

# AS3093 AS3094

## 400 TO 3000 MHz SMT0-8 CASCADABLE AMPLIFIERS

| Typical Values                 | AS3093          | AS3094          |
|--------------------------------|-----------------|-----------------|
| Low Noise Figure . . . . .     | <1.7 dB         | <1.7 dB         |
| Medium Output Power . . . . .  | +18.5 dBm       | +23.8 dBm       |
| Broad Bandwidth . . . . .      | 400 to 3000 MHz | 400 to 3000 MHz |
| Designed with Internal Limiter |                 |                 |
| High Performance Thin Film     |                 |                 |
| Standard Size SMT0-8           |                 |                 |

### SPECIFICATIONS\*

| Parameter                          | Typical          | Guaranteed             |                        |                        |
|------------------------------------|------------------|------------------------|------------------------|------------------------|
|                                    |                  | 0 to 50 °C             | -55 to +85 °C          |                        |
| Frequency (Min.)                   | 300-3200 MHz     | 400-3000 MHz           | 400-3000 MHz           |                        |
| Small Signal Gain (Min.)           | 14.8 dB          | 14.0 dB                | 13.5 dB                |                        |
| Gain Flatness (Max.)               | ±0.3 dB          | ±0.6 dB                | ±0.7 dB                |                        |
| Noise Figure (Max.)                | AS3093<br>AS3094 | <1.7 dB<br><1.7 dB     | 2.0 dB<br>2.2 dB       | 2.5 dB<br>2.7 dB       |
| SWR (Max.)                         | Input/Output     | 1.5:1                  | 1.8:1                  | 1.9:1                  |
| Power Output (Min.)<br>@ 1dB comp. | AS3093<br>AS3094 | +18.5 dBm<br>+23.8 dBm | +17.5 dBm<br>+22.5 dBm | +17.0 dBm<br>+22.0 dBm |
| Reverse Isolation                  | 20.5 dB          | —                      | —                      |                        |
| DC Current (Max.)                  | AS3093<br>AS3094 | 55.0 mA<br>108.0 mA    | 60.0 mA<br>113.0 mA    | 63.0 mA<br>115.0 mA    |

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

### INTERMODULATION PERFORMANCE

| Typical @ 25 °C; 1500 MHz                      | AS3093  | AS3094    |
|--|---------|-----------|
| Second Order Harmonic Intercept Point . . .    | +48 dBm | +51 dBm   |
| Second Order Two Tone Intercept Point . . . .  | +42 dBm | +45 dBm   |
| Third Order Two Tone Intercept Point . . . . . | +31 dBm | +37.5 dBm |

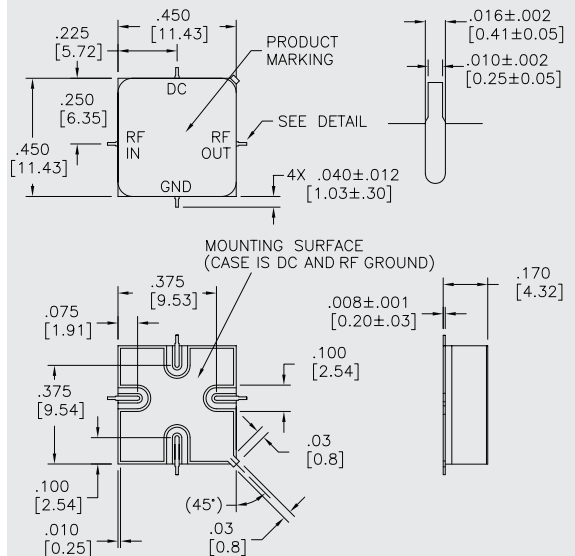
### ABSOLUTE MAXIMUM RATINGS

|  |                |
|--|----------------|
| Storage Temperature . . . . .                                | -62 to +125 °C |
| Maximum Case Temperature . . . . .                           | +125 °C        |
| Maximum DC Voltage . . . . .                                 | +20 Volts      |
| Maximum Continuous RF Input Power . . . . .                  | +30 dBm        |
| Maximum Short Term Input Power (1 Minute Max.) . . . . .     | +33 dBm        |
| Maximum Peak Power (3 μsec Max.) . . . . .                   | +36 dBm        |
| Burn-in Temperature . . . . .                                | +125 °C        |
| Thermal Resistance <sup>1</sup> (θjc; AS3093) . . . . .      | +15 °C/Watt    |
| Thermal Resistance <sup>1</sup> (θjc; AS3094) . . . . .      | +11.5 °C/Watt  |
| Junction Temperature Rise Above Case (Tjc; AS3093) . . . . . | +12.3 °C       |
| Junction Temperature Rise Above Case (Tjc; AS3094) . . . . . | +18.7 °C       |

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

### AS3093/AS3094

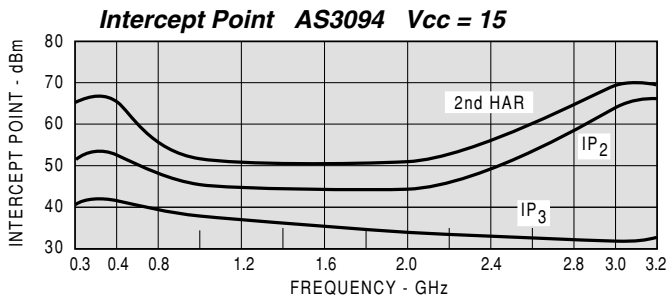
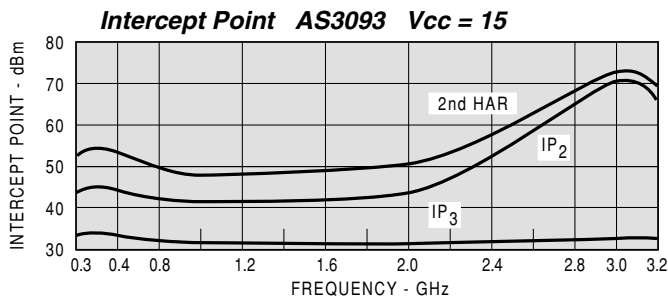
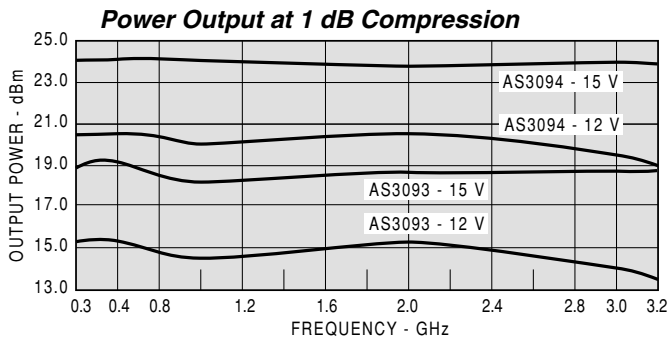
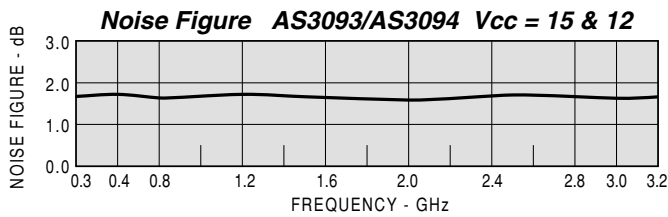
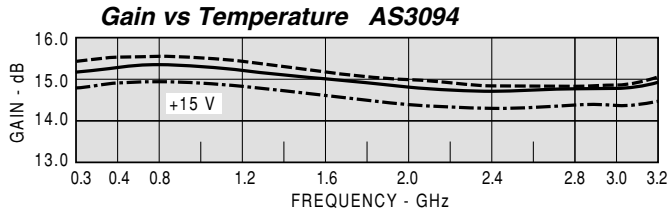
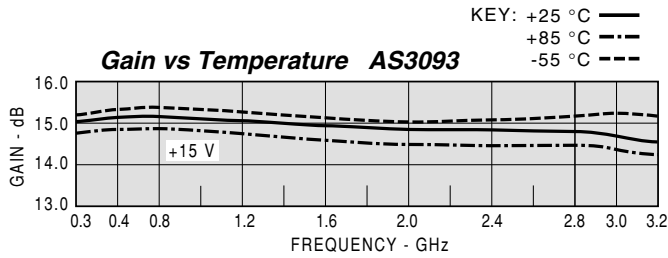
#### SMT0-8 Package for Amplifiers



DIMENSIONS ARE IN INCHES [MILLIMETERS]

## TYPICAL PERFORMANCE

## TYPICAL AUTOMATIC TEST DATA



| Model: AS3093 |      |      |       | Vcc= +15V |       |         | lcc= 54.78 |
|---------------|------|------|-------|-----------|-------|---------|------------|
| FREQ          | SWR  | SWR  | GAIN  | PHASE     | DELAY | REV/ISO |            |
| MHZ           | IN   | OUT  | DB    | DEG       | NSEC  | DB      |            |
| 300           | 1.41 | 1.63 | 15.06 | 167.00    | 0.46  | -20.80  |            |
| 400           | 1.28 | 1.48 | 15.15 | 154.00    | 0.36  | -20.70  |            |
| 600           | 1.22 | 1.30 | 15.20 | 131.00    | 0.30  | -20.50  |            |
| 800           | 1.26 | 1.18 | 15.18 | 111.00    | 0.28  | -20.40  |            |
| 1000          | 1.34 | 1.07 | 15.15 | 91.00     | 0.27  | -20.40  |            |
| 1200          | 1.42 | 1.03 | 15.09 | 71.00     | 0.28  | -20.40  |            |
| 1400          | 1.48 | 1.12 | 15.02 | 51.00     | 0.27  | -20.40  |            |
| 1600          | 1.53 | 1.21 | 14.93 | 32.00     | 0.27  | -20.40  |            |
| 1800          | 1.54 | 1.29 | 14.84 | 13.00     | 0.27  | -20.60  |            |
| 2000          | 1.53 | 1.34 | 14.81 | -7.00     | 0.28  | -20.50  |            |
| 2200          | 1.50 | 1.37 | 14.83 | -27.00    | 0.29  | -20.40  |            |
| 2400          | 1.45 | 1.34 | 14.83 | -47.00    | 0.29  | -20.50  |            |
| 2600          | 1.40 | 1.28 | 14.84 | -68.00    | 0.30  | -20.50  |            |
| 2800          | 1.35 | 1.19 | 14.90 | -91.00    | 0.32  | -20.30  |            |
| 3000          | 1.30 | 1.20 | 14.82 | -115.00   | 0.33  | -20.20  |            |
| 3200          | 1.31 | 1.39 | 14.75 | -140.00   | 0.37  | -20.40  |            |

Model: AS3093

Vcc= +15V

lcc= 54.78

| FREQ. | S11  |         | S21  |         | S12  |         | S22  |         |
|-------|------|---------|------|---------|------|---------|------|---------|
|       | MAG  | ANG     | MAG  | ANG     | MAG  | ANG     | MAG  | ANG     |
| 300   | 0.17 | -70.60  | 5.66 | 166.90  | 0.09 | -1.70   | 0.24 | 120.70  |
| 400   | 0.12 | -66.10  | 5.72 | 153.80  | 0.09 | -10.60  | 0.19 | 117.20  |
| 600   | 0.10 | -48.60  | 5.76 | 131.30  | 0.09 | -24.90  | 0.13 | 109.60  |
| 800   | 0.12 | -41.10  | 5.74 | 110.60  | 0.10 | -37.20  | 0.08 | 98.80   |
| 1000  | 0.14 | -46.00  | 5.72 | 90.50   | 0.10 | -50.10  | 0.03 | 82.90   |
| 1200  | 0.17 | -57.30  | 5.68 | 70.70   | 0.10 | -61.90  | 0.01 | -84.60  |
| 1400  | 0.19 | -70.40  | 5.64 | 51.30   | 0.10 | -73.00  | 0.06 | -106.40 |
| 1600  | 0.21 | -85.50  | 5.58 | 31.90   | 0.10 | -84.90  | 0.10 | -121.50 |
| 1800  | 0.21 | -102.50 | 5.52 | 12.60   | 0.09 | -97.00  | 0.13 | -136.20 |
| 2000  | 0.21 | -120.10 | 5.50 | -7.10   | 0.10 | -108.30 | 0.15 | -148.00 |
| 2200  | 0.20 | -139.60 | 5.52 | -27.10  | 0.10 | -120.90 | 0.15 | -160.10 |
| 2400  | 0.18 | -161.50 | 5.51 | -47.20  | 0.10 | -131.50 | 0.15 | -170.40 |
| 2600  | 0.17 | 173.30  | 5.52 | -68.40  | 0.09 | -144.20 | 0.12 | -178.00 |
| 2800  | 0.15 | 140.70  | 5.56 | -90.90  | 0.10 | -156.40 | 0.09 | -174.70 |
| 3000  | 0.13 | 107.10  | 5.51 | -114.60 | 0.10 | -170.40 | 0.09 | -129.40 |
| 3200  | 0.13 | 69.80   | 5.46 | -140.20 | 0.10 | 174.80  | 0.16 | -112.60 |

Model: AS3094

Vcc= +15V

lcc= 108.44

| FREQ | SWR  | SWR  | GAIN  | PHASE   | DELAY | REV/ISO |
|------|------|------|-------|---------|-------|---------|
| MHZ  | IN   | OUT  | DB    | DEG     | NSEC  | DB      |
| 300  | 1.33 | 1.70 | 14.92 | 167.00  | 0.45  | -20.30  |
| 400  | 1.18 | 1.54 | 15.02 | 154.00  | 0.36  | -20.20  |
| 600  | 1.09 | 1.35 | 15.11 | 132.00  | 0.30  | -20.10  |
| 800  | 1.15 | 1.21 | 15.10 | 112.00  | 0.28  | -20.00  |
| 1000 | 1.24 | 1.10 | 15.07 | 92.00   | 0.27  | -20.10  |
| 1200 | 1.34 | 1.08 | 15.00 | 72.00   | 0.27  | -20.10  |
| 1400 | 1.40 | 1.16 | 14.92 | 53.00   | 0.26  | -20.20  |
| 1600 | 1.42 | 1.26 | 14.81 | 34.00   | 0.27  | -20.30  |
| 1800 | 1.41 | 1.36 | 14.71 | 15.00   | 0.27  | -20.50  |
| 2000 | 1.40 | 1.45 | 14.64 | -5.00   | 0.28  | -20.70  |
| 2200 | 1.37 | 1.53 | 14.64 | -24.00  | 0.28  | -20.70  |
| 2400 | 1.32 | 1.57 | 14.57 | -43.00  | 0.27  | -21.00  |
| 2600 | 1.24 | 1.59 | 14.58 | -63.00  | 0.27  | -21.20  |
| 2800 | 1.15 | 1.55 | 14.69 | -83.00  | 0.28  | -21.40  |
| 3000 | 1.09 | 1.44 | 14.71 | -105.00 | 0.30  | -21.30  |
| 3200 | 1.10 | 1.28 | 14.89 | -129.00 | 0.35  | -21.70  |

Model: AS3094

Vcc= +15V

lcc= 108.44

| FREQ. | S11  |         | S21  |         | S12  |         | S22  |         |
|-------|------|---------|------|---------|------|---------|------|---------|
|       | MAG  | ANG     | MAG  | ANG     | MAG  | ANG     | MAG  | ANG     |
| 300   | 0.14 | -85.30  | 5.57 | 167.40  | 0.10 | -2.50   | 0.26 | 121.10  |
| 400   | 0.08 | -85.30  | 5.64 | 154.40  | 0.10 | -11.70  | 0.21 | 116.20  |
| 600   | 0.04 | -42.50  | 5.69 | 132.20  | 0.10 | -27.00  | 0.15 | 106.20  |
| 800   | 0.07 | -20.10  | 5.69 | 111.70  | 0.10 | -40.70  | 0.10 | 89.50   |
| 1000  | 0.11 | -28.40  | 5.67 | 91.70   | 0.10 | -53.70  | 0.05 | 56.30   |
| 1200  | 0.14 | -40.20  | 5.62 | 72.10   | 0.10 | -66.80  | 0.04 | -30.30  |
| 1400  | 0.17 | -52.70  | 5.57 | 53.00   | 0.10 | -79.40  | 0.07 | -80.40  |
| 1600  | 0.17 | -66.80  | 5.50 | 33.70   | 0.10 | -91.80  | 0.11 | -103.00 |
| 1800  | 0.17 | -83.00  | 5.44 | 14.70   | 0.10 | -104.40 | 0.15 | -122.50 |
| 2000  | 0.17 | -100.00 | 5.40 | -4.60   | 0.09 | -117.00 | 0.18 | -138.20 |
| 2200  | 0.15 | -115.90 | 5.39 | -24.00  | 0.09 | -129.60 | 0.21 | -153.00 |
| 2400  | 0.14 | -130.70 | 5.35 | -43.00  | 0.09 | -140.70 | 0.22 | -168.00 |
| 2600  | 0.11 | -147.90 | 5.36 | -62.70  | 0.09 | -153.50 | 0.23 | -177.90 |
| 2800  | 0.07 | -175.70 | 5.43 | -83.20  | 0.09 | -165.20 | 0.22 | 162.50  |
| 3000  | 0.04 | 139.60  | 5.44 | -105.10 | 0.09 | -177.20 | 0.18 | 147.00  |
| 3200  | 0.05 | 79.40   | 5.55 | -128.70 | 0.08 | 169.70  | 0.12 | 129.40  |