



# GaAs MULTI-CHIP MODULE

## MC-7894

### 1 GHz CATV 24 dB POWER DOUBLER AMPLIFIER

#### DESCRIPTION

The MC-7894 is a GaAs Multi-chip Module designed for use in CATV applications up to 1 GHz. This unit has low distortion, low noise figure and return loss across the entire frequency band.

Reliability and performance uniformity are assured by our stringent quality and control procedures.

#### FEATURES

- Low distortion
- High linear gain  $G_L = 24.5 \text{ dB MIN. @ } f = 1 \text{ GHz}$
- Low return loss

#### ORDERING INFORMATION

Part Number	Order Number	Package	Supplying Form
MC-7894	MC-7894-AZ	7-pin special with heatsink (Pb-Free)	50 pcs MAX./Tray

**Remark** To order evaluation samples, contact your nearby sales office.

Part number for sample order: MC-7894

#### ABSOLUTE MAXIMUM RATINGS ( $T_A = +25^\circ\text{C}$ , unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Supply Voltage	$V_{DD}$	30	V
Input Voltage <sup>Note</sup>	$V_i$	70.0	dBmV
Operating Case Temperature	$T_c$	-30 to +100	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 to +100	$^\circ\text{C}$

**Note** In case of single tone

**Caution** Observe precautions when handling because these devices are sensitive to electrostatic discharge.

The information in this document is subject to change without notice. Before using this document, please confirm that this is the latest version.

**RECOMMENDED OPERATING CONDITIONS ( $Z_s = Z_L = 75 \Omega$ , unless otherwise specified)**

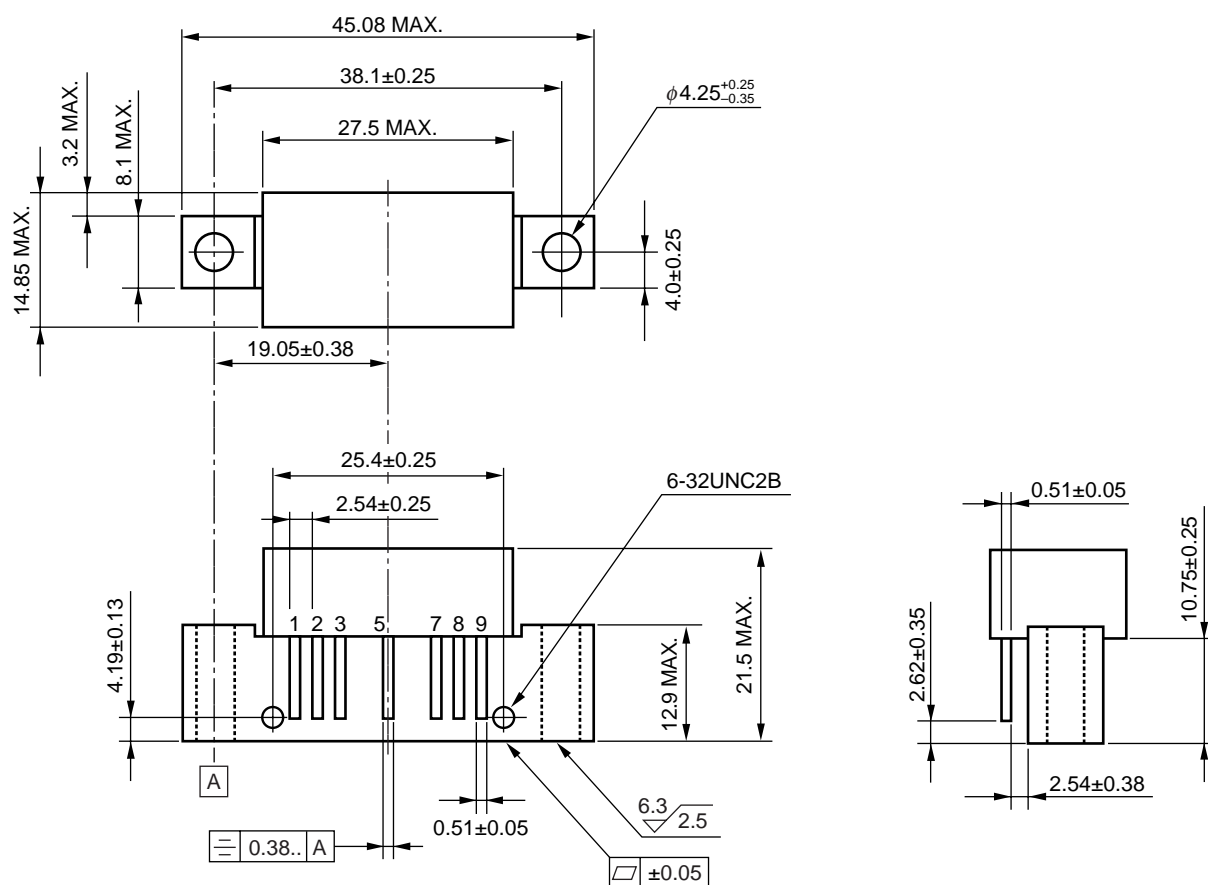
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Supply Voltage	$V_{DD}$		23.5	24.0	24.5	V
Input Voltage	$V_i$	77 channel, 7 dB tilted across the band	–	28.0	34.0	dBmV
Operating Case Temperature	$T_C$		–30	+25	+85	°C

**ELECTRICAL CHARACTERISTICS ( $T_C = 30 \pm 5^\circ\text{C}$ ,  $V_{DD} = 24 \text{ V}$ ,  $Z_s = Z_L = 75 \Omega$ , unless otherwise specified)**

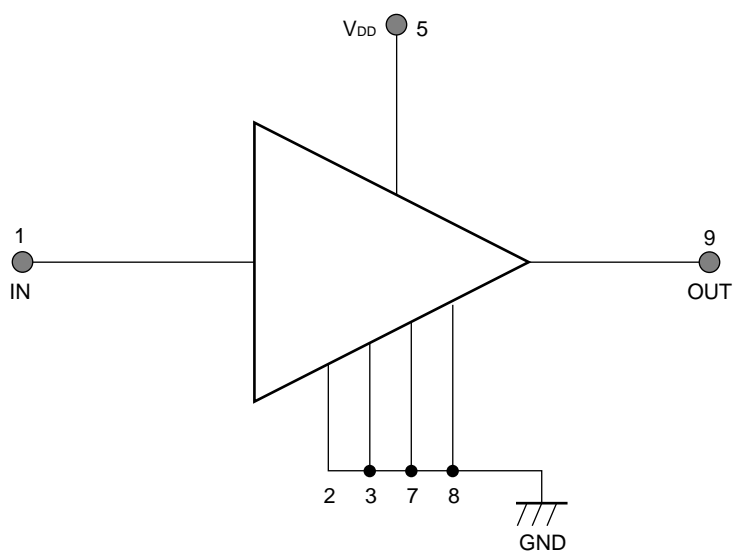
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Linear Gain 1	$G_{L1}$	$f = 40 \text{ MHz}$	22.5	–	24.0	dB
Linear Gain 2	$G_{L2}$	$f = 1 \text{ GHz}$	24.5	–	25.5	dB
Gain Slope	$G_{\text{Slope}}$	$f = 40 \text{ MHz to } 1 \text{ GHz}$	1.0	–	2.4	dB
Gain Flatness	$G_{\text{Flatness}}$	$f = 40 \text{ MHz to } 1 \text{ GHz}$ , Peak to valley	–	–	0.6	dB
Noise Figure 1	$NF_1$	$f = 50 \text{ MHz}$	–	–	6.0	dB
Noise Figure 2	$NF_2$	$f = 1 \text{ GHz}$	–	–	6.5	dB
Operating Current	$I_{DD}$	RF OFF	–	–	385	mA
Composite Triple Beat	CTB	77 channel, $V_o = 52 \text{ dBmV}$ at 547.25 MHz, 7 dB tilted across the band	–	–	–63	dBc
Cross Modulation	XM		–	–	–60	dBc
Composite 2nd Order Beat	CSO		–	–	–65	dBc
Input Return Loss 1	$RL_{i1}$	$f = 40 \text{ MHz}$	20	–	–	dB
Input Return Loss 2	$RL_{i2}$	$f = 1 \text{ GHz}$	14	–	–	dB
Output Return Loss 1	$RL_{o1}$	$f = 40 \text{ MHz}$	23	–	–	dB
Output Return Loss 2	$RL_{o2}$	$f = 1 \text{ GHz}$	17	–	–	dB

## PACKAGE DIMENSIONS

## 7-PIN SPECIAL WITH HEATSINK (UNIT: mm)



## PIN CONNECTION



**NOTES ON CORRECT USE**

- (1) The space between PC board and root of the lead should be kept more than 1 mm to prevent undesired stress to the lead and also should be kept less than 4 mm to prevent undesired parasitic inductance.  
Recommended that space is 2.0 to 3.0 mm typical.
- (2) Recommended torque strength of the screw is 59 to 78 Ncm.
- (3) Form the ground pattern as wide as possible to minimize ground impedance.  
(to prevent undesired oscillation)  
All the ground pins must be connected together with wide ground pattern to decrease impedance difference.

**RECOMMENDED SOLDERING CONDITIONS**

This product should be soldered and mounted under the following recommended conditions. For soldering methods and conditions other than those recommended below, contact your nearby sales office.

Soldering Method	Soldering Conditions	Recommended Condition Symbol
Partial Heating	Peak temperature (pin temperature) : 350°C or below <sup>Note</sup> Soldering time (per pin of device) : 3 seconds or less	—

**Note** The point of pin part heating must be kept more than 1.2 mm distance from the root of lead.

Subject: Compliance with EU Directives

CEL certifies, to its knowledge, that semiconductor and laser products detailed below are compliant with the requirements of European Union (EU) Directive 2002/95/EC Restriction on Use of Hazardous Substances in electrical and electronic equipment (RoHS) and the requirements of EU Directive 2003/11/EC Restriction on Penta and Octa BDE.

CEL Pb-free products have the same base part number with a suffix added. The suffix –A indicates that the device is Pb-free. The –AZ suffix is used to designate devices containing Pb which are exempted from the requirement of RoHS directive (\*). In all cases the devices have Pb-free terminals. All devices with these suffixes meet the requirements of the RoHS directive.

This status is based on CEL's understanding of the EU Directives and knowledge of the materials that go into its products as of the date of disclosure of this information.

Restricted Substance per RoHS	Concentration Limit per RoHS (values are not yet fixed)	Concentration contained in CEL devices	
		-A	-AZ
Lead (Pb)	< 1000 PPM	Not Detected	(*)
Mercury	< 1000 PPM	Not Detected	
Cadmium	< 100 PPM	Not Detected	
Hexavalent Chromium	< 1000 PPM	Not Detected	
PBB	< 1000 PPM	Not Detected	
PBDE	< 1000 PPM	Not Detected	

If you should have any additional questions regarding our devices and compliance to environmental standards, please do not hesitate to contact your local representative.

**Important Information and Disclaimer:** Information provided by CEL on its website or in other communications concerning the substance content of its products represents knowledge and belief as of the date that it is provided. CEL bases its knowledge and belief on information provided by third parties and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. CEL has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. CEL and CEL suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall CEL's liability arising out of such information exceed the total purchase price of the CEL part(s) at issue sold by CEL to customer on an annual basis.

See CEL Terms and Conditions for additional clarification of warranties and liability.