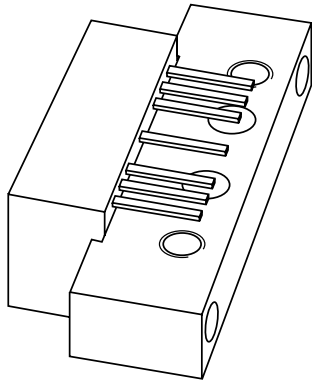


DATA SHEET



BGY785A

**750 MHz, 18.5 dB gain push-pull
amplifier**

Product specification
Supersedes data of 1999 Mar 30

2001 Nov 15

750 MHz, 18.5 dB gain push-pull amplifier

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FEATURES

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

APPLICATIONS

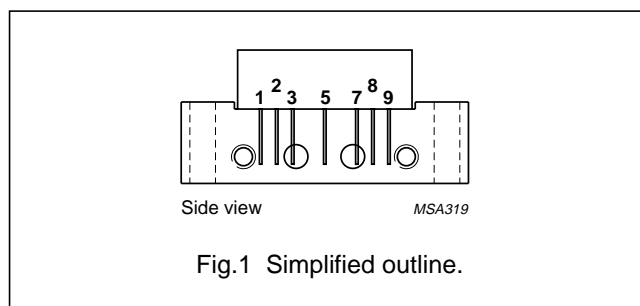
- CATV systems operating in the 40 to 750 MHz frequency range.

DESCRIPTION

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

PINNING - SOT115J

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



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 | – | 240 | mA |

LIMITING VALUES

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

| 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 |

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CHARACTERISTICS

Table 1 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 | 19.5 | – | dB |
| SL | slope cable equivalent | f = 40 to 750 MHz | 0 | 0.9 | 2 | dB |
| FL | flatness of frequency response | f = 40 to 750 MHz | – | ± 0.1 | ± 0.3 | dB |
| S_{11} | input return losses | f = 40 to 80 MHz | 20 | 30 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 29.5 | – | dB |
| | | f = 160 to 320 MHz | 17 | 28 | – | dB |
| | | f = 320 to 640 MHz | 15.5 | 26 | – | dB |
| | | f = 640 to 750 MHz | 14 | 21 | – | dB |
| S_{22} | output return losses | f = 40 to 80 MHz | 20 | 29 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 26 | – | dB |
| | | f = 160 to 320 MHz | 17 | 23.5 | – | dB |
| | | f = 320 to 640 MHz | 15.5 | 22 | – | dB |
| | | f = 640 to 750 MHz | 14 | 24 | – | dB |
| CTB | composite triple beat | 110 channels flat; $V_o = 44$ dBmV; measured at 745.25 MHz | – | –54.5 | –53 | dB |
| X_{mod} | cross modulation | 110 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz | – | –57.5 | –56 | dB |
| CSO | composite second order distortion | 110 channels flat; $V_o = 44$ dBmV; measured at 746.5 MHz | – | –62 | –53 | dB |
| d_2 | second order distortion | note 1 | – | –77 | –65 | dB |
| V_o | output voltage | $d_{im} = -60$ dB; note 2 | 59 | 62 | – | dBmV |
| F | noise figure | f = 50 MHz | – | 4.5 | 5.5 | dB |
| | | f = 450 MHz | – | – | 5.5 | dB |
| | | f = 550 MHz | – | – | 5.5 | dB |
| | | f = 600 MHz | – | – | 6 | dB |
| | | f = 750 MHz | – | 6 | 7 | dB |
| I_{tot} | total current consumption (DC) | note 3 | – | 225 | 240 | 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.

750 MHz, 18.5 dB gain push-pull amplifier

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Table 2 Bandwidth 40 to 600 MHz; $V_B = 24$ V; $T_{case} = 30$ °C; $Z_S = Z_L = 75 \Omega$

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|------------------|-----------------------------------|---|------|------|------|------|
| G _p | power gain | f = 50 MHz | 18 | 18.5 | 19 | dB |
| | | f = 600 MHz | 18.5 | – | – | dB |
| SL | slope cable equivalent | f = 40 to 600 MHz | 0 | – | 1.5 | 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 | 30 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 29.5 | – | dB |
| | | f = 160 to 320 MHz | 17 | 28 | – | dB |
| | | f = 320 to 600 MHz | 16 | 26 | – | dB |
| S ₂₂ | output return losses | f = 40 to 80 MHz | 20 | 29 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 26 | – | dB |
| | | f = 160 to 320 MHz | 17 | 23.5 | – | dB |
| | | f = 320 to 600 MHz | 16 | 22 | – | dB |
| CTB | composite triple beat | 85 channels flat; V _o = 44 dBmV; measured at 595.25 MHz | – | – | –57 | dB |
| X _{mod} | cross modulation | 85 channels flat; V _o = 44 dBmV; measured at 55.25 MHz | – | – | –59 | dB |
| CSO | composite second order distortion | 85 channels flat; V _o = 44 dBmV; measured at 596.5 MHz | – | – | –58 | dB |
| d ₂ | second order distortion | note 1 | – | – | –70 | dB |
| V _o | output voltage | d _{im} = –60 dB; note 2 | 61 | – | – | dBmV |
| F | noise figure | see Table 1 | – | – | – | dB |
| I _{tot} | total current consumption (DC) | note 3 | – | 225 | 240 | 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.

750 MHz, 18.5 dB gain push-pull amplifier

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Table 3 Bandwidth 40 to 550 MHz; $V_B = 24$ V; $T_{case} = 30$ °C; $Z_S = Z_L = 75 \Omega$

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|------------------|-----------------------------------|---|------|-------|------|------|
| G _p | power gain | f = 50 MHz | 18 | 18.5 | 19 | dB |
| | | f = 550 MHz | 18.5 | – | – | dB |
| SL | slope cable equivalent | f = 40 to 550 MHz | 0 | – | 1.5 | 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 | 30 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 29.5 | – | dB |
| | | f = 160 to 320 MHz | 17 | 28 | – | dB |
| | | f = 320 to 550 MHz | 16 | 26 | – | dB |
| S ₂₂ | output return losses | f = 40 to 80 MHz | 20 | 29 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 26 | – | dB |
| | | f = 160 to 320 MHz | 17 | 23.5 | – | dB |
| | | f = 320 to 550 MHz | 16 | 22 | – | dB |
| CTB | composite triple beat | 77 channels flat; V _o = 44 dBmV; measured at 547.25 MHz | – | –61 | –60 | dB |
| X _{mod} | cross modulation | 77 channels flat; V _o = 44 dBmV; measured at 55.25 MHz | – | –61 | –60 | dB |
| CSO | composite second order distortion | 77 channels flat; V _o = 44 dBmV; measured at 548.5 MHz | – | –67.5 | –60 | dB |
| d ₂ | second order distortion | note 1 | – | – | –72 | dB |
| V _o | output voltage | d _{im} = –60 dB; note 2 | 62 | – | – | dBmV |
| F | noise figure | see Table 1 | – | – | – | dB |
| I _{tot} | total current consumption (DC) | note 3 | – | 225 | 240 | 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.

750 MHz, 18.5 dB gain push-pull amplifier

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Table 4 Bandwidth 40 to 450 MHz; $V_B = 24$ V; $T_{case} = 30$ °C; $Z_S = Z_L = 75 \Omega$

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|------------------|-----------------------------------|---|------|------|------|------|
| G _p | power gain | f = 50 MHz | 18 | 18.5 | 19 | dB |
| | | f = 450 MHz | 18.5 | – | – | dB |
| SL | slope cable equivalent | f = 40 to 450 MHz | 0 | – | 1.5 | 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 | 30 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 29.5 | – | dB |
| | | f = 160 to 320 MHz | 17 | 28 | – | dB |
| | | f = 320 to 450 MHz | 16 | 26 | – | dB |
| S ₂₂ | output return losses | f = 40 to 80 MHz | 20 | 29 | – | dB |
| | | f = 80 to 160 MHz | 18.5 | 26 | – | dB |
| | | f = 160 to 320 MHz | 17 | 23.5 | – | dB |
| | | f = 320 to 450 MHz | 16 | 22 | – | dB |
| CTB | composite triple beat | 60 channels flat; V _o = 46 dBmV; measured at 445.25 MHz | – | – | –61 | dB |
| X _{mod} | cross modulation | 60 channels flat; V _o = 46 dBmV; measured at 55.25 MHz | – | – | –60 | dB |
| CSO | composite second order distortion | 60 channels flat; V _o = 46 dBmV; measured at 446.5 MHz | – | – | –61 | dB |
| d ₂ | second order distortion | note 1 | – | – | –75 | 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 | – | 225 | 240 | 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.

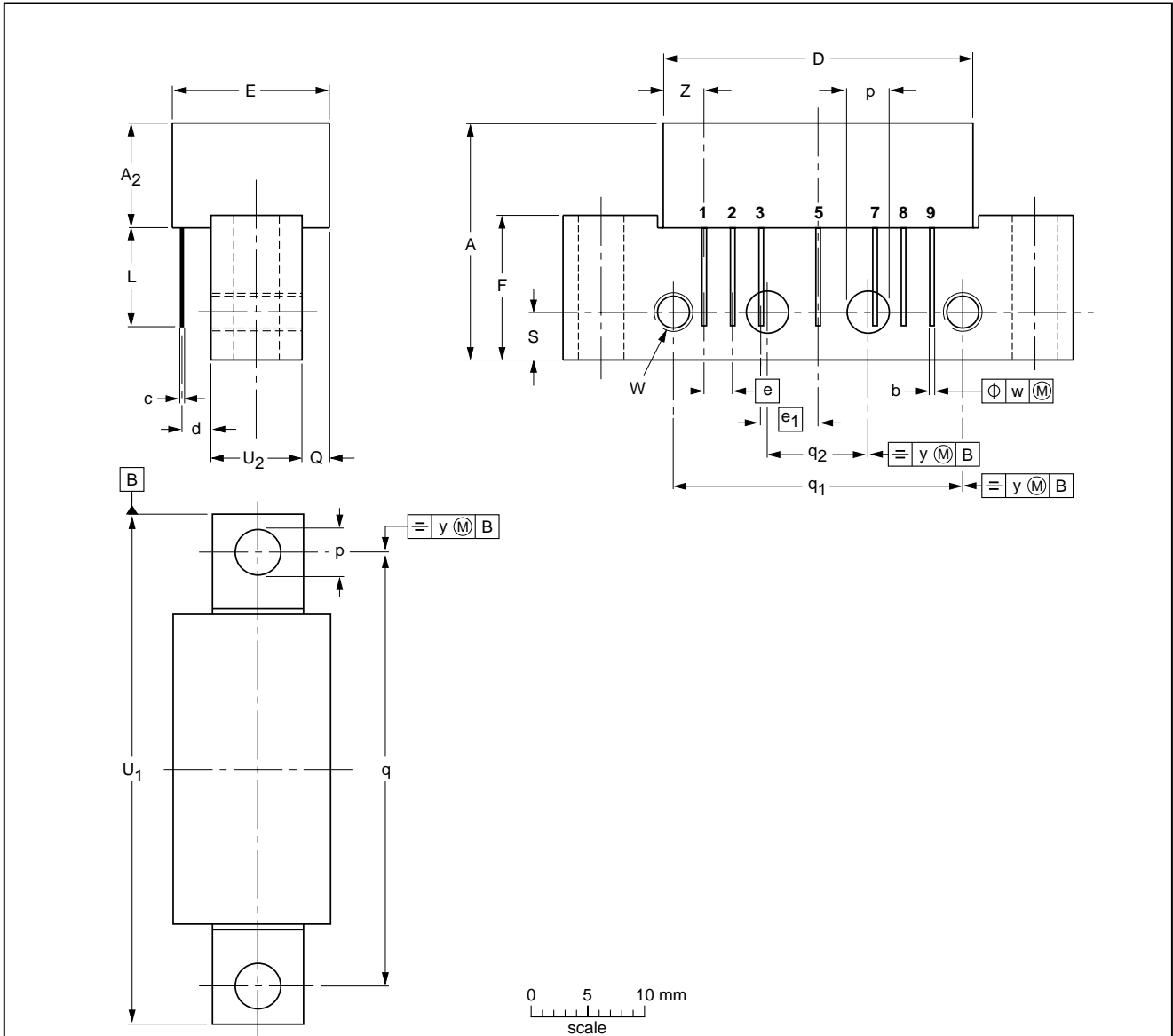
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PACKAGE OUTLINE

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 | | | | | | 99-02-06 |

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DATA SHEET STATUS

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NOTES

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NOTES

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