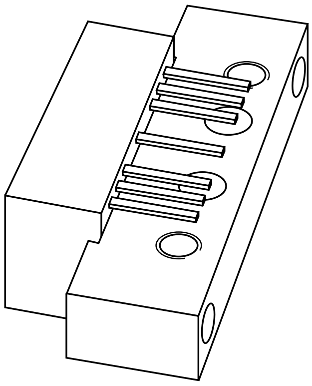
DATA SHEET



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	$+V_B$	$+V_B$
7, 8	common	common
9	output	input

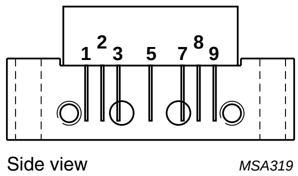


Fig.1 Simplified outline SOT115J.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 50 MHz	21.2	21.8	dB
		f = 900 MHz	22	23	dB
I_{tot}	total current consumption (DC)	V_B = 24 V; T_{mb} = 35 °C	405	435	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

CHARACTERISTICS

Bandwidth 40 to 900 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 = 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_{11}	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_{22}	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_{21}	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	49 chs flat; V_o = 47 dBmV; f_m = 859.25 MHz	–	–68.5	–66	dB
		77 chs flat; V_o = 44 dBmV; f_m = 547.25 MHz	–	–70	–67	dB
		110 chs flat; V_o = 44 dBmV; f_m = 745.25 MHz	–	–63	–61	dB
		129 chs flat; V_o = 44 dBmV; f_m = 859.25 MHz	–	–59	–57	dB
		110 chs; f_m = 397.25 MHz; V_o = 49 dBmV at 550 MHz; note 1	–	–62.5	–60.5	dB
		129 chs; f_m = 697.25 MHz; V_o = 49.5 dBmV at 860 MHz; note 2	–	–57	–54.5	dB
X_{mod}	cross modulation	49 chs flat; V_o = 47 dBmV; f_m = 55.25 MHz	–	–64	–62	dB
		77 chs flat; V_o = 44 dBmV; f_m = 55.25 MHz	–	–67.5	–65	dB
		110 chs flat; V_o = 44 dBmV; f_m = 55.25 MHz	–	–64	–61.5	dB
		129 chs flat; V_o = 44 dBmV; f_m = 55.25 MHz	–	–61	–60	dB
		110 chs; f_m = 397.25 MHz; V_o = 49 dBmV at 550 MHz; note 1	–	–60	–58	dB
		129 chs; f_m = 859.25 MHz; V_o = 49.5 dBmV at 860 MHz; note 2	–	–56.5	–55	dB

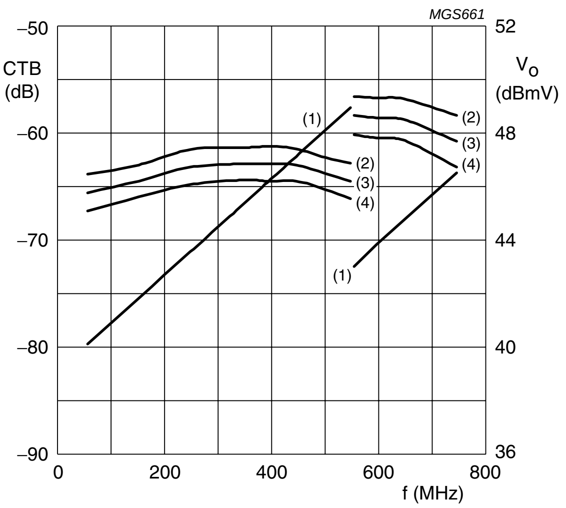
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
CSO	composite second order distortion	49 chs flat; V_o = 47 dBmV; f_m = 860.5 MHz	–	–63	–59	dB
		77 chs flat; V_o = 44 dBmV; f_m = 548.5 MHz	–	–74	–65	dB
		110 chs flat; V_o = 44 dBmV; f_m = 746.5 MHz	–	–66	–58	dB
		129 chs flat; V_o = 44 dBmV; f_m = 860.5 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

1. Tilt = 9 dB (50 to 550 MHz)
tilt = 3.5 dB at –6 dB offset (550 to 750 MHz).
2. Tilt = 12.5 dB (50 to 860 MHz).
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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

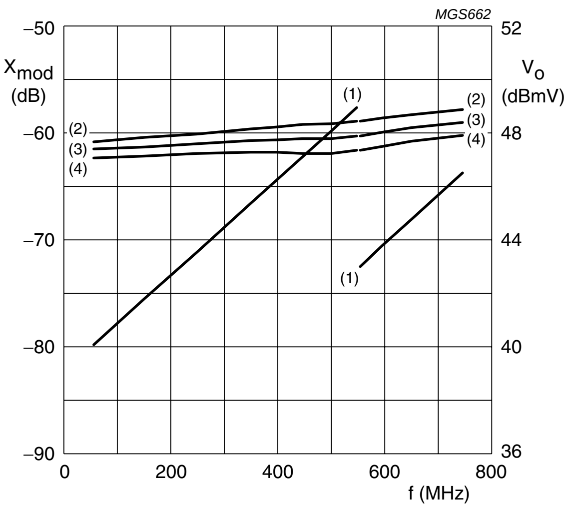
BGD906; BGD906MI



$Z_S = Z_L = 75\ \Omega$; $V_B = 24$ V; 110 chs; tilt = 9 dB (50 to 550 MHz); tilt = 3.5 dB at −6 dB offset (550 to 750 MHz).

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

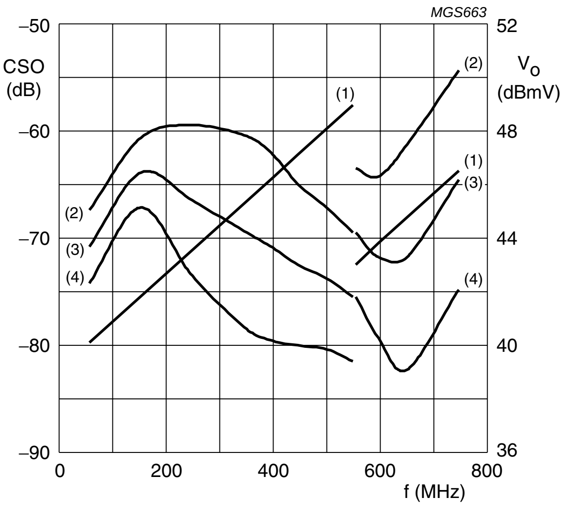
Fig.2 Composite triple beat as a function of frequency under tilted conditions.



$Z_S = Z_L = 75\ \Omega$; $V_B = 24$ V; 110 chs; tilt = 9 dB (50 to 550 MHz); tilt = 3.5 dB at −6 dB offset (550 to 750 MHz).

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

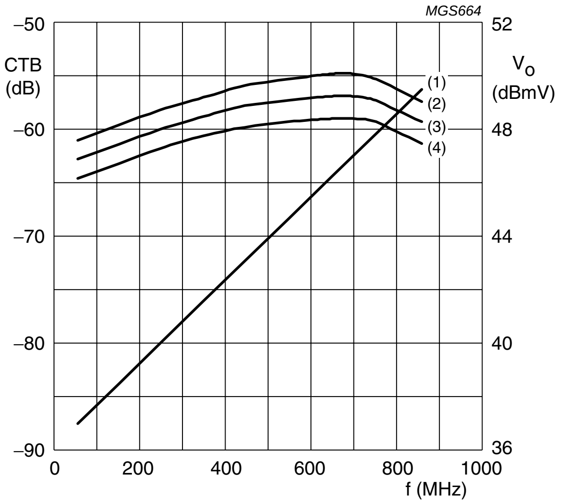
Fig.3 Cross modulation as a function of frequency under tilted conditions.



$Z_S = Z_L = 75\ \Omega$; $V_B = 24$ V; 110 chs; tilt = 9 dB (50 to 550 MHz); tilt = 3.5 dB at −6 dB offset (550 to 750 MHz).

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

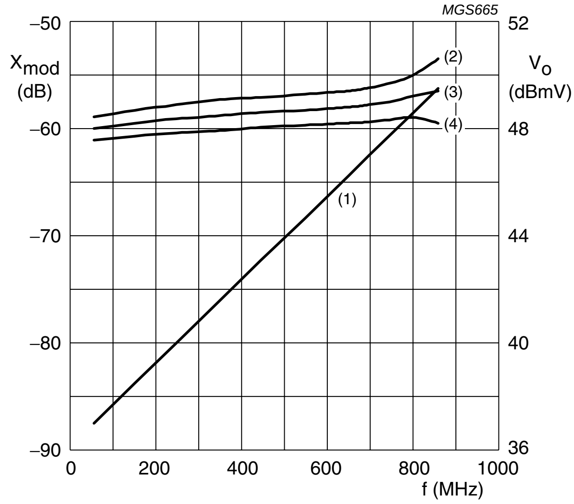
Fig.4 Composite second order distortion as a function of frequency under tilted conditions.



$Z_S = Z_L = 75\ \Omega$; $V_B = 24$ V; 129 chs;
tilt = 12.5 dB (50 to 860 MHz).

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

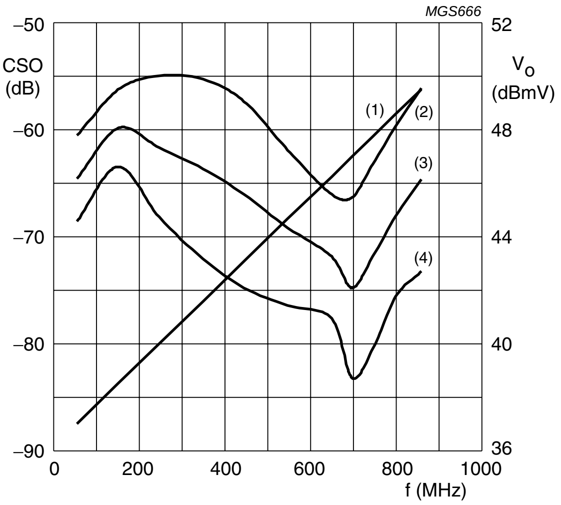
Fig.5 Composite triple beat as a function of frequency under tilted conditions.



$Z_S = Z_L = 75\ \Omega$; $V_B = 24$ V; 129 chs;
tilt = 12.5 dB (50 to 860 MHz).

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

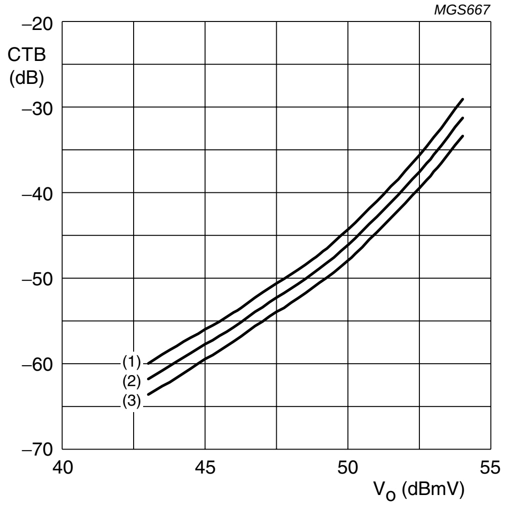
Fig.6 Cross modulation as a function of frequency under tilted conditions.



$Z_S = Z_L = 75\ \Omega$; $V_B = 24$ V; 129 chs;
tilt = 12.5 dB (50 to 860 MHz).

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

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



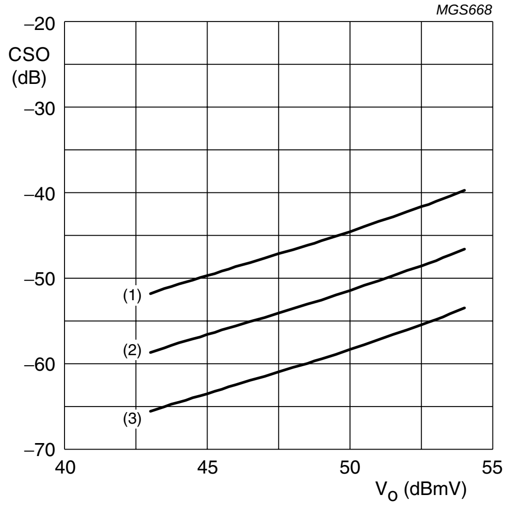
$Z_S = Z_L = 75\ \Omega$; $V_B = 24$ V; 129 chs; $f_m = 859.25$ MHz.

(1) Typ. +3 σ.

(2) Typ.

(3) Typ. −3 σ.

Fig.8 Composite triple beat as a function of output voltage.



$Z_S = Z_L = 75\ \Omega$; $V_B = 24$ V; 129 chs; $f_m = 860.5$ MHz.

(1) Typ. +3 σ.

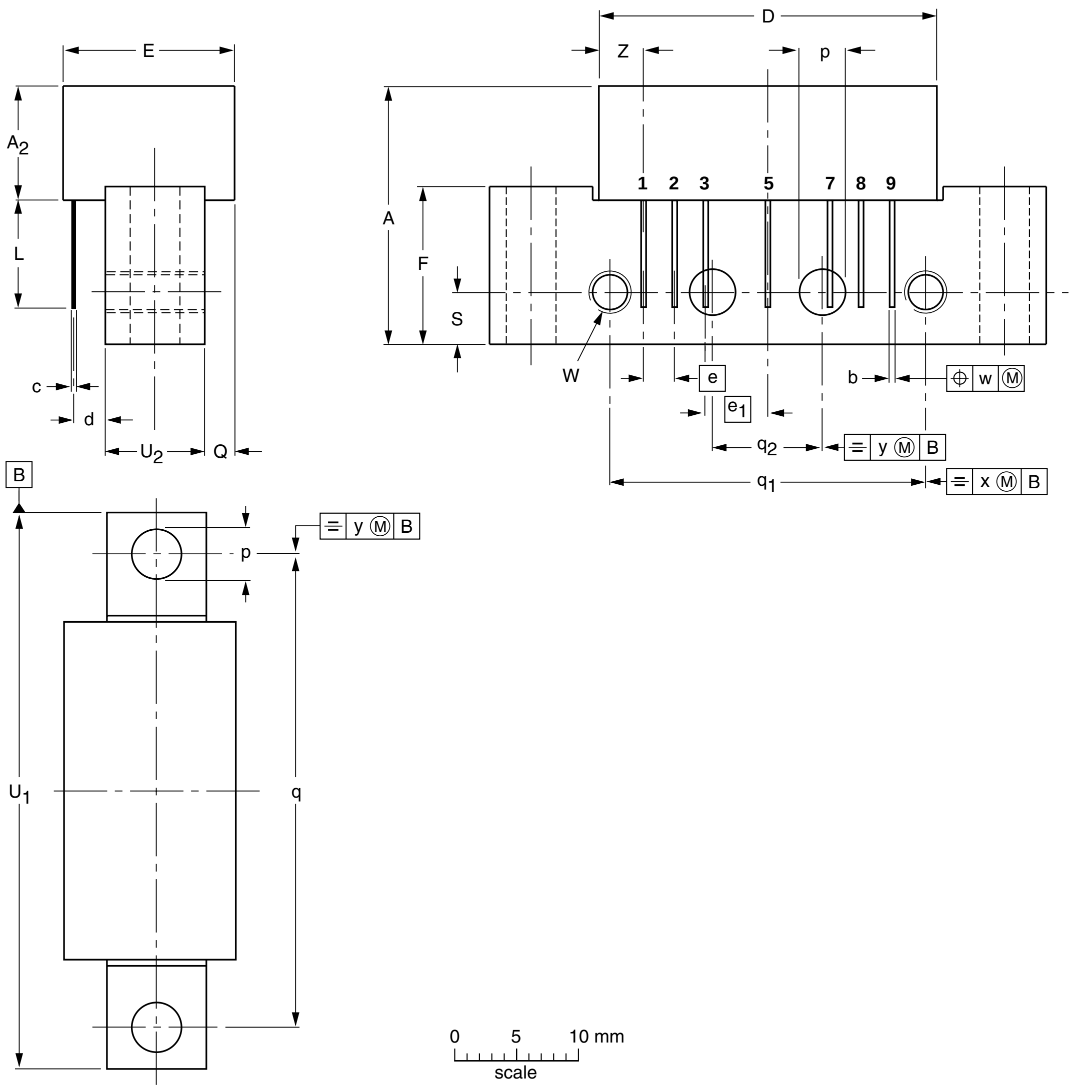
(2) Typ.

(3) Typ. −3 σ.

Fig.9 Composite second order distortion as a function of output voltage.

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

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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Customer notification

This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content, except for package outline drawings which were updated to the latest version.

Contact information

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