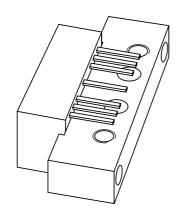
DISCRETE SEMICONDUCTORS

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

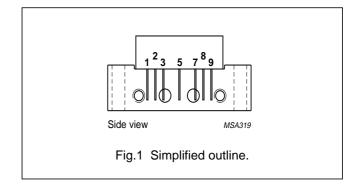
 CATV systems operating in the 40 to 750 MHz frequency range.

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
Gp	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		MAX.	UNIT
Vi	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; $V_B = 24 \text{ V}$; $T_{mb} = 35 \,^{\circ}\text{C}$; $Z_S = Z_L = 75 \,\Omega$

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Gp	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
СТВ	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
Vo	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

```
1. 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.
```

2. Measured according to DIN45004B:

```
\begin{split} &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;} \\ &\text{measured at } f_p + f_q - f_r = 738.25 \text{ MHz.} \end{split}
```

3. 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; $V_B = 24$ 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	Ī-	_	±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
СТВ	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
Vo	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

```
1. 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.
```

2. Measured according to DIN45004B:

```
\begin{split} 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;} \\ \text{measured at } f_p + f_q - f_r = 588.25 \text{ MHz.} \end{split}
```

3. 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; $V_B = 24$ V; $T_{mb} = 35$ °C; $Z_S = Z_L = 75$ Ω

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Gp	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
СТВ	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
Vo	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

```
1. 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.
```

2. Measured according to DIN45004B:

```
\begin{split} 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;} \\ \text{measured at } f_p + f_q - f_r = 538.25 \text{ MHz.} \end{split}
```

3. 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; $V_B = 24$ 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
СТВ	composite triple beat	60 channels flat; V ₀ = 46 dBmV; measured at 445.25 MHz	_	_	-68	dB
X _{mod}	cross modulation	60 channels flat; V ₀ = 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
Vo	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

```
1. 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}.
```

2. Measured according to DIN45004B:

```
\begin{split} 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;} \\ \text{measured at } f_p + f_q - f_r = 438.25 \text{ MHz.} \end{split}
```

3. The modules normally operate at $V_B = 24 \text{ V}$, but are able to withstand supply transients up to $V_B = 30 \text{ V}$.

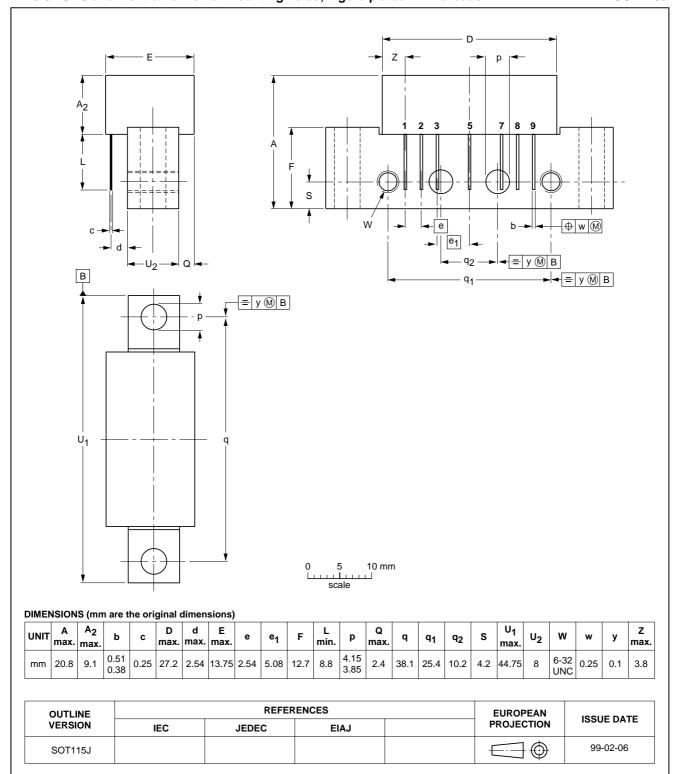
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PACKAGE OUTLINE

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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