

## Cascadable Amplifier 5 to 500 MHz

Rev. V3

### Features

- HIGH DYNAMIC RANGE: +118 DBM (1 MHz Band)
- HIGH OUTPUT POWER: +22 dBm (TYP.)
- HIGH THIRD ORDER I.P.: +36 dBm (TYP.)
- LOW NOISE FIGURE: 4.3 dB (TYP.)
- WIDE POWER SUPPLY RANGE: +5 to +15 VOLTS

### Description

The A59 RF amplifier is a discrete hybrid design, which uses thin film manufacturing processes for accurate performance and high reliability.

This single stage bipolar transistor feedback amplifier design displays impressive performance over a broadband frequency range. An active DC biasing network insures temperature-stable performance.

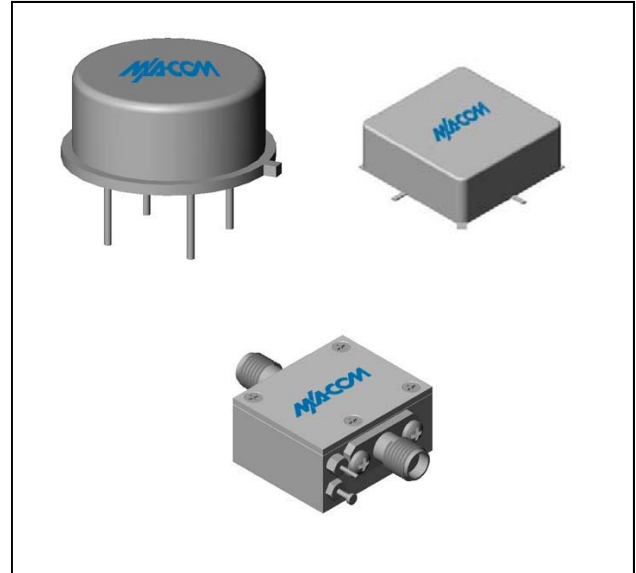
Both TO-8 and Surface Mount packages are hermetically sealed, and MIL-STD-883 environmental screening is available.

### Ordering Information

| Part Number | Package           |
|-------------|-------------------|
| A59         | TO-8              |
| SMA59       | Surface Mount     |
| CA59 **     | SMA Connectorized |

\*\* The connectorized version is not RoHs compliant.

### Product Image



### Electrical Specifications: $Z_0 = 50\Omega$ , $V_{CC} = +15 V_{DC}$

| Parameter                          | Units | Typical       | Guaranteed    |                |
|------------------------------------|-------|---------------|---------------|----------------|
|                                    |       | 25°C          | 0° to 50°C    | -54° to +85°C* |
| Frequency                          | MHz   | 2-700         | 5-500         | 5-500          |
| Small Signal Gain (min)            | dB    | 11.5          | 10.5          | 10.0           |
| Gain Flatness (max)                | dB    | ±0.3          | ±0.7          | ±1.0           |
| Reverse Isolation                  | dB    | 16            |               |                |
| Noise Figure (max)                 | dB    | 4.3           | 5.5           | 6.0            |
| Power Output<br>@ 1 dB comp. (min) | dBm   | 22.0          | 20.5          | 20.0           |
| IP3                                | dBm   | +36           |               |                |
| IP2                                | dBm   | +56           |               |                |
| Second Order Harmonic IP           | dBm   | +62           |               |                |
| VSWR Input / Output (max)          |       | 1.5:1 / 1.5:1 | 1.9:1 / 1.9:1 | 2.0:1 / 2.0:1  |
| DC Current @ 15 Volts (max)        | mA    | 88            | 93            | 98             |

### Absolute Maximum Ratings

| Parameter                                 | Absolute Maximum |
|-------------------------------------------|------------------|
| Storage Temperature                       | -62°C to +125°C  |
| Case Temperature                          | +125°C           |
| DC Voltage                                | +17 V            |
| Continuous Input Power                    | +18 dBm          |
| Short Term Input power<br>(1 minute max.) | 100 mW           |
| Peak Power (3 µsec max.)                  | 0.5 W            |
| "S" Series Burn-In<br>Temperature (case)  | +100°C           |

### Thermal Data: $V_{CC} = +15 V_{DC}$

| Parameter                                        | Rating  |
|--------------------------------------------------|---------|
| Thermal Resistance $\theta_{jc}$                 | 75°C/W  |
| Transistor Power Dissipation $P_d$               | 0.869 W |
| Junction Temperature Rise<br>Above Case $T_{jc}$ | +64°C   |

\* Over temperature performance limits for part number CA59, guaranteed from 0°C to +50°C only.

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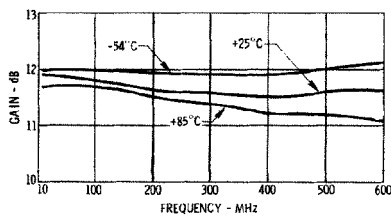
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## Outline Drawing: TO-8 \*

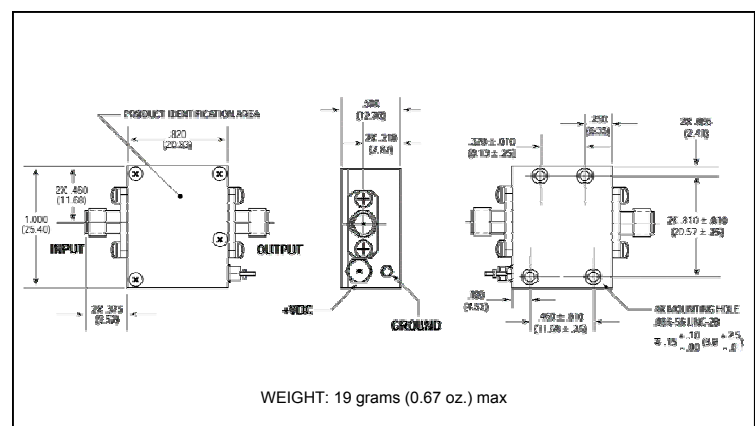
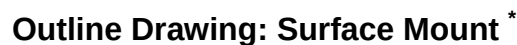


| Frequency (MHz) | 3RD ORDER TWO-TONE (dBm) | 2ND ORDER TWO-TONE (dBm) | 2ND HARMONIC (dBm) |
|-----------------|--------------------------|--------------------------|--------------------|
| 0               | 65                       | 58                       | 40                 |
| 100             | 64                       | 57                       | 39                 |
| 200             | 58                       | 52                       | 38                 |
| 300             | 60                       | 55                       | 39                 |
| 400             | 65                       | 60                       | 40                 |
| 500             | 68                       | 62                       | 42                 |

A line graph titled "NOISE FIGURE - dB" versus "FREQUENCY - MHZ". The y-axis ranges from 4 to 7 dB, and the x-axis ranges from 50 to 900 MHz. The noise figure starts at approximately 5.6 dB at 50 MHz, remains relatively flat until about 400 MHz, and then increases steadily to approximately 6.2 dB at 800 MHz.

| FREQUENCY - MHZ | NOISE FIGURE - dB |
|-----------------|-------------------|
| 50              | 5.6               |
| 100             | 5.5               |
| 200             | 5.5               |
| 300             | 5.6               |
| 400             | 5.6               |
| 500             | 5.7               |
| 600             | 5.9               |
| 700             | 6.1               |
| 800             | 6.2               |

| Frequency (MHz) | Power Output (dBm) |
|-----------------|--------------------|
| 1               | 21.5               |
| 50              | 21.5               |
| 100             | 21.5               |
| 200             | 21.5               |
| 300             | 21.5               |
| 400             | 21.0               |
| 500             | 21.5               |
| 600             | 21.5               |
| 700             | 21.5               |
| 800             | 21.5               |



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