

## 870 MHz CATV 25 dB POWER DOUBLER AMPLIFIER

## DESCRIPTION

The MC-7884 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  $G_L = 25.0$  dB MIN. @  $f = 870$  MHz
- Low return loss

## ORDERING INFORMATION

| Part Number | Package                     | Supplying Form   |
|-------------|-----------------------------|------------------|
| MC-7884     | 7-pin special with heatsink | 50 pcs MAX./Tray |

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

Part number for sample order: MC-7884

ABSOLUTE MAXIMUM RATINGS ( $T_A = +25^\circ\text{C}$ )

| Parameter                     | Symbol    | Ratings     | Unit             |
|-------------------------------|-----------|-------------|------------------|
| Supply Voltage                | $V_{DD}$  | 30          | V                |
| Input Voltage <sup>Note</sup> | $V_i$     | 65.0        | 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.

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Not all devices/types available in every country. Please check with local NEC Compound Semiconductor Devices representative for availability and additional information.

**RECOMMENDED OPERATING CONDITIONS ( $Z_S = Z_L = 75 \Omega$ )**

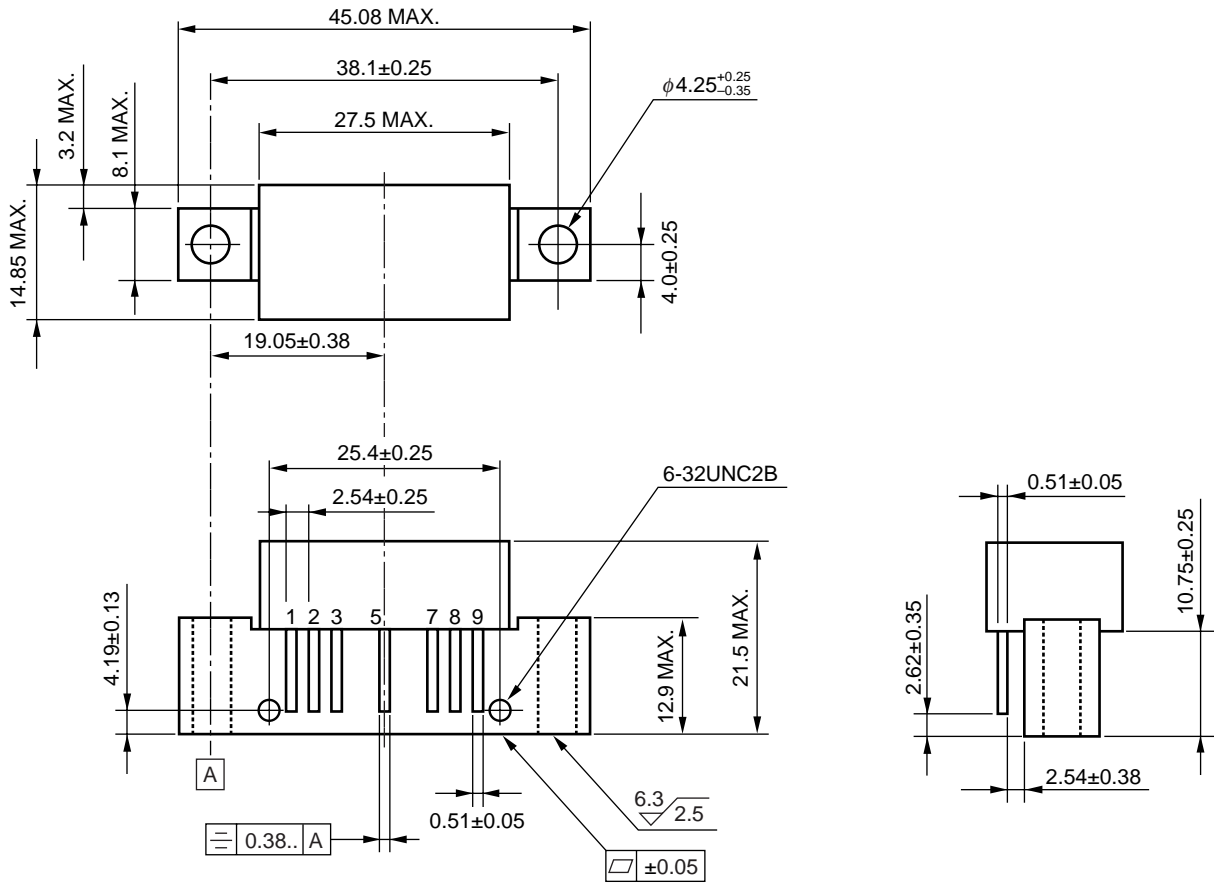
| Parameter                  | Symbol   | Test Conditions                              | MIN. | TYP. | MAX. | Unit |
|----------------------------|----------|--|------|------|------|------|
| Supply Voltage             | $V_{DD}$ |  | 23.5 | 24.0 | 24.5 | V    |
| Input Voltage              | $V_i$    | 110 channel,<br>10 dB tilted across the band | –    | 29.0 | 32.0 | dBmV |
| Operating Case Temperature | $T_c$    |  | –30  | +25  | +85  | °C   |

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

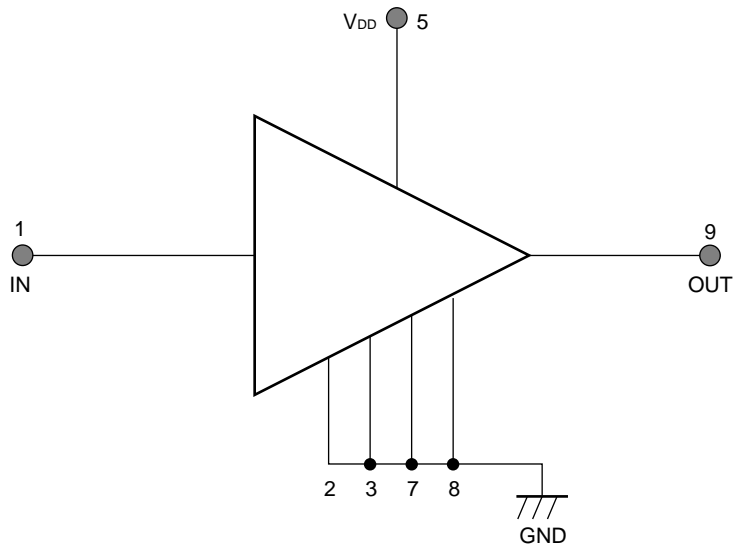
| Parameter                | Symbol                | Test Conditions                                       | MIN. | TYP. | MAX. | Unit |
|--------------------------|-----------------------|---|------|------|------|------|
| Linear Gain              | $G_L$                 | $f = 870 \text{ MHz}$                                 | 25.0 | –    | 26.0 | dB   |
| Gain Slope               | $G_{\text{slope}}$    | $f = 40 \text{ to } 870 \text{ MHz}$                  | 1.0  | 1.4  | 1.8  | dB   |
| Gain Flatness            | $G_{\text{flatness}}$ | $f = 40 \text{ to } 870 \text{ MHz}$ , Peak to valley | –    | –    | 0.6  | dB   |
| Noise Figure 1           | $NF_1$                | $f = 50 \text{ MHz}$                                  | –    | –    | 5.0  | dB   |
| Noise Figure 2           | $NF_2$                | $f = 870 \text{ MHz}$                                 | –    | –    | 5.5  | dB   |
| Operating Current        | $I_{DD}$              | RF OFF  | 310  | –    | 360  | mA   |
| Composite Triple Beat    | CTB                   | 110 channel,  | –    | –    | –60  | dBc  |
| Cross Modulation         | XM                    | $V_o = 52 \text{ dBmV}$ at 745.25 MHz,                | –    | –    | –55  | dBc  |
| Composite 2nd Order Beat | CSO                   | 10 dB tilted across the band                          | –    | –    | –63  | dBc  |
| Input Return Loss 1      | $RL_{i1}$             | $f = 40 \text{ to } 160 \text{ MHz}$                  | 20   | –    | –    | dB   |
| Input Return Loss 2      | $RL_{i2}$             | $f = 160 \text{ to } 320 \text{ MHz}$                 | 20   | –    | –    | dB   |
| Input Return Loss 3      | $RL_{i3}$             | $f = 320 \text{ to } 640 \text{ MHz}$                 | 19   | –    | –    | dB   |
| Input Return Loss 4      | $RL_{i4}$             | $f = 640 \text{ to } 870 \text{ MHz}$                 | 17   | –    | –    | dB   |
| Output Return Loss 1     | $RL_{o1}$             | $f = 40 \text{ to } 160 \text{ MHz}$                  | 20   | –    | –    | dB   |
| Output Return Loss 2     | $RL_{o2}$             | $f = 160 \text{ to } 320 \text{ MHz}$                 | 20   | –    | –    | dB   |
| Output Return Loss 3     | $RL_{o3}$             | $f = 320 \text{ to } 640 \text{ MHz}$                 | 19   | –    | –    | dB   |
| Output Return Loss 4     | $RL_{o4}$             | $f = 640 \text{ to } 870 \text{ MHz}$                 | 18   | –    | –    | 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><br>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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**SAFETY INFORMATION ON THIS PRODUCT**

|                       |                      |   |
|-----------------------|----------------------|---|
| <p><b>Caution</b></p> | <p>GaAs Products</p> | <p>The product contains gallium arsenide, GaAs.<br/>GaAs vapor and powder are hazardous to human health if inhaled or ingested.</p> <ul style="list-style-type: none"> <li>• Do not destroy or burn the product.</li> <li>• Do not cut or cleave off any part of the product.</li> <li>• Do not crush or chemically dissolve the product.</li> <li>• Do not put the product in the mouth.</li> </ul> <p>Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.</p> |
|-----------------------|----------------------|---|

► **Business issue**

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► **Technical issue**

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