



Thin-Film Cascadable Amplifier 5 to 500 MHz

Technical Data

UTO/UTC 519 Series

Features

- **Frequency Range: 5 to 500 MHz**
- **High Dynamic Range**
- **Output Power: +19 dBm (Typ)**
- **Noise Figure: 4.4 dB (Typ)**
- **Temperature Compensated**
- **Surface Mount Option**

Applications

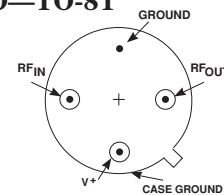
- **IF/RF Amplification**
- **Surface Mount Assembly**

Description

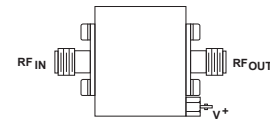
The 519 Series is a wideband, high-power RF amplifier for lower cost applications. Using output choke coupling and transistors on a thin-film substrate, this amplifier provides reliable and stable operation over wide temperature range. The 519 Series amplifiers are available in three packages: the surface mount PlanarPak PP-38 (.375 in. x .375 in.) case, the TO-8 hermetic case and the connectorized TC-1A case.

Pin Configuration

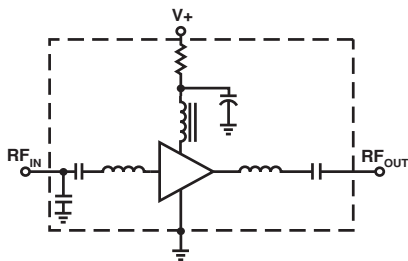
UTO—TO-8T



UTC—TC-1A



Schematic



Maximum Ratings

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

Thermal Characteristics¹

θ_{JC}	75°C/W
Active Transistor Power Dissipation	637 mW
Junction Temperature Above Case Temperature	48°C
MTBF (MIL-HDBK-217E, A_{UF} @ 90°C)	785,200 Hrs.

Weight: (typical) PPA—0.5 grams; UTO—2.1 grams; UTC—21.5 grams

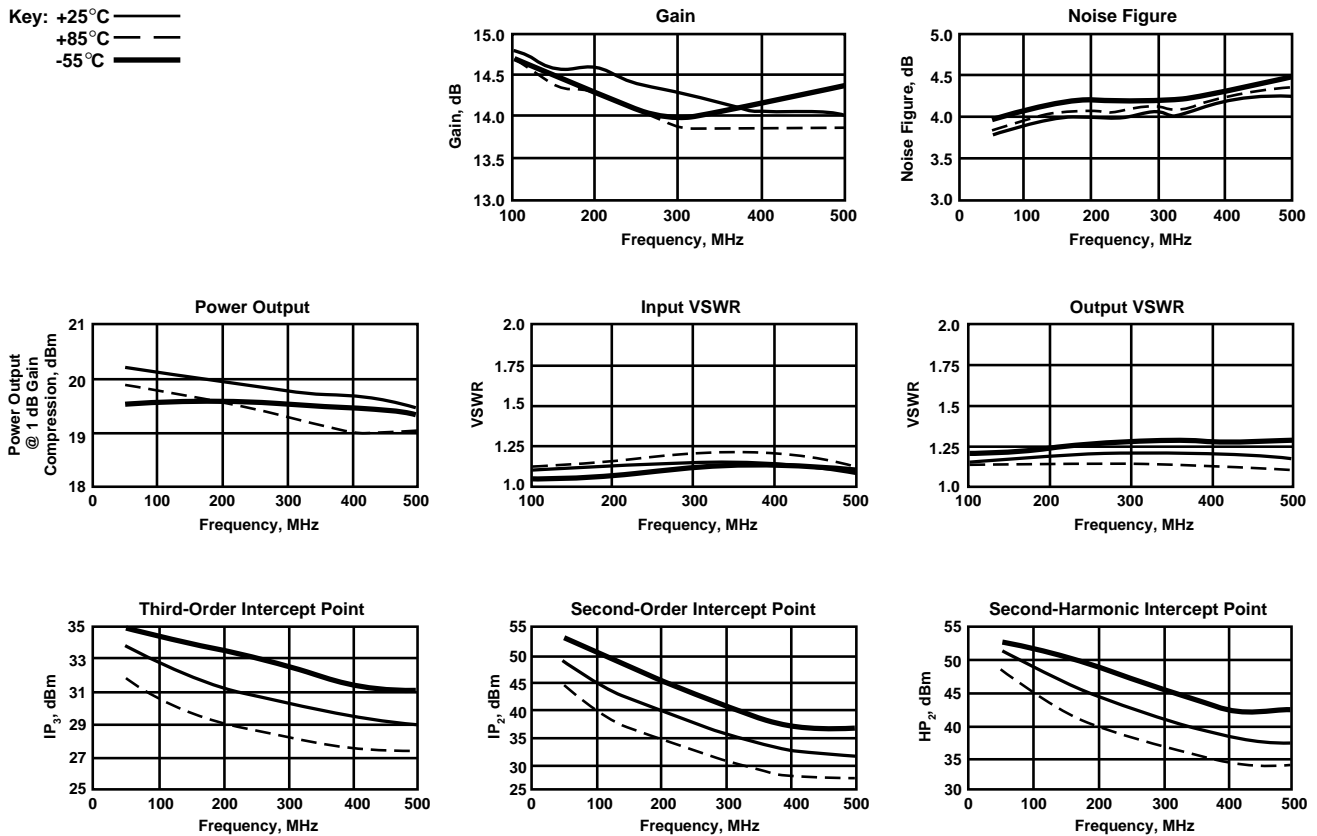
Electrical Specifications

(Measured in 50 Ω system @ +15 VDC nominal unless otherwise noted)

Symbol	Characteristic	Typical $T_C = 25^\circ\text{C}$	Guaranteed Specifications		Unit
			$T_C = 0 \text{ to } 50^\circ\text{C}$	$T_C = -55 \text{ to } +85^\circ\text{C}$	
BW	Frequency Range	5-500	5-500	5-500	MHz
GP	Small Signal Gain (Min.)	14.3	13.0	12.0	dB
—	Gain Flatness (Max.)	± 0.3	± 0.7	± 1.0	dB
NF	Noise Figure (Max.)	4.4	5.5	6.0	dB
P _{1dB}	Power Output @ +1 dB Comp. (Min.)	+19.0	+18.0	+17.0	dBm
—	Input VSWR (Max.)	<1.2:1	2.0:1	2.0:1	—
—	Output VSWR (Max.)	<1.2:1	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	+31.0	—	—	dBm
HP ₂	One Tone 2nd Harmonic Intercept Point	+37.0	—	—	dBm
I _D	DC Current	70	—	—	mA

Typical Performance Over Temperature (@ +15 VDC unless otherwise noted)

Key: +25°C —
+85°C —
-55°C —



Automatic Network Analyzer Measurements (Typical production unit @ +25°C ambient)

Numerical Readings
Bias = 15.00 Volts

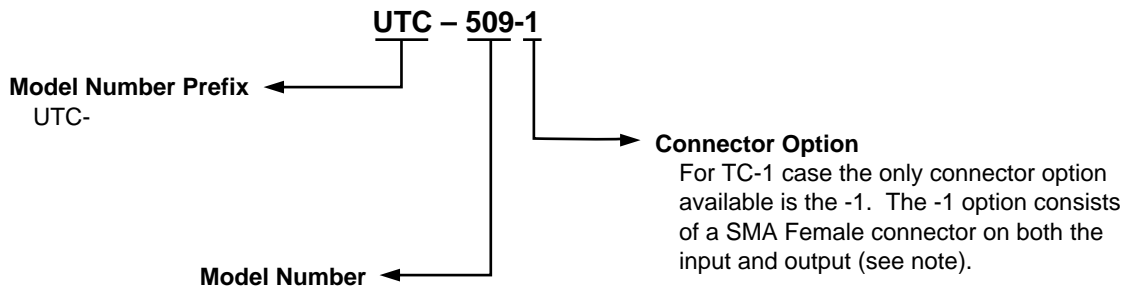
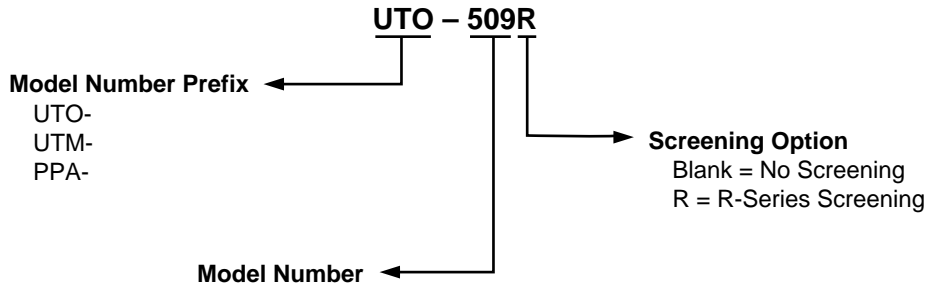
FREQUENCY MHz	VSWR IN	GAIN dB	PHASE DEGREES	PHASE DEV	GROUP DELAY ns	VSWR OUT	ISOLATION dB
100.0	1.07	14.86	166.21	-.29	.00	1.02	19.06
150.0	1.07	14.84	159.21	-.43	.37	1.03	18.88
200.0	1.08	14.77	152.92	.13	.36	1.04	19.03
250.0	1.08	14.68	146.17	.24	.37	1.06	19.09
300.0	1.07	14.60	139.50	.44	.38	1.09	19.12
350.0	1.06	14.48	132.61	.42	.39	1.13	19.17
400.0	1.04	14.38	125.62	.30	.40	1.17	19.25
450.0	1.04	14.30	118.19	-.27	.40	1.22	19.27
500.0	1.08	14.24	111.04	-.54	.39	1.28	19.27
550.0	1.14	14.20	104.00	—	.41	1.34	19.26
600.0	1.23	14.06	96.11	—	.43	1.41	19.22
650.0	1.35	13.87	88.55	—	.45	1.47	19.31
700.0	1.50	13.66	80.04	—	.49	1.53	19.37
750.0	1.68	13.41	70.84	—	.52	1.59	19.47
800.0	1.93	13.11	61.30	—	.52	1.63	19.46
850.0	2.27	12.87	52.03	—	.52	1.65	19.84
900.0	2.70	12.44	42.73	—	.52	1.65	19.93
950.0	3.26	11.85	33.36	—	.55	1.62	20.57
1000.0	3.99	11.18	22.87	—	.55	1.58	21.05
1050.0	4.79	10.27	13.61	—	.52	1.55	21.65
1100.0	5.82	9.26	4.24	—	.50	1.52	22.48
1150.0	6.98	7.96	-4.41	—	.45	1.50	23.38
1200.0	8.00	6.66	-12.05	—	.42	1.51	24.10
1250.0	8.80	5.23	-19.40	—	.36	1.53	25.42
1300.0	9.81	3.82	-25.15	—	.31	1.57	26.28
1350.0	11.49	2.45	-30.63	—	.29	1.62	27.57
1400.0	12.57	.82	-35.56	—	.24	1.67	28.80
1450.0	12.66	-.63	-39.43	—	.23	1.71	29.61
1500.0	12.82	-2.16	-43.90	—	.00	1.75	30.21

LINEARIZATION RANGE: 100.0 to 500.0 MHz

S-Parameters
Bias = 15.00 Volts

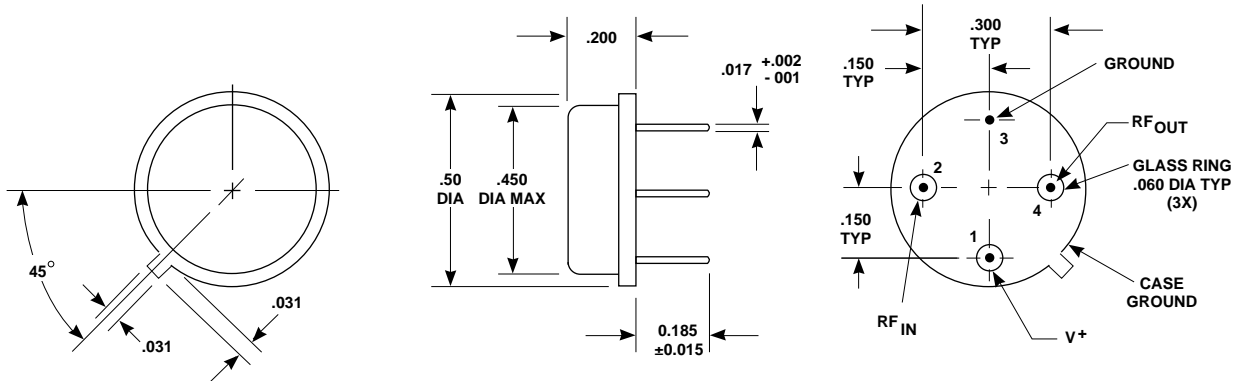
FREQUENCY MHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang
100.00	.034	-132.5	14.816	165.1	-18.942	-4.0	.012	92.9
200.00	.037	-132.6	14.737	150.5	-18.954	-10.3	.018	-4.2
300.00	.031	-133.2	14.587	136.0	-19.137	-16.5	.046	-29.2
400.00	.019	-98.7	14.366	120.9	-19.310	-23.4	.081	-53.1
500.00	.039	-22.5	14.208	105.2	-19.265	-31.4	.125	-72.9
600.00	.107	-21.7	14.044	89.4	-19.267	-39.9	.169	-92.2
700.00	.196	-27.2	13.645	72.2	-19.336	-49.2	.209	-112.3
800.00	.320	-39.3	13.122	52.2	-19.528	-60.0	.235	-135.5
900.00	.455	-52.3	12.451	32.1	-19.959	-71.7	.246	-162.1
1000.00	.600	-66.9	11.160	11.3	-21.060	-85.6	.223	165.4
1100.00	.709	-81.0	9.195	-8.4	-22.488	-98.3	.201	124.5
1200.00	.777	-92.8	6.628	-26.1	-24.144	-107.9	.198	82.8
1300.00	.823	-102.7	3.807	-40.1	-26.350	-115.9	.216	46.3
1400.00	.852	-109.8	.815	-52.0	-28.799	-124.2	.248	21.1
1500.00	.871	-114.9	-2.146	-61.2	-30.242	-128.0	.277	3.8
1600.00	.870	-119.4	-5.149	-69.7	-32.149	-131.4	.289	-9.4
1700.00	.891	-123.2	-7.756	-75.5	-33.359	-133.2	.297	-22.5
1800.00	.887	-127.1	-10.407	-79.7	-34.754	-131.2	.295	-33.8
1900.00	.937	-130.8	-13.149	-85.6	-35.497	-136.3	.288	-45.1
2000.00	.928	-133.9	-15.936	-90.3	-36.142	-139.2	.273	-60.5

Product Options



Note: R-Series screening is not available in the TC-1 case as the case is non-hermetic.

Case Drawings TO-8T



APPROXIMATE WEIGHT 2.1 GRAMS

- NOTES (UNLESS OTHERWISE SPECIFIED):
 1. DIMENSIONS ARE SPECIFIED IN INCHES
 2. TOLERANCES: xx ± .02
 xxx ± .010

TC-1A

