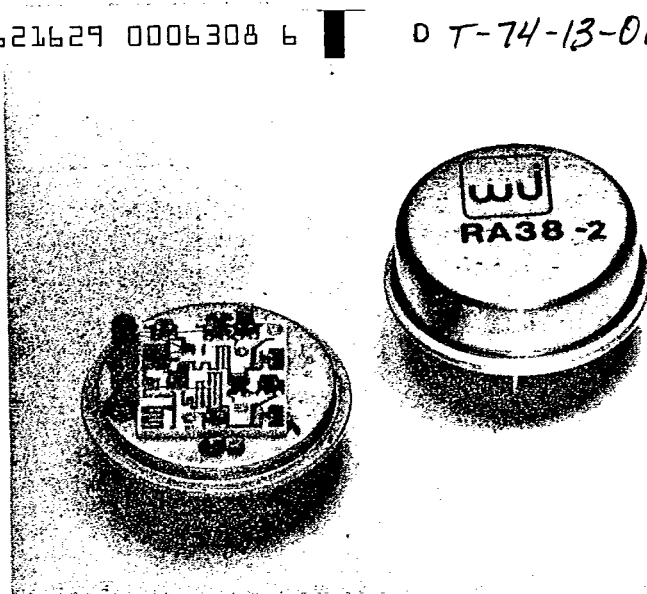


WJ-RA38-2

200 TO 2600 MHz TO-8B² CASCADABLE AMPLIFIER

- ULTRA-WIDE BANDWIDTH:
200-2600 MHz
- ¹HIGH GAIN – TWO STAGES:
13.0 dB (TYP.)
- HIGH OUTPUT LEVEL: > +18 dBm (TYP.)



Specifications

Characteristics	Typ.	Guaranteed ¹	
		0° - 50°C	-54°C - +85°C
Frequency (Min.)	150-2800 MHz	200-2600 MHz	200-2600 MHz
Small Signal Gain (Min.)	13.0 dB	11.0 dB	10.0 dB
Gain Flatness (Max.)	±0.7 dB	±1.0 dB	±1.2 dB
Noise Figure (Max.)			
200-2000	6.5 dB	7.5 dB	8.0 dB
2000-2600	7.0 dB	8.5 dB	9.0 dB
Power Output at 1 dB Compression (Min.)			
200-2000	18.0 dBm	17.0 dBm	16.5 dBm
2000-2600	19.0 dBm	18.5 dBm	18.0 dBm
VSWR (Max.) Input/Output	<1.8:1	2.3:1	2.3:1
DC Current (Max.) at 15 Volts	127 mA	132 mA	133 mA

Notes:

1. Measured in a 50-ohm system at +15 Vdc nominal.
2. TO-8B is larger than standard TO-8 package – see outline drawing.

Typical Intermodulation Performance at 25°C

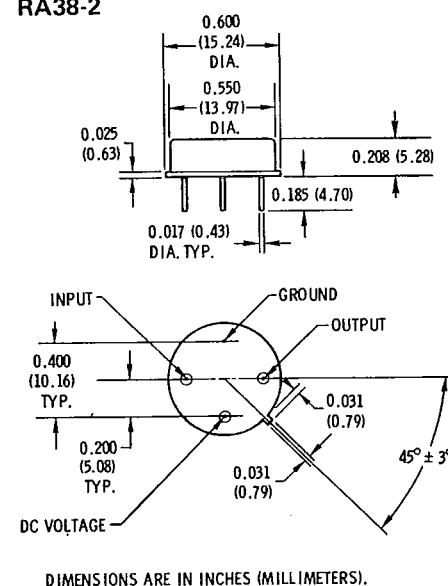
Second Order Harmonic Intercept Point	+35 dBm (Typ.)
Second Order Two Tone Intercept Point	+30 dBm (Typ.)
Third Order Two Tone Intercept Point	+25 dBm (Typ.)

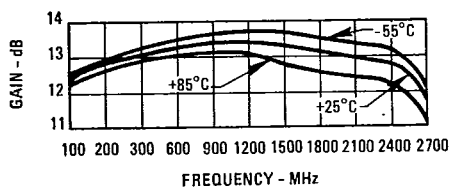
Absolute Maximum Ratings

Ambient Operating Temperature	-54°C to +100°C
Storage Temperature	-62°C to +125°C
Maximum Case Temperature	105°C
Maximum DC Voltage	+17 Volts
Maximum Continuous RF Input Power	+13 dBm
Maximum Short Term RF Input Power	100 Milliwatts (1 Minute Max.)
Maximum Peak Power	0.5 Watt (3 μsec Max.)
"S" Series Burn-In Temperature	100°C

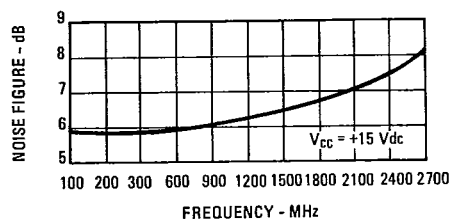
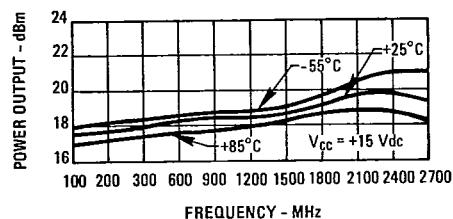
Outline Drawings

RA38-2



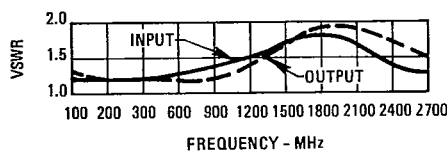
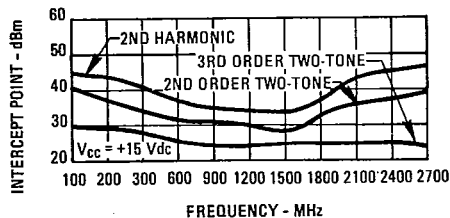
Typical Performance at 25°C Typical Automatic Test Data**Gain****V_{CC} = +12 Vdc**

FREQ MHZ	USWR IN	USWR OUT	GAIN DB
100.	1.2	1.3	12.5
200.	1.2	1.2	13.0
300.	1.2	1.2	13.1
400.	1.3	1.3	13.2
500.	1.3	1.3	13.3
600.	1.3	1.2	13.3
700.	1.4	1.2	13.3
800.	1.4	1.2	13.4
900.	1.4	1.2	13.4
1000.	1.5	1.3	13.5
1100.	1.5	1.3	13.5
1200.	1.5	1.4	13.4
1300.	1.6	1.4	13.3
1400.	1.7	1.5	13.1
1500.	1.7	1.7	12.9
1600.	1.8	1.7	12.8
1700.	1.8	1.8	12.8
1800.	1.8	1.9	12.7
1900.	1.8	1.9	12.7
2000.	1.8	1.9	12.7
2100.	1.7	1.9	12.7
2200.	1.6	1.9	12.8
2300.	1.5	1.8	12.9
2400.	1.4	1.7	12.8
2500.	1.3	1.6	12.5
2600.	1.3	1.5	12.2
2700.	1.3	1.5	11.7
2800.	1.4	1.4	11.0

Noise Figure**Power Output*****Linear S-Parameters**

FREQ MHZ	MAG S11	ANG S11	MAG S21	ANG S21	MAG S12	ANG S12	MAG S22	ANG S22
100.	.10	-138.3	4.19	-2.6	.04	18.7	.13	-166.4
200.	.10	-140.8	4.47	-26.8	.04	.5	.11	-179.5
300.	.11	-141.0	4.52	-47.7	.04	-9.4	.11	-173.3
400.	.13	-143.6	4.55	-67.9	.04	-18.3	.12	-165.6
500.	.14	-142.8	4.62	-86.1	.04	-27.3	.11	-155.5
600.	.15	-144.0	4.63	-105.4	.04	-35.7	.11	-142.0
700.	.16	-146.4	4.61	-124.1	.04	-42.6	.11	-123.8
800.	.17	-147.0	4.66	-144.1	.04	-51.3	.10	-102.2
900.	.18	-145.8	4.68	-163.3	.04	-59.1	.10	-74.2
1000.	.18	-145.6	4.72	-177.6	.04	-66.1	.10	-43.3
1100.	.19	-145.8	4.73	-159.1	.04	-73.4	.12	-14.4
1200.	.21	-146.5	4.67	-141.0	.04	-81.5	.15	-10.1
1300.	.23	-148.0	4.63	-122.9	.04	-89.4	.18	-30.7
1400.	.25	-151.0	4.54	-104.6	.04	-97.5	.21	-48.1
1500.	.26	-155.3	4.44	-86.1	.04	-104.9	.25	-63.7
1600.	.28	-160.9	4.39	-67.6	.04	-111.9	.27	-78.3
1700.	.29	-166.3	4.34	-50.0	.04	-119.1	.29	-92.3
1800.	.29	-172.7	4.32	-32.8	.04	-126.5	.31	-105.8
1900.	.29	-179.6	4.32	-15.5	.04	-133.7	.32	-119.1
2000.	.28	-172.8	4.33	-2.0	.04	-140.4	.32	-132.6
2100.	.26	-160.3	4.34	-19.6	.04	-147.5	.31	-147.1
2200.	.23	-149.3	4.38	-37.8	.04	-154.7	.30	-162.6
2300.	.20	-136.4	4.43	-57.0	.04	-162.0	.29	-179.5
2400.	.17	-118.8	4.35	-77.0	.04	-169.6	.26	-160.9
2500.	.13	-92.9	4.24	-97.9	.05	-177.8	.23	-138.1
2600.	.12	-56.4	4.06	-119.8	.05	-172.7	.20	-112.2
2700.	.13	-16.9	3.83	-141.4	.05	-163.1	.19	-83.9
2800.	.17	-13.2	3.57	-162.6	.05	-152.8	.18	-57.0

* at 1 dB Gain Compression

VSWR**Deviation from Linear Phase, Gain and Group Delay****Intercept Point**

FREQ MHZ	DEV LIN DEG	REL 0 DEG	GAIN DEV DB	ABS GAIN DB	GROUP DELAY N-SEC
200.	4.79	.00	.18	13.01	.58
300.	2.42	-20.87	.27	13.10	.57
400.	.71	-41.07	.34	13.17	.53
500.	1.00	-59.29	.46	13.30	.52
600.	.16	-78.62	.48	13.31	.53
700.	.01	-97.27	.45	13.28	.54
800.	-1.51	-117.30	.54	13.37	.55
900.	-2.27	-136.56	.57	13.41	.53
1000.	-2.85	-155.63	.66	13.49	.52
1100.	-2.84	-174.13	.67	13.50	.51
1200.	-2.46	-192.25	.55	13.39	.50
1300.	-2.06	-210.35	.48	13.31	.51
1400.	-1.87	-228.65	.32	13.15	.51
1500.	-1.79	-247.08	.11	12.94	.51
1600.	-1.84	-265.62	.01	12.84	.50
1700.	-.91	-283.20	-.07	12.76	.48
1800.	.37	-300.41	-.12	12.71	.48
1900.	1.53	-317.75	-.12	12.71	.48
2000.	2.61	-335.18	-.09	12.74	.49
2100.	3.48	-352.81	-.08	12.75	.50
2200.	3.76	-371.03	.01	12.84	.52
2300.	3.09	-390.20	.09	12.92	.55
2400.	1.54	-410.25	-.06	12.78	.57
2500.	-.79	-431.08	-.28	12.55	.60
2600.	-4.28	-453.07	-.67	12.16	.61

Typical Automatic Test Data (Cont.)

V_{cc} = +15 Vdc

FREQ MHZ	USMR IN	USMR OUT	GAIN DB
100.	1.2	1.3	12.6
200.	1.2	1.2	13.1
300.	1.3	1.2	13.1
400.	1.3	1.3	13.2
500.	1.3	1.3	13.4
600.	1.4	1.3	13.4
700.	1.4	1.2	13.4
800.	1.4	1.2	13.5
900.	1.4	1.2	13.6
1000.	1.4	1.2	13.7
1100.	1.5	1.2	13.8
1200.	1.5	1.3	13.8
1300.	1.6	1.4	13.8
1400.	1.6	1.5	13.6
1500.	1.7	1.6	13.5
1600.	1.8	1.6	13.4
1700.	1.8	1.7	13.3
1800.	1.9	1.8	13.2
1900.	1.9	1.8	13.3
2000.	1.9	1.8	13.3
2100.	1.8	1.8	13.3
2200.	1.7	1.7	13.4
2300.	1.6	1.6	13.5
2400.	1.5	1.5	13.4
2500.	1.4	1.4	13.2
2600.	1.4	1.3	12.9
2700.	1.4	1.3	12.4
2800.	1.5	1.3	11.7

Linear S-Parameters

FREQ MHZ	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
100.	.10	-134.2	4.25	-3.5	.04	17.2	.12	-157.3
200.	.10	-138.3	4.50	-26.8	.04	.3	.11	-172.0
300.	.11	-139.7	4.54	-47.0	.04	-9.0	.11	-179.0
400.	.13	-143.3	4.58	-66.7	.04	-17.7	.11	-173.6
500.	.15	-143.6	4.66	-84.5	.04	-26.2	.11	-164.6
600.	.16	-145.9	4.68	-103.5	.04	-34.1	.11	-152.5
700.	.16	-149.1	4.68	-121.7	.04	-41.2	.11	-136.9
800.	.17	-150.2	4.75	-141.3	.04	-49.6	.10	-118.5
900.	.17	-149.5	4.80	-160.3	.04	-57.2	.09	-93.3
1000.	.18	-148.7	4.87	-179.3	.04	-64.5	.09	-61.8
1100.	.18	-147.5	4.92	-162.3	.04	-71.8	.10	-29.4
1200.	.20	-146.6	4.90	-144.1	.04	-79.6	.12	-1.2
1300.	.22	-146.7	4.89	-125.9	.04	-87.6	.15	-22.7
1400.	.24	-148.6	4.81	-107.5	.04	-96.1	.18	-42.1
1500.	.26	-152.3	4.72	-88.9	.04	-104.1	.22	-59.0
1600.	.28	-157.6	4.67	-70.6	.04	-111.8	.24	-74.7
1700.	.30	-163.2	4.60	-52.6	.04	-119.5	.26	-89.4
1800.	.30	-169.9	4.57	-35.1	.04	-127.1	.27	-103.5
1900.	.31	-177.4	4.62	-17.4	.04	-134.4	.28	-117.4
2000.	.30	-174.3	4.60	-5	.04	-141.1	.28	-131.3
2100.	.29	-161.2	4.61	-18.2	.04	-148.6	.27	-146.2
2200.	.26	-149.3	4.67	-36.5	.04	-155.5	.26	-162.1
2300.	.24	-135.2	4.72	-55.8	.05	-163.3	.24	-179.5
2400.	.20	-116.3	4.68	-76.3	.05	-171.1	.21	-159.6
2500.	.17	-90.6	4.60	-97.6	.05	-179.8	.17	-134.7
2600.	.16	-57.4	4.41	-119.7	.05	-170.2	.15	-104.4
2700.	.17	-22.2	4.16	-141.7	.06	-160.1	.14	-71.3
2800.	.20	-7.8	3.84	-163.1	.06	-149.4	.14	-42.1

Deviation from Linear Phase, Gain and Group Delay

FREQ MHZ	DEV LIN Ø DEG	REL Ø DEG	GAIN DEV DB	ABS GAIN DB	GROUP DELAY N-SEC
200.	2.43	.00	-.30	13.06	.56
300.	.80	-20.16	-.22	13.14	.55
400.	-.38	-39.87	-.15	13.21	.52
500.	.39	-57.64	.01	13.37	.51
600.	-.08	-76.64	.04	13.40	.52
700.	.27	-94.82	.04	13.40	.53
800.	-.82	-114.45	.18	13.54	.54
900.	-1.31	-133.46	.26	13.62	.53
1000.	-1.76	-152.46	.39	13.75	.52
1100.	-1.63	-170.85	.48	13.84	.51
1200.	-1.31	-189.06	.44	13.80	.51
1300.	-.98	-207.26	.42	13.78	.51
1400.	-.85	-225.67	.29	13.65	.51
1500.	-.95	-244.31	.12	13.48	.51
1600.	-.69	-262.57	.02	13.38	.50
1700.	-.11	-280.53	-.10	13.26	.49
1800.	.84	-298.11	-.16	13.20	.49
1900.	1.69	-315.79	-.07	13.29	.49
2000.	2.31	-333.70	-.10	13.26	.49
2100.	3.18	-351.36	-.09	13.27	.50
2200.	3.40	-369.68	.02	13.39	.52
2300.	2.60	-389.01	.12	13.48	.55
2400.	.70	-409.44	.04	13.40	.58
2500.	-2.09	-430.76	-.12	13.25	.60
2600.	-5.66	-452.87	-.48	12.89	.61