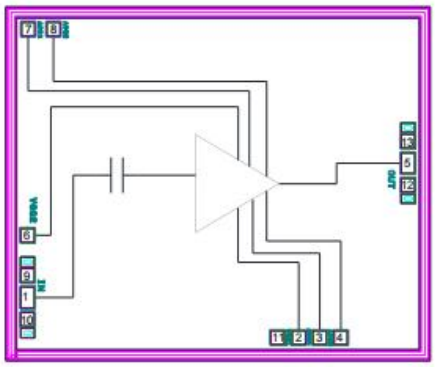
TFPA364-H
0.05 ~ 8 GHz GaAs MMIC Power Amplifier Chip

★1.Product Features

- Operating Frequency: 0.05 ~ 8 GHz
- Gain: 15 dB
- Output 1dB Compression Point Power: 30 dBm
- Power Added Efficiency: 25%
- Input Return Loss: -18 dB
- Output Return Loss: -18 dB
- Quiescent Current: 320 mA @ +12 V
- Die Size: 2.95 × 2.4 × 0.1 mm^3
- Alternative to: HMC637A

Functional Block Diagram



★2.Product Introduction

The TFPA364-H is an ultra-wideband power amplifier die covering an operating band of 0.05 ~ 8 GHz with multiple supply voltages. Under a drain voltage of +12 V and a quiescent current of 320 mA, it provides 15 dB small-signal gain, 1 W output power at 1 dB compression, and 25% power added efficiency, with a low noise figure. Its performance and outline interface are pin-to-pin replaceable with the foreign product HMC637A.

The backside of the die is metallized, and eutectic die attach is recommended. The die adopts an on-chip metallized via-hole process to ensure good grounding, which makes it simple to use without additional grounding measures.

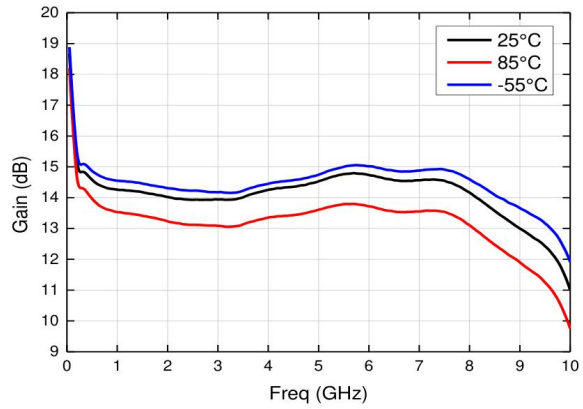
★3.Typical Electrical Characteristics

TA=+25℃, 50Ω system, VDD=+12V, VGG2=+6V

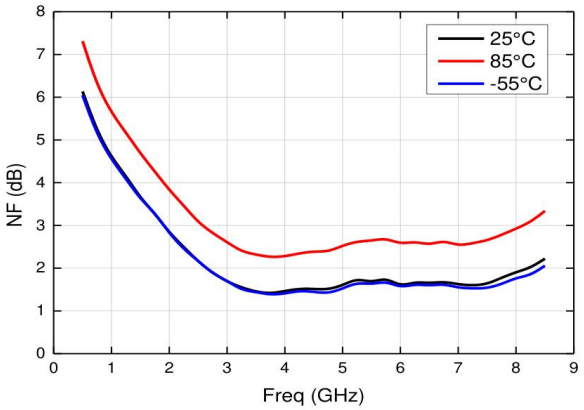
Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Frequency	Freq	0.05	-	8	GHz
Gain	Gain	14	14.5	15	dB
Gain Flatness	δGain	-	±0.5	-	dB
Noise Figure @ 2~8 GHz	NF	-	1.8	3	dB
Output 1dB Compression Power	OP1dB	28	30	-	dBm
Output 3dB Compression Power	OP3dB	29	31	-	dBm
PAE @ P1dB	PAE@P1dB	16%	25%	-	-
PAE @ P3dB	PAE@P3dB	18%	27%	-	-
Input Return Loss	RL_in	-	-18	-14	dB
Output Return Loss	RL_out	-	-18	-10	dB
Quiescent Current*	IDQ	-	320	-	mA
* Adjust VGG1 within -2V ~ -0.5V so that the quiescent current equals 320 mA.					

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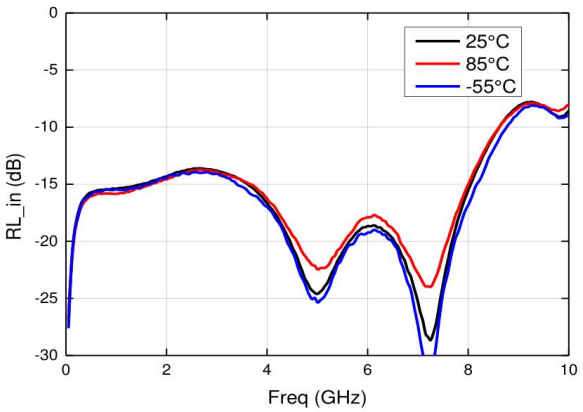
★4.Typical Test Curves



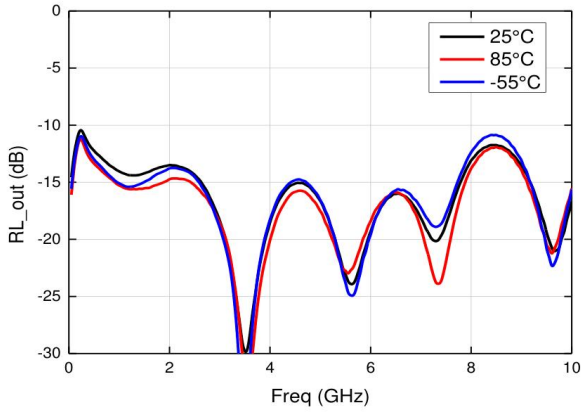
Gain vs. Frequency



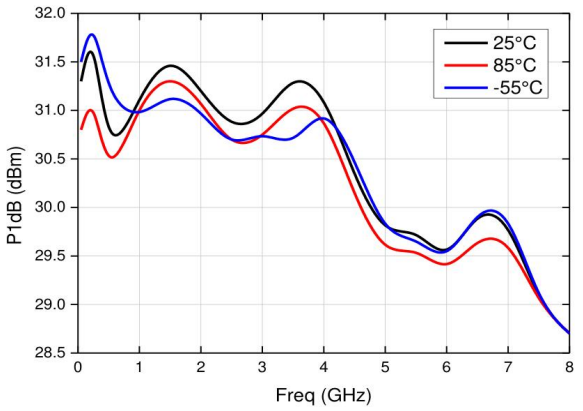
Noise Figure vs. Frequency



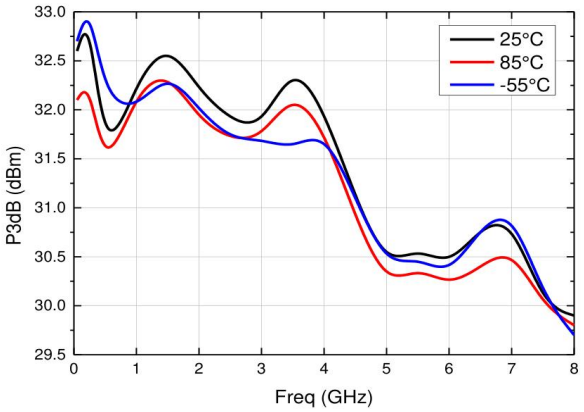
Input Return Loss vs. Frequency



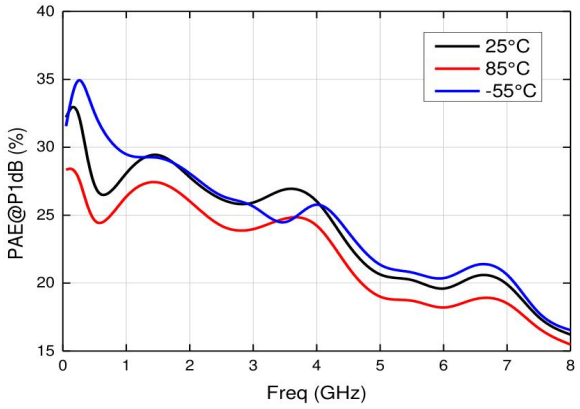
Output Return Loss vs. Frequency



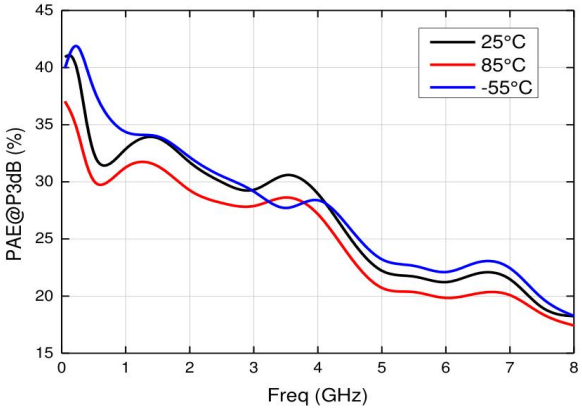
Output P1dB Power vs. Frequency



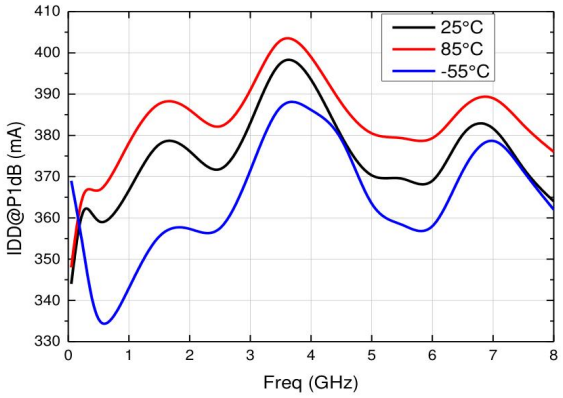
Output P3dB Power vs. Frequency



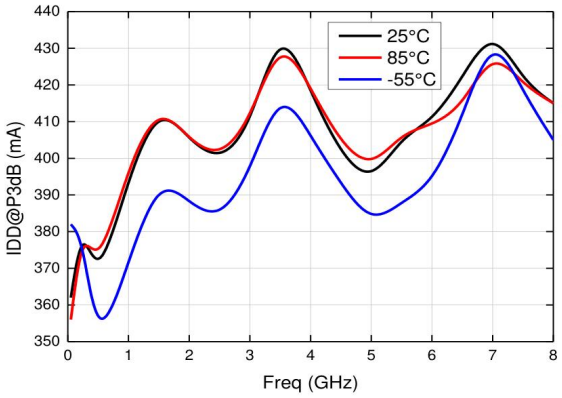
P1dB Power Added Efficiency vs. Frequency



P3dB Power Added Efficiency vs. Frequency

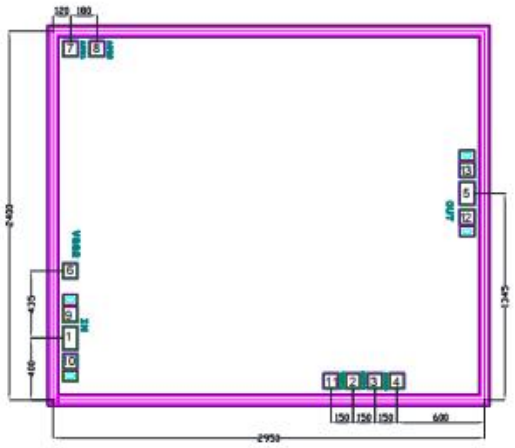


P1dB Dynamic Current vs. Frequency



P3dB Dynamic Current vs. Frequency

★5.Outline Dimensions



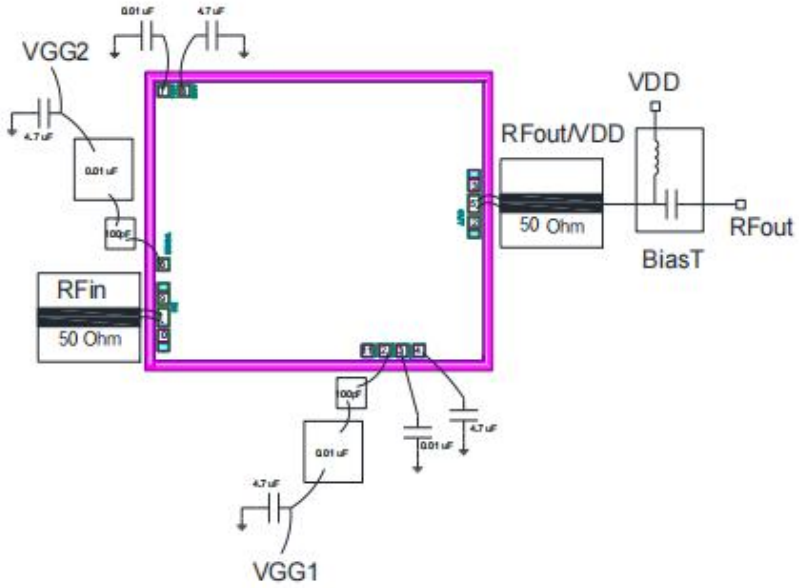
Notes:

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; connect to 50 Ω system, with on-chip DC blocking
5	RFout/VDD	RF signal output / drain voltage supply; connect to 50 Ω system, without on-chip DC blocking
2	VGG1	Gate bias terminal 1
6	VGG2	Gate bias terminal 2
3	ACG4	External capacitor terminal 4
4	ACG3	External capacitor terminal 3
7	ACG1	External capacitor terminal 1
8	ACG2	External capacitor terminal 2
Other	GND	Ground pad

★7.Application Schematic



Notes:

1. The RF ports are double-wire bonded to the microstrip with 25 μm diameter gold wire; the bond length shall not exceed 300 μm.
2. An external bias tee is required at the chip output for drain voltage supply, with a current capability of no less than 500 mA.
3. If the application band is above 500 MHz, the connections to pads 3/4/7/8 may be omitted.
4. The external capacitors at ports 3/4 are interchangeable, and those at ports 7/8 are also interchangeable.

★8.Precautions

Absolute Maximum Ratings	Numerical value
Input Power Pin, 50 Ω	+25 dBm
Drain Voltage	+16 V
Storage Temperature	-65℃ ~ +150℃
Operating Temperature	-55 ~ +125℃
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.