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PESD3V3L1UA; PESD3V3L1UB; PESD3V3L1UL

Low capacitance unidirectional ESD protection diodes

1.1 General description

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	
PESD3V3L1UA	SOD323	SC-76	very small
PESD3V3L1UB	SOD523	SC-79	ultra small and flat lead
PESD3V3L1UL	SOD882	-	leadless ultra small

1.2 Features

- Unidirectional ESD protection of one line
- Low diode capacitance: C_d = 34 pF
- Low clamping voltage: V_{CL} = 11 V
- Very low leakage current: I_{RM} = 100 nA
- ESD protection up to 30 kV
- IEC 61000-4-2; level 4 (ESD)
- AEC-Q101 qualified

1.3 Applications

- Computers and peripherals
- Audio and video equipment
- Cellular handsets and accessories
- Communication systems
- Subscriber Identity Module (SIM) card protection
- Portable electronics
- FireWire
- High-speed data lines

1.4 Quick reference data

Table 2. Quick reference data

T_{amb} = 25 °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	-	34	40	pF

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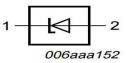
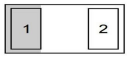
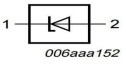
2. Pinning information

Table 3. Pinning

Pin	Description		Simplified outline	Graphic symbol
PESD3V3L1UA; PESD3V3L1UB				
1	cathode	[1]	 001aab540	 006aaa152
2	anode			
PESD3V3L1UL				
1	cathode	[1]	 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
PESD3V3L1UA	SC-76	plastic surface-mounted package; 2 leads	SOD323
PESD3V3L1UB	SC-79	plastic surface-mounted package; 2 leads	SOD523
PESD3V3L1UL	-	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
PESD3V3L1UA	1H
PESD3V3L1UB	Z7
PESD3V3L1UL	XW

5. Limiting values

Table 6. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
P_{PP}	peak pulse power	t_p = 8/20 µs	[1][2]	-	45	W
I_{PP}	peak pulse current	t_p = 8/20 µs	[1][2]	-	4.5	A
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			−55	+150	°C
T_{stg}	storage temperature			−65	+150	°C

[1] Non-repetitive current pulse 8/20 µs exponential decay waveform according to IEC 61000-4-5.

[2] Measured from pin 1 to pin 2.

Table 7. ESD maximum ratings

T_{amb} = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Max	Unit
V_{ESD}	electrostatic discharge voltage	IEC 61000-4-2 (contact discharge)	[1]	-	30	kV
		machine model		-	400	V
		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)	> 15 kV (air); > 8 kV (contact)
MIL-STD-883; class 3 (human body model)	> 4 kV

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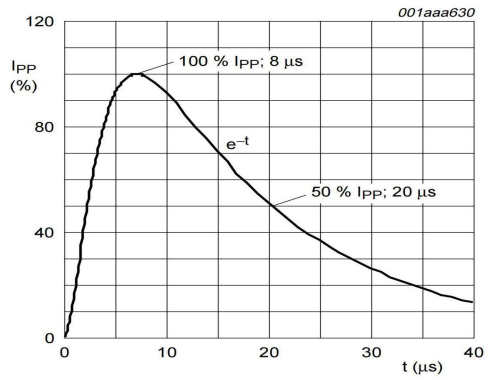


Fig 1. 8/20 µs pulse waveform according to IEC 61000-4-5

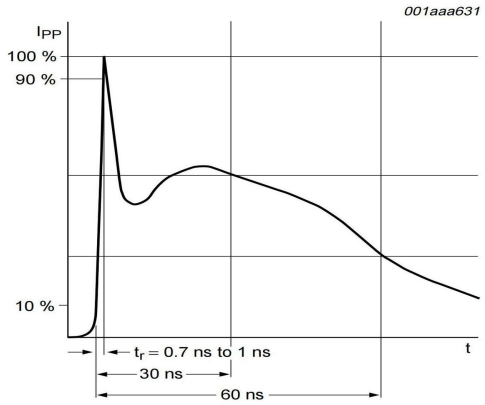


Fig 2. ESD pulse waveform according to IEC 61000-4-2

6. Characteristics

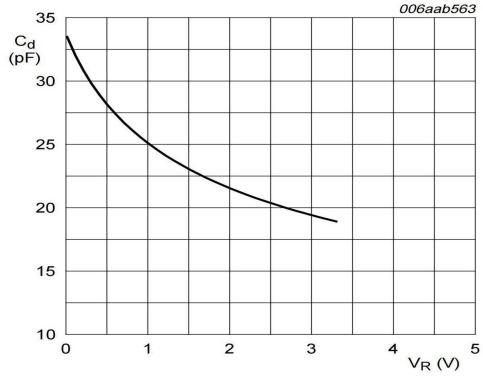
Table 9. Characteristics

T_{amb} = 25 °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} = 3.3 V	-	100	300	nA
V_{BR}	breakdown voltage	I_R = 5 mA	5.3	5.6	6.0	V
C_d	diode capacitance	f = 1 MHz; V_R = 0 V	-	34	40	pF
V_{CL}	clamping voltage	[1][2]				
		I_{PP} = 1 A	-	-	8	V
		I_{PP} = 4.5 A	-	-	11	V
r_{dif}	differential resistance	I_R = 5 mA	-	-	30	Ω
V_F	forward voltage	I_F = 200 mA	-	-	1.2	V

[1] Non-repetitive current pulse 8/20 µs exponential decay waveform according to IEC 61000-4-5.

[2] Measured from pin 1 to pin 2.



f = 1 MHz; T_{amb} = 25 °C

Fig 3. Diode capacitance as a function of reverse voltage; typical values

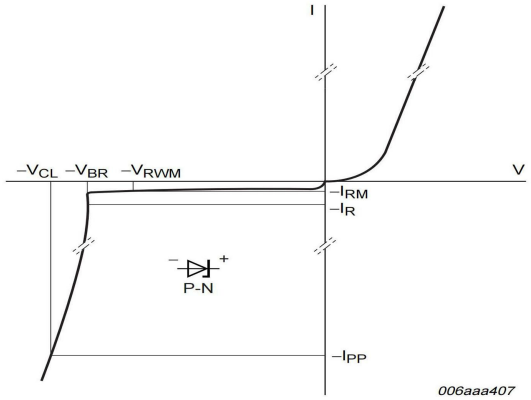


Fig 4. V-I characteristics for a unidirectional ESD protection diode