



UTO/UTC 513 Series
Thin-Film Cascadable Amplifier
5 to 500 MHz

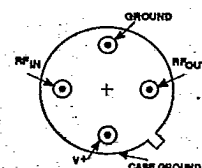
T.74-09-01

FEATURES

- Frequency Range: 5 to 500 MHz
- Medium Power Output:
+16 dBm (Typ)
- Medium Gain: 17 dB (Typ)
- Temperature Compensated
- 24-Volt Supply

APPLICATIONS

- IF/RF Amplification

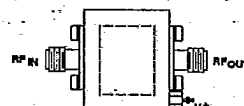


UTO—TO-8U, p. 16-48

DESCRIPTION

The 513 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

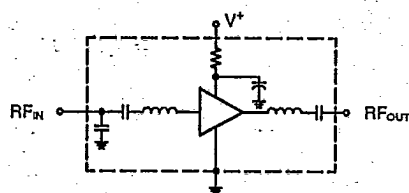
couple the RF through the amplifier. The 513 Series is available in either the TO-8 hermetic case or connected TC-1 package.



UTC—TC-1, p. 16-42

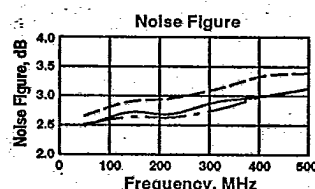
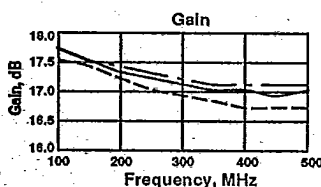
ELECTRICAL SPECIFICATIONS (Measured in a 50-ohm system @ +24 VDC nominal unless otherwise noted)

Symbol	Characteristic	Typical $T_0 = 25^\circ\text{C}$	Guaranteed Specifications		Unit
			$T_0 = 0^\circ$ to 50°C	$T_0 = -55^\circ$ to $+85^\circ\text{C}$	
BW	Frequency Range	5-500	5-500	5-500	MHz
GP	Small Signal Gain (Min.)	17.0	16.0	15.5	dB
—	Gain Flatness (Max.)	± 0.5	± 1.0	± 1.0	dB
NF	Noise Figure (Max.)	3.0	4.0	5.0	dB
$P_{1\text{dB}}$	Power Output @ +1 dB Compression (Min.)	+16.0	+14.0	+14.0	dBm
—	Input VSWR (Max.)	<1.5:1	2.0:1	2.0:1	—
—	Output VSWR (Max.)	<1.3:1	2.0:1	2.0:1	—
IP_3	Two Tone 3rd Order Intercept Point	+29.0	—	—	dBm
IP_2	Two Tone 2nd Order Intercept Point	+40.0	—	—	dBm
HP_2	One Tone 2nd Harmonic Intercept Point	+48.0	—	—	dBm
I_0	DC Current	50	—	—	mA

SCHEMATIC**TYPICAL PERFORMANCE OVER TEMPERATURE**

(@ +24 VDC unless otherwise noted)

KEY: +25°C —
+85°C —
-55°C —

**MAXIMUM RATINGS**

DC Voltage	+26 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_{JA}	85°C/W
Active Transistor Power Dissipation	260 mW
Junction Temperature Above Case Temperature	22°C
MTBF (MIL-HDBK-217E, A_{VR} @ 90°C)	1,221,000 Hrs.

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

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

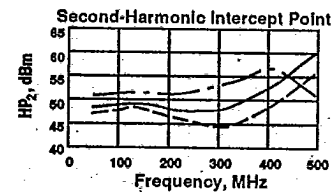
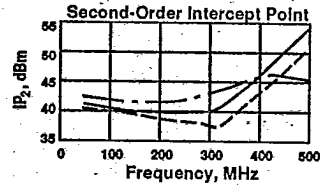
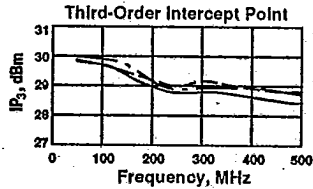
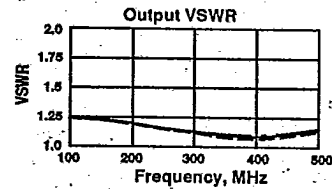
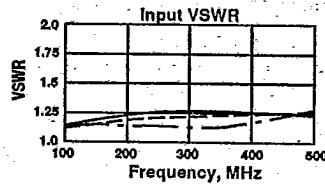
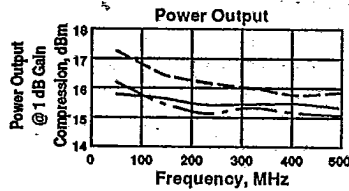
Avantek, Inc. • 481 Cottonwood Drive, Milpitas, CA 95035 • Contact your local representative, distributor or field sales office for further information. Listings are in the back of this Data Book.

AVANTEK INC

UTO/UTC 513 Series
Thin-Film Cascadable Amplifier

TYPICAL PERFORMANCE OVER TEMPERATURE (continued)

T-74-09-01



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

NUMERICAL READINGS

BIAS = 24.00 VOLTS

FREQ MHz	VSWR IN	GAIN dB	PHASE DEG	PHASE DEV	GPDEL ns	VSWR OUT	ISOL dB
100.0	1.17	17.18	151.55	-1.87	—	1.06	22.61
150.0	1.27	17.02	137.68	-.74	.79	1.08	22.75
200.0	1.36	17.00	123.18	-.42	.79	1.10	22.89
250.0	1.46	17.01	109.32	.53	.76	1.12	22.97
300.0	1.54	17.07	95.67	1.71	.77	1.14	23.18
350.0	1.60	17.10	81.47	2.32	.81	1.15	23.30
400.0	1.59	17.19	66.50	2.17	.88	1.18	23.35
450.0	1.50	17.27	49.83	.31	1.00	1.24	23.17
500.0	1.40	17.32	30.47	-4.21	1.16	1.34	22.66
550.0	1.59	16.95	8.04	—	1.29	1.50	22.00
600.0	2.38	15.83	-15.82	—	1.28	1.69	21.58
650.0	3.83	13.95	-37.86	—	1.11	1.84	21.84

LINEARIZATION RANGE: 100.0 to 500.0 MHz

S-PARAMETERS

BIAS = 24.00 VOLTS

FREQ MHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang
100.00	.076	-99.8	16.91	152.4	-22.73	-10.7	.028	85.7
150.00	.112	-107.9	16.84	139.2	-22.97	-15.6	.038	68.8
200.00	.147	-115.9	16.81	125.5	-23.10	-21.4	.046	49.0
250.00	.179	-126.2	16.85	111.6	-23.22	-26.9	.052	28.9
300.00	.208	-139.2	16.97	97.7	-23.22	-31.9	.055	6.9
350.00	.225	-154.5	17.09	83.5	-23.48	-36.3	.058	-21.7
400.00	.230	-177.3	17.27	68.2	-23.48	-40.0	.072	-55.9
450.00	.219	147.4	17.43	50.6	-23.10	-44.9	.102	-89.5
500.00	.234	94.3	17.42	30.3	-22.50	-51.0	.154	-120.4
550.00	.339	36.6	16.93	7.0	-21.83	-61.1	.222	-148.7