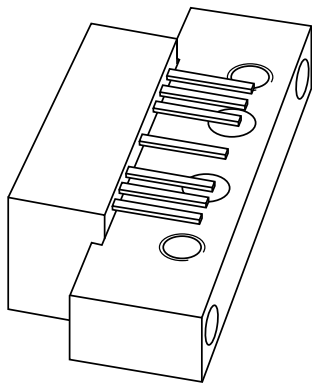


DATA SHEET



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

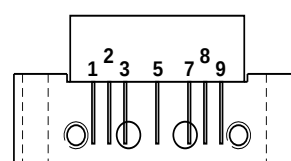
- CATV systems operating in the 40 to 750 MHz frequency range.

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



Side view

MSA319

Fig.1 Simplified outline.

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.

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Table 2 Bandwidth 40 to 600 MHz; $V_B = 24\text{ V}$; $T_{mb} = 35\text{ °C}$; $Z_S = Z_L = 75\text{ }\Omega$

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

Notes

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

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Table 3 Bandwidth 40 to 550 MHz; $V_B = 24\text{ V}$; $T_{mb} = 35\text{ °C}$; $Z_S = Z_L = 75\text{ }\Omega$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G_p	power gain	$f = 50\text{ MHz}$	18	18.5	19	dB
		$f = 550\text{ MHz}$	18.5	19.3	–	dB
SL	slope cable equivalent	$f = 40\text{ to }550\text{ MHz}$	0.2	–	2	dB
FL	flatness of frequency response	$f = 40\text{ to }550\text{ MHz}$	–	–	± 0.3	dB
S_{11}	input return losses	$f = 40\text{ to }80\text{ MHz}$	20	27	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	30	–	dB
		$f = 160\text{ to }320\text{ MHz}$	18	29	–	dB
		$f = 320\text{ to }550\text{ MHz}$	17	22	–	dB
S_{22}	output return losses	$f = 40\text{ to }80\text{ MHz}$	20	23	–	dB
		$f = 80\text{ to }160\text{ MHz}$	19	24	–	dB
		$f = 160\text{ to }320\text{ MHz}$	18	23	–	dB
		$f = 320\text{ to }550\text{ MHz}$	17	21	–	dB
S_{21}	phase response	$f = 50\text{ MHz}$	–45	–	+45	deg
CTB	composite triple beat	77 channels flat; $V_o = 44\text{ dBmV}$; measured at 547.25 MHz	–	–68	–67	dB
X_{mod}	cross modulation	77 channels flat; $V_o = 44\text{ dBmV}$; measured at 55.25 MHz	–	–68	–67	dB
CSO	composite second order distortion	77 channels flat; $V_o = 44\text{ dBmV}$; measured at 548.5 MHz	–	–68	–62	dB
d_2	second order distortion	note 1	–	–81	–72	dB
V_o	output voltage	$d_{im} = -60\text{ dB}$; 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

- $f_p = 55.25\text{ MHz}$; $V_p = 44\text{ dBmV}$;
 $f_q = 493.25\text{ MHz}$; $V_q = 44\text{ dBmV}$;
measured at $f_p + f_q = 548.5\text{ MHz}$.
- Measured according to DIN45004B:
 $f_p = 540.25\text{ MHz}$; $V_p = V_o$;
 $f_q = 547.25\text{ MHz}$; $V_q = V_o - 6\text{ dB}$;
 $f_r = 549.25\text{ MHz}$; $V_r = V_o - 6\text{ dB}$;
measured at $f_p + f_q - f_r = 538.25\text{ MHz}$.
- The modules normally operate at $V_B = 24\text{ V}$, but are able to withstand supply transients up to $V_B = 30\text{ V}$.

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Table 4 Bandwidth 40 to 450 MHz; $V_B = 24\text{ V}$; $T_{mb} = 35\text{ °C}$; $Z_S = Z_L = 75\text{ }\Omega$

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

Notes

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

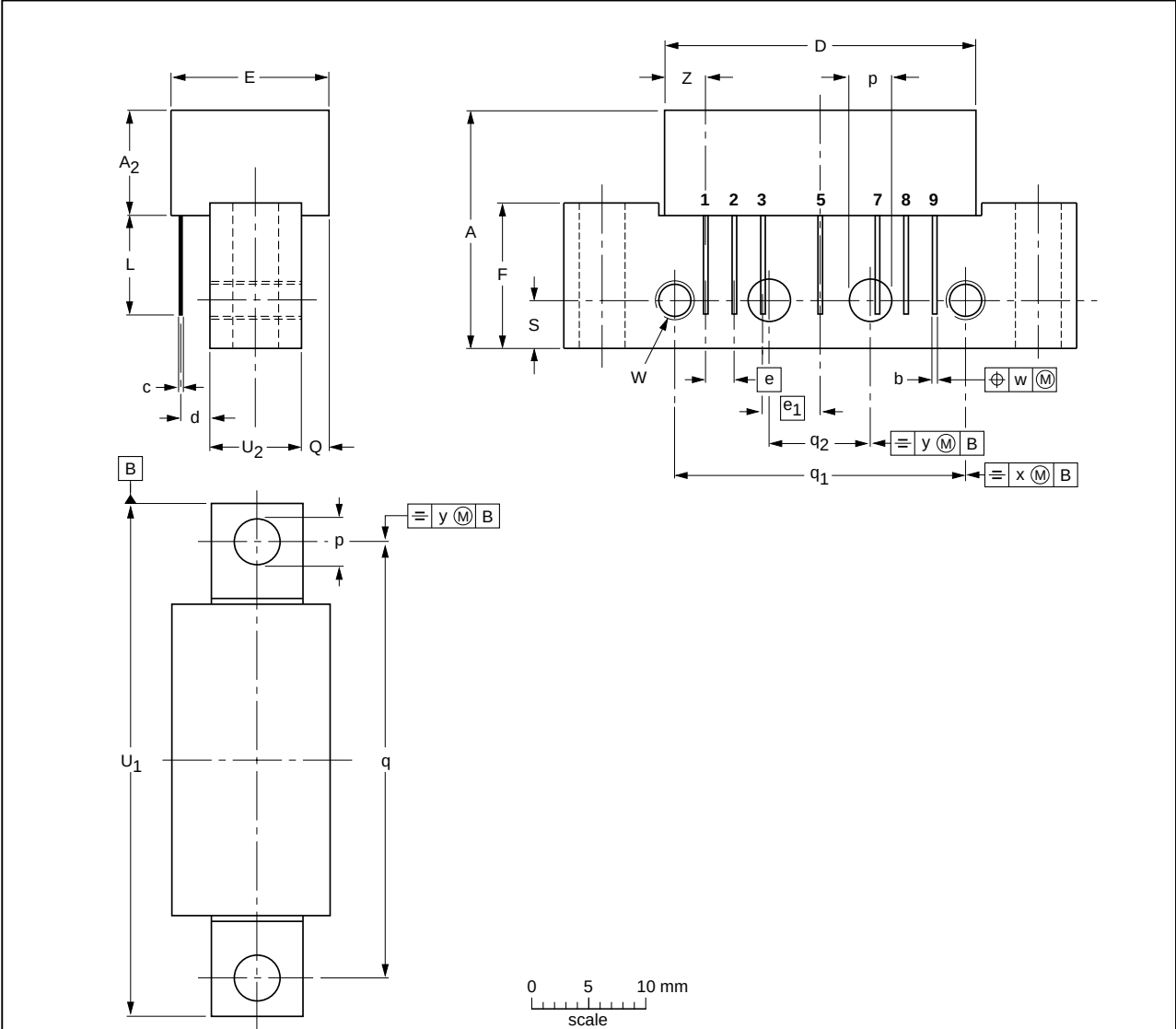
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amplifier

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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	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

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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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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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