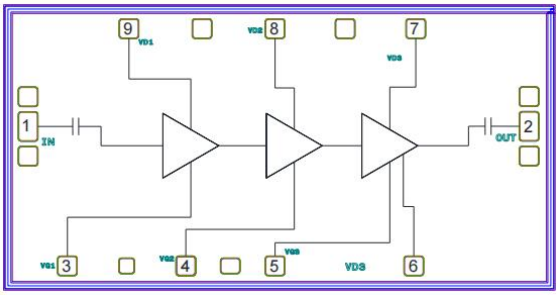
TFPA314-H
12 GHz ~ 17 GHz GaAs MMIC Power Amplifier Chip

★1.Product Features

- Frequency Range: 12 GHz ~ 17 GHz
- Small Signal Gain: 23 dB
- Output 1dB Compression Point Power: 26.5 dBm
- Output 3dB Compression Point Power: 27.5 dBm
- Input Return Loss: -10 dB
- Output Return Loss: -13 dB
- Quiescent Current: 415 mA @ +5V/-0.6V
- Die Size: 2.75 × 1.4 × 0.100 mm

Functional Block Diagram



★2.Product Introduction

The TFPA314-H is a Ku-band driver amplifier die operating over the 12 GHz ~ 17 GHz frequency range, suitable for transmit channels in LEO satellite communications and phased-array radars. It provides 23 dB small-signal gain, 27.5 dBm output power at 3 dB compression, and 27% power added efficiency.

The die surface adopts a passivation process, suitable for special application environments such as aviation and aerospace. The backside of the die is metallized, suitable for conductive adhesive bonding or eutectic sintering. The chip adopts an on-chip metallized via-hole process to ensure good grounding, which makes it simple and convenient to use without additional grounding measures.

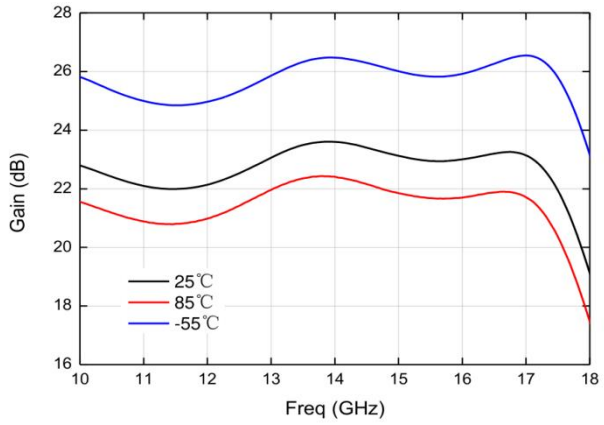
★3.Typical Electrical Characteristics

TA=+25℃, VD=+5V, VG=-0.6V, 50Ω system

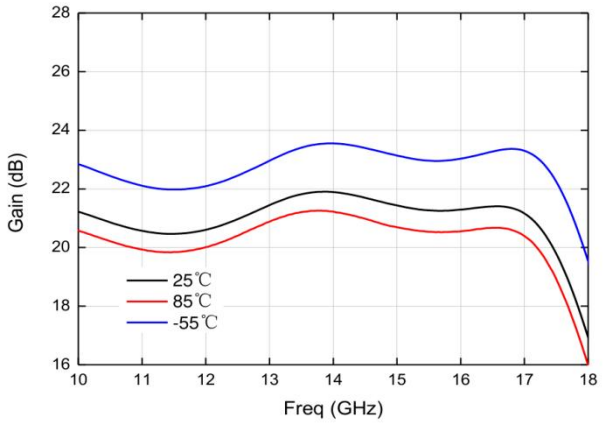
Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Frequency	Freq	12	-	17	GHz
Small Signal Gain	Gain	-	23	-	dB
Gain Flatness	δGain	-	±1	-	dB
Output P1dB	OP1dB	-	26.5	-	dBm
PAE at P1dB	PAE-1dB	-	23	-	%
Output P3dB	OP3dB	-	27.5	-	dBm
PAE at P3dB	PAE-3dB	-	27	-	%
Input Return Loss	RL_in	-	-10	-8	dB
Output Return Loss	RL_out	-	-13	-10	dB
Quiescent Current	IDQ	-	415	-	mA

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

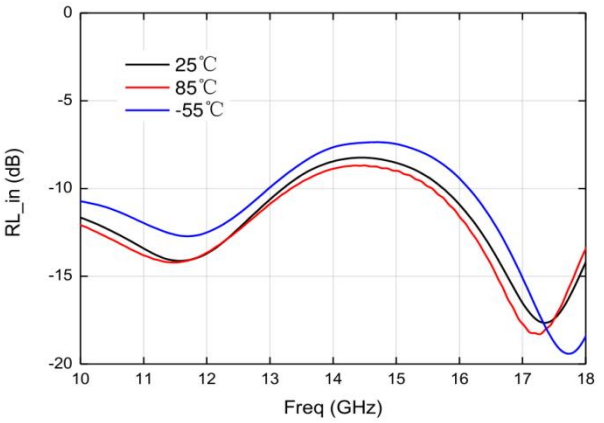
★4.Typical Test Curves



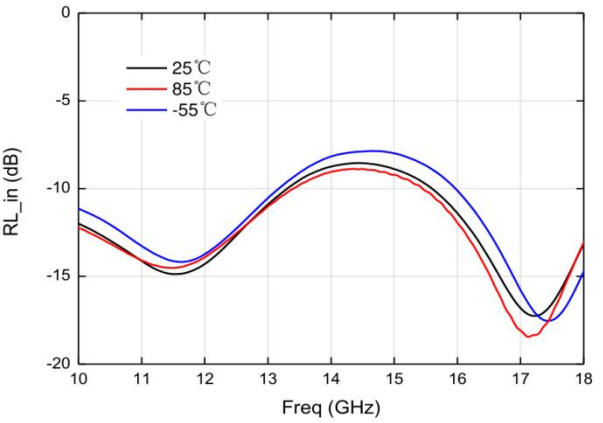
Gain vs. Frequency (VG = -0.6 V)



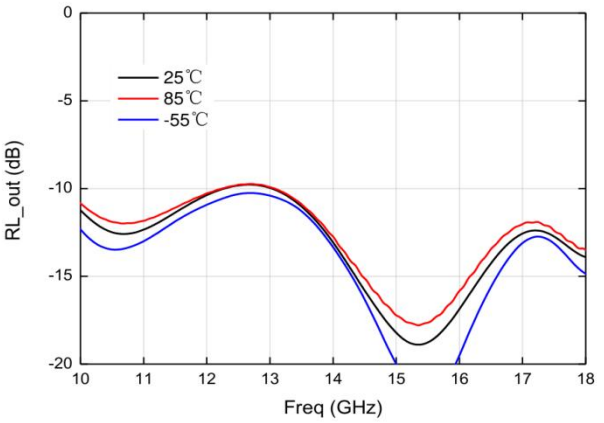
Gain vs. Frequency (VG = -0.7 V)



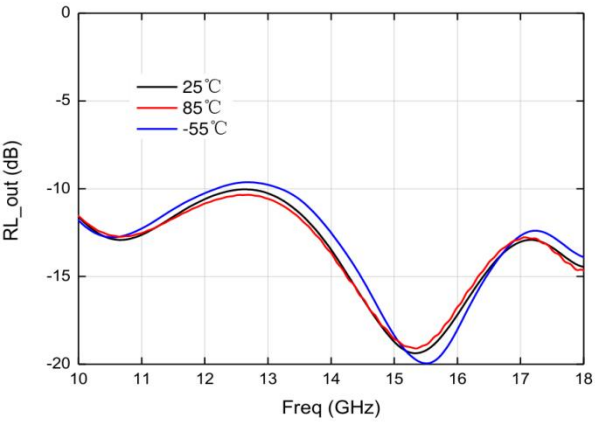
Input Return Loss vs. Frequency (VG = -0.6 V)



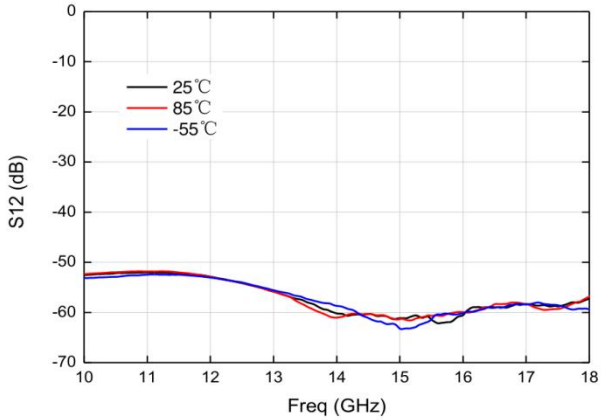
Input Return Loss vs. Frequency (VG = -0.7 V)



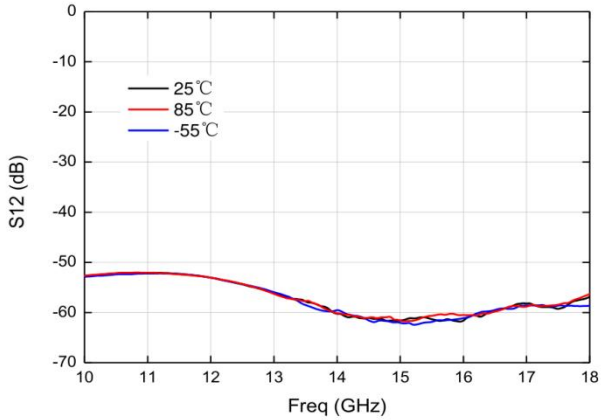
Output Return Loss vs. Frequency (VG = -0.6 V)



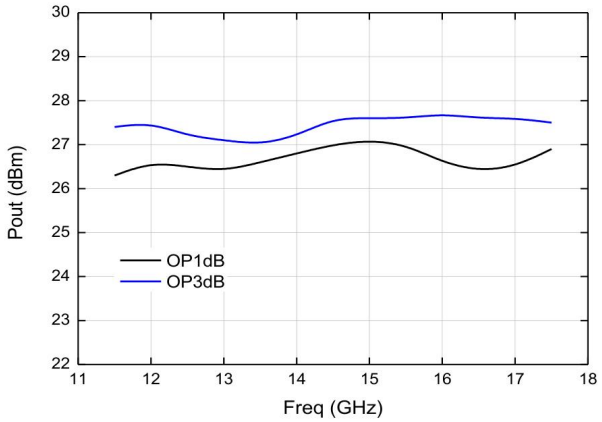
Output Return Loss vs. Frequency (VG = -0.7 V)



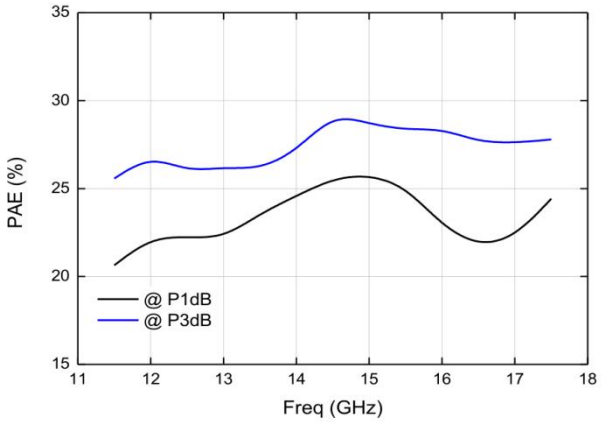
Isolation vs. Frequency (VG = -0.6 V)



Isolation vs. Frequency (VG = -0.7 V)

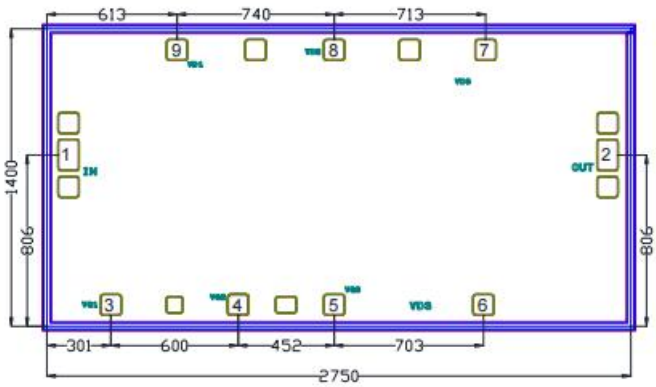


Output Power vs. Frequency (VG = -0.6 V)



Power Added Efficiency vs. Frequency (VG = -0.6 V)

★5.Outline Dimensions



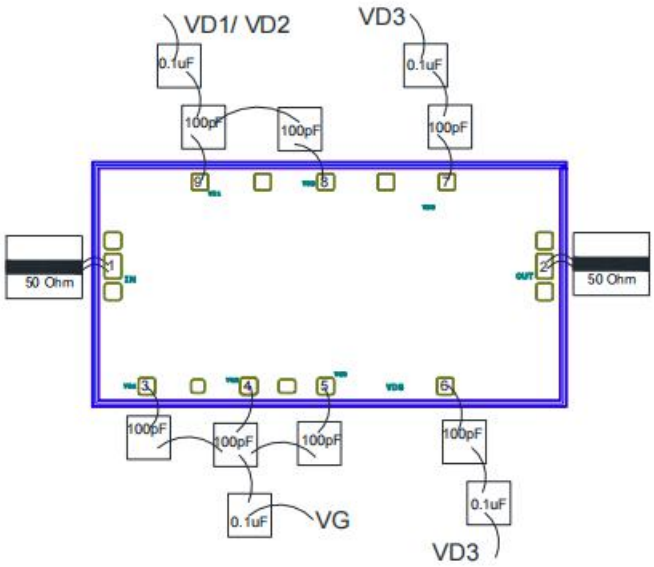
Notes:

1. Unit: μm
2. The backside of the die is gold-plated and grounded.
3. RF pad size: 150 μm × 100 μm
4. DC pad size: 100 μm × 100 μm
5. Outline dimension tolerance: ±50 μm

★6.Bond Pad Definition

Pressure Point Number	Function Definition	Function Description
1	RFin	RF signal input; internal DC blocking
2	RFout	RF signal output; internal DC blocking
3	VG1	Gate feed terminal 1
4	VG2	Gate feed terminal 2
5	VG3	Gate feed terminal 3
6, 7	VD3	Drain feed terminal 3 Either pad may be powered alone or both simultaneously
8	VD2	Drain feed terminal 2
9	VD1	Drain feed terminal 1
Other	GND	Ground pad

★7.Reference Circuit



★8.Precautions

Absolute Maximum Ratings	Numerical value
Input Power Pin, 50 Ω	10 dBm
Drain Voltage	+9 V
Gate Voltage	-2 V
Storage Temperature	-65℃ ~ +150℃
Operating Temperature	-55 ~ +85℃
Sintering Temperature (30 s, N2)	300℃
Exceeding 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.