

AC513

5 TO 500 MHz TO-8 CASCADABLE AMPLIFIER

Typical Values

| | |
|--|------------------------|
| Low Noise Figure | AC513 1.9 dB |
| High Gain | 20.0 dB |
| Low Power Consumption | 14 mA at +15V |
| High Performance Thin Film | |
| Standard Size TO-8 | |

SPECIFICATIONS

| Parameter | Typical | Guaranteed* | | |
|------------------------------------|-----------|-------------|---------------|-----------|
| | | 0 to 50° C | -55 to +85° C | 5-500 MHz |
| Frequency (Min.) | 3-600 MHz | 5-500 MHz | 5-500 MHz | |
| Small Signal Gain (Min.) | 20.0 dB | 19.5 dB | 19.0 dB | |
| Gain Flatness (Max.) | ±0.25 dB | ±0.5 dB | ±0.8 dB | |
| Noise Figure (Max.) | 1.9 dB | 2.3 dB | 2.8 dB | |
| SWR (Max.) Input/Output | < 1.5:1 | 1.7:1 | 2.0:1 | |
| Power Output (Min.) @ 1dB comp. | +3.5 dBm | +2.0 dBm | +1.5 dBm | |
| DC Current (Max.) | 14 mA | 16 mA | 18 mA | |

* Measured in a 50-ohm system at +15 Vdc unless otherwise specified.

INTERMODULATION PERFORMANCE

Typical @ 25° C

| | |
|--|-------------------------|
| Second Order Harmonic Intercept Point | AC513 +23 dBm |
| Second Order Two Tone Intercept Point | +17 dBm |
| Third Order Two Tone Intercept Point | +16 dBm |

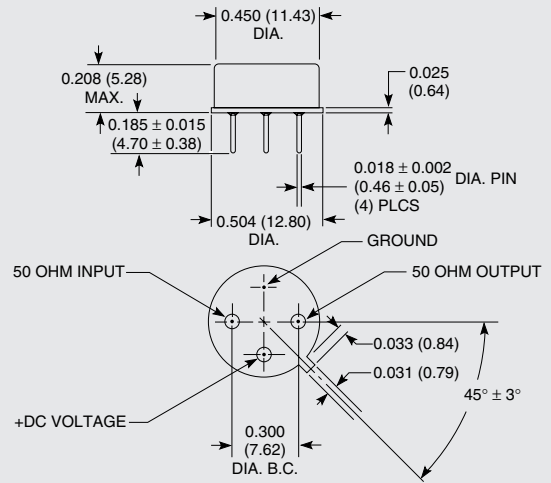
ABSOLUTE MAXIMUM RATINGS

| | |
|---|---------------|
| Storage Temperature | -62 to 125° C |
| Maximum Case Temperature | +125° C |
| Maximum DC Voltage | +21 Volts |
| Maximum Continuous RF Input Power | +13 dBm |
| Maximum Short Term Input Power (1 Minute Max.) | 50 Milliwatts |
| Maximum Peak Power (3 μsec Max.) | 0.5 Watt |
| Burn-in Temperature | +125° C |
| Thermal Resistance¹ (θjc) | +57° C/Watt |
| Junction Temperature Rise Above Case (Tjc) | +13.6° C |

¹ Thermal resistance is based on total power dissipation.

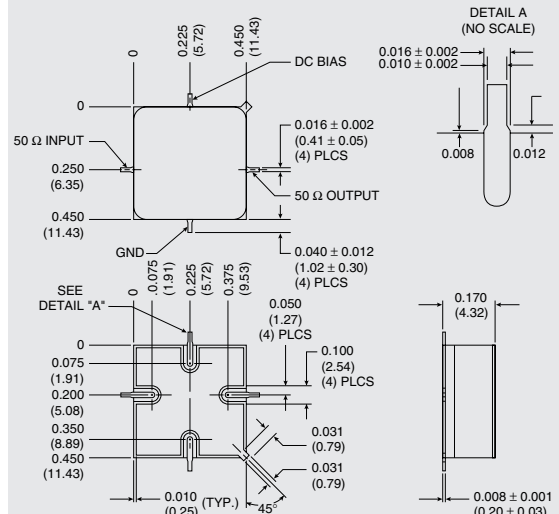
AC513

TO-8 Package for Amplifiers



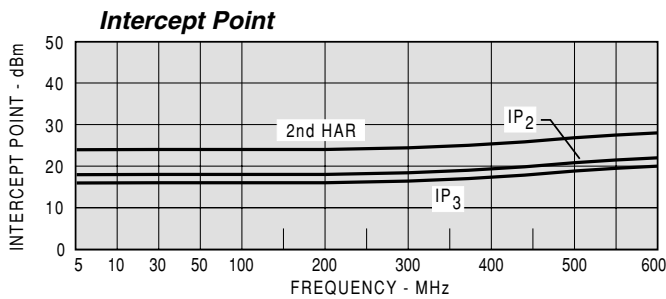
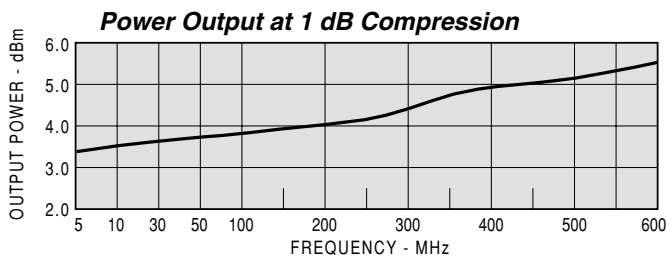
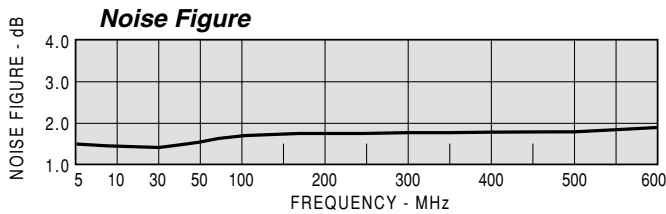
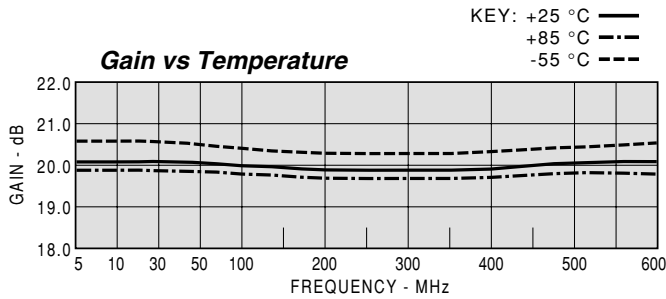
AS513

SMT0-8 Package for Amplifiers



DIMENSIONS ARE IN INCHES (MILLIMETERS)

TYPICAL PERFORMANCE



TYPICAL AUTOMATIC TEST DATA

| Model: AC513 | | | Vcc=+15V | | Icc=13.83 | |
|--------------|--------|---------|----------|-------------|-----------|--|
| FREQ | SWR IN | SWR OUT | GAIN | GROUP DELAY | REV/ISO | |
| MHZ | | | DB | NSEC | DB | |
| 5 | 1.30 | 1.27 | 20.6 | | -24.1 | |
| 10 | 1.29 | 1.26 | 20.6 | | -24.1 | |
| 20 | 1.29 | 1.26 | 20.6 | 0.870 | -24.1 | |
| 50 | 1.27 | 1.25 | 20.6 | 0.624 | -24.1 | |
| 100 | 1.28 | 1.26 | 20.5 | 0.513 | -24.1 | |
| 200 | 1.25 | 1.29 | 20.4 | 0.544 | -24.1 | |
| 300 | 1.18 | 1.32 | 20.4 | 0.545 | -23.9 | |
| 400 | 1.12 | 1.35 | 20.4 | 0.549 | -23.8 | |
| 500 | 1.09 | 1.39 | 20.5 | 0.578 | -23.6 | |
| 600 | 1.20 | 1.46 | 20.5 | 0.639 | -23.3 | |

Model: AC513 Vcc=+15V Icc=13.83

| FREQ. | S11 | | S21 | | S12 | | S22 | |
|-------|------|--------|-------|--------|-------|-------|------|--------|
| | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 5 | 0.13 | -175.2 | 10.78 | -177.6 | 0.062 | 5.0 | 0.12 | -175.6 |
| 10 | 0.13 | -179.2 | 10.76 | 179.6 | 0.062 | 2.0 | 0.12 | 178.3 |
| 20 | 0.13 | 177.7 | 10.66 | 176.4 | 0.062 | 1.0 | 0.11 | 172.2 |
| 50 | 0.12 | 172.1 | 10.69 | 169.6 | 0.063 | -2.0 | 0.11 | 160.5 |
| 100 | 0.12 | 166.8 | 10.57 | 160.5 | 0.063 | -4.0 | 0.11 | 142.7 |
| 200 | 0.11 | 154.3 | 10.47 | 140.9 | 0.063 | -8.0 | 0.13 | 112.9 |
| 300 | 0.08 | 150.4 | 10.44 | 121.1 | 0.064 | -13.0 | 0.14 | 88.3 |
| 400 | 0.05 | 154.5 | 10.47 | 101.5 | 0.065 | -17.0 | 0.15 | 70.2 |
| 500 | 0.04 | -178.7 | 10.57 | 80.6 | 0.066 | -22.0 | 0.16 | 58.8 |
| 600 | 0.09 | -155.8 | 10.58 | 57.6 | 0.069 | -26.0 | 0.19 | 53.5 |
| 700 | 0.17 | -162.1 | 10.36 | 32.6 | 0.072 | -32.0 | 0.23 | 46.6 |

| Model: AC513 | | | Vcc=+12V | | Icc=11.08 | |
|--------------|--------|---------|----------|-------------|-----------|--|
| FREQ | SWR IN | SWR OUT | GAIN | GROUP DELAY | REV/ISO | |
| MHZ | | | DB | NSEC | DB | |
| 5 | 1.10 | 1.11 | 19.8 | | -23.4 | |
| 10 | 1.09 | 1.10 | 19.8 | | -23.4 | |
| 20 | 1.09 | 1.10 | 19.8 | 0.893 | -23.4 | |
| 50 | 1.09 | 1.10 | 19.8 | 0.608 | -23.3 | |
| 100 | 1.10 | 1.10 | 19.7 | 0.506 | -23.4 | |
| 200 | 1.09 | 1.13 | 19.6 | 0.540 | -23.4 | |
| 300 | 1.09 | 1.16 | 19.7 | 0.541 | -23.3 | |
| 400 | 1.13 | 1.19 | 19.7 | 0.550 | -23.2 | |
| 500 | 1.18 | 1.24 | 19.8 | 0.583 | -23.1 | |
| 600 | 1.34 | 1.36 | 19.8 | 0.646 | -22.8 | |

Model: AC513 Vcc=+12V Icc=11.08

| FREQ. | S11 | | S21 | | S12 | | S22 | |
|-------|------|--------|------|--------|-------|-------|------|--------|
| | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 5 | 0.05 | -169.9 | 9.81 | -177.8 | 0.068 | 4.0 | 0.05 | -170.2 |
| 10 | 0.04 | -177.2 | 9.80 | 179.6 | 0.068 | 2.0 | 0.05 | 179.2 |
| 20 | 0.04 | -177.3 | 9.74 | 176.4 | 0.068 | 0.0 | 0.05 | 169.6 |
| 50 | 0.04 | -179.2 | 9.77 | 169.8 | 0.068 | -2.0 | 0.05 | 152.4 |
| 100 | 0.05 | 179.1 | 9.67 | 160.7 | 0.068 | -5.0 | 0.05 | 130.5 |
| 200 | 0.04 | -175.2 | 9.60 | 141.4 | 0.068 | -10.0 | 0.06 | 102.0 |
| 300 | 0.04 | -154.5 | 9.62 | 121.8 | 0.068 | -14.0 | 0.08 | 81.8 |
| 400 | 0.06 | -131.1 | 9.69 | 102.1 | 0.069 | -19.0 | 0.09 | 72.2 |
| 500 | 0.08 | -131.7 | 9.81 | 81.0 | 0.070 | -24.0 | 0.11 | 70.5 |
| 600 | 0.15 | -144.2 | 9.82 | 57.8 | 0.072 | -29.0 | 0.15 | 69.5 |
| 700 | 0.21 | -158.8 | 9.59 | 32.8 | 0.076 | -35.0 | 0.22 | 60.0 |