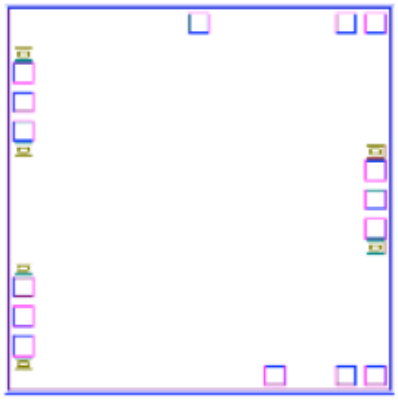
AMT1327

6 - 18GHz Transceiver Integrated Multi-Function Chip



Key Features :

- Frequency range : 6 – 18GHz
- Receiver gain : 19dB
- Transmitter gain : 19.5dB
- Receiver noise : 4dB
- Receive input/output standing wave : 1.3/1.3
- Transmit input/output standing wave : 1.5/1.5
- Receiver output power at P-1 : 13dBm
- Transceiver output power at P-1 : 18dBm
- Transmit saturated output power : 20dBm
- Receiver power dissipation : 5V/30mA
- Transmitter power dissipation : 5V/120mA
- Switch control method : 0/-5V
- Chip dimensions : 2.0mm x 2.0mm x 0.1mm
- Applications : wireless communication, transceiver module, radio telecommunication etc.

Description :

AMT1327 is a high performance transceiver multi-function chip, frequency range is 6 – 18GHz, it integrates switch and bi-directional power amplifier, receiver gain is 19dB, noise figure is 4dB, transmitter gain is 19.5dB, and transmitter output power at P-1 is 18dBm. It is designed by Gallium Arsenide (GaAs) process. 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
VD	Drain voltage	+7V	
VEE	Driver supply voltage	-6V	
Pin	Max. Input Signal Power	25dBm	
Tch	Operation Temperature	150°C	
Tm	Sintering Temperature	310°C	30s, N_2 protection
Tstg	Storage Temperature	-65 ~ +150°C	

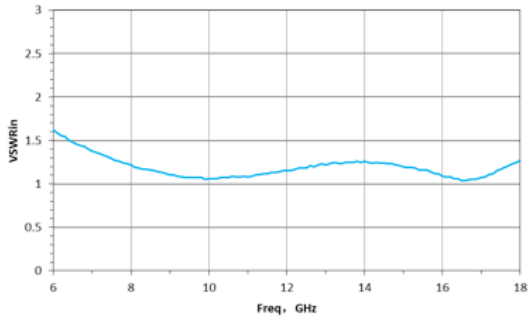
[1] Operation outside any of the Absolute Maximum Ratings may cause permanent device damage.

Electrical Characteristics (Ta = 25°C)

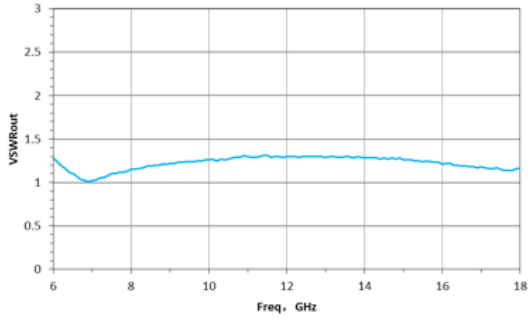
Symbol	Parameter	Test Conditions	Value			Unit
			Min	Typical	Max	
G_R	Receiver gain	F : 6 ~ 18GHz VD1 = 0V, VD2 = +5V, VG1 = 0V, SW1 = 0V, SW2 = -5V	-	19	-	dB
NF	Receiver noise figure		-	4	-	dB
$VSWR_{RX}$	Receiver input standing wave		-	1.3	-	-
$VSWR_{RX}$	Receiver output standing wave		-	1.3	-	-
$P_{R\text{-}1dB}$	Receiver output power at P-1 point		-	13	-	dBm
G_T	Transmitter gain	F : 6 ~ 18GHz VD1 = +5V, VD2 = 0V, VG1 = -5V, SW1= -5V, SW2 = 0V	-	19.5	-	dB
$VSWR_{TX}$	Transmitter input standing wave		-	1.5	-	-
$VSWR_{TX}$	Transmitter output standing wave		-	1.5	-	-
$P_{T\text{-}1dB}$	Transmitter output power at P-1 point		-	18	-	dBm
Pout	Transmit saturated output power		-	20	-	dBm

Typical Performance

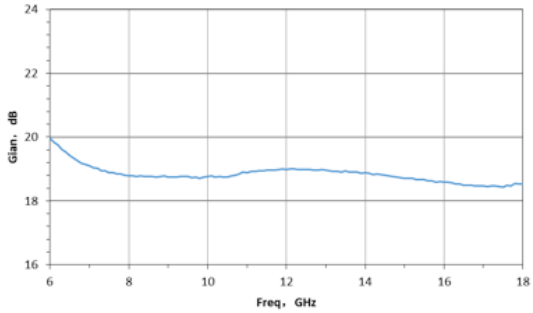
Receiver Input Standing Wave Curve



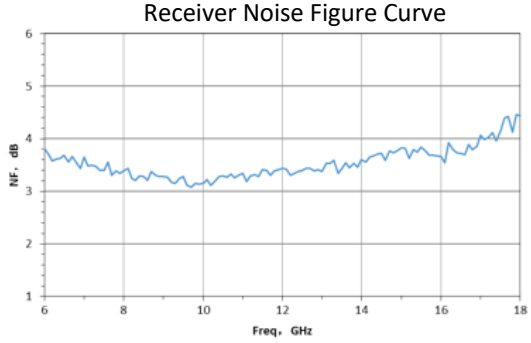
Receiver Output Standing Wave Curve



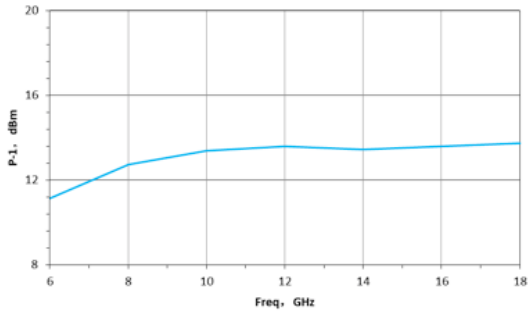
Receiver Gain Curve



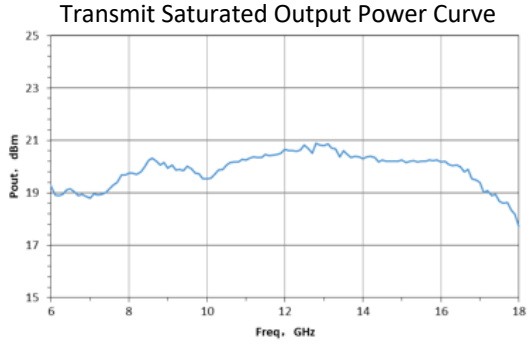
Receiver Noise Figure Curve



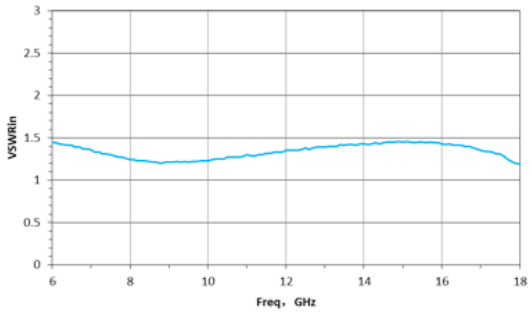
Receiver Output Power at P-1 Curve



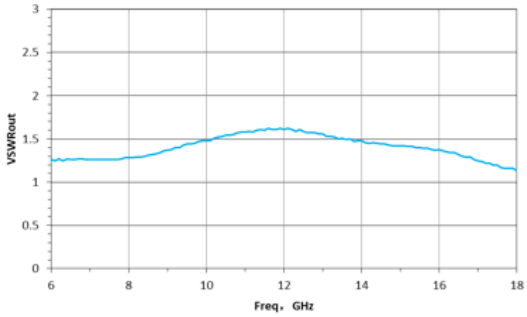
Transmit Saturated Output Power Curve



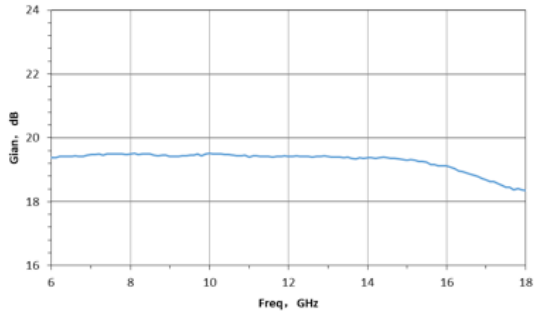
Transmitter Input Standing Wave Curve



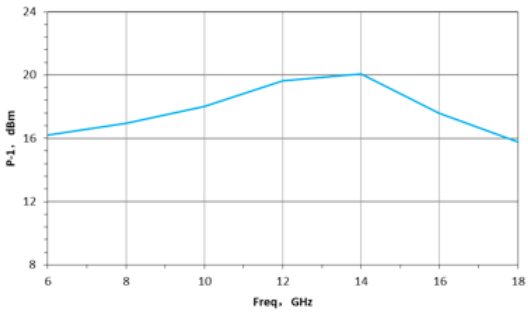
Transmitter Output Standing Wave Curve



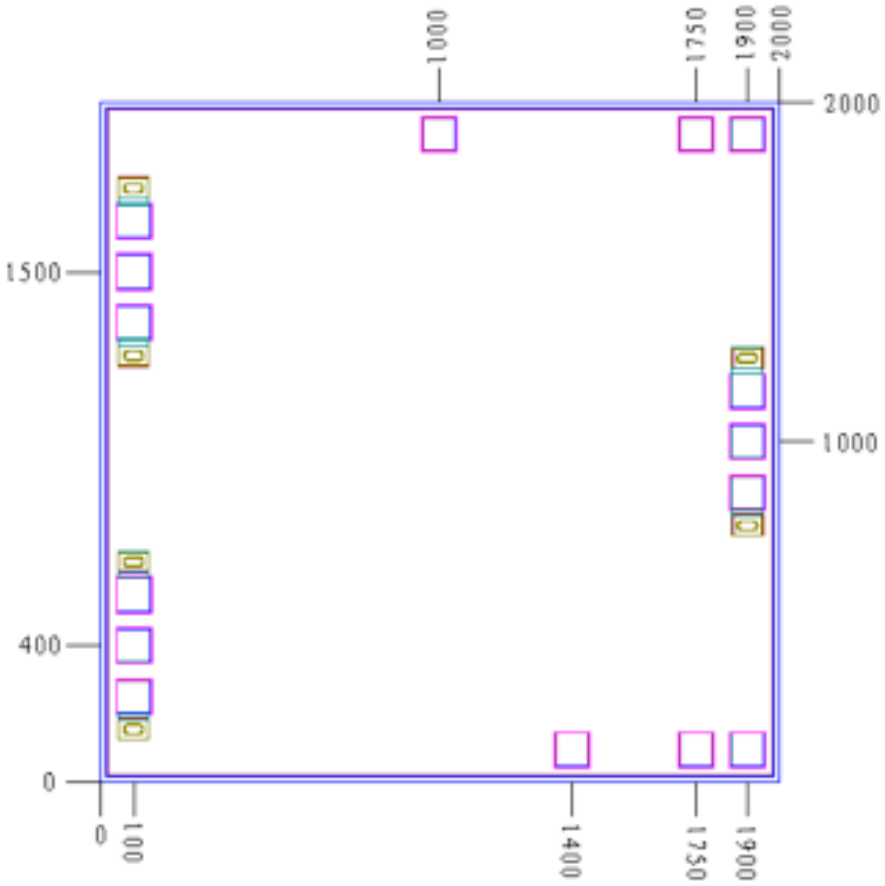
Transmitter Gain Curve



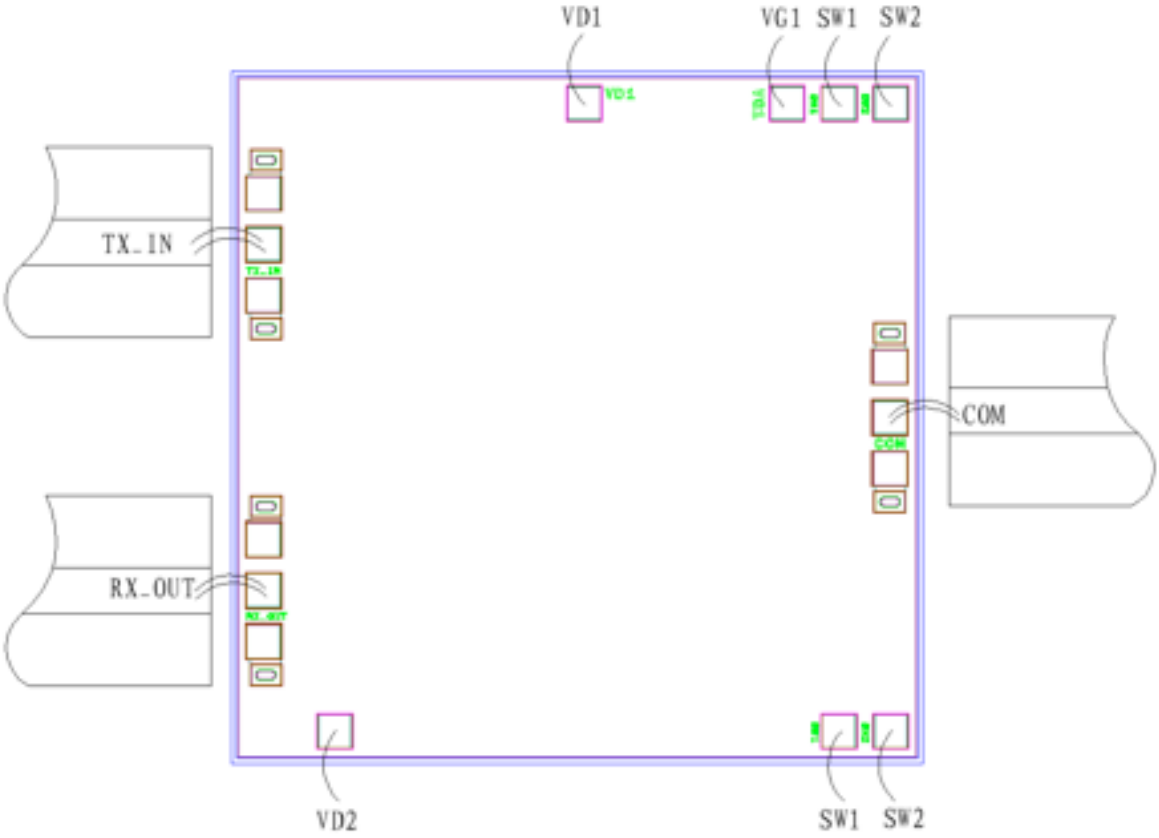
Transmitter Output Power at P-1 Curve



Chip Dimensions (Unit : µm)



Chip Layout Diagram



Pad Definition

Symbol	Function Description	Dimensions
TX_IN	RF signal transmit input port, external connecting to 50Ω system, internal built-in DC blocking capacitor.	100μm * 100μm
RX_OUT	RF signal receive output port, external connecting to 50Ω system, internal built-in DC blocking capacitor.	100μm * 100μm
COM	RF signal transmit output/receive input port, external connecting to 50Ω system, internal built-in DC blocking capacitor.	100μm * 100μm
VD1	Amplifier voltage bias at transmit state, refer to usage explanation for control logic	100μm * 100μm
VD2	Amplifier voltage bias at receive state, refer to usage explanation for control logic	100μm * 100μm
VG	Amplifier voltage bias at transmit state, refer to usage explanation for control logic	100μm * 100μm
SW1	Supply control port, refer to usage explanation for control logic	100μm * 100μm
SW2	Supply control port, refer to usage explanation for control logic	100μm * 100μm

Usage Explanation

Operation State	Receive State (COM-RX_OUT)	Transmit State (TX_IN-COM)
Voltage bias	VD1 = 0V, VD2 = +5V, VG = 0V, SW1 = -5V, SW2 = 0V	VD1 = +5V, VD2 = 0V, VG = -5V, SW1 = 0V, SW2 = -5V

Note, use either one of SW1 / SW2.

Please see appendix A for details.