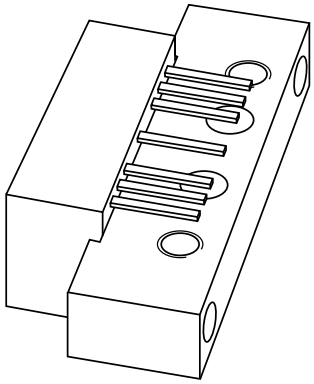
DATA SHEET



BGD712

750 MHz, 18.5 dB gain power doubler amplifier

Product specification
Supersedes data of 2001 Oct 29

2001 Nov 02

750 MHz, 18.5 dB gain power doubler amplifier

BGD712

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 750 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	$+V_B$
7, 8	common
9	output

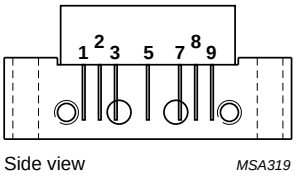


Fig.1 Simplified outline.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G_p	power gain	f = 45 MHz	18.2	18.8	dB
		f = 750 MHz	19	20	dB
I_{tot}	total current consumption (DC)	V_B = 24 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

CHARACTERISTICS

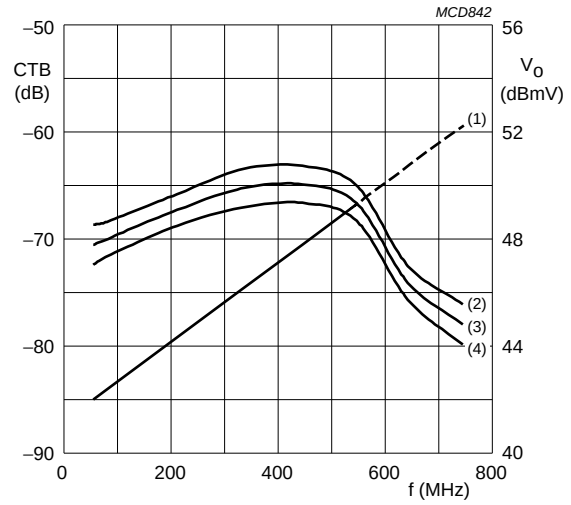
Bandwidth 40 to 750 MHz; V_B = 24 V; T_{mb} = 35 °C; $Z_S = Z_L$ = 75 Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	f = 45 MHz	18.2	18.5	18.8	dB
		f = 750 MHz	19	19.5	20	dB
SL	slope straight line	f = 45 to 750 MHz; note 1	0.5	1	1.5	dB
FL	flatness straight line	f = 45 to 100 MHz	–	–	±0.35	dB
		f = 100 to 700 MHz	–	–	±0.5	dB
		f = 700 to 750 MHz	–	–	±0.15	dB
S_{11}	input return losses	f = 45 to 80 MHz	23	–	–	dB
		f = 80 to 160 MHz	23	–	–	dB
		f = 160 to 320 MHz	21	–	–	dB
		f = 320 to 550 MHz	20	–	–	dB
		f = 550 to 650 MHz	20	–	–	dB
		f = 650 to 750 MHz	19	–	–	dB
		f = 750 to 790 MHz	17	–	–	dB
S_{22}	output return losses	f = 45 to 80 MHz	23	–	–	dB
		f = 80 to 160 MHz	23	–	–	dB
		f = 160 to 320 MHz	20	–	–	dB
		f = 320 to 550 MHz	20	–	–	dB
		f = 550 to 650 MHz	19	–	–	dB
		f = 650 to 750 MHz	19	–	–	dB
		f = 750 to 790 MHz	17	–	–	dB
S_{21}	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	112 channels flat; V_o = 44 dBmV; f_m = 745.25 MHz	–	–	–62	dB
		79 channels flat; V_o = 44 dBmV; f_m = 547.25 MHz	–	–	–68	dB
		79 channels; f_m = 445.25 MHz; V_o = 49.3 dBmV at 547 MHz; note 2	–	–	–63	dB
X_{mod}	cross modulation	112 channels flat; V_o = 44 dBmV; f_m = 55.25 MHz	–	–	–63	dB
		79 channels flat; V_o = 44 dBmV; f_m = 55.25 MHz	–	–	–69	dB
		79 channels; f_m = 745.25 MHz; V_o = 49.3 dBmV at 547 MHz; note 2	–	–	–60	dB

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
CSO	composite second order distortion	112 channels flat; V_o = 44 dBmV; f_m = 746.5 MHz	–	–	–63	dB
		79 channels flat; V_o = 44 dBmV; f_m = 548.5 MHz	–	–	–68	dB
		79 channels; f_m = 746.5 MHz; V_o = 49.3 dBmV at 547 MHz; note 2	–	–	–62	dB
d_2	second order distortion	note 3	–	–	–74	dB
V_o	output voltage	d_{im} = –60 dB; note 4	64	–	–	dBmV
NF	noise figure	f = 50 MHz	–	–	5.5	dB
		f = 550 MHz	–	–	5.5	dB
		f = 750 MHz	–	–	7	dB
I_{tot}	total current consumption (DC)	note 5	380	395	410	mA

Notes

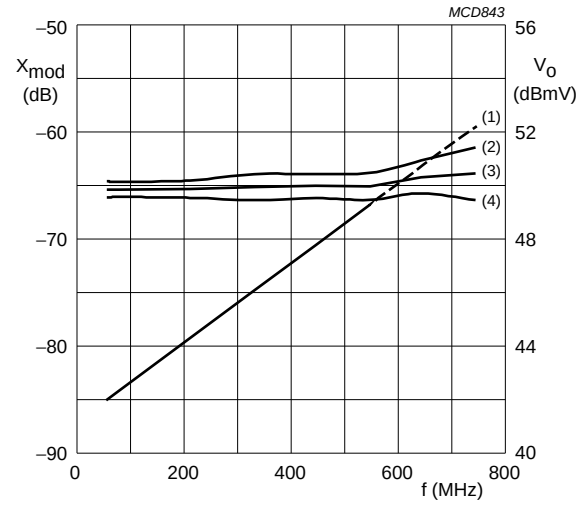
1. Slope straight line is defined as gain at 750 MHz – gain at 45 MHz.
2. Tilt = 7.3 dB (55 to 547 MHz).
3. f_p = 55.25 MHz; V_p = 44 dBmV;
   f_q = 691.25 MHz; V_q = 44 dBmV;
   measured at $f_p + f_q$ = 746.5 MHz.
4. Measured according to DIN45004B:
   f_p = 740.25 MHz; $V_p = V_o$;
   f_q = 747.25 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.
5. The module normally operates at V_B = 24 V, but is able to withstand supply transients up to 30 V.



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

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

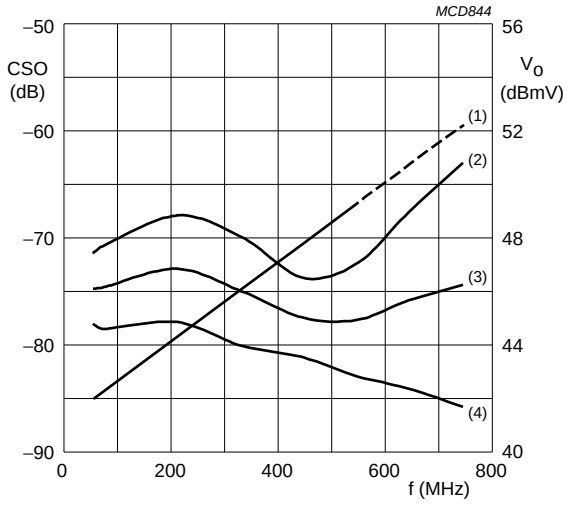
Fig.2 Composite triple beat as a function of frequency under tilted conditions.



$Z_S = Z_L = 75\ \Omega$; $V_B = 24$ V; 79 channels; 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.



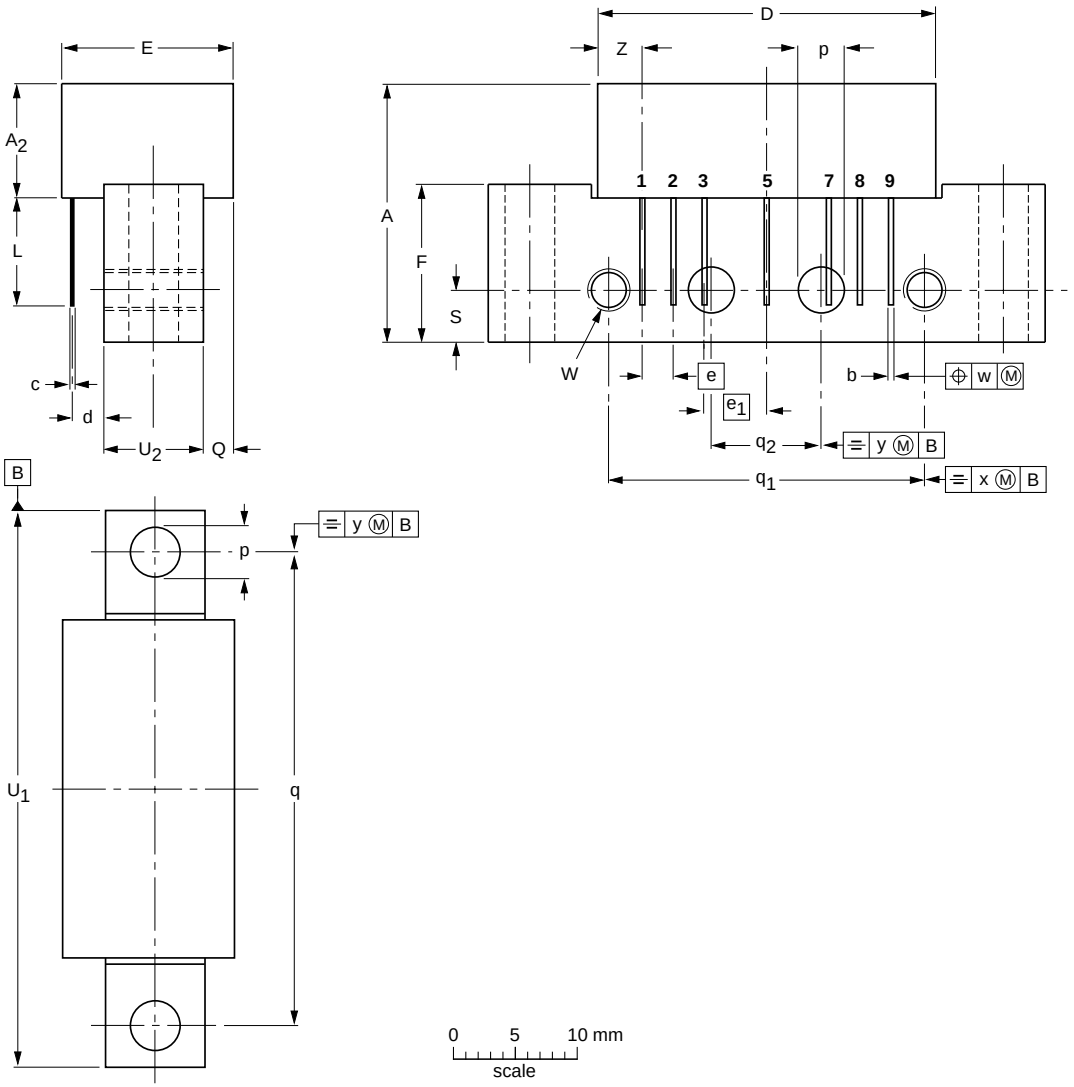
$Z_S = Z_L = 75\ \Omega$; $V_B = 24$ V; 79 channels; tilt = 7.3 dB (50 to 550 MHz).

(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.

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

For additional information please visit: **http://www.nxp.com**
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