

DATA SHEET

BGY683 CATV amplifier module

Product specification
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Philips Semiconductors



PHILIPS

CATV amplifier module

BGY683

FEATURES

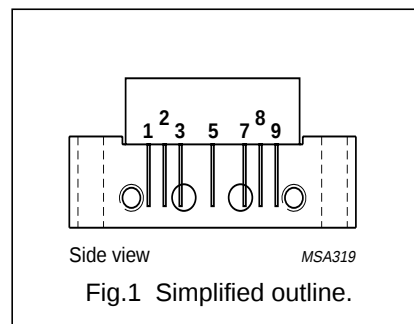
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

DESCRIPTION

Hybrid high dynamic range amplifier module for CATV systems operating over a frequency range of 40 to 600 MHz 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	13.5	14.5	dB
		f = 600 MHz	14.5	–	dB
I _{tot}	total current consumption (DC)	V _B = 24 V	–	240	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

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CHARACTERISTICS

Bandwidth 40 to 600 MHz; $V_B = 24\text{ V}$; $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$; $Z_S = Z_L = 75\text{ }\Omega$.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	$f = 50\text{ MHz}$	13.5	14.5	dB
		$f = 600\text{ MHz}$	14.5	–	dB
SL	slope cable equivalent	$f = 40\text{ to }600\text{ MHz}$	0.2	1.7	dB
FL	flatness of frequency response	$f = 40\text{ to }600\text{ MHz}$	–	± 0.2	dB
S_{11}	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	dB
		$f = 160\text{ to }600\text{ MHz}$	18	–	dB
S_{22}	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	dB
		$f = 160\text{ to }600\text{ MHz}$	18	–	dB
S_{21}	phase response	$f = 50\text{ MHz}$	–45	+45	deg
CTB	composite triple beat	85 channels flat; $V_o = 44\text{ dBmV}$; measured at 595.25 MHz	–	–55	dB
X_{mod}	cross modulation	85 channels flat; $V_o = 44\text{ dBmV}$; measured at 55.25 MHz	–	–59	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44\text{ dBmV}$; measured at 596.5 MHz	–	–57	dB
d_2	second order distortion	note 1	–	–68	dB
V_o	output voltage	$d_{\text{im}} = -60\text{ dB}$; note 2	58	–	dBmV
F	noise figure	$f = 600\text{ MHz}$	–	9	dB
I_{tot}	total current consumption (DC)	note 3	–	240	mA

Notes

- $f_p = 55.25\text{ MHz}$; $V_p = 44\text{ dBmV}$;
 $f_q = 541.25\text{ MHz}$; $V_q = 44\text{ dBmV}$;
measured at $f_p + f_q = 596.5\text{ MHz}$.
- Measured according to DIN45004B:
 $f_p = 590.25\text{ MHz}$; $V_p = V_o$;
 $f_q = 597.25\text{ MHz}$; $V_q = V_o - 6\text{ dB}$;
 $f_r = 599.25\text{ MHz}$; $V_r = V_o - 6\text{ dB}$;
measured at $f_p + f_q - f_r = 588.25\text{ MHz}$.
- The module normally operates at $V_B = 24\text{ V}$, but is able to withstand supply transients up to 30 V.

CATV amplifier module

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CHARACTERISTICS

Bandwidth 40 to 550 MHz; $V_B = 24\text{ V}$; $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$; $Z_S = Z_L = 75\text{ }\Omega$.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	$f = 50\text{ MHz}$	13.5	–	14.5	dB
		$f = 550\text{ MHz}$	14.5	–	–	dB
SL	slope cable equivalent	$f = 40\text{ to }550\text{ MHz}$	0.2	–	1.5	dB
FL	flatness of frequency response	$f = 40\text{ to }550\text{ MHz}$	–	–	± 0.2	dB
S_{11}	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	–	dB
		$f = 160\text{ to }550\text{ MHz}$	18	–	–	dB
S_{22}	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	–	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	–	–	dB
		$f = 160\text{ to }550\text{ MHz}$	18	–	–	dB
S_{21}	phase response	$f = 50\text{ MHz}$	–45	–	+45	deg
CTB	composite triple beat	77 channels flat; $V_o = 44\text{ dBmV}$; measured at 547.25 MHz	–	–	–59	dB
X_{mod}	cross modulation	77 channels flat; $V_o = 44\text{ dBmV}$; measured at 55.25 MHz	–	–	–61	dB
CSO	composite second order distortion	77 channels flat; $V_o = 44\text{ dBmV}$; measured at 548.5 MHz	–	–	–59	dB
d_2	second order distortion	note 1	–	–	–72	dB
V_o	output voltage	$d_{\text{im}} = -60\text{ dB}$; note 2	61.5	–	–	dBmV
F	noise figure	$f = 550\text{ MHz}$	–	–	8.5	dB
I_{tot}	total current consumption (DC)	note 3	–	200	240	mA

Notes

- $f_p = 55.25\text{ MHz}$; $V_p = 44\text{ dBmV}$;
 $f_q = 493.25\text{ MHz}$; $V_q = 44\text{ dBmV}$;
measured at $f_p + f_q = 548.5\text{ MHz}$.
- Measured according to DIN45004B:
 $f_p = 440.25\text{ MHz}$; $V_p = V_o$;
 $f_q = 447.25\text{ MHz}$; $V_q = V_o - 6\text{ dB}$;
 $f_r = 449.25\text{ MHz}$; $V_r = V_o - 6\text{ dB}$;
measured at $f_p + f_q - f_r = 438.25\text{ MHz}$.
- The module normally operates at $V_B = 24\text{ V}$, but is able to withstand supply transients up to 30 V.

CATV amplifier module

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CHARACTERISTICS

Bandwidth 40 to 450 MHz; $V_B = 24$ V; $T_{case} = 30$ °C; $Z_S = Z_L = 75$ Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	$f = 50$ MHz	16.5	–	17.5	dB
		$f = 450$ MHz	17.4	–	18.8	dB
SL	slope cable equivalent	$f = 40$ to 450 MHz	0.5	–	1.8	dB
FL	flatness of frequency response	$f = 40$ to 450 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 450 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 450 MHz	18	–	–	dB
S_{21}	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–	–61	dB
X_{mod}	cross modulation	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–	–60	dB
CSO	composite second order distortion	60 channels flat; $V_o = 46$ dBmV; measured at 446.5 MHz	–	–	–61	dB
d_2	second order distortion	note 1	–	–	–75	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	64	–	–	dBmV
F	noise figure	$f = 450$ MHz	–	–	7	dB
I_{tot}	total current consumption (DC)	note 3	–	200	240	mA

Notes

- $f_p = 55.25$ MHz; $V_p = 46$ dBmV;
 $f_q = 391.25$ MHz; $V_q = 46$ dBmV;
measured at $f_p + f_q = 446.5$ MHz.
- Measured according to DIN45004B:
 $f_p = 440.25$ MHz; $V_p = V_o$;
 $f_q = 447.25$ MHz; $V_q = V_o - 6$ dB;
 $f_r = 449.25$ MHz; $V_r = V_o - 6$ dB;
measured at $f_p + f_q - f_r = 438.25$ MHz.
- The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.