

# AC1012 AC1015

## 0.3 TO 1000 MHz TO-8 CASCADABLE AMPLIFIERS

| Typical Values                                           | AC1012          | AC1015          |
|----------------------------------------------------------|-----------------|-----------------|
| Extended Bandwidth.....                                  | 0.1 to 1000 MHz | 0.1 to 1000 MHz |
| Low Noise Figure .....                                   | 3.2 dB          | 3.4 dB          |
| Medium Output Level .....                                | +9.0 dBm        | +9.0 dBm        |
| Medium Third Order I.P.....                              | +21.0 dBm       | +21.0 dBm       |
| High Performance Thin Film<br>Standard Size TO-8 Package |                 |                 |

### SPECIFICATIONS\*

| Parameter                          | Typical      | Guaranteed   |               |
|------------------------------------|--------------|--------------|---------------|
|                                    |              | 0 to 50 °C   | -55 to +85 °C |
| Frequency (Min.)                   | 0.1-1100 MHz | 0.3-1000 MHz | 0.3-1000 MHz  |
| Small Signal Gain (Min.)           |              |              |               |
| AC1012                             | 16.0 dB      | 15.0 dB      | 14.5 dB       |
| AC1015                             | 15.0 dB      | 14.0 dB      | 13.5 dB       |
| Gain Flatness (Max.)               | ±0.25 dB     | ±0.7 dB      | ±0.8 dB       |
| Noise Figure (Max.)                |              |              |               |
| AC1012                             | < 3.2 dB     | 3.7 dB       | 4.2 dB        |
| AC1015                             | < 3.4 dB     | 4.0 dB       | 4.5 dB        |
| SWR (Max.)                         | Input/Output | 1.7:1        | 2.0:1         |
| Power Output (Min.)<br>@ 1dB comp. | +9.0 dBm     | +7.0 dBm     | +7.0 dBm      |
| Reverse Isolation                  | 20.0 dB      | —            | —             |
| DC Current (Max.)                  | 24.0 mA      | 26.0 mA      | 28.0 mA       |

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

### INTERMODULATION PERFORMANCE

Typical @ 25 °C

|                                             |         |
|---------------------------------------------|---------|
| Second Order Harmonic Intercept Point.....  | +39 dBm |
| Second Order Two Tone Intercept Point ..... | +33 dBm |
| Third Order Two Tone Intercept Point .....  | +21 dBm |

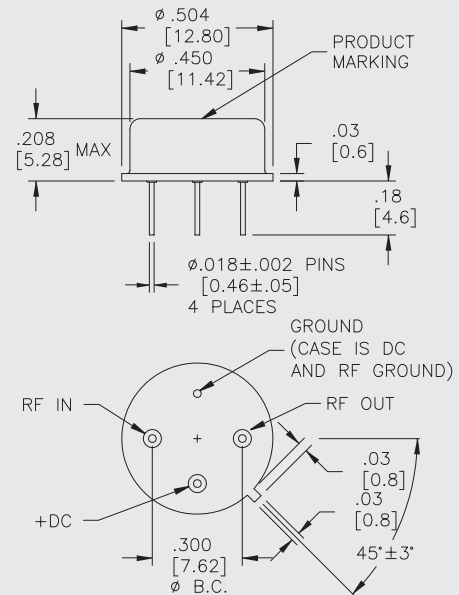
### ABSOLUTE MAXIMUM RATINGS

|                                                        |                |
|--------------------------------------------------------|----------------|
| Storage Temperature .....                              | -62 to +125 °C |
| Maximum Case Temperature .....                         | +125 °C        |
| Maximum DC Voltage .....                               | +18 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 (AC1012/AC1015) .....              | +125 °C        |
| Thermal Resistance <sup>1</sup> (θjc; AC1012) .....    | +59 °C/Watt    |
| Thermal Resistance <sup>1</sup> (θjc; AC1015) .....    | +59 °C/Watt    |
| Junction Temperature Rise Above Case (Tjc; AC1012) ... | +23.0 °C       |
| Junction Temperature Rise Above Case (Tjc; AC1015) ... | +23.0 °C       |

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

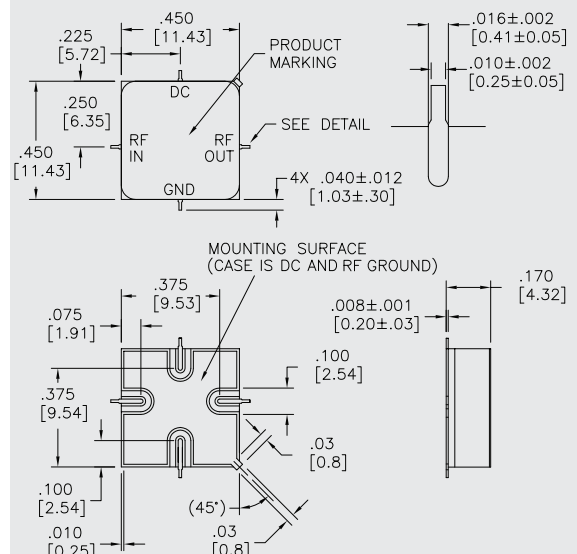
### AC1012/AC1015

#### TO-8 Package for Amplifiers



### AS1012/AS1015

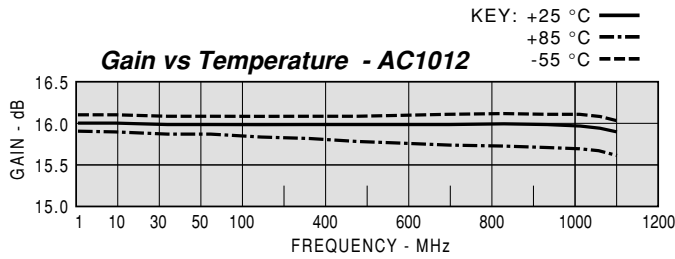
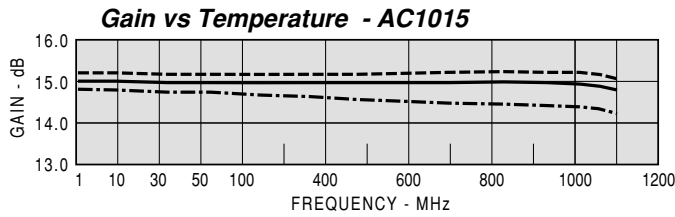
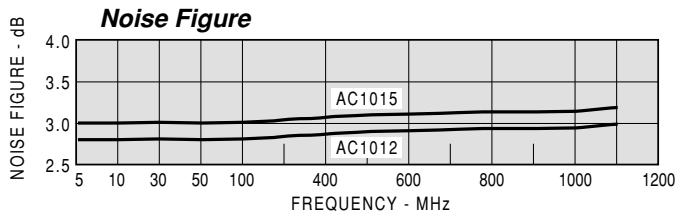
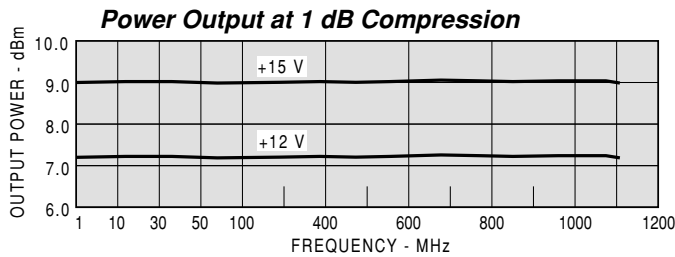
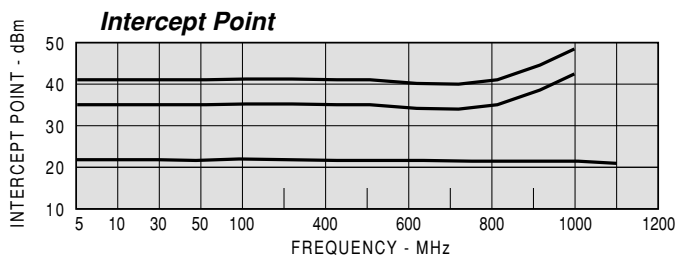
#### SMT0-8 Package for Amplifiers



If DC is present on RF input/output, this model requires additional external blocking capacitors.

DIMENSIONS ARE IN INCHES [MILLIMETERS]

## TYPICAL PERFORMANCE



## TYPICAL AUTOMATIC TEST DATA

| Model: AC1012 |      |      |      | Vcc=+15V |         | Icc=24.87 |  |
|---------------|------|------|------|----------|---------|-----------|--|
| FREQ          | SWR  | SWR  | GAIN | DELAY    | REV/ISO |           |  |
| MHZ           | IN   | OUT  | DB   | NSEC     | DB      |           |  |
| 0.3           | 1.35 | 1.49 | 16.2 |          | -20.4   |           |  |
| 1             | 1.24 | 1.41 | 16.0 |          | -20.5   |           |  |
| 10            | 1.23 | 1.39 | 16.0 | 0.989    | -20.4   |           |  |
| 50            | 1.20 | 1.38 | 15.9 | 0.419    | -20.5   |           |  |
| 100           | 1.20 | 1.37 | 15.8 | 0.388    | -20.5   |           |  |
| 200           | 1.21 | 1.34 | 15.8 | 0.398    | -20.6   |           |  |
| 300           | 1.22 | 1.30 | 15.8 | 0.389    | -20.7   |           |  |
| 400           | 1.24 | 1.24 | 15.8 | 0.380    | -20.8   |           |  |
| 500           | 1.25 | 1.18 | 15.8 | 0.407    | -20.7   |           |  |
| 600           | 1.28 | 1.12 | 15.9 | 0.411    | -20.7   |           |  |
| 700           | 1.30 | 1.06 | 15.9 | 0.412    | -21.0   |           |  |
| 800           | 1.33 | 1.10 | 15.9 | 0.432    | -21.0   |           |  |
| 900           | 1.36 | 1.21 | 15.8 | 0.445    | -20.9   |           |  |
| 1000          | 1.41 | 1.36 | 15.8 | 0.457    | -21.2   |           |  |
| 1100          | 1.42 | 1.52 | 15.6 | 0.448    | -21.2   |           |  |

| Model: AC1012 |      |        |      | Vcc=+15V |       |       |      | Icc=24.87 |  |
|---------------|------|--------|------|----------|-------|-------|------|-----------|--|
| FREQ.         | S11  |        | S21  |          | S12   |       | S22  |           |  |
| MHZ           | MAG  | ANG    | MAG  | ANG      | MAG   | ANG   | MAG  | ANG       |  |
| 0             | 0.15 | -142.9 | 6.46 | -173.2   | 0.095 | -7.0  | 0.20 | -149.2    |  |
| 1             | 0.11 | -168.7 | 6.33 | -178.4   | 0.094 | -2.0  | 0.17 | -170.5    |  |
| 10            | 0.10 | 177.8  | 6.27 | 178.5    | 0.095 | -1.0  | 0.16 | 178.5     |  |
| 50            | 0.09 | 171.8  | 6.24 | 172.5    | 0.094 | -3.0  | 0.16 | 171.3     |  |
| 100           | 0.09 | 169.5  | 6.20 | 165.4    | 0.094 | -6.0  | 0.16 | 163.5     |  |
| 200           | 0.10 | 154.9  | 6.16 | 151.1    | 0.093 | -12.0 | 0.15 | 148.1     |  |
| 300           | 0.10 | 143.7  | 6.18 | 137.2    | 0.092 | -18.0 | 0.13 | 133.2     |  |
| 400           | 0.11 | 131.3  | 6.19 | 123.3    | 0.091 | -24.0 | 0.11 | 117.7     |  |
| 500           | 0.11 | 122.1  | 6.17 | 108.8    | 0.092 | -30.0 | 0.08 | 98.7      |  |
| 600           | 0.12 | 113.0  | 6.24 | 94.1     | 0.092 | -35.0 | 0.06 | 72.7      |  |
| 700           | 0.13 | 101.4  | 6.21 | 79.3     | 0.089 | -41.0 | 0.03 | 15.2      |  |
| 800           | 0.14 | 93.2   | 6.22 | 63.5     | 0.090 | -47.0 | 0.05 | -67.5     |  |
| 900           | 0.15 | 86.2   | 6.20 | 47.5     | 0.090 | -54.0 | 0.09 | -102.2    |  |
| 1000          | 0.17 | 76.7   | 6.13 | 31.2     | 0.087 | -58.0 | 0.15 | -123.5    |  |
| 1100          | 0.17 | 68.9   | 5.99 | 15.0     | 0.087 | -64.0 | 0.21 | -140.6    |  |
| 1200          | 0.19 | 58.4   | 5.79 | -2.0     | 0.085 | -70.0 | 0.26 | -157.4    |  |

| Model: AC1015 |      |      |      | Vcc=+15V |         | Icc=24.34 |  |
|---------------|------|------|------|----------|---------|-----------|--|
| FREQ          | SWR  | SWR  | GAIN | DELAY    | REV/ISO |           |  |
| MHZ           | IN   | OUT  | DB   | NSEC     | DB      |           |  |
| 0.3           | 1.23 | 1.33 | 15.3 |          | -19.7   |           |  |
| 1             | 1.08 | 1.21 | 15.1 |          | -19.9   |           |  |
| 10            | 1.05 | 1.20 | 15.0 | 1.062    | -19.8   |           |  |
| 50            | 1.03 | 1.19 | 15.0 | 0.349    | -19.8   |           |  |
| 100           | 1.05 | 1.19 | 14.9 | 0.316    | -19.8   |           |  |
| 200           | 1.07 | 1.20 | 14.9 | 0.331    | -20.0   |           |  |
| 300           | 1.11 | 1.21 | 14.9 | 0.323    | -19.9   |           |  |
| 400           | 1.13 | 1.23 | 14.9 | 0.319    | -20.1   |           |  |
| 500           | 1.18 | 1.26 | 14.9 | 0.329    | -20.0   |           |  |
| 600           | 1.25 | 1.28 | 15.0 | 0.336    | -20.0   |           |  |
| 700           | 1.33 | 1.31 | 14.9 | 0.338    | -20.1   |           |  |
| 800           | 1.40 | 1.34 | 15.0 | 0.351    | -20.3   |           |  |
| 900           | 1.50 | 1.37 | 14.9 | 0.363    | -20.2   |           |  |
| 1000          | 1.62 | 1.42 | 14.9 | 0.360    | -20.3   |           |  |
| 1100          | 1.73 | 1.48 | 14.8 | 0.363    | -20.4   |           |  |

| Model: AC1015 |      |        |      | Vcc=+15V |       |       |      | Icc=24.34 |  |
|---------------|------|--------|------|----------|-------|-------|------|-----------|--|
| FREQ.         | S11  |        | S21  |          | S12   |       | S22  |           |  |
| MHZ           | MAG  | ANG    | MAG  | ANG      | MAG   | ANG   | MAG  | ANG       |  |
| 0             | 0.10 | -108.7 | 5.79 | -171.6   | 0.103 | -7.0  | 0.14 | -127.3    |  |
| 1             | 0.04 | -133.9 | 5.67 | -178.0   | 0.102 | -3.0  | 0.10 | -159.5    |  |
| 10            | 0.02 | -178.8 | 5.65 | 178.7    | 0.102 | -1.0  | 0.09 | 178.1     |  |
| 50            | 0.02 | -166.1 | 5.63 | 173.6    | 0.102 | -3.0  | 0.09 | 165.9     |  |
| 100           | 0.02 | -137.8 | 5.59 | 168.0    | 0.102 | -5.0  | 0.09 | 154.0     |  |
| 200           | 0.03 | -148.4 | 5.54 | 156.1    | 0.100 | -10.0 | 0.09 | 129.6     |  |
| 300           | 0.05 | -149.0 | 5.57 | 144.3    | 0.101 | -14.0 | 0.10 | 106.9     |  |
| 400           | 0.06 | -161.8 | 5.57 | 132.9    | 0.099 | -19.0 | 0.10 | 87.1      |  |
| 500           | 0.08 | -168.0 | 5.55 | 121.0    | 0.099 | -24.0 | 0.11 | 66.8      |  |
| 600           | 0.11 | 179.3  | 5.62 | 108.9    | 0.100 | -28.0 | 0.12 | 47.8      |  |
| 700           | 0.14 | 169.1  | 5.57 | 96.9     | 0.099 | -32.0 | 0.13 | 28.7      |  |
| 800           | 0.17 | 159.0  | 5.60 | 84.1     | 0.096 | -36.0 | 0.15 | 9.5       |  |
| 900           | 0.20 | 148.2  | 5.56 | 71.0     | 0.098 | -42.0 | 0.16 | -9.8      |  |
| 1000          | 0.24 | 138.0  | 5.57 | 58.2     | 0.097 | -44.0 | 0.17 | -29.6     |  |
| 1100          | 0.27 | 129.9  | 5.49 | 45.2     | 0.096 | -49.0 | 0.19 | -47.9     |  |
| 1200          | 0.30 | 120.1  | 5.35 | 31.9     | 0.095 | -54.0 | 0.21 | -66.4     |  |