# 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 V (DC); $Z_S = Z_L$ = 75 Ω; $T_{mb}$ = 35 °C; unless otherwise specified.*

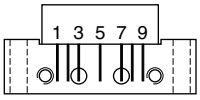
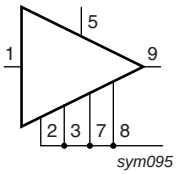
| Symbol | Parameter | Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|
| $G_p$ | power gain | f = 45 MHz | | 30.0 | 31.0 | 32.0 | dB |
| | | f = 870 MHz | | 31.4 | 32.4 | 33.4 | dB |
| | | f = 1003 MHz | | 32.0 | 33.0 | 34.0 | dB |
| CTB | composite triple beat | $V_o$ = 44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

[1] 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.

[2] 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 |
| 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 |
|---|---|---|---|---|---|---|
| $V_B$ | supply voltage | | | - | 30 | V |
| $V_{i(RF)}$ | RF input voltage | single tone | | - | 75 | dBmV |
| $V_{ESD}$ | electrostatic discharge voltage | Human Body Model (HBM); According JEDEC standard 22-A114E | [1] | - | 2000 | V |
| | | Biased; According IEC61000-4-2 | | - | 2000 | V |
| $T_{stg}$ | storage temperature | | | −40 | +100 | °C |
| $T_{mb}$ | mounting base temperature | | | −20 | +100 | °C |

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


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# 5. Characteristics

**Table 5. Characteristics**

*Bandwidth 40 MHz to 1003 MHz; $V_B$ = 24 V (DC); $Z_S = Z_L$ = 75 Ω; $T_{mb}$ = 35 °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 | 2.55 | 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 |
| **79 NTSC channels + 75 digital channels** | | | | | | | |
| 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 |
| **79 NTSC channels** | | | | | | | |
| 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 |
| **98 PAL channels** | | | | | | | |
| 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.

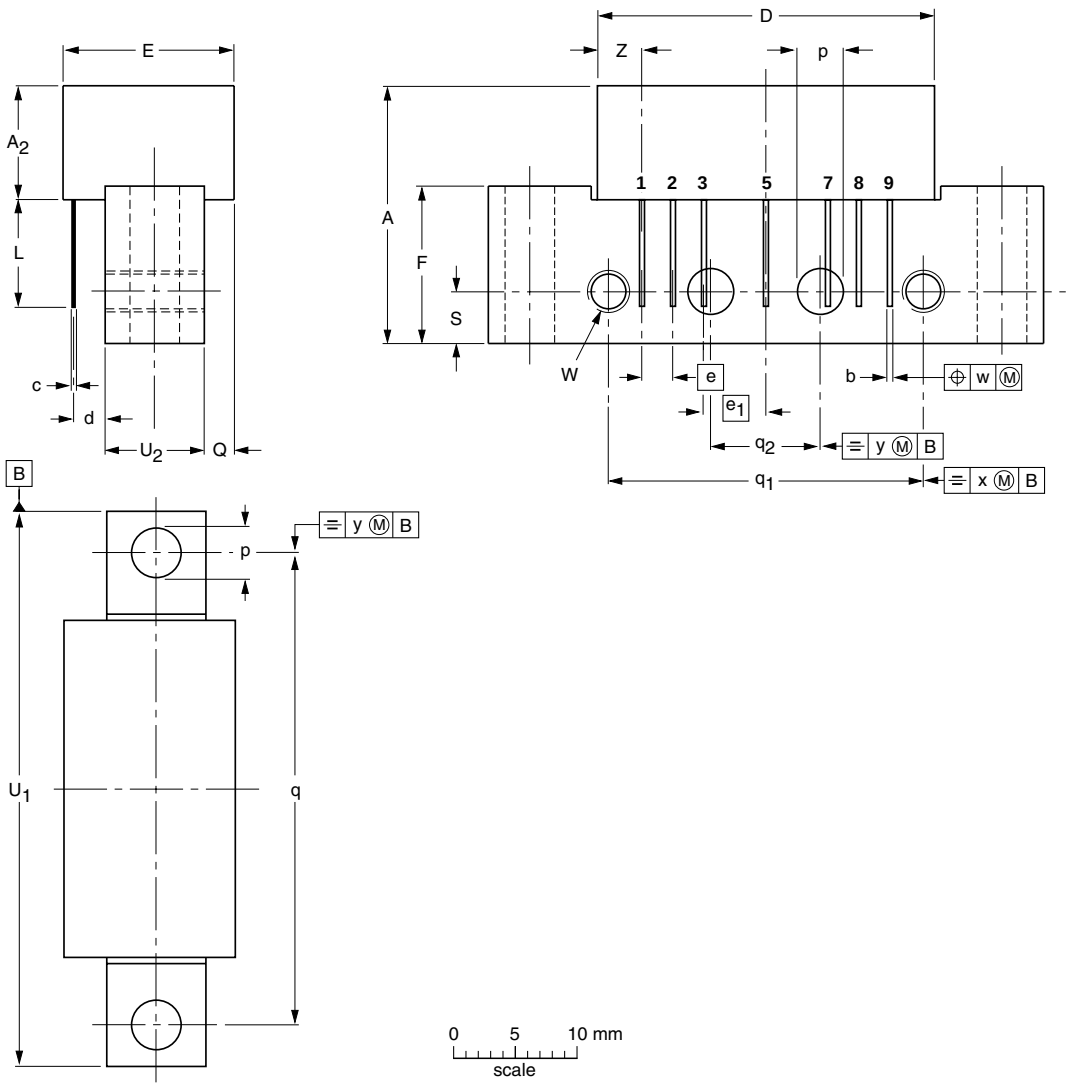
[6] 98 PAL channels [f = 49.75 MHz to 847.25 MHz]; flat output level.


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## 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<br>0.38 | 0.25 | 27.2 | 2.04<br>2.54 | 13.75 | 2.54 | 5.08 | 12.7 | 8.8 | 4.15<br>3.85 | 2.4 | 38.1 | 25.4 | 10.2 | 4.2 | 44.75<br>44.25 | 8.2<br>7.8 | 6-32<br>UNC | 0.25 | 0.7 | 0.1 | 3.8 |

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

**Fig 1. Package outline SOT115J**


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# 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 | - | - |


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| 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. |
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[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: 10 February 2011**
**Document identifier: CGY1032**