

DATA SHEET

BGD702D

CATV amplifier module

Product specification
Supersedes data of June 1995
File under Discrete Semiconductors, SC16

1997 Mar 25

CATV amplifier module

BGD702D

FEATURES

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

APPLICATIONS

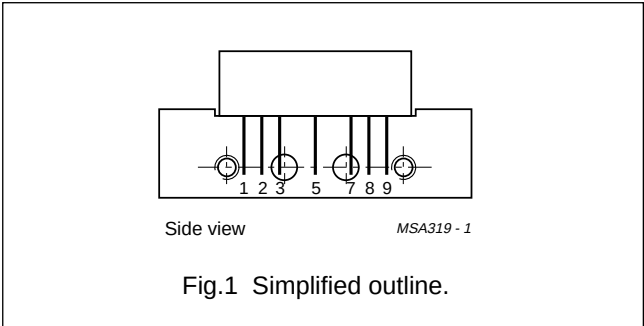
CATV systems in the 40 to 750 MHz frequency range.

DESCRIPTION

Hybrid high dynamic range cascode amplifier module with darlington pre-stage dies 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



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G _p	power gain	f = 50 MHz	18	19	dB
		f = 750 MHz	20	—	dB
I _{tot}	total current consumption (DC)	V _B = 24 V	400	435	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V _B	supply voltage	—	25	V
V _i	RF input voltage	—	65	dBmV
T _{stg}	storage temperature	−40	+100	°C
T _{mb}	operating mounting base temperature	−20	+100	°C

CATV amplifier module

BGD702D

CHARACTERISTICS

Table 1 Bandwidth 40 to 750 MHz; $V_B = 24\text{ V}$; $T_{\text{case}} = 35\text{ °C}$; $Z_S = Z_L = 75\text{ }\Omega$

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	$f = 50\text{ MHz}$	18	19	dB
		$f = 750\text{ MHz}$	20	–	dB
SL	slope cable equivalent	$f = 40\text{ to }750\text{ MHz}$	2	4	dB
FL	flatness of frequency response	$f = 40\text{ to }750\text{ MHz}$	–	± 0.5	dB
S_{11}	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }640\text{ MHz}$	15.5	–	dB
		$f = 640\text{ to }750\text{ MHz}$	14	–	dB
S_{22}	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	18.5	–	dB
		$f = 160\text{ to }320\text{ MHz}$	17	–	dB
		$f = 320\text{ to }640\text{ MHz}$	15.5	–	dB
		$f = 640\text{ to }750\text{ MHz}$	14	–	dB
S_{21}	phase response	$f = 50\text{ MHz}$	–45	+45	deg
CTB	composite triple beat	110 channels flat; $V_o = 44\text{ dBmV}$; measured at 745.25 MHz	–	–62	dB
X_{mod}	cross modulation	110 channels flat; $V_o = 44\text{ dBmV}$; measured at 55.25 MHz	–	–59	dB
CSO	composite second order distortion	110 channels flat; $V_o = 44\text{ dBmV}$; measured at 746.5 MHz	–	–62	dB
d_2	second order distortion	note 1	–	–72	dB
V_o	output voltage	$d_{\text{im}} = -60\text{ dB}$; note 2	64	–	dBmV
F	noise figure	$f = 50\text{ MHz}$	–	5.5	dB
		$f = 750\text{ MHz}$	–	7	dB
I_{tot}	total current consumption (DC)	note 3	400	435	mA

Notes

- $f_p = 55.25\text{ MHz}$; $V_p = 44\text{ dBmV}$;
 $f_q = 691.25\text{ MHz}$; $V_q = 44\text{ dBmV}$;
measured at $f_p + f_q = 746.5\text{ MHz}$.
- Measured according to DIN45004B:
 $f_p = 740.25\text{ MHz}$; $V_p = V_o$;
 $f_q = 747.25\text{ MHz}$; $V_q = V_o - 6\text{ dB}$;
 $f_r = 749.25\text{ MHz}$; $V_r = V_o - 6\text{ dB}$;
measured at $f_p + f_q - f_r = 738.25\text{ MHz}$.
- The module normally operates at $V_B = 24\text{ V}$, but is able to withstand supply transients up to 30 V.

CATV amplifier module

BGD702D

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	$f = 50$ MHz	18	19	dB
		$f = 600$ MHz	19.5	–	dB
SL	slope cable equivalent	$f = 40$ to 600 MHz	1.5	3.5	dB
FL	flatness of frequency response	$f = 40$ to 600 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 600 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 600 MHz	16	–	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	–	–68	dB
X_{mod}	cross modulation	85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–61	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz	–	–62	dB
d_2	second order distortion	note 1	–	–74	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	68	–	dBmV
F	noise figure	$f = 50$ MHz	–	5.5	dB
		$f = 600$ MHz	–	6	dB
I_{tot}	total current consumption (DC)	note 3	400	435	mA

Notes

- $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 541.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 596.5$ MHz.
- 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.
- The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

CATV amplifier module

BGD702D

Table 3 Bandwidth 40 to 550 MHz; $V_B = 24$ V; $T_{case} = 35$ °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	19	–	dB
SL	slope cable equivalent	$f = 40$ to 550 MHz	1	3	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	–45	+45	deg
CTB	composite triple beat	77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz	–	–69	dB
X_{mod}	cross modulation	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–62	dB
CSO	composite second order distortion	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–66	dB
d_2	second order distortion	note 1	–	–78	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	69	–	dBmV
F	noise figure	$f = 50$ MHz	–	5.5	dB
		$f = 550$ MHz	–	5.5	dB
I_{tot}	total current consumption (DC)	note 3	400	435	mA

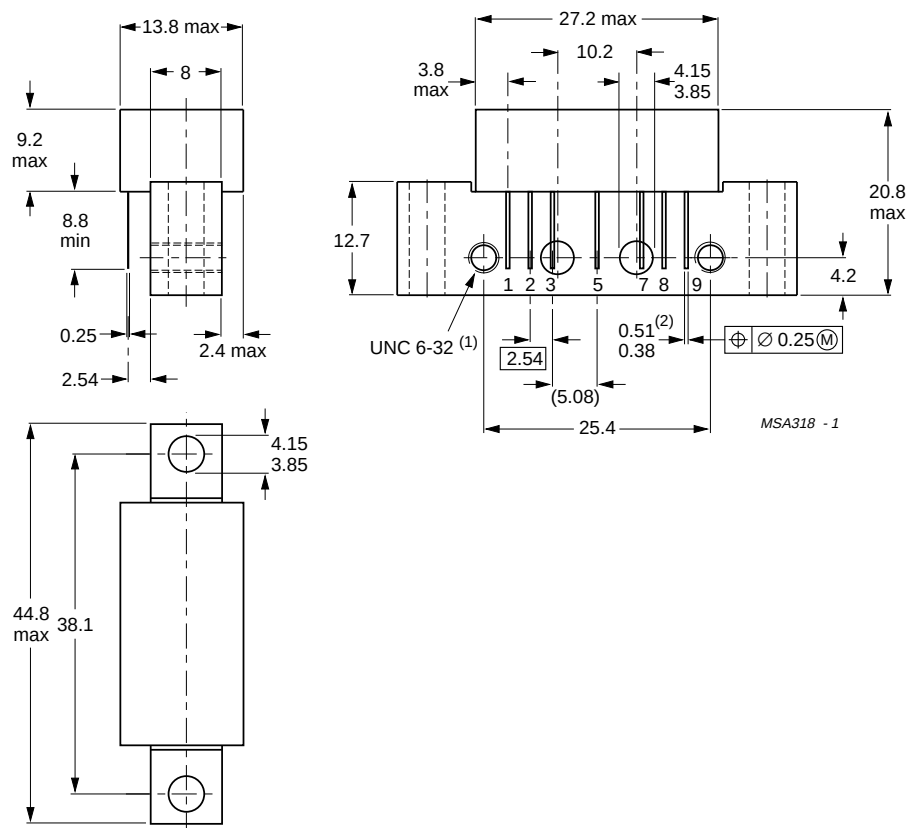
Notes

- $f_p = 55.25$ 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 module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

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BGD702D

PACKAGE OUTLINE



Dimensions in mm.

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

(2) Leads gold plated.

Fig.2 SOT115J.

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BGD702D

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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