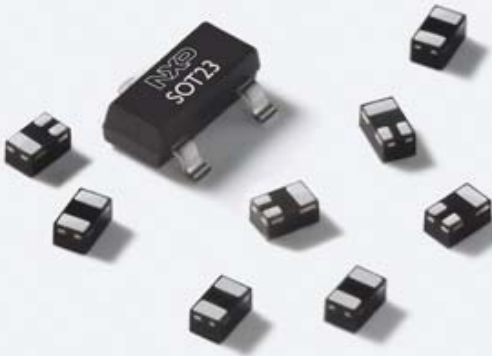


## ESD protection diodes with low capacitance and high ESD rating



### Best protection in smallest leadless packages

NXP offers a series of ESD protection diodes that are perfect for safeguarding your systems against ESD and other voltage-induced transient pulses. Ultra-small packages, yet offering very low line capacity and excellent ESD protection - they are your flexible solution to protect today's electronics.

#### Key benefits

- ▶ Minimal PCB area and maximum design flexibility
- ▶ Longer battery lifetime for all kind of portable electronics
- ▶ ESD Protection for high-speed applications
- ▶ Better protection for gate oxide. Improved protection for multiple ESD strikes
- ▶ Reducing customer field returns due to superior quality






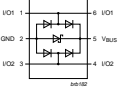


















#### Key features

- ▶ Broad portfolio in very small leadless packages
- ▶ Ultra-low leakage current:  $I_{RM}$  down to 1 nA
- ▶ Ultra-low diode capacitance down to  $C_d = 0.9$  pF
- ▶ Lower clamping voltages and higher reliability compared to varistors
- ▶ High ESD rating up to 30 kV in compliance to IEC 61000-4-2

#### Key applications

- ▶ Portable electronics - MP3, PDA, MPA
- ▶ Cellular handsets, accessories and Subscriber Identity Module (SIM) protection
- ▶ Antenna / RF-Protection / high-speed datalines (Ethernet, Firewire)
- ▶ Audio and video equipment
- ▶ Computers and peripherals - notebooks, desktop, server, printer

## ESD protection diodes in leadless packages

$C_d$ [typ] [pF]	$V_{RWM}$ [max] [V]	$V_{ESD}$ [max] [kV]	$I_{RM}$ [typ] [μA]	$V_{BR}$ [typ] [V]	No. of protected lines [bi]	No. of protected lines [uni]	configuration symbol	SOD882	SOT883	SOT891	SOT886
											
								1.0 x 0.6 x 0.5	1.0 x 0.6 x 0.5	1.0 x 1.0 x 0.5	1.45 x 1.0 x 0.5
0.9	5	9	0.001	7.5	1		PESD5V0X1BL				
1	5.5	8	0.1 (max)	6 (min)	2				PRTR5V0U2K	PRTR5V0U2F	
2	5	9	0.001	6.8		1		PESD5V0U1UL			
2.9	5	10	0.1 (max)	7	2			PESD5V0U2BM			
2.9	5	10	0.1 (max)	7	4					PESD5V0U4BF	
2.9	5	10	0.1 (max)	7	5					PESD5V0U5BF	
2.9	5	10	0.005	7	1		PESD5V0U1BL				
12	5	12	0.003	6.8	3	4					PESD5V0V4UF
15	3.3	12	0.04	5.6	3	4					PESD3V3L4UF PESD3V3V4UF
16	5	15	0.005	6.8	1	2			PESD5V0L2UM		
16	5	20	0.005	6.8	3	4					PESD5V0L4UF
16	5	20	0.005	6.8	4	5					PESD5V0L5UF
22	3.3	20	0.075	5.6	4	5					PESD3V3L5UF
23	24	23	0.001	27		1		PESD24VS1UL			
32	15	30	0.001	18		1		PESD15VS1UL			
35	5	30	0.005			1		PESD5V0S1BL			
38	12	30	0.001	15		1		PESD12VS1UL			
152	5	30	0.1	6.8		1		PESD5V0S1UL			
165	5	30	0.08	6.8	3	4					PESD5V0S4UF
215	3.3	30	0.3	5.6	3	4					PESD3V3S4UF

## Application examples

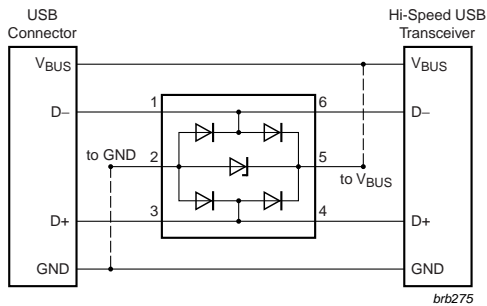
Several factors are responsible for increased ESD sensitivity of ICs: portable electronics are getting smaller and smaller, data interfaces have higher data transmission rates, chip sizes are being reduced and their density maximized.

Especially in high speed data transmission like USB 2.0 with a maximum data speed of 480 Mbits/s the capacity of an ESD protection is an issue. Due to a maximum allowed line capacitance of 10 pF, ESD protection diodes capacitance must be as low as possible.

NXP offers a dedicated ultra-high-speed series that is ideal for protecting high speed data lines:

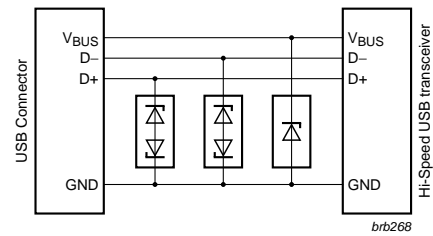
- ▶ Diode capacitance as low as 0.9 pF
- ▶ ESD standard compliance IEC 61000-4-2; level 4 (ESD), MIL-STD-883; class 3 (HBM)
- ▶ ESD robustness up to 9 kV contact

### ESD protection for USB



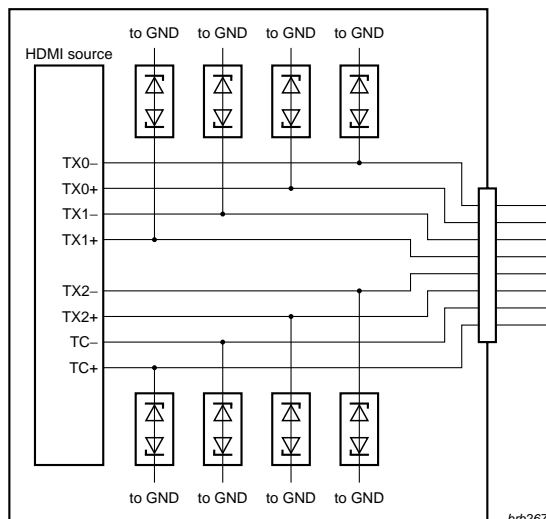
New PRTR5V0U2F or PRTR5V0U2K  
One device to protect a single USB Port

### ESD protection for USB



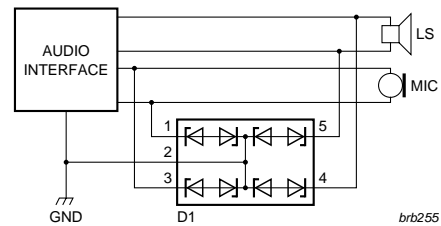
New PESD5V0X1BL and PESD5V0U1UL  
Flexible design to protect one USB Port

### ESD protection for HDMI



New PESD5V0X1BL

### ESD protection for mobile phones



New PESD5V0U4BF