

# CGD944C

870 MHz, 25 dB gain power doubler amplifier

Rev. 02 — 16 November 2009

Product data sheet

## 1. Product profile

### 1.1 General description

Hybrid amplifier module in a SOT115J package, operating at a supply voltage of 24 V (DC), employing Hetero Field Effect Transistor (HFET) GaAs dies.



This device is sensitive to ElectroStatic Discharge (ESD). Therefore care should be taken during transport and handling.

### 1.2 Features

- High output capability
- Excellent linearity
- Extremely low noise
- Excellent return loss properties
- Rugged construction
- Gold metallization ensures excellent reliability

### 1.3 Applications

- CATV systems operating in the 40 MHz to 870 MHz frequency range

### 1.4 Quick reference data

Table 1. Quick reference data

|           | Parameter     | Conditions            |       | Typ | Max | Unit |
|-----------|---------------|-----------------------|-------|-----|-----|------|
| $G_p$     | power gain    | $f = 870 \text{ MHz}$ | 24    | 25  | 26  | dB   |
| $I_{tot}$ | total current | $V_B = 24 \text{ V}$  | [1] - | 450 | -   | mA   |

[1] Direct Current (DC)

## 2. Pinning information

Table 2. Pinning

|      | Description     | Graphic symbol |
|------|-----------------|----------------|
| 1    | input           |                |
| 2, 3 | common          |                |
| 5    | +V <sub>B</sub> |                |
| 7, 8 | common          |                |
| 9    | output          |                |

## 3. Ordering information

Table 3. Ordering information

|         | Package |  |         |
|---------|---------|--|---------|
|         | Name    | Description  | Version |
| CGD944C | -       | rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 × 6-32 UNC and 2 extra horizontal mounting holes; 7 gold-plated in-line leads | SOT115J |

## 4. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

| Symbol             | Parameter                 | Conditions        | Max  | Unit |
|--------------------|---------------------------|-------------------|------|------|
| V <sub>B</sub>     | supply voltage            | -                 | 30   | V    |
| V <sub>i(RF)</sub> | RF input voltage          | single tone       | 75   | dBmV |
|                    |                           | 132 channels flat | 45   | dBmV |
| T <sub>stg</sub>   | storage temperature       | -40               | +100 | °C   |
| T <sub>mb</sub>    | mounting base temperature | -20               | +100 | °C   |

## 5. Characteristics

**Table 5. Characteristics**

Bandwidth to 870 MHz;  $V_B = 24$  V (DC);  $T_{mb} = 35$  °C; unless otherwise specified.

| Symbol     | Parameter                         | Conditions                 |       | Typ | Max | Unit |
|------------|-----------------------------------|----------------------------|-------|-----|-----|------|
| $G_p$      | power gain                        | f = 870 MHz                | 24    | 25  | 26  | dB   |
| $SL_{sl}$  | slope straight line               | f = 40 MHz to 870 MHz      | [1] 1 | -   | 2   | dB   |
| FL         | flatness of frequency response    | f = 40 MHz to 870 MHz      | [2] - | 0.5 | -   | dB   |
| CTB        | composite triple beat             | 79 + 53 flat NTSC channels | [3] - | -68 | -66 | dBc  |
|            |                                   | 98 flat PAL channels       | [4] - | -66 | -   | dBc  |
| CSO        | composite second-order distortion | 79 + 53 flat NTSC channels | [3] - | -70 | -67 | dBc  |
|            |                                   | 98 flat PAL channels       | [4] - | -66 | -   | dBc  |
| Xmod       | cross modulation                  | 79 + 53 flat NTSC channels | [3] - | -66 | -58 | dB   |
| $RL_{in}$  | input return loss                 | f = 40 MHz to 80 MHz       | 20    | -   | -   | dB   |
|            |                                   | f = 80 MHz to 160 MHz      | 19    | -   | -   | dB   |
|            |                                   | f = 160 MHz to 320 MHz     | 18    | -   | -   | dB   |
|            |                                   | f = 320 MHz to 640 MHz     | 18    | -   | -   | dB   |
|            |                                   | f = 640 MHz to 870 MHz     | 18    | -   | -   | dB   |
| $RL_{out}$ | output return loss                | f = 40 MHz to 80 MHz       | 20    | -   | -   | dB   |
|            |                                   | f = 80 MHz to 160 MHz      | 19    | -   | -   | dB   |
|            |                                   | f = 160 MHz to 320 MHz     | 18    | -   | -   | dB   |
|            |                                   | f = 320 MHz to 640 MHz     | 18    | -   | -   | dB   |
|            |                                   | f = 640 MHz to 870 MHz     | 18    | -   | -   | dB   |
| NF         | noise figure                      | f = 50 MHz                 | -     | 3.5 | 5.0 | dB   |
|            |                                   | f = 870 MHz                | -     | 3.5 | 5.0 | dB   |
| $I_{tot}$  | total current                     | $V_B = 24$ V               | [5] - | 450 | -   | mA   |

[1]  $G_p$  at 870 MHz minus  $G_p$  at 40 MHz.

[2] flatness straight line (peak to valley).

[3] 79 NTSC channels (5.25 MHz to 547.25 MHz, 48 dBmV output level) + 53 NTSC channels (553.25 MHz to 997.25 MHz, 38 dBmV output level).

[4]  $V_o = 48$  dBmV

[5] Direct Current (DC)

## 6. Package outline

Rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 x 6-32 UNC and 2 extra horizontal mounting holes; 7 gold-plated in-line leads

SOT115J

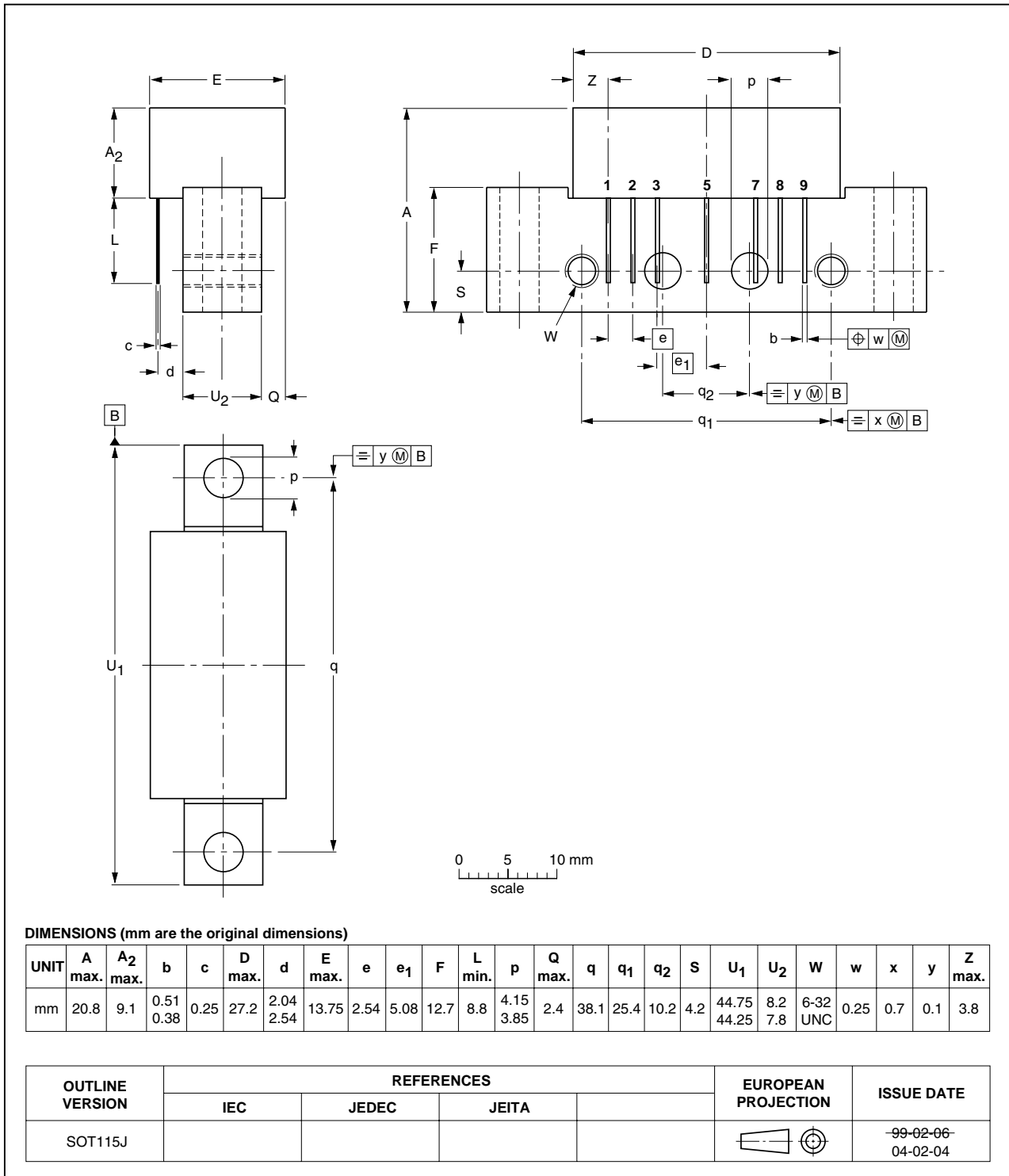


Fig 1. Package outline SOT115J

## 7. Abbreviations

**Table 6. Abbreviations**

| Acronym | Description                            |
|---------|--|
| CATV    | Community Antenna TeleVision           |
| DC      | Direct Current                         |
| GaAs    | Gallium-Arsenide                       |
| NTSC    | National Television Standard Committee |
| PAL     | Phase-Alternation Line                 |
| RF      | Radio Frequency                        |
| UNC     | UNified Coarse thread                  |

## 8. Revision history

**Table 7. Revision history**

|                | Release date | Data sheet status  | Change notice   | Supersedes |
|----------------|--------------|--------------------|---|------------|
| CGD944C_2      | 20091116     | Product data sheet | -   | CGD944C_1  |
| Modifications: |              |                    | <ul style="list-style-type: none"><li>• <a href="#">Table 5 on page 3</a>: Correction made to the unit of CTB.</li><li>• <a href="#">Table 5 on page 3</a>: Correction made to the unit of CSO.</li></ul> |            |
| CGD944C_1      | 20070606     | Product data sheet | -   | -          |

## 9. Legal information

### 9.1 Data sheet status

|                                |               |   |
|--------------------------------|---------------|---|
| Objective [short] data sheet   | Development   | This document contains data from the objective specification for product development. |
| Preliminary [short] data sheet | Qualification | This document contains data from the preliminary specification.                       |
| Product [short] data sheet     | Production    | This document contains the product specification.                                     |

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## 11. Contents

|           |                                   |          |
|-----------|-----------------------------------|----------|
| <b>1</b>  | <b>Product profile</b> .....      | <b>1</b> |
| 1.1       | General description .....         | 1        |
| 1.2       | Features .....                    | 1        |
| 1.3       | Applications .....                | 1        |
| 1.4       | Quick reference data .....        | 1        |
| <b>2</b>  | <b>Pinning information</b> .....  | <b>2</b> |
| <b>3</b>  | <b>Ordering information</b> ..... | <b>2</b> |
| <b>4</b>  | <b>Limiting values</b> .....      | <b>2</b> |
| <b>5</b>  | <b>Characteristics</b> .....      | <b>3</b> |
| <b>6</b>  | <b>Package outline</b> .....      | <b>4</b> |
| <b>7</b>  | <b>Abbreviations</b> .....        | <b>5</b> |
| <b>8</b>  | <b>Revision history</b> .....     | <b>5</b> |
| <b>9</b>  | <b>Legal information</b> .....    | <b>6</b> |
| 9.1       | Data sheet status .....           | 6        |
| 9.2       | Definitions .....                 | 6        |
| 9.3       | Disclaimers .....                 | 6        |
| 9.4       | Trademarks .....                  | 6        |
| <b>10</b> | <b>Contact information</b> .....  | <b>6</b> |
| <b>11</b> | <b>Contents</b> .....             | <b>7</b> |



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