



Thin-Film Cascadable Amplifier 30 to 500 MHz

Technical Data

UTO/UTC/PSA 550 Series

Features

- **High Efficiency:**
80 mW power consumption
- **Low Distortion:**
 $IP_3 = +21$ dBm (Typ)
- **Low Noise Figure:**
2.5 dB (Typ)
- **High Gain:** 22.0 dB (Typ)

Applications

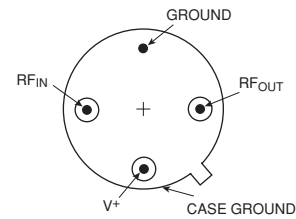
- **Satellite Systems**
- **Portable Radios**
- **5V Systems**

Description

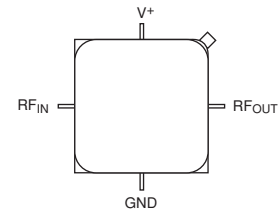
The 550 Series is a thin-film amplifier designed for high efficiency applications operating from a +5V supply. The circuit incorporates impedance transformation within a feedback loop. The active device delivers power into a higher impedance than 50Ω and therefore exhibits improved current efficiency. The 550 Series amplifiers are available in the TO-8, SM-45 hermetic cases or connected TC-1A package.

Pin Configuration

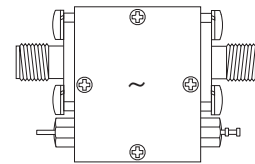
UTO—TO-8T



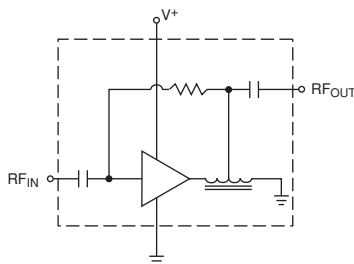
PSA—SM-45



UTC—TC-1A



Schematic



Maximum Ratings

Parameter	Maximum
DC Voltage	+10 Volts
Continuous RF Input Power	+15 dBm
Operating Case Temperature	-55 to +85°C
Storage Temperature	-62 to +150°C
"R" Series Burn-In Temperature	+125°C

Thermal Characteristics

θ_{JC}	105°C/W
Active Transistor Power Dissipation	53 mW
Junction Temperature Above Case Temperature	5.6°C
MTBF (MIL-HDBK-217F, A_{UF} @ 90°C)	846,000 Hrs.

Weight: (typical) UTO—2.1 grams; SM-45—1.7 grams; UTC—21.5 grams

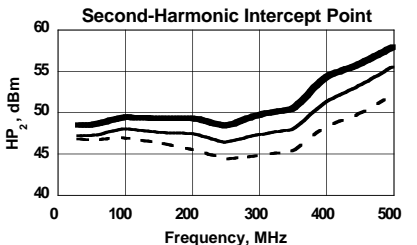
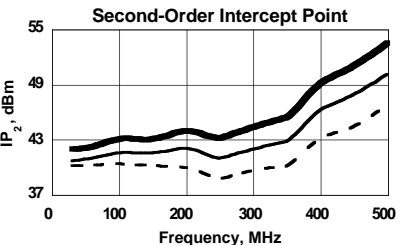
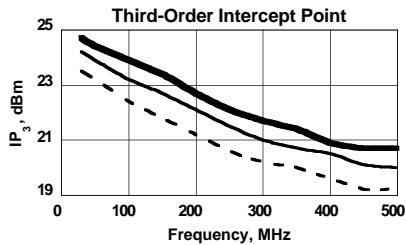
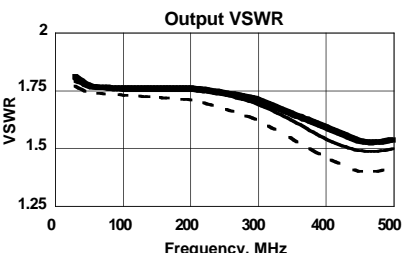
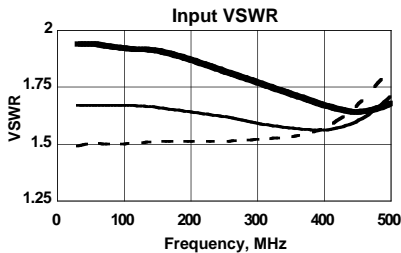
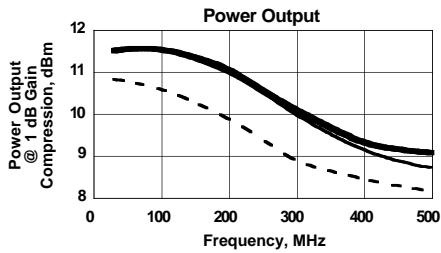
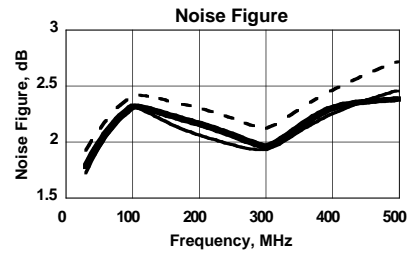
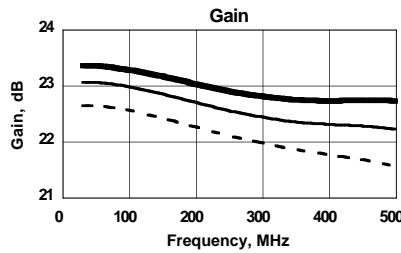
Electrical Specifications

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

Symbol	Characteristic	Typical T _C = 25°C	Guaranteed Specifications		Unit
			T _C = 0 to 50°C	T _C = -55 to +85°C	
BW	Frequency Range	30–500	30–500	30–500	MHz
GP	Small Signal Gain (Min.)	22.0	21.0	20.5	dB
—	Gain Flatness (Max.)	±0.5	±.75	±1.0	dB
NF	Noise Figure (Max.)	2.5	3.0	3.5	dB
P _{1dB}	Power Output @ +1 dB Comp. (Min.)	+10.0	+9.0	+8.0	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	+21.0	—	—	dBm
IP ₂	Two Tone 2nd Order Intercept Point	+41.0	—	—	dBm
HP ₂	One Tone 2nd Harmonic Intercept Point	+47.0	—	—	dBm
I _D	DC Current	16	—	—	mA

Typical Performance Over Temperature (@ +5 VDC unless otherwise noted)

Key: +25°C —
 +85°C - - -
 -55°C —

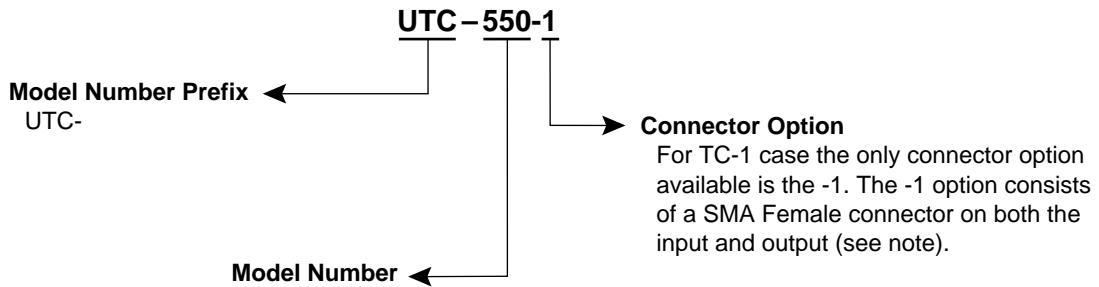
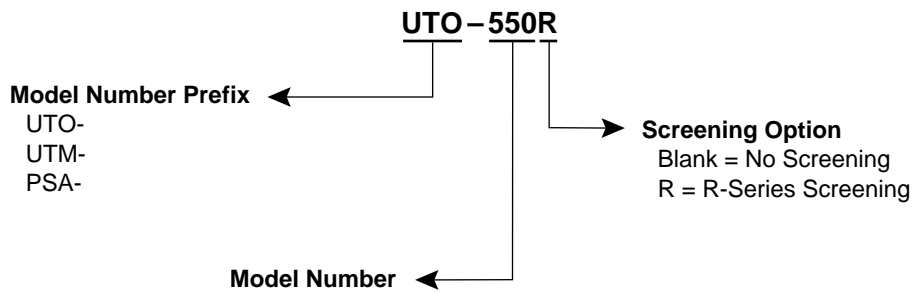


Automatic Network Analyzer Measurements (Typical production unit @ 25°C ambient)**S-Parameters****Bias = 5.00 Volts**

FREQ MHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂		GPDEL ns	PHASE DEV
	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang		
5.0	0.343	-127.8	23.157	-163.2	-28.874	14.8	0.405	155.8	6.02	
10.0	0.267	-150.7	23.047	-174.0	-28.179	6.5	0.319	163.6	4.14	
15.0	0.255	-159.2	23.040	-178.1	-28.179	4.5	0.301	166.7	1.89	
20.0	0.252	-163.8	23.053	179.2	-27.959	1.3	0.292	168.4	1.38	
25.0	0.250	-166.6	23.070	176.9	-27.959	2.2	0.287	169.1	1.16	
30.0	0.252	-168.9	23.062	175.0	-27.959	1.6	0.284	169.5	1.04	.92
35.0	0.251	-170.4	23.070	173.2	-27.744	.7	0.281	170.1	0.95	.47
40.0	0.251	-171.6	23.068	171.6	-27.959	.1	0.280	170.3	0.89	.18
45.0	0.251	-172.2	23.062	170.0	-27.744	-.2	0.278	170.3	0.86	-.05
50.0	0.252	-173.2	23.057	168.5	-27.959	-1.8	0.277	170.0	0.80	-.23
100.0	0.250	-177.3	22.985	154.1	-27.744	-4.1	0.274	167.4	0.77	-1.11
150.0	0.249	-179.2	22.853	140.7	-27.535	-7.5	0.274	162.1	0.74	-1.09
200.0	0.243	-179.7	22.698	127.6	-27.131	-11.5	0.272	154.5	0.72	-.69
250.0	0.236	-179.4	22.546	114.8	-26.745	-15.8	0.267	144.8	0.71	-.02
300.0	0.228	-177.9	22.441	102.0	-26.558	-19.8	0.256	131.7	0.72	.67
350.0	0.221	-174.5	22.355	89.0	-26.196	-25.2	0.236	115.3	0.74	1.11
400.0	0.219	-168.8	22.308	75.5	-25.680	-31.2	0.214	93.5	0.77	1.12
450.0	0.230	-161.4	22.276	61.3	-25.514	-38.2	0.196	63.6	0.83	.37
500.0	0.263	-154.7	22.221	45.8	-25.193	-45.9	0.199	27.0	0.94	-1.65
600.0	0.397	-154.6	21.553	10.7	-24.883	-65.1	0.267	-43.3	0.99	
700.0	0.531	-170.2	19.297	-25.5	-25.352	-83.7	0.283	-84.8	0.89	
800.0	0.578	172.1	16.018	-53.1	-25.849	-102.3	0.296	-85.2	0.67	
900.0	0.574	157.3	12.994	-73.6	-26.375	-122.7	0.461	-90.6	0.54	
1000.0	0.545	144.7	10.339	-91.7	-27.535	-141.2	0.626	-107.7	0.43	
1500.0	0.302	99.8	-1.535	-166.0	-33.979	144.0	0.872	-170.1	0.41	

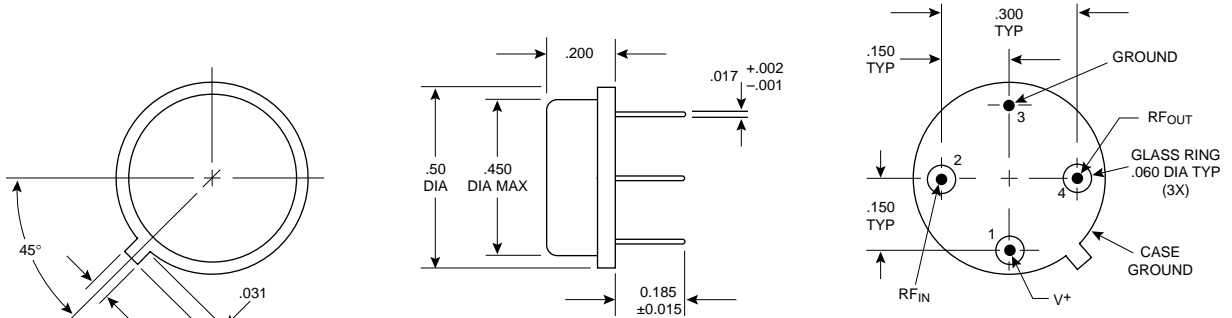
LINEARIZATION RANGE: 30.0 to 500.0 MHz

Product Options



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

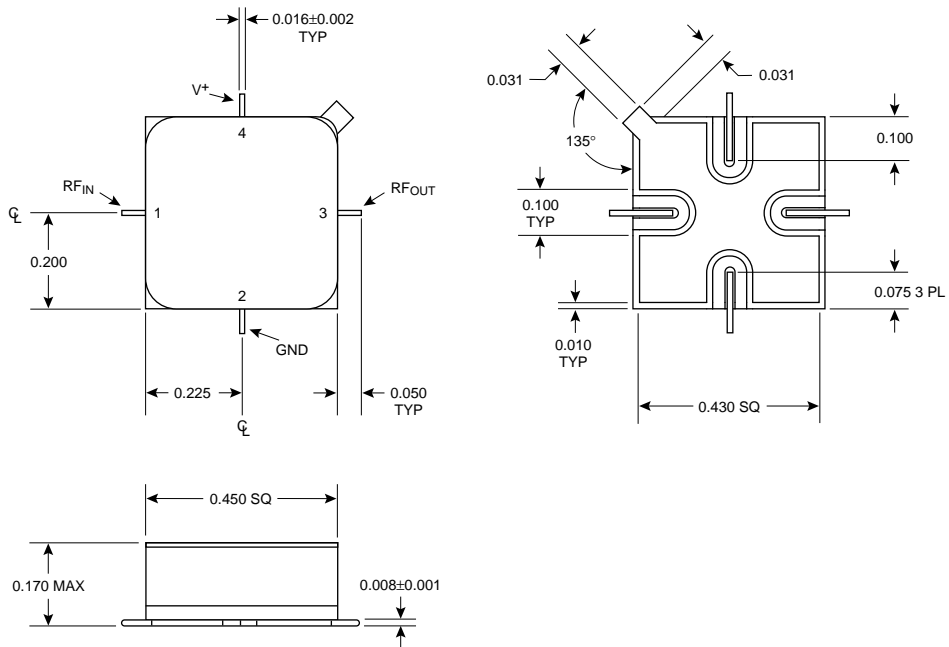
**Case Drawings
TO-8T**



APPROXIMATE WEIGHT 2.1 GRAMS

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

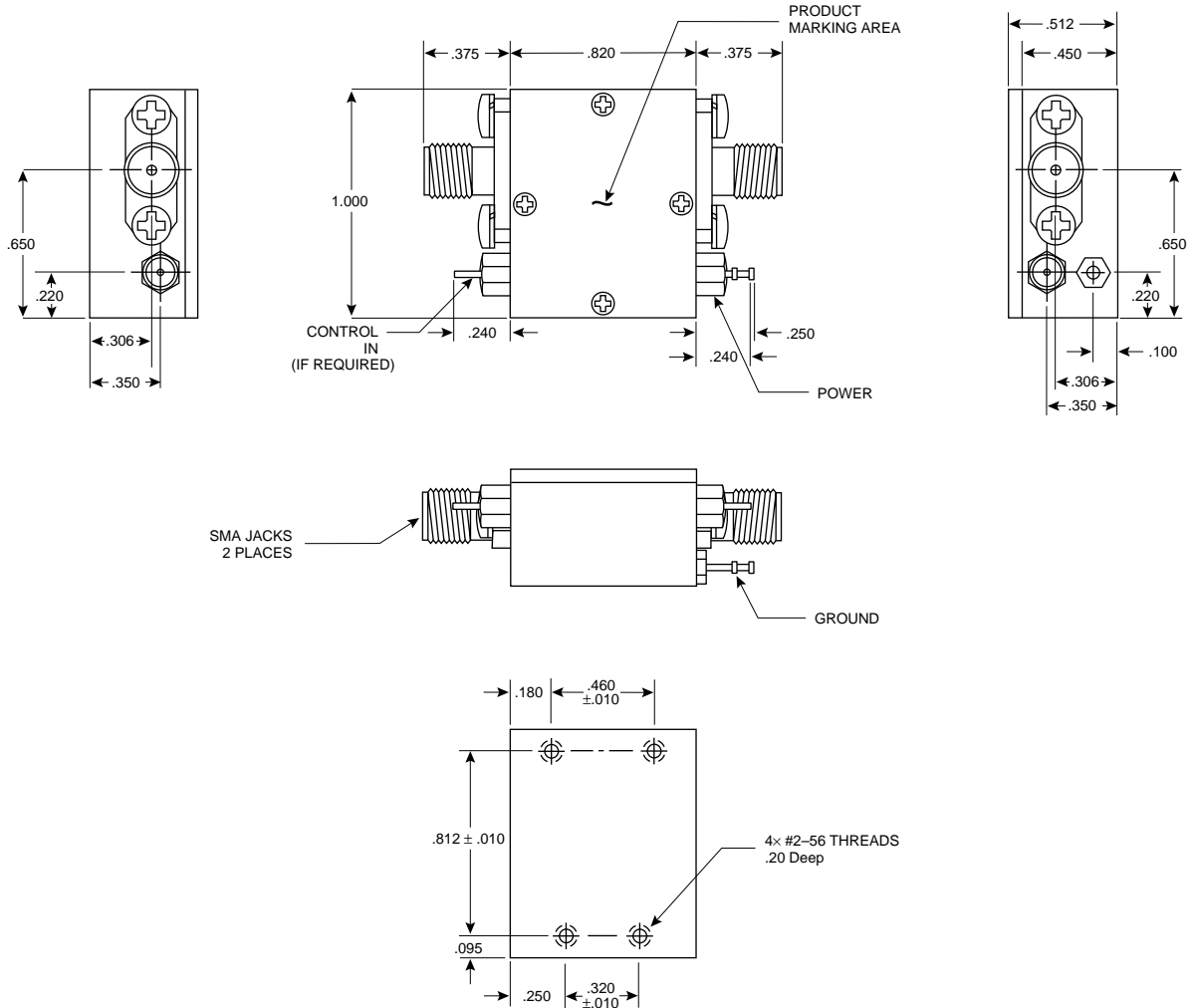
SM-45



APPROXIMATE WEIGHT 1.7 GRAMS TYPICAL

- NOTES (UNLESS OTHERWISE SPECIFIED):**
 1. MAXIMUM TEMPERATURE EXPOSURE IS 260°C FOR 10 SECONDS.
 2. LEADS ARE FOR TESTING ONLY AND MAY BE TRIMMED FLUSH.
 3. DIMENSIONS ARE SPECIFIED IN INCHES
 4. TOLERANCES: xx ±.01
 xxx ±.005

Case Drawings TC-1



NOTES (UNLESS OTHERWISE SPECIFIED):

1. MATERIAL AL ALY 6061-T6
2. FINISH CHEM FILM PER MIL-G-5541C CLASS 3 COLOR-GOLD
3. BREAK ALL SHARP EDGES & CORNERS & GRIND SMOOTH

Contact Teledyne Microwave Solutions:
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650-962-6845 fax

Check for updates:
www.teledynemicrowave.com