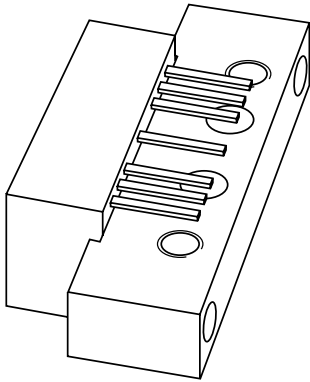


DATA SHEET



BGD802N CATV amplifier module

Product specification
Supersedes data of 1997 Sep 03

1999 Mar 22

CATV amplifier module

BGD802N

FEATURES

- Extremely flat gain response
- Excellent linearity
- Extremely low noise
- Excellent return loss properties
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

APPLICATIONS

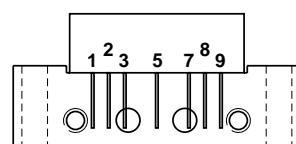
- CATV systems operating in the 40 to 860 MHz frequency range.

DESCRIPTION

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

PINNING - SOT115J

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



Side view

MSA319

Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G _p	power gain	f = 50 MHz	18	19	dB
		f = 860 MHz	18.5	–	dB
I _{tot}	total current consumption (DC)	V _B = 24 V	–	410	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V _B	supply voltage	–	25	V
V _i	RF input voltage	–	65	dBmV
T _{stg}	storage temperature	–40	+100	°C
T _{mb}	operating mounting base temperature	–20	+100	°C

CATV amplifier module

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CHARACTERISTICS

Table 1 Bandwidth 40 to 860 MHz; $V_B = 24$ V; $T_{case} = 35$ °C; $Z_S = Z_L = 75$ Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	$f = 50$ MHz	18	18.5	19	dB
		$f = 860$ MHz	18.5	19.5	–	dB
SL	slope cable equivalent	$f = 40$ to 860 MHz	0.2	0.9	2	dB
FL	flatness of frequency response	$f = 40$ to 860 MHz	–	± 0.1	± 0.25	dB
S_{11}	input return losses	$f = 40$ to 80 MHz	20	32	–	dB
		$f = 80$ to 160 MHz	18.5	27	–	dB
		$f = 160$ to 320 MHz	17	24	–	dB
		$f = 320$ to 640 MHz	15.5	22	–	dB
		$f = 640$ to 860 MHz	14	20.5	–	dB
S_{22}	output return losses	$f = 40$ to 80 MHz	20	33	–	dB
		$f = 80$ to 160 MHz	18.5	29	–	dB
		$f = 160$ to 860 MHz	17	22	–	dB
S_{21}	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat	49 channels flat; $V_o = 47$ dBmV; measured at 859.25 MHz	–	–65	–63	dB
X_{mod}	cross modulation	49 channels flat; $V_o = 47$ dBmV; measured at 55.25 MHz	–	–64	–62	dB
CSO	composite second order distortion	49 channels flat; $V_o = 47$ dBmV; measured at 860.5 MHz	–	–68	–60	dB
d_2	second order distortion	note 1	–	–75	–69	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	61.5	63.5	–	dBmV
F	noise figure	$f = 50$ MHz	–	4.5	5.5	dB
		$f = 550$ MHz	–	–	6	dB
		$f = 650$ MHz	–	–	7	dB
		$f = 750$ MHz	–	–	7.5	dB
		$f = 860$ MHz	–	6.5	9	dB
I_{tot}	total current consumption (DC)	note 3	–	395	410	mA

Notes

- $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 805.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 860.5$ MHz.
- 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.
- The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

CATV amplifier module

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Table 2 Bandwidth 40 to 860 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	18	18.5	19	dB
		$f = 860$ MHz	18.5	19.5	–	dB
SL	slope cable equivalent	$f = 40$ to 860 MHz	0.2	0.9	2	dB
FL	flatness of frequency response	$f = 40$ to 860 MHz	–	± 0.1	± 0.25	dB
S_{11}	input return losses	$f = 40$ to 80 MHz	20	32	–	dB
		$f = 80$ to 160 MHz	18.5	27	–	dB
		$f = 160$ to 320 MHz	17	24	–	dB
		$f = 320$ to 640 MHz	15.5	22	–	dB
		$f = 640$ to 860 MHz	14	20.5	–	dB
S_{22}	output return losses	$f = 40$ to 80 MHz	20	33	–	dB
		$f = 80$ to 160 MHz	18.5	29	–	dB
		$f = 160$ to 860 MHz	17	22	–	dB
S_{21}	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat	129 channels flat; $V_o = 44$ dBmV; measured at 859.25 MHz	–	–	–54	dB
X_{mod}	cross modulation	129 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–	–59	dB
CSO	composite second order distortion	129 channels flat; $V_o = 44$ dBmV; measured at 860.5 MHz	–	–	–56	dB
d_2	second order distortion	note 1	–	–75	–69	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	61.5	63.5	–	dBmV
F	noise figure	see Table 1	–	–	–	dB
I_{tot}	total current consumption (DC)	note 3	–	395	410	mA

Notes

- $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 805.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 860.5$ MHz.
- 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.
- The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

CATV amplifier module

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Table 3 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	18	18.5	19	dB
		$f = 750$ MHz	18.5	–	–	dB
SL	slope cable equivalent	$f = 40$ to 750 MHz	0.2	–	2	dB
FL	flatness of frequency response	$f = 40$ to 750 MHz	–	–	± 0.25	dB
S_{11}	input return losses	$f = 40$ to 80 MHz	20	32	–	dB
		$f = 80$ to 160 MHz	18.5	27	–	dB
		$f = 160$ to 320 MHz	17	24	–	dB
		$f = 320$ to 640 MHz	15.5	22	–	dB
		$f = 640$ to 750 MHz	14	20.5	–	dB
S_{22}	output return losses	$f = 40$ to 80 MHz	20	33	–	dB
		$f = 80$ to 160 MHz	18.5	29	–	dB
		$f = 160$ to 750 MHz	17	22	–	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	–	–	–59	dB
X_{mod}	cross modulation	110 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–	–60	dB
CSO	composite second order distortion	110 channels flat; $V_o = 44$ dBmV; measured at 746.5 MHz	–	–	–60	dB
d_2	second order distortion	note 1	–	–	–72	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	64	–	–	dBmV
F	noise figure	see Table 1	–	–	–	dB
I_{tot}	total current consumption (DC)	note 3	–	395	410	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.
- 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.
- The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

CATV amplifier module

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Table 4 Bandwidth 40 to 650 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	18	18.5	19	dB
		$f = 650$ MHz	18.5	–	–	dB
SL	slope cable equivalent	$f = 40$ to 650 MHz	0.2	–	2	dB
FL	flatness of frequency response	$f = 40$ to 650 MHz	–	–	± 0.2	dB
S_{11}	input return losses	$f = 40$ to 80 MHz	20	32	–	dB
		$f = 80$ to 160 MHz	18.5	27	–	dB
		$f = 160$ to 320 MHz	17	24	–	dB
		$f = 320$ to 650 MHz	15	22	–	dB
S_{22}	output return losses	$f = 40$ to 80 MHz	20	33	–	dB
		$f = 80$ to 160 MHz	18.5	29	–	dB
		$f = 160$ to 650 MHz	17	22	–	dB
S_{21}	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat	94 channels flat; $V_o = 44$ dBmV; measured at 649.25 MHz	–	–	–61	dB
X_{mod}	cross modulation	94 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–	–61	dB
CSO	composite second order distortion	94 channels flat; $V_o = 44$ dBmV; measured at 650.5 MHz	–	–	–62	dB
d_2	second order distortion	note 1	–	–	–72	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	65	–	–	dBmV
F	noise figure	see Table 1	–	–	–	dB
I_{tot}	total current consumption (DC)	note 3	–	395	410	mA

Notes

- $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 595.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 650.5$ MHz.
- Measured according to DIN45004B:
 $f_p = 640.25$ MHz; $V_p = V_o$;
 $f_q = 647.25$ MHz; $V_q = V_o - 6$ dB;
 $f_r = 649.25$ MHz; $V_r = V_o - 6$ dB;
measured at $f_p + f_q - f_r = 638.25$ MHz.
- The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

CATV amplifier module

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Table 5 Bandwidth 40 to 550 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	18	18.5	19	dB
		$f = 550$ MHz	18.5	–	–	dB
SL	slope cable equivalent	$f = 40$ to 550 MHz	0.2	–	2	dB
FL	flatness of frequency response	$f = 40$ to 550 MHz	–	–	± 0.2	dB
S_{11}	input return losses	$f = 40$ to 80 MHz	20	32	–	dB
		$f = 80$ to 160 MHz	18.5	27	–	dB
		$f = 160$ to 320 MHz	17	24	–	dB
		$f = 320$ to 550 MHz	16	22	–	dB
S_{22}	output return losses	$f = 40$ to 80 MHz	20	33	–	dB
		$f = 80$ to 160 MHz	18.5	29	–	dB
		$f = 160$ to 550 MHz	17	22	–	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	–	–	–63	dB
CSO	composite second order distortion	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–	–65	dB
d_2	second order distortion	note 1	–	–	–74	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	66	–	–	dBmV
F	noise figure	see Table 1	–	–	–	dB
I_{tot}	total current consumption (DC)	note 3	–	395	410	mA

Notes

- $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 493.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 548.5$ MHz.
- 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.
- The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

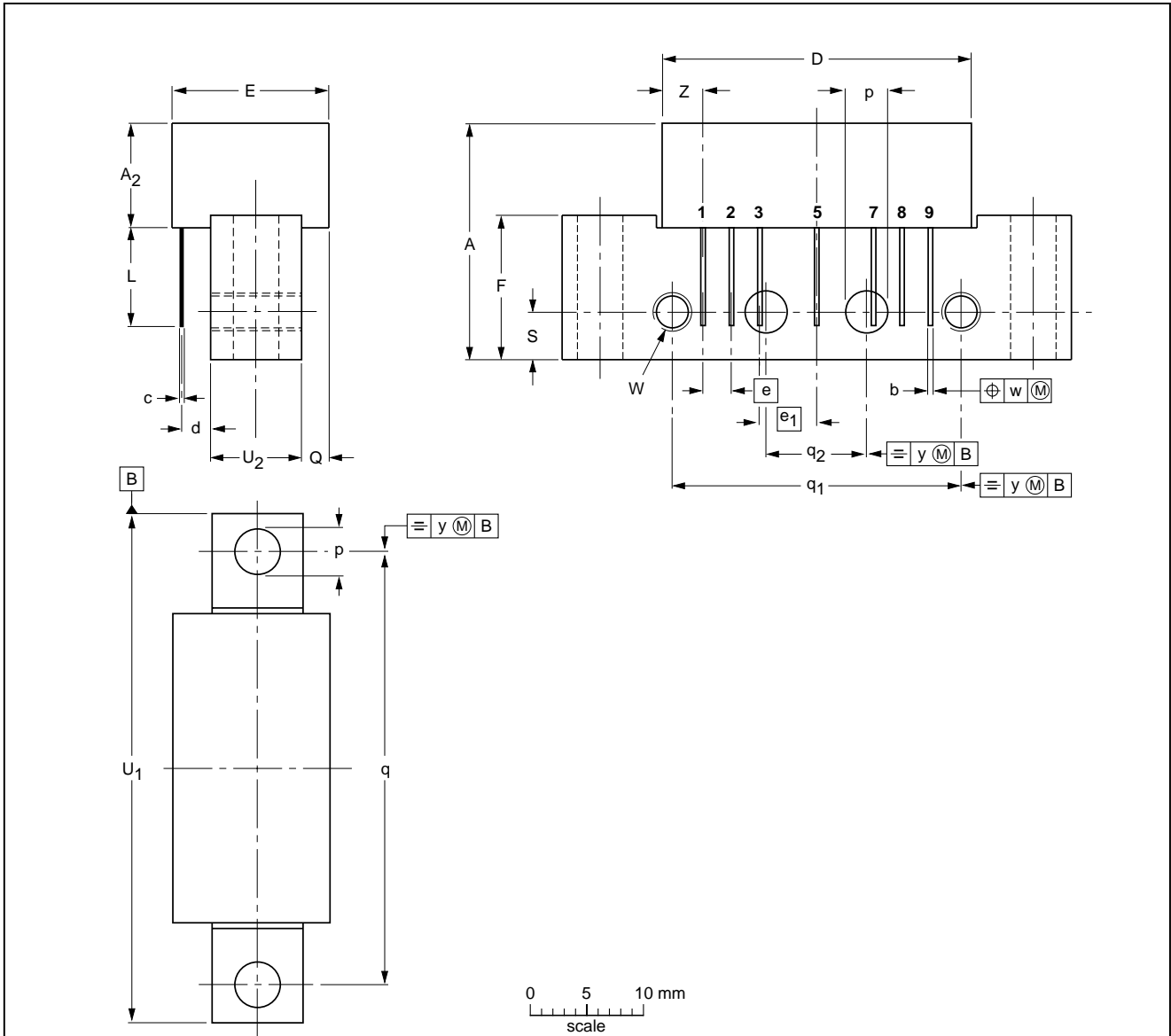
CATV amplifier module

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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 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

CATV amplifier module

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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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