



Thin-Film Cascadable Amplifier 10 to 1000 MHz

Technical Data

UTM-1056

Features

- **Frequency Range: 10 to 1000 MHz**
- **MODAMP Silicon Monolithic Gain Stages**
- **High Gain: 26.5 dB (Typ)**
- **Low VSWR**

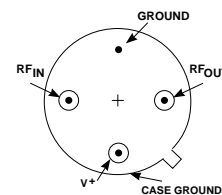
Applications

- **IF/RF Amplification**

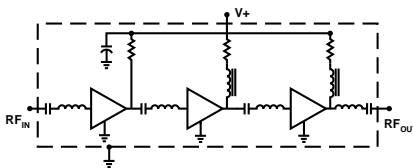
Description

The UTM-1056 contains three monolithic microwave integrated circuits mounted on a thin-film substrate to provide an RF amplifier suitable for wideband, high-gain applications. Internal blocking capacitors couple the RF through this three-stage amplifier. The UTM-1056 is offered in the TO-8 hermetic package.

Pin Configuration UTM—TO-8T



Schematic



Maximum Ratings

Parameter	Maximum
DC Voltage	+17 Volts
Continuous RF Input Power	+20 dBm
Operating Case Temperature	-55 to +125°C
Storage Temperature	-62 to +150°C
"R" Series Burn-In Temperature	+100°C

Thermal Characteristics¹

θ_{JC}	100/90/90°C/W ²
Active Transistor Power Dissipation	175/240/308 mW ²
Junction Temperature Above Case Temperature	18/22/28°C ²
MTBF (MIL-HDBK-217E, A _{UF} @ 90°C)	284,100 Hrs.

Notes:

1. Values refer to 1st, 2nd, 3rd stage transistors respectively.

Weight: (typical) UTM—2.1 grams

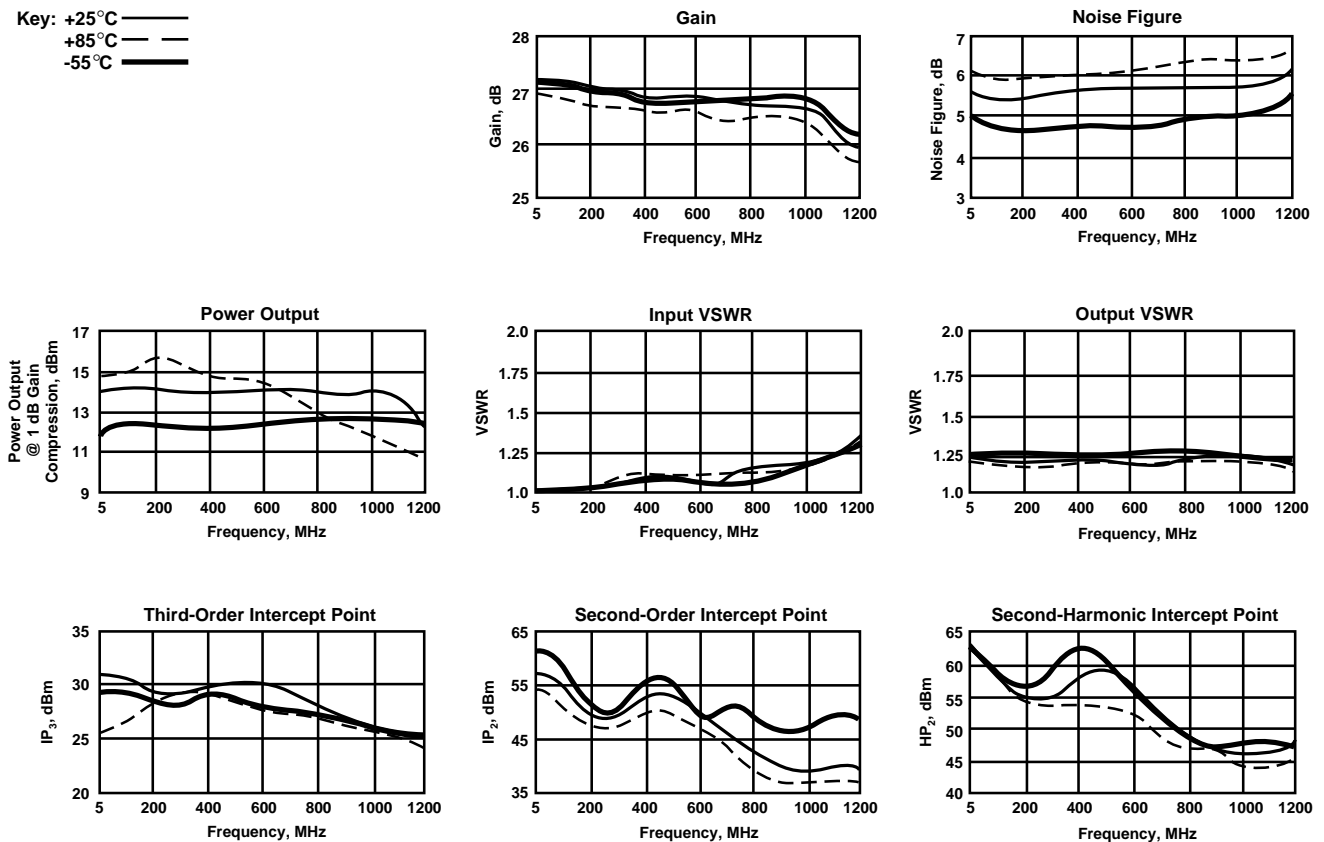
Electrical Specifications

(Measured in 50 Ω system @ +15 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	10-1000	10-1000	10-1000	MHz
GP	Small Signal Gain (Min.)	26.5	25.5	25.0	dB
—	Gain Flatness (Max.)	± 0.9	± 2.0	± 2.0	dB
NF	Noise Figure (Max.)	5.5	6.5	7.0	dB
P _{1dB}	Power Output @ +1 dB Comp. (Min.)	+13.5	+12.0	+10.5	dBm
—	Input VSWR (Max.)	1.4:1	1.7:1	1.7:1	—
—	Output VSWR (Max.)	1.4:1	1.7:1	1.7:1	—
IP ₃	Two Tone 3rd Order Intercept Point	+26.0	—	—	dBm
IP ₂	Two Tone 2nd Order Intercept Point	+40.0	—	—	dBm
HP ₂	One Tone 2nd Harmonic Intercept Point	+45.0	—	—	dBm
I _D	DC Current	135	—	—	mA

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

Key: +25°C —
+85°C - -
-55°C —



Automatic Network Analyzer Measurements (Typical production unit @ +25°C ambient)**Numerical Readings****Bias = 15.00 Volts**

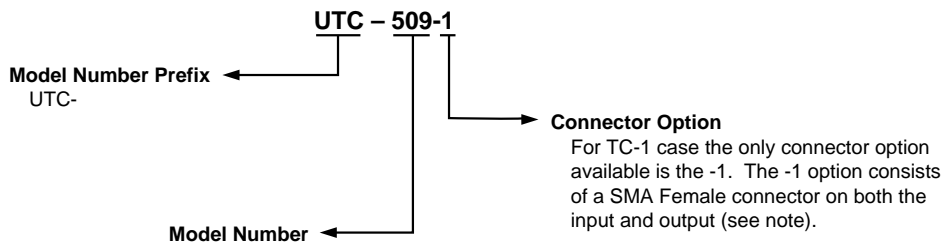
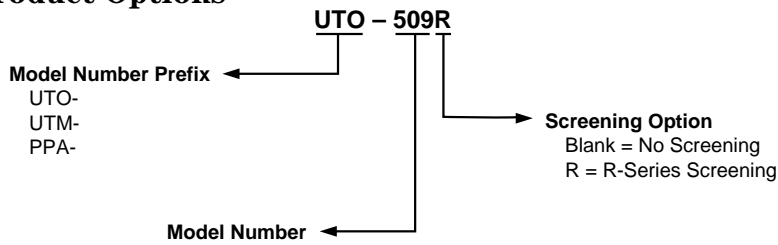
FREQUENCY MHz	VSWR IN	GAIN dB	PHASE DEV	GROUP DELAY ns	VSWR OUT
100.0	1.06	27.11	-1.39	.00	1.16
200.0	1.04	26.99	-.77	.67	1.21
300.0	1.05	26.73	-.48	.67	1.23
400.0	1.06	26.48	.18	.66	1.26
500.0	1.05	26.52	.94	.65	1.30
600.0	1.06	26.76	2.49	.67	1.30
700.0	1.13	26.68	1.91	.71	1.31
800.0	1.18	26.70	.47	.72	1.34
900.0	1.22	26.70	-.39	.73	1.31
1000.0	1.28	26.49	-2.96	.77	1.24
1100.0	1.36	26.12		.79	1.14
1200.0	1.44	25.73		.79	1.09
1300.0	1.55	25.00		.80	1.30
1400.0	1.70	23.67		.78	1.63
1500.0	1.68	23.16		.79	1.87
1600.0	1.72	21.70		.81	2.50
1700.0	1.77	19.89		.75	3.20
1800.0	1.81	17.56		.70	3.82
1900.0	1.76	15.65		.63	4.18
2000.0	1.70	13.62		.00	4.46

Linearization Range: 100.0 to 1000.0 MHz

Bias = 15.00 Volts
135 mA**S-Parameters**

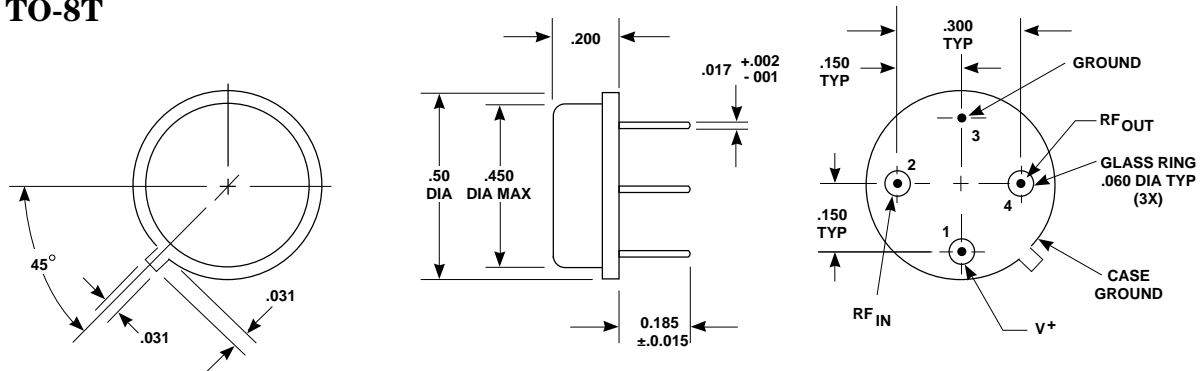
FREQUENCY MHz	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang
100.00	.005	66.7	26.968	155.9	-58.461	-86.5	.095	4.2
200.00	.014	71.0	26.819	129.9	-51.146	-18.7	.096	7.3
300.00	.022	60.6	26.771	107.9	-62.887	29.9	.105	4.0
400.00	.029	66.4	26.495	82.6	-52.593	-9.4	.117	1.2
500.00	.016	74.1	26.567	59.1	-55.136	-.8	.132	-4.7
600.00	.017	95.3	26.513	35.1	-52.968	-21.2	.134	-13.2
700.00	.062	112.8	26.689	10.1	-51.633	-26.9	.128	-18.2
800.00	.074	99.2	26.636	-15.3	-51.910	-39.9	.148	-26.9
900.00	.078	91.6	26.532	-41.2	-52.173	-66.5	.144	-44.3
1000.00	.107	84.8	26.515	-68.2	-53.165	-61.3	.115	-64.6
1100.00	.134	84.6	25.953	-96.9	-52.159	-82.0	.060	-99.7
1200.00	.170	74.9	25.763	-125.3	-51.498	-78.5	.041	151.7
1300.00	.213	67.3	24.976	-153.2	-55.669	-95.1	.123	96.2
1400.00	.241	55.5	24.022	178.3	-57.330	-76.3	.235	66.2
1500.00	.284	39.1	22.711	150.5	-50.292	.6	.299	41.7
1600.00	.257	27.7	21.627	120.4	-48.659	-44.7	.433	31.8
1700.00	.256	21.9	19.874	94.0	-50.520	-117.8	.524	12.1
1800.00	.274	15.5	17.720	68.4	-58.857	-33.9	.580	-5.3
1900.00	.267	6.7	15.558	45.4	-55.695	-39.2	.618	-18.5
2000.00	.258	-.8	13.380	25.0	-58.326	-30.1	.643	-29.6

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

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