DATA SHEET

BGY785AD/8M
CATV amplifier module

Product specification
File under Discrete Semiconductors, SC16

1997 Mar 27

Philips
Semiconductors

PHILIPS

CATV amplifier module BGY785AD/8M

FEATURES

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

APPLICATIONS

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

DESCRIPTION

Hybrid high dynamic range cascode amplifier module with Darlington pre-stage dies in a SOT115J package, operating at a voltage supply of 24 V (DC).

PINNING - SOT115J

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

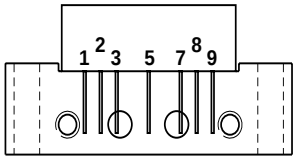


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	18	19	dB
		f = 870 MHz	18.5	–	dB
I_{tot}	total current consumption (DC)	V_B = 24 V	–	265	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

CHARACTERISTICS

Table 1 Bandwidth 40 to 870 MHz; V_B = 24 V; T_{case} = 30 °C; $Z_S = Z_L$ = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	18	19	dB
		f = 870 MHz	18.5	–	dB
SL	slope cable equivalent	f = 40 to 870 MHz	0.2	2	dB
FL	flatness of frequency response	f = 40 to 870 MHz	–	±0.5	dB
S_{11}	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 870 MHz	14	–	dB
S_{22}	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 870 MHz	14	–	dB
S_{21}	phase response	f = 50 MHz	135	225	deg
CTB	composite triple beat	110 channels flat, note 1; V_o = 44 dBmV; measured at 745.25 MHz	–	–58	dB
X_{mod}	cross modulation	110 channels flat, note 1; V_o = 44 dBmV; measured at 55.25 MHz	–	–56	dB
CSO	composite second order distortion	110 channels flat, note 1 V_o = 44 dBmV; measured at 746.5 MHz	–	–58	dB
d_2	second order distortion	notes 1 and 2	–	–68	dB
V_o	output voltage	d_{im} = –60 dB; notes 1 and 3	61	–	dBmV
F	noise figure	f = 50 MHz	–	5.5	dB
		f = 550 MHz	–	5.5	dB
		f = 650 MHz	–	5.5	dB
		f = 750 MHz	–	6	dB
		f = 870 MHz	–	6.5	dB
I_{tot}	total current consumption (DC)	note 4	–	265	mA

Notes

1. Linearity guaranteed up to 750 MHz.
2. 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.
3. 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.
4. 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 650 MHz; V_B = 24 V; T_{case} = 30 °C; $Z_S = Z_L$ = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	18	19	dB
		f = 650 MHz	18.5	–	dB
SL	slope cable equivalent	f = 40 to 650 MHz	0.2	2	dB
FL	flatness of frequency response	f = 40 to 650 MHz	–	±0.4	dB
S_{11}	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 650 MHz	16	–	dB
S_{22}	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 650 MHz	16	–	dB
S_{21}	phase response	f = 50 MHz	135	225	deg
CTB	composite triple beat	94 channels flat, note 1; V_o = 44 dBmV; measured at 649.25 MHz	–	–62	dB
X_{mod}	cross modulation	94 channels flat, note 1; V_o = 44 dBmV; measured at 55.25 MHz	–	–57	dB
CSO	composite second order distortion	94 channels flat, note 1; V_o = 44 dBmV; measured at 650.5 MHz	–	–60	dB
d_2	second order distortion	notes 1 and 2	–	–70	dB
V_o	output voltage	d_{im} = –60 dB; notes 1 and 3	63	–	dBmV
F	noise figure	see Table 1	–	–	dB
I_{tot}	total current consumption (DC)	note 4	–	265	mA

Notes

1. Linearity guaranteed up to 750 MHz.
2. f_p = 55.25 MHz; V_p = 44 dBmV; f_q = 595.25 MHz; V_q = 44 dBmV; measured at $f_p + f_q$ = 650.5 MHz.
3. Measured according to DIN45004B:
   f_p = 640.25 MHz; $V_p = V_o$; f_q = 647.25 MHz; $V_q = V_o$ –6 dB; f_r = 649.25 MHz; $V_r = V_o$ –6 dB;
   measured at $f_p + f_q - f_r$ = 638.25 MHz.
4. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

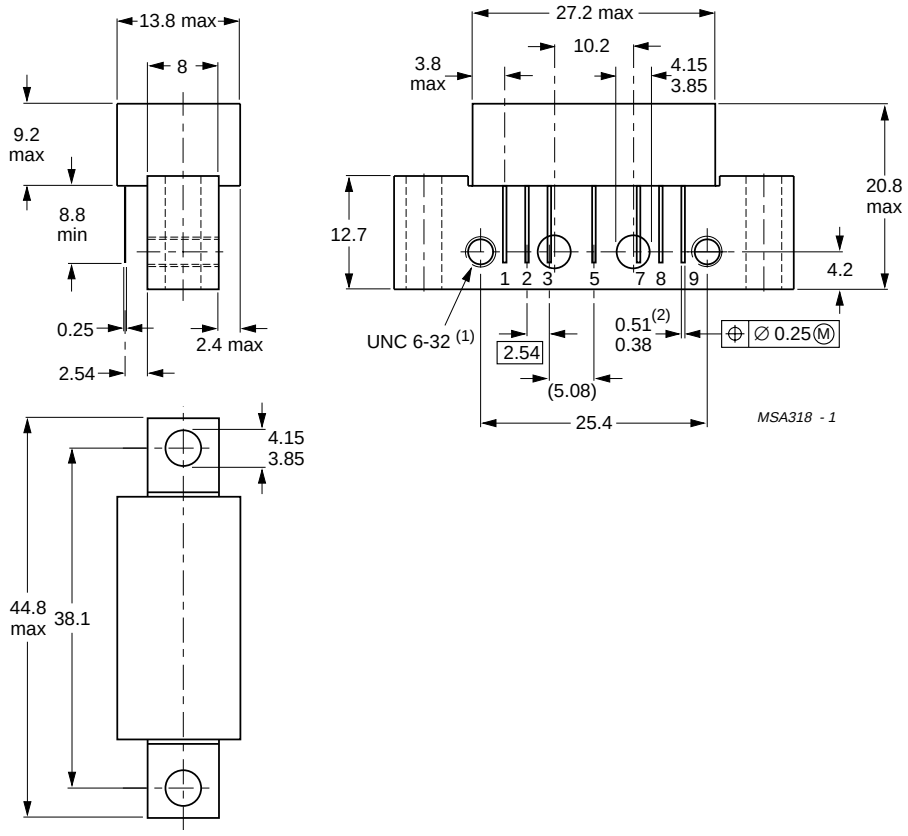
Table 3 Bandwidth 40 to 550 MHz; V_B = 24 V; T_{case} = 30 °C; $Z_S = Z_L$ = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	18	19	dB
		f = 550 MHz	18.5	–	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0.2	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	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 550 MHz	16	–	dB
S_{22}	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 550 MHz	16	–	dB
S_{21}	phase response	f = 50 MHz	135	225	deg
CTB	composite triple beat	77 channels flat, note 1; V_o = 44 dBmV; measured at 547.25 MHz	–	–65	dB
X_{mod}	cross modulation	77 channels flat, note 1; V_o = 44 dBmV; measured at 55.25 MHz	–	–59	dB
CSO	composite second order distortion	77 channels flat, note 1; V_o = 44 dBmV; measured at 548.5 MHz	–	–62	dB
d_2	second order distortion	notes 1 and 2	–	–72	dB
V_o	output voltage	d_{im} = –60 dB; notes 1 and 3	64.5	–	dBmV
F	noise figure	see Table 1	–	–	dB
I_{tot}	total current consumption (DC)	note 4	–	265	mA

Notes

1. Linearity guaranteed up to 750 MHz.
2. 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.
3. 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.
4. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

PACKAGE OUTLINE



Dimensions in mm.

(1) Screw 6-32 UNC-2A available on request.

(2) Leads gold plated.

Fig.2 SOT115J.

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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Printed in The Netherlands 127167/00/01/pp8 Date of release: 1997 Mar 27 Document order number: 9397 750 01986

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