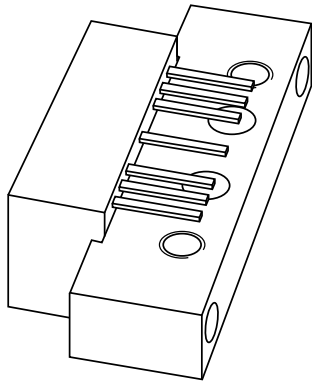


DATA SHEET



BGD816L

**860 MHz, 21.5 dB gain power
doubler amplifier**

Product specification
Supersedes data of 2001 May 18

2001 Nov 15



860 MHz, 21.5 dB gain power doubler amplifier

BGD816L

FEATURES

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

APPLICATIONS

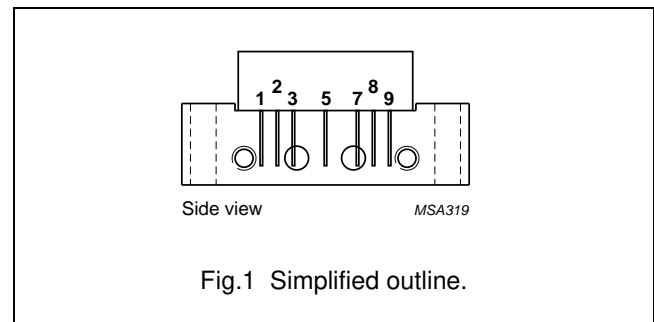
- CATV systems operating in the 40 to 870 MHz frequency range.

DESCRIPTION

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

PINNING - SOT115J

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



QUICK REFERENCE DATA

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|------------------|--------------------------------|-----------------------|------|------|------|
| G _p | power gain | f = 45 MHz | 21.2 | 21.8 | dB |
| | | f = 870 MHz | 22 | 23 | dB |
| I _{tot} | total current consumption (DC) | V _B = 24 V | 345 | 375 | mA |

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

| SYMBOL | PARAMETER | MIN. | MAX. | UNIT |
|------------------|-------------------------------------|------|------|------|
| V _B | supply voltage | – | 30 | V |
| V _i | RF input voltage | – | 70 | dBmV |
| T _{stg} | storage temperature | –40 | +100 | °C |
| T _{mb} | operating mounting base temperature | –20 | +100 | °C |

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CHARACTERISTICS

Bandwidth 40 to 870 MHz; $V_B = 24\text{ V}$; $T_{mb} = 35\text{ °C}$; $Z_S = Z_L = 75\ \Omega$

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|------------------|------------------------|---|------|------|-------|------|
| G _p | power gain | f = 45 MHz | 21.2 | – | 21.8 | dB |
| | | f = 870 MHz | 22 | – | 23 | dB |
| SL | slope straight line | f = 45 to 870 MHz; note 1 | 0.5 | 1 | 1.5 | dB |
| FL | flatness straight line | f = 45 to 100 MHz | – | – | ±0.25 | dB |
| | | f = 100 to 800 MHz | – | – | ±0.5 | dB |
| | | f = 800 to 870 MHz | –0.4 | – | 0.1 | dB |
| S ₁₁ | input return losses | f = 45 to 80 MHz | 22 | – | – | dB |
| | | f = 80 to 160 MHz | 21 | – | – | dB |
| | | f = 160 to 320 MHz | 19 | – | – | dB |
| | | f = 320 to 550 MHz | 18 | – | – | dB |
| | | f = 550 to 650 MHz | 17 | – | – | dB |
| | | f = 650 to 750 MHz | 16 | – | – | dB |
| | | f = 750 to 870 MHz | 15 | – | – | dB |
| | | f = 870 to 914 MHz | 12 | – | – | dB |
| S ₂₂ | output return losses | f = 45 to 80 MHz | 25 | – | – | dB |
| | | f = 80 to 160 MHz | 23 | – | – | dB |
| | | f = 160 to 320 MHz | 18 | – | – | dB |
| | | f = 320 to 550 MHz | 17 | – | – | dB |
| | | f = 550 to 650 MHz | 16 | – | – | dB |
| | | f = 650 to 750 MHz | 15 | – | – | dB |
| | | f = 750 to 870 MHz | 15 | – | – | dB |
| | | f = 870 to 914 MHz | 12 | – | – | dB |
| S ₂₁ | phase response | f = 50 MHz | –45 | – | +45 | deg |
| CTB | composite triple beat | 79 chs flat; V _o = 44 dBmV; f _m = 547.25 MHz | – | – | –66 | dB |
| | | 112 chs flat; V _o = 44 dBmV; f _m = 745.25 MHz | – | – | –59.5 | dB |
| | | 132 chs flat; V _o = 44 dBmV; f _m = 859.25 MHz | – | – | –55 | dB |
| | | 112 chs; f _m = 547.25 MHz; V _o = 48.2 dBmV at 745 MHz; note 2 | – | – | –59 | dB |
| | | 79 chs; f _m = 331.25 MHz; V _o = 45.3 dBmV at 547 MHz; note 3 | – | – | –68.5 | dB |
| X _{mod} | cross modulation | 79 chs flat; V _o = 44 dBmV; f _m = 55.25 MHz | – | – | –64 | dB |
| | | 112 chs flat; V _o = 44 dBmV; f _m = 55.25 MHz | – | – | –61 | dB |
| | | 132 chs flat; V _o = 44 dBmV; f _m = 55.25 MHz | – | – | –58 | dB |
| | | 112 chs; f _m = 745.25 MHz; V _o = 48.2 dBmV at 745 MHz; note 2 | – | – | –60 | dB |
| | | 79 chs; f _m = 445.25 MHz; V _o = 45.3 dBmV at 547 MHz; note 3 | – | – | –66 | dB |

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| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------|-----------------------------------|--|------|------|------|------|
| CSO | composite second order distortion | 79 chs flat; $V_o = 44$ dBmV; $f_m = 548.5$ MHz | – | – | –66 | dB |
| | | 112 chs flat; $V_o = 44$ dBmV; $f_m = 746.5$ MHz | – | – | –58 | dB |
| | | 132 chs flat; $V_o = 44$ dBmV; $f_m = 860.5$ MHz | – | – | –56 | dB |
| | | 112 chs; $f_m = 210.0$ MHz; $V_o = 48.2$ dBmV at 745 MHz; note 2 | – | – | –57 | dB |
| | | 79 chs; $f_m = 210.0$ MHz; $V_o = 45.3$ dBmV at 547 MHz; note 3 | – | – | –64 | dB |
| d_2 | second order distortion | note 4 | – | – | –70 | dB |
| V_o | output voltage | $d_{im} = -60$ dB; note 5 | 62 | – | – | dBmV |
| | | CTB compression = 1 dB; 132 chs flat; $f = 859.25$ MHz | 48 | – | – | dBmV |
| | | CSO compression = 1 dB; 132 chs flat; $f = 860.5$ MHz | 49 | – | – | dBmV |
| NF | noise figure | $f = 50$ MHz | – | – | 5.5 | dB |
| | | $f = 550$ MHz | – | – | 5.5 | dB |
| | | $f = 750$ MHz | – | – | 6.5 | dB |
| | | $f = 870$ MHz | – | – | 7.5 | dB |
| I_{tot} | total current consumption (DC) | note 6 | 345 | 360 | 375 | mA |

Notes

- Slope straight line is defined as gain at 870 MHz against gain at 45 MHz.
- Tilt = 10.2 dB (55 to 745 MHz).
- Tilt = 7.3 dB (55 to 547 MHz).
- $f_p = 55.25$ 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 35 V.

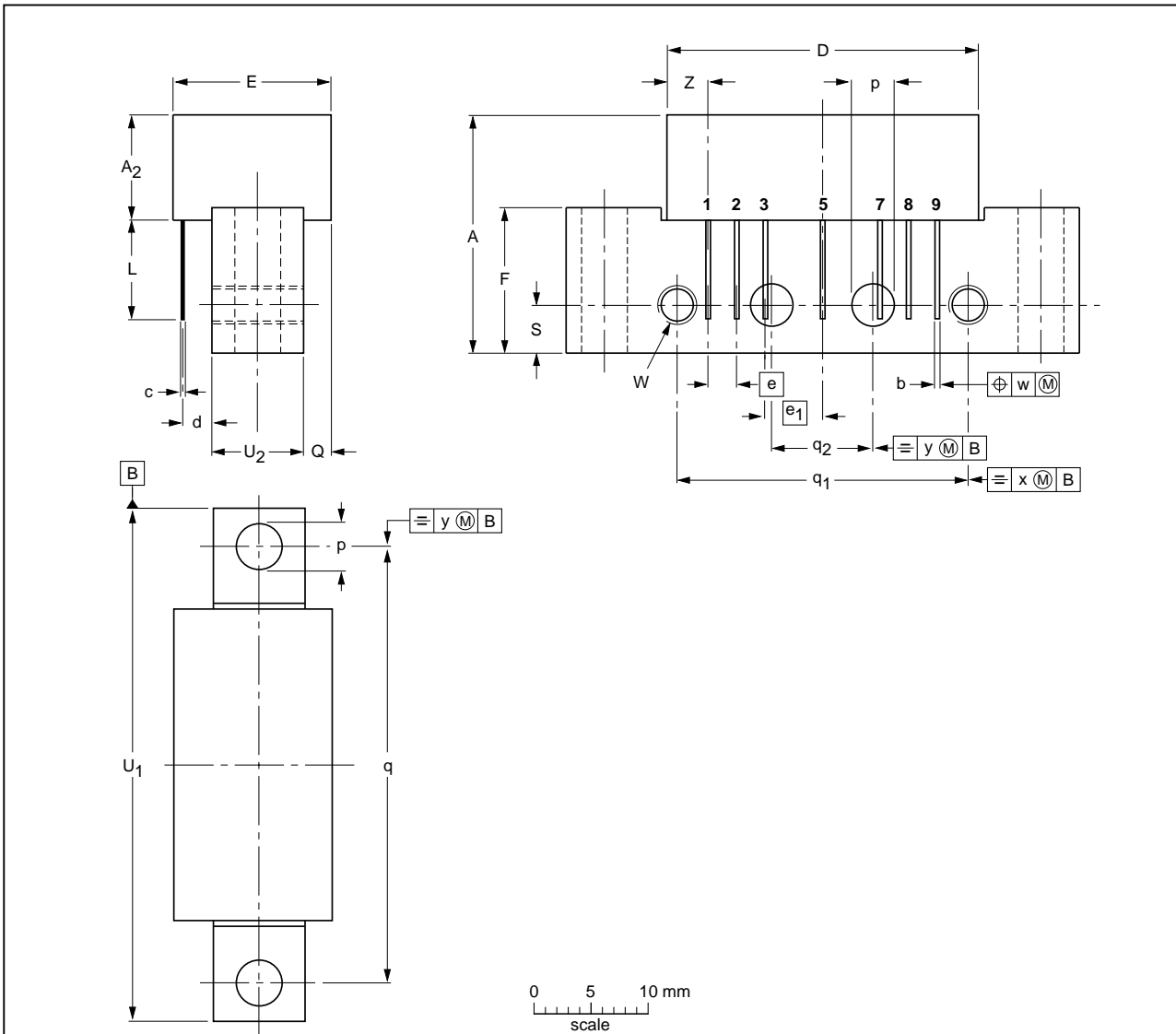
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PACKAGE OUTLINE

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 | 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 0.38 | 0.25 | 27.2 | 2.04 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 44.25 | 8.2 7.8 | 6-32 UNC | 0.25 | 0.7 | 0.1 | 3.8 |

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

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| DOCUMENT STATUS ⁽¹⁾ | PRODUCT STATUS ⁽²⁾ | DEFINITION |
|--------------------------------|-------------------------------|---|
| Objective data sheet | Development | This document contains data from the objective specification for product development. |
| Preliminary data sheet | Qualification | This document contains data from the preliminary specification. |
| Product data sheet | Production | This document contains the product specification. |

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