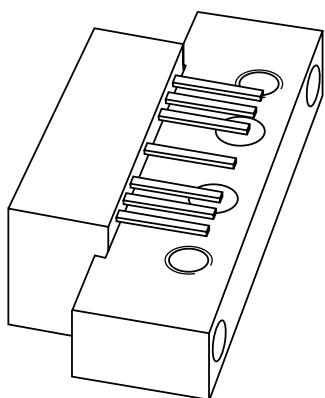


DATA SHEET



BGD812

860 MHz, 18.5 dB gain power
doubler amplifier

Product specification
Supersedes data of 2001 Sep 07

2001 Oct 30

860 MHz, 18.5 dB gain power doubler amplifier

BGD812

FEATURES

- 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 870 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, 3	common
5	+V _B
7, 8	common
9	output

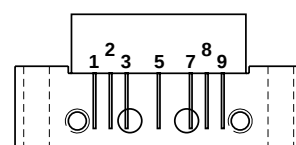


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G _p	power gain	f = 45 MHz	18.2	18.8	dB
		f = 870 MHz	19	20	dB
I _{tot}	total current consumption (DC)	V _B = 24 V	380	410	mA

LIMITING VALUES

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

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

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CHARACTERISTICS

Bandwidth 40 to 870 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	$f = 45$ MHz	18.2	–	18.8	dB
		$f = 870$ MHz	19	–	20	dB
SL	slope straight line	$f = 45$ to 870 MHz; note 1	0.4	0.9	1.4	dB
FL	flatness straight line	$f = 45$ to 100 MHz	–	–	± 0.25	dB
		$f = 100$ to 800 MHz	–	–	± 0.5	dB
		$f = 800$ to 870 MHz	–0.3	–	+0.1	dB
S_{11}	input return losses	$f = 45$ to 80 MHz	25	–	–	dB
		$f = 80$ to 160 MHz	23	–	–	dB
		$f = 160$ to 320 MHz	20	–	–	dB
		$f = 320$ to 550 MHz	18	–	–	dB
		$f = 550$ to 650 MHz	18	–	–	dB
		$f = 650$ to 750 MHz	17	–	–	dB
		$f = 750$ to 870 MHz	17	–	–	dB
		$f = 870$ to 914 MHz	13	–	–	dB
S_{22}	output return losses	$f = 45$ to 80 MHz	23	–	–	dB
		$f = 80$ to 160 MHz	22	–	–	dB
		$f = 160$ to 320 MHz	18	–	–	dB
		$f = 320$ to 550 MHz	18	–	–	dB
		$f = 550$ to 650 MHz	16	–	–	dB
		$f = 650$ to 750 MHz	15	–	–	dB
		$f = 750$ to 870 MHz	15	–	–	dB
		$f = 870$ to 914 MHz	14	–	–	dB
S_{21}	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat	79 chs flat; $V_o = 44$ dBmV; $f_m = 547.25$ MHz	–	–	–66.5	dB
		112 chs flat; $V_o = 44$ dBmV; $f_m = 745.25$ MHz	–	–	–61	dB
		132 chs flat; $V_o = 44$ dBmV; $f_m = 859.25$ MHz	–	–	–57	dB
		112 chs; $f_m = 547.25$ MHz; $V_o = 50.2$ dBmV at 745 MHz; note 2	–	–	–56	dB
		79 chs; $f_m = 331.25$ MHz; $V_o = 47.3$ dBmV at 547 MHz; note 3	–	–	–66	dB
X_{mod}	cross modulation	79 chs flat; $V_o = 44$ dBmV; $f_m = 55.25$ MHz	–	–	–67	dB
		112 chs flat; $V_o = 44$ dBmV; $f_m = 55.25$ MHz	–	–	–64	dB
		132 chs flat; $V_o = 44$ dBmV; $f_m = 55.25$ MHz	–	–	–62	dB
		112 chs; $f_m = 745.25$ MHz; $V_o = 50.2$ dBmV at 745 MHz; note 2	–	–	–59	dB
		79 chs; $f_m = 331.25$ MHz; $V_o = 47.3$ dBmV at 547 MHz; note 3	–	–	–67	dB

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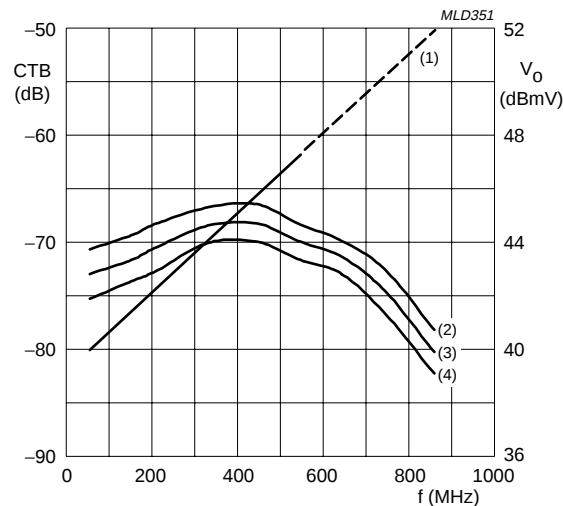
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
CSO	composite second order distortion	79 chs flat; $V_o = 44$ dBmV; $f_m = 548.5$ MHz	–	–	–67	dB
		112 chs flat; $V_o = 44$ dBmV; $f_m = 746.5$ MHz	–	–	–60	dB
		132 chs flat; $V_o = 44$ dBmV; $f_m = 860.5$ MHz	–	–	–58	dB
		112 chs; $f_m = 210$ MHz; $V_o = 50.2$ dBmV at 745 MHz; note 2	–	–	–57	dB
		79 chs; $f_m = 210$ MHz; $V_o = 47.3$ dBmV at 547 MHz; note 3	–	–	–64	dB
d_2	second order distortion	note 4	–	–	–71	dB
V_o	output voltage	$d_{im} = -60$ dB; note 5	64	–	–	dBmV
		CTB compression = 1 dB; 132 chs flat; $f = 859.25$ MHz	48	–	–	dBmV
		CSO compression = 1 dB; 132 chs flat; $f = 860.5$ MHz	51	–	–	dBmV
NF	noise figure	$f = 50$ MHz	–	–	5.5	dB
		$f = 550$ MHz	–	–	5.5	dB
		$f = 750$ MHz	–	–	6.5	dB
		$f = 870$ MHz	–	–	7.5	dB
I_{tot}	total current consumption (DC)	note 6	380	395	410	mA

Notes

- Slope straight line is defined as gain at 870 MHz against gain at 45 MHz.
- Tilt = 10.2 dB (55 to 745 MHz).
- Tilt = 7.3 dB (55 to 547 MHz).
- $f_p = 55.25$ 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 35 V.

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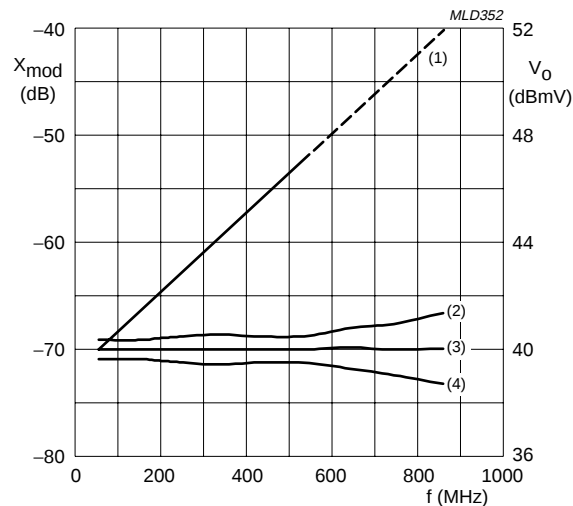
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$Z_S = Z_L = 75 \, \Omega$; $V_B = 24 \, \text{V}$; 79 chs; tilt = 7.3 dB (50 to 550 MHz).

- (1) V_0 . (3) Typ.
(2) Typ. +3 σ . (4) Typ. -3 σ .

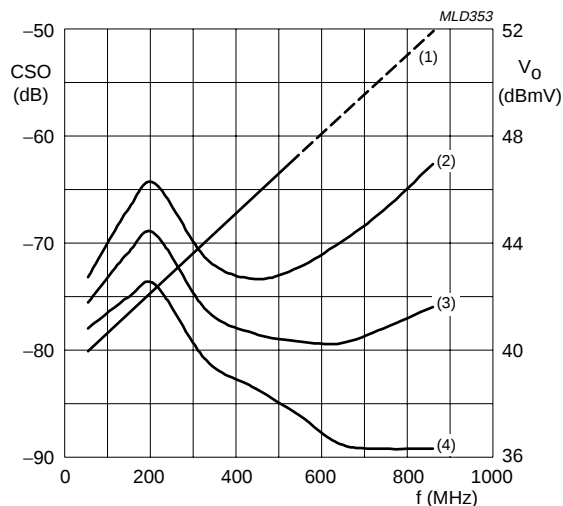
Fig.2 Composite triple beat as a function of frequency under tilted conditions.



$Z_S = Z_L = 75 \, \Omega$; $V_B = 24 \, \text{V}$; 79 chs; tilt = 7.3 dB (50 to 550 MHz).

- (1) V_0 . (3) Typ.
(2) Typ. +3 σ . (4) Typ. -3 σ .

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



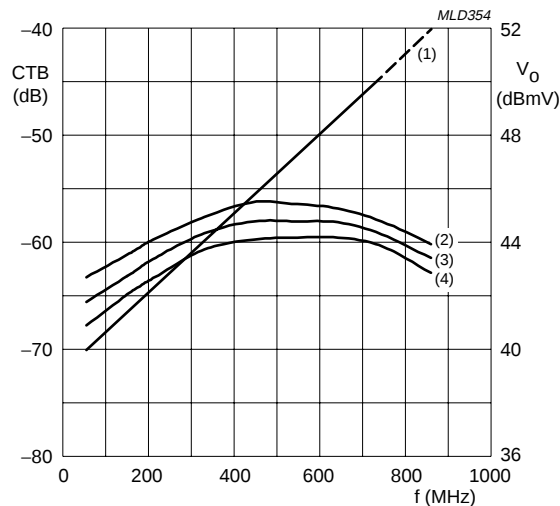
$Z_S = Z_L = 75 \, \Omega$; $V_B = 24 \, \text{V}$; 79 chs; tilt = 7.3 dB (50 to 550 MHz).

- (1) V_0 . (3) Typ.
(2) Typ. +3 σ . (4) Typ. -3 σ .

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

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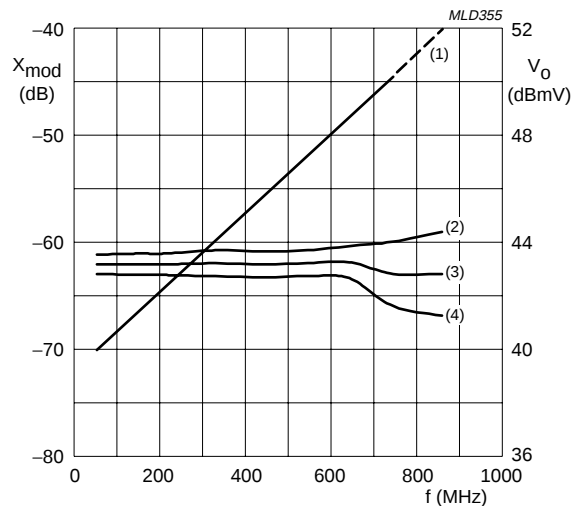
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$Z_S = Z_L = 75\ \Omega$; $V_B = 24\text{ V}$; 112 chs; tilt = 10.3 dB (50 to 750 MHz).

- (1) V_0 . (3) Typ.
(2) Typ. +3 σ . (4) Typ. -3 σ .

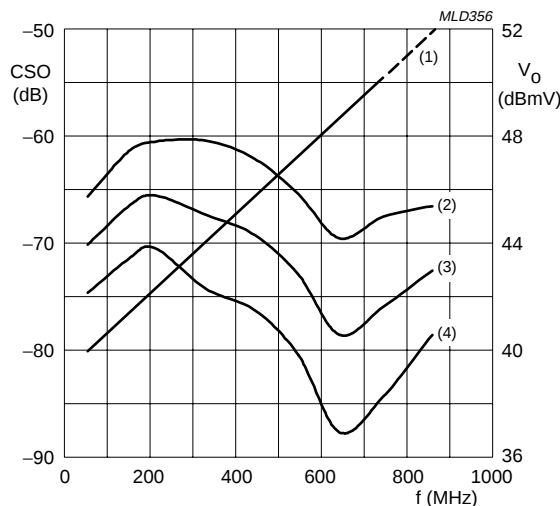
Fig.5 Composite triple beat as a function of frequency under tilted conditions.



$Z_S = Z_L = 75\ \Omega$; $V_B = 24\text{ V}$; 112 chs; tilt = 10.3 dB (50 to 750 MHz).

- (1) V_0 . (3) Typ.
(2) Typ. +3 σ . (4) Typ. -3 σ .

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



$Z_S = Z_L = 75\ \Omega$; $V_B = 24\text{ V}$; 112 chs; tilt = 10.3 dB (50 to 750 MHz).

- (1) V_0 . (3) Typ.
(2) Typ. +3 σ . (4) Typ. -3 σ .

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

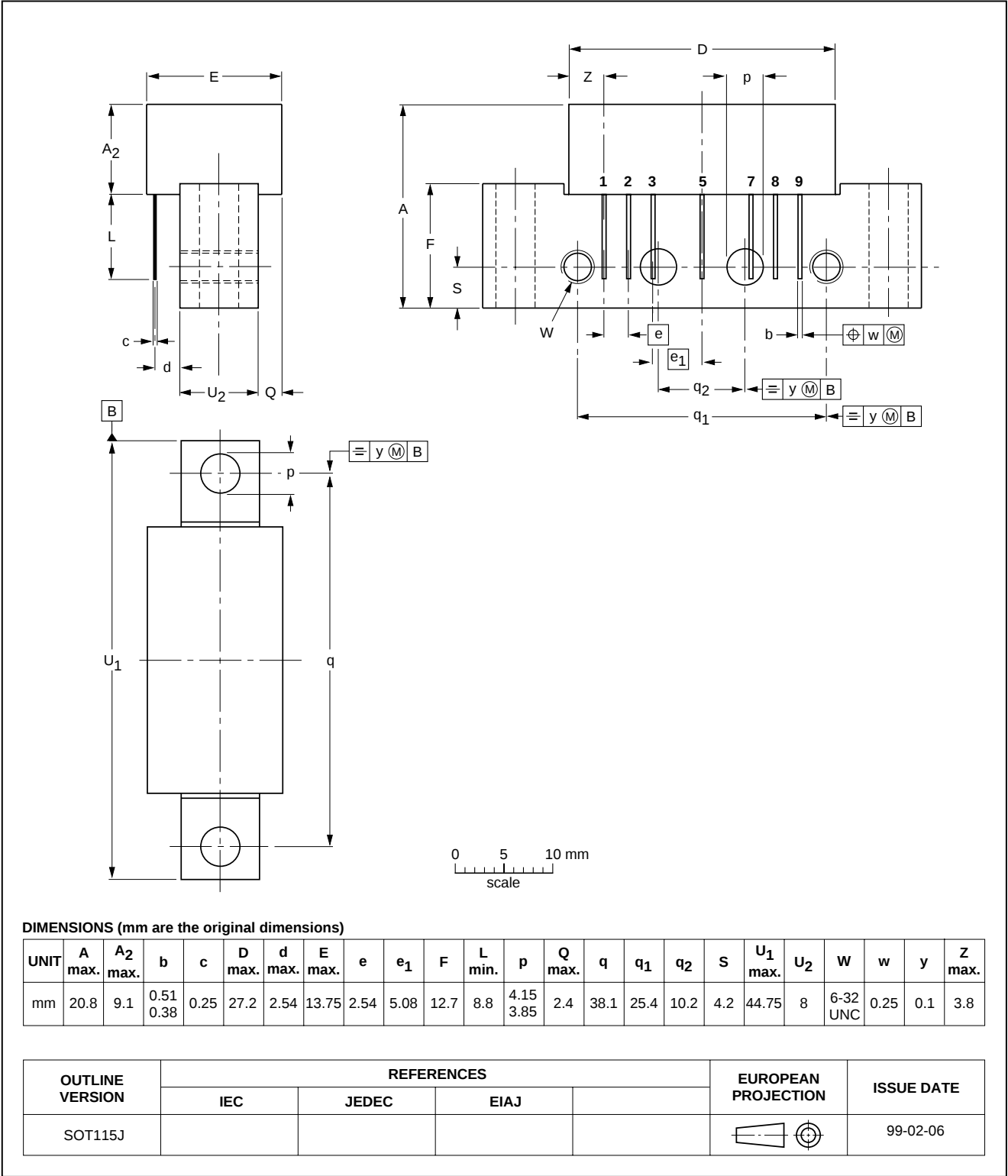
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PACKAGE OUTLINE

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



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DATA SHEET STATUS

DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾	DEFINITIONS
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Printed in The Netherlands

613518/04/pp12

Date of release: 2001 Oct 30

Document order number: 9397 750 08852

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