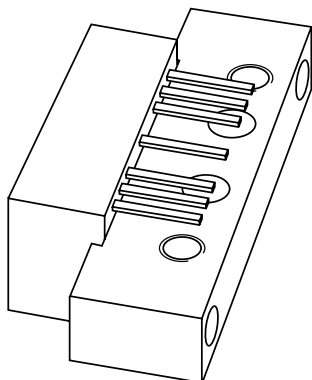


DATA SHEET



BGD902L CATV amplifier module

Product specification
Supersedes data of 1999 Mar 26

1999 Aug 17

CATV amplifier module

BGD902L

FEATURES

- Excellent linearity
- Extremely low noise
- Excellent return loss properties
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability
- Low DC current consumption.

APPLICATIONS

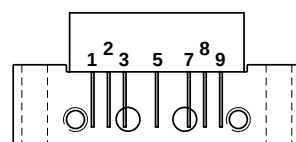
- CATV systems operating in the 40 to 900 MHz frequency range.

DESCRIPTION

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

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	18.2	18.8	dB
		f = 900 MHz	19	20	dB
I _{tot}	total current consumption (DC)	V _B = 24 V	350	380	mA

LIMITING VALUES

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V _B	supply voltage	–	30	V
V _i	RF input voltage	–	70	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

Bandwidth 40 to 900 MHz; $V_B = 24$ V; $T_{mb} = 35$ °C; $Z_S = Z_L = 75$ Ω .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	$f = 50$ MHz	18.2	18.5	18.8	dB
		$f = 900$ MHz	19	19.5	20	dB
SL	slope straight line	$f = 40$ to 900 MHz	0.4	0.9	1.4	dB
FL	flatness straight line	$f = 40$ to 900 MHz	–	± 0.15	± 0.3	dB
S_{11}	input return losses	$f = 40$ to 80 MHz	21	24	–	dB
		$f = 80$ to 160 MHz	22	26	–	dB
		$f = 160$ to 320 MHz	22	28	–	dB
		$f = 320$ to 650 MHz	19	22	–	dB
		$f = 650$ to 900 MHz	18	21	–	dB
S_{22}	output return losses	$f = 40$ to 80 MHz	25	32	–	dB
		$f = 80$ to 160 MHz	25	33	–	dB
		$f = 160$ to 320 MHz	21	29	–	dB
		$f = 320$ to 750 MHz	20	22	–	dB
		$f = 750$ to 900 MHz	19	22	–	dB
S_{21}	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat	49 channels flat; $V_o = 47$ dBmV; $f_m = 859.25$ MHz	–	–66.5	–65	dB
		77 channels flat; $V_o = 44$ dBmV; $f_m = 547.25$ MHz	–	–68	–66	dB
		110 channels flat; $V_o = 44$ dBmV; $f_m = 745.25$ MHz	–	–61.5	–60	dB
		129 channels flat; $V_o = 44$ dBmV; $f_m = 859.25$ MHz	–	–58	–56	dB
		110 channels; $f_m = 445.25$ MHz; $V_o = 49$ dBmV at 550 MHz; note 1	–	–62	–60	dB
		129 channels; $f_m = 697.25$ MHz; $V_o = 49.5$ dBmV at 860 MHz; note 2	–	–56	–53.5	dB
X_{mod}	cross modulation	49 channels flat; $V_o = 47$ dBmV; $f_m = 55.25$ MHz	–	–64.5	–62	dB
		77 channels flat; $V_o = 44$ dBmV; $f_m = 55.25$ MHz	–	–67.5	–65	dB
		110 channels flat; $V_o = 44$ dBmV; $f_m = 55.25$ MHz	–	–64	–61.5	dB
		129 channels flat; $V_o = 44$ dBmV; $f_m = 55.25$ MHz	–	–62.5	–60	dB
		110 channels; $f_m = 55.25$ MHz; $V_o = 49$ dBmV at 550 MHz; note 1	–	–60.5	–58	dB
		129 channels; $f_m = 859.25$ MHz; $V_o = 49.5$ dBmV at 860 MHz; note 2	–	–58	–55	dB

CATV amplifier module

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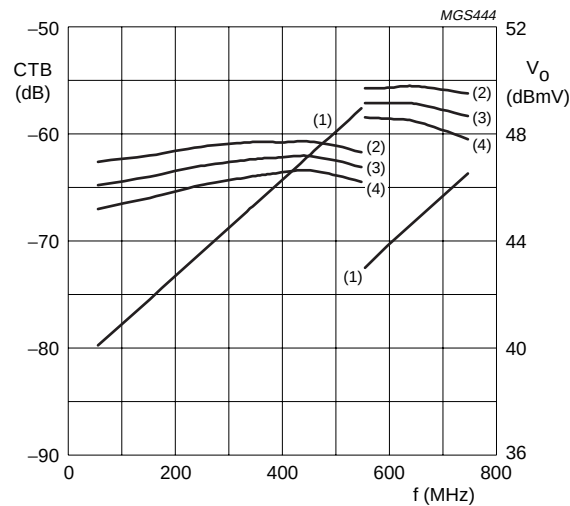
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
CSO	composite second order distortion	49 channels flat; $V_o = 47$ dBmV; $f_m = 860.5$ MHz	–	–66	–63	dB
		77 channels flat; $V_o = 44$ dBmV; $f_m = 548.5$ MHz	–	–71	–66	dB
		110 channels flat; $V_o = 44$ dBmV; $f_m = 746.5$ MHz	–	–65	–60	dB
		129 channels flat; $V_o = 44$ dBmV; $f_m = 860.5$ MHz	–	–62	–59	dB
		110 channels; $f_m = 246$ MHz; $V_o = 49$ dBmV at 550 MHz; note 1	–	–69	–64	dB
		129 channels; $f_m = 246$ MHz; $V_o = 49.5$ dBmV at 860 MHz; note 2	–	–64	–59	dB
d_2	second order distortion	note 3	–	–80	–74	dB
		note 4	–	–83	–77	dB
		note 5	–	–84	–78	dB
V_o	output voltage	$d_{im} = -60$ dB; note 6	63	64.5	–	dBmV
		$d_{im} = -60$ dB; note 7	64	65.5	–	dBmV
		$d_{im} = -60$ dB; note 8	66	67.5	–	dBmV
		CTB compression = 1 dB; 129 channels flat; $f = 859.25$ MHz	47	48	–	dBmV
		CSO compression = 1 dB; 129 channels flat; $f = 860.5$ MHz	49.5	51.5	–	dBmV
NF	noise figure	$f = 50$ MHz	–	4	5	dB
		$f = 550$ MHz	–	4.3	5.5	dB
		$f = 750$ MHz	–	5	6.5	dB
		$f = 900$ MHz	–	6	7.5	dB
I_{tot}	total current consumption (DC)	note 9	350	365	380	mA

Notes

1. Tilt = 9 dB (50 to 550 MHz); tilt = 3.5 dB at –6 dB offset (550 to 750 MHz).
2. Tilt = 12.5 dB (50 to 860 MHz).
3. $f_p = 55.25$ MHz; $V_p = 44$ dBmV; $f_q = 805.25$ MHz; $V_q = 44$ dBmV; measured at $f_p + f_q = 860.5$ MHz.
4. $f_p = 55.25$ MHz; $V_p = 44$ dBmV; $f_q = 691.25$ MHz; $V_q = 44$ dBmV; measured at $f_p + f_q = 746.5$ MHz.
5. $f_p = 55.25$ MHz; $V_p = 44$ dBmV; $f_q = 493.25$ MHz; $V_q = 44$ dBmV; measured at $f_p + f_q = 548.5$ MHz.
6. 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.
7. 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.
8. 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.
9. The module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 35 V.

CATV amplifier module

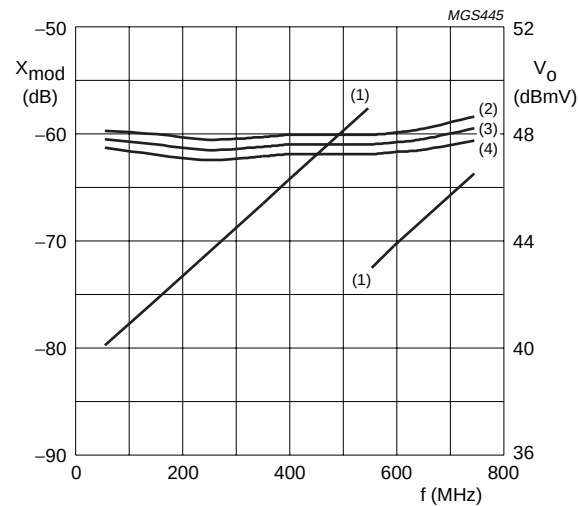
BGD902L



$Z_S = Z_L = 75 \Omega$; $V_B = 24 \text{ V}$; 110 chs; tilt = 9 dB (50 to 550 MHz); tilt = 3.5 dB at -6 dB offset (550 to 750 MHz).

- (1) V_O . (3) Typ.
(2) Typ. +3 σ . (4) Typ. -3 σ .

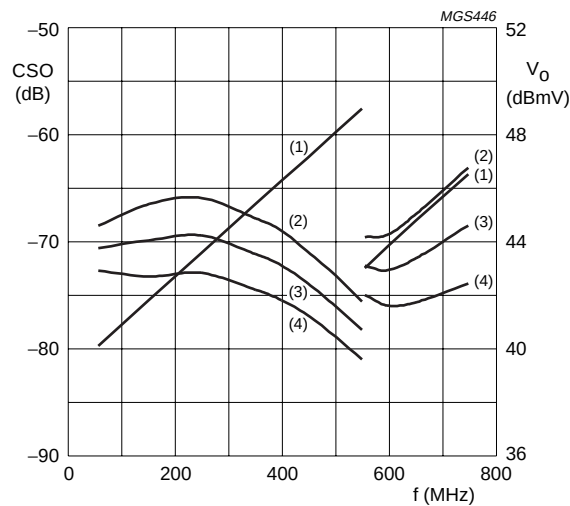
Fig.2 Composite triple beat as a function of frequency under tilted conditions.



$Z_S = Z_L = 75 \Omega$; $V_B = 24 \text{ V}$; 110 chs; tilt = 9 dB (50 to 550 MHz); tilt = 3.5 dB at -6 dB offset (550 to 750 MHz).

- (1) V_O . (3) Typ.
(2) Typ. +3 σ . (4) Typ. -3 σ .

Fig.3 Cross modulation as a function of frequency under tilted conditions.



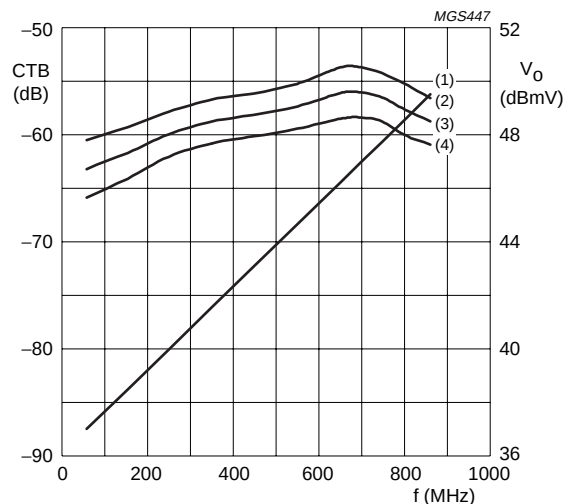
$Z_S = Z_L = 75 \Omega$; $V_B = 24 \text{ V}$; 110 chs; tilt = 9 dB (50 to 550 MHz); tilt = 3.5 dB at -6 dB offset (550 to 750 MHz).

- (1) V_O . (3) Typ.
(2) Typ. +3 σ . (4) Typ. -3 σ .

Fig.4 Composite second order distortion as a function of frequency under tilted conditions.

CATV amplifier module

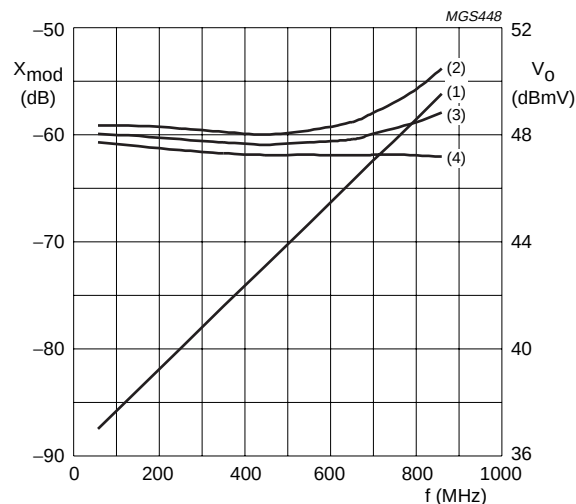
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$Z_S = Z_L = 75 \Omega$; $V_B = 24 \text{ V}$; 129 chs;
tilt = 12.5 dB; (50 to 860 MHz).

(1) V_O . (3) Typ.
(2) Typ. +3 σ . (4) Typ. -3 σ .

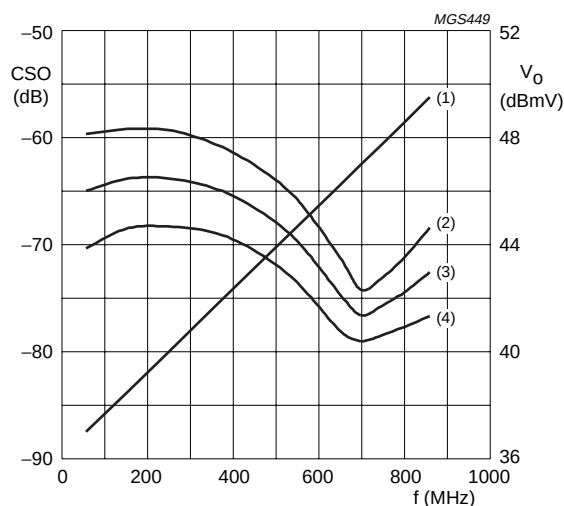
Fig.5 Composite triple beat as a function of frequency under tilted conditions.



$Z_S = Z_L = 75 \Omega$; $V_B = 24 \text{ V}$; 129 chs;
tilt = 12.5 dB; (50 to 860 MHz).

(1) V_O . (3) Typ.
(2) Typ. +3 σ . (4) Typ. -3 σ .

Fig.6 Cross modulation as a function of frequency under tilted conditions.



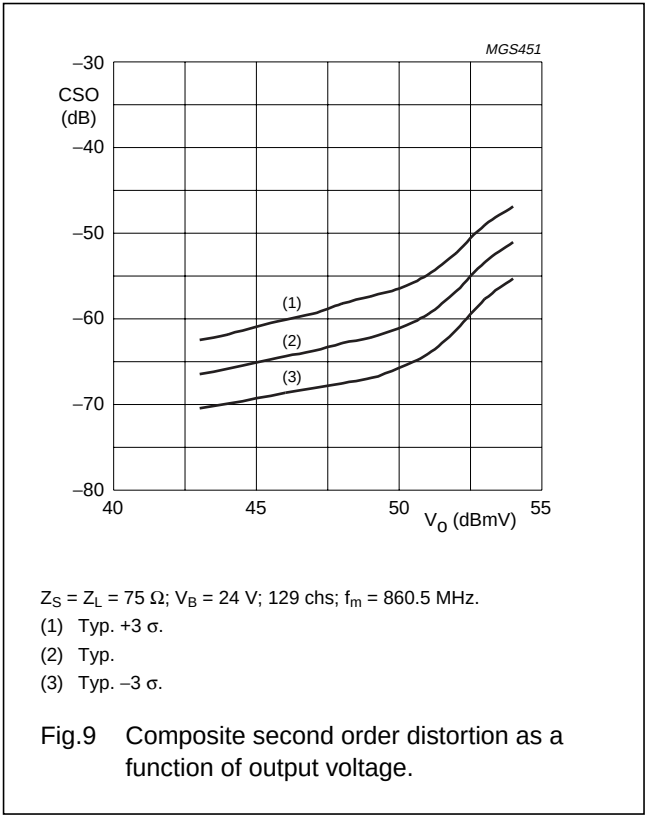
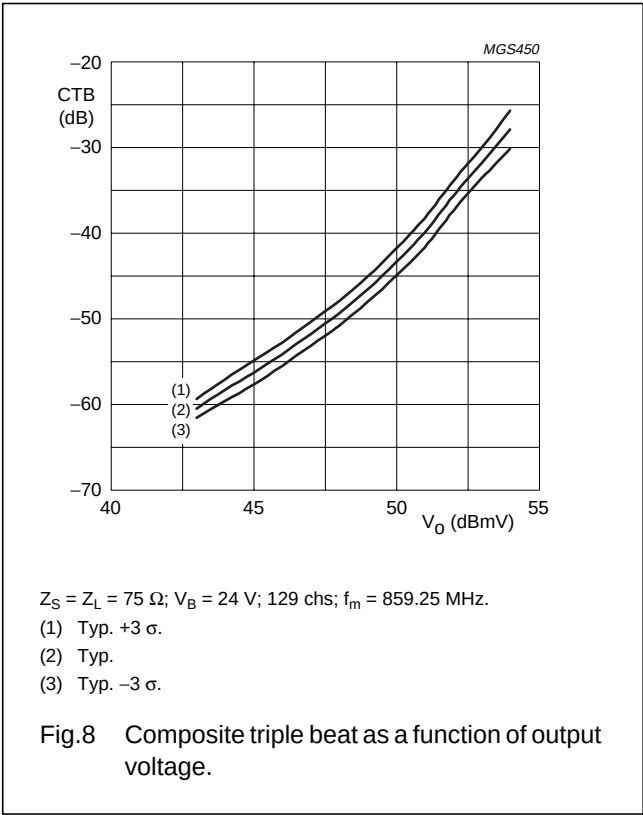
$Z_S = Z_L = 75 \Omega$; $V_B = 24 \text{ V}$; 129 chs;
tilt = 12.5 dB; (50 to 860 MHz).

(1) V_O . (3) Typ.
(2) Typ. +3 σ . (4) Typ. -3 σ .

Fig.7 Composite second order distortion as a function of frequency under tilted conditions.

CATV amplifier module

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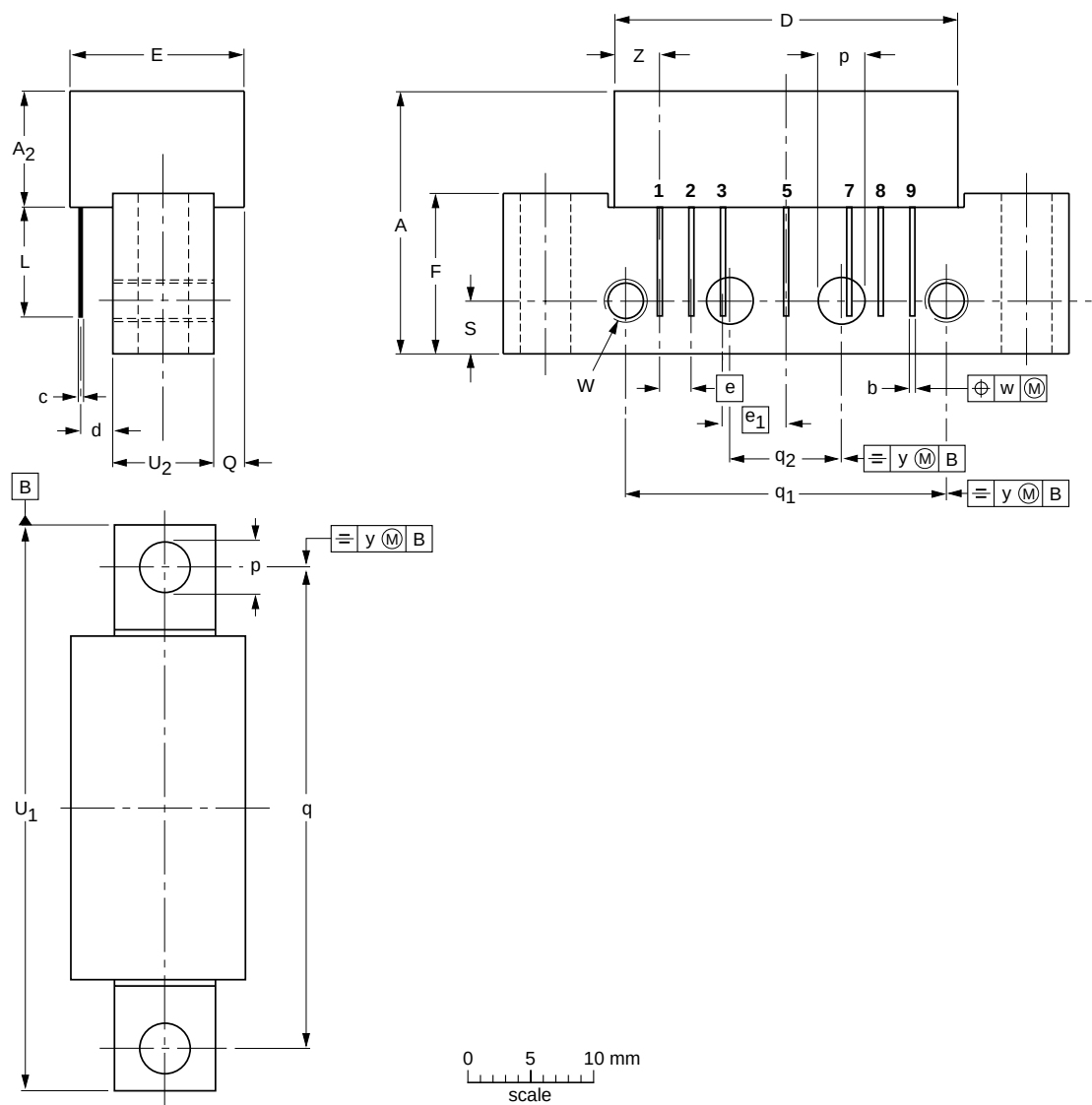
CATV amplifier module

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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

BGD902L

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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NOTES

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