★1.Product Features

- Frequency Range:8~12GHz
- Psat:48dBm (Pulsed), 47dBm (CW)
- PAE:45% (Pulsed), 40% (CW)
- Power Gain:23 dB (Pulsed), 22 dB (CW)
- Bias: VD=+28V, VG=-2.2V~-1.8V
  (Pulsed VD: Period=1 ms, Duty=10%)
- Package Dimensions:
  15.2mm×15.2mm×3.5mm

★2.Product Description

TFPA3038P is a power amplifier chip manufactured based on GaN HEMT technology. Its operating frequency band covers 8~12 GHz, and it can operate under both continuous wave (CW) and pulse wave conditions. In pulse wave mode, it provides a power gain of 23 dB at a drain voltage of +28 V, with a typical saturated output power of 48 dBm and a typical power added efficiency (PAE) of 45%. In CW mode, it provides a power gain of 22 dB at a drain voltage of +28 V, with a typical saturated output power of 47 dBm and a typical PAE of 40%. The chip achieves grounding from the back of the chip through on-chip vias and employs a eutectic sintering assembly method.

★3.DC Parameters （TA=+25℃,CW）

Parameter	Min.	Typ.	Max.	Unit
Drain voltage VD	20	28	32	V
Gate voltage VG	-2.2	-2.0	-1.8	V
DC drain current IDQ	1.55	2.55	3.5	A
RF drain current IDD	5	5.5	6.3	A

★4.Microwave Parameters（TA=+25℃，CW）

Parameter	Min.	Typ.	Max.	Unit
Frequency range	8	10	11	GHz
Psat	47	47.5	48	dBm
PAE	35	40	44	%
Power gain	20	21	22	dB
Power gain flatness ΔGp		±0.5		dB
Linear Gain	27	28	29	dB
Linear gain flatness ΔGs		±1		dB
Input return loss S11	-23	-15	-12	dB

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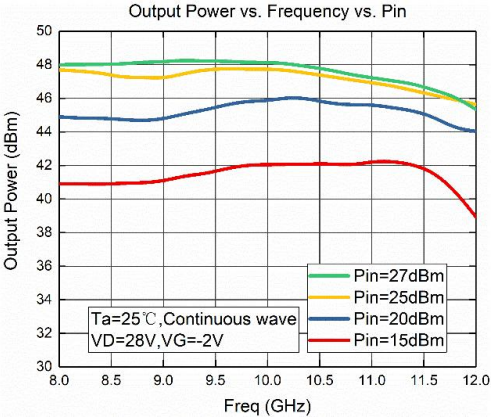
★5.Limited Parameters [1]

Parameter	Value
Maximum drain voltage VDmax	+32V
Minimum gate voltage VGmin	-5V
Maximum input power Pinmax	+30dBm (CW)
Maximum channel temperature Tj	200℃
Maximum storage temperature Tstg	-65℃~+120℃

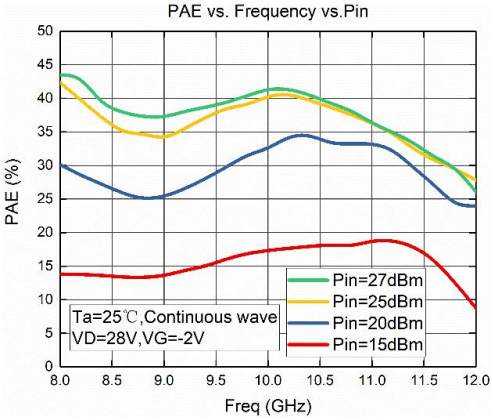
[1] Exceeding any of the above maximum limits may result in permanent damage.

★6.Typical Performance Plots

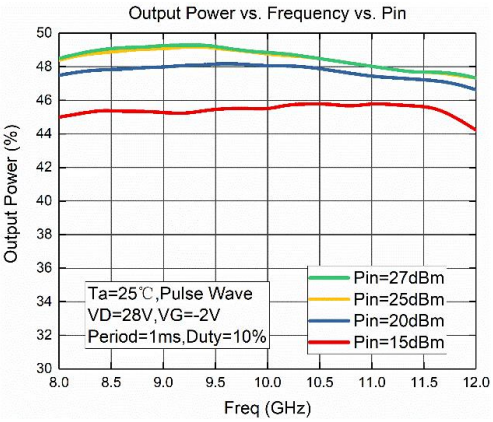
Output Power vs. Frequency vs. Input Power



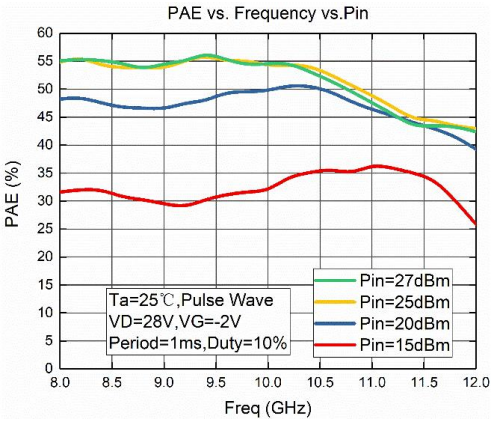
PAE vs. Frequency vs. Input Power



Output Power vs. Frequency vs. Input Power

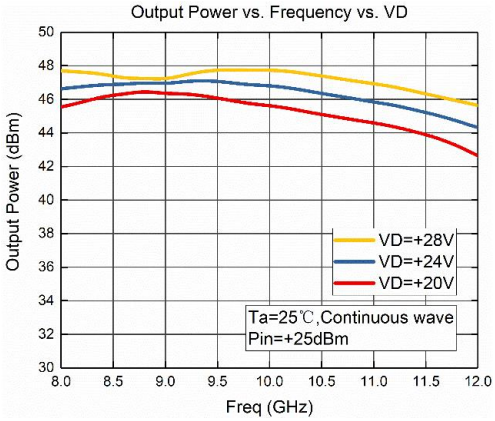


PAE vs. Frequency vs. Input Power

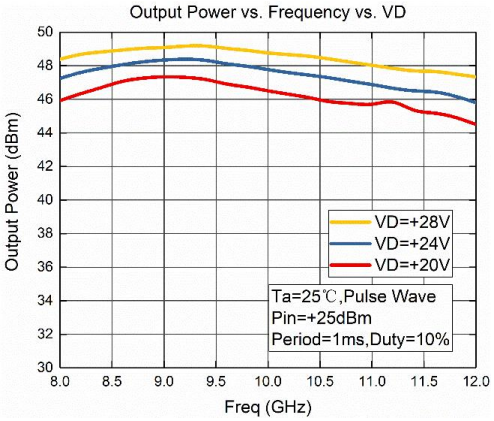


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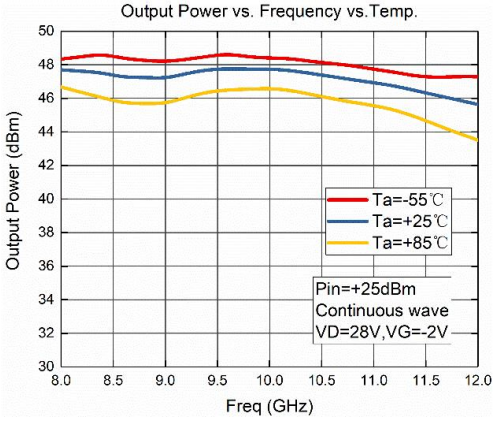
Output Power vs. Frequency vs. Drain Voltage



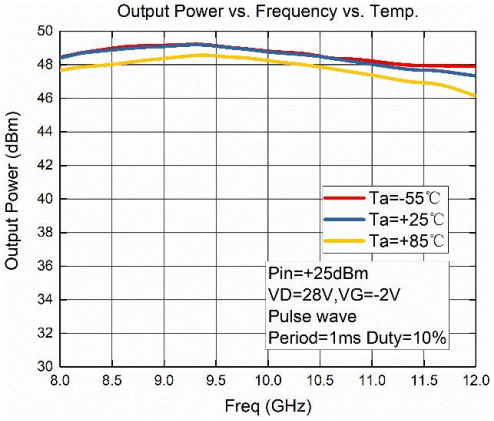
Output Power vs. Frequency vs. Drain Voltage



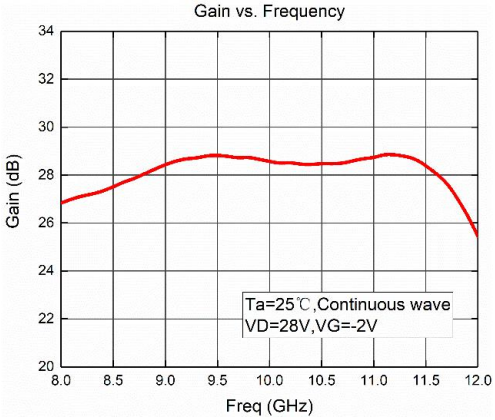
Output Power vs. Frequency vs. Temperature



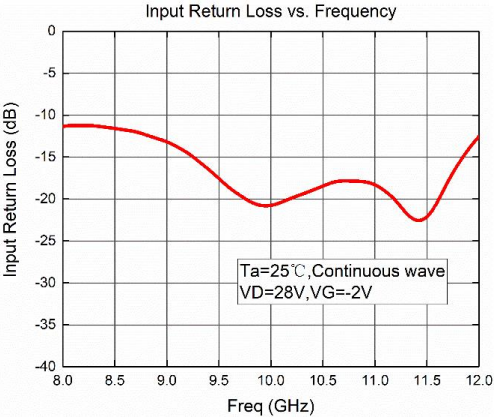
Output Power vs. Frequency vs. Temperature



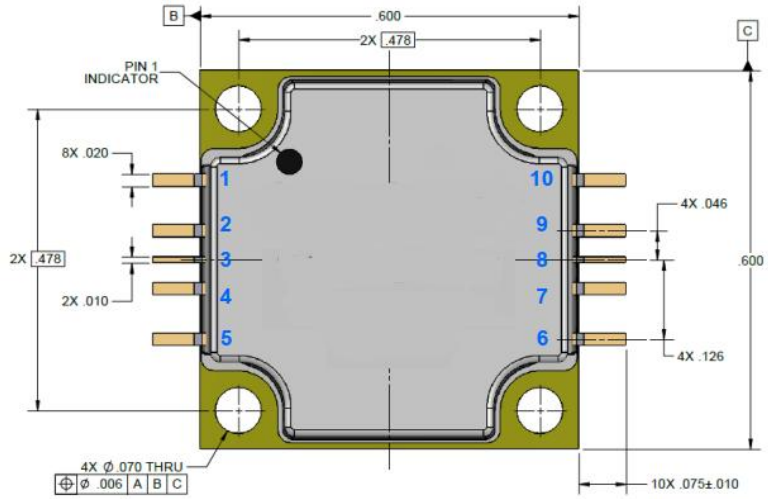
Linear Gain vs. Frequency

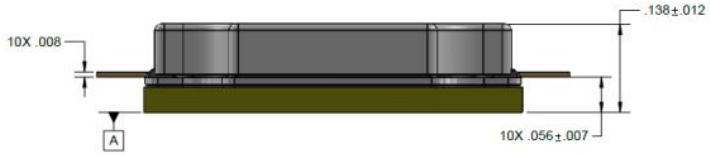


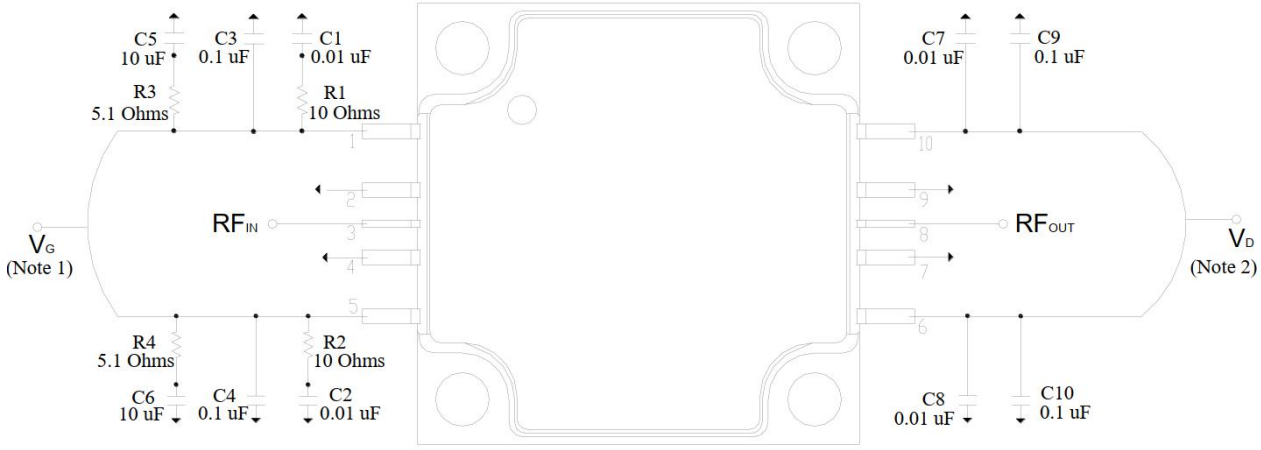
Input Return Loss vs. Frequency



★7.Applications Information and Pin







Notes: 1. VG must be biased from both sides (Pins 1 and 5)

2. VD must be biased from both sides (Pins 6 and 10)

Bias up procedure	Bias down procedure
1. Set ID limit to 7 A, IG limit to 20 mA	1. Turn off RF supply
2. Apply −5 V to VG	2. Reduce VG to −5 V; ensure IDQ is approx. 0 mA
3. Apply 28 V to VD; ensure IDQ is approx. 0 mA	3. Set VD to 0 V
4. Adjust VG until IDQ = 2.55A	4. Turn off VD supply
5. Turn on RF supply	5. Turn off VG supply

★8.Pin Description

Pad No.	Symbol	Description
1,5	VG	Gate Voltage; Bias network is required; must be biased from both sides; See recommended Application Information above.
2,4,7,9	GND	Must be grounded on the PCB.
3	RFIN	Input; matched to 50Ω; DC blocked
6,10	VD	Drain voltage; Bias network is required; must be biased from both sides; See recommended Application Information above.
8	RFOUT	Output; matched to 50Ω; DC shorted to ground.