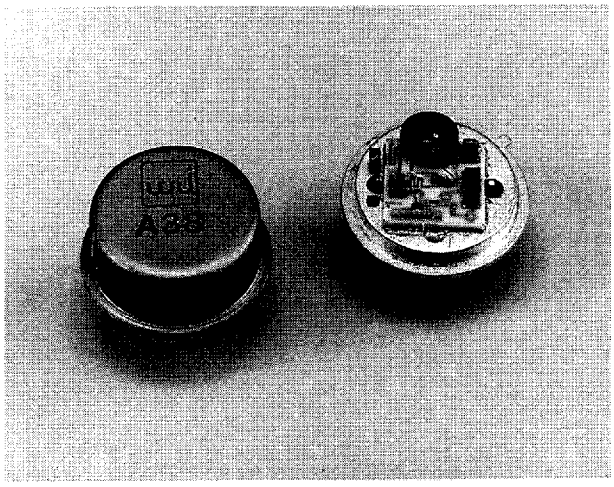
# WJ-A38 / SMA38

## 10 to 2000 MHz
## TO-8 CASCADABLE AMPLIFIER



- ◆ AVAILABLE IN SURFACE MOUNT
- ◆ HIGH OUTPUT POWER: +19 dBm (TYP.)
- ◆ HIGH THIRD ORDER I.P.: +30 dBm (TYP.)
- ◆ WIDE BANDWIDTH: 10-2000 MHz

## Specifications *

| Characteristics | Typical | Guaranteed 0° to 50°C | Guaranteed -54° to +85°C |
|---|---|---|---|
| Frequency (Min.) | 5-2050 MHz | 10-2000 MHz | 10-2000 MHz |
| Small Signal Gain (Min.) | 7.5 dB | 6.5 dB | 6.0 dB |
| Gain Flatness (Max.) | ±0.3 dB | ±0.7 dB | ±1.0 dB |
| Noise Figure (Max.) | | | |
| 10-1500 MHz | 6.5 dB | 7.7 dB | 8.2 dB |
| 1500-2000 MHz | 7.5 dB | 9.0 dB | 9.5 dB |
| Power Output at 1 dB Compression (Min.) | | | |
| 10-1500 MHz | +18.0 dBm | +17.0 dBm | +16.5 dBm |
| 1500-2000 MHz | +19.0 dBm | +18.0 dBm | +17.5 dBm |
| VSWR (Max.) Input/Output | 1.8:1 | 2.2:1 | 2.2:1 |
| DC Current (Max.) at 15 Volts | 65 mA | 69 mA | 72 mA |

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

Notes:
1. WJ-CA38 is a standard WJ-A38 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.....+52 dBm (Typ.)
Second Order Two Tone Intercept Point.....+45 dBm (Typ.)
Third Order Two Tone Intercept Point.....+30 dBm (Typ.)

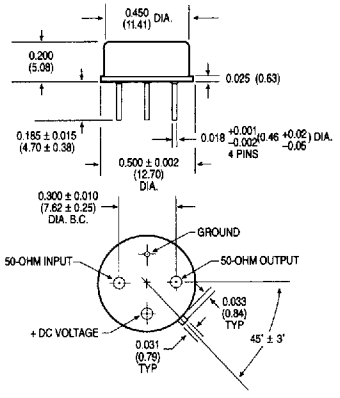
## Absolute Maximum Ratings

Storage Temperature .....-62°C to +125°C
Maximum Case Temperature .....125°C
Maximum DC Voltage.....+17 Volts
Maximum Continuous RF Input Power .....+17 dBm
Maximum Short Term CW Input .....100 Milliwatt (1 Minute Max.)
Maximum Peak Power .....0.5 Watt (3 µsec Max.)
"S" Series Burn-in Temperature (Case) .....125°C

Weight approximately 2.0 grams (0.07 oz.)

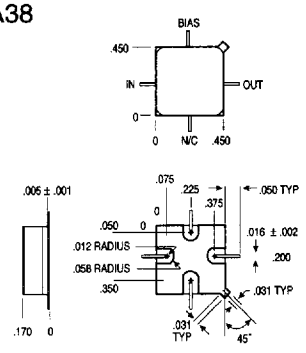
## Outline Drawings

A38



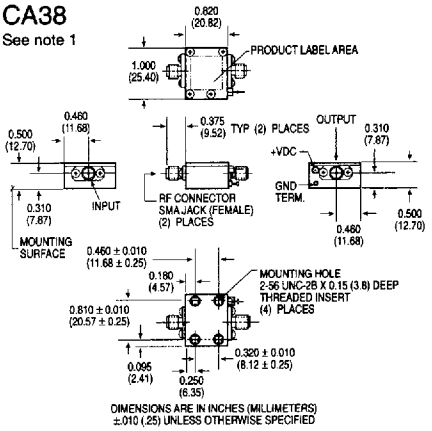

DIMENSIONS ARE IN INCHES (MILLIMETERS)
± .005 (.13) UNLESS OTHERWISE SPECIFIED

SMA38




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

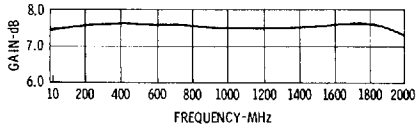
CA38
See note 1

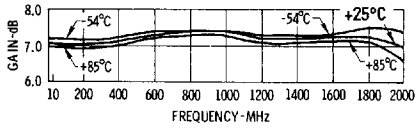


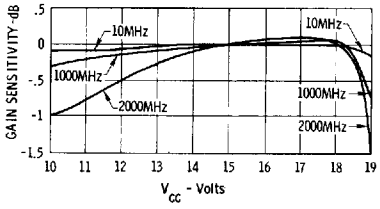

DIMENSIONS ARE IN INCHES (MILLIMETERS)
±.010 (.25) UNLESS OTHERWISE SPECIFIED

## Typical Performance at 25°C

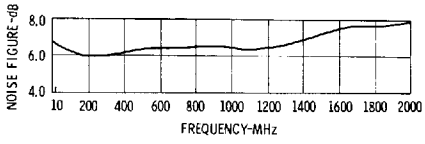
### Gain



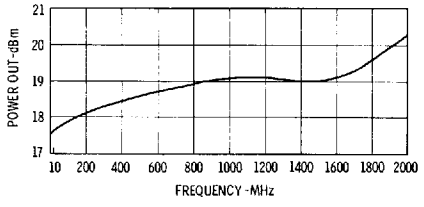



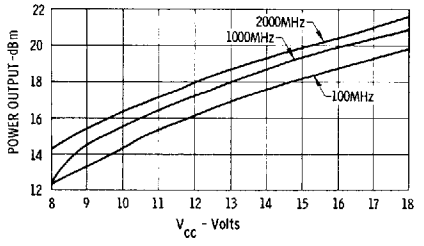




### Noise Figure



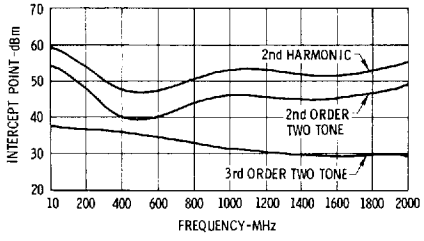

### Power Output *



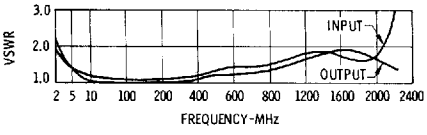




*at 1 dB Gain Compression

### Intercept Point




### VSWR




## Typical Automatic Test Data

### $V_{CC}$ = 15.0 V

| Frequency MHz | VSWR IN | VSWR OUT | GAIN DB |
|---|---|---|---|
| 1.0 | 1.6 | 2.8 | 5.9 |
| 2.0 | 1.6 | 2.1 | 8.3 |
| 5.0 | 1.4 | 1.5 | 9.2 |
| 10.0 | 1.4 | 1.5 | 9.3 |
| 50.0 | 1.4 | 1.4 | 9.4 |
| 100.0 | 1.4 | 1.4 | 9.3 |
| 200.0 | 1.4 | 1.4 | 9.4 |
| 300.0 | 1.3 | 1.4 | 9.4 |
| 400.0 | 1.3 | 1.4 | 9.5 |
| 500.0 | 1.2 | 1.3 | 9.5 |
| 600.0 | 1.2 | 1.3 | 9.6 |
| 700.0 | 1.1 | 1.2 | 9.6 |
| 800.0 | 1.0 | 1.2 | 9.7 |
| 900.0 | 1.0 | 1.1 | 9.8 |
| 1000.0 | 1.1 | 1.1 | 9.8 |
| 1100.0 | 1.1 | 1.1 | 9.9 |
| 1200.0 | 1.2 | 1.1 | 9.9 |
| 1300.0 | 1.3 | 1.2 | 9.9 |
| 1400.0 | 1.3 | 1.2 | 9.9 |
| 1500.0 | 1.3 | 1.2 | 9.8 |
| 1600.0 | 1.3 | 1.2 | 9.8 |
| 1700.0 | 1.3 | 1.3 | 9.8 |
| 1800.0 | 1.2 | 1.3 | 9.6 |
| 1900.0 | 1.1 | 1.3 | 9.4 |
| 2000.0 | 1.2 | 1.2 | 9.1 |
| 2100.0 | 1.5 | 1.2 | 8.8 |
| 2200.0 | 2.0 | 1.1 | 8.4 |

### Linear S-Parameters

| Frequency | S11 | | S21 | | S12 | | S22 | |
|---|---|---|---|---|---|---|---|---|
| MHz | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 1.0 | .219 | –83 | 1.966 | –151 | .118 | 31 | .479 | –148 |
| 2.0 | .222 | –107 | 2.604 | –155 | .149 | 27 | .344 | 171 |
| 5.0 | .178 | –150 | 2.896 | –171 | .168 | 10 | .210 | 169 |
| 10.0 | .170 | –165 | 2.913 | –176 | .171 | 5 | .192 | 172 |
| 50.0 | .173 | 174 | 2.935 | 176 | .173 | –1 | .179 | 168 |
| 100.0 | .166 | 165 | 2.928 | 170 | .173 | –4 | .176 | 160 |
| 200.0 | .154 | 153 | 2.936 | 159 | .173 | –8 | .172 | 143 |
| 300.0 | .148 | 138 | 2.937 | 149 | .175 | –12 | .166 | 125 |
| 400.0 | .122 | 124 | 2.982 | 139 | .177 | –16 | .153 | 108 |
| 500.0 | .108 | 108 | 2.979 | 129 | .179 | –21 | .136 | 90 |
| 600.0 | .084 | 93 | 3.010 | 118 | .181 | –25 | .114 | 69 |
| 700.0 | .049 | 66 | 3.024 | 107 | .182 | –30 | .094 | 48 |
| 800.0 | .020 | 45 | 3.059 | 96 | .184 | –35 | .072 | 22 |
| 900.0 | .015 | –85 | 3.078 | 85 | .187 | –40 | .060 | –12 |
| 1000.0 | .045 | –131 | 3.100 | 73 | .188 | –46 | .048 | –53 |
| 1100.0 | .064 | –151 | 3.112 | 62 | .191 | –51 | .051 | –99 |
| 1200.0 | .087 | –166 | 3.130 | 50 | .193 | –57 | .061 | –132 |
| 1300.0 | .116 | 177 | 3.136 | 38 | .193 | –63 | .070 | –163 |
| 1400.0 | .141 | 165 | 3.122 | 26 | .194 | –69 | .088 | 169 |
| 1500.0 | .138 | 147 | 3.103 | 14 | .194 | –75 | .101 | 146 |
| 1600.0 | .145 | 134 | 3.086 | 1 | .195 | –81 | .109 | 124 |
| 1700.0 | .127 | 113 | 3.090 | –12 | .195 | –88 | .122 | 105 |
| 1800.0 | .096 | 100 | 3.007 | –25 | .195 | –94 | .126 | 90 |
| 1900.0 | .033 | 88 | 2.967 | –39 | .200 | –102 | .119 | 77 |
| 2000.0 | .071 | –141 | 2.852 | –53 | .200 | –111 | .106 | 65 |
| 2100.0 | .187 | –157 | 2.760 | –67 | .194 | –120 | .082 | 57 |
| 2200.0 | .328 | 179 | 2.644 | –82 | .186 | –128 | .029 | 49 |

## Thermal Data: $V_{cc}$ = 15 Vdc

Thermal Resistance $\theta_{jc}$ ..... 45°C/W
Transistor Power Dissipation $P_d$ ..... 0.652 W
Junction Temperature Rise Above Case $T_{jc}$ ... 29°C