

# BGR269

200 MHz, 35 dB gain reverse amplifier

Rev. 05 — 30 May 2005

Product data sheet

## 1. Product profile

### 1.1 General description

High performance amplifier in a SOT115J package, operating at a voltage supply of 24 V (DC).

#### CAUTION



This device is sensitive to ElectroStatic Discharge (ESD). Therefore care should be taken during transport and handling.

### 1.2 Features

- Excellent linearity
- Silicon nitride passivation
- Rugged construction
- Gold metallization ensures excellent reliability
- 35 dB amplification up to 200 MHz

### 1.3 Applications

- Reverse amplifier in two-way CATV systems operating in the 5 MHz to 200 MHz frequency range

### 1.4 Quick reference data

Table 1: Quick reference data

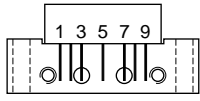
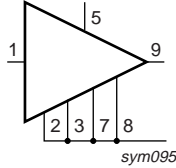
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$G_p$	power gain	$f = 5 \text{ MHz}$	34.5	35	35.5	dB
		$f = 200 \text{ MHz}$	35	-	36	dB
$I_{\text{tot}}$	total current consumption	$V_B = 24 \text{ V}$	[1] 145	160	175	mA

[1] The module normally operates at  $V_B = 24 \text{ V}$ , but is able to withstand supply transients up to  $V_B = 35 \text{ V}$ .

# PHILIPS

## 2. Pinning information

Table 2: Pinning

Pin	Description	Simplified outline	Symbol
1	input		
2	common		
3	common		
5	+V <sub>B</sub>		
7	common		
8	common		
9	output		

## 3. Ordering information

Table 3: Ordering information

Type number	Package		
	Name	Description	Version
BGR269	-	rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 × 6-32 UNC and 2 extra horizontal mounting holes; 7 gold-plated in-line leads	SOT115J

## 4. Limiting values

Table 4: Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>i</sub>	RF input voltage		-	50	dBmV
T <sub>mb</sub>	mounting base temperature		-20	+100	°C
T <sub>stg</sub>	storage temperature range		-40	+100	°C

## 5. Characteristics

**Table 5: Characteristics**

Bandwidth 5 MHz to 200 MHz;  $V_B = 24$  V;  $T_{mb} = 30$  °C;  $Z_S = Z_L = 75$  Ω; unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$G_p$	power gain	$f = 5$ MHz	34.5	35	35.5	dB	
		$f = 200$ MHz	35	-	36	dB	
SL	slope straight line	$f = 5$ MHz to 200 MHz	0	-	0.6	dB	
FL	flatness of frequency response	$f = 5$ MHz to 10 MHz	-0.1	-	+0.4	dB	
		$f = 10$ MHz to 190 MHz	-0.1	-	+0.5	dB	
		$f = 190$ MHz to 200 MHz	-0.1	-	+0.4	dB	
$S_{11}$	input return losses	$f = 5$ MHz to 200 MHz	20	-	-	dB	
$S_{22}$	output return losses	$f = 5$ MHz to 200 MHz	20	-	-	dB	
$\phi_{S21}$	phase response	$f = 5$ MHz	-45	-	+45	deg	
$S_{12}$	reverse isolation	$f = 5$ MHz to 200 MHz	-	-	-42	dB	
CTB	composite triple beat	$V_o = 50$ dBmV					
		6 channels flat; measured at 37 MHz	[1]	-	-	-74	dB
		10 channels flat; measured at 67.25 MHz	[2]	-	-	-68	dB
		28 channels flat; measured at 199.25 MHz	[3]	-	-	-57	dB
$X_{mod}$	cross modulation	$V_o = 50$ dBmV					
		6 channels flat; measured at 37 MHz	[1]	-	-	-66	dB
		10 channels flat; measured at 25 MHz	[2]	-	-	-57	dB
		28 channels flat; measured at 25 MHz	[3]	-	-	-50	dB
CSO	composite second order distortion	$V_o = 50$ dBmV					
		6 channels flat; measured at 38 MHz	[1]	-	-	-74	dB
		10 channels flat; measured at 68.5 MHz	[2]	-	-	-74	dB
		28 channels flat; measured at 200.5 MHz	[3]	-	-	-66	dB
$V_o$	output voltage	$d_{im} = -60$ dB	[4]	62	-	dBmV	
$d_2$	second order distortion		[5]	-	-	-70	dB
NF	noise figure	$f = 70$ MHz	-	-	5.3	dB	
		$f = 200$ MHz	-	-	5.5	dB	
$I_{tot}$	total current consumption		[6]	145	160	175	mA

[1] From the following frequencies: 7.00 MHz, 13.00 MHz, 19.00 MHz, 25.00 MHz, 31.00 MHz and 37.00 MHz.

[2] From the following frequencies: 7.00 MHz, 13.00 MHz, 19.00 MHz, 25.00 MHz, 31.00 MHz, 37.00 MHz, 43.00 MHz, 55.25 MHz, 61.25 MHz and 67.25 MHz.

[3] From the following frequencies: 7.00 MHz, 13.00 MHz, 19.00 MHz, 25.00 MHz, 31.00 MHz, 37.00 MHz, 43.00 MHz, 55.25 MHz, 61.25 MHz, 67.25 MHz, 77.25 MHz, 83.25 MHz, 109.25 MHz, 115.25 MHz, 121.25 MHz, 127.25 MHz, 133.25 MHz, 139.25 MHz, 145.25 MHz, 151.25 MHz, 157.25 MHz, 163.25 MHz, 169.25 MHz, 175.25 MHz, 181.25 MHz, 187.25 MHz, 193.25 MHz and 199.25 MHz.

[4] Measured according to DIN45004B;

$f_p = 197.25$  MHz;  $V_p = V_o$ ;  $f_q = 204.25$  MHz;  $V_q = V_o - 6$  dB;  $f_r = 206.25$  MHz;  $V_r = V_o - 6$  dB; measured at  $f_p + f_q - f_r = 195.25$  MHz.

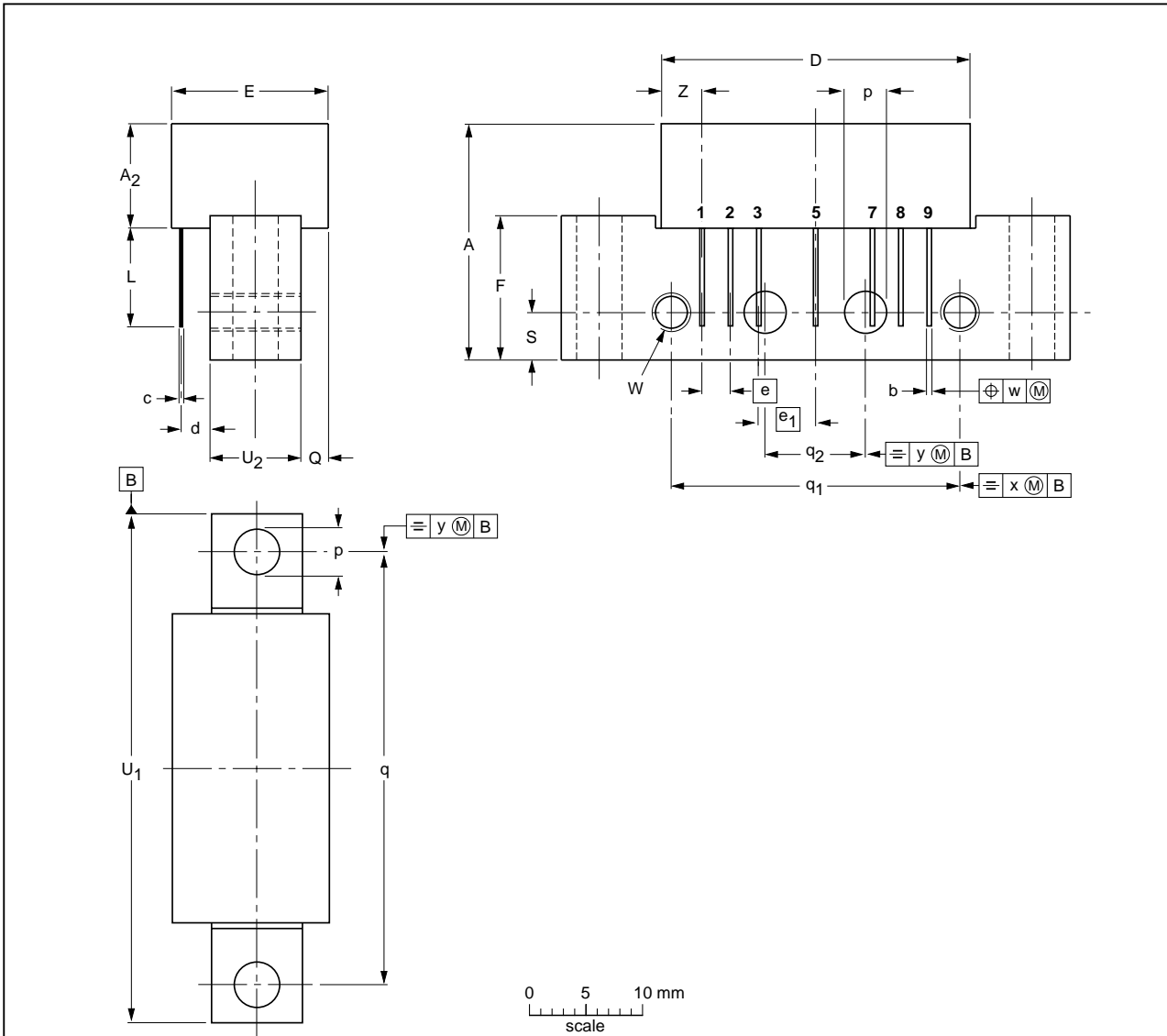
[5]  $f_p = 83.25$  MHz;  $V_p = 50$  dBmV;  $f_q = 115.25$  MHz;  $V_q = 50$  dBmV; measured at  $f_p + f_q = 198.5$  MHz.

[6] The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to  $V_B = 35$  V.

**6. 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 <sub>2</sub> max.	b	c	D max.	d max.	E max.	e	e <sub>1</sub>	F	L min.	p	Q max.	q	q <sub>1</sub>	q <sub>2</sub>	S	U <sub>1</sub>	U <sub>2</sub>	W	w	x	y	Z max.
mm	20.8	9.1	0.51 0.38	0.25	27.2	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						99-02-06 04-02-04

Fig 1. Package outline SOT115J

## 7. Revision history

**Table 6: Revision history**

Document ID	Release date	Data sheet status	Change notice	Doc. number	Supersedes
BGR269_5	20050530	Product data sheet	-	9397 750 14741	BGR269_4
Modifications:	<ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the new presentation and information standard of Philips Semiconductors.</li></ul>				
BGR269_4	20020305	Product specification	-	9397 750 09455	BGR269_N_3
BGR269_N_3	20010928	Preliminary specification	-	9397 750 08867	BGR269_N_2
BGR269_N_2	20001212	Preliminary specification	-	9397 750 07841	BGR269_1
BGR269_1	20000501	Objective specification	-	9397 750 07043	-

## 8. Data sheet status

Level	Data sheet status <sup>[1]</sup>	Product status <sup>[2] [3]</sup>	Definition
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

[1] Please consult the most recently issued data sheet before initiating or completing a design.

[2] The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL <http://www.semiconductors.philips.com>.

[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

## 9. Definitions

**Short-form specification** — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

**Limiting values definition** — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

**Application information** — Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors make no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

## 10. Disclaimers

**Life support** — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips Semiconductors

## 12. Contact information

For additional information, please visit: <http://www.semiconductors.philips.com>

For sales office addresses, send an email to: [sales.addresses@www.semiconductors.philips.com](mailto:sales.addresses@www.semiconductors.philips.com)

customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

**Right to make changes** — Philips Semiconductors reserves the right to make changes in the products - including circuits, standard cells, and/or software - described or contained herein in order to improve design and/or performance. When the product is in full production (status 'Production'), relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN). Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no license or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

## 11. Trademarks

**Notice** — All referenced brands, product names, service names and trademarks are the property of their respective owners.

## 13. Contents

---

<b>1</b>	<b>Product profile</b> .....	<b>1</b>
1.1	General description .....	1
1.2	Features .....	1
1.3	Applications .....	1
1.4	Quick reference data .....	1
<b>2</b>	<b>Pinning information</b> .....	<b>2</b>
<b>3</b>	<b>Ordering information</b> .....	<b>2</b>
<b>4</b>	<b>Limiting values</b> .....	<b>2</b>
<b>5</b>	<b>Characteristics</b> .....	<b>3</b>
<b>6</b>	<b>Package outline</b> .....	<b>4</b>
<b>7</b>	<b>Revision history</b> .....	<b>5</b>
<b>8</b>	<b>Data sheet status</b> .....	<b>6</b>
<b>9</b>	<b>Definitions</b> .....	<b>6</b>
<b>10</b>	<b>Disclaimers</b> .....	<b>6</b>
<b>11</b>	<b>Trademarks</b> .....	<b>6</b>
<b>12</b>	<b>Contact information</b> .....	<b>6</b>



© Koninklijke Philips Electronics N.V. 2005

All rights are reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Date of release: 30 May 2005  
Document number: 9397 750 14741

Published in The Netherlands