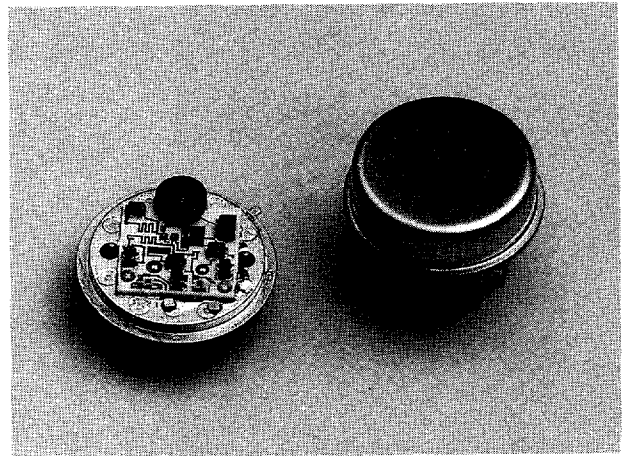


WJ-RA89/SMRA89

5 to 500 MHz TO-8B¹ CASCADABLE AMPLIFIER

- ◆ AVAILABLE IN SURFACE MOUNT
- ◆ HIGH GAIN - TWO STAGES: 26.5 dB (TYP.)
- ◆ HIGH OUTPUT POWER: +21.5 dBm (TYP.)
- ◆ HIGH THIRD-ORDER I.P.: +35 dBm (TYP.)



Specifications *

Characteristics	Typical	Guaranteed	
		0° to 50°C	-54°C to +85°C
Frequency (Min.)	3 - 700 MHz	5 - 500 MHz	5 - 500 MHz
Small Signal Gain (Min.)	26.5 dB	25.5 dB	25.0 dB
Gain Flatness (Max.)	±0.2 dB	±0.7 dB	±1.0 dB
Noise Figure (Max.)	3.7 dB	4.5 dB	5.0 dB
Power Output			
at 1 dB Compression (Min.)			
Vcc = +15 Volts	+21.5 dBm	+20.5 dBm	+20.0 dBm
Vcc = +12 Volts	+19.5 dBm	+19.0 dBm	+18.0 dBm
VSWR (Max.) Input/Output	1.5:1	1.8:1	2.0:1
DC Current at +12 Volts	102 mA	108 mA	111 mA
DC Current at +15 Volts	130 mA	136 mA	139 mA

* Measured in a 50-ohm system at +15 Vdc Nominal.

Notes:

1. WJ-RA89 amplifier is in a TO-8B package which is slightly larger than the standard TO-8 package.
2. WJ-CRA89 is a standard WJ-RA89 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.....	+65.0 dBm (Typ.)
Second Order Two Tone Intercept Point.....	+55.0 dBm (Typ.)
Third Order Two Tone Intercept Point.....	+35.0 dBm (Typ.)

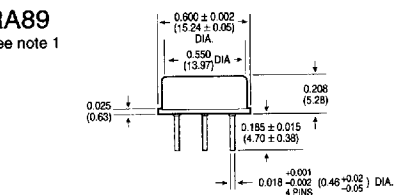
Absolute Maximum Ratings

Storage Temperature	-62°C to +125°C
Maximum Case Temperature	125°C
Maximum DC Voltage	+17 Volts
Maximum Continuous RF Input Power	+13 dBm
Maximum Short Term RF Input Power (1 Minute Max.)	50 Milliwatts
Maximum Peak Power	0.5 Watt (3 μsec Max.)
"S" Series Burn-In Temperature (Case)	125°C

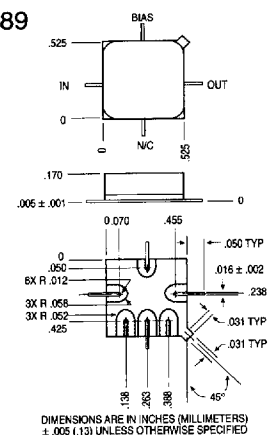
Weight approximately 3.0 grams (0.11 oz.)

Outline Drawings

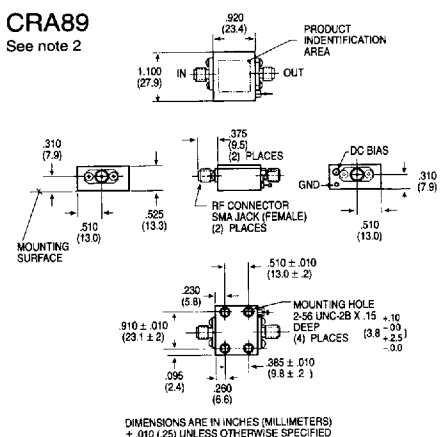
RA89
See note 1



SMRA89

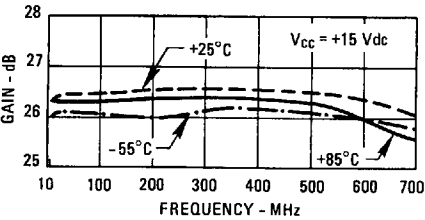
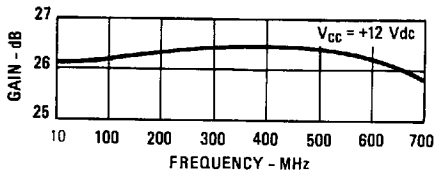


CRA89
See note 2

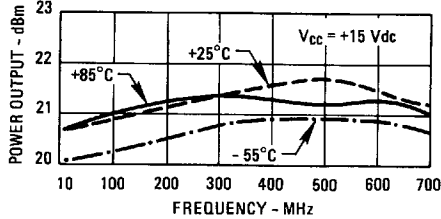
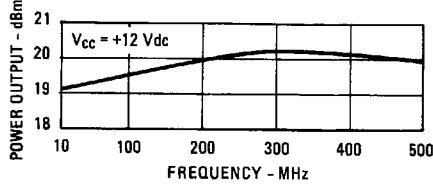


Typical Performance at 25°C

Gain

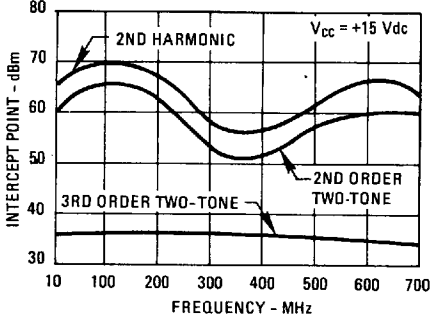
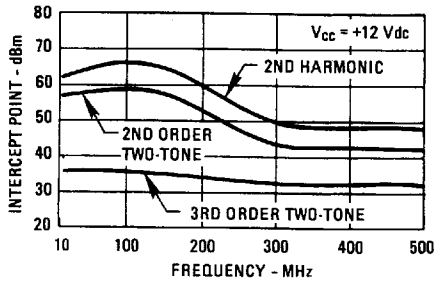


Power Output*

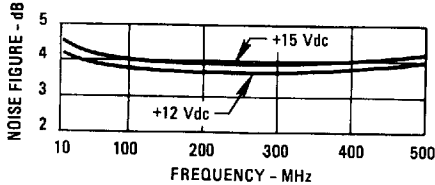


*at 1 dB Gain Compression

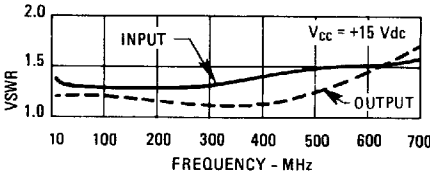
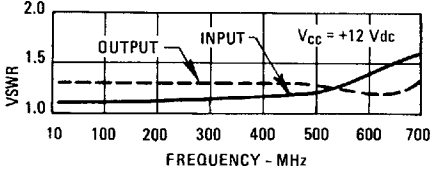
Intercept Point



Noise Figure



VSWR



Typical Automatic Test Data

Vcc = 15.0 V

Frequency MHz	VSWR IN	VSWR OUT	GAIN DB
2.0	1.2	1.9	31.0
5.0	1.1	1.2	30.9
10.0	1.0	1.1	30.9
50.0	1.0	1.0	31.0
100.0	1.1	1.1	31.0
200.0	1.1	1.1	31.1
300.0	1.1	1.2	31.1
400.0	1.1	1.3	31.2
500.0	1.2	1.3	30.9
600.0	1.4	1.3	30.5
700.0	1.8	1.4	29.8

Vcc = 12.0 V

Frequency MHz	VSWR IN	VSWR OUT	GAIN DB
2.0	1.2	1.8	30.7
5.0	1.1	1.2	30.6
10.0	1.0	1.1	30.6
50.0	1.0	1.0	30.7
100.0	1.1	1.1	30.7
200.0	1.1	1.1	30.8
300.0	1.2	1.2	30.8
400.0	1.2	1.3	30.9
500.0	1.3	1.3	30.6
600.0	1.5	1.4	30.2
700.0	2.0	1.5	29.4

Linear S-Parameters

Frequency MHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2.0	.102	138	35.625	26	.009	29	.301	114
5.0	.032	112	35.027	8	.010	11	.107	106
10.0	.013	114	34.986	2	.010	7	.054	108
50.0	.017	-114	35.419	-13	.011	2	.016	-158
100.0	.031	-122	35.522	-29	.011	2	.037	-141
200.0	.053	-138	36.006	-59	.011	-1	.068	-163
300.0	.062	-147	36.077	-90	.011	-3	.097	174
400.0	.067	-147	36.130	-122	.012	-3	.119	150
500.0	.103	-142	35.105	-154	.013	-10	.135	123
600.0	.175	-144	33.426	171	.014	-15	.146	93
700.0	.297	-159	30.913	136	.015	-24	.156	59

Linear S-Parameters

Frequency MHz	S11		S21		S12		S22	
	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2.0	.090	130	34.402	25	.009	28	.284	113
5.0	.030	88	33.786	8	.010	10	.102	106
10.0	.015	39	33.775	2	.010	6	.052	109
50.0	.016	-65	34.111	-13	.011	2	.015	-154
100.0	.029	-103	34.216	-29	.011	1	.037	-139
200.0	.056	-122	34.693	-59	.011	1	.068	-157
300.0	.071	-135	34.862	-90	.011	-3	.099	-179
400.0	.083	-134	34.941	-123	.012	-4	.126	159
500.0	.128	-135	33.882	-156	.014	-8	.149	133
600.0	.209	-146	32.242	169	.015	-15	.168	104
700.0	.343	-163	29.632	133	.016	-23	.185	71

Thermal Data: Vcc = 15 Vdc

Thermal Resistance θ_{jc} 45°C/W
 Transistor Power Dissipation P_d 0.781 W
 Junction Temperature Rise Above Case T_{jc} ... 35°C