

DATA SHEET

BGD502; BGD504 CATV power doubler amplifier modules

Product specification
Supersedes data of February 1994
File under Discrete Semiconductors, SC16

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CATV power doubler amplifier modules

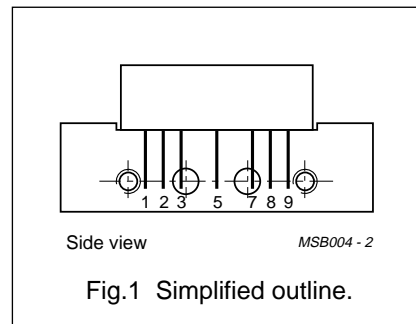
BGD502; BGD504

FEATURES

- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

PINNING - SOT115C

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



DESCRIPTION

Hybrid amplifier modules for CATV systems operating over a frequency range of 40 to 550 MHz at a voltage supply of 24 V (DC).

QUICK REFERENCE DATA

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|------------------|--------------------------------|-----------------------|------|------|------|
| G _p | power gain | f = 50 MHz | 18 | 19 | dB |
| | BGD502 | | | | |
| | BGD504 | 19.5 | 20.5 | dB | |
| | power gain | f = 550 MHz | 18.8 | 20.8 | dB |
| BGD502 | | | | | |
| BGD504 | 20.2 | 22.2 | 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 | – | 60 | dBmV |
| T _{stg} | storage temperature | –40 | +100 | °C |
| T _{mb} | operating mounting base temperature | –20 | +100 | °C |

CATV power doubler amplifier modules

BGD502; BGD504

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------|---|---|------|------|-----------|------|
| G_p | power gain BGD502 BGD504 | f = 50 MHz | 18 | – | 19 | dB |
| | | | 19.5 | – | 20.5 | dB |
| | power gain BGD502 BGD504 | f = 550 MHz | 18.8 | – | 20.8 | dB |
| | | | 20.2 | – | 22.2 | dB |
| SL | slope cable equivalent | f = 40 to 550 MHz | 0.2 | – | 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 550 MHz | 18 | – | – | dB |
| S_{22} | output return losses | f = 40 to 80 MHz | 20 | – | – | dB |
| | | f = 80 to 160 MHz | 19 | – | – | dB |
| | | f = 160 to 550 MHz | 18 | – | – | dB |
| S_{21} | phase response | f = 50 MHz | +135 | – | +225 | deg |
| CTB | composite triple beat BGD502 BGD504 | 77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz | – | – | –65 | dB |
| | | | – | – | –64 | dB |
| X_{mod} | cross modulation BGD502 BGD504 | 77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz | – | – | –68 | dB |
| | | | – | – | –67 | dB |
| CSO | composite second order distortion BGD502 BGD504 | 77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz | – | – | –62 | dB |
| | | | – | – | –60 | dB |
| d_2 | second order distortion BGD502 BGD504 | note 1 | – | – | –72 | dB |
| | | | – | – | –70 | dB |
| V_o | output voltage BGD502 BGD504 | $d_{im} = -60$ dB; note 2 | 64 | – | – | dBmV |
| | | | 63.5 | – | – | dBmV |
| F | noise figure | f = 550 MHz | – | – | 8 | dB |
| I_{tot} | total current consumption (DC) | note 3 | – | 415 | 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 modules normally operate at $V_B = 24$ V, but are able to withstand supply transients up to 30 V.

CATV power doubler amplifier modules

BGD502; BGD504

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

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-----------|---|---|------|------|-----------|------|
| G_p | power gain BGD502 BGD504 | f = 50 MHz | 18 | – | 19 | dB |
| | | | 19.5 | – | 20.5 | dB |
| | power gain BGD502 BGD504 | f = 450 MHz | 18.6 | – | 20.6 | dB |
| | | | 20 | – | 22 | dB |
| SL | slope cable equivalent BGD502 BGD504 | f = 40 to 450 MHz | 0.2 | – | 1.8 | dB |
| | | | 0 | – | 1.65 | 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 450 MHz | 18 | – | – | dB |
| S_{22} | output return losses | f = 40 to 80 MHz | 20 | – | – | dB |
| | | f = 80 to 160 MHz | 19 | – | – | dB |
| | | f = 160 to 450 MHz | 18 | – | – | dB |
| S_{21} | phase response | f = 50 MHz | +135 | – | +225 | deg |
| CTB | composite triple beat BGD502 BGD504 | 60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz | – | – | –67 | dB |
| | | | – | – | –66 | dB |
| CSO | composite second order distortion BGD502 BGD504 | 60 channels flat; $V_o = 46$ dBmV; measured at 548.5 MHz | – | – | t.b.f. | dB |
| | | | – | – | t.b.f. | dB |
| X_{mod} | cross modulation BGD502 BGD504 | 60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz | – | – | –67 | dB |
| | | | – | – | –66 | dB |
| d_2 | second order distortion BGD502 BGD504 | note 1 | – | – | –75 | dB |
| | | | – | – | –73 | dB |
| V_o | output voltage BGD502 BGD504 | $d_{im} = -60$ dB; note 2 | 67 | – | – | dBmV |
| | | | 66.5 | – | – | dBmV |
| F | noise figure | f = 450 MHz | – | – | 7 | dB |
| I_{tot} | total current consumption (DC) | note 3 | – | 415 | 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 modules normally operate at $V_B = 24$ V, but are able to withstand supply transients up to 30 V.

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