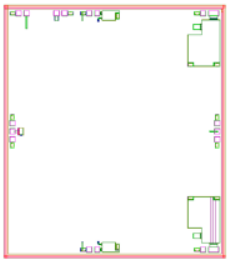
AMT2102
2 – 6GHz Power Amplifier Chip



Key Features :

- Frequency : 2 – 6GHz
- Typical small signal gain : 29dB
- Typical output power : 45dBm
- Typical power added efficiency : 35%
- Supply voltage : 28V, -2V
- Chip dimensions : 4mm x 4.6mm x 0.1mm
- Applications : wireless communication, transceiver module, radio telecommunication etc.

Description :

AMT2102 chip is a high performance high efficiency 2 – 6GHz power amplifier, it is designed based on Gallium Nitrate (GaN) HEMT process, with ground through metal via on the back technology. All chip products are 100% RF tested. AMT2102 is with dual voltage supply, drain voltage Vds = 28V, provides 45dBm output power in 2 – 6GHz frequency range.

Absolute Maximum Ratings (Ta = 25°C)

Symbol	Parameter	Value	Remark
Vd	Drain Voltage	35V	
Id	Drain Current	5A	
Vg	Gate Voltage	-1.5V	
Ig	Gate Current	150mA	
Pd	DC Power Consumption	120W	
Pin	Input Signal Power	30dBm	
Tch	Operating Temperature	150°C	
Tm	Sintering Temperature	310°C	30s, N_2 protection

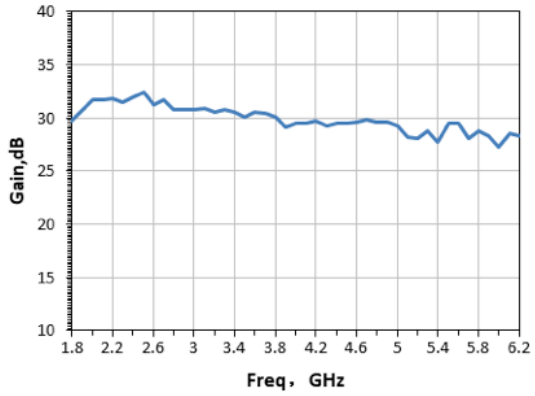
[1] Operation outside any of the Absolute Maximum Ratings may cause permanent device damage

Electrical Characteristics (Ta = 25°C)

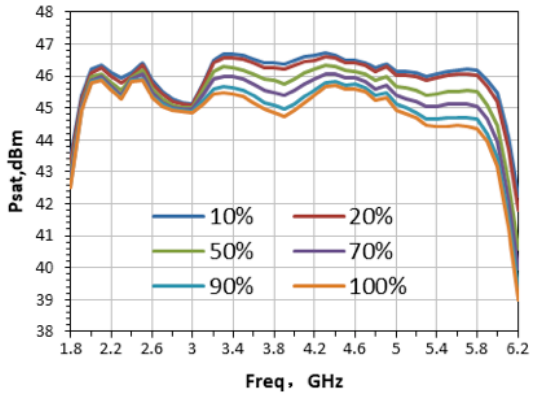
Symbol	Parameter	Test Condition	Value			Unit
			Min	Typical	Max	
G	Small Signal Gain	Vd = 28V Vg = -2V F : 2~6GHz Duty Cycle : 10%	-	29	-	dB
VSWRi	Input SW		-	1.5	1.8	dB
Pout	Saturated Output Power		-	45	-	dBm
PAE	Power Added Efficiency		-	35	-	%
Id	Operating Current		-	3.5	-	A

Typical Performance

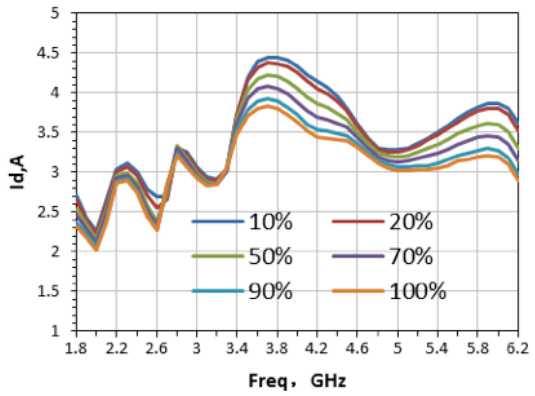
Room Temperature Small Signal Gain Curve



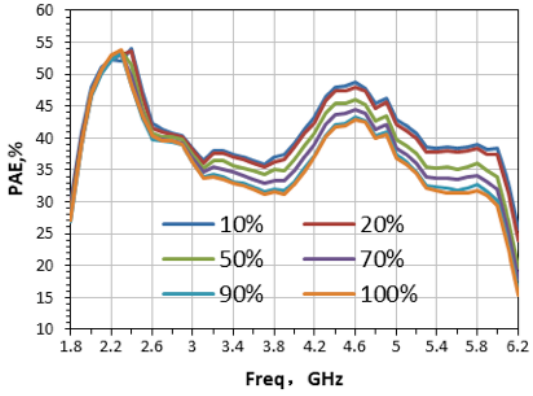
Output Power at Different Duty Cycle Curve



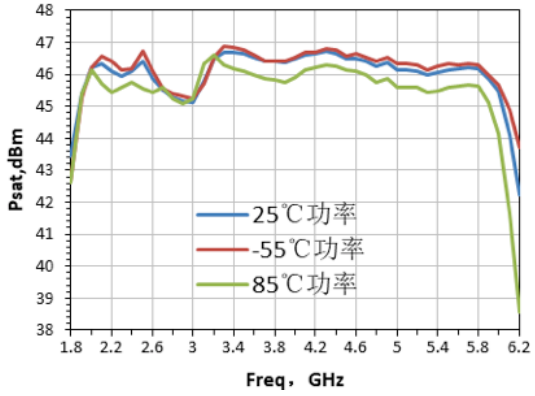
Drain Current at Different Pulse Curve



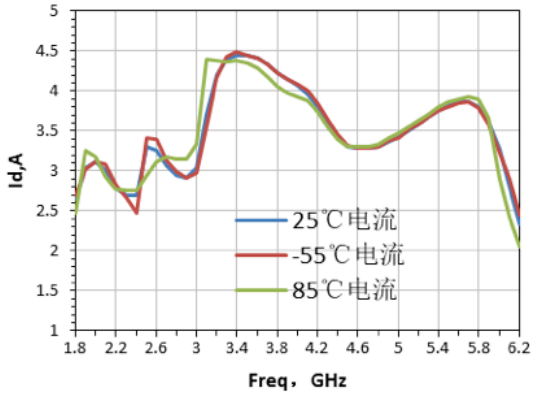
Efficiency at Different Duty Cycle Curve



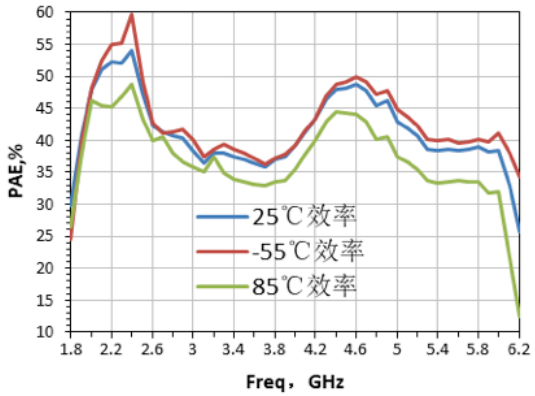
Output Power at Different Temperature Curve (10% Duty Cycle)



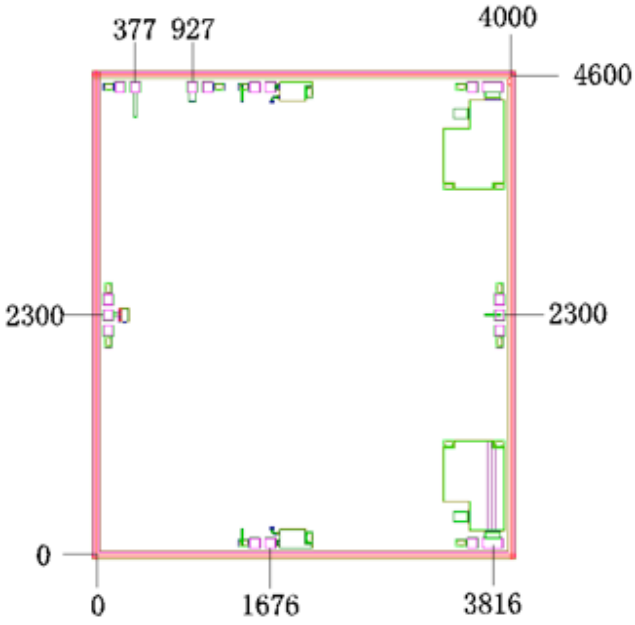
Drain Current at Different Temperature Curve (10% Duty Cycle)



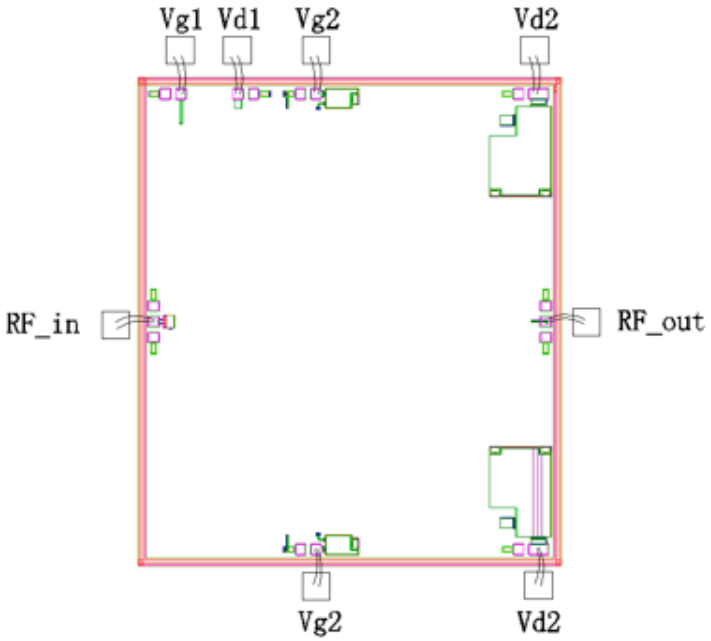
Efficiency at Different Temperature Curve
(10% Duty Cycle)



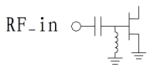
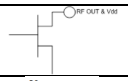
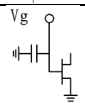
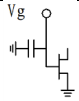
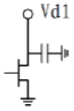
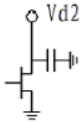
Chip Dimension (Unit : μm)



Chip Layout Diagram



Pad Definition

Symbol	Function	Dimension	Equivalent Circuit
RF_in	RF signal input port, connecting to external 50Ω system. DC blocking capacitor is needed, if external DC current is applied to this pad.	110*110μm^2	
RF_out	RF signal output port, connecting to external 50Ω system, no need to add DC blocking capacitor.	130*120μm^2	
Vg1	Amplifier gate bias, need external 100pF, 1000pF capacitor.	150*150μm^2	
Vg2	Amplifier gate bias, need external 100pF, 1000pF capacitor.	150*100μm^2	
Vd1	Amplifier drain bias, need external 100pF, 1000pF capacitor.	130*150μm^2	
Vd2	Amplifier drain bias, need external 100pF, 1000pF capacitor.	150*120μm^2	

Please see Appendix A for details.