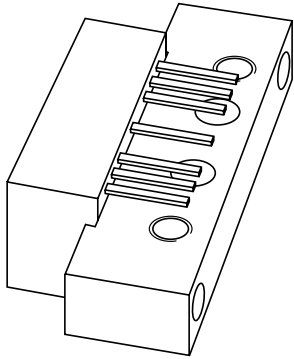


# DATA SHEET



## **BGD816** CATV amplifier module

Objective specification

2000 Apr 12

# CATV amplifier module

# BGD816

## FEATURES

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

## APPLICATIONS

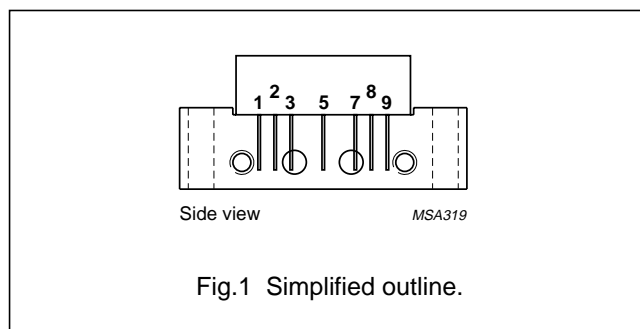
- CATV systems operating in the 40 to 870 MHz frequency range.

## DESCRIPTION

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

## PINNING - SOT115J

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



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 45 MHz	21.2	21.8	dB
		f = 870 MHz	22	23	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	380	410	mA

## LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>B</sub>	supply voltage	–	30	V
V <sub>i</sub>	RF input voltage	–	70	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

## CATV amplifier module

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	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	–	–	±0.35	dB
		f = 100 to 800 MHz	–	–	±0.5	dB
		f = 800 to 870 MHz	–	–	±0.15	dB
S <sub>11</sub>	input return losses	f = 45 to 80 MHz	21	–	–	dB
		f = 80 to 160 MHz	20	–	–	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	14	–	–	dB
S <sub>22</sub>	output return losses	f = 45 to 80 MHz	21	–	–	dB
		f = 80 to 160 MHz	20	–	–	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	14	–	–	dB
S <sub>21</sub>	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	79 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 547.25 MHz	–	–	–66	dB
		112 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 745.25 MHz	–	–	–60	dB
		132 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 859.25 MHz	–	–	–56	dB
		112 chs; f <sub>m</sub> = tbd MHz; V <sub>o</sub> = 48.2 dBmV at 745 MHz; note 2	–	–	–59	dB
		79 chs; f <sub>m</sub> = tbd MHz; V <sub>o</sub> = 45.3 dBmV at 547 MHz; note 3	–	–	–67	dB
X <sub>mod</sub>	cross modulation	79 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz	–	–	–65	dB
		112 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz	–	–	–61	dB
		132 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz	–	–	–60	dB
		112 chs; f <sub>m</sub> = tbd MHz; V <sub>o</sub> = 48.2 dBmV at 745 MHz; note 2	–	–	–56	dB
		79 chs; f <sub>m</sub> = tbd MHz; V <sub>o</sub> = 45.3 dBmV at 547 MHz; note 3	–	–	–65	dB

## CATV amplifier module

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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	–	–	–65	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	–	–	–54	dB
		112 chs; $f_m =$ tbd MHz; $V_o = 48.2$ dBmV at 745 MHz; note 2	–	–	–56	dB
		79 chs; $f_m =$ tbd MHz; $V_o = 45.3$ dBmV at 547 MHz; note 3	–	–	–63	dB
$d_2$	second order distortion	note 4	–	–	–74	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 5	64.5	–	–	dBmV
		CTB compression = 1 dB; 132 chs flat; $f =$ tbd MHz	tbd	–	–	dBmV
		CSO compression = 1 dB; 132 chs flat; $f =$ tbd MHz	tbd	–	–	dBmV
F	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	380	395	410	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.

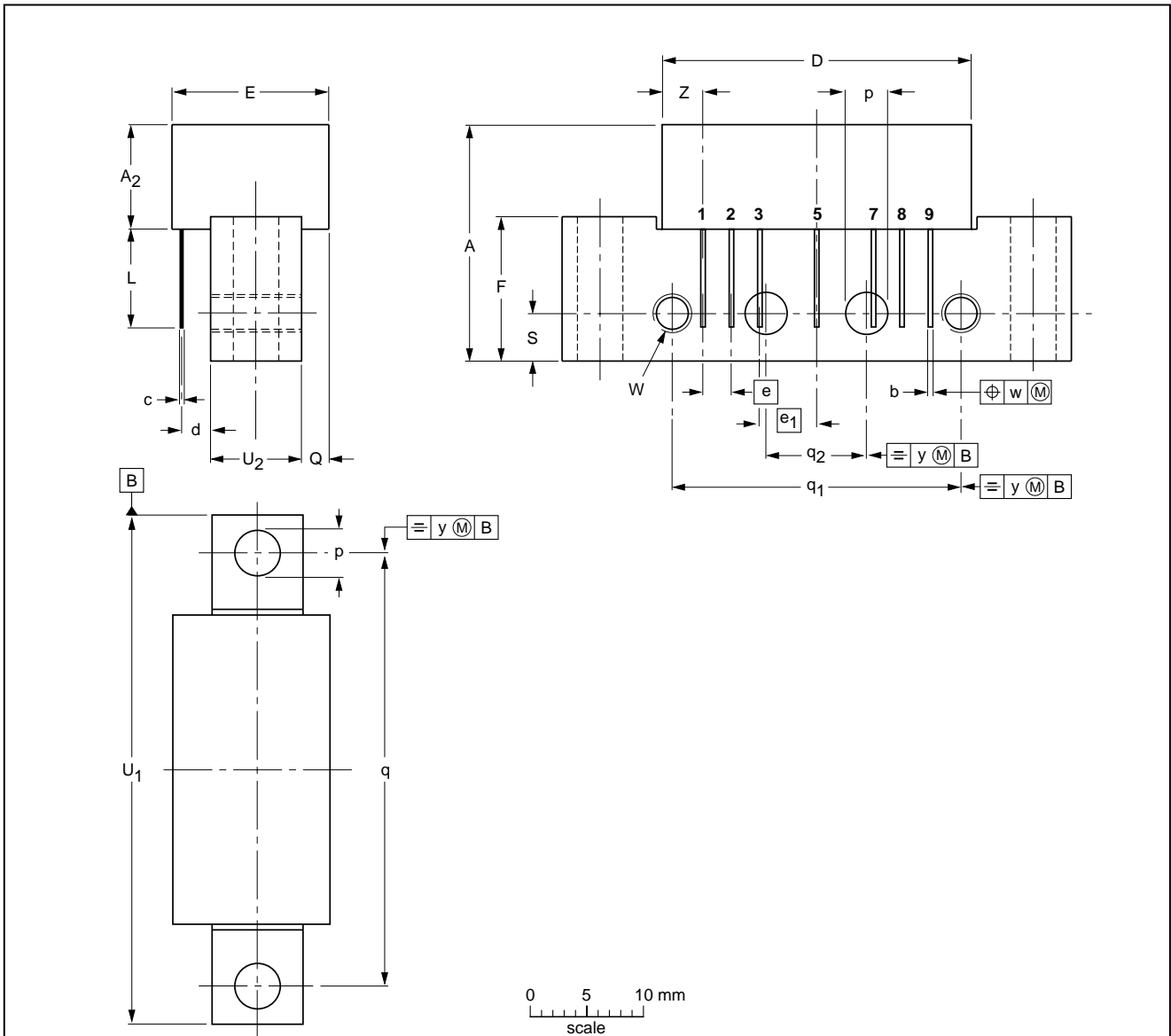
CATV amplifier module

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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 max.	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> max.	U <sub>2</sub>	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

## CATV amplifier module

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## DATA SHEET STATUS

DATA SHEET STATUS	PRODUCT STATUS	DEFINITIONS <sup>(1)</sup>
Objective specification	Development	This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.
Preliminary specification	Qualification	This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
Product specification	Production	This data sheet contains final specifications. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.

## Note

1. Please consult the most recently issued data sheet before initiating or completing a design.

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**Limiting values definition** — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device.

These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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## CAUTION

This product is supplied in anti-static packing to prevent damage caused by electrostatic discharge during transport and handling. For further information, refer to Philips specs.: SNW-EQ-608, SNW-FQ-302A and SNW-FQ-302B.

CATV amplifier module

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