

To our customers,

Old Company Name in Catalogs and Other Documents

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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>.

Not recommended
for new design

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GaAs MULTI-CHIP MODULE
MC-7891

1 GHz CATV 19 dB POWER DOUBLER AMPLIFIER

DESCRIPTION

The MC-7891 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 $G_L = 18.5 \text{ dB MIN. @ } f = 1 \text{ GHz}$
- Low return loss

ORDERING INFORMATION

| Part Number | Order Number | Package | Supplying Form |
|-------------|--------------|---------------------------------------|------------------|
| MC-7891 | MC-7891-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-7891

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

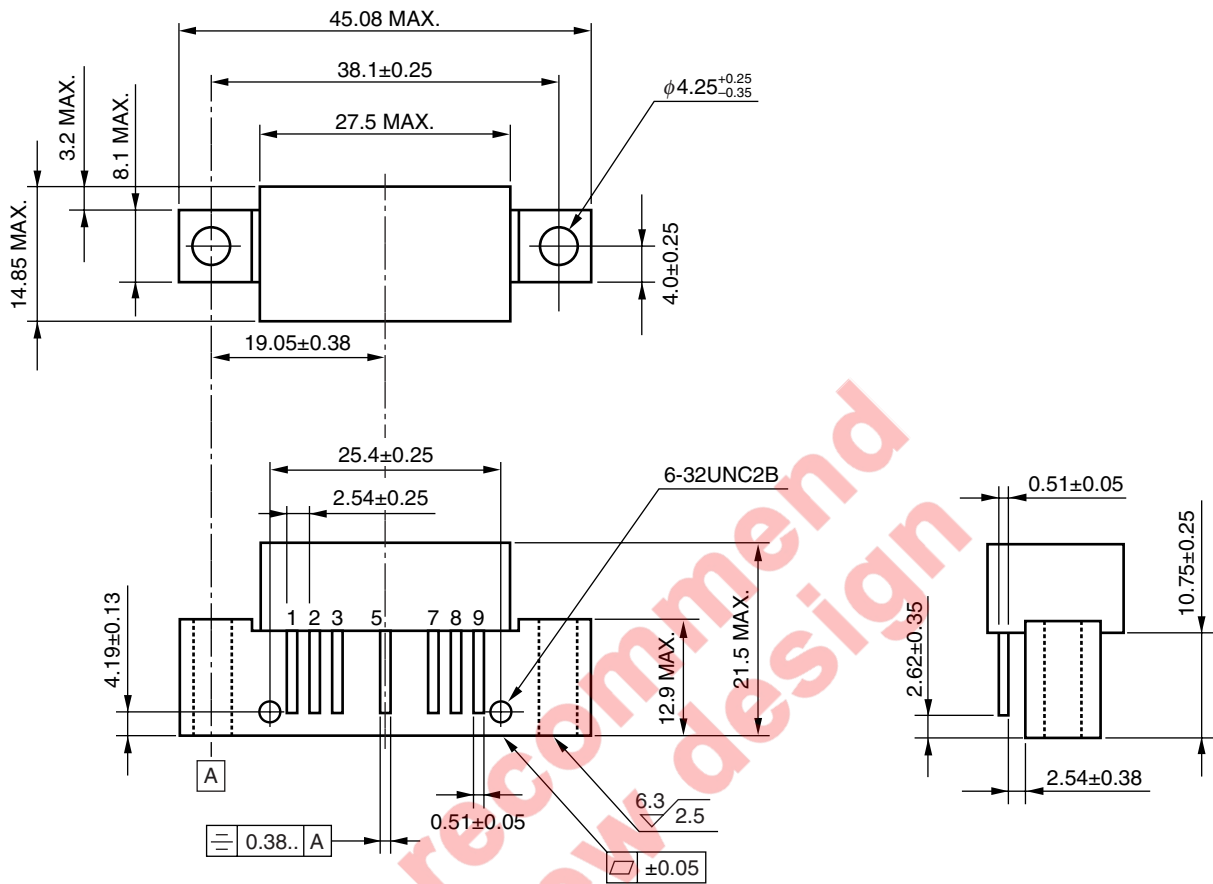
| Parameter | Symbol | Test Conditions | MIN. | TYP. | MAX. | Unit |
|----------------------------|----------|--|------|------|------|------|
| Supply Voltage | V_{DD} | | 23.5 | 24.0 | 24.5 | V |
| Input Voltage | V_i | 77 channel, 7 dB tilted across the band | – | 33.0 | 39.0 | dBmV |
| Operating Case 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)

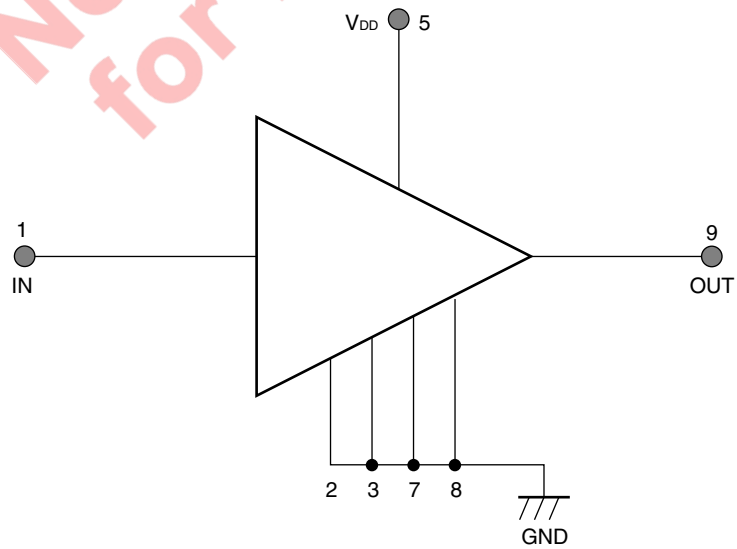
| Parameter | Symbol | Test Conditions | MIN. | TYP. | MAX. | Unit |
|--------------------------|----------------|---|------|------|------|------|
| Linear Gain 1 | G_{L1} | $f = 40 \text{ MHz}$ | 18.0 | – | 19.5 | dB |
| Linear Gain 2 | G_{L2} | $f = 1 \text{ GHz}$ | 18.5 | – | 20.0 | dB |
| Gain Slope | G_{Slope} | $f = 40 \text{ MHz to } 1 \text{ GHz}$ | 0.2 | – | 1.4 | dB |
| Gain Flatness | $G_{Flatness}$ | $f = 40 \text{ MHz to } 1 \text{ GHz}$, Peak to valley | – | – | 0.8 | dB |
| Noise Figure 1 | NF1 | $f = 50 \text{ MHz}$ | – | – | 6.5 | dB |
| Noise Figure 2 | NF2 | $f = 1 \text{ GHz}$ | – | – | 7.0 | 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 | $f = 40 \text{ MHz}$ | 21 | – | – | dB |
| Output Return Loss 2 | RLo2 | $f = 1 \text{ GHz}$ | 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.

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"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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|-----------------------|----------------------|---|
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|-----------------------|----------------------|---|

Not recommend for new design