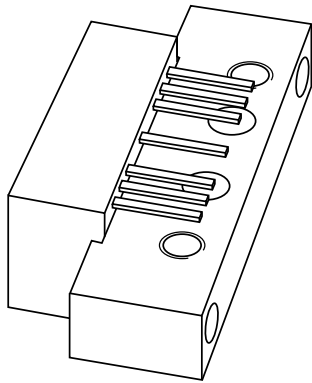


# DATA SHEET



## **BGD502**

550 MHz, 18.5 dB gain power  
doubler amplifier

Product specification  
Supersedes data of 1995 Oct 25

2001 Nov 15



# 550 MHz, 18.5 dB gain power doubler amplifier

**BGD502**

**FEATURES**

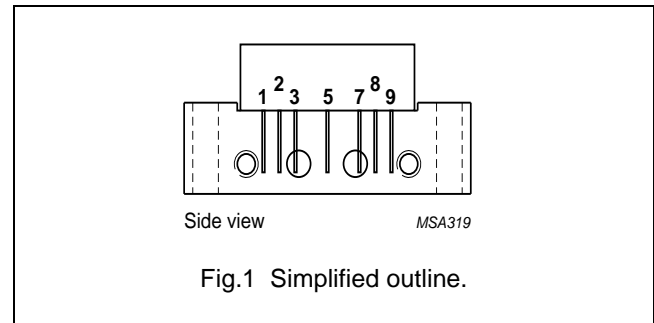
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- TiPtAu metallized crystals ensure optimal reliability.

**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 - SOT115J**

PIN	DESCRIPTION
1	input
2, 3	common
5	+V <sub>B</sub>
7, 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
		f = 550 MHz	18.8	20.8	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 60134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	65	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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## CHARACTERISTICS

**Table 1** Bandwidth 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	f = 50 MHz	18	–	19	dB
		f = 550 MHz	18.8	–	20.8	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	77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz	–	–	–65	dB
$X_{mod}$	cross modulation	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–	–68	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	–	–	dBmV
NF	noise figure	f = 550 MHz	–	–	8	dB
$I_{tot}$	total current consumption (DC)	note 3	–	415	435	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 are able to withstand supply transients up to  $V_B = 30$  V.

# 550 MHz, 18.5 dB gain power doubler amplifier

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**Table 2** Bandwidth 40 to 450 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 <sub>p</sub>	power gain	f = 50 MHz	18	–	19	dB
		f = 450 MHz	18.6	–	20.6	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0.2	–	1.8	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	–	±0.3	dB
S <sub>11</sub>	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 <sub>22</sub>	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 <sub>21</sub>	phase response	f = 50 MHz	+135	–	+225	deg
CTB	composite triple beat	60 channels flat; V <sub>o</sub> = 46 dBmV; measured at 445.25 MHz	–	–	–67	dB
CSO	composite second order distortion	60 channels flat; V <sub>o</sub> = 46 dBmV; measured at 446.5 MHz	–	–	–60	dB
X <sub>mod</sub>	cross modulation	60 channels flat; V <sub>o</sub> = 46 dBmV; measured at 55.25 MHz	–	–	–67	dB
d <sub>2</sub>	second order distortion	note 1	–	–	–75	dB
V <sub>o</sub>	output voltage	d <sub>im</sub> = –60 dB; note 2	67	–	–	dBmV
NF	noise figure	f = 450 MHz	–	–	7	dB
I <sub>tot</sub>	total current consumption (DC)	note 3	–	415	435	mA

## Notes

1. f<sub>p</sub> = 55.25 MHz; V<sub>p</sub> = 46 dBmV; f<sub>q</sub> = 391.25 MHz; V<sub>q</sub> = 46 dBmV; measured at f<sub>p</sub> + f<sub>q</sub> = 446.5 MHz.
2. Measured according to DIN45004B: f<sub>p</sub> = 440.25 MHz; V<sub>p</sub> = V<sub>o</sub>; f<sub>q</sub> = 447.25 MHz; V<sub>q</sub> = V<sub>o</sub> –6 dB; f<sub>r</sub> = 449.25 MHz; V<sub>r</sub> = V<sub>o</sub> –6 dB; measured at f<sub>p</sub> + f<sub>q</sub> – f<sub>r</sub> = 438.25 MHz.
3. The modules normally operate at V<sub>B</sub> = 24 V, but are able to withstand supply transients up to V<sub>B</sub> = 30 V.

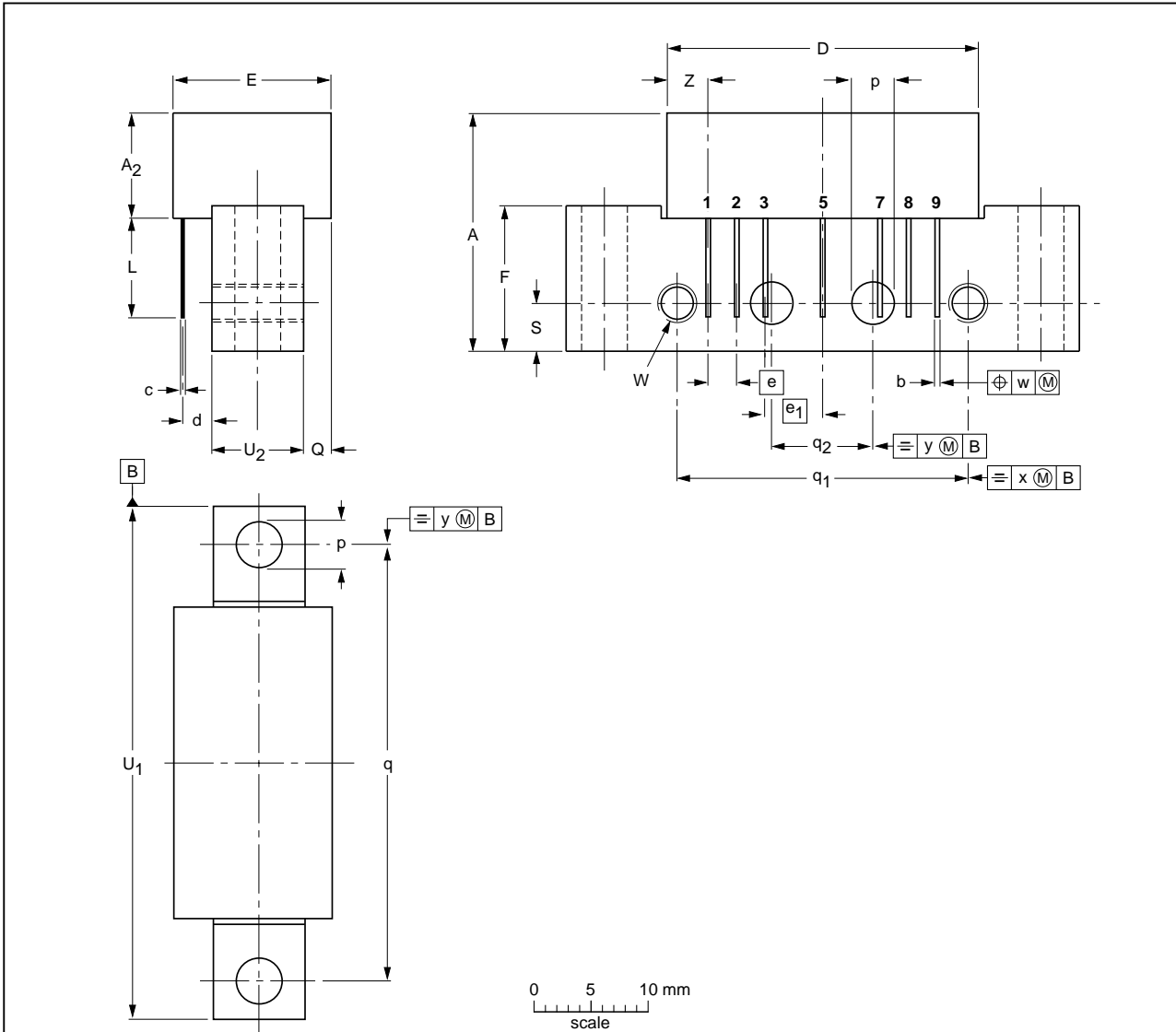
550 MHz, 18.5 dB gain power doubler amplifier

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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 <sub>2</sub> max.	b	c	D max.	d	E max.	e	e <sub>1</sub>	F	L min.	p	Q max.	q	q <sub>1</sub>	q <sub>2</sub>	S	U <sub>1</sub>	U <sub>2</sub>	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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**DATA SHEET STATUS**

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	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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## **Contact information**

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