

# The RF Line Gallium Arsenide CATV Amplifier Module

**MHW9186A**

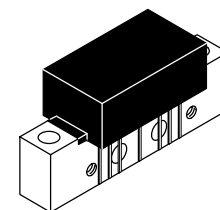
## Features

- Specified for 79-, 112- and 132-Channel Loading
- Excellent Distortion Performance
- Built-in Input Diode Protection
- GaAs FET Transistor Technology
- Unconditionally Stable Under All Load Conditions
- Improved Ruggedness

**870 MHz  
18.5 dB GAIN  
132-CHANNEL  
GaAs CATV AMPLIFIER**

## Applications

- CATV Systems Operating in the 40 to 870 MHz Frequency Range
- Input Stage Amplifier in Optical Nodes, Line Extenders and Trunk Distribution Amplifiers for CATV Systems
- Output Stage Amplifier on Applications Requiring Low Power Dissipation and High Output Performance
- Driver Amplifier in Linear General Purpose Applications



CASE 1302-01, STYLE 1

## Description

- 24 Vdc Supply, 40 to 870 MHz, CATV GaAs Forward Amplifier

## MAXIMUM RATINGS

| Rating                           | Symbol    | Value       | Unit |
|----------------------------------|-----------|-------------|------|
| RF Voltage Input (Single Tone)   | $V_{in}$  | +65         | dBmV |
| DC Supply Voltage                | $V_{CC}$  | +26         | Vdc  |
| Operating Case Temperature Range | $T_C$     | -20 to +100 | °C   |
| Storage Temperature Range        | $T_{stg}$ | -40 to +100 | °C   |

## ESD MAXIMUM RATINGS

| Rating                              | Input Value | Output Value | Unit |
|-------------------------------------|-------------|--------------|------|
| Surge Voltage per IEC 1000-4-5      | 300         | 300          | V    |
| Human Body Model per Mil. Std. 1686 | 2           | 2            | kV   |

## ELECTRICAL CHARACTERISTICS ( $V_{CC} = 24$ Vdc, $T_C = +30^\circ\text{C}$ , 75 $\Omega$ system unless otherwise noted)

| Characteristic                             | Symbol | Min            | Typ         | Max         | Unit |
|--|--------|----------------|-------------|-------------|------|
| Frequency Range                            | BW     | 40             | —           | 870         | MHz  |
| Power Gain 870 MHz                         | $G_p$  | 18             | 18.5        | 19.5        | dB   |
| Slope 40-870 MHz                           | S      | 0.1            | 0.6         | 1.2         | dB   |
| Gain Flatness (40-870 MHz, Peak-to-Valley) | $G_F$  | —              | 0.3         | 0.8         | dB   |
| Return Loss — Input<br>( $Z_0 = 75$ Ohms)  | IRL    | 20<br>19<br>18 | —<br>—<br>— | —<br>—<br>— | dB   |
| Return Loss — Output<br>( $Z_0 = 75$ Ohms) | ORL    | 20<br>19<br>18 | —<br>—<br>— | —<br>—<br>— | dB   |

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**ELECTRICAL CHARACTERISTICS - continued** ( $V_{CC} = 24 \text{ Vdc}$ ,  $T_C = +30^\circ\text{C}$ , 75  $\Omega$  system unless otherwise noted)

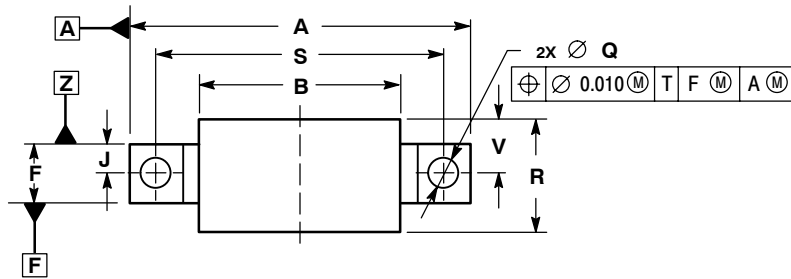
| Characteristic   |                  | Symbol      | Min | Typ | Max | Unit |
|--|------------------|-------------|-----|-----|-----|------|
| Composite Second Order   |                  |             |     |     |     | dBc  |
| ( $V_{out} = +44 \text{ dBmV/ch.}$ , Worst Case)                                   | 132-Channel FLAT | $CSO_{132}$ | —   | -67 | -60 |      |
| ( $V_{out} = +46 \text{ dBmV/ch.}$ , Worst Case)                                   | 112-Channel FLAT | $CSO_{112}$ | —   | -65 | -61 |      |
| ( $V_{out} = +48 \text{ dBmV/ch.}$ , Worst Case)                                   | 79-Channel FLAT  | $CSO_{79}$  | —   | -72 | -64 |      |
| Cross Modulation Distortion @ Ch 2   |                  |             |     |     |     | dBc  |
| ( $V_{out} = +44 \text{ dBmV/ch.}$ , FM = 55 MHz)                                  | 132-Channel FLAT | $XMD_{132}$ | —   | -58 | -52 |      |
| ( $V_{out} = +46 \text{ dBmV/ch.}$ , FM = 55 MHz)                                  | 112-Channel FLAT | $XMD_{112}$ | —   | -58 | -52 |      |
| ( $V_{out} = +48 \text{ dBmV/ch.}$ , FM = 55 MHz)                                  | 79-Channel FLAT  | $XMD_{79}$  | —   | -58 | -52 |      |
| Composite Triple Beat  |                  |             |     |     |     | dBc  |
| ( $V_{out} = +44 \text{ dBmV/ch.}$ , Worst Case)                                   | 132-Channel FLAT | $CTB_{132}$ | —   | -62 | -58 |      |
| ( $V_{out} = +46 \text{ dBmV/ch.}$ , Worst Case)                                   | 112-Channel FLAT | $CTB_{112}$ | —   | -61 | -58 |      |
| ( $V_{out} = +48 \text{ dBmV/ch.}$ , Worst Case)                                   | 79-Channel FLAT  | $CTB_{79}$  | —   | -64 | -60 |      |
| Noise Figure   | 50 MHz           | NF          | —   | 4.6 | 6.0 | dB   |
|  | 870 MHz          |             | —   | 3.7 | 6.0 |      |
| DC Current ( $V_{DC} = 24 \text{ V}$ , $T_C = -20^\circ$ to $+100^\circ\text{C}$ ) |                  | $I_{DC}$    | 230 | 250 | 265 | mA   |

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**NOTES**

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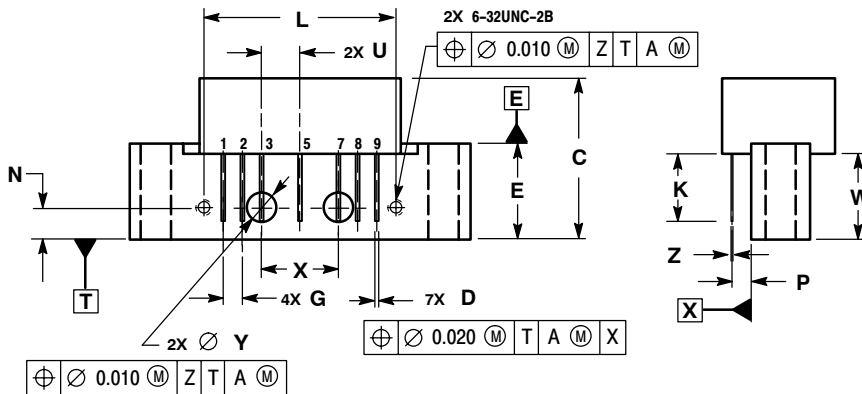
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## PACKAGE DIMENSIONS



- NOTES:  
 1. DIMENSIONS ARE IN INCHES.  
 2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 1994.

| DIM | INCHES    |       | MILLIMETERS |        |
|-----|-----------|-------|-------------|--------|
|     | MIN       | MAX   | MIN         | MAX    |
| A   | ---       | 1.775 | ---         | 45.085 |
| B   | ---       | 1.085 | ---         | 27.559 |
| C   | ---       | 0.840 | ---         | 21.336 |
| D   | 0.015     | 0.021 | 0.381       | 0.533  |
| E   | 0.465     | 0.510 | 11.811      | 12.954 |
| F   | 0.300     | 0.325 | 7.62        | 8.255  |
| G   | 0.100 BSC |       | 2.540 BSC   |        |
| J   | 0.156 BSC |       | 3.962 BSC   |        |
| K   | 0.315     | 0.355 | 8.001       | 9.017  |
| L   | 1.000 BSC |       | 25.400 BSC  |        |
| N   | 0.165 BSC |       | 4.191 BSC   |        |
| P   | 0.100 BSC |       | 2.540 BSC   |        |
| Q   | 0.148     | 0.168 | 3.759       | 4.267  |
| R   | ---       | 0.600 | ---         | 15.24  |
| S   | 1.500 BSC |       | 38.100 BSC  |        |
| U   | 0.200 BSC |       | 5.080 BSC   |        |
| V   | ---       | 0.250 | ---         | 6.350  |
| W   | 0.435     | ---   | 11.049      | ---    |
| X   | 0.400 BSC |       | 10.160 BSC  |        |
| Y   | 0.152     | 0.163 | 3.861       | 4.140  |
| Z   | 0.009     | 0.011 | 0.229       | 0.279  |



- STYLE 1:  
 PIN 1: RF INPUT  
 2: GROUND  
 3: GROUND  
 4: DELETED  
 5: VDC  
 6: DELETED  
 7: GROUND  
 8: GROUND  
 9: RF OUTPUT

### CASE 1302-01 ISSUE B

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