To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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DATA SHEET

NEC

GaAs MULTI-CHIP MODULE
MC-7831-HA

1 GHz CATV 18 dB PUSH-PULL AMPLIFIER

DESCRIPTION

The MC-7831-HA is a GaAs Multi-chip Module designed for use in input stages 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 = 18.0 dB MIN. @f = 870 MHz
- Low return loss

ORDERING INFORMATION

Part Number	Order Number	Package	Supplying Form
MC-7831-HA	MC-7831-HA-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-7831-HA

ABSOLUTE MAXIMUM RATINGS (T_A = +25°C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Supply Voltage	V_{DD}	30	V
Input Voltage [Note]	V_i	65.0	dBmV
Operating Case Temperature	T_C	–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.

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Date Published October 2007 NS
Printed in Japan

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

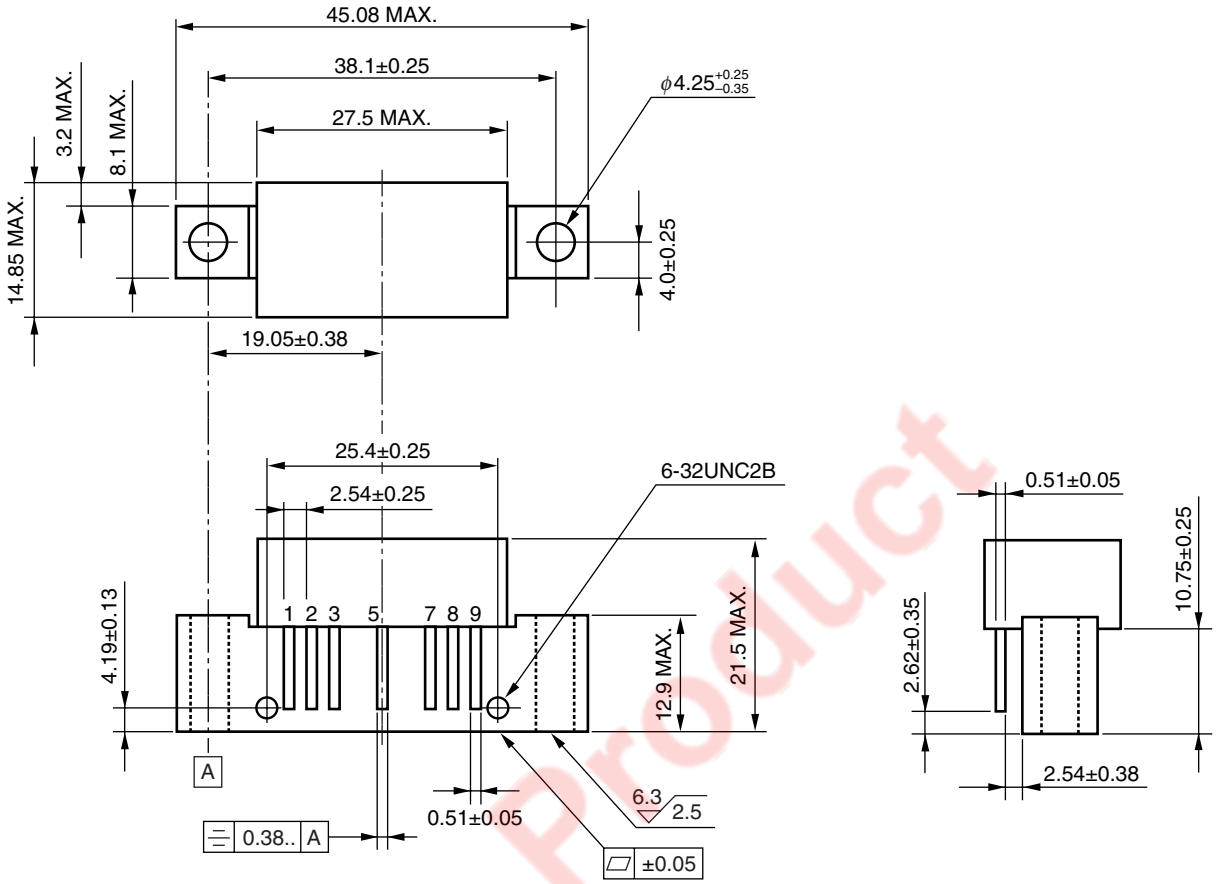
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Supply Voltage	V_{DD}		23.5	24.0	24.5	V
Input Voltage	V_i	110 channel, Flat	–	21.0	27.5	dBmV
Operating Case Temperature	T_C		–30	+25	+85	°C

ELECTRICAL CHARACTERISTICS ($T_C = 30 \pm 5$°C, $V_{DD} = 24$ V, $Z_S = Z_L = 75\ \Omega$, unless otherwise specified)

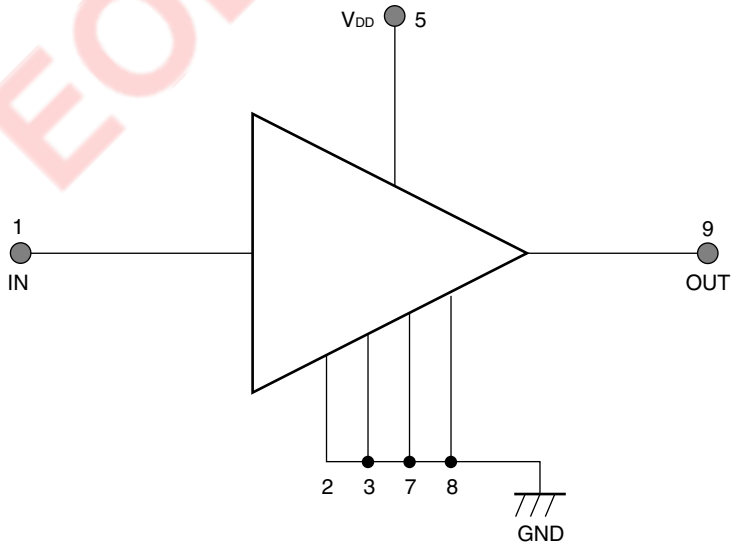
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Linear Gain	G_L	f = 870 MHz	18.0	–	21.0	dB
Gain Slope	G_{Slope}	f = 40 to 870 MHz	0.2	–	1.0	dB
Gain Flatness 1	$G_{Flatness}1$	f = 40 to 870 MHz	–0.35	–	+0.35	dB
Gain Flatness 2	$G_{Flatness}2$	f = 40 to 1 000 MHz	–0.35	–	+0.85	dB
Noise Figure 1	NF1	f = 50 MHz	–	–	6.5	dB
Noise Figure 2	NF2	f = 870 MHz	–	–	7.0	dB
Operating Current	I_{DD}	RF OFF (P_{in} = None)	180	–	240	mA
Composite Triple Beat	CTB	110 channel, V_O = 44 dBmV, Flat	–	–	–57	dBc
Cross Modulation	XM		–	–	–50	dBc
Composite 2nd Order Beat	CSO		–	–	–57	dBc
Input Return Loss 1	RLi1	f = 40 to 160 MHz	20.0	–	–	dB
Input Return Loss 2	RLi2	f = 160 to 320 MHz	19.0	–	–	dB
Input Return Loss 3	RLi3	f = 320 to 640 MHz	17.5	–	–	dB
Input Return Loss 4	RLi4	f = 640 to 870 MHz	16.0	–	–	dB
Input Return Loss 5	RLi5	f = 870 to 1 000 MHz	10.0	–	–	dB
Output Return Loss 1	RLo1	f = 40 to 160 MHz	20.0	–	–	dB
Output Return Loss 2	RLo2	f = 160 to 320 MHz	19.0	–	–	dB
Output Return Loss 3	RLo3	f = 320 to 640 MHz	17.5	–	–	dB
Output Return Loss 4	RLo4	f = 640 to 870 MHz	16.0	–	–	dB
Output Return Loss 5	RLo5	f = 870 to 1 000 MHz	12.0	–	–	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
Pin Part Heating	Pin area 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.

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M8E 02. 11-1

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