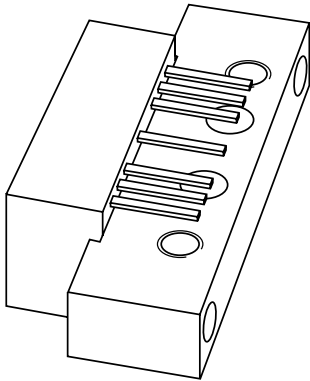


# DATA SHEET



## **BGY787**

**750 MHz, 21.5 dB gain push-pull  
amplifier**

Product specification  
Supersedes data of 1999 Mar 30

2001 Oct 31

# 750 MHz, 21.5 dB gain push-pull amplifier

# BGY787

### FEATURES

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

### APPLICATIONS

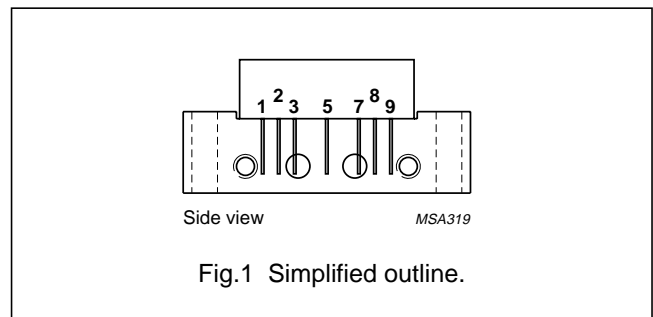
CATV systems operating over a 40 to 750 MHz frequency range.

### DESCRIPTION

Hybrid amplifier module in a SOT115J package operating with a voltage supply of 24 V (DC).

### PINNING - SOT115J

PIN	DESCRIPTION
1	input
2	common
3	common
5	+V <sub>B</sub>
7	common
8	common
9	output



### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	21	22	dB
		f = 750 MHz	21.5	–	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	–	240	mA

### LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>i</sub>	RF input voltage	–	60	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	mounting base operating temperature	–20	+100	°C

## 750 MHz, 21.5 dB gain push-pull amplifier

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## CHARACTERISTICS

**Table 1** Bandwidth 40 to 750 MHz;  $V_B = 24$  V;  $T_{case} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$G_p$	power gain	f = 50 MHz	21	21.5	22	dB
		f = 750 MHz	21.5	22.5	–	dB
SL	slope cable equivalent	f = 40 to 750 MHz	0	1	1.5	dB
FL	flatness of frequency response	f = 40 to 750 MHz	–	$\pm 0.2$	$\pm 0.5$	dB
$S_{11}$	input return losses	f = 40 to 80 MHz	20	33	–	dB
		f = 80 to 160 MHz	18.5	30	–	dB
		f = 160 to 320 MHz	17	25	–	dB
		f = 320 to 640 MHz	15.5	22.5	–	dB
		f = 640 to 750 MHz	14	20.5	–	dB
$S_{22}$	output return losses	f = 40 to 80 MHz	20	28.5	–	dB
		f = 80 to 160 MHz	18.5	27.5	–	dB
		f = 160 to 320 MHz	17	25	–	dB
		f = 320 to 640 MHz	15.5	22	–	dB
		f = 640 to 750 MHz	14	20	–	dB
$S_{21}$	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	110 channels flat; $V_o = 44$ dBmV; measured at 745.25 MHz	–	–54.5	–53	dB
$X_{mod}$	cross modulation	110 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–54	–52	dB
CSO	composite second order distortion	110 channels flat; $V_o = 44$ dBmV; measured at 746.5 MHz	–	–57.5	–53	dB
$d_2$	second order distortion	note 1	–	–75	–63	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 2	61	63	–	dBmV
F	noise figure	f = 50 MHz	–	4	5	dB
		f = 450 MHz	–	–	5.5	dB
		f = 550 MHz	–	–	5.5	dB
		f = 600 MHz	–	–	6	dB
		f = 750 MHz	–	5	6.5	dB
$I_{tot}$	total current consumption (DC)	note 3	–	220	240	mA

## Notes

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

## 750 MHz, 21.5 dB gain push-pull amplifier

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**Table 2** Bandwidth 40 to 600 MHz;  $V_B = 24$  V;  $T_{\text{case}} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	21	21.5	22	dB
		f = 600 MHz	21.5	–	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	0	–	1.5	dB
FL	flatness of frequency response	f = 40 to 600 MHz	–	–	±0.3	dB
S <sub>11</sub>	input return losses	f = 40 to 80 MHz	20	33	–	dB
		f = 80 to 160 MHz	18.5	30	–	dB
		f = 160 to 320 MHz	17	25	–	dB
		f = 320 to 600 MHz	16	22.5	–	dB
S <sub>22</sub>	output return losses	f = 40 to 80 MHz;	20	28.5	–	dB
		f = 80 to 160 MHz	18.5	27.5	–	dB
		f = 160 to 320 MHz	17	25	–	dB
		f = 320 to 600 MHz	16	22	–	dB
S <sub>21</sub>	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	85 channels flat; V <sub>o</sub> = 44 dBmV; measured at 595.25 MHz	–	–59.5	–58	dB
X <sub>mod</sub>	cross modulation	85 channels flat; V <sub>o</sub> = 44 dBmV; measured at 55.25 MHz	–	–55.5	–53	dB
CSO	composite second order distortion	85 channels flat; V <sub>o</sub> = 44 dBmV; measured at 596.5 MHz	–	–64	–56	dB
d <sub>2</sub>	second order distortion	note 1	–	–	–68	dB
V <sub>o</sub>	output voltage	d <sub>im</sub> = –60 dB; note 2	62.5	–	–	dBmV
F	noise figure	see Table 1	–	–	–	dB
I <sub>tot</sub>	total current consumption (DC)	note 3	–	220	240	mA

**Notes**

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

## 750 MHz, 21.5 dB gain push-pull amplifier

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**Table 3** Bandwidth 40 to 550 MHz;  $V_B = 24$  V;  $T_{\text{case}} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	21	21.5	22	dB
		f = 550 MHz	21.5	–	–	dB
SL	slope cable equivalent	f = 40 to 550 MHz	0	–	1.5	dB
FL	flatness of frequency response	f = 40 to 550 MHz	–	–	±0.3	dB
S <sub>11</sub>	input return losses	f = 40 to 80 MHz	20	33	–	dB
		f = 80 to 160 MHz	18.5	30	–	dB
		f = 160 to 320 MHz	17	25	–	dB
		f = 320 to 550 MHz	16	22.5	–	dB
S <sub>22</sub>	output return losses	f = 40 to 80 MHz	20	28.5	–	dB
		f = 80 to 160 MHz	18.5	27.5	–	dB
		f = 160 to 320 MHz	17	25	–	dB
		f = 320 to 550 MHz	16	22	–	dB
S <sub>21</sub>	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	77 channels flat; V <sub>o</sub> = 44 dBmV; measured at 547.25 MHz	–	–61	–60	dB
X <sub>mod</sub>	cross modulation	77 channels flat; V <sub>o</sub> = 44 dBmV; measured at 55.25 MHz	–	–56.5	–55	dB
CSO	composite second order distortion	77 channels flat; V <sub>o</sub> = 44 dBmV; measured at 548.5 MHz	–	–65.5	–58	dB
d <sub>2</sub>	second order distortion	note 1	–	–	–70	dB
V <sub>o</sub>	output voltage	d <sub>im</sub> = –60 dB; note 2	63	–	–	dBmV
F	noise figure	see Table 1	–	–	–	dB
I <sub>tot</sub>	total current consumption (DC)	note 3	–	220	240	mA

**Notes**

1.  $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  
 $f_q = 493.25$  MHz;  $V_q = 44$  dBmV;  
measured at  $f_p + f_q = 548.5$  MHz.
2. Measure 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.

## 750 MHz, 21.5 dB gain push-pull amplifier

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**Table 4** Bandwidth 40 to 450 MHz;  $V_B = 24$  V;  $T_{\text{case}} = 30$  °C;  $Z_S = Z_L = 75$   $\Omega$ 

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	21	21.5	22	dB
		f = 450 MHz	21.5	–	–	dB
SL	slope cable equivalent	f = 40 to 450 MHz	0	–	1.5	dB
FL	flatness of frequency response	f = 40 to 450 MHz	–	–	±0.3	dB
S <sub>11</sub>	input return losses	f = 40 to 80 MHz	20	33	–	dB
		f = 80 to 160 MHz	18.5	30	–	dB
		f = 160 to 320 MHz	17	25	–	dB
		f = 320 to 450 MHz	16	22.5	–	dB
S <sub>22</sub>	output return losses	f = 40 to 80 MHz	20	28.5	–	dB
		f = 80 to 160 MHz	18.5	27.5	–	dB
		f = 160 to 320 MHz	17	25	–	dB
		f = 320 to 450 MHz	16	22	–	dB
S <sub>21</sub>	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	60 channels flat; V <sub>o</sub> = 46 dBmV; measured at 445.25 MHz	–	–	–59	dB
X <sub>mod</sub>	cross modulation	60 channels flat; V <sub>o</sub> = 46 dBmV; measured at 55.25 MHz	–	–	–54	dB
CSO	composite second order distortion	60 channels flat; V <sub>o</sub> = 46 dBmV; measured at 446.5 MHz	–	–	–60	dB
d <sub>2</sub>	second order distortion	note 1	–	–	–73	dB
V <sub>o</sub>	output voltage	d <sub>im</sub> = –60 dB; note 2	64	–	–	dBmV
F	noise figure	see Table 1	–	–	–	dB
I <sub>tot</sub>	total current consumption (DC)	note 3	–	220	240	mA

**Notes**

1.  $f_p = 55.25$  MHz;  $V_p = 46$  dBmV;  
 $f_q = 391.25$  MHz;  $V_q = 46$  dBmV;  
measured at  $f_p + f_q = 446.5$  MHz.
2. Measure 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.

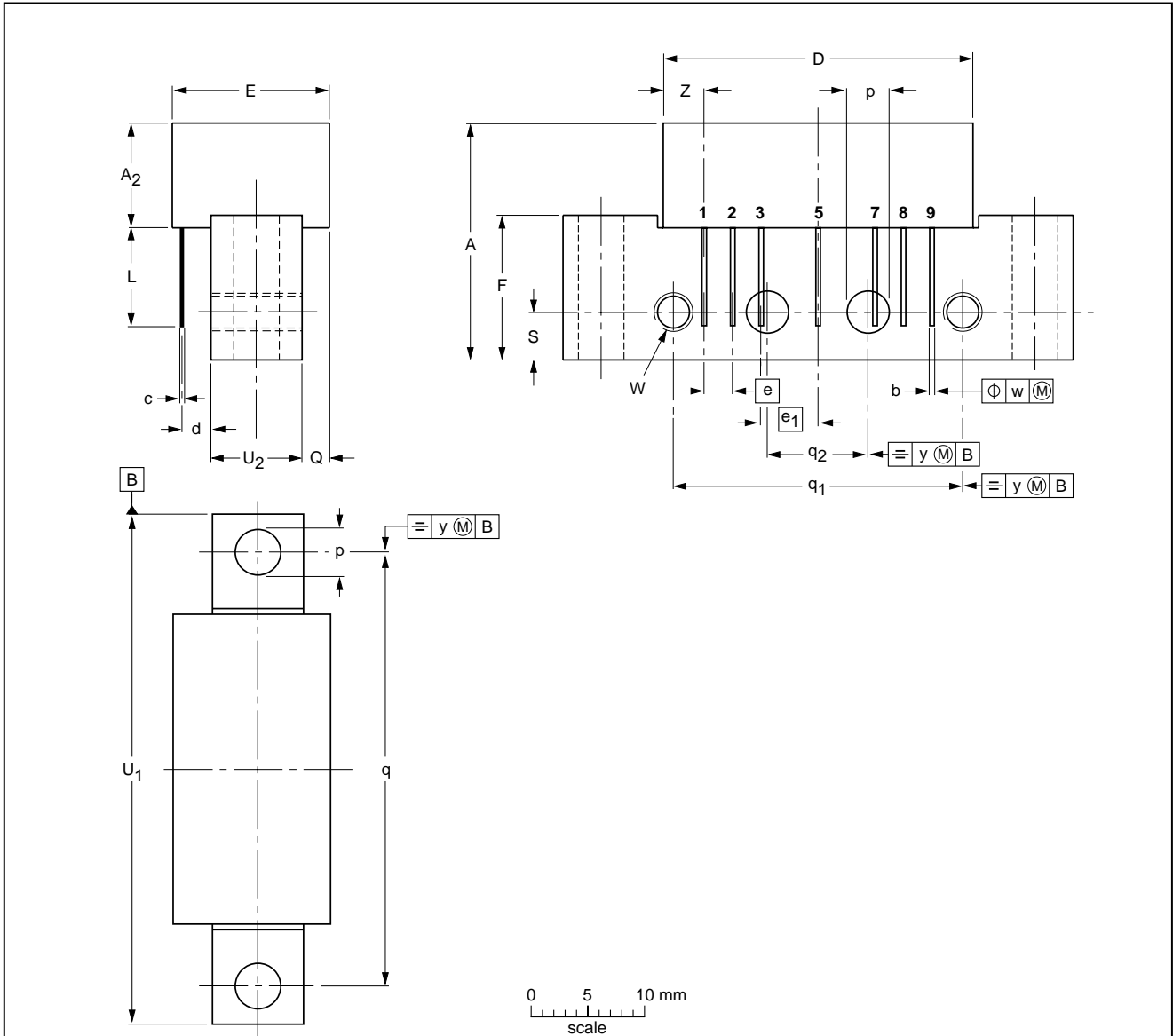
750 MHz, 21.5 dB gain push-pull amplifier

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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 <sub>2</sub> max.	b	c	D max.	d max.	E max.	e	e <sub>1</sub>	F	L min.	p	Q max.	q	q <sub>1</sub>	q <sub>2</sub>	S	U <sub>1</sub> max.	U <sub>2</sub>	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						99-02-06

## 750 MHz, 21.5 dB gain push-pull amplifier

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## DATA SHEET STATUS

DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITIONS
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**NOTES**

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**NOTES**

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**NOTES**

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