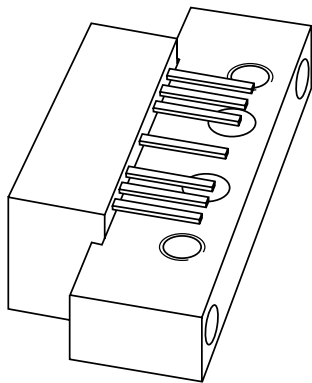


DATA SHEET



BGD702MI CATV amplifier module

Product specification
Supersedes data of 1997 Mar 25
File under Discrete Semiconductors, SC16

1998 Mar 13

CATV amplifier module

BGD702MI

FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability
- Mirrored image pinning of the BGD702.

APPLICATIONS

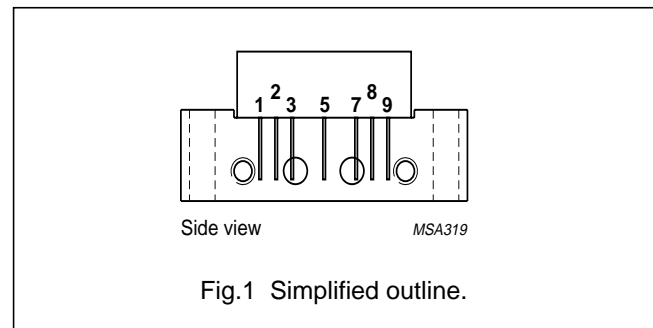
- CATV systems operating in the 40 to 750 MHz frequency range.

DESCRIPTION

Hybrid amplifier module in a SOT115J package operating at a voltage supply of 24 V (DC).

PINNING - SOT115J

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



QUICK REFERENCE DATA

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|------------------|--------------------------------|-----------------------|------|------|------|
| G _p | power gain | f = 50 MHz | 18 | 19 | dB |
| | | f = 750 MHz | 18.5 | – | dB |
| I _{tot} | total current consumption (DC) | V _B = 24 V | – | 435 | mA |

LIMITING VALUES

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

| SYMBOL | PARAMETER | MIN. | MAX. | UNIT |
|------------------|-------------------------------------|------|------|------|
| 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 module

BGD702MI

CHARACTERISTICS

Table 1 Bandwidth 40 to 750 MHz; $V_B = 24$ V; $T_{mb} = 35$ °C; $Z_S = Z_L = 75$ Ω

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-----------|-----------------------------------|---|------|-----------|------|
| G_p | power gain | f = 50 MHz | 18 | 19 | dB |
| | | f = 750 MHz | 18.5 | – | 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 | – | dB |
| | | f = 80 to 160 MHz | 19 | – | dB |
| | | f = 160 to 320 MHz | 18 | – | dB |
| | | f = 320 to 640 MHz | 17 | – | dB |
| | | f = 640 to 750 MHz | 16 | – | dB |
| S_{22} | output 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 640 MHz | 17 | – | dB |
| | | f = 640 to 750 MHz | 16 | – | 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 | – | –58 | dB |
| X_{mod} | cross modulation | 110 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz | – | –62 | dB |
| CSO | composite second order distortion | 110 channels flat; $V_o = 44$ dBmV; measured at 746.5 MHz | – | –58 | dB |
| d_2 | second order distortion | note 1 | – | –68 | dB |
| V_o | output voltage | $d_{im} = -60$ dB; note 2 | 61 | – | dBmV |
| F | noise figure | f = 50 MHz | – | 5.5 | dB |
| | | f = 450 MHz | – | 6.5 | dB |
| | | f = 550 MHz | – | 6.5 | dB |
| | | f = 600 MHz | – | 7 | dB |
| | | f = 750 MHz | – | 8.5 | dB |
| I_{tot} | total current consumption (DC) | note 3 | – | 435 | mA |

Notes

- $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 691.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 746.5$ MHz.
- 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.
- The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

CATV amplifier module

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Table 2 Bandwidth 40 to 600 MHz; $V_B = 24$ V; $T_{mb} = 35$ °C; $Z_S = Z_L = 75$ Ω

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-----------|-----------------------------------|---|------|-----------|------|
| G_p | power gain | f = 50 MHz | 18 | 19 | dB |
| | | f = 600 MHz | 18.5 | – | dB |
| SL | slope cable equivalent | f = 40 to 600 MHz | 0.2 | 2 | dB |
| FL | flatness of frequency response | f = 40 to 600 MHz | – | ± 0.3 | dB |
| S_{11} | 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 600 MHz | 17 | – | dB |
| S_{22} | output 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 600 MHz | 17 | – | dB |
| S_{21} | phase response | f = 50 MHz | –45 | +45 | deg |
| CTB | composite triple beat | 85 channels flat; $V_o = 44$ dBmV; measured at 595.25 MHz | – | –65 | dB |
| X_{mod} | cross modulation | 85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz | – | –65 | dB |
| CSO | composite second order distortion | 85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz | – | –60 | dB |
| d_2 | second order distortion | note 1 | – | –70 | 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 | – | 435 | mA |

Notes

- $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 541.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 596.5$ MHz.
- Measured according to DIN45004B:
 $f_p = 590.25$ MHz; $V_p = V_o$;
 $f_q = 597.25$ MHz; $V_q = V_o - 6$ dB;
 $f_r = 599.25$ MHz; $V_r = V_o - 6$ dB;
measured at $f_p + f_q - f_r = 588.25$ MHz.
- The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

CATV amplifier module

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Table 3 Bandwidth 40 to 550 MHz; $V_B = 24$ V; $T_{mb} = 35$ °C; $Z_S = Z_L = 75$ Ω

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-----------|-----------------------------------|---|------|-----------|------|
| G_p | power gain | f = 50 MHz | 18 | 19 | dB |
| | | f = 550 MHz | 18.5 | – | 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 | – | dB |
| | | f = 80 to 160 MHz | 19 | – | dB |
| | | f = 160 to 320 MHz | 18 | – | dB |
| | | f = 320 to 550 MHz | 17 | – | dB |
| S_{22} | output 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 | 17 | – | 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 | dB |
| X_{mod} | cross modulation | 77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz | – | –67 | dB |
| CSO | composite second order distortion | 77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz | – | –62 | dB |
| d_2 | second order distortion | note 1 | – | –72 | dB |
| V_o | output voltage | $d_{im} = -60$ dB; note 2 | 64.5 | – | dBmV |
| F | noise figure | see Table 1 | – | – | dB |
| I_{tot} | total current consumption (DC) | note 3 | – | 435 | mA |

Notes

- $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 493.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 548.5$ MHz.
- 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.
- The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

CATV amplifier module

BGD702MI

Table 4 Bandwidth 40 to 450 MHz; $V_B = 24$ V; $T_{mb} = 35$ °C; $Z_S = Z_L = 75$ Ω

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|-----------|-----------------------------------|---|------|-----------|------|
| G_p | power gain | f = 50 MHz | 18 | 19 | dB |
| | | f = 450 MHz | 18.5 | – | dB |
| SL | slope cable equivalent | f = 40 to 450 MHz | 0.2 | 2 | dB |
| FL | flatness of frequency response | f = 40 to 450 MHz | – | ± 0.3 | dB |
| S_{11} | 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 450 MHz | 17 | – | dB |
| S_{22} | output 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 450 MHz | 17 | – | dB |
| S_{21} | phase response | f = 50 MHz | –45 | +45 | deg |
| CTB | composite triple beat | 60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz | – | –68 | dB |
| X_{mod} | cross modulation | 60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz | – | –65 | dB |
| CSO | composite second order distortion | 60 channels flat; $V_o = 46$ dBmV; measured at 446.5 MHz | – | –65 | dB |
| d_2 | second order distortion | note 1 | – | –75 | dB |
| V_o | output voltage | $d_{im} = -60$ dB; note 2 | 67 | – | dBmV |
| F | noise figure | see Table 1 | – | – | dB |
| I_{tot} | total current consumption (DC) | note 3 | – | 435 | mA |

Notes

- $f_p = 55.25$ MHz; $V_p = 46$ dBmV;
 $f_q = 391.25$ MHz; $V_q = 46$ dBmV;
measured at $f_p + f_q = 446.5$ MHz.
- Measured according to DIN45004B:
 $f_p = 440.25$ MHz; $V_p = V_o$;
 $f_q = 447.25$ MHz; $V_q = V_o - 6$ dB;
 $f_r = 449.25$ MHz; $V_r = V_o - 6$ dB;
measured at $f_p + f_q - f_r = 438.25$ MHz.
- The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

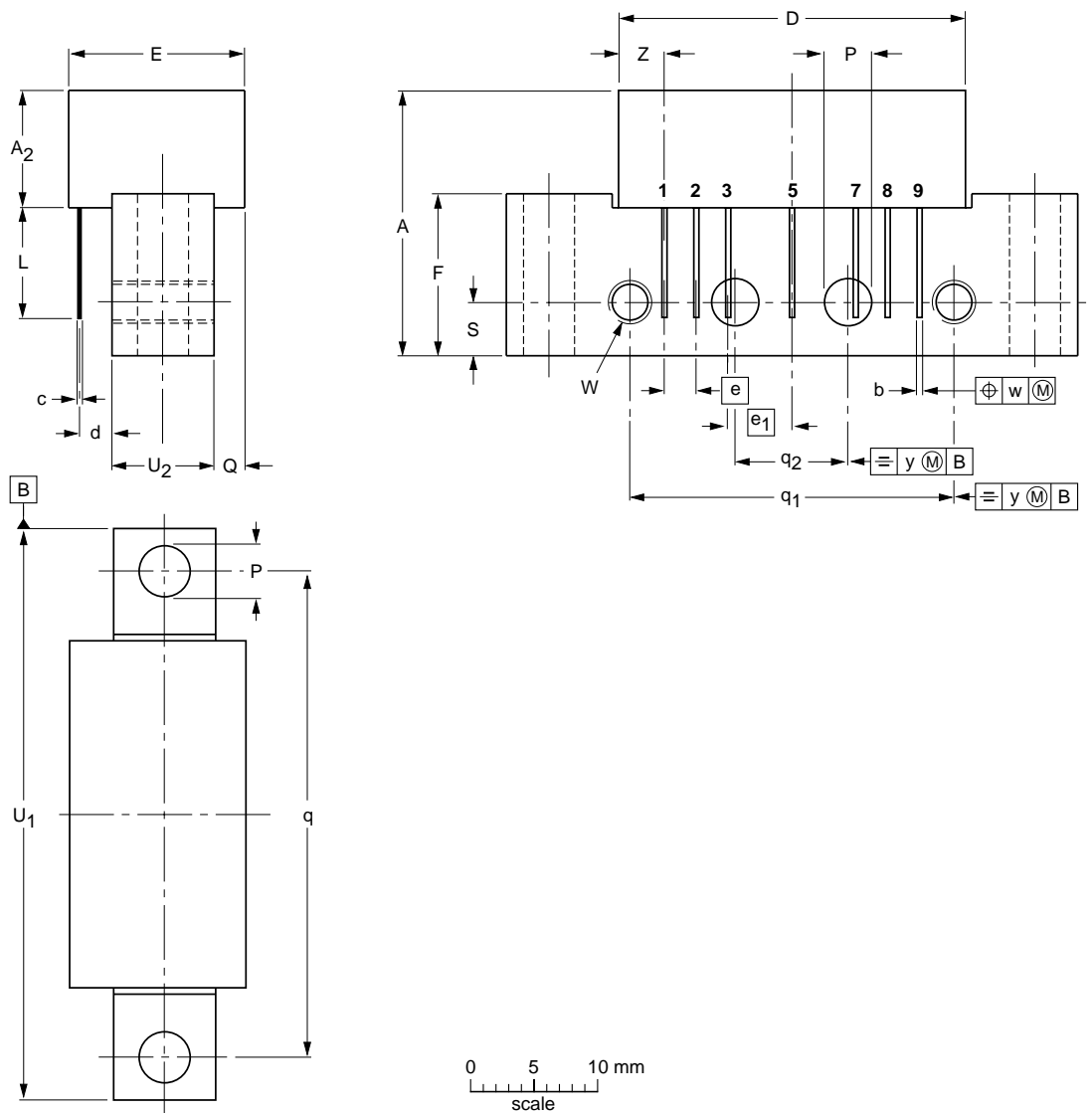
CATV amplifier module

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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 | | | | | | 97-04-10 |

CATV amplifier module

BGD702MI

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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NOTES

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微波光电部专业代理经销高频、微波、光纤、光电元器件、组件、部件、模块、整机；电磁兼容元器件、材料、设备；微波 CAD、EDA 软件、开发测试仿真工具；微波、光纤仪器仪表。欢迎国外高科技微波、光纤厂商将优秀产品介绍到中国、共同开拓市场。长期大量现货专业批发高频、微波、卫星、光纤、电视、CATV 器件：晶振、VCO、连接器、PIN 开关、变容二极管、开关二极管、低噪晶体管、功率电阻及电容、放大器、功率管、MMIC、混频器、耦合器、功分器、振荡器、合成器、衰减器、滤波器、隔离器、环行器、移相器、调制解调器；光电子元件和组件：红外发射管、红外接收管、光电开关、光敏管、发光二极管和发光二极管组件、半导体激光二极管和激光器组件、光电探测器和光接收组件、光发射接收模块、光纤激光器和光放大器、光调制器、光开关、DWDM 用光发射和接收器件、用户接入系统光收发器件与模块、光纤连接器、光纤跳线/尾纤、光衰减器、光纤适配器、光隔离器、光耦合器、光环行器、光复用器/转换器；无线收发芯片和模组、蓝牙芯片和模组。

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