

# CGY1032

1 GHz, 32 dB gain GaAs push-pull amplifier

Rev. 1 — 10 February 2011

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 Direct Current (DC), employing Heterojunction Field Effect Transistor (HFET) GaAs dies.

### 1.2 Features and benefits

- Excellent linearity, stability and reliability
- Extremely low noise
- Excellent return loss properties
- Rugged construction
- Unconditionally stable
- Thermally optimized design
- Superior levels of ESD protection
- Compliant to Directive 2002/95/EC, regarding Restriction of Hazardous Substances (RoHS)
- Integrated ring wave surge protection
- Power gain is specified for both 870 MHz and 1003 MHz bandwidth

### 1.3 Applications

- CATV systems operating in the 40 MHz to 1003 MHz frequency range

### 1.4 Quick reference data

**Table 1. Quick reference data**

Bandwidth 40 MHz to 1003 MHz;  $V_B = 24\text{ V (DC)}$ ;  $Z_S = Z_L = 75\ \Omega$ ;  $T_{mb} = 35\text{ }^\circ\text{C}$ ; unless otherwise specified.

| Symbol    | Parameter                  | Conditions             | Min   | Typ  | Max  | Unit |
|-----------|----------------------------|------------------------|-------|------|------|------|
| $G_p$     | power gain                 | $f = 45\text{ MHz}$    | 30.0  | 31.0 | 32.0 | dB   |
|           |                            | $f = 870\text{ MHz}$   | 31.4  | 32.4 | 33.4 | dB   |
|           |                            | $f = 1003\text{ MHz}$  | 32.0  | 33.0 | 34.0 | dB   |
| CTB       | composite triple beat      | $V_o = 44\text{ dBmV}$ | [1] - | -62  | -    | dBc  |
| CCN       | carrier-to-composite noise | $V_o = 44\text{ dBmV}$ | [1] - | 63   | -    | dBc  |
| $I_{tot}$ | total current              |                        | [2] - | 265  | 280  | mA   |

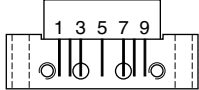
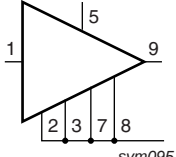
[1] 79 NTSC channels [ $f = 55.25\text{ MHz to }547.25\text{ MHz}$ ] + 75 digital channels [ $f = 547.25\text{ MHz to }1003\text{ MHz}$ ] (-6 dB offset); flat output level.

[2] Direct Current (DC).



## 2. Pinning information

Table 2. Pinning

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

## 3. Ordering information

Table 3. Ordering information

| Type number | Package |                                                                                                                                                                |         |
|-------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|             | Name    | Description                                                                                                                                                    | Version |
| CGY1032     | -       | 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 <sub>B</sub>     | supply voltage                  |                                                           | -   | 30   | V    |
| V <sub>i(RF)</sub> | RF input voltage                | single tone                                               | -   | 75   | dBmV |
| V <sub>ESD</sub>   | electrostatic discharge voltage | Human Body Model (HBM); According JEDEC standard 22-A114E | [1] | 2000 | V    |
|                    |                                 | Biased; According IEC61000-4-2                            | -   | 2000 | V    |
| T <sub>stg</sub>   | storage temperature             |                                                           | -40 | +100 | °C   |
| T <sub>mb</sub>    | mounting base temperature       |                                                           | -20 | +100 | °C   |

[1] The value of 2000 V corresponds to a class 2 classification.

## 5. Characteristics

**Table 5. Characteristics**

Bandwidth 40 MHz to 1003 MHz;  $V_B = 24$  V (DC);  $Z_S = Z_L = 75\ \Omega$ ;  $T_{mb} = 35\ ^\circ\text{C}$ ; unless otherwise specified.

| Symbol                                        | Parameter                         | Conditions                | Min  | Typ  | Max  | Unit    |
|-----------------------------------------------|-----------------------------------|---------------------------|------|------|------|---------|
| $G_p$                                         | power gain                        | $f = 45$ MHz              | 30.0 | 31.0 | 32.0 | dB      |
|                                               |                                   | $f = 870$ MHz             | 31.4 | 32.4 | 33.4 | dB      |
|                                               |                                   | $f = 1003$ MHz            | 32.0 | 33.0 | 34.0 | dB      |
| $SL_{sl}$                                     | slope straight line               | $f = 45$ MHz to 1003 MHz  | [1]  | 1.05 | 1.8  | dB      |
| FL                                            | flatness of frequency response    | $f = 45$ MHz to 1003 MHz  | [2]  | -    | -    | 0.85 dB |
| $RL_{in}$                                     | input return loss                 | $f = 45$ MHz to 200 MHz   | 20   | -    | -    | dB      |
|                                               |                                   | $f = 200$ MHz to 550 MHz  | 20   | -    | -    | dB      |
|                                               |                                   | $f = 550$ MHz to 870 MHz  | 20   | -    | -    | dB      |
|                                               |                                   | $f = 870$ MHz to 914 MHz  | 20   | -    | -    | dB      |
|                                               |                                   | $f = 914$ MHz to 1003 MHz | 16   | -    | -    | dB      |
| $RL_{out}$                                    | output return loss                | $f = 45$ MHz to 200 MHz   | 18   | -    | -    | dB      |
|                                               |                                   | $f = 200$ MHz to 550 MHz  | 18   | -    | -    | dB      |
|                                               |                                   | $f = 550$ MHz to 870 MHz  | 18   | -    | -    | dB      |
|                                               |                                   | $f = 870$ MHz to 914 MHz  | 18   | -    | -    | dB      |
|                                               |                                   | $f = 914$ MHz to 1003 MHz | 16   | -    | -    | dB      |
| NF                                            | noise figure                      | $f = 50$ MHz              | -    | 3.4  | 4.0  | dB      |
|                                               |                                   | $f = 1003$ MHz            | -    | 4.4  | 4.9  | dB      |
| $I_{tot}$                                     | total current                     |                           | [3]  | -    | 265  | 280 mA  |
| <b>79 NTSC channels + 75 digital channels</b> |                                   |                           |      |      |      |         |
| CTB                                           | composite triple beat             | $V_o = 44$ dBmV           | [4]  | -    | -62  | - dBc   |
| CSO                                           | composite second-order distortion | $V_o = 44$ dBmV           | [4]  | -    | -64  | - dBc   |
| Xmod                                          | cross modulation                  | $V_o = 44$ dBmV           | [4]  | -    | -58  | - dB    |
| CCN                                           | carrier-to-composite noise        | $V_o = 44$ dBmV           | [4]  | -    | 63   | - dBc   |
| <b>79 NTSC channels</b>                       |                                   |                           |      |      |      |         |
| CTB                                           | composite triple beat             | $V_o = 44$ dBmV           | [5]  | -    | -    | -62 dBc |
| CSO                                           | composite second-order distortion | $V_o = 44$ dBmV           | [5]  | -    | -    | -64 dBc |
| Xmod                                          | cross modulation                  | $V_o = 44$ dBmV           | [5]  | -    | -58  | - dB    |
| <b>98 PAL channels</b>                        |                                   |                           |      |      |      |         |
| CTB                                           | composite triple beat             | $V_o = 44$ dBmV           | [6]  | -    | -68  | - dBc   |
| CSO                                           | composite second-order distortion | $V_o = 44$ dBmV           | [6]  | -    | -66  | - dBc   |
| Xmod                                          | cross modulation                  | $V_o = 44$ dBmV           | [6]  | -    | -58  | - dB    |

[1]  $G_p$  at 1003 MHz minus  $G_p$  at 45 MHz.

[2] Flatness is defined as peak deviation to straight line.

[3] Direct Current (DC).

[4] 79 NTSC channels [ $f = 55.25$  MHz to 547.25 MHz] + 75 digital channels [ $f = 547.25$  MHz to 1003 MHz] (-6 dB offset); flat output level.

[5] 79 NTSC channels [ $f = 55.25$  MHz to 550 MHz]; flat output level.

[6] 98 PAL channels [ $f = 49.75$  MHz to 847.25 MHz]; flat output level.

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

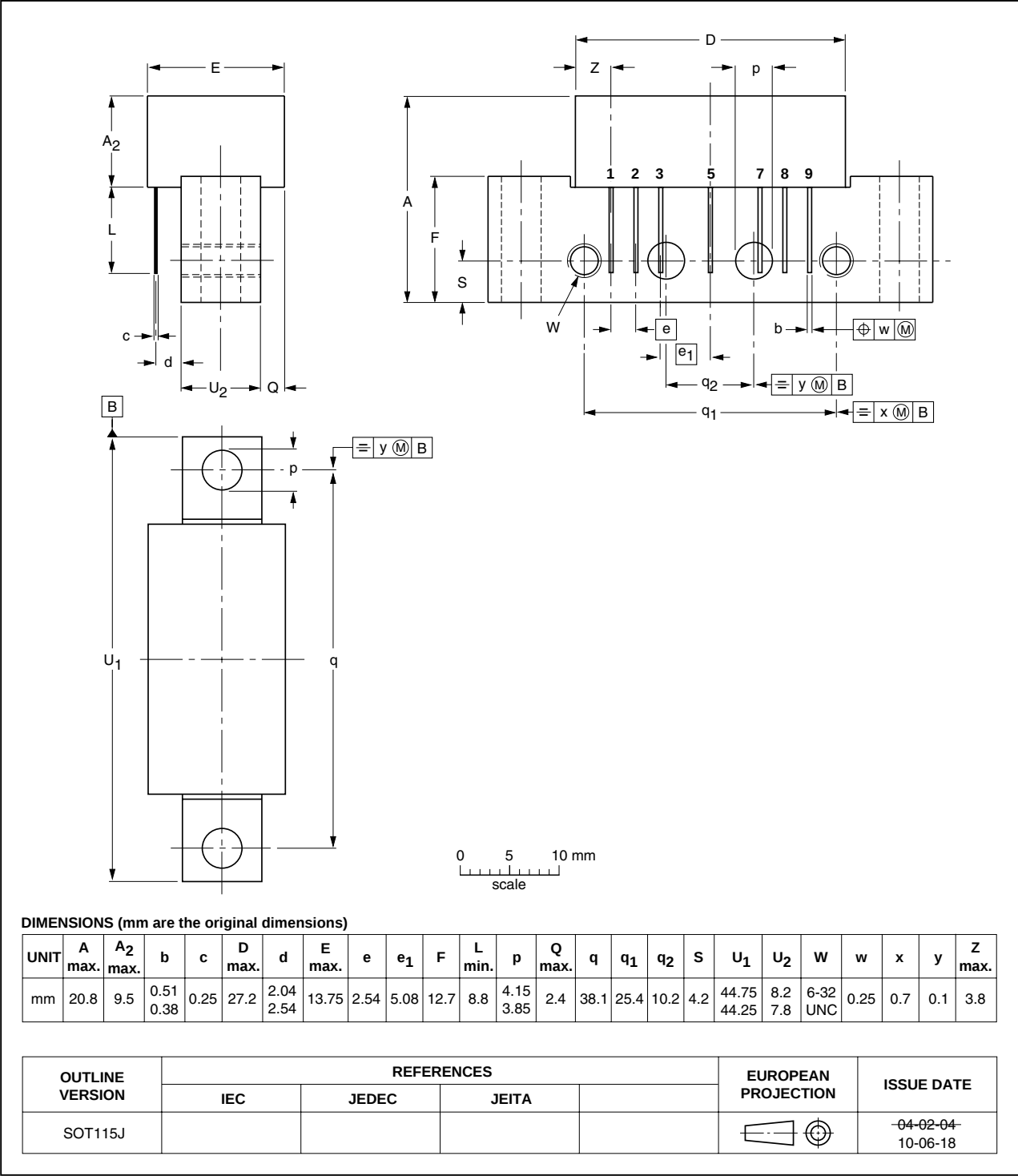


Fig 1. Package outline SOT115J

## 7. Abbreviations

Table 6. Abbreviations

| Acronym | Description                            |
|---------|----------------------------------------|
| CATV    | Community Antenna TeleVision           |
| ESD     | ElectroStatic Discharge                |
| GaAs    | Gallium Arsenide                       |
| 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 |
|-------------|--------------|--------------------|---------------|------------|
| CGY1032 v.1 | 20110210     | 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. |
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