DATA SHEET
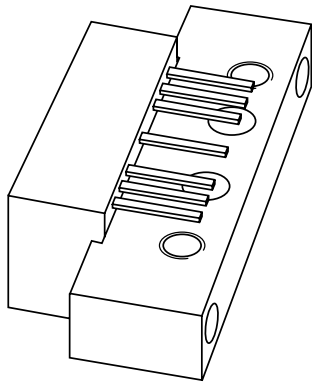
BGD712

750 MHz, 18.5 dB gain power
doubler amplifier

Product specification

Supersedes data of 2001 Oct 29

2001 Nov 02

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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.
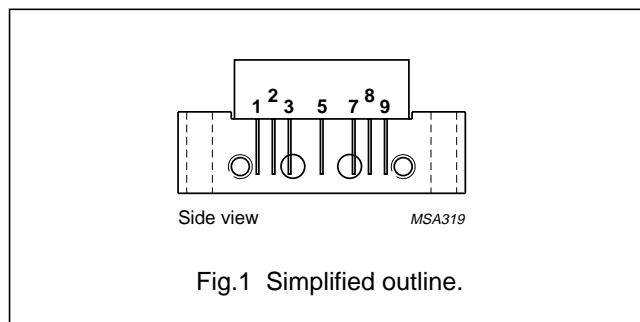
APPLICATIONS

- 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

Side view   MSA319

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

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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

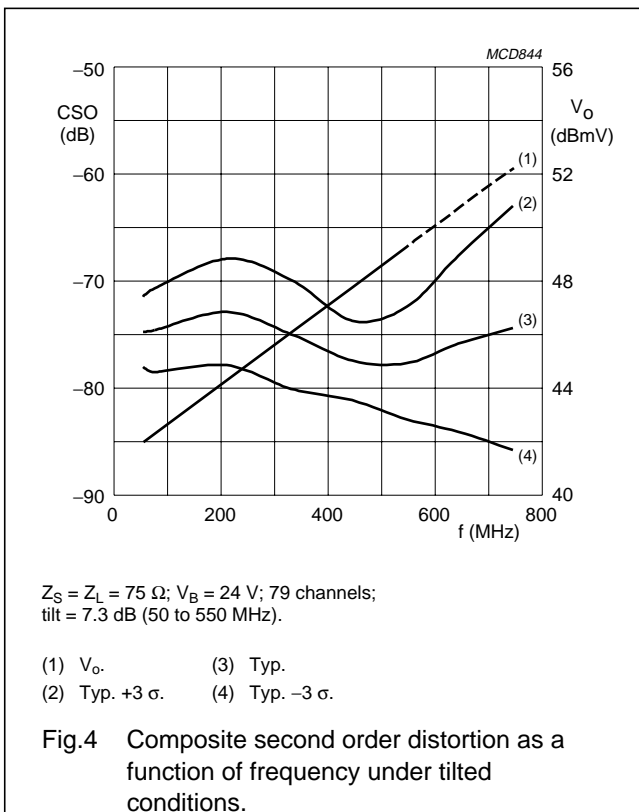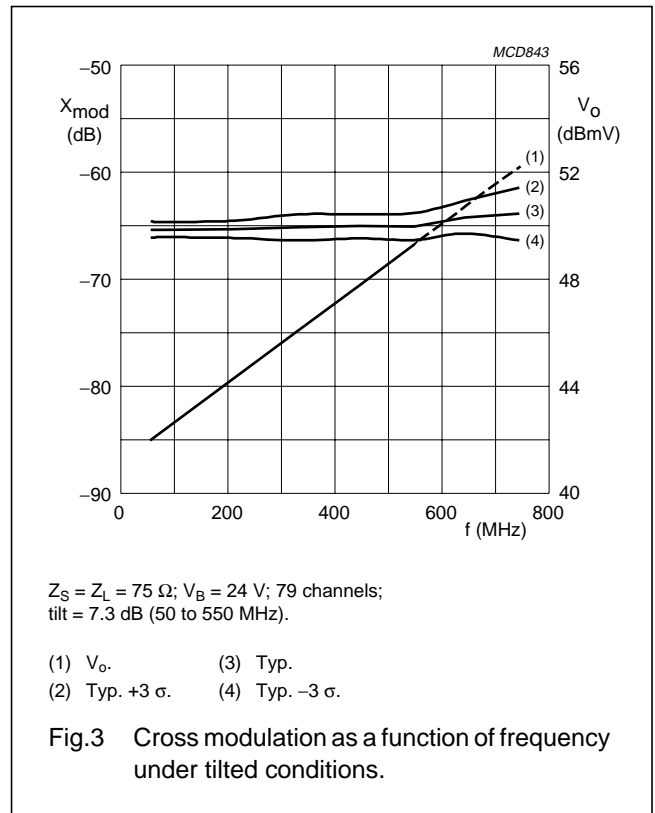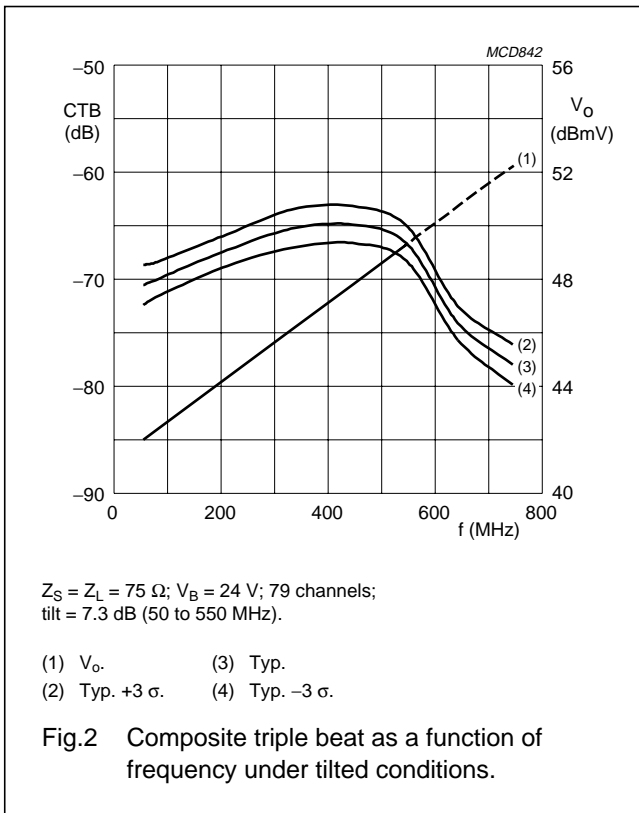## 750 MHz, 18.5 dB gain power doubler amplifier

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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.

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$Z_S = Z_L = 75 \ \Omega$; $V_B = 24$ 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.

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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

0   5   10 mm

scale
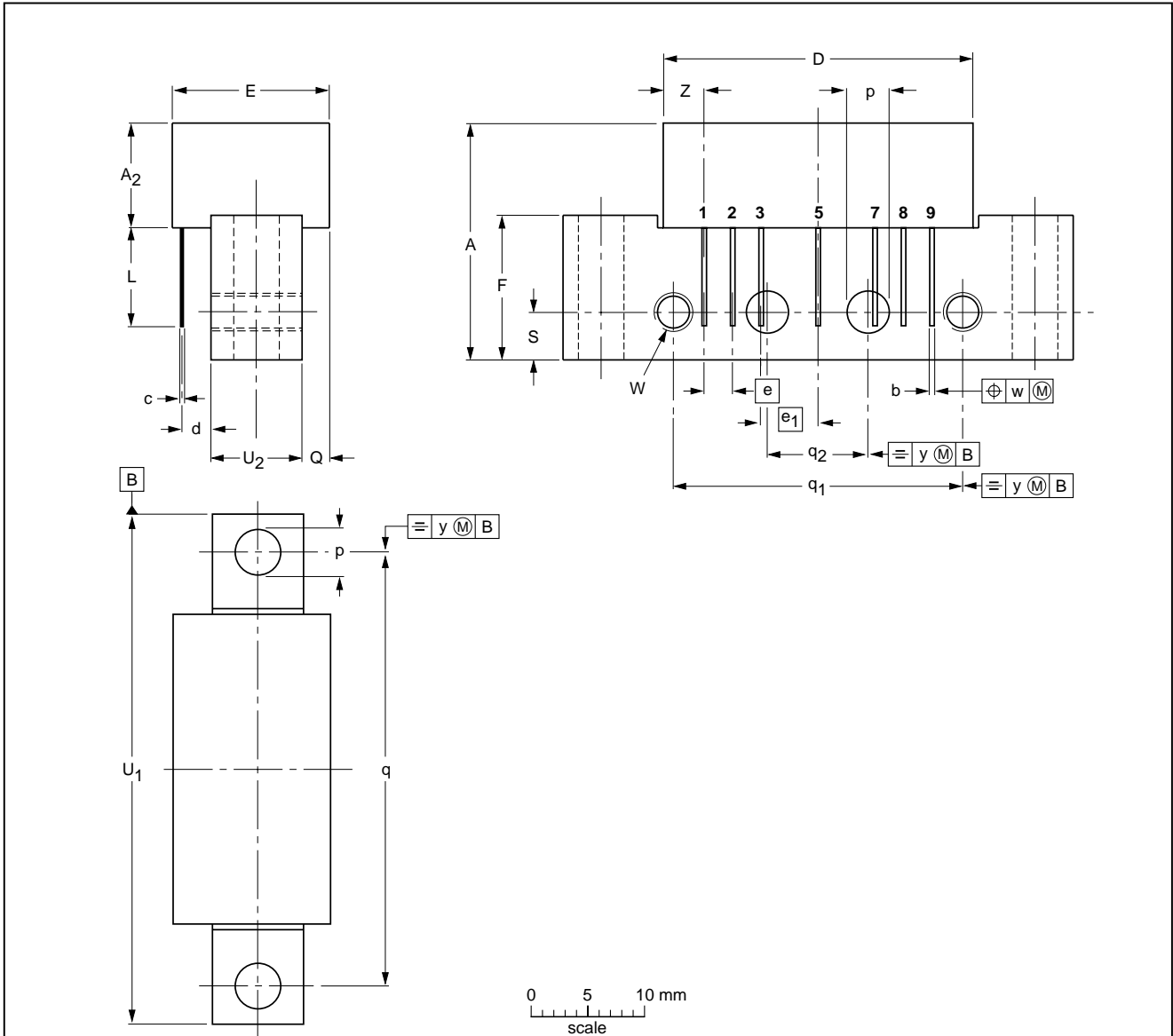
DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A2 max.	b	c	D max.	d max.	E max.	e	e1	F	L min.	p	Q max.	q	q1	q2	S	U1 max.	U2	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

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DATA SHEET STATUS

DATA SHEET STATUS[1]	PRODUCT STATUS[2]	DEFINITIONS
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