



470- 960 MHz POWER AMPLIFIER MODULE WPM0510EPU¹

WPM0510EPU LNA is a wideband, high power, and high linearity amplifier. The amplifier offers the exceptional gain flatness of +/- 0.50 dB, 31.0 dB gain, 38.0 dBm P_{1dB} and output 49 dBm IP₃ at the frequency range from 470 MHz to 960 MHz.

WPM0510EPU is most suitable for digital broadcast, cellular base stations, wireless data communications, tower top receiver amplifiers, cellular micro-cells, last-mile wireless communication systems, and wireless measurement applications of UHF and Cellular bands.

Preliminary

Key Features:

Impedance:	50 Ohm
Output IP ₃ :	49.0 dBm
Gain:	31.0
Gain Flatness:	+/-0.5 dB
Input VSWR:	1.5:1 typical
Output VSWR:	1.5:1 typical
P _{1dB} :	38.0 dBm
Single Power Supply:	750 mA, @ +28 V
Frequency Range:	470 ~ 960 MHz
Operating Temperature:	-20 ~ +85 °C

Absolute Maximum Ratings²:

Symbol	Parameters	Units	Absolute Maximum
V _{dd}	DC Power Supply Voltage	V	30
I _{dd}	Drain Current	mA	1000
P _{diss}	Total Power Dissipation	W	30
P _{In,Max}	RF Input Power	dBm	10
T _{ch}	Channel Temperature	°C	175
T _{STG}	Storage Temperature	°C	-65 ~ 150
T _{O,MAX}	Maximum Operating Temperature	°C	-20 ~ +85
R _{th,c}	Thermal Resistance	°C/W	2.2

¹ Specifications are subject to change without notice.

² Operation of this device above any one of these parameters may cause permanent damage.



Specifications:

a) **Table 1** Summary of the electrical specifications of WPM0510EPU at room temperature

Index	Testing Item	Symbol	Test Constraints	Nom (RT)	Min	Max	Unit
1	Gain	S_{21}	470 - 960 MHz	31	29	33	dB
2	Gain Variation	ΔG	470 - 960 MHz	+/- 0.5		+/- 0.75	dB
3	Input Return Loss	S_{11}	470 - 960 MHz	14	10		dB
4	Output Return Loss	S_{22}	470 - 960 MHz	14	10		dB
5	Reverse Isolation	S_{12}	470 - 960 MHz	40	35		dB
7	Output P _{1dB} compression	P _{1dB}	470 - 960 MHz	38			dBm
8	Output-Third-Order Interception point	IP ₃	Two-Tone, Pout 0 dBm each, 1 MHz separation	49			dBm
10	Current Consumption	I _{dd}	V _{dd} = +28 V	750			mA
11	Power Supply Voltage	V _{dd}		+28	+26	+30	V
12	Operating Temperature	T _o			-20	+85	°C
14	Maximum Average RF Input Power	P _{IN, MAX}	470 - 960 MHz			10	dBm

As shown in **Figure 1**, the typical gain of the WPM0510EPU is 31.0 dB across 470 MHz to 960MHz. The typical input and output return losses are 15 dB and better than 10 dB, respectively.

The output 1-dB compression point and IP₃ are shown in **Figure 2**. WPM0510EPU offers typical 38.0 dBm of P_{1dB} and 49.0 dBm of IP₃ with total output composite power of 30 dBm.

Figure 3 demonstrates the stability factor *k* of the amplifier. *k* is great than 1 in any frequency and thus the amplifier is unconditional stable.

Figure 4 is the block diagram of internal circuit of WPM0510EPU. It is a two-stage amplifier with the DC block capacitors at the input and output RF ports. All the RF matching networks, DC-DC converter, DC bias circuitries, and temperature compensation circuits are built in.

Figure 5 shows the mechanical outline of WPM0510EPU.

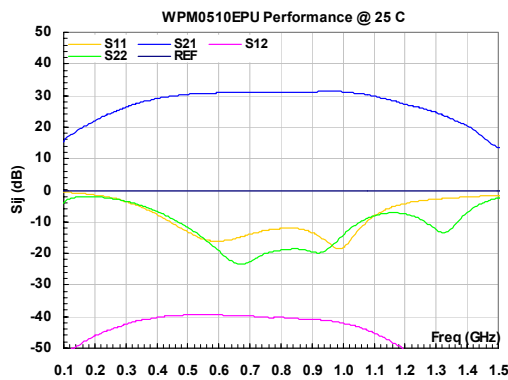


FIG. 1 Small signal performance of WBA0512AS

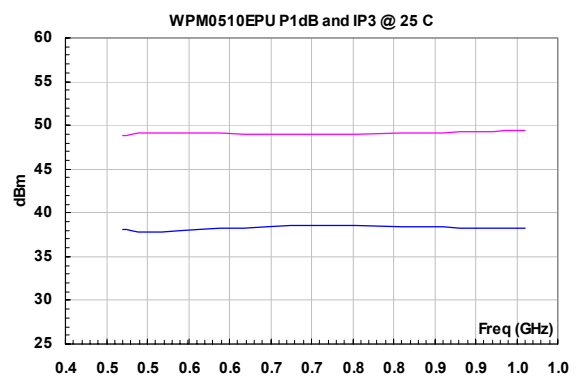


FIG. 2 Output 1-dB compression point and IP₃

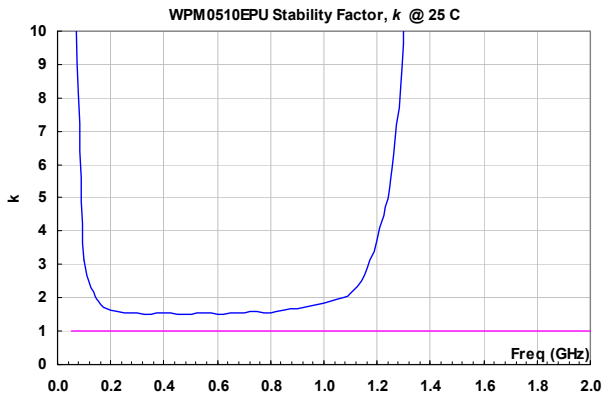


Fig. 3 Stability factor *k*

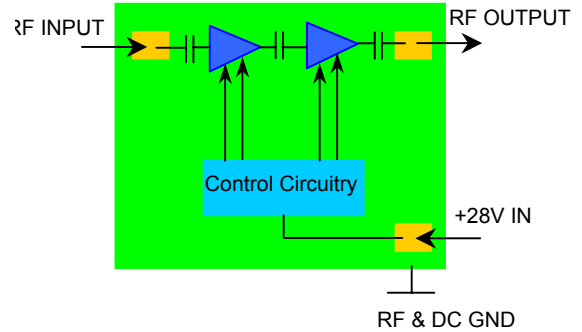


Fig. 4 Block diagram of WPM0510EPU

WPM0510EPU MECHANICAL OUTLINE:

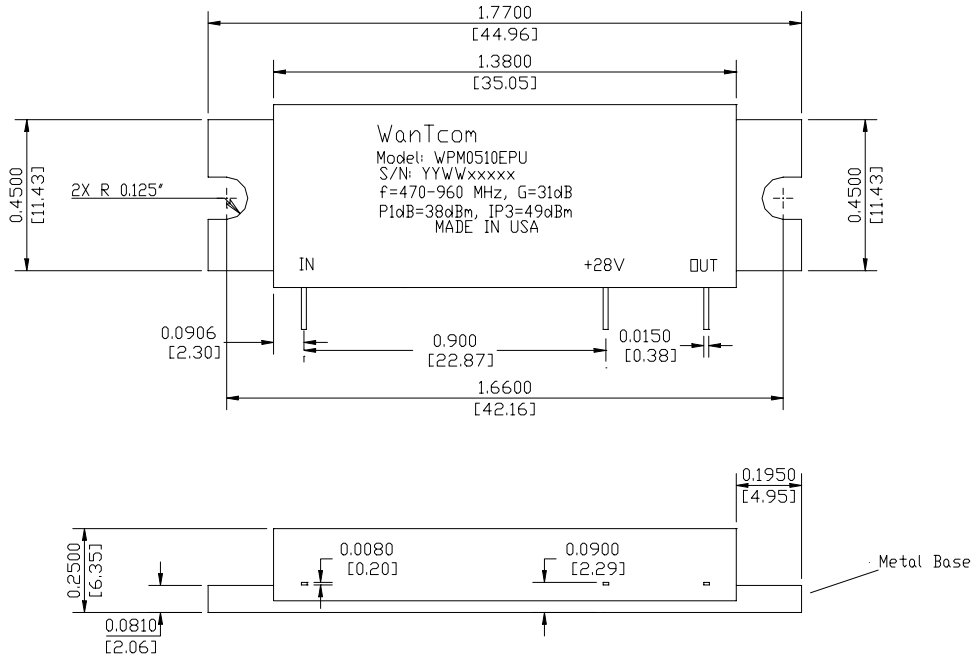


FIG. 5 WPM0510EPU Outline

ORDERING INFORMATION



Function	Normal
Model Number:	WPM0510EPU

SMALL SIGNAL S-PARAMETERS:

! WPM0510EPU
! Vdd =+28V, Idd = 750 mA, Ta= 25 C, Date: 9/27/04

ghz s ma r 50

0.05	0.961	159.8	2.447	166.3	0.000888	168.5	0.224	111.0
0.10	0.934	139.9	5.891	94.9	0.002482	97.7	0.641	-146.8
0.20	0.836	98.2	12.314	27.1	0.004907	37.4	0.783	147.1
0.30	0.657	51.1	20.107	-27.9	0.007602	-9.8	0.667	102.5
0.40	0.413	-1.1	27.663	-84.3	0.009674	-60.1	0.458	61.2
0.50	0.223	-57.2	32.421	-139.5	0.011000	-110.2	0.248	22.6
0.60	0.162	-121.1	34.177	167.9	0.011000	-158.0	0.101	-30.0
0.70	0.202	-178.3	34.478	117.3	0.010000	156.5	0.079	-137.6
0.80	0.246	136.8	34.437	68.2	0.009753	111.5	0.117	170.2
0.90	0.210	98.5	35.051	16.4	0.008982	65.8	0.106	157.2
1.00	0.125	125.4	35.214	-41.2	0.007880	15.9	0.196	-175.5
1.10	0.394	124.8	30.396	-102.7	0.005519	-33.8	0.392	152.5
1.20	0.611	86.8	22.731	-160.9	0.003058	-72.2	0.412	113.2
1.30	0.715	53.8	16.378	140.6	0.001487	-99.6	0.221	103.5
1.40	0.774	27.6	9.722	79.1	0.000320	-113.1	0.455	138.0
1.50	0.821	2.6	4.203	24.3	0.000553	0.5	0.758	105.9
1.60	0.847	-21.1	1.834	-26.9	0.001252	-17.7	0.872	77.1
1.70	0.855	-43.0	1.126	-72.0	0.001350	-36.1	0.911	53.4
1.80	0.847	-64.5	0.801	-96.3	0.001640	-73.0	0.908	33.6
1.90	0.784	-86.0	0.839	-121.8	0.001077	-85.0	0.928	17.5
2.00	0.689	-101.5	0.628	-139.2	0.000909	-82.1	0.944	0.6