PESD3V3U1UA; PESD3V3U1UB; PESD3V3U1UL

Ultra low capacitance unidirectional ESD protection diodes

Rev. 01 — 30 October 2008

Product data sheet

1. Product profile

1.1 General description

Ultra low capacitance unidirectional ElectroStatic Discharge (ESD) protection diodes in small Surface-Mounted Device (SMD) plastic packages designed to protect one signal line from the damage caused by ESD and other transients.

Table 1. Product overview

Type number	ype number Package		Package configuration
	NXP	JEITA	
PESD3V3U1UA	SOD323	SC-76	very small
PESD3V3U1UB	SOD523	SC-79	ultra small and flat lead
PESD3V3U1UL	SOD882	-	leadless ultra small

1.2 Features

- Unidirectional ESD protection of one line ESD protection up to 9 kV
- Ultra low diode capacitance: C_d = 2.6 pF IEC 61000-4-2; level 4 (ESD)
- Very low leakage current: I_{RM} = 1 nA

1.3 Applications

- USB interfaces
- 10/100/1000 Mbit/s Ethernet
- FireWire
- High-speed data lines
- Subscriber Identity Module (SIM) card protection

1.4 Quick reference data

Table 2.Quick reference data

 $T_{amb} = 25 \circ C$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Тур	Мах	Unit
V _{RWM}	reverse standoff voltage		-	-	3.3	V
C _d	diode capacitance	$f = 1 \text{ MHz}; V_R = 0 \text{ V}$	-	2.6	3.1	pF



- Cellular handsets and accessories
- Portable electronics

AEC-Q101 qualified

- Communication systems
- Computers and peripherals
- Audio and video equipment

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2. Pinning information

Table 3.	Pinning		
Pin	Description	Simplified outline	Graphic symbol
PESD3V3	3U1UA; PESD3V3U1UB		
1	cathode	[1]	
2	anode	1 2 001aab540	1 2 006aaa152
PESD3V	3U1UL		
1	cathode	<u>[1]</u>	
2	anode	1 2 Transparent top view	1 2 006aaa152

[1] The marking bar indicates the cathode.

3. Ordering information

Table 4. Orderi	ing informa	tion	
Type number	Package		
	Name	Description	Version
PESD3V3U1UA	SC-76	plastic surface-mounted package; 2 leads	SOD323
PESD3V3U1UB	SC-79	plastic surface-mounted package; 2 leads	SOD523
PESD3V3U1UL	-	leadless ultra small plastic package; 2 terminals; body $1.0 \times 0.6 \times 0.5$ mm	SOD882

4. Marking

Table 5. Marking codesType numberMarking codePESD3V3U1UAQTPESD3V3U1UBT8PESD3V3U1ULXZ

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5. Limiting values

Table 6. Limiting values

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

Symbol	Parameter	Conditions	Min	Max	Unit
Tj	junction temperature		-	150	°C
T _{amb}	ambient temperature		-55	+150	°C
T _{stg}	storage temperature		-65	+150	°C

Table 7.ESD maximum ratings

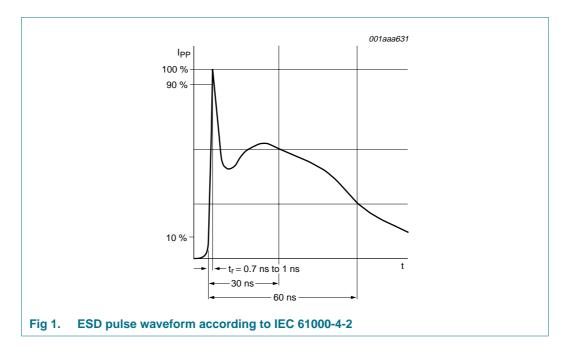
 $T_{amb} = 25 \circ C$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Max	Unit
V _{ESD}	electrostatic discharge voltage	IEC 61000-4-2 (contact discharge)	<u>[1]</u> _	9	kV
		MIL-STD-883 (human body model)	-	10	kV

[1] Device stressed with ten non-repetitive ESD pulses.

Table 8. ESD standards compliance

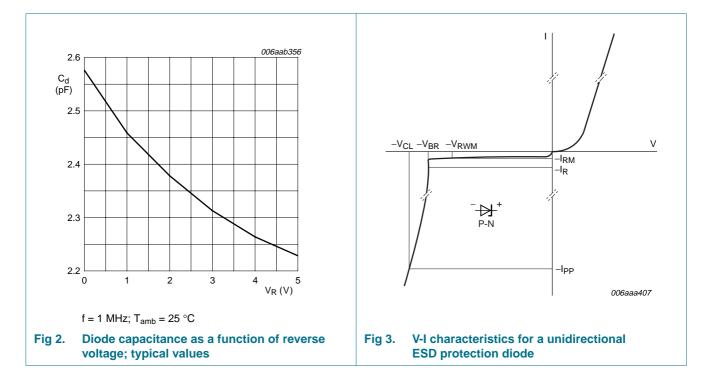
Standard	Conditions
IEC 61000-4-2; level 4 (ESD)	> 8 kV (contact)
MIL-STD-883; class 3 (human body model)	> 4 kV



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6. Characteristics

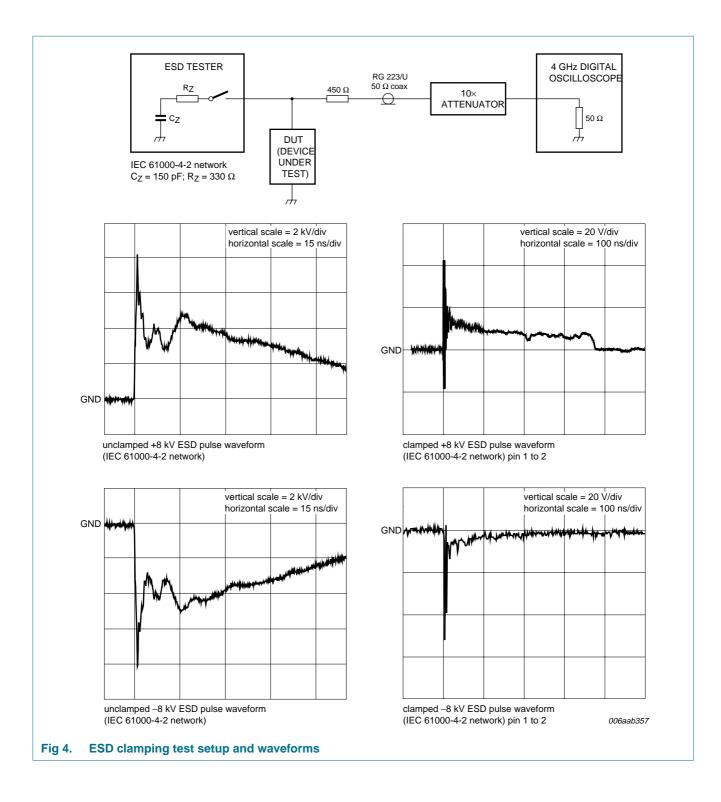
Table 9. $T_{amb} = 25^\circ$	Characteristics °C unless otherwise specific	ed.				
Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V _{RWM}	reverse standoff voltage		-	-	3.3	V
I _{RM}	reverse leakage current	$V_{RWM} = 3 V$	-	1	100	nA
V _{BR}	breakdown voltage	$I_R = 5 \text{ mA}$	4.5	5.6	6.8	V
C _d	diode capacitance	$f = 1 \text{ MHz}; V_R = 0 \text{ V}$	-	2.6	3.1	pF
r _{dif}	differential resistance	I _R = 5 mA	-	-	100	Ω



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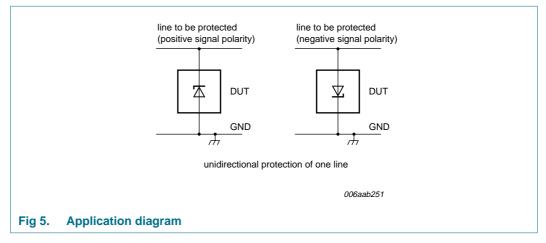


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7. Application information

The PESD3V3U1Ux series is designed for the protection of one unidirectional data or signal line from the damage caused by ESD. The devices may be used on lines where the signal polarities are either positive or negative with respect to ground.



Circuit board layout and protection device placement

Circuit board layout is critical for the suppression of ESD and Electrical Fast Transient (EFT). The following guidelines are recommended:

- 1. Place the device as close to the input terminal or connector as possible.
- 2. The path length between the device and the protected line should be minimized.
- 3. Keep parallel signal paths to a minimum.
- 4. Avoid running protected conductors in parallel with unprotected conductors.
- 5. Minimize all Printed-Circuit Board (PCB) conductive loops including power and ground loops.
- 6. Minimize the length of the transient return path to ground.
- 7. Avoid using shared transient return paths to a common ground point.
- 8. Ground planes should be used whenever possible. For multilayer PCBs, use ground vias.

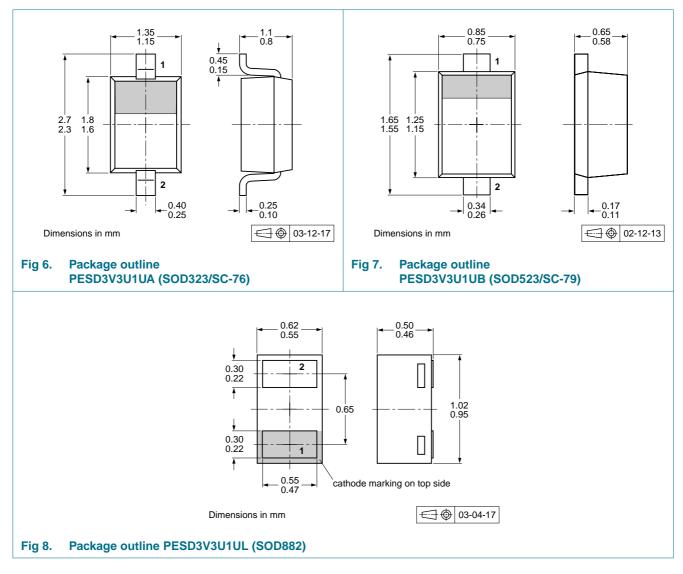
8. Test information

8.1 Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard *Q101* - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

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9. Package outline



10. Packing information

Table 10. Packing methods

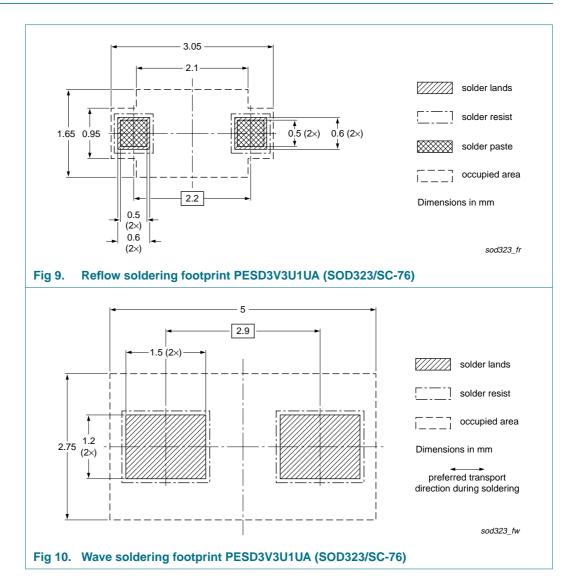
The indicated -xxx are the last three digits of the 12NC ordering code.[1]

Type number	Package	Description	Packing quantity		
			3000	8000	10000
PESD3V3U1UA	SOD323	4 mm pitch, 8 mm tape and reel	-115	-	-135
PESD3V3U1UB	SOD523	2 mm pitch, 8 mm tape and reel	-	-315	-
		4 mm pitch, 8 mm tape and reel	-115	-	-135
PESD3V3U1UL	SOD882	2 mm pitch, 8 mm tape and reel	-	-	-315

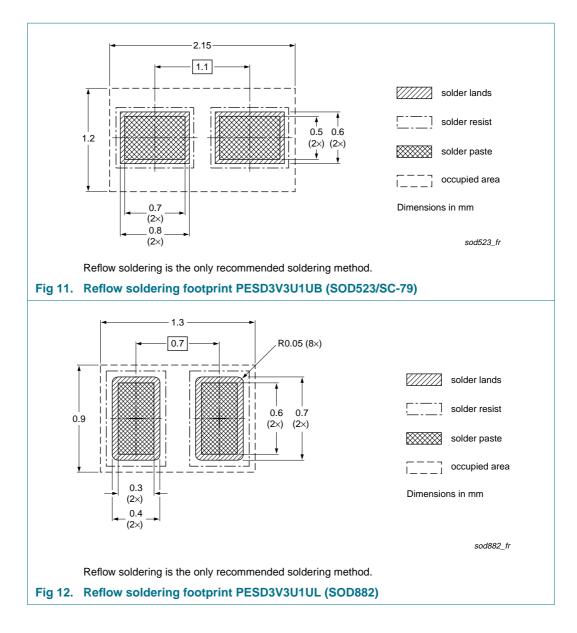
[1] For further information and the availability of packing methods, see Section 14.

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11. Soldering



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12. Revision history

Table 11. Revision history	/			
Document ID	Release date	Data sheet status	Change notice	Supersedes
PESD3V3U1UA_UB_UL_1	20081030	Product data sheet	-	-

13. Legal information

13.1 Data sheet status

Document status ^{[1][2]}	Product status ^[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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