RLAC0510A

500 ~ 1000 MHz Super Low Noise Amplifier[1]

RLAC0510A is an ultra low noise figure, wideband, and unconditionally stable SMT packaged amplifier with exceptionally low input and output VSWR. The amplifier offers a typical 0.40 dB noise figure, 20 dB input and output return losses, 38.0 dB gain, 19 dBm output P1dB and 30 dBm OIP3 over the UHF, Cellular and GSM frequency bands from 500 MHz to 1000 MHz. It is most suitable for receivers, wireless data communications, and other measurement applications.
RLAC0510A is designed to meet the rugged standards of MIL-STD-202 and MILSTD-883.
Lead-Tin and **RoHS** compliant versions are both available.
A surface mount package version is also available, RLAS0510A.

Key Features:

Wide frequency range	500 ~ 1000 MHz
Ultra low noise:	0.40 dB
High OIP3:	30.0 dBm
Very low VSWR:	1.22:1
Impedance:	50 Ohm
Unconditional stable:	*k* >1
Single DC Supply:	100 mA @ +5.0V
MTBF[2]:	>600,000 hrs (68 Years)
Small Size:	1.00"x1.08"x0.41" (27.4x25.4x10.4mm)
Built-In Functions:	DC blocks at input and output ports, temperature compensation circuitry

Absolute Maximum Ratings[3]:

Parameters	Symbol	Value	Units
DC Power Supply Voltage	V_{dd}	7	V
Drain Current	I_{dd}	150	mA
Total Power Dissipation	P_{diss}	1000	mW
RF Input Power	$P_{In,Max}$	10	dBm
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{STG}	-65 ~ 150	°C
Maximum Operating Temperature	$T_{O,MAX}$	-55 ~ 100	°C

Electrical Specifications: (at room temperature)

Testing Item	Symbol	Test Constraints	Min	Nom	Max	Unit
Gain	S_{21}	500 ~ 1000 MHz	36	38	40	dB
Gain Variation	ΔG	500 ~ 1000 MHz		+/- 1.2	+/- 1.5	dB
Input VSWR	$VSWR_1$	500 ~ 1000 MHz		1.22	1.30	
Output VSWR	$VSWR_2$	500 ~ 1000 MHz		1.22	1.30	
Reverse Isolation	S_{12}	500 ~ 1000 MHz	40	45		dB
Noise Figure	NF	500 ~ 1000 MHz		0.40	0.55	dB
Output Power @ 1dB Gain Comp. Point	P_{1dB}	500 ~ 1000 MHz		19		dBm
Output IP3	OIP_3	2-Tone, Pout 0 dBm each, 1 MHz separation		30		dBm
Current Consumption	I_{dd}	V_{dd}= +5.0 V		100		mA
Power Supply Voltage	V_{dd}		+4.8[4]	+5.0	+5.2	V
Operating Temperature	T_o		-40		+85	oC
Maximum Average RF Input Power	$P_{IN,\ MAX}$	500 ~ 1000 MHz			10	dBm

[1] Specifications are subject to change without notice
[2] MTBF: Mean Time Between Failure, Per TR-NWT-000332, ISSUE 3, SEPTEMBER, 1990, T=40 °C
[3] Operation of this device above any one of these parameters may cause permanent damage.
[4] The lower DC supply voltage reduces the LNA performance.

Frequency Response

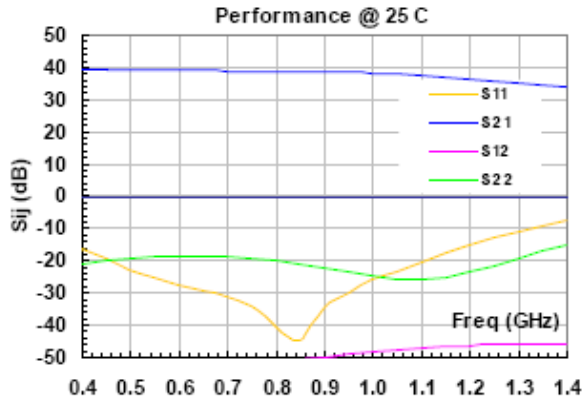


FIG. 1 Small signal performance.

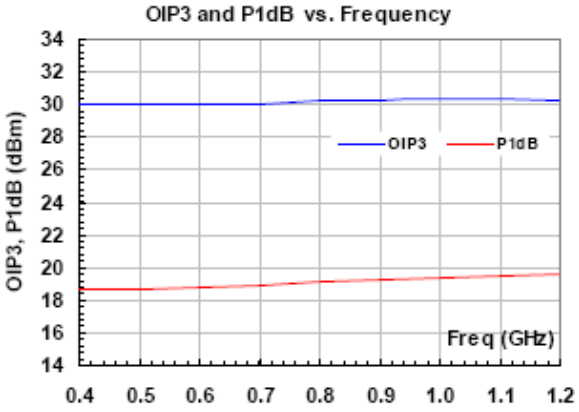


FIG. 2 P_{1dB} and OIP3 at room temperature.

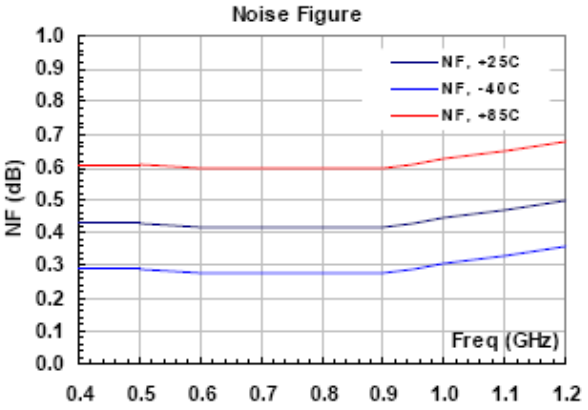


FIG. 3 Noise figure performance at full temperature

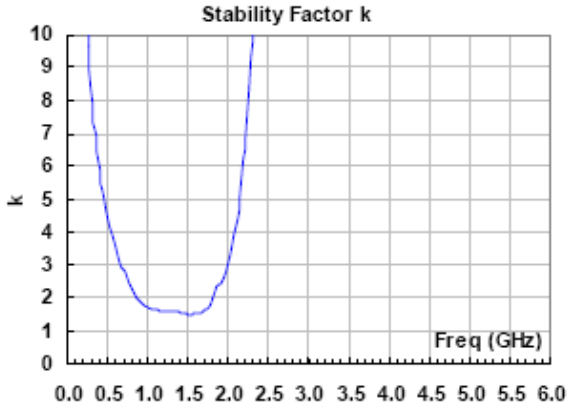


FIG. 4 Stability factor ***k***

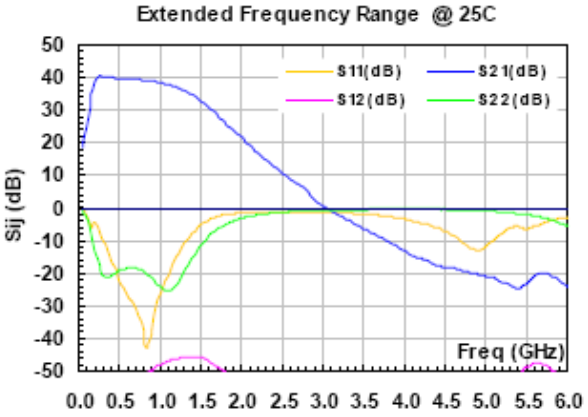


FIG. 5 Frequency response in extended frequency

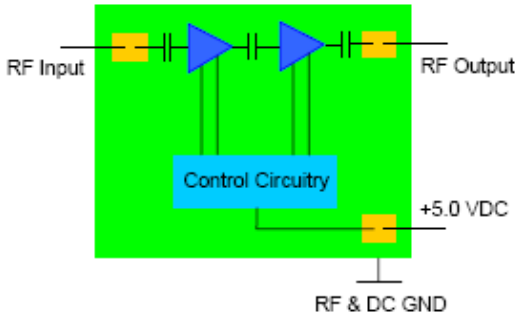
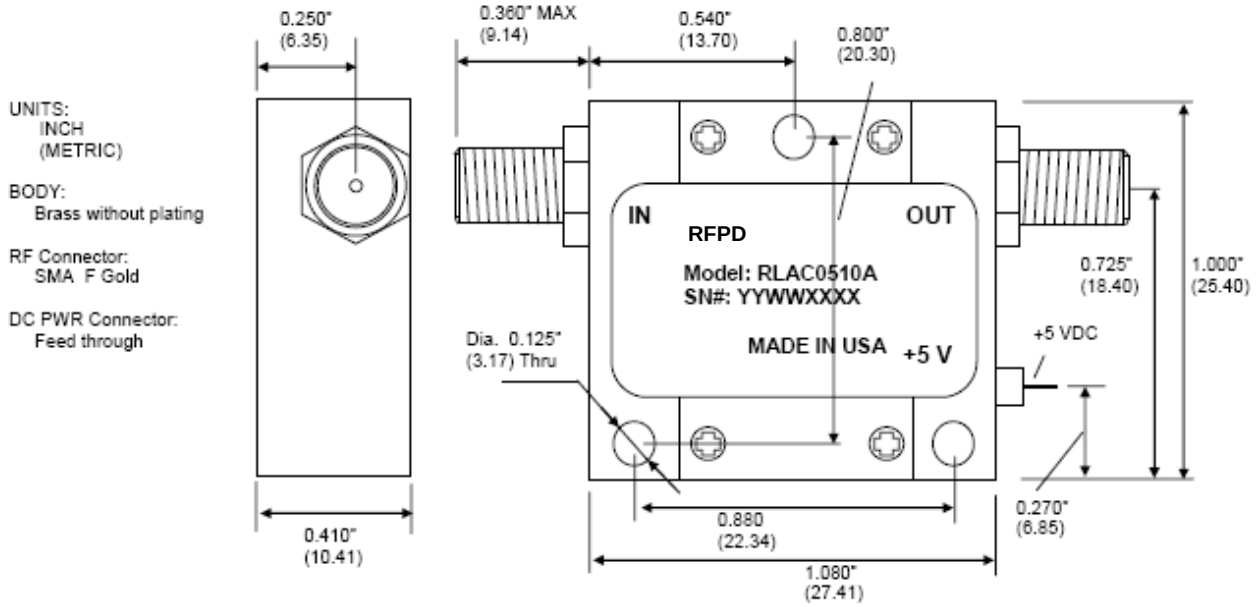


FIG. 6 Block diagram

Mechanical Outline:



Ordering Information

Part Number	Description
RLAC0510A	Lead-Tin
RLAC0510A-G	RoHS

Richardson RFPD, Inc.
40W267 Keslinger Road
P.O. Box 307
LaFox, IL 60147
Telephone: (800) 737-6937
(630) 208-2700
Fax: (630) 208-2662
Internet: www.richardsonrfpd.com