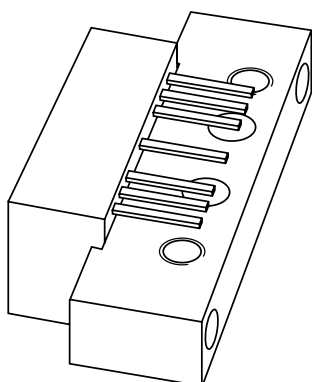


DATA SHEET



BGD704

750 MHz, 20 dB gain power
doubler amplifier

Product specification
Supersedes data of 2001 Oct 29

2001 Nov 02

750 MHz, 20 dB gain power doubler amplifier

BGD704

FEATURES

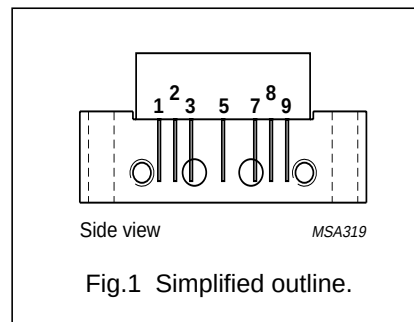
- Excellent linearity
- Extremely low noise
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability.

APPLICATIONS

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

PINNING - SOT115J

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



DESCRIPTION

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

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G _p	power gain	f = 50 MHz	19.5	20.5	dB
		f = 750 MHz	20	—	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; $Z_S = Z_L = 75 \Omega$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	$f = 50$ MHz	19.5	20	20.5	dB
		$f = 750$ MHz	20	21	–	dB
SL	slope cable equivalent	$f = 40$ to 750 MHz	0	1	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	31	–	dB
		$f = 80$ to 160 MHz	19	29	–	dB
		$f = 160$ to 320 MHz	18	25	–	dB
		$f = 320$ to 640 MHz	17	21	–	dB
		$f = 640$ to 750 MHz	16	21	–	dB
S_{22}	output return losses	$f = 40$ to 80 MHz	20	26	–	dB
		$f = 80$ to 160 MHz	19	27	–	dB
		$f = 160$ to 320 MHz	18	26	–	dB
		$f = 320$ to 640 MHz	17	24	–	dB
		$f = 640$ to 750 MHz	16	23	–	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	–	–58	–57	dB
X_{mod}	cross modulation	110 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–63	–61	dB
CSO	composite second order distortion	110 channels flat; $V_o = 44$ dBmV; measured at 746.5 MHz	–	–61	–56	dB
d_2	second order distortion	note 1	–	–75	–66	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	60.5	63.5	–	dBmV
F	noise figure	$f = 50$ MHz	–	4.5	5	dB
		$f = 450$ MHz	–	–	6.5	dB
		$f = 550$ MHz	–	–	7	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 module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

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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	19.5	20	20.5	dB
		$f = 600$ MHz	20	20.7	–	dB
SL	slope cable equivalent	$f = 40$ to 600 MHz	0	–	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	31	–	dB
		$f = 80$ to 160 MHz	19	29	–	dB
		$f = 160$ to 320 MHz	18	25	–	dB
		$f = 320$ to 600 MHz	17	21	–	dB
S_{22}	output return losses	$f = 40$ to 80 MHz	20	26	–	dB
		$f = 80$ to 160 MHz	19	27	–	dB
		$f = 160$ to 320 MHz	18	26	–	dB
		$f = 320$ to 600 MHz	17	24	–	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	–	–65	–64	dB
X_{mod}	cross modulation	85 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–65	–64	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44$ dBmV; measured at 596.5 MHz	–	–66	–58	dB
d_2	second order distortion	note 1	–	–	–68	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	63	–	–	dBmV
F	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 module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 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	19.5	20	20.5	dB
		$f = 550$ MHz	20	20.6	–	dB
SL	slope cable equivalent	$f = 40$ to 550 MHz	0	–	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	31	–	dB
		$f = 80$ to 160 MHz	19	29	–	dB
		$f = 160$ to 320 MHz	18	25	–	dB
		$f = 320$ to 550 MHz	17	21	–	dB
S_{22}	output return losses	$f = 40$ to 80 MHz	20	26	–	dB
		$f = 80$ to 160 MHz	19	27	–	dB
		$f = 160$ to 320 MHz	18	26	–	dB
		$f = 320$ to 550 MHz	17	24	–	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	–	–67	–66	dB
X_{mod}	cross modulation	77 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	–	–67	–66	dB
CSO	composite second order distortion	77 channels flat; $V_o = 44$ dBmV; measured at 548.5 MHz	–	–67	–60	dB
d_2	second order distortion	note 1	–	–	–70	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	63.5	–	–	dBmV
F	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 module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 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	19.5	20	20.5	dB
		$f = 450$ MHz	20	20.6	–	dB
SL	slope cable equivalent	$f = 40$ to 450 MHz	0	–	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	31	–	dB
		$f = 80$ to 160 MHz	19	29	–	dB
		$f = 160$ to 320 MHz	18	25	–	dB
		$f = 320$ to 450 MHz	17	21	–	dB
S_{22}	output return losses	$f = 40$ to 80 MHz	20	26	–	dB
		$f = 80$ to 160 MHz	19	27	–	dB
		$f = 160$ to 320 MHz	18	26	–	dB
		$f = 320$ to 450 MHz	17	25	–	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	–	–	–67	dB
X_{mod}	cross modulation	60 channels flat; $V_o = 46$ dBmV; measured at 55.25 MHz	–	–	–64	dB
CSO	composite second order distortion	60 channels flat; $V_o = 46$ dBmV measured at 446.5 MHz	–	–	–63	dB
d_2	second order distortion	note 1	–	–	–73	dB
V_o	output voltage	$d_{im} = -60$ dB; note 2	66	–	–	dBmV
F	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 module normally operates at $V_B = 24$ V, but is able to withstand supply transients up to 30 V.

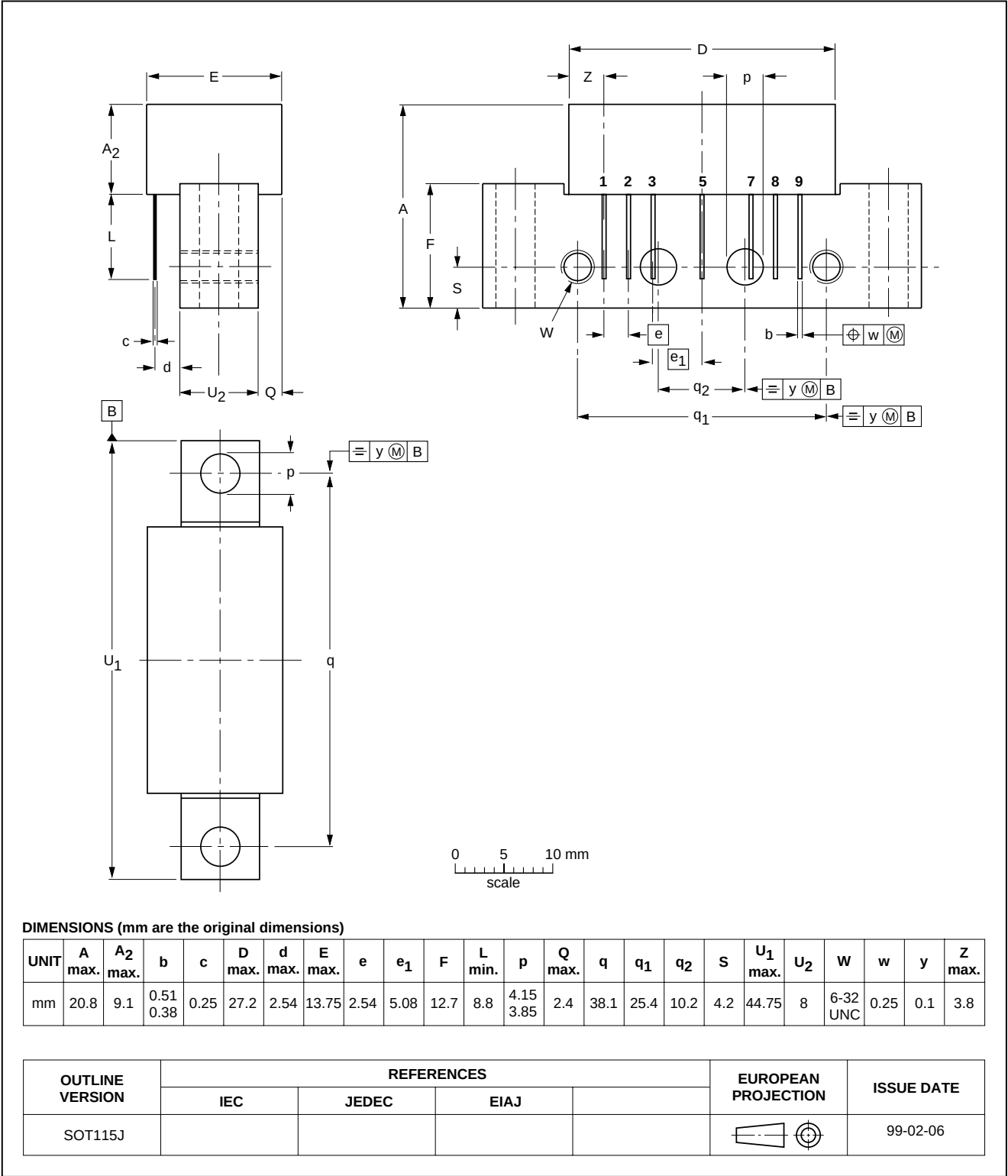
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PACKAGE OUTLINE

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



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NOTES

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NOTES

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