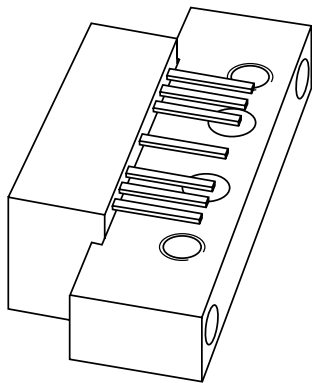


DATA SHEET



BGD802; BGD802MI CATV amplifier modules

Product specification
Supersedes data of 1998 Mar 13

1999 Mar 26

CATV amplifier modules

BGD802; BGD802MI

FEATURES

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

APPLICATIONS

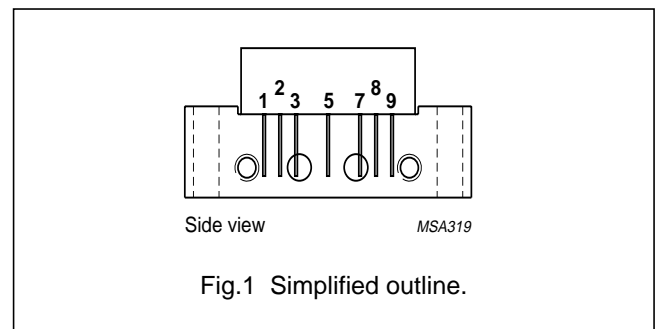
- CATV systems operating in the 40 to 860 MHz frequency range.

DESCRIPTION

Hybrid amplifier modules in a SOT115J package operating with a voltage supply of 24 V (DC). Both modules are electrically identical, only the pinning is different.

PINNING - SOT115J

| PIN | DESCRIPTION | |
|-----|-----------------|-----------------|
| | BGD802 | BGD802MI |
| 1 | input | output |
| 2 | common | common |
| 3 | common | common |
| 5 | +V _B | +V _B |
| 7 | common | common |
| 8 | common | common |
| 9 | output | input |



QUICK REFERENCE DATA

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|------------------|--------------------------------|-----------------------|------|------|------|
| G _p | power gain | f = 50 MHz | 18 | 19 | dB |
| | | f = 860 MHz | 18.5 | – | dB |
| I _{tot} | total current consumption (DC) | V _B = 24 V | – | 410 | mA |

LIMITING VALUES

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

| SYMBOL | PARAMETER | MIN. | MAX. | UNIT |
|------------------|-------------------------------------|------|------|------|
| V _B | supply voltage | – | 25 | V |
| V _i | RF input voltage | – | 65 | dBmV |
| T _{stg} | storage temperature | –40 | +100 | °C |
| T _{mb} | operating mounting base temperature | –20 | +100 | °C |

CATV amplifier modules

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CHARACTERISTICS

Table 1 Bandwidth 40 to 860 MHz; $V_B = 24$ V; $T_{case} = 35$ °C; $Z_S = Z_L = 75$ Ω

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------|-----------------------------------|--------------------------------------------------------------|------|-----------|-----------|------|
| G_p | power gain | f = 50 MHz | 18 | 18.5 | 19 | dB |
| | | f = 860 MHz | 18.5 | 19.5 | – | dB |
| SL | slope cable equivalent | f = 40 to 860 MHz | 0.2 | 1.1 | 2 | dB |
| FL | flatness of frequency response | f = 40 to 860 MHz | – | ± 0.2 | ± 0.5 | dB |
| S_{11} | input return losses | f = 40 to 80 MHz | 20 | 35 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 31 | – | dB |
| | | f = 160 to 320 MHz | 17 | 27 | – | dB |
| | | f = 320 to 640 MHz | 15.5 | 22 | – | dB |
| | | f = 640 to 860 MHz | 14 | 20 | – | dB |
| S_{22} | output return losses | f = 40 to 80 MHz | 20 | 29.5 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 29 | – | dB |
| | | f = 160 to 320 MHz | 17 | 25.5 | – | dB |
| | | f = 320 to 640 MHz | 15.5 | 23 | – | dB |
| | | f = 640 to 860 MHz | 14 | 22 | – | dB |
| S_{21} | phase response | f = 50 MHz | –45 | – | +45 | deg |
| CTB | composite triple beat | 49 channels flat; $V_o = 47$ dBmV; measured at 859.25 MHz | – | –66 | –63 | dB |
| X_{mod} | cross modulation | 49 channels flat; $V_o = 47$ dBmV; measured at 55.25 MHz | – | –65 | –62 | dB |
| CSO | composite second order distortion | 49 channels flat; $V_o = 47$ dBmV; measured at 860.5 MHz | – | –67.5 | –60 | dB |
| d_2 | second order distortion | note 1 | – | –75 | –69 | dB |
| V_o | output voltage | $d_{im} = -60$ dB; note 2 | 61.5 | 63.5 | – | dBmV |
| F | noise figure | f = 50 MHz | – | 4.5 | 5.5 | dB |
| | | f = 550 MHz | – | – | 6 | dB |
| | | f = 650 MHz | – | – | 7 | dB |
| | | f = 750 MHz | – | – | 7.5 | dB |
| | | f = 860 MHz | – | 6.5 | 9 | dB |
| I_{tot} | total current consumption (DC) | note 3 | – | 395 | 410 | mA |

Notes

- $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 805.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 860.5$ MHz.
- Measured according to DIN45004B:
 $f_p = 851.25$ MHz; $V_p = V_o$;
 $f_q = 858.25$ MHz; $V_q = V_o - 6$ dB;
 $f_r = 860.25$ MHz; $V_r = V_o - 6$ dB;
measured at $f_p + f_q - f_r = 849.25$ MHz.
- The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

CATV amplifier modules

BGD802; BGD802MI

Table 2 Bandwidth 40 to 860 MHz; $V_B = 24$ V; $T_{case} = 30$ °C; $Z_S = Z_L = 75$ Ω

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|------------------|-----------------------------------|---------------------------------------------------------------------------|------|-------|------|------|
| G _p | power gain | f = 50 MHz | 18 | 18.5 | 19 | dB |
| | | f = 860 MHz | 18.5 | 19.5 | – | dB |
| SL | slope cable equivalent | f = 40 to 860 MHz | 0.2 | 1.1 | 2 | dB |
| FL | flatness of frequency response | f = 40 to 860 MHz | – | ±0.2 | ±0.5 | dB |
| S ₁₁ | input return losses | f = 40 to 80 MHz | 20 | 35 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 31 | – | dB |
| | | f = 160 to 320 MHz | 17 | 27 | – | dB |
| | | f = 320 to 640 MHz | 15.5 | 22 | – | dB |
| | | f = 640 to 860 MHz | 14 | 20 | – | dB |
| S ₂₂ | output return losses | f = 40 to 80 MHz | 20 | 29.5 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 29 | – | dB |
| | | f = 160 to 320 MHz | 17 | 25.5 | – | dB |
| | | f = 320 to 640 MHz | 15.5 | 23 | – | dB |
| | | f = 640 to 860 MHz | 14 | 22 | – | dB |
| S ₂₁ | phase response | f = 50 MHz | –45 | – | +45 | deg |
| CTB | composite triple beat | 129 channels flat; V _o = 44 dBmV; measured at 859.25 MHz | – | –56.5 | –54 | dB |
| X _{mod} | cross modulation | 129 channels flat; V _o = 44 dBmV; measured at 55.25 MHz | – | –61 | –59 | dB |
| CSO | composite second order distortion | 129 channels flat; V _o = 44 dBmV; measured at 860.5 MHz | – | –64.5 | –56 | dB |
| d ₂ | second order distortion | note 1 | – | –75 | –69 | dB |
| V _o | output voltage | d _{im} = –60 dB; note 2 | 61.5 | 63 | – | dBmV |
| F | noise figure | see Table 1 | – | – | – | dB |
| I _{tot} | total current consumption (DC) | note 3 | – | 395 | 410 | mA |

Notes

1. $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 805.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 860.5$ MHz.
2. Measured according to DIN45004B:
 $f_p = 851.25$ MHz; $V_p = V_o$;
 $f_q = 858.25$ MHz; $V_q = V_o - 6$ dB;
 $f_r = 860.25$ MHz; $V_r = V_o - 6$ dB;
measured at $f_p + f_q - f_r = 849.25$ MHz.
3. The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

CATV amplifier modules

BGD802; BGD802MI

Table 3 Bandwidth 40 to 750 MHz; $V_B = 24$ V; $T_{case} = 30$ °C; $Z_S = Z_L = 75$ Ω

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|------------------|-----------------------------------|---------------------------------------------------------------------------|------|-------|------|------|
| G _p | power gain | f = 50 MHz | 18 | 18.5 | 19 | dB |
| | | f = 750 MHz | 18.5 | 19.4 | – | dB |
| SL | slope cable equivalent | f = 40 to 750 MHz | 0.2 | – | 2 | dB |
| FL | flatness of frequency response | f = 40 to 750 MHz | – | – | ±0.5 | dB |
| S ₁₁ | input return losses | f = 40 to 80 MHz | 20 | 35 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 31 | – | dB |
| | | f = 160 to 320 MHz | 17 | 27 | – | dB |
| | | f = 320 to 640 MHz | 15.5 | 22 | – | dB |
| | | f = 640 to 750 MHz | 14 | 20 | – | dB |
| S ₂₂ | output return losses | f = 40 to 80 MHz | 20 | 29.5 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 29 | – | dB |
| | | f = 160 to 320 MHz | 17 | 25.5 | – | dB |
| | | f = 320 to 640 MHz | 15.5 | 23 | – | dB |
| | | f = 640 to 750 MHz | 14 | 22 | – | dB |
| S ₂₁ | phase response | f = 50 MHz | –45 | – | +45 | deg |
| CTB | composite triple beat | 110 channels flat; V _o = 44 dBmV; measured at 745.25 MHz | – | –60.5 | –58 | dB |
| X _{mod} | cross modulation | 110 channels flat; V _o = 44 dBmV; measured at 55.25 MHz | – | –62.5 | –60 | dB |
| CSO | composite second order distortion | 110 channels flat; V _o = 44 dBmV; measured at 746.5 MHz | – | –66 | –60 | dB |
| d ₂ | second order distortion | note 1 | – | – | –72 | dB |
| V _o | output voltage | d _{im} = –60 dB; note 2 | 64 | – | – | dBmV |
| F | noise figure | see Table 1 | – | – | – | dB |
| I _{tot} | total current consumption (DC) | note 3 | – | 395 | 410 | mA |

Notes

1. $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 691.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 746.5$ MHz.
2. Measured according to DIN45004B:
 $f_p = 740.25$ MHz; $V_p = V_o$;
 $f_q = 747.25$ MHz; $V_q = V_o - 6$ dB;
 $f_r = 749.25$ MHz; $V_r = V_o - 6$ dB;
measured at $f_p + f_q - f_r = 738.25$ MHz.
3. The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

CATV amplifier modules

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Table 4 Bandwidth 40 to 550 MHz; $V_B = 24$ V; $T_{case} = 30$ °C; $Z_S = Z_L = 75$ Ω

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|------------------|-----------------------------------|--------------------------------------------------------------------------|------|------|------|------|
| G _p | power gain | f = 50 MHz | 18 | 18.5 | 19 | dB |
| | | f = 550 MHz | 18.5 | 19.3 | – | dB |
| SL | slope cable equivalent | f = 40 to 550 MHz | 0.2 | – | 2 | dB |
| FL | flatness of frequency response | f = 40 to 550 MHz | – | – | ±0.3 | dB |
| S ₁₁ | input return losses | f = 40 to 80 MHz | 20 | 35 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 31 | – | dB |
| | | f = 160 to 320 MHz | 17 | 27 | – | dB |
| | | f = 320 to 550 MHz | 16 | 22 | – | dB |
| S ₂₂ | input return losses | f = 40 to 80 MHz | 20 | 29.5 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 29 | – | dB |
| | | f = 160 to 320 MHz | 17 | 25.5 | – | dB |
| | | f = 320 to 550 MHz | 16 | 23 | – | dB |
| S ₂₁ | phase response | f = 50 MHz | –45 | – | +45 | deg |
| CTB | composite triple beat | 77 channels flat; V _o = 44 dBmV; measured at 547.25 MHz | – | –67 | –65 | dB |
| X _{mod} | cross modulation | 77 channels flat; V _o = 44 dBmV; measured at 55.25 MHz | – | –66 | –63 | dB |
| CSO | composite second order distortion | 77 channels flat; V _o = 44 dBmV; measured at 548.5 MHz | – | –67 | –63 | dB |
| d ₂ | second order distortion | note 1 | – | – | –72 | dB |
| V _o | output voltage | d _{im} = –60 dB; note 2 | 65 | – | – | dBmV |
| F | noise figure | see Table 1 | – | – | – | dB |
| I _{tot} | total current consumption (DC) | note 3 | – | 395 | 410 | mA |

Notes

1. $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 493.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 548.5$ MHz.
2. Measured according to DIN45004B:
 $f_p = 540.25$ MHz; $V_p = V_o$;
 $f_q = 547.25$ MHz; $V_q = V_o - 6$ dB;
 $f_r = 549.25$ MHz; $V_r = V_o - 6$ dB;
measured at $f_p + f_q - f_r = 538.25$ MHz.
3. The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

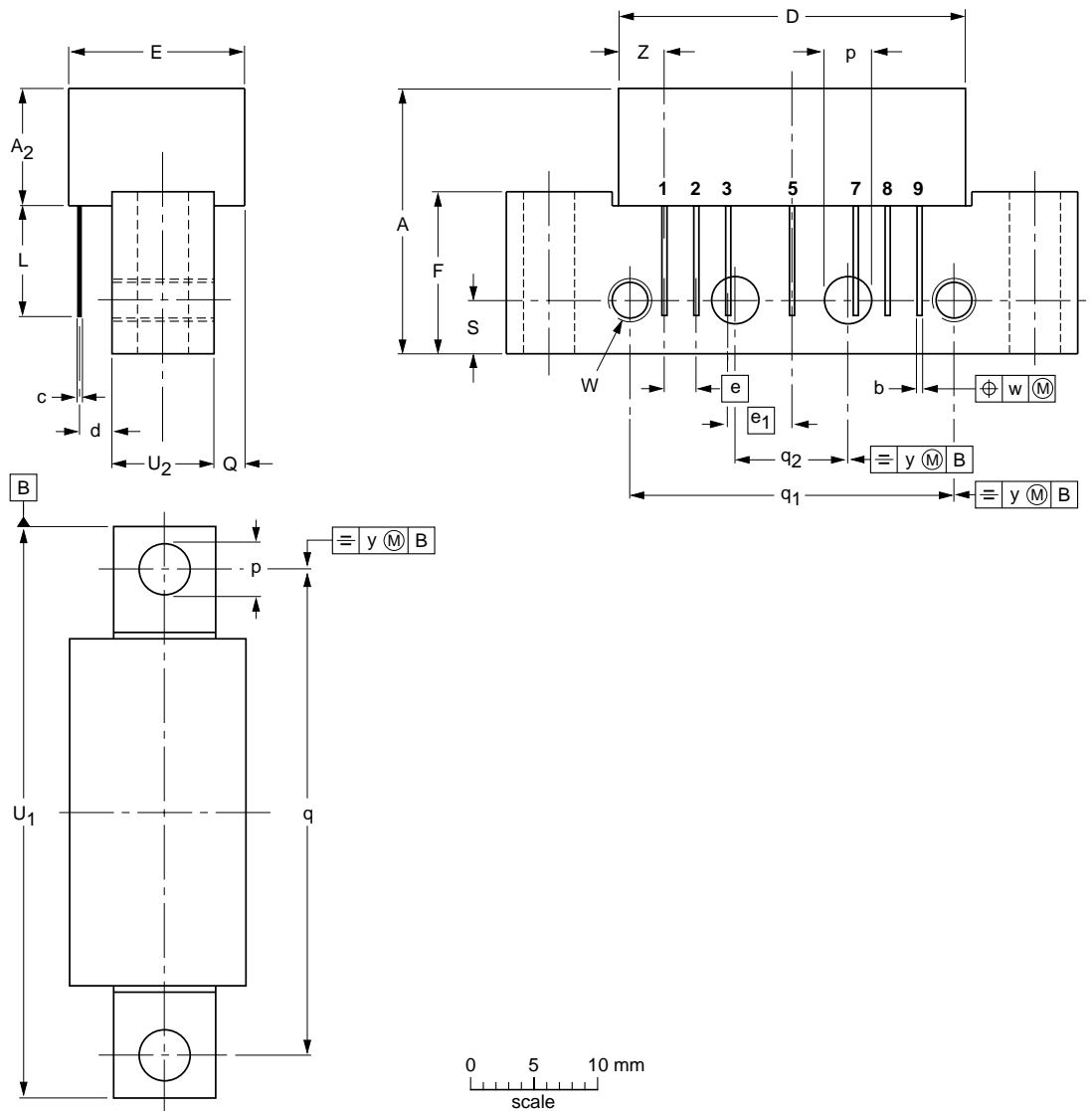
CATV amplifier modules

BGD802; BGD802MI

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 max. | E max. | e | e ₁ | F | L min. | p | Q max. | q | q ₁ | q ₂ | S | U ₁ max. | U ₂ | W | w | y | Z max. |
|------|--------|---------------------|--------------|------|--------|--------|--------|------|----------------|------|--------|--------------|--------|------|----------------|----------------|-----|---------------------|----------------|-------------|------|-----|--------|
| mm | 20.8 | 9.1 | 0.51 0.38 | 0.25 | 27.2 | 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 | 8 | 6-32 UNC | 0.25 | 0.1 | 3.8 |

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

CATV amplifier modules

BGD802; BGD802MI

DEFINITIONS

| Data Sheet Status | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 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. |
| Limiting values | |
| 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. | |
| Application information | |
| Where application information is given, it is advisory and does not form part of the specification. | |

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NOTES

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