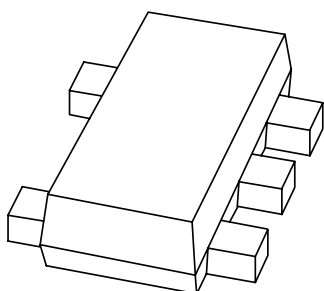


# DATA SHEET



## **PESDxL4UW series**

Low capacitance quadruple ESD  
protection array

Product specification  
Supersedes data of 2003 Aug 15

2004 Apr 06

# Low capacitance quadruple ESD protection array

## PESDxL4UW series

### FEATURES

- Uni-directional ESD protection of four lines or bi-directional ESD protection of 3 lines
- Reverse standoff voltage: 3.3 and 5 V
- Low diode capacitance
- Ultra low leakage current
- Ultra small SOT665 surface mount package
- ESD protection >20 kV
- IEC 61000-4-2; level 4 (ESD); 15 kV (air) or 8 kV (contact).

### APPLICATIONS

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

### MARKING

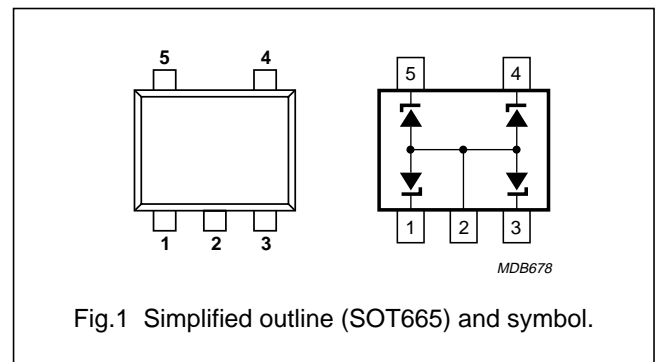
| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| PESD3V3L4UW | A2           |
| PESD5V0L4UW | A1           |

### DESCRIPTION

Low capacitance quadruple ESD protection array in a five pad SOT665 ultra small plastic package designed to protect up to four transmission or data lines from ElectroStatic Discharge (ESD) damage.

### 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 |
| PESD3V3L4UW | -       | plastic surface mounted package; 5 leads | SOT665  |
| PESD5V0L4UW |         |  |         |

## Low capacitance quadruple ESD protection array

## PESDxL4UW series

### LIMITING VALUES

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

| SYMBOL    | PARAMETER                                     | CONDITIONS                            | MIN. | MAX. | UNIT |
|-----------|---|---------------------------------------|------|------|------|
| $I_{pp}$  | peak pulse current                            | 8/20 $\mu$ s; notes 1 and 2           | –    | 3    | A    |
|           | PESD3V3L4UW                                   |                                       |      |      |      |
|           | PESD5V0L4UW                                   |                                       | –    | 2.5  | A    |
| $P_{pp}$  | peak pulse power                              | 8/20 $\mu$ 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    |
|           | PESD3V3L4UW                                   |                                       |      |      |      |
|           | PESD5V0L4UW                                   |                                       | –    | 0.8  | A    |
| $P_{tot}$ | total power dissipation                       | $T_{amb} = 25$ °C; note 3             | –    | 250  | 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   |
| ESD       | electrostatic discharge                       | IEC 61000-4-2 (contact discharge)     | 20   | –    | kV   |
|           |   | HBM MIL-Std 883                       | 10   | –    | kV   |

### Notes

1. Non-repetitive current pulse 8/20  $\mu$ s exponentially decaying waveform see Fig.5.
2. Pins 1, 3, 4 or 5 to pin 2.
3. Device mounted on standard printed-circuit board.

### ESD standards compliance

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

### THERMAL CHARACTERISTICS

| SYMBOL         | PARAMETER  | CONDITIONS                | VALUE | UNIT |
|----------------|--|---------------------------|-------|------|
| $R_{th(j-a)}$  | thermal resistance from junction to ambient      | all diodes loaded         | 370   | K/W  |
| $R_{th(j-sp)}$ | thermal resistance from junction to solder point | one diode loaded; note 1  | 135   | K/W  |
|                |  | all diodes loaded; note 1 | 125   | K/W  |

### Notes

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

# Low capacitance quadruple ESD protection array

## PESDxL4UW series

### ELECTRICAL CHARACTERISTICS

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

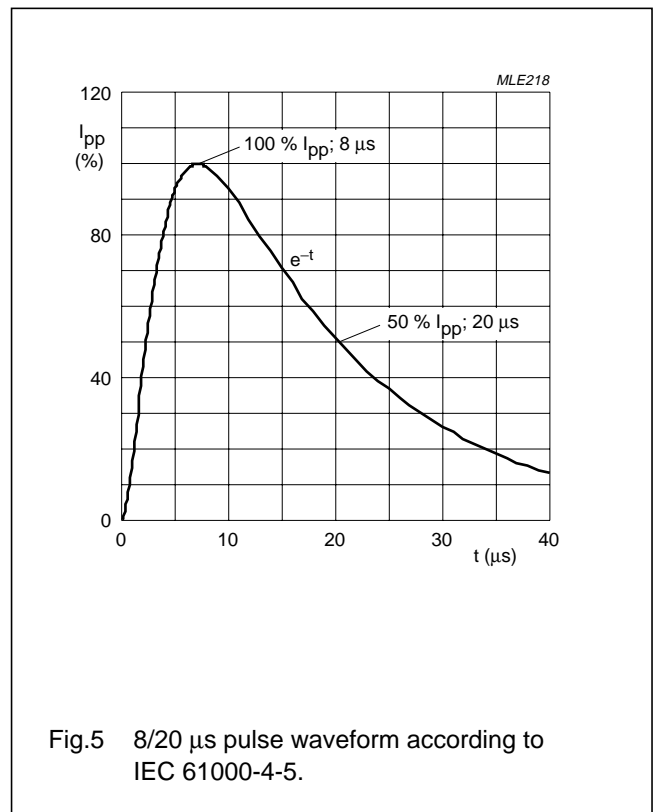
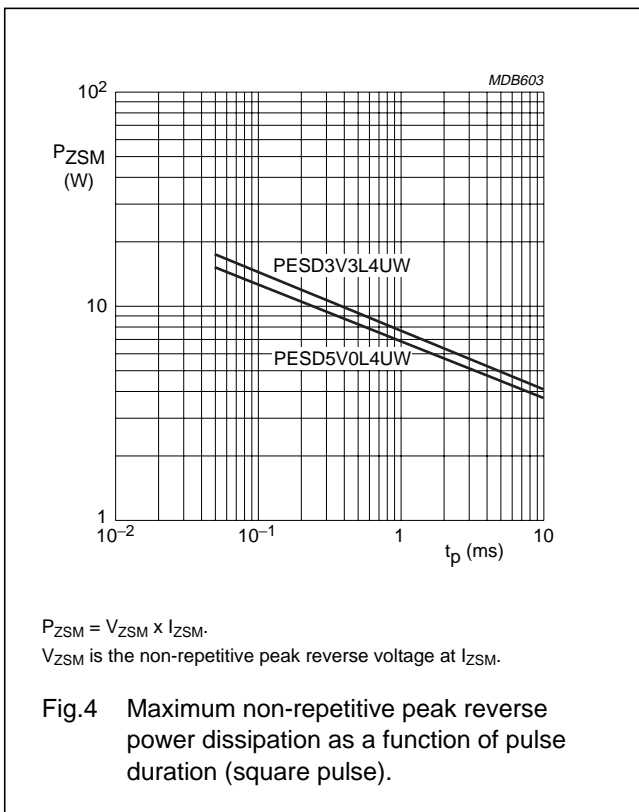
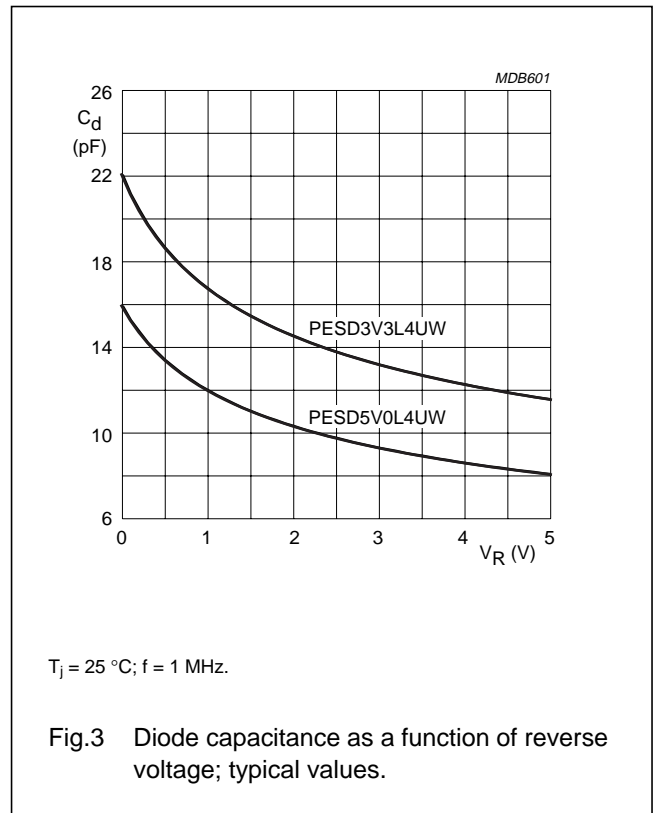
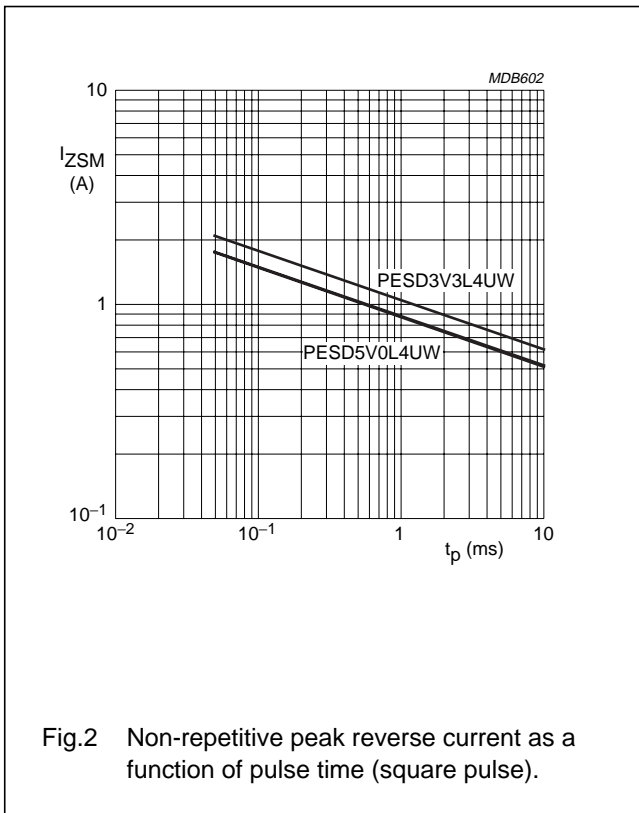
| SYMBOL           | PARAMETER                 | CONDITIONS                              | MIN. | TYP. | MAX. | UNIT     |
|------------------|---------------------------|---|------|------|------|----------|
| <b>Per diode</b> |                           |   |      |      |      |          |
| $V_F$            | forward voltage           | $I_F = 200\text{ mA}$                   | –    | 1    | 1.2  | V        |
| $V_{RWM}$        | reverse stand-off voltage |   |      |      |      |          |
|                  | PESD3V3L4UW               |   | –    | –    | 3.3  | V        |
|                  | PESD5V0L4UW               |   | –    | –    | 5    | V        |
| $I_{RM}$         | reverse leakage current   |   |      |      |      |          |
|                  | PESD3V3L4UW               | $V_{RWM} = 3.3\text{ V}$                | –    | 75   | 300  | nA       |
|                  | PESD5V0L4UW               | $V_{RWM} = 5\text{ V}$                  | –    | 5    | 25   | nA       |
| $V_{(CL)R}$      | clamping voltage          |   |      |      |      |          |
|                  | PESD3V3L4UW               | $I_{pp} = 1\text{ A}$ ; note 1          | –    | –    | 8    | V        |
|                  |                           | $I_{pp} = 3\text{ A}$ ; note 1          | –    | –    | 12   | V        |
|                  | PESD5V0L4UW               | $I_{pp} = 1\text{ A}$ ; note 1          | –    | –    | 10   | V        |
|                  |                           | $I_{pp} = 2.5\text{ A}$ ; note 1        | –    | –    | 13   | V        |
| $V_{BR}$         | breakdown voltage         | $I_Z = 1\text{ mA}$                     |      |      |      |          |
|                  | PESD3V3L4UW               |   | 5.32 | 5.6  | 5.88 | V        |
|                  | PESD5V0L4UW               |   | 6.46 | 6.8  | 7.14 | V        |
| $r_{diff}$       | differential resistance   | $I_R = 1\text{ mA}$                     |      |      |      |          |
|                  | PESD3V3L4UW               |   | –    | –    | 200  | $\Omega$ |
|                  | PESD5V0L4UW               |   | –    | –    | 100  | $\Omega$ |
| $C_d$            | diode capacitance         |   |      |      |      |          |
|                  | PESD3V3L4UW               | $f = 1\text{ MHz}$ ; $V_R = 0\text{ V}$ | –    | 22   | 28   | pF       |
|                  |                           | $f = 1\text{ MHz}$ ; $V_R = 5\text{ V}$ | –    | 12   | 17   | pF       |
|                  | PESD5V0L4UW               | $f = 1\text{ MHz}$ ; $V_R = 0\text{ V}$ | –    | 16   | 19   | pF       |
|                  |                           | $f = 1\text{ MHz}$ ; $V_R = 5\text{ V}$ | –    | 8    | 11   | pF       |

### Notes

- Pins 1, 3, 4 or 5 to pin 2.

Low capacitance quadruple ESD protection array

PESDxL4UW series



# Low capacitance quadruple ESD protection array

## PESDxL4UW series

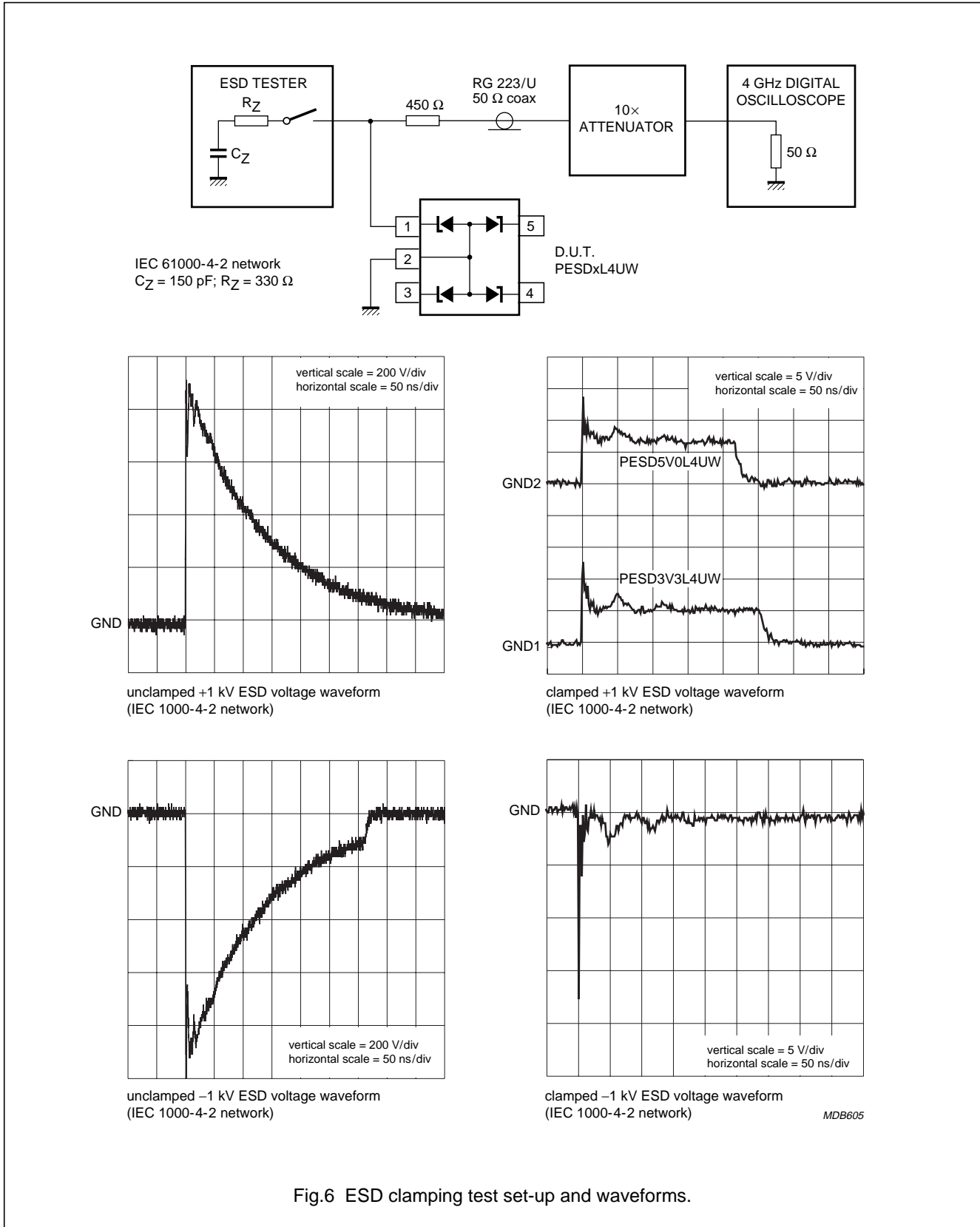


Fig.6 ESD clamping test set-up and waveforms.

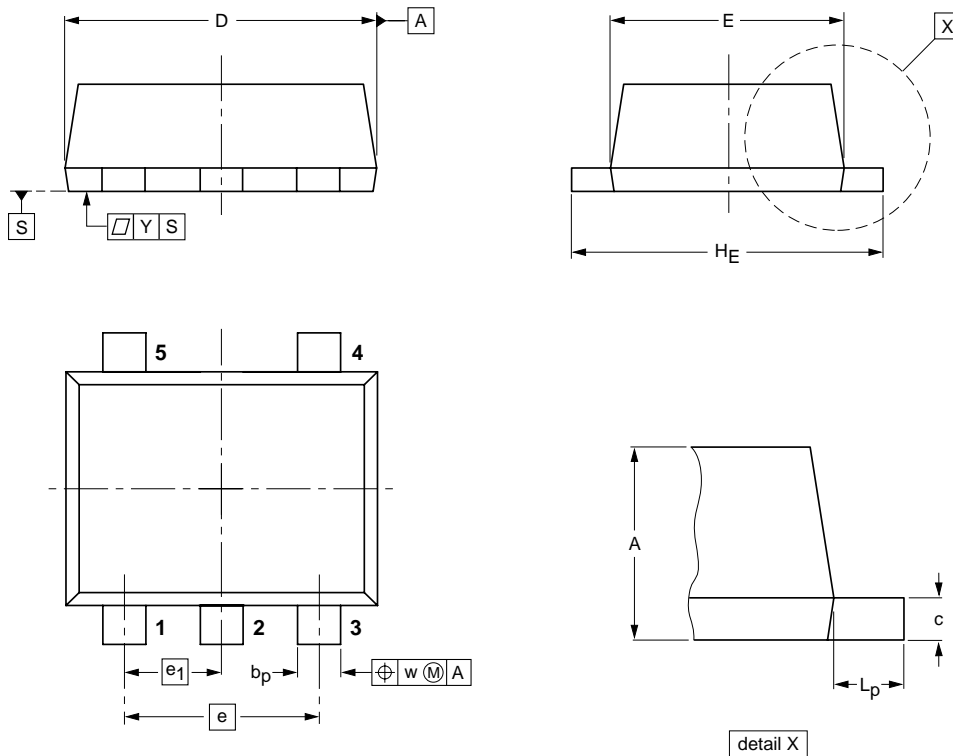
Low capacitance quadruple ESD protection array

PESDxL4UW series

PACKAGE OUTLINE

Plastic surface mounted package; 5 leads

SOT665



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | b <sub>p</sub> | c            | D          | E          | e   | e <sub>1</sub> | H <sub>E</sub> | L <sub>p</sub> | w   | y   |
|------|------------|----------------|--------------|------------|------------|-----|----------------|----------------|----------------|-----|-----|
| mm   | 0.6<br>0.5 | 0.27<br>0.17   | 0.18<br>0.08 | 1.7<br>1.5 | 1.3<br>1.1 | 1.0 | 0.5            | 1.7<br>1.5     | 0.3<br>0.1     | 0.1 | 0.1 |

| OUTLINE VERSION | REFERENCES |       |      | EUROPEAN PROJECTION | ISSUE DATE           |
|-----------------|------------|-------|------|---------------------|----------------------|
|                 | IEC        | JEDEC | EIAJ |                     |                      |
| SOT665          |            |       |      |                     | 01-01-04<br>01-08-27 |

## Low capacitance quadruple ESD protection array

## PESDxL4UW series

### DATA SHEET STATUS

| LEVEL | DATA SHEET STATUS <sup>(1)</sup> | PRODUCT STATUS <sup>(2)(3)</sup> | DEFINITION   |
|-------|----------------------------------|----------------------------------|--|
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| 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.             |
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