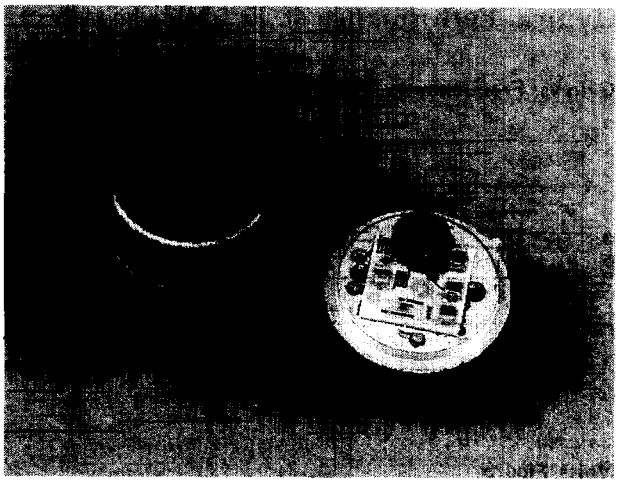
# A72 / SMA72



## 5 to 500 MHz
## TO-8 CASCADABLE AMPLIFIER

- ◆ AVAILABLE IN SURFACE MOUNT
- ◆ LOW POWER DRAIN: 31 mA (TYP.) @ +5 Vdc
- ◆ HIGH OUTPUT LEVEL WITH LOW Vcc: +12.5 dBm (TYP.) @ 5 Vdc
- ◆ HIGH THIRD ORDER I.P.: +28 dBm (TYP.) @ Vcc = +8 Vdc

## Specifications*

| Characteristics | Typical | Guaranteed 0° to 50°c | Guaranteed -54° to +85°C |
|---|---|---|---|
| Frequency (Min.) | 2-700 MHz | 5-500 MHz | 5-500 MHz |
| Small Signal Gain (Min.) | 15.0 dB | 14.0 dB | 13.5 dB |
| Gain Flatness (Max.) | ±0.2 dB | ±0.7 dB | ±1.0 dB |
| Noise Figure (Max.) | 3.3 dB | 4.0 dB | 4.5 dB |
| Power Output at 1 dB Compression (Min.) | | | |
| Vcc = 5 V | +12.5 dBm | +11.5 dBm | +11.0 dBm |
| Vcc = 8 V | +16.5 dBm | +15.5 dBm | +15.0 dBm |
| VSWR (Max.) Input/Output | <1.3:1 | 1.7:1 | 1.8 :1 |
| DC Current (Max.) at 5 Volts | | | |
| Vcc = 5 V | 31 mA | 34 mA | 36 mA |
| Vcc = 8 V | 52 mA | 56 mA | 58 mA |

*Measured in a 50-ohm system at +5 Vdc unless otherwise specified.

Notes:

1. WJ-CA72 is a standard WJ-A72 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 ..... +42 dBm (Typ.), 5 V
+39 dBm (Typ.), 8 V

Second Order Two Tone Intercept Point ..... +36 dBm (Typ.), 5 V
+33 dBm (Typ.), 8 V

Third Order Two Tone Intercept Point ..... +26 dBm (Typ.), 5 V
+28 dBm (Typ.), 8 V

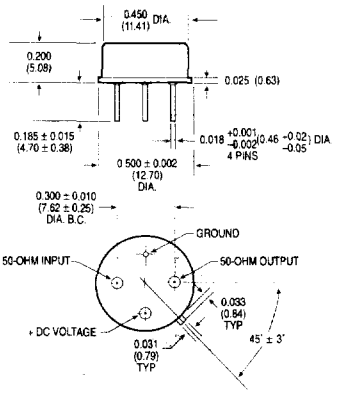
## Absolute Maximum Rating

Storage Temperature ..... -62° to +125°C
Maximum Case Temperature ..... 125°C
Maximum DC Voltage ..... 9 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 2.0 grams (0.07 oz.)

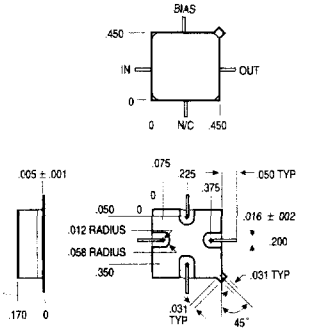
## Outline Drawings

A72



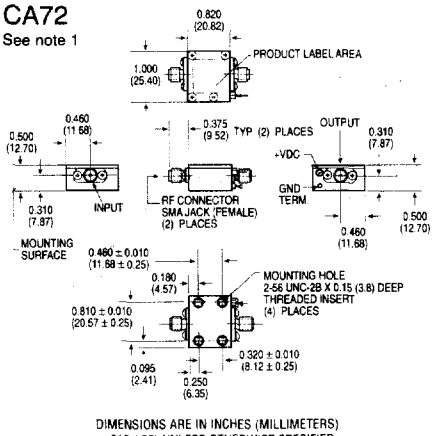

DIMENSIONS ARE IN INCHES (MILLIMETERS)
±.005 (.13) UNLESS OTHERWISE SPECIFIED

SMA72




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

CA72
See note 1




DIMENSIONS ARE IN INCHES (MILLIMETERS)
±.010 (.25) UNLESS OTHERWISE SPECIFIED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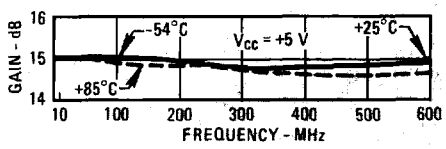
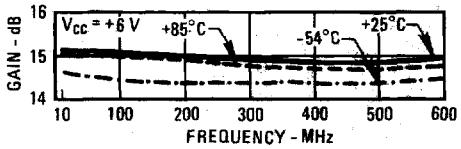
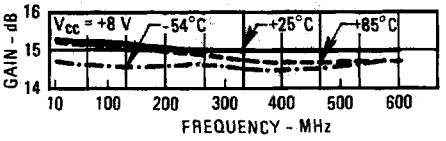
# Typical Performance at 25°C

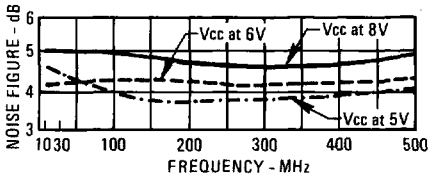
## Gain



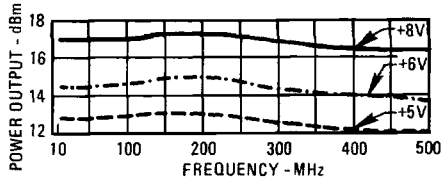




## Noise Figure

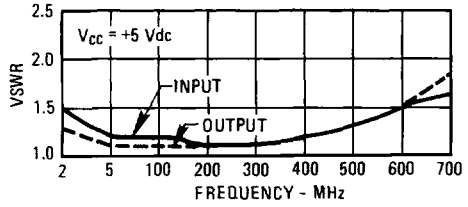



## Power Output*

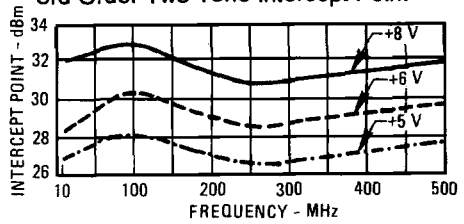



* at 1 dB Gain Compression

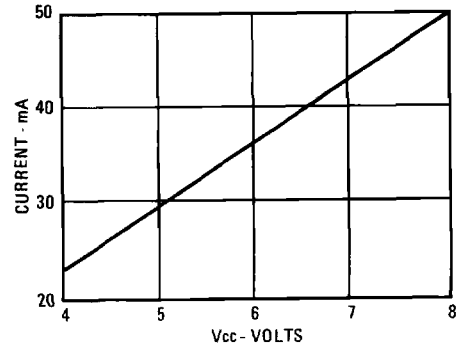
## VSWR




## 3rd Order Two Tone Intercept Point




## Current Drain vs. $V_{CC}$




# Typical Automatic Test Data

## $V_{CC}$ = 8.0 V

| Frequency MHz | VSWR IN | VSWR OUT | GAIN DB |
|---|---|---|---|
| 1.0 | 2.0 | 2.4 | 12.6 |
| 2.0 | 1.5 | 1.6 | 14.7 |
| 5.0 | 1.2 | 1.2 | 15.2 |
| 10.0 | 1.1 | 1.1 | 15.3 |
| 50.0 | 1.0 | 1.0 | 15.3 |
| 100.0 | 1.0 | 1.1 | 15.3 |
| 200.0 | 1.1 | 1.1 | 15.3 |
| 300.0 | 1.1 | 1.1 | 15.3 |
| 400.0 | 1.2 | 1.1 | 15.4 |
| 500.0 | 1.2 | 1.0 | 15.6 |
| 600.0 | 1.3 | 1.1 | 15.8 |
| 700.0 | 1.4 | 1.3 | 16.0 |

## Linear S-Parameters

| Frequency | S11 | | S21 | | S12 | | S22 | |
|---|---|---|---|---|---|---|---|---|
| MHz | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 1.0 | .342 | –50 | 4.265 | –136 | .076 | 45 | .411 | –173 |
| 2.0 | .205 | –74 | 5.432 | –155 | .097 | 26 | .228 | 140 |
| 5.0 | .081 | –89 | 5.746 | –171 | .103 | 10 | .089 | 116 |
| 10.0 | .044 | –96 | 5.794 | –176 | .104 | 5 | .051 | 110 |
| 50.0 | .017 | 163 | 5.849 | 172 | .105 | –3 | .024 | 86 |
| 100.0 | .023 | 94 | 5.824 | 163 | .105 | –9 | .029 | 75 |
| 200.0 | .037 | 68 | 5.796 | 145 | .105 | –18 | .043 | 60 |
| 300.0 | .057 | 49 | 5.815 | 128 | .103 | –27 | .051 | 43 |
| 400.0 | .087 | 17 | 5.892 | 111 | .103 | –36 | .039 | 23 |
| 500.0 | .109 | –11 | 6.000 | 92 | .100 | –46 | .009 | 0 |
| 600.0 | .134 | –46 | 6.194 | 72 | .097 | –57 | .048 | 166 |
| 700.0 | .157 | –91 | 6.334 | 49 | .090 | –68 | .142 | 140 |

## $V_{CC}$ = 5.0 V

| Frequency MHz | VSWR IN | VSWR OUT | GAIN DB |
|---|---|---|---|
| 1.0 | 2.1 | 2.4 | 12.3 |
| 2.0 | 1.5 | 1.6 | 14.5 |
| 5.0 | 1.2 | 1.2 | 15.0 |
| 10.0 | 1.1 | 1.1 | 15.0 |
| 50.0 | 1.0 | 1.0 | 15.1 |
| 100.0 | 1.0 | 1.0 | 15.1 |
| 200.0 | 1.1 | 1.0 | 15.0 |
| 300.0 | 1.1 | 1.0 | 15.0 |
| 400.0 | 1.1 | 1.0 | 15.2 |
| 500.0 | 1.2 | 1.1 | 15.2 |
| 600.0 | 1.2 | 1.2 | 15.4 |
| 700.0 | 1.3 | 1.5 | 15.5 |

## Linear S-Parameters

| Frequency | S11 | | S21 | | S12 | | S22 | |
|---|---|---|---|---|---|---|---|---|
| MHz | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 1.0 | .362 | –51 | 4.115 | –136 | .077 | 45 | .407 | –174 |
| 2.0 | .213 | –70 | 5.293 | –154 | .099 | 26 | .227 | 136 |
| 5.0 | .082 | –78 | 5.604 | –171 | .105 | 10 | .086 | 104 |
| 10.0 | .044 | –77 | 5.651 | –177 | .106 | 5 | .048 | 90 |
| 50.0 | .003 | 98 | 5.707 | 172 | .107 | –3 | .023 | 42 |
| 100.0 | .019 | 67 | 5.674 | 163 | .107 | –8 | .021 | 31 |
| 200.0 | .025 | 36 | 5.648 | 145 | .106 | –17 | .020 | 37 |
| 300.0 | .041 | 39 | 5.647 | 127 | .105 | –25 | .016 | 53 |
| 400.0 | .064 | 7 | 5.738 | 109 | .105 | –34 | .015 | 128 |
| 500.0 | .076 | –21 | 5.775 | 91 | .103 | –43 | .049 | 145 |
| 600.0 | .096 | –56 | 5.889 | 70 | .100 | –53 | .106 | 136 |
| 700.0 | .119 | –99 | 5.929 | 47 | .095 | –62 | .195 | 118 |

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

Thermal Resistance $\theta_{jc}$ .....140°C/W
Transistor Power Dissipation $P_d$ .....0.126 W
Junction Temperature Rise Above Case $T_{jc}$ .....18°C

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