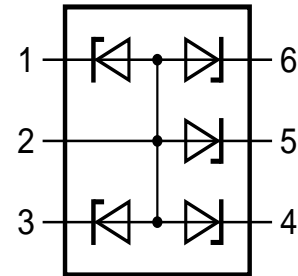


## Description

Low capacitance unidirectional fivefold ElectroStatic Discharge (ESD) protection diode arrays in small Surface-Mounted Device (SMD) plastic packages designed to protect up to five unidirectional signal lines from the damage caused by ESD and other transients.



## Features

- ESD protection of up to five lines
- Low diode capacitance
- Max. peak pulse power:  $P_{PP} = 25 \text{ W}$
- Low clamping voltage:  $V_{CL} = 12 \text{ V}$
- Ultra low leakage current:  $I_{RM} = 5 \text{ nA}$
- ESD protection up to 20 kV
- IEC 61000-4-2; level 4 (ESD)
- IEC 61000-4-5 (surge);  $I_{PP} = 2.5 \text{ A}$

## Applications

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

## Quick reference data

### Quick reference data

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
<b>Per diode</b>							
$V_{RWM}$	reverse standoff voltage						
	PESD3V3L5UF PESD3V3L5UV PESD3V3L5UY		-	-	3.3	V	
	PESD5V0L5UF PESD5V0L5UV PESD5V0L5UY		-	-	5.0	V	
	$C_d$	diode capacitance	$f = 1 \text{ MHz}; V_R = 0 \text{ V}$				
		PESD3V3L5UF PESD3V3L5UV PESD3V3L5UY		-	22	28	pF
		PESD5V0L5UF PESD5V0L5UV PESD5V0L5UY		-	16	19	pF

## Limiting values

### Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
<b>Per diode</b>						
P <sub>PP</sub>	peak pulse power	t <sub>p</sub> = 8/20 μs	[1][2]	-	25	W
I <sub>PP</sub>	peak pulse current	t <sub>p</sub> = 8/20 μs	[1][2]	-	2.5	A
<b>Per device</b>						
T <sub>j</sub>	junction temperature			-	150	°C
T <sub>amb</sub>	ambient temperature			-65	+150	°C
T <sub>stg</sub>	storage temperature			-65	+150	°C

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

[2] Measured from pin 1, 3, 4, 5 or 6 to pin 2.

### ESD maximum ratings

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

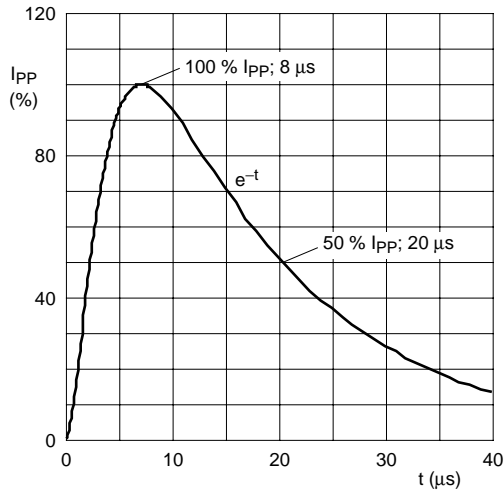
Symbol	Parameter	Conditions		Min	Max	Unit
<b>Per diode</b>						
V <sub>ESD</sub>	electrostatic discharge voltage	IEC 61000-4-2 (contact discharge)	[1][2]	-	20	kV
		MIL-STD-883 (human body model)		-	10	kV

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

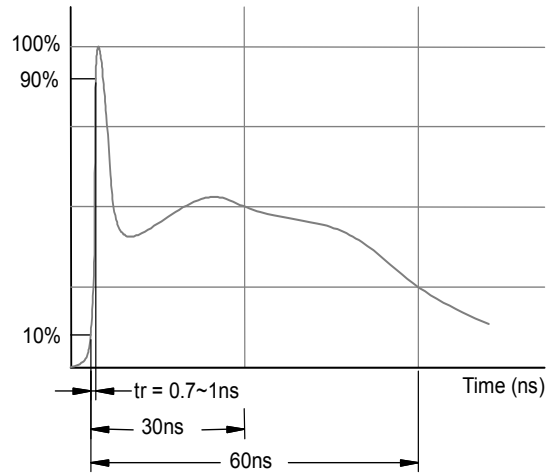
[2] Measured from pin 1, 3, 4, 5 or 6 to pin 2.

### ESD standards compliance

Standard	Conditions
<b>Per diode</b>	
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**

## Characteristics

### Characteristics

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

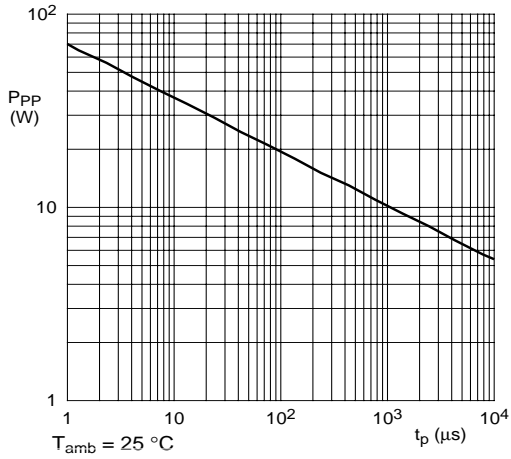
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per diode</b>						
V <sub>RWM</sub>	reverse standoff voltage					
	PESD3V3L5UF PESD3V3L5UV PESD3V3L5UY		-	-	3.3	V
	PESD5V0L5UF PESD5V0L5UV PESD5V0L5UY		-	-	5.0	V
I <sub>RM</sub>	reverse leakage current					
	PESD3V3L5UF PESD3V3L5UV PESD3V3L5UY	V <sub>RWM</sub> = 3.3 V	-	75	300	nA
	PESD5V0L5UF PESD5V0L5UV PESD5V0L5UY	V <sub>RWM</sub> = 5.0 V	-	5	25	nA
V <sub>BR</sub>	breakdown voltage	I <sub>R</sub> = 1 mA				
	PESD3V3L5UF PESD3V3L5UV PESD3V3L5UY		5.3	5.6	5.9	V
	PESD5V0L5UF PESD5V0L5UV PESD5V0L5UY		6.4	6.8	7.2	V

**Characteristics ...continued**
 $T_{amb} = 25\text{ °C}$  unless otherwise specified.

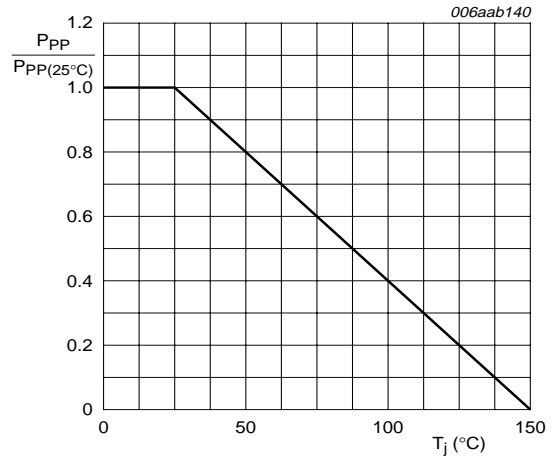
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$C_d$	diode capacitance	$f = 1\text{ MHz};$ $V_R = 0\text{ V}$				
	PESD3V3L5UF PESD3V3L5UV PESD3V3L5UY		-	22	28	pF
	PESD5V0L5UF PESD5V0L5UV PESD5V0L5UY		-	16	19	pF
$V_{CL}$	clamping voltage		[1][2]			
	PESD3V3L5UF PESD3V3L5UV PESD3V3L5UY	$I_{PP} = 1\text{ A}$	-	-	10	V
	PESD3V3L5UF PESD3V3L5UV PESD3V3L5UY	$I_{PP} = 2.5\text{ A}$	-	-	12	V
	PESD5V0L5UF PESD5V0L5UV PESD5V0L5UY	$I_{PP} = 1\text{ A}$	-	-	10	V
	PESD5V0L5UF PESD5V0L5UV PESD5V0L5UY	$I_{PP} = 2.5\text{ A}$	-	-	12	V
$r_{dif}$	differential resistance	$I_R = 1\text{ mA}$				
	PESD3V3L5UF PESD3V3L5UV PESD3V3L5UY		-	-	200	$\Omega$
	PESD5V0L5UF PESD5V0L5UV PESD5V0L5UY		-	-	100	$\Omega$

[1] Non-repetitive current pulse 8/20  $\mu\text{s}$  exponential decay waveform according to IEC 61000-4-5.

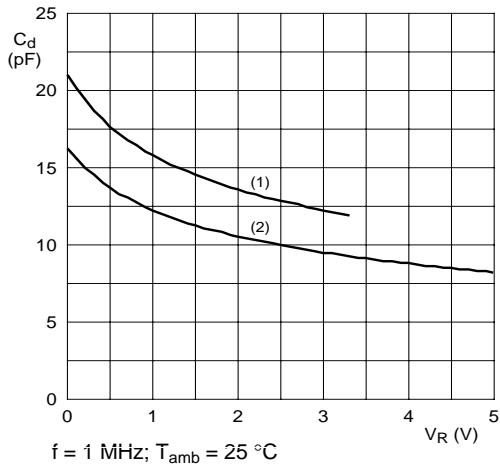
[2] Measured from pin 1, 3, 4, 5 or 6 to pin 2.



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

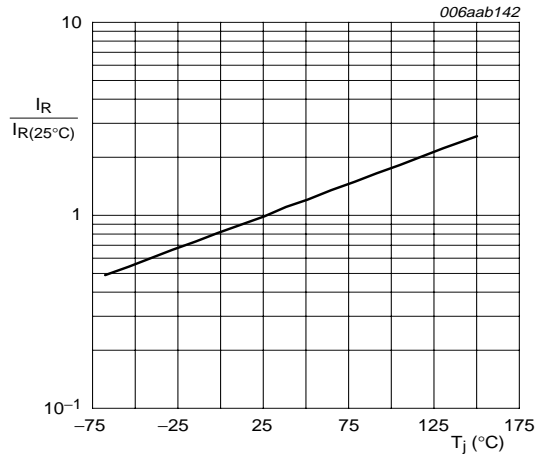


**Fig 4. Relative variation of peak pulse power as a function of junction temperature; typical values**

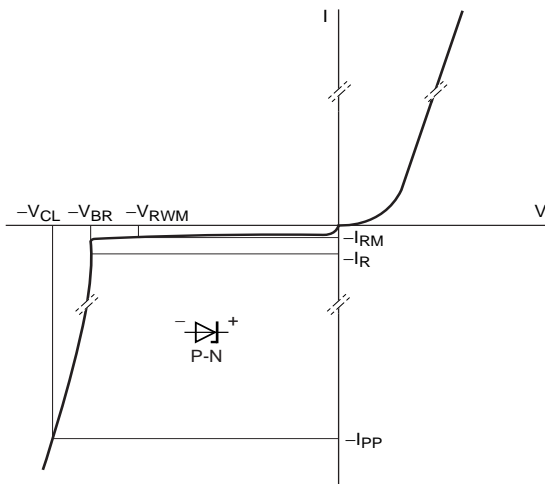


- (1) PESD3V3L5UF; PESD3V3L5UV; PESD3V3L5UY  
 (2) PESD5V0L5UF; PESD5V0L5UV; PESD5V0L5UY

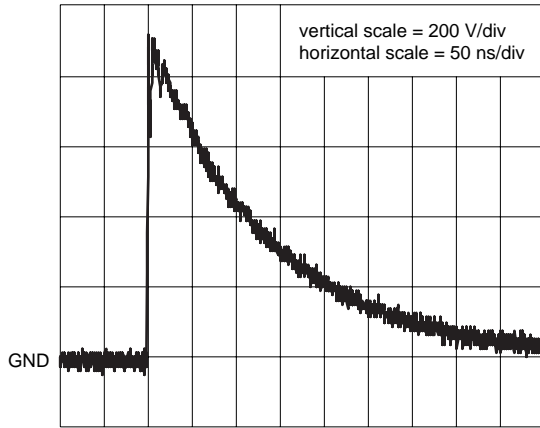
**Fig 5. Diode capacitance as a function of reverse voltage; typical values**



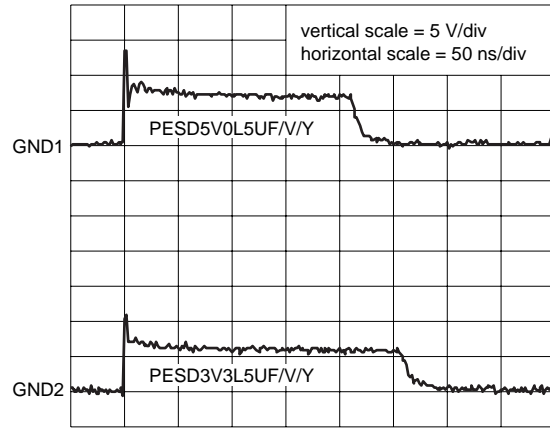
**Fig 6. Relative variation of reverse current as a function of junction temperature; typical values**



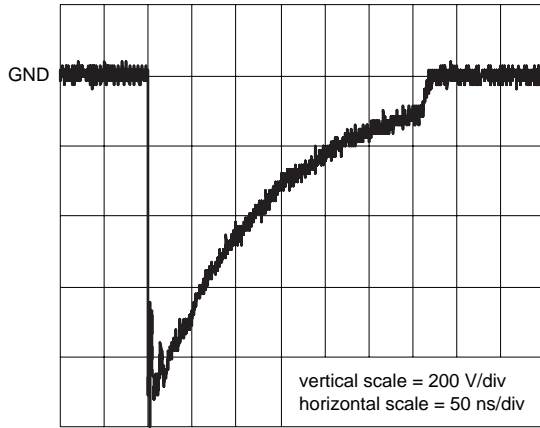
**Fig 7. V-I characteristics for a unidirectional ESD protection diode**



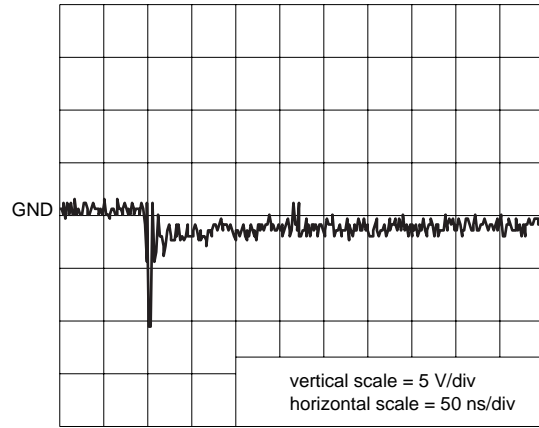
unclamped +1 kV ESD voltage waveform  
(IEC 61000-4-2 network)



clamped +1 kV ESD voltage waveform  
(IEC 61000-4-2 network)



unclamped -1 kV ESD voltage waveform  
(IEC 61000-4-2 network)

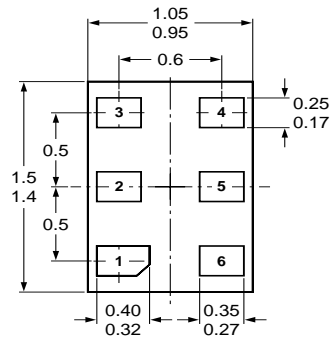


clamped -1 kV ESD voltage waveform  
(IEC 61000-4-2 network)

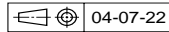
006aab143

**Fig 8. ESD clamping test setup and waveforms**

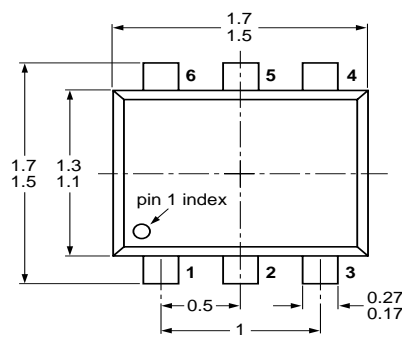
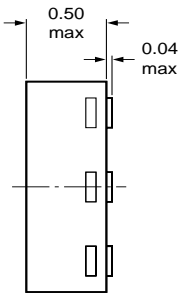
**SOT-886/SOT-666/SOT-363 PACKAGE OUTLINE DIMENSIONS**



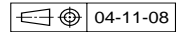
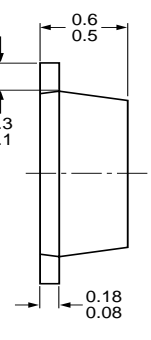
Dimensions in mm



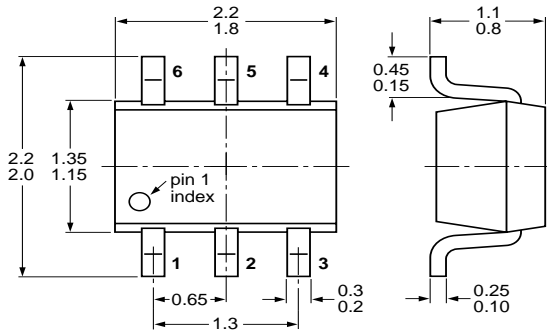
**PESDxL5UF (SOT886)**



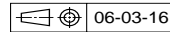
Dimensions in mm



**PESDxL5UV (SOT666)**

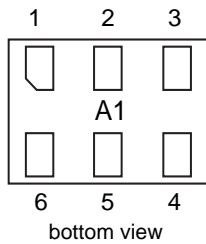


Dimensions in mm



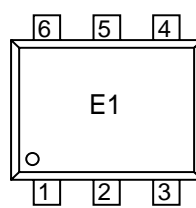
**PESDxL5UY (SOT363/SC-88)**

**Marking**

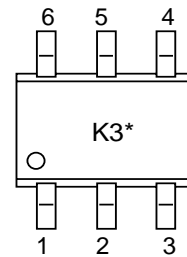


bottom view

SOT-886



SOT-666



SOT-363

1.\*代表周期

**Ordering information**

Order code	Marking code	Package	Baseqty	Deliverymode
PESD3V3L5UF	A1	SOT-886	5000	Tape and reel
PESD5V0L5UF	A2	SOT-886	5000	Tape and reel
PESD3V3L5UV	E1	SOT-666	4000	Tape and reel
PESD5V0L5UV	E2	SOT-666	4000	Tape and reel
PESD3V3L5UY	K3*	SOT-363	3000	Tape and reel
PESD5V0L5UY	K4*	SOT-363	3000	Tape and reel