



Thin-Film Cascadable Amplifier 5 to 1000 MHz

Technical Data

UTO/UTC 1052 Series

Features

- **Frequency Range: 5 to 1000 MHz**
- **5-Volt Supply**
- **Medium Power: +7.5 dBm (Typ)**
- **High Efficiency**
- **Low VSWR**
- **Temperature Compensated**

Applications

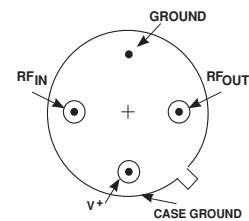
- **IF/RF Amplification**
- **5 Volt Systems**

Description

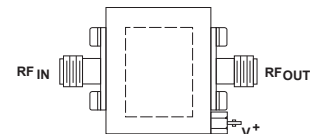
The 1052 Series is a medium-gain thin-film RF amplifier using 5-volt bias for efficient operation. Resistive feedback and active bias assure temperature compensation and increased immunity to bias voltage variations. Low VSWR is maintained by inductive tuning while the RF is coupled through the amplifier by internal blocking capacitors. The 1052 Series amplifiers are available in either the TO-8 hermetic case or connected TC-1A package.

Pin Configuration

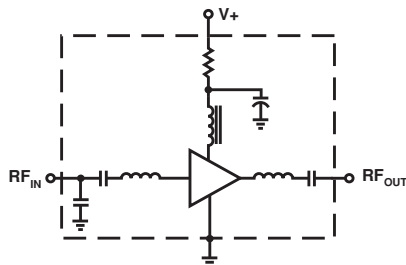
UTO—TO-8T



UTC—TC-1A



Schematic



Maximum Ratings

Parameter	Maximum
DC Voltage	+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 Characteristics¹

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)	1,550,000 Hrs.

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

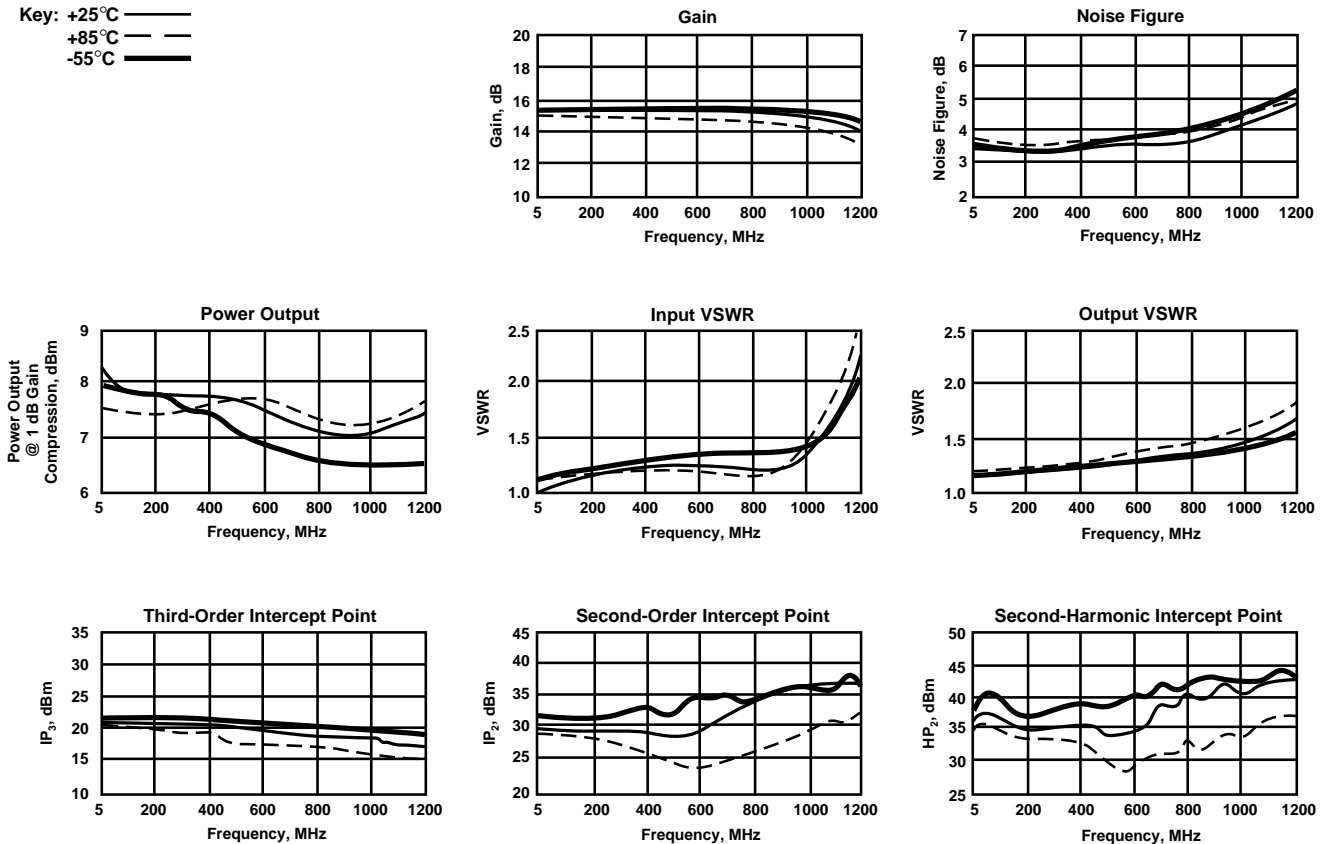
Electrical Specifications

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

Symbol	Characteristic	Typical $T_C = 25^\circ\text{C}$	Guaranteed Specifications		Unit
			$T_C = 0 \text{ to } 50^\circ\text{C}$	$T_C = -55 \text{ to } +85^\circ\text{C}$	
BW	Frequency Range	5-1000	5-1000	5-1000	MHz
GP	Small Signal Gain (Min.)	14.3	13.0	12.0	dB
—	Gain Flatness (Max.)	± 0.2	± 0.7	± 1.0	dB
NF	Noise Figure (Max.)	3.7	5.0	5.5	dB
P _{1dB}	Power Output @ +1 dB Comp. (Min.)	+7.5	+6.0	+5.5	dBm
—	Input VSWR (Max.)	<1.3:1	2.0:1	2.0:1	—
—	Output VSWR (Max.)	<1.4:1	2.0:1	2.0:1	—
IP ₃	Two Tone 3rd Order Intercept Point	+18.0	—	—	dBm
IP ₂	Two Tone 2nd Order Intercept Point	+28.0	—	—	dBm
HP ₂	One Tone 2nd Harmonic Intercept Point	+35.0	—	—	dBm
I _D	DC Current	18	—	—	mA

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

Key: +25°C —
+85°C - - -
-55°C = = =



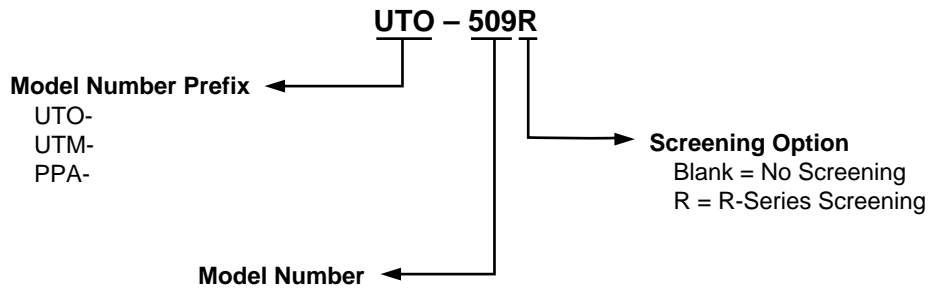
Automatic Network Analyzer Measurements (Typical production unit @ +25°C ambient)

S-Parameters
Bias = 5.00 Volts

FREQ GHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂		K	GPDEL ns	PHASE DEG
	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang			
.05	.02	1.1	14.43	172.9	-18.9	-3.6	.08	9.88	1.13	.50	-1.20
.10	.03	39.2	14.42	163.8	-18.9	-9.6	.08	4.99	1.13	.50	-1.44
.15	.04	42.7	14.41	155.2	-18.9	-15.0	.09	2.07	1.13	.48	-1.27
.20	.05	40.7	14.40	146.7	-19.0	-20.1	.09	-.25	1.13	.47	-.95
.25	.07	36.2	14.39	138.3	-19.0	-25.5	.10	-2.86	1.13	.47	-.54
.30	.08	30.3	14.37	130.1	-19.1	-30.7	.10	-5.75	1.13	.46	0.00
.35	.09	23.3	14.36	121.6	-19.1	-35.8	.11	-9.32	1.13	.47	.35
.40	.10	16.7	14.34	113.2	-19.2	-41.3	.12	-12.75	1.14	.47	.71
.45	.11	9.0	14.33	104.8	-19.3	-46.4	.12	-16.88	1.14	.47	1.13
.50	.11	1.5	14.33	96.3	-19.4	-51.8	.13	-21.61	1.14	.47	1.40
.55	.11	-4.9	14.32	87.7	-19.4	-57.1	.14	-26.32	1.14	.48	1.58
.60	.11	-11.1	14.32	78.9	-19.5	-62.6	.14	-30.87	1.14	.49	1.64
.65	.11	-16.2	14.31	70.2	-19.6	-68.2	.15	-34.73	1.15	.48	1.69
.70	.11	-19.8	14.31	61.2	-19.7	-73.6	.16	-38.59	1.16	.50	1.50
.75	.10	-21.7	14.30	52.1	-19.8	-79.1	.16	-42.27	1.16	.51	1.24
.80	.09	-18.9	14.30	42.9	-20.0	-85.0	.17	-45.28	1.17	.51	.79
.85	.09	-11.3	14.29	33.4	-20.1	-90.7	.18	-47.90	1.18	.53	.11
.90	.09	.5	14.27	23.7	-20.3	-96.5	.18	-49.88	1.19	.54	-.84
.95	.11	10.9	14.24	13.6	-20.4	-102.5	.19	-51.84	1.20	.56	-2.10
1.00	.15	16.6	14.18	3.1	-20.6	-108.8	.20	-53.84	1.21	.58	-3.80
1.05	.19	16.6	14.08	-7.8	-20.8	-115.1	.22	-55.73	1.22	.60	
1.10	.25	12.8	13.92	-19.0	-21.1	-121.1	.24	-57.73	1.23	.62	
1.15	.32	6.9	13.69	-30.6	-21.4	-127.7	.25	-60.48	1.25	.65	
1.20	.39	-.5	13.38	-42.4	-21.7	-134.0	.27	-63.98	1.26	.66	
1.25	.46	-8.7	12.95	-54.5	-22.1	-140.1	.29	-68.19	1.27	.67	
1.30	.53	-17.6	12.40	-66.4	-22.5	-146.3	.31	-72.90	1.28	.66	
1.35	.60	-26.7	11.74	-78.3	-23.0	-151.8	.33	-77.94	1.29	.66	
1.40	.66	-35.6	10.98	-89.7	-23.4	-157.4	.34	-83.29	1.31	.64	
1.45	.71	-44.1	10.14	-100.7	-23.2	-162.2	.35	-88.84	1.32	.61	
1.50	.75	-52.2	9.24	-111.2	-24.3	-167.0	.35	-94.42	1.34	.58	
1.55	.79	-59.8	8.30	-121.3	-24.6	-171.9	.35	-99.92	1.37	.56	
1.60	.22	-66.8	7.32	-130.8	-25.0	-176.5	.35	-105.48	1.40	.52	
1.65	.84	-73.5	6.33	-139.2	-25.3	179.6	.34	-111.13	1.45	.50	
1.70	.85	-79.6	5.31	-148.4	-25.7	175.1	.34	-116.61	1.51	.48	
1.75	.87	-85.3	4.29	-156.6	-26.0	171.2	.33	-122.27	1.60	.46	
1.80	.88	-90.5	3.29	-164.5	-26.2	166.8	.32	-127.94	1.70	.44	
1.85	.88	-95.4	2.29	-171.9	-26.4	162.8	.31	-133.67	1.82	.42	
1.90	.89	-100.1	1.30	-179.3	-26.6	158.6	.30	-139.76	1.99	.40	
1.95	.89	-104.4	.32	173.6	-26.8	154.2	.29	-146.09	2.16	.40	
2.00	.90	-108.7	-.67	166.6	-27.0	149.2	.28	-152.28	2.40	.38	
2.05	.90	-112.5	-1.61	159.7	-27.2	145.5	.27	-158.86	2.58	.38	
2.10	.90	-116.4	-2.59	153.2	-27.3	140.5	.26	-165.48	2.87	.37	
2.15	.91	-120.1	-3.54	146.2	-27.5	136.1	.26	-171.93	3.18	.38	
2.20	.91	-123.6	-4.49	139.9	-27.7	131.6	.25	-178.40	3.60	.34	
2.25	.91	-127.1	-5.44	133.7	-27.7	126.8	.25	175.33	4.04	.36	
2.30	.91	-130.5	-6.38	127.2	-27.9	122.3	.25	169.58	4.54	.37	
2.35	.91	-133.9	-7.36	121.0	-28.1	117.7	.25	164.06	5.18	.33	
2.40	.91	-137.4	-8.32	114.6	-28.3	112.7	.25	159.16	5.88	.36	
2.45	.91	-140.9	-9.30	108.4	-28.4	107.9	.26	154.89	6.63	.36	
2.50	.90	-144.3	-10.30	101.9	-28.6	103.6	.26	151.29	7.80	.35	

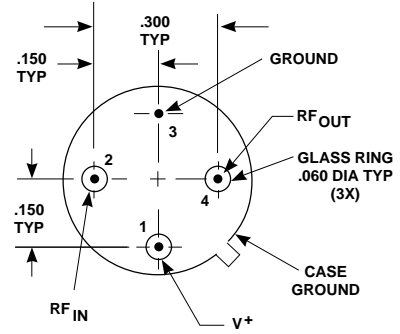
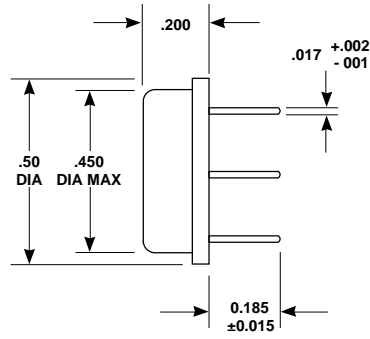
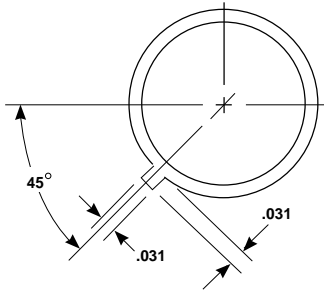
LINEARIZATION RANGE: .05 to 1.00 GHz

Product Options



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

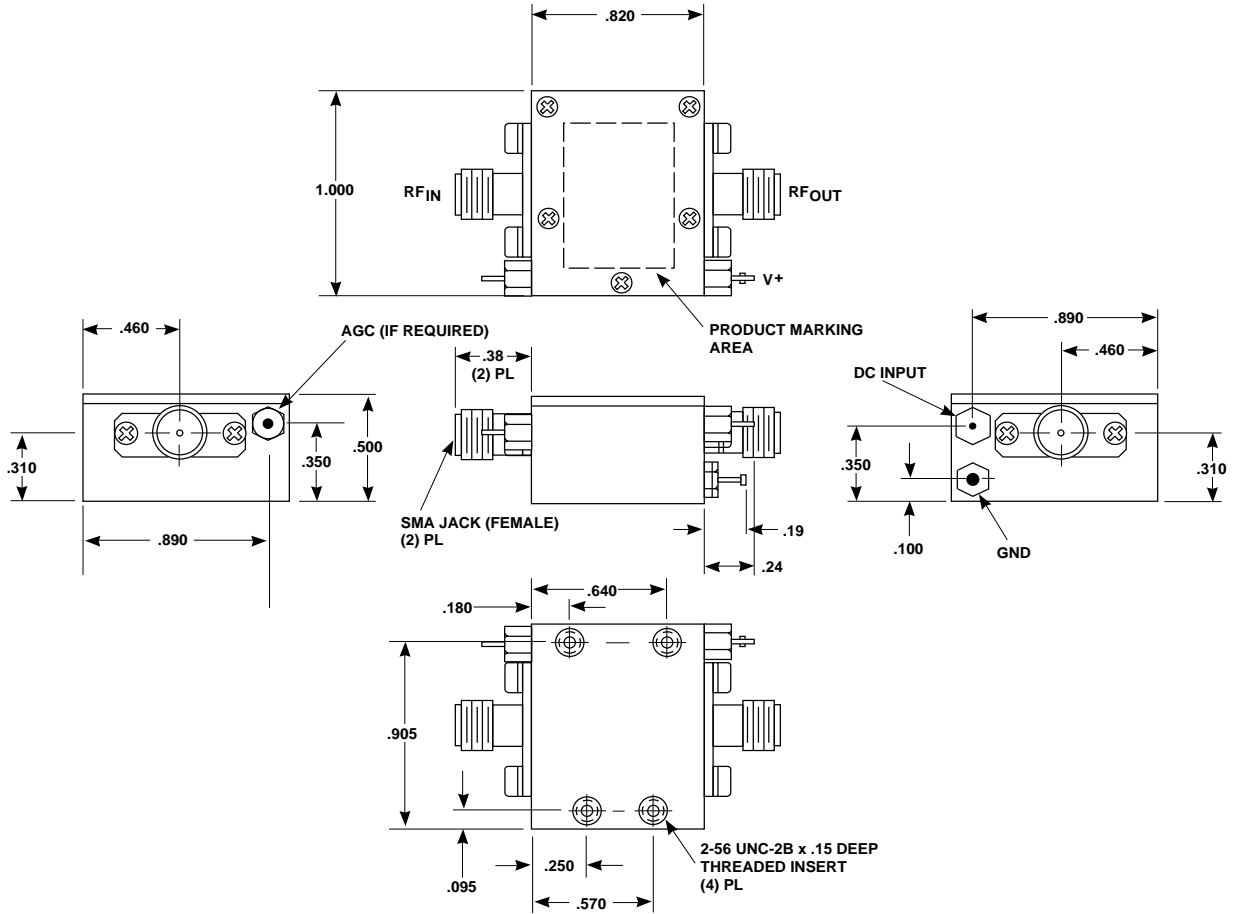
**Case Drawings
TO-8T**



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

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