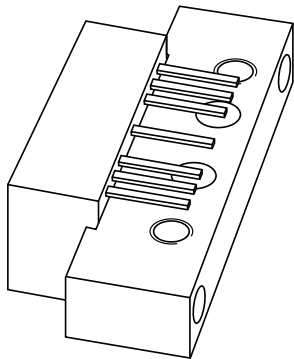


# DATA SHEET



## **BGD814**

860 MHz, 20 dB gain power  
doubler amplifier

Product specification  
Supersedes data of 2001 Sep 07

2001 Nov 01



# 860 MHz, 20 dB gain power doubler amplifier

**BGD814**

**FEATURES**

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

**APPLICATIONS**

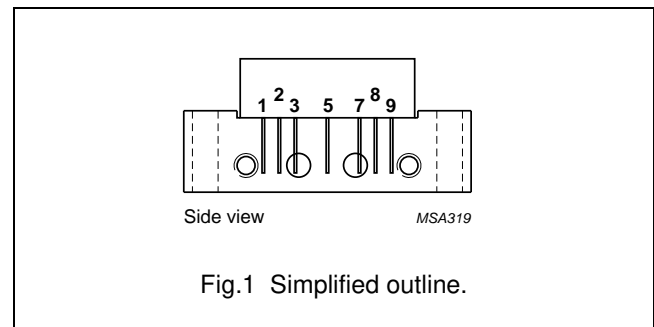
- CATV systems operating in the 40 to 870 MHz frequency range.

**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 <sub>B</sub>
7, 8	common
9	output



**QUICK REFERENCE DATA**

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 45 MHz	19.7	20.3	dB
		f = 870 MHz	20.5	21.5	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	380	410	mA

**LIMITING VALUES**

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

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V <sub>B</sub>	supply voltage	–	30	V
V <sub>i</sub>	RF input voltage	–	70	dBmV
T <sub>stg</sub>	storage temperature	–40	+100	°C
T <sub>mb</sub>	operating mounting base temperature	–20	+100	°C

# 860 MHz, 20 dB gain power doubler amplifier

## BGD814

### CHARACTERISTICS

Bandwidth 40 to 870 MHz;  $V_B = 24$  V;  $T_{mb} = 35$  °C;  $Z_S = Z_L = 75$   $\Omega$ .

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 45 MHz	19.7	–	20.3	dB
		f = 870 MHz	20.5	–	21.5	dB
SL	slope straight line	f = 45 to 870 MHz; note 1	0.5	–	1.5	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	–0.4	–	0.1	dB
S <sub>11</sub>	input return losses	f = 45 to 80 MHz	25	–	–	dB
		f = 80 to 160 MHz	22	–	–	dB
		f = 160 to 320 MHz	19	–	–	dB
		f = 320 to 550 MHz	17	–	–	dB
		f = 550 to 650 MHz	17	–	–	dB
		f = 650 to 750 MHz	16	–	–	dB
		f = 750 to 870 MHz	15	–	–	dB
		f = 870 to 914 MHz	12	–	–	dB
S <sub>22</sub>	output return losses	f = 45 to 80 MHz	24	–	–	dB
		f = 80 to 160 MHz	22	–	–	dB
		f = 160 to 320 MHz	17	–	–	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	13	–	–	dB
S <sub>21</sub>	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	79 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 547.25 MHz	–	–	–66	dB
		112 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 745.25 MHz	–	–	–60.5	dB
		132 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 859.25 MHz	–	–	–56	dB
		112 chs; f <sub>m</sub> = 547.25 MHz; V <sub>o</sub> = 50.2 dBmV at 745 MHz; note 2	–	–	–55.5	dB
		79 chs; f <sub>m</sub> = 331.25 MHz; V <sub>o</sub> = 47.3 dBmV at 547 MHz; note 3	–	–	–65	dB
X <sub>mod</sub>	cross modulation	79 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz	–	–	–66	dB
		112 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz	–	–	–62.5	dB
		132 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz	–	–	–61	dB
		112 chs; f <sub>m</sub> = 745.25 MHz; V <sub>o</sub> = 50.2 dBmV at 745 MHz; note 2	–	–	–57	dB
		79 chs; f <sub>m</sub> = 445.25 MHz; V <sub>o</sub> = 47.3 dBmV at 547 MHz; note 3	–	–	–66	dB

# 860 MHz, 20 dB gain power doubler amplifier

## BGD814

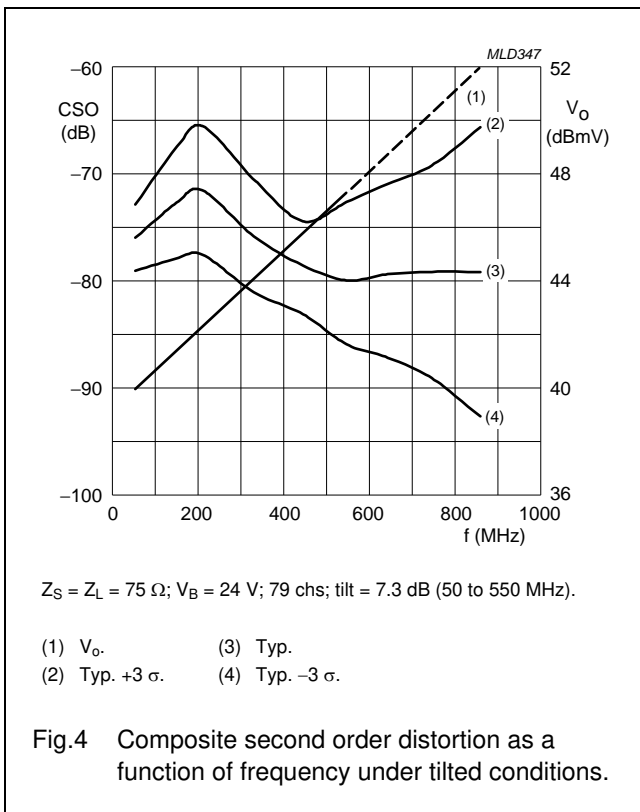
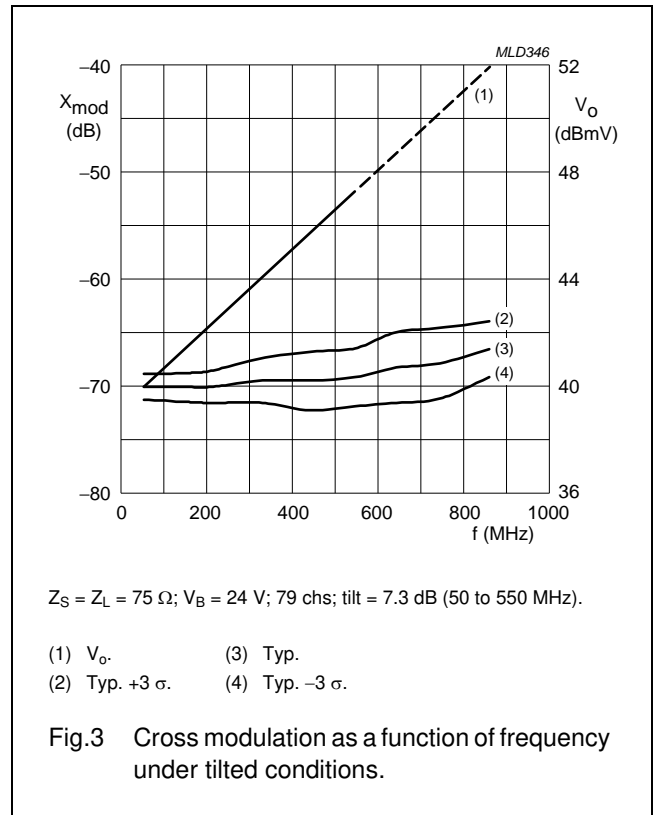
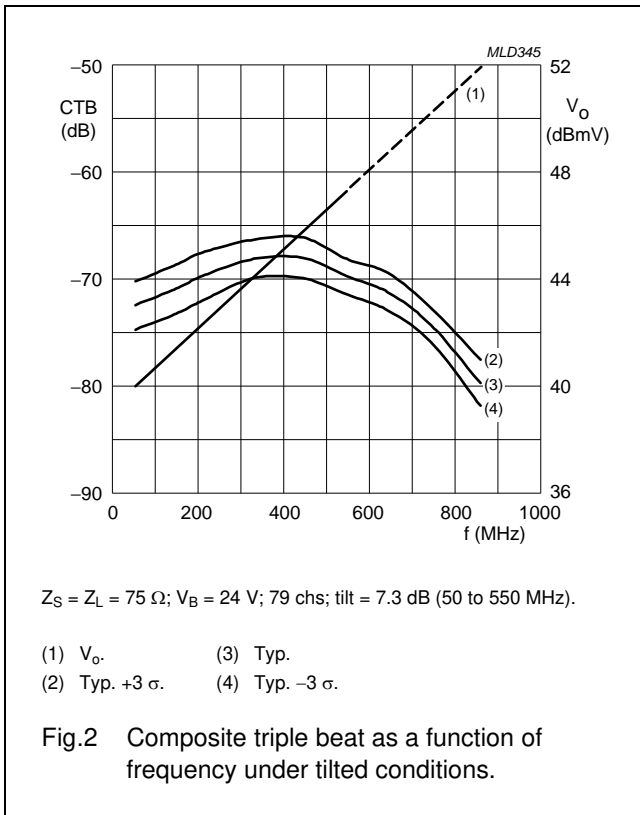
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
CSO	composite second order distortion	79 chs flat; $V_o = 44$ dBmV; $f_m = 548.5$ MHz	–	–	–68	dB
		112 chs flat; $V_o = 44$ dBmV; $f_m = 746.5$ MHz	–	–	–61	dB
		132 chs flat; $V_o = 44$ dBmV; $f_m = 860.5$ MHz	–	–	–57	dB
		112 chs; $f_m = 210$ MHz; $V_o = 50.2$ dBmV at 745 MHz; note 2	–	–	–56	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	–	–	–69	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	50	–	–	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.

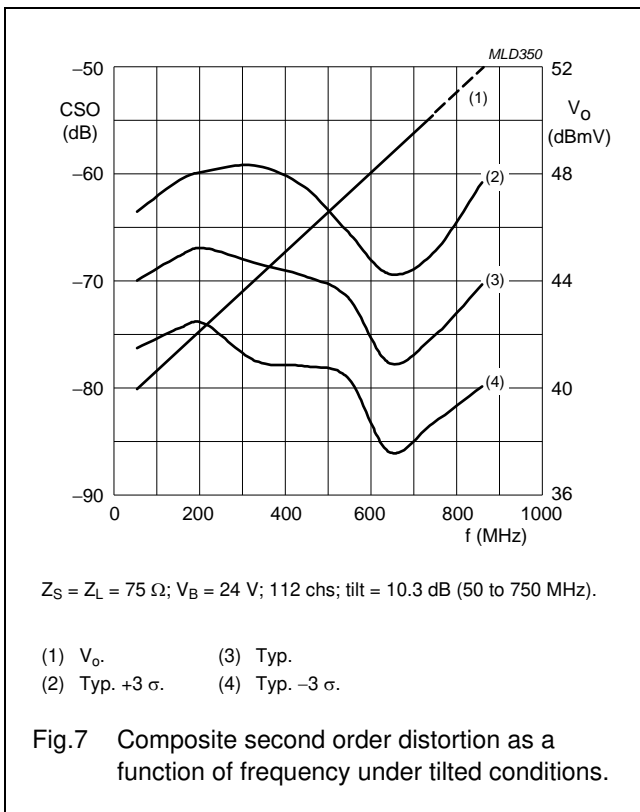
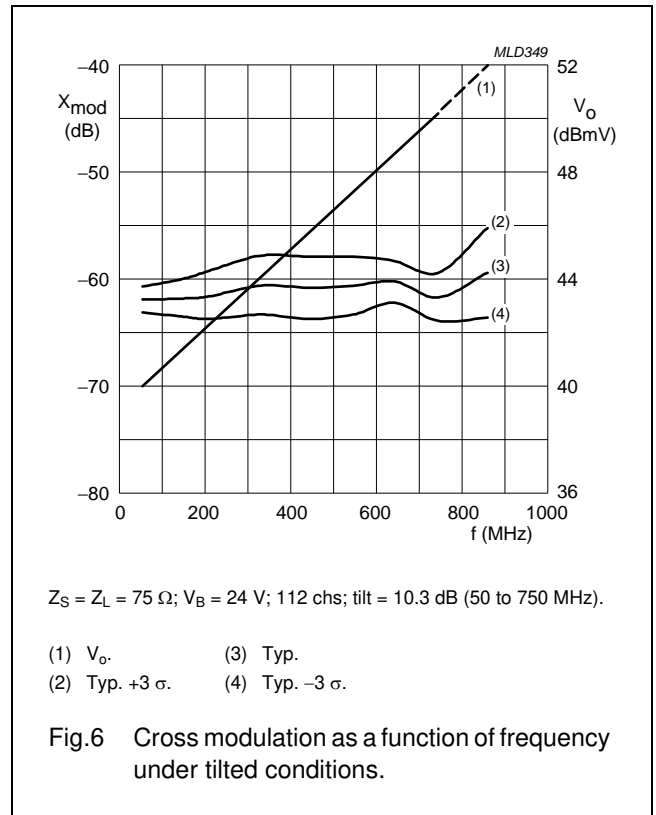
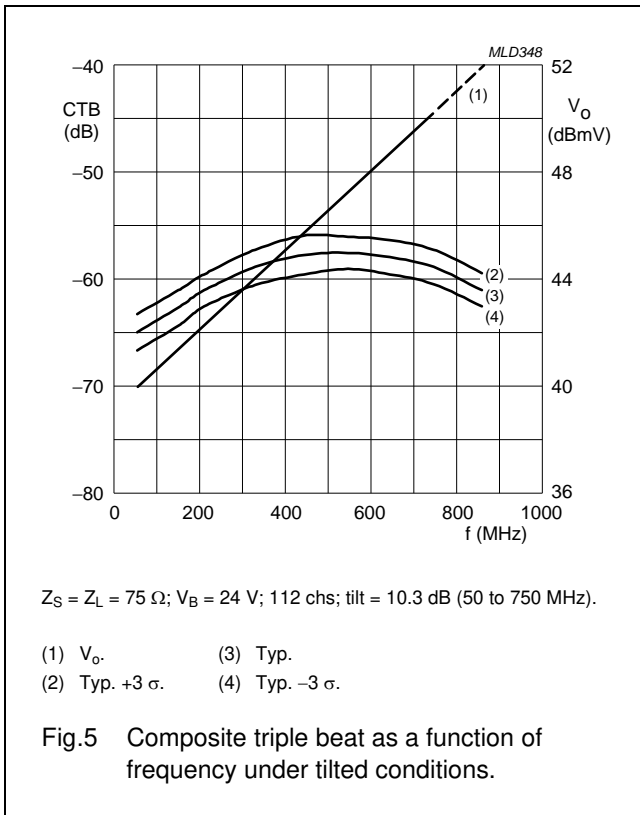
# 860 MHz, 20 dB gain power doubler amplifier

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# 860 MHz, 20 dB gain power doubler amplifier

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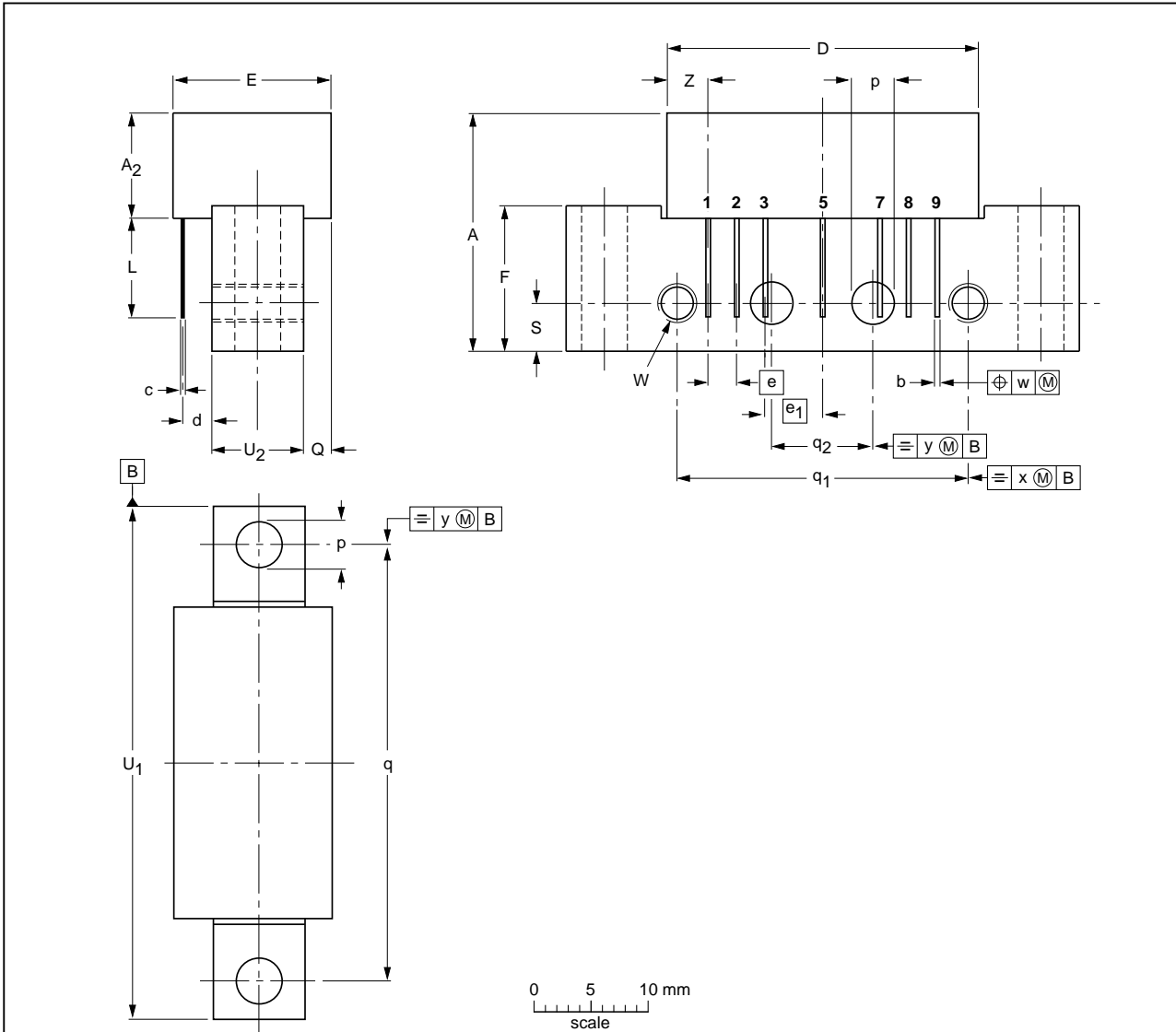
# 860 MHz, 20 dB gain power doubler amplifier

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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 <sub>2</sub> max.	b	c	D max.	d	E max.	e	e <sub>1</sub>	F	L min.	p	Q max.	q	q <sub>1</sub>	q <sub>2</sub>	S	U <sub>1</sub>	U <sub>2</sub>	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, 20 dB gain power doubler amplifier

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**DATA SHEET STATUS**

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	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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## 860 MHz, 20 dB gain power doubler amplifier

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Printed in The Netherlands

613518/04/pp10

Date of release: 2001 Nov 01

Document order number: 9397 750 08857