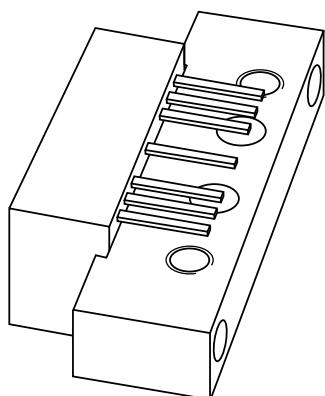


DATA SHEET



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.

PINNING - SOT115J

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

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).

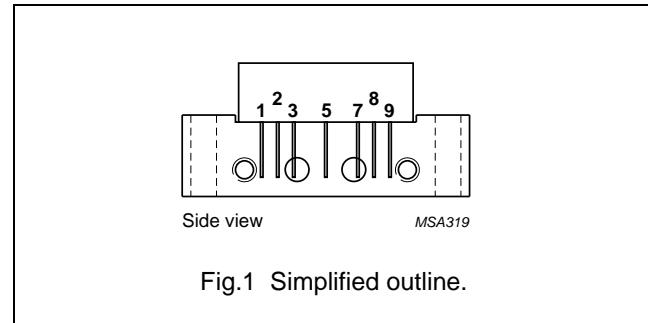


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	$f = 45 \text{ MHz}$	18.2	18.8	dB
		$f = 870 \text{ MHz}$	19	20	dB
I_{tot}	total current consumption (DC)	$V_B = 24 \text{ V}$	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

860 MHz, 18.5 dB gain power doubler amplifier

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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
		79 chs flat; $V_o = 44$ dBmV; $f_m = 55.25$ MHz	—	—	-67	dB
X_{mod}	cross modulation	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

860 MHz, 18.5 dB gain power doubler
amplifier

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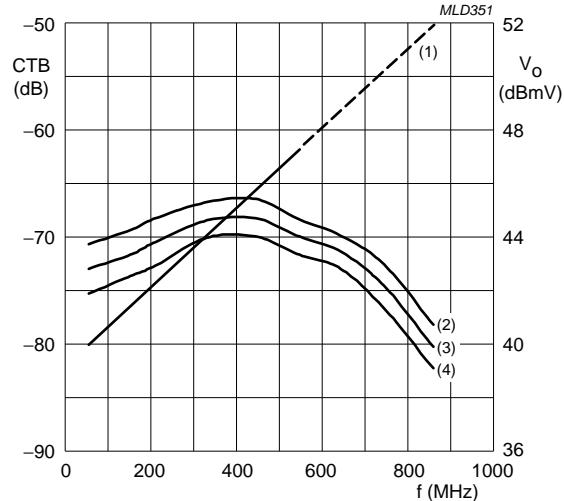
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
CSO	composite second order distortion	79 chs flat; $V_o = 44 \text{ dBmV}$; $f_m = 548.5 \text{ MHz}$	—	—	-67	dB
		112 chs flat; $V_o = 44 \text{ dBmV}$; $f_m = 746.5 \text{ MHz}$	—	—	-60	dB
		132 chs flat; $V_o = 44 \text{ dBmV}$; $f_m = 860.5 \text{ MHz}$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

Notes

1. Slope straight line is defined as gain at 870 MHz against gain at 45 MHz.
2. Tilt = 10.2 dB (55 to 745 MHz).
3. Tilt = 7.3 dB (55 to 547 MHz).
4. $f_p = 55.25 \text{ MHz}$; $V_p = 44 \text{ dBmV}$; $f_q = 805.25 \text{ MHz}$; $V_q = 44 \text{ dBmV}$; measured at $f_p + f_q = 860.5 \text{ MHz}$.
5. Measured according to DIN45004B: $f_p = 851.25 \text{ MHz}$; $V_p = V_o$; $f_q = 858.25 \text{ MHz}$; $V_q = V_o - 6 \text{ dB}$; $f_r = 860.25 \text{ MHz}$; $V_r = V_o - 6 \text{ dB}$; measured at $f_p + f_q - f_r = 849.25 \text{ MHz}$.
6. The module normally operates at $V_B = 24 \text{ V}$, but is able to withstand supply transients up to 35 V.

860 MHz, 18.5 dB gain power doubler amplifier

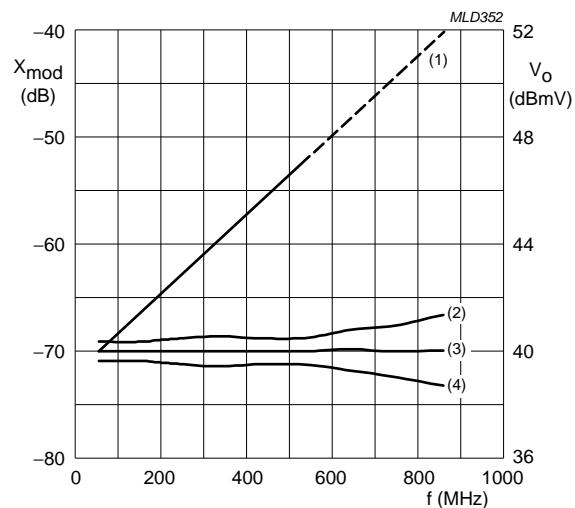
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$Z_S = Z_L = 75 \Omega$; $V_B = 24$ V; 79 chs; tilt = 7.3 dB (50 to 550 MHz).

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

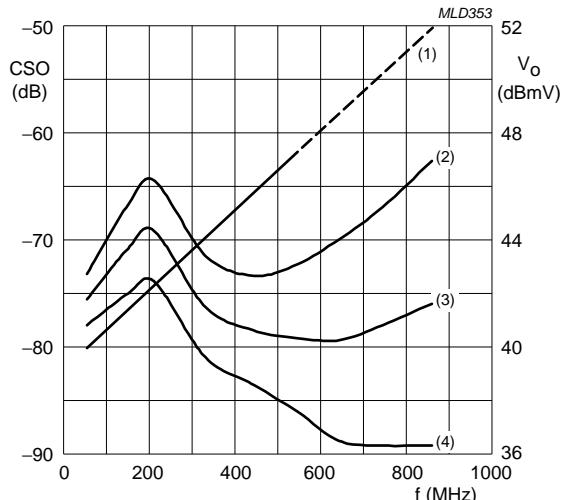
Fig.2 Composite triple beat as a function of frequency under tilted conditions.



$Z_S = Z_L = 75 \Omega$; $V_B = 24$ V; 79 chs; tilt = 7.3 dB (50 to 550 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.



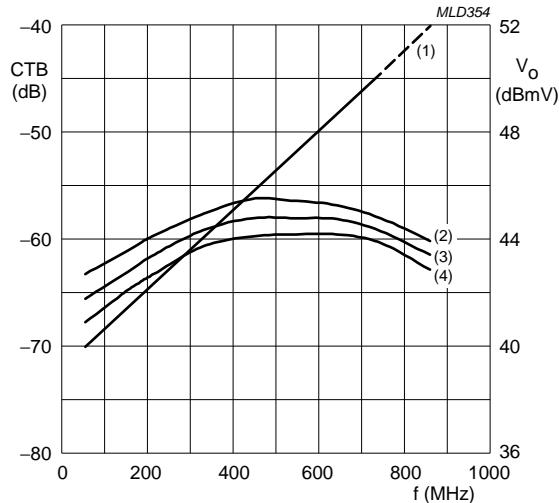
$Z_S = Z_L = 75 \Omega$; $V_B = 24$ V; 79 chs; tilt = 7.3 dB (50 to 550 MHz).

(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.

860 MHz, 18.5 dB gain power doubler amplifier

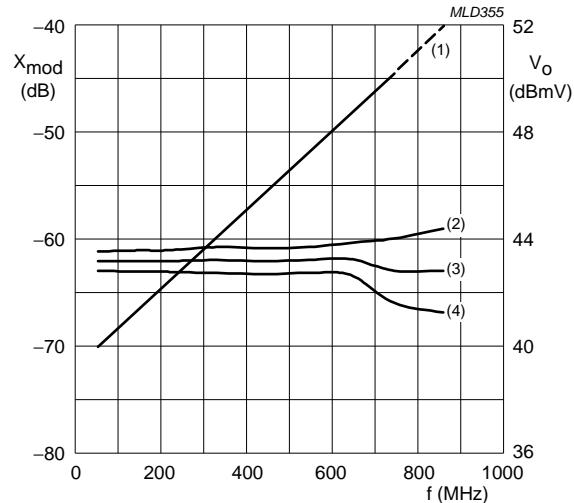
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$Z_S = Z_L = 75 \Omega$; $V_B = 24$ V; 112 chs; tilt = 10.3 dB (50 to 750 MHz).

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

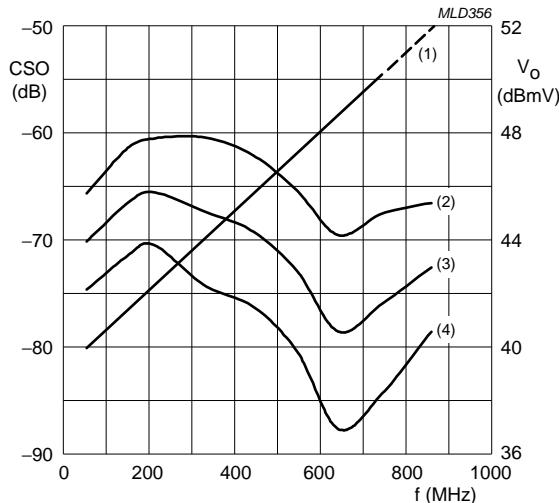
Fig.5 Composite triple beat as a function of frequency under tilted conditions.



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



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

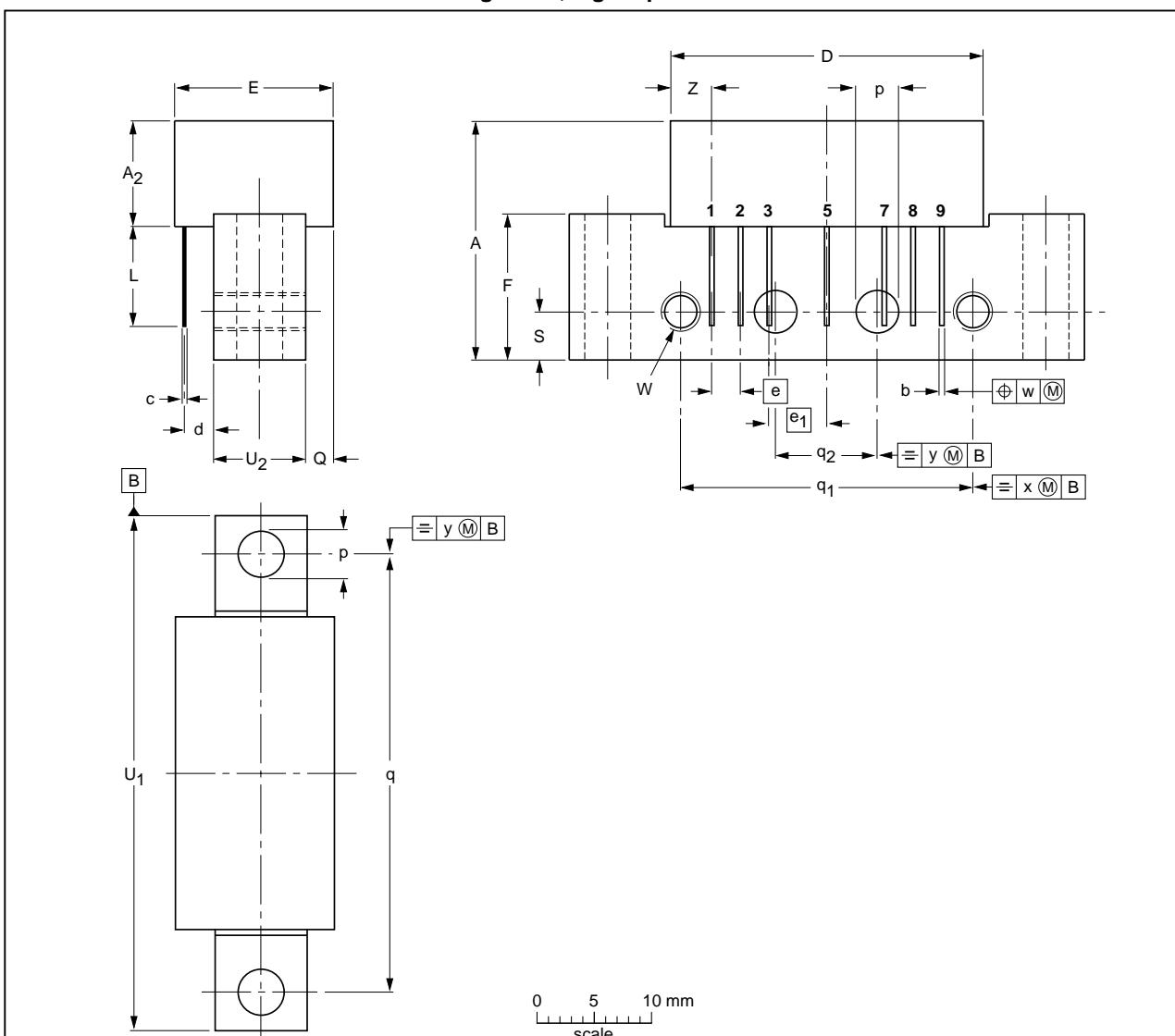
860 MHz, 18.5 dB gain power doubler amplifier

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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	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

860 MHz, 18.5 dB gain power doubler amplifier

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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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Contact information

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