

The RF Line

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

Applications

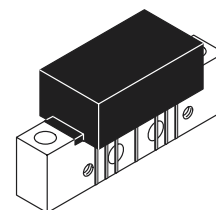
- CATV Systems Operating in the 47 to 870 MHz Frequency Range
- Output Stage Amplifier in Optical Nodes, Line Extenders and Trunk Distribution Amplifiers for CATV Systems
- Driver Amplifier in Linear General Purpose Applications

Description

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

MHW9227

870 MHz
22.1 dB GAIN
132-CHANNEL
GaAs CATV AMPLIFIER MODULE



CASE 1302-01, STYLE 1

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
RF Voltage Input (Single Tone)	V_{in}	+70	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	200	200	V
Human Body Model per Mil. Std. 1686	2	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	47	—	870	MHz
Power Gain 870 MHz	G_p	21.5	22.1	22.7	dB
Slope 47-870 MHz	S	0	0.5	1.0	dB
Gain Flatness (40-870 MHz, Peak-to-Valley)	—	—	—	0.7	dB
Return Loss — Input/Output ($Z_o = 75$ Ohms)	IRL	20 18 16	— — —	— — —	dB
		47-500 MHz			
		501-750 MHz			
		751-870 MHz			

Freescale Semiconductor, Inc.

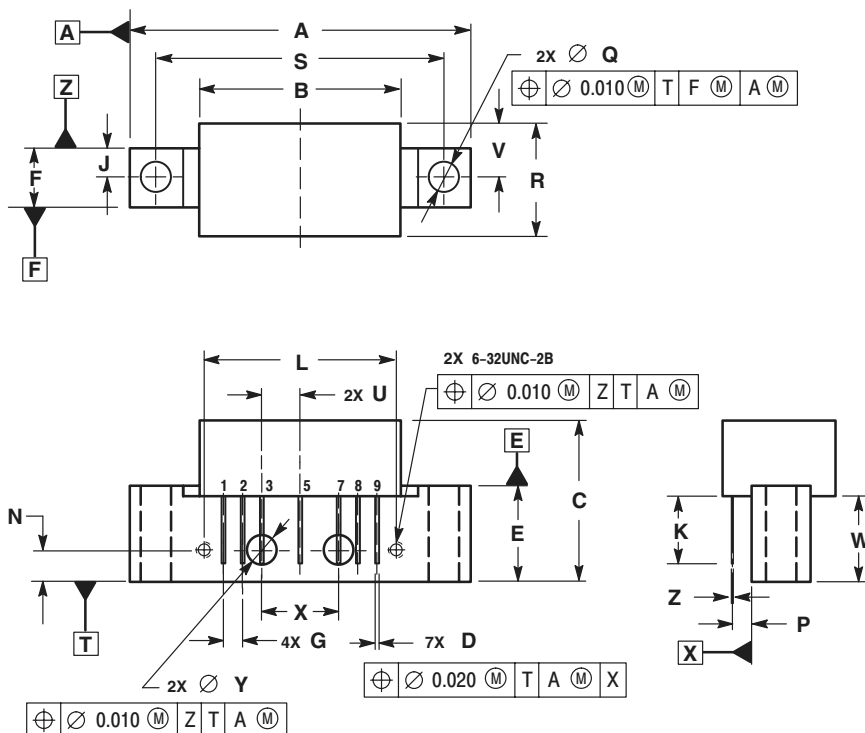
ELECTRICAL CHARACTERISTICS – continued ($V_{CC} = 24$ Vdc, $T_C = +45^\circ\text{C}$, 75 Ω system unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Composite Second Order					dBc
($V_{out} = +48$ dBmV/ch., Worst Case) 132–Channel FLAT	CSO_{132}	—	–64	–62	
($V_{out} = +48$ 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, 12 dB Tilt	CSO_{112}	—	–65	–63	
($V_{out} = +56$ dBmV @ 870 MHz Equiv) 112–Channel, 13.5 dB Tilt	CSO_{112}	—	–64	–62	
($V_{out} = +56$ dBmV @ 870 MHz Equiv) 112–Channel, 17 dB Tilt	CSO_{112}	—	–63	–61	
($V_{out} = +58$ dBmV @ 870 MHz Equiv) 79–Channel, 12 dB Tilt	CSO_{79}	—	–69	–67	
($V_{out} = +58$ dBmV @ 870 MHz Equiv) 79–Channel, 13.5 dB Tilt	CSO_{79}	—	–74	–72	
($V_{out} = +58$ dBmV @ 870 MHz Equiv) 79–Channel, 17 dB Tilt	CSO_{79}	—	–73	–71	
Cross Modulation Distortion @ Ch 2					dBc
($V_{out} = +48$ dBmV/ch., FM = 55 MHz) 132–Channel FLAT	XMD_{132}	—	–57	–55	
($V_{out} = +48$ 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, 12 dB Tilt	XMD_{112}	—	–53	–51	
($V_{out} = +56$ dBmV @ 870 MHz Equiv) 112–Channel, 13.5 dB Tilt	XMD_{112}	—	–55	–53	
($V_{out} = +56$ dBmV @ 870 MHz Equiv) 112–Channel, 17 dB Tilt	XMD_{112}	—	–58	–56	
($V_{out} = +58$ dBmV @ 870 MHz Equiv) 79–Channel, 12 dB Tilt	XMD_{79}	—	–60	–47	
($V_{out} = +58$ dBmV @ 870 MHz Equiv) 79–Channel, 13.5 dB Tilt	XMD_{79}	—	–62	–60	
($V_{out} = +58$ dBmV @ 870 MHz Equiv) 79–Channel, 17 dB Tilt	XMD_{79}	—	–67	–65	
Composite Triple Beat					dBc
($V_{out} = +48$ dBmV/ch., Worst Case) 132–Channel FLAT	CTB_{132}	—	–58	–56	
($V_{out} = +48$ dBmV/ch., Worst Case) 112–Channel FLAT	CTB_{112}	—	–62	–60	
($V_{out} = +48$ dBmV/ch., Worst Case) 79–Channel FLAT	CTB_{79}	—	–66	–64	
($V_{out} = +56$ dBmV @ 870 MHz Equiv) 112–Channel, 12 dB Tilt	CTB_{112}	—	–57	–55	
($V_{out} = +56$ dBmV @ 870 MHz Equiv) 112–Channel, 13.5 dB Tilt	CTB_{112}	—	–58	–56	
($V_{out} = +56$ dBmV @ 870 MHz Equiv) 112–Channel, 17 dB Tilt	CTB_{112}	—	–60	–58	
($V_{out} = +58$ dBmV @ 870 MHz Equiv) 79–Channel, 12 dB Tilt	CTB_{79}	—	–63	–61	
($V_{out} = +58$ dBmV @ 870 MHz Equiv) 79–Channel, 13.5 dB Tilt	CTB_{79}	—	–65	–63	
($V_{out} = +58$ dBmV @ 870 MHz Equiv) 79–Channel, 17 dB Tilt	CTB_{79}	—	–69	–67	
Noise Figure					dB
50 MHz	NF	—	4.0	4.5	
550 MHz		—	4.0	4.5	
750 MHz		—	4.0	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 trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

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. 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

MHW9227/D