



Thin-Film Cascadable Amplifier 5 to 500 MHz

Technical Data

UTO/UTC 523 Series

Features

- **Frequency Range:** 5 to 500 MHz
- **High Gain:** 25.5 dB (Typ)
- **Medium Output Power:** +13.5 dB (Typ)

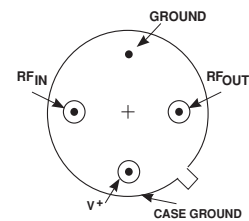
Applications

- **IF/RF Amplification**

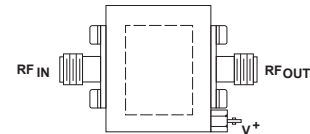
Description

The 523 Series is a high-gain, medium-power, two-stage amplifier. Built on a thin-film substrate, it will provide consistent performance over a wide range of temperature variations. The 523 Series is available in either the TO-8 hermetic case or connected TC-1A package.

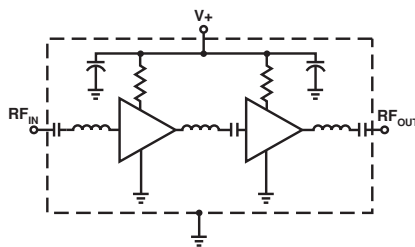
Pin Configuration UTO—TO-8U



UTC—TC-1A



Schematic



Maximum Ratings

Parameter	Maximum
DC Voltage	+17 Volts
Continuous RF Input Power	+13 dBm
Operating Case Temperature	-55 to +125°C
Storage Temperature	-62 to +150°C
"R" Series Burn-In Temperature	+125°C

Thermal Characteristics¹

θ_{JC}	70/75°C/W ²
Active Transistor Power Dissipation	90/321 mW ²
Junction Temperature Above Case Temperature	7/22°C ²
MTBF (MIL-HDBK-217E, A_{UF} @ 90°C)	1,276,000 Hrs.

Notes:

1. Values refer to first and second stages, respectively.

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

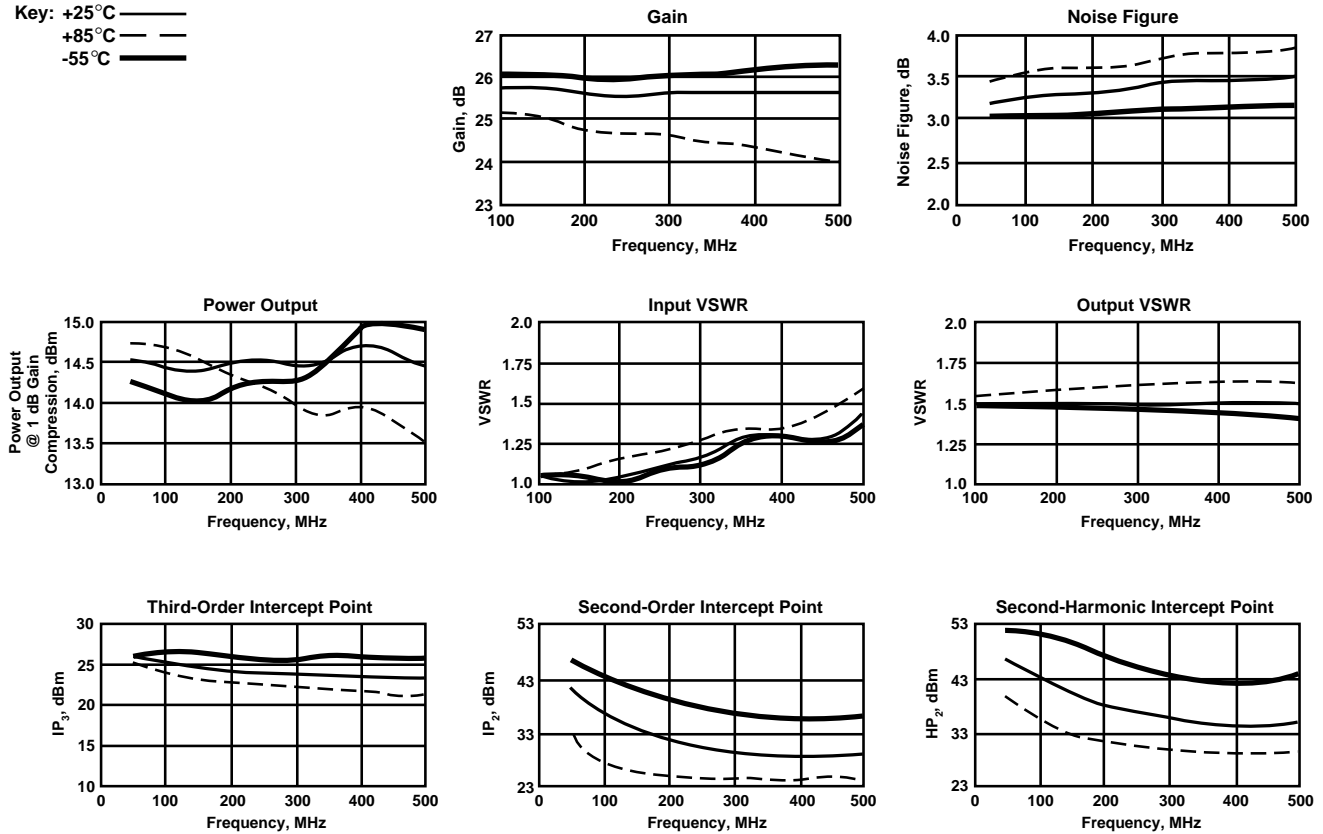
Electrical Specifications

(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.)	25.5	23.0	23.0	dB
—	Gain Flatness (Max.)	± 0.5	± 1.0	± 1.0	dB
NF	Noise Figure (Max.)	3.5	7.0	7.0	dB
P _{1dB}	Power Output @ +1 dB Comp. (Min.)	+13.5	+12.0	+12.0	dBm
—	Input VSWR (Max.)	<1.2:1	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	+25.0	—	—	dBm
IP ₂	Two Tone 2nd Order Intercept Point	+33.0	—	—	dBm
HP ₂	One Tone 2nd Harmonic Intercept Point	+40.0	—	—	dBm
I _D	DC Current	80	—	—	mA

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

Key: +25°C —
+85°C —
-55°C —



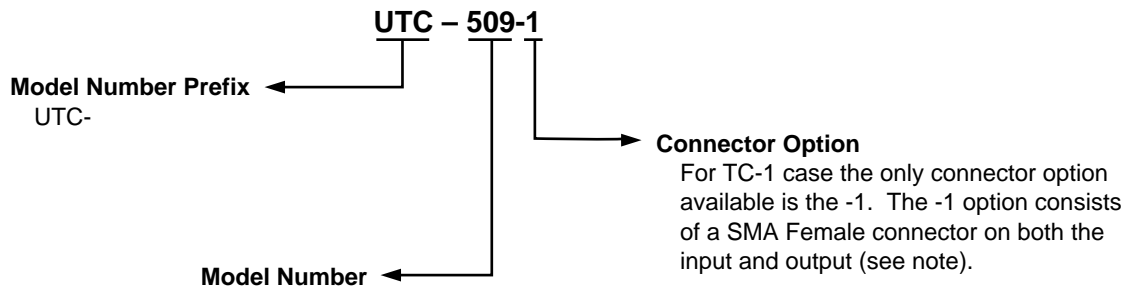
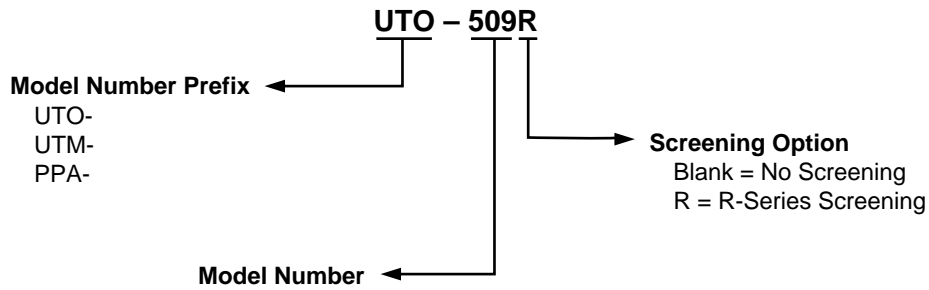
Automatic Network Analyzer Measurements (Typical production unit @ +25°C ambient)

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	26.02	-34.45	-.55	—	1.07	42.66
150.0	1.06	25.88	-52.04	-.09	1.00	1.06	46.44
200.0	1.02	25.77	-70.50	-.50	1.02	1.07	48.04
250.0	1.04	25.37	-88.59	-.54	.96	1.09	47.67
300.0	1.06	25.38	-105.00	1.08	.94	1.10	44.60
350.0	1.10	25.75	-122.59	1.55	1.01	1.09	46.45
400.0	1.15	25.66	-141.35	.83	1.04	1.13	41.06
450.0	1.20	25.62	-160.00	.24	1.08	1.17	46.12
500.0	1.29	25.76	179.70	-2.00	1.08	1.20	42.76
550.0	1.42	25.78	161.03	—	1.10	1.25	39.86
600.0	1.58	25.72	140.28	—	1.23	1.33	38.52
650.0	1.91	25.52	116.85	—	1.31	1.43	42.63
700.0	2.48	25.14	92.97	—	1.41	1.51	40.96

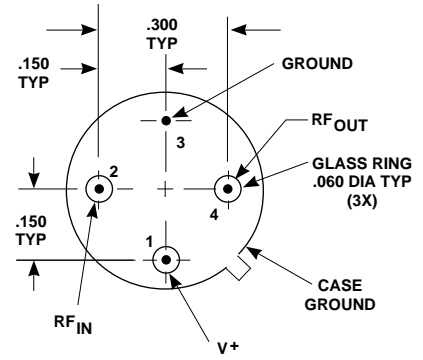
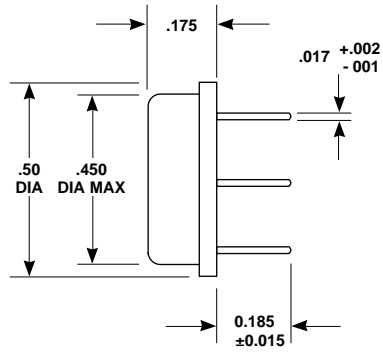
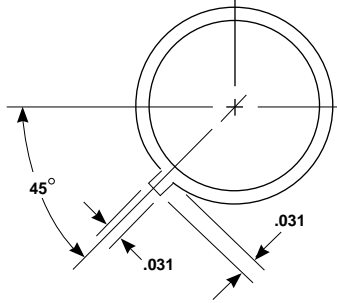
LINEARIZATION RANGE: 100.0 to 500.0 MHz

Product Options



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

Case Drawings TO-8U



APPROXIMATE WEIGHT 2.1 GRAMS

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

TC-1A

