

1.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.

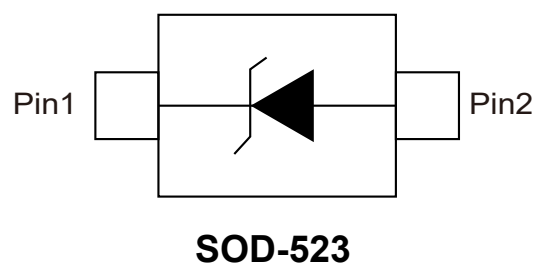
2.Features

- Unidirectional ESD protection of
- ESD protection up to 26 kV
- Low diode capacitance: $C_d=25\text{pF}$
- IEC 61000-4-2; level 4 (ESD)
- Low clamping voltage: $V_{CL}=12\text{V}$
- Very low leakage current: $I_{RM}=10\text{nA}$
- AEC-Q101 qualified

3.Applications

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

4.Pinning information



5. Quick reference data

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
reverse standoff voltage	V_{RWM}				5	V
diode capacitance	C_d	$V_R=0\text{V}$, $f=1\text{MHz}$		25	30	pF



6. Limiting values

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
peak pulse power	P_{PP}	$t_p=8/20\mu s$ ①②			42	W
peak pulse current	I_{PP}	$t_p=8/20\mu s$ ①②			3.5	A
junction temperature	T_J				150	°C
ambient temperature	T_{amb}		-55		150	°C
storage temperature	T_{STG}		-65		150	°C

Notes:

- 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.

7. ESD maximum ratings

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
electrostatic discharge voltage	V_{ESD}	IEC 61000-4-2 (contact discharge) ①			26	kV
		machine model			400	V
		MIL-STD-883 (human body model)			10	kV

Notes:

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

8. ESD standards compliance

Parameter	Conditions
IEC 61000-4-2; level 4 (ESD)	> 15 kV (air); > 8 kV (contact)
MIL-STD-883; class 3 (human body model)	> 4 kV



9. Electrical Characteristic ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
reverse standoff voltage	V_{RWM}				5	V
reverse leakage current	I_{RM}	$V_{\text{RWM}}=5\text{V}$		10	100	μA
breakdown voltage	V_{BR}	$I_{\text{R}}=5\text{mA}$	6.4	6.8	7.2	V
diode capacitance	C_{d}	$V_{\text{R}}=0\text{V}$, $f=1\text{MHz}$		25	30	pF
clamping voltage	V_{CL}	①②				
		$I_{\text{PP}}=1\text{A}$			9	V
		$I_{\text{PP}}=3.5\text{A}$			12	V
differential resistance	r_{dif}	$I_{\text{R}}=5\text{mA}$			30	Ω
forward voltage	V_{F}	$I_{\text{F}}=200\text{mA}$			1.2	V

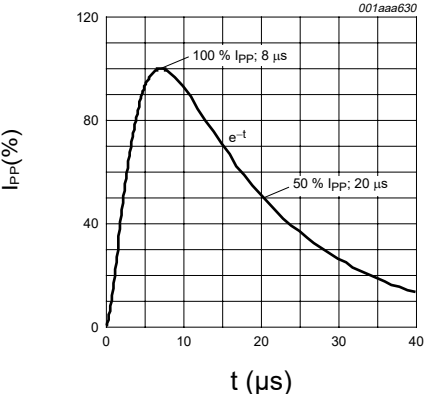
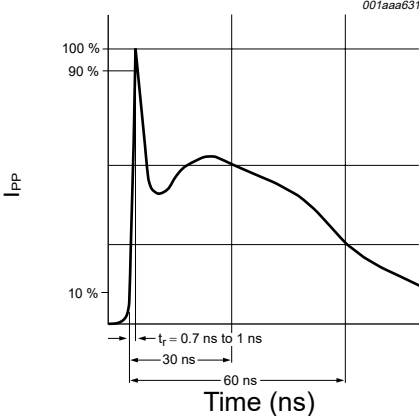
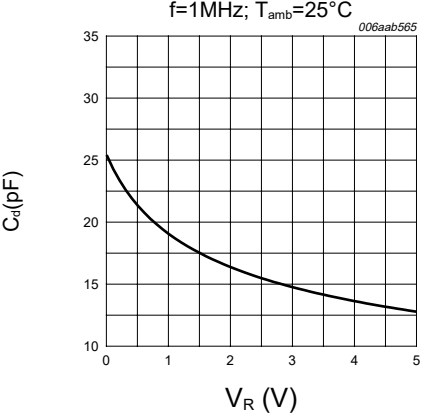
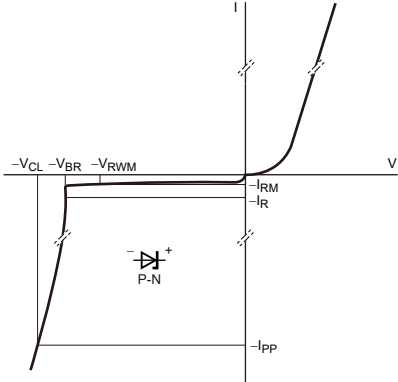
Notes:

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.



10.1Typical characteristic

	
Figure 1: 8/20 μ s pulse waveform according to IEC 61000-4-5	Figure 2: ESD pulse waveform according to IEC 61000-4-2
	
Figure 3: Diode capacitance as a function of reverse voltage; typical values	Figure 4: V-I characteristics for a unidirectional ESD protection diode



10.2 Typical characteristic

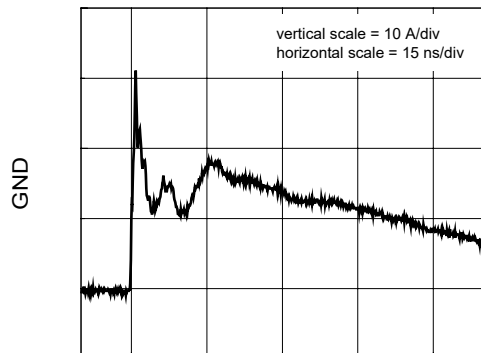


Figure 1: unclamped +8 kV ESD pulse waveform
(IEC 61000-4-2 network)

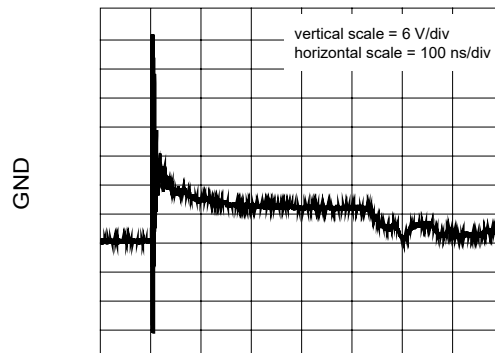


Figure 2: clamped +8 kV ESD pulse waveform
(IEC 61000-4-2 network) pin 1 to 2

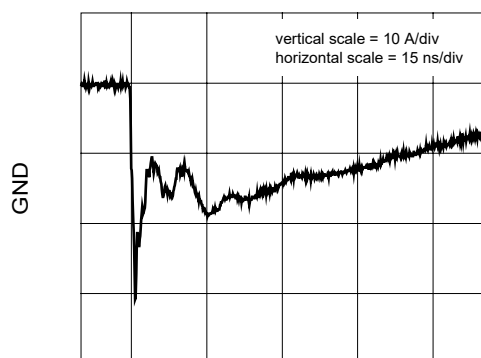


Figure 3: unclamped -8 kV ESD pulse waveform
(IEC 61000-4-2 network)

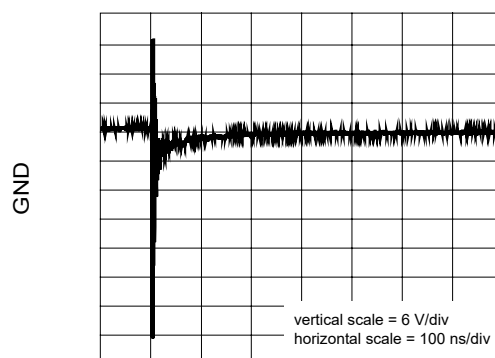
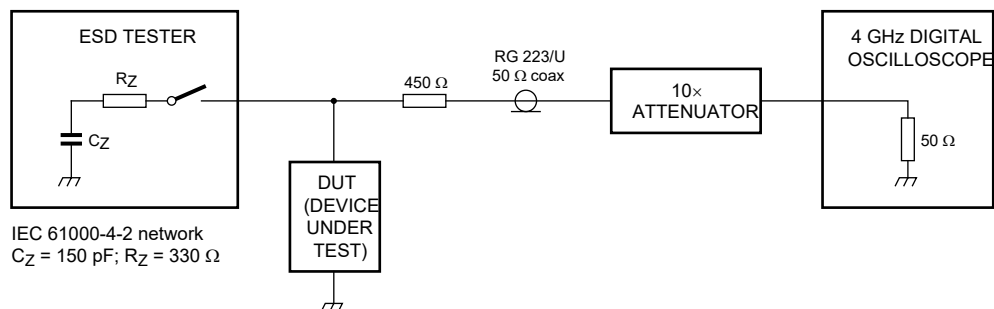
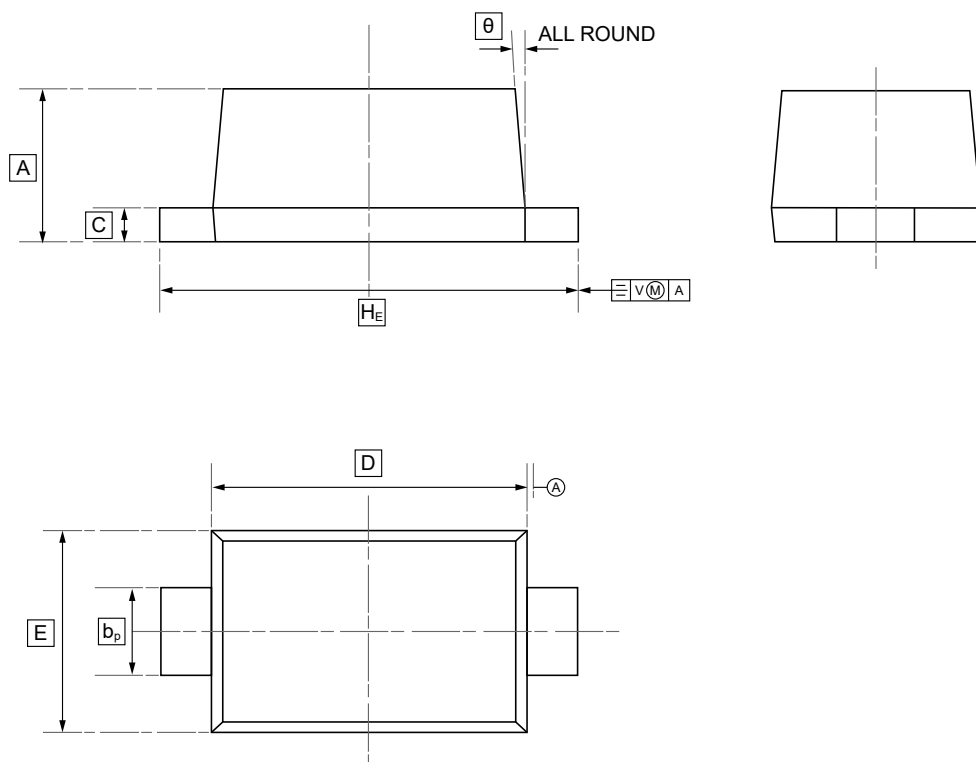


Figure 4: clamped -8 kV ESD pulse waveform
(IEC 61000-4-2 network) pin 1 to 2





11.SOD-523 Package Outline Dimensions

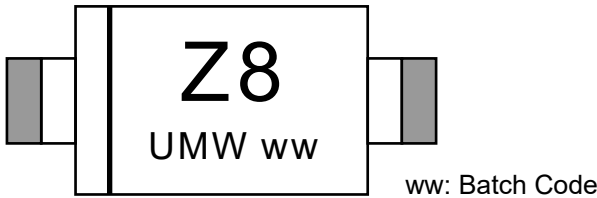


DIMENSIONS (mm are the original dimensions)

Symbol	A	b _p	C	D	E	H _E	θ
Min	0.58	0.3	0.100	1.15	0.75	1.5	5°
Max	0.68	0.4	0.135	1.25	0.85	1.7	



12.Ordering information



Order Code	Package	Base QTY	Delivery Mode
UMW PESD5V0L1UB	SOD-523	3000	Tape and reel



13.Disclaimer

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