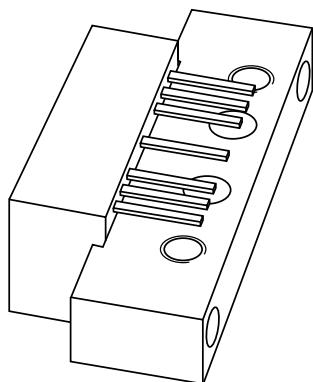


DATA SHEET



BGY685A

600 MHz, 18.2 dB gain push-pull
amplifier

Product specification
Supersedes data of 1998 Mar 16

2001 Oct 22



600 MHz, 18.2 dB gain push-pull amplifier

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

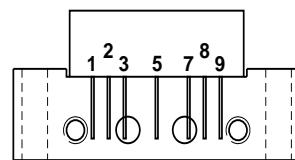


Fig.1 Simplified outline.

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 60134).

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

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

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	$d_{im} = -60 \text{ dB}$; 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.

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Table 2 Bandwidth 40 to 550 MHz; $T_{case} = 30^\circ\text{C}$; $Z_S = Z_L = 75 \Omega$

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	$d_{im} = -60 \text{ dB}$; 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.

600 MHz, 18.2 dB gain push-pull amplifier

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Table 3 Bandwidth 40 to 450 MHz; $T_{case} = 30^\circ\text{C}$; $Z_S = Z_L = 75 \Omega$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	$f = 50 \text{ MHz}$	17.7	—	18.7	dB
		$f = 450 \text{ MHz}$	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	$d_{im} = -60 \text{ dB}$; 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.

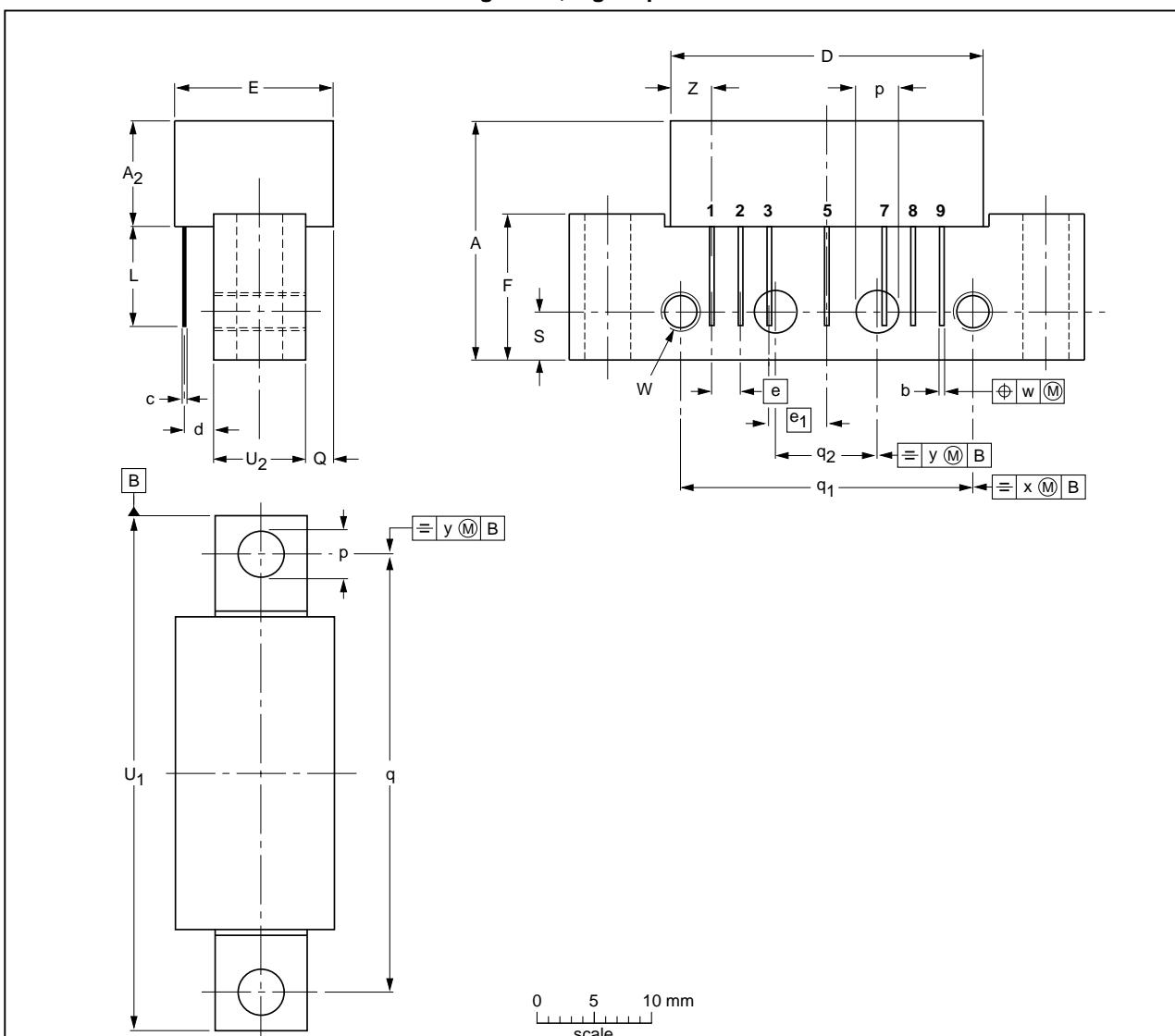
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PACKAGE OUTLINE

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	E max.	e	e ₁	F	L min.	p	Q max.	q	q ₁	q ₂	S	U ₁	U ₂	W	w	x	y	z max.
mm	20.8	9.5	0.51 0.38	0.25	27.2	2.04 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 44.25	8.2 7.8	6-32 UNC	0.25	0.7	0.1	3.8

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT115J						-04-02-04- 10-06-18

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DATA SHEET STATUS

DOCUMENT STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

Contact information

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