

1.Description

Unidirectional ElectroStatic Discharge (ESD) protection diodes in a very small Surface Mounted Device (SMD) plastic package designed to protect one signal line from the damage caused by ESD and transient overvoltage.

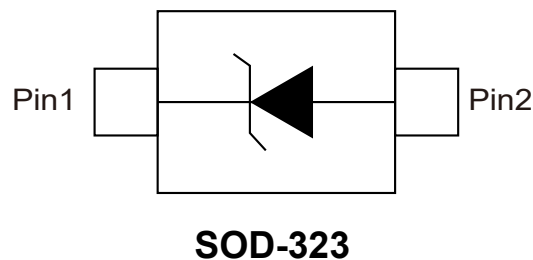
3.Features

- Transient Voltage Suppression (TVS) protection of one line
- Max. peak pulse power: $P_{PP}=890W$
- Low clamping voltage: $V_{CL}=19V$
- Low leakage current: $I_{RM}=300nA$

2.Applications

- Computers and peripherals
- Communication systems
- Audio and video equipment
- Portable electronics
- Cellular handsets and accessories
- Medical and industrial equipment

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}					
PESD5VOS1UJ					5	V
PESD12VS1UJ					12	V
diode capacitance	C_d	$V_R=0\text{V}$, $f=1\text{MHz}$				
PESD5VOS1UJ				480	530	pF
PESD12VS1UJ				160	180	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}	$t_p=8/20\mu\text{s}$ ①②				
PESD5VOS1UJ					890	W
PESD12VS1UJ					600	W
peak pulse current	I_{PP}	$t_p=8/20\mu\text{s}$ ①②				
PESD5VOS1UJ					47	A
PESD12VS1UJ					22.5	A
total power dissipation	P_{tot}	$T_{amb}\leq 25^{\circ}\text{C}$ ③④			420	mW
					720	mW
junction temperature	T_J				150	$^{\circ}\text{C}$
ambient temperature	T_{amb}		-55		150	$^{\circ}\text{C}$
storage temperature	T_{STG}		-65		150	$^{\circ}\text{C}$

Notes:

- ① Non-repetitive current pulse 8/20 μs exponential decay waveform according to IEC 61000-4-5.
- ② Soldering point of cathode tab.
- ③ Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.
- ④ Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm^2 .



7.ESD maximum ratings

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
electrostatic discharge voltage	V_{ESD}	IEC 61000-4-2 (contact discharge) ①			30	kV
		machine model			400	V
		MIL-STD-883 (human body model)			16	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

7.ESD maximum ratings

Parameter	Symbol	Conditions	Min	Typ	Max	Units
thermal resistance from junction to ambient	$R_{th(j-a)}$	in free air ①			290	KW
		②			170	KW
thermal resistance from junction to solder point	$R_{th(j-sp)}$	③			35	KW

Notes:

① Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

② Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm².

③ Soldering point of cathode tab.



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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
reverse standoff voltage	V _{RWM}					
PESD5VOS1UJ				5	V	
PESD12VS1UJ				12	V	
reverse leakage current	I _{RM}					
PESD5VOS1UJ		V _{RWM} =5V		0.3	4	μA
PESD12VS1UJ		V _{RWM} =12V		<1	100	nA
breakdown voltage	V _{BR}	I _R =5mA				
PESD5VOS1UJ			6.2	6.8	7.3	V
PESD12VS1UJ			13.3	14.5	15.75	V
diode capacitance	C _d	V _R =0V, f=1MHz				
PESD5VOS1UJ				480	530	pF
PESD12VS1UJ				160	180	pF
clamping voltage		①				
PESD5VOS1UJ	V _{CL}	I _{PP} =47A			19	V
		I _{PP} =25A			13.5	V
		I _{PP} =5A			9.8	V
PESD12VS1UJ		I _{PP} =22.5A			27	V
		I _{PP} =15A			23.5	V
		I _{PP} =5A			19	V
differential resistance	r _{dif}	I _R =5mA				
PESD5VOS1UJ				2	100	Ω
PESD12VS1UJ				5	100	Ω

Notes:

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



10.1 Typical characteristic

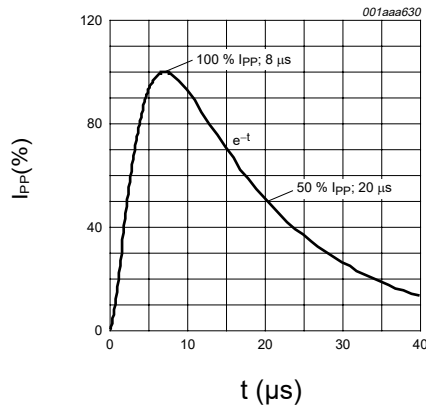


Figure 1: 8/20 μ s pulse waveform according to IEC 61000-4-5

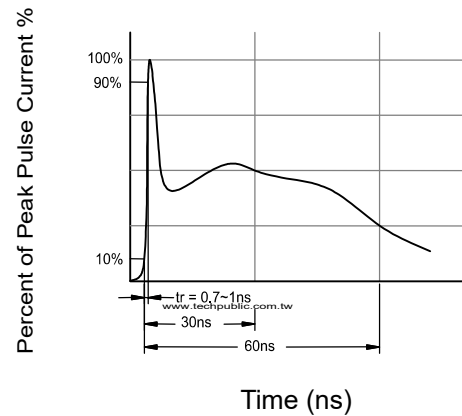


Figure 2: ESD pulse waveform according to IEC 61000-4-2

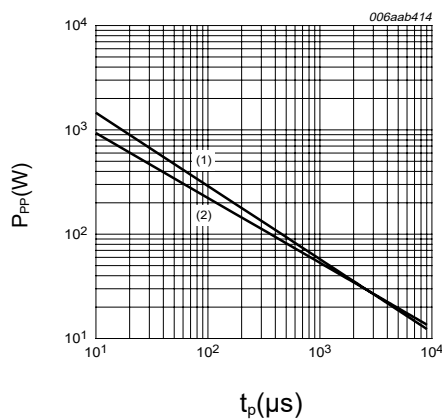


Figure 3: Peak pulse power as a function of exponential pulseduration; typical values

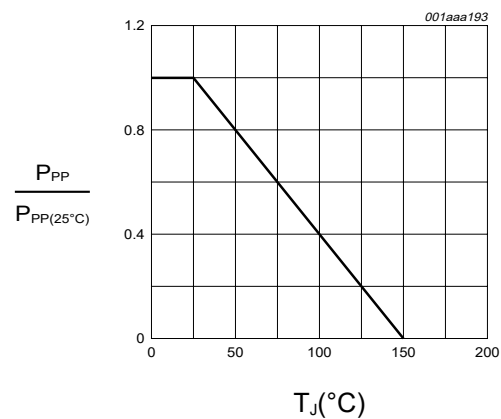


Figure 4: Relative variation of peak pulse power as a function of junction temperature; typical values

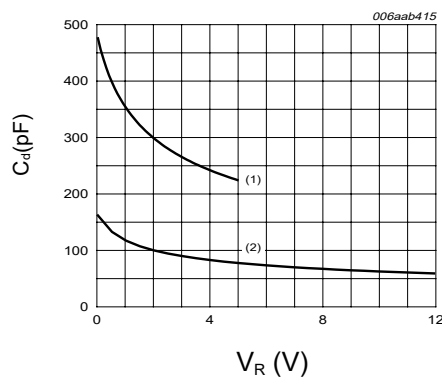


Figure 5: Diode capacitance as a function of reverse voltage; typical values

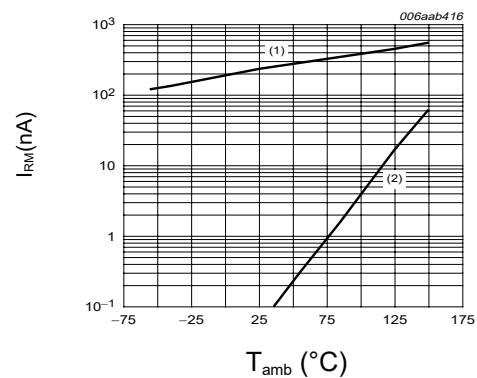


Figure 6: Reverse leakage current as a function of ambient temperature; typical values



10.2Typical characteristic

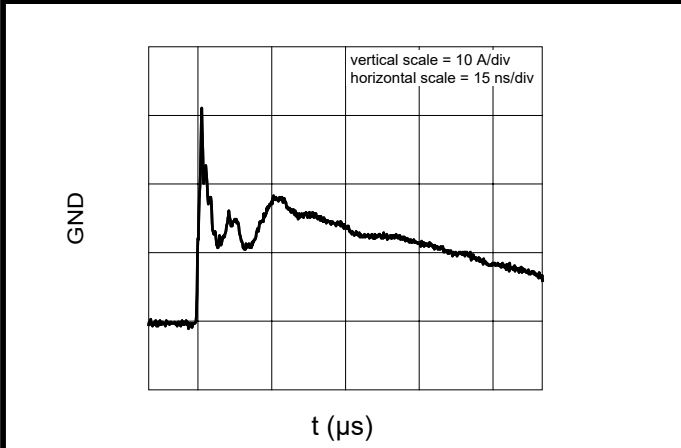


Figure 7: unclamped +8 kV ESD pulse waveform (IEC 61000-4-2 network)

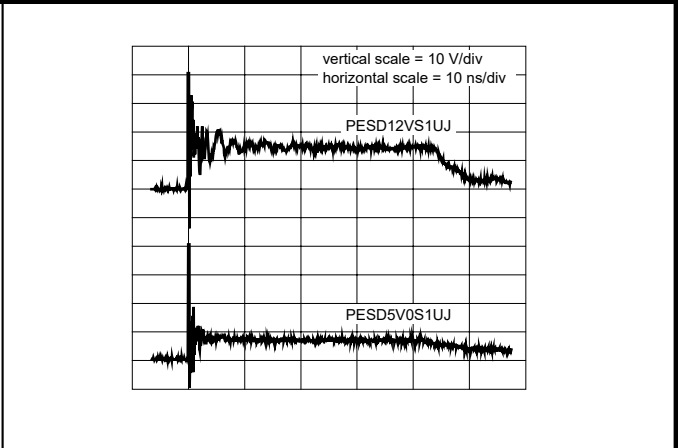
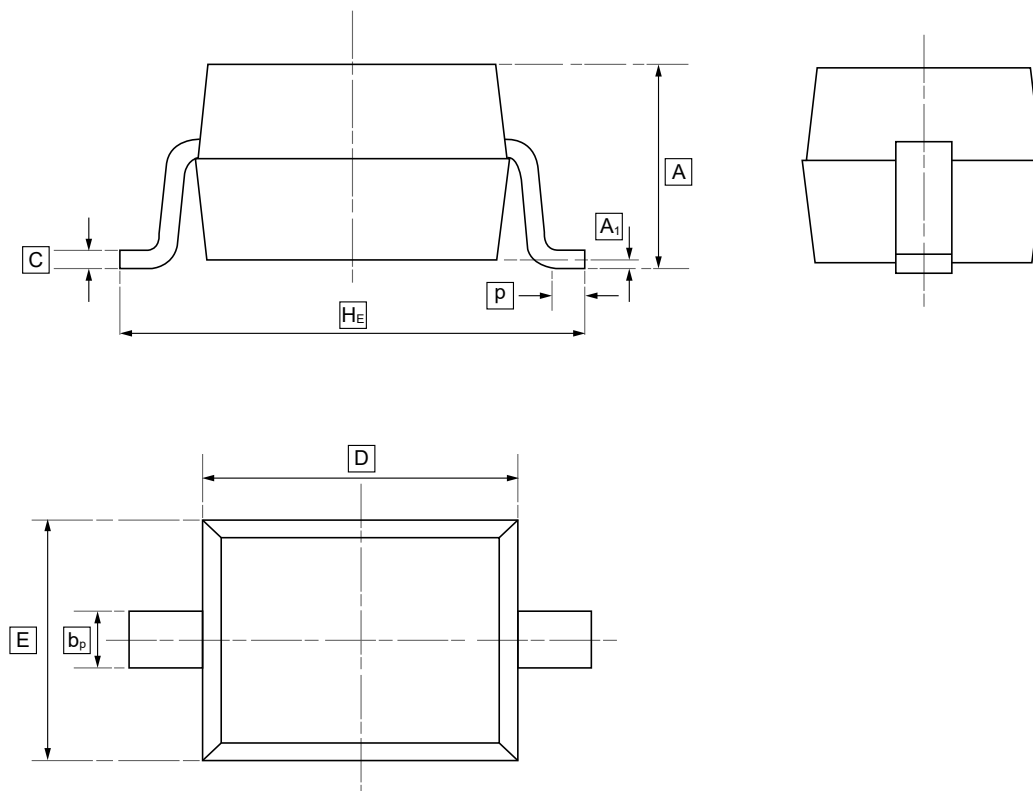


Figure 8: clamped +8 kV ESD pulse waveform (IEC 61000-4-2 network)



11.SOD-323 Package Outline Dimensions

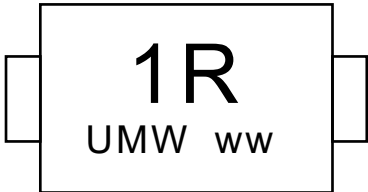


DIMENSIONS (mm are the original dimensions)

Symbol	A	b_p	C	D	E	H_E	A_1	L_p
Min	0.90	0.25	0.10	1.60	1.15	2.30	0.01	0.20
Max	1.20	0.40	0.15	1.80	1.35	2.80	0.10	0.50



12.Ordering information



ww: Batch Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW PESD5V0S1UJ	1Q	SOD-323	3000	Tape and reel
UMW PESD12VS1UJ	1R	SOD-323	3000	Tape and reel



13.Disclaimer

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