



UTM-1053 Thin-Film Cascadable Amplifier 5 to 1000 MHz

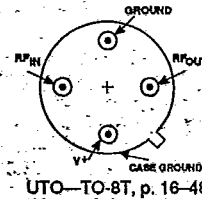
T-74-09-01

FEATURES

- Frequency Range: 5 to 1000 MHz
- MODAMP Silicon Monolithic Gain Stages
- High Gain: +30 dB (Typ)
- Low VSWR

APPLICATIONS

- IF/RF Amplification



UTO—TO-8T, p. 16-48

DESCRIPTION

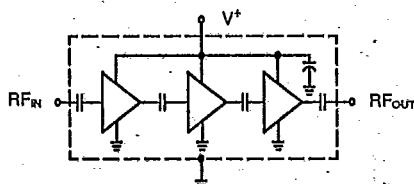
The UTM-1053 contains three silicon monolithic microwave integrated circuit RF amplifiers mounted on a thin-film substrate to provide wideband, high gain performance. Internal

blocking capacitors couple the RF through this three-stage amplifier. The UTM-1053 is available in the TO-8 hermetic package.

ELECTRICAL SPECIFICATIONS (Measured in a 50-ohm system @ +15 VDC nominal unless otherwise noted)

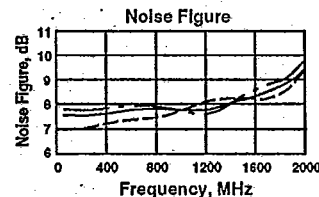
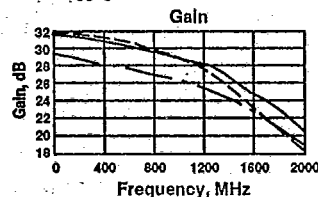
Symbol	Characteristic	Typical $T_c = 25^\circ\text{C}$	Guaranteed Specifications		Unit
			$T_c = 0^\circ\text{ to }50^\circ\text{C}$	$T_c = -55^\circ\text{ to }+85^\circ\text{C}$	
BW	Frequency Range	5-1000	5-1000	5-1000	MHz
GP	Small Signal Gain (Min.)	30.0	27.0	25.0	dB
—	Gain Flatness (Max.)	± 1.5	± 2.0	± 2.0	dB
NF	Noise Figure (Max.)	8.0	9.0	9.0	dB
P_{1dB}	Power Output @ +1 dB Compression (Min.)	+9.0	+5.0	+4.0	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	+30.0	—	—	dBm
HP_2	One Tone 2nd Harmonic Intercept Point	+35.0	—	—	dBm
I_b	DC Current	90	—	—	mA

SCHEMATIC



TYPICAL PERFORMANCE OVER TEMPERATURE (@ +15 VDC unless otherwise noted)

KEY: +25°C ———
+85°C - - - - -
-55°C ······



MAXIMUM RATINGS

DC Voltage	17 Volts
Continuous RF Input Power	+17 dBm
Operating Case Temperature	-55°C to +71°C
Storage Temperature	-62°C to +71°C
"R" Series Burn-In Temperature	+71°C

THERMAL CHARACTERISTICS

θ_{JA}^1	130/130/130°C/W
Active Transistor Power Dissipation ¹	125/125/175 mW
Junction Temperature Above Case Temperature ¹	16/16/23°C
MTBF (MIL-HDBK-217E, A_{UF} @ 90°C)	535,000 Hrs.

Note 1: Values refer to 1st and 2nd stage transistors respectively.

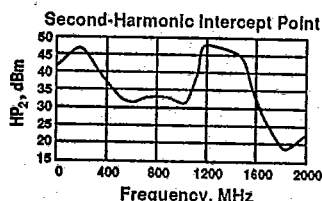
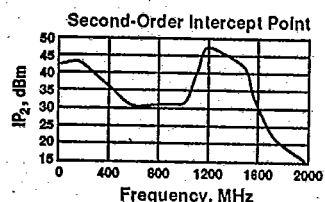
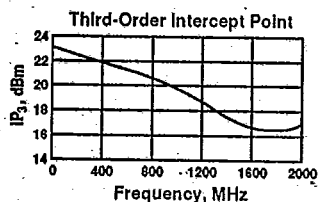
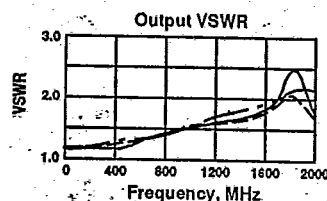
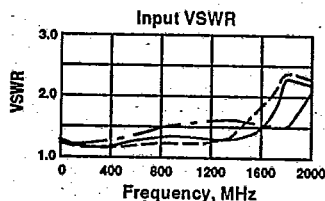
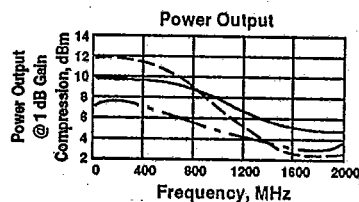
WEIGHT: (typical) UTO—2.1 grams

Avantek, Inc. • 481 Cottonwood Drive, Milpitas, CA 95035 • Contact your local representative, distributor or field sales office for further information. Listings are in the back of this Data Book.

UTM 1053
Thin-Film Cascadable Amplifier

TYPICAL PERFORMANCE OVER TEMPERATURE (continued)

T-74-09-01

AUTOMATIC NETWORK ANALYZER MEASUREMENTS (Typical production unit @ $\pm 25^{\circ}\text{C}$ ambient)

NUMERICAL READINGS

BIAS = 15.00 VOLTS

FREQ MHz	VSWR IN	GAIN dB	PHASE DEV	GPDEL ns	VSWR OUT	ISOL dB
100.0	1.15	31.10	2.01	.00	1.06	43.20
200.0	1.08	30.79	.12	.74	1.13	48.73
300.0	1.12	30.46	-.76	.67	1.15	58.84
400.0	1.16	30.11	-.94	.68	1.20	55.41
500.0	1.22	29.90	-.96	.66	1.24	51.72
600.0	1.27	29.77	-.07	.65	1.30	54.65
700.0	1.31	29.48	.17	.67	1.33	49.54
800.0	1.36	29.20	.60	.68	1.39	51.27
900.0	1.39	28.99	.34	.69	1.43	49.36
1000.0	1.41	28.85	-.55	.70	1.49	47.69

S-PARAMETERS

BIAS = 15.00 VOLTS

FREQ MHz	S_{11}		S_{21}		S_{12}		S_{22}	
	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang
100.00	.055	-168.8	31.488	159.6	-49.622	23.4	.041	-18.5
150.00	.044	-162.6	31.381	148.6	-52.352	8.1	.048	-16.8
200.00	.044	-151.7	31.268	137.8	-54.150	39.4	.058	-24.8
250.00	.049	-139.7	31.171	128.3	-55.565	80.8	.064	-33.3
300.00	.051	-127.9	31.000	118.6	-59.922	73.1	.067	-39.4
350.00	.059	-118.6	30.855	109.3	-62.893	30.4	.080	-45.1
400.00	.069	-115.4	30.656	100.1	-68.065	91.3	.088	-50.9
450.00	.080	-109.4	30.510	90.7	-66.606	54.3	.098	-55.2
500.00	.090	-109.4	30.398	81.6	-59.501	70.4	.110	-60.7
550.00	.101	-108.8	30.297	72.5	-60.129	47.5	.121	-64.0
600.00	.113	-110.1	30.230	63.6	-55.868	61.5	.133	-67.3
650.00	.123	-110.7	30.113	54.8	-53.130	96.5	.144	-69.9
700.00	.132	-112.5	29.959	45.6	-55.095	70.4	.152	-73.8
750.00	.140	-115.8	29.853	36.4	-54.666	85.4	.164	-77.6
800.00	.149	-119.4	29.662	26.8	-51.949	80.2	.176	-78.5
850.00	.155	-122.0	29.525	16.8	-53.425	106.0	.181	-79.9
900.00	.169	-124.5	29.375	6.9	-51.872	93.9	.186	-82.6
950.00	.166	-128.1	29.324	-3.2	-50.651	113.6	.198	-84.3
1000.00	.169	-130.1	29.172	-13.0	-51.330	100.3	.206	-84.9
1100.00	.167	-132.8	28.807	-32.5	-49.174	118.9	.216	-89.3
1200.00	.163	-132.6	28.347	-52.9	-46.878	123.1	.233	-89.2
1300.00	.156	-129.7	27.681	-72.8	-46.023	116.7	.242	-91.5
1400.00	.157	-123.8	26.792	-92.0	-44.046	115.0	.259	-92.8
1500.00	.171	-117.3	25.869	-109.8	-42.855	112.2	.270	-94.0
1600.00	.204	-112.8	24.811	-126.6	-40.686	112.2	.301	-97.7
1700.00	.222	-109.9	23.520	-142.2	-38.903	108.0	.292	-100.5
1800.00	.389	-95.2	23.283	-154.1	-35.449	53.8	.427	-93.3
1900.00	.394	-126.1	21.584	-175.4	-44.824	72.7	.352	-120.1
2000.00	.363	-137.2	20.254	172.3	-41.273	95.2	.280	-123.3