



Thin-Film Cascadable Amplifier 5 to 500 MHz

Technical Data

UTO/UTC 533 Series

Features

- **Frequency Range: 5 to 500 MHz**
- **Medium Output Power: +17.0 dBm (Typ)**
- **Medium Gain: 17.0 dB (Typ)**
- **Temperature Compensated**

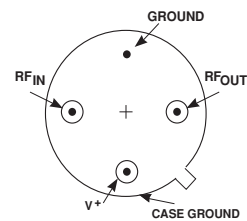
Applications

- **IF/RF Amplification**

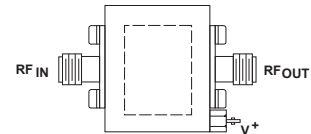
Description

The 533 Series is a single-stage bipolar RF amplifier built on a thin-film substrate. Resistive feedback and active bias compensate for temperature and voltage variations. A set of internal blocking capacitors couple RF through the amplifier. The 533 Series is available in either the TO-8 hermetic case or connected TC-1A package.

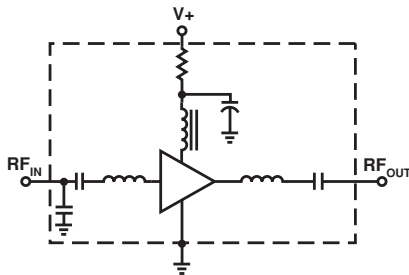
Pin Configuration UTO—TO-8T



UTC—TC-1A



Schematic



Maximum Ratings

Parameter	Maximum
DC Voltage	+17 Volts
Continuous RF Input Power	+13 dBm
Operating Case Temperature	-55 to +115°C
Storage Temperature	-62 to +150°C
“R” Series Burn-In Temperature	+115°C

Thermal Characteristics¹

θ_{JC}	75°C/W
Active Transistor Power Dissipation	475 mW
Junction Temperature Above Case Temperature	36°C
MTBF (MIL-HDBK-217E, A_{UF} @ 90°C)	693,000 Hrs.

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

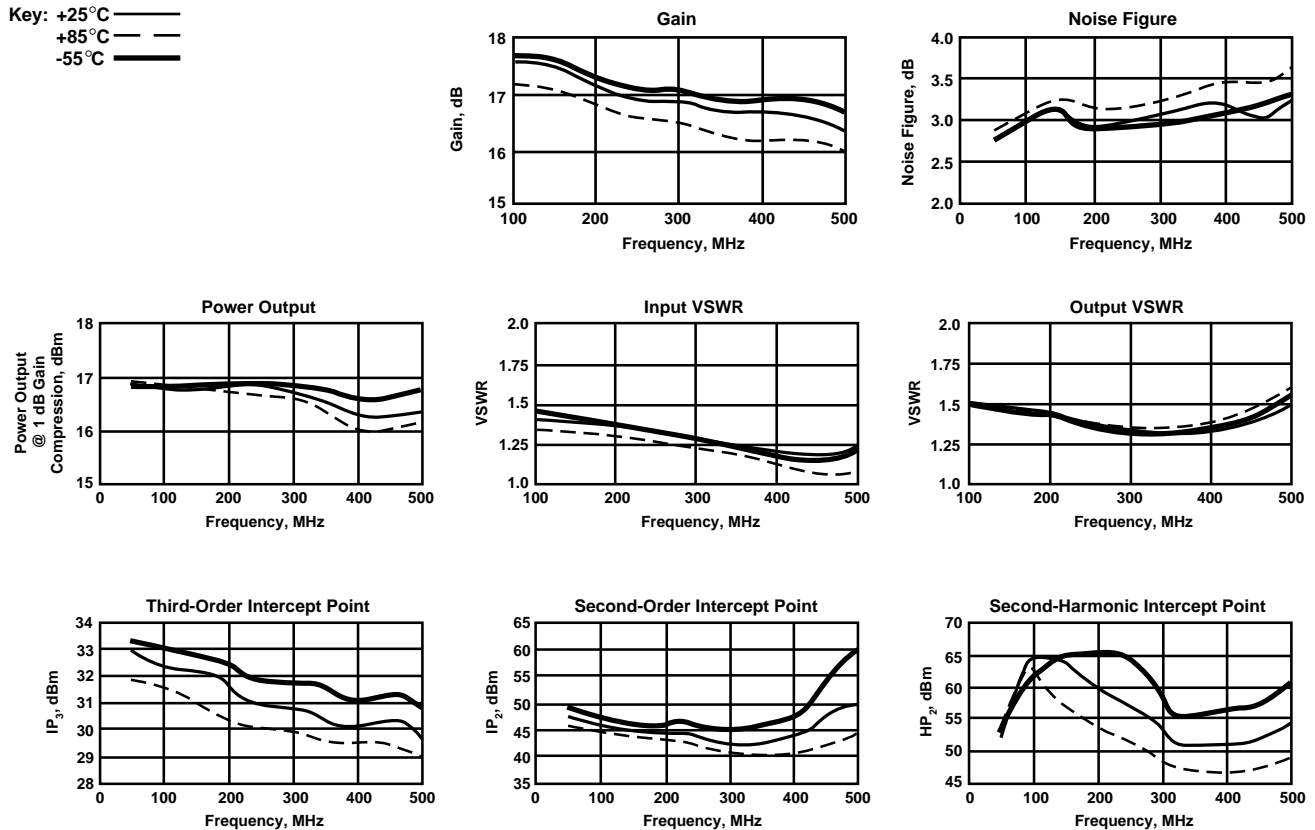
Electrical Specifications

(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.)	17.0	16.0	15.0	dB
—	Gain Flatness (Max.)	± 0.5	± 0.7	± 1.0	dB
NF	Noise Figure (Max.)	3.5	5.0	5.5	dB
P _{1dB}	Power Output @ +1 dB Comp. (Min.)	+17.0	+14.0	+13.0	dBm
—	Input VSWR (Max.)	<1.5:1	2.0:1	2.0:1	—
—	Output VSWR (Max.)	<1.5:1	2.0:1	2.0:1	—
IP ₃	Two Tone 3rd Order Intercept Point	+30.0	—	—	dBm
IP ₂	Two Tone 2nd Order Intercept Point	+43.0	—	—	dBm
HP ₂	One Tone 2nd Harmonic Intercept Point	+49.0	—	—	dBm
I _D	DC Current	53	—	—	mA

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

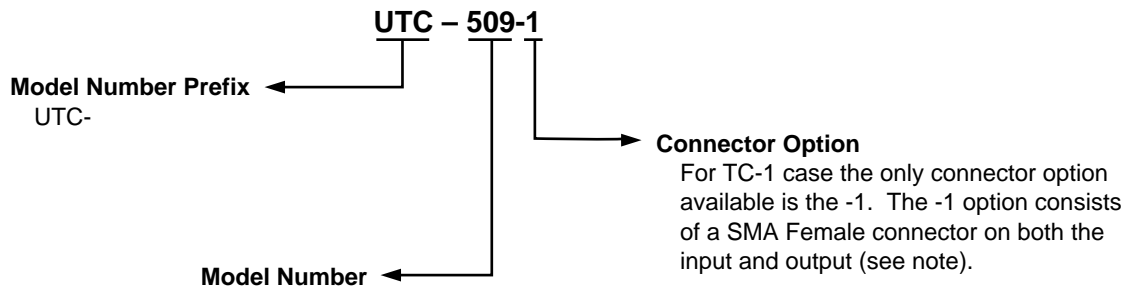
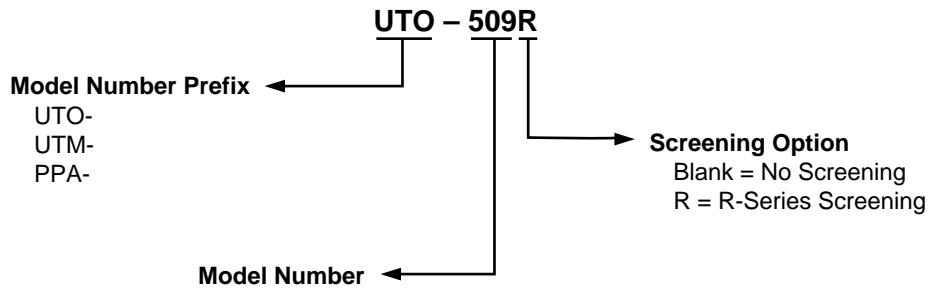
Key: +25°C —
+85°C —
-55°C —



Automatic Network Analyzer Measurements (Typical production unit @ +25°C ambient)**S-Parameters****Bias = 15.00 Volts**

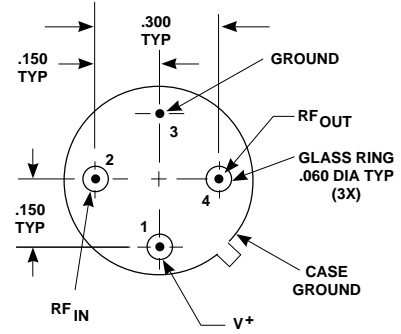
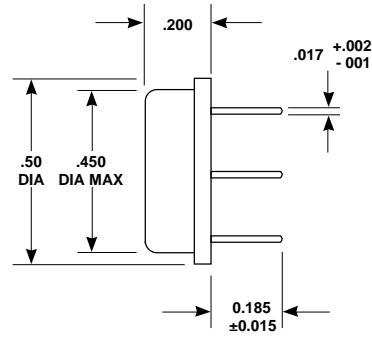
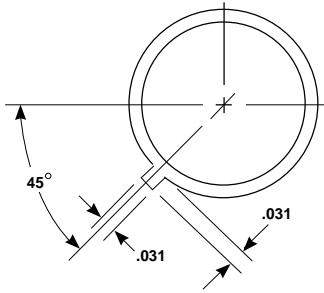
FREQUENCY MHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang
100.00	.117	-169.9	16.959	155.6	-22.427	-13.3	.219	160.5
150.00	.119	-167.0	16.931	-143.1	-22.254	-18.4	.209	150.8
200.00	.121	-163.8	16.899	129.9	-22.473	-24.5	.204	142.6
250.00	.130	-159.2	16.971	117.0	-22.458	-30.7	.194	135.4
300.00	.145	-158.1	17.069	104.3	-22.181	-37.0	.185	128.5
350.00	.163	-163.3	17.174	91.3	-22.501	-44.6	.179	124.4
400.00	.180	-173.6	17.320	77.9	-22.585	-53.4	.174	121.6
450.00	.187	168.5	17.498	63.5	-22.464	-61.7	.176	120.9
500.00	.199	139.1	17.658	47.2	-22.640	-70.2	.190	120.2
550.00	.230	97.9	17.838	29.0	-22.925	-79.5	.215	117.4
600.00	.318	50.2	17.676	7.2	-23.363	-91.6	.248	110.2
650.00	.474	8.8	16.886	-17.0	-24.183	-103.1	.269	99.0
700.00	.629	-24.8	15.238	-40.4	-25.508	-111.3	.271	87.1
750.00	.737	-51.3	13.019	-59.7	-27.101	-118.1	.256	77.5
800.00	.809	-71.3	10.584	-75.0	-28.227	-122.9	.236	71.8
850.00	.851	-86.2	8.223	-87.7	-29.293	-125.8	.222	68.2
900.00	.874	-98.3	5.956	-97.1	-30.027	-129.6	.218	65.9
950.00	.892	-108.0	3.837	-104.7	-30.773	-132.1	.215	64.0
1000.00	.907	-115.9	1.928	-111.0	-31.479	-135.5	.216	61.8

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

