



# CATV Amplifier Module

## Features

- Specified for 77-, 110- and 128-Channel Loading
- Excellent Distortion Performance
- Silicon Bipolar Transistor Technology
- Unconditionally Stable Under All Load Conditions

## Applications

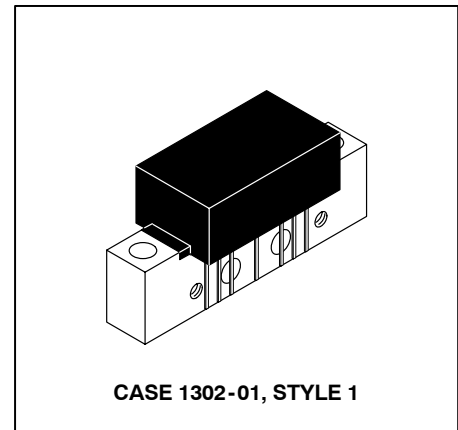
- CATV Systems Operating in the 40 to 860 MHz Frequency Range
- Input Stage Amplifier in Optical Nodes, Line Extenders and Trunk Distribution Amplifiers for CATV Systems
- Driver Amplifier in Linear General Purpose Applications
- Output Stage Amplifier on Applications Requiring Low Power Dissipation

## Description

- 24 Vdc Supply, 40 to 860 MHz, CATV Forward Amplifier Module
- Replaced MHW8222B. There are no form, fit or function changes with this part replacement.
- RoHS Compliant

**MHW8222BN**

**860 MHz  
 22.7 dB GAIN  
 128-CHANNEL  
 CATV AMPLIFIER MODULE**



**Table 1. Maximum Ratings**

| Rating                           | Symbol    | Value       | Unit |
|----------------------------------|-----------|-------------|------|
| DC Supply Voltage                | $V_{CC}$  | +28         | Vdc  |
| RF Input Voltage (Single Tone)   | $V_{in}$  | +70         | dBmV |
| Operating Case Temperature Range | $T_C$     | -20 to +100 | °C   |
| Storage Temperature Range        | $T_{stg}$ | -40 to +100 | °C   |

**Table 2. 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  | —            | 860        | MHz    |
| Power Gain                               | $G_p$       | f = 50 MHz<br>21.4<br>f = 860 MHz<br>21.8 | 21.9<br>22.7 | 22.4<br>24 | dB     |
| Slope (f = 40 - 860 MHz)                 | S           | 0.1                                       | 0.8          | 1.5        | —      |
| Gain Flatness (Peak To Valley)           | $G_F$       | —   | 0.4          | 0.6        | —      |
| Input/Output Return Loss @ f = 40 MHz    | IRL/ORL     | 20  | 24           | —          | dB     |
| Derate Return Loss @ f > 40 MHz          | RLD         | —   | —            | 0.009      | dB/MHz |
| Composite Second Order                   |             |   |              |            | dBc    |
| ( $V_{out} = +38$ dBmV/ch; 128 Channels) | $CSO_{128}$ | —   | -68          | -60        |        |
| ( $V_{out} = +40$ dBmV/ch; 110 Channels) | $CSO_{110}$ | —   | -64          | -61        |        |
| ( $V_{out} = +44$ dBmV/ch; 77 Channels)  | $CSO_{77}$  | —   | -65          | -62        |        |

LIFETIME BUY

LAST SHIP 30 JUN 08  
 LAST ORDER 31 DEC 07

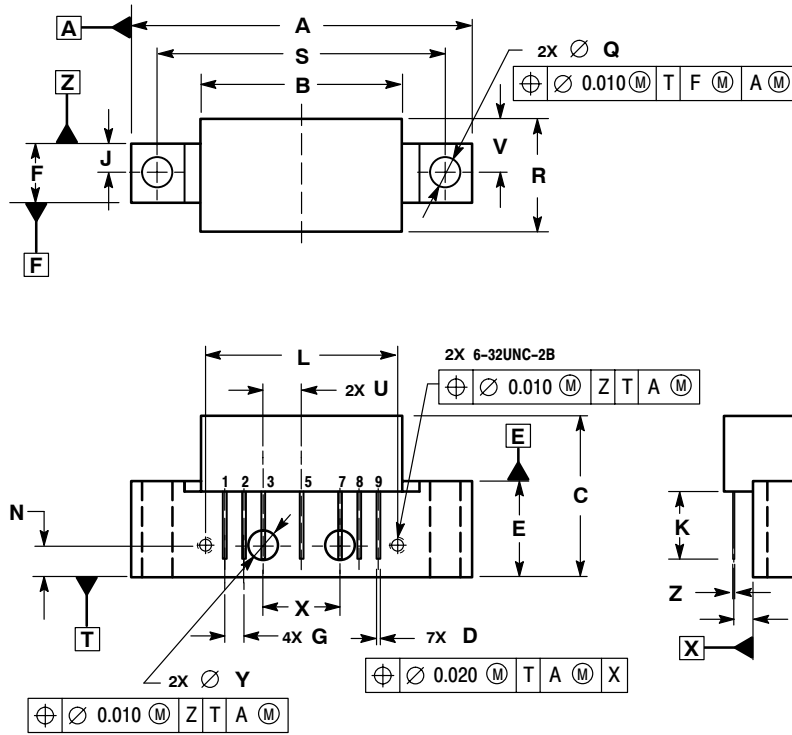
LIFETIME BUY

LAST SHIP 30 JUN 08  
LAST ORDER 31 DEC 07

**Table 2. Electrical Characteristics** ( $V_{CC} = 24$  Vdc,  $T_C = +30^\circ\text{C}$ ,  $75\ \Omega$  system unless otherwise noted) (continued)

| Characteristic  | Symbol  | Min         | Typ                  | Max                  | Unit |
|---|---|-------------|----------------------|----------------------|------|
| Cross Modulation Distortion<br>( $V_{out} = +38$ dBmV/ch, 128-Channel @ $F_m = 55.25$ MHz)<br>( $V_{out} = +40$ dBmV/ch, 110-Channel @ $F_m = 55.25$ MHz)<br>( $V_{out} = +44$ dBmV/ch, 77-Channel @ $F_m = 55.25$ MHz) | XMD <sub>128</sub><br>XMD <sub>110</sub><br>XMD <sub>77</sub> | —<br>—<br>— | - 65<br>- 63<br>- 59 | - 63<br>- 60<br>- 56 | dBc  |
| Composite Triple Beat<br>( $V_{out} = +38$ dBmV/ch, 128-Channels, Worst Case)<br>( $V_{out} = +40$ dBmV/ch, 110-Channels, Worst Case)<br>( $V_{out} = +44$ dBmV/ch, 77-Channels, Worst Case)                            | CTB <sub>128</sub><br>CTB <sub>110</sub><br>CTB <sub>77</sub> | —<br>—<br>— | - 66<br>- 64<br>- 65 | - 64<br>- 61<br>- 62 | dBc  |
| Noise Figure<br>f = 50 MHz<br>f = 750 MHz<br>f = 860 MHz  | NF  | —<br>—<br>— | 3.7<br>5<br>5.6      | 4.5<br>6.5<br>7      | dB   |
| DC Current  | $I_{DC}$  | 180         | 220                  | 240                  | 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  
 2. GROUND  
 3. GROUND  
 4. DELETED  
 5. VDC  
 6. DELETED  
 7. GROUND  
 8. GROUND  
 9. RF OUTPUT

### CASE 1302-01 ISSUE E

## **How to Reach Us:**

### **Home Page:**

[www.freescale.com](http://www.freescale.com)

### **E-mail:**

[support@freescale.com](mailto:support@freescale.com)

### **USA/Europe or Locations Not Listed:**

Freescale Semiconductor  
Technical Information Center, CH370  
1300 N. Alma School Road  
Chandler, Arizona 85224  
+1-800-521-6274 or +1-480-768-2130  
[support@freescale.com](mailto:support@freescale.com)

### **Europe, Middle East, and Africa:**

Freescale Halbleiter Deutschland GmbH  
Technical Information Center  
Schatzbogen 7  
81829 Muenchen, Germany  
+44 1296 380 456 (English)  
+46 8 52200080 (English)  
+49 89 92103 559 (German)  
+33 1 69 35 48 48 (French)  
[support@freescale.com](mailto:support@freescale.com)

### **Japan:**

Freescale Semiconductor Japan Ltd.  
Headquarters  
ARCO Tower 15F  
1-8-1, Shimo-Meguro, Meguro-ku,  
Tokyo 153-0064  
Japan  
0120 191014 or +81 3 5437 9125  
[support.japan@freescale.com](mailto:support.japan@freescale.com)

### **Asia/Pacific:**

Freescale Semiconductor Hong Kong Ltd.  
Technical Information Center  
2 Dai King Street  
Tai Po Industrial Estate  
Tai Po, N.T., Hong Kong  
+800 2666 8080  
[support.asia@freescale.com](mailto:support.asia@freescale.com)

### **For Literature Requests Only:**

Freescale Semiconductor Literature Distribution Center  
P.O. Box 5405  
Denver, Colorado 80217  
1-800-441-2447 or 303-675-2140  
Fax: 303-675-2150  
[LDCForFreescaleSemiconductor@hibbertgroup.com](mailto:LDCForFreescaleSemiconductor@hibbertgroup.com)

Information in this document is provided solely to enable system and software implementers to use Freescale Semiconductor products. There are no express or implied copyright licenses granted hereunder to design or fabricate any integrated circuits or integrated circuits based on the information in this document.

Freescale Semiconductor reserves the right to make changes without further notice to any products herein. Freescale Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Freescale Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters that may be provided in Freescale Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals", must be validated for each customer application by customer's technical experts. Freescale Semiconductor does not convey any license under its patent rights nor the rights of others. Freescale Semiconductor products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Freescale Semiconductor product could create a situation where personal injury or death may occur. Should Buyer purchase or use Freescale Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold Freescale Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Freescale Semiconductor was negligent regarding the design or manufacture of the part.

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners.

© Freescale Semiconductor, Inc. 2006. All rights reserved.

