



Thin-Film Cascadable Amplifier 5 to 1000 MHz

Technical Data

UTO/UTC 1007 Series

Features

- **Frequency Range: 5 to 1000 MHz**
- **High Output Power: +12.0 dBm (Typ)**
- **5-Volt Supply**
- **Surface Mount Option**

Applications

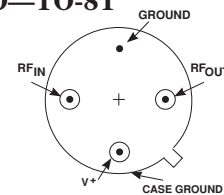
- **IF/RF Amplification**
- **5-Volt Systems**
- **Surface Mount Assembly**

Description

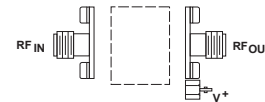
The 1007 Series is a 5-volt wideband thinfilm bipolar RF amplifier that can be used where voltage or power requirements are important. Output choke coupling, resistive feedback and active bias combine to provide a low noise, medium gain amplifier. Blocking capacitors couple the RF through the amplifier. The 1007 Series amplifiers are available in three packages: the surface mount hermetic PP-38 (.375 in. x .375 in.) case, the TO-8 hermetic case and the connectorized TC-1A case.

Pin Configuration

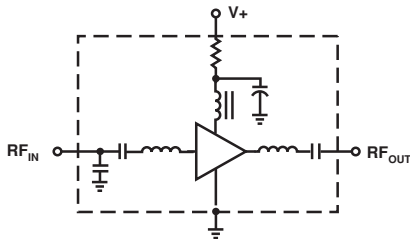
UTO—TO-8T



UTC—TC-1A



Schematic



Maximum Ratings

Parameter	Maximum
DC Voltage	+10 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}	105°C/W
Active Transistor Power Dissipation	110 mW
Junction Temperature Above Case Temperature	11.4°C
MTBF (MIL-HDBK-217E, A_{UF} @ 90°C)	1,645,000 Hrs.

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

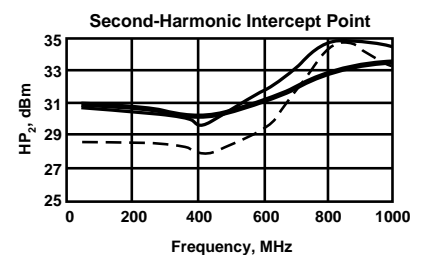
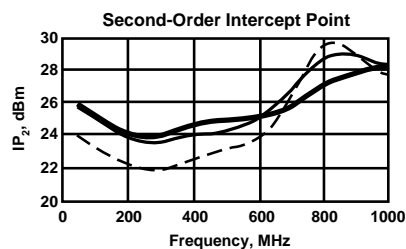
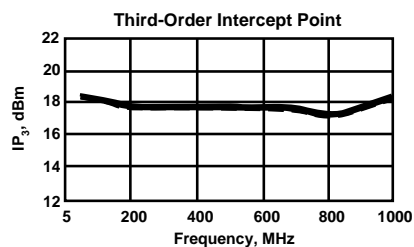
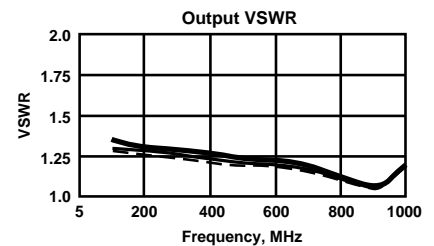
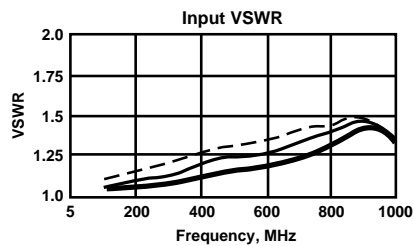
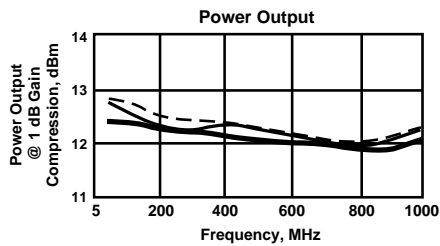
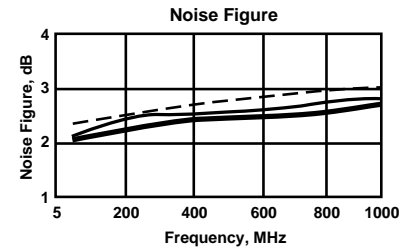
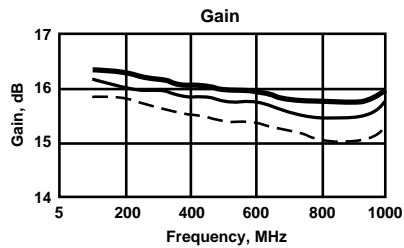
Electrical Specifications

(Measured in 50 Ω system @ +5 VDC nominal unless otherwise noted)

Symbol	Characteristic	Typical $T_C = 25^\circ\text{C}$	Guaranteed Specifications		Unit
			$T_C = 0$ to 50°C	$T_C = -55$ to $+85^\circ\text{C}$	
BW	Frequency Range	5-1000	5-1000	5-1000	MHz
GP	Small Signal Gain (Min.)	13.5	12.5	11.5	dB
—	Gain Flatness (Max.)	± 0.1	± 0.7	± 1.0	dB
NF	Noise Figure (Max.)	3.8	5.0	5.5	dB
P_{1dB}	Power Output @ +1 dB Comp. (Min.)	+12.5	+11.0	+10.0	dBm
—	Input VSWR (Max.)	<1.4:1	2.0:1	2.0:1	—
—	Output VSWR (Max.)	<1.3:1	2.0:1	2.0:1	—
IP_3	Two Tone 3rd Order Intercept Point	+21.0	—	—	dBm
IP_2	Two Tone 2nd Order Intercept Point	+21.0	—	—	dBm
HP_2	One Tone 2nd Harmonic Intercept Point	+28.0	—	—	dBm
I_D	DC Current	33	—	—	mA

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

Key: $+25^\circ\text{C}$ —
 $+85^\circ\text{C}$ - -
 -55°C —



Automatic Network Analyzer Measurements (Typical production unit @ +25°C ambient)**Numerical Readings****Bias = 5.00 Volts**

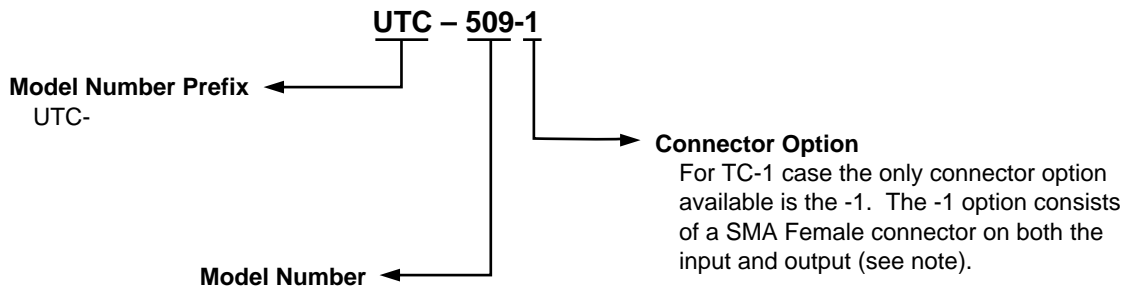
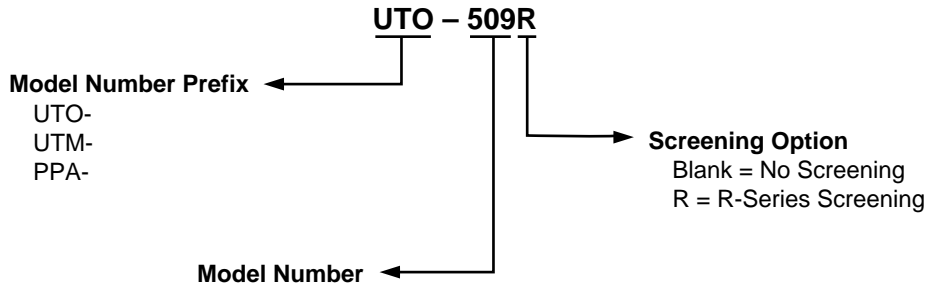
FREQUENCY MHz	VSWR IN	GAIN dB	PHASE DEGREES	PHASE DEV	GROUP DELAY ns	VSWR OUT	ISOLATION dB
100.0	1.46	13.90	166.73	-.31	.00	1.28	19.39
200.0	1.31	13.66	152.58	-1.11	.37	1.27	18.15
300.0	1.32	13.82	139.76	-.58	.36	1.25	18.36
400.0	1.25	13.61	126.72	-.29	.35	1.24	18.59
500.0	1.20	13.65	114.26	.58	.34	1.19	18.31
600.0	1.14	13.72	102.22	1.89	.35	1.16	18.19
700.0	1.06	13.66	88.96	1.96	.38	1.15	18.14
800.0	1.09	13.45	74.69	1.06	.41	1.11	18.03
900.0	1.16	13.42	59.41	-.88	.42	1.06	17.90
1000.0	1.26	13.48	44.64	-2.31	.41	1.04	17.83
1200.0	1.60	13.32	12.61	—	.47	1.18	17.85
1400.0	2.57	13.00	-23.11	—	.53	1.47	18.20
1600.0	6.10	11.17	-64.48	—	.60	2.03	19.81
1800.0	25.80	8.00	-104.89	—	.48	2.53	21.54
2000.0	88.94	4.10	-135.14	—	.00	3.14	22.93

LINEARIZATION RANGE: 100.0 to 1000.0 MHz

S-Parameters**Bias = 5.00 Volts**

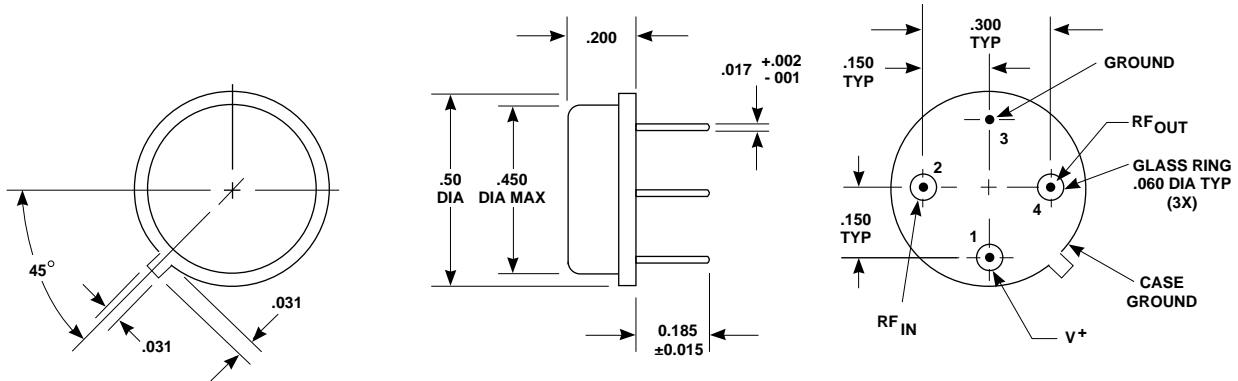
FREQUENCY MHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang
100.00	.170	170.2	13.870	168.9	-18.380	-2.1	.117	158.2
200.00	.147	155.0	13.762	156.3	-18.454	-7.1	.116	132.7
300.00	.123	142.9	13.754	144.5	-19.224	-11.2	.112	111.2
400.00	.094	127.4	13.756	132.7	-18.194	-16.0	.108	87.8
500.00	.069	110.5	13.821	121.6	-18.042	-20.6	.106	66.8
600.00	.048	72.1	13.822	110.7	-17.984	-25.4	.101	43.1
700.00	.045	25.1	13.657	98.6	-17.959	-30.2	.090	17.4
800.00	.064	-10.0	13.486	84.9	-18.041	-35.4	.072	-11.4
900.00	.091	-28.5	13.458	70.9	-17.926	-41.1	.054	-48.2
1000.00	.124	-36.4	13.431	57.3	-18.029	-47.0	.037	-106.5
1100.00	.161	-43.2	13.368	42.3	-17.932	-54.3	.057	176.1
1200.00	.210	-48.1	13.250	26.5	-17.836	-61.7	.113	135.4
1300.00	.275	-52.1	12.931	9.2	-18.122	-69.7	.180	102.3
1400.00	.357	-58.2	12.369	-10.1	-18.616	-80.6	.261	73.4
1500.00	.455	-66.9	11.215	-29.9	-19.290	-90.4	.343	45.9
1600.00	.556	-76.7	9.380	-49.3	-20.354	-100.1	.404	20.4
1700.00	.630	-87.8	7.117	-66.8	-21.351	-106.9	.436	-3.0
1800.00	.679	-98.1	5.462	-78.1	-22.819	-107.9	.454	-24.0
1900.00	.714	-107.6	3.348	-88.5	-23.328	-112.1	.458	-41.5
2000.00	.741	-116.1	1.435	-97.7	-24.279	-115.2	.452	-57.6

Product Options



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

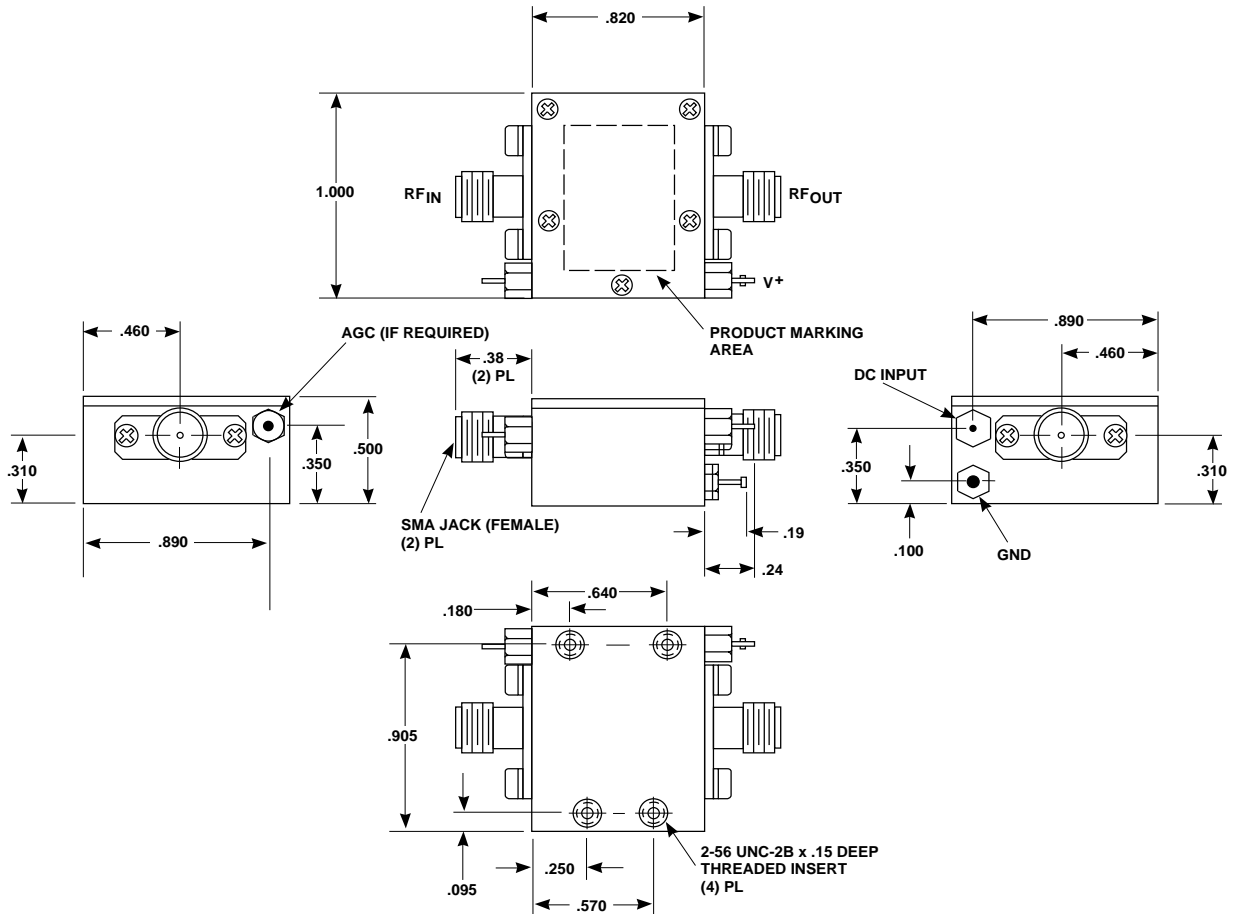
Case Drawings TO-8T



APPROXIMATE WEIGHT 2.1 GRAMS

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

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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