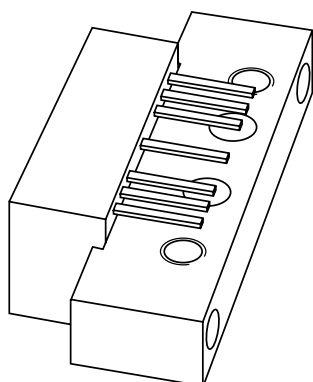


# DATA SHEET



## **BGD904; BGD904MI** 860 MHz, 20 dB gain power doubler amplifier

Product specification  
Supersedes data of 2000 Jan 10

2001 Nov 01

# 860 MHz, 20 dB gain power doubler amplifier

# BGD904; BGD904MI

## FEATURES

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

## APPLICATIONS

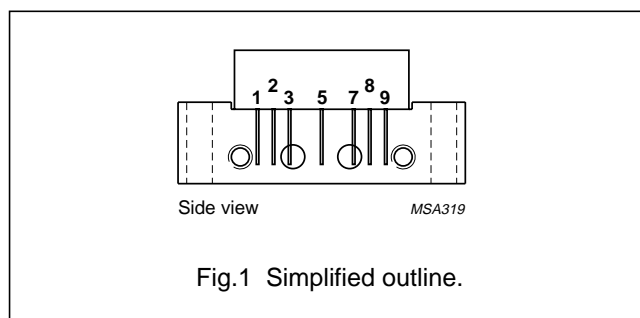
- CATV systems operating in the 40 to 900 MHz frequency range.

## DESCRIPTION

Hybrid amplifier modules in a SOT115J package operating with a voltage supply of 24 V (DC). Both modules are electrically identical, only the pinning is different.

## PINNING - SOT115J

PIN	DESCRIPTION	
	BGD904	BGD904MI
1	input	output
2, 3	common	common
5	+V <sub>B</sub>	+V <sub>B</sub>
7, 8	common	common
9	output	input



## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G <sub>p</sub>	power gain	f = 50 MHz	19.7	20.3	dB
		f = 900 MHz	20.5	21.5	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	405	435	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

## BGD904; BGD904MI

**CHARACTERISTICS**Bandwidth 40 to 900 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 = 50 MHz	19.7	20	20.3	dB
		f = 900 MHz	20.5	21	21.5	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 <sub>11</sub>	input return losses	f = 40 to 80 MHz	21	25	–	dB
		f = 80 to 160 MHz	22	30	–	dB
		f = 160 to 320 MHz	21	29	–	dB
		f = 320 to 550 MHz	18	24	–	dB
		f = 550 to 650 MHz	17	22	–	dB
		f = 650 to 750 MHz	16	21	–	dB
		f = 750 to 900 MHz	16	21	–	dB
S <sub>22</sub>	output return losses	f = 40 to 80 MHz	25	29	–	dB
		f = 80 to 160 MHz	23	28	–	dB
		f = 160 to 320 MHz	20	25	–	dB
		f = 320 to 550 MHz	20	24	–	dB
		f = 550 to 650 MHz	19	24	–	dB
		f = 650 to 750 MHz	18	24	–	dB
		f = 750 to 900 MHz	17	23	–	dB
S <sub>21</sub>	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	49 chs flat; V <sub>o</sub> = 47 dBmV; f <sub>m</sub> = 859.25 MHz	–	–68	–66.5	dB
		77 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 547.25 MHz	–	–69.5	–67.5	dB
		110 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 745.25 MHz	–	–63	–61.5	dB
		129 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 859.25 MHz	–	–59.5	–57.5	dB
		110 chs; f <sub>m</sub> = 400 MHz; V <sub>o</sub> = 49 dBmV at 550 MHz; note 1	–	–63.5	–61.5	dB
		129 chs; f <sub>m</sub> = 650 MHz; V <sub>o</sub> = 49.5 dBmV at 860 MHz; note 2	–	–58.5	–56	dB
X <sub>mod</sub>	cross modulation	49 chs flat; V <sub>o</sub> = 47 dBmV; f <sub>m</sub> = 55.25 MHz	–	–66	–63	dB
		77 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz	–	–68.5	–66	dB
		110 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz	–	–65.5	–62.5	dB
		129 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz	–	–64	–61	dB
		110 chs; f <sub>m</sub> = 400 MHz; V <sub>o</sub> = 49 dBmV at 550 MHz; note 1	–	–61.5	–59	dB
		129 chs; f <sub>m</sub> = 860 MHz; V <sub>o</sub> = 49.5 dBmV at 860 MHz; note 2	–	–60	–57	dB

## 860 MHz, 20 dB gain power doubler amplifier

## BGD904; BGD904MI

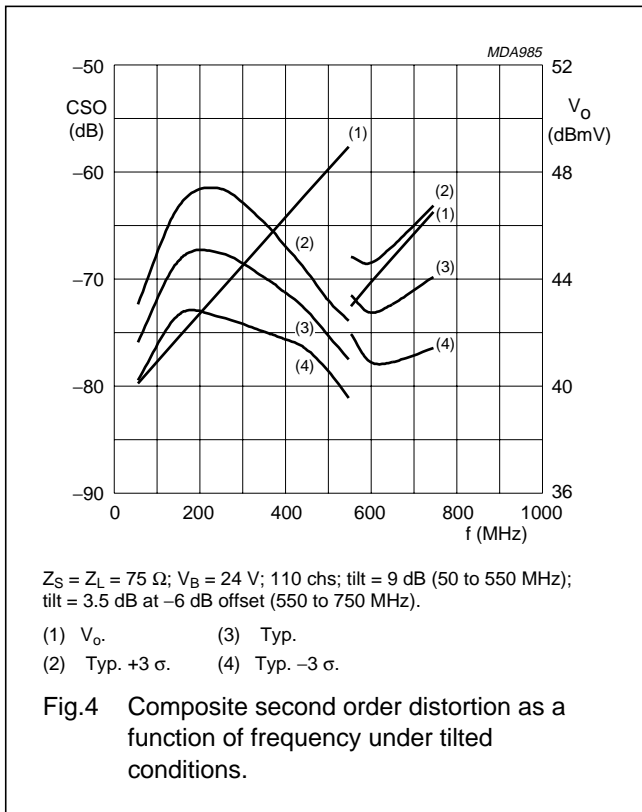
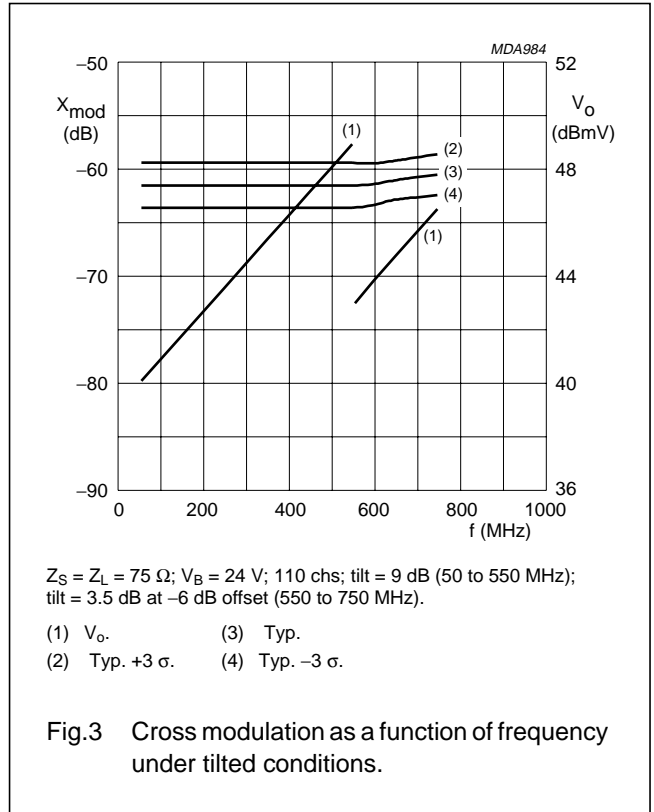
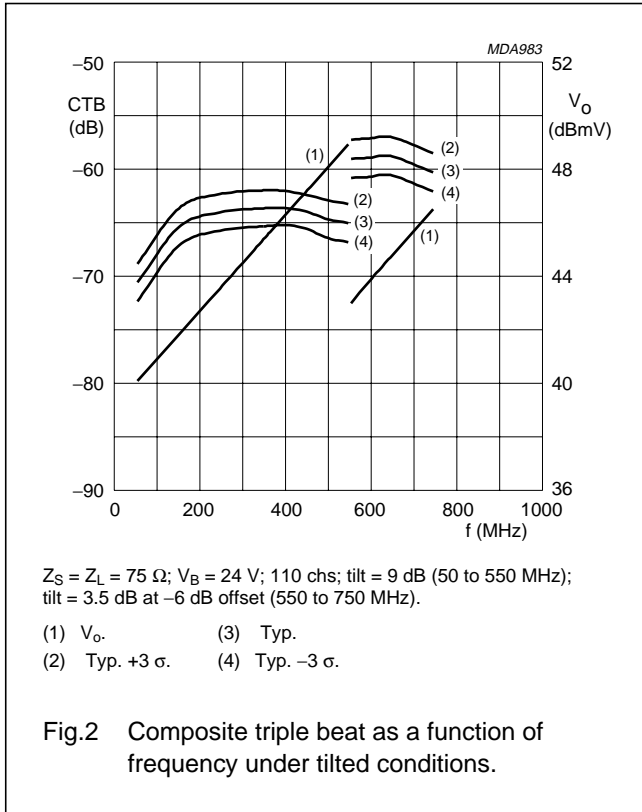
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
CSO	composite second order distortion	49 chs flat; $V_o = 47$ dBmV; $f_m = 860.5$ MHz	–	–68	–62	dB
		77 chs flat; $V_o = 44$ dBmV; $f_m = 548.5$ MHz	–	–72	–67	dB
		110 chs flat; $V_o = 44$ dBmV; $f_m = 746.5$ MHz	–	–68	–62	dB
		129 chs flat; $V_o = 44$ dBmV; $f_m = 860.5$ MHz	–	–64	–58	dB
		110 chs; $f_m = 250$ MHz; $V_o = 49$ dBmV at 550 MHz; note 1	–	–67	–62	dB
		129 chs; $f_m = 250$ MHz; $V_o = 49.5$ dBmV at 860 MHz; note 2	–	–62	–58	dB
$d_2$	second order distortion	note 3	–	–82	–75	dB
		note 4	–	–82	–76	dB
		note 5	–	–83	–77	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 6	64	65.5	–	dBmV
		$d_{im} = -60$ dB; note 7	65	67	–	dBmV
		$d_{im} = -60$ dB; note 8	67	69	–	dBmV
		CTB compression = 1 dB; 129 chs flat; $f = 859.25$ MHz	48.5	49	–	dBmV
		CSO compression = 1 dB; 129 chs flat; $f = 860.5$ MHz	50	52	–	dBmV
F	noise figure	$f = 50$ MHz	–	4	5	dB
		$f = 550$ MHz	–	4.5	5.5	dB
		$f = 750$ MHz	–	5.1	6.5	dB
		$f = 900$ MHz	–	6.2	7.5	dB
$I_{tot}$	total current consumption (DC)	note 9	405	420	435	mA

**Notes**

- Tilt = 9 dB (50 to 550 MHz); tilt = 3.5 dB at –6 dB offset (550 to 750 MHz).
- Tilt = 12.5 dB (50 to 860 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.
- $f_p = 55.25$  MHz;  $V_p = 44$  dBmV;  $f_q = 691.25$  MHz;  $V_q = 44$  dBmV; measured at  $f_p + f_q = 746.5$  MHz.
- $f_p = 55.25$  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:  
 $f_p = 851.25$  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.
- 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.
- 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 35 V.

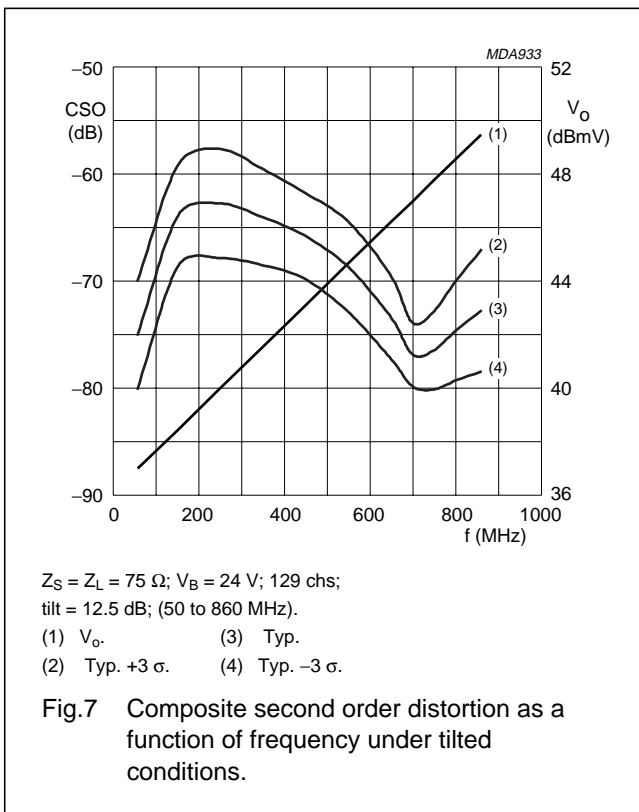
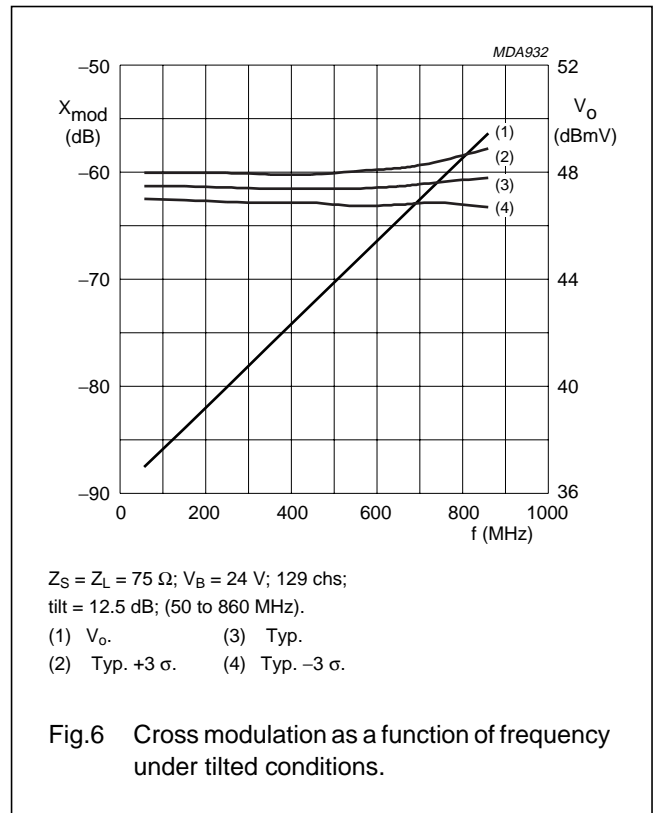
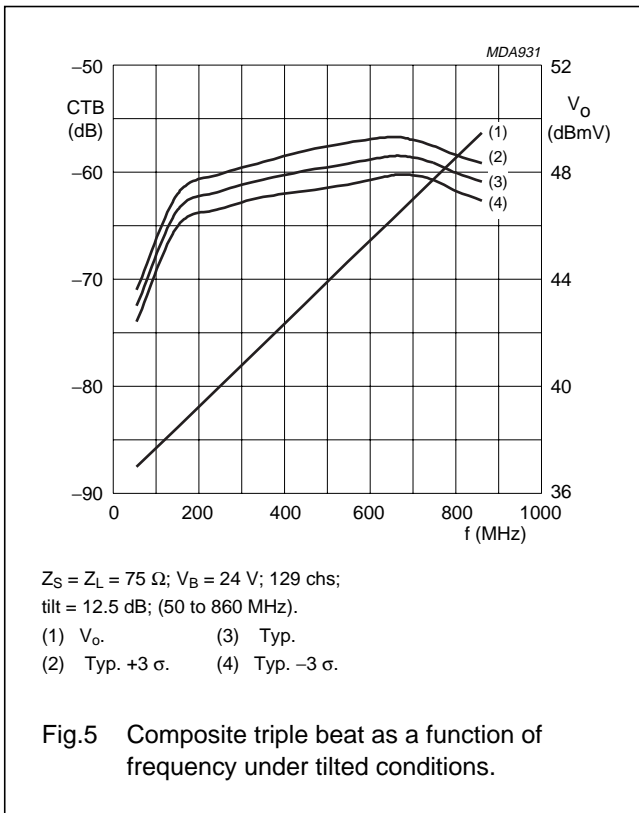
860 MHz, 20 dB gain power doubler amplifier

BGD904; BGD904MI



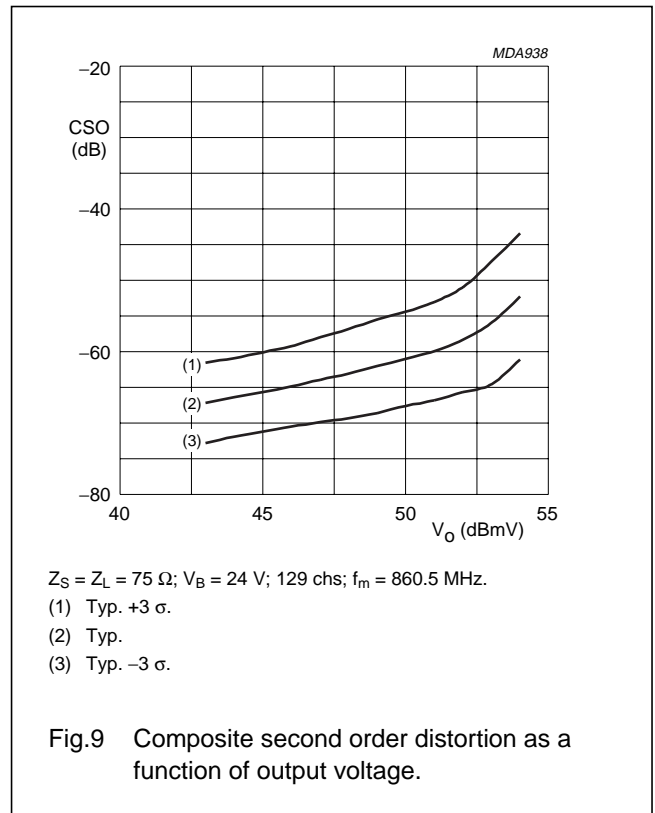
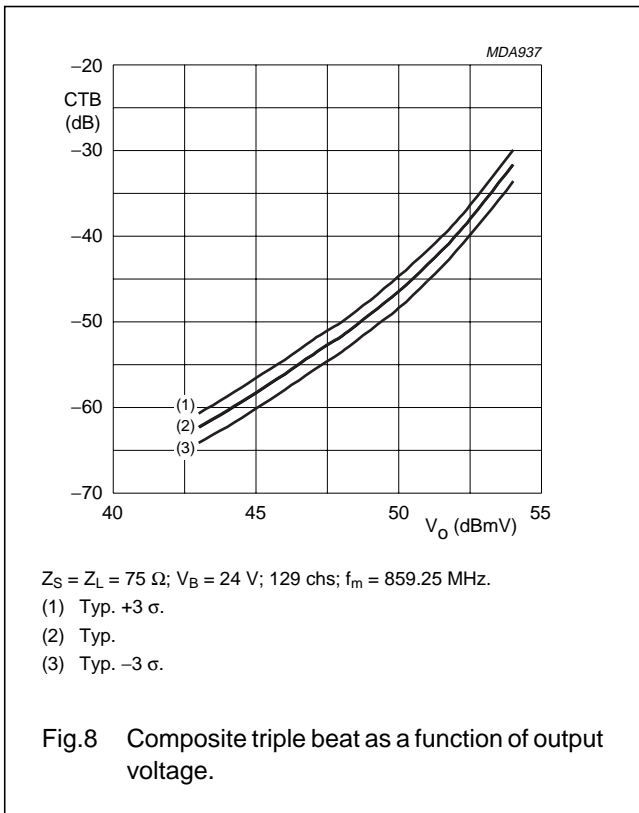
860 MHz, 20 dB gain power doubler amplifier

BGD904; BGD904MI



860 MHz, 20 dB gain power doubler amplifier

BGD904; BGD904MI



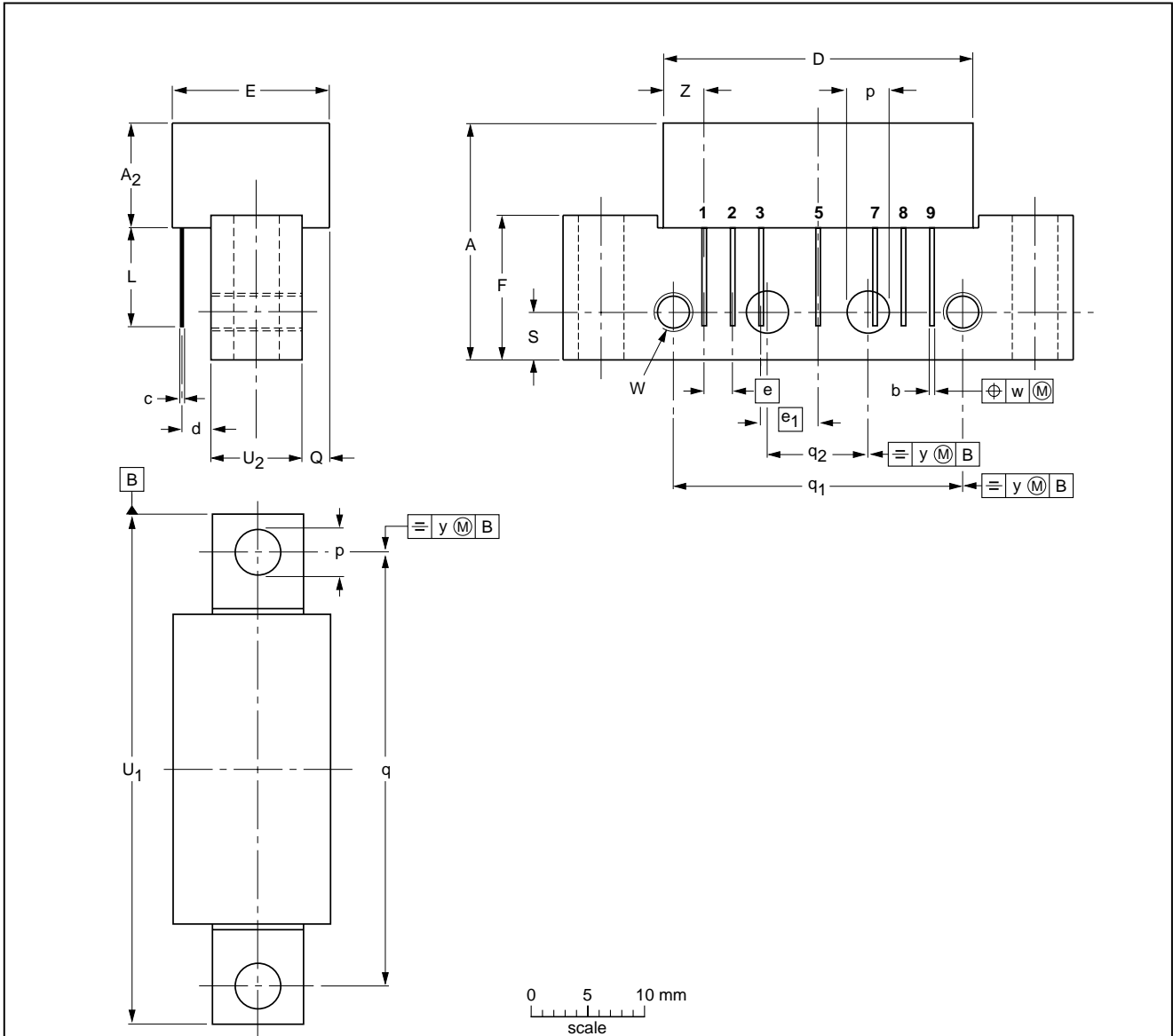
860 MHz, 20 dB gain power doubler amplifier

BGD904; BGD904MI

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 max.	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> max.	U <sub>2</sub>	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



## 860 MHz, 20 dB gain power doubler amplifier

BGD904; BGD904MI

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860 MHz, 20 dB gain power doubler amplifier

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**NOTES**

860 MHz, 20 dB gain power doubler amplifier

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**NOTES**

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Printed in The Netherlands

613518/07/pp12

Date of release: 2001 Nov 01

Document order number: 9397 750 08858

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