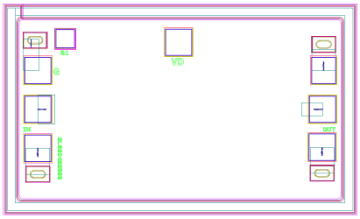
AMT1231
7 – 14GHz Low Noise Amplifier Chip



Key Features :

- Frequency range : 7 – 14GHz
- Typical gain : 23dB @ 27mA
  20dB @ 10mA
- Input standing wave : 1.4
- Output standing wave : 1.5
- Noise figure : 0.9dB
- P-1 : 10.5dBm @ +5V/27mA
  3dBm @ +5V/10mA (Low power mode)
- Chip dimensions : 1.3mm x 0.75mm x 0.1mm
- Applications : wireless communication, transceiver module, radio telecommunication etc.

Description :

AMT1231 chip is a Gallium Arsenide (GaAs) high performance Low Noise Amplifier, it covers 7 – 14GHz frequency range. It uses +5V single voltage operation, noise figure is 0.9dB, and 23dB typical gain. This chip is designed with ground through metal vias on the back technology.

Absolute Maximum Ratings (Ta = 25°C)

Symbol	Parameter	Value	Remark
Vd	Drain Voltage	+7V	
Pin	Input Signal Power	17dBm	
Tch	Operating Temperature	150°C	
Tm	Sintering Temperature	310°C	30s, N_2 protection
Tstg	Storage Temperature	-65 ~ +150°C	

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

Electrical Characteristics (Ta = 25°C)

Symbol	Parameter	Test Conditions	Value			Unit
			Min	Typical	Max	
G	Gain	Vd = +5V F : 7 ~ 14GHz	-	23	-	dB
NF	Noise Figure		-	0.9	-	dB
Id	Static Current		-	27	-	mA
VSWR_in	Input Standing Wave		-	1.4	-	-
VSWR_out	Output Standing Wave		-	1.5	-	-
P-1	Output Power at 1dB point		-	10.5	-	dBm

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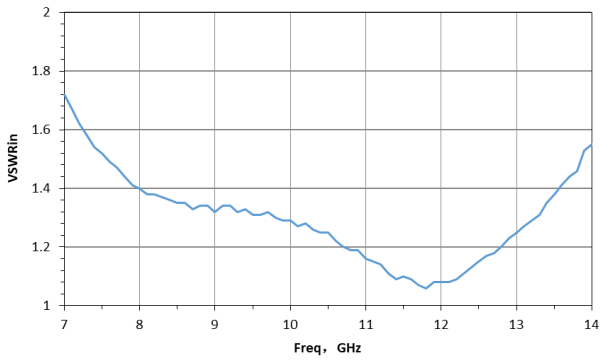
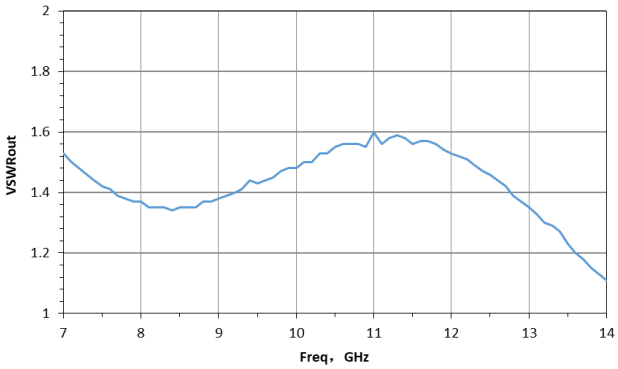
Typical Performance

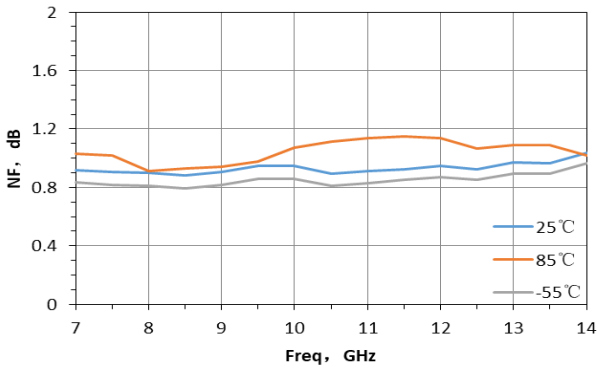
Input Standing Wave Curve



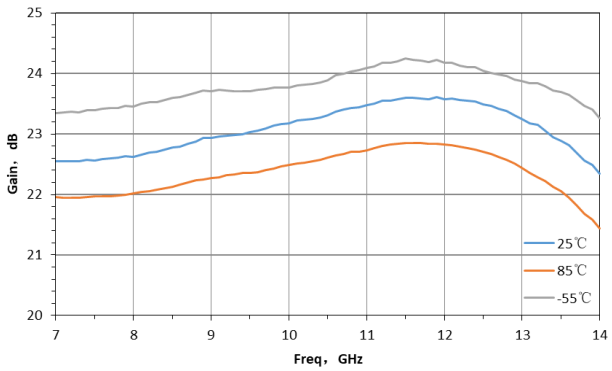
Output Standing Wave Curve



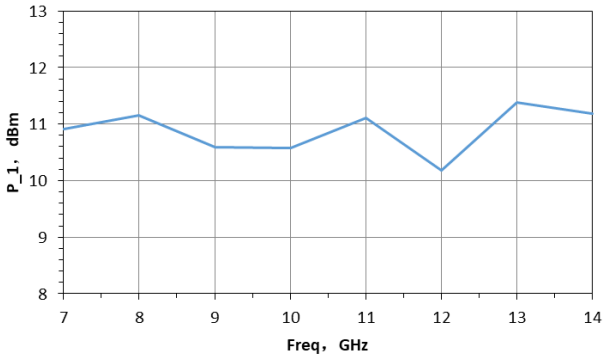
Noise Figure Curve



Gain Curve



P-1 Compression Characteristic Curve



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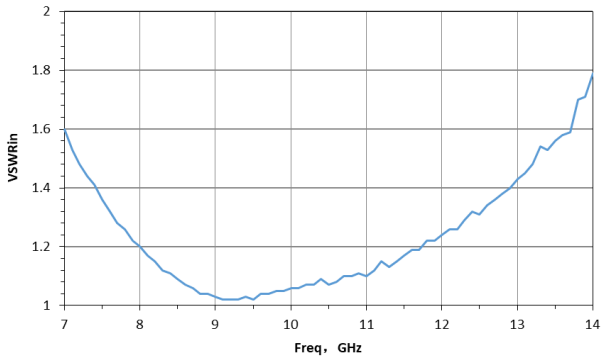
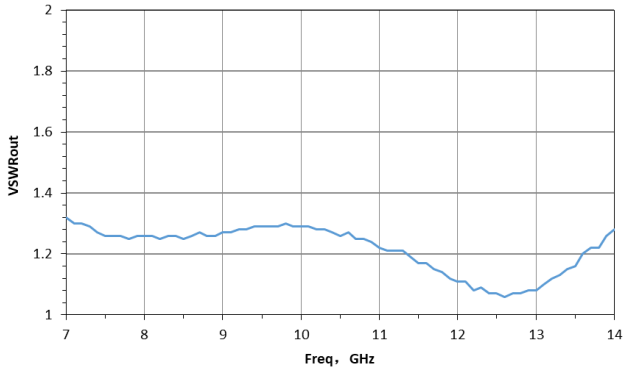
Typical Performance (Low Power Mode)

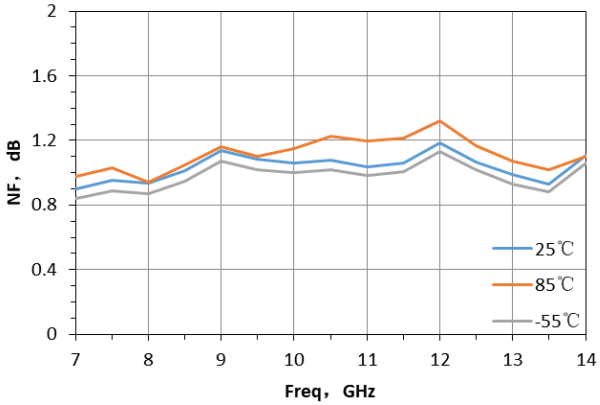
Input Standing Wave Curve



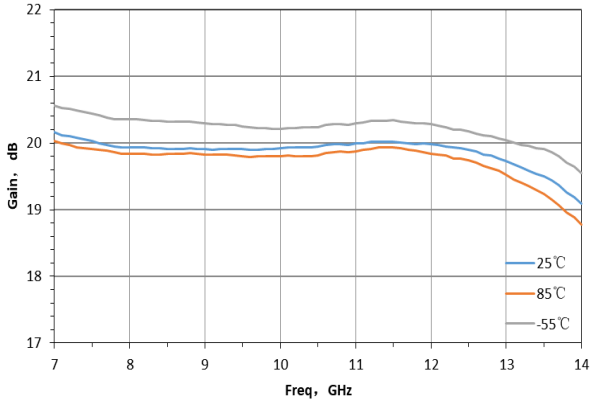
Output Standing Wave Curve



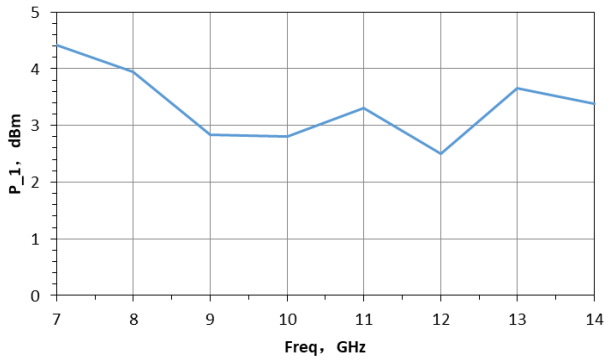
Noise Figure Curve



Gain Curve



P-1 Compression Characteristic Curve



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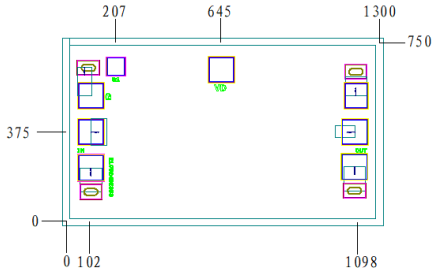
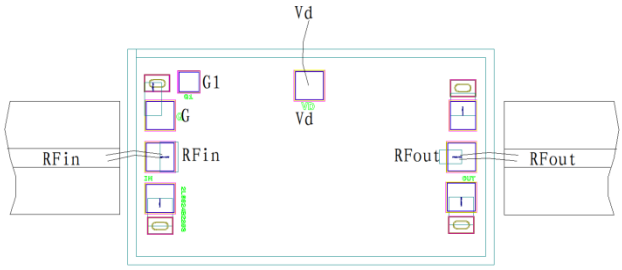
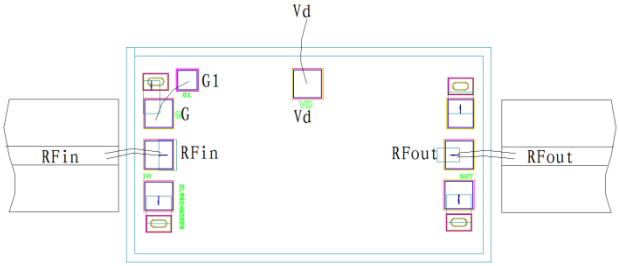
Chip Dimensions (Unit : μm)



Chip Layout Diagram

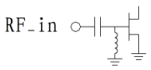
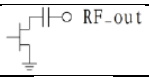


Normal Mode



Low Power Mode (G1 connected to G)

Pad Definition

Symbol	Function Description	Demensions	Equivalent Circuit
RFin	RF signal input port, connecting to external 50Ω system, no need to add DC blocking capacitor.	100μm*100μm	
RFout	RF signal output port, connecting to external 50Ω system, no need to add DC blocking capacitor.	100μm*100μm	
Vd	Amplifier bias, need to connect 100pF external capacitor	100μm*100μm	
G	Ground	100μm*100μm	-
G1	Low power mode when connected to G pad	80μm*80μm	-

Please see Appendix A for details.