

# CGY888C

34 dB, 870 MHz GaAs push-pull forward amplifier

Rev. 4 — 28 September 2010

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 junction Field Effect Transistor (HFET) GaAs MMIC.

#### CAUTION



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

### 1.2 Features and benefits

- High gain
- Excellent linearity
- Superior levels of ESD protection
- Extremely low noise
- Excellent return loss properties
- Gain compensation over temperature
- Rugged construction
- Unconditionally stable
- Thermally optimized design
- Compliant with Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)
- Integrated ring wave surge protection

### 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**

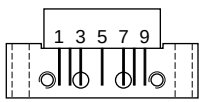
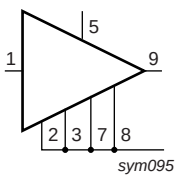
Bandwidth to 870 MHz;  $V_B = 24\text{ V (DC)}$ ;  $T_{mb} = 35\text{ }^{\circ}\text{C}$ ; unless otherwise specified.

| Symbol    | Parameter     | Conditions           | Min  | Typ | Max  | Unit |
|-----------|---------------|----------------------|------|-----|------|------|
| $G_p$     | power gain    | $f = 45\text{ MHz}$  | -    | 34  | -    | dB   |
|           |               | $f = 870\text{ MHz}$ | 34.5 | -   | 36.5 | dB   |
| $I_{tot}$ | total current | [1]                  | 260  | 280 | 300  | 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 |                                                                                                                                                                |         |
|-------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|             | Name    | Description                                                                                                                                                    | Version |
| CGY888C     | -       | 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                                               | -   | 70   | dBmV               |
| $V_{ESD}$   | electrostatic discharge voltage | Human Body Model (HBM); According JEDEC standard 22-A114E | -   | 2000 | V                  |
|             |                                 | Biased; According IEC61000-4-2                            | -   | 2000 | V                  |
| $T_{stg}$   | storage temperature             |                                                           | -40 | +100 | $^{\circ}\text{C}$ |
| $T_{mb}$    | mounting base temperature       |                                                           | -20 | +100 | $^{\circ}\text{C}$ |

## 5. Characteristics

**Table 5. Characteristics**

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

| Symbol     | Parameter                         | Conditions                             | Min     | Typ  | Max  | Unit |
|------------|-----------------------------------|----------------------------------------|---------|------|------|------|
| $G_p$      | power gain                        | $f = 45\text{ MHz}$                    | -       | 34   | -    | dB   |
|            |                                   | $f = 870\text{ MHz}$                   | 34.5    | -    | 36.5 | dB   |
| $SL_{sl}$  | slope straight line               | $f = 45\text{ MHz to }870\text{ MHz}$  | [1] -   | 1.5  | -    | dB   |
| FL         | flatness of frequency response    | $f = 45\text{ MHz to }870\text{ MHz}$  | [2] -   | 0.25 | -    | dB   |
| CTB        | composite triple beat             | 112 NTSC channels                      | [3] -   | -    | -65  | dBc  |
|            |                                   | 98 PAL channels                        | [4] -   | -68  | -    | dBc  |
| CSO        | composite second-order distortion | 112 NTSC channels                      | [3] -   | -    | -63  | dBc  |
|            |                                   | 98 PAL channels                        | [4] -   | -66  | -    | dBc  |
| Xmod       | cross modulation                  | 112 NTSC channels                      | [3] -   | -72  | -    | dB   |
| $RL_{in}$  | input return loss                 | $f = 45\text{ MHz to }320\text{ MHz}$  | 20      | -    | -    | dB   |
|            |                                   | $f = 320\text{ MHz to }870\text{ MHz}$ | 18      | -    | -    | dB   |
| $RL_{out}$ | output return loss                | $f = 45\text{ MHz to }320\text{ MHz}$  | 20      | -    | -    | dB   |
|            |                                   | $f = 320\text{ MHz to }870\text{ MHz}$ | 17      | -    | -    | dB   |
| NF         | noise figure                      | $f = 50\text{ MHz}$                    | -       | 3.5  | 4.0  | dB   |
|            |                                   | $f = 870\text{ MHz}$                   | -       | 4.0  | 5.0  | dB   |
| $I_{tot}$  | total current                     |                                        | [5] 260 | 280  | 300  | mA   |

[1]  $G_p$  at 870 MHz minus  $G_p$  at 45 MHz.

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

[3]  $f = 55.25\text{ MHz to }745.25\text{ MHz}$ ;  $V_o = 44\text{ dBmV}$ , flat output level.

[4]  $f = 49.75\text{ MHz to }847.25\text{ MHz}$ ;  $V_o = 44\text{ dBmV}$ , flat output level.

[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

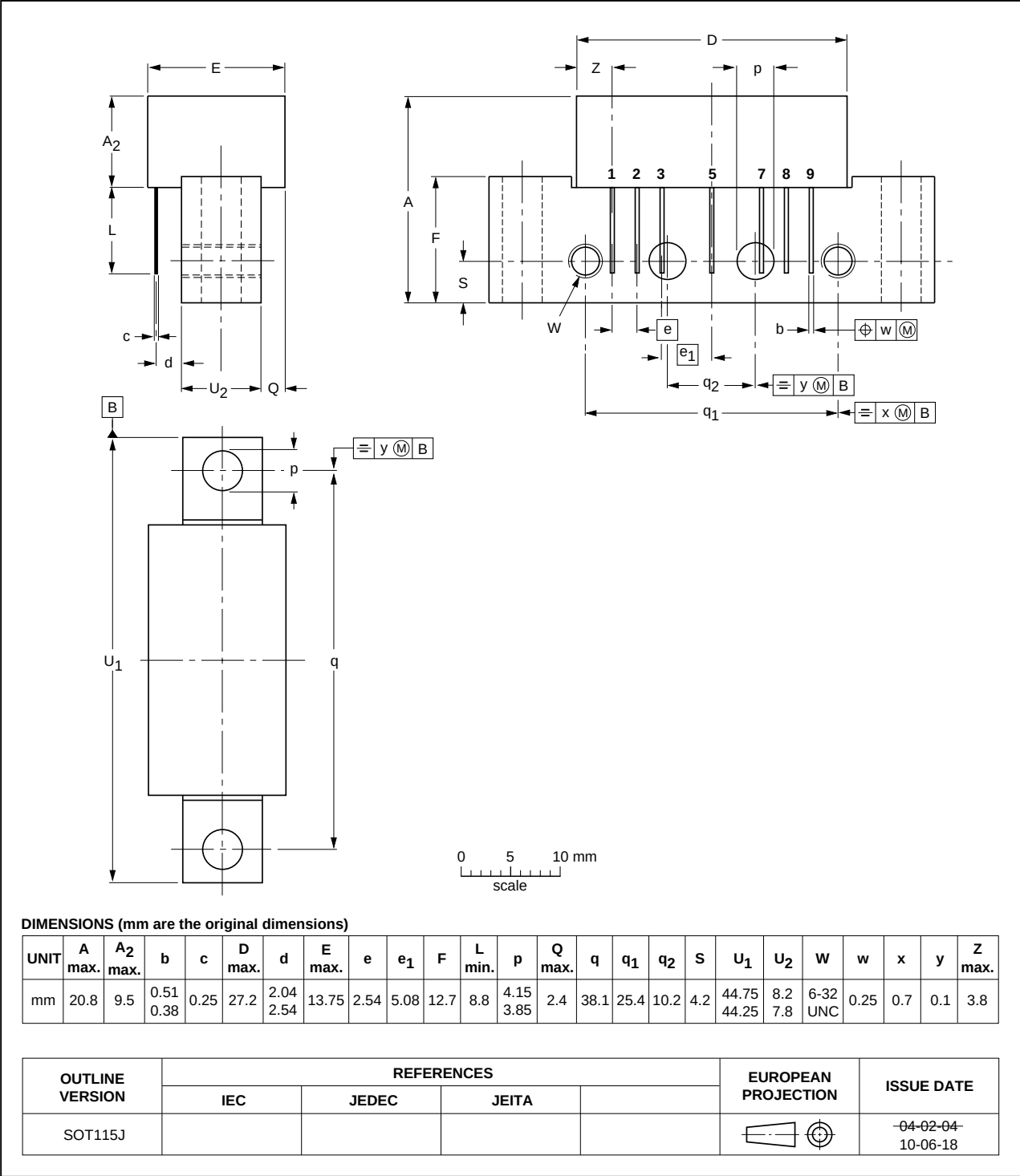


Fig 1. Package outline SOT115J

## 7. Abbreviations

Table 6. Abbreviations

| Acronym | Description                             |
|---------|-----------------------------------------|
| CATV    | Community Antenna TeleVision            |
| DC      | Direct Current                          |
| GaAs    | Gallium-Arsenide                        |
| MMIC    | Monolithic Microwave Integrated Circuit |
| NTSC    | National Television Standard Committee  |
| PAL     | Phase Alternating Line                  |
| RF      | Radio Frequency                         |
| UNC     | UNified Coarse                          |

## 8. Revision history

Table 7. Revision history

| Document ID    | Release date                                                                                                                                                 | Data sheet status  | Change notice | Supersedes  |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------|-------------|
| CGY888C v.4    | 20100928                                                                                                                                                     | Product data sheet | -             | CGY888C v.3 |
| Modifications: | <ul style="list-style-type: none"><li>• Package outline drawings have been updated to the latest version.</li><li>• Legal texts have been updated.</li></ul> |                    |               |             |
| CGY888C v.3    | 20091014                                                                                                                                                     | Product data sheet | -             | CGY888C v.2 |
| CGY888C v.2    | 20090921                                                                                                                                                     | Product data sheet | -             | CGY888C v.1 |
| CGY888C v.1    | 20080619                                                                                                                                                     | Product data sheet | -             | -           |

## 9. Legal information

### 9.1 Data sheet status

| Document status <sup>[1][2]</sup> | Product status <sup>[3]</sup> | 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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