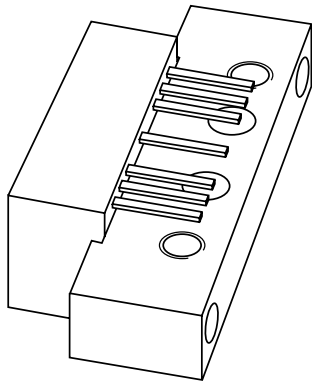


# DATA SHEET



**BGD906; BGD906MI**  
860 MHz, 21.5 dB gain power  
doubler amplifier

Product specification  
Supersedes data of 2000 Mar 28

2001 Nov 01



# 860 MHz, 21.5 dB gain power doubler amplifier

## BGD906; BGD906MI

### FEATURES

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

### APPLICATIONS

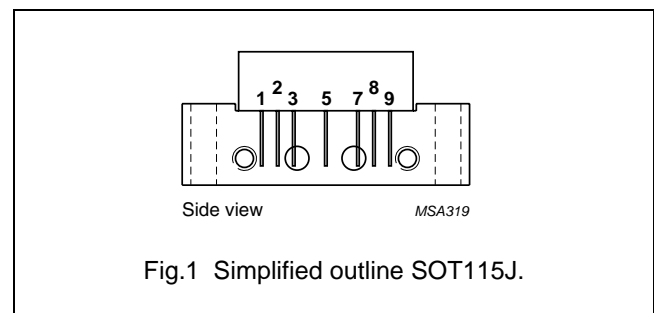
- CATV systems operating in the 40 to 900 MHz frequency range.

### 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	
	BGD906	BGD906MI
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	21.2	21.8	dB
		f = 900 MHz	22	23	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V; T <sub>mb</sub> = 35 °C	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, 21.5 dB gain power doubler amplifier

BGD906; BGD906MI

## 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	21.2	21.5	21.8	dB
		f = 900 MHz	22	22.5	23	dB
SL	slope straight line	f = 40 to 900 MHz	0.5	1	1.5	dB
FL	flatness straight line	f = 40 to 900 MHz	–	–	±0.35	dB
S <sub>11</sub>	input return losses	f = 40 to 80 MHz	22	25	–	dB
		f = 80 to 160 MHz	21	24	–	dB
		f = 160 to 320 MHz	18	23	–	dB
		f = 320 to 550 MHz	17	23	–	dB
		f = 550 to 900 MHz	16	20	–	dB
S <sub>22</sub>	output return losses	f = 40 to 80 MHz	22	25	–	dB
		f = 80 to 160 MHz	21	25	–	dB
		f = 160 to 320 MHz	20	23	–	dB
		f = 320 to 550 MHz	19	22	–	dB
		f = 550 to 650 MHz	18	24	–	dB
		f = 650 to 750 MHz	17	23	–	dB
		f = 750 to 900 MHz	16	21	–	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	–	–68.5	–66	dB
		77 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 547.25 MHz	–	–70	–67	dB
		110 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 745.25 MHz	–	–63	–61	dB
		129 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 859.25 MHz	–	–59	–57	dB
		110 chs; f <sub>m</sub> = 397.25 MHz; V <sub>o</sub> = 49 dBmV at 550 MHz; note 1	–	–62.5	–60.5	dB
		129 chs; f <sub>m</sub> = 697.25 MHz; V <sub>o</sub> = 49.5 dBmV at 860 MHz; note 2	–	–57	–54.5	dB
X <sub>mod</sub>	cross modulation	49 chs flat; V <sub>o</sub> = 47 dBmV; f <sub>m</sub> = 55.25 MHz	–	–64	–62	dB
		77 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz	–	–67.5	–65	dB
		110 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz	–	–64	–61.5	dB
		129 chs flat; V <sub>o</sub> = 44 dBmV; f <sub>m</sub> = 55.25 MHz	–	–61	–60	dB
		110 chs; f <sub>m</sub> = 397.25 MHz; V <sub>o</sub> = 49 dBmV at 550 MHz; note 1	–	–60	–58	dB
		129 chs; f <sub>m</sub> = 859.25 MHz; V <sub>o</sub> = 49.5 dBmV at 860 MHz; note 2	–	–56.5	–55	dB

# 860 MHz, 21.5 dB gain power doubler amplifier

BGD906; BGD906MI

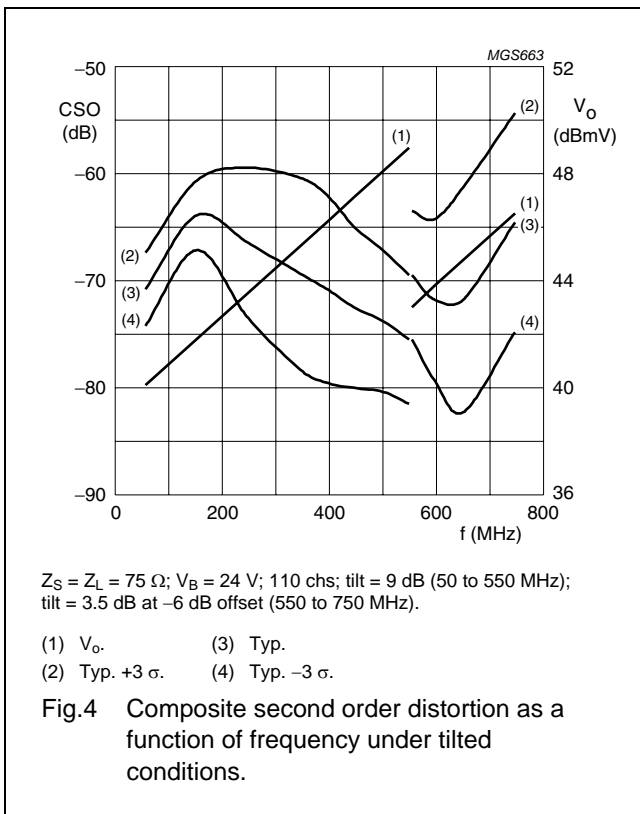
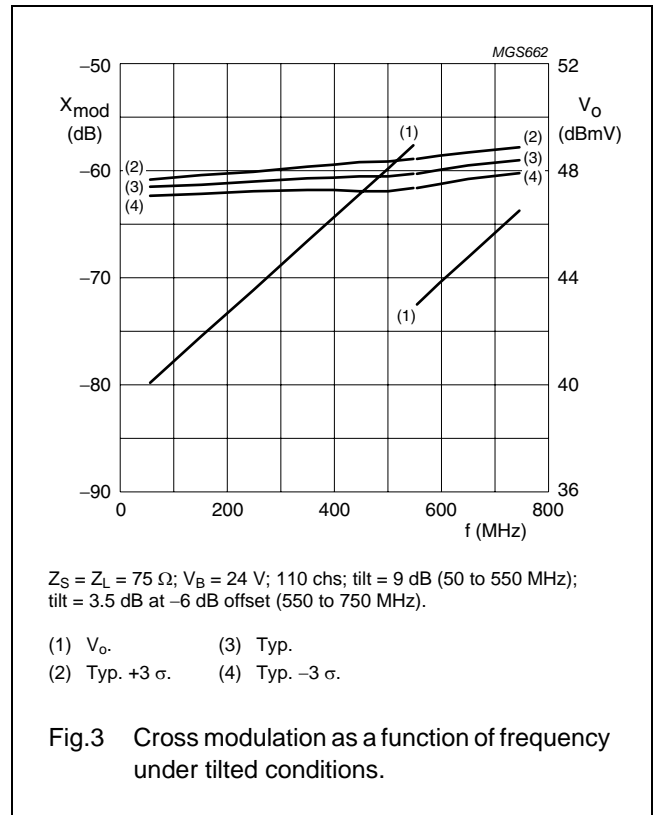
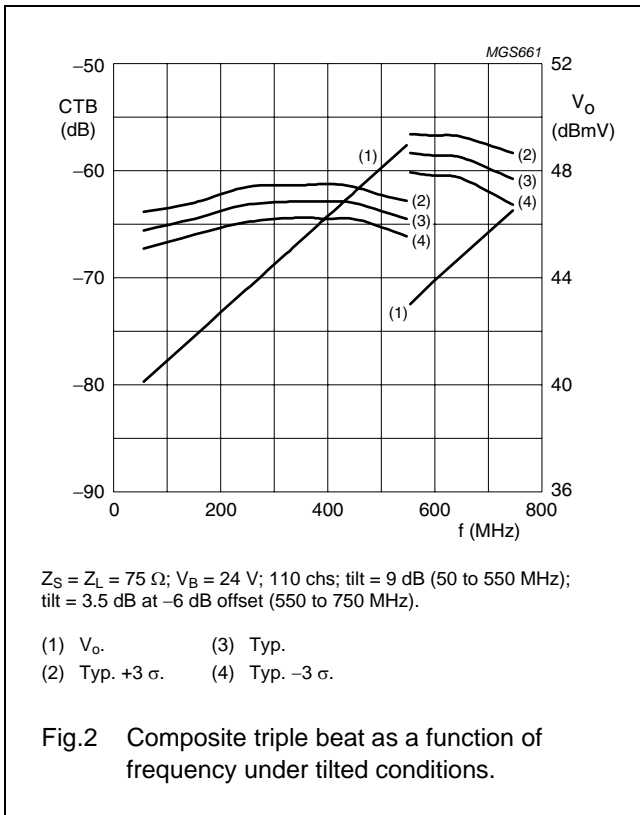
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
CSO	composite second order distortion	49 chs flat; $V_o = 47$ dBmV; $f_m = 860.5$ MHz	–	–63	–59	dB
		77 chs flat; $V_o = 44$ dBmV; $f_m = 548.5$ MHz	–	–74	–65	dB
		110 chs flat; $V_o = 44$ dBmV; $f_m = 746.5$ MHz	–	–66	–58	dB
		129 chs flat; $V_o = 44$ dBmV; $f_m = 860.5$ MHz	–	–59	–54	dB
		110 chs; $f_m = 150$ MHz; $V_o = 49$ dBmV at 550 MHz; note 1	–	–64	–60	dB
		129 chs; $f_m = 150$ MHz; $V_o = 49.5$ dBmV at 860 MHz; note 2	–	–60	–54	dB
$d_2$	second order distortion	note 3	–	–83	–70	dB
		note 4	–	–81.5	–73	dB
		note 5	–	–79	–76	dB
$V_o$	output voltage	$d_{im} = -60$ dB; note 6	63.5	64.5	–	dBmV
		$d_{im} = -60$ dB; note 7	64.5	66.5	–	dBmV
		$d_{im} = -60$ dB; note 8	66.5	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	51	54	–	dBmV
NF	noise figure	$f = 50$ MHz	–	5	5.5	dB
		$f = 550$ MHz	–	4.5	5	dB
		$f = 750$ MHz	–	5	6	dB
		$f = 900$ MHz	–	6	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.

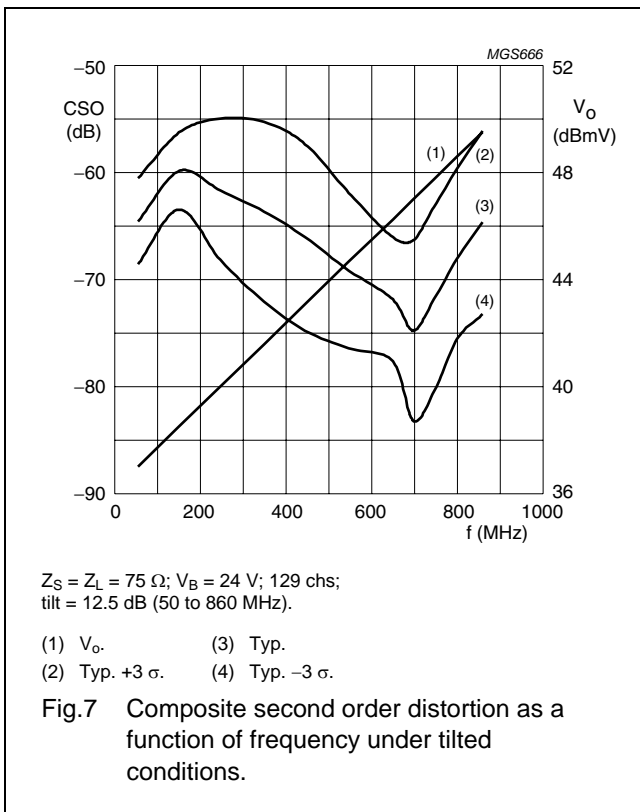
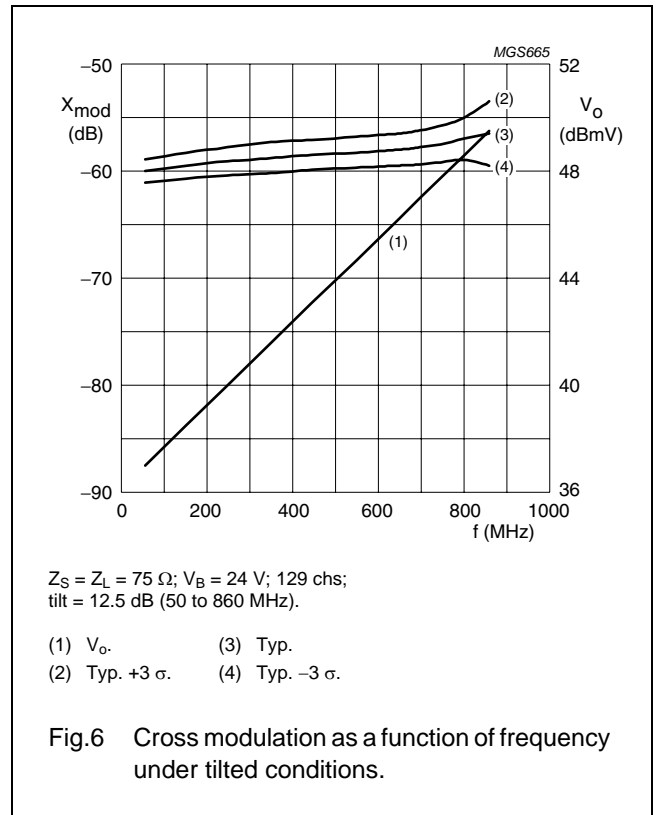
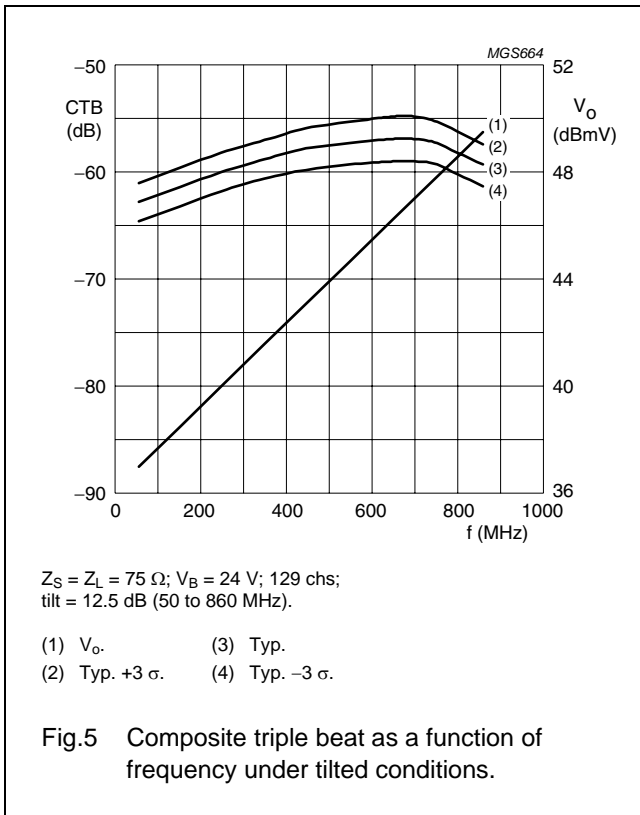
# 860 MHz, 21.5 dB gain power doubler amplifier

BGD906; BGD906MI



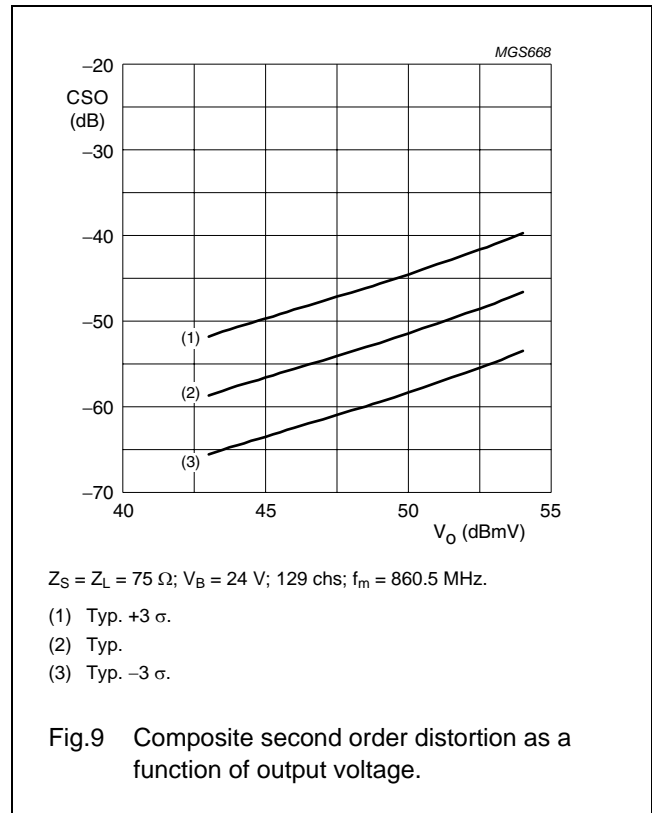
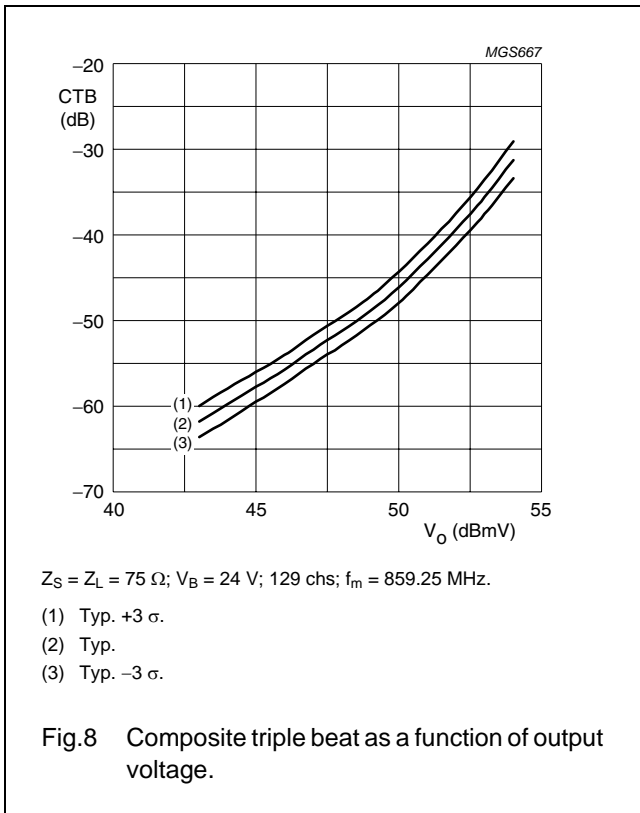
# 860 MHz, 21.5 dB gain power doubler amplifier

BGD906; BGD906MI



860 MHz, 21.5 dB gain power doubler amplifier

BGD906; BGD906MI



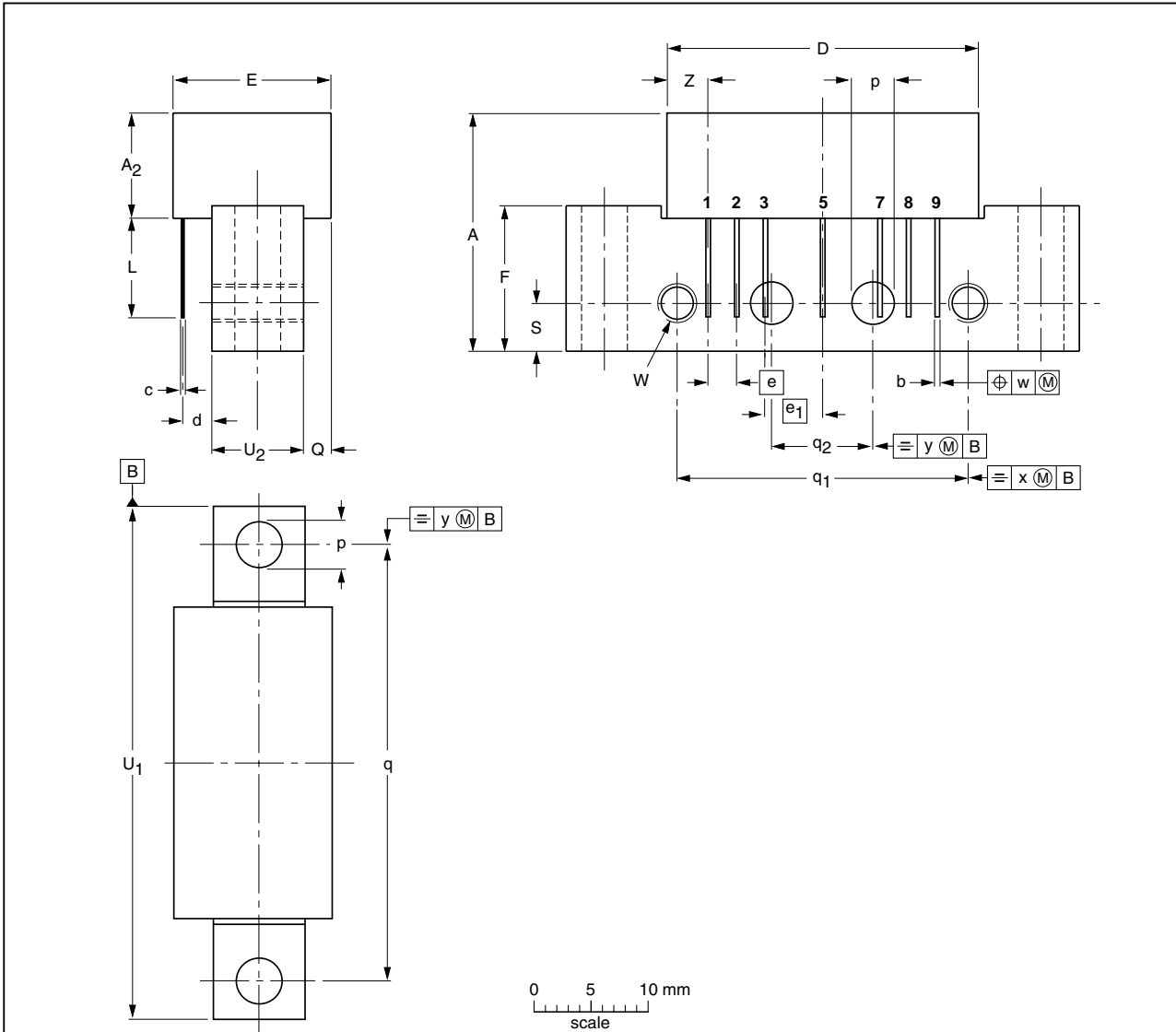
860 MHz, 21.5 dB gain power doubler amplifier

BGD906; BGD906MI

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, 21.5 dB gain power doubler amplifier

## BGD906; BGD906MI

### 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, 21.5 dB gain power doubler amplifier

BGD906; BGD906MI

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## **Contact information**

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Printed in The Netherlands



613518/04/pp11

Date of release: 2001 Nov 01

Document order number: 9397 750 08863

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