

**The RF Line**  
**Gallium Arsenide**  
**CATV Amplifier Module**

**MHW9207A**

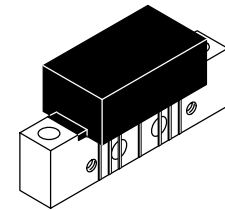
**Features**

- 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

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

**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



**CASE 1302-01, STYLE 1**

**Description**

- 24 Vdc Supply, 47 to 870 MHz, CATV GaAs Forward Power Doubler Amplifier Module

**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

**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

**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	47	—	870	MHz
Power Gain 870 MHz	$G_p$	20.6	21.3	22	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	—	—	

# Freescale Semiconductor, Inc.

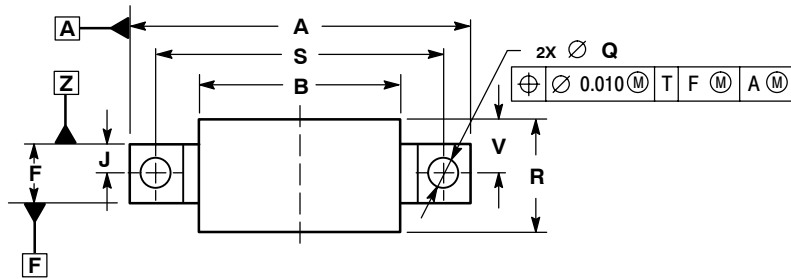
## ELECTRICAL CHARACTERISTICS - continued ( $V_{CC} = 24$ Vdc, $T_C = +45^\circ\text{C}$ , 75 $\Omega$ system unless otherwise noted)

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

**NOTES**

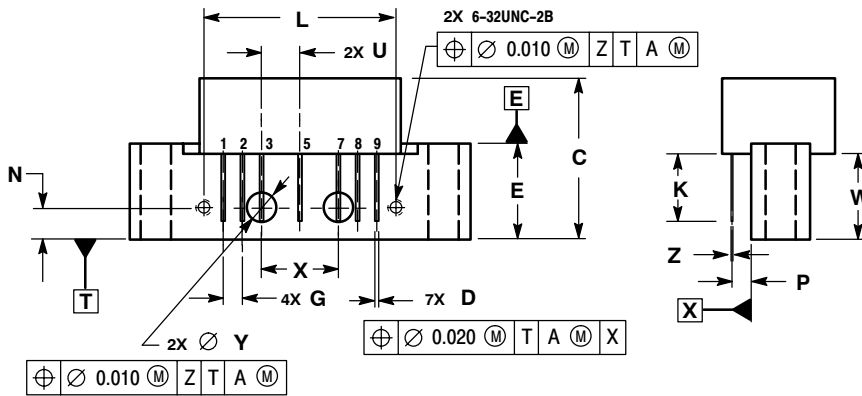
# Freescale Semiconductor, Inc.

## 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 B

Information in this document is provided solely to enable system and software implementers to use Motorola 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.

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola 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 Motorola 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. Motorola does not convey any license under its patent rights nor the rights of others. Motorola 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 Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola 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 Motorola was negligent regarding the design or manufacture of the part.

MOTOROLA and the Stylized M Logo are registered in the US Patent and Trademark Office. All other product or service names are the property of their respective owners. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

© Motorola Inc. 2004

#### HOW TO REACH US:

**USA/EUROPE/LOCATIONS NOT LISTED:**  
 Motorola Literature Distribution  
 P.O. Box 5405, Denver, Colorado 80217  
 1-800-521-6274 or 480-768-2130

**JAPAN:** Motorola Japan Ltd.; SPS, Technical Information Center,  
 3-20-1, Minami-Azabu, Minato-ku, Tokyo 106-8573, Japan  
 81-3-3440-3569

**ASIA/PACIFIC:** Motorola Semiconductors H.K. Ltd.; Silicon Harbour Centre,  
 2 Dai King Street, Tai Po Industrial Estate, Tai Po, N.T., Hong Kong  
 852-26668334

**HOME PAGE:** <http://motorola.com/semiconductors>



**MOTOROLA**

For More Information On This Product,  
 Go to: [www.freescale.com](http://www.freescale.com)

MHW9207A/D

Freescale Semiconductor, Inc.