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PESD3V3U1UA; PESD3V3U1UB; PESD3V3U1UL

Ultra low capacitance unidirectional ESD protection diodes



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	Package		Package configuration
	Nexperia	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
- AEC-Q101 qualified

1.3 Applications

- USB interfaces
- 10/100/1000 Mbit/s Ethernet
- FireWire
- High-speed data lines
- Subscriber Identity Module (SIM) card protection
- Cellular handsets and accessories
- Portable electronics
- Communication systems
- Computers and peripherals
- Audio and video equipment

1.4 Quick reference data

Table 2. Quick reference data

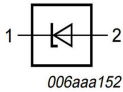
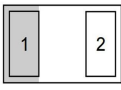
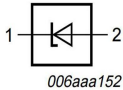
$T_{amb} = 25^\circ\text{C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage		-	-	3.3	V
C_d	diode capacitance	$f = 1$ MHz; $V_R = 0$ V	-	2.6	3.1	pF

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2. Pinning information

Table 3. Pinning

Pin	Description	Simplified outline	Graphic symbol
PESD3V3U1UA; PESD3V3U1UB			
1	cathode	 001aab540	 006aaa152
2	anode		
PESD3V3U1UL			
1	cathode	 Transparent top view	 006aaa152
2	anode		

[1] The marking bar indicates the cathode.

3. Ordering information

Table 4. Ordering information

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 × 0.6 × 0.5 mm	SOD882

4. Marking

Table 5. Marking codes

Type number	Marking code
PESD3V3U1UA	QT
PESD3V3U1UB	T8
PESD3V3U1UL	XZ

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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
T_j	junction temperature		-	150	°C
T_{amb}	ambient temperature		-55	+150	°C
T_{stg}	storage temperature		-65	+150	°C

Table 7. ESD maximum ratings

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

Symbol	Parameter	Conditions	Min	Max	Unit
V_{ESD}	electrostatic discharge voltage	IEC 61000-4-2 (contact discharge)	[1] -	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

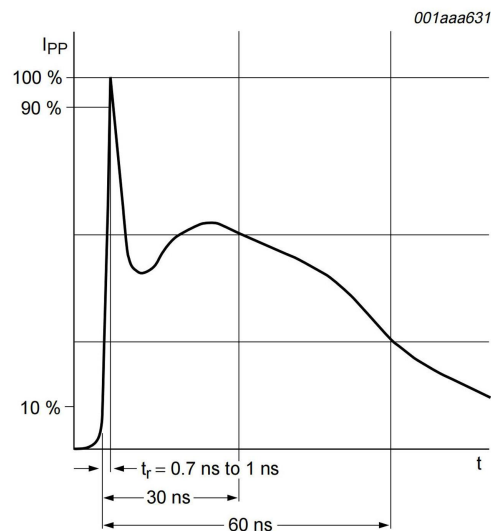


Fig 1. ESD pulse waveform according to IEC 61000-4-2

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6. Characteristics

Table 9. Characteristics
 $T_{amb} = 25^{\circ}\text{C}$ unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{RWM}	reverse standoff voltage		-	-	3.3	V
I_{RM}	reverse leakage current	$V_{RWM} = 3\text{ V}$	-	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	$I_R = 5\text{ mA}$	-	-	100	Ω



$f = 1\text{ MHz}; T_{amb} = 25^{\circ}\text{C}$

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

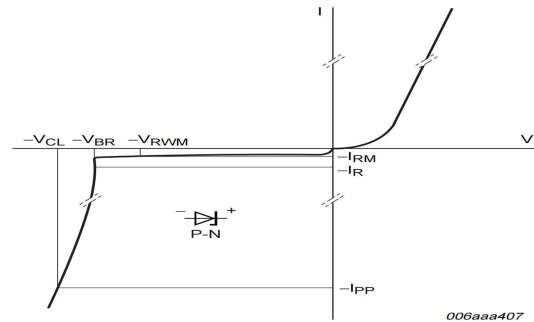


Fig 3. V-I characteristics for a unidirectional ESD protection diode

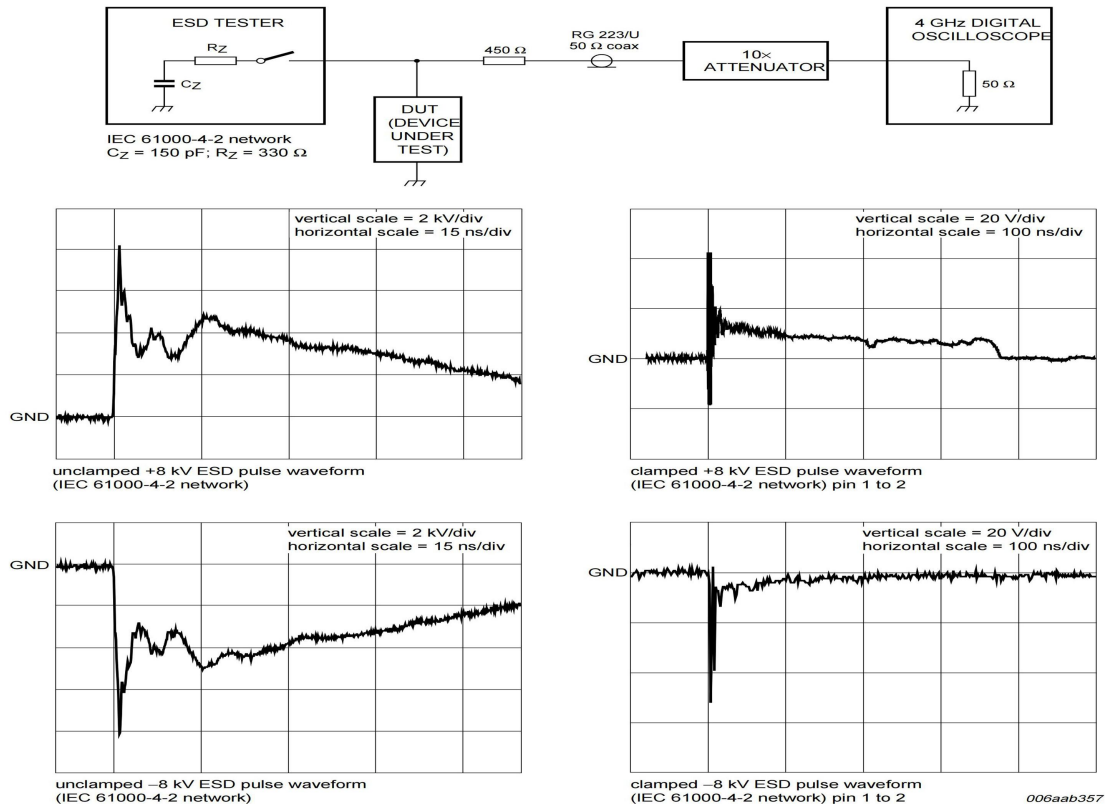


Fig 4. ESD clamping test setup and waveforms