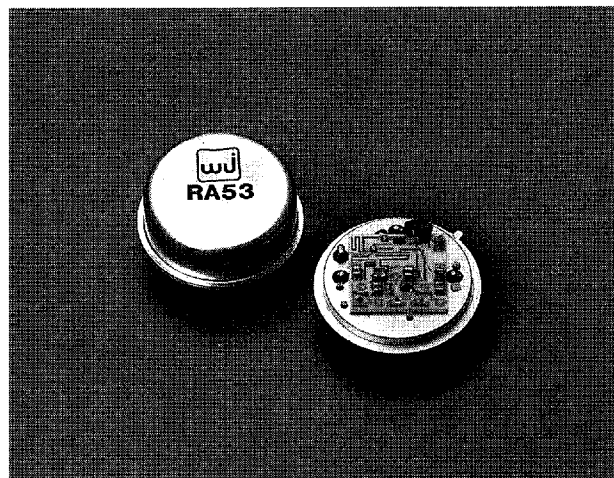


WJ-RA53/SMRA53

1000 to 5000 MHz
TO-8B¹ CASCADABLE AMPLIFIER

- ◆ AVAILABLE IN SURFACE MOUNT
- ◆ ULTRA-WIDE BANDWIDTH: 0.8-5.0 GHz (TYP.)
- ◆ HIGH GAIN: 21.0 dB (TYP.)
- ◆ LOW NOISE: 4.5 dB (TYP.)
- ◆ MEDIUM OUTPUT POWER: +11.5 dBm (TYP.)



Specifications*

Characteristics	Typical	Guaranteed	
		0° to 50°C	-54° to +85°C
Frequency (Min.)	800-5000 MHz	1000-5000 MHz	1000-5000 MHz
Small Signal Gain (Min.)	21.0 dB	19.5 dB	18.0 dB
Gain Flatness (Max.)	±0.7 dB	±0.9 dB	±1.2 dB
Noise Figure (Max.)	4.5 dB	5.3 dB	5.8 dB
Power Output			
at 1 dB Compression (Min.)	+11.5 dBm	+10.5 dBm	+9.5 dBm
VSWR (Max.) Input/Output	1.7:1	2.1:1	2.3:1
DC Current (Max.) at +5 Volts	115 mA	140 mA	150 mA

* Measured in a 50-ohm system at +5 Vdc Nominal.

Notes:

1. WJ-RA53 amplifier is in a TO-8B package which is slightly larger than the standard TO-8 package.
2. WJ-CRA53 is a standard WJ-RA53 installed in a miniature SMA connector housing and guaranteed over 0°C to 50°C temperature range.

Typical Intermodulation Performance at 25°C

Second Order Harmonic Intercept Point.....	+35 dBm (Typ.)
Second Order Two Tone Intercept Point.....	+31 dBm (Typ.)
Third Order Two Tone Intercept Point.....	+22 dBm (Typ.)

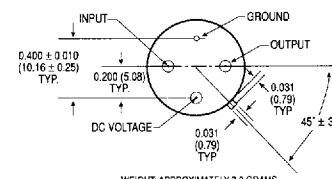
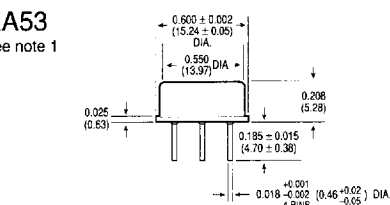
Absolute Maximum Ratings

Storage Temperature	-64°C to +125°C
Maximum Case Temperature	85°C
Maximum DC Voltage.....	+6 Volts
Maximum Continuous RF Input Power	+7 dBm
Maximum Short Term Input Power (1 Minute Max.)	100 Milliwatts
Maximum Peak Power	0.25 Watt (3 μsec Max.)
"S" Series Burn-In Temperature (Case)	85°C

Weight approximately 3.0 grams (0.11 oz.)

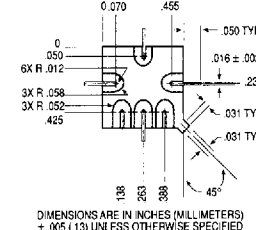
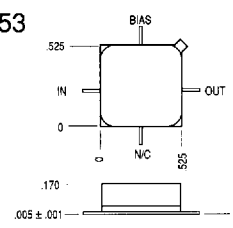
Outline Drawings

RA53
See note 1



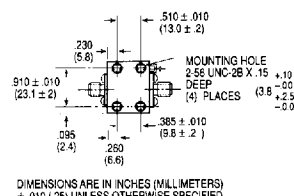
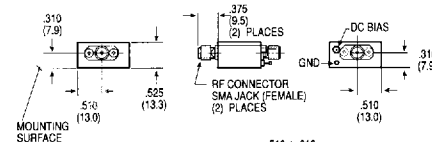
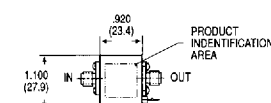
WEIGHT APPROXIMATELY 3.0 GRAMS

SMRA53



DIMENSIONS ARE IN INCHES (MILLIMETERS)
± .005 (.13) UNLESS OTHERWISE SPECIFIED

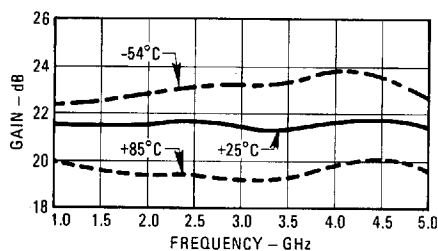
CRA53
See note 2



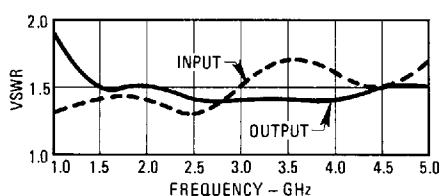
DIMENSIONS ARE IN INCHES (MILLIMETERS)
± .010 (.25) UNLESS OTHERWISE SPECIFIED

Typical Performance at 25°C

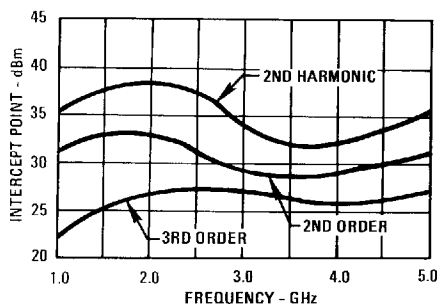
Gain



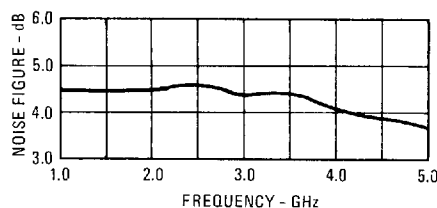
VSWR



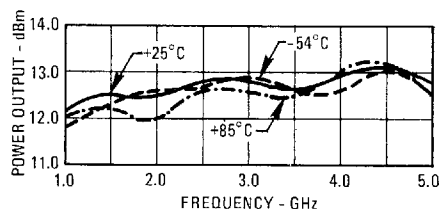
Intercept Point



Noise Figure



Power Output*



*at 1 dB Gain Compression

Thermal Data: $V_{CC} = 5 \text{ Vdc}$

Thermal Resistance θ_{jc} 97.8°C/W

Transistor Power Dissipation P_d 0.176 W

Junction Temperature Rise Above Case T_{jc} ... 17°C

Typical Automatic Test Data

$V_{CC} = +5 \text{ Vdc}$

$V_{CC} = 5.0 \text{ V}$

Frequency MHz	VSWR IN	VSWR OUT	GAIN DB
600.0	1.7	1.7	24.1
800.0	1.2	1.7	24.1
1000.0	1.0	1.5	24.1
1200.0	1.1	1.4	24.2
1400.0	1.1	1.3	24.3
1600.0	1.2	1.2	24.4
1800.0	1.2	1.1	24.5
2000.0	1.2	1.1	24.7
2200.0	1.3	1.1	24.9
2400.0	1.3	1.2	25.1
2600.0	1.4	1.2	25.1
2800.0	1.4	1.3	25.1
3000.0	1.4	1.3	25.0
3200.0	1.4	1.3	24.8
3400.0	1.4	1.2	24.8
3600.0	1.4	1.2	24.7
3800.0	1.3	1.1	24.6
4000.0	1.2	1.1	24.5
4200.0	1.1	1.1	24.4
4400.0	1.1	1.1	24.2
4600.0	1.2	1.1	24.2
4800.0	1.4	1.1	24.2
5000.0	1.5	1.2	24.3
5200.0	1.7	1.3	24.5
5400.0	1.9	1.4	24.7

Linear S-Parameters

Frequency MHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
600.0	.257	104	16.109	-169	.001	18	.254	161
800.0	.098	35	16.032	74	.002	-72	.255	109
1000.0	.024	-82	16.000	-19	.001	-110	.210	51
1200.0	.050	159	16.248	-101	.004	161	.166	-4
1400.0	.069	111	16.382	-176	.001	126	.120	-58
1600.0	.088	67	16.631	111	.002	114	.085	-108
1800.0	.092	32	16.861	41	.003	49	.059	-168
2000.0	.102	-9	17.198	-28	.001	-29	.048	108
2200.0	.113	-54	17.616	-97	.001	-48	.055	39
2400.0	.137	-95	17.896	-165	.003	-84	.081	-18
2600.0	.157	-142	18.016	126	.001	-82	.108	-70
2800.0	.168	173	17.934	59	.003	-175	.119	-114
3000.0	.181	129	17.742	-9	.002	-173	.125	-154
3200.0	.181	87	17.468	-75	.002	71	.121	163
3400.0	.179	50	17.293	-142	.003	21	.094	123
3600.0	.166	14	17.088	152	.002	-39	.070	90
3800.0	.139	-20	16.984	86	.001	-59	.056	47
4000.0	.103	-50	16.837	19	.001	-147	.036	61
4200.0	.065	-56	16.601	-47	.002	137	.033	-18
4400.0	.060	-38	16.308	-114	.000	125	.041	-71
4600.0	.096	-39	16.191	179	.002	59	.046	-118
4800.0	.154	-60	16.209	111	.002	-2	.069	-151
5000.0	.194	-91	16.485	43	.003	-14	.100	160
5200.0	.250	-121	16.843	-28	.002	-103	.127	112
5400.0	.303	-155	17.231	-102	.003	-127	.171	59