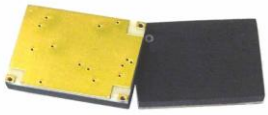
RichardsonRFPD
An Arrow Company

RLAS0205A

200 ~ 550 MHz Super Low Noise Amplifier[1]

RLAS0205A 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 0.50 dB noise figure, 22 dB input and output return losses, 43.0 dB gain, 18 dBm output P_{1dB} and 35 dBm OIP3 over the UHF frequency band from 200 MHz to 550 MHz. It is most suitable for receivers, wireless data communications, and other measurement applications.



RLAS0205A is designed to meet the rugged standards of MIL-STD-202 and MIL-STD-883.

RLAS0205A is **RoHS** compliant. A connectorized version is also available.

Key Features:

Wide frequency range:	200 ~ 550 MHz
Ultra low noise:	0.50 dB
High OIP3:	35.0 dBm
Very low VSWR:	1.18:1
Impedance:	50 Ohm
Unconditional stable:	*k* >1
Single DC Supply:	90 mA @ +5.0V
MTBF[2]:	>600,000 hrs (68 Years)
Small Size:	0.50"x0.35"x0.08" (SMT package)
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}	200 ~ 550 MHz		43		dB
Gain Variation	ΔG	200 ~ 550 MHz		+/- 0.75	+/- 1.0	dB
Input VSWR	$VSWR_1$	200 ~ 550 MHz		1.18	1.22	
Output VSWR	$VSWR_2$	200 ~ 550 MHz		1.18	1.22	
Reverse Isolation	S_{12}	200 ~ 550 MHz	42	45		dB
Noise Figure	NF	200 ~ 550 MHz		0.50	0.65	dB
Output Power @ 1dB Gain Comp. Point	P_{1dB}	200 ~ 550 MHz		18		dBm
Output IP3	OIP_3	2-Tone, Pout 0 dBm each, 1 MHz separation		35		dBm
Current Consumption	I_{dd}	V_{dd}= +5.0 V		90		mA
Power Supply Voltage	V_{dd}		+4.8[4]	+5.0	+5.2	V
Thermal Resistance	$R_{th,c}$	Junction to case			215	°C/W
Operating Temperature	T_o		-40		+85	°C
Maximum Average RF Input Power	$P_{IN,\ MAX}$	200 ~ 550 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

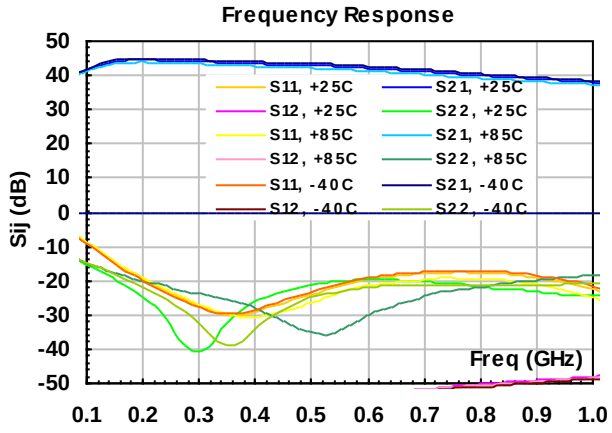


FIG. 1 Small signal performance.

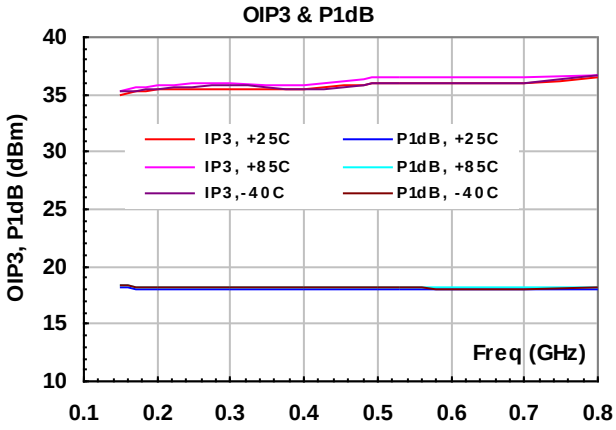


FIG. 2 P_{1dB} and OIP3 at room temperature.

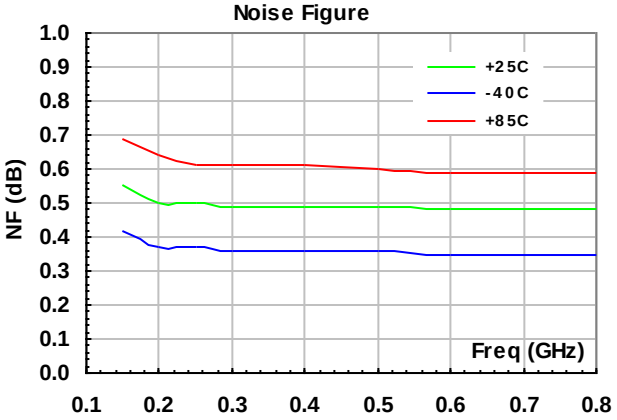


FIG. 3 Noise figure performance at full temperature

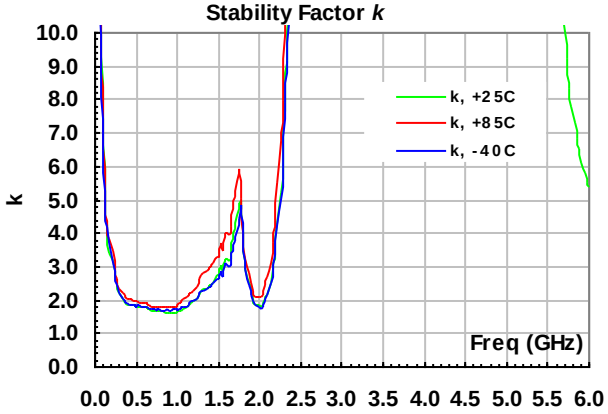


FIG. 4 Stability factor ***k***

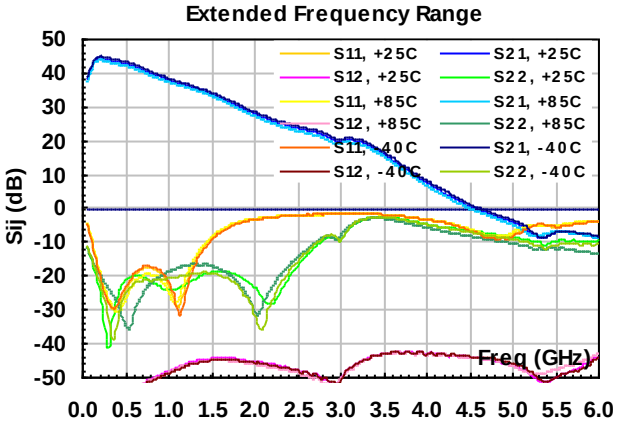


FIG. 5 Frequency response in extended frequency

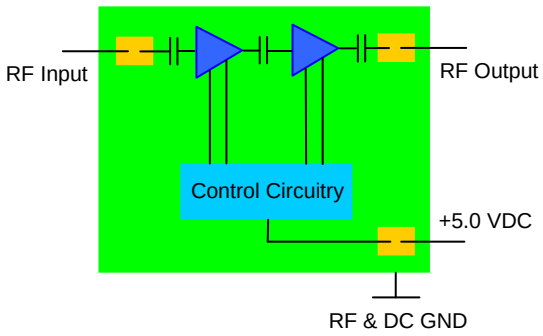


FIG. 6 Block diagram

Mechanical Outline: (2:1 ratio)

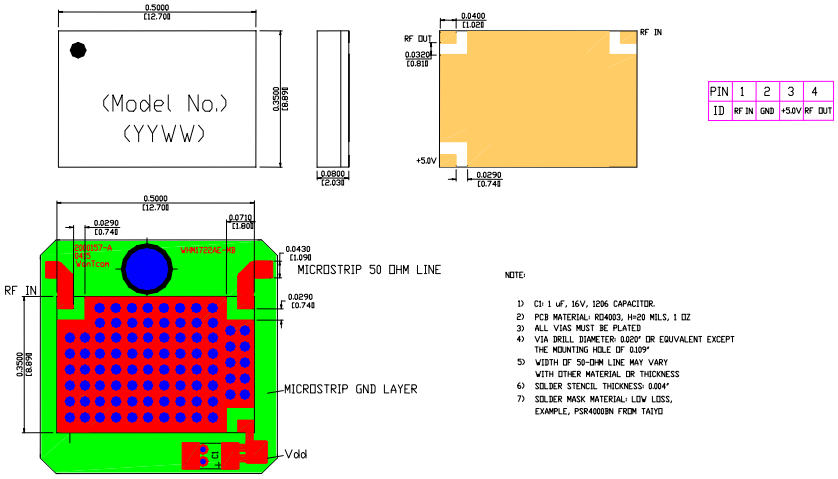


FIG. 7 Outline of standard package and recommended PCB layout.

Ordering Information

Model Number	RLAS0205A

RLAS0205A, @ +25C, including the test fixture
V_{dd} = +5.0 V, I_{dd} = 90 mA, Last update: 9/22/04
GHz s ma r 50

Freq (GHz)	MAGS11	ANGS11	MAGS21	ANGS21	MAGS12	ANGS12	MAGS22	ANGS22
0.05	0.545	13.5	64.502	124.6	0.0001	139.2	0.264	152.9
0.15	0.191	-89.6	138.511	32.6	0.0005	110.1	0.106	94.9
0.25	0.066	-127.1	158.085	-22.9	0.0008	89.4	0.026	68.4
0.35	0.031	-175.7	149.630	-58.6	0.0011	84.9	0.027	-165.8
0.45	0.047	120.2	141.316	-87.4	0.0015	77.0	0.070	165.1
0.55	0.083	83.8	131.864	-114.6	0.0019	67.2	0.097	128.8
0.65	0.116	49.4	118.810	-140.2	0.0024	56.8	0.102	90.1
0.75	0.131	19.3	104.710	-163.0	0.0027	49.1	0.090	52.2
0.85	0.122	-6.9	92.902	176.5	0.0032	40.8	0.074	12.8
0.95	0.093	-35.5	83.158	157.2	0.0037	32.3	0.062	-29.0
1.05	0.049	-76.9	75.318	138.4	0.0042	24.5	0.061	-73.5
1.15	0.043	166.9	68.718	119.6	0.0047	14.3	0.070	-116.3
1.25	0.120	114.6	62.600	100.7	0.0052	4.0	0.083	-154.2
1.35	0.215	87.2	56.748	81.6	0.0057	-7.3	0.096	175.1
1.45	0.319	63.5	50.975	62.5	0.0060	-19.3	0.111	147.5
1.55	0.416	42.2	45.115	43.6	0.0063	-31.6	0.117	119.8
1.65	0.507	22.3	39.581	25.2	0.0063	-43.0	0.116	93.0
1.75	0.582	3.4	34.435	7.7	0.0061	-54.0	0.107	68.5
1.85	0.640	-14.1	29.815	-8.5	0.0058	-63.6	0.091	44.6
1.95	0.679	-29.9	26.112	-23.3	0.0056	-72.0	0.076	18.7
2.05	0.711	-44.6	23.335	-37.8	0.0054	-81.1	0.057	-19.7
2.15	0.727	-57.8	20.762	-51.7	0.0051	-87.8	0.038	-77.0
2.25	0.755	-69.8	18.938	-65.0	0.0048	-95.3	0.045	-135.3
2.35	0.777	-82.1	17.455	-78.4	0.0047	-101.2	0.074	-171.4
2.45	0.794	-94.1	16.166	-91.7	0.0042	-105.1	0.120	163.0
2.55	0.807	-105.8	15.166	-105.3	0.0037	-112.3	0.172	139.2
2.65	0.816	-116.8	14.307	-119.2	0.0036	-117.1	0.231	118.4
2.75	0.818	-127.5	13.482	-134.2	0.0034	-121.5	0.305	97.1
2.85	0.827	-137.4	12.029	-149.5	0.0029	-120.2	0.374	71.1
2.95	0.843	-147.6	10.500	-159.3	0.0026	-106.2	0.341	46.1
3.05	0.856	-158.3	10.654	-168.9	0.0040	-96.3	0.426	48.2
3.15	0.852	-169.5	10.458	172.5	0.0048	-104.3	0.578	25.1
3.25	0.851	-179.9	9.462	153.3	0.0058	-115.2	0.674	-0.4
3.35	0.838	169.7	8.098	134.1	0.0065	-127.9	0.727	-25.5
3.45	0.819	159.5	6.688	116.0	0.0070	-140.3	0.743	-49.0
3.55	0.802	148.9	5.324	99.3	0.0073	-156.0	0.737	-70.8
3.65	0.784	140.0	4.135	84.6	0.0077	-167.8	0.713	-91.8
3.75	0.756	129.9	3.168	70.3	0.0075	-178.4	0.676	-111.0
3.85	0.730	119.8	2.420	56.3	0.0073	167.4	0.639	-128.1
3.95	0.699	110.8	1.878	42.5	0.0073	153.7	0.607	-144.5
4.05	0.665	102.1	1.494	28.1	0.0075	145.0	0.577	-160.9
4.15	0.629	92.5	1.217	13.5	0.0070	135.4	0.541	-176.2
4.25	0.591	83.8	1.038	-2.6	0.0064	124.3	0.520	169.5
4.35	0.544	76.2	0.900	-20.3	0.0066	111.7	0.504	154.5
4.45	0.501	68.7	0.832	-36.0	0.0065	102.3	0.481	138.6
4.95	0.373	66.4	0.899	-89.3	0.0049	47.3	0.379	66.2
5.45	0.536	31.8	0.874	-108.5	0.0029	37.1	0.313	1.5
5.95	0.638	-0.3	1.045	-131.5	0.0061	13.6	0.328	-90.3
6.00	0.643	-4.6	1.040	-133.4	0.0063	4.8	0.342	-96.4

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