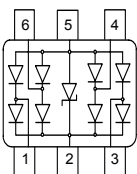


Ultra-Low Capacitance ESD Diode Array

- 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

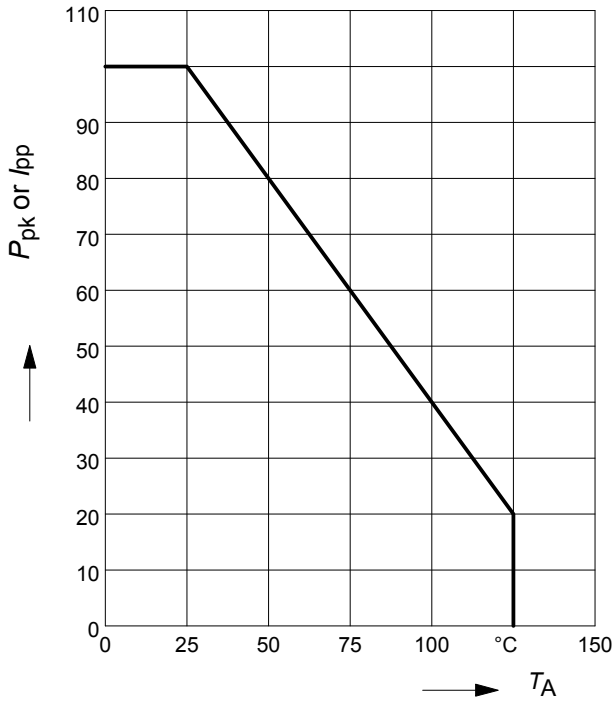
³⁾ It is strongly recommended that pin 5 is connected to ground for proper functionality.

⁴⁾ I/O pins are pin 1, 3, 4, 6

⁵⁾ Total capacitance line to ground

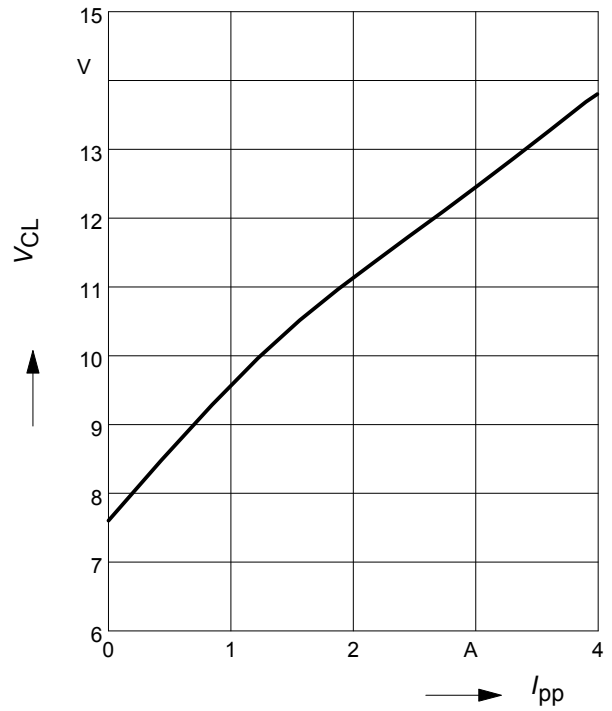
⁶⁾ according to TLP tests

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



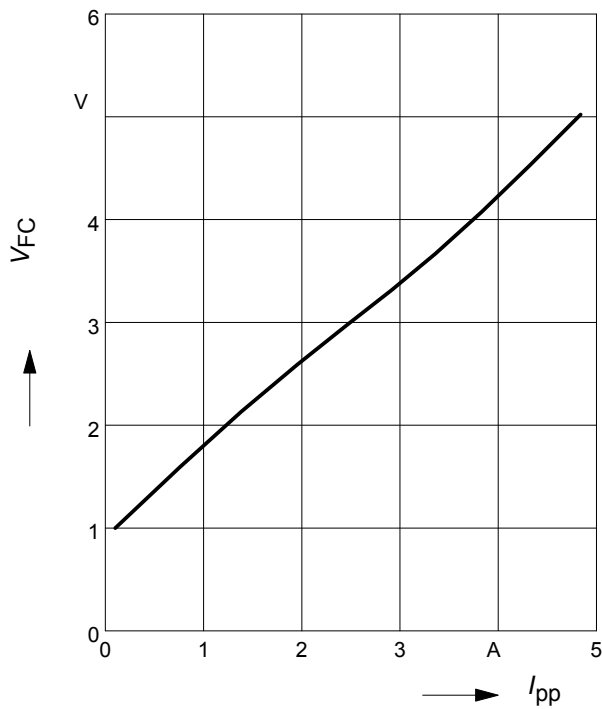
Clamping voltage, $V_{cl} = f(I_{pp})$

$t_p = 8 / 20 \mu s$



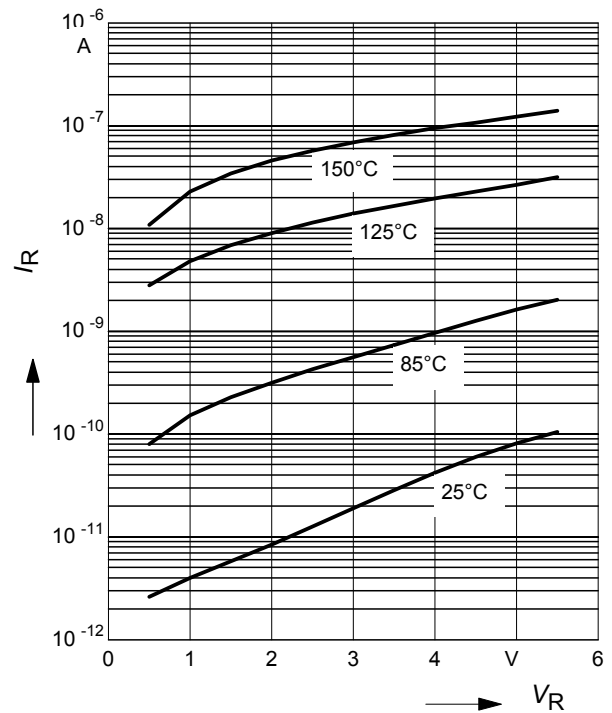
Forward clamping voltage $V_{FC} = f(I_{PP})$

$t_p = 8 / 20 \mu s$



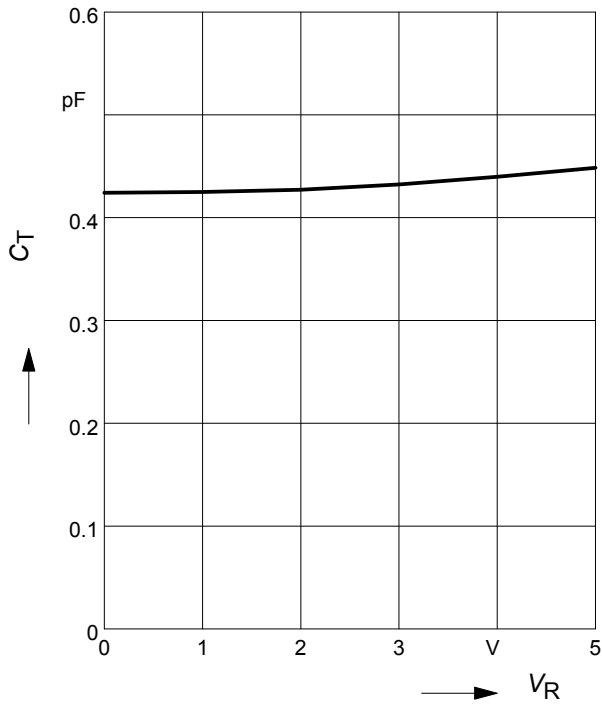
Reverse current $I_R = f(V_R)$

$T_A = \text{Parameter}$



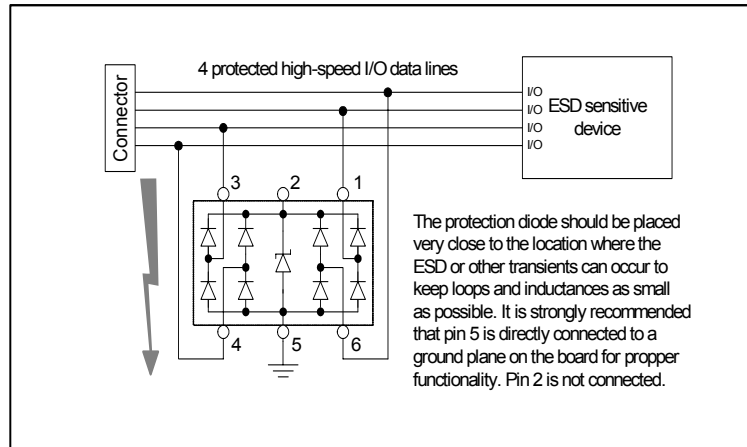
Diode capacitance $C_T = f(V_R)$

$f = 1\text{MHz}$



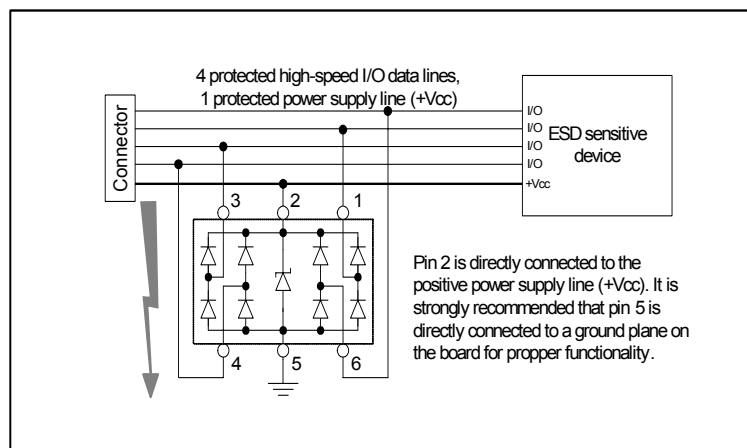
Application example ESD5V3U4RRS

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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