



CGD944C

870 MHz, 25 dB gain power doubler amplifier

Rev. 4 — 25 June 2014

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.

1.2 Features and benefits

- 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

| Symbol | Parameter | Conditions | Min | 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

| Pin | Description | Simplified outline | Graphic symbol |
|------|-------------|--------------------|----------------|
| 1 | input | | |
| 2, 3 | common | | |
| 5 | + V_B | | |
| 7, 8 | common | | |
| 9 | output | | |



3. Ordering information

Table 3. Ordering information

| Type number | Package | | Version |
|-------------|---------|--|---------|
| | Name | Description | |
| 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 | Min | Max | Unit |
|-------------|---------------------------|-------------------|-----|------|------|
| V_B | supply voltage | | - | 30 | V |
| $V_{i(RF)}$ | RF input voltage | single tone | - | 75 | dBmV |
| | | 132 channels flat | - | 45 | dBmV |
| T_{stg} | storage temperature | | -40 | +100 | °C |
| T_{mb} | 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 | Min | 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 | |

Table 5. Characteristics ...continuedBandwidth to 870 MHz; $V_B = 24\text{ V (DC)}$; $T_{mb} = 35\text{ °C}$; unless otherwise specified.

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|-----------|---------------|-------------------------|-----|-----|-----|------|
| NF | noise figure | f = 50 MHz | - | 3.5 | 5.0 | dB |
| | | f = 870 MHz | - | 3.5 | 5.0 | dB |
| I_{tot} | total current | $V_B = 24\text{ V}$ [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 870 MHz, 38 dBmV output level).

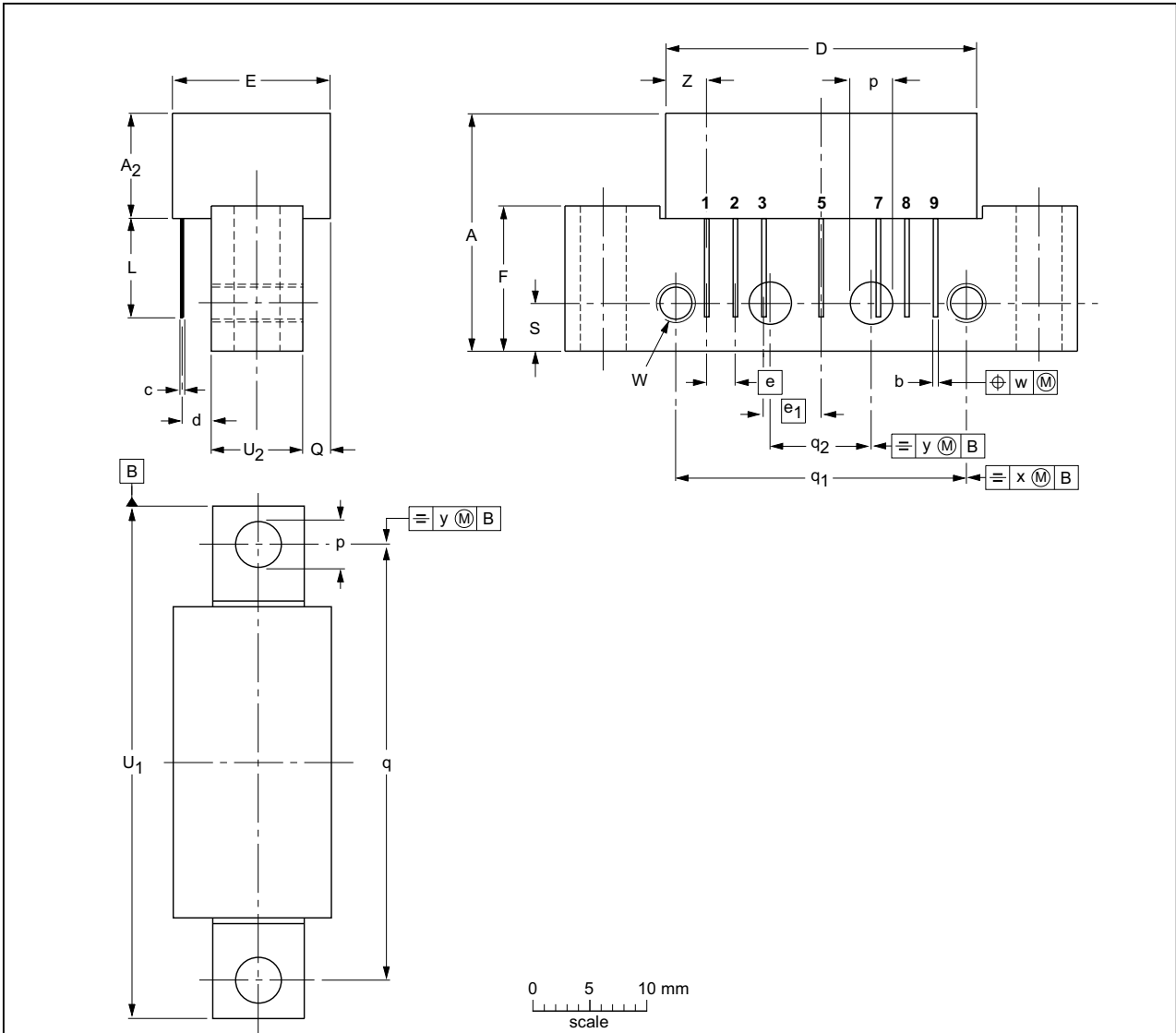
[4] $V_o = 48\text{ dBmV}$.

[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



DIMENSIONS (mm are the original dimensions)

| UNIT | A max. | A ₂ max. | b | c | D max. | d | E max. | e | e ₁ | F | L min. | p | Q max. | q | q ₁ | q ₂ | S | U ₁ | U ₂ | W | w | x | y | Z max. |
|------|--------|---------------------|--------------|------|--------|--------------|--------|------|----------------|------|--------|--------------|--------|------|----------------|----------------|-----|----------------|----------------|-------------|------|-----|-----|--------|
| mm | 20.8 | 9.5 | 0.51 0.38 | 0.25 | 27.2 | 2.04 2.54 | 13.75 | 2.54 | 5.08 | 12.7 | 8.8 | 4.15 3.85 | 2.4 | 38.1 | 25.4 | 10.2 | 4.2 | 44.75 44.25 | 8.2 7.8 | 6-32 UNC | 0.25 | 0.7 | 0.1 | 3.8 |

| OUTLINE VERSION | REFERENCES | | | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|-------|-------|---------------------|-----------------------|
| | IEC | JEDEC | JEITA | | |
| SOT115J | | | | | -04-02-04 10-06-18 |

Fig 1. Package outline SOT115J

7. Handling information

CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Observe precautions for handling electrostatic sensitive devices.

Such precautions are described in the *ANSI/ESD S20.20*, *IEC/ST 61340-5*, *JESD625-A* or equivalent standards.

8. 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 |

9. Revision history

Table 7. Revision history

| Document ID | Release date | Data sheet status | Change notice | Supersedes |
|----------------|--|--------------------|---------------|-------------|
| CGD944C v.4 | 20140625 | Product data sheet | - | CGD944C v.3 |
| Modifications: | <ul style="list-style-type: none"> • Table note 3 on page 3: 997.25 MHz has been changed to 870 MHz. • Section 7 on page 5: The ESD warning has been moved here from the front page. • Legal texts have been updated. | | | |
| CGD944C v.3 | 20100929 | Product data sheet | - | CGD944C v.2 |
| CGD944C v.2 | 20091116 | Product data sheet | - | CGD944C v.1 |
| CGD944C v.1 | 20070606 | Product data sheet | - | - |

10. Legal information

10.1 Data sheet status

| Document status ^{[1][2]} | Product status ^[3] | Definition |
|-----------------------------------|-------------------------------|---|
| 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. |

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

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Date of release: 25 June 2014

Document identifier: CGD944C