



Thin-Film Cascadable Amplifier 5 to 500 MHz

Technical Data

UTO/UTC 518 Series

Features

- **Frequency Range: 5 to 500 MHz**
- **High Dynamic Range**
- **High Power Output: +24.5 dBm (Typ)**
- **Noise Figure: 5.5 dB (Typ)**
- **Temperature Compensated**

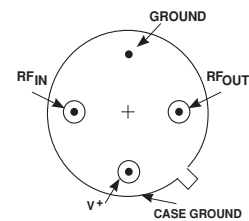
Applications

- **IF/RF Amplification**
- **Output Stage**

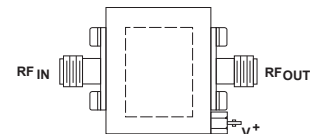
Description

The 518 Series is a thin-film high-power RF amplifier that uses two transistors in parallel for better RF and thermal performance. Resistive feedback and active bias provide temperature compensation and increased immunity to bias voltage variations. Blocking capacitors couple the RF through the amplifier. The 518 Series is available in either the TO-8 hermetic case or connected TC-1A package.

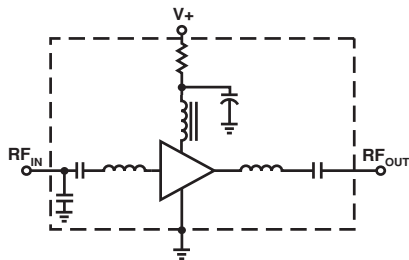
Pin Configuration UTO—TO-8T



UTC—TC-1A



Schematic



Maximum Ratings

Parameter	Maximum
DC Voltage	+17 Volts
Continuous RF Input Power	+15 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	580 mW
Junction Temperature Above Case Temperature	43°C
MTBF (MIL-HDBK-217E, A_{UF} @ 90°C)	422,100 Hrs.

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

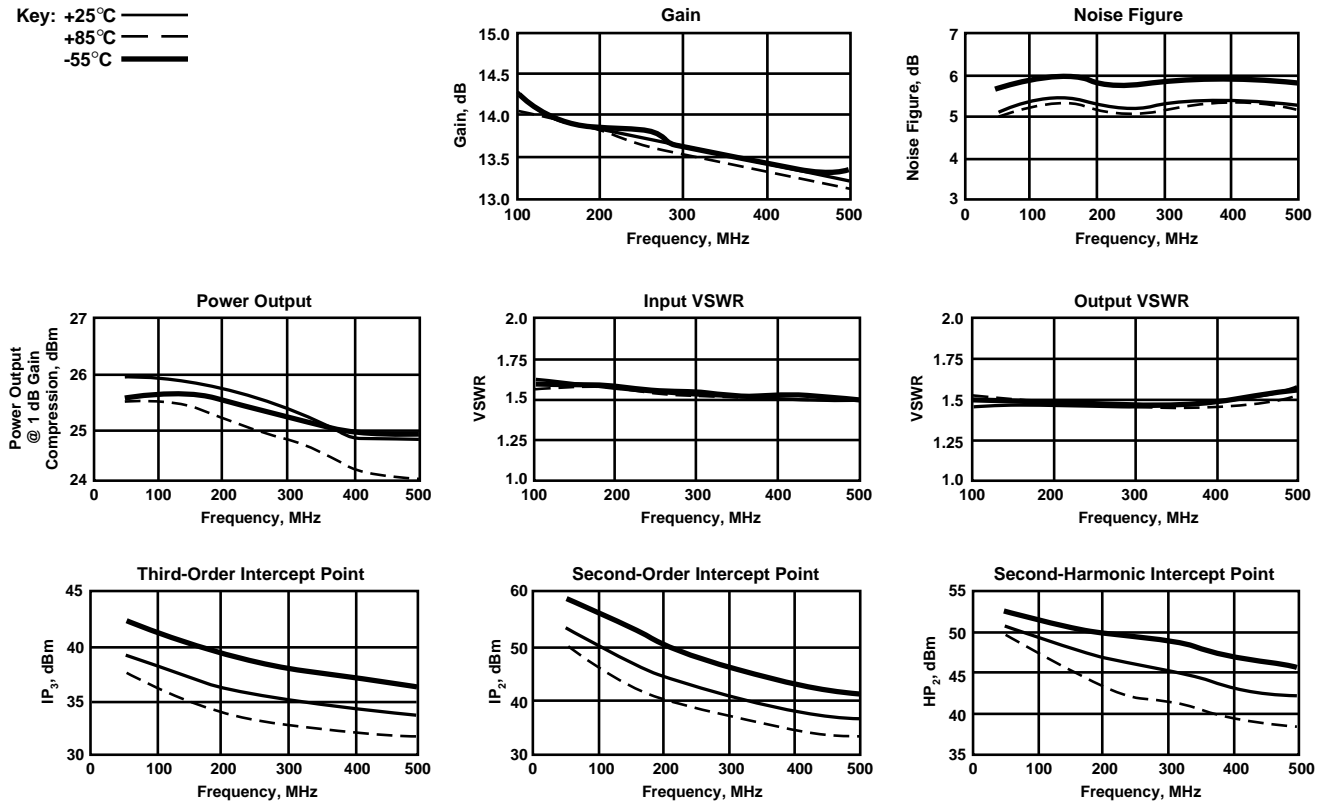
Electrical Specifications

(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.)	13.7	13.0	12.0	dB
—	Gain Flatness (Max.)	± 0.4	± 0.7	± 1.0	dB
NF	Noise Figure (Max.)	5.5	6.0	6.5	dB
$P_{1\text{dB}}$	Power Output @ +1 dB Comp. (Min.)	+24.5	+22.5	+22.0	dBm
—	Input VSWR (Max.)	<1.5:1	2.0:1	2.0:1	—
—	Output VSWR (Max.)	<1.51	2.0:1	2.0:1	—
IP_3	Two Tone 3rd Order Intercept Point	+35.0	—	—	dBm
IP_2	Two Tone 2nd Order Intercept Point	+36.0	—	—	dBm
HP_2	One Tone 2nd Harmonic Intercept Point	+41.0	—	—	dBm
I_D	DC Current	130	—	—	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

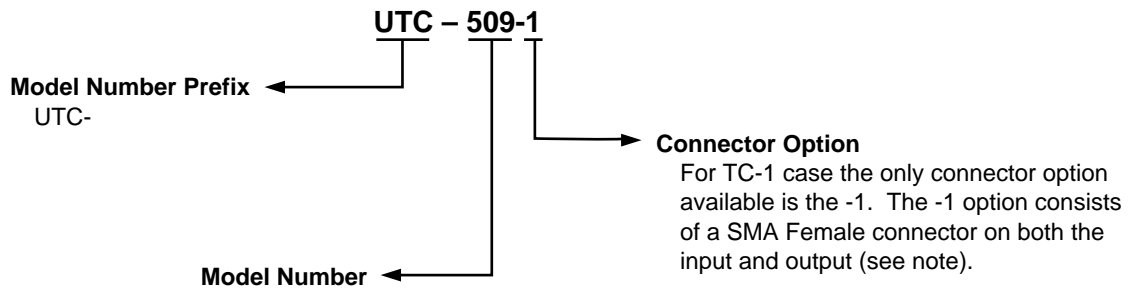
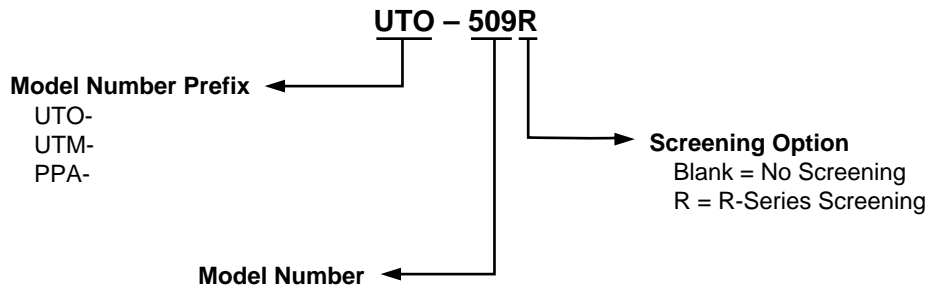
FREQUENCY MHz	VSWR IN	GAIN dB	PHASE DEGREES	PHASE DEV	GROUP DELAY ns	VSWR OUT	ISOLATION dB
100.0	1.17	14.40	165.43	-.32	.00	1.08	18.69
150.0	1.21	14.36	158.09	-.33	.39	1.09	18.59
200.0	1.27	14.29	151.34	.26	.39	1.12	18.59
250.0	1.32	14.20	143.97	.25	.41	1.15	18.53
300.0	1.36	14.13	136.63	.25	.41	1.19	18.41
350.0	1.38	13.99	129.39	.35	.41	1.25	18.40
400.0	1.38	13.92	121.85	.15	.43	1.31	18.29
450.0	1.37	13.83	114.01	-.34	.42	1.39	18.17
500.0	1.36	13.82	106.71	-.28	.41	1.48	18.00
550.0	1.33	13.81	99.10	—	.44	1.60	17.70
600.0	1.30	13.71	90.88	—	.45	1.73	17.52
650.0	1.31	13.62	82.75	—	.49	1.87	17.30
700.0	1.41	13.49	73.14	—	.56	2.06	17.08
750.0	1.58	13.34	62.54	—	.59	2.29	16.95
800.0	1.84	13.12	51.78	—	.61	2.52	16.82
850.0	2.25	13.00	40.42	—	.62	2.76	16.92
900.0	2.89	12.54	29.38	—	.63	2.95	17.07
950.0	3.79	11.91	17.68	—	.71	3.00	17.62
1000.0	4.95	10.98	3.94	—	.68	3.04	18.33
1100.0	8.02	8.44	-18.71	—	.59	2.88	20.34
1200.0	10.92	5.12	-35.58	—	.44	2.71	22.48
1300.0	11.89	1.57	-49.19	—	.34	2.57	25.36
1400.0	13.98	-2.16	-60.92	—	.22	2.57	28.28
1500.0	13.12	-5.73	-89.36	—	.00	2.61	30.23

LINEARIZATION RANGE: 100.0 to 500.0 MHz

S-Parameters
Bias = 15.00 Volts

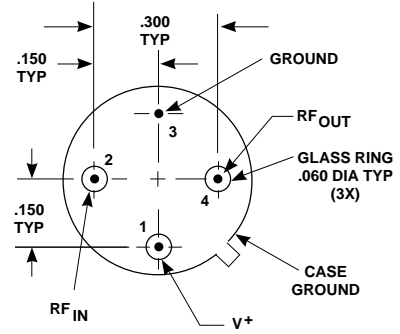
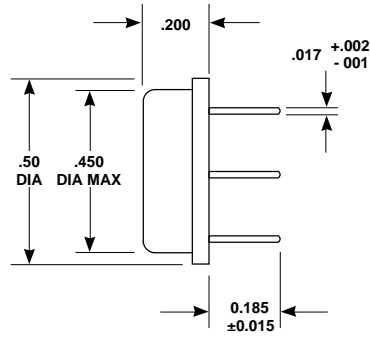
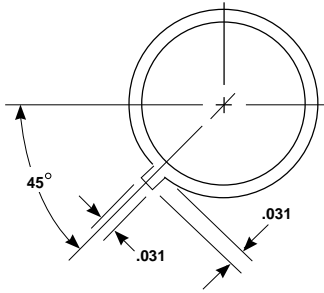
FREQUENCY MHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang
100.00	.076	-123.7	14.377	164.3	-18.750	-3.5	.034	-161.9
200.00	.118	-134.3	14.274	149.0	-18.502	-7.2	.058	-125.5
300.00	.147	-149.8	14.131	133.4	-18.527	-12.6	.091	-118.0
400.00	.158	-168.2	13.922	117.3	-18.373	-18.6	.139	-118.6
500.00	.149	165.6	13.813	101.1	-18.033	-26.2	.199	-125.0
600.00	.126	124.1	13.710	84.4	-17.551	-35.1	.269	-135.7
700.00	.166	64.8	13.498	65.5	-17.049	-46.1	.350	-151.1
800.00	.287	15.7	13.169	43.1	-16.802	-60.0	.434	-171.8
900.00	.478	-17.3	12.596	19.0	-17.038	-76.5	.497	161.8
1000.00	.665	-45.4	11.060	-7.0	-18.179	-96.7	.509	128.8
1100.00	.782	-68.2	8.471	-30.7	-20.168	-112.6	.494	96.1
1200.00	.835	-84.2	5.222	-49.4	-22.480	-124.5	.468	65.8
1300.00	.856	-96.3	1.693	-63.9	-25.430	-133.4	.444	38.9
1400.00	.869	-104.2	-1.998	-77.6	-28.284	-141.4	.440	15.2
1500.00	.877	-109.5	-5.585	-86.9	-30.265	-143.2	.450	-5.3
1600.00	.870	-113.9	-9.402	-94.7	-32.729	-143.8	.449	-25.3
1700.00	.886	-117.4	-13.255	-99.8	-34.313	-142.5	.461	-48.4
1800.00	.876	-120.8	-17.945	-99.2	-36.121	-137.2	.466	-73.6
1900.00	.920	-124.1	-23.880	-82.9	-37.257	-136.2	.470	-103.5
2000.00	.909	-126.6	-24.890	-43.7	-38.152	-134.5	.475	-137.7

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

