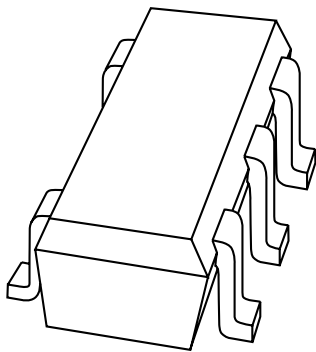


DATA SHEET



PESDxL4UG series

Low capacitance quadruple ESD protection diode array in SOT353 package

Product specification

2004 Mar 23

Low capacitance quadruple ESD protection diode array in SOT353 package

PESDxL4UG series

FEATURES

- Uni-directional ESD protection of up to four lines
- Low diode capacitance
- Maximum peak pulse power: $P_{pp} = 30\text{ W}$ at $t_p = 8/20\mu\text{s}$
- Low clamping voltage: $V_{CL(R)} = 12\text{ V}$ at $I_{pp} = 3\text{ A}$
- Ultra low leakage current: $I_{RM} = 5\text{ nA}$ at $V_{RWM} = 5\text{ V}$
- ESD protection > 20 kV
- IEC 61000-4-2; level 4 (ESD).

APPLICATIONS

- Cellular handsets and accessories
- Portable electronics
- Computers and peripherals
- Communications systems
- Audio and video equipment.

DESCRIPTION

ESD protection diode arrays designed to protect up to four transmissions or data lines from ElectroStatic Discharge (ESD) damage and other transients.

MARKING

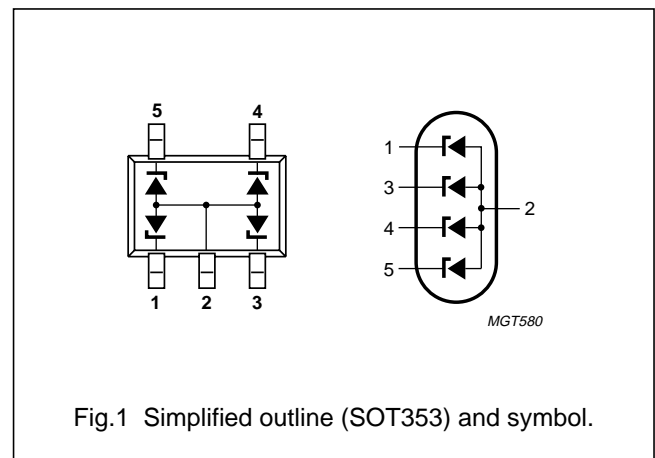
TYPE NUMBER	MARKING
PESD3V3L4UG	L1
PESD5V0L4UG	L2

QUICK REFERENCE DATA

SYMBOL	PARAMETER	VALUE	UNIT
V_{RWM}	reverse standoff voltage		
	PESD3V3L4UG	3.3	V
	PESD5V0L4UG	5	V
C_d	diode capacitance		
	PESD3V3L4UG	22	pF
	PESD5V0L4UG	16	pF
	number of protected lines	4	

PINNING

PIN	DESCRIPTION
1	cathode 1
2	common anode
3	cathode 2
4	cathode 3
5	cathode 4



ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
PESD3V3L4UG	–	plastic surface mounted package; 5 leads	SOT353
PESD5V0L4UG	–	plastic surface mounted package; 5 leads	SOT353

Low capacitance quadruple ESD protection diode array in SOT353 package

PESDxL4UG series

LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
Per diode					
I_{pp}	peak pulse current	8/20 μ s; notes 1 and 2	–	3	A
	PESD3V3L4UG				
	PESD5V0L4UG		–	2.5	A
P_{pp}	peak pulse power	8/20 μ s; notes 1 and 2	–	30	W
I_{FSM}	non-repetitive peak forward current	$t_p = 1$ ms; square pulse	–	3.5	A
I_{ZSM}	non-repetitive peak reverse current	$t_p = 1$ ms; square pulse	–	0.9	A
	PESD3V3L4UG				
	PESD5V0L4UG		–	0.8	A
P_{tot}	total power dissipation	$T_{amb} = 25$ °C; note 3	–	300	mW
P_{ZSM}	non-repetitive peak reverse power dissipation	$t_p = 1$ ms; square pulse; see Fig.4	–	6	W
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Notes

1. Non-repetitive current pulse 8/20 μ s exponentially decaying waveform; see Fig.5.
2. Between any of pins 1, 3, 4 or 5 and pin 2.
3. Device mounted on standard printed-circuit board.

ESD maximum ratings

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
Per diode				
ESD	electrostatic discharge capability	IEC 61000-4-2 (contact discharge); notes 1 and 2	20	kV
		HBM MIL-Std 883	10	kV

Notes

1. Device stressed with ten non-repetitive Electrostatic Discharge (ESD) pulses.
2. Measured from any of pins 1, 3, 4, or 5 to pin 2.

ESD standards compliance

STANDARD	CONDITION
IEC 61000-4-2, level 4 (ESD)	>15 kV (air); >8 kV (contact)
HBM MIL-Std 883, class 3	>4 kV

Low capacitance quadruple ESD protection diode array in SOT353 package

PESDxL4UG series

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th(j-a)}$	thermal resistance from junction to ambient	all diodes loaded	410	K/W
$R_{th(j-s)}$	thermal resistance from junction to solder point	one diode loaded; note 1	200	K/W
		all diodes loaded; note 1	185	K/W

Note

1. Solder point of common anode (pin 2).

ELECTRICAL CHARACTERISTICS

$T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Per diode						
V_F	forward voltage	$I_F = 200\text{ mA}$	–	1	1.2	V
I_{RM}	reverse leakage current					
	PESD3V3L4UG	$V_{RWM} = 3.3\text{ V}$	–	75	300	nA
	PESD5V0L4UG	$V_{RWM} = 5\text{ V}$	–	5	25	nA
$V_{CL(R)}$	clamping voltage	PESD3V3L4UG				
			$I_{pp} = 1\text{ A}$; notes 1 and 2	–	–	8
		$I_{pp} = 3\text{ A}$; notes 1 and 2	–	–	12	V
	PESD5V0L4UG					
		$I_{pp} = 1\text{ A}$; notes 1 and 2	–	–	10	V
		$I_{pp} = 2.5\text{ A}$; notes 1 and 2	–	–	13	V
V_{RWM}	reverse stand-off voltage					
		PESD3V3L4UG	–	–	3.3	V
	PESD5V0L4UG	–	–	5	V	
V_{BR}	breakdown voltage					
		PESD3V3L4UG	5.32	5.6	5.88	V
	PESD5V0L4UG	6.46	6.8	7.14	V	
r_{diff}	differential resistance					
		PESD3V3L4UG	–	–	200	Ω
	PESD5V0L4UG	–	–	100	Ω	
C_d	diode capacitance	PESD3V3L4UG				
			$V_R = 0\text{ V}$; $f = 1\text{ MHz}$	–	22	28
		$V_R = 5\text{ V}$; $f = 1\text{ MHz}$	–	12	17	pF
	PESD5V0L4UG					
		$V_R = 0\text{ V}$; $f = 1\text{ MHz}$	–	16	19	pF
		$V_R = 5\text{ V}$; $f = 1\text{ MHz}$	–	8	11	pF

Notes

1. Non-repetitive current pulse $8 \times 20\text{ ms}$ exponentially decay waveform; see Fig.5.
2. Between any of pins 1, 3, 4 or 5 and pin 2.

Low capacitance quadruple ESD protection diode array in SOT353 package

PESDxL4UG series

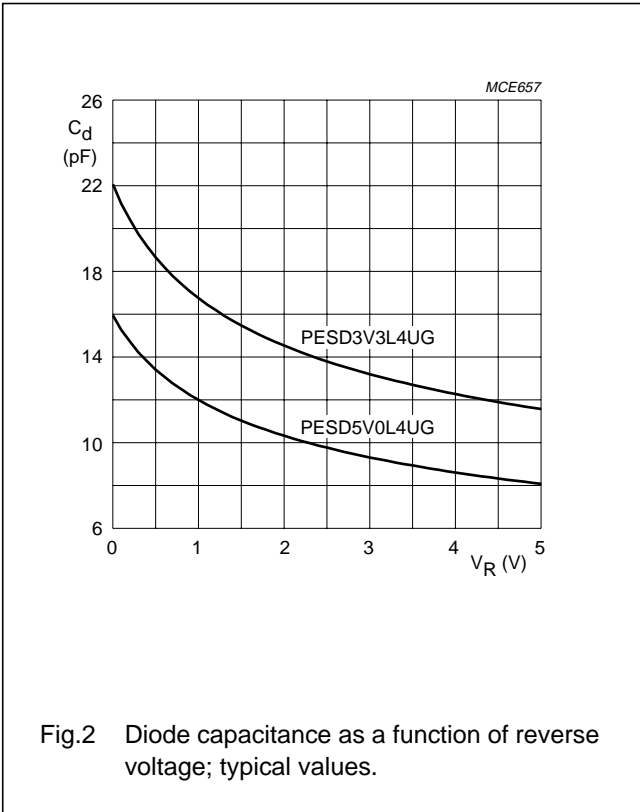


Fig.2 Diode capacitance as a function of reverse voltage; typical values.

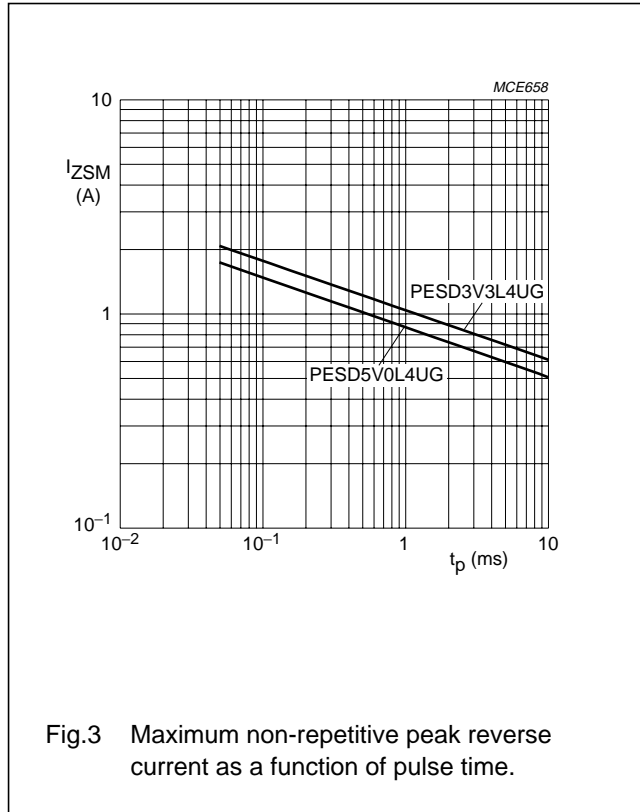


Fig.3 Maximum non-repetitive peak reverse current as a function of pulse time.

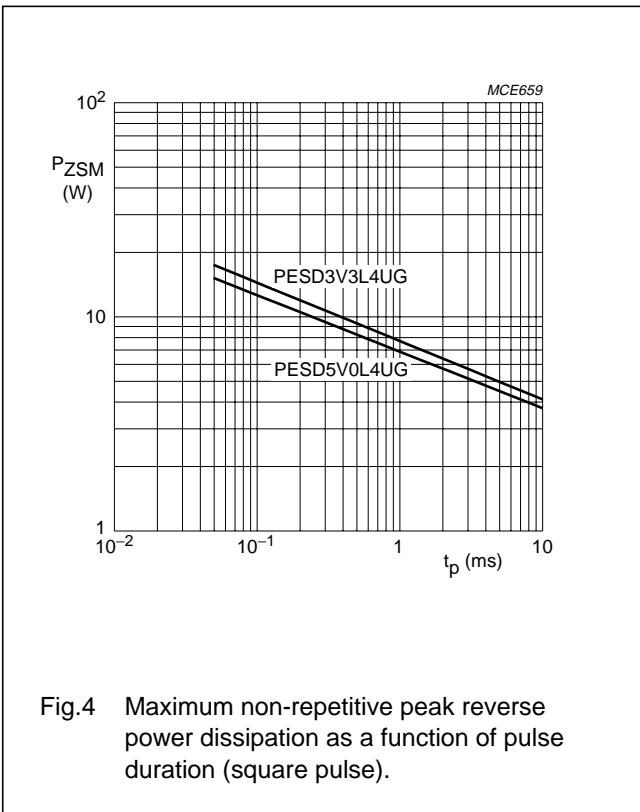


Fig.4 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (square pulse).

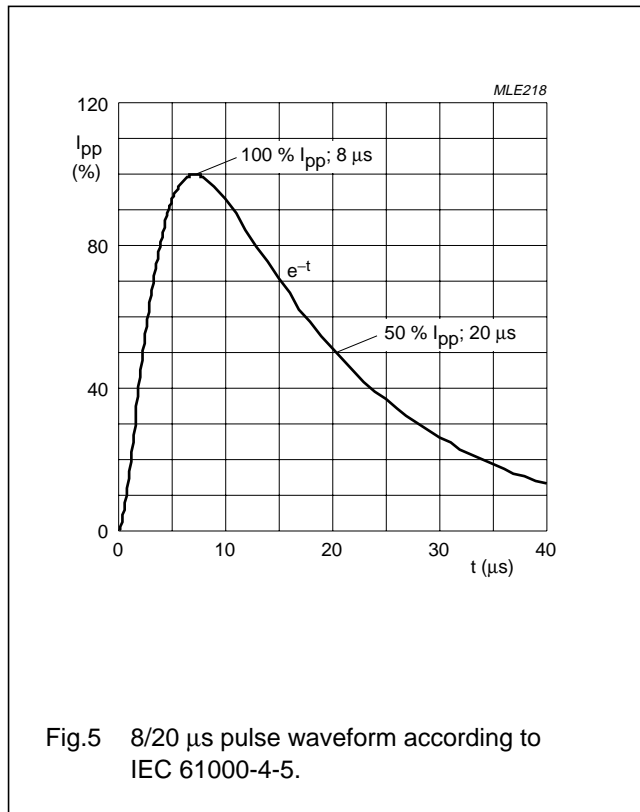


Fig.5 8/20 μ s pulse waveform according to IEC 61000-4-5.

Low capacitance quadruple ESD protection diode array in SOT353 package

PESDxL4UG series

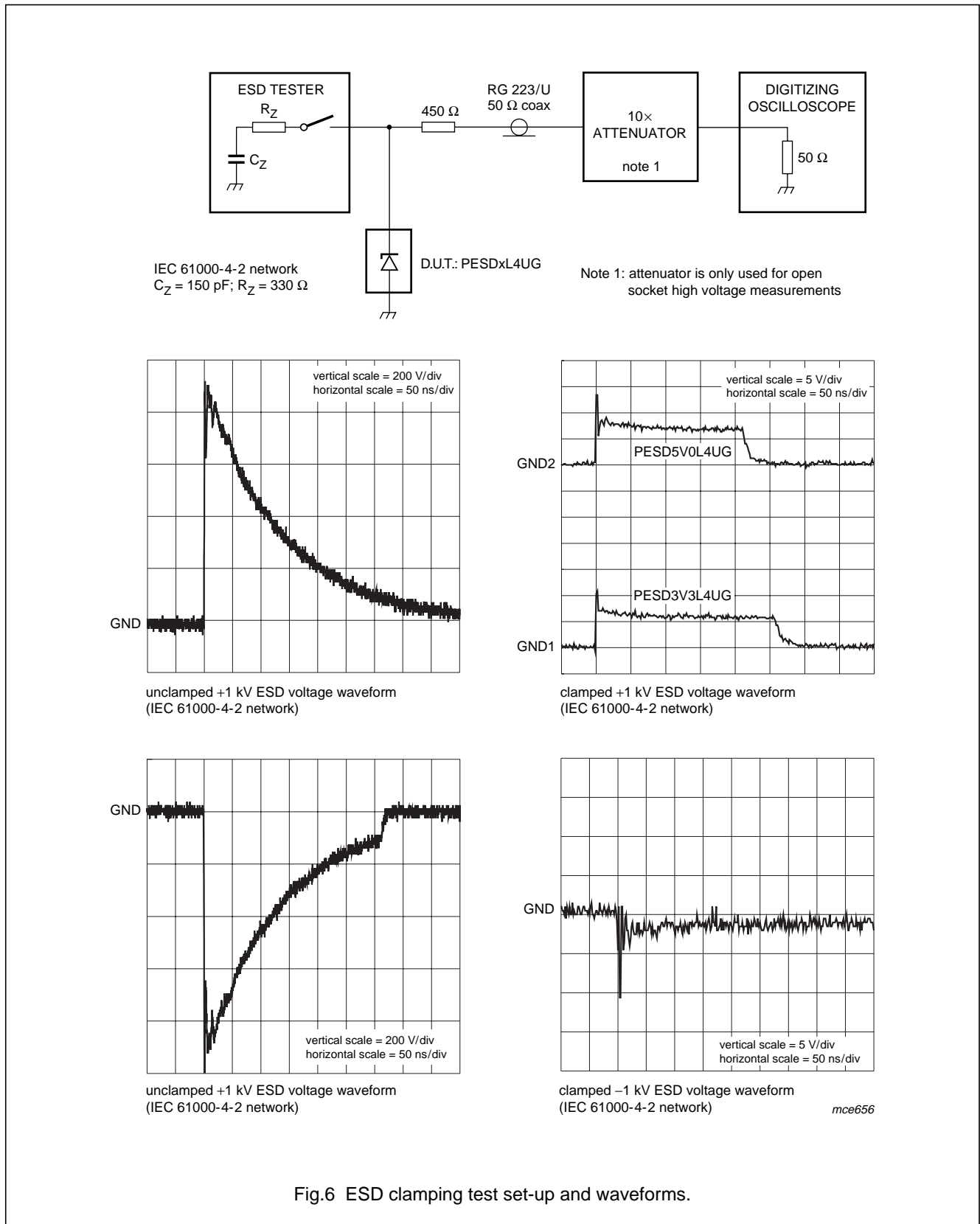


Fig.6 ESD clamping test set-up and waveforms.

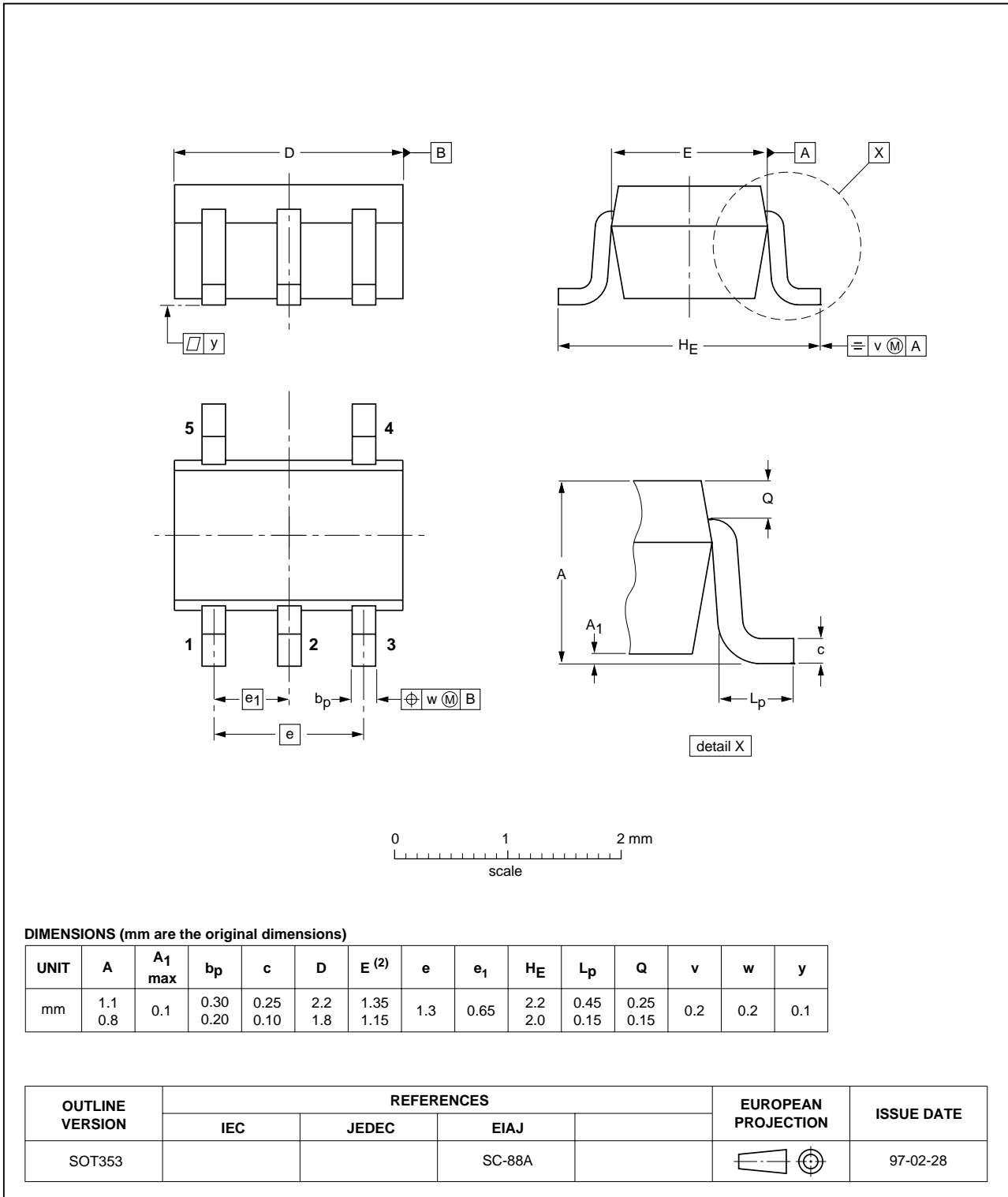
Low capacitance quadruple ESD protection diode array in SOT353 package

PESDxL4UG series

PACKAGE OUTLINE

Plastic surface mounted package; 5 leads

SOT353



Low capacitance quadruple ESD protection diode array in SOT353 package

PESDxL4UG series

DATA SHEET STATUS

LEVEL	DATA SHEET STATUS ⁽¹⁾	PRODUCT STATUS ⁽²⁾⁽³⁾	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).

Notes

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.

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.

DISCLAIMERS

Life support applications — 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 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 licence 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.

Philips Semiconductors – a worldwide company

Contact information

For additional information please visit <http://www.semiconductors.philips.com>. Fax: +31 40 27 24825

For sales offices addresses send e-mail to: sales.addresses@www.semiconductors.philips.com.

© Koninklijke Philips Electronics N.V. 2004

SCA76

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.

Printed in The Netherlands

R76/01/pp9

Date of release: 2004 Mar 23

Document order number: 9397 750 12226

Let's make things better.

**Philips
Semiconductors**



PHILIPS