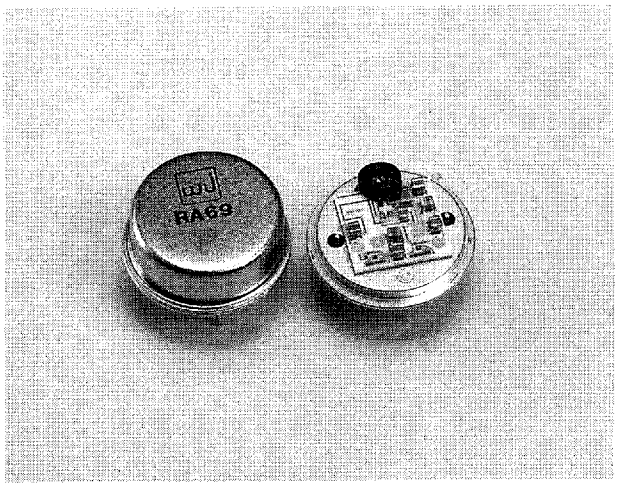
WJ-RA69/SMRA69

10 to 1000 MHz
TO-8B[1] CASCADABLE AMPLIFIER

- ◆ AVAILABILITY IN SURFACE MOUNT
- ◆ HIGH GAIN - TWO STAGES: 25.0 dB (TYP.)
- ◆ HIGH OUTPUT POWER: +23.0 dBm (TYP.)
- ◆ HIGH THIRD ORDER I.P.: +34 dBm (TYP.)



Specifications*

Characteristics	Typical	Guaranteed 0° to 50°C	Guaranteed -54°C to +85°C
Frequency (Min.)	5-1000 MHz	10-1000 MHz	10-1000 MHz
Small Signal Gain (Min.)	25.0 dB	24.0 dB	23.0 dB
Gain Flatness (Max.)	±0.3 dB	±0.7 dB	±1.0 dB
Noise Figure (Max.)	4.5 dB	5.5 dB	6.0 dB
Power Output			
at 1 dB Compression (Min.)			
Vcc = +15 Volts	+23.0 dBm	+20.0 dBm	+20.0 dBm
Vcc = +12 Volts	+20.5 dBm	+18.0 dBm	+18.0 dBm
VSWR (Max.) Input/Output	1.5:1	2.0:1	2.0:1
DC Current at +15 Volts	130 mA	138 mA	145 mA
DC Current at +12 Volts	104 mA	110 mA	114 mA

* Measured in a 50-ohm system at +15 Vdc Nominal.
Notes:
1. WJ-RA69 amplifier is in a TO-8B package which is slightly larger than the standard TO-8 package.
2. WJ-CRA69 is a standard WJ-RA69 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.....+60 dBm (Typ.)
Second Order Two Tone Intercept Point.....+55 dBm (Typ.)
Third Order Two Tone Intercept Point.....+34 dBm (Typ.)

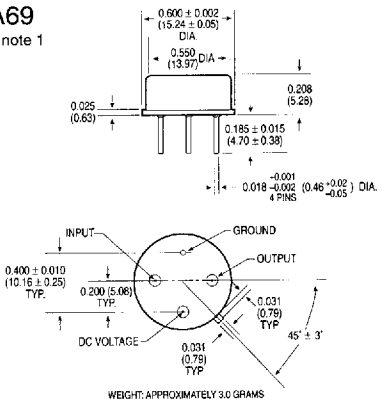
Absolute Maximum Ratings (At 15 Vdc)

Storage Temperature .....-62°C to +125°C
Maximum Case Temperature .....125°C
Maximum DC Voltage.....+17 Volts
Maximum Continuous RF 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

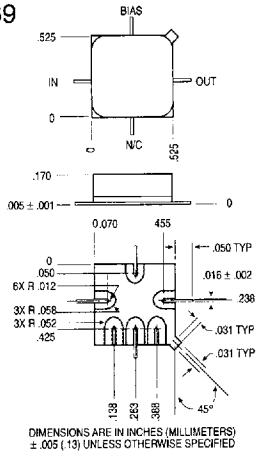
Weight approximately 3.0 grams (0.11 oz.)

Outline Drawings

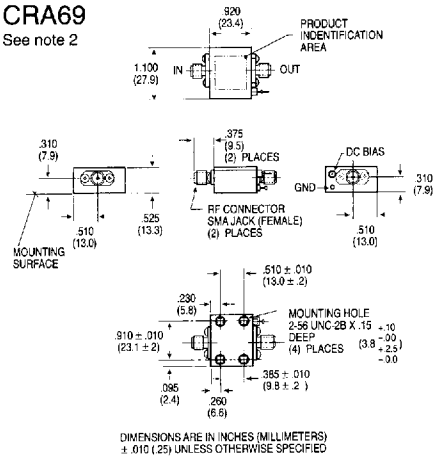
RA69
See note 1



SMRA69

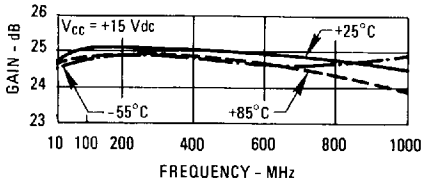


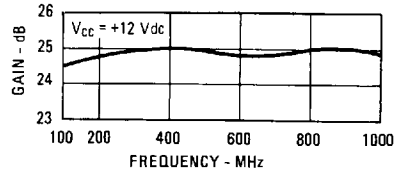
CRA69
See note 2



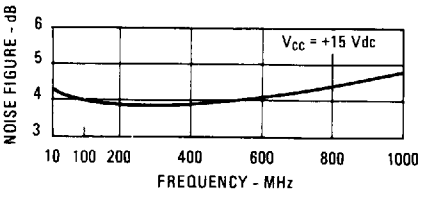
Typical Performance at 25°C

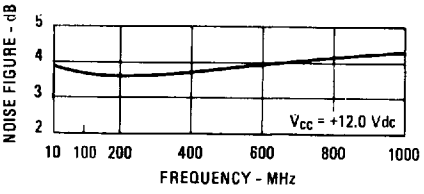
Gain



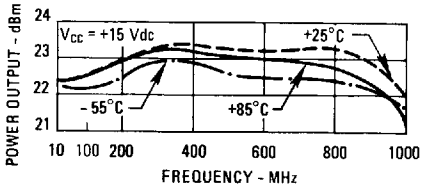


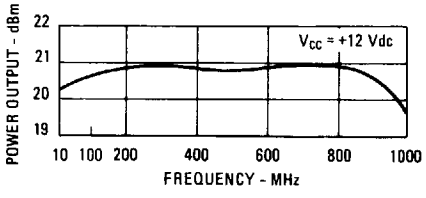
Noise Figure



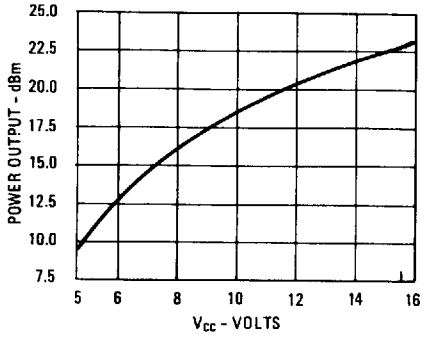


Power Output*



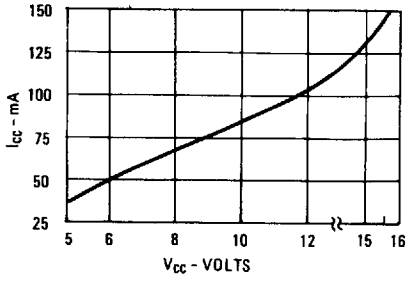


Power Output* vs. V_{CC} at 500 MHz

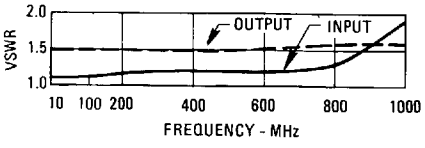


*at 1 dB Gain Compression

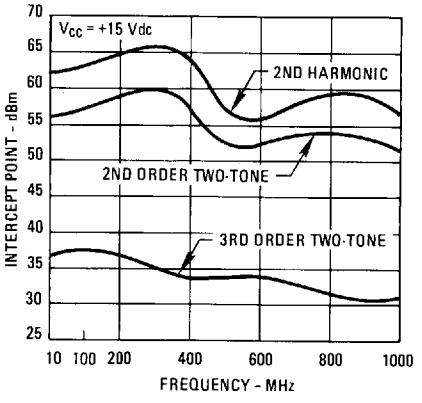
I_{CC} in mA vs. V_{CC} in Volts

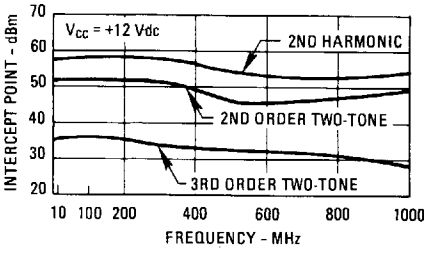


VSWR



Intercept Point





Typical Automatic Test Data

V_{CC} = 15.0 V

Frequency MHz	VSWR IN	VSWR OUT	GAIN DB
2.0	1.3	1.8	26.4
5.0	1.4	1.2	26.2
10.0	1.4	1.1	26.2
50.0	1.4	1.1	26.2
100.0	1.4	1.1	26.2
200.0	1.3	1.1	26.3
300.0	1.3	1.1	26.3
400.0	1.3	1.1	26.3
500.0	1.3	1.1	26.2
600.0	1.3	1.1	26.2
700.0	1.4	1.1	26.1
800.0	1.3	1.1	26.2
900.0	1.1	1.2	26.2
1000.0	1.3	1.5	26.0
1100.0	2.0	2.1	25.3

Linear S-Parameters

Frequency	S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2.0	.125	26	20.901	24	.013	27	.287	105
5.0	.156	7	20.337	8	.015	10	.103	84
10.0	.161	2	20.322	2	.015	4	.058	69
50.0	.159	–7	20.461	–12	.015	–2	.032	17
100.0	.151	–9	20.463	–26	.015	–4	.029	4
200.0	.144	–23	20.625	–54	.015	–9	.033	3
300.0	.127	–28	20.619	–81	.016	–17	.041	–10
400.0	.128	–31	20.616	–109	.016	–21	.050	–35
500.0	.131	–34	20.326	–136	.017	–28	.061	–62
600.0	.142	–40	20.313	–165	.018	–35	.064	–93
700.0	.157	–53	20.231	167	.019	–44	.062	–130
800.0	.126	–75	20.354	137	.020	–53	.051	171
900.0	.047	–81	20.443	105	.022	–66	.083	83
1000.0	.115	35	20.041	69	.023	–86	.194	27
1100.0	.334	7	18.334	31	.023	–108	.354	–20

Thermal Data: V_{CC} = 15 Vdc

Thermal Resistance θ_{jc} ..... 45°C/W
Transistor Power Dissipation P_d ..... 0.765 W
Junction Temperature Rise Above Case T_{jc} ... 34°C

V_{CC} = 12.0 V

Frequency MHz	VSWR IN	VSWR OUT	GAIN DB
2.0	1.3	1.7	26.2
5.0	1.4	1.2	26.0
10.0	1.4	1.1	26.0
50.0	1.4	1.1	26.0
100.0	1.4	1.1	26.0
200.0	1.4	1.1	26.1
300.0	1.3	1.1	26.1
400.0	1.3	1.1	26.1
500.0	1.3	1.1	26.0
600.0	1.3	1.1	26.0
700.0	1.3	1.1	26.0
800.0	1.2	1.2	26.0
900.0	1.0	1.3	26.1
1000.0	1.4	1.7	25.8
1100.0	2.4	2.5	24.7

Linear S-Parameters

Frequency	S11		S21		S12		S22	
MHz	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
2.0	.137	23	20.415	23	.013	24	.270	104
5.0	.164	7	19.879	7	.015	10	.098	84
10.0	.167	1	19.853	2	.015	5	.056	69
50.0	.164	–8	20.011	–12	.015	–1	.031	16
100.0	.166	–12	19.997	–27	.015	–4	.028	2
200.0	.151	–25	20.137	–54	.016	–8	.030	–3
300.0	.135	–31	20.128	–82	.017	–14	.036	–17
400.0	.134	–36	20.192	–110	.017	–19	.046	–44
500.0	.129	–40	19.907	–138	.017	–26	.056	–74
600.0	.141	–45	19.880	–167	.019	–35	.063	–108
700.0	.146	–60	19.876	164	.020	–43	.068	–152
800.0	.105	–86	20.031	133	.022	–53	.076	147
900.0	.019	–173	20.144	100	.024	–68	.136	80
1000.0	.182	48	19.418	63	.026	–88	.263	28
1100.0	.411	7	17.190	23	.024	–112	.426	–21

Thermal Data: V_{CC} = 12 Vdc

Thermal Resistance θ_{jc} ..... 45°C/W
Transistor Power Dissipation P_d 0.495W
Junction Temperature Rise Above Case T_{jc} ... 22°C