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Freescale Semiconductor
 Technical Data

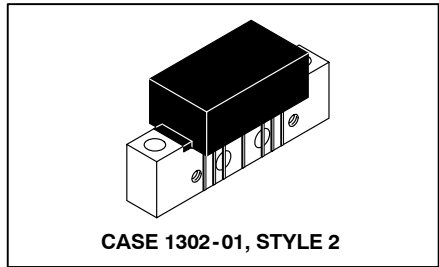
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 Rev. 2, 5/2006



Gallium Arsenide CATV Amplifier Module

MHW9189AN

**870 MHz
 20.3 dB GAIN
 132-CHANNEL
 GaAs 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

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 18 16	— — —	— — —	dB
Return Loss — Output ($Z_o = 75$ Ohms)	ORL	20 18	— —	— —	dB

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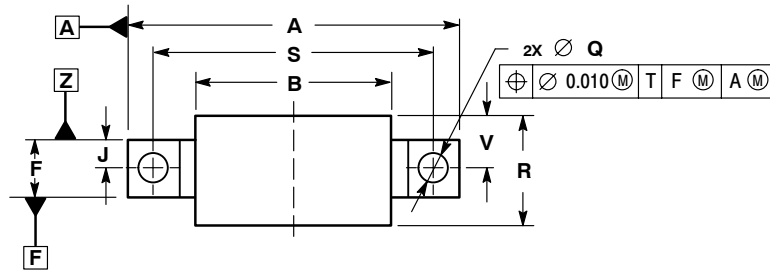
Table 3. Electrical Characteristics ($V_{CC} = 24 \text{ Vdc}$, $T_C = +45^\circ\text{C}$, 75Ω system unless otherwise noted) (continued)

Characteristic	Symbol	Min	Typ	Max	Unit
Composite Second Order					dBc
($V_{out} = +48 \text{ dBmV/ch.}$, Worst Case) 132-Channel FLAT	CSO ₁₃₂	—	-64	-62	
($V_{out} = +48 \text{ dBmV/ch.}$, 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					dBc
($V_{out} = +48 \text{ dBmV/ch.}$, FM = 55 MHz) 132-Channel FLAT	XMD ₁₃₂	—	-57	-55	
($V_{out} = +48 \text{ dBmV/ch.}$, 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					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	—	-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					dB
50 MHz	NF	—	4.0	5.0	
550 MHz		—	4.0	5.0	
750 MHz		—	4.0	5.0	
870 MHz		—	4.0	5.0	
DC Current ($V_{DC} = 24 \text{ V}$, $T_C = 45^\circ\text{C}$)	I_{DC}	410	425	440	mA

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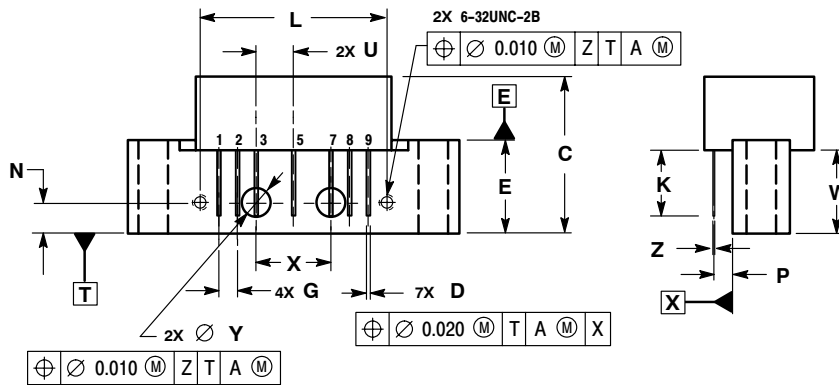
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PACKAGE DIMENSIONS



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

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