AMT1326

32 - 38GHz Amplitude and Phase Multi-Function Chip

Key Features :

- Frequency range : 32 – 38GHz
- Insertion loss : 14dB
- Phase shift bit : 6 bits
- Phase shift step : 5.625°
- Phase shift RMS : 3°, amplitude variation ±0.8dB
- Attenuation bit : 5 bits
- Attenuation step : 0.5dB
- Attenuation RMS : 0.1dB, additive phase shift ±5°
- Input/Output standing wave : 1.2
- Operation voltage : -5V
- Control method : TTL, parallel control
- Chip dimensions : 3.2mm x 1.19mm x 0.1mm
- Applications : wireless communication, transceiver module, radio telecommunication etc.

Description :

AMT1326 is an amplitude and phase multi-function GaAs (MMIC) chip, it incorporates with, 5-bit control attenuator, 6-bit control phase shifter, control driver etc. functions, covers 32 - 38GHz frequency range. It is designed by Gallium Arsenide (GaAs) process. The chip uses -5V supply voltage, control signal is TTL, and parallel control for phase shift and attenuation. This chip is designed with ground through metal vias on the back technology. All chip products p are 100% RF tested.

Absolute Maximum Ratings (Ta = 25°C)

Symbol	Parameter	Value	Remark
VEE	Operation voltage	-6V	
Pin	Max. Input Signal Power	+15dBm	
Tch	Operation Temperature	150°C	
Tm	Sintering Temperature	310°C	30s, N_2 protection
Tstg	Storage Temperature	-65 ~ +150°C	

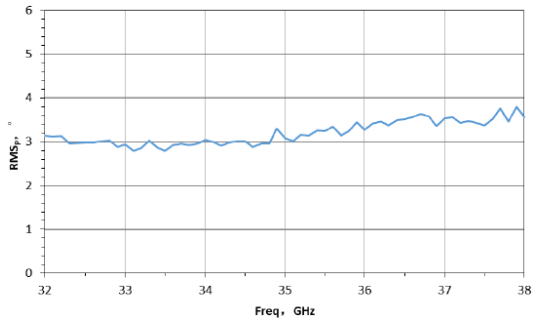
[1] Operation outside any of the Absolute Maximum Ratings may cause permanent device damage.

Electrical Characteristics (Ta = 25°C)

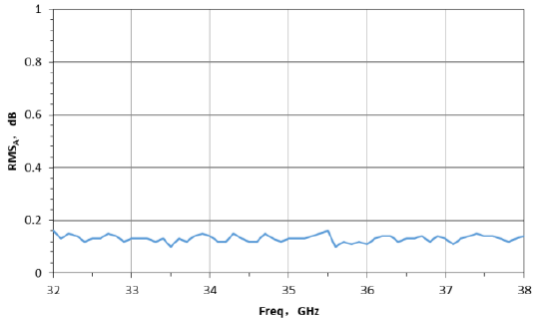
Symbol	Parameter	Value			Unit	Remark
		Min	Typical	Max		
F	Frequency		32 ~ 38		GHz	
PS	Phase shift range		5.625 – 354.375 (6 bits phase shift)		°	
Δatt	Phase shift additive attenuation variation	-	±0.8	-	dB	
RMS_ps	Phase shift RMS	-	3	4	°	
ATT	Attenuation range		0.5 – 15.5 (5 bits attenuation)		dB	
Δps	Attenuation additive phase shift variation	-	±5		°	
RMS_att	Attenuation RMS	-	0.1	0.2	dB	
VSWRin	Input standing wave	-	1.2	1.3	-	
VSWRout	Output standing wave	-	1.2	1.4	-	

Typical Performance

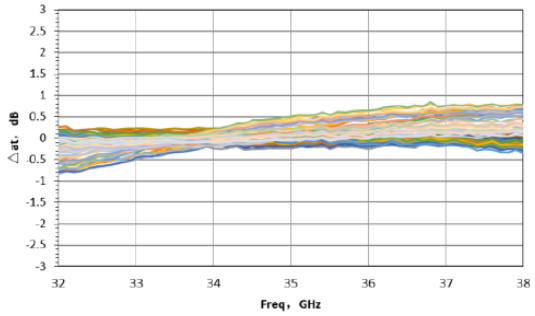
Phase Shift RMS Curve



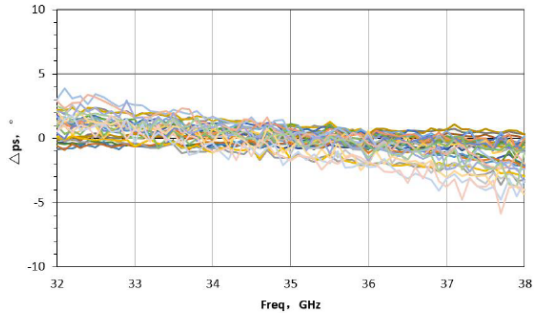
Attenuation RMS Curve



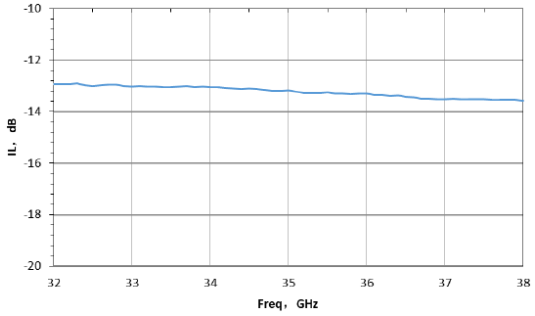
Phase Shift Additive Attenuation Curve



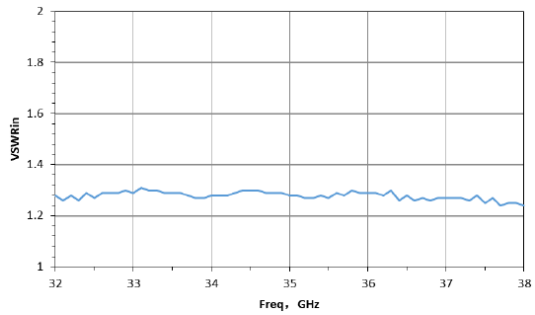
Attenuation Additive Phase Shift Curve

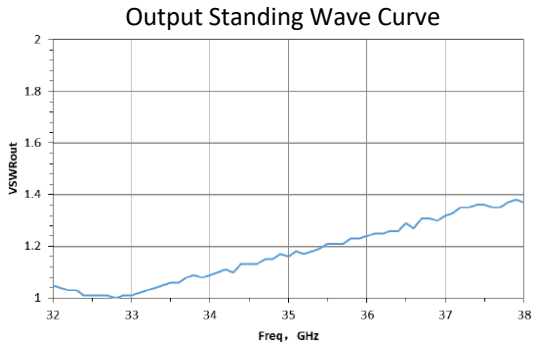


Insertion Loss Curve

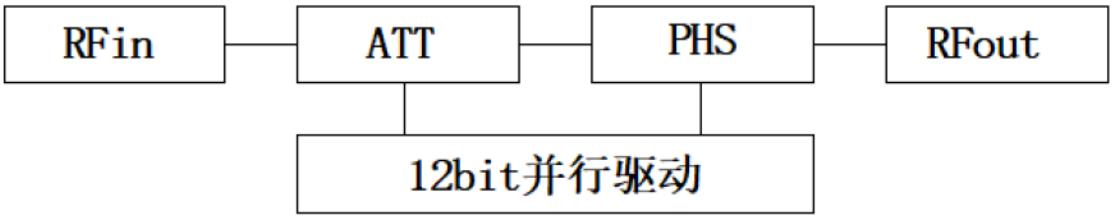


Input Standing Wave Curve

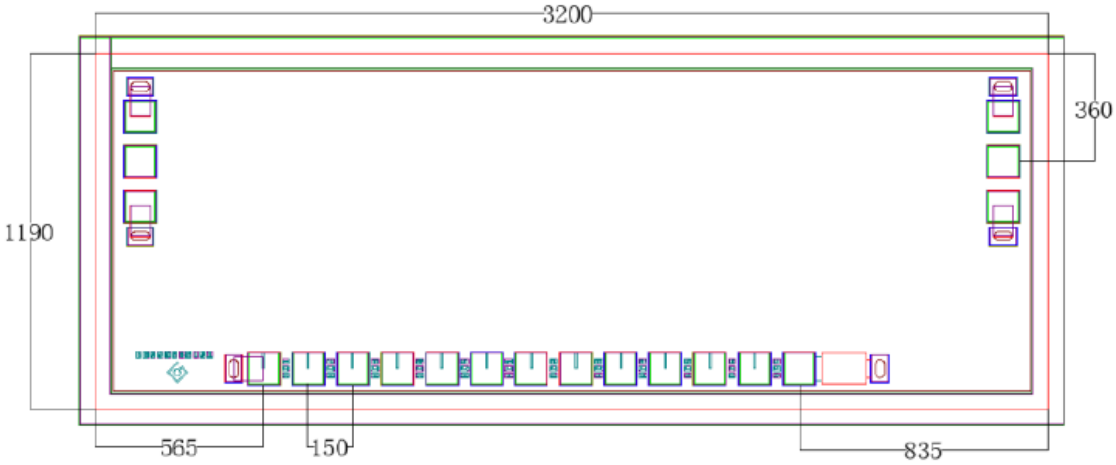




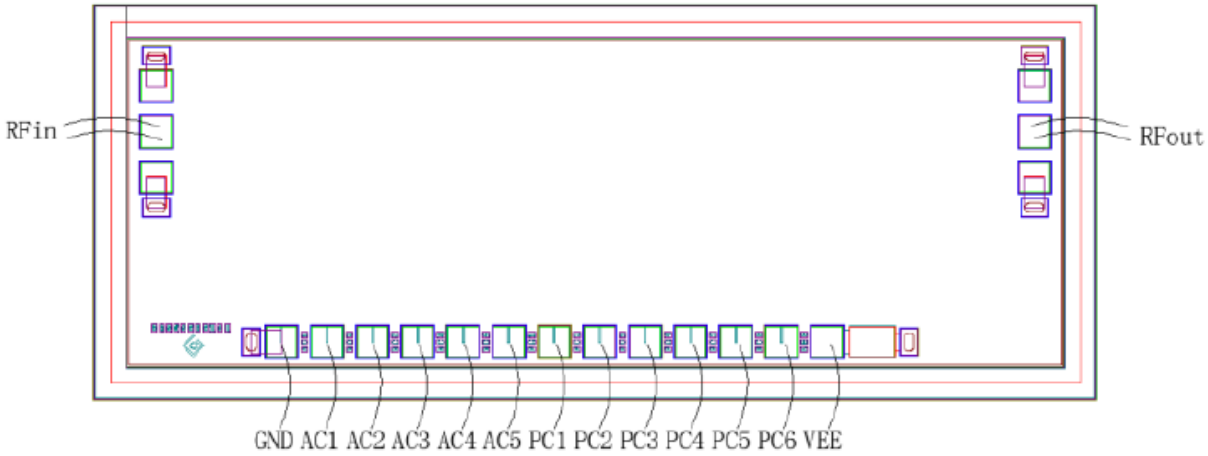
Internal Functional Block Diagram



Chip Dimensions (Unit : μm)



Chip Layout Diagram



Solder Pad Definition

Name	Dimension	Explanation
RFin	100μm x 100μm	RF input
AC1	100μm x 100μm	0.5dB attenuation bit control
AC2	100μm x 100μm	1dB attenuation bit control
AC3	100μm x 100μm	2dB attenuation bit control
AC4	100μm x 100μm	4dB attenuation bit control
AC5	100μm x 100μm	8dB attenuation bit control
PC1	100μm x 100μm	5.625° phase shift bit control
PC2	100μm x 100μm	11.25° phase shift bit control
PC3	100μm x 100μm	22.5° phase shift bit control
PC4	100μm x 100μm	45° phase shift bit control
PC5	100μm x 100μm	90° phase shift bit control
PC6	100μm x 100μm	180° phase shift bit control
GND	100μm x 100μm	Ground
RFout	100μm x 100μm	RF output
VEE	100μm x 100μm	-5V supply voltage

Control Description

Truth Table

Phase Shift	5.625 °	11.25 °	22.5 °	45 °	90 °	180 °
	PC1	PC2	PC3	PC4	PC5	PC6
Initial State	0	0	0	0	0	0
5.625 °	1	0	0	0	0	0
11.25 °	0	1	0	0	0	0
22.5 °	0	0	1	0	0	0
45 °	0	0	0	1	0	0
90 °	0	0	0	0	1	0
180 °	0	0	0	0	0	1
Attenuation	0.5 dB	1 dB	2 dB	4 dB	8 dB	
	AC1	AC2	AC3	AC4	AC5	
Initial State	0	0	0	0	0	
0.5 dB	1	0	0	0	0	
1 dB	0	1	0	0	0	
2 dB	0	0	1	0	0	
4 dB	0	0	0	1	0	
8 dB	0	0	0	0	1	

Please see Appendix A for details.