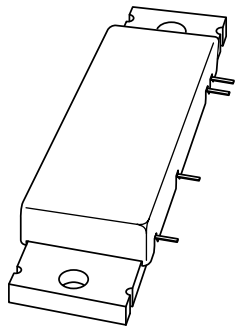


# DATA SHEET



## **BGY1816S** UHF amplifier module

Product specification  
Supersedes data of 1999 Jan 07

1999 Apr 13

# UHF amplifier module

# BGY1816S

## FEATURES

- 26 V nominal supply voltage
- 16 W output power into a load of 50 Ω with an RF drive power of ≤20 mW.

## APPLICATIONS

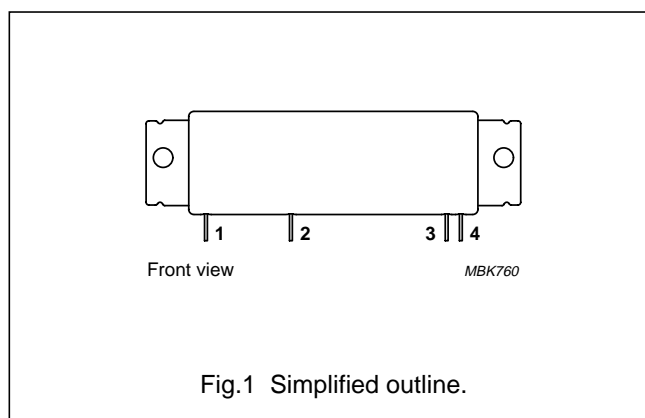
- Base station transmitting equipment operating in the 1805 to 1880 MHz frequency band.

## DESCRIPTION

The BGY1816S is a three-stage UHF amplifier module in a SOT501A package with a plastic cap. It consists of three NPN silicon planar transistor dies mounted together with matching and bias circuit components on a metallized ceramic AlN substrate.

## PINNING - SOT501A

PIN	DESCRIPTION
1	RF input
2	V <sub>S1</sub>
3	V <sub>S2</sub>
4	RF output
Flange	ground



## QUICK REFERENCE DATA

RF performance at T<sub>mb</sub> = 25 °C.

MODE OF OPERATION	f (MHz)	V <sub>S1</sub> (V)	V <sub>S2</sub> (V)	P <sub>L</sub> (W)	G <sub>p</sub> (dB)	η (%)	Z <sub>S</sub> ; Z <sub>L</sub> (Ω)
CW	1805 to 1880	5	26	≥16	≥29	≥30	50

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>S1</sub>	DC supply voltage		4.5	5.5	V
V <sub>S2</sub>	DC supply voltage		–	28	V
P <sub>D</sub>	input drive power		–	120	mW
P <sub>L</sub>	load power	T <sub>mb</sub> = 25 °C	–	20	W
T <sub>stg</sub>	storage temperature		–30	+100	°C
T <sub>mb</sub>	operating mounting base temperature		–10	+90	°C

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**CHARACTERISTICS**

$T_{mb} = 25\text{ }^{\circ}\text{C}$ ;  $V_{S1} = 5\text{ V}$ ;  $V_{S2} = 26\text{ V}$ ;  $P_L = 16\text{ W}$ ;  $Z_S = Z_L = 50\text{ }\Omega$  unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
f	frequency		1805	–	1880	MHz
$I_{S1}$	supply current		–	80	–	mA
$I_{S2}$	supply current	$P_D < -60\text{ dBm}$	–	430	–	mA
$P_L$	load power	$P_D < 20\text{ mW}$	16	–	–	W
$G_p$	power gain		29	–	–	dB
$\eta$	efficiency		30	–	–	%
$H_2$	second harmonic		–	–	-35	dBc
$H_3$	third harmonic		–	–	-40	dBc
$VSWR_{in}$	input VSWR		–	–	2 : 1	
	stability	$VSWR \leq 2 : 1$ through all phases; $P_L \leq 16\text{ W}$ ; $V_{S2} = 25\text{ to }27\text{ V}$	–	–	-60	dBc
	reverse intermodulation	$P_{carrier} = 16\text{ W}$ ; $P_{reverse} = -40\text{ dBc}$ ; $f_i = f_c \pm 200\text{ kHz}$	–	–	-53	dBc
B	AM bandwidth	corner frequency = 3 dB; $P_{carrier} = 16\text{ W}$ ; modulation = 20%	2	–	–	MHz
	ruggedness	$VSWR \leq 5 : 1$ through all phases	no degradation			

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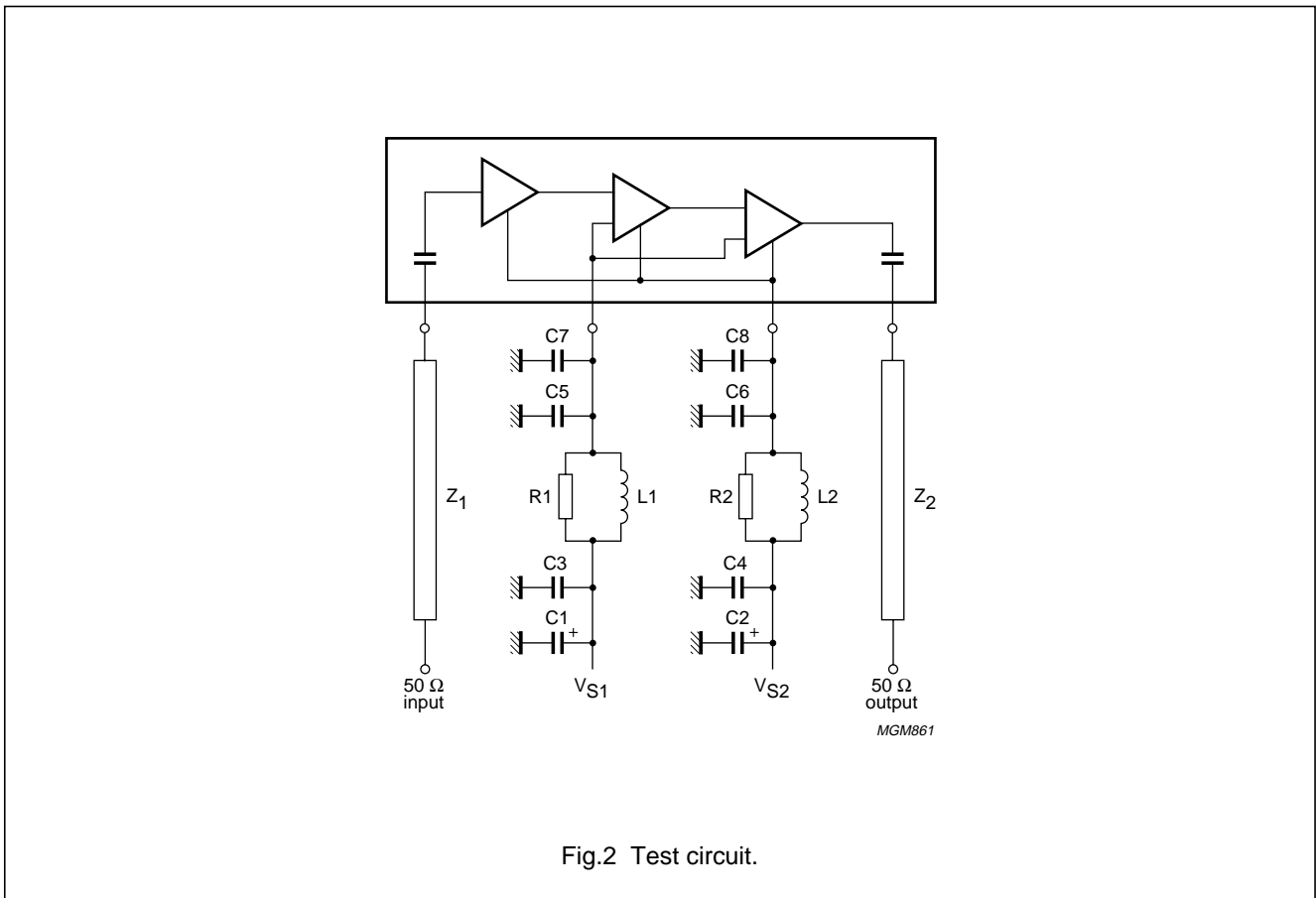


Fig.2 Test circuit.

List of components (see Figs 2 and 3)

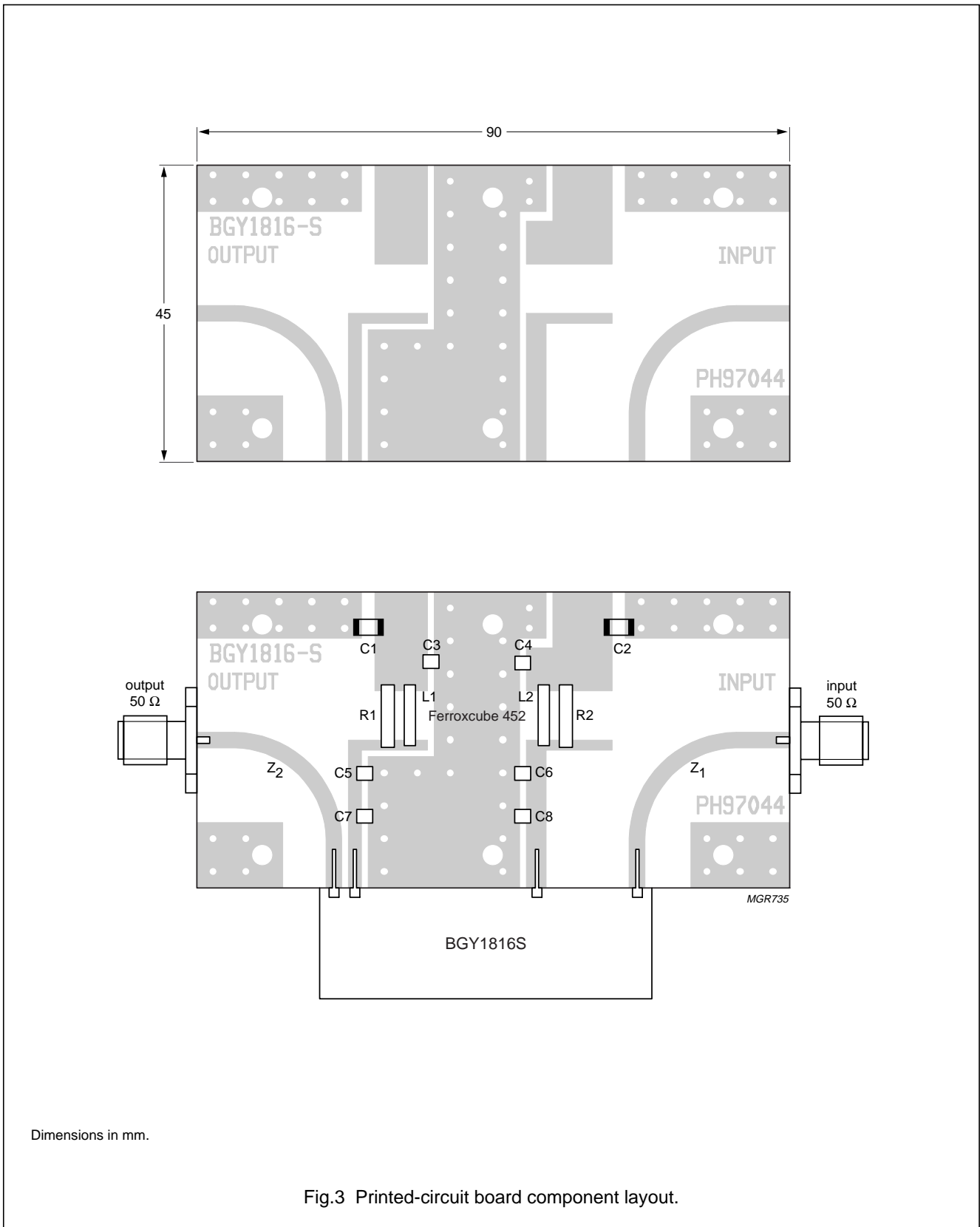
COMPONENT	DESCRIPTION	VALUE	CATALOGUE NO.
C1, C2	electrolytic capacitor	10 $\mu$ F; 35 V	
C3, C4	multilayer ceramic chip capacitor	10 nF; 50 V	
C5, C6	multilayer ceramic chip capacitor	100 pF; 50 V	
C7, C8	multilayer ceramic chip capacitor	10 pF; 50 V	
L1, L2	Grade 4S2 Ferroxcube bead		4330 030 36300
R1, R2	metal film resistor	10 $\Omega$ ; 0.4 W	2322 195 13109
Z1, Z2	stripline; note 1	50 $\Omega$	—

Note

1. The striplines are on a double copper-clad printed-circuit board with epoxy dielectric ( $\epsilon_r = 4.5$ ); thickness = 1 mm.

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## UHF amplifier module

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### **MOUNTING RECOMMENDATIONS**

To ensure a good thermal contact and to prevent mechanical stress when bolted down, the flatness of the mounting base is designed to be typically better than 0.1 mm. The mounting area of the heatsink should be flat and free from burrs and loose particles. The heatsink should be rigid and not prone to bowing under thermal cycling conditions. The thickness of a solid heatsink should be not less than 5 mm to ensure a rigid assembly.

A thin, even layer of thermal compound should be applied between the mounting base and the heatsink to achieve the best possible thermal contact resistance. Excessive use of thermal compound will result in an increase in thermal resistance and possible bowing of the mounting base; too little will also result in poor thermal conduction.

The module should be mounted to the heatsink using 3 mm bolts with flat washers. The bolts should first be tightened to "finger tight" and then further tightened in alternating steps to a maximum torque of 0.4 to 0.6 Nm.

Once mounted on the heatsink, the module leads can be soldered to the printed-circuit board. A soldering iron may be used up to a temperature of 250 °C for a maximum of 10 seconds at a distance of 2 mm from the plastic cap.

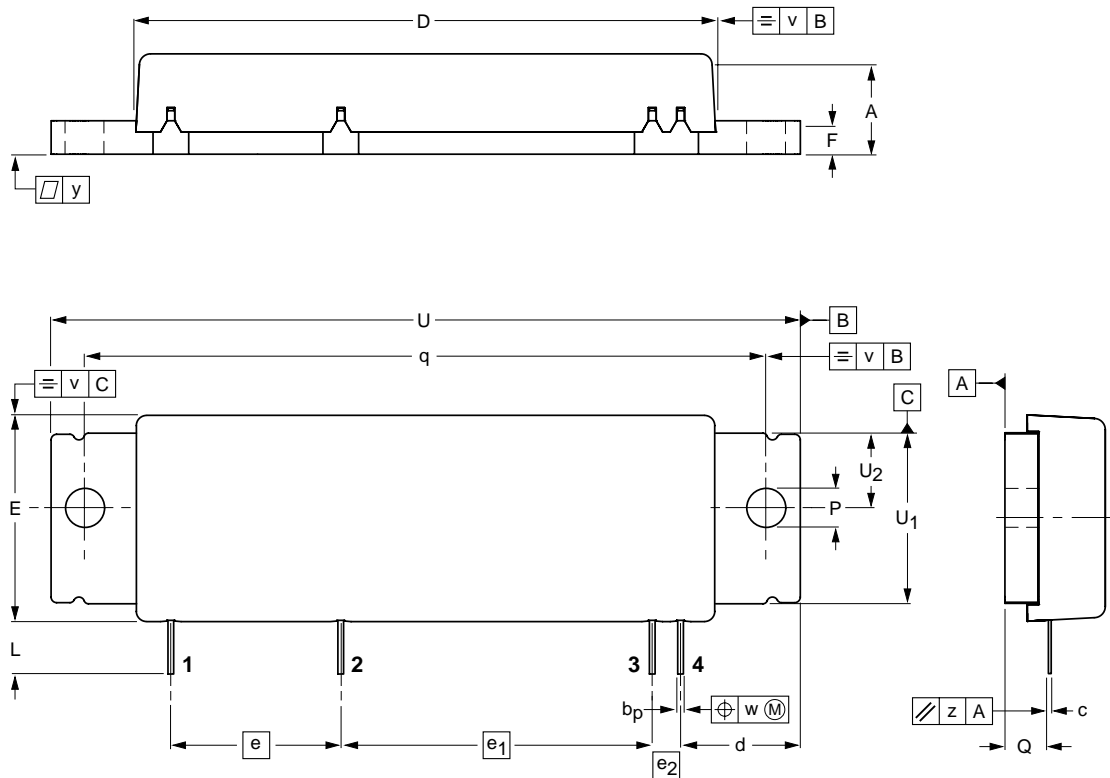
ESD precautions must be taken to protect the device from electrostatic damage.

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PACKAGE OUTLINE

Plastic rectangular single-ended flat package; flange mounted; 2 mounting holes; 4 in-line leads SOT501A



DIMENSIONS (mm are the original dimensions)

UNIT	A	b <sub>p</sub>	c	D	d	E	e	e <sub>1</sub>	e <sub>2</sub>	F	L	P	Q	q	U	U <sub>1</sub>	U <sub>2</sub>	v	w	y	z
mm	9.4 8.9	0.56 0.46	0.3 0.2	52.1 51.7	10.9 10.5	18.7 18.3	15.24	27.94	2.54	3.1 2.9	6.5 6.1	3.6 3.4	4.1 3.7	61.2 61.0	67.4 67.0	15.5 15.1	6.9 6.5	0.2	0.25	0.1	0.3

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT501A						98-10-28

## UHF amplifier module

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**DEFINITIONS**

<b>Data Sheet Status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

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**NOTES**

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**NOTES**

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**NOTES**

# Philips Semiconductors – a worldwide company

**Argentina:** see South America

**Australia:** 34 Waterloo Road, NORTH RYDE, NSW 2113,  
Tel. +61 2 9805 4455, Fax. +61 2 9805 4466

**Austria:** Computerstr. 6, A-1101 WIEN, P.O. Box 213,  
Tel. +43 1 60 101 1248, Fax. +43 1 60 101 1210

**Belarus:** Hotel Minsk Business Center, Bld. 3, r. 1211, Volodarski Str. 6,  
220050 MINSK, Tel. +375 172 20 0733, Fax. +375 172 20 0773

**Belgium:** see The Netherlands

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**Bulgaria:** Philips Bulgaria Ltd., Energoproject, 15th floor,  
51 James Bourchier Blvd., 1407 SOFIA,  
Tel. +359 2 68 9211, Fax. +359 2 68 9102

**Canada:** PHILIPS SEMICONDUCTORS/COMPONENTS,  
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**China/Hong Kong:** 501 Hong Kong Industrial Technology Centre,  
72 Tat Chee Avenue, Kowloon Tong, HONG KONG,  
Tel. +852 2319 7888, Fax. +852 2319 7700

**Colombia:** see South America

**Czech Republic:** see Austria

**Denmark:** Sydhavnsgade 23, 1780 COPENHAGEN V,  
Tel. +45 33 29 3333, Fax. +45 33 29 3905

**Finland:** Sinikalliontie 3, FIN-02630 ESPOO,  
Tel. +358 9 615 800, Fax. +358 9 6158 0920

**France:** 51 Rue Carnot, BP317, 92156 SURESNES Cedex,  
Tel. +33 1 4099 6161, Fax. +33 1 4099 6427

**Germany:** Hammerbrookstraße 69, D-20097 HAMBURG,  
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**Hungary:** see Austria

**India:** Philips INDIA Ltd, Band Box Building, 2nd floor,  
254-D, Dr. Annie Besant Road, Worli, MUMBAI 400 025,  
Tel. +91 22 493 8541, Fax. +91 22 493 0966

**Indonesia:** PT Philips Development Corporation, Semiconductors Division,  
Gedung Philips, Jl. Buncit Raya Kav.99-100, JAKARTA 12510,  
Tel. +62 21 794 0040 ext. 2501, Fax. +62 21 794 0080

**Ireland:** Newstead, Clonskeagh, DUBLIN 14,  
Tel. +353 1 7640 000, Fax. +353 1 7640 200

**Israel:** RAPAC Electronics, 7 Kehilat Saloniki St, PO Box 18053,  
TEL AVIV 61180, Tel. +972 3 645 0444, Fax. +972 3 649 1007

**Italy:** PHILIPS SEMICONDUCTORS, Piazza IV Novembre 3,  
20124 MILANO, Tel. +39 2 6752 2531, Fax. +39 2 6752 2557

**Japan:** Philips Bldg 13-37, Kohnan 2-chome, Minato-ku,  
TOKYO 108-8507, Tel. +81 3 3740 5130, Fax. +81 3 3740 5077

**Korea:** Philips House, 260-199 Itaewon-dong, Yongsan-ku, SEOUL,  
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**Malaysia:** No. 76 Jalan Universiti, 46200 PETALING JAYA, SELANGOR,  
Tel. +60 3 750 5214, Fax. +60 3 757 4880

**Mexico:** 5900 Gateway East, Suite 200, EL PASO, TEXAS 79905,  
Tel. +9-5 800 234 7381, Fax +9-5 800 943 0087

**Middle East:** see Italy

**Netherlands:** Postbus 90050, 5600 PB EINDHOVEN, Bldg. VB,  
Tel. +31 40 27 82785, Fax. +31 40 27 88399

**New Zealand:** 2 Wagener Place, C.P.O. Box 1041, AUCKLAND,  
Tel. +64 9 849 4160, Fax. +64 9 849 7811

**Norway:** Box 1, Manglerud 0612, OSLO,  
Tel. +47 22 74 8000, Fax. +47 22 74 8341

**Pakistan:** see Singapore

**Philippines:** Philips Semiconductors Philippines Inc.,  
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Metro MANILA, Tel. +63 2 816 6380, Fax. +63 2 817 3474

**Poland:** Ul. Lukiska 10, PL 04-123 WARSZAWA,  
Tel. +48 22 612 2831, Fax. +48 22 612 2327

**Portugal:** see Spain

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**Russia:** Philips Russia, Ul. Usatcheva 35A, 119048 MOSCOW,  
Tel. +7 095 755 6918, Fax. +7 095 755 6919

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**South Africa:** S.A. PHILIPS Pty Ltd., 195-215 Main Road Martindale,  
2092 JOHANNESBURG, P.O. Box 7430 Johannesburg 2000,  
Tel. +27 11 470 5911, Fax. +27 11 470 5494

**South America:** Al. Vicente Pinzon, 173, 6th floor,  
04547-130 SÃO PAULO, SP, Brazil,  
Tel. +55 11 821 2333, Fax. +55 11 821 2382

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Tel. +34 93 301 6312, Fax. +34 93 301 4107

**Sweden:** Kottbygatan 7, Akalla, S-16485 STOCKHOLM,  
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**Switzerland:** Allmendstrasse 140, CH-8027 ZÜRICH,  
Tel. +41 1 488 2741 Fax. +41 1 488 3263

**Taiwan:** Philips Semiconductors, 6F, No. 96, Chien Kuo N. Rd., Sec. 1,  
TAIPEI, Taiwan Tel. +886 2 2134 2886, Fax. +886 2 2134 2874

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209/2 Sanpavuth-Bangna Road Prakanong, BANGKOK 10260,  
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**Turkey:** Talatpasa Cad. No. 5, 80640 GÜLTEPE/ISTANBUL,  
Tel. +90 212 279 2770, Fax. +90 212 282 6707

**Ukraine:** PHILIPS UKRAINE, 4 Patrice Lumumba str., Building B, Floor 7,  
252042 KIEV, Tel. +380 44 264 2776, Fax. +380 44 268 0461

**United Kingdom:** Philips Semiconductors Ltd., 276 Bath Road, Hayes,  
MIDDLESEX UB3 5BX, Tel. +44 181 730 5000, Fax. +44 181 754 8421

**United States:** 811 East Arques Avenue, SUNNYVALE, CA 94088-3409,  
Tel. +1 800 234 7381, Fax. +1 800 943 0087

**Uruguay:** see South America

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**Yugoslavia:** PHILIPS, Trg N. Pasica 5/v, 11000 BEOGRAD,  
Tel. +381 11 62 5344, Fax. +381 11 63 5777

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International Marketing & Sales Communications, Building BE-p, P.O. Box 218,  
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