AVANTEK

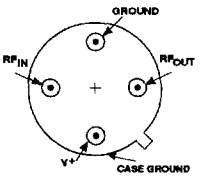
UTO/UTC 1023 Series
Thin-Film Cascadable Amplifier
10 to 1000 MHz

FEATURES

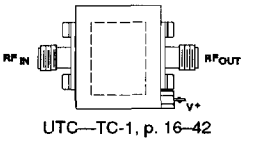
- Frequency Range: 10 to 1000 MHz
- High Power: +26.5 dBm (Typ)
- Medium Gain: 13.0 dB (Typ)
- Temperature Compensated
- Low Phase Noise

APPLICATIONS

- IF/RF Amplification
- Output Stage



UTO—TO-8T, p. 16–48



UTC—TC-1, p. 16–42

DESCRIPTION

The 1023 Series is a thin-film bipolar RF amplifier for higher output power and medium-gain applications up to 1000 MHz. 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 1023 Series amplifiers are available in either the TO-8 hermetic case or connectored TC-1 package. See page 3–128 for schematic.

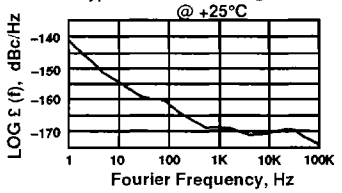
ELECTRICAL SPECIFICATIONS (Measured in a 50-ohm system @ +15 VDC nominal unless otherwise noted)

Symbol	Characteristic	Typical T_C = 25°C	Guaranteed Specifications T_C = 0° to 50°C	Guaranteed Specifications T_C = –55° to +85°C	Unit
BW	Frequency Range	10-1000	10-1000	10-1000	MHz
GP	Small Signal Gain (Min.)	13.0	12.0	12.0	dB
—	Gain Flatness (Max.)	±0.2	±1.0	±1.0	dB
NF	Noise Figure (Max.)				
	30-500 MHz (Max.)	7.0	7.5	8.0	dB
	500-1000 MHz (Max.)	8.0	8.5	9.5	dB
$P_{1\,dB}$	Power Output @ +1 dB Compression (Min.)				
	10-500 MHz	+28.0	+26.0	+25.5	dBm
	500-1000 MHz	+26.5	+24.5	+24.0	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	+36.0	+32.0	+30.0	dBm
IP_2	Two Tone 2nd Order Intercept Point	+42.0	—	—	dBm
HP_2	One Tone 2nd Harmonic Intercept Point	+48.0	—	—	dBm
I_D	DC Current	205	—	—	mA
—	Phase Noise @ 500 MHz; 1KHz Offset	–165	—	—	dBc/Hz

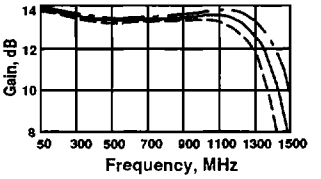
TYPICAL PERFORMANCE OVER TEMPERATURE (@ +15 VDC unless otherwise noted)

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

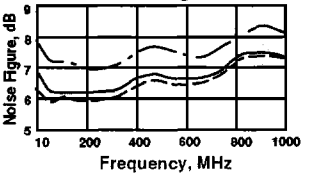
Typical Phase Noise @ 500 MHz @ +25°C



Gain



Noise Figure



MAXIMUM RATINGS

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

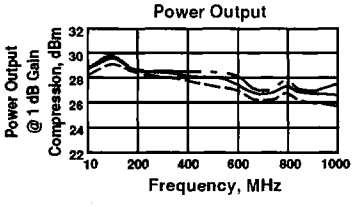
THERMAL CHARACTERISTICS*

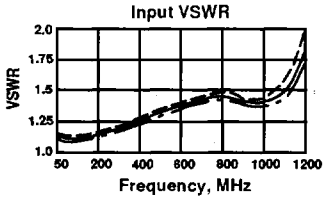
θ_{JC}	52°C/W
Active Transistor Power Dissipation	924/661/661 mW
Junction Temperature Above Case Temperature	48/34/34°C
MTBF (MIL-HDBK-217E, A_{UF} @ 90°C)	410,200 Hrs.

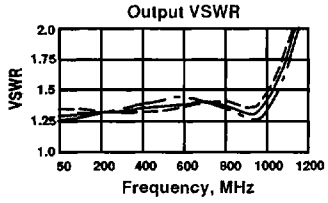
*For further information, see High Reliability section, p. 17–2.

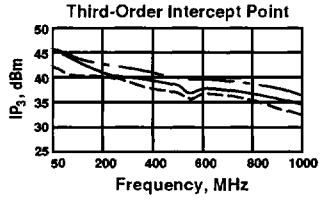
WEIGHT: (typical) UTO—2.1 grams; UTC—21.5 grams

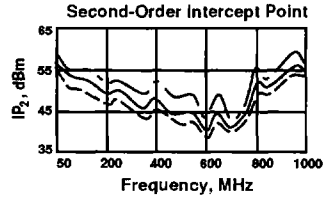
TYPICAL PERFORMANCE OVER TEMPERATURE (continued)

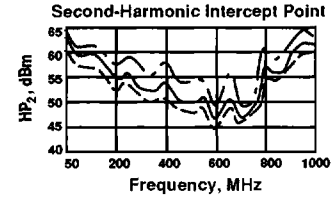












AUTOMATIC NETWORK ANALYZER MEASUREMENTS (Typical production unit at +25°C ambient)

S-PARAMETERS — BIAS = 15.00 VOLTS

FREQ	S_{11}		S_{21}		S_{12}		S_{22}			GPDEL	PHASE
GHz	Mag	Ang	dB	Ang	dB	Ang	Mag	Ang	K	ns	DEG
.05	.05	–31.0	13.6	171.8	–19.9	–3.0	.13	174.08	1.25	.64	–.32
.10	.04	–21.4	13.6	160.3	–19.9	–9.6	.13	–178.73	1.25	.64	–1.24
.15	.05	–20.8	13.5	149.5	–19.9	–15.4	.13	–174.13	1.26	.59	–1.32
.20	.06	–23.4	13.5	139.0	–20.0	–20.9	.13	–170.65	1.27	.59	–1.26
.25	.07	–29.8	13.4	128.7	–20.0	–26.4	.13	–167.63	1.27	.58	–.98
.30	.08	–37.0	13.4	118.6	–20.0	–31.9	.14	–164.78	1.28	.56	–.47
.35	.09	–45.8	13.3	108.3	–20.0	–37.4	.14	–162.71	1.28	.57	–.09
.40	.10	–55.1	13.3	98.1	–20.0	–42.9	.15	–160.83	1.28	.57	.32
.45	.12	–64.3	13.2	87.9	–20.0	–48.6	.16	–159.18	1.29	.57	.70
.50	.13	–74.0	13.2	77.7	–20.1	–54.4	.16	–157.64	1.29	.57	1.15
.55	.14	–84.2	13.2	67.6	–20.1	–60.0	.16	–156.40	1.29	.56	1.63
.60	.16	–94.7	13.1	57.2	–20.0	–66.0	.17	–155.50	1.29	.57	1.91
.65	.17	–105.1	13.1	46.8	–20.0	–72.0	.17	–154.47	1.29	.58	2.10
.70	.17	–116.4	13.2	36.2	–20.0	–78.4	.16	–153.12	1.29	.59	2.11
.75	.18	–128.4	13.2	25.3	–20.0	–84.9	.16	–151.21	1.28	.60	1.88
.80	.18	–141.6	13.2	14.3	–20.0	–91.8	.15	–147.75	1.28	.62	1.42
.85	.17	–156.1	13.3	2.9	–20.0	–99.0	.14	–141.66	1.28	.64	.65
.90	.17	–173.3	13.4	–9.1	–19.3	–106.4	.13	–132.12	1.27	.66	–.72
.95	.16	166.3	13.5	–21.5	–19.9	–114.5	.13	–117.40	1.26	.69	–2.50
1.00	.16	140.7	13.5	–34.6	–19.9	–123.2	.15	–102.32	1.26	.73	–4.97
1.10	.19	80.8	13.6	–63.0	–20.2	–141.9	.25	–86.40	1.24	.81	
1.20	.29	30.6	13.3	–94.9	–20.8	–162.2	.41	–89.64	1.23	.91	
1.30	.40	–6.9	12.6	–131.1	–22.0	177.7	.57	–100.99	1.21	1.04	
1.40	.48	–35.6	10.7	–171.2	–23.7	158.9	.71	–115.51	1.22	1.14	
1.50	.52	–53.7	7.0	149.7	–25.9	143.8	.80	–130.62	1.43	1.04	
1.60	.57	–66.0	2.0	120.7	–28.3	133.8	.83	–144.34	2.28	.72	
1.70	.63	–77.6	–3.1	102.8	–31.0	129.7	.84	–156.22	4.63	.43	
1.80	.68	–88.8	–7.6	92.0	–33.3	138.5	.84	–166.66	9.44	.25	
1.90	.71	–99.0	–11.5	85.2	–32.5	154.0	.82	–175.60	13.15	.14	
2.00	.74	–108.0	–14.8	82.6	–29.5	152.8	.81	177.14	13.42	.05	
2.10	.77	–116.2	–17.3	81.5	–27.4	138.6	.81	170.41	12.87	.02	
2.20	.79	–123.9	–19.1	78.3	–26.6	122.3	.82	163.51	12.44	.08	
2.30	.81	–131.2	–20.7	73.9	–26.5	107.5	.84	156.54	12.61	.14	
2.40	.82	–138.0	–22.0	69.1	–26.6	93.8	.85	149.70	13.26	.14	
2.50	.83	–144.6	–23.5	62.5	–27.0	81.9	.85	143.51	15.06	.18	

LINEARIZATION RANGE: .05 to 1.00 GHz