

GaAs MULTI-CHIP MODULE MC-7881

870 MHz CATV 18 dB POWER DOUBLER AMPLIFIER

DESCRIPTION

The MC-7881 is a GaAs Multi-chip Module designed for use in CATV applications up to 870 MHz. 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

GL = 18.0 dB MIN. @ f = 870 MHz

Low return loss

<R> ORDERING INFORMATION

Part Number	Order Number	Package	Supplying Form
MC-7881	MC-7881-AZ	7-pin special with heatsink (Pb-Free)	25 pcs MAX./Tray

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

Part number for sample order: MC-7881

ABSOLUTE MAXIMUM RATINGS ($T_A = +25$ °C)

Parameter	Symbol	Ratings	Unit
Supply Voltage	V _{DD}	30	V
Input Voltage Note	Vi	65.0	dBmV
Operating Case Temperature	Tc	−30 to +100	°C
Storage Temperature	T _{stg}	-40 to +100	°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.

Document No. PG10313EJ02V0DS (2nd edition) Date Published December 2006 NS CP(N)

© NEC Electronics Corporation 2002, 2006

RECOMMENDED OPERATING CONDITIONS (Zs = ZL = 75 Ω)

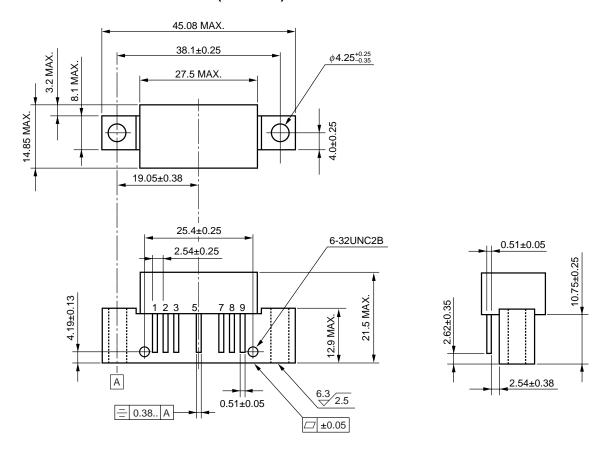
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Supply Voltage	V _{DD}		23.5	24.0	24.5	V
Input Voltage	Vi	110 channel, 10 dB tilted across the band	ı	36.0	39.0	dBmV
Operating Case Temperature	Tc		-30	+25	+85	°C

ELECTRICAL CHARACTERISTICS (Tc = $30\pm5^{\circ}$ C, Vdd = 24 V, Zs = ZL = 75 Ω)

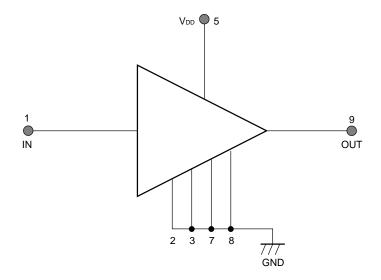
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Linear Gain	GL	f = 870 MHz	18.0	-	19.0	dB
Gain Slope	GSlope	f = 40 to 870 MHz	0.2	0.6	1.0	dB
Gain Flatness	GFlatness	f = 40 to 870 MHz, Peak to valley	-	-	0.6	dB
Noise Figure 1	NF1	f = 50 MHz	-	-	6.5	dB
Noise Figure 2	NF2	f = 870 MHz	-	-	7.0	dB
Operating Current	IDD	RF OFF	310	-	360	mA
Composite Triple Beat	СТВ	110 channel,	-	-	-60	dBc
Cross Modulation	XM	Vo = 52 dBmV at 745.25 MHz,	-	-	-55	dBc
Composite 2nd Order Beat	CSO	10 dB tilted across the band	-	ı	-63	dBc
Input Return Loss 1	RLi1	f = 40 to 160 MHz	20	ı	-	dB
Input Return Loss 2	RLi2	f = 160 to 320 MHz	19	-	-	dB
Input Return Loss 3	RLi3	f = 320 to 640 MHz	17.5	-	-	dB
Input Return Loss 4	RLi4	f = 640 to 870 MHz	16	-	-	dB
Output Return Loss 1	RLo1	f = 40 to 160 MHz	20	-	-	dB
Output Return Loss 2	RLo2	f = 160 to 320 MHz	19	ı	-	dB
Output Return Loss 3	RLo3	f = 320 to 640 MHz	17.5	ı	-	dB
Output Return Loss 4	RLo4	f = 640 to 870 MHz	16	-	-	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 Note 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.

- The information in this document is current as of December, 2006. The information is subject to change without notice. For actual design-in, refer to the latest publications of NEC Electronics data sheets or data books, etc., for the most up-to-date specifications of NEC Electronics products. Not all products and/or types are available in every country. Please check with an NEC Electronics sales representative for availability and additional information.
- No part of this document may be copied or reproduced in any form or by any means without the prior
 written consent of NEC Electronics. NEC Electronics assumes no responsibility for any errors that may
 appear in this document.
- NEC Electronics does not assume any liability for infringement of patents, copyrights or other intellectual
 property rights of third parties by or arising from the use of NEC Electronics products listed in this document
 or any other liability arising from the use of such products. No license, express, implied or otherwise, is
 granted under any patents, copyrights or other intellectual property rights of NEC Electronics or others.
- Descriptions of circuits, software and other related information in this document are provided for illustrative
 purposes in semiconductor product operation and application examples. The incorporation of these
 circuits, software and information in the design of a customer's equipment shall be done under the full
 responsibility of the customer. NEC Electronics assumes no responsibility for any losses incurred by
 customers or third parties arising from the use of these circuits, software and information.
- While NEC Electronics endeavors to enhance the quality, reliability and safety of NEC Electronics products, customers agree and acknowledge that the possibility of defects thereof cannot be eliminated entirely. To minimize risks of damage to property or injury (including death) to persons arising from defects in NEC Electronics products, customers must incorporate sufficient safety measures in their design, such as redundancy, fire-containment and anti-failure features.
- NEC Electronics products are classified into the following three quality grades: "Standard", "Special" and "Specific".

The "Specific" quality grade applies only to NEC Electronics products developed based on a customerdesignated "quality assurance program" for a specific application. The recommended applications of an NEC Electronics product depend on its quality grade, as indicated below. Customers must check the quality grade of each NEC Electronics product before using it in a particular application.

- "Standard": Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots.
- "Special": Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support).
- "Specific": Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems and medical equipment for life support, etc.

The quality grade of NEC Electronics products is "Standard" unless otherwise expressly specified in NEC Electronics data sheets or data books, etc. If customers wish to use NEC Electronics products in applications not intended by NEC Electronics, they must contact an NEC Electronics sales representative in advance to determine NEC Electronics' willingness to support a given application.

(Note)

- (1) "NEC Electronics" as used in this statement means NEC Electronics Corporation and also includes its majority-owned subsidiaries.
- (2) "NEC Electronics products" means any product developed or manufactured by or for NEC Electronics (as defined above).

M8E 02.11-1

Caution

GaAs Products

This product uses gallium arsenide (GaAs).

GaAs vapor and powder are hazardous to human health if inhaled or ingested, so please observe the following points.

- Follow related laws and ordinances when disposing of the product. If there are no applicable laws and/or ordinances, dispose of the product as recommended below.
- Commission a disposal company able to (with a license to) collect, transport and dispose of materials that contain arsenic and other such industrial waste materials.
- 2. Exclude the product from general industrial waste and household garbage, and ensure that the product is controlled (as industrial waste subject to special control) up until final disposal.
- Do not burn, destroy, cut, crush, or chemically dissolve the product.
- Do not lick the product or in any way allow it to enter the mouth.



4590 Patrick Henry Drive Santa Clara, CA 95054-1817 Telephone: (408) 919-2500

Facsimile: (408) 988-0279

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)		on contained devices	
Lead (Pb)	< 1000 PPM	-A Not Detected	-AZ (*)	
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 concerting 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.