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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



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

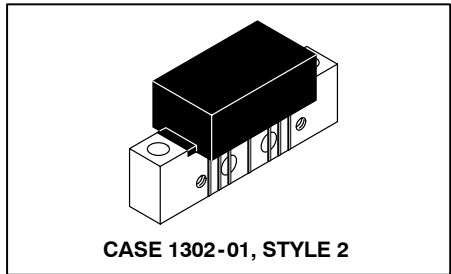
- CATV Systems Operating in the 47 to 870 MHz Frequency Range
- Output Stage Amplifier in Optical Nodes, Line Extenders and Trunk Distribution Amplifiers for CATV Systems
- Driver Amplifier in Linear General Purpose Applications

Description

- 24 Vdc Supply, 47 to 870 MHz, CATV GaAs Forward Power Doubler Amplifier Module
- Replaced MHW9189A. There are no form, fit or function changes with this part replacement.
- RoHS Compliant

MHW9189AN

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



ARCHIVE INFORMATION

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Table 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 |

Table 2. 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 |

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

| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|--------|------|------|------|------|
| Frequency Range | BW | 47 | — | 870 | MHz |
| Power Gain 870 MHz | G_p | 19.7 | 20.3 | 20.9 | 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 ($Z_o = 75$ Ohms) | IRL | 20 | — | — | dB |
| | | 18 | — | — | |
| | | 16 | — | — | |
| Return Loss — Output ($Z_o = 75$ Ohms) | ORL | 20 | — | — | dB |
| | | 18 | — | — | |

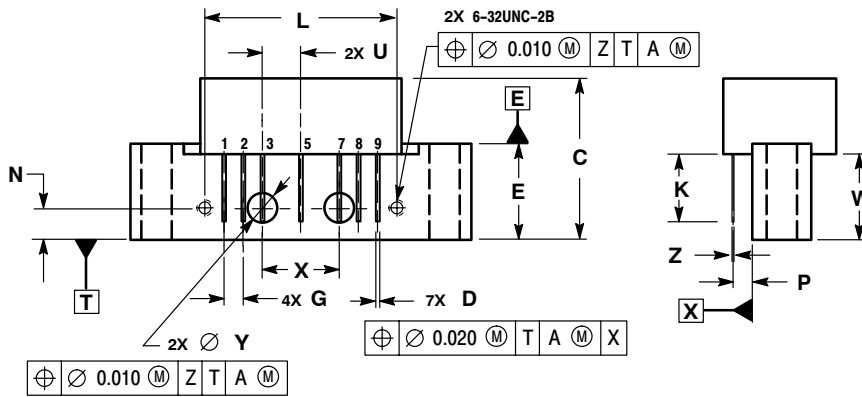
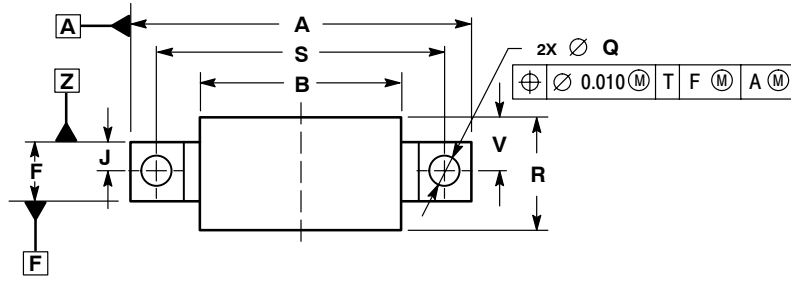
Table 3. Electrical Characteristics ($V_{CC} = 24 \text{ Vdc}$, $T_C = +45^\circ\text{C}$, 75Ω system unless otherwise noted) (continued)

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

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

CASE 1302-01
 ISSUE E

How to Reach Us:

Home Page:
www.freescale.com

E-mail:
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

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

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

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

For Literature Requests Only:
Freescale Semiconductor Literature Distribution Center
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1-800-441-2447 or 303-675-2140
Fax: 303-675-2150
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