WMPA0527A

0.4 - 2.7 GHz LOW NOISE MODULATOR POWER AMPLIFIER

REV A
October 2010

Key Features

- 0.4 ~ 2.7 GHz
- 2.20 dB noise figure
- 45.0 dBm output IP_3
- 36.0 dB Gain
- 33.0 dBm P_{1dB} CW
- 34.0 dBm P_{pk}
- Single Power Supply
- >34 Years MTBF
- Unconditional Stable
- RoHS Compliant

Product Description

WMPA0527A integrates WanTcom proprietary modulator power amplifier technology, high frequency micro electronic assembly techniques, and high reliability design to realize pulse modulation, wideband, high linearity, and unconditional stable performances together. With single +10.0V DC operation, the amplifier can be used either CW or pulse modulator power amplifier at 50-Ohm impedance system. The amplifier has standard WanTcom WP-9M connectorized housing.

The amplifier is designed to meet the rugged standard of MIL-STD-202.

Applications

- Mobile Infrastructures
- WiMax
- GPS
- CATV/DBS
- Defense
- Security System
- Measurement
- Fixed Wireless

Specifications

Summary of the electrical specifications WMPA0527A at room temperature

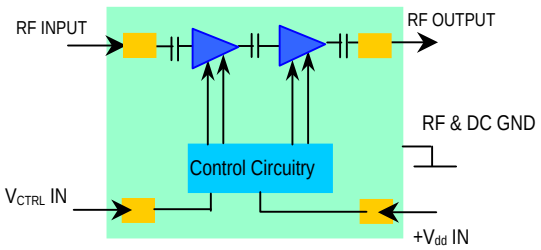
Index	Testing Item	Symbol	Test Constraints	Min	Nom	Max	Unit
1	Gain	S_{21}	0.4 – 2.7 GHz	34	36	38	dB
2	Gain Variation	ΔG	0.4 – 2.7 GHz		+/- 0.5	+/-1.0	dB
3	Input VSWR	SWR_1	0.4 – 2.7 GHz		1.5:1	2:1	Ratio
4	Output VSWR	SWR_2	0.4 – 2.7 GHz		1.5:1	2:1	Ratio
5	Reverse Isolation	S_{12}	0.4 – 2.7 GHz	65	70		dB
6	Noise figure	NF	0.4 – 2.7 GHz		2.2	2.8	dB
7	Output Power 1dB Compression Point	P_{1dB}	0.4 – 2.7 GHz, CW	31	33		dBm
8	Output-Third-Order Interception point	IP_3	Two-Tone, P_{out} +10 dBm each, 1 MHz separation	41	45		dBm
9	Output Maximum Load Mis-match	$SWR_{2,MAX}$	0.4 – 2.7 GHz, CW			10:1	Ratio
10	Current Consumption	I_{dd}	V_{dd}= +10 V, V_{CTRL} = +5.0V		600		mA
11	Power Supply Voltage	V_{dd}		+11	+12	+15	V
12	Turn ON Time	T_{ON}	10 % to 90 %		0.5		uS
13	Turn OFF Time	T_{OFF}	90% to 10 %		2.0		uS
14	Duty Cycle Range	DCR		5		20	%
15	Minimum Working Pulse Time Period	T_P		20			uS
16	Thermal Resistance	$R_{th,c}$	Junction to case, last stage transistor			20	°C/W
17	Operating Temperature	T_o		-40		+85	°C
18	Maximum Average RF Input Power	$P_{IN, MAX}$	DC – 6 GHz			10	dBm

Absolute Maximum Ratings

Parameters	Units	Ratings
DC Power Supply Voltage	V	12.5
Drain Current	mA	750
Total Power Dissipation	W	8
RF Input Power	dBm	10
Channel Temperature	°C	150
Storage Temperature	°C	-55 ~ 125
Operating Temperature	°C	-40 ~ 85

Operation of this device above any one of these parameters may cause permanent damage.

Functional Block Diagram



Specifications and information are subject to change without notice.

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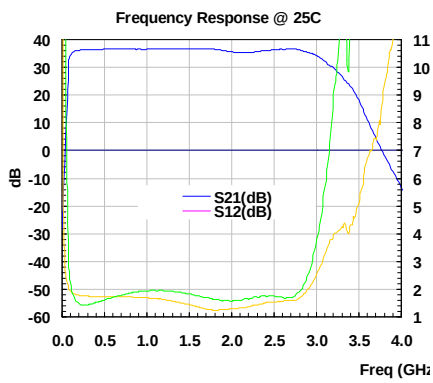
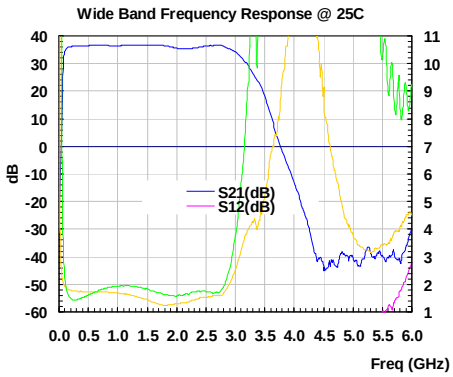
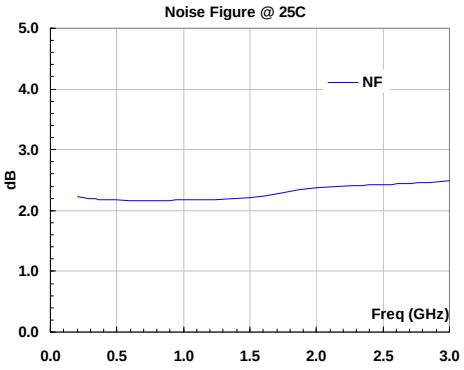
Ordering Information

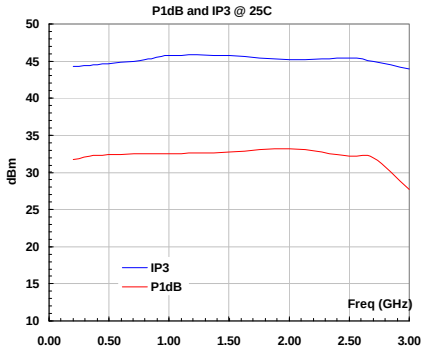
Model Number	WMPA0527A

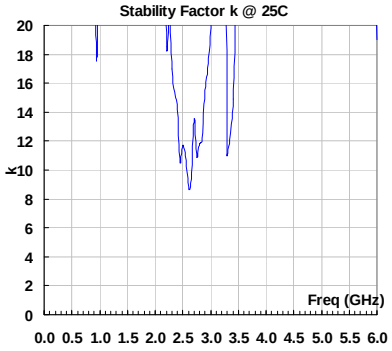
Typical Data





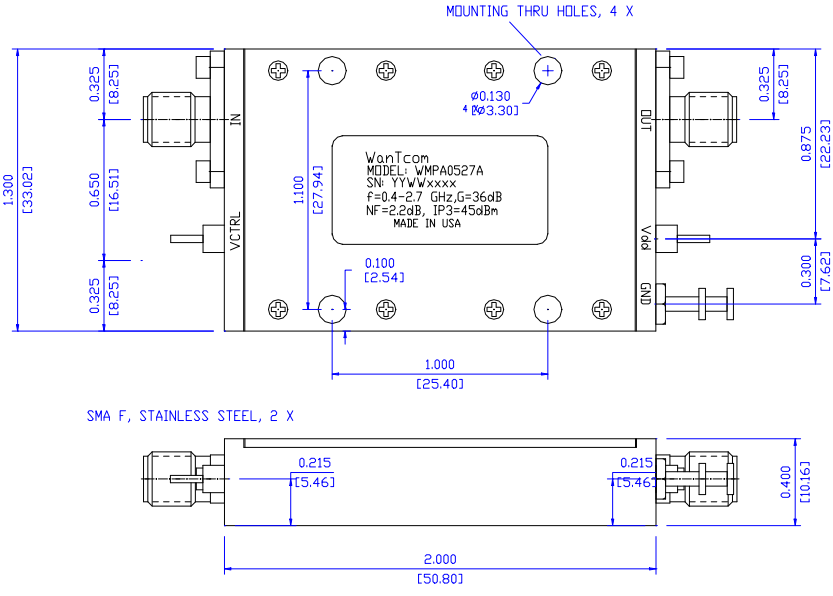






Outline, WP-9M Housing

UNITS:	INCH [mm]
BODY:	Brass
Finish:	Gold Plating
RF Connector:	SMA F Stainless Steel
V_{dd} PWR:	Feed through



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Application Notes:

A. CW and Pulse Working Modes

a. CW Application

For CW application, apply +5V at V_{CTRL} pin to turn on the power amplifier and 0V to turn it off. In order to have clean control and high linearity performance, the control voltage shall be clean and interference free.

b. Pulse Application

For pulse modulation application, a 10 uF DC block capacitor is needed to filter out any DC components of the pulse signal presenting at V_{CTRL} pin. The minimum pulse time period shall not be less than 20 uS. The duty cycle shall be in the range of 5% to 20% for the best modulation performance. For example, a pulse of 8 uS duration with 80 uS time period works well to modulate the amplifier. A pulse of 2 uS duration with 80 uS time period may works fine with the de-graded pulse shape.

B. SMA Torque Wrench Selection

Always use a torque wrench with 5 ~ 6 inch-lb coupling torque setting for mating the SMA cables to the amplifier. Never use torque more than 8 inch-lb wrench for tightening the mating cable to the connector. Otherwise, the permanent damage will occur to the SMA connectors of the amplifier. 8710-1582 (5 inch-lb) is one of the good torque wrench choice from Agilent Technology.

C. DC Power Line Connection

Strip the insulation layer at the end of DC power supply wire. The stripped distance should be in the range of 0.100” to 0.200”. The 24 ~ 26 American Wire Gauge wire is suitable. Wound the stripped terminal wire about 1 to 2 turns on the DC feed thru center pin. Solder the wounded wire and the center pin together. Clean the soldering area by Q-tip with alcohol to remove the flux and residue.

Repeat the process to solder the DC return wire on the ground turret.

D. Mounting the Amplifier

Use three pieces of #4-40 with longer than 9/16” screws for mounting the amplifier on a metal-based chase. Flat and spring washers are needed to prevent the screw loosening during the shock and vibration. Always use the appropriate torque setting of the power screwdriver to mount them.

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