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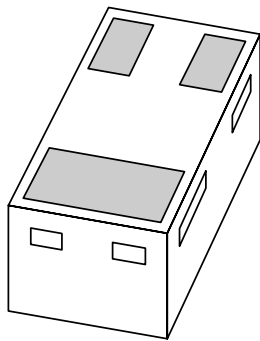
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Kind regards,

Team Nexperia

# DATA SHEET



## **PESDxL2UM series** Low capacitance double ESD protection diode

Product data sheet  
Supersedes data of 2003 Aug 05

2005 May 23

# Low capacitance double ESD protection diode

## PESDxL2UM series

### FEATURES

- Uni-directional ESD protection of two lines or bi-directional ESD protection of one line
- Reverse standoff voltage 3.3 and 5 V
- Low diode capacitance
- Ultra low leakage current
- Leadless ultra small SOT883 surface mount package (1 × 0.6 × 0.5 mm)
- Board space 1.17 mm<sup>2</sup> (approx. 10% of SOT23)
- ESD protection >15 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

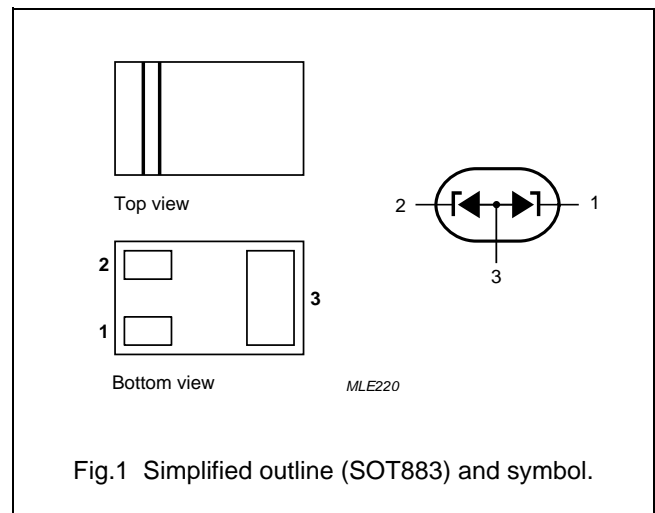
| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| PESD3V3L2UM | F2           |
| PESD5V0L2UM | F1           |

### DESCRIPTION

Low capacitance ESD protection diode in a three pad SOT883 leadless ultra small plastic package designed to protect up to two transmission or data lines from ElectroStatic Discharge (ESD) damage.

### PINNING

| PIN | DESCRIPTION  |
|-----|--------------|
| 1   | cathode 1    |
| 2   | cathode 2    |
| 3   | common anode |



# Low capacitance double ESD protection diode

## PESDxL2UM series

### LIMITING VALUES

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

| SYMBOL           | PARAMETER                                     | CONDITIONS                            | MIN. | MAX. | UNIT |
|------------------|---|---------------------------------------|------|------|------|
| <b>Per diode</b> |   |                                       |      |      |      |
| $I_{pp}$         | peak pulse current                            | 8/20 $\mu$ s pulse; notes 1, 2 and 3  | –    | 3    | A    |
|                  | PESD3V3L2UM<br>PESD5V0L2UM                    |                                       |      | 2.5  | A    |
| $P_{pp}$         | peak pulse power                              | 8/20 $\mu$ s pulse; notes 1, 2 and 3  | –    | 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    |
|                  | PESD3V3L2UM<br>PESD5V0L2UM                    |                                       |      | 0.8  | A    |
| $P_{tot}$        | total power dissipation                       | $T_{amb} = 25$ °C; note 4             | –    | 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)     | 15   | –    | kV   |
|                  |   | HBM MIL-Std 883                       | 10   | –    | kV   |

### Notes

1. Non-repetitive current pulse 8/20  $\mu$ s exponential decay waveform; see Fig.5.
2. Pins 1 and 3 or 2 and 3.
3. Pins 1 and 2.
4. 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; note 1 | 500   | K/W  |
|               |   | one diode loaded; note 2  | 290   | K/W  |

### Notes

1. Refer to SOT883 standard mounting conditions (footprint), FR4 with 60  $\mu$ m copper strip line.
2. FR4 single-sided copper 1 cm<sup>2</sup>.

Low capacitance double ESD protection diode

PESDxL2UM series

**ELECTRICAL CHARACTERISTICS**

T<sub>j</sub> = 25 °C unless otherwise specified.

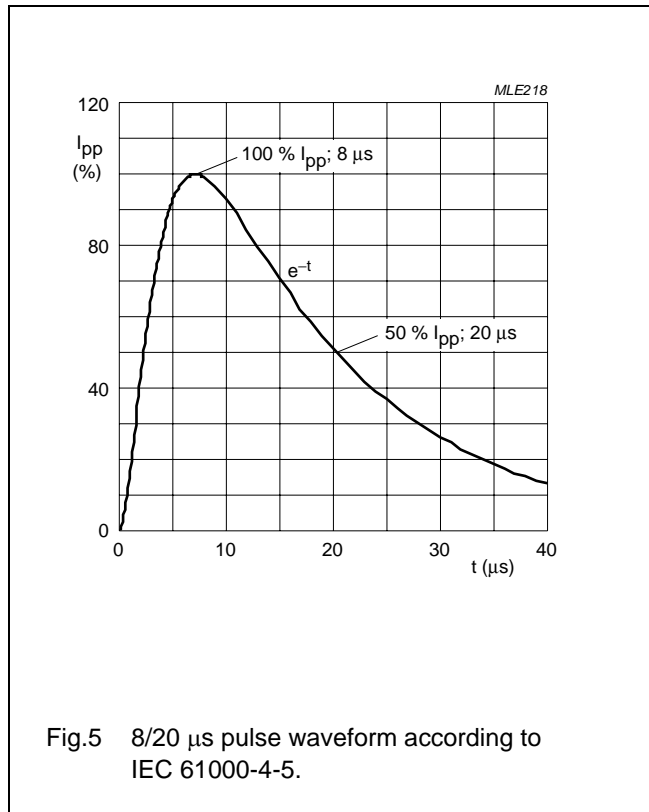
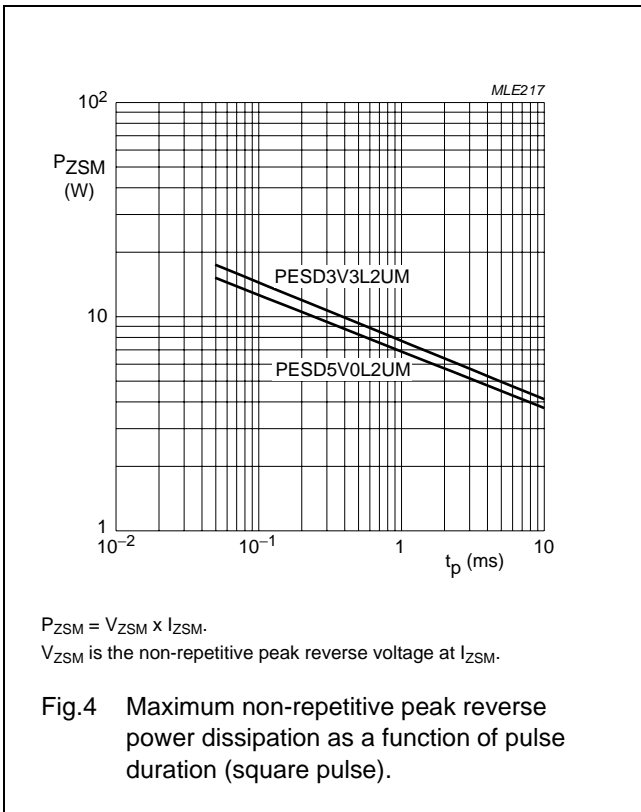
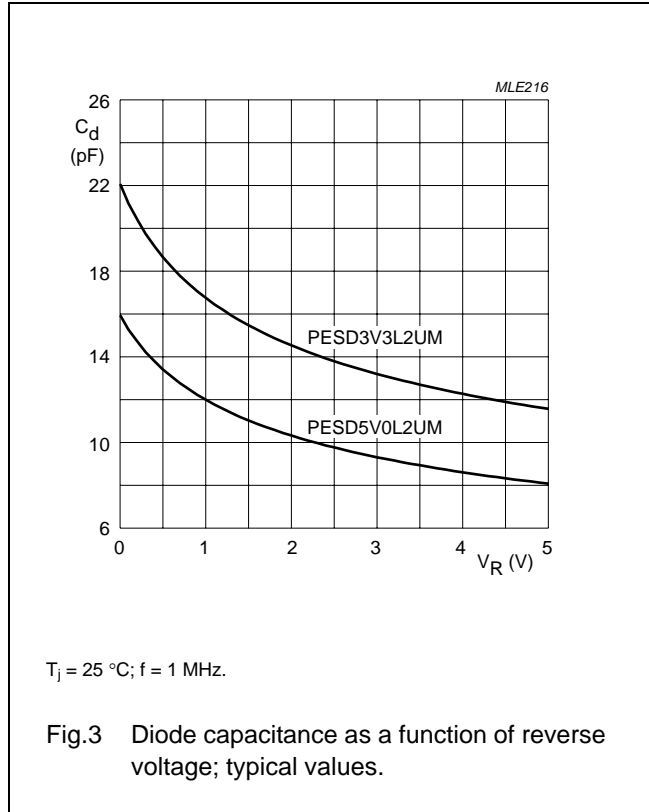
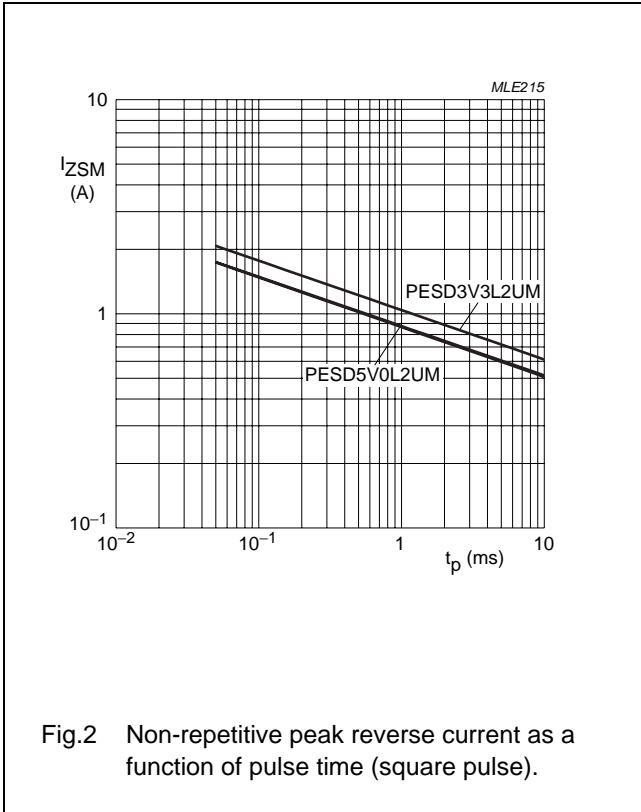
| SYMBOL             | PARAMETER                              | CONDITIONS                             | MIN. | TYP. | MAX. | UNIT |
|--------------------|--|--|------|------|------|------|
| <b>Per diode</b>   |  |  |      |      |      |      |
| V <sub>F</sub>     | forward voltage                        | I <sub>F</sub> = 200 mA                | –    | 1    | 1.2  | V    |
| V <sub>RWM</sub>   | reverse stand-off voltage              |  |      |      |      |      |
|                    | PESD3V3L2UM                            |  | –    | –    | 3.3  | V    |
|                    | PESD5V0L2UM                            |  | –    | –    | 5    | V    |
| I <sub>RM</sub>    | reverse leakage current                |  |      |      |      |      |
|                    | PESD3V3L2UM                            | V <sub>R</sub> = 3.3 V                 | –    | 75   | 300  | nA   |
|                    | PESD5V0L2UM                            | V <sub>R</sub> = 5 V                   | –    | 5    | 25   | nA   |
| V <sub>(CL)R</sub> | clamping voltage<br>PESD3V3L2UM        | 8/20 μs pulse                          |      |      |      |      |
|                    |  | I <sub>pp</sub> = 1 A; notes 1 and 2   | –    | –    | 8    | V    |
|                    |  | I <sub>pp</sub> = 3 A; notes 1 and 2   | –    | –    | 12   | V    |
|                    |  | I <sub>pp</sub> = 1 A; notes 1 and 3   | –    | –    | 9    | V    |
|                    | PESD5V0L2UM                            | I <sub>pp</sub> = 3 A; notes 1 and 3   | –    | –    | 13   | V    |
|                    |  | I <sub>pp</sub> = 1 A; notes 1 and 2   | –    | –    | 10   | V    |
|                    |  | I <sub>pp</sub> = 2.5 A; notes 1 and 2 | –    | –    | 13   | V    |
|                    |  | I <sub>pp</sub> = 1 A; notes 1 and 3   | –    | –    | 11   | V    |
|                    | I <sub>pp</sub> = 2.5 A; notes 1 and 3 | –                                      | –    | 15   | V    |      |
| V <sub>BR</sub>    | breakdown voltage                      | I <sub>Z</sub> = 1 mA                  |      |      |      |      |
|                    | PESD3V3L2UM                            |  | 5.32 | 5.6  | 5.88 | V    |
|                    | PESD5V0L2UM                            |  | 6.46 | 6.8  | 7.14 | V    |
| S <sub>Z</sub>     | temperature coefficient                | I <sub>Z</sub> = 1 mA                  |      |      |      |      |
|                    | PESD3V3L2UM                            |  | –    | 1.3  | –    | mV/K |
|                    | PESD5V0L2UM                            |  | –    | 2.9  | –    | mV/K |
| r <sub>diff</sub>  | differential resistance                | I <sub>R</sub> = 1 mA                  |      |      |      |      |
|                    | PESD3V3L2UM                            |  | –    | –    | 200  | Ω    |
|                    | PESD5V0L2UM                            |  | –    | –    | 100  | Ω    |
| C <sub>d</sub>     | diode capacitance<br>PESD3V3L2UM       | f = 1 MHz; V <sub>R</sub> = 0          | –    | 22   | 28   | pF   |
|                    |  | f = 1 MHz; V <sub>R</sub> = 5          | –    | 12   | 17   | pF   |
|                    | PESD5V0L2UM                            | f = 1 MHz; V <sub>R</sub> = 0          | –    | 16   | 19   | pF   |
|                    |  | f = 1 MHz; V <sub>R</sub> = 5          | –    | 8    | 11   | pF   |

**Notes**

1. Non-repetitive current pulse 8/20 μs exponential decay waveform; see Fig.5.
2. Pins 1 and 3 or 2 and 3.
3. Pins 1 and 2.

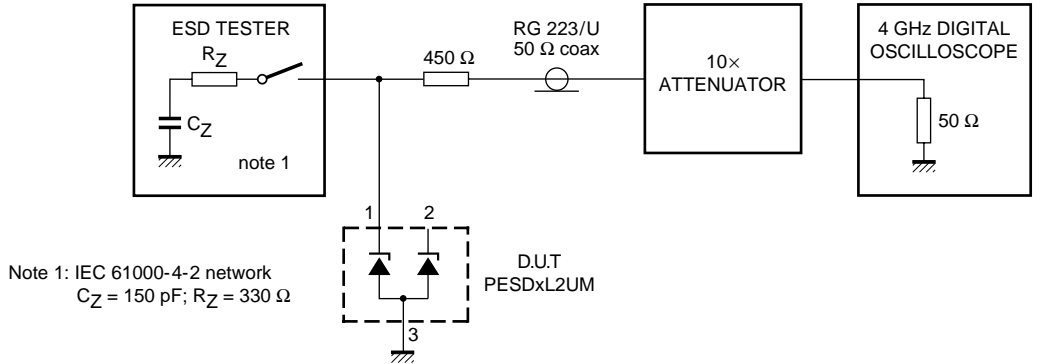
Low capacitance double ESD protection diode

PESDxL2UM series

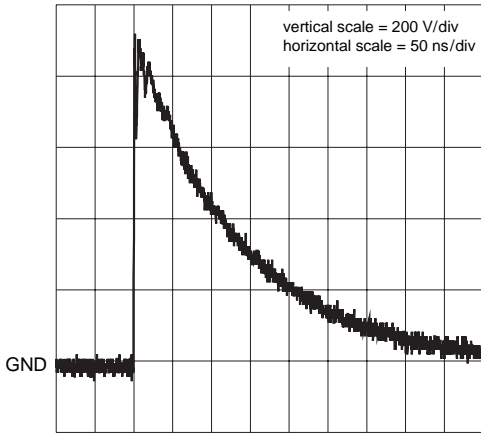


# Low capacitance double ESD protection diode

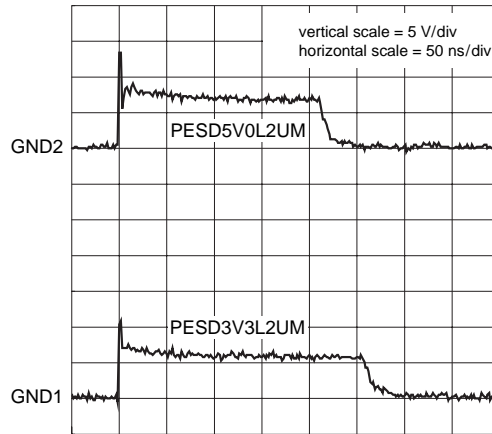
## PESDxL2UM series



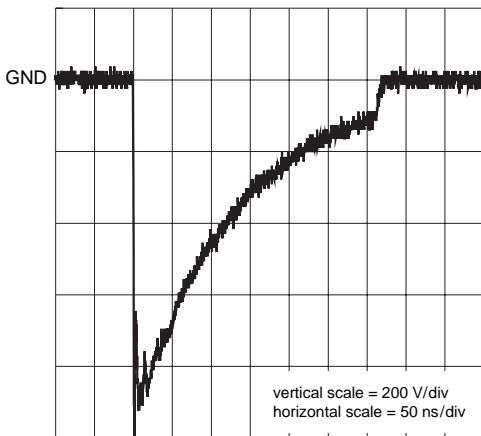
Note 1: IEC 61000-4-2 network  
 $C_Z = 150 \text{ pF}$ ;  $R_Z = 330 \text{ }\Omega$



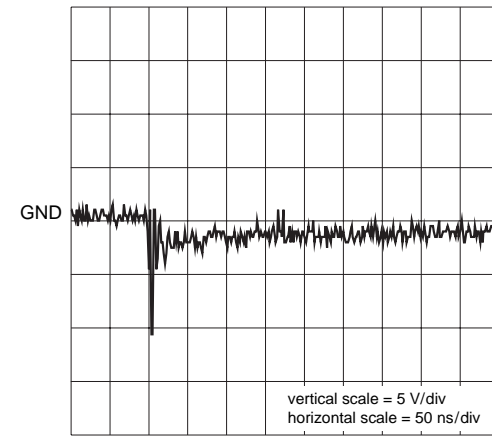
unclamped +1 kV ESD voltage waveform (IEC 61000-4-2 network)



clamped +1 kV ESD voltage waveform (IEC 61000-4-2 network)



unclamped -1 kV ESD voltage waveform (IEC 61000-4-2 network)



clamped -1 kV ESD voltage waveform (IEC 61000-4-2 network)

MLE219

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

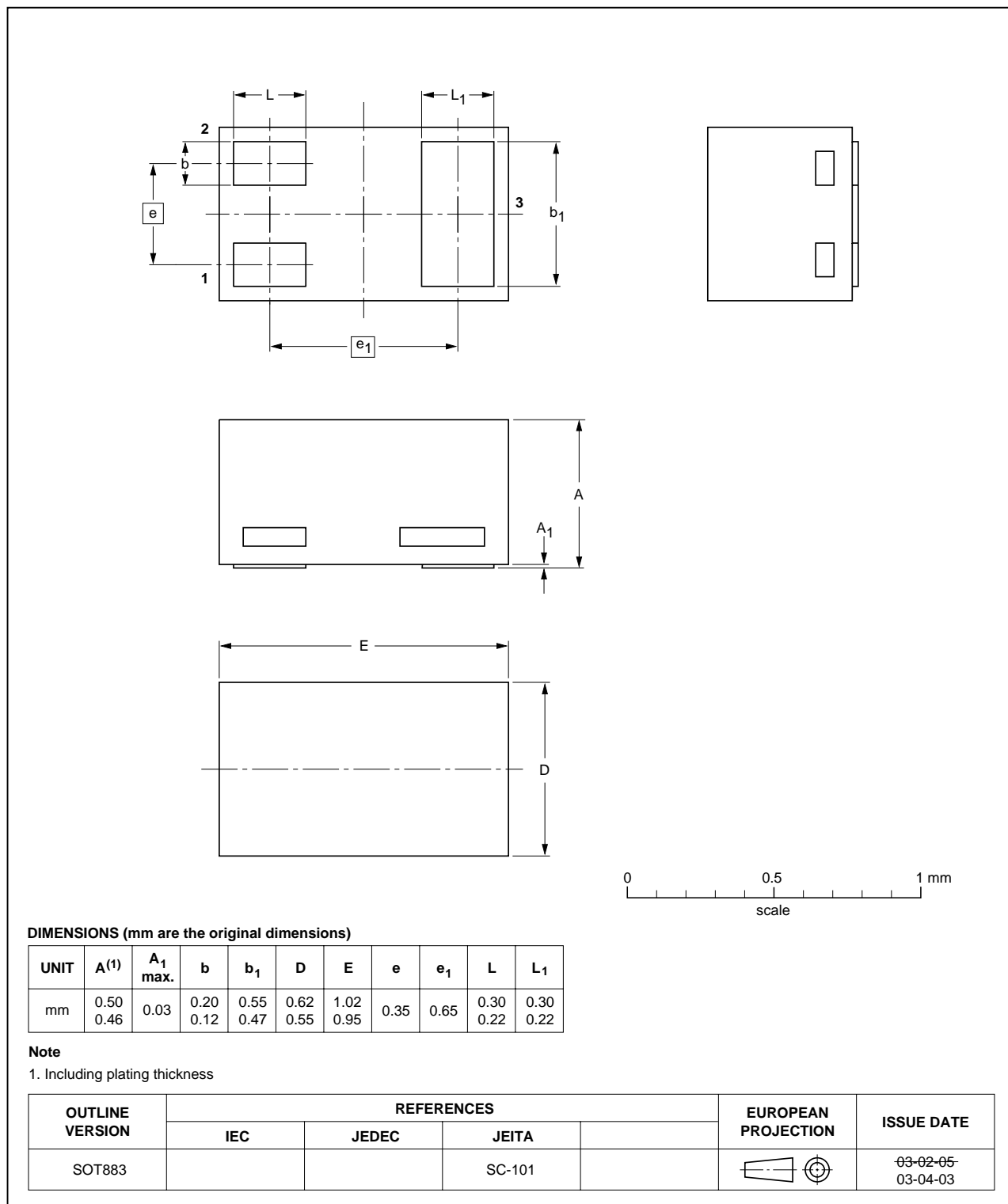
# Low capacitance double ESD protection diode

## PESDxL2UM series

### PACKAGE OUTLINE

Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm

SOT883



Low capacitance double ESD protection diode

PESDxL2UM series

**DATA SHEET STATUS**

| DOCUMENT STATUS <sup>(1)</sup> | PRODUCT STATUS <sup>(2)</sup> | DEFINITION  |
|--------------------------------|-------------------------------|---|
| Objective data sheet           | Development                   | This document contains data from the objective specification for product development. |
| Preliminary data sheet         | Qualification                 | This document contains data from the preliminary specification.                       |
| Product data sheet             | Production                    | This document contains the product specification.                                     |

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# ***NXP Semiconductors***

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