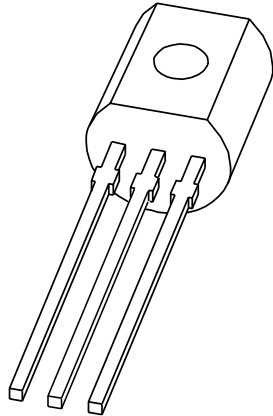


# DATA SHEET



## **JC559; JC560** PNP general purpose transistors

Product specification  
Supersedes data of September 1994  
File under Discrete Semiconductors, SC04

1997 Jul 09

# PNP general purpose transistors

# JC559; JC560

### FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 45 V).

### APPLICATIONS

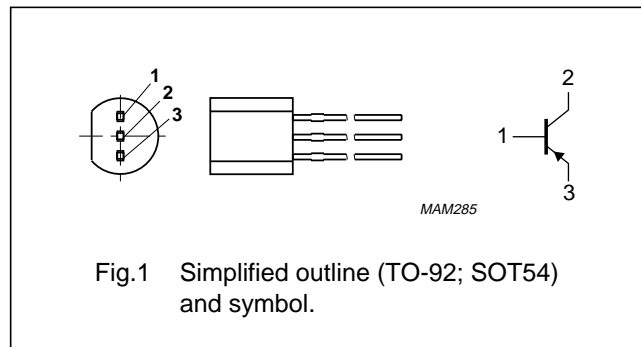
- General purpose switching and amplification
- Low-noise input stages in tape recorders, hi-fi amplifiers and other audio-frequency equipment.

### DESCRIPTION

PNP transistor in a TO-92; SOT54 plastic package.  
 NPN complements: JC549 and JC550.

### PINNING

PIN	DESCRIPTION
1	base
2	collector
3	emitter



### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage JC559 JC560	open emitter		-30	V
				-50	V
$V_{CEO}$	collector-emitter voltage JC559 JC560	open base	-	-30	V
			-	-45	V
$I_{CM}$	peak collector current		-	-200	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ }^\circ\text{C}$	-	500	mW
$h_{FE}$	DC current gain	$I_C = -2\text{ mA}; V_{CE} = -5\text{ V}$	125	800	
$f_T$	transition frequency	$I_C = -10\text{ mA}; V_{CE} = -5\text{ V}; f = 100\text{ MHz}$	100	-	MHz

## PNP general purpose transistors

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**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V <sub>CBO</sub>	collector-base voltage	open emitter			
	JC559		–	–30	V
	JC560		–	–50	V
V <sub>CEO</sub>	collector-emitter voltage	open base			
	JC559		–	–30	V
	JC560		–	–45	V
V <sub>EBO</sub>	emitter-base voltage	open collector	–	–5	V
I <sub>C</sub>	collector current (DC)		–	–100	mA
I <sub>CM</sub>	peak collector current		–	–200	mA
I <sub>BM</sub>	peak base current		–	–200	mA
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C; note 1	–	500	mW
T <sub>stg</sub>	storage temperature		–65	+150	°C
T <sub>j</sub>	junction temperature		–	150	°C
T <sub>amb</sub>	operating ambient temperature		–65	+150	°C

**Note**

1. Transistor mounted on an FR4 printed-circuit board.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
R <sub>th j-a</sub>	thermal resistance from junction to ambient	note 1	250	K/W

**Note**

1. Transistor mounted on an FR4 printed-circuit board.

## PNP general purpose transistors

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**CHARACTERISTICS** $T_j = 25\text{ °C}$  unless otherwise specified

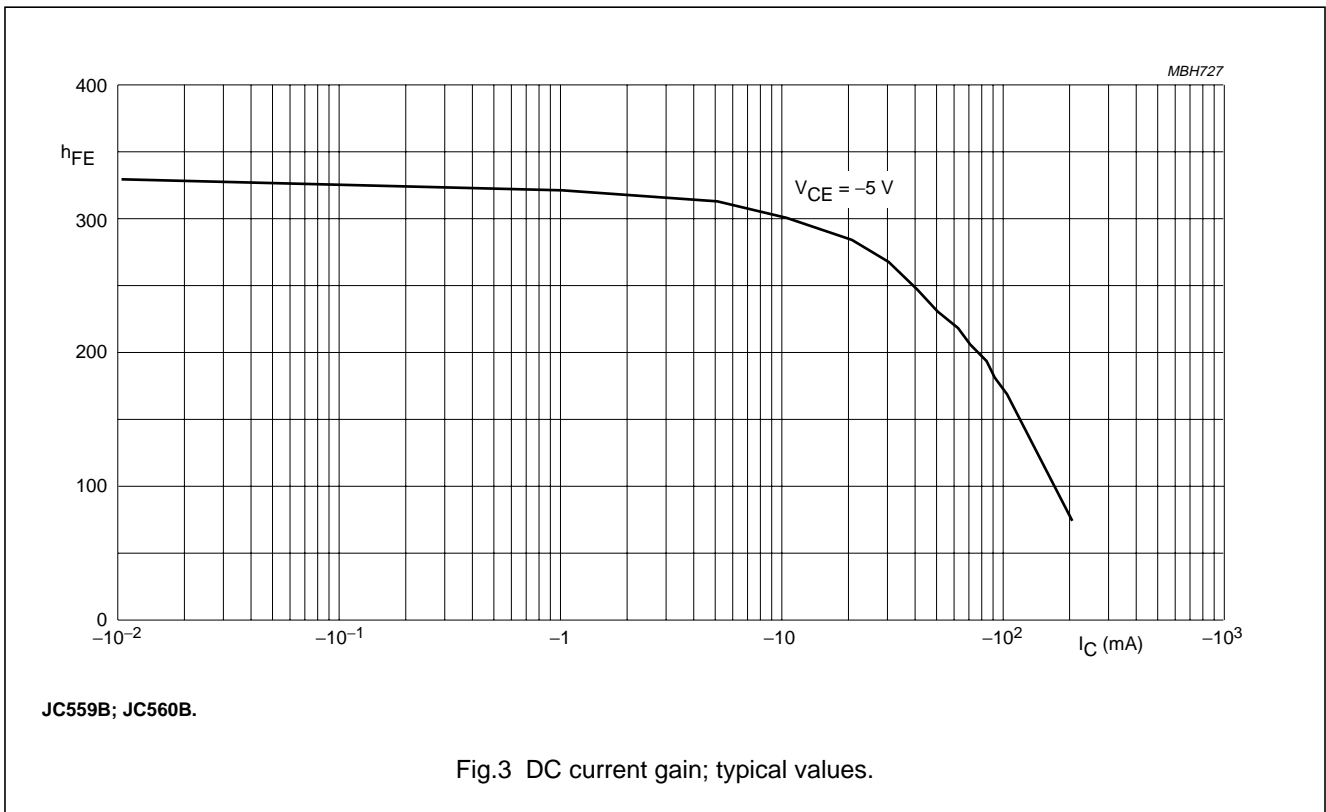
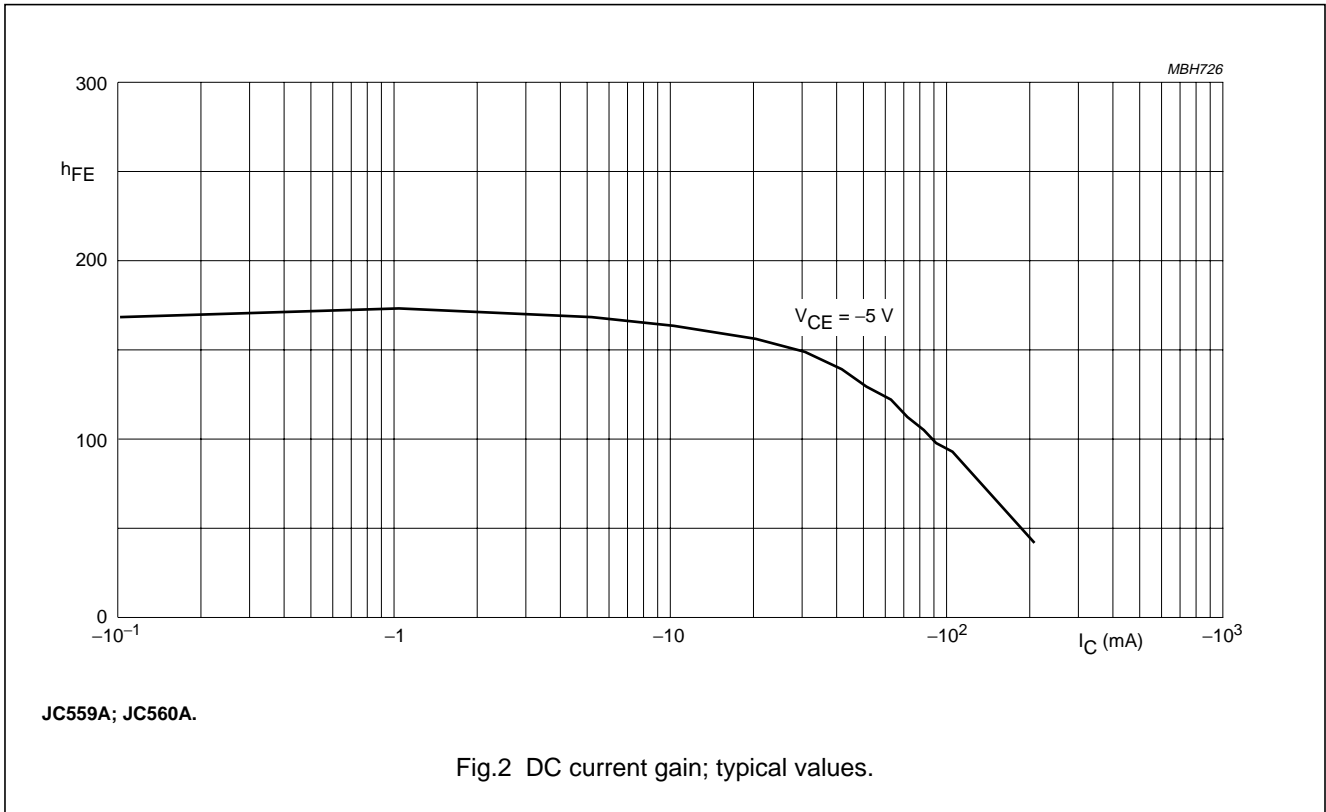
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector cut-off current	$I_E = 0; V_{CB} = -30\text{ V}$	–	–1	–15	nA
		$I_E = 0; V_{CB} = -30\text{ V}; T_j = 150\text{ °C}$	–	–	–4	$\mu\text{A}$
$I_{EBO}$	emitter cut-off current	$I_C = 0; V_{EB} = -5\text{ V}$	–	–	–100	nA
$h_{FE}$	DC current gain JC559; JC560 JC559A; JC560A JC559B; JC560B JC559C; JC560C	$I_C = -2\text{ mA}; V_{CE} = -5\text{ V}$ see Figs 2, 3 and 4	125	–	800	
			125	–	250	
			220	–	475	
			420	–	800	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -0.5\text{ mA}; \text{note 1}$	–	–60	–300	mV
		$I_C = -100\text{ mA}; I_B = -5\text{ mA}; \text{note 1}$	–	–180	–650	mV
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -0.5\text{ mA}; \text{note 1}$	–	–750	–	mV
		$I_C = -100\text{ mA}; I_B = -5\text{ mA}; \text{note 1}$	–	–930	–	mV
$V_{BE}$	base-emitter voltage	$I_C = -2\text{ mA}; V_{CE} = -5\text{ V}; \text{note 2}$	–600	–650	–750	mV
		$I_C = -10\text{ mA}; V_{CE} = -5\text{ V}; \text{note 2}$	–	–	–820	mV
$C_c$	collector capacitance	$I_E = i_e = 0; V_{CB} = -10\text{ V}; f = 1\text{ MHz}$	–	4	–	pF
$C_e$	emitter capacitance	$I_C = i_c = 0; V_{EB} = -500\text{ mV}; f = 1\text{ MHz}$	–	12	–	pF
$f_T$	transition frequency	$I_C = -10\text{ mA}; V_{CE} = -5\text{ V}; f = 100\text{ MHz}$	100	–	–	MHz
F	noise figure JC559B; JC560B; JC559C; JC560C	$I_C = -200\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; R_S = 2\text{ k}\Omega;$ $f = 10\text{ Hz to }15.7\text{ kHz}$	–	–	4	dB
			–	–	4	dB
F	noise figure JC559B; JC560B; JC559C; JC560C	$I_C = -200\text{ }\mu\text{A}; V_{CE} = -5\text{ V}; R_S = 2\text{ k}\Omega;$ $f = 1\text{ kHz}; B = 200\text{ Hz}$	–	–	4	dB

**Notes**

- $V_{BEsat}$  decreases by about  $-1.7\text{ mV/K}$  with increasing temperature.
- $V_{BE}$  decreases by about  $-2\text{ mV/K}$  with increasing temperature.

PNP general purpose transistors

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PNP general purpose transistors

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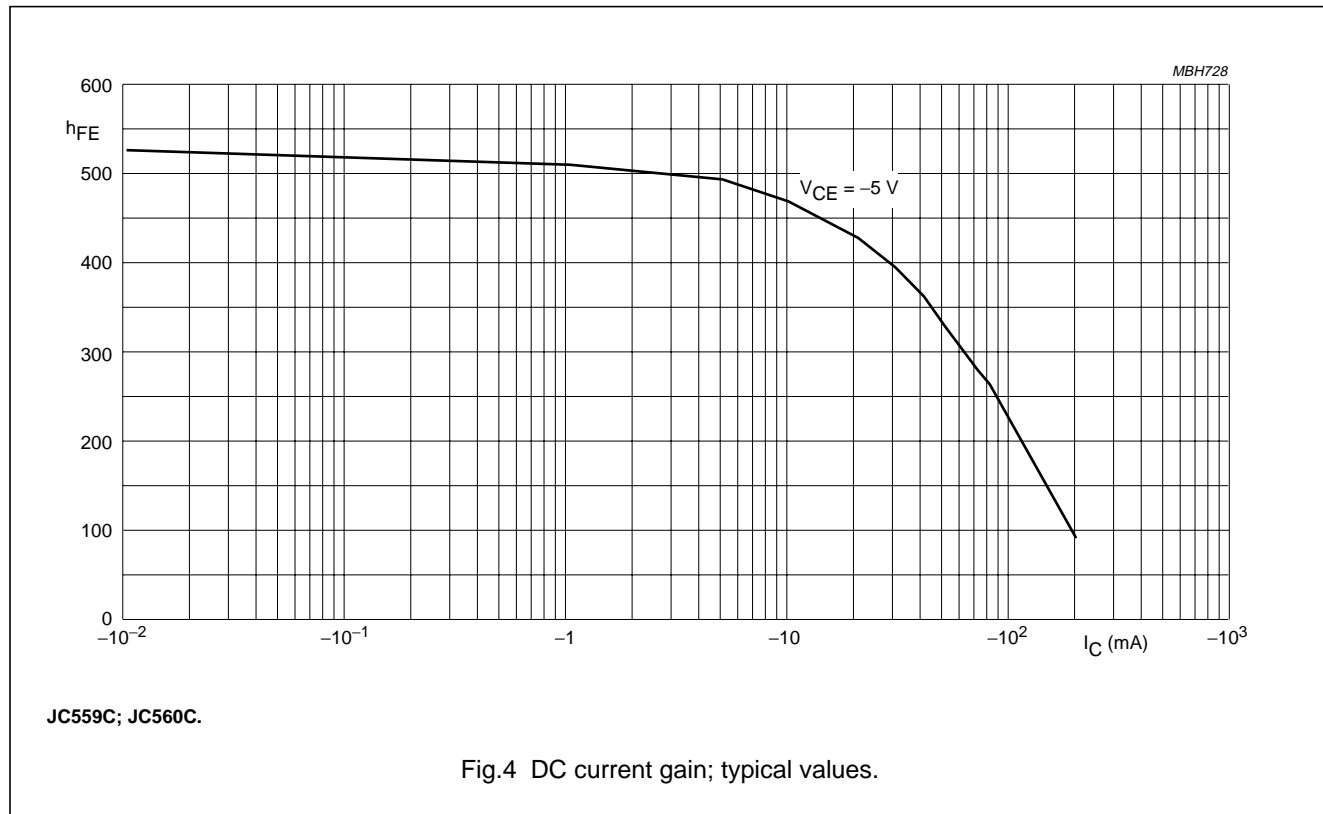


Fig.4 DC current gain; typical values.

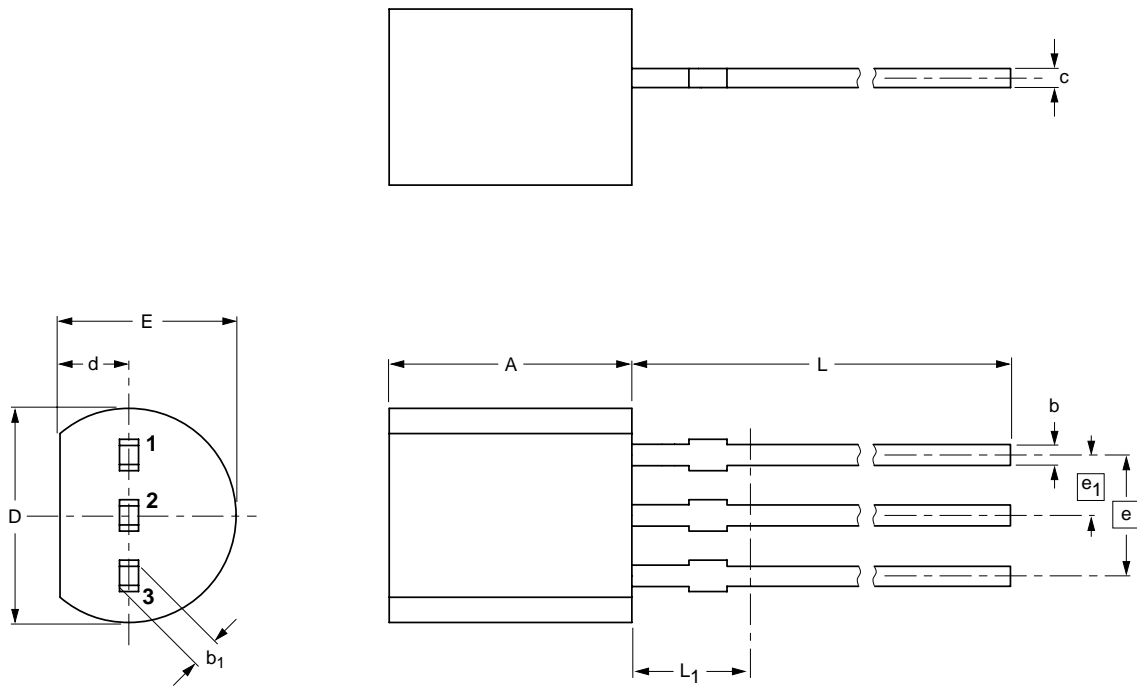
PNP general purpose transistors

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PACKAGE OUTLINE

Plastic single-ended leaded (through hole) package; 3 leads

SOT54



DIMENSIONS (mm are the original dimensions)

UNIT	A	b	b <sub>1</sub>	c	D	d	E	e	e <sub>1</sub>	L	L <sub>1</sub> <sup>(1)</sup>
mm	5.2	0.48	0.66	0.45	4.8	1.7	4.2	2.54	1.27	14.5	2.5
	5.0	0.40	0.56	0.40	4.4	1.4	3.6				

Note

1. Terminal dimensions within this zone are uncontrolled to allow for flow of plastic and terminal irregularities.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT54		TO-92	SC-43			97-02-28

## PNP general purpose transistors

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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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PNP general purpose transistors

JC559; JC560

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**NOTES**

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PNP general purpose transistors

JC559; JC560

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**NOTES**

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PNP general purpose transistors

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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. +43 160 1010, Fax. +43 160 101 1210

**Belarus:** Hotel Minsk Business Center, Bld. 3, r. 1211, Volodarski Str. 6, 220050 MINSK, Tel. +375 172 200 733, Fax. +375 172 200 773

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**Bulgaria:** Philips Bulgaria Ltd., Energoproject, 15th floor, 51 James Bourchier Blvd., 1407 SOFIA, Tel. +359 2 689 211, Fax. +359 2 689 102

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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

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**Finland:** Sinikalliontie 3, FIN-02630 ESPOO, Tel. +358 9 615800, Fax. +358 9 61580920

**France:** 4 Rue du Port-aux-Vins, BP317, 92156 SURESNES Cedex, Tel. +33 1 40 99 6161, Fax. +33 1 40 99 6427

**Germany:** Hammerbrookstraße 69, D-20097 HAMBURG, Tel. +49 40 23 53 60, Fax. +49 40 23 536 300

**Greece:** No. 15, 25th March Street, GR 17778 TAVROS/ATHENS, Tel. +30 1 4894 339/239, Fax. +30 1 4814 240

**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:** see Singapore

**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

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**Middle East:** see Italy

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

**Philippines:** Philips Semiconductors Philippines Inc., 106 Valero St. Salcedo Village, P.O. Box 2108 MCC, MAKATI, 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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**Spain:** Balmes 22, 08007 BARCELONA, Tel. +34 3 301 6312, Fax. +34 3 301 4107

**Sweden:** Kottbygatan 7, Akalla, S-16485 STOCKHOLM, Tel. +46 8 632 2000, Fax. +46 8 632 2745

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**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

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