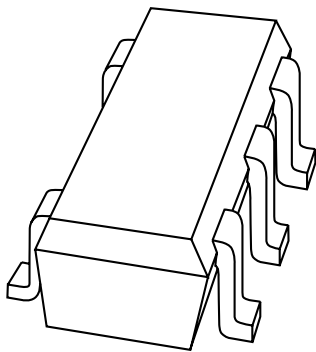


DATA SHEET



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

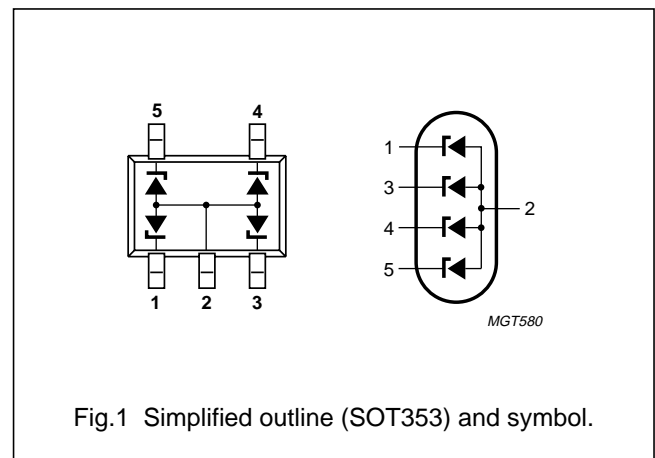
TYPE NUMBER	MARKING
PESD3V3L4UG	L1
PESD5V0L4UG	L2

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

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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			
	PESD3V3L4UG PESD5V0L4UG		–	0.9 0.8	A 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

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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

- 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

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

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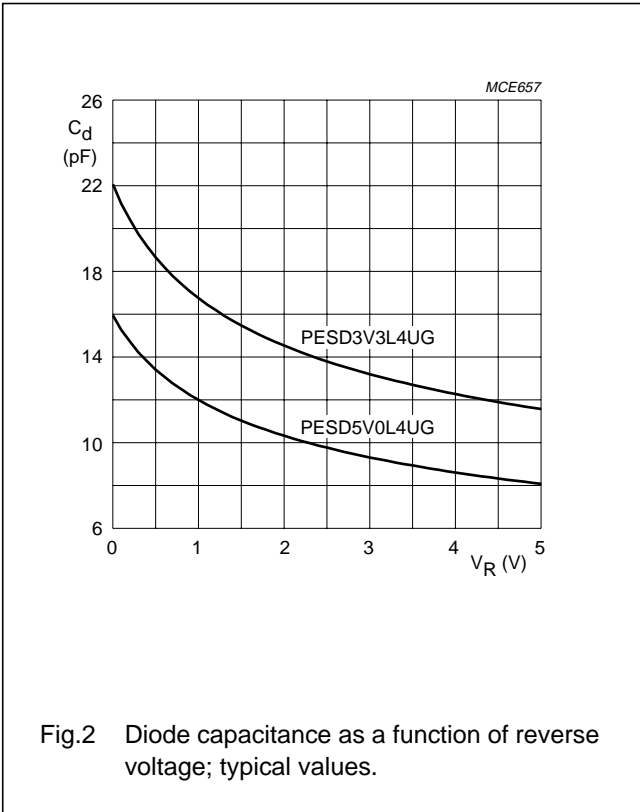


Fig.2 Diode capacitance as a function of reverse voltage; typical values.

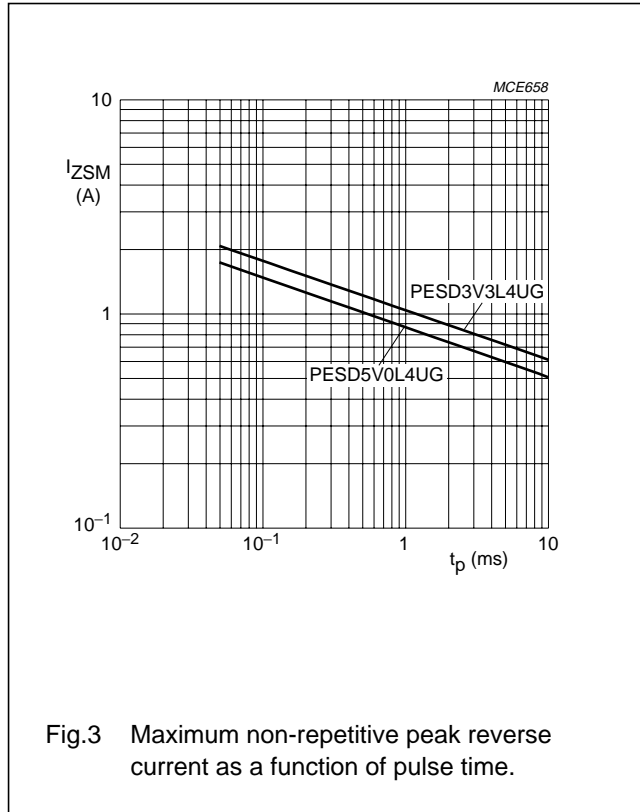


Fig.3 Maximum non-repetitive peak reverse current as a function of pulse time.

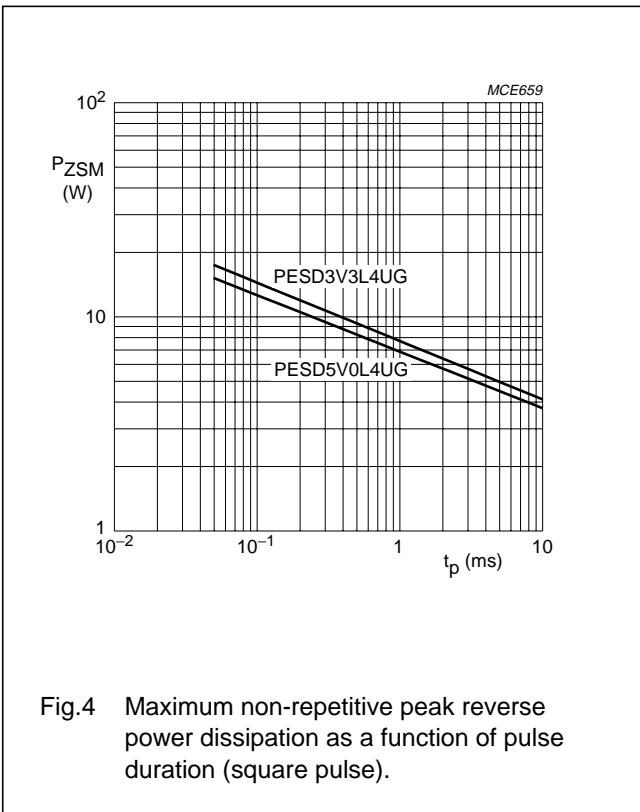


Fig.4 Maximum non-repetitive peak reverse power dissipation as a function of pulse duration (square pulse).

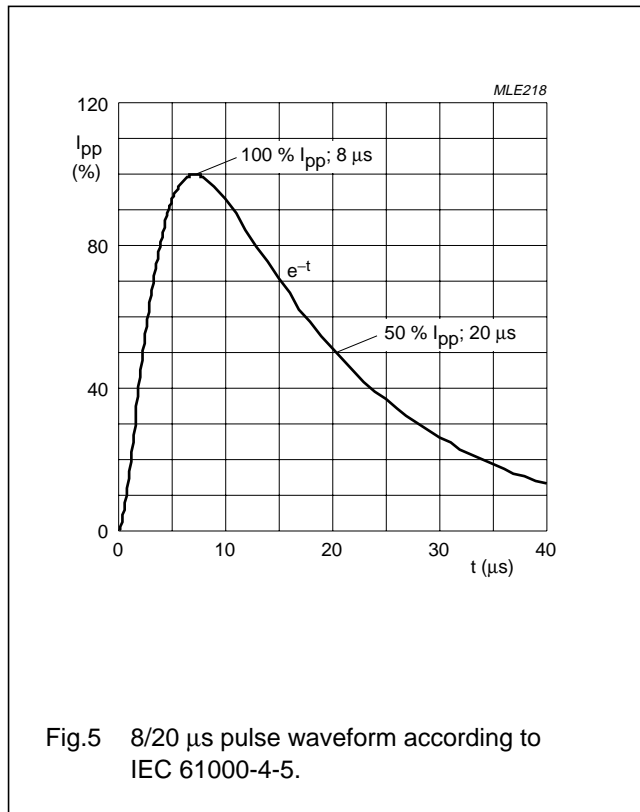


Fig.5 8/20 μ s pulse waveform according to IEC 61000-4-5.

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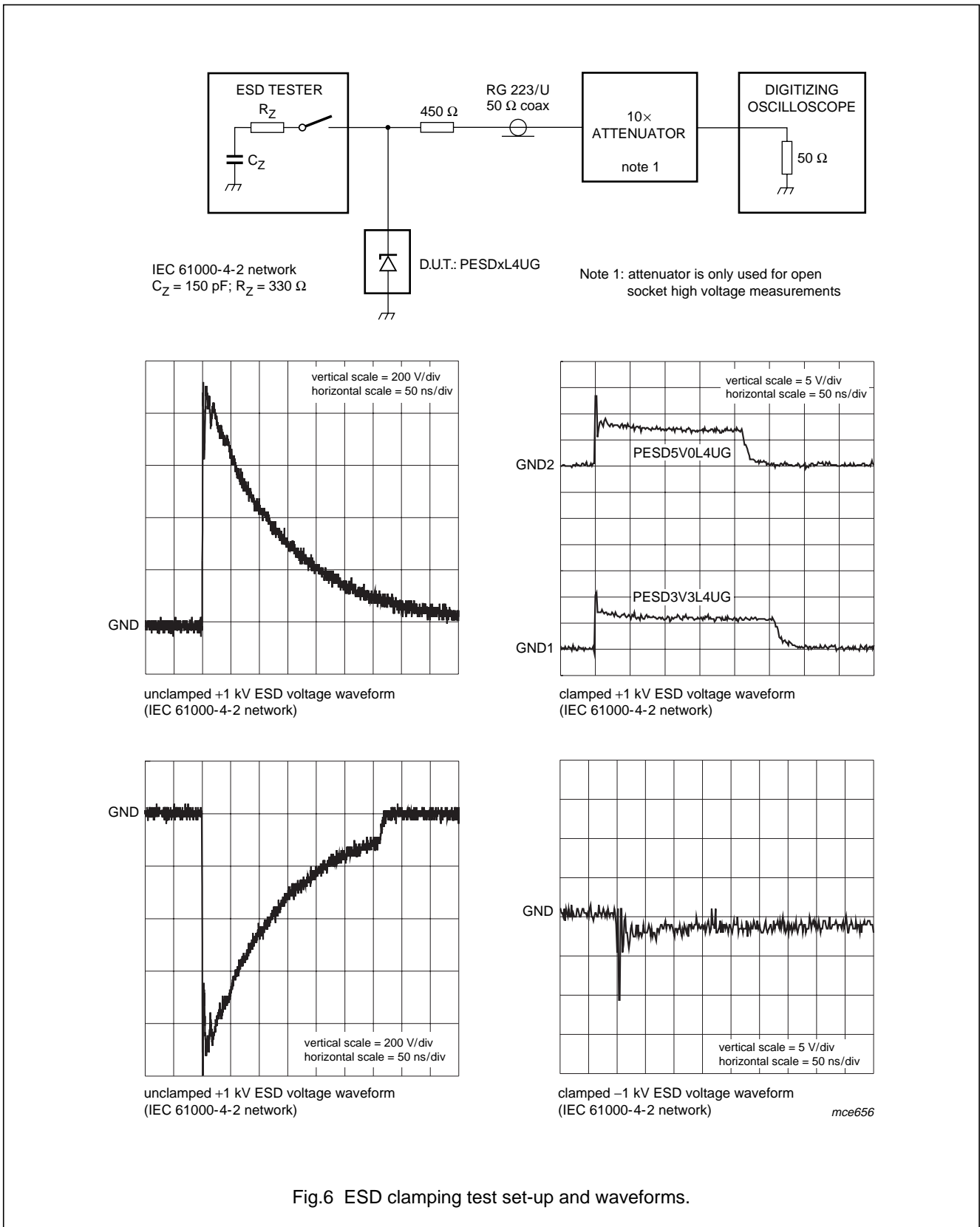


Fig.6 ESD clamping test set-up and waveforms.

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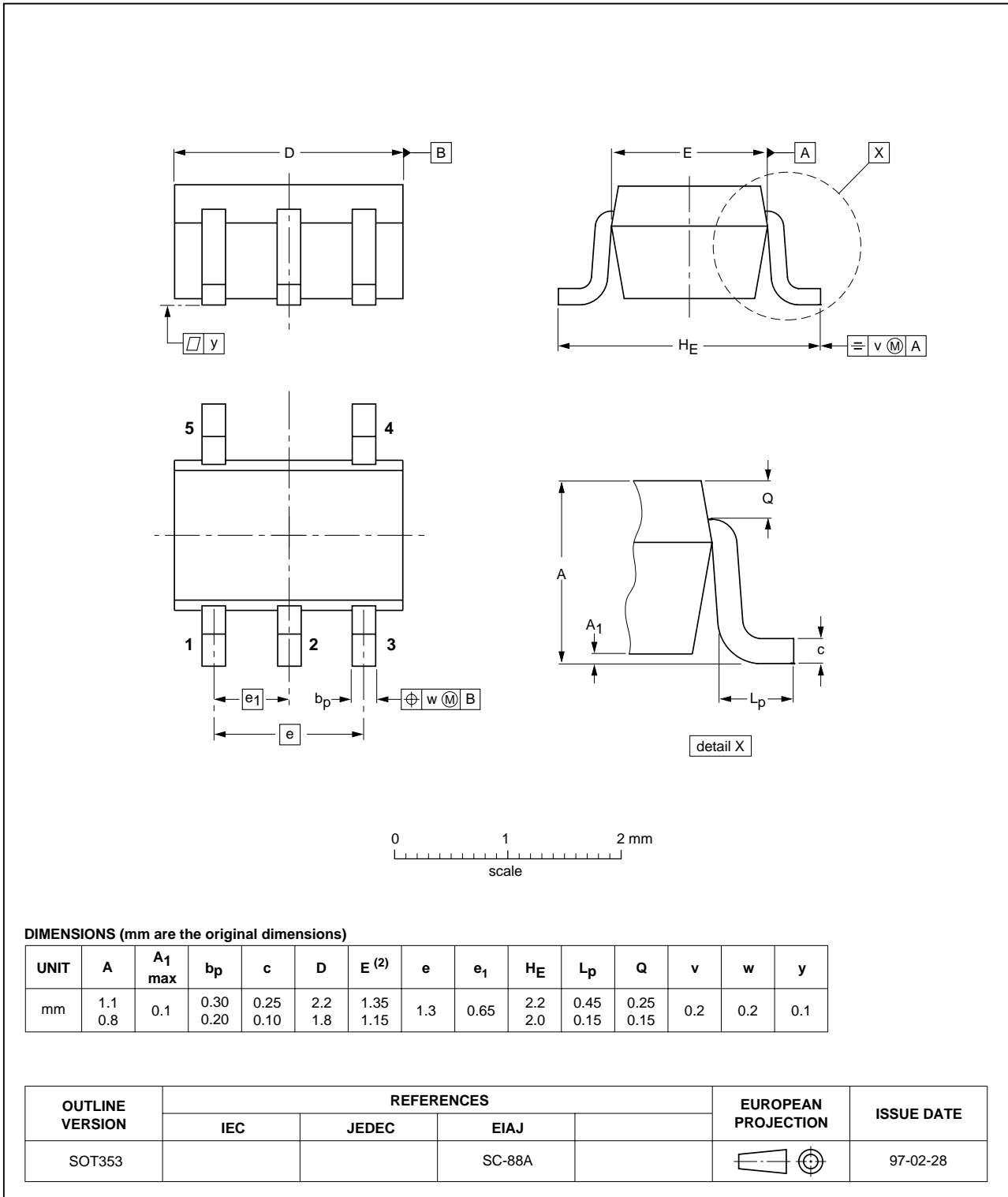
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PACKAGE OUTLINE

Plastic surface mounted package; 5 leads

SOT353



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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.
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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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