DATA SHEET

BGY887B
CATV amplifier module

Product specification
Supersedes data of February 1995

1997 Apr 15

CATV amplifier module BGY887B

FEATURES

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

APPLICATIONS

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

DESCRIPTION

Hybrid amplifier module in a SOT115J package operating with a voltage supply of 24 V (DC). This high gain module consists of two cascaded stages, both in cascode configuration.

PINNING - SOT115J

PIN	DESCRIPTION
1	input
2	common
3	common
5	$+V_B$
7	common
8	common
9	output

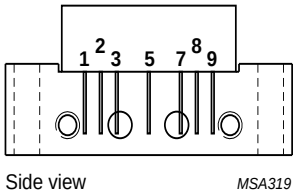


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	28.5	29.5	dB
		f = 860 MHz	29	–	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_{stg}	storage temperature	−40	+100	°C
T_{mb}	operating mounting base temperature	−20	+100	°C

CHARACTERISTICS

Table 1 Bandwidth 40 to 860 MHz; V_B = 24 V; T_{mb} = 30 °C; $Z_S = Z_L$ = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	28.5	29.5	dB
		f = 860 MHz	29	–	dB
SL	slope cable equivalent	f = 40 to 860 MHz	0.5	2.5	dB
FL	flatness of frequency response	f = 40 to 860 MHz	–	±0.5	dB
S_{11}	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 860 MHz	14	–	dB
S_{22}	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 860 MHz	14	–	dB
CTB	composite triple beat	49 channels flat; V_o = 44 dBmV; measured at 859.25 MHz	–	−60	dB
X_{mod}	cross modulation	49 channels flat; V_o = 44 dBmV; measured at 55.25 MHz	–	−60	dB
CSO	composite second order distortion	49 channels flat; V_o = 44 dBmV; measured at 860.5 MHz	–	−60	dB
d_2	second order distortion	note 1	–	−70	dB
V_o	output voltage	d_{im} = −60 dB; note 2	58.5	–	dBmV
F	noise figure	f = 50 MHz	–	5	dB
		f = 550 MHz	–	5.5	dB
		f = 600 MHz	–	5.5	dB
		f = 650 MHz	–	5.5	dB
		f = 750 MHz	–	6	dB
		f = 860 MHz	–	6.5	dB
I_{tot}	total current consumption (DC)	note 3	–	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.

Table 2 Bandwidth 40 to 860 MHz; V_B = 24 V; T_{mb} = 30 °C; $Z_S = Z_L$ = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	28.5	29.5	dB
		f = 860 MHz	29	–	dB
SL	slope cable equivalent	f = 40 to 860 MHz	0.5	2.5	dB
FL	flatness of frequency response	f = 40 to 860 MHz	–	±0.5	dB
S_{11}	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 860 MHz	14	–	dB
S_{22}	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 860 MHz	14	–	dB
CTB	composite triple beat	129 channels flat; V_o = 44 dBmV; measured at 859.25 MHz	–	−46	dB
X_{mod}	cross modulation	129 channels flat; V_o = 44 dBmV; measured at 55.25 MHz	–	−52	dB
CSO	composite second order distortion	129 channels flat; V_o = 44 dBmV; measured at 860.5 MHz	–	−53	dB
d_2	second order distortion	note 1	–	−70	dB
V_o	output voltage	d_{im} = −60 dB; note 2	58.5	–	dBmV
F	noise figure	see Table 1	–	–	dB
I_{tot}	total current consumption (DC)	note 3	–	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.

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	28.5	29.5	dB
		f = 750 MHz	29	–	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	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 750 MHz	14	–	dB
S_{22}	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 640 MHz	15.5	–	dB
		f = 640 to 750 MHz	14	–	dB
CTB	composite triple beat	110 channels flat; V_o = 44 dBmV; measured at 745.25 MHz	–	–50	dB
X_{mod}	cross modulation	110 channels flat; V_o = 44 dBmV; measured at 55.25 MHz	–	–54	dB
CSO	composite second order distortion	110 channels flat; V_o = 44 dBmV; measured at 746.5 MHz	–	–56	dB
d_2	second order distortion	note 1	–	–70	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	–	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.

Table 4 Bandwidth 40 to 600 MHz; V_B = 24 V; T_{mb} = 30 °C; $Z_S = Z_L$ = 75 Ω

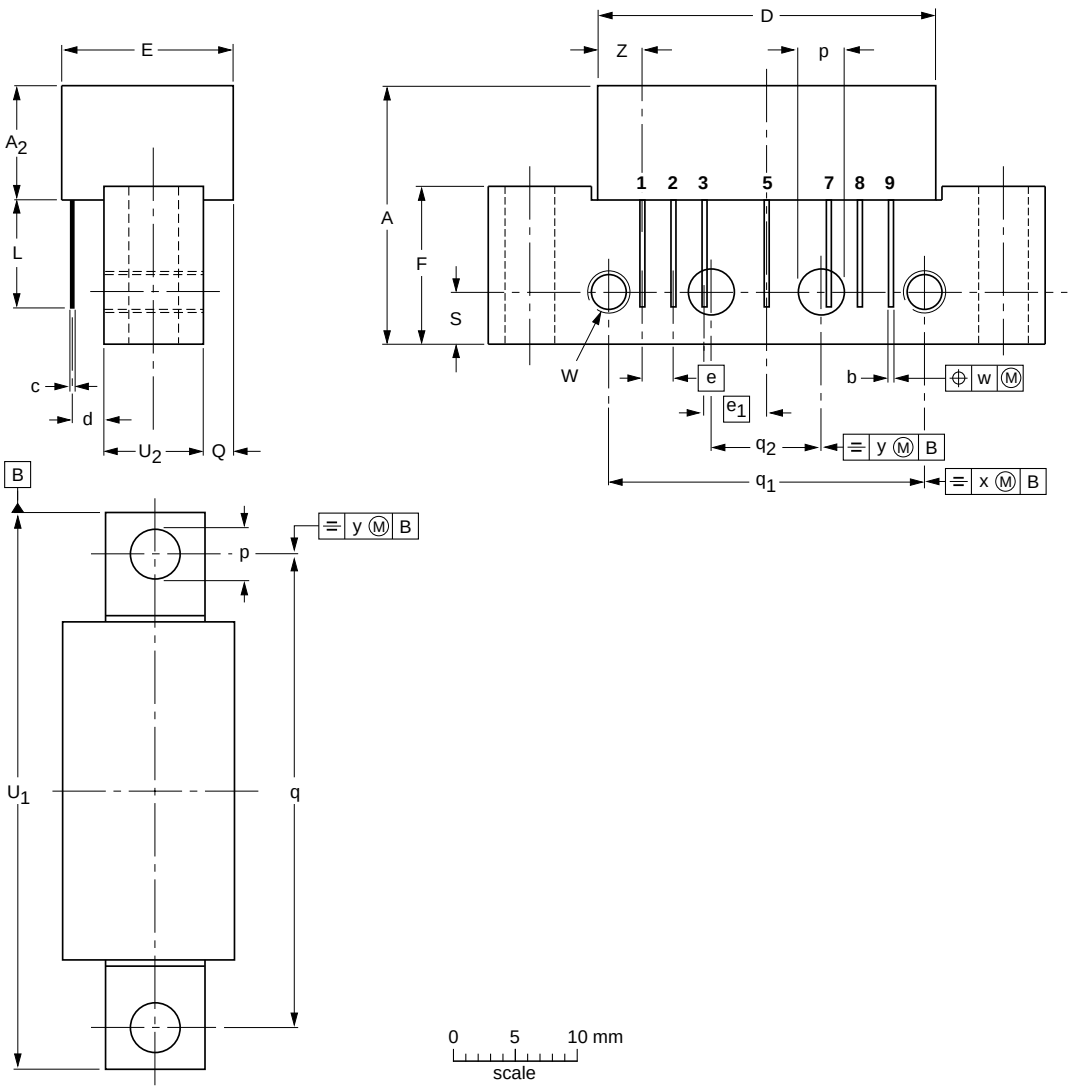
SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	28.5	29.5	dB
		f = 600 MHz	29	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	–	2	dB
FL	flatness of frequency response	f = 40 to 600 MHz	–	±0.35	dB
S_{11}	input return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 600 MHz	16	–	dB
S_{22}	output return losses	f = 40 to 80 MHz	20	–	dB
		f = 80 to 160 MHz	18.5	–	dB
		f = 160 to 320 MHz	17	–	dB
		f = 320 to 600 MHz	16	–	dB
CTB	composite triple beat	85 channels flat; V_o = 44 dBmV; measured at 595.25 MHz	–	−55	dB
X_{mod}	cross modulation	85 channels flat; V_o = 44 dBmV; measured at 55.25 MHz	–	−56	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	–	−72	dB
V_o	output voltage	d_{im} = −60 dB; note 2	61	–	dBmV
F	noise figure	see Table 1	–	–	dB
I_{tot}	total current consumption (DC)	note 3	–	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.

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

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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