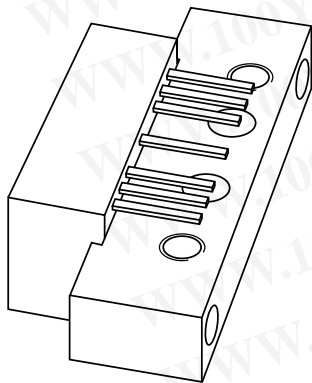


DATA SHEET



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BGY887

**860 MHz, 21.5 dB gain push-pull
amplifier**

Product specification
Supersedes data of 1999 Mar 30

2001 Nov 15



860 MHz, 21.5 dB gain push-pull amplifier

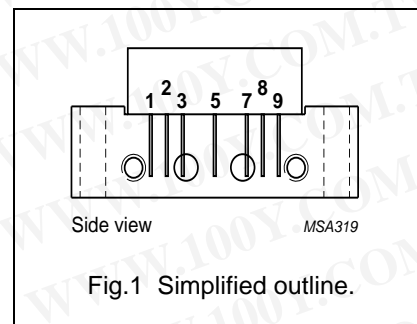
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FEATURES

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

PINNING - SOT115J

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



APPLICATIONS

- CATV systems operating in the 40 to 860 MHz frequency range.

DESCRIPTION

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

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
G _p	power gain	f = 50 MHz	21	22	dB
		f = 860 MHz	21.5	–	dB
I _{tot}	total current consumption (DC)	V _B = 24 V	–	235	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 860 MHz; $V_B = 24$ V; $T_{\text{case}} = 30$ °C; $Z_S = Z_L = 75$ Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G _p	power gain	f = 50 MHz	21	21.5	22	dB
		f = 860 MHz	21.5	22.5	–	dB
SL	slope cable equivalent	f = 40 to 860 MHz	0.2	1	2	dB
FL	flatness of frequency response	f = 40 to 860 MHz	–	±0.2	±0.3	dB
S ₁₁	input return losses	f = 40 to 80 MHz	20	29.5	–	dB
		f = 80 to 160 MHz	18.5	27.5	–	dB
		f = 160 to 320 MHz	17	23	–	dB
		f = 320 to 640 MHz	15.5	22	–	dB
		f = 640 to 860 MHz	14	20	–	dB
S ₂₂	output return losses	f = 40 to 80 MHz	20	27	–	dB
		f = 80 to 160 MHz	18.5	25	–	dB
		f = 160 to 320 MHz	17	20.5	–	dB
		f = 320 to 640 MHz	15.5	19	–	dB
		f = 640 to 860 MHz	14	19	–	dB
S ₂₁	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	49 channels flat; V _o = 44 dBmV; measured at 859.25 MHz	–	–64.5	–62	dB
X _{mod}	cross modulation	49 channels flat; V _o = 44 dBmV; measured at 55.25 MHz	–	–64.5	–61	dB
CSO	composite second order distortion	49 channels flat; V _o = 44 dBmV; measured at 860.5 MHz	–	–67.5	–61	dB
d ₂	second order distortion	note 1	–	–77	–70	dB
V _o	output voltage	d _{im} = –60 dB; note 2	59	60.5	–	dBmV
F	noise figure	f = 50 MHz	–	4	4.5	dB
		f = 550 MHz	–	–	5	dB
		f = 600 MHz	–	–	5	dB
		f = 650 MHz	–	–	5	dB
		f = 750 MHz	–	–	5.5	dB
		f = 860 MHz	–	5	6.5	dB
I _{tot}	total current consumption (DC)	note 3	–	220	235	mA

Notes

- f_p = 55.25 MHz; V_p = 44 dBmV;
f_q = 805.25 MHz; V_q = 44 dBmV;
measured at f_p + f_q = 860.5 MHz.
- Measured according to DIN45004B:
f_p = 851.25 MHz; V_p = V_o;
f_q = 858.25 MHz; V_q = V_o – 6 dB;
f_r = 860.25 MHz; V_r = V_o – 6 dB;
measured at f_p + f_q – f_r = 849.25 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 860 MHz; $V_B = 24$ V; $T_{case} = 30$ °C; $Z_S = Z_L = 75 \Omega$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G _p	power gain	f = 50 MHz	21	21.5	22	dB
		f = 860 MHz	21.5	22.5	–	dB
SL	slope cable equivalent	f = 40 to 860 MHz	0.2	1	2	dB
FL	flatness of frequency response	f = 40 to 860 MHz	–	±0.2	±0.3	dB
S ₁₁	input return losses	f = 40 to 80 MHz	20	29.5	–	dB
		f = 80 to 160 MHz	18.5	27.5	–	dB
		f = 160 to 320 MHz	17	23	–	dB
		f = 320 to 640 MHz	15.5	22	–	dB
		f = 640 to 860 MHz	14	20	–	dB
S ₂₂	output return losses	f = 40 to 80 MHz	20	27	–	dB
		f = 80 to 160 MHz	18.5	25	–	dB
		f = 160 to 320 MHz	17	20.5	–	dB
		f = 320 to 640 MHz	15.5	19	–	dB
		f = 640 to 860 MHz	14	19	–	dB
S ₂₁	phase response	f = 50 MHz	–45	–	+45	deg
CTB	composite triple beat	129 channels flat; V _o = 42 dBmV; measured at 859.25 MHz	–	–54	–51	dB
X _{mod}	cross modulation	129 channels flat; V _o = 42 dBmV; measured at 55.25 MHz	–	–60	–57	dB
CSO	composite second order distortion	129 channels flat; V _o = 42 dBmV; measured at 860.5 MHz	–	–60.5	–55	dB
d ₂	second order distortion	note 1	–	–77	–70	dB
V _o	output voltage	d _{im} = –60 dB; note 2	59	60.5	–	dBmV
F	noise figure	see Table 1	–	–	–	dB
I _{tot}	total current consumption (DC)	note 3	–	220	235	mA

Notes

- f_p = 55.25 MHz; V_p = 44 dBmV;
f_q = 805.25 MHz; V_q = 44 dBmV;
measured at f_p + f_q = 860.5 MHz.
- Measured according to DIN45004B:
f_p = 851.25 MHz; V_p = V_o;
f_q = 858.25 MHz; V_q = V_o – 6 dB;
f_r = 860.25 MHz; V_r = V_o – 6 dB;
measured at f_p + f_q – f_r = 849.25 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 750 MHz; $V_B = 24$ V; $T_{case} = 30$ °C; $Z_S = Z_L = 75 \Omega$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G _p	power gain	f = 50 MHz	21	21.5	22	dB
		f = 750 MHz	21.5	22.3	–	dB
SL	slope cable equivalent	f = 40 to 750 MHz	0.2	–	2	dB
FL	flatness of frequency response	f = 40 to 750 MHz	–	–	±0.3	dB
S ₁₁	input return losses	f = 40 to 80 MHz	20	29.5	–	dB
		f = 80 to 160 MHz	18.5	27.5	–	dB
		f = 160 to 320 MHz	17	23	–	dB
		f = 320 to 640 MHz	15.5	22	–	dB
		f = 640 to 750 MHz	14	20	–	dB
S ₂₂	output return losses	f = 40 to 80 MHz	20	27	–	dB
		f = 80 to 160 MHz	18.5	25	–	dB
		f = 160 to 320 MHz	17	20.5	–	dB
		f = 320 to 640 MHz	15.5	19	–	dB
		f = 640 to 750 MHz	14	19	–	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	–	–53	–51	dB
X _{mod}	cross modulation	110 channels flat; V _o = 44 dBmV; measured at 55.25 MHz	–	–57	–54	dB
CSO	composite second order distortion	110 channels flat; V _o = 44 dBmV; measured at 746.5 MHz	–	–62	–56	dB
d ₂	second order distortion	note 1	–	–78	–70	dB
V _o	output voltage	d _{im} = –60 dB; note 2	60	62	–	dBmV
F	noise figure	see Table 1	–	–	–	dB
I _{tot}	total current consumption (DC)	note 3	–	220	235	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 4 Bandwidth 40 to 600 MHz; $V_B = 24$ V; $T_{case} = 30$ °C; $Z_S = Z_L = 75 \Omega$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G _p	power gain	f = 50 MHz	21	21.5	22	dB
		f = 600 MHz	21.5	22.1	–	dB
SL	slope cable equivalent	f = 40 to 600 MHz	0.2	–	2	dB
FL	flatness of frequency response	f = 40 to 600 MHz	–	–	±0.2	dB
S ₁₁	input return losses	f = 40 to 80 MHz	20	29.5	–	dB
		f = 80 to 160 MHz	18.5	27.5	–	dB
		f = 160 to 320 MHz	17	23	–	dB
		f = 320 to 600 MHz	16	22	–	dB
S ₂₂	output return losses	f = 40 to 80 MHz	20	27	–	dB
		f = 80 to 160 MHz	18.5	25	–	dB
		f = 160 to 320 MHz	17	20.5	–	dB
		f = 320 to 600 MHz	16	19	–	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	–	–	–56	dB
X _{mod}	cross modulation	85 channels flat; V _o = 44 dBmV; measured at 55.25 MHz	–	–	–57	dB
CSO	composite second order distortion	85 channels flat; V _o = 44 dBmV; measured at 596.5 MHz	–	–	–58	dB
d ₂	second order distortion	note 1	–	–	–70	dB
V _o	output voltage	d _{im} = –60 dB; note 2	61	–	–	dBmV
F	noise figure	see Table 1	–	–	–	dB
I _{tot}	total current consumption (DC)	note 3	–	220	235	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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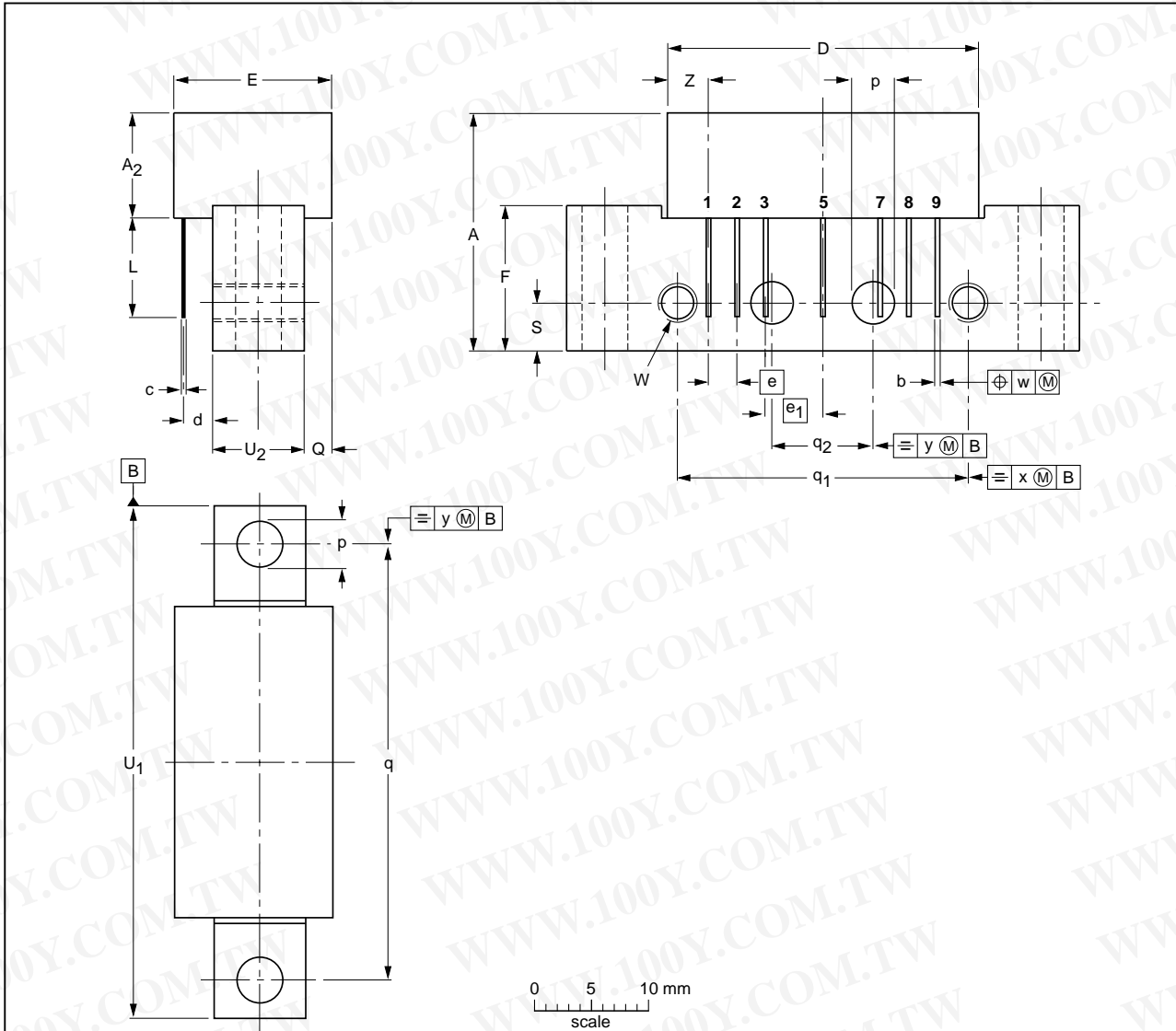
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PACKAGE OUTLINE

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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Contact information

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

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