EVVOSEMI®

THINK CHANGE DO

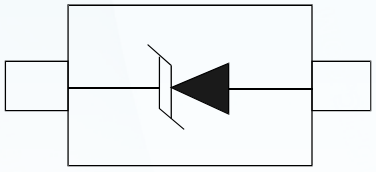
ESD TVS MOS LDO Diode Sensor DC-DC

Product Specification

Domestic Part Number	PESDxxxS1UJ
Overseas Part Number	PESDxxxS1UJ
Equivalent Part Number	PESDxxxS1UJ

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
P_{PP}	peak pulse power	t_p = 8/20 µs	[1][2]			
	PESD5V0S1UJ			-	890	W
	PESD12VS1UJ			-	600	W
I_{PP}	peak pulse current	t_p = 8/20 µs	[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_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[3]	-	420	mW
			[4]	-	720	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			–55	+150	°C
T_{stg}	storage temperature			–65	+150	°C

[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.

ESD maximum ratings

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_{ESD}	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

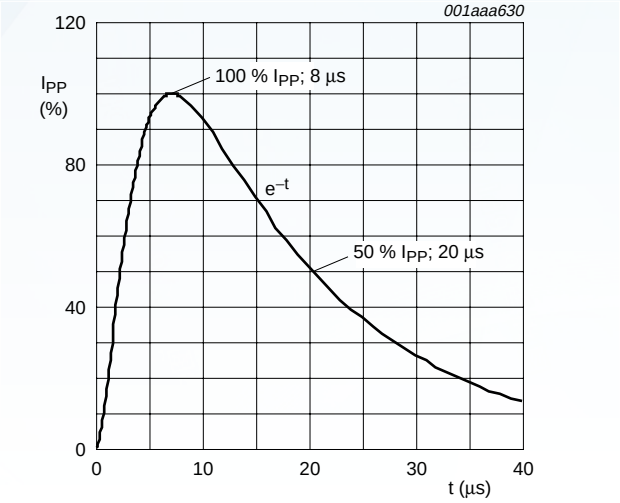


Fig 1. 8/20 µs pulse waveform according to IEC 61000-4-5

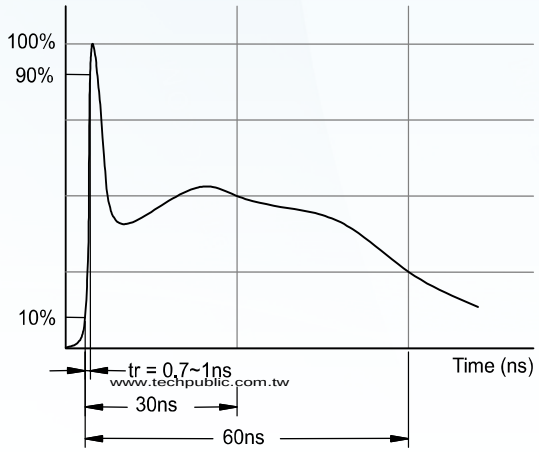


Fig 2. ESD pulse waveform according to IEC 61000-4-2

Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	290	K/W
			[2]	-	-	170	K/W
$R_{th(j-sp)}$	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^2.

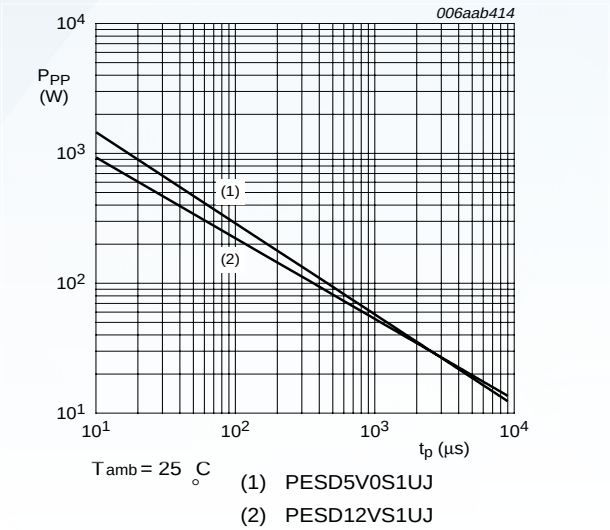
[3] Soldering point of cathode tab.

Characteristics

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
I_{RM}	reverse leakage current						
	PESD5V0S1UJ	V_{RWM} = 5 V		-	0.3	4	µA
	PESD12VS1UJ	V_{RWM} = 12 V		-	< 1	100	nA
V_{BR}	breakdown voltage	I_R = 5 mA					
	PESD5V0S1UJ			6.2	6.8	7.3	V
	PESD12VS1UJ			13.3	14.5	15.75	V
C_d	diode capacitance	f = 1 MHz; V_R = 0 V					
	PESD5V0S1UJ			-	480	530	pF
	PESD12VS1UJ			-	160	180	pF
V_{CL}	clamping voltage		[1]				
	PESD5V0S1UJ	I_{PP} = 47 A		-	-	19	V
		I_{PP} = 25 A		-	-	13.5	V
		I_{PP} = 5 A		-	-	9.8	V
	PESD12VS1UJ	I_{PP} = 22.5 A		-	-	27	V
		I_{PP} = 15 A		-	-	23.5	V
		I_{PP} = 5 A		-	-	19	V
r_{dif}	differential resistance	I_R = 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.



(1) PESD5V0S1UJ

(2) PESD12VS1UJ

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

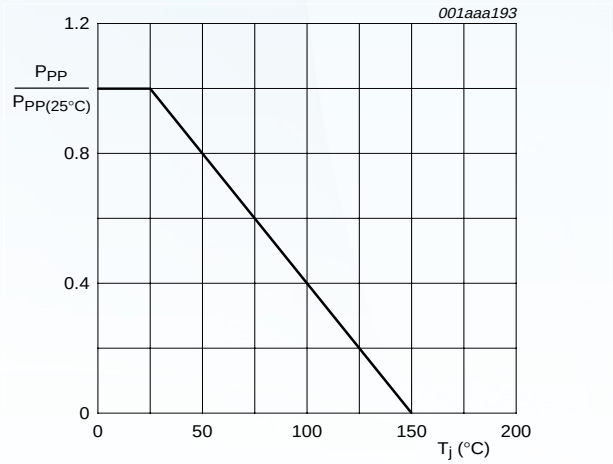
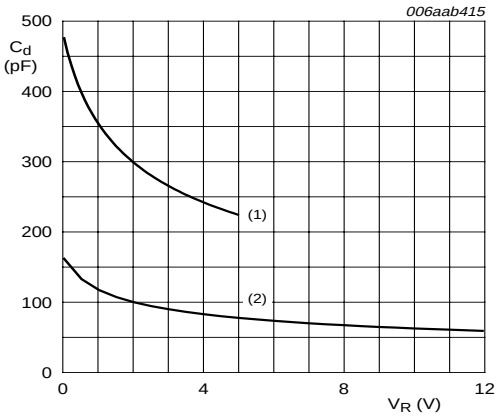


Fig 4. Relative variation of peak pulse power as a function of junction temperature; typical values

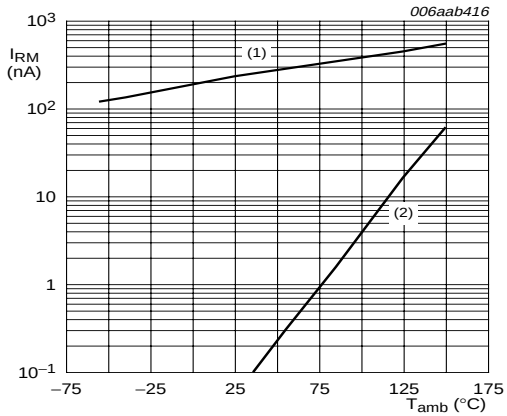


f = 1 MHz; T_{amb} = 25 °C

(1) PESD5V0S1UJ

(2) PESD12VS1UJ

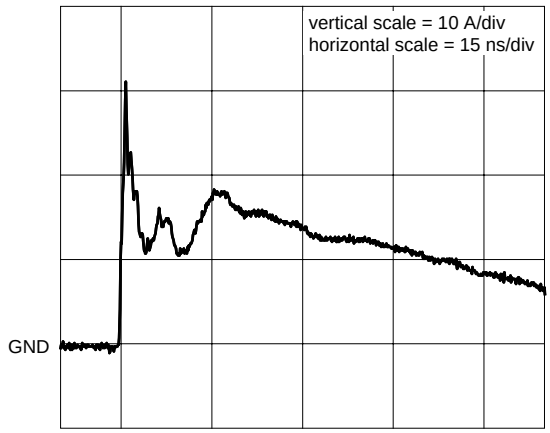
Fig 5. Diode capacitance as a function of reverse voltage; typical values



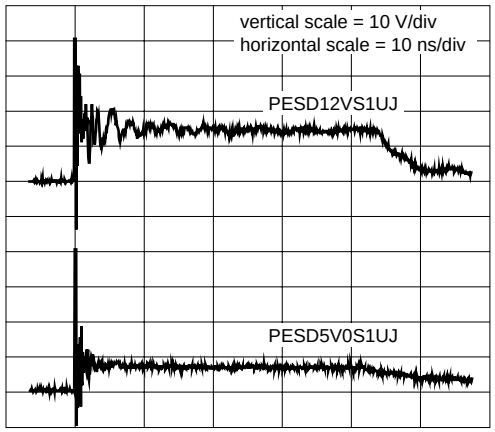
(1) PESD5V0S1UJ

(2) PESD12VS1UJ

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

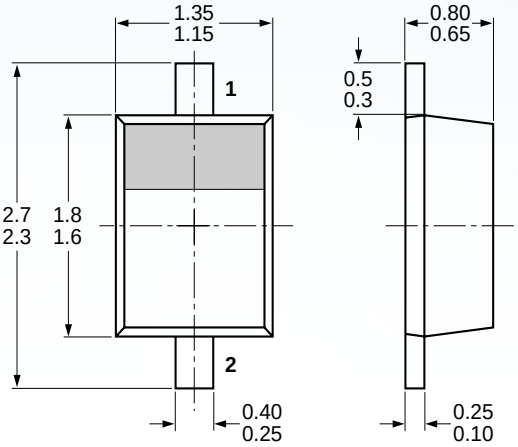


unclamped +8 kV ESD pulse waveform
(IEC 61000-4-2 network)



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

Outline Drawing – SOD-323F



Dimensions in mm

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

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