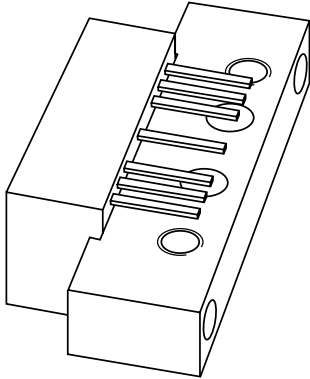


# DATA SHEET



## **CGD914** CATV amplifier module

Preliminary specification

1999 Nov 12

# CATV amplifier module

# CGD914

## FEATURES

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

## APPLICATIONS

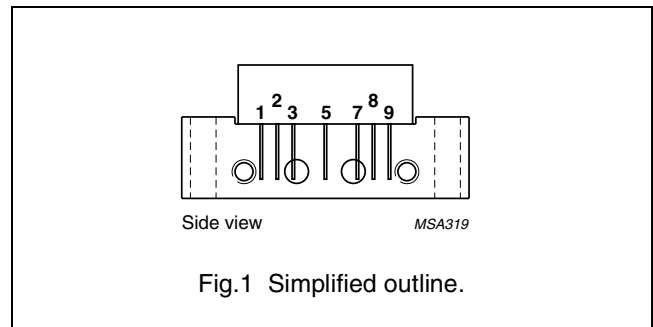
- CATV systems operating in the 40 to 870 MHz frequency range.

## DESCRIPTION

Hybrid amplifier module in a SOT115J package operating with a voltage supply of 24 V (DC), employing both GaAs and Si dies.

## PINNING - SOT115J

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



## QUICK REFERENCE DATA

| SYMBOL           | PARAMETER                      | CONDITIONS            | MIN.  | MAX.  | UNIT |
|------------------|--------------------------------|-----------------------|-------|-------|------|
| G <sub>p</sub>   | power gain                     | f = 45 MHz            | 19.75 | 20.25 | dB   |
|                  |                                | f = 870 MHz           | 20.2  | 21.5  | dB   |
| I <sub>tot</sub> | total current consumption (DC) | V <sub>B</sub> = 24 V | 345   | 375   | mA   |

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

| SYMBOL           | PARAMETER                           | MIN. | MAX. | UNIT |
|------------------|-------------------------------------|------|------|------|
| V <sub>B</sub>   | supply voltage                      | –    | 30   | V    |
| V <sub>i</sub>   | RF input voltage                    | –    | 65   | dBmV |
| T <sub>stg</sub> | storage temperature                 | –40  | +100 | °C   |
| T <sub>mb</sub>  | operating mounting base temperature | –20  | +100 | °C   |

## CATV amplifier module

## CGD914

**CHARACTERISTICS**Bandwidth 45 to 870 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75 \Omega$ 

| SYMBOL           | PARAMETER              | CONDITIONS  | MIN.  | TYP. | MAX.  | UNIT |
|------------------|------------------------|---|-------|------|-------|------|
| G <sub>p</sub>   | power gain             | f = 45MHz   | 19.75 | 20   | 20.25 | dB   |
|                  |                        | f = 870 MHz   | 20.2  | 21   | 21.5  | dB   |
| SL               | slope straight line    | f = 45 to 870 MHz   | 0.2   | 1    | 1.5   | dB   |
| FL               | flatness straight line | f = 45 to 870 MHz   | –     | –    | ±0.45 | dB   |
|                  | flatness narrow band   | in each 6 MHz segment   | –     | –    | ±0.1  | dB   |
| S <sub>11</sub>  | input return losses    | f = 40 to 80 MHz  | 20    | –    | –     | dB   |
|                  |                        | f = 80 to 160 MHz   | 19    | –    | –     | dB   |
|                  |                        | f = 160 to 320 MHz  | 18    | –    | –     | dB   |
|                  |                        | f = 320 to 550 MHz  | 16    | –    | –     | dB   |
|                  |                        | f = 550 to 650 MHz  | 15    | –    | –     | dB   |
|                  |                        | f = 650 to 750 MHz  | 14    | –    | –     | dB   |
|                  |                        | f = 750 to 870 MHz  | 14    | –    | –     | dB   |
|                  |                        | f = 870 to 914 MHz  | 10    | –    | –     | dB   |
| S <sub>22</sub>  | output return losses   | f = 40 to 80 MHz  | 21    | –    | –     | dB   |
|                  |                        | f = 80 to 160 MHz   | 21    | –    | –     | dB   |
|                  |                        | f = 160 to 320 MHz  | 20    | –    | –     | dB   |
|                  |                        | f = 320 to 550 MHz  | 19    | –    | –     | dB   |
|                  |                        | f = 550 to 650 MHz  | 18    | –    | –     | dB   |
|                  |                        | f = 650 to 750 MHz  | 17    | –    | –     | dB   |
|                  |                        | f = 750 to 870 MHz  | 16    | –    | –     | dB   |
|                  |                        | f = 870 to 914 MHz  | 14    | –    | –     | dB   |
| S <sub>21</sub>  | phase response         | f = 50 MHz  | –45   | –    | +45   | deg  |
| S <sub>12</sub>  | reverse isolation      | RF <sub>out</sub> to RF <sub>in</sub>                               | –     | –    | 21    | dB   |
| CTB              | composite triple beat  | 79 chs; f <sub>m</sub> = 445.25 MHz; note 1                         | –     | –    | –76   | dB   |
|                  |                        | 112 chs; f <sub>m</sub> = 649.25 MHz; note 2                        | –     | –    | –63   | dB   |
|                  |                        | 132 chs; f <sub>m</sub> = 745.25 MHz; note 3                        | –     | –    | –55   | dB   |
|                  |                        | 79 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 547.25 MHz  | –     | –    | –73   | dB   |
|                  |                        | 112 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 745.25 MHz | –     | –    | –63   | dB   |
|                  |                        | 132 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 745.25 MHz | –     | –    | –59.5 | dB   |
| X <sub>mod</sub> | cross modulation       | 79 chs; f <sub>m</sub> = 55.25 MHz; note 1                          | –     | –    | –73   | dB   |
|                  |                        | 112 chs; f <sub>m</sub> = 55.25 MHz; note 2                         | –     | –    | –64   | dB   |
|                  |                        | 132 chs; f <sub>m</sub> = 55.25 MHz; note 3                         | –     | –    | –58   | dB   |
|                  |                        | 79 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz   | –     | –    | –71   | dB   |
|                  |                        | 112 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz  | –     | –    | –67   | dB   |
|                  |                        | 132 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz  | –     | –    | –64   | dB   |

## CATV amplifier module

## CGD914

| SYMBOL    | PARAMETER                                | CONDITIONS                                       | MIN. | TYP. | MAX. | UNIT |
|-----------|--|--|------|------|------|------|
| CSO Sum   | composite second order distortion (sum)  | 79 chs; $f_m = 446.5$ MHz; note 1                | –    | –    | –70  | dB   |
|           |  | 112 chs; $f_m = 746.5$ MHz; note 2               | –    | –    | –60  | dB   |
|           |  | 132 chs; $f_m = 860.5$ MHz; note 3               | –    | –    | –56  | dB   |
|           |  | 79 chs flat; $V_o = 44$ dBmV; $f_m = 548.5$ MHz  | –    | –    | –61  | dB   |
|           |  | 112 chs flat; $V_o = 44$ dBmV; $f_m = 746.5$ MHz | –    | –    | –52  | dB   |
|           |  | 132 chs flat; $V_o = 44$ dBmV; $f_m = 860.5$ MHz | –    | –    | –50  | dB   |
| CSO Diff  | composite second order distortion (diff) | 79 chs; $f_m = 150$ MHz; note 1                  | –    | –    | –58  | dB   |
|           |  | 112 chs; $f_m = 150$ MHz; note 2                 | –    | –    | –52  | dB   |
|           |  | 132 chs; $f_m = 150$ MHz; note 3                 | –    | –    | –48  | dB   |
|           |  | 79 chs flat; $V_o = 44$ dBmV; $f_m = 150$ MHz    | –    | –    | –58  | dB   |
|           |  | 112 chs flat; $V_o = 44$ dBmV; $f_m = 150$ MHz   | –    | –    | –56  | dB   |
|           |  | 132 chs flat; $V_o = 44$ dBmV; $f_m = 150$ MHz   | –    | –    | –55  | dB   |
| NF        | noise figure                             | $f = 50$ MHz                                     | –    | 2.5  | 3.5  | dB   |
|           |  | $f = 550$ MHz                                    | –    | 2.5  | 3.2  | dB   |
|           |  | $f = 750$ MHz                                    | –    | 2.6  | 3.5  | dB   |
|           |  | $f = 870$ MHz                                    | –    | 3    | 4    | dB   |
| $I_{tot}$ | total current consumption (DC)           | note 4   | 345  | 360  | 375  | mA   |

**Notes**

1.  $V_o = 38$  dBmV at 54 MHz; Tilt = 7.3 dB (55 to 547 MHz) extrapolated to 12 dB at 870 MHz.
2.  $V_o = 38$  dBmV at 54 MHz; Tilt = 10.2 dB (55 to 745 MHz) extrapolated to 12 dB at 870 MHz.
3.  $V_o = 38$  dBmV at 54 MHz; Tilt = 12 dB (55 to 865 MHz).
4. The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

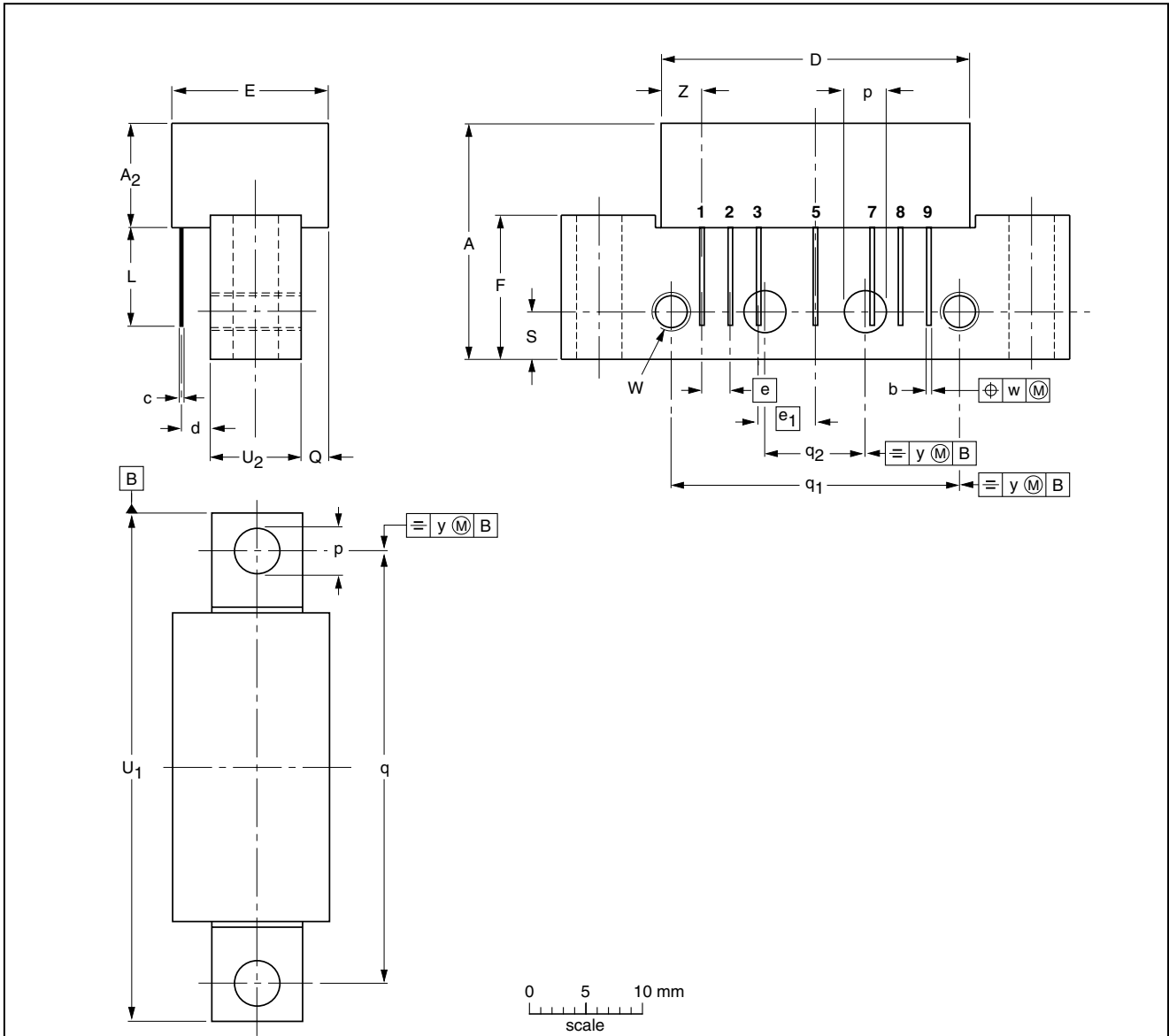
CATV amplifier module

CGD914

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 <sub>2</sub> max. | b            | c    | D max. | d max. | E max. | e    | e <sub>1</sub> | F    | L min. | p            | Q max. | q    | q <sub>1</sub> | q <sub>2</sub> | S   | U <sub>1</sub> max. | U <sub>2</sub> | W           | w    | y   | Z max. |
|------|--------|---------------------|--------------|------|--------|--------|--------|------|----------------|------|--------|--------------|--------|------|----------------|----------------|-----|---------------------|----------------|-------------|------|-----|--------|
| mm   | 20.8   | 9.1                 | 0.51<br>0.38 | 0.25 | 27.2   | 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               | 8              | 6-32<br>UNC | 0.25 | 0.1 | 3.8    |

| OUTLINE VERSION | REFERENCES |       |      |  | EUROPEAN PROJECTION | ISSUE DATE |
|-----------------|------------|-------|------|--|---------------------|------------|
|                 | IEC        | JEDEC | EIAJ |  |                     |            |
| SOT115J         |            |       |      |  |                     | 99-02-06   |

## CATV amplifier module

CGD914

**DEFINITIONS**

|   |   |
|---|---|
| <b>Data Sheet Status</b>  |   |
| Objective specification   | This data sheet contains target or goal specifications for product development.       |
| Preliminary specification   | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification   | This data sheet contains final product specifications.                                |
| <b>Limiting values</b>  |   |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability. |   |
| <b>Application information</b>  |   |
| Where application information is given, it is advisory and does not form part of the specification.   |   |

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