WBPA04-2045A

370 – 480 MHz 4W POWER AMPLIFIER

REV B
November 2017

Key Features

- 370 ~ 480 MHz
- 40% Added Efficiency @ P_{1dB}
- 48.0 dBm Output IP_3
- 20.0 dB Gain
- 36.0 dBm P_{1dB}
- 1.5:1 VSWR
- Single Power Supply
- >68 Years MTBF
- Unconditional Stable
- RoHS Compliant

Product Description

CAUTION: ELECTROSTATIC DISCHARGE SENSITIVE

WBPA04-2045A is integrated with WanTcom proprietary power amplifier technology, high frequency micro electronic assembly techniques, and high reliability design to realize optimum low noise figure, wideband, high linearity, and unconditional stable performances together. With single +10.0V DC operation, the amplifier has optimal input and output matching in the specified frequency range at 50-Ohm impedance system. The amplifier has standard SMA connectorized WP-6 Gold plated housing.

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

Applications

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

Specifications

Summary of the electrical specifications WBPA04-2045A at room temperature

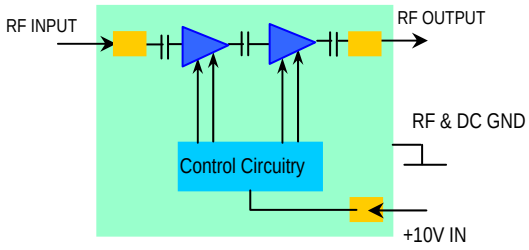
Index	Testing Item	Symbol	Test Constraints	Min	Nom	Max	Unit
1	Gain	S_{21}	370 – 480 MHz		20		dB
2	Gain Variation	ΔG	370 – 480 MHz		+/- 0.5	+/-0.75	dB
3	Input VSWR	SWR_1	370 – 480 MHz		1.5:1	1.8:1	Ratio
4	Output VSWR	SWR_2	370 – 480 MHz		1.5:1	1.8:1	Ratio
5	Reverse Isolation	S_{12}	370 – 480 MHz		20		dB
6	Power Added Efficiency @ P_{1dB}	η	370 – 480 MHz		40		%
7	Output 1dB Gain Compression Point	P_{1dB}	370 – 480 MHz	34	36		dBm
8	Output-Third-Order Interception Point	IP_3	Two-Tone, P_{out} +20 dBm each, 1 MHz separation	45	48		dBm
9	Current Consumption	I_{dd}	V_{dd}= +10 V		800		mA
10	Power Supply Voltage	V_{dd}		+9.5	+10	+10.5	V
11	Thermal Resistance, Junction to case	$R_{th,c}$	Last stage transistor, Vds = 9.5V, Ids = 400 mA			8	°C/W
12	Operating Temperature	T_o		-40		+85	°C
13	Maximum Input CW RF Power	$P_{IN, MAX}$	DC – 6 GHz			24	dBm

Absolute Maximum Ratings

Parameters	Units	Ratings
DC Power Supply Voltage	V	12.0
Drain Current	A	1.0
Total Power Dissipation	W	10.0
Input CW RF Power	dBm	24.0
Channel Temperature	°C	170
Storage Temperature	°C	-55 ~ 125
Operating Temperature	°C	-40 ~ 85
Thermal Resistance	°C/W	8.0

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

Functional Block Diagram



Ordering Information

Model	WBPA04-2045A

Specifications and information are subject to change without notice.

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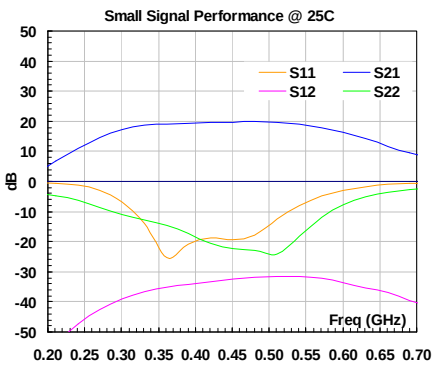
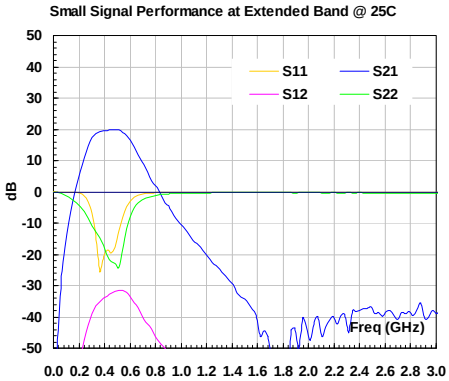
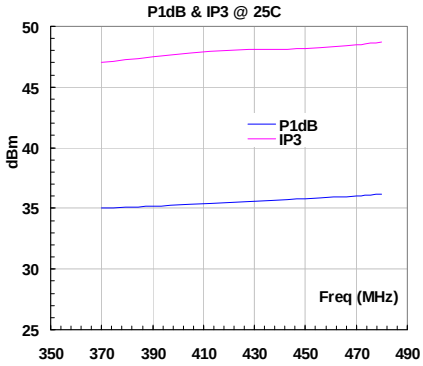
Typical Data

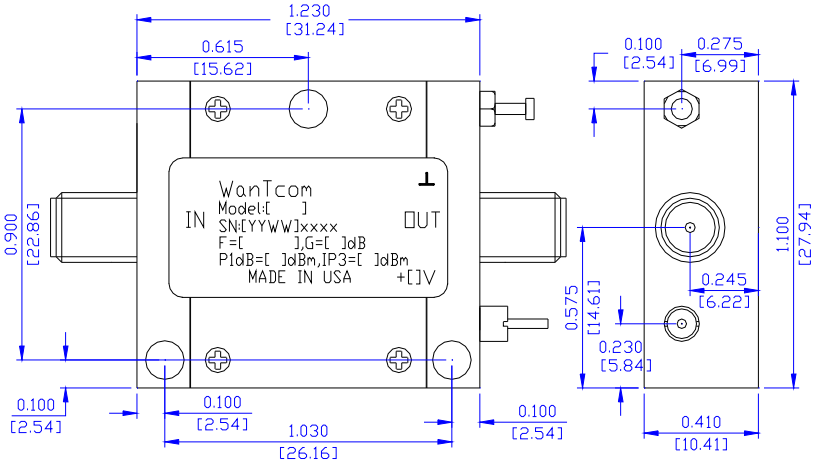






Outline, WP-6 Housing

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



Application Notes:

A. 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 connectors. Otherwise, the permanent damage will occur to the SMA connectors of the amplifier. 8710-1582 (5 inch-lb) is one of the ideal torque wrench choice from Agilent Technology.

B. DC Power Line Connection

Strip the insulation layer at the end of DC power supply wire. The stripped length should be around 0.100” to 0.200”. The 24 ~ 26 American Wire Gauge wire is suitable. Wound the stripped wire about 3/4 to 1 turn on the DC feed thru center pin. Solder the wounded wire and the center pin together. Clean the soldering joint by a Q-tip with alcohol to remove the flux and residue.

Do not use large soldering iron tip with more than 750 degree Fahrenheit to solder the wire and feed thru pin. Damage may occur to the feed thru. 0.010” size tip with 750 degree Fahrenheit temperature setting is suitable for the soldering works.

Repeat the process to solder the DC return wire on the ground turret. Higher temperature and larger tip can be used for this ground soldering.

C. 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.

High thermal conductivity thermal film such as T-gon is needed between the bottom of the PA and the heat sink surface. Refer to AN-155 for heat sink design, http://wantcominc.com/engineering_tools.htm .

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