

# The RF Line Gallium Arsenide CATV Amplifier Module

**MHW9207A**

## Features

- Specified for 79-, 112- and 132-Channel Loading
- Excellent Distortion Performance
- Higher Output Capability
- Built-in Input Diode Protection
- GaAs FET Transistor Technology
- Unconditionally Stable Under All Load Conditions
- Output Port Ring Wave Protection

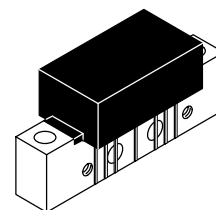
**870 MHz  
21.3 dB GAIN  
132-CHANNEL  
GaAs CATV AMPLIFIER MODULE**

## Applications

- CATV Systems Operating in the 47 to 870 MHz Frequency Range
- Output Stage Amplifier in Optical Nodes, Line Extenders and Trunk Distribution Amplifiers for CATV Systems
- Driver Amplifier in Linear General Purpose Applications

## Description

- 24 Vdc Supply, 47 to 870 MHz, CATV GaAs Forward Power Doubler Amplifier Module



CASE 1302-01, STYLE 1

## MAXIMUM RATINGS

| Rating                           | Symbol    | Value       | Unit |
|----------------------------------|-----------|-------------|------|
| RF Voltage Input (Single Tone)   | $V_{in}$  | +75         | 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, $T_C = +45^\circ\text{C}$ , 75 $\Omega$ system unless otherwise noted)

| Characteristic                             | Symbol | Min            | Typ         | Max         | Unit |
|--------------------------------------------|--------|----------------|-------------|-------------|------|
| Frequency Range                            | BW     | 47             | —           | 870         | MHz  |
| Power Gain 870 MHz                         | $G_p$  | 20.6           | 21.3        | 22          | dB   |
| Slope 47-870 MHz                           | S      | 0              | 0.5         | 1.0         | dB   |
| Gain Flatness (47-870 MHz, Peak-to-Valley) | $G_F$  | —              | —           | 0.5         | dB   |
| Return Loss — Input<br>( $Z_o = 75$ Ohms)  | IRL    | 20<br>18<br>16 | —<br>—<br>— | —<br>—<br>— | dB   |
| Return Loss — Output<br>( $Z_o = 75$ Ohms) | ORL    | 20<br>18       | —<br>—      | —<br>—      | dB   |

REV 0

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**For More Information On This Product,  
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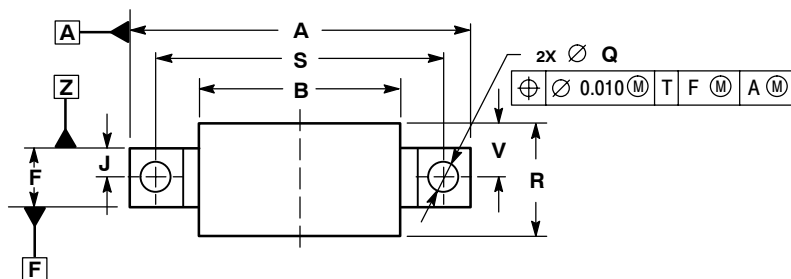
## ELECTRICAL CHARACTERISTICS - continued (V<sub>CC</sub> = 24 Vdc, T<sub>C</sub> = +45°C, 75 Ω system unless otherwise noted)

| Characteristic                                             |                           | Symbol             | Min | Typ | Max | Unit |
|------------------------------------------------------------|---------------------------|--------------------|-----|-----|-----|------|
| Composite Second Order                                     |                           |                    |     |     |     | dBc  |
| (V <sub>out</sub> = +48 dBmV/ch., Worst Case)              | 132-Channel FLAT          | CSO <sub>132</sub> | —   | -64 | -62 |      |
| (V <sub>out</sub> = +48 dBmV/ch., Worst Case)              | 112-Channel FLAT          | CSO <sub>112</sub> | —   | -66 | -64 |      |
| (V <sub>out</sub> = +48 dBmV/ch., Worst Case)              | 79-Channel FLAT           | CSO <sub>79</sub>  | —   | -70 | -68 |      |
| (V <sub>out</sub> = +56 dBmV @ 870 MHz Equiv)              | 112-Channel, 12 dB Tilt   | CSO <sub>112</sub> | —   | -65 | -63 |      |
| (V <sub>out</sub> = +56 dBmV @ 870 MHz Equiv)              | 112-Channel, 13.5 dB Tilt | CSO <sub>112</sub> | —   | -64 | -62 |      |
| (V <sub>out</sub> = +56 dBmV @ 870 MHz Equiv)              | 112-Channel, 17 dB Tilt   | CSO <sub>112</sub> | —   | -63 | -61 |      |
| (V <sub>out</sub> = +58 dBmV @ 870 MHz Equiv)              | 79-Channel, 12 dB Tilt    | CSO <sub>79</sub>  | —   | -69 | -67 |      |
| (V <sub>out</sub> = +58 dBmV @ 870 MHz Equiv)              | 79-Channel, 13.5 dB Tilt  | CSO <sub>79</sub>  | —   | -74 | -72 |      |
| (V <sub>out</sub> = +58 dBmV @ 870 MHz Equiv)              | 79-Channel, 17 dB Tilt    | CSO <sub>79</sub>  | —   | -73 | -71 |      |
| Cross Modulation Distortion @ Ch 2                         |                           |                    |     |     |     | dBc  |
| (V <sub>out</sub> = +48 dBmV/ch., FM = 55 MHz)             | 132-Channel FLAT          | XMD <sub>132</sub> | —   | -57 | -55 |      |
| (V <sub>out</sub> = +48 dBmV/ch., FM = 55 MHz)             | 112-Channel FLAT          | XMD <sub>112</sub> | —   | -59 | -57 |      |
| (V <sub>out</sub> = +48 dBmV/ch., FM = 55 MHz)             | 79-Channel FLAT           | XMD <sub>79</sub>  | —   | -62 | -60 |      |
| (V <sub>out</sub> = +56 dBmV @ 870 MHz Equiv)              | 112-Channel, 12 dB Tilt   | XMD <sub>112</sub> | —   | -53 | -51 |      |
| (V <sub>out</sub> = +56 dBmV @ 870 MHz Equiv)              | 112-Channel, 13.5 dB Tilt | XMD <sub>112</sub> | —   | -55 | -53 |      |
| (V <sub>out</sub> = +56 dBmV @ 870 MHz Equiv)              | 112-Channel, 17 dB Tilt   | XMD <sub>112</sub> | —   | -58 | -56 |      |
| (V <sub>out</sub> = +58 dBmV @ 870 MHz Equiv)              | 79-Channel, 12 dB Tilt    | XMD <sub>79</sub>  | —   | -60 | -47 |      |
| (V <sub>out</sub> = +58 dBmV @ 870 MHz Equiv)              | 79-Channel, 13.5 dB Tilt  | XMD <sub>79</sub>  | —   | -62 | -60 |      |
| (V <sub>out</sub> = +58 dBmV @ 870 MHz Equiv)              | 79-Channel, 17 dB Tilt    | XMD <sub>79</sub>  | —   | -67 | -65 |      |
| Composite Triple Beat                                      |                           |                    |     |     |     | dBc  |
| (V <sub>out</sub> = +48 dBmV/ch., Worst Case)              | 132-Channel FLAT          | CTB <sub>132</sub> | —   | -58 | -56 |      |
| (V <sub>out</sub> = +48 dBmV/ch., Worst Case)              | 112-Channel FLAT          | CTB <sub>112</sub> | —   | -62 | -60 |      |
| (V <sub>out</sub> = +48 dBmV/ch., Worst Case)              | 79-Channel FLAT           | CTB <sub>79</sub>  | —   | -68 | -66 |      |
| (V <sub>out</sub> = +56 dBmV @ 870 MHz Equiv)              | 112-Channel, 12 dB Tilt   | CTB <sub>112</sub> | —   | -57 | -55 |      |
| (V <sub>out</sub> = +56 dBmV @ 870 MHz Equiv)              | 112-Channel, 13.5 dB Tilt | CTB <sub>112</sub> | —   | -58 | -56 |      |
| (V <sub>out</sub> = +56 dBmV @ 870 MHz Equiv)              | 112-Channel, 17 dB Tilt   | CTB <sub>112</sub> | —   | -60 | -58 |      |
| (V <sub>out</sub> = +58 dBmV @ 870 MHz Equiv)              | 79-Channel, 12 dB Tilt    | CTB <sub>79</sub>  | —   | -63 | -61 |      |
| (V <sub>out</sub> = +58 dBmV @ 870 MHz Equiv)              | 79-Channel, 13.5 dB Tilt  | CTB <sub>79</sub>  | —   | -65 | -63 |      |
| (V <sub>out</sub> = +58 dBmV @ 870 MHz Equiv)              | 79-Channel, 17 dB Tilt    | CTB <sub>79</sub>  | —   | -69 | -67 |      |
| Noise Figure                                               |                           | NF                 |     |     |     | dB   |
|                                                            | 50 MHz                    |                    | —   | 4.0 | 5.0 |      |
|                                                            | 550 MHz                   |                    | —   | 4.0 | 5.0 |      |
|                                                            | 750 MHz                   |                    | —   | 4.0 | 5.0 |      |
|                                                            | 870 MHz                   |                    | —   | 4.0 | 5.0 |      |
| DC Current (V <sub>DC</sub> = 24 V, T <sub>C</sub> = 45°C) |                           | I <sub>DC</sub>    | 410 | 425 | 440 | mA   |

# NOTES

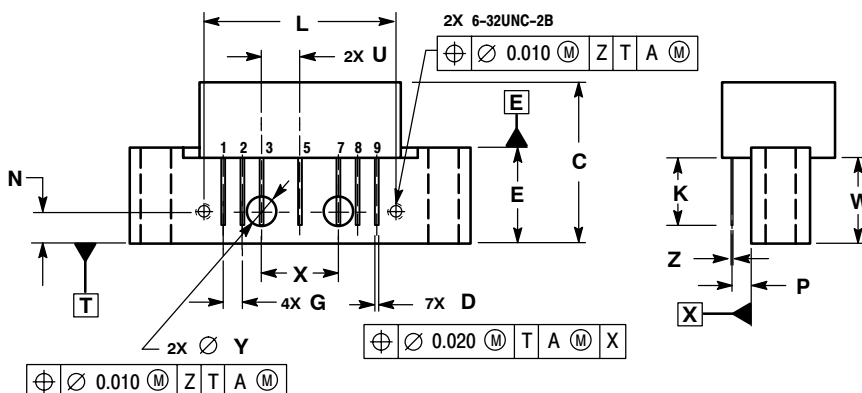
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## PACKAGE DIMENSIONS



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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**MHW9207A/D**