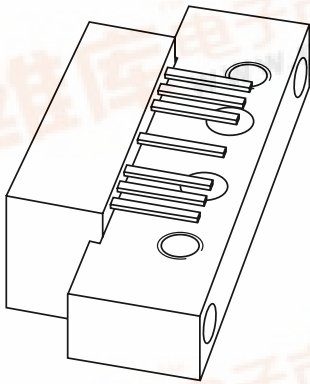


DISCRETE SEMICONDUCTORS

DATA SHEET



BGY685A CATV amplifier module

Product specification

1998 Mar 16

Supersedes data of 1997 Apr 21

File under Discrete Semiconductors, SC16

CATV amplifier module

BGY685A

FEATURES

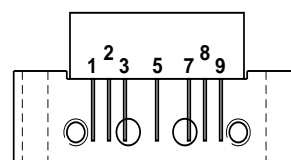
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

DESCRIPTION

Special super-high dynamic range amplifier module designed for applications in CATV systems with a bandwidth of 40 to 600 MHz 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



Side view

MSA319

Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G _p	power gain	f = 50 MHz	17.7	–	18.7	dB
		f = 600 MHz	19	–	–	dB
I _{tot}	total current consumption (DC)	V _B = 24 V	–	220	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}	mounting base operating temperature	–20	+100	°C

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CHARACTERISTICS

Table 1 Bandwidth 40 to 600 MHz; $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$; $Z_S = Z_L = 75\ \Omega$

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	$f = 50\text{ MHz}$	17.7	18.7	dB
		$f = 600\text{ MHz}$	19	–	dB
SL	slope cable equivalent	$f = 40\text{ to }600\text{ MHz}$	0.5	2.2	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	–	–60	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44\text{ dBmV}$; measured at 596.5 MHz	–	–56	dB
d_2	second order distortion	note 1	–	–70	dB
V_o	output voltage	$d_{\text{im}} = -60\text{ dB}$; note 2	60	–	dBmV
F	noise figure	$f = 600\text{ MHz}$	–	8.5	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 $f_p + f_q = 596.5\text{ MHz}$.
- $f_p = 590.25\text{ MHz}$; $V_p = V_o$;
 $f_q = 597.25\text{ MHz}$; $V_q = V_o - 6\text{ dB}$;
 $f_r = 599.25\text{ MHz}$; $V_r = V_o - 6\text{ dB}$;
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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Table 2 Bandwidth 40 to 550 MHz; $T_{\text{case}} = 30\text{ }^{\circ}\text{C}$; $Z_S = Z_L = 75\ \Omega$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	$f = 50\text{ MHz}$	17.7	–	18.7	dB
		$f = 550\text{ MHz}$	18.8	–	20	dB
SL	slope cable equivalent	$f = 40\text{ to }550\text{ MHz}$	0.5	–	2	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	–	–	–62	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	dB
I_{tot}	total current consumption (DC)	note 3	–	220	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 $f_p + f_q = 548.5\text{ MHz}$.
- $f_p = 540.25\text{ MHz}$; $V_p = V_o$;
 $f_q = 547.25\text{ MHz}$; $V_q = V_o - 6\text{ dB}$;
 $f_r = 549.25\text{ MHz}$; $V_r = V_o - 6\text{ dB}$;
measured at $f_p + f_q - f_r = 538.25\text{ MHz}$.
- 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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Table 3 Bandwidth 40 to 450 MHz; $T_{\text{case}} = 30\text{ °C}$; $Z_S = Z_L = 75\ \Omega$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	$f = 50\text{ MHz}$	17.7	–	18.7	dB
		$f = 450\text{ MHz}$	18.6	–	19.8	dB
SL	slope cable equivalent	$f = 40\text{ to }450\text{ MHz}$	0.5	–	1.8	dB
FL	flatness of frequency response	$f = 40\text{ to }450\text{ MHz}$	–	–	± 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
		$f = 160\text{ to }450\text{ MHz}$	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
		$f = 160\text{ to }450\text{ MHz}$	18	–	–	dB
S_{21}	phase response	$f = 50\text{ MHz}$	–45	–	+45	deg
CTB	composite triple beat	60 channels flat; $V_o = 46\text{ dBmV}$; measured at 445.25 MHz	–	–	–61	dB
X_{mod}	cross modulation	60 channels flat; $V_o = 46\text{ dBmV}$; measured at 55.25 MHz	–	–	–61	dB
CSO	composite second order distortion	60 channels flat; $V_o = 46\text{ dBmV}$; measured at 446.5 MHz	–	–	–61	dB
d_2	second order distortion	note 1	–	–	–75	dB
V_o	output voltage	$d_{\text{im}} = -60\text{ dB}$; note 2	64	–	–	dBmV
F	noise figure	$f = 450\text{ MHz}$	–	–	7	dB
I_{tot}	total current consumption (DC)	note 3	–	220	240	mA

Notes

- $f_p = 55.25\text{ MHz}$; $V_p = 46\text{ dBmV}$;
 $f_q = 391.25\text{ MHz}$; $V_q = 46\text{ dBmV}$;
measured at $f_p + f_q = 446.5\text{ MHz}$.
- $f_p = 440.25\text{ MHz}$; $V_p = V_o$;
 $f_q = 447.25\text{ MHz}$; $V_q = V_o - 6\text{ dB}$;
 $f_r = 449.25\text{ MHz}$; $V_r = V_o - 6\text{ dB}$;
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.

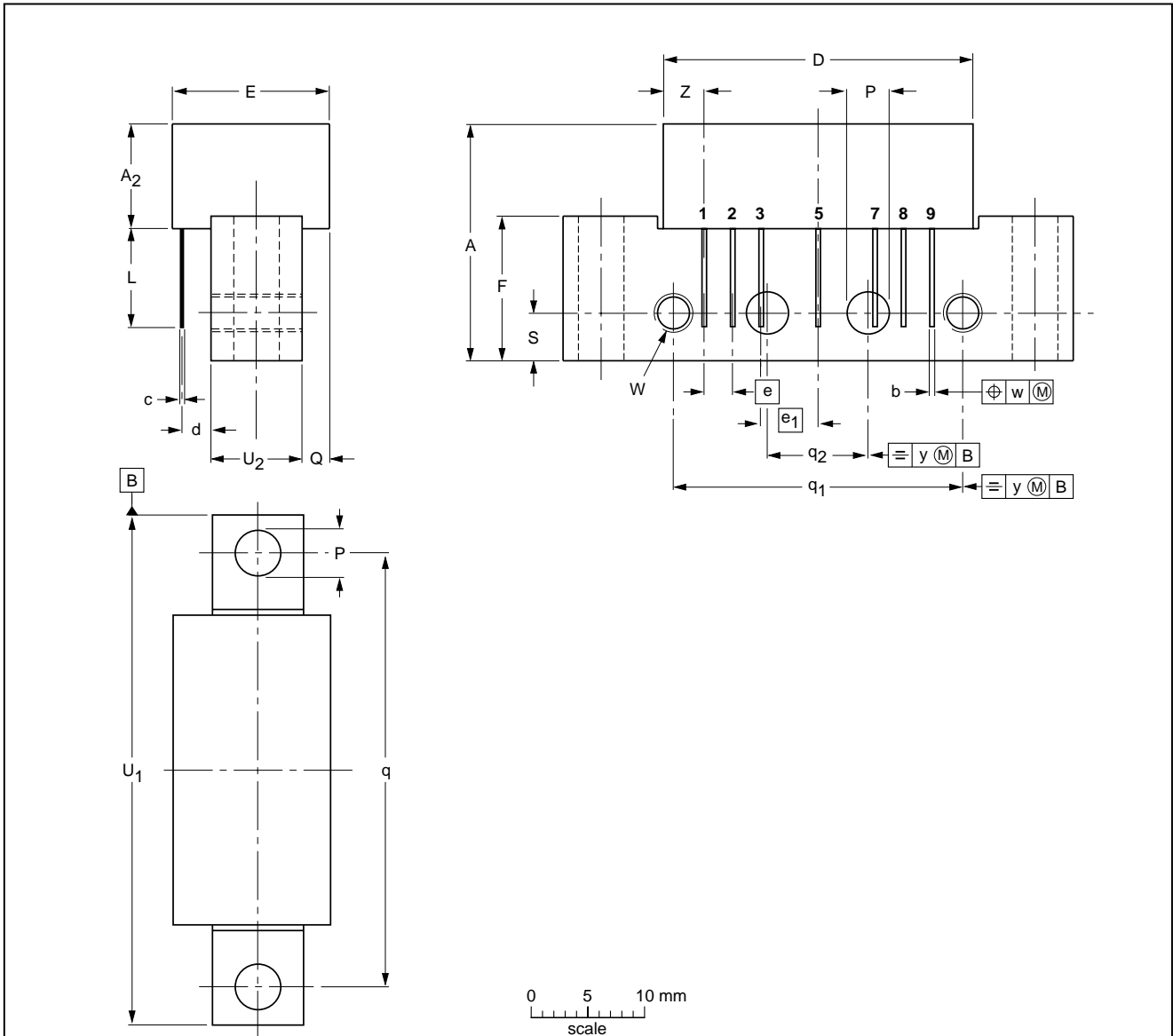
CATV amplifier module

BGY685A

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

CATV amplifier module**BGY685A**

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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