



Thin-Film Cascadable Amplifier 5 to 1500 MHz

Technical Data

UTO/UTC 1522 Series

Features

- **Frequency Range:** 5 to 1500 MHz
- **High Gain:** 20.0 dB (Typ)
- **Medium Output Power:** +13.0 dBm (Typ)
- **Temperature Compensated**

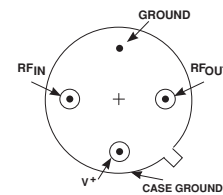
Applications

- **IF/RF Amplification**

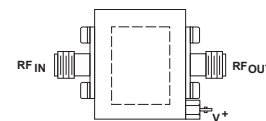
Description

The 1522 Series is a two-stage bipolar RF amplifier built on a thin-film substrate. Active bias and resistive feedback provide stability over temperature and bias voltage variations. Input/output blocking capacitors couple the RF through the amplifier, and our low VSWR is maintained through inductive tuning. The 1522 Series amplifiers are available in either the TO-8 hermetic case or connected TC-1A package.

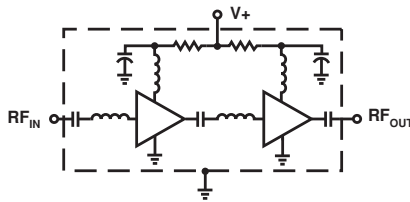
Pin Configuration UTO—TO-8U



UTC—TC-1A



Schematic



Maximum Ratings

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

Thermal Characteristics¹

θ_{JC}	105/75°C/W ²
Active Transistor Power Dissipation	187/460 mW ²
Junction Temperature Above Case Temperature	20/34°C ²
MTBF (MIL-HDBK-217E, A_{UF} @ 90°C)	550,200 Hrs.

Notes:

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

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

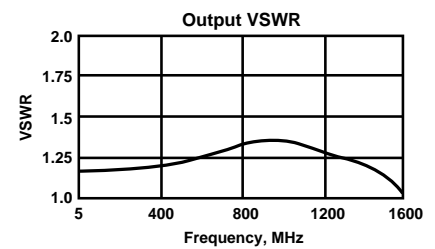
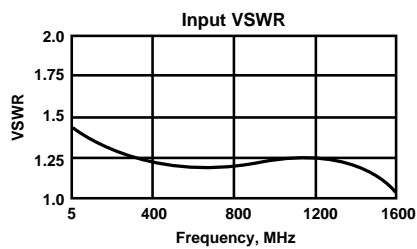
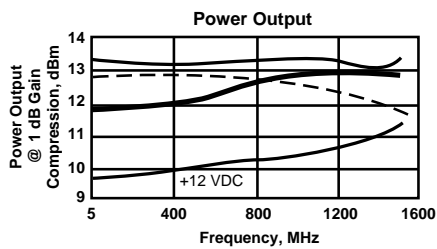
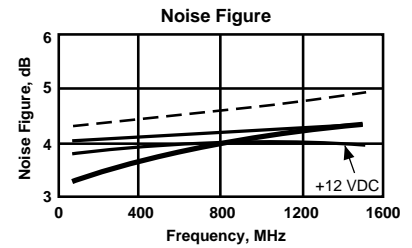
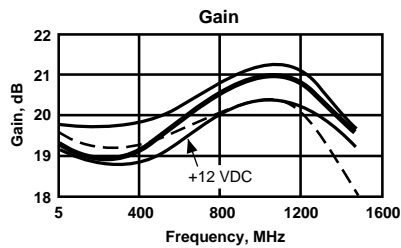
Electrical Specifications

(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	5-1500	5-1500	5-1500	MHz
GP	Small Signal Gain (Min.)	20.0	18.0	17.0	dB
—	Gain Flatness (Max.)	± 0.8	± 1.5	± 1.5	dB
NF	Noise Figure (Max.)	4.5	5.5	6.0	dB
P_{1dB}	Power Output @ +1 dB Comp. (Min.)	+13.0	+11.0	+10.0	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	+23.0	—	—	dBm
I_D	DC Current	85	—	—	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

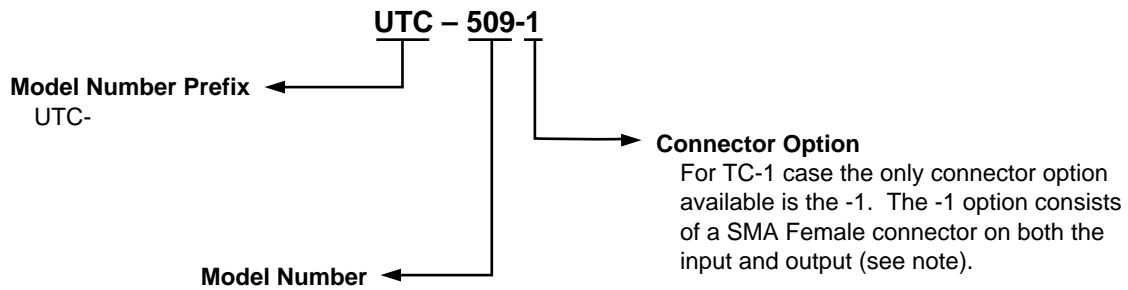
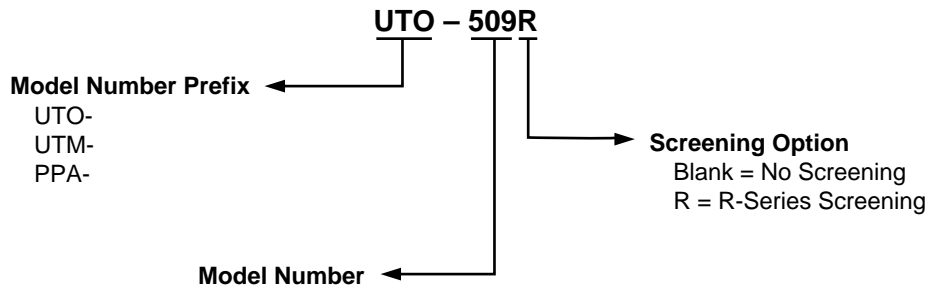
FREQUENCY MHz	VSWR IN	GAIN dB	PHASE DEGREES	PHASE DEV	GROUP DELAY ns	VSWR OUT	ISOLATION dB
100.0	1.64	20.92	-18.52	-4.62	.00	1.29	36.97
150.0	1.64	20.93	-27.57	-4.03	.47	1.29	36.44
200.0	1.66	20.90	-35.58	-2.40	.47	1.30	36.29
250.0	1.66	20.81	-44.65	-1.83	.50	1.31	36.42
300.0	1.67	20.84	-53.69	-1.22	.50	1.32	36.39
350.0	1.65	20.87	-52.69	-.57	.50	1.32	36.65
400.0	1.65	20.95	-71.51	.25	.51	1.33	36.59
450.0	1.63	21.09	-81.10	.30	.51	1.34	36.57
500.0	1.60	21.22	-89.82	1.21	.49	1.36	36.74
600.0	1.54	21.38	-107.92	2.39	.52	1.39	37.16
700.0	1.46	21.47	-126.90	2.69	.55	1.43	37.43
800.0	1.39	21.38	-146.77	2.12	.54	1.48	37.86
900.0	1.34	21.28	-166.58	1.58	.54	1.52	38.81
1000.0	1.35	21.29	174.38	1.83	.54	1.54	39.98
1100.0	1.42	21.52	155.44	2.18	.53	1.52	41.44
1200.0	1.51	21.56	135.50	1.53	.59	1.43	41.94
1300.0	1.50	21.37	113.44	-1.24	.61	1.32	41.77
1400.0	1.43	20.83	91.85	-3.54	.58	1.25	41.86
1500.0	1.38	20.21	71.23	-4.87	.57	1.20	42.13
1600.0	1.43	19.66	50.56	—	.58	1.16	42.29
1700.0	1.52	19.01	30.82	—	.53	1.15	42.92
1800.0	1.57	17.98	12.32	—	.50	1.17	43.04
1900.0	1.59	16.94	-5.02	—	.46	1.20	42.17
2000.0	1.60	15.99	-20.87	—	.00	1.24	41.43

Linearization Range: 100.0 to 1500.0 MHz

S-Parameters
Bias = 15.00 Volts

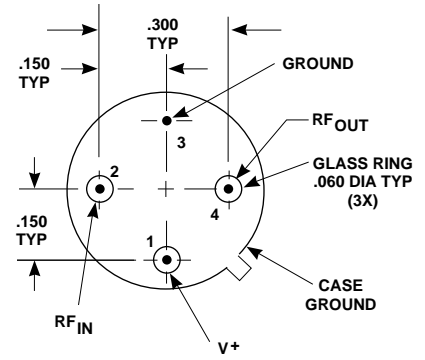
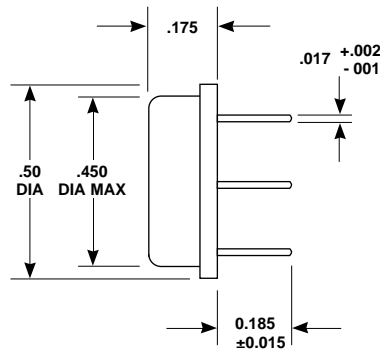
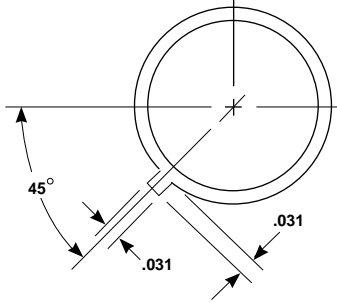
FREQUENCY MHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang
100.00	.244	154.3	20.700	-18.2	-35.509	-1.9	.157	173.4
200.00	.250	137.0	20.669	-35.4	-35.329	-11.0	.165	170.5
300.00	.250	121.9	20.597	-53.1	-36.050	-18.0	.176	164.4
400.00	.250	107.9	20.719	-70.4	-36.091	-26.4	.184	155.3
500.00	.240	93.5	21.057	-88.4	-36.082	-33.3	.196	143.8
600.00	.218	76.2	21.280	-106.5	-36.594	-43.9	.211	130.4
700.00	.187	53.5	21.450	-125.4	-37.182	-52.2	.229	117.0
800.00	.160	23.9	21.441	-145.4	-37.887	-62.0	.248	103.8
900.00	.147	-10.7	21.388	-165.7	-38.653	-69.7	.265	91.7
1000.00	.157	-41.1	21.423	174.7	-39.998	-76.0	.274	80.3
1100.00	.179	-67.5	21.695	155.6	-41.777	-82.5	.266	66.4
1200.00	.199	-95.4	21.718	135.4	-42.936	-78.1	.238	51.3
1300.00	.188	-126.4	21.517	112.8	-42.193	-76.0	.196	36.5
1400.00	.154	-159.9	20.896	90.7	-40.949	-79.5	.158	22.7
1500.00	.130	160.2	20.249	70.3	-41.216	-88.3	.140	6.9
1600.00	.135	116.5	19.649	49.9	-41.271	-99.1	.134	-9.3
1700.00	.162	82.5	19.023	30.7	-41.843	-100.5	.142	-24.5
1800.00	.187	58.9	18.102	12.8	-41.828	-106.2	.163	-38.9
1900.00	.205	42.0	17.196	-4.9	-42.248	-109.0	.185	-52.3
2000.00	.219	29.0	16.360	-21.4	-42.362	-109.6	.205	-66.2

Product Options



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

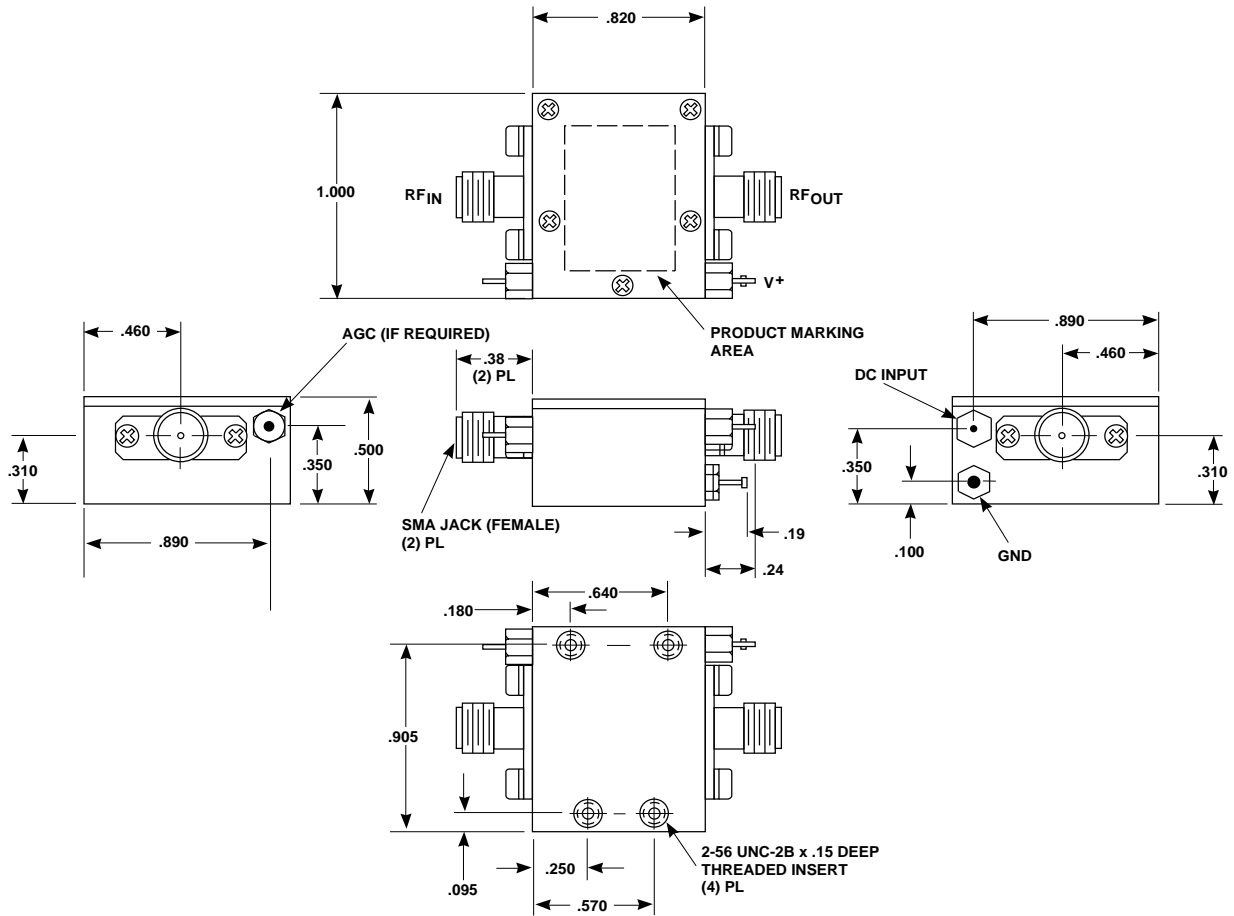
**Case Drawings
TO-8U**



APPROXIMATE WEIGHT 2.1 GRAMS

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

Case Drawings TC-1



TYPICAL WEIGHT WITH CONNECTORS = 21.5 GRAMS

NOTES: 1. THE TC-1 CASE IS A NON-HERMETIC CASE.
2. THE ONLY CONNECTOR OPTION AVAILABLE FOR THE TC-1 CASE IS THE -1, SMA FEMALE CONNECTORS AT BOTH INPUT AND OUTPUT PORTS.

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

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