



**UTO/UTC 442 Series
Thin-Film Cascadable Amplifier
10 to 400 MHz**

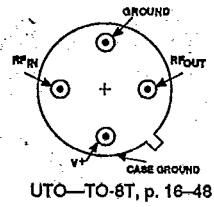
T-74-09-01

FEATURES

- Frequency Range: 10 to 400 MHz
- High Output Power:
+21.5 dBm (Typ)
- High Dynamic Range
- Temperature Compensated

APPLICATIONS

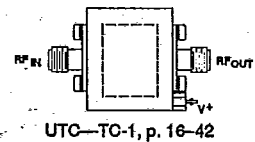
- IF/RF Amplification



DESCRIPTION

The 442 Series is a high-efficiency, medium-gain bipolar RF amplifier built on a thin-film substrate using output transformer coupling to increase efficiency. Blocking

capacitors couple the RF through the amplifier. The 442 Series is available in either the TO-8 hermetic case or connected TC-1 package.

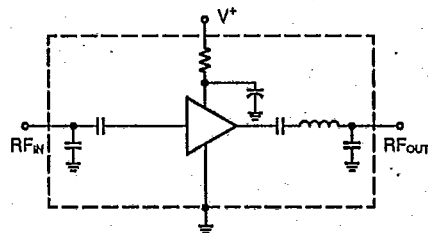


ELECTRICAL SPECIFICATIONS¹ (Measured in a 50-ohm system @ +15 VDC nominal unless otherwise noted)

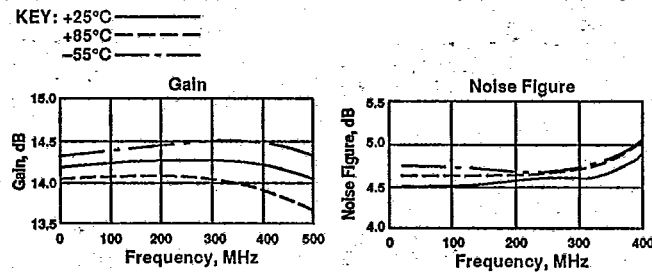
Symbol	Characteristic	Typical T _c = 25°C	Guaranteed Specifications		Unit
			T _c = 0° to 50°C	T _c = -55° to +85°C	
BW	Frequency Range	10-400	20-400	20-400	MHz
GP	Small Signal Gain (Min.)	14.0	13.0	12.5	dB
—	Gain Flatness (Max.)	±0.1	±0.7	±0.7	dB
NF	Noise Figure (Max.)	4.7	5.5	6.0	dB
P _{1dB}	Power Output @ +1 dB Compression (Min.)	+21.5	+20.0	+19.0	dBm
—	Input VSWR (Max.)	1.4:1	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	+33.0	—	—	dBm
IP ₂	Two Tone 2nd Order Intercept Point	+47.0	—	—	dBm
HP ₂	One Tone 2nd Harmonic Intercept Point	+54.0	—	—	dBm
I _b	DC Current	62	—	—	mA

NOTE: A portion of any DC voltage applied to the RF input pin will appear at the RF output pin (i.e., a resistive DC path exists between pins). There is no input or output blocking capacitor.

SCHEMATIC



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



MAXIMUM RATINGS

DC Voltage	+17 Volts
Continuous RF Input Power	+15 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	560 mW
Junction Temperature Above Case Temperature	42°C
MTBF (MIL-HDBK-217E, A _{VR} @ 90°C)	437,500 Hrs.

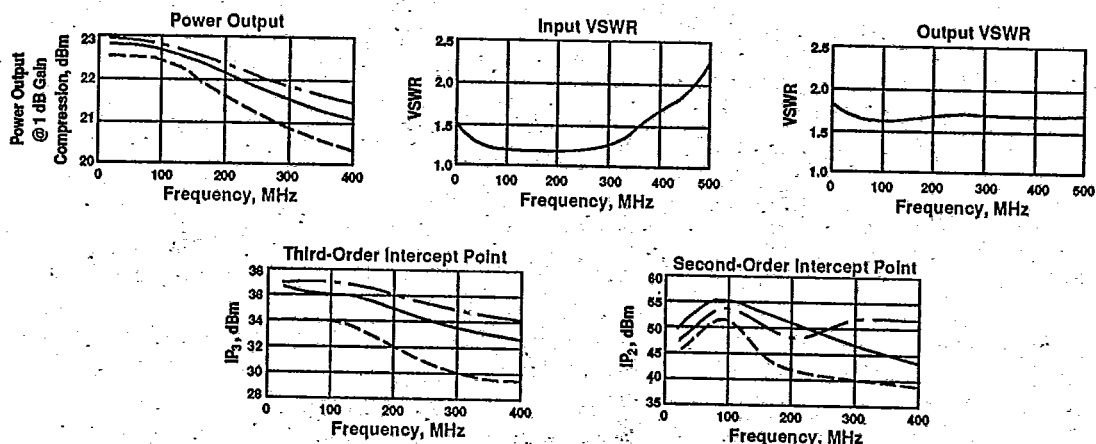
*For further information, see High Reliability section, p. 17-2.

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.

TYPICAL PERFORMANCE OVER TEMPERATURE (continued)

T-74-09-01



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	1.27	14.28	159.58	-10	.00	1.58	20.19
200.0	1.16	14.24	135.61	-18	.65	1.63	20.04
300.0	1.20	14.21	112.60	.69	.67	1.71	19.93
400.0	1.42	14.28	87.62	-39	.71	1.70	19.54
500.0	1.79	14.16	61.81		.75	1.66	18.97
600.0	2.18	13.35	33.33		.81	1.84	18.74
700.0	2.38	12.00	3.35		.79	2.48	18.14
800.0	2.25	10.16	-23.81		.71	3.47	19.82
900.0	2.03	7.96	-47.93		.61	4.50	20.78
1000.0	1.92	5.67	-67.95		.53	5.61	21.60
1100.0	1.91	3.48	-88.21		.51	6.50	22.37
1200.0	2.05	1.57	-104.37		.48	6.85	22.92
1300.0	2.37	-.24	-120.63		.44	7.29	23.45
1400.0	2.83	-1.95	-136.35		.48	7.97	23.82
1500.0	3.37	-3.61	-155.27		.50	9.08	24.33
1600.0	3.90	-4.97	-172.42		.45	9.81	25.05
1700.0	4.35	-6.42	-172.50		.43	12.30	25.83
1800.0	4.47	-7.58	156.80		.39	14.53	26.73
1900.0	4.26	-8.69	144.23		.37	16.73	27.88
2000.0	3.97	-9.10	129.81		.00	19.75	29.13

LINEARIZATION RANGE: 100.0 to 400.0 MHz

S-PARAMETERS

BIAS = 15.00 VOLTS

FREQ MHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang
100.00	.114	-174.4	14.267	159.5	-20.192	-6.4	.222	174.1
200.00	.078	-161.1	14.200	135.7	-20.036	-15.1	.236	169.9
300.00	.088	-110.1	14.200	112.5	-19.930	-24.0	.259	153.6
400.00	.173	-97.4	14.267	87.7	-19.535	-33.5	.255	122.8
500.00	.278	-107.8	14.108	62.4	-18.969	-45.4	.248	77.1
600.00	.375	-123.5	13.328	34.0	-18.737	-60.1	.301	17.3
700.00	.423	-137.5	12.030	4.4	-19.137	-76.4	.424	-30.4
800.00	.399	-148.3	10.245	-22.9	-19.818	-91.6	.548	-64.2
900.00	.347	-154.1	8.040	-47.3	-20.776	-104.6	.635	-87.7
1000.00	.316	-152.4	5.730	-67.1	-21.600	-115.9	.699	-104.6
1100.00	.320	-145.6	3.645	-85.6	-22.371	-126.0	.734	-116.7
1200.00	.358	-138.1	1.649	-104.1	-22.915	-137.3	.746	-127.0
1300.00	.410	-134.2	-.234	-119.9	-23.449	-149.5	.759	-135.9
1400.00	.480	-135.5	-1.931	-135.2	-23.823	-162.5	.780	-143.1
1500.00	.547	-140.3	-3.591	-154.4	-24.334	-177.1	.799	-148.7
1600.00	.601	-146.6	-4.917	-171.5	-25.052	168.4	.819	-154.1
1700.00	.631	-154.6	-6.355	173.5	-25.826	183.1	.852	-158.7
1800.00	.640	-161.5	-7.511	157.7	-26.731	140.7	.869	-163.1
1900.00	.631	-166.7	-8.626	144.9	-27.985	128.4	.887	-168.0
2000.00	.604	-171.7	-9.017	130.7	-29.130	117.6	.905	-172.5