

## EOS and ESD Transil™ protection for charger and battery port

### Features

- Breakdown voltage  $V_{BR} = 8.2 \text{ V}$
- Unidirectional device
- High peak power dissipation: 500 W (8/20  $\mu\text{s}$  waveform)
- ESD protection level better than IEC 61000-4-2, level 4: 30 kV contact discharge
- Low leakage current ( $< 0.5 \mu\text{A}$  @ 5 V)

### Benefits

- High EOS and ESD protection level
- High integration
- Suitable for high density boards

### Complies with the following standards:

- IEC 61000-4-2 level 4
  - $\pm 15 \text{ kV}$  (air discharge)
  - $\pm 8 \text{ kV}$  (contact discharge)
- MIL STD 883G - Method 3015-7: class 3B
  - HBM (human body model):  $\geq 8 \text{ kV}$

### Applications

This product is particularly recommended for the protection of power supply lines of portable devices, where EOS and ESD transient overvoltage protection in sensitive equipment is required, such as:

- Computers
- Printers
- Communication systems
- Cellular phone handsets and accessories
- Video equipment

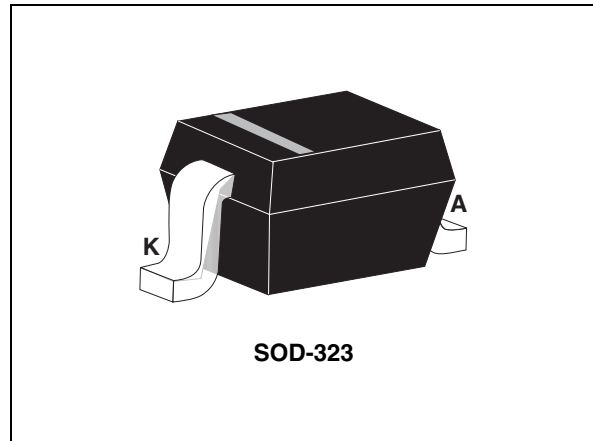
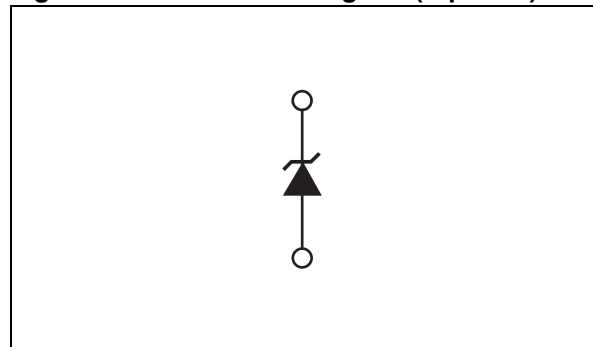


Figure 1. Functional diagram (top view)



### Description

The ESDA8V2-1J is a unidirectional single line Transil diode designed specifically for the protection of integrated circuits in portable equipment and miniaturized electronic devices subject to EOS and ESD transient overvoltages.

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# 1 Characteristics

**Table 1. Absolute maximum ratings ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ )**

Symbol	Parameter	Value	Unit
$V_{PP}$	ESD discharge:		
	IEC 61000-4-2 air discharge on input pin	$\pm 30$	kV
	IEC 61000-4-2 contact discharge on input pin	$\pm 30$	
MIL STD 883G - Method 3015-7: class 3B	$\pm 30$		
$P_{PP}$	Peak pulse power dissipation (8/20 $\mu\text{s}$ ) <sup>(1)</sup>	$T_{j \text{ initial}} = T_{amb}$ 500	W
$I_{PP}$	Peak pulse current (8/20 $\mu\text{s}$ )	25	A
$T_j$	Junction temperature range	-40 to +125	$^{\circ}\text{C}$
$T_{stg}$	Storage temperature range	- 55 to +150	$^{\circ}\text{C}$
$T_L$	Maximum lead temperature for soldering during 10 s	260	$^{\circ}\text{C}$

1. For a surge greater than the maximum values, the diode will fail in short-circuit

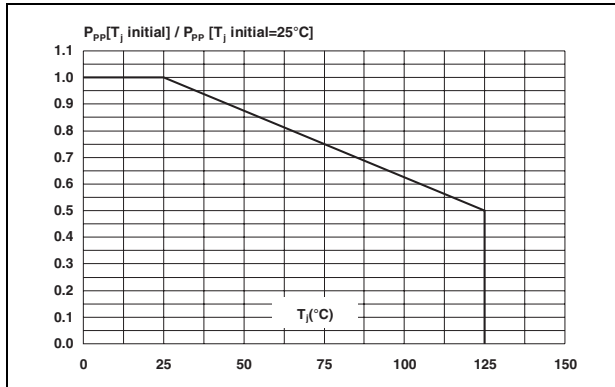
**Table 2. Electrical characteristics (definitions)**

Symbol	Parameter
$V_{BR}$	Breakdown voltage
$I_{RM}$	Leakage current @ $V_{RM}$
$V_{RM}$	Stand-of voltage
$V_{CL}$	Clamping voltage
$I_{PP}$	Peak pulse current
C	Input capacitance

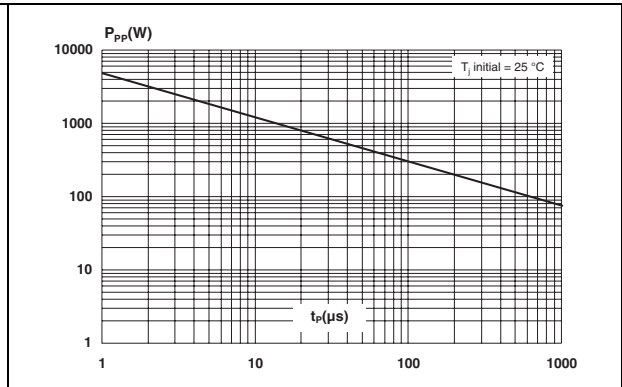
**Table 3. Electrical characteristics (values,  $T_{amb} = 25\text{ }^{\circ}\text{C}$ )**

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
$V_{BR}$	Breakdown voltage	$I_R = 1\text{ mA}$	8.2	-	-	V
$I_{RM}$	Leakage current @ $V_{RM}$	$V_{RM} = 5\text{ V}$	-	0.1	0.5	$\mu\text{A}$
$V_{CL}$	Clamping voltage (8/20 $\mu\text{s}$ waveform)	$I_{PP} = 1\text{ A}$	-	-	11	V
		$I_{PP} = 5\text{ A}$	-	-	13	V
		$I_{pp} = 25\text{ A}$	-	-	20	V
C	Input capacitance	$V_R = 0\text{ V}$ , $F_{osc} = 1\text{ MHz}$ , $V_{osc} = 30\text{ mV}$	-	210	250	pF

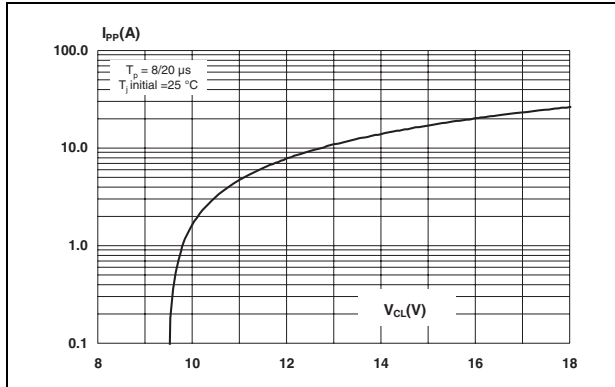
**Figure 2. Relative variation of peak pulse power versus initial junction temperature**



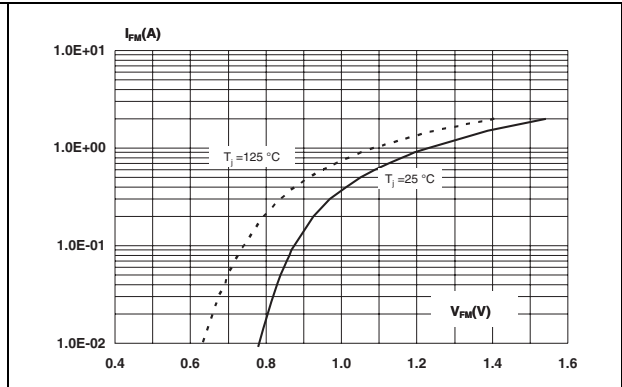
**Figure 3. Peak pulse power versus exponential pulse duration**



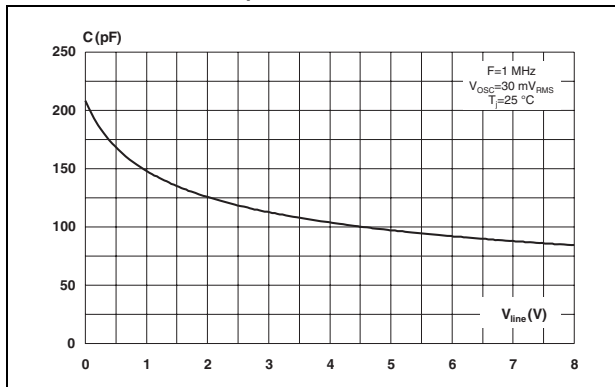
**Figure 4. Clamping voltage versus peak pulse current (typical values, exponential waveform)**



**Figure 5. Forward voltage drop versus peak forward current (typical values)**



**Figure 6. Junction capacitance versus reverse voltage applied (typical values)**



**Figure 7. Relative variation of leakage current versus junction temperature (typical values)**

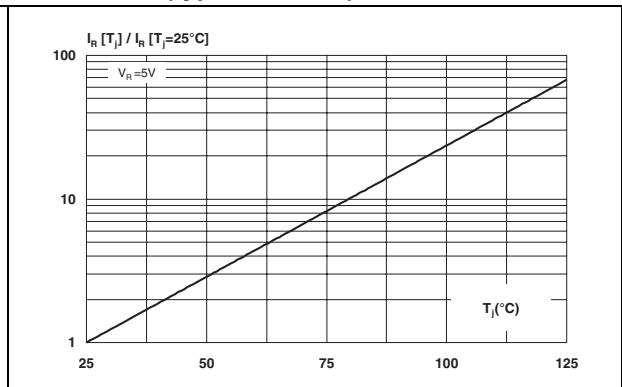


Figure 8. ESD response to IEC 61000-4-2 (+15 kV air discharge)

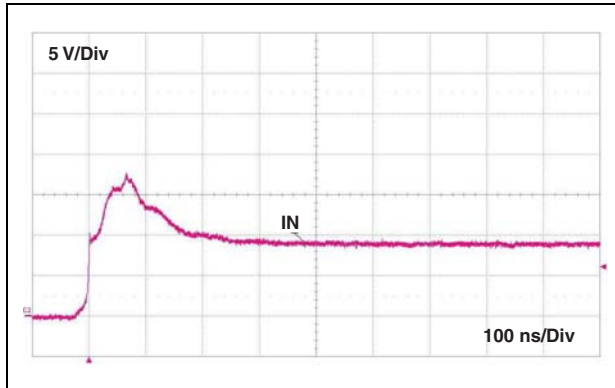
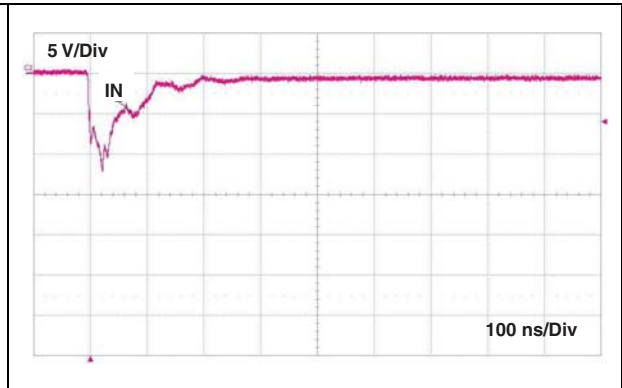
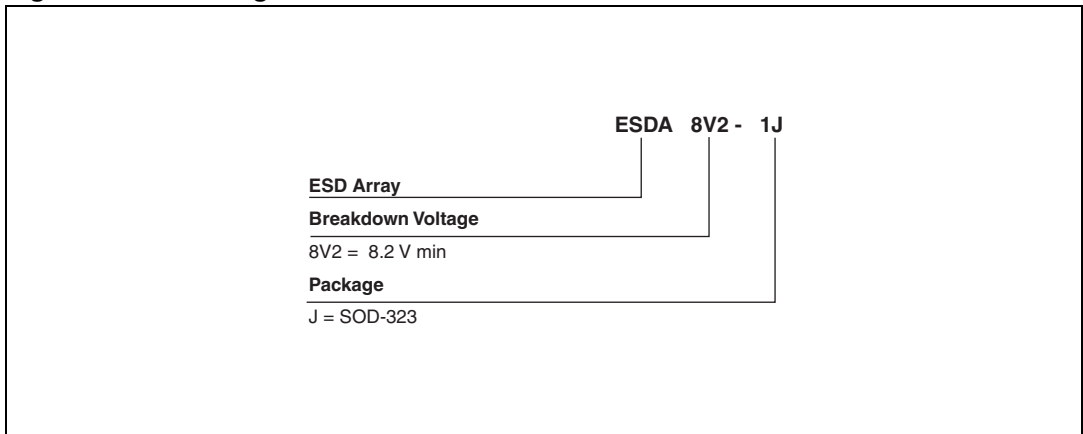


Figure 9. ESD response to IEC 61000-4-2 (-15 kV air discharge)



## 2 Ordering information scheme

Figure 10. Ordering information scheme



### 3 Package information

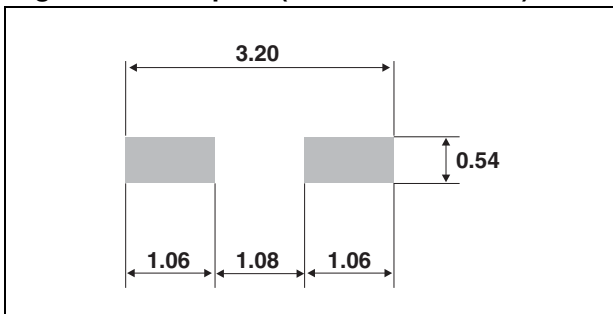
- Epoxy meets UL94, V0
- Bar indicates cathode

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK® is an ST trademark.

**Table 4. SOD-323 dimensions**

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		1.17		0.046
A1	0	0.1	0	0.004
b	0.25	0.44	0.01	0.017
c	0.1	0.25	0.004	0.01
D	1.52	1.8	0.06	0.071
E	1.11	1.45	0.044	0.057
H	2.3	2.7	0.09	0.106
L	0.1	0.46	0.004	0.02
Q1	0.1	0.41	0.004	0.016

**Figure 11. Footprint (dimensions in mm)**



**Figure 12. Marking**

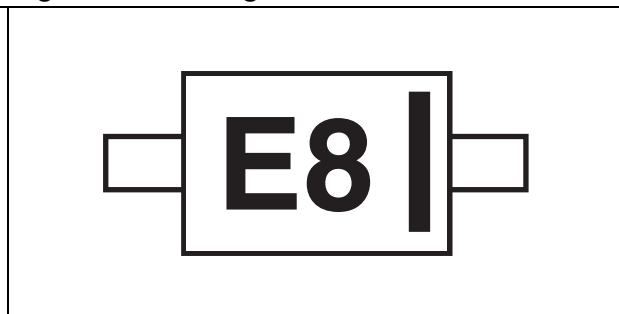
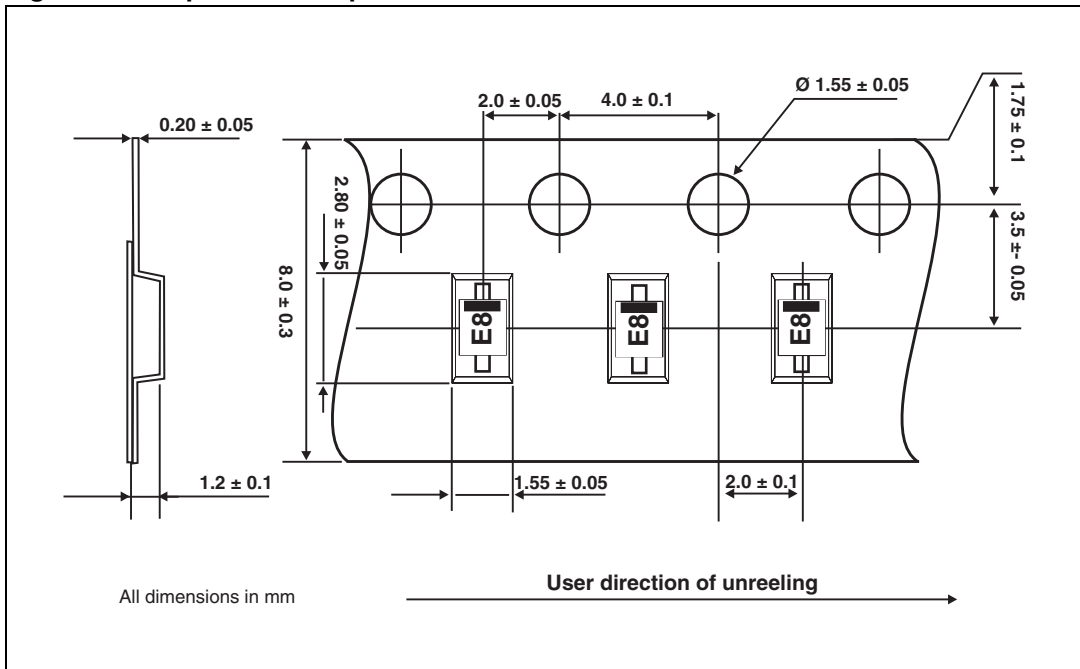


Figure 13. Tape and reel specifications



## 4 Ordering information

Table 5. Ordering information

Order code	Marking	Weight	Base qty	Delivery mode
ESDA8V2-1J	E8	5 mg	3000	Tape and reel

## 5 Revision history

Table 6. Document revision history

Date	Revision	Changes
11-Aug-2009	1	Initial release

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