

Product specification Supersedes data of 1999 Mar 30 2001 Nov 15



**BGY887** 

## 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 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 <sub>p</sub>	power gain	f = 50 MHz	21	22	dB
		f = 860 MHz	21.5	_	dB
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	_	235	mA

# LIMITING VALUES

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

SYMBOL	PARAMETER		MAX.	UNIT
Vi	RF input voltage		65	dBmV
T <sub>stg</sub>	storage temperature		+100	°C
T <sub>mb</sub>	operating mounting base temperature	-20	+100	°C

### **PINNING - SOT115J**

PIN	DESCRIPTION	
1	input	
2	common	
3	common	
5	+V <sub>B</sub>	
7	common	
8	common	
9	output	



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## CHARACTERISTICS

Table 1 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
Gp	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 <sub>11</sub>	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 <sub>22</sub>	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 <sub>21</sub>	phase response	f = 50 MHz	-45	-	+45	deg
СТВ	composite triple beat	49 channels flat; $V_o = 44 \text{ dBmV}$ ; measured at 859.25 MHz	-	-64.5	-62	dB
X <sub>mod</sub>	cross modulation	49 channels flat; $V_o = 44 \text{ dBmV}$ ; measured at 55.25 MHz	-	-64.5	-61	dB
CSO	composite second order distortion	49 channels flat; $V_o = 44 \text{ dBmV}$ ; measured at 860.5 MHz	-	-67.5	-61	dB
d <sub>2</sub>	second order distortion	note 1	-	-77	-70	dB
Vo	output voltage	d <sub>im</sub> = -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 <sub>tot</sub>	total current consumption (DC)	note 3	_	220	235	mA

- 1.  $f_p = 55.25 \text{ MHz}; V_p = 44 \text{ dBmV};$  $f_q = 805.25 \text{ MHz}; V_q = 44 \text{ dBmV};$ measured at  $f_p + f_q = 860.5 \text{ MHz}.$
- 2. Measured according to DIN45004B:  $f_p = 851.25 \text{ MHz}; V_p = V_o;$   $f_q = 858.25 \text{ MHz}; V_q = V_o -6 \text{ dB};$   $f_r = 860.25 \text{ MHz}; V_r = V_o -6 \text{ dB};$ measured at  $f_p + f_q - f_r = 849.25 \text{ MHz}.$
- 3. The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

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SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	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 <sub>11</sub>	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 <sub>22</sub>	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 <sub>21</sub>	phase response	f = 50 MHz	-45	-	+45	deg
СТВ	composite triple beat	129 channels flat; $V_o = 42 \text{ dBmV};$ measured at 859.25 MHz	-	-54	-51	dB
X <sub>mod</sub>	cross modulation	129 channels flat; $V_o = 42 \text{ dBmV};$ measured at 55.25 MHz	-	-60	-57	dB
CSO	composite second order distortion	129 channels flat; V <sub>o</sub> = 42 dBmV; measured at 860.5 MHz	-	-60.5	-55	dB
d <sub>2</sub>	second order distortion	note 1	-	-77	-70	dB
Vo	output voltage	d <sub>im</sub> = -60 dB; note 2	59	60.5	-	dBmV
F	noise figure	see Table 1	-	-	-	dB
I <sub>tot</sub>	total current consumption (DC)	note 3	-	220	235	mA

## Table 2 Bandwidth 40 to 860 MHz; V\_B = 24 V; T\_{case} = 30 °C; Z\_S = Z\_L = 75 $\Omega$

- 1.  $f_p = 55.25 \text{ MHz}; V_p = 44 \text{ dBmV};$  $f_q = 805.25 \text{ MHz}; V_q = 44 \text{ dBmV};$ measured at  $f_p + f_q = 860.5 \text{ MHz}.$
- 2. Measured according to DIN45004B:  $f_p = 851.25 \text{ MHz}; V_p = V_o;$   $f_q = 858.25 \text{ MHz}; V_q = V_o -6 \text{ dB};$   $f_r = 860.25 \text{ MHz}; V_r = V_o -6 \text{ dB};$ measured at  $f_p + f_q - f_r = 849.25 \text{ MHz}.$
- 3. The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

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SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	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 <sub>11</sub>	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 <sub>22</sub>	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 <sub>21</sub>	phase response	f = 50 MHz	-45	-	+45	deg
СТВ	composite triple beat	110 channels flat; $V_o = 44 \text{ dBmV};$ measured at 745.25 MHz	-	-53	-51	dB
X <sub>mod</sub>	cross modulation	110 channels flat; $V_o = 44 \text{ dBmV};$ measured at 55.25 MHz	-	-57	-54	dB
CSO	composite second order distortion	110 channels flat; $V_o = 44 \text{ dBmV}$ ; measured at 746.5 MHz	-	-62	-56	dB
d <sub>2</sub>	second order distortion	note 1	_	-78	-70	dB
Vo	output voltage	d <sub>im</sub> = -60 dB; note 2	60	62	-	dBmV
F	noise figure	see Table 1	_	_	_	dB
I <sub>tot</sub>	total current consumption (DC)	note 3	_	220	235	mA

## Table 3 Bandwidth 40 to 750 MHz; V\_B = 24 V; T\_{case} = 30 °C; Z\_S = Z\_L = 75 $\Omega$

- 1.  $f_p = 55.25 \text{ MHz}; V_p = 44 \text{ dBmV};$  $f_q = 691.25 \text{ MHz}; V_q = 44 \text{ dBmV};$ measured at  $f_p + f_q = 746.5 \text{ MHz}.$
- 2. Measured according to DIN45004B:  $f_p = 740.25 \text{ MHz}; V_p = V_o;$   $f_q = 747.25 \text{ MHz}; V_q = V_o -6 \text{ dB};$   $f_r = 749.25 \text{ MHz}; V_r = V_o -6 \text{ dB};$ measured at  $f_p + f_q - f_r = 738.25 \text{ MHz}.$
- 3. The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

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SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
G <sub>p</sub>	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 <sub>11</sub>	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 <sub>22</sub>	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 <sub>21</sub>	phase response	f = 50 MHz	-45	_	+45	deg
СТВ	composite triple beat	85 channels flat; $V_o = 44 \text{ dBmV};$ measured at 595.25 MHz	-	-	-56	dB
X <sub>mod</sub>	cross modulation	85 channels flat; $V_o = 44 \text{ dBmV}$ ; measured at 55.25 MHz	-	-	-57	dB
CSO	composite second order distortion	85 channels flat; $V_o = 44 \text{ dBmV};$ measured at 596.5 MHz	-	-	-58	dB
d <sub>2</sub>	second order distortion	note 1	_	_	-70	dB
Vo	output voltage	d <sub>im</sub> = -60 dB; note 2	61	_	-	dBmV
F	noise figure	see Table 1	_	-	-	dB
I <sub>tot</sub>	total current consumption (DC)	note 3	-	220	235	mA

# Table 4 Bandwidth 40 to 600 MHz; V\_B = 24 V; T\_{case} = 30 °C; Z\_S = Z\_L = 75 $\Omega$

- 1.  $f_p = 55.25 \text{ MHz}; V_p = 44 \text{ dBmV};$  $f_q = 541.25 \text{ MHz}; V_q = 44 \text{ dBmV};$ measured at  $f_p + f_q = 596.5 \text{ MHz}.$
- 2. 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  $f_p + f_q - f_r = 588.25 \text{ MHz}.$
- 3. The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.

Rectangular single-ended package; aluminium flange; 2 vertical mounting holes;

## PACKAGE OUTLINE



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### DATA SHEET STATUS

DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITIONS
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# 860 MHz, 21.5 dB gain push-pull amplifier

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