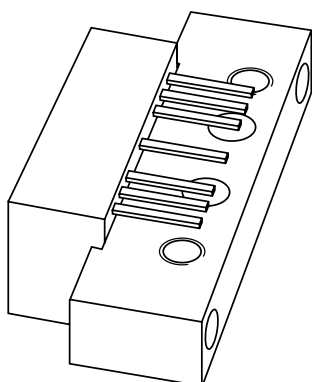


DATA SHEET



BGD702

750 MHz, 18.5 dB gain
power doubler amplifier

Product specification
Supersedes data of 2001 Nov 02

2001 Nov 27

750 MHz, 18.5 dB gain power doubler amplifier

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FEATURES

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

APPLICATIONS

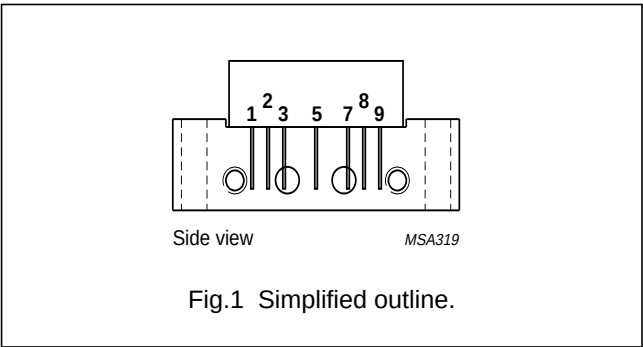
- CATV systems operating in the 40 to 750 MHz frequency range.

DESCRIPTION

Hybrid amplifier module in a SOT115J package operating at a supply voltage of 24 V (DC).

PINNING - SOT115J

PIN	DESCRIPTION
1	input
2, 3	common
5	+V _B
7, 8	common
9	output



QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G _p	power gain	f = 50 MHz	18	19	dB
		f = 750 MHz	18.5	—	dB
I _{tot}	total current consumption (DC)	V _B = 24 V	—	435	mA

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	MIN.	MAX.	UNIT
V _i	RF input voltage	—	65	dBmV
T _{stg}	storage temperature	−40	+100	°C
T _{mb}	operating mounting base temperature	−20	+100	°C

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CHARACTERISTICS

Table 1 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	$f = 50$ MHz	18	18.5	19	dB
		$f = 750$ MHz	18.5	19.7	–	dB
SL	slope cable equivalent	$f = 40$ to 750 MHz	0.2	1.3	2	dB
FL	flatness of frequency response	$f = 40$ to 750 MHz	–	± 0.2	± 0.5	dB
S_{11}	input return losses	$f = 40$ to 80 MHz	20	27	–	dB
		$f = 80$ to 160 MHz	19	30	–	dB
		$f = 160$ to 320 MHz	18	29	–	dB
		$f = 320$ to 640 MHz	17	22	–	dB
		$f = 640$ to 750 MHz	16	21	–	dB
S_{22}	output return losses	$f = 40$ to 80 MHz	20	23	–	dB
		$f = 80$ to 160 MHz	19	24	–	dB
		$f = 160$ to 320 MHz	18	23	–	dB
		$f = 320$ to 640 MHz	17	21	–	dB
		$f = 640$ to 750 MHz	16	21	–	dB
S_{21}	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat	110 channels flat; $V_o = 44$ dBmV; measured at 745.25 MHz	–	–59	–58	dB
X_{mod}	cross modulation	110 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–64	–62	dB
CSO	composite second order distortion	110 channels flat; $V_o = 44$ dBmV; measured at 746.5 MHz	–	–63	–58	dB
d_2	second order distortion	note 1	–	–78	–68	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	61	64	–	dBmV
NF	noise figure	$f = 50$ MHz	–	4.5	5.5	dB
		$f = 450$ MHz	–	–	6.5	dB
		$f = 550$ MHz	–	–	6.5	dB
		$f = 600$ MHz	–	–	7	dB
		$f = 750$ MHz	–	6.5	8.5	dB
I_{tot}	total current consumption (DC)	note 3	–	425	435	mA

Notes

- $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 691.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 746.5$ MHz.
- 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.
- The modules normally operate at $V_B = 24$ V, but are able to withstand supply transients up to $V_B = 30$ V.

750 MHz, 18.5 dB gain power doubler amplifier

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Table 2 Bandwidth 40 to 600 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	18	18.5	19	dB
		$f = 600$ MHz	18.5	19.4	–	dB
SL	slope cable equivalent	$f = 40$ to 600 MHz	0.2	–	2	dB
FL	flatness of frequency response	$f = 40$ to 600 MHz	–	–	± 0.3	dB
S_{11}	input return losses	$f = 40$ to 80 MHz	20	27	–	dB
		$f = 80$ to 160 MHz	19	30	–	dB
		$f = 160$ to 320 MHz	18	29	–	dB
		$f = 320$ to 600 MHz	17	22	–	dB
S_{22}	output return losses	$f = 40$ to 80 MHz	20	23	–	dB
		$f = 80$ to 160 MHz	19	24	–	dB
		$f = 160$ to 320 MHz	18	23	–	dB
		$f = 320$ to 600 MHz	17	21	–	dB
S_{21}	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat	85 channels flat; $V_o = 44$ dBmV; measured at 595.25 MHz	–	–66	–65	dB
X_{mod}	cross modulation	85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–66	–65	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz	–	–68	–60	dB
d_2	second order distortion	note 1	–	–80	–70	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	64	67	–	dBmV
NF	noise figure	see Table 1	–	–	–	dB
I_{tot}	total current consumption (DC)	note 3	–	425	435	mA

Notes

- $f_p = 55.25$ MHz; $V_p = 44$ dBmV;
 $f_q = 541.25$ MHz; $V_q = 44$ dBmV;
measured at $f_p + f_q = 596.5$ MHz.
- Measured according to DIN45004B:
 $f_p = 590.25$ MHz; $V_p = V_o$;
 $f_q = 597.25$ MHz; $V_q = V_o - 6$ dB;
 $f_r = 599.25$ MHz; $V_r = V_o - 6$ dB;
measured at $f_p + f_q - f_r = 588.25$ MHz.
- The modules normally operate at $V_B = 24$ V, but are able to withstand supply transients up to $V_B = 30$ V.

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Table 3 Bandwidth 40 to 550 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	18	18.5	19	dB
		$f = 550$ MHz	18.5	19.3	–	dB
SL	slope cable equivalent	$f = 40$ to 550 MHz	0.2	–	2	dB
FL	flatness of frequency response	$f = 40$ to 550 MHz	–	–	± 0.3	dB
S_{11}	input return losses	$f = 40$ to 80 MHz	20	27	–	dB
		$f = 80$ to 160 MHz	19	30	–	dB
		$f = 160$ to 320 MHz	18	29	–	dB
		$f = 320$ to 550 MHz	17	22	–	dB
S_{22}	output return losses	$f = 40$ to 80 MHz	20	23	–	dB
		$f = 80$ to 160 MHz	19	24	–	dB
		$f = 160$ to 320 MHz	18	23	–	dB
		$f = 320$ to 550 MHz	17	21	–	dB
S_{21}	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat	77 channels flat; $V_o = 44$ dBmV; measured at 547.25 MHz	–	–68	–67	dB
X_{mod}	cross modulation	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–68	–67	dB
CSO	composite second order distortion	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–68	–62	dB
d_2	second order distortion	note 1	–	–81	–72	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	64.5	68	–	dBmV
NF	noise figure	see Table 1	–	–	–	dB
I_{tot}	total current consumption (DC)	note 3	–	425	435	mA

Notes

- $f_p = 55.25$ 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:
 $f_p = 540.25$ 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 modules normally operate at $V_B = 24$ V, but are able to withstand supply transients up to $V_B = 30$ V.

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Table 4 Bandwidth 40 to 450 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	18	18.5	19	dB
		$f = 450$ MHz	18.5	19.2	–	dB
SL	slope cable equivalent	$f = 40$ to 450 MHz	0.2	–	2	dB
FL	flatness of frequency response	$f = 40$ to 450 MHz	–	–	± 0.3	dB
S_{11}	input return losses	$f = 40$ to 80 MHz	20	27	–	dB
		$f = 80$ to 160 MHz	19	30	–	dB
		$f = 160$ to 320 MHz	18	29	–	dB
		$f = 320$ to 450 MHz	17	22	–	dB
S_{22}	output return losses	$f = 40$ to 80 MHz	20	23	–	dB
		$f = 80$ to 160 MHz	19	24	–	dB
		$f = 160$ to 320 MHz	18	23	–	dB
		$f = 320$ to 450 MHz	17	21	–	dB
S_{21}	phase response	$f = 50$ MHz	–45	–	+45	deg
CTB	composite triple beat	60 channels flat; $V_o = 46$ dBmV; measured at 445.25 MHz	–	–	–68	dB
X_{mod}	cross modulation	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–	–65	dB
CSO	composite second order distortion	60 channels flat; $V_o = 46$ dBmV measured at 446.5 MHz	–	–	–65	dB
d_2	second order distortion	note 1	–	–	–75	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	67	–	–	dBmV
NF	noise figure	see Table 1	–	–	–	dB
I_{tot}	total current consumption (DC)	note 3	–	425	435	mA

Notes

- $f_p = 55.25$ MHz; $V_p = 46$ dBmV;
 $f_q = 391.25$ MHz; $V_q = 46$ dBmV;
measured at $f_p + f_q = 446.5$ MHz.
- Measured according to DIN45004B:
 $f_p = 440.25$ MHz; $V_p = V_o$;
 $f_q = 447.25$ MHz; $V_q = V_o - 6$ dB;
 $f_r = 449.25$ MHz; $V_r = V_o - 6$ dB;
measured at $f_p + f_q - f_r = 438.25$ MHz.
- The modules normally operate at $V_B = 24$ V, but are able to withstand supply transients up to $V_B = 30$ V.

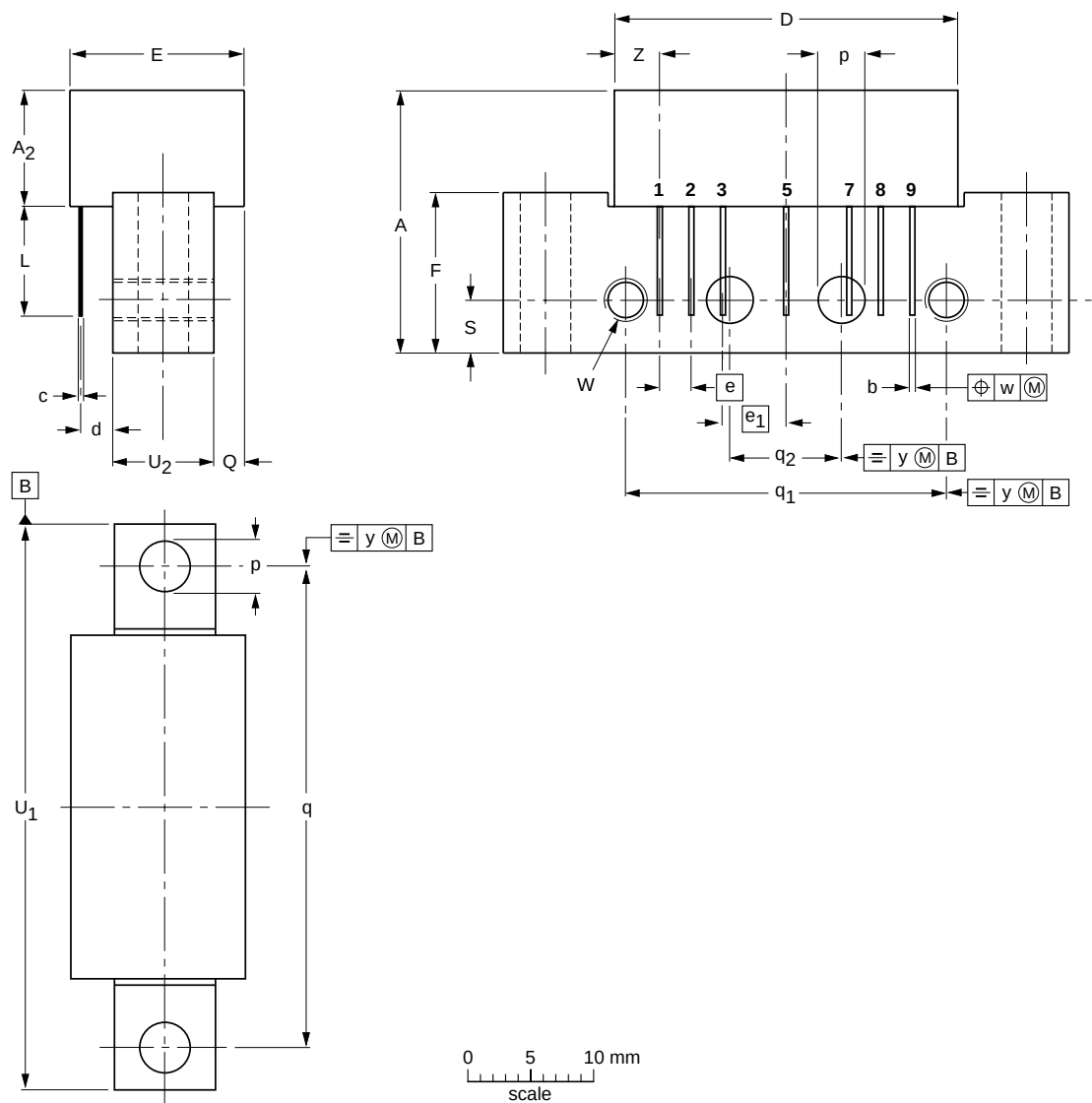
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PACKAGE OUTLINE

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



DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A ₂ max.	b	c	D max.	d max.	E max.	e	e ₁	F	L min.	p	Q max.	q	q ₁	q ₂	S	U ₁ max.	U ₂	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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This product is supplied in anti-static packing to prevent damage caused by electrostatic discharge during transport and handling. For further information, refer to Philips specs.: SNW-EQ-608, SNW-FQ-302A and SNW-FQ-302B.

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NOTES

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NOTES

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Printed in The Netherlands

613518/07/pp12

Date of release: 2001 Nov 27

Document order number: 9397 750 09068

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