

# AC251 10 TO 200 MHz TO-8 CASCADABLE AMPLIFIER

**Typical Values** **AC251**  
**Low Noise Figure** ..... 1.2 dB  
**Medium Output Power** ..... +13.2 dBm  
**High Efficiency** ..... 11 mA Current Drain  
**High Performance Thin Film**  
**Standard Size TO-8 Package**

## SPECIFICATIONS\*

| Parameter                                  | Typical           | Guaranteed        |                   |  |
|--|-------------------|-------------------|-------------------|--|
|  |                   | 0 to 50 °C        | -55 to +85 °C     |  |
| <b>Frequency (Min.)</b>                    | <b>10-250 MHz</b> | <b>10-200 MHz</b> | <b>10-200 MHz</b> |  |
| <b>Small Signal Gain (Min.)</b>            | 8.0 dB            | 7.5^ dB           | 7.0^ dB           |  |
| <b>Gain Flatness (Max.)</b>                |                   |                   |                   |  |
| 20-200 MHz                                 | ±0.2 dB           | ±0.3 dB           | ±0.4 dB           |  |
| 10-200 MHz                                 | ±0.2 dB           | ±0.6 dB           | ±0.7 dB           |  |
| <b>Noise Figure (Max.)</b>                 | 1.2 dB            | 1.7 dB            | 2.2 dB            |  |
| <b>SWR (Max.)</b> Input/Output             | <1.4:1            | 1.5:1†            | 1.7:1†            |  |
| <b>Power Output (Min.)</b><br>@ 1 dB comp. | +13.2 dBm         | +12.0 dBm         | +11.5 dBm         |  |
| <b>Reverse Isolation</b>                   | 11.0 dB           | —                 | —                 |  |
| <b>DC Current (Max.)</b>                   | 11.0 mA           | 14.0 mA           | 17.0 mA           |  |

\* Measured in a 50-ohm system at +5 Vdc unless otherwise specified.  
 ^ 0.5 dB lower below 20 MHz. † 0.3 higher below 20 MHz.

## INTERMODULATION PERFORMANCE

| Typical @ 25 °C                                    | +5 volts | +8 volts |
|--|----------|----------|
| <b>Second Order Harmonic Intercept Point</b> ..... | +54 dBm  | +58 dBm  |
| <b>Second Order Two Tone Intercept Point</b> ..... | +49 dBm  | +52 dBm  |
| <b>Third Order Two Tone Intercept Point</b> .....  | +30 dBm  | +33 dBm  |

## ABSOLUTE MAXIMUM RATINGS

|   |                |
|---|----------------|
| <b>Storage Temperature</b> .....                            | -62 to +125 °C |
| <b>Maximum Case Temperature</b> .....                       | +125 °C        |
| <b>Maximum DC Voltage</b> .....                             | +9 Volts       |
| <b>Maximum Continuous RF Input Power</b> .....              | +13 dBm        |
| <b>Maximum Short Term Input Power (1 Minute Max.)</b> ..... | 200 Milliwatts |
| <b>Maximum Peak Power (3 μsec Max.)</b> .....               | 0.5 Watt       |
| <b>Burn-in Temperature</b> .....                            | +125 °C        |
| <b>Thermal Resistance<sup>1</sup> (θjc)</b> .....           | +69 °C/Watt    |
| <b>Junction Temperature Rise Above Case (Tjc)</b> .....     | +4.8 °C        |

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

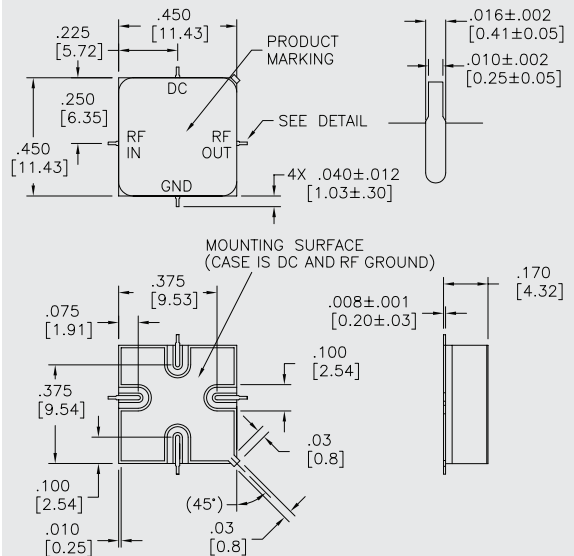
## AC251

### TO-8 Package for Amplifiers



## AS251

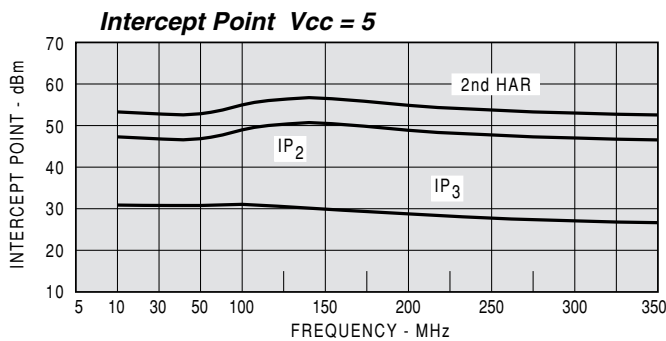
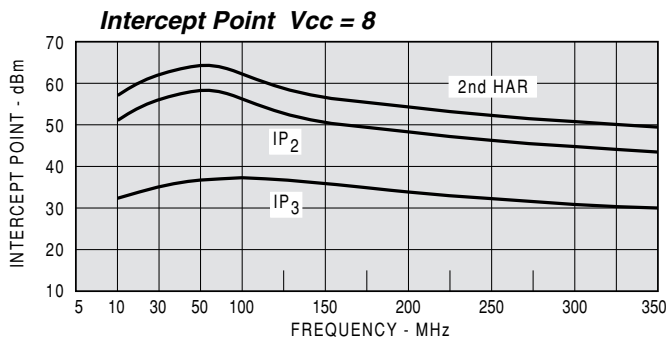
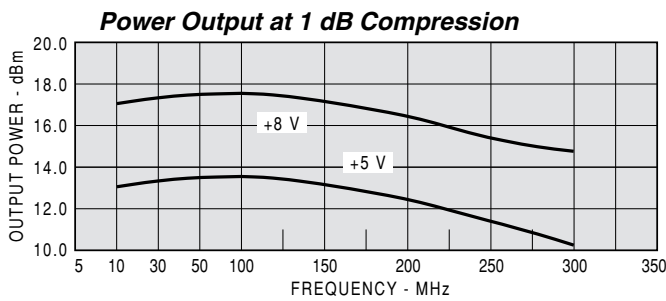
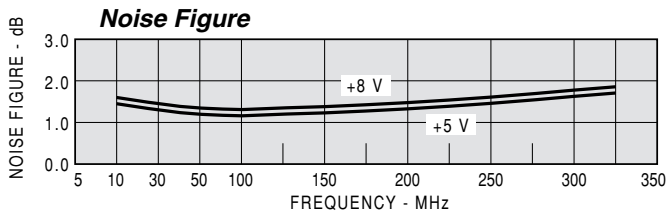
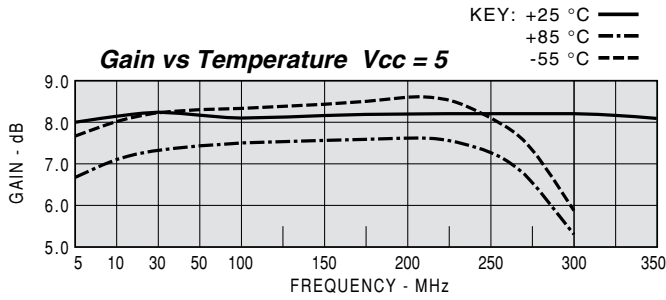
### SMT0-8 Package for Amplifiers



DIMENSIONS ARE IN INCHES [MILLIMETERS]

**TYPICAL PERFORMANCE**

**TYPICAL AUTOMATIC TEST DATA**



Model: AC251 Vcc=+5V Icc=10.76

| FREQ. MHZ | SWR IN | SWR OUT | GAIN DB | PHASE DEG | GROUP DELAY NSEC | REV/ISO DB |
|-----------|--------|---------|---------|-----------|------------------|------------|
| 5         | 1.12   | 1.13    | 7.97    | 10        |                  | -11.0      |
| 10        | 1.09   | 1.10    | 8.13    | 3         |                  | -10.9      |
| 20        | 1.08   | 1.09    | 8.19    | -2        | 1.6              | -10.8      |
| 50        | 1.07   | 1.09    | 8.20    | -13       | 0.97             | -10.8      |
| 100       | 1.06   | 1.12    | 8.14    | -27       | 0.81             | -11.0      |
| 200       | 1.03   | 1.17    | 8.17    | -56       | 0.8              | -11.4      |
| 300       | 1.29   | 1.29    | 8.22    | -88       | 0.88             | -12.0      |

Model: AC251 Vcc=+5V Icc=10.76

LINEAR S-PARAMETERS

| FREQ. MHZ | S11  |       | S21  |       | S12   |       | S22  |       |
|-----------|------|-------|------|-------|-------|-------|------|-------|
| MHZ       | MAG  | ANG   | MAG  | ANG   | MAG   | ANG   | MAG  | ANG   |
| 5         | 0.06 | 152.4 | 2.50 | 10.1  | 0.281 | 10.4  | 0.06 | 165.4 |
| 10        | 0.04 | 152.1 | 2.55 | 3.2   | 0.287 | 3.3   | 0.05 | 156.1 |
| 20        | 0.04 | 148.2 | 2.57 | -2.5  | 0.288 | -2.4  | 0.04 | 146.9 |
| 50        | 0.03 | 133.8 | 2.57 | -13.0 | 0.287 | -12.4 | 0.04 | 127.5 |
| 100       | 0.03 | 109.4 | 2.55 | -27.5 | 0.282 | -26.6 | 0.06 | 108.2 |
| 200       | 0.02 | 156.5 | 2.56 | -56.2 | 0.270 | -54.6 | 0.08 | 101.8 |
| 300       | 0.13 | 179.8 | 2.58 | -87.9 | 0.250 | -85.3 | 0.13 | 136.5 |

Model: AC251 Vcc=+8V Icc=19.78

| FREQ. MHZ | SWR IN | SWR OUT | GAIN DB | PHASE DEG | GROUP DELAY NSEC | REV/ISO DB |
|-----------|--------|---------|---------|-----------|------------------|------------|
| 5         | 1.34   | 1.34    | 7.74    | 16        |                  | -11.2      |
| 10        | 1.22   | 1.23    | 7.98    | 6         |                  | -11.0      |
| 20        | 1.17   | 1.18    | 8.11    | -1        | 1.9              | -10.9      |
| 50        | 1.13   | 1.16    | 8.16    | -12       | 1.0              | -10.9      |
| 100       | 1.11   | 1.18    | 8.14    | -26       | 0.81             | -11.0      |
| 200       | 1.07   | 1.23    | 8.16    | -55       | 0.79             | -11.4      |
| 300       | 1.30   | 1.29    | 8.23    | -86       | 0.86             | -12.1      |

Model: AC251 Vcc=+8V Icc=19.78

LINEAR S-PARAMETERS

| FREQ. MHZ | S11  |       | S21  |       | S12   |       | S22  |       |
|-----------|------|-------|------|-------|-------|-------|------|-------|
| MHZ       | MAG  | ANG   | MAG  | ANG   | MAG   | ANG   | MAG  | ANG   |
| 5         | 0.14 | 137.4 | 2.44 | 15.5  | 0.275 | 15.9  | 0.15 | 145.8 |
| 10        | 0.10 | 141.3 | 2.51 | 6.2   | 0.282 | 6.4   | 0.10 | 143.2 |
| 20        | 0.08 | 143.2 | 2.54 | -0.6  | 0.285 | -0.5  | 0.08 | 141.0 |
| 50        | 0.06 | 137.8 | 2.56 | -11.8 | 0.286 | -11.5 | 0.07 | 128.6 |
| 100       | 0.05 | 122.3 | 2.55 | -26.4 | 0.281 | -26.1 | 0.08 | 110.8 |
| 200       | 0.04 | 135.5 | 2.56 | -55.0 | 0.269 | -54.2 | 0.10 | 97.0  |
| 300       | 0.13 | 171.7 | 2.58 | -86.1 | 0.250 | -84.9 | 0.13 | 123.9 |

