AVANTEK

UTO/UTC 515 Series
Thin-Film Cascadable Amplifier
2 to 500 MHz

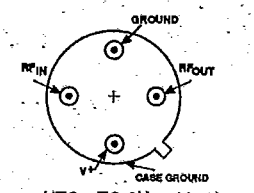
T-74-09-01

FEATURES

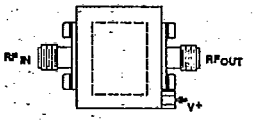
- Frequency Range: 2 to 500 MHz
- Medium Power Output: +15.5 dBm (Typ)
- Temperature Compensated

APPLICATIONS

- IF/RF Amplification



UTO—TO-8U, p.16–48.



UTC—TC-1, p. 16–42

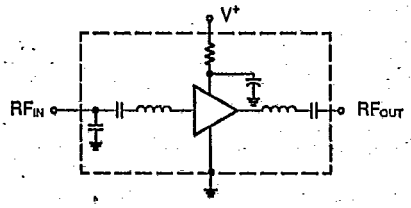
DESCRIPTION

The 515 Series is a thin-film bipolar RF amplifier that uses resistive feedback and active bias to provide temperature compensation and increased immunity to bias voltage variations. Blocking capacitors couple the RF through the amplifier. The 515 Series is 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	2-500	2-500	2-500	MHz
GP	Small Signal Gain (Min.)	12.5	12.0	11.0	dB
—	Gain Flatness (Max.)	±0.2	±0.5	±0.7	dB
NF	Noise Figure (Max.)	4.5	5.5	6.0	dB
P_{1dB}	Power Output @ +1 dB Compression (Min.)	+15.5	+14.0	+13.0	dBm
—	Input VSWR (Max.)	<1.3:1	2.0:1	2.0:1	—
—	Output VSWR (Max.)	<1.6:1	2.0:1	2.0:1	—
IP_3	Two Tone 3rd Order Intercept Point	+24.0	—	—	dBm
IP_2	Two Tone 2nd Order Intercept Point	+35.0	—	—	dBm
HP_2	One Tone 2nd Harmonic Intercept Point	+40.0	—	—	dBm
I_D	DC Current	65	—	—	mA

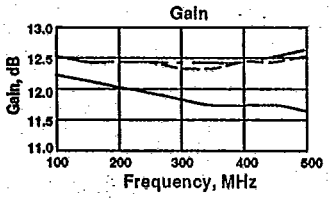
SCHEMATIC

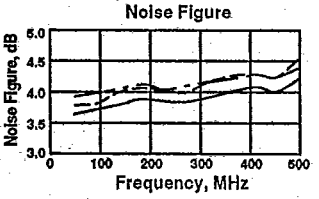


TYPICAL PERFORMANCE OVER TEMPERATURE

(@ +15 VDC unless otherwise noted)

KEY: +25°C ——— +85°C — — — –55°C —·— ·—





MAXIMUM RATINGS

DC Voltage	+17 Volts
Continuous RF Input Power	+13 dBm
Operating Case Temperature	–55°C to +100°C
Storage Temperature	–62°C to +150°C
"R" Series Burn-In Temperature	+100°C

THERMAL CHARACTERISTICS*

θ_{JC}	75°C/W
Active Transistor Power Dissipation	600 mW
Junction Temperature Above Case Temperature	45°C
MTBF (MIL-HDBK-217E, A_{UF} @ 90°C)	1,328,000 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)

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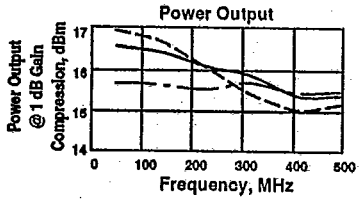

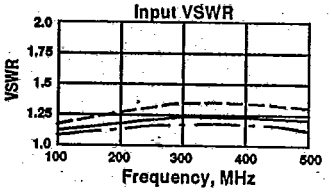

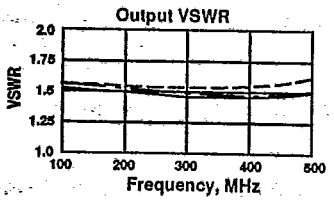

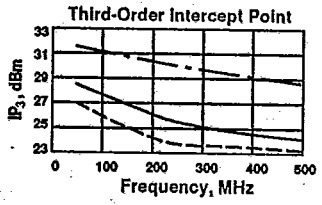

AUTOMATIC NETWORK ANALYZER MEASUREMENTS (Typical production unit @ +25°C ambient)

NUMERICAL READINGS

BIAS = 15.00 VOLTS

FREQ MHz	VSWR IN	GAIN dB	PHASE DEG	PHASE DEV	GPDEL ns	VSWR OUT	ISOL dB
100.0	1.21	12.87	152.97	–.70	—	1.30	21.72
150.0	1.20	12.86	139.61	–.60	.73	1.31	21.72
200.0	1.17	12.70	126.69	–.05	.72	1.31	21.69
250.0	1.14	12.70	113.72	.44	.72	1.33	21.67
300.0	1.11	12.64	100.88	1.06	.73	1.36	21.59
350.0	1.10	12.61	87.30	.95	.77	1.40	21.50
400.0	1.11	12.59	73.33	.45	.78	1.46	21.47
450.0	1.16	12.63	59.29	–.12	.80	1.55	21.40
500.0	1.25	12.71	44.50	–1.44	.83	1.67	21.39
550.0	1.37	12.76	29.34	—	.87	1.84	21.47
600.0	1.55	12.82	13.21	—	.98	2.09	21.63

LINEARIZATION RANGE: 100.0 to 500.0 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	.112	–18.6	13.16	151.4	–21.51	–14.1	.129	164.5
200.00	.090	–36.8	12.98	127.3	–21.51	–30.4	.133	146.1
300.00	.059	–42.3	12.97	100.2	–21.21	–47.6	.153	123.9
400.00	.036	5.2	12.88	72.5	–21.31	–67.5	.185	98.1
500.00	.094	42.2	12.84	44.0	–21.21	–90.9	.248	71.4
600.00	.208	37.1	12.86	12.7	–21.31	–115.5	.347	40.9
700.00	.408	20.4	12.85	–24.7	–22.38	–146.1	.487	7.2
800.00	.680	–5.2	11.30	–70.2	–25.68	–178.5	.549	–25.8
900.00	.880	–37.3	7.50	–115.2	–30.75	167.8	.523	–48.5
1000.00	.927	–61.4	2.54	–143.1	–33.15	166.8	.554	–58.6