

DISCRETE SEMICONDUCTORS

DATA SHEET

UZZ9000

Sensor Conditioning Electronics

Objective specification

1998 May 18

Supersedes data of 1996 Dec 03

File under Discrete Semiconductors, SC17

Sensor Conditioning Electronics

UZZ9000

FEATURES

- One chip angle sensor output signal conditioning
- Overall accuracy better than 1° for 100° angle range
- Temperature range from -40 to 150 °C
- Adjustable angle range
- Adjustable zero point.

DESCRIPTION

The UZZ9000 is an integrated circuit which is able to combine two sinusoidal signals (sin and cos) into one single linear output signal. These signals might come from magnetoresistive sensors. In that case this function can provide good results as the signal conditioning electronic for angle measurement forming from the output signal of two magnetoresistive sensors. This gives the sin (α) and the cos (α) of the angle to be measured a linear output characteristic for angles up to 360°. This integrated circuit can also be used for all other applications in which the sin and the cos of a signal have to be transferred in one output characteristic. A typical application would be any kind of resolver application. The two primary input signals are converted into the digital domain, with a CORDIC algorithm performing the arctan transformation. Since today's applications work typically with analog output signals (e.g. potentiometers), the resulting signal which is transferred back to the analog domain is a ratiometric one. This integrated circuit enables the user to set both the angle range to be measured (Fig.3, α_2 to α_1) and the zero point (Fig.3, α_1) in wide ranges. These ranges are determined by an external voltage divider.

PINNING

SYMBOL	PIN	DESCRIPTION
+V _{O2}	1	sensor 2 positive differential input
+V _{O1}	2	sensor 1 positive differential input
V _{DD2}	3	supply voltage (digital 2)
V _{SS}	4	ground (digital)
GND	5	ground
GND	6	ground
GND	7	ground
–	8	note 1
GND	9	ground
GND	10	ground
–	11	note 1
V _{OUT}	12	output voltage
VIA2	13	voltage input adjust 2
VIA1	14	voltage input adjust 1
OFFS2	15	voltage input adjust sensor offset 2
OFFS1	16	voltage input adjust sensor offset 1
V _{DDA}	17	supply voltage (analog)
V _{SSA}	18	ground (analog)
GND	19	ground
GND	20	ground
V _{DD1}	21	supply voltage (digital 1)
–	22	note 1
-V _{O2}	23	sensor 2 negative differential input
-V _{O1}	24	sensor 1 negative differential input

Note

1. Pin to be left unconnected.

Sensor Conditioning Electronics

UZZ9000

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MIN.	TYP.	MAX.	UNIT
V_{DDA}	supply voltage; note 1	4.5	5	5.5	V
V_{DD1}	supply voltage; note 1	4.5	5	5.5	V
V_{DD2}	supply voltage; note 1	4.5	5	5.5	V
$I_{CC (tot)}$	total supply current	–	12	–	mA
V_{S1}	differential input voltage (peak voltage)	–140	–	+140	mV
V_{S2}	differential input voltage (peak voltage)	–140	–	+140	mV
V_{S1}	common mode range	2.2	–	2.8	V
V_{S2}	common mode range	2.2	–	2.8	V
V_{out}	output voltage range (ratiometric)	5	–	95	% V_{DD}
VIA1	programmable offset voltage	–2.5	–	+2.5	% V_{DD}
VIA2	programmable gain factor	1	–	6	
A	accuracy (deviation from best straight line)	–0.5	–	+0.5	% V_{DD}
R	resolution	–	0.05	0.1	% V_{DD}
H	hysteresis	–	0.05	0.1	% V_{DD}
T_{amb}	ambient temperature	–40	–	+150 ⁽²⁾	°C

Notes

1. V_{DDA} , V_{DD1} and V_{DD2} must be connected to the same supply voltage.
2. 200 hours (125 °C continuous).

Sensor Conditioning Electronics

UZZ9000

CIRCUIT BLOCK DIAGRAM

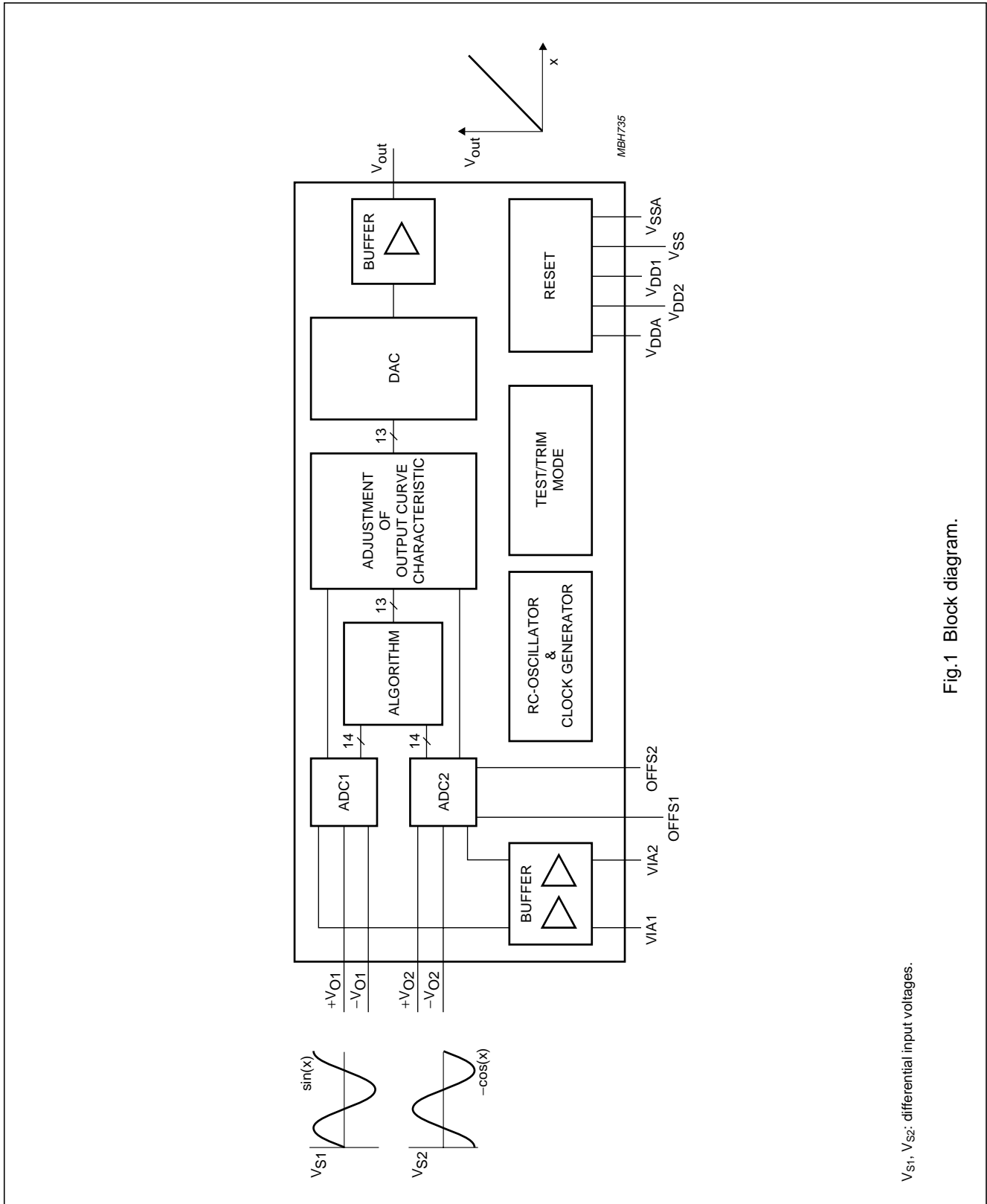


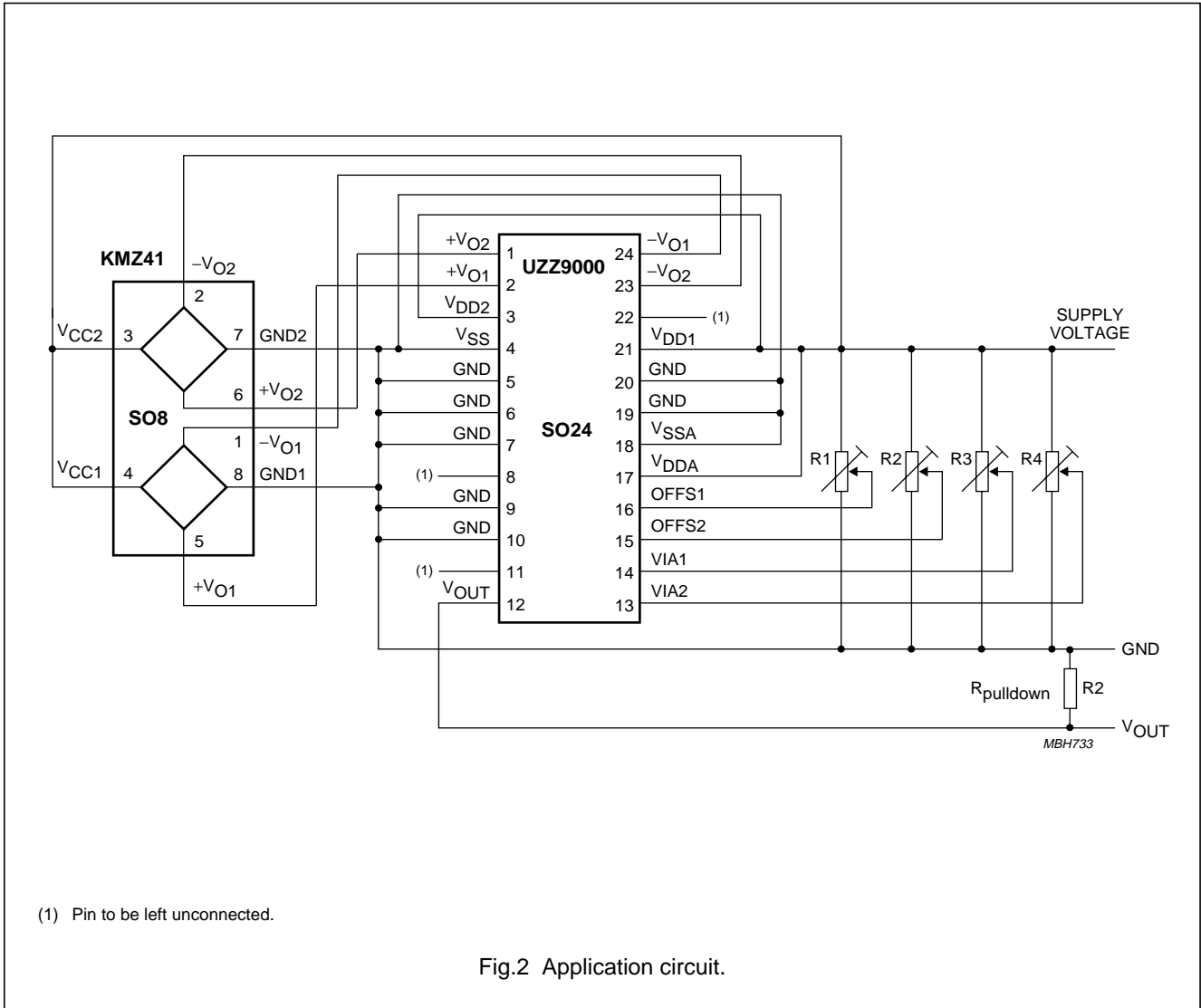
Fig.1 Block diagram.

V_{S1} , V_{S2} : differential input voltages.

Sensor Conditioning Electronics

UZZ9000

APPLICATION INFORMATION



Sensor Conditioning Electronics

UZZ9000

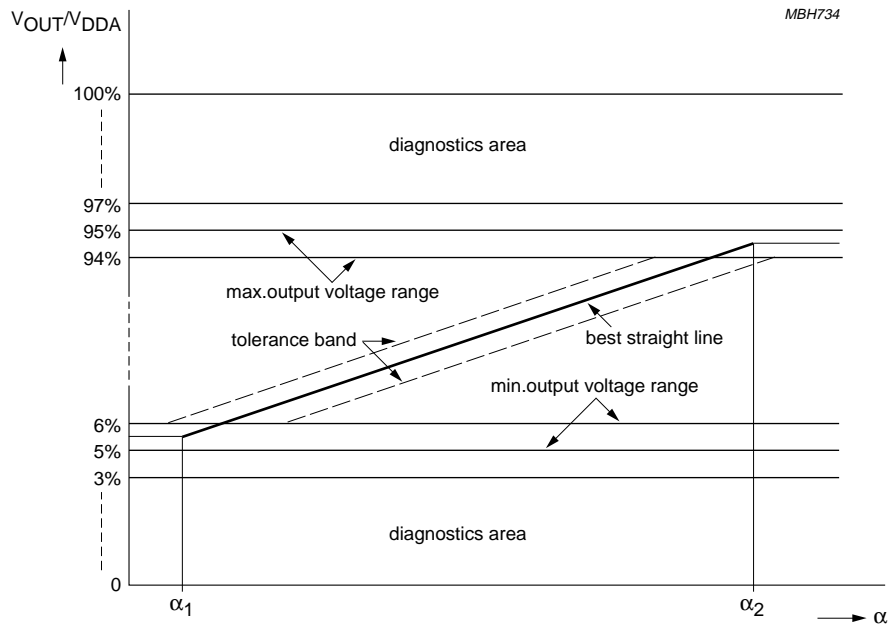


Fig.3 Output characteristic.

Sensor Conditioning Electronics

UZZ9000

DEFINITIONS

Data Sheet Status	
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.
Limiting values	
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.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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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

Belgium: see The Netherlands

Brazil: see South America

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

Canada: PHILIPS SEMICONDUCTORS/COMPONENTS,
Tel. +1 800 234 7381

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: Prags Boulevard 80, PB 1919, DK-2300 COPENHAGEN S,
Tel. +45 32 88 2636, Fax. +45 31 57 0044

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

France: 51 Rue Carnot, 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: 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,
Tel. +82 2 709 1412, Fax. +82 2 709 1415

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

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.,
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

Romania: see Italy

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

Singapore: Lorong 1, Toa Payoh, SINGAPORE 319762,
Tel. +65 350 2538, Fax. +65 251 6500

Slovakia: see Austria

Slovenia: see Italy

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

Spain: Balmes 22, 08007 BARCELONA,
Tel. +34 93 301 6312, Fax. +34 93 301 4107

Sweden: Kottbygatan 7, Akalla, S-16485 STOCKHOLM,
Tel. +46 8 5985 2000, Fax. +46 8 5985 2745

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 2865, Fax. +886 2 2134 2874

Thailand: PHILIPS ELECTRONICS (THAILAND) Ltd.,
209/2 Sanpavuth-Bangna Road Prakanong, BANGKOK 10260,
Tel. +66 2 745 4090, Fax. +66 2 398 0793

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

Uruguay: see South America

Vietnam: see Singapore

Yugoslavia: PHILIPS, Trg N. Pasica 5/v, 11000 BEOGRAD,
Tel. +381 11 625 344, Fax. +381 11 635 777

For all other countries apply to: Philips Semiconductors,
International Marketing & Sales Communications, Building BE-p, P.O. Box 218,
5600 MD EINDHOVEN, The Netherlands, Fax. +31 40 27 24825

Internet: <http://www.semiconductors.philips.com>

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