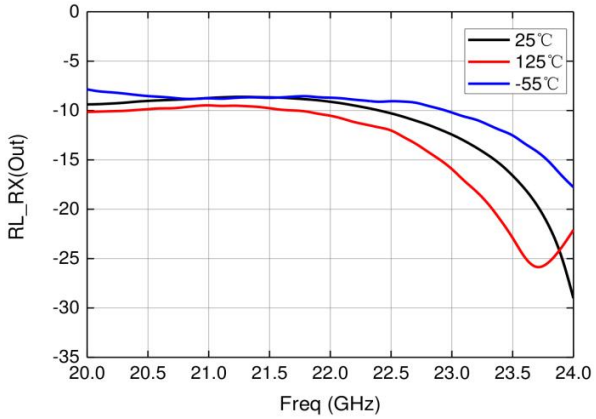


Email: ttf@ttfelectronic.com
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Address: Building 16, Area C, Entrepreneurship and R&D Park, Xi'an High-tech Industrial Development Zone, China

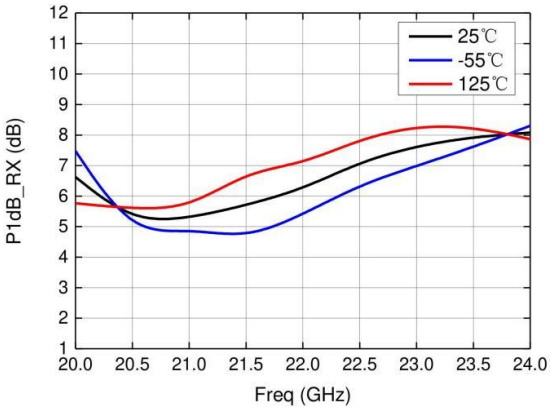
Receive Input Return Loss vs. Frequency



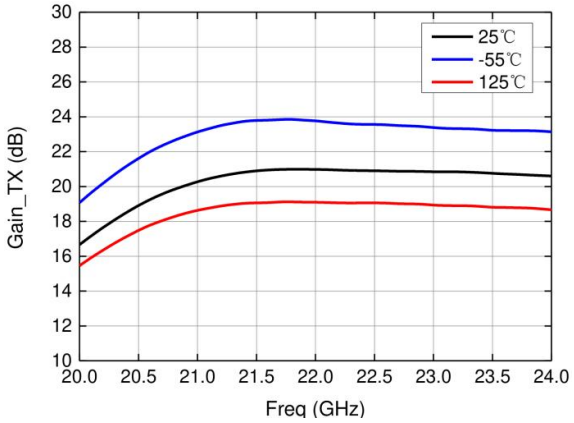
Receive Output Return Loss vs. Frequency



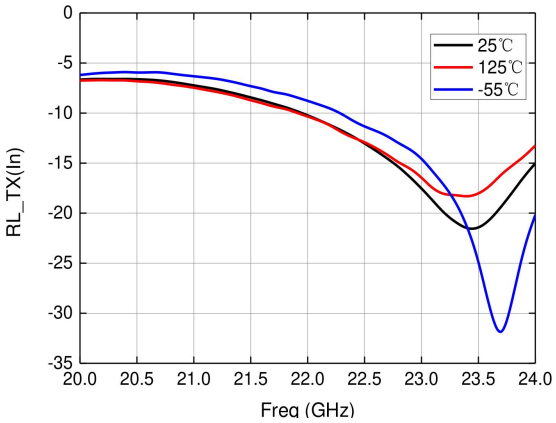
Receive Output P1dB vs. Frequency



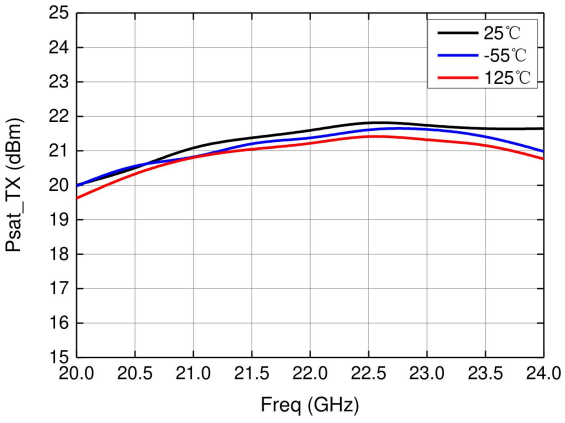
Transmit Gain vs. Frequency



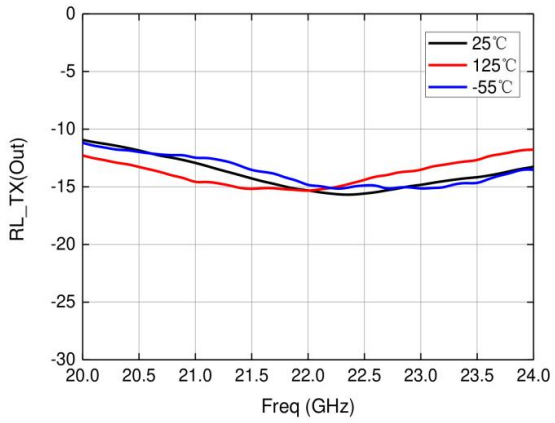
Transmit Input Return Loss vs. Frequency



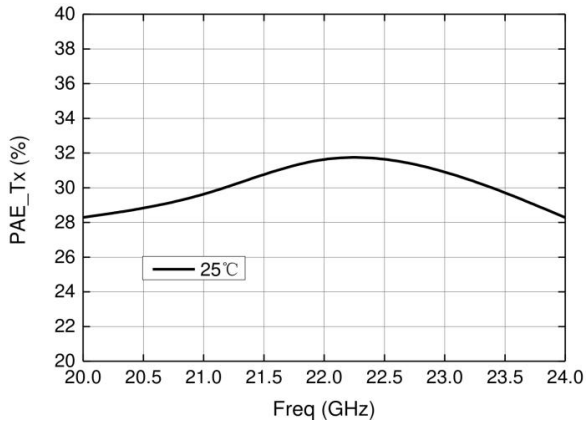
Transmit Saturated Output Power vs. Frequency



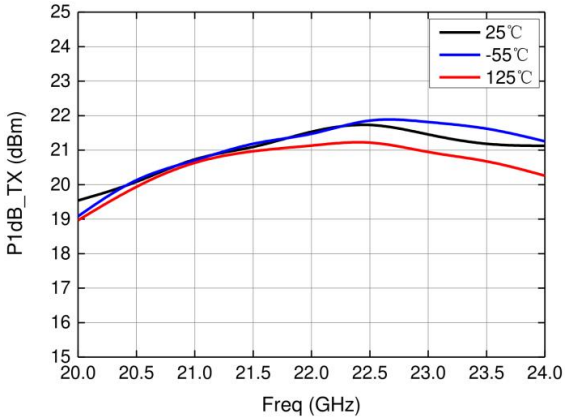
Transmit Output Return Loss vs. Frequency



Transmit Power Added Efficiency vs. Frequency



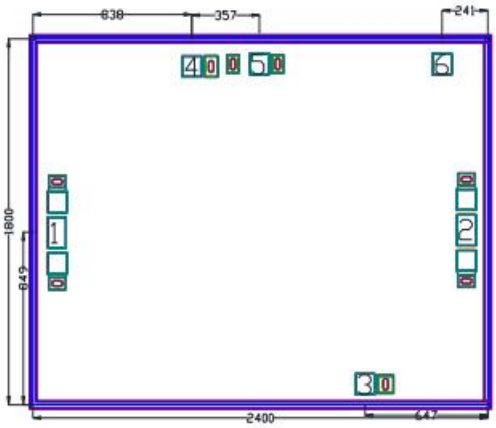
Transmit Output P1dB vs. Frequency



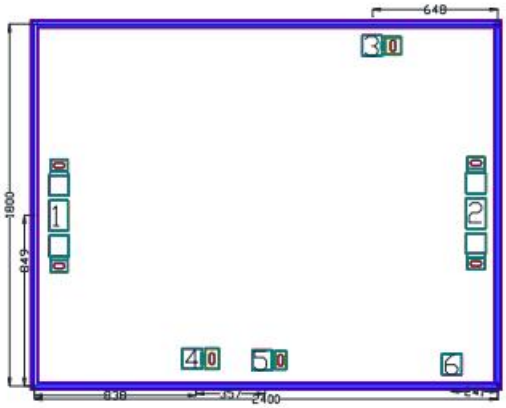
★5.Truth Table

Operating State	Receive	Transmit
Bias Voltage	VDR=+5V VDT=0V VGT=-5V	VDR=0V VDT=+5V VGT=-5V

★6.Outline Dimensions



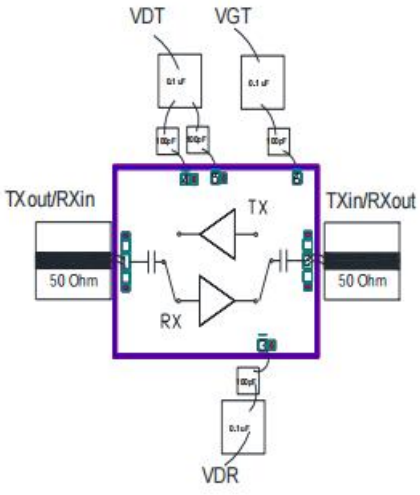
TFBA016A-H



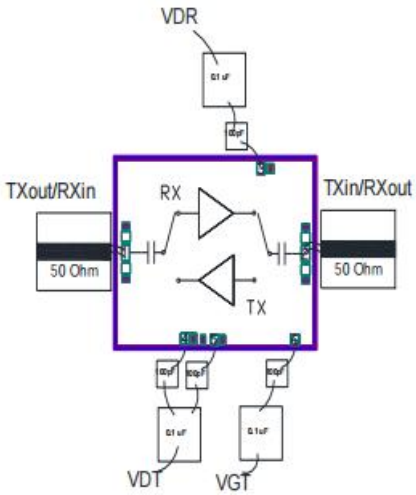
TFBA016B-H

Notes:
1. Unit: μm
2. Chip backside is gold-plated and grounded
3. I/O pad size: 150 μm × 100 μm
4. GND pad size: 100 μm × 100 μm
5. Outline dimension tolerance: ±50 μm

★7.Suggested Assembly Drawing



TFBA016A-H



TFBA016B-H

★8.Bonding Pressure Point Definition

Pressure Point Number	Function Definition	Function Description
1	TXout/RXin	Transmit output / receive input, external 50 Ω system, with internal DC blocking capacitor
2	TXin/RXout	Transmit input / receive output, external 50 Ω system, with internal DC blocking capacitor
3	VDR	Receive channel drain supply (+5 V)
4,5	VDT	Transmit channel drain supply (+5 V)
6	VGT	Transmit channel gate supply (-5 V)

★9.Precautions

Absolute Maximum Ratings	Numerical value
Input Power (Pin, 50 Ω)	+10 dBm
Drain Voltage	+6 V
Storage Temperature	-65 ℃ ~ +150 ℃
Operating Temperature	-55 ℃ ~ +125 ℃
Sintering Temperature (30 s, N_2 Protection)	300 ℃
Exceeding any of the above conditions may cause permanent damage to the chip	



This product is sensitive to static electricity.

Please take precautions against static electricity during use.