

# 100 TO 8000 MHz SMT0-8 CASCADABLE AMPLIFIER

# AS8002

|                                  |               |
|----------------------------------|---------------|
| High Gain . . . . .              | 19.5 dB       |
| High Reverse Isolation . . . . . | 40.0 dB       |
| Medium Output Power . . . . .    | +15.5 dBm     |
| Ultra Broadband Width . . . . .  | 0.1 – 8.0 GHz |
| High Efficiency                  |               |
| High Performance Thin Film       |               |
| Standard Size SMT0-8 Package     |               |

## SPECIFICATIONS\*

| Parameter                       | Typical      | Guaranteed   |               |
|---------------------------------|--------------|--------------|---------------|
|                                 |              | 0 to 50 °C   | -55 to +85 °C |
| Frequency (Min.)                | 100-8000 MHz | 100-8000 MHz | 100-8000 MHz  |
| <b>Small Signal Gain (Min.)</b> |              |              |               |
| 100-7000 MHz                    | 19.5 dB      | 18.0 dB      | 17.5 dB       |
| 7000-8000 MHz                   | 18.0 dB      | 17.0 dB      | 16.0 dB       |
| <b>Gain Flatness (Max.)</b>     |              |              |               |
| 100-7000 MHz                    | ±0.5 dB      | ±0.8 dB      | ±1.2 dB       |
| 7000-8000 MHz                   | ±0.8 dB      | ±1.2 dB      | ±1.8 dB       |
| <b>Noise Figure (Max.)</b>      | 2.5 dB       | 3.3† dB      | 3.8† dB       |
| <b>SWR (Max.)</b> Input/Output  | <1.6:1^      | 1.9:1^       | 2.0:1^        |
| <b>Power Output (Min.)</b>      |              |              |               |
| @ 1dB comp. 100-2000 MHz        | +14.0 dBm    | +13.5 dBm    | +13.0 dBm     |
| 2000-4000 MHz                   | +15.5 dBm    | +14.0 dBm    | +13.5 dBm     |
| 4000-8000 MHz                   | +17.0 dBm    | +15.5 dBm    | +15.0 dBm     |
| <b>Reverse Isolation</b>        | 40.0 dB      | —            | —             |
| <b>DC Current (Max.)</b>        | 92 mA        | 98 mA        | 100 mA        |

<sup>^</sup> Input VSWR 0.3:1 higher above 7.4 GHz.    <sup>†</sup> 0.5 dB higher below 500 MHz.

## INTERMODULATION PERFORMANCE

| Typical @ 25 °C                             | +12 Volts | +15 Volts |
|---------------------------------------------|-----------|-----------|
| Second Order Harmonic Intercept Point ..... | +47 dBm   | +45 dBm   |
| Second Order Two Tone Intercept Point ..... | +41 dBm   | +39 dBm   |
| Third Order Two Tone Intercept Point .....  | +26 dBm   | +28 dBm   |

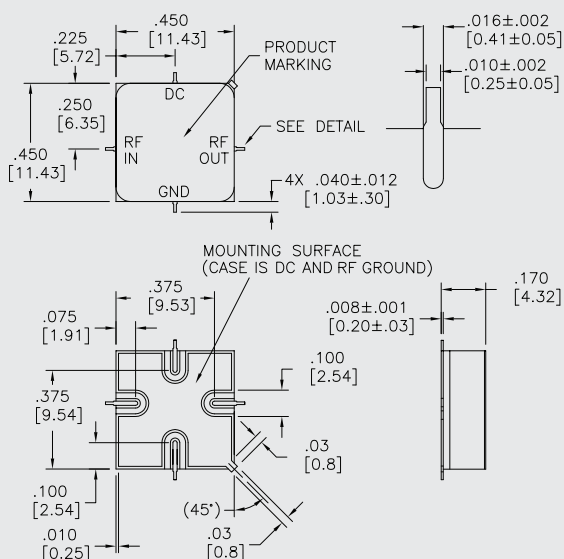
## ABSOLUTE MAXIMUM RATINGS

|                                                             |                |
|-------------------------------------------------------------|----------------|
| <b>Storage Temperature</b> .....                            | -62 to +125 °C |
| <b>Maximum Case Temperature</b> .....                       | +125 °C        |
| <b>Maximum DC Voltage</b> .....                             | +17 Volts      |
| <b>Maximum Continuous RF Input Power</b> .....              | +13 dBm        |
| <b>Maximum Short Term Input Power (1 Minute Max.)</b> ..... | 50 Milliwatts  |
| <b>Burn-in Temperature</b> .....                            | +125 °C        |
| <b>Thermal Resistance<sup>1</sup> (θjc)</b> .....           | +19.7 °C/Watt  |
| <b>Junction Temperature Rise Above Case (Tjc)</b> .....     | +26.1 °C       |

<sup>1</sup> Thermal resistance is based on total power dissipation.

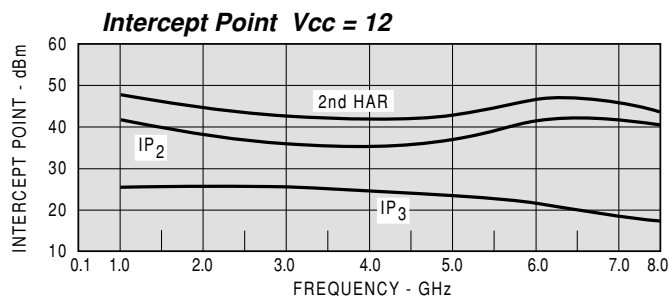
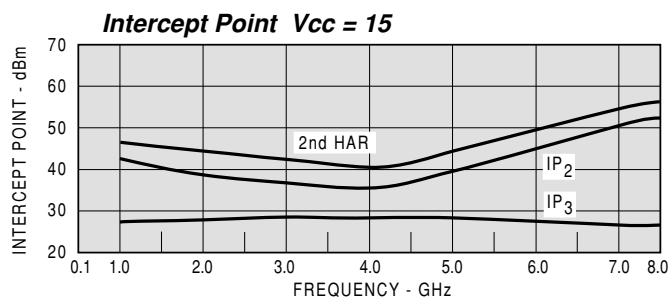
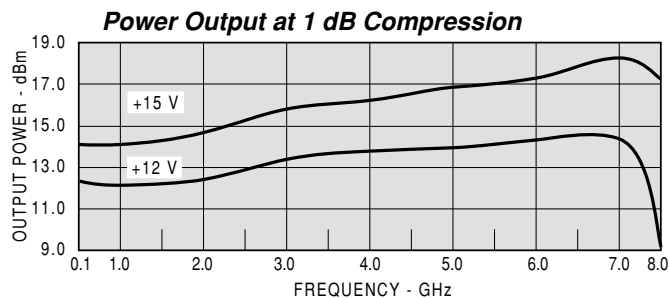
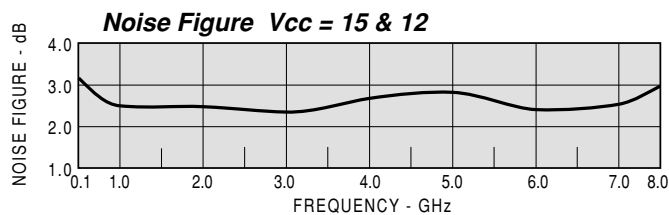
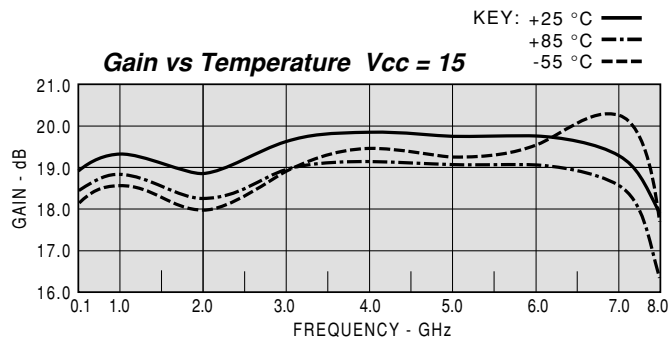
# AS8002

## SMT0-8 Package for Amplifiers



DIMENSIONS ARE IN INCHES [MILLIMETERS]

**TYPICAL PERFORMANCE**



**TYPICAL AUTOMATIC TEST DATA**

| Model: AS8002 |      |      | Vcc=+15V |       |             | Icc=90.97 |  |
|---------------|------|------|----------|-------|-------------|-----------|--|
| FREQ          | SWR  | SWR  | GAIN     | PHASE | GROUP DELAY | REV/ISO   |  |
| MHZ           | IN   | OUT  | DB       | DEG   | NSEC        | DB        |  |
| 100           | 1.14 | 1.36 | 19.07    | 8     | 0.47        | -35.7     |  |
| 500           | 1.12 | 1.48 | 19.73    | -40   | 0.28        | -38.9     |  |
| 1000          | 1.22 | 1.47 | 19.48    | -85   | 0.24        | -38.0     |  |
| 1200          | 1.27 | 1.46 | 19.36    | -102  | 0.24        | -38.1     |  |
| 1400          | 1.32 | 1.45 | 19.21    | -119  | 0.23        | -39.4     |  |
| 1600          | 1.37 | 1.43 | 19.07    | -135  | 0.23        | -40.0     |  |
| 1800          | 1.41 | 1.43 | 19.01    | -151  | 0.22        | -41.1     |  |
| 2000          | 1.46 | 1.44 | 19.00    | -167  | 0.22        | -38.2     |  |
| 2200          | 1.49 | 1.45 | 19.09    | 178   | 0.22        | -38.7     |  |
| 2400          | 1.51 | 1.47 | 19.21    | 161   | 0.23        | -37.9     |  |
| 2600          | 1.54 | 1.52 | 19.43    | 145   | 0.24        | -38.3     |  |
| 2800          | 1.57 | 1.54 | 19.61    | 127   | 0.24        | -39.3     |  |
| 3000          | 1.59 | 1.56 | 19.68    | 110   | 0.25        | -40.9     |  |
| 3200          | 1.62 | 1.59 | 19.80    | 92    | 0.25        | -38.7     |  |
| 3400          | 1.64 | 1.60 | 19.84    | 75    | 0.24        | -40.0     |  |
| 3600          | 1.67 | 1.58 | 19.85    | 57    | 0.25        | -41.9     |  |
| 3800          | 1.68 | 1.55 | 19.82    | 39    | 0.24        | -41.8     |  |
| 4000          | 1.68 | 1.53 | 19.80    | 22    | 0.24        | -41.3     |  |
| 4200          | 1.67 | 1.50 | 19.78    | 4     | 0.24        | -40.7     |  |
| 4400          | 1.67 | 1.44 | 19.78    | -13   | 0.24        | -42.0     |  |
| 4600          | 1.65 | 1.38 | 19.76    | -31   | 0.24        | -43.0     |  |
| 4800          | 1.63 | 1.32 | 19.76    | -49   | 0.25        | -39.5     |  |
| 5000          | 1.59 | 1.28 | 19.78    | -66   | 0.25        | -39.3     |  |
| 5200          | 1.54 | 1.25 | 19.78    | -84   | 0.25        | -41.8     |  |
| 5400          | 1.48 | 1.22 | 19.79    | -103  | 0.25        | -42.5     |  |
| 5600          | 1.42 | 1.23 | 19.72    | -121  | 0.25        | -42.0     |  |
| 5800          | 1.36 | 1.24 | 19.67    | -139  | 0.25        | -43.0     |  |
| 6000          | 1.28 | 1.22 | 19.61    | -158  | 0.25        | -40.5     |  |
| 6200          | 1.23 | 1.21 | 19.56    | -176  | 0.26        | -42.0     |  |
| 6400          | 1.19 | 1.21 | 19.51    | 165   | 0.26        | -43.4     |  |
| 6600          | 1.19 | 1.20 | 19.49    | 146   | 0.26        | -42.0     |  |
| 6800          | 1.23 | 1.20 | 19.42    | 127   | 0.27        | -41.5     |  |
| 7000          | 1.32 | 1.22 | 19.37    | 107   | 0.28        | -41.6     |  |
| 7200          | 1.43 | 1.26 | 19.29    | 87    | 0.29        | -40.6     |  |
| 7400          | 1.59 | 1.33 | 19.20    | 66    | 0.31        | -40.6     |  |
| 7600          | 1.74 | 1.38 | 18.89    | 43    | 0.32        | -40.3     |  |
| 7800          | 1.84 | 1.41 | 18.34    | 21    | 0.30        | -39.0     |  |
| 8000          | 1.93 | 1.43 | 17.67    | 0     | 0.29        | -37.1     |  |

**LINEAR S-PARAMETERS**

| Model: AS8002 |      |        | Vcc=+15V |        |       | Icc=90.97 |      |
|---------------|------|--------|----------|--------|-------|-----------|------|
| FREQ.         | S11  |        | S21      |        | S12   |           | S22  |
| MHZ           | MAG  | ANG    | MAG      | ANG    | MAG   | ANG       | MAG  |
| 100           | 0.09 | -59.4  | 8.92     | 9.1    | 0.019 | 38.4      | 0.19 |
| 500           | 0.06 | -69.6  | 9.66     | -39.1  | 0.009 | -20.5     | 0.20 |
| 1000          | 0.10 | -104.2 | 9.43     | -83.5  | 0.011 | -42.4     | 0.20 |
| 1200          | 0.11 | -118.3 | 9.32     | -100.6 | 0.011 | -52.2     | 0.19 |
| 1400          | 0.13 | -133.6 | 9.18     | -117.2 | 0.012 | -74.6     | 0.19 |
| 1600          | 0.14 | -147.7 | 9.06     | -133.4 | 0.008 | -57.3     | 0.19 |
| 1800          | 0.16 | -162.8 | 9.03     | -149.0 | 0.010 | -88.4     | 0.19 |
| 2000          | 0.17 | -178.0 | 9.04     | -164.8 | 0.012 | -89.1     | 0.19 |
| 2200          | 0.18 | 166.7  | 9.16     | 179.6  | 0.011 | -85.0     | 0.19 |
| 2400          | 0.18 | 151.3  | 9.29     | 163.4  | 0.013 | -105.6    | 0.20 |
| 2600          | 0.19 | 136.4  | 9.54     | 146.8  | 0.012 | -115.7    | 0.21 |
| 2800          | 0.20 | 121.3  | 9.77     | 129.6  | 0.011 | -123.6    | 0.22 |
| 3000          | 0.21 | 104.6  | 9.89     | 111.8  | 0.011 | -130.0    | 0.23 |
| 3200          | 0.22 | 89.8   | 10.03    | 94.3   | 0.011 | -144.6    | 0.24 |
| 3400          | 0.22 | 73.8   | 10.08    | 76.7   | 0.010 | -164.2    | 0.25 |
| 3600          | 0.23 | 57.6   | 10.12    | 58.7   | 0.010 | -171.2    | 0.25 |
| 3800          | 0.24 | 43.2   | 10.11    | 41.2   | 0.009 | 177.9     | 0.25 |
| 4000          | 0.25 | 28.6   | 10.10    | 23.5   | 0.011 | 159.5     | 0.24 |
| 4200          | 0.25 | 14.7   | 10.07    | 6.2    | 0.011 | 152.5     | 0.25 |
| 4400          | 0.26 | 1.9    | 10.09    | -11.6  | 0.009 | 146.5     | 0.24 |
| 4600          | 0.25 | -10.6  | 10.05    | -29.3  | 0.010 | 134.1     | 0.23 |
| 4800          | 0.26 | -23.3  | 10.01    | -47.4  | 0.011 | 116.3     | 0.21 |
| 5000          | 0.25 | -35.9  | 9.98     | -65.0  | 0.011 | 114.5     | 0.20 |
| 5200          | 0.24 | -48.0  | 9.98     | -82.9  | 0.011 | 93.0      | 0.20 |
| 5400          | 0.23 | -61.6  | 9.98     | -101.0 | 0.011 | 87.3      | 0.19 |
| 5600          | 0.21 | -75.3  | 9.89     | -119.4 | 0.011 | 81.4      | 0.20 |
| 5800          | 0.19 | -90.3  | 9.81     | -137.6 | 0.010 | 49.9      | 0.20 |
| 6000          | 0.16 | -110.4 | 9.73     | -155.7 | 0.010 | 44.5      | 0.19 |
| 6200          | 0.14 | -135.4 | 9.70     | -173.8 | 0.012 | 36.0      | 0.19 |
| 6400          | 0.12 | -165.6 | 9.71     | 167.8  | 0.009 | 15.8      | 0.18 |
| 6600          | 0.12 | 158.6  | 9.72     | 148.5  | 0.010 | 8.5       | 0.17 |
| 6800          | 0.14 | 127.8  | 9.69     | 129.0  | 0.010 | -8.6      | 0.17 |
| 7000          | 0.17 | 103.1  | 9.64     | 108.8  | 0.012 | -18.9     | 0.16 |
| 7200          | 0.19 | 83.6   | 9.50     | 88.1   | 0.013 | -34.0     | 0.16 |
| 7400          | 0.22 | 69.1   | 9.26     | 66.9   | 0.014 | -26.2     | 0.17 |
| 7600          | 0.25 | 55.1   | 8.89     | 45.5   | 0.013 | -44.6     | 0.19 |
| 7800          | 0.27 | 43.0   | 8.48     | 24.1   | 0.018 | -62.0     | 0.18 |
| 8000          | 0.29 | 30.4   | 7.90     | 2.2    | 0.020 | -80.2     | 0.15 |

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