AVANTEK

UTO/UTC 1501
Thin-Film Cascadable Amplifier
5 to 1500 MHz

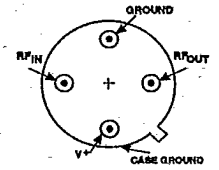
T-74-13-01

FEATURES

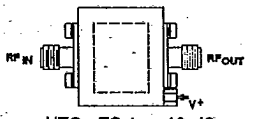
- Frequency Range: 5 to 1500 MHz
- Medium Gain: 10.0 dB (Typ)
- Low Supply Current

APPLICATIONS

- IF/RF Amplification
- Low Power Systems



UTO—TO-8U, p. 16–48



UTC—TC-1, p. 16–42

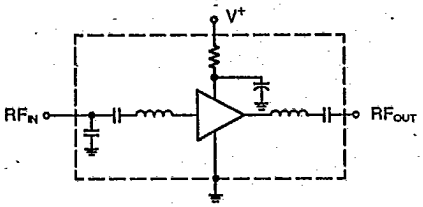
DESCRIPTION

The 1501 Series is a wideband, thin-film bipolar RF amplifier that incorporates resistive feedback and active bias to provide a stable and reliable gain stage. Inductively-coupled input and output networks provide good VSWR under all conditions. The 1501 Series amplifiers are available in either the TO-8 hermetic case or connectored TC-1 package.

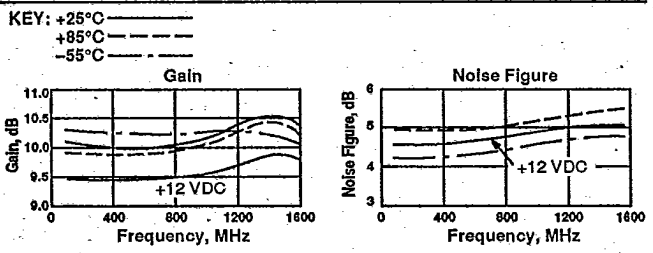
ELECTRICAL SPECIFICATIONS (Measured in a 50-ohm system @ +15 VDC nominal unless otherwise noted)

Symbol	Characteristic	Typical T_C = 25°C	Guaranteed Specifications T_C = 0° to 50°C	Guaranteed Specifications T_C = –55° to +85°C	Unit
BW	Frequency Range	5-1500	5-1500	5-1500	MHz
GP	Small Signal Gain (Min.)	10.0	9.0	8.5	dB
—	Gain Flatness (Max.)	±0.3	±0.5	±1.0	dB
NF	Noise Figure (Max.)	4.5	5.5	6.0	dB
$P_{1\,dB}$	Power Output @ +1 dB Compression (Min.)	+0.0	–3.0	–4.0	dBm
—	Input VSWR (Max.)	<1.5:1	2.0:1	2.0:1	—
—	Output VSWR (Max.)	<1.5:1	2.0:1	2.0:1	—
IP_3	Two Tone 3rd Order Intercept Point	+10.0	—	—	dBm
I_D	DC Current	10	—	—	mA

SCHEMATIC



TYPICAL PERFORMANCE OVER TEMPERATURE
(@ +15 VDC unless otherwise noted)



MAXIMUM RATINGS

DC Voltage	17 Volts
Continuous RF Input Power	+13 dBm
Operating Case Temperature	–55°C to +125°C
Storage Temperature	–62°C to +150°C
"R" Series Burn-In Temperature	+125°C

THERMAL CHARACTERISTICS*

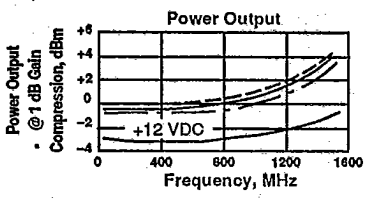
θ_{JC}	90°C/W
Active Transistor Power Dissipation	67 mW
Junction Temperature Above Case Temperature	6°C
MTBF (MIL-HDBK-217E, A_{UF} @ 90°C)	1,228,000 Hrs.

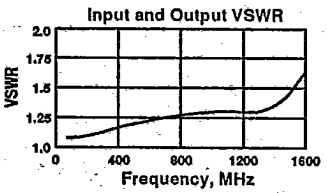
*For further information, see High Reliability section, p. 17–2.

WEIGHT: (typical) UTO—2.1 grams; UTC—21.5 grams

TYPICAL PERFORMANCE OVER TEMPERATURE (continued)

T-74-13-01





AUTOMATIC NETWORK ANALYZER MEASUREMENTS (Typical production unit @ +25°C ambient)

NUMERICAL READINGS

BIAS = 15.00 VOLTS

FREQ MHz	VSWR IN	GAIN dB	PHASE DEG	PHASE DEV	GPDEL ns	VSWR OUT	ISOL dB
100.0	1.10	10.19	164.95	-1.96	—	1.15	16.20
200.0	1.11	10.04	150.08	-2.11	.41	1.16	16.30
300.0	1.14	10.04	135.54	-1.94	.40	1.19	16.33
400.0	1.17	10.10	121.40	-1.36	.38	1.23	16.38
500.0	1.20	10.14	107.77	-.28	.38	1.26	16.39
600.0	1.24	10.13	94.43	1.08	.38	1.29	16.42
700.0	1.26	10.12	80.64	2.00	.39	1.32	16.45
800.0	1.31	10.16	66.67	2.74	.39	1.33	16.44
900.0	1.34	10.22	52.40	3.19	.41	1.35	16.43
1000.0	1.38	10.32	37.60	3.11	.42	1.35	16.42
1100.0	1.40	10.45	22.23	2.45	.43	1.36	16.40
1200.0	1.42	10.62	6.34	1.25	.46	1.36	16.38
1300.0	1.45	10.77	-10.21	-.58	.47	1.38	16.34
1400.0	1.51	10.89	-27.54	-3.20	.49	1.42	16.26
1500.0	1.64	10.97	-45.92	-6.86	.54	1.52	16.21
1600.0	1.89	10.74	-66.18	—	.57	1.67	16.28
1700.0	2.31	10.46	-86.81	—	.57	1.87	16.55
1800.0	2.91	9.77	-107.06	—	.56	2.10	17.04

LINEARIZATION RANGE: 100.0 to 1500.0 MHz

S-PARAMETERS

BIAS = 15.00 VOLTS

FREQ	S_{11}		S_{21}		S_{12}		S_{22}	
MHz	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang
100.00	.076	-171.7	9.97	165.4	-16.19	-6.0	.094	157.3
200.00	.080	-170.0	9.91	151.9	-16.25	-11.5	.101	135.5
300.00	.089	-169.4	9.82	138.2	-16.25	-17.5	.113	116.1
400.00	.097	-169.5	9.85	124.3	-16.31	-23.1	.126	100.3
500.00	.108	-173.5	9.91	110.8	-16.42	-29.2	.137	87.2
600.00	.118	-177.6	9.92	97.9	-16.42	-35.7	.146	76.0
700.00	.128	177.6	9.91	84.8	-16.42	-42.0	.151	64.9
800.00	.138	171.1	9.92	71.4	-16.42	-48.3	.153	55.5
900.00	.144	162.6	9.98	57.8	-16.48	-54.7	.153	45.8
1000.00	.150	152.7	9.98	44.0	-16.42	-61.1	.148	38.2
1100.00	.150	142.1	10.10	29.7	-16.36	-67.3	.142	31.1
1200.00	.150	127.0	10.18	14.8	-16.36	-74.4	.137	27.3
1300.00	.155	109.3	10.28	-.8	-16.31	-81.8	.134	23.9
1400.00	.166	85.2	10.38	-17.0	-16.25	-89.7	.137	23.1
1500.00	.194	59.8	10.41	-33.5	-16.19	-98.5	.150	20.5
1600.00	.242	35.1	10.31	-51.1	-16.19	-107.6	.175	16.8
1700.00	.315	12.9	10.12	-70.3	-16.25	-116.9	.208	7.9