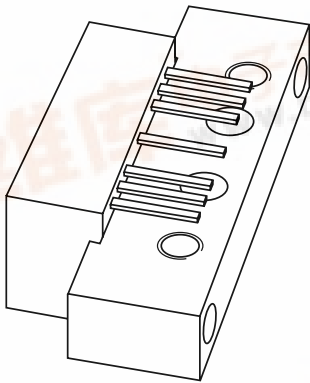


DISCRETE SEMICONDUCTORS

DATA SHEET



BGY888 CATV amplifier module

Product specification
Supersedes data of 1997 Apr 10

1999 Mar 30

CATV amplifier module

BGY888

FEATURES

- Excellent linearity
- Extremely low noise
- High gain
- Excellent return loss properties.

APPLICATIONS

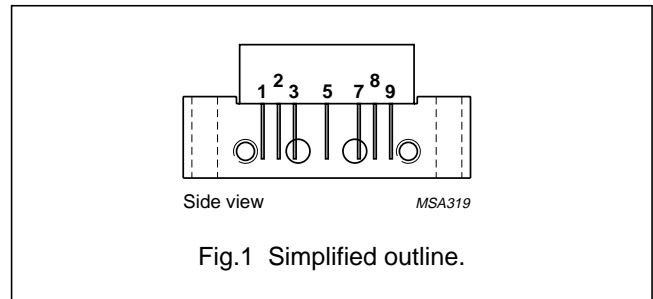
- Single module line extender in CATV systems operating over a frequency range of 40 to 860 MHz.

DESCRIPTION

Hybrid high dynamic range amplifier module operating with a voltage supply of 24 V in a SOT115J package. The high gain module consists of two cascaded stages both in cascode configuration.

PINNING SOT115J

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



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G _p	power gain	f = 50 MHz	33.5	34.5	dB
		f = 860 MHz	34	–	dB
I _{tot}	total current consumption (DC)	V _B = 24 V	–	340	mA

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V _i	RF input voltage	–	55	dBmV
T _{mb}	operating mounting base temperature	–20	+100	°C
T _{stg}	storage temperature	–40	+100	°C

CATV amplifier module

BGY888

CHARACTERISTICS

Table 1 Bandwidth 40 to 860 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	33.5	34	34.5	dB
		f = 860 MHz	34	35	–	dB
SL	slope cable equivalent	f = 40 to 860 MHz	0.5	1.1	2.5	dB
FL	flatness of frequency response	f = 40 to 860 MHz	–	±0.2	±0.5	dB
S ₁₁	input return losses	f = 40 to 80 MHz	20	25	–	dB
		f = 80 to 160 MHz	18.5	28	–	dB
		f = 160 to 320 MHz	17	28	–	dB
		f = 320 to 640 MHz	15.5	21	–	dB
		f = 640 to 860 MHz	14	18.5	–	dB
S ₂₂	output return losses	f = 40 to 80 MHz	20	25.5	–	dB
		f = 80 to 160 MHz	18.5	28.5	–	dB
		f = 160 to 320 MHz	17	26.5	–	dB
		f = 320 to 640 MHz	15.5	20.5	–	dB
		f = 640 to 860 MHz	14	21	–	dB
S ₂₁	phase response	f = 50 MHz	135	–	225	deg
CTB	composite triple beat	49 channels flat; V _o = 44 dBmV; measured at 859.25 MHz	–	–63.5	–60	dB
X _{mod}	cross modulation	49 channels flat; V _o = 44 dBmV; measured at 55.25 MHz	–	–63	–59	dB
CSO	composite second order distortion	49 channels flat; V _o = 44 dBmV; measured at 860.5 MHz	–	–64	–55	dB
d ₂	second order distortion	note 1	–	–74	–65	dB
V _o	output voltage	d _{im} = –60 dB; note 2	58	60	–	dBmV
F	noise figure	f = 50 MHz	–	4	4.5	dB
		f = 550 MHz	–	–	5	dB
		f = 600 MHz	–	–	5	dB
		f = 650 MHz	–	–	5.5	dB
		f = 750 MHz	–	–	6	dB
		f = 860 MHz	–	5.5	7	dB
I _{tot}	total current consumption (DC)	note 3	–	325	340	mA

Notes

1. $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 805.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 860.5$ MHz.
2. Measured according to DIN45004B:
 $f_p = 851.25$ MHz; $V_p = V_o$;
 $f_q = 858.25$ MHz; $V_q = V_o - 6$ dB;
 $f_r = 860.25$ MHz; $V_r = V_o - 6$ dB;
measured at $f_p + f_q - f_r = 849.25$ MHz.
3. The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

CATV amplifier module

BGY888

Table 2 Bandwidth 40 to 860 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	33.5	34	34.5	dB
		f = 860 MHz	34	35	–	dB
SL	slope cable equivalent	f = 40 to 860 MHz	0.5	1.1	2.5	dB
FL	flatness of frequency response	f = 40 to 860 MHz	–	±0.2	±0.5	dB
S ₁₁	input return losses	f = 40 to 80 MHz	20	25	–	dB
		f = 80 to 160 MHz	18.5	28	–	dB
		f = 160 to 320 MHz	17	28	–	dB
		f = 320 to 640 MHz	15.5	21	–	dB
		f = 640 to 860 MHz	14	18.5	–	dB
S ₂₂	output return losses	f = 40 to 80 MHz	20	25.5	–	dB
		f = 80 to 160 MHz	18.5	28.5	–	dB
		f = 160 to 320 MHz	17	26.5	–	dB
		f = 320 to 640 MHz	15.5	20.5	–	dB
		f = 640 to 860 MHz	14	21	–	dB
S ₂₁	phase response	f = 50 MHz	135	–	225	deg
CTB	composite triple beat	129 channels flat; V _o = 44 dBmV; measured at 859.25 MHz	–	–47.5	–46	dB
X _{mod}	cross modulation	129 channels flat; V _o = 44 dBmV; measured at 55.25 MHz	–	–53.5	–50	dB
CSO	composite second order distortion	129 channels flat; V _o = 44 dBmV; measured at 860.5 MHz	–	–56	–48	dB
d ₂	second order distortion	note 1	–	–74	–65	dB
V _o	output voltage	d _{im} = –60 dB; note 2	58	60	–	dBmV
F	noise figure	see Table 1	–	–	–	dB
I _{tot}	total current consumption (DC)	note 3	–	325	340	mA

Notes

1. $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 805.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 860.5$ MHz.
2. Measured according to DIN45004B:
 $f_p = 851.25$ MHz; $V_p = V_o$;
 $f_q = 858.25$ MHz; $V_q = V_o - 6$ dB;
 $f_r = 860.25$ MHz; $V_r = V_o - 6$ dB;
measured at $f_p + f_q - f_r = 849.25$ MHz.
3. The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

CATV amplifier module

BGY888

Table 3 Bandwidth 40 to 750 MHz; $V_B = 24$ V; $T_{\text{case}} = 30$ °C; $Z_S = Z_L = 75$ Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G _p	power gain	f = 50 MHz	33.5	34	34.5	dB
		f = 750 MHz	34	–	–	dB
SL	slope cable equivalent	f = 40 to 750 MHz	0.2	–	2.2	dB
FL	flatness of frequency response	f = 40 to 750 MHz	–	–	±0.45	dB
S ₁₁	input return losses	f = 40 to 80 MHz	20	25	–	dB
		f = 80 to 160 MHz	18.5	28	–	dB
		f = 160 to 320 MHz	17	28	–	dB
		f = 320 to 640 MHz	15.5	21	–	dB
		f = 640 to 750 MHz	14	18.5	–	dB
S ₂₂	output return losses	f = 40 to 80 MHz	20	25.5	–	dB
		f = 80 to 160 MHz	18.5	28.5	–	dB
		f = 160 to 320 MHz	17	26.5	–	dB
		f = 320 to 640 MHz	15.5	20.5	–	dB
		f = 640 to 750 MHz	14	21	–	dB
S ₂₁	phase response	f = 50 MHz	135	–	225	deg
CTB	composite triple beat	110 channels flat; V _o = 44 dBmV; measured at 745.25 MHz	–	–52.5	–50	dB
X _{mod}	cross modulation	110 channels flat; V _o = 44 dBmV; measured at 55.25 MHz	–	–55.5	–51	dB
CSO	composite second order distortion	110 channels flat; V _o = 44 dBmV; measured at 746.5 MHz	–	–61.5	–53	dB
d ₂	second order distortion	note 1	–	–	–65	dB
V _o	output voltage	d _{im} = –60 dB; note 2	59	–	–	dBmV
F	noise figure	see Table 1	–	–	–	dB
I _{tot}	total current consumption (DC)	note 3	–	325	340	mA

Notes

1. 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.
2. Measured 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.
3. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.

CATV amplifier module

BGY888

Table 4 Bandwidth 40 to 600 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	33.5	34	34.5	dB
		f = 600 MHz	34	–	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	0	–	2	dB
FL	flatness of frequency response	f = 40 to 600 MHz	–	–	±0.35	dB
S ₁₁	input return losses	f = 40 to 80 MHz	20	25	–	dB
		f = 80 to 160 MHz	18.5	28	–	dB
		f = 160 to 320 MHz	17	28	–	dB
		f = 320 to 600 MHz	16	21	–	dB
S ₂₂	output return losses	f = 40 to 80 MHz	20	25.5	–	dB
		f = 80 to 160 MHz	18.5	28.5	–	dB
		f = 160 to 320 MHz	17	26.5	–	dB
		f = 320 to 600 MHz	16	20.5	–	dB
S ₂₁	phase response	f = 50MHz	135	–	225	deg
CTB	composite triple beat	85 channels flat; V _o = 44 dBmV; measured at 595.25 MHz	–	–56.5	–55	dB
X _{mod}	cross modulation	85 channels flat; V _o = 44 dBmV; measured at 55.25 MHz	–	–58	–54	dB
CSO	composite second order distortion	85 channels flat; V _o = 44 dBmV; measured at 596.5 MHz	–	–69.5	–56	dB
d ₂	second order distortion	note 1	–	–	–68	dB
V _o	output voltage	d _{im} = –60 dB; note 2	61	–	–	dBmV
F	noise figure (DC)	see Table 1	–	–	–	dB
I _{tot}	total current consumption	note 3	–	325	340	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. 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.
3. The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

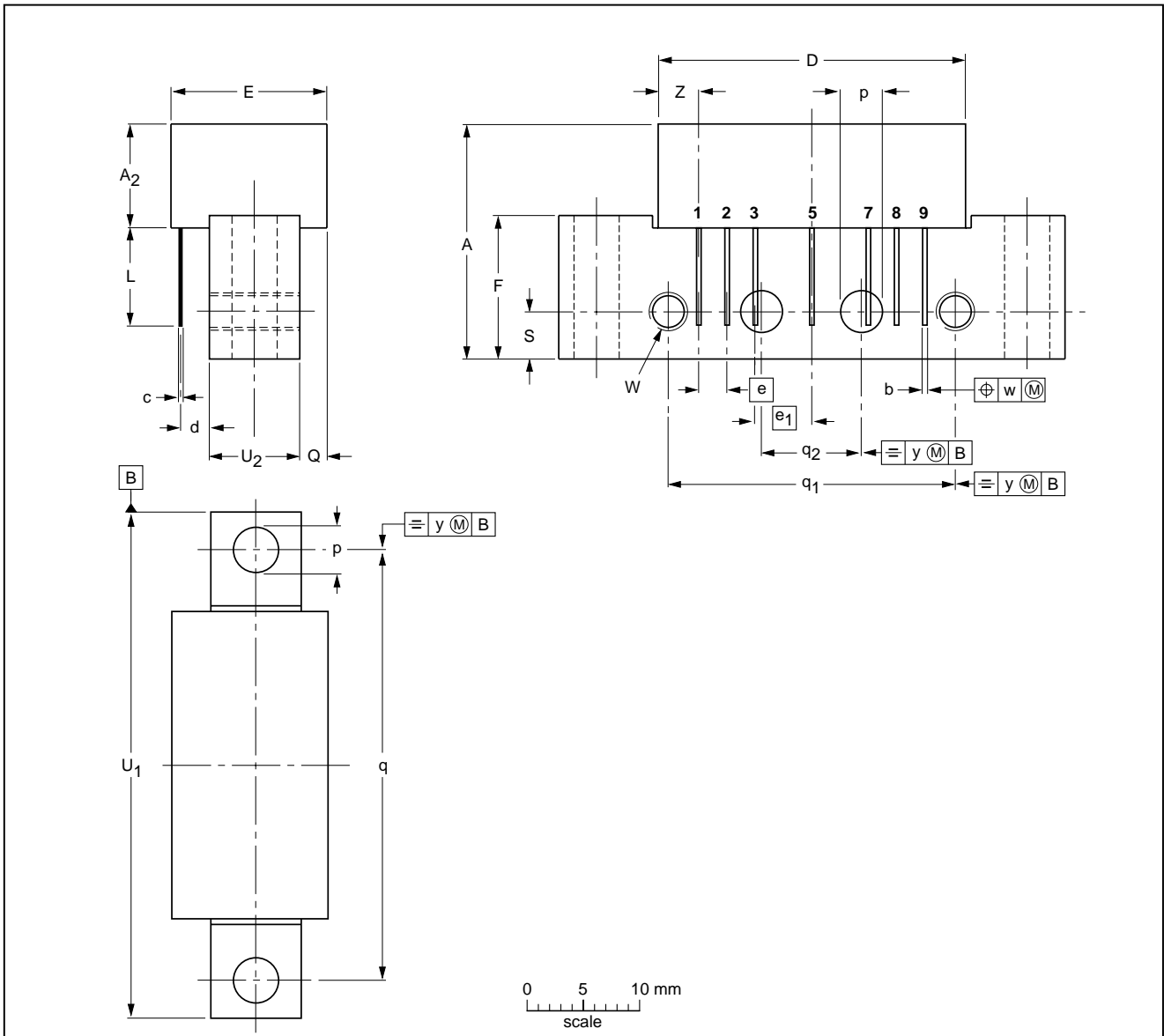
CATV amplifier module

BGY888

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					99-02-06

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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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NOTES

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