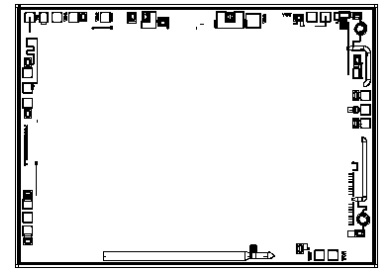


AMT2402

13 ~ 18GHz Switch Power Amplifier Chip

Key Features :

- Frequency range : 13~18GHz
- Typical small signal gain : 30dB
- Typical output power : [43dBm@13~16.5GHz](#), 42dBm@16.5-18GHz
- Typical added efficiency : 24%
- Supply Voltage: 28V, -1.8V
- Chip dimensions: 4.0mm*2.9mm*0.1mm
- Application : microwave transceiver, wireless communication etc.



Description :

AMT2402 chip is a high performance 13 ~ 18GHz switch power amplifier, it is designed by Gallium Nitrate (GaN) HEMT process, with ground through metal via on the back technology. All chip products are 100% RF tested. AMT2402 chip is with dual voltage supply, drain voltage $V_{ds} = 28V$, provides 43dBm output power in 13 ~ 16.5GHz frequency range.

Absolute Maximum Ratings ($T_a = 25^\circ C$)

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

13 ~ 18GHz Switch Power Amplifier Chip

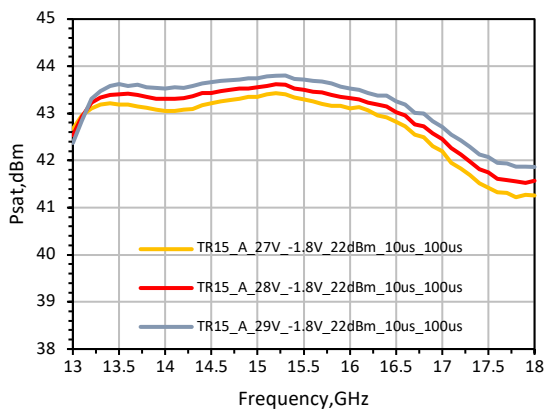
Electrical Characteristics (Ta = 25°C)

Symbol	Parameter	Test Condition	Value			Unit
			Min	Typical	Max	
G _L	Small Signal Gain	Transmit : VD : 28V, VG : -1.8V VCT : -28V, VCR : 0V F : 13~18GHz Duty Cycle : 10% Receive : VCT : 0V, VCR : -28V F : 13~18GHz	-	30	-	dB
G _P	Power Gain		-	21	-	dB
P _{out}	Saturated Output Power		-	43	-	dBm
PAE	Power Added Efficiency		-	24	-	%
I _d	Operating Current		-	2.85	-	A
IL	Insertion Loss		-	1.4	-	dB
IRL	Input Return Loss		-	-20	-	dB
ORL	Output Return Loss		-	-20	-	dB
ISO	Isolation		-	-30	-	dB

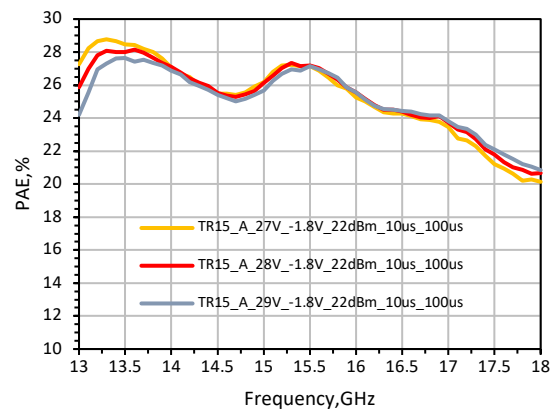
Note, non CW operation.

Typical Performance

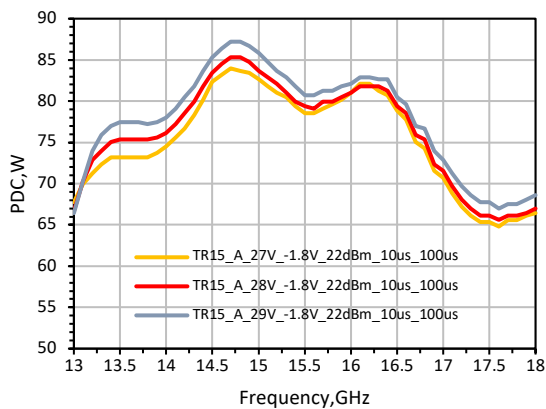
Transmit Output Power Curve



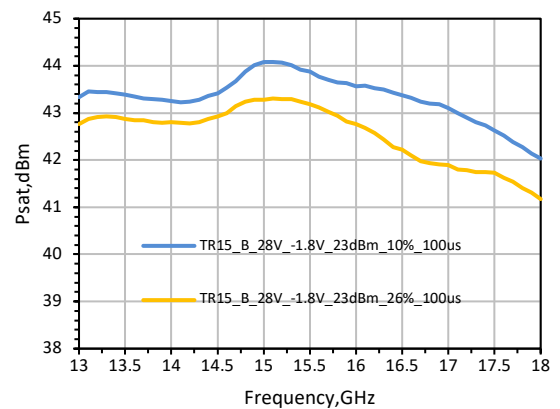
Transmit Efficiency Curve



Transmit Power Consumption Curve

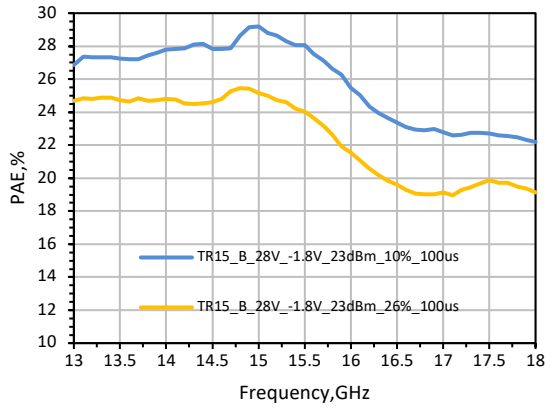


Power Curve under Different Transmit Duty Cycle

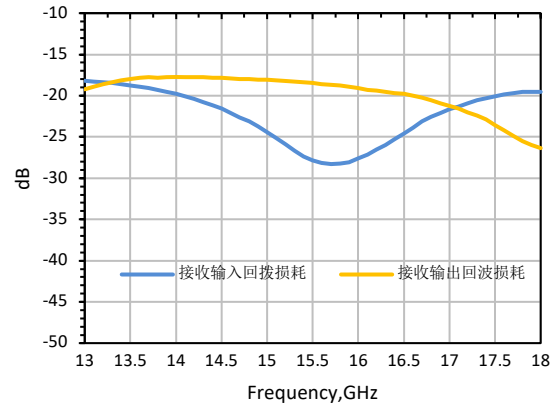


13 ~ 18GHz Switch Power Amplifier Chip

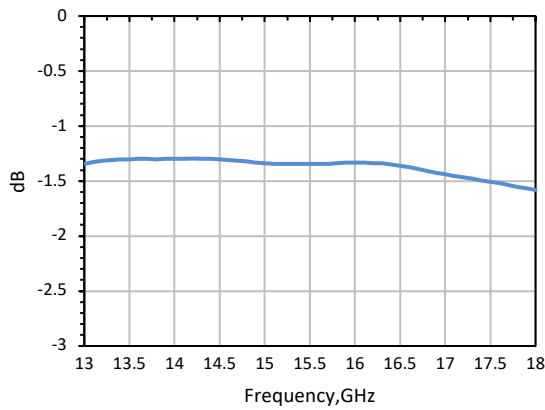
Efficiency Curve under Different Transmit Duty Cycle



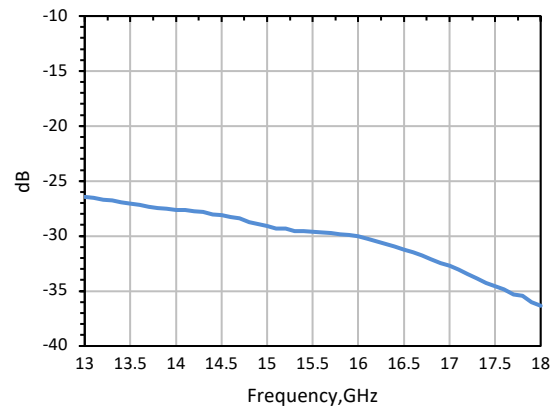
Receive Return Loss Curve



Receive Insertion Loss Curve

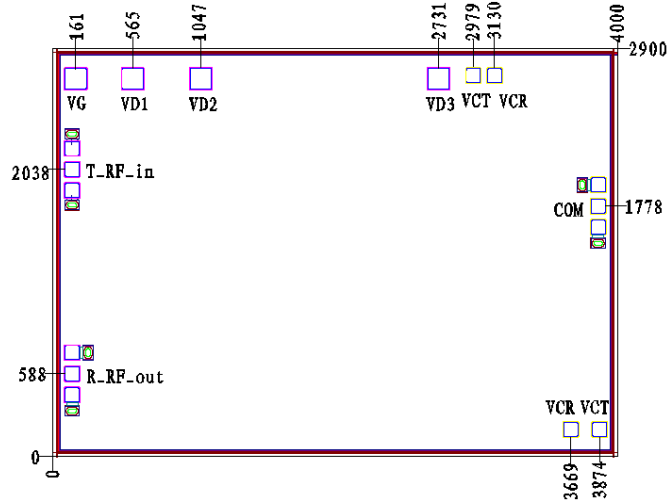


Switch Isolation Curve

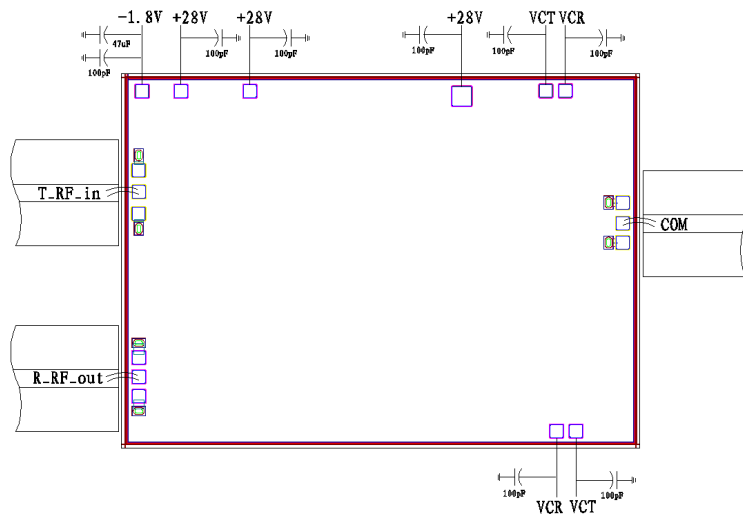


13 ~ 18GHz Switch Power Amplifier Chip

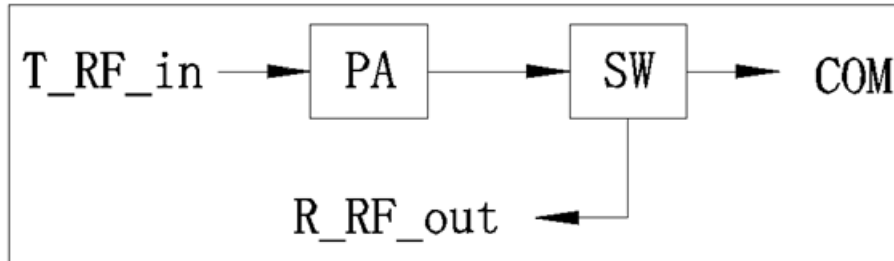
Chip Dimension (Unit : μm)



Chip Layout Diagram



Internal Function Diagram



Pad Definition

Symbol	Function	Dimension
T_RF_in	Transmit RF signal input port	100*100 μm^2
R_RF_out	Receive RF signal output port	100*100 μm^2
COM	Transmit RF output port/Receive RF input port	100*100 μm^2
VG	Power amplifier gate supply port	150*150 μm^2
VD1	Power amplifier first stage drain supply port	150*150 μm^2
VD2	Power amplifier second stage drain supply port	150*150 μm^2
VD3	Power amplifier third stage drain supply port	150*150 μm^2
VCT	Switch control voltage supply port	100*100 μm^2
VCR	Switch control voltage supply port	100*100 μm^2

Truth Table

VCT	VCR	Operation Status
0	1	Transmit link operates
1	0	Receive link operates

Note, "1" is high level 0V, "0" is low level -40V.

Please see Appendix A for details.