

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

MHW9187

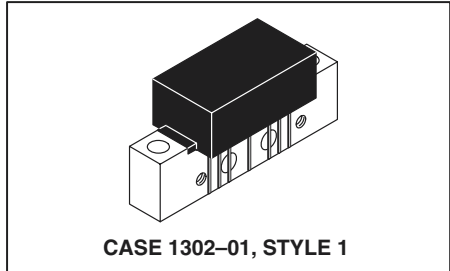
Features

- Specified for 79-, 112- and 132-Channel Loading
- Excellent Distortion Performance
- Higher Output Capability
- GaAs FET Transistor Technology
- Unconditionally Stable Under All Load Conditions

**870 MHz
 20 dB GAIN
 132-CHANNEL
 GaAs CATV AMPLIFIER**

Applications

- CATV Systems Operating in the 40 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, 40 to 870 MHz, CATV GaAs Forward Power Doubler Amplifier

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

ESD MAXIMUM RATINGS

Rating	Input Value	Output Value	Unit
Surge Voltage per IEC 1000-4-5	200	200	V
Human Body Model per Mil. Std. 1686	0.7	2	kV

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	40	—	870	MHz
Power Gain 870 MHz	G_p	19.4	20	20.6	dB
Slope 40-870 MHz	S	0	0.5	1.0	dB
Gain Flatness (40-870 MHz, Peak-to-Valley)	G_F	—	—	0.5	dB
Return Loss — Input ($Z_o = 75$ Ohms)	IRL	20	—	—	dB
		40-500 Mhz	18	—	
		501-750 Mhz	16	—	
		751-870 Mhz	—	—	
Return Loss — Output ($Z_o = 75$ Ohms)	ORL	20	—	—	dB
		40-160 Mhz	18	—	
		f > 160 Mhz	—	—	

Freescale Semiconductor, Inc.

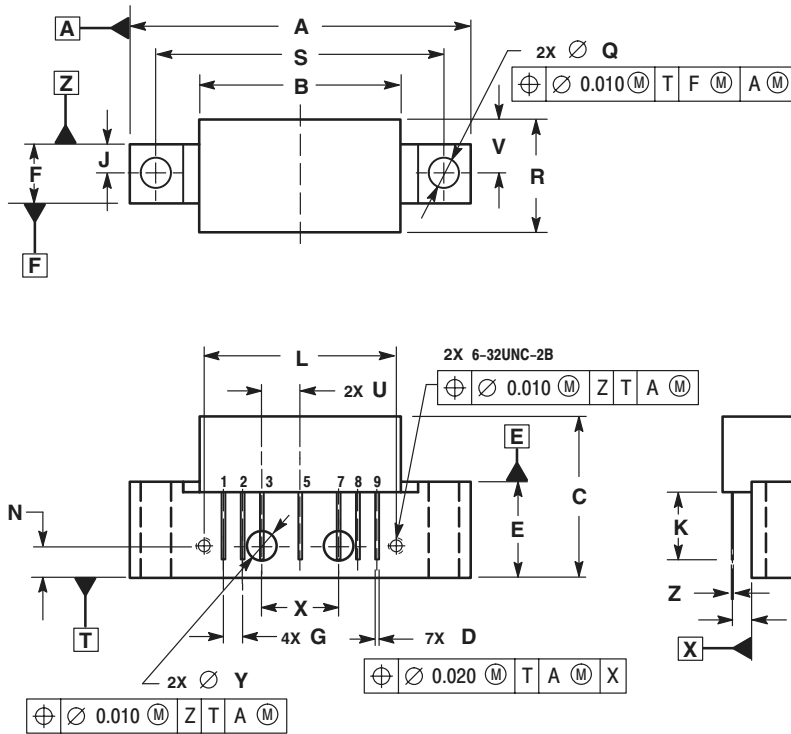
ELECTRICAL CHARACTERISTICS – continued ($V_{CC} = 24$ Vdc, $T_C = +45^\circ\text{C}$, 75 Ω system unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Composite Second Order					
($V_{out} = +48$ 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	—	-65	-63	
($V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 13.5db Tilt	CSO ₁₁₂	—	-64	-62	
($V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 17db Tilt	CSO ₁₁₂	—	-63	-61	
($V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 12db Tilt	CSO ₇₉	—	-69	-67	
($V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 13.5db Tilt	CSO ₇₉	—	-74	-72	
($V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 17db Tilt	CSO ₇₉	—	-73	-71	
Cross Modulation Distortion @ Ch 2					
($V_{out} = +48$ dBmV/ch., FM = 55 MHz) 132-Channel FLAT	XMD ₁₃₂	—	-57	-55	dBc
($V_{out} = +48$ dBmV/ch., FM = 55 MHz) 112-Channel FLAT	XMD ₁₁₂	—	-59	-57	
($V_{out} = +48$ dBmV/ch., FM = 55 MHz) 79-Channel FLAT	XMD ₇₉	—	-62	-60	
($V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 12db Tilt	XMD ₁₁₂	—	-53	-51	
($V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 13.5db Tilt	XMD ₁₁₂	—	-55	-53	
($V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 17db Tilt	XMD ₁₁₂	—	-58	-56	
($V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 12db Tilt	XMD ₇₉	—	-60	-47	
($V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 13.5db Tilt	XMD ₇₉	—	-62	-60	
($V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 17db Tilt	XMD ₇₉	—	-67	-65	
Composite Triple Beat					
($V_{out} = +48$ dBmV/ch., Worst Case) 132-Channel FLAT	CTB ₁₃₂	—	-60	-56	dBc
($V_{out} = +48$ dBmV/ch., Worst Case) 112-Channel FLAT	CTB ₁₁₂	—	-64	-60	
($V_{out} = +48$ dBmV/ch., Worst Case) 79-Channel FLAT	CTB ₇₉	—	-68	-66	
($V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 12db Tilt	CTB ₁₁₂	—	-60	-58	
($V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 13.5db Tilt	CTB ₁₁₂	—	-61	-59	
($V_{out} = +56$ dBmV @ 870 Mhz Equiv) 112-Channel, 17db Tilt	CTB ₁₁₂	—	-64	-62	
($V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 12db Tilt	CTB ₇₉	—	-66	-64	
($V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 13.5db Tilt	CTB ₇₉	—	-71	-69	
($V_{out} = +58$ dBmV @ 870 Mhz Equiv) 79-Channel, 17db Tilt	CTB ₇₉	—	-74	-72	
Noise Figure					
50 MHz	NF	—	4.0	4.5	dB
550 MHz		—	3.5	4.5	
750 MHz		—	3.5	4.5	
870 MHz		—	4.0	4.5	
DC Current ($V_{DC} = 24$ V, $T_C = 45^\circ\text{C}$)					
	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

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 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 & 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. 2002.

How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution; P.O. Box 5405, Denver, Colorado 80217. 1-303-675-2140 or 1-800-441-2447

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

Technical Information Center: 1-800-521-6274

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



MOTOROLA

For More Information On This Product,
 Go to: www.freescale.com

MHW9187/D