

Ultra-Low Capacitance ESD Diode Array

- Rail-to-rail diodes with internal TVS diode
- ESD / transient protection of four I/O lines and one Vcc line exceeding:
 - IEC61000-4-2 (ESD): ± 15 kV (contact)
 - IEC61000-4-4 (EFT): 2.5 kV / 50 A (5/50 ns)
 - IEC61000-4-5 (surge): 3 A (8/20 μ s)
- Reverse working voltage data lines: 5.3 V max.
- Reverse working voltage Vcc: 6 V max.
- Very low capacitance: 0.4 pF typ.
- Very low reverse current < 10 nA typ.
- Very low clamping voltage:
 - 12 V typ. at positive transients
 - 4 V typ. at negative transients
- Pb-free (RoHS compliant) package

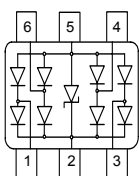


Applications

- USB 2.0 ports and future USB 3.0 ports
- Ethernet port: 10/100/1000 Mb/s
- IEEE 1394 FireWire ports
- Mobile communications e.g. high-speed SIM card protection
- Consumer products (STB, DVD, DSC, DVC...)
- Notebooks and desktop computers, peripherals



ESD5V3U4RRS



Type	Package	Configuration	Marking
ESD5V3U4RRS	SOT363	6 pins, uni-directional	E8s

Maximum Ratings at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Value	Unit
ESD contact discharge ¹⁾	V_{ESD}	15	kV
Peak pulse current ($t_p = 8 / 20 \mu\text{s}$) ²⁾	I_{pp}	3	A
Peak pulse power ($t_p = 8 / 20 \mu\text{s}$) ²⁾	P_{pk}	50	W
Operating temperature range	T_{op}	-55...125	°C
Storage temperature	T_{stg}	-65...150	

Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics ³⁾					
Reverse working voltage I/O pin ⁴⁾ to pin 5 pin 2 to pin 5	V_{RWM}	-	-	5.3 6	V
Breakdown voltage $I_{\text{(BR)}} = 1 \text{ mA}$, any pin to pin 5	$V_{\text{(BR)}}$	6.3	-	-	
Reverse current $V_{\text{R}} = 5.3 \text{ V}$, any pin to pin 5	I_{R}	-	< 10	100	nA
Clamping voltage $I_{\text{PP}} = 1 \text{ A}$, $t_p = 8/20 \mu\text{s}$ ²⁾ , any pin to pin 5 $I_{\text{PP}} = 3 \text{ A}$, $t_p = 8/20 \mu\text{s}$ ²⁾ , any pin to pin 5	V_{CL}	-	10 12	13 15	V
Forward clamping voltage $I_{\text{PP}} = 1 \text{ A}$, $t_p = 8/20 \mu\text{s}$ ²⁾ , any pin to pin 5 $I_{\text{PP}} = 3 \text{ A}$, $t_p = 8/20 \mu\text{s}$ ²⁾ , any pin to pin 5	V_{FC}	-	2 4	4 6	
Line capacitance ⁵⁾⁴⁾ $V_{\text{R}} = 0 \text{ V}$, $f = 1 \text{ MHz}$, any I/O pin to pin 5	C_{T}	-	0.4	0.6	pF
Dynamic resistance ⁶⁾	R_{D}	-	-	-	-

¹⁾ V_{ESD} according to IEC61000-4-2

²⁾ I_{pp} according to IEC61000-4-5

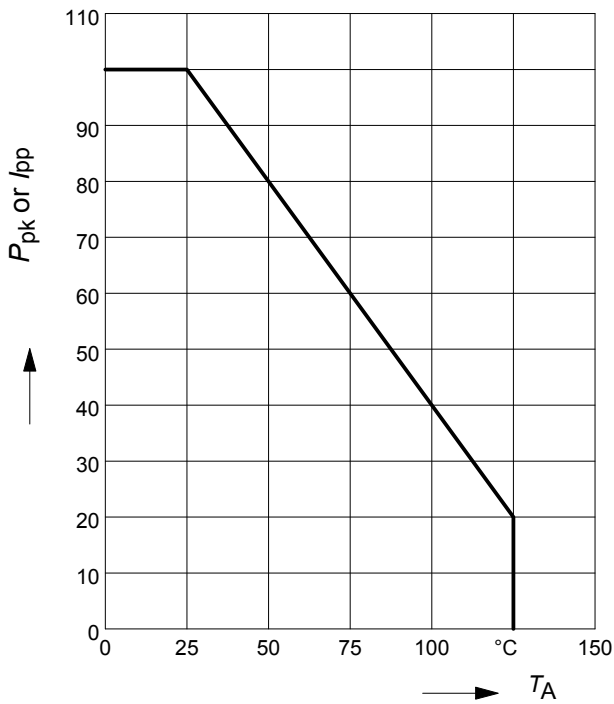
³⁾ It is strongly recommended that pin 5 is connected to ground for proper functionality.

⁴⁾ I/O pins are pin 1, 3, 4, 6

⁵⁾ Total capacitance line to ground

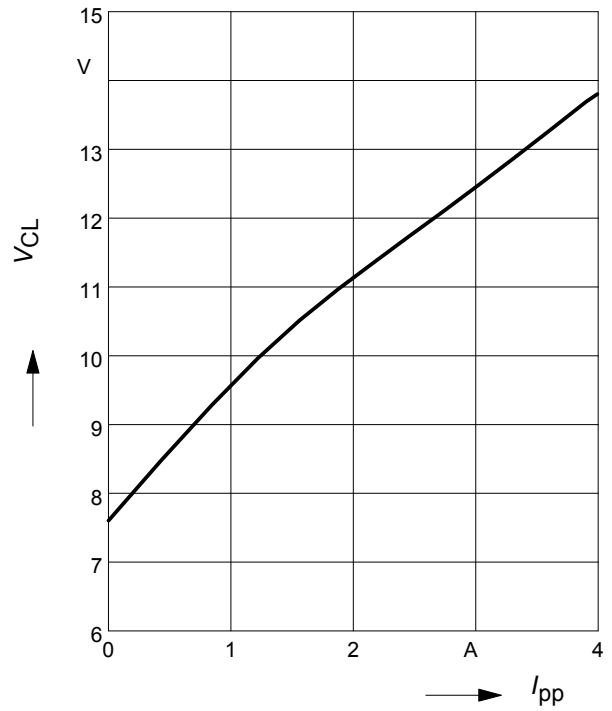
⁶⁾ according to TLP tests

Power derating curve $P_{pk} = f(T_A)$



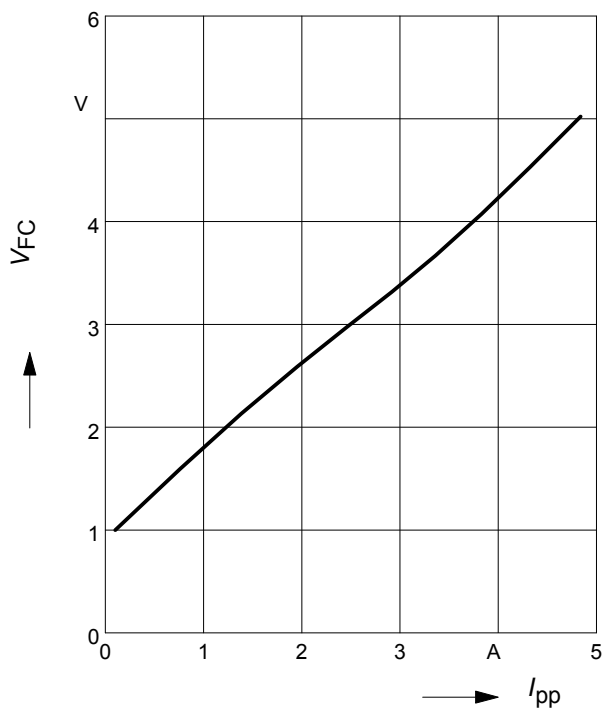
Clamping voltage, $V_{cl} = f(I_{pp})$

$t_p = 8 / 20 \mu s$



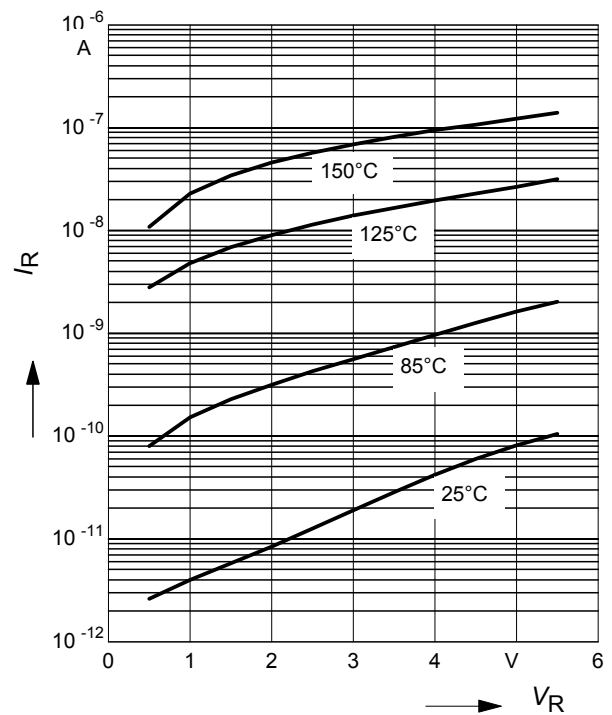
Forward clamping voltage $V_{FC} = f(I_{PP})$

$t_p = 8 / 20 \mu s$



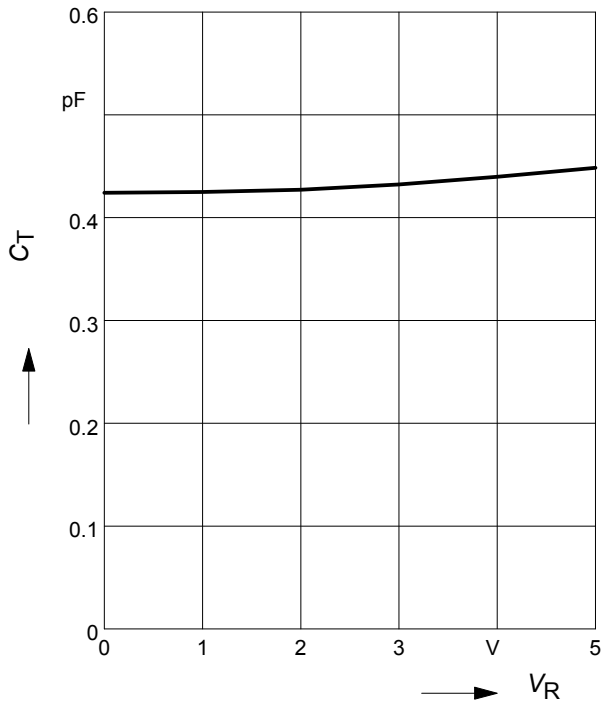
Reverse current $I_R = f(V_R)$

$T_A = \text{Parameter}$



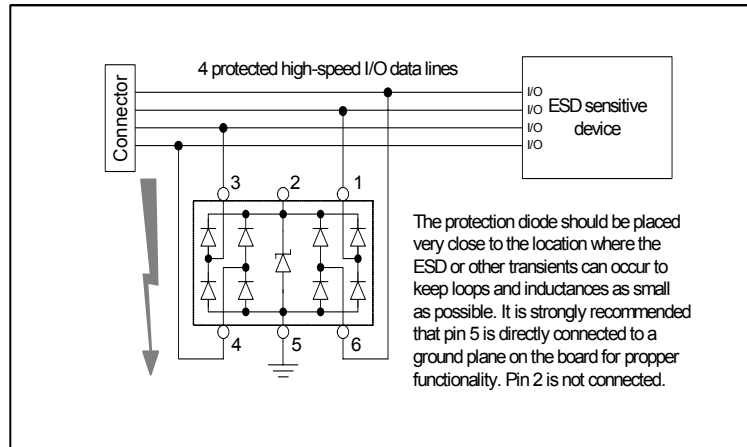
Diode capacitance $C_T = f(V_R)$

$f = 1\text{MHz}$



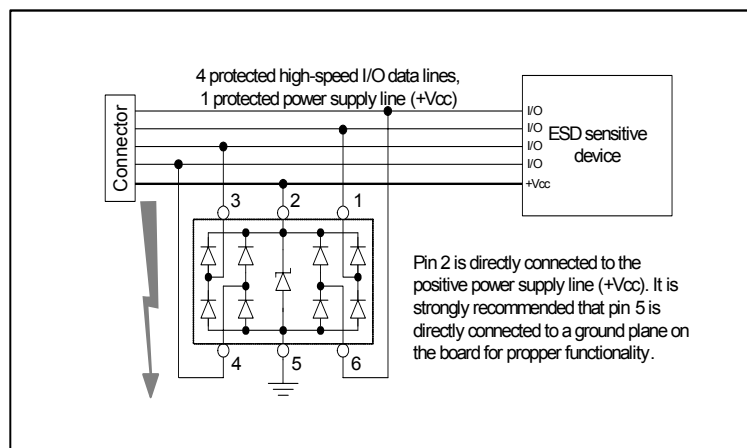
Application example ESD5V3U4RRS

4 data lines, uni-directional



Application example ESD5V3U4RRS

4 data lines and 1 power supply line, uni-directional



Package Outline



Foot Print



Marking Layout (Example)

Small variations in positioning of Date code, Type code and Manufacture are possible.



Standard Packing

Reel \varnothing 180 mm = 3.000 Pieces/Reel
 Reel \varnothing 330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.



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