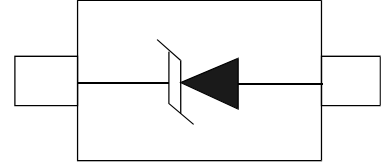


## Description

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.



## Features

- Transient Voltage Suppression (TVS) protection of one line
- Max. peak pulse power:  $P_{PP} = 890$  W
- Low clamping voltage:  $V_{CL} = 19$  V
- Low leakage current:  $I_{RM} = 300$  nA
- ESD protection up to 30 kV
- IEC 61000-4-2; level 4 (ESD)
- IEC 61000-4-5 (surge);  $I_{PP} = 47$  A
- AEC-Q101 qualified

## Applications

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

## Quick reference data

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$V_{RWM}$	reverse standoff voltage					
	PESD5V0S1UJ		-	-	5	V
	PESD12VS1UJ		-	-	12	V
$C_d$	diode capacitance	$f = 1$ MHz; $V_R = 0$ V				
	PESD5V0S1UJ		-	480	530	pF
	PESD12VS1UJ		-	160	180	pF

## Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
PPp	peak pulse power	$t_p = 8/20 \mu s$	[1][2]			
	PESD5V0S1UJ			-	890	W
	PESD12VS1UJ			-	600	W
Ipp	peak pulse current	$t_p = 8/20 \mu s$	[1][2]			
	PESD5V0S1UJ			-	47	A
	PESD12VS1UJ			-	22.5	A

## Limiting values ...continued

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

Symbol	Parameter	Conditions		Min	Max	Unit
P <sub>tot</sub>	total power dissipation	$T_{amb} \leq 25 \text{ }^\circ\text{C}$	[3]	-	420	mW
			[4]	-	720	mW
T <sub>j</sub>	junction temperature			-	150	°C
T <sub>amb</sub>	ambient temperature			-55	+150	°C
T <sub>stg</sub>	storage temperature			-65	+150	°C

[1] Non-repetitive current pulse 8/20  $\mu s$  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<sup>2</sup>.

## ESD maximum ratings

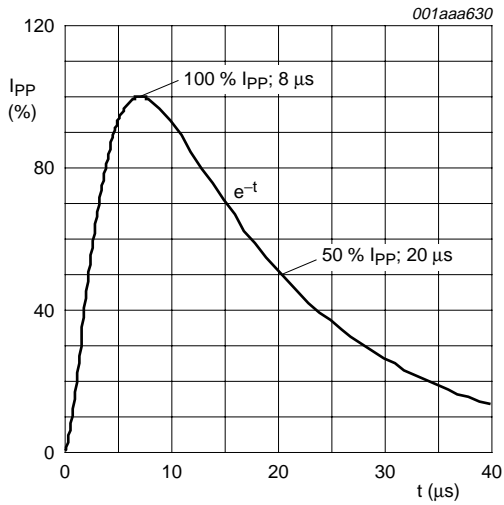
T<sub>amb</sub> = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions		Min	Max	Unit
VESD	electrostatic discharge voltage	IEC 61000-4-2 (contact discharge)	[1]	-	30	kV
		machine model		-	400	V
		MIL-STD-883 (human body model)		-	16	kV

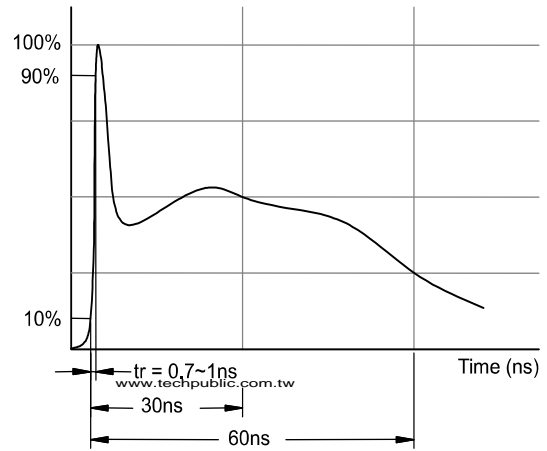
[1] Device stressed with ten non-repetitive ESD pulses.

## 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



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



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

### Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	in free air	[1]	-	-	290	K/W
			[2]	-	-	170	K/W
R <sub>th(j-sp)</sub>	thermal resistance from junction to solder point		[3]	-	-	35	K/W

[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 cm<sup>2</sup>.

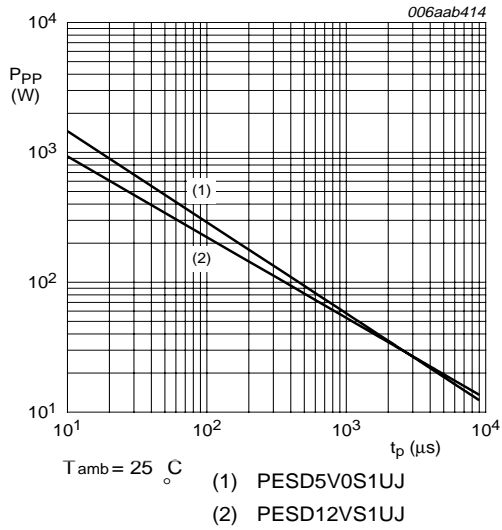
[3] Soldering point of cathode tab.

## Characteristics

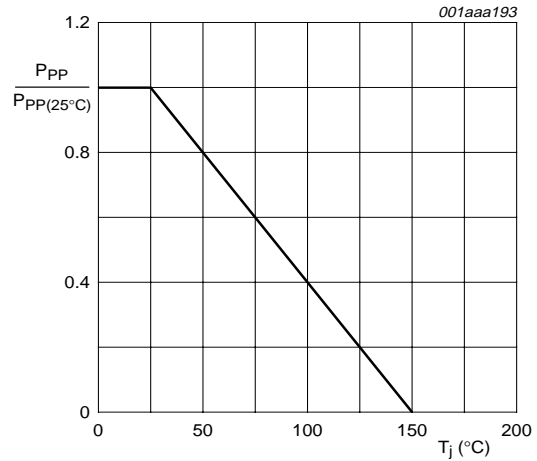
T<sub>amb</sub> = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>RWM</sub>	reverse standoff voltage					
	PESD5V0S1UJ		-	-	5	V
	PESD12VS1UJ		-	-	12	V
I <sub>RM</sub>	reverse leakage current					
	PESD5V0S1UJ	V <sub>RWM</sub> = 5 V	-	0.3	4	μA
	PESD12VS1UJ	V <sub>RWM</sub> = 12 V	-	< 1	100	nA
V <sub>BR</sub>	breakdown voltage	I <sub>R</sub> = 5 mA				
	PESD5V0S1UJ		6.2	6.8	7.3	V
	PESD12VS1UJ		13.3	14.5	15.75	V
C <sub>d</sub>	diode capacitance	f = 1 MHz; V <sub>R</sub> = 0 V				
	PESD5V0S1UJ		-	480	530	pF
	PESD12VS1UJ		-	160	180	pF
V <sub>CL</sub>	clamping voltage		[1]			
	PESD5V0S1UJ	I <sub>PP</sub> = 47 A	-	-	19	V
		I <sub>PP</sub> = 25 A	-	-	13.5	V
		I <sub>PP</sub> = 5 A	-	-	9.8	V
	PESD12VS1UJ	I <sub>PP</sub> = 22.5 A	-	-	27	V
		I <sub>PP</sub> = 15 A	-	-	23.5	V
		I <sub>PP</sub> = 5 A	-	-	19	V
r <sub>dif</sub>	differential resistance	I <sub>R</sub> = 5 mA				
	PESD5V0S1UJ		-	2	100	Ω
	PESD12VS1UJ		-	5	100	Ω

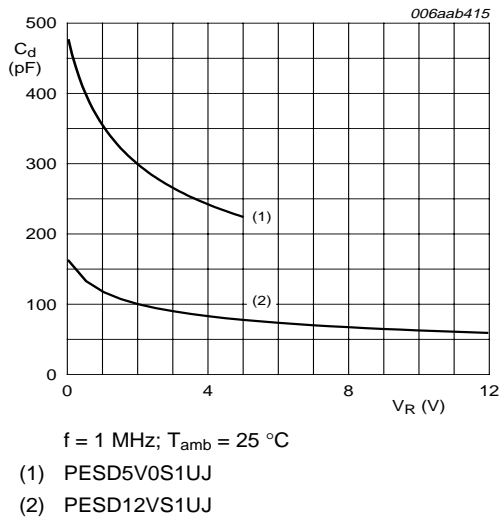
[1] Non-repetitive current pulse 8/20 μs exponential decay waveform according to IEC 61000-4-5.



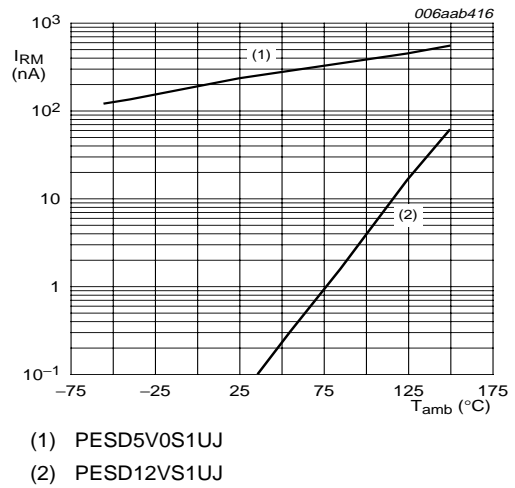
**Fig 3. Peak pulse power as a function of exponential pulse duration; typical values**



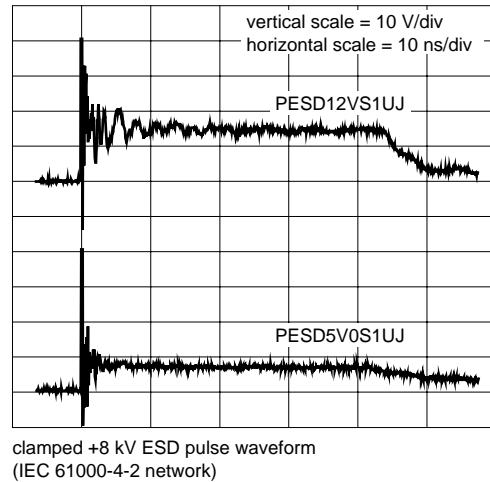
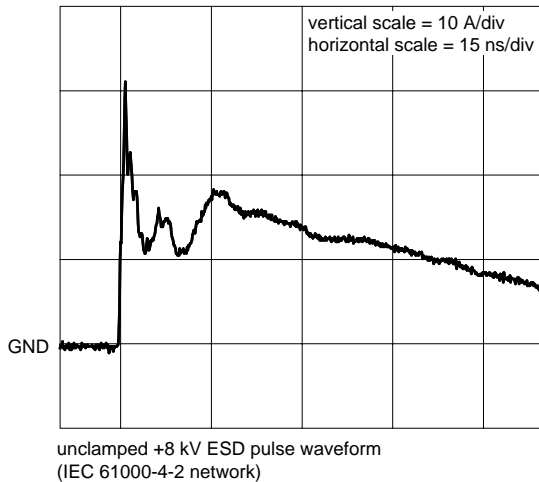
**Fig 4. Relative variation of peak pulse power as a function of junction temperature; typical values**



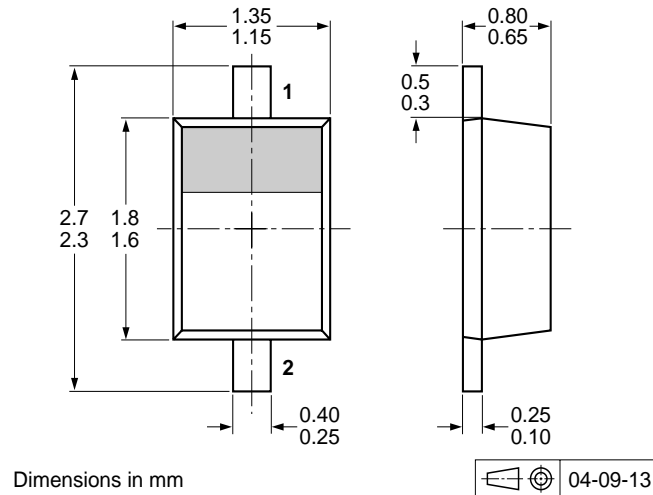
**Fig 5. Diode capacitance as a function of reverse voltage; typical values**



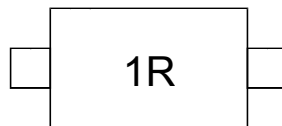
**Fig 6. Reverse leakage current as a function of ambient temperature; typical values**



**Outline Drawing – SOD-323F**



**Marking**



**Ordering information**

Order code	Marking code	Package	Baseqt	Deliverymode
PESD5V0S1UJ	1Q	SOD-323F	3000	Tape and reel
PESD12VS1UJ	1R	SOD-323F	3000	Tape and reel