

# 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

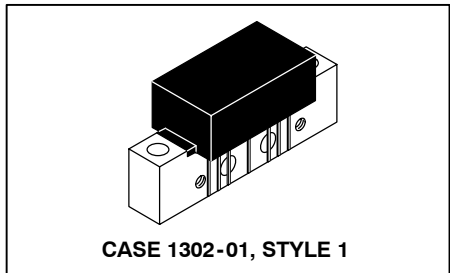
- CATV Systems Operating in the 40 to 1000 MHz Frequency Range
- Output Stage Amplifier in Optical Nodes, Line Extenders and Trunk Distribution Amplifiers for CATV Systems
- Driver Amplifier in Linear General Purpose Applications

## Description

- 24 Vdc Supply, 40 to 1000 MHz, CATV GaAs Forward Power Doubler Amplifier Module
- RoHS Compliant

**MHW10247AN**

**1000 MHz  
25.5 dB GAIN  
132-CHANNEL  
GaAs CATV AMPLIFIER MODULE**



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**Table 1. Maximum Ratings**

Rating	Symbol	Value	Unit
RF Voltage Input (Single Tone)	$V_{in}$	+70	dBmV
DC Supply Voltage	$V_{CC}$	+28	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

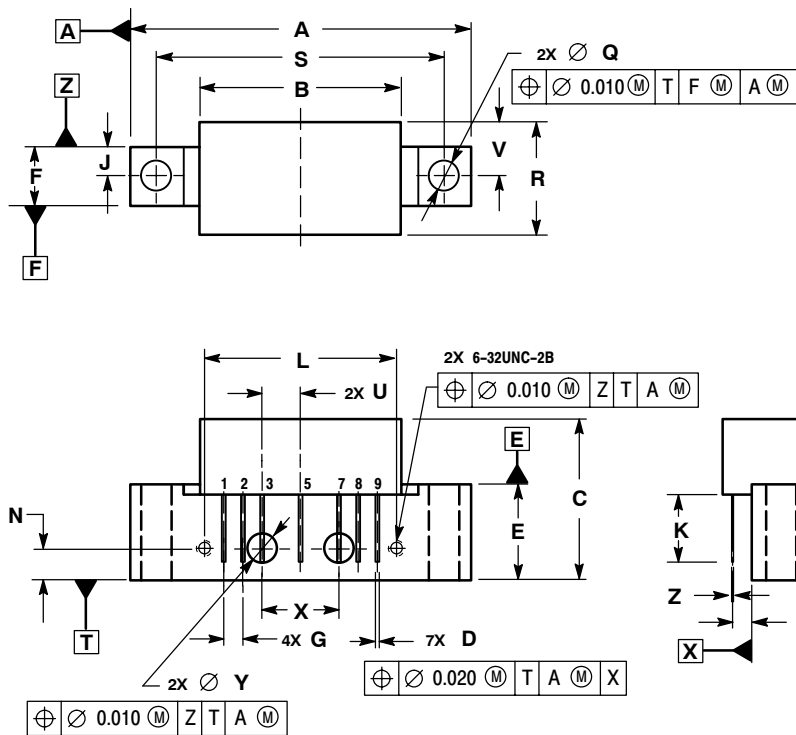
**Table 3. Electrical Characteristics** ( $V_{CC} = 24$  Vdc,  $T_C = +45^\circ\text{C}$ , 75  $\Omega$  system unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Frequency Range	BW	40	—	1000	MHz
Power Gain 1000 MHz	$G_p$	24.8	25.5	26.2	dB
Slope 40-1000 MHz	S	0.2	1.2	2	dB
Gain Flatness (40-1000 MHz, Peak-to-Valley)	$G_F$	—	—	0.8	dB
Return Loss — Input ( $Z_o = 75$ Ohms)	IRL				dB
40-500 MHz		20	—	—	
501-750 MHz		18	—	—	
751-870 MHz		16	—	—	
871-1000 MHz		14	—	—	
Return Loss — Output ( $Z_o = 75$ Ohms)	ORL				dB
40-160 MHz		20	—	—	
161-870 MHz		18	—	—	
871-1000 MHz		16	—	—	

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>Composite Second Order</b>					
( $V_{out} = +48$ dBmV/ch., Worst Case) 132-Channel FLAT	$CSO_{132}$	—	-64	-62	dBc
( $V_{out} = +48$ dBmV/ch., Worst Case) 112-Channel FLAT	$CSO_{112}$	—	-66	-64	
( $V_{out} = +48$ dBmV/ch., Worst Case) 79-Channel FLAT	$CSO_{79}$	—	-70	-68	
( $V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 12db Tilt	$CSO_{112}$	—	-66	—	
( $V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 13.5db Tilt	$CSO_{112}$	—	-67	—	
( $V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 17db Tilt	$CSO_{112}$	—	-68	—	
( $V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 12db Tilt	$CSO_{79}$	—	-71	—	
( $V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 13.5db Tilt	$CSO_{79}$	—	-74	—	
( $V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 17db Tilt	$CSO_{79}$	—	-74	—	
<b>Cross Modulation Distortion @ Ch 2</b>					
( $V_{out} = +48$ dBmV/ch., FM = 55 MHz) 132-Channel FLAT	$XMD_{132}$	—	-56	-54	dBc
( $V_{out} = +48$ dBmV/ch., FM = 55 MHz) 112-Channel FLAT	$XMD_{112}$	—	-58	-56	
( $V_{out} = +48$ dBmV/ch., FM = 55 MHz) 79-Channel FLAT	$XMD_{79}$	—	-60	-58	
( $V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 12db Tilt	$XMD_{112}$	—	-53	—	
( $V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 13.5db Tilt	$XMD_{112}$	—	-54	—	
( $V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 17db Tilt	$XMD_{112}$	—	-55	—	
( $V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 12db Tilt	$XMD_{79}$	—	-55	—	
( $V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 13.5db Tilt	$XMD_{79}$	—	-58	—	
( $V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 17db Tilt	$XMD_{79}$	—	-61	—	
<b>Composite Triple Beat</b>					
( $V_{out} = +48$ dBmV/ch., Worst Case) 132-Channel FLAT	$CTB_{132}$	—	-58	-56	dBc
( $V_{out} = +48$ dBmV/ch., Worst Case) 112-Channel FLAT	$CTB_{112}$	—	-61	-59	
( $V_{out} = +48$ dBmV/ch., Worst Case) 79-Channel FLAT	$CTB_{79}$	—	-68	-66	
( $V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 12db Tilt	$CTB_{112}$	—	-58	—	
( $V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 13.5db Tilt	$CTB_{112}$	—	-59	—	
( $V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 17db Tilt	$CTB_{112}$	—	-61	—	
( $V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 12db Tilt	$CTB_{79}$	—	-64	—	
( $V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 13.5db Tilt	$CTB_{79}$	—	-67	—	
( $V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 17db Tilt	$CTB_{79}$	—	-69	—	
<b>Noise Figure</b>					
50 MHz	NF	—	5.5	7	dB
870 MHz		—	6	7	
1000 MHz		—	6.5	7.5	
<b>DC Current (<math>V_{DC} = 24</math> V, <math>T_C = 45^\circ\text{C}</math>)</b>					
	$I_{DC}$	420	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  
 2. GROUND  
 3. GROUND  
 4. DELETED  
 5. VDC  
 6. DELETED  
 7. GROUND  
 8. GROUND  
 9. RF OUTPUT

CASE 1302-01  
 ISSUE E

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