

AP2048

200 TO 2000 MHz TO-8 CASCADABLE AMPLIFIER

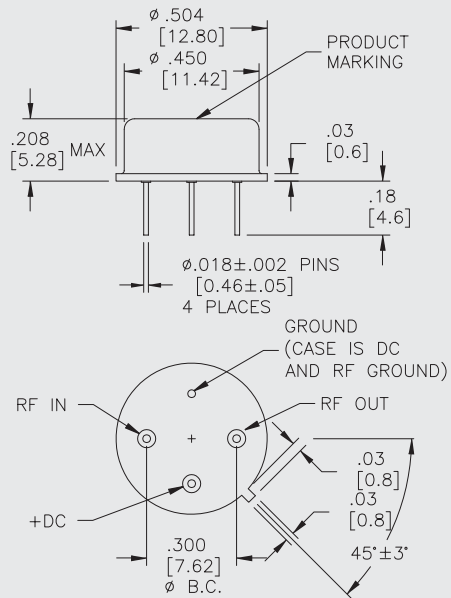
Typical Values

| | |
|--|-------------------|
| High Dynamic Range (1 MHz band) | +121.5 dBm |
| High Output Power | +23.5 dBm |
| High Third Order I.P. | +39.0 dBm |
| Low Noise Figure | 4.8 dB |
| High Performance Thin Film | |
| Standard Size TO-8 Package | |

AP2048

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TO-8 Package for Amplifiers



SPECIFICATIONS*

| Parameter | Typical | Guaranteed | |
|---------------------------------|--------------|--------------|---------------|
| | | 0 to 50 °C | -55 to +85 °C |
| Frequency (Min.) | 100-2200 MHz | 200-2000 MHz | 200-2000 MHz |
| Small Signal Gain (Min.) | 9.0 dB | 8.0 dB | 7.5 dB |
| Gain Flatness (Max.) | ±0.4 dB | ±0.5 dB | ±0.8 dB |
| Noise Figure (Max.) | 4.8 dB | 5.5 dB | 6.0 dB |
| SWR (Max.) Input/Output | < 1.5:1 | 2.0:1 | 2.0:1 |
| Power Output (Min.) @ 1dB comp. | +23.5 dBm | +23.0 dBm | +22.5 dBm |
| Reverse Isolation | 17.0 dB | — | — |
| DC Current (Max.) | 150.0 mA | 158.0 mA | 162.0 mA |

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

INTERMODULATION PERFORMANCE

Typical @ 25 °C

| | |
|--|----------------|
| Second Order Harmonic Intercept Point | +56 dBm |
| Second Order Two Tone Intercept Point | +50 dBm |
| Third Order Two Tone Intercept Point | +39 dBm |

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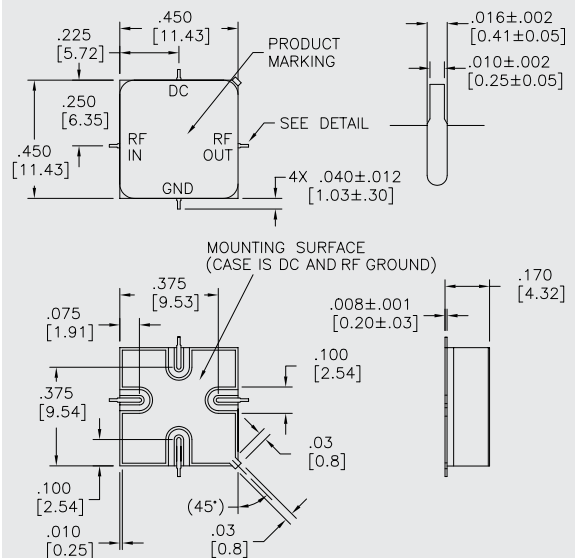
ABSOLUTE MAXIMUM RATINGS

| | |
|---|-----------------------|
| Storage Temperature | -62 to +125 °C |
| Maximum Case Temperature | +85 °C |
| Maximum DC Voltage | +17 Volts |
| Maximum Continuous RF Input Power | +17 dBm |
| Maximum Short Term Input Power (1 Minute Max.) | 100 Milliwatts |
| Maximum Peak Power (3 μsec Max.) | 0.5 Watt |
| Burn-in Temperature | +100 °C |
| Thermal Resistance¹ (θjc) | +18 °C/Watt |
| Junction Temperature Rise Above Case (Tjc) | +43.6 °C |

¹ Thermal resistance is based on total power dissipation.

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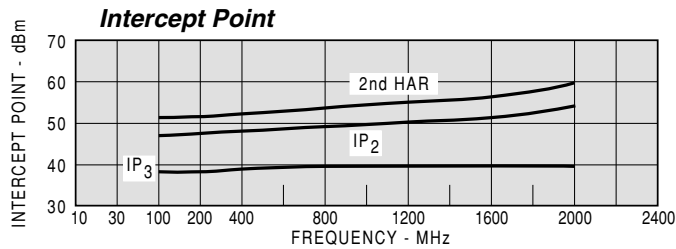
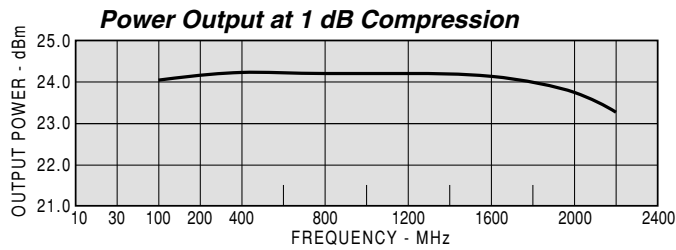
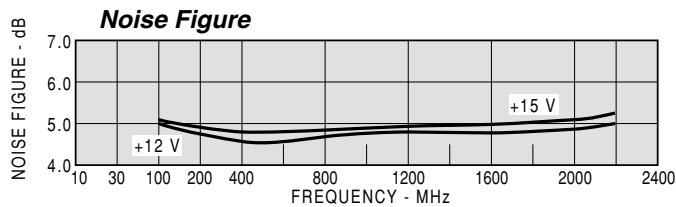
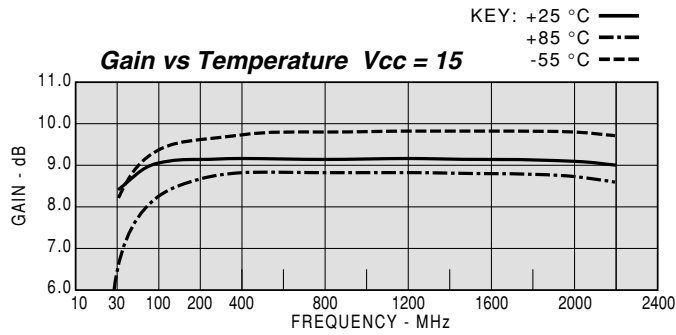
SMTO-8 Package for Amplifiers



DIMENSIONS ARE IN INCHES [MILLIMETERS]

TYPICAL PERFORMANCE

TYPICAL AUTOMATIC TEST DATA



MODEL: AP2048 Vcc = +15V Icc = 148.26 mA

| FREQ. MHz | VSWR IN | VSWR OUT | GAIN DB | GROUP DELAY NSEC | REV/ISO DB |
|-----------|---------|----------|---------|------------------|------------|
| 100 | 1.72 | 1.20 | 9.0 | 0.399 | -17.5 |
| 200 | 1.64 | 1.15 | 9.1 | 0.399 | -17.6 |
| 400 | 1.59 | 1.13 | 9.1 | 0.312 | -17.7 |
| 600 | 1.54 | 1.12 | 9.2 | 0.294 | -17.7 |
| 800 | 1.49 | 1.11 | 9.1 | 0.283 | -17.7 |
| 1000 | 1.46 | 1.09 | 9.1 | 0.285 | -17.7 |
| 1200 | 1.40 | 1.08 | 9.2 | 0.289 | -17.7 |
| 1400 | 1.33 | 1.09 | 9.2 | 0.296 | -17.7 |
| 1600 | 1.26 | 1.09 | 9.2 | 0.300 | -17.6 |
| 1800 | 1.22 | 1.11 | 9.2 | 0.312 | -17.7 |
| 2000 | 1.32 | 1.14 | 9.2 | 0.332 | -17.8 |
| 2200 | 1.65 | 1.17 | 9.0 | 0.350 | -18.1 |

MODEL: AP2048 Vcc = +15V Icc = 148.26 mA

LINEAR S-PARAMETERS

| FREQ. MHz | S11 | | S21 | | S12 | | S22 | |
|-----------|------|--------|------|-------|-------|------|------|--------|
| | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 100 | 0.27 | -24.4 | 2.81 | 179.0 | 0.134 | -9 | 0.09 | -131.9 |
| 200 | 0.24 | -29.5 | 2.84 | 164.7 | 0.131 | -13 | 0.07 | -174.6 |
| 400 | 0.23 | -48.7 | 2.87 | 142.4 | 0.130 | -23 | 0.06 | 143.8 |
| 600 | 0.21 | -67.7 | 2.87 | 121.4 | 0.131 | -34 | 0.06 | 111.9 |
| 800 | 0.20 | -90.1 | 2.85 | 100.8 | 0.131 | -45 | 0.06 | 93.4 |
| 1000 | 0.19 | -111.1 | 2.86 | 80.4 | 0.130 | -57 | 0.04 | 78.3 |
| 1200 | 0.17 | -133.3 | 2.87 | 59.5 | 0.130 | -70 | 0.04 | 69.9 |
| 1400 | 0.14 | -158.6 | 2.87 | 38.3 | 0.131 | -82 | 0.04 | 64.9 |
| 1600 | 0.12 | 168.1 | 2.88 | 16.7 | 0.131 | -96 | 0.04 | 56.4 |
| 1800 | 0.10 | 119.5 | 2.89 | -5.8 | 0.130 | -110 | 0.05 | 36.5 |
| 2000 | 0.14 | 58.0 | 2.87 | -29.9 | 0.128 | -126 | 0.06 | 10.1 |
| 2200 | 0.25 | 12.3 | 2.81 | -55.0 | 0.124 | -142 | 0.08 | -24.9 |
| 2400 | 0.39 | -23.4 | 2.60 | -82.0 | 0.116 | -161 | 0.10 | -63.3 |

MODEL: AP2048 Vcc = +12V Icc = 132.00 mA

| FREQ. MHz | VSWR IN | VSWR OUT | GAIN DB | GROUP DELAY NSEC | REV/ISO DB |
|-----------|---------|----------|---------|------------------|------------|
| 100 | 1.70 | 1.27 | 9.0 | 0.392 | -17.9 |
| 200 | 1.64 | 1.25 | 9.0 | 0.392 | -18.1 |
| 400 | 1.60 | 1.23 | 9.1 | 0.309 | -18.1 |
| 600 | 1.56 | 1.22 | 9.1 | 0.290 | -18.0 |
| 800 | 1.51 | 1.21 | 9.0 | 0.283 | -17.9 |
| 1000 | 1.48 | 1.19 | 9.1 | 0.283 | -17.9 |
| 1200 | 1.42 | 1.18 | 9.1 | 0.287 | -17.8 |
| 1400 | 1.36 | 1.18 | 9.1 | 0.295 | -17.6 |
| 1600 | 1.29 | 1.18 | 9.1 | 0.298 | -17.5 |
| 1800 | 1.23 | 1.21 | 9.2 | 0.313 | -17.4 |
| 2000 | 1.29 | 1.25 | 9.2 | 0.335 | -17.3 |
| 2200 | 1.59 | 1.30 | 9.0 | 0.348 | -17.5 |

MODEL: AP2048 Vcc = +12V Icc = 132.00 mA

LINEAR S-PARAMETERS

| FREQ. MHz | S11 | | S21 | | S12 | | S22 | |
|-----------|------|--------|------|-------|-------|------|------|--------|
| | MAG | ANG | MAG | ANG | MAG | ANG | MAG | ANG |
| 100 | 0.26 | -22.6 | 2.81 | 178.0 | 0.127 | -9 | 0.12 | -151.0 |
| 200 | 0.24 | -28.1 | 2.83 | 164.2 | 0.125 | -12 | 0.11 | 176.5 |
| 400 | 0.23 | -46.5 | 2.84 | 142.0 | 0.125 | -22 | 0.10 | 142.1 |
| 600 | 0.22 | -65.3 | 2.84 | 121.2 | 0.128 | -32 | 0.10 | 118.5 |
| 800 | 0.20 | -86.6 | 2.83 | 101.0 | 0.127 | -43 | 0.10 | 100.7 |
| 1000 | 0.19 | -107.5 | 2.84 | 80.7 | 0.127 | -54 | 0.09 | 85.0 |
| 1200 | 0.17 | -128.4 | 2.86 | 59.9 | 0.129 | -66 | 0.08 | 71.6 |
| 1400 | 0.15 | -151.3 | 2.85 | 38.8 | 0.132 | -79 | 0.08 | 60.5 |
| 1600 | 0.13 | 178.4 | 2.87 | 17.0 | 0.134 | -92 | 0.08 | 47.8 |
| 1800 | 0.10 | 133.8 | 2.89 | -5.0 | 0.135 | -106 | 0.09 | 29.7 |
| 2000 | 0.13 | 70.6 | 2.89 | -29.3 | 0.136 | -123 | 0.11 | 6.7 |
| 2200 | 0.23 | 19.2 | 2.82 | -54.3 | 0.133 | -139 | 0.13 | -22.4 |
| 2400 | 0.38 | -19.5 | 2.59 | -82.0 | 0.126 | -159 | 0.15 | -56.4 |