

# Gallium Arsenide CATV Amplifier Module

## 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

## Applications

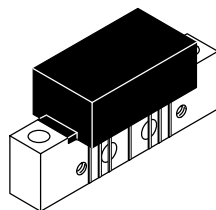
- CATV Systems Operating in the 47 to 870 MHz Frequency Range
- Output Stage Amplifier in Optical Nodes, Line Extenders and Trunk Distribution Amplifiers for CATV Systems
- Driver Amplifier in Linear General Purpose Applications

## Description

- 24 Vdc Supply, 47 to 870 MHz, CATV GaAs Forward Power Doubler Amplifier Module
- Replaced MHW9267A. There are no form, fit or function changes with this part replacement.
- RoHS Compliant

**MHW9267AN**

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



**CASE 1302-01, STYLE 1**

**Table 1. Maximum Ratings**

| Rating                           | Symbol    | Value       | Unit |
|----------------------------------|-----------|-------------|------|
| RF Voltage Input (Single Tone)   | $V_{in}$  | +70         | 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   |

**Table 2. ESD Maximum Ratings**

| Rating                              | Input Value | Output Value | Unit |
|-------------------------------------|-------------|--------------|------|
| Surge Voltage per IEC 1000-4-5      | 200         | 200          | V    |
| Human Body Model per Mil. Std. 1686 | 2           | 2            | kV   |

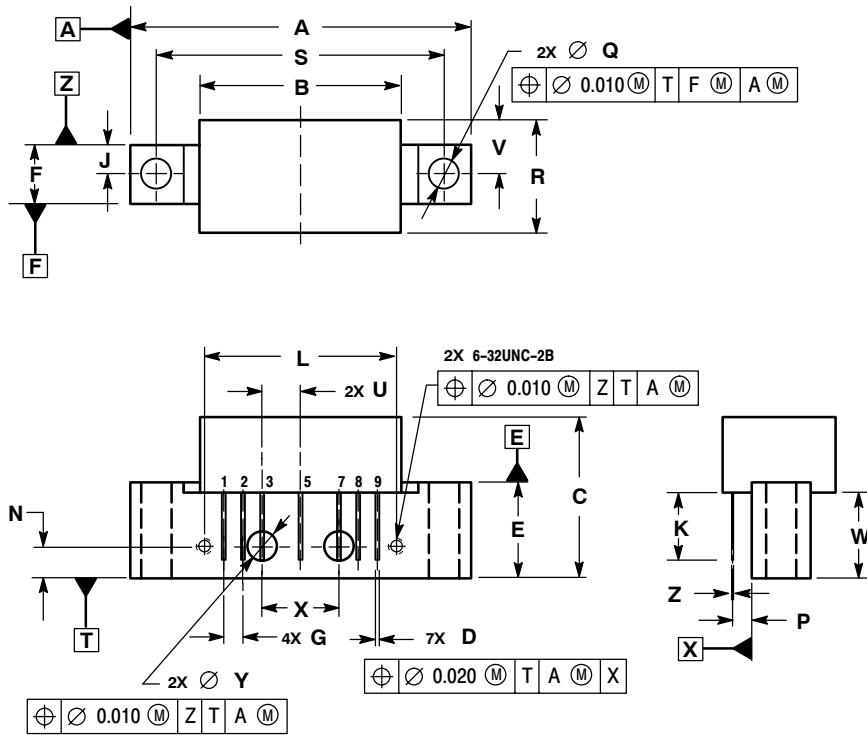
**Table 3. Electrical Characteristics** ( $V_{CC} = 24$  Vdc,  $T_C = +45^\circ\text{C}$ , 75  $\Omega$  system unless otherwise noted)

| Characteristic                             | Symbol | Min            | Typ         | Max         | Unit |
|--------------------------------------------|--------|----------------|-------------|-------------|------|
| Frequency Range                            | BW     | 40             | —           | 870         | MHz  |
| Power Gain 870 MHz                         | $G_p$  | 27             | 27.6        | 28.2        | dB   |
| Slope 47-870 MHz                           | S      | 0              | 0.7         | 1.4         | dB   |
| Gain Flatness (40-870 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   |
|                                            |        | 47-500 MHz     |             |             |      |
|                                            |        | 501-750 MHz    |             |             |      |
|                                            |        | 751-870 MHz    |             |             |      |

**Table 3. Electrical Characteristics** ( $V_{CC} = 24 \text{ Vdc}$ ,  $T_C = +45^\circ\text{C}$ ,  $75 \Omega$  system unless otherwise noted) (continued)

| Characteristic                                                    |                          | Symbol      | Min | Typ | Max | Unit |
|-------------------------------------------------------------------|--------------------------|-------------|-----|-----|-----|------|
| Return Loss — Output<br>( $Z_o = 75 \text{ Ohms}$ )               | 47-160 MHz               | ORL         | 20  | —   | —   | dB   |
|                                                                   | $f > 160 \text{ MHz}$    |             | 18  | —   | —   |      |
| Composite Second Order                                            |                          |             |     |     |     | dBc  |
| ( $V_{out} = +48 \text{ dBmV/ch.}$ , Worst Case)                  | 132-Channel FLAT         | $CSO_{132}$ | —   | -62 | -60 |      |
| ( $V_{out} = +48 \text{ dBmV/ch.}$ , Worst Case)                  | 112-Channel FLAT         | $CSO_{112}$ | —   | -64 | -62 |      |
| ( $V_{out} = +48 \text{ dBmV/ch.}$ , Worst Case)                  | 79-Channel FLAT          | $CSO_{79}$  | —   | -68 | -66 |      |
| ( $V_{out} = +56 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 112-Channel, 12db Tilt   | $CSO_{112}$ | —   | -64 | -62 |      |
| ( $V_{out} = +56 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 112-Channel, 13.5db Tilt | $CSO_{112}$ | —   | -65 | -63 |      |
| ( $V_{out} = +56 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 112-Channel, 17db Tilt   | $CSO_{112}$ | —   | -66 | -64 |      |
| ( $V_{out} = +58 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 79-Channel, 12db Tilt    | $CSO_{79}$  | —   | -69 | -67 |      |
| ( $V_{out} = +58 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 79-Channel, 13.5db Tilt  | $CSO_{79}$  | —   | -71 | -69 |      |
| ( $V_{out} = +58 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 79-Channel, 17db Tilt    | $CSO_{79}$  | —   | -72 | -70 |      |
| Cross Modulation Distortion @ Ch 2                                |                          |             |     |     |     | dBc  |
| ( $V_{out} = +48 \text{ dBmV/ch.}$ , FM = 55 MHz)                 | 132-Channel FLAT         | $XMD_{132}$ | —   | -56 | -54 |      |
| ( $V_{out} = +48 \text{ dBmV/ch.}$ , FM = 55 MHz)                 | 112-Channel FLAT         | $XMD_{112}$ | —   | -58 | -56 |      |
| ( $V_{out} = +48 \text{ dBmV/ch.}$ , FM = 55 MHz)                 | 79-Channel FLAT          | $XMD_{79}$  | —   | -60 | -58 |      |
| ( $V_{out} = +56 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 112-Channel, 12db Tilt   | $XMD_{112}$ | —   | -52 | -50 |      |
| ( $V_{out} = +56 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 112-Channel, 13.5db Tilt | $XMD_{112}$ | —   | -53 | -51 |      |
| ( $V_{out} = +56 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 112-Channel, 17db Tilt   | $XMD_{112}$ | —   | -55 | -53 |      |
| ( $V_{out} = +58 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 79-Channel, 12db Tilt    | $XMD_{79}$  | —   | -55 | -52 |      |
| ( $V_{out} = +58 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 79-Channel, 13.5db Tilt  | $XMD_{79}$  | —   | -58 | -56 |      |
| ( $V_{out} = +58 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 79-Channel, 17db Tilt    | $XMD_{79}$  | —   | -61 | -59 |      |
| Composite Triple Beat                                             |                          |             |     |     |     | dBc  |
| ( $V_{out} = +48 \text{ dBmV/ch.}$ , Worst Case)                  | 132-Channel FLAT         | $CTB_{132}$ | —   | -58 | -56 |      |
| ( $V_{out} = +48 \text{ dBmV/ch.}$ , Worst Case)                  | 112-Channel FLAT         | $CTB_{112}$ | —   | -61 | -59 |      |
| ( $V_{out} = +48 \text{ dBmV/ch.}$ , Worst Case)                  | 79-Channel FLAT          | $CTB_{79}$  | —   | -66 | -64 |      |
| ( $V_{out} = +56 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 112-Channel, 12db Tilt   | $CTB_{112}$ | —   | -58 | -56 |      |
| ( $V_{out} = +56 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 112-Channel, 13.5db Tilt | $CTB_{112}$ | —   | -59 | -57 |      |
| ( $V_{out} = +56 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 112-Channel, 17db Tilt   | $CTB_{112}$ | —   | -61 | -59 |      |
| ( $V_{out} = +58 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 79-Channel, 12db Tilt    | $CTB_{79}$  | —   | -62 | -60 |      |
| ( $V_{out} = +58 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 79-Channel, 13.5db Tilt  | $CTB_{79}$  | —   | -64 | -62 |      |
| ( $V_{out} = +58 \text{ dBmV @ } 870 \text{ MHz Equiv}$ )         | 79-Channel, 17db Tilt    | $CTB_{79}$  | —   | -67 | -65 |      |
| Noise Figure                                                      | 50 MHz                   | NF          | —   | 5.5 | 7.0 | dB   |
|                                                                   | 550 MHz                  |             | —   | 5.5 | 7.0 |      |
|                                                                   | 750 MHz                  |             | —   | 5.8 | 7.0 |      |
|                                                                   | 870 MHz                  |             | —   | 6.0 | 7.0 |      |
| DC Current ( $V_{DC} = 24 \text{ V}$ , $T_C = 45^\circ\text{C}$ ) |                          | $I_{DC}$    | 410 | 440 | 460 | mA   |

# 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
  - GROUND
  - GROUND
  - DELETED
  - VDC
  - DELETED
  - GROUND
  - GROUND
  - RF OUTPUT

CASE 1302-01  
ISSUE E

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