

# 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

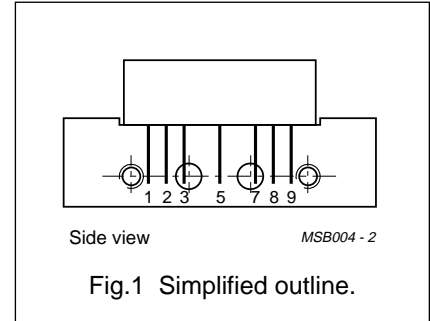
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

### 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).

### PINNING - SOT115C

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	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 <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	435	mA

### LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

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## BGD502; BGD504

**CHARACTERISTICS**Bandwidth 40 to 550 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

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	–	–	$\pm 0.3$	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

**CHARACTERISTICS**Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

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	–	–	$\pm 0.3$	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.