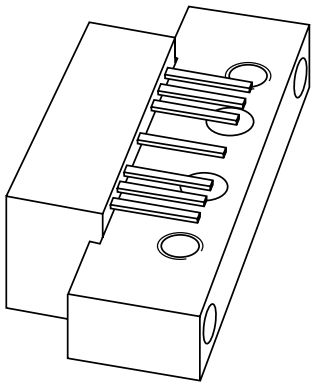
DATA SHEET



BGD704N
CATV amplifier module

Product specification
File under Discrete Semiconductors, SC16

1998 Feb 02

Philips
Semiconductors

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CATV amplifier module BGD704N

FEATURES

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

APPLICATIONS

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

DESCRIPTION

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

PINNING - SOT115J

PIN	DESCRIPTION
1	input
2, 3, 7, 8	common
5	$+V_B$
9	output

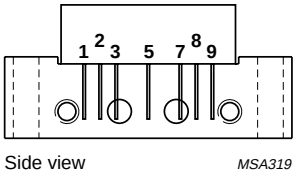


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	19.5	20.5	dB
		f = 750 MHz	20	–	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	–	65	dBmV
T_{stg}	storage temperature	–40	+100	°C
T_{mb}	operating mounting base temperature	–20	+100	°C

CHARACTERISTICS

Table 1 Bandwidth 40 to 750 MHz; V_B = 24 V; T_{mb} = 35 °C; $Z_S = Z_L$ = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	19.5	20.5	dB
		f = 750 MHz	20	–	dB
SL	slope cable equivalent	f = 40 to 750 MHz	0	2	dB
FL	flatness of frequency response	f = 40 to 750 MHz	–	±0.25	dB
S_{11}	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 320 MHz	18	–	dB
		f = 320 to 640 MHz	17	–	dB
		f = 640 to 750 MHz	16	–	dB
S_{22}	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 320 MHz	18	–	dB
		f = 320 to 640 MHz	17	–	dB
		f = 640 to 750 MHz	16	–	dB
S_{21}	phase response	f = 50 MHz	–45	+45	deg
CTB	composite triple beat	110 channels flat; V_o = 44 dBmV; measured at 745.25 MHz	–	–57	dB
X_{mod}	cross modulation	110 channels flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–61	dB
CSO	composite second order distortion	110 channels flat; V_o = 44 dBmV; measured at 746.5 MHz	–	–56	dB
d_2	second order distortion	note 1	–	–66	dB
V_o	output voltage	d_{im} = –60 dB; note 2	60.5	–	dBmV
F	noise figure	f = 50 MHz	–	5	dB
		f = 450 MHz	–	6.5	dB
		f = 550 MHz	–	7	dB
		f = 600 MHz	–	7	dB
		f = 750 MHz	–	8.5	dB
I_{tot}	total current consumption (DC)	note 3	–	435	mA

Notes

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

Table 2 Bandwidth 40 to 600 MHz; V_B = 24 V; T_{mb} = 35 °C; $Z_S = Z_L$ = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	19.5	20.5	dB
		f = 600 MHz	20	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	0	2	dB
FL	flatness of frequency response	f = 40 to 600 MHz	–	±0.2	dB
S_{11}	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 320 MHz	18	–	dB
		f = 320 to 600 MHz	17	–	dB
S_{22}	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 320 MHz	18	–	dB
		f = 320 to 600 MHz	17	–	dB
S_{21}	phase response	f = 50 MHz	–45	+45	deg
CTB	composite triple beat	85 channels flat; V_o = 44 dBmV; measured at 595.25 MHz	–	–64	dB
X_{mod}	cross modulation	85 channels flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–64	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	–	–68	dB
V_o	output voltage	d_{im} = –60 dB; note 2	63	–	dBmV
F	noise figure	see Table 1	–	–	dB
I_{tot}	total current consumption (DC)	note 3	–	435	mA

Notes

1. 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.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

Table 3 Bandwidth 40 to 550 MHz; V_B = 24 V; T_{mb} = 35 °C; $Z_S = Z_L$ = 75 Ω

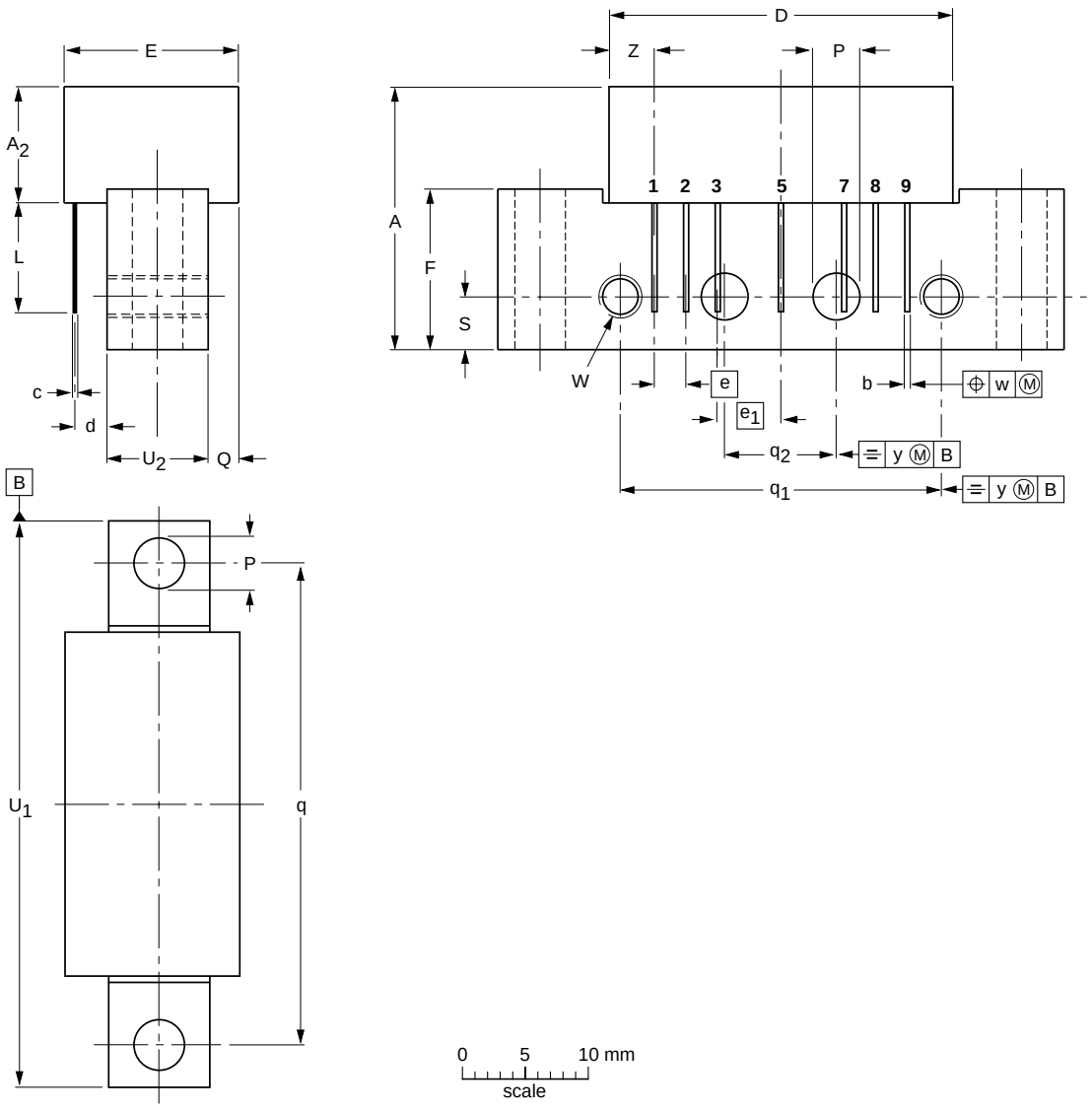
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	19.5	20.5	dB
		f = 550 MHz	20	–	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0	2	dB
FL	flatness of frequency response	f = 40 to 550 MHz	–	±0.2	dB
S_{11}	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 320 MHz	18	–	dB
		f = 320 to 550 MHz	17	–	dB
S_{22}	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	19	–	dB
		f = 160 to 320 MHz	18	–	dB
		f = 320 to 550 MHz	17	–	dB
S_{21}	phase response	f = 50 MHz	–45	+45	deg
CTB	composite triple beat	77 channels flat; V_o = 44 dBmV; measured at 547.25 MHz	–	–66	dB
X_{mod}	cross modulation	77 channels flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–66	dB
CSO	composite second order distortion	77 channels flat; V_o = 44 dBmV; measured at 548.5 MHz	–	–60	dB
d_2	second order distortion	note 1	–	–70	dB
V_o	output voltage	d_{im} = –60 dB; note 2	63.5	–	dBmV
F	noise figure	see Table 1	–	–	dB
I_{tot}	total current consumption (DC)	note 3	–	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 is able to withstand supply transients up to 30 V.

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						97-04-10

DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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