



# Thin-Film Cascadable Amplifier 5 to 2000 MHz

## Technical Data

### UTO/UTC 2055 Series

#### Features

- **Frequency Range: 5 to 2000 MHz**
- **5 Volt Supply**
- **Low Supply Current**
- **Temperature Compensated**

#### Applications

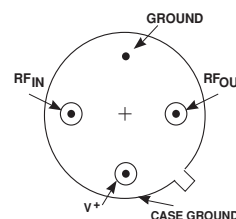
- **IF/RF Amplification**
- **5 Volt Systems**

#### Description

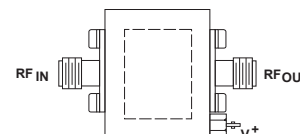
The 2055 Series is a high power thin-film bipolar RF amplifier that operates on 5-volt bias to provide medium output power. Resistive feedback and active bias assure temperature compensation and increased immunity to bias voltage variations. Input/output blocking capacitors couple RF through the amplifier, while a low VSWR is maintained through inductive tuning. The 2055 Series amplifiers are available in either the TO-8 hermetic case or connected TC-1A package.

#### Pin Configuration

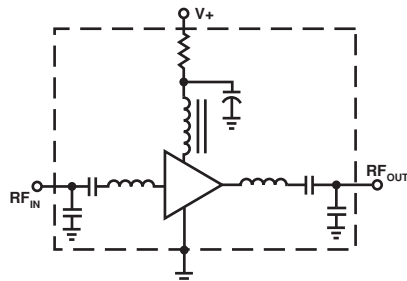
##### UTO—TO-8T



##### UTC—TC-1A



#### Schematic



#### Maximum Ratings

Parameter	Maximum
DC Voltage	+8.0 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<sup>1</sup>

$\theta_{JC}$	87°C/W
Active Transistor Power Dissipation	115 mW
Junction Temperature Above Case Temperature	10°C

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

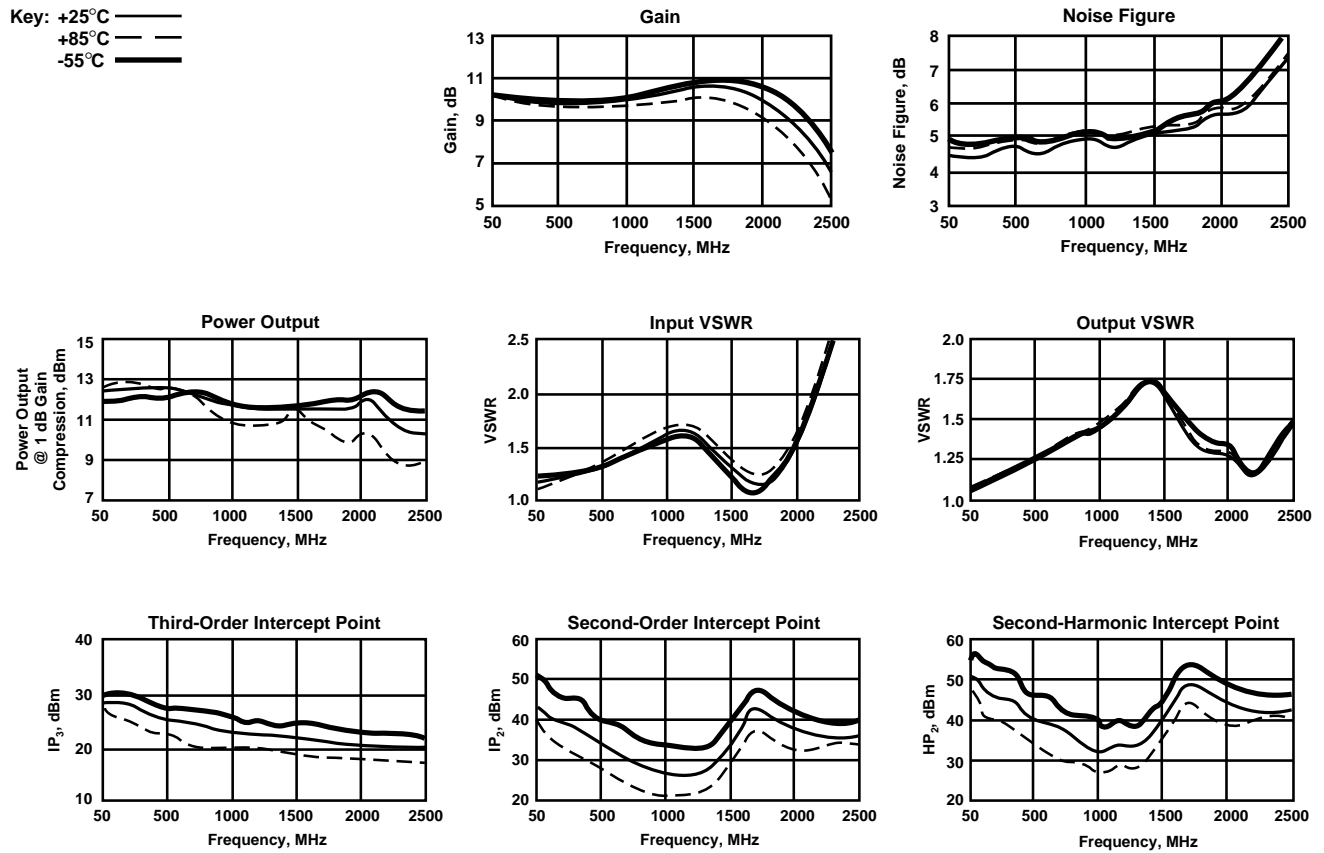
## Electrical Specifications

(Measured in 50  $\Omega$  system @ +5 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	5-2000	5-2000	5-2000	MHz
GP	Small Signal Gain (Min.)	9.5	8.5	7.5	dB
—	Gain Flatness (Max.)	$\pm 0.3$	$\pm 0.7$	$\pm 1.0$	dB
NF	Noise Figure (Max.)	5.0	6.0	6.5	dB
P <sub>1dB</sub>	Power Output @ +1 dB Comp. (Min.)	+11.5	+10.0	+9.0	dBm
—	Input VSWR (Max.)	1.6:1	2.0:1	2.0:1	—
—	Output VSWR (Max.)	1.7:1	2.0:1	2.0:1	—
IP <sub>3</sub>	Two Tone 3rd Order Intercept Point	+22.0	—	—	dBm
IP <sub>2</sub>	Two Tone 2nd Order Intercept Point	+30.0	—	—	dBm
HP <sub>2</sub>	One Tone 2nd Harmonic Intercept Point	+36.0	—	—	dBm
I <sub>D</sub>	DC Current	32	—	—	mA

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

Key: +25°C —  
+85°C —  
-55°C —

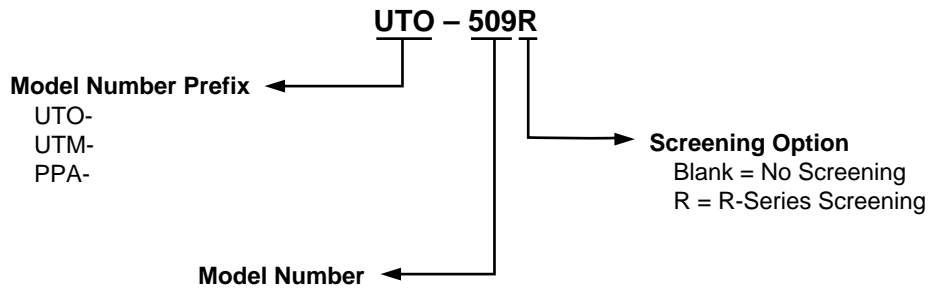


**Automatic Network Analyzer Measurements** (Typical production unit @ +25°C ambient)**S-Parameters and Numerical Readings****Bias = 5.00 Volts; Current = 32 mA**

FREQ GHz	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>		GPDEL ns	PHASE DEG
	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang		
.005	.12	-117.0	9.7	-168.9	-15.1	13.1	.07	119.33		
.010	.08	-138.2	9.7	-175.9	-15.1	5.6	.04	128.45		
.020	.06	-153.1	9.7	-179.9	-15.2	1.4	.03	138.60		
.050	.06	-161.3	9.7	174.5	-15.1	-3.0	.03	128.76	.40	-5.44
.100	.07	-160.2	9.7	167.4	-15.2	-8.0	.03	109.14	.40	-5.51
.150	.07	-157.5	9.7	160.6	-15.2	-12.5	.04	94.61	.38	-5.17
.200	.08	-155.6	9.7	154.0	-15.2	-16.9	.05	83.21	.37	-4.69
.250	.09	-154.0	9.6	147.5	-16.2	-21.2	.06	73.59	.36	-4.09
.300	.10	-153.7	9.6	141.0	-15.3	-25.4	.07	65.41	.36	-3.44
.350	.11	-154.5	9.6	134.5	-15.3	-29.6	.08	57.67	.36	-2.83
.400	.12	-155.9	9.6	128.0	-15.3	-33.8	.09	50.24	.36	-2.22
.450	.13	-157.7	9.6	121.5	-15.3	-38.0	.10	42.96	.36	-1.60
.500	.14	-159.8	9.6	115.1	-15.4	-42.1	.11	35.74	.36	-.94
.650	.15	-162.2	9.6	108.7	-15.4	-46.2	.12	28.48	.36	-.28
.600	.15	-164.9	9.6	102.2	-15.4	-50.3	.13	21.38	.36	.40
.650	.16	-168.0	9.6	95.8	-15.4	-54.3	.13	14.25	.36	1.07
.700	.17	-171.2	9.6	89.3	-15.5	-58.4	.14	7.09	.36	1.71
.750	.18	-174.8	9.6	82.8	-15.5	-62.5	.15	-1.10	.36	2.31
.800	.19	-178.6	9.6	76.3	-15.5	-66.6	.15	-7.34	.36	2.91
.850	.19	177.4	9.7	69.8	-15.5	-70.6	.16	-14.67	.36	3.45
.900	.20	173.3	9.7	63.2	-15.5	-74.8	.17	-22.11	.36	4.03
.950	.20	168.9	9.7	56.6	-15.5	-78.8	.17	-29.49	.37	4.52
1.000	.21	164.3	9.8	49.9	-15.5	-82.9	.18	-37.03	.37	4.95
1.050	.21	159.6	9.8	43.2	-15.5	-87.1	.18	-44.69	.37	5.32
1.100	.21	154.6	9.9	36.4	-15.5	-91.3	.19	-52.42	.38	5.63
1.150	.21	149.4	9.9	29.6	-15.4	-95.5	.19	-60.21	.38	5.87
1.200	.21	143.9	10.0	22.6	-15.4	-99.8	.19	-68.05	.39	5.98
1.250	.20	138.0	10.0	15.5	-15.4	104.1	.20	-76.00	.40	5.97
1.300	.20	131.7	10.1	8.2	-15.3	-108.5	.20	-84.15	.40	5.82
1.350	.19	124.7	10.2	.9	-15.3	-113.0	.20	-92.24	.41	5.57
1.400	.18	116.9	10.3	-6.7	-15.3	-117.6	.20	-100.37	.42	5.10
1.450	.16	108.2	10.3	-14.4	-15.2	-122.2	.20	-108.66	.43	4.44
1.500	.14	98.1	10.4	-22.5	-15.2	-127.0	.19	-116.98	.44	3.51
1.550	.12	85.8	10.5	-30.7	-15.2	-131.8	.19	-125.16	.46	2.34
1.600	.10	70.3	10.5	-39.2	-15.2	-136.6	.18	-133.35	.47	.91
1.650	.08	49.7	10.4	-47.8	-15.2	-141.3	.18	-141.69	.47	-.53
1.700	.08	20.8	10.4	-56.4	-15.2	-146.0	.18	-150.24	.48	-2.06
1.750	.06	-14.5	10.3	-85.0	-15.1	-150.6	.17	-159.60	.47	-3.50
1.800	.07	-43.9	10.1	-73.5	-15.0	-155.4	.17	-170.25	.47	-4.89
1.850	.09	-63.1	10.0	-81.9	-14.9	-160.4	.16	177.77	.47	-6.27
1.900	.12	-75.5	9.9	-90.5	-14.8	-165.8	.16	164.59	.48	-7.76
1.950	.15	-84.8	9.8	-99.3	-14.7	-171.4	.15	150.13	.48	-9.39
2.000	.18	-92.5	9.7	-108.2	-14.6	-177.4	.14	134.47	.49	-11.19
2.050	.21	-99.5	9.5	-117.3	-14.6	176.4	.14	118.05	.51	
2.100	.25	-106.0	9.3	-126.7	-14.6	170.1	.13	101.01	.52	
2.150	.28	-112.3	9.1	-136.1	-14.6	163.6	.13	83.87	.52	
2.000	.32	-118.3	8.9	-145.7	-14.6	156.9	.13	67.66	.53	
2.250	.35	-124.0	8.6	-155.4	-14.6	150.1	.14	52.78	.53	
2.300	.38	-129.5	8.2	-165.1	-14.7	143.3	.14	39.44	.54	
2.350	.41	-134.8	7.9	-174.9	-14.8	136.4	.15	28.06	.54	
2.400	.44	-139.7	7.4	175.3	-15.0	129.3	.15	18.94	.55	
2.450	.46	-144.2	7.0	165.4	-15.2	122.2	.16	11.94	.55	
2.500	.48	-148.4	6.5	155.6	-15.4	114.9	.17	6.82	.55	
3.000	.72	178.8	-1.8	55.0	-20.6	37.0	.55	-43.02	.56	

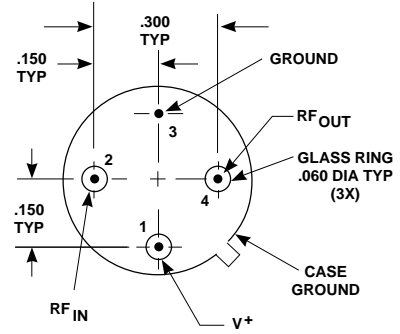
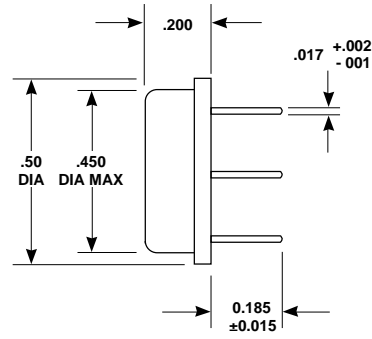
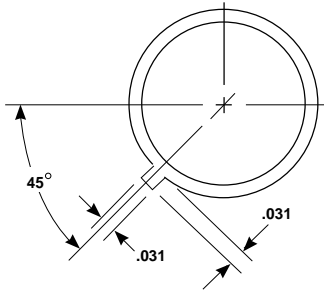
LINEARIZATION RANGE: .005 to 2.000 GHz

## Product Options



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

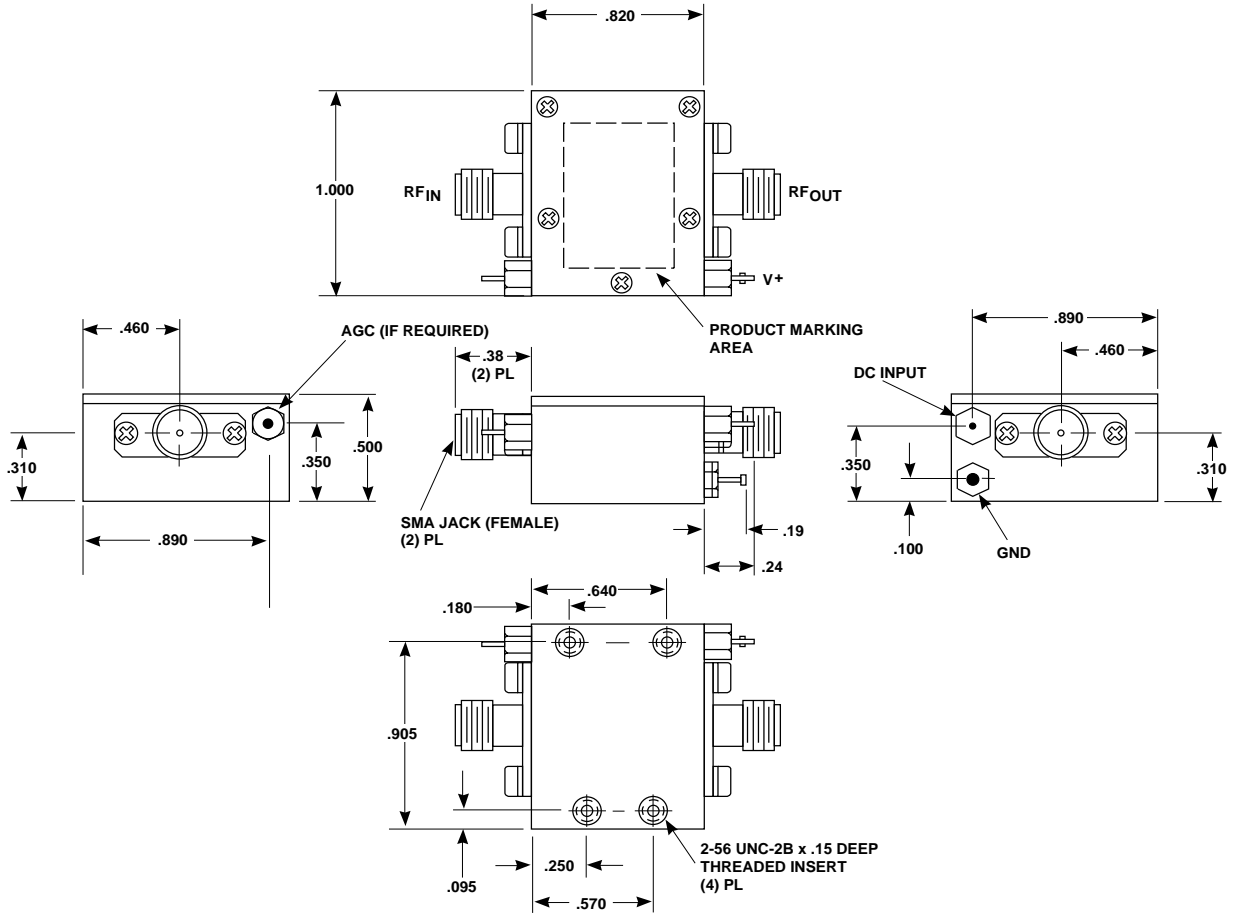
**Case Drawings  
TO-8T**



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

Contact Teledyne Microwave Solutions:  
 650-691-9800  
 650-962-6845 fax

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