

DATA SHEET

BGY685AD

Hybrid CATV amplifier module

Product specification
Supersedes data of 1995 Oct 03
File under Discrete Semiconductors, SC16

1997 Apr 18

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FEATURES

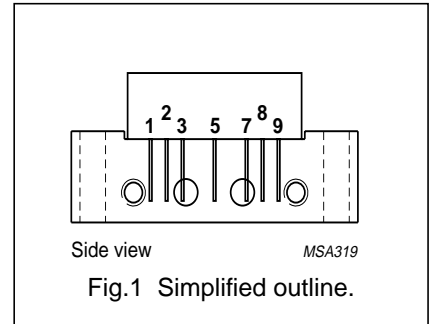
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

APPLICATIONS

- CATV systems operating over a 40 to 600 MHz frequency range.

PINNING - SOT115J

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V _B
7	common
8	common
9	output



DESCRIPTION

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

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G _p	power gain	f = 50 MHz	18	19	dB
		f = 600 MHz	18.75	–	dB
I _{tot}	total current consumption (DC)	V _B = 24 V	–	250	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

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CHARACTERISTICS

Table 1 Bandwidth 40 to 600 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 = 600 MHz	18.75	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	0.2	2.2	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	19	–	dB
		f = 160 to 600 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 600 MHz	18	–	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	–	–62	dB
X_{mod}	cross modulation	85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–58	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz	–	–60	dB
d_2	second order distortion	note 1	–	–70	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	62	–	dBmV
F	noise figure	f = 50 MHz	–	6	dB
		f = 600 MHz	–	8	dB
I_{tot}	total current consumption (DC)	note 3	–	250	mA

Notes

- $V_p = V_q = 44$ dBmV;
 $f_p = 55.25$ MHz; $f_q = 541.25$ MHz;
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.

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Table 2 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	18.8	–	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0.2	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	19	–	dB
		f = 160 to 550 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 550 MHz	18	–	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	–	–65	dB
X _{mod}	cross modulation	77 channels flat; V _o = 44 dBmV; measured at 55.25 MHz	–	–60	dB
CSO	composite second order distortion	77 channels flat; V _o = 44 dBmV; measured at 548.5 MHz	–	–62	dB
d ₂	second order distortion	note 1	–	–72	dB
V _o	output voltage	d _{im} = –60 dB; note 2	63	–	dBmV
F	noise figure	f = 50 MHz	–	6	dB
		f = 550 MHz	–	7.5	dB
I _{tot}	total current consumption (DC)	note 3	–	250	mA

Notes

1. $V_p = V_q = 44$ dBmV;
f_p = 55.25 MHz; f_q = 493.25 MHz;
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.

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Table 3 Bandwidth 40 to 450 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 = 450 MHz	18.6	–	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0.2	1.8	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	±0.3	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	–	–66	dB
X _{mod}	cross modulation	60 channels flat; V _o = 46 dBmV; measured at 55.25 MHz	–	–58	dB
CSO	composite second order distortion	60 channels flat; V _o = 46 dBmV; measured at 446.5 MHz	–	–67	dB
d ₂	second order distortion	note 1	–	–75	dB
V _o	output voltage	d _{im} = –60 dB; note 2	65	–	dBmV
F	noise figure	f = 50 MHz	–	6	dB
		f = 450 MHz	–	7	dB
I _{tot}	total current consumption (DC)	note 3	–	250	mA

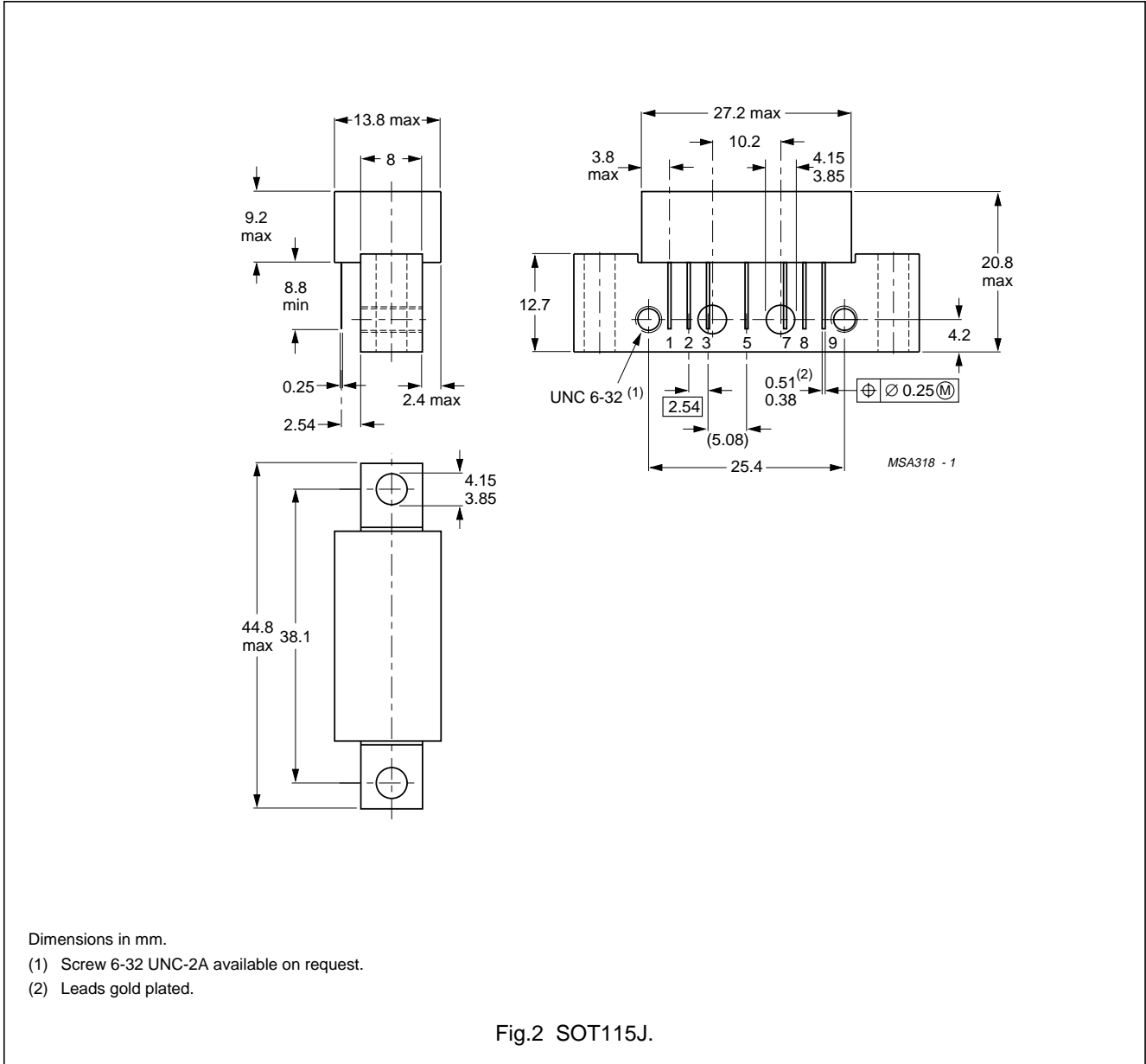
Notes

1. $V_p = V_q = 46$ dBmV;
f_p = 55.25 MHz; f_q = 391.25 MHz;
measured at f_p + f_q = 446.5 MHz.
2. 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

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PACKAGE OUTLINE



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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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