



# RA63-1 / SMRA63-1

2000 to 6000 MHz  
TO-8B<sup>1</sup> CASCADABLE AMPLIFIER

- ◆ AVAILABLE IN SURFACE MOUNT
- ◆ ULTRAWIDE BANDWIDTH: 1.8-6.2 GHz (TYP.)
- ◆ HIGH GAIN: 19.5 dB (TYP.)
- ◆ HIGH OUTPUT POWER: +16.0 dBm (TYP.)
- ◆ LOW POWER SUPPLY VOLTAGE: +5 VDC



## Specifications \*

Characteristics	Typical	Guaranteed	
		0° to 50°C	-54°C to +85°C
Frequency (Min.)	1.8-6.2 GHz	2-6 GHz	2-6 GHz
Small Signal Gain (Min.)	19.5 dB	16.5 dB	15.5 dB
Gain Flatness (Max.)	±0.5 dB	±1.0 dB	±1.2 dB
Noise Figure (Max.)	5.5 dB	7.0 dB	7.5 dB
Power Output at 1 dB Compression (Min.)	+16.0 dBm	+13.0 dBm	+12.5 dBm
VSWR (Max.)			
Input	1.7:1	2.2:1	2.3:1
Output	1.7:1	2.0:1	2.1:1
DC Current (Max.) at +5 Volts	120 mA	135 mA	140 mA

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

### Notes:

1. WJ-RA63-1 amplifier is in a TO-8B package which is slightly larger than the standard TO-8 package.
2. WJ-CRA63-1 is a standard WJ-RA63-1 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 .....+54 dBm (Typ.)  
 Second Order Two Tone Intercept Point .....+50 dBm (Typ.)  
 Third Order Two Tone Intercept Point .....+32 dBm (Typ.)

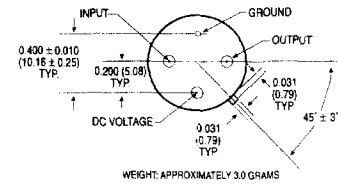
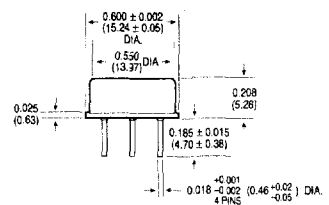
## Absolute Maximum Ratings

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

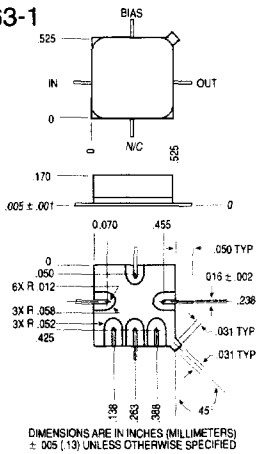
Weight approximately 3.0 grams (0.11 oz.)

## Outline Drawings

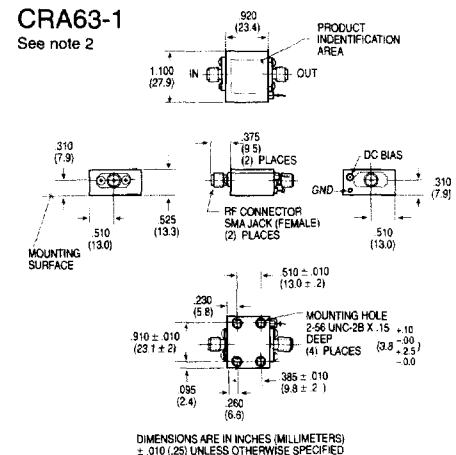
RA63-1  
See note 1



SMRA63-1



CRA63-1  
See note 2

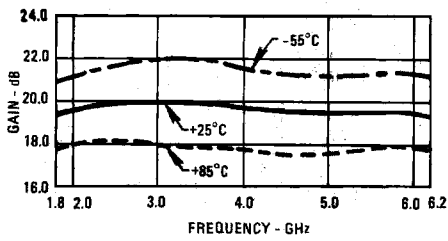


# Typical Automatic Test Data

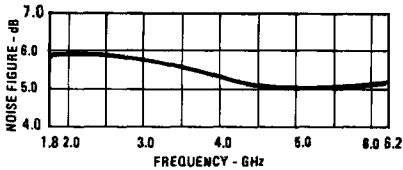
# Typical Performance at 25°C

WJ-RA63-1/SMRA63-1

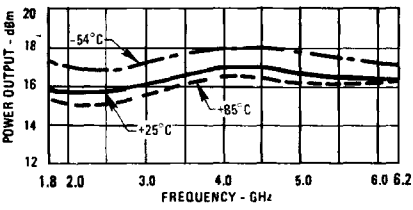
## Gain



## Noise Figure

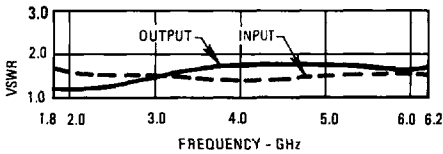


## Power Output\*

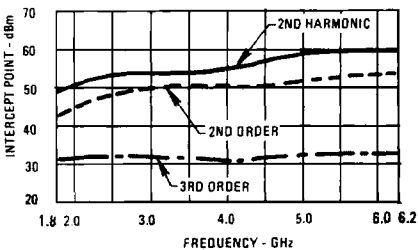


\*at 1 dB Gain Compression

## VSWR



## Intercept Point



## Vcc = 5.0 V

Frequency MHz	VSWR IN	VSWR OUT	GAIN DB
1000.0	1.5	1.4	20.4
1200.0	1.4	1.3	21.0
1400.0	1.3	1.3	21.3
1600.0	1.3	1.3	21.5
1800.0	1.2	1.3	21.5
2000.0	1.2	1.4	21.6
2200.0	1.2	1.4	21.6
2400.0	1.2	1.4	21.6
2600.0	1.2	1.4	21.5
2800.0	1.2	1.5	21.5
3000.0	1.2	1.4	21.4
3200.0	1.1	1.4	21.3
3400.0	1.1	1.4	21.3
3600.0	1.0	1.3	21.2
3800.0	1.1	1.3	21.2
4000.0	1.1	1.2	21.2
4200.0	1.1	1.2	21.2
4400.0	1.1	1.3	21.2
4600.0	1.1	1.3	21.2
4800.0	1.0	1.3	21.2
5000.0	1.1	1.4	21.3
5200.0	1.2	1.4	21.2
5400.0	1.4	1.4	21.2
5600.0	1.5	1.5	21.1
5800.0	1.6	1.5	21.1
6000.0	1.7	1.5	20.9
6200.0	2.0	1.5	20.4
6400.0	2.5	1.5	19.4

## Linear S-Parameters

Frequency MHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
1000.0	.212	81	10.514	-28	.003	176	.158	-97
1200.0	.177	36	11.248	-102	.004	127	.145	-140
1400.0	.146	-13	11.621	-171	.003	96	.142	173
1600.0	.123	-59	11.825	121	.003	44	.135	125
1800.0	.106	-117	11.934	56	.003	-1	.137	81
2000.0	.111	-168	12.042	-8	.003	-63	.151	37
2200.0	.108	148	12.070	-72	.002	-83	.151	-6
2400.0	.102	102	12.044	-134	.002	-126	.164	-43
2600.0	.097	55	11.927	163	.003	-170	.179	-83
2800.0	.097	17	11.865	101	.002	112	.184	-120
3000.0	.084	-18	11.768	39	.002	78	.183	-155
3200.0	.061	-65	11.643	-22	.004	32	.183	164
3400.0	.030	-117	11.599	-84	.002	-22	.164	124
3600.0	.022	130	11.480	-145	.002	-40	.145	84
3800.0	.041	56	11.462	154	.001	-100	.129	37
4000.0	.057	7	11.509	93	.004	-161	.108	-10
4200.0	.064	-35	11.502	32	.002	-177	.102	-54
4400.0	.066	-71	11.454	-30	.003	124	.112	-105
4600.0	.040	-124	11.503	-92	.003	92	.116	-150
4800.0	.013	115	11.535	-155	.004	28	.128	172
5000.0	.055	19	11.559	141	.002	-22	.152	129
5200.0	.101	-27	11.512	77	.004	-56	.163	86
5400.0	.165	-73	11.478	12	.002	-119	.178	47
5600.0	.191	-124	11.379	-54	.005	-163	.203	1
5800.0	.222	.178	11.327	-121	.005	158	.202	-46
6000.0	.263	111	11.057	169	.003	123	.203	-90
6200.0	.326	43	10.412	96	.004	81	.214	-133
6400.0	.433	-24	9.312	21	.005	18	.208	-173

## Thermal Data: Vcc = 15 Vdc

Thermal Resistance  $\theta_{jc}$  .....185°C/W  
 Transistor Power Dissipation  $P_d$  .....0.203 W  
 Junction Temperature Rise Above Case  $T_{jc}$  .....38°C

