

1. Description

Ultra low capacitance unidirectional ElectroStatic Discharge (ESD) protection diode in a SOD-523 ultra small and flat lead Surface-Mounted Device (SMD) plastic package designed to protect one signal line from the damage caused by ESD and other transients. The combination of extremely low capacitance and ultra low clamping voltage makes the device ideal for high-speed data line protection applications.

3. Applications

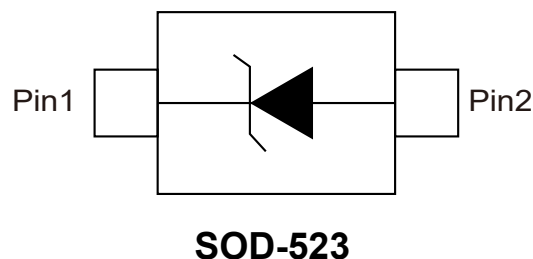
- Computers and peripherals
- Audio and video equipment
- Cellular handsets and accessories
- 10/100/1000 Mbit/s Ethernet
- Communication systems
- Portable electronics

2. Features

- ESD protection of one line
- Ultra low diode capacitance
- $C_d=0.95\text{pF}$
- Ultra low clamping voltage: $V_{CL}=8\text{V}$
- Ultra low leakage current: $I_{RM}=1\text{nA}$
- ESD protection up to 8 kV

- Subscriber Identity Module (SIM) card protection
- USB, High-Definition Multimedia
- Interface (HDMI), FireWire
- High-speed data lines

4. Pinning information





5. Quick reference data

Parameter	Symbol	Conditions	Min	Typ	Max	Units
reverse standoff voltage	V_{RWM}				5.5	V
diode capacitance	C_d	$V_R=0V$, $f=1MHz$		0.95	1.1	pF



6. Limiting values

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
peak pulse current	I_{PP}	$t_p=8/20\mu s$ ①②			1.5	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) ①②			8	kV
		machine model			400	V
		MIL-STD-883 (human body model)②			10	kV

Notes:

- ① Device stressed with ten non-repetitive ESD pulses.
 ② Measured from pin 1 to 2.

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}	$V_{RWM}=5\text{V}$		1	100	nA
breakdown voltage	V_{BR}	$I_R=10\text{mA}$	5.8	7.5	10	V
diode capacitance	C_d	$V_R=0\text{V}$, $f=1\text{MHz}$		0.95	1.1	pF
clamping voltage	V_{CL}	$I_{PP}=1.5\text{A}$ ①②		8		V
dynamic resistance	r_{dyn}	$I_R=10\text{A}$		0.25		Ω

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.
- ③ Non-repetitive current pulse, Transmission Line Pulse (TLP) $t_p = 100\text{ ns}$; square pulse.

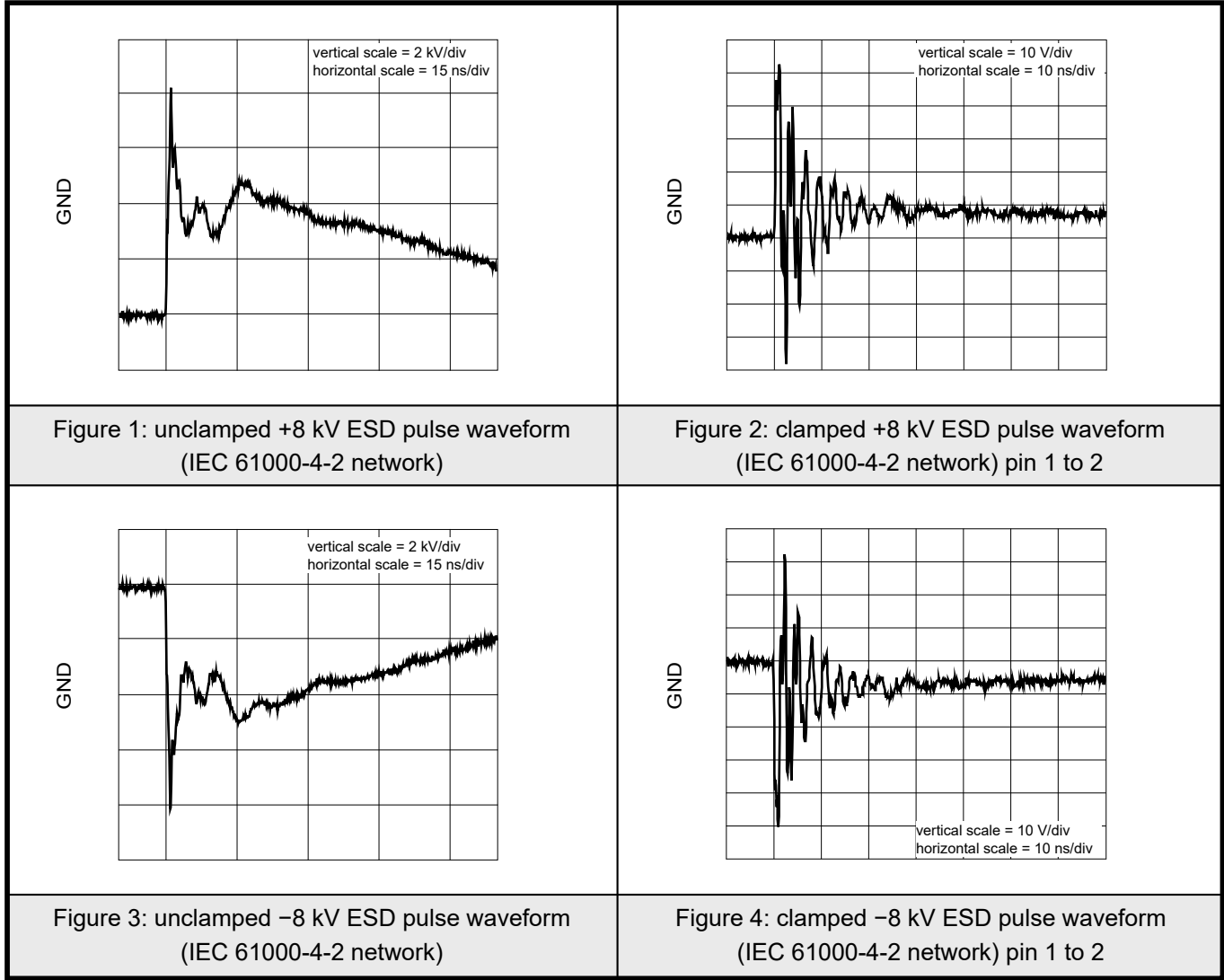


10.1Typical characteristic

Figure 1: 8/20 μs 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

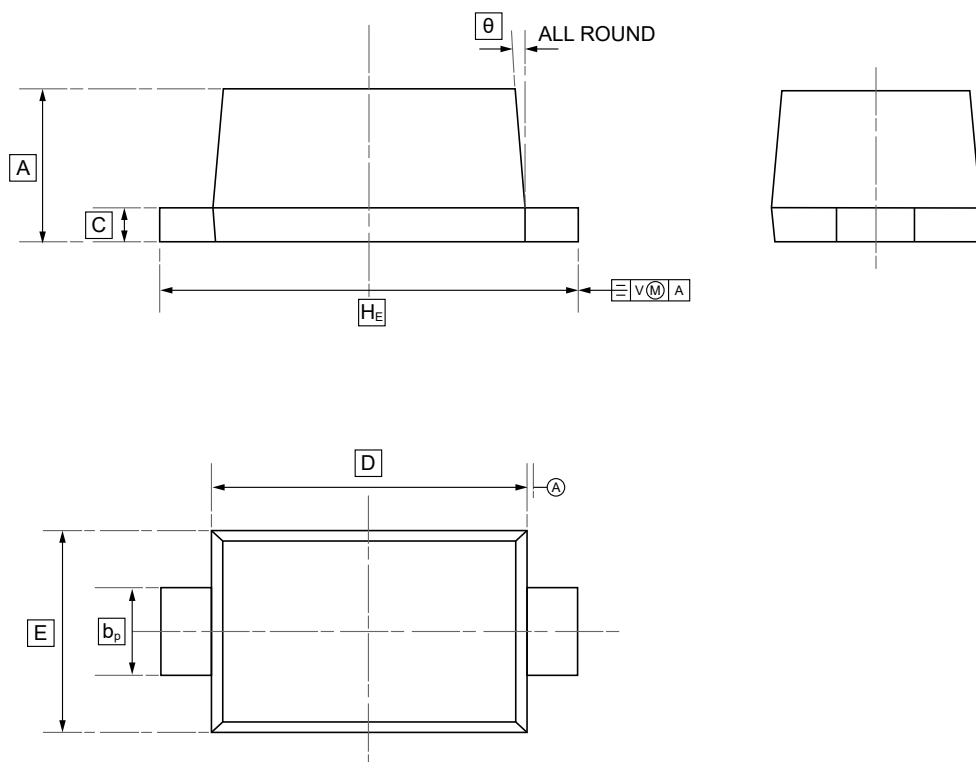


10.2Typical characteristic





11.SOD-523 Package Outline Dimensions

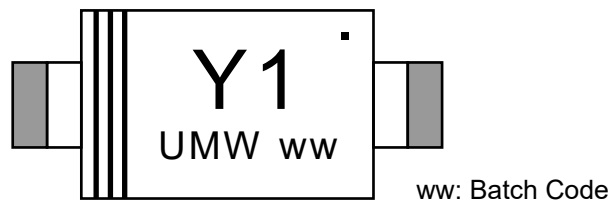


DIMENSIONS (mm are the original dimensions)

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 PESD5V0X1UB	SOD-523	3000	Tape and reel



13.Disclaimer

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