TELEDYNE
MICROWAVE SOLUTIONS
Everywhereyoulook™

Thin-Film Cascadable Amplifier 5 to 500 MHz

Technical Data

UTO/UTC 552 Series

Features

- **Frequency Range: 5 to 500 MHz**
- **Medium Gain: 15.0 dB (Typ)**
- **5-Volt System**
- **Temperature Compensated**

Applications

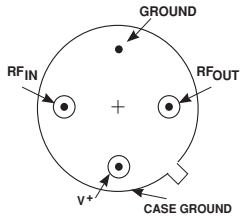
- **IF/RF Amplification**
- **High Efficiency**

Description

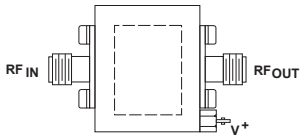
The 552 Series is a medium-gain, medium-power, thin-film RF bipolar amplifier that operates from S-volt bias. It uses resistive feedback and active bias for stability over temperature and over bias variations. Blocking capacitors couple the RF through the amplifier and inductors provide good VSWR. The 552 Series amplifiers are available in either the TO-8 hermetic case or connectored TC-1A package.

Pin Configuration

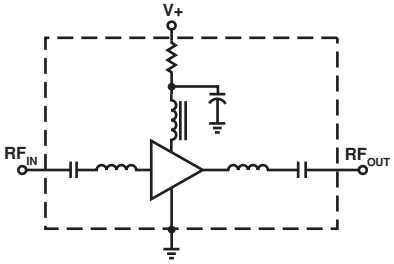
UTO—TO-8T



UTC—TC-1A



Schematic



Maximum Ratings

Parameter	Maximum
DC Voltage	+9 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 Characteristics[1]

θ_{JC}	105°C/W
Active Transistor Power Dissipation	59 mW
Junction Temperature Above Case Temperature	6°C
MTBF (MIL-HDBK-217E, A_{UF} @ 90°C)	1,483,000 Hrs.

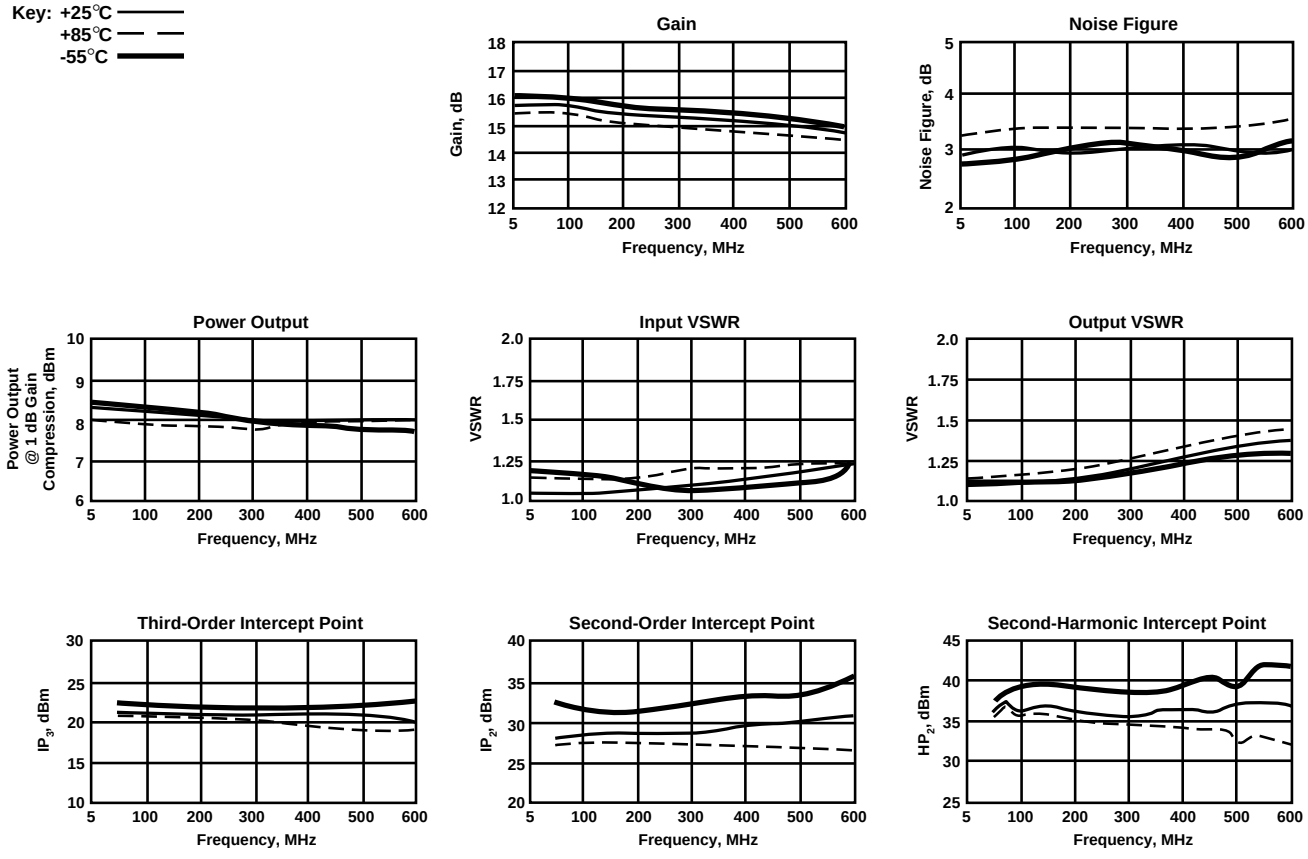
Weight: (typical) UTO—2.1 grams; UTC—21.5 grams

Electrical Specifications

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

Symbol	Characteristic	Typical	Guaranteed Specifications		Unit
		T_C = 25°C	T_C = 0 to 50°C	T_C = –55 to +85°C	
BW	Frequency Range	5-500	5-500	5-500	MHz
GP	Small Signal Gain (Min.)	15.0	13.5	13.0	dB
—	Gain Flatness (Max.)	±0.2	±0.7	±0.7	dB
NF	Noise Figure (Max.)	2.9	4.0	4.5	dB
P_{1dB}	Power Output @ +1 dB Comp. (Min.)	+8.0	+6.5	+6.5	dBm
—	Input VSWR (Max.)	<1.2:1	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	+28.0	—	—	dBm
HP_2	One Tone 2nd Harmonic Intercept Point	+36.0	—	—	dBm
I_D	DC Current	18	—	—	mA

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



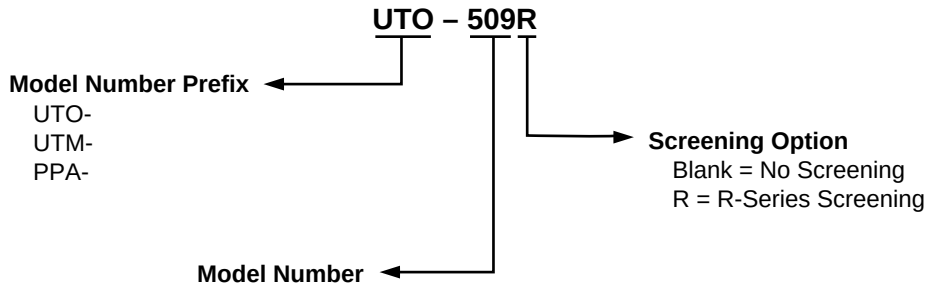
Automatic Network Analyzer Measurements (Typical production unit @ +25°C ambient)

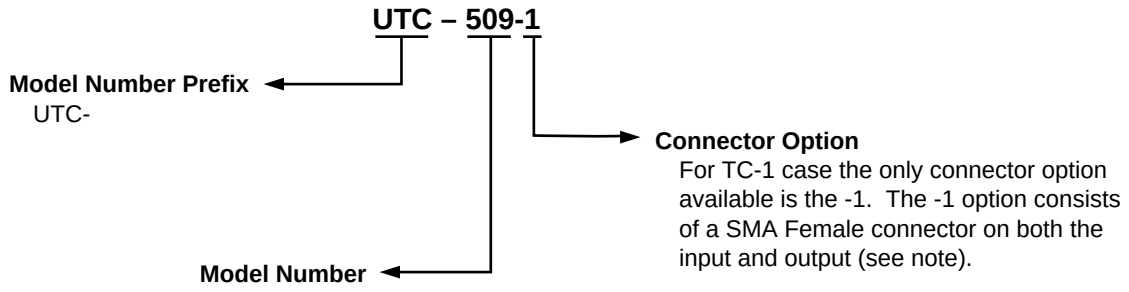
S-Parameters **Bias = 5.00 Volts**

Freq. GHz	S_{11} Mag	S_{11} Ang	S_{21} dB	S_{21} Ang	S_{11} dB	S_{11} Ang	S_{11} Mag	S_{11} Ang	GPDEL (ns)	PHASE DEV (deg)
.05	.02	–73.8	15.23	171.7	–19.3	–3.3	.06	19.90	.57	.59
.10	.01	–67.1	15.20	161.5	–19.3	–8.9	.06	14.47	.57	–.08
.15	.02	–64.4	15.17	151.8	–19.3	–14.0	.07	11.19	.54	–.24
.20	.02	–58.4	15.12	142.3	–19.3	–18.8	.08	7.39	.53	–.27
.25	.02	–53.7	15.07	132.8	–19.4	–23.8	.09	2.26	.53	–.24
.30	.03	–52.0	15.01	123.5	–19.4	–28.7	.09	–3.96	.52	–.02
.35	.04	–52.6	14.94	114.0	–19.4	–33.5	.10	–11.66	.53	–.07
.40	.05	–53.9	14.86	104.5	–19.4	–38.5	.11	–19.45	.53	–.01
.45	.06	–55.3	14.77	95.2	–19.4	–43.5	.12	–28.43	.52	.14
.50	.07	–57.3	14.69	85.7	–19.4	–48.5	.12	–38.23	.52	.20
.55	.08	–58.1	14.60	76.1	–19.4	–53.8	.13	–48.65	.53	
.60	.09	–58.6	14.52	66.5	–19.4	–59.0	.13	–59.35	.54	
.65	.10	–59.1	14.43	56.9	–19.4	–64.6	.13	–70.42	.53	
.70	.11	–58.6	14.33	47.1	–19.4	–70.1	.13	–82.64	.55	
.75	.13	–58.3	14.25	37.1	–19.4	–75.8	.12	–96.33	.55	
.80	.15	–57.1	14.16	27.0	–19.4	–81.8	.11	–111.57	.56	
.85	.17	–56.1	14.08	16.6	–19.3	–88.0	.11	–129.51	.58	
.90	.20	–55.8	14.00	5.9	–19.4	94.5	.10	–152.32	.60	
.95	.24	–56.1	13.90	–5.4	–19.4	–101.2	.09	178.52	.62	
1.00	.29	–57.6	13.76	–17.2	–19.4	–108.4	.11	146.78	.66	
1.05	.34	–60.5	13.59	–29.6	–19.5	–115.9	.13	117.19	.69	
1.10	.41	–64.7	13.34	–42.5	–19.6	–123.9	.17	92.13	.72	
1.15	.48	–69.9	12.99	–56.2	–19.8	–132.1	.22	71.68	.76	
1.20	.55	–76.1	12.51	–70.2	–20.1	–140.7	.28	54.07	.78	
1.25	.62	–83.0	11.87	–84.7	–20.5	–149.3	.35	38.18	.80	
1.30	.68	–90.2	11.05	–99.3	–21.0	–157.7	.41	23.68	.81	
1.35	.74	–97.6	10.05	–113.9	–21.6	–165.6	.46	10.19	.81	
1.40	.78	–104.8	8.88	–128.2	–22.3	–173.2	.51	–2.03	.80	
1.45	.82	–111.5	7.51	–142.4	–23.0	–179.9	.54	–13.24	.78	
1.50	.84	–117.9	6.00	–156.0	–23.8	174.2	.56	–23.55	.76	
1.55	.86	–123.7	4.30	–169.4	–24.5	168.8	.58	–32.83	.75	
1.60	.87	–129.1	2.39	177.7	–25.1	163.9	.59	–41.20	.72	
1.65	.87	–133.9	.21	165.4	–25.7	159.5	.59	–48.83	.68	
1.70	.88	–138.3	–2.33	159.3	–26.3	155.2	.59	–55.70	.63	
1.75	.88	–142.3	–5.34	144.1	–26.8	151.2	.59	–62.00	.55	
1.80	.88	–146.0	–8.93	137.4	–27.2	147.2	.59	–67.96	.37	
1.85	.88	–149.5	–13.38	138.0	–27.7	143.3	.59	–73.62	–.06	
1.90	.89	–152.3	–17.92	157.4	–28.0	139.6	.59	–79.18	–1.06	
1.95	.89	–156.2	–18.41	–169.3	–28.4	135.3	.59	–85.13	–1.87	
2.00	.89	–159.6	–16.01	–155.8	–28.7	131.0	.59	–90.95	–.78	
2.05	.90	–162.8	–14.32	–154.8	–29.0	127.2	.60	–97.21	.04	
2.10	.90	–166.1	–13.23	–160.1	–29.3	123.4	.60	–103.83	.24	
2.15	.90	–169.5	–12.70	–167.5	–29.6	119.9	.60	–110.60	.41	
2.20	.90	–172.8	–12.45	–175.0	–29.8	115.4	.60	–117.62	.43	
2.25	.90	–176.2	–12.51	177.1	–30.1	111.3	.60	–124.93	.42	
2.30	.90	–179.5	–12.72	169.0	–30.3	107.4	.60	–132.30	.48	
2.35	.90	–177.1	–13.10	161.0	–30.7	103.5	.60	–139.72	.43	
2.40	.90	–173.6	–13.61	152.9	–30.9	99.5	.60	–147.17	.44	
2.45	.90	–170.0	–14.20	145.3	–31.2	95.4	.60	–154.44	.42	
2.50	.90	166.5	–14.80	137.5	–31.4	92.0	.61	–161.53	.44	

LINEARIZATION RANGE: 50.0 to 500.0 MHz

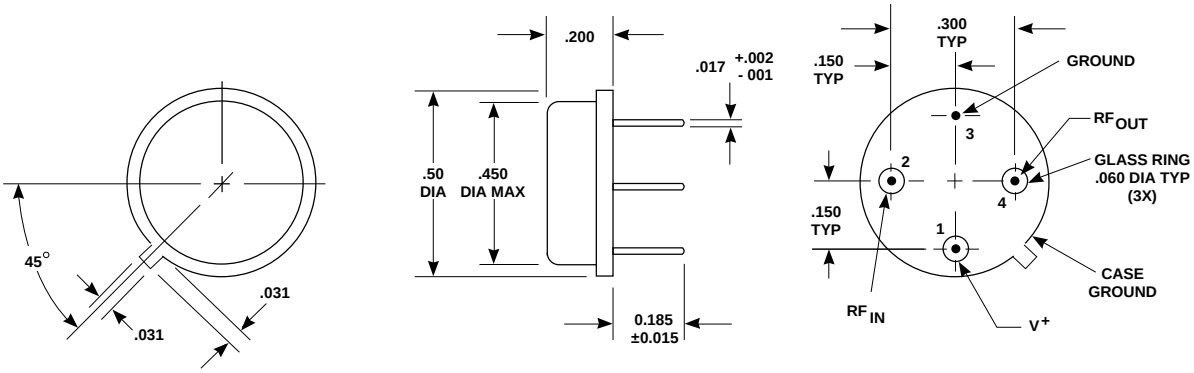
Product Options





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

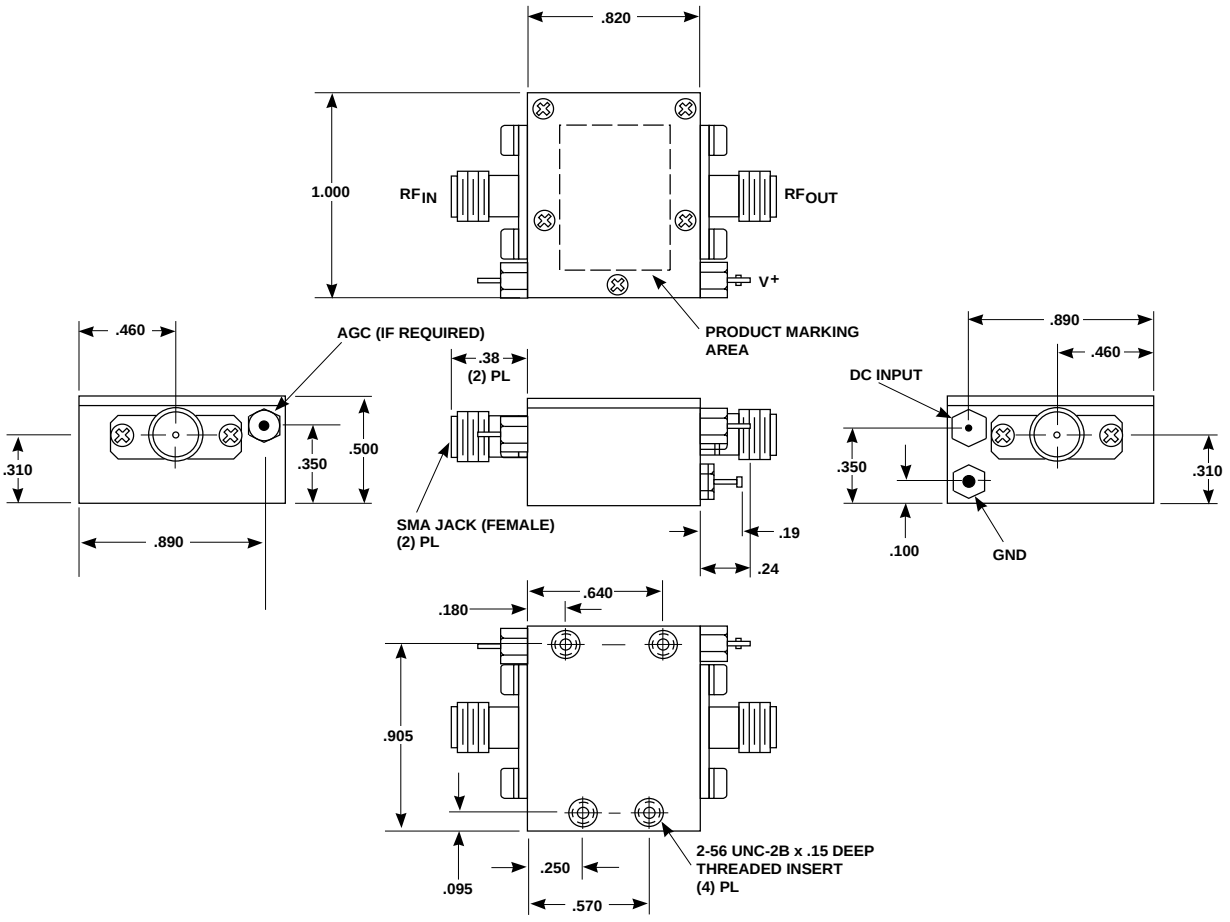
Case Drawings
TO-8T



APPROXIMATE WEIGHT 2.1 GRAMS

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

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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