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Freescale Semiconductor  
 Technical Data

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# Gallium Arsenide CATV Amplifier Module

## Features

- Specified for 79-, 112- and 132-Channel Loading
- Excellent Distortion Performance
- Built-in Input Diode Protection
- GaAs FET Transistor Technology
- Unconditionally Stable Under All Load Conditions

## Applications

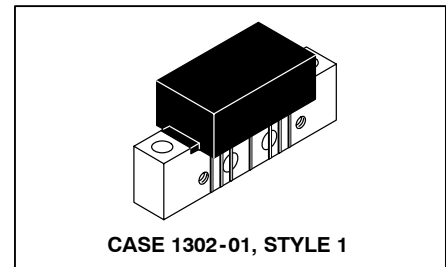
- CATV Systems Operating in the 40 to 870 MHz Frequency Range
- Input Stage Amplifier in Optical Nodes, Line Extenders and Trunk Distribution Amplifiers for CATV Systems
- Output Stage Amplifier on Applications Requiring Low Power Dissipation and High Output Performance
- Driver Amplifier in Linear General Purpose Applications

## Description

- 24 Vdc Supply, 40 to 870 MHz, CATV GaAs Forward Amplifier Module
- Replaced MHW9146. There are no form, fit or function changes with this part replacement.
- RoHS Compliant

**MHW9146N**

**870 MHz  
 14.3 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)	$V_{in}$	+65	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	200	200	V
Human Body Model per Mil. Std. 1686	2	2	kV

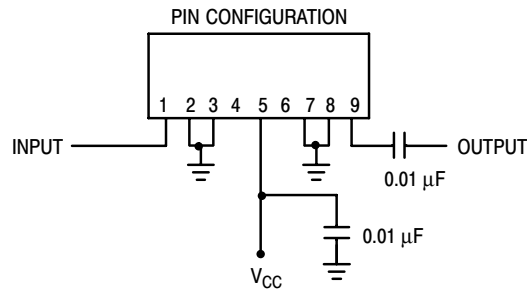
**Table 3. Electrical Characteristics** ( $V_{CC} = 24$  Vdc,  $T_C = +45^\circ\text{C}$ , 75  $\Omega$  system unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Frequency Range	BW	40	—	870	MHz
Power Gain 870 MHz	$G_p$	13.8	14.3	14.8	dB
Slope 40-870 MHz	S	0	0.4	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 18	— —	— —	dB
Return Loss — Output ( $Z_o = 75$ Ohms)	ORL	20 18	— —	— —	dB

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

Characteristic		Symbol	Min	Typ	Max	Unit
Composite Second Order ( $V_{out} = +48 \text{ dBmV/ch.}$ , Worst Case) ( $V_{out} = +46 \text{ dBmV/ch.}$ , Worst Case) ( $V_{out} = +44 \text{ dBmV/ch.}$ , Worst Case)	79-Channel FLAT	$CSO_{79}$	—	-68	-64	dBc
	112-Channel FLAT	$CSO_{112}$	—	-63	-60	
	132-Channel FLAT	$CSO_{132}$	—	-63	-60	
Cross Modulation Distortion @ Ch 2 ( $V_{out} = +48 \text{ dBmV/ch.}$ , FM = 55.25 MHz ) ( $V_{out} = +46 \text{ dBmV/ch.}$ , FM = 55.25 MHz) ( $V_{out} = +44 \text{ dBmV/ch.}$ , FM = 55.25 MHz)	79-Channel FLAT	$XMD_{79}$	—	-60	-55	dBc
	112-Channel FLAT	$XMD_{112}$	—	-60	-55	
	132-Channel FLAT	$XMD_{132}$	—	-60	-55	
Composite Triple Beat ( $V_{out} = +48 \text{ dBmV/ch.}$ , Worst Case) ( $V_{out} = +46 \text{ dBmV/ch.}$ , Worst Case) ( $V_{out} = +44 \text{ dBmV/ch.}$ , Worst Case)	79-Channel FLAT	$CTB_{79}$	—	-64	-60	dBc
	112-Channel FLAT	$CTB_{112}$	—	-64	-60	
	132-Channel FLAT	$CTB_{132}$	—	-64	-60	
Noise Figure	50 MHz	NF	—	4.4	5.5	dB
	550 MHz		—	3.8	—	
	750 MHz		—	4.0	—	
	870 MHz		—	4.3	5.5	
DC Current ( $V_{DC} = 24 \text{ V}$ , $T_C = 45^\circ\text{C}$ )		$I_{DC}$	230	245	260	mA

Note: This device requires an external  $0.01 \mu\text{F}$  DC blocking capacitor connected to the output pin (Pin 9) as indicated in Figure 1.



**Figure 1. External Connections**



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