

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>)

Send any inquiries to <http://www.renesas.com/inquiry>.

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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)	25 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°C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Supply Voltage	V _{DD}	30	V
Input Voltage ^{Note}	V _i	70.0	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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RECOMMENDED OPERATING CONDITIONS ($Z_s = Z_L = 75 \Omega$, unless otherwise specified)

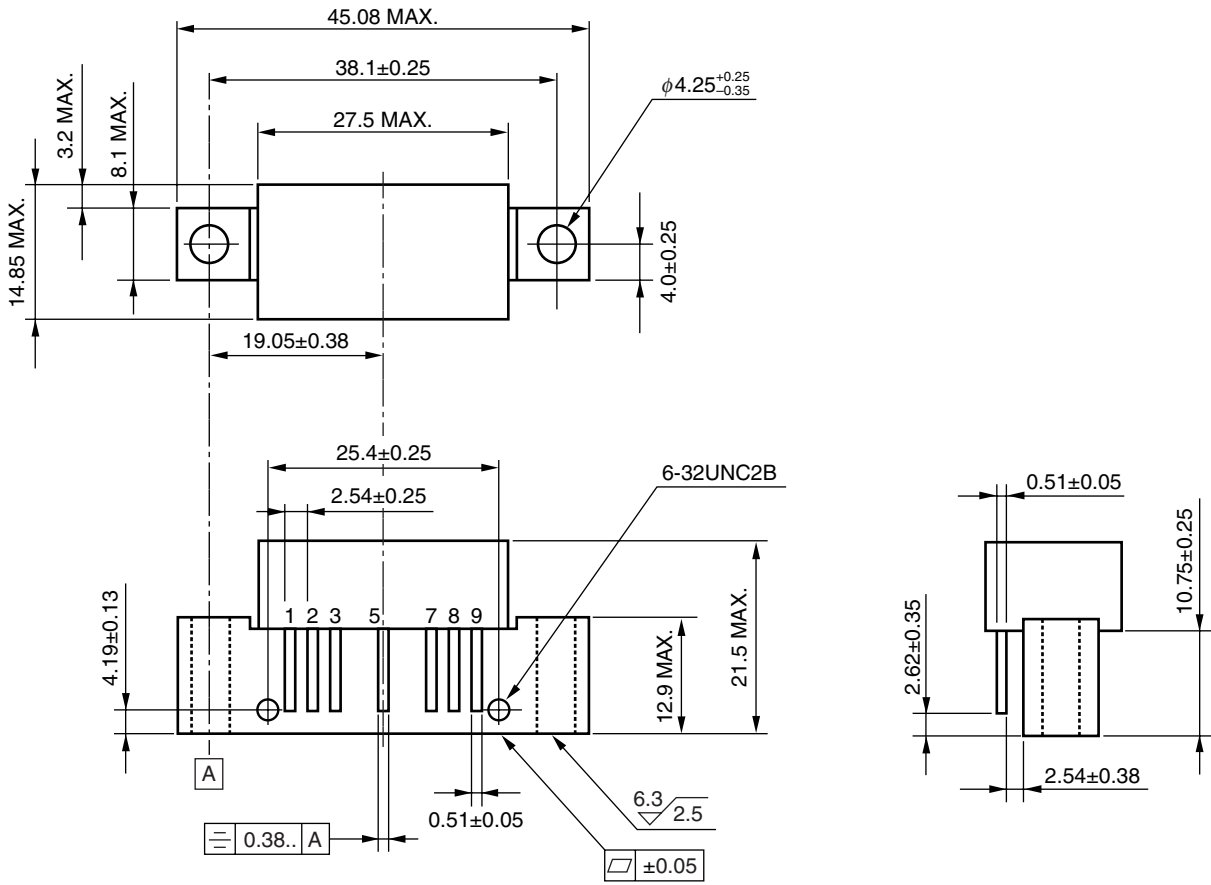
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Supply Voltage	V_{DD}		23.5	24.0	24.5	V
Input Voltage	V_i	77 channel, 7 dB tilted across the band	–	28.0	34.0	dBmV
Operating Case Temperature	T_c		–30	+25	+85	°C

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

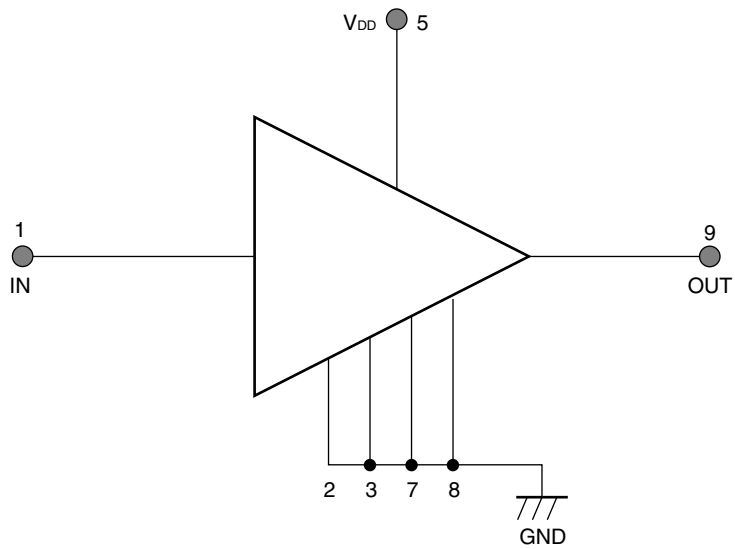
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Linear Gain 1	G_{L1}	$f = 40 \text{ MHz}$	22.5	–	24.0	dB
Linear Gain 2	G_{L2}	$f = 1 \text{ GHz}$	24.5	–	25.5	dB
Gain Slope	G_{Slope}	$f = 40 \text{ MHz to } 1 \text{ GHz}$	1.0	–	2.4	dB
Gain Flatness	$G_{Flatness}$	$f = 40 \text{ MHz to } 1 \text{ GHz}$, Peak to valley	–	–	0.6	dB
Noise Figure 1	NF1	$f = 50 \text{ MHz}$	–	–	6.0	dB
Noise Figure 2	NF2	$f = 1 \text{ GHz}$	–	–	6.5	dB
Operating Current	I_{DD}	RF OFF	–	–	385	mA
Composite Triple Beat	CTB	77 channel,	–	–	–63	dBc
Cross Modulation	XM	$V_o = 52 \text{ dBmV}$ at 547.25 MHz,	–	–	–60	dBc
Composite 2nd Order Beat	CSO	7 dB tilted across the band	–	–	–65	dBc
Input Return Loss 1	RLi1	$f = 40 \text{ MHz}$	20	–	–	dB
Input Return Loss 2	RLi2	$f = 1 \text{ GHz}$	14	–	–	dB
Output Return Loss 1	RLo1	$f = 40 \text{ MHz}$	23	–	–	dB
Output Return Loss 2	RLo2	$f = 1 \text{ GHz}$	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 ^{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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"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.

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