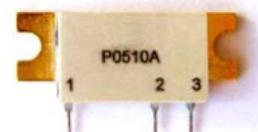


470 ~ 960 MHz Broadband Ultra Linear Power Amplifier¹



RPAM0510A is a broadband, high power, and high linearity amplifier. The amplifier offers exceptional ± 0.50 dB gain flatness, 31 dB gain, 35 dBm P1dB and 49 dBm output IP3 at output composite power of 29 dBm for the frequency range from 470 MHz to 960 MHz.

RPAM0510A 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.



(Actual size)

RPAM0510A is **RoHS compliant**.

Key Features:

Broad Frequency Range:	470 ~ 960 MHz
High Gain:	31 dB
High Power (P_{1dB}):	35 dBm
High Linearity (Output IP3):	49 dBm
Low Input VSWR:	1.5:1 (typical)
Low Output VSWR:	1.5:1 (typical)
Impedance:	50 Ohm
Single DC Supply:	0.95 A @ +10V
Wide Operating Temperature:	-40 ~ +85 °C
MTTF:	>10 ⁵ Hours

Absolute Maximum Ratings²:

Parameters	Symbol	Value	Units
DC Power Supply Voltage	V_{dd}	10.5	V
Drain Current	I_{dd}	1.05	A
Total Power Dissipation	P_{diss}	12	W
RF Input Power	$P_{in,Max}$	10	dBm
Junction Temperature	T_{jc}	175	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C
Maximum Operating Temperature	$T_{O,MAX}$	-40 ~ +85	°C
Thermal Resistance	$R_{th,jc}$	9	°C/W

Electrical Specifications: (at +25 °C)

Testing Item	Symbol	Test Constraints	Min	Nom	Max	Unit
Gain	S_{21}	470 ~ 960 MHz	29.5	31	32.5	dB
Gain Variation	ΔG	470 ~ 960 MHz		+/- 0.5	+/- 0.75	dB
Input Return Loss	S_{11}	470 ~ 960 MHz	12	14		dB
Output Return Loss	S_{22}	470 ~ 960 MHz	12	14		dB
Reverse Isolation	S_{12}	470 ~ 960 MHz	43	48		dB
Noise Figure	NF	470 ~ 960 MHz		3		dB
Output Power @ 1dB Gain Comp. Point	P_{1dB}	470 ~ 960 MHz	34.5	35		dBm
Output IP3	OIP3	2-Tone, Pout 24 dBm each, 1 MHz separation	47	49		dBm
Spurious		Single-Tone, $f_0 = 470$ MHz, $P_{out} = 25$ dBm		-73	-70	dBc
Current Consumption	I_{dd}	$V_{dd} = +10$ V	0.91	0.95	1.03	A
DC Power Supply Voltage	V_{dd}		+9	+10	+10.5	V
Thermal Resistance	$R_{th,c}$	Junction to case		6	9	°C/W
Junction Temperature	T_{jc}				+175	°C
Operating Temperature	T_o	Case temperature	-40		+85	°C
Maximum Average RF Input Power	$P_{IN,MAX}$	470 ~ 960 MHz			10	dBm

¹ Specifications are subject to change without notice.

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

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Frequency Response

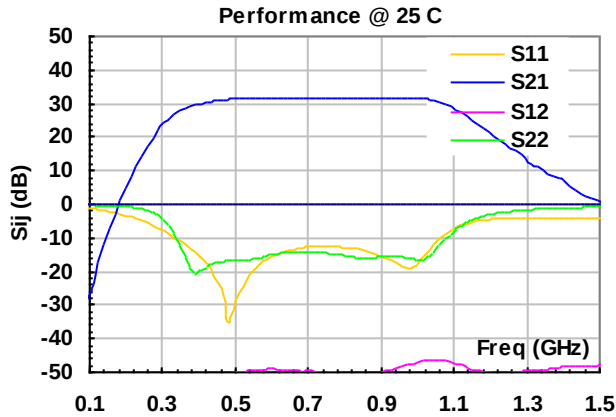


FIG. 1 Small signal performance

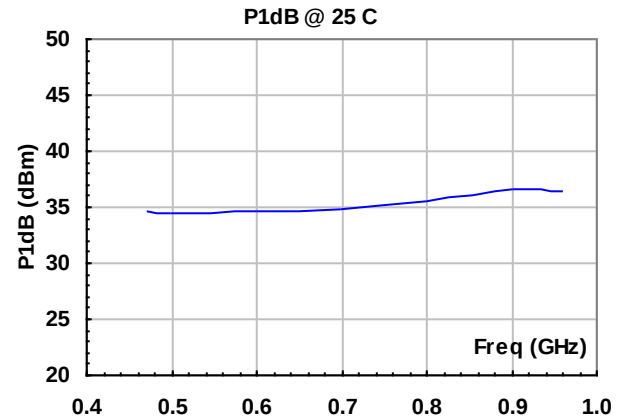


FIG. 2 Output 1-dB compression point

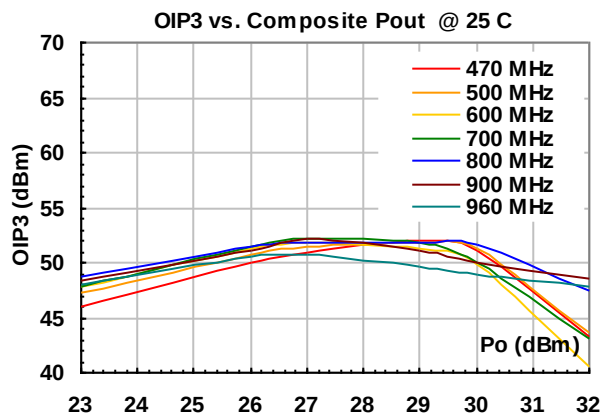


Fig. 3 Output IP_3 vs output power at different frequencies

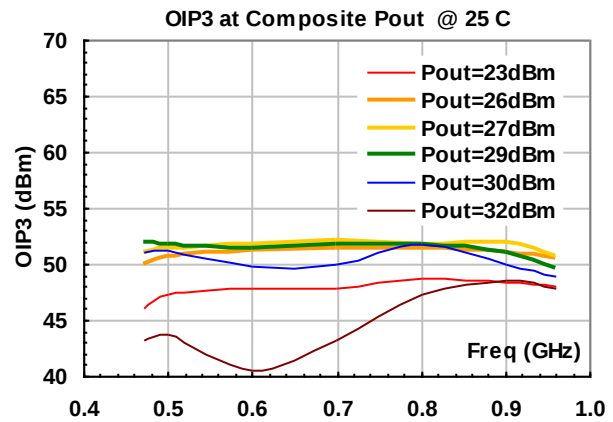


Fig. 4 Output IP_3 at composite output power

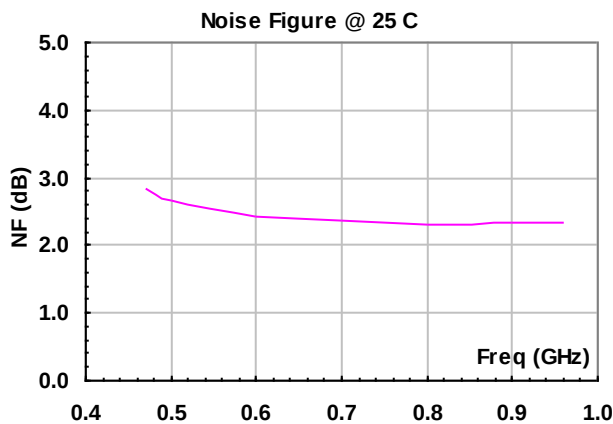


Fig. 5 Noise figure performance

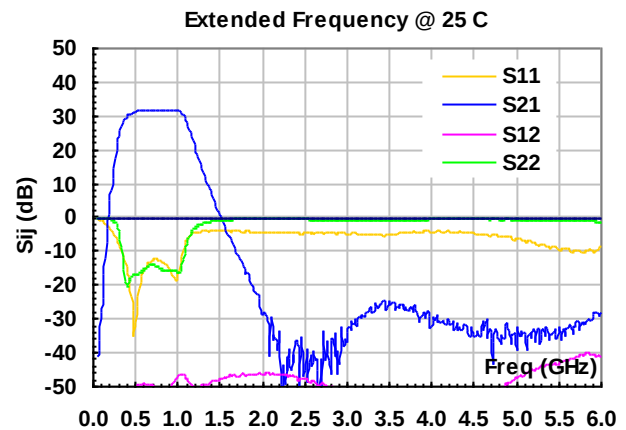


Fig. 6 Performance at the extended frequency

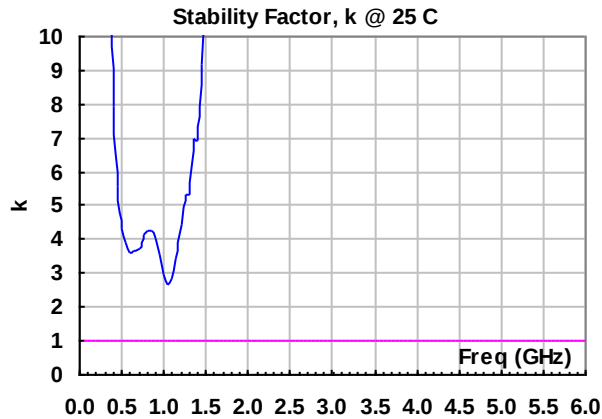


Fig. 7 Stability factor k

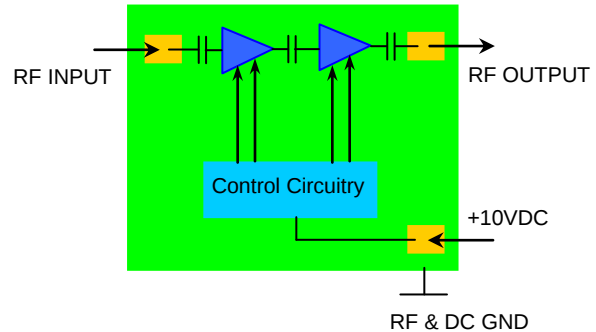
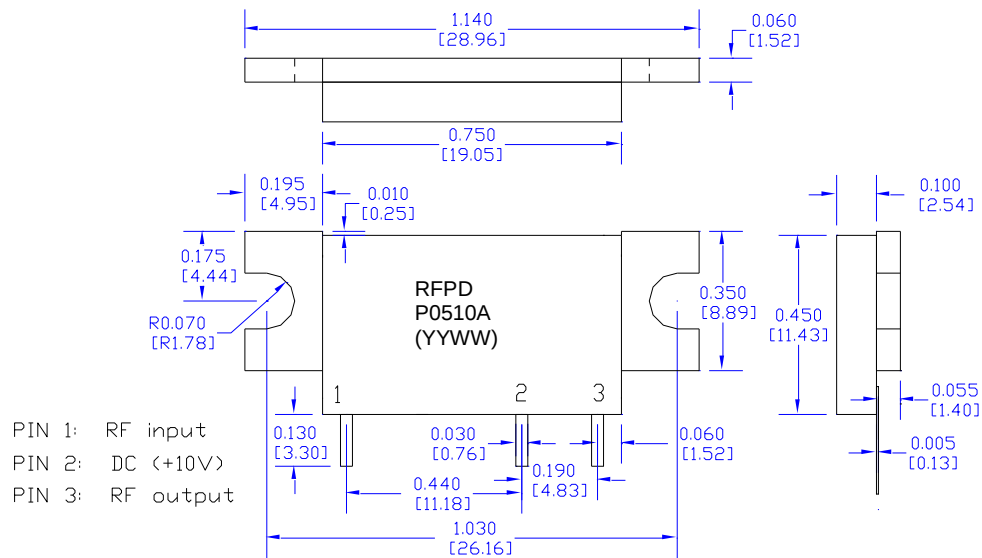


Fig. 8 Block diagram

Mechanical Outline (scale 2:1)



Ordering Information

Model Number: RPAM0510A

Device marking: P0510A

SMALL SIGNAL S-PARAMETERS:

RPAM0510A, S-parameters, including the test fixture.
 Vdd = +10V, Idd = 0.95A, Ta = 25 C, Date: 11/28/04

ghz s ma r 50

0.05	0.938	146.4	0.008	21.3	0.000089	53.4	0.979	164.1
0.1	0.877	112.3	0.045	-1.4	0.000249	48.7	0.968	146.7
0.2	0.678	42.1	1.799	-77.9	0.000238	12.7	0.933	104.0
0.3	0.414	-32.7	15.569	170.6	0.000548	-81.1	0.603	25.3
0.4	0.172	-107.6	30.697	52.6	0.001984	153.1	0.098	-151.4
0.5	0.031	41.0	36.669	-30.8	0.003123	85.2	0.142	141.3
0.6	0.170	-54.1	38.437	-100.3	0.003511	34.4	0.175	140.5
0.7	0.231	-112.5	38.114	-160.9	0.003317	-12.3	0.198	127.9
0.8	0.225	-162.2	37.683	143.2	0.002913	-67.8	0.171	122.0
0.9	0.168	145.1	37.546	85.8	0.003162	-139.3	0.164	132.6
1	0.127	12.9	37.617	18.9	0.004459	144.4	0.153	146.7
1.1	0.440	-103.3	26.508	-63.1	0.004401	80.4	0.403	173.9
1.2	0.595	-164.5	11.160	-128.5	0.003085	57.7	0.704	138.4
1.3	0.626	156.9	4.677	-171.4	0.003564	54.1	0.826	110.2
1.4	0.630	127.4	2.241	159.5	0.004012	42.7	0.882	88.5
1.5	0.623	103.4	1.080	138.5	0.004134	31.7	0.910	70.1
1.6	0.623	82.6	0.527	116.9	0.004467	16.4	0.928	53.7
1.7	0.624	61.9	0.277	94.8	0.004657	1.3	0.936	38.4
1.8	0.614	40.9	0.165	70.9	0.004763	-9.9	0.943	24.0
1.9	0.607	23.1	0.092	58.7	0.004764	-21.8	0.946	10.3
2	0.605	5.3	0.039	37.5	0.004881	-32.9	0.946	-3.5
2.1	0.599	-13.5	0.031	19.6	0.004599	-42.5	0.946	-16.9
2.2	0.590	-32.8	0.006	-53.1	0.004432	-53.3	0.945	-30.1
2.3	0.584	-49.2	0.008	-81.8	0.004093	-65.7	0.944	-43.5
2.4	0.595	-66.1	0.001	-89.9	0.004028	-75.3	0.941	-57.1
2.5	0.587	-85.2	0.005	165.9	0.003807	-84.5	0.937	-70.4
2.6	0.576	-102.6	0.007	113.5	0.003522	-90.4	0.932	-84.4
2.7	0.585	-117.6	0.016	-121.3	0.003267	-96.7	0.928	-98.4
2.8	0.594	-133.6	0.012	148.9	0.002755	-104.8	0.923	-112.4
2.9	0.584	-151.4	0.014	-176.9	0.002429	-114.6	0.922	-126.1
3	0.574	-166.9	0.023	-155.5	0.002117	-123.9	0.919	-140.7
3.1	0.579	178.4	0.028	177.8	0.001961	-138.7	0.912	-154.9
3.2	0.572	163.2	0.036	165.8	0.001667	-139.1	0.912	-168.5
3.3	0.543	150.7	0.046	138.9	0.001367	-145.7	0.914	177.7
3.4	0.545	140.7	0.054	109.7	0.001120	-159.2	0.915	163.7
3.5	0.572	129.2	0.057	76.4	0.001268	-169.2	0.919	150.7
3.6	0.580	115.7	0.044	52.5	0.000977	170.4	0.922	138.0
3.7	0.588	104.1	0.045	19.5	0.000767	162.5	0.922	124.8
3.8	0.614	92.4	0.039	13.7	0.000686	127.0	0.926	112.4
3.9	0.620	78.0	0.039	-4.5	0.000774	134.5	0.932	100.9
4	0.612	65.0	0.029	-26.3	0.000850	116.3	0.933	89.1
4.1	0.621	54.7	0.026	-41.1	0.000982	87.9	0.936	77.8
4.2	0.625	42.2	0.023	-68.2	0.001286	61.6	0.939	67.1
4.3	0.606	27.1	0.029	-65.0	0.001365	49.7	0.939	56.7
4.4	0.586	16.8	0.024	-80.8	0.001403	39.3	0.936	46.3
4.5	0.588	5.1	0.019	-87.8	0.001400	28.3	0.939	36.5
5	0.476	-69.8	0.017	-139.1	0.003300	-12.6	0.935	-12.8
5.5	0.333	-155.7	0.019	150.8	0.006236	-67.0	0.909	-61.7
6	0.370	127.0	0.041	85.0	0.008488	-166.7	0.868	-115.0

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