

# BGE788

750 MHz, 34 dB gain push-pull amplifier

Rev. 04 — 30 March 2005

Product data sheet

## 1. Product profile

### 1.1 General description

Hybrid high dynamic range amplifier module in a SOT115J package operating at a supply voltage of 24 V (DC). The module consists of two cascaded stages both in cascode configuration.

#### CAUTION



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

### 1.2 Features

- Excellent linearity
- Extremely low noise
- High gain
- Excellent return loss properties

### 1.3 Applications

- Single module line extender in CATV systems operating in the 40 MHz to 750 MHz frequency range.

### 1.4 Quick reference data

Table 1: Quick reference data

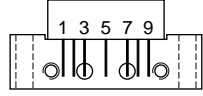
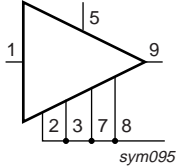
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$G_p$	power gain	$f = 50 \text{ MHz}$	33.5	-	34.5	dB
		$f = 750 \text{ MHz}$	34	-	-	dB
$I_{\text{tot}}$	total current consumption (DC)	$V_B = 24 \text{ V}$	<a href="#">[1]</a> 290	-	320	mA

[1] The module normally operates at  $V_B = 24 \text{ V}$ , but is able to withstand supply transients up to 30 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
BGE788	-	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>B</sub>	supply voltage		-	25	V
V <sub>i</sub>	RF input voltage		-	55	dBmV
T <sub>stg</sub>	storage temperature		-40	+100	°C
T <sub>mb</sub>	mounting base temperature		-20	+100	°C

## 5. Characteristics

**Table 5: Characteristics**

Bandwidth 40 MHz to 740 MHz;  $V_B = 24$  V;  $T_{case} = 30$  °C;  $Z_S = Z_L = 75$  Ω; unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
$G_p$	power gain	$f = 50$ MHz	33.5	-	34.5	dB	
		$f = 750$ MHz	34	-	-	dB	
SL	slope cable equivalent	$f = 40$ MHz to 750 MHz	0.5	-	2.5	dB	
FL	flatness of frequency response	$f = 40$ MHz to 750 MHz	-	-	±0.5	dB	
$S_{11}$	input return losses	$f = 40$ MHz to 80 MHz	20	-	-	dB	
		$f = 80$ MHz to 160 MHz	18.5	-	-	dB	
		$f = 160$ MHz to 320 MHz	17	-	-	dB	
		$f = 320$ MHz to 640 MHz	15.5	-	-	dB	
		$f = 640$ MHz to 750 MHz	14	-	-	dB	
$S_{22}$	output return losses	$f = 40$ MHz to 80 MHz	20	-	-	dB	
		$f = 80$ MHz to 160 MHz	18.5	-	-	dB	
		$f = 160$ MHz to 320 MHz	17	-	-	dB	
		$f = 320$ MHz to 640 MHz	15.5	-	-	dB	
		$f = 640$ MHz to 750 MHz	14	-	-	dB	
$\varphi_{s21}$	phase response	$f = 50$ MHz	135	-	225	deg	
CTB	composite triple beat	110 channels flat; $V_o = 44$ dBmV; measured at 745.25 MHz	-	-	-49	dB	
$X_{mod}$	cross modulation	110 channels flat; $V_o = 44$ dBmV; measured at 55.25 MHz	-	-	-51	dB	
CSO	composite second order distortion	110 channels flat; $V_o = 44$ dBmV; measured at 746.5 MHz	-	-	-52	dB	
$d_2$	second order distortion		[1]	-	-	-64	dB
$V_o$	output voltage	$d_{im} = -60$ dB	[2]	58	-	-	dBmV
F	noise figure	$f = 750$ MHz	-	-	7	dB	
PM	positive match	$f = 40$ MHz to 2 GHz	-	-	3	dB	
$I_{tot}$	total current consumption (DC)		[3]	290	-	320	mA

[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.

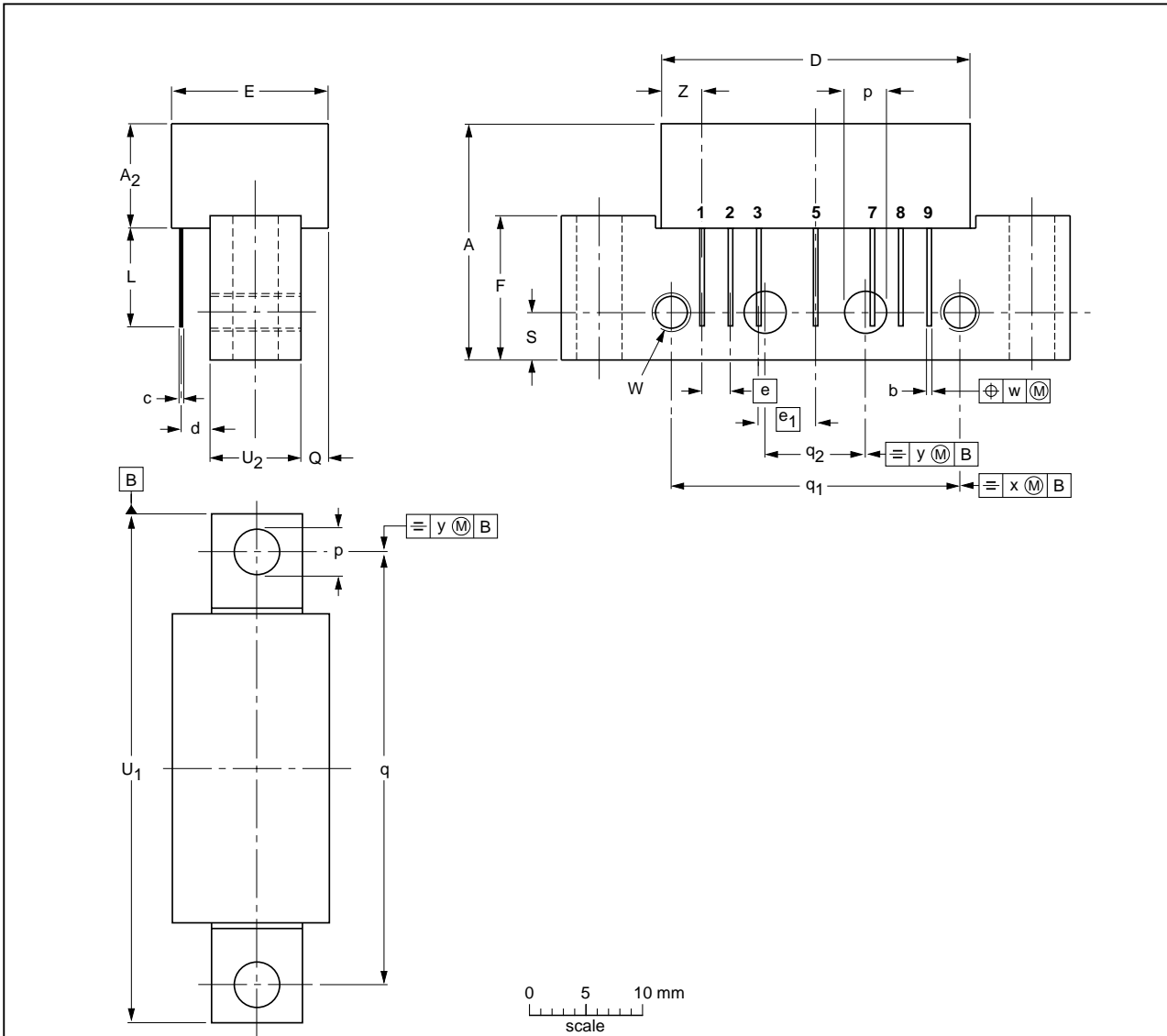
[2] Measured according to DIN45004B;  $f_p = 740.25$  MHz;  $V_p = V_o$ ;  $f_q = 747.25$  MHz;  $V_q = V_o - 6$  dB;  $f_r = 749.25$  MHz;  $V_r = V_o - 6$  dB; measured at  $f_p + f_q - f_r = 738.25$  MHz.

[3] The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 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
BGE788_4	20050330	Product data sheet	-	9397 750 14433	BGE788_3
Modifications:	<ul style="list-style-type: none"><li>The format of this data sheet has been redesigned to comply with the new representation and information standard of Philips Semiconductors</li></ul>				
BGE788_3	20011115	Product specification	-	9397 750 08812	BGE788_2
BGE788_2	19980108	Product specification	-	9397 750 02981	BGE788_N_1
BGE788_N_1	19970505	Preliminary specification	-	9397 750 02294	-

## 8. Data sheet status

Level	Data sheet status <sup>[1]</sup>	Product status <sup>[2]</sup> <sup>[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.
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[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.

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