

AMT1611
0 - 20GHz Digital Attenuator Chip



Key Features :

- Frequency range : 0 – 20GHz
- Insertion loss : 5dB
- Attenuation range : 0 – 31.5dB
- Attenuation RMS : 0.5dB
- Attenuation RMS : 0.6dB
- Attenuation additional phase shift : $\pm 12^\circ$
- Input/output standing wave : 1.6/1.6
- Control method : TTL level parallel control
- Supply : -3V/14mA
- Chip dimensions : 2.5mm x 1.5mm x 0.1mm
- Applications : wireless communication, transceiver module, radio telecommunication etc.

Description :

AMT1611 is a 6-bit digital control attenuator, it is designed by Gallium Arsenide (GaAs) process. This chip is designed with ground through metal vias on the back technology, it covers a frequency range of 0 ~ 20GHz, typical insertion loss is 5dB, typical attenuation RMS is 0.6dB, it uses TTL logic control. This chip is for microwave transceiver module, to realize transceiver signal amplitude control function.

Absolute Maximum Ratings (Ta = 25°C)

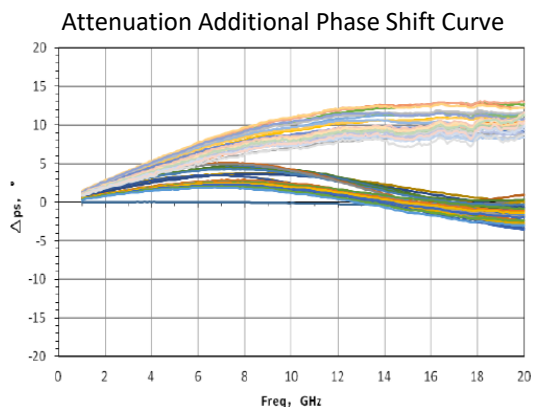
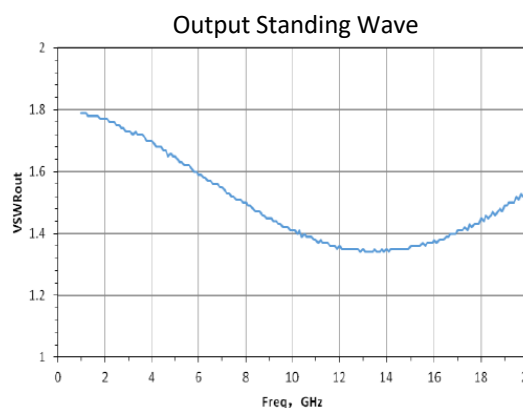
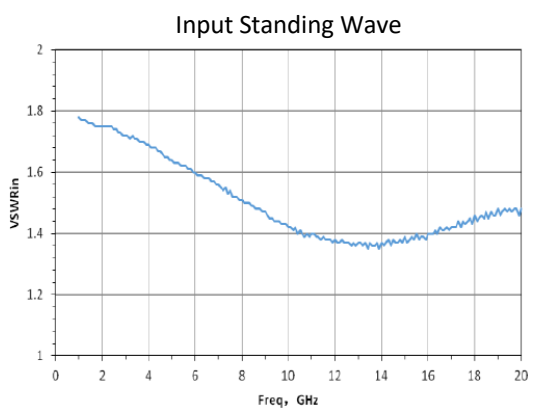
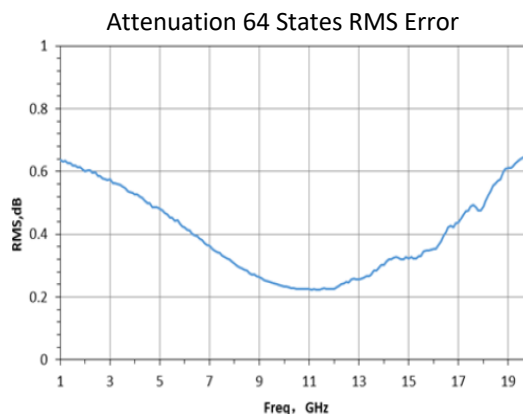
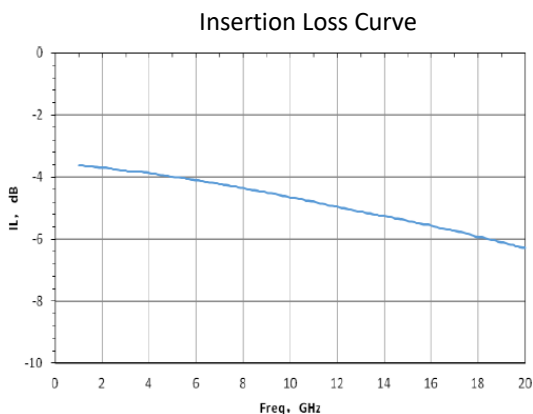
Symbol	Parameter	Value	Remark
Pin	Input Power	25dBm	
Tch	Operation Temperature	-55 ~ +125°C	
Tm	Sintering Temperature	310°C	30s, N ₂ protection
Tstg	Storage Temperature	-65 ~ +150°C	

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

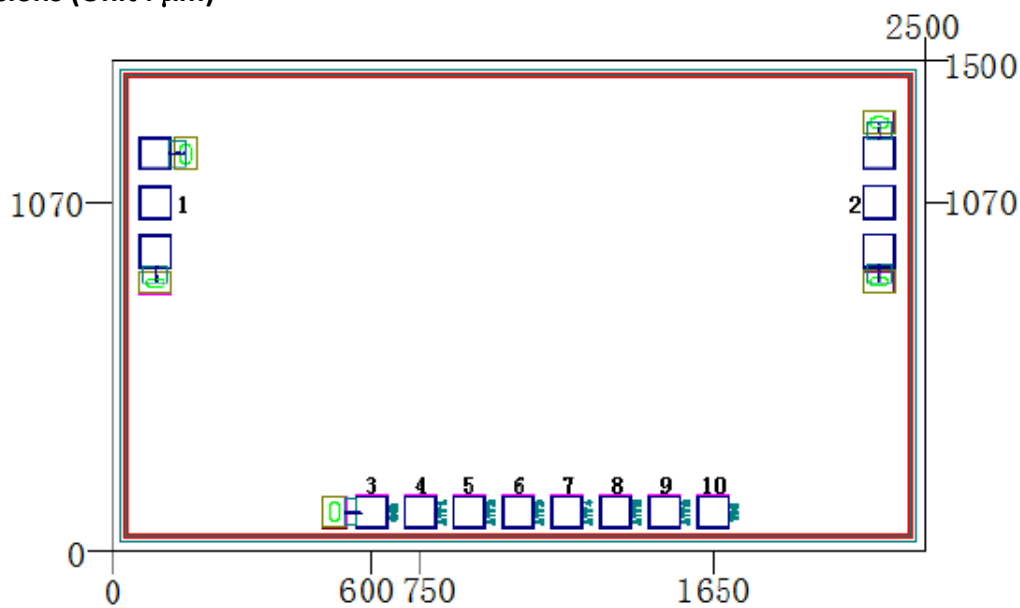
Electrical Characteristics (Ta = 25°C)

Symbol	Parameter	Test Conditions	Value			Unit
			Min	Typical	Max	
IL	Insertion Loss	VEE = -5V F : 0 ~ 20GHz	-	5	6.3	dB
ATT	Attenuation range		0.5 – 31.5			dB
Δps	Attenuation additional phase shift		-13	± 10	13	$^\circ$
RMS	64 states attenuation RMS error		-	0.6	0.7	dB
VSWRin	Input Standing Wave		-	1.6	1.8	-
VSWRout	Output Standing Wave		-	1.6	1.8	-

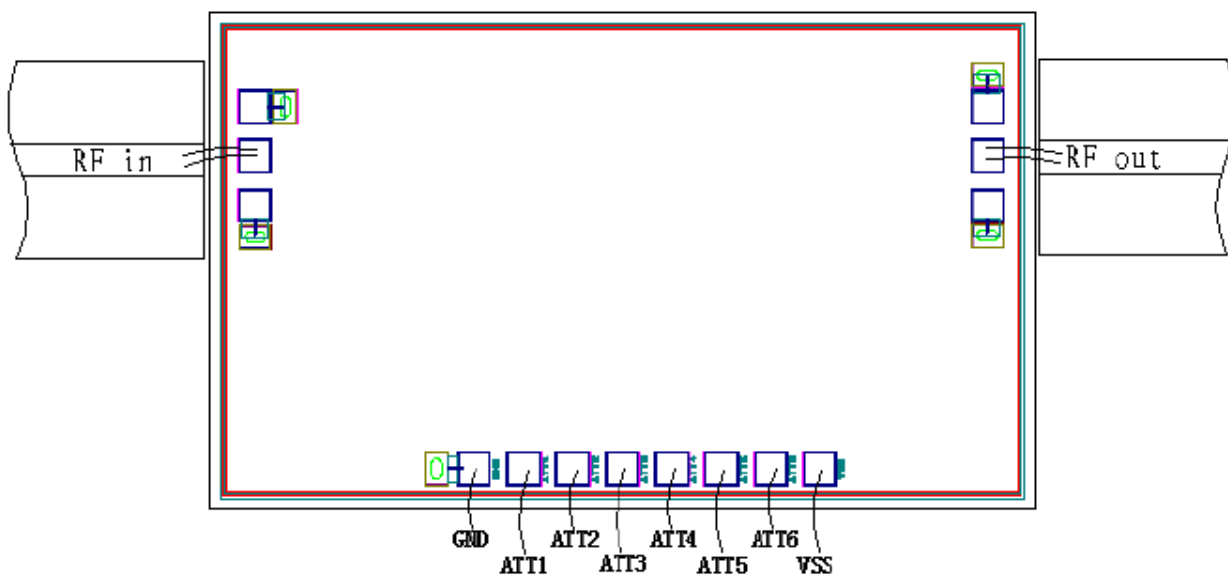
Typical Performance



Chip Dimensions (Unit : μm)



Chip Layout Diagram



Pad Definition

Symbol	Function	Dimension
RFin	RF signal input port, external connect to 50Ω system, no DC blocking capacitor	100μm*100μm
RFout	RF signal output port, external connect to 50Ω system, no DC blocking capacitor	100μm*100μm
GND	Ground	100μm*100μm
ATT1	0.5dB bit control	100μm*100μm
ATT2	1 dB bit control	100μm*100μm
ATT3	2 dB bit control	100μm*100μm
ATT4	4 dB bit control	100μm*100μm
ATT5	8 dB bit control	100μm*100μm
ATT6	16 dB bit control	100μm*100μm
VSS	-3V supply	100μm*100μm

Truth Table

Attenuation	0.5dB	1 dB	2 dB	4 dB	8 dB	16 dB
	ATT1	ATT2	ATT3	ATT4	ATT5	ATT6
Initial	0	0	0	0	0	0
0.5dB	1	0	0	0	0	0
1 dB	0	1	0	0	0	0
2 dB	0	0	1	0	0	0
4 dB	0	0	0	1	0	0
8 dB	0	0	0	0	1	0
16 dB	0	0	0	0	0	1

Please see Appendix A for details.