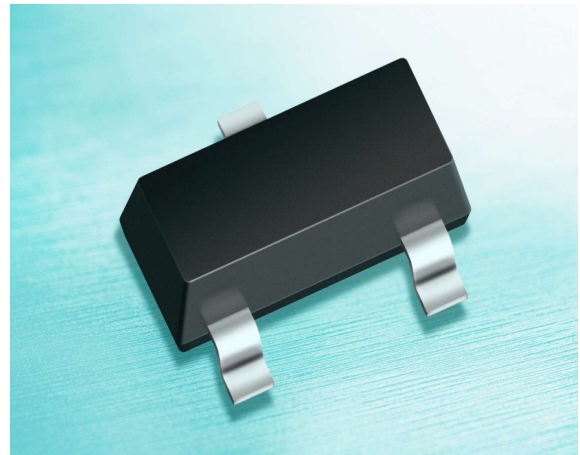


Silicon TVS diodes

- ESD / transient protection of CAN/LIN bus networks power supply lines according to:
IEC61000-4-2 (ESD): $\pm 30\text{kV}$ (air / contact)
IEC61000-4-4 (EFT): 80 A (5/50 ns)
IEC61000-4-5 (surge): 5 A (8/20 μs)
ISO7637-2: Pulse 1 (max. 50 V),
Pulse 2 (max. 125 V), Pulse 3a, b (max.800 V)
- Max. working voltage: 24 V
- Low capacitance: 24 pF typ.
- Low clamping voltage: < 41 V
- Extremely low reverse current: < 1 nA typ.
- Pb-free (RoHS compliant) package

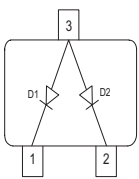


Applications

- Low and High-Speed CAN
- Fault Tolerant CAN
- Industrial control networks
- 12/24 V DC power supply lines



ESD24VS2U



| Type | Package | Configuration | Marking |
|-----------|---------|---------------------------|---------|
| ESD24VS2U | SOT23 | 2 lines, uni-directional* | EUs |

* 1 line, bi-directional between pins 1 and 2, if pin 3 is not connected

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

| Parameter | Symbol | Value | Unit |
|-----------------------------------------------------------------|------------------|-----------|------|
| ESD contact discharge ¹⁾ | V_{ESD} | 30 | kV |
| Peak pulse current ($t_p = 8 / 20 \mu\text{s}$) ²⁾ | I_{pp} | 5 | A |
| Peak pulse power ($t_p = 8 / 20 \mu\text{s}$) ²⁾ | P_{pk} | 230 | W |
| Operating temperature range | T_{op} | -55...150 | °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

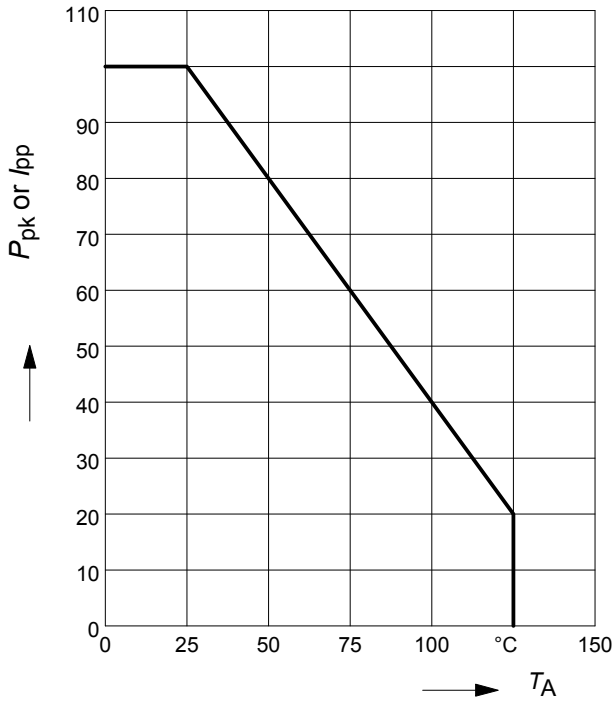
| | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----|----------|----------|----|
| Reverse working voltage | V_{RWM} | - | - | 24 | V |
| Breakdown voltage $I_{(\text{BR})} = 1 \text{ mA}$ | $V_{(\text{BR})}$ | 26 | - | 32 | |
| Reverse current $V_R = 24 \text{ V}$ | I_R | - | <1 | 10 | nA |
| Clamping voltage $I_{\text{PP}} = 1 \text{ A}, t_p = 8 / 20 \mu\text{s}$) ²⁾ $I_{\text{PP}} = 5 \text{ A}, t_p = 8 / 20 \mu\text{s}$) ²⁾ | V_{CL} | - | 30 36 | 34 41 | V |
| Line capacitance ³⁾ $V_R = 0 \text{ V}, f = 1 \text{ MHz}$, (pins 1 to 2, pin 3 n.c.) $V_R = 0 \text{ V}, f = 1 \text{ MHz}$, (pins 1 or 2 to 3) | C_T | - | 24 48 | 28 52 | |

¹⁾ V_{ESD} according to IEC61000-4-2. Device stressed with 10 positive / negative ESD pulses.

²⁾ I_{pp} according to IEC61000-4-5. Non-repetitive current pulse.

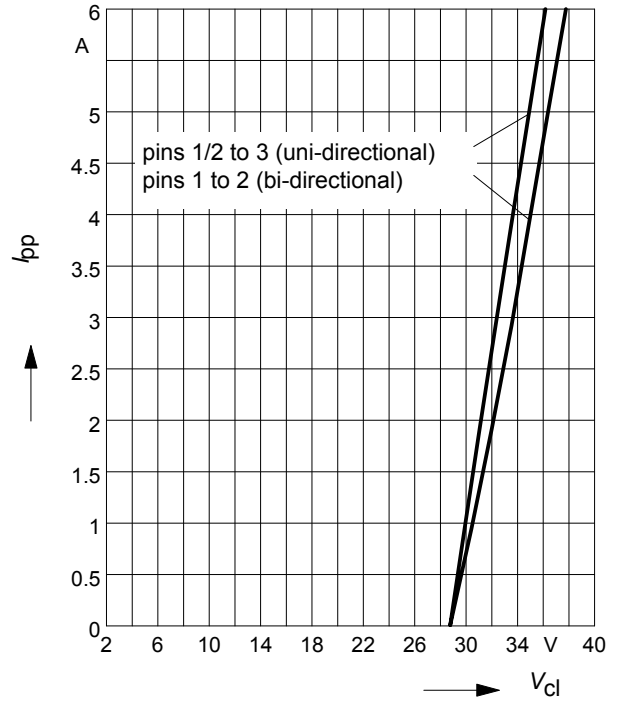
³⁾Total capacitance line to ground (per line)

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



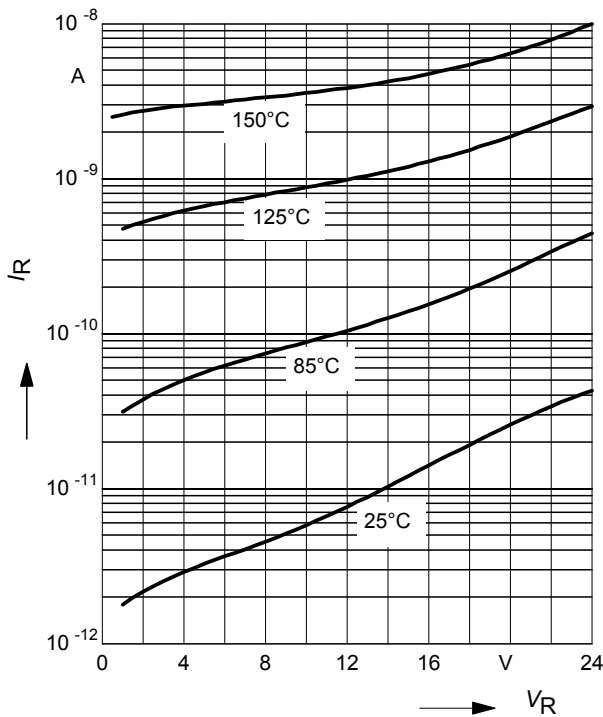
Clamping voltage, $V_{cl} = f(I_{pp})$

$t_p = 8 / 20 \mu s$



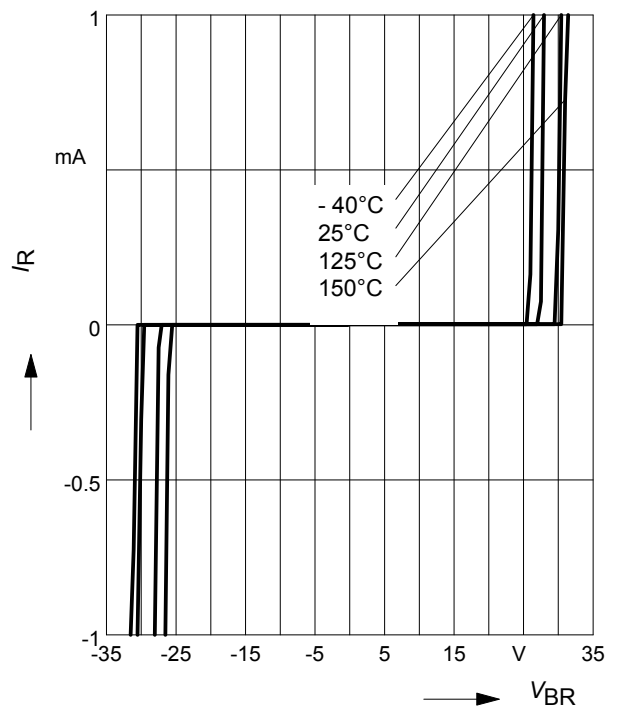
Reverse current $I_R = f(V_R)$

$T_A =$ Parameter, pins 1 / 2 to 3
(uni-directional)



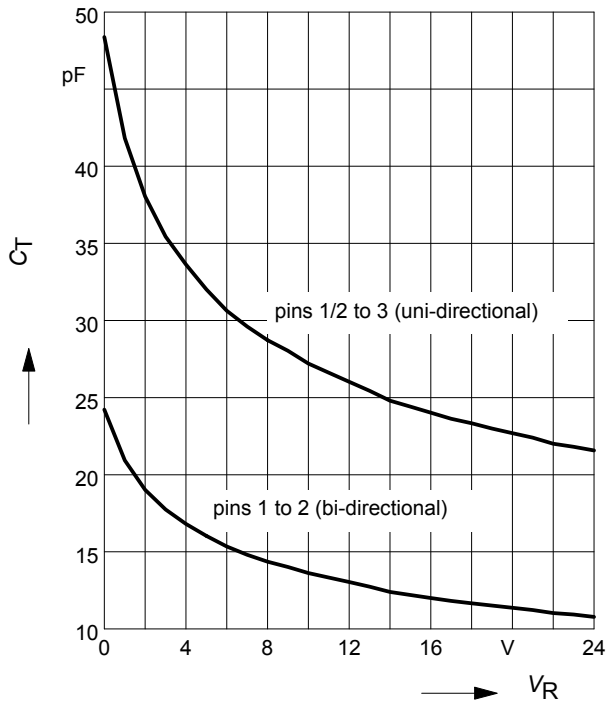
Breakdown voltage $V_{BR} = f(I_R)$

$T_A =$ Parameter, pins 1 to 2
(bi-directional)

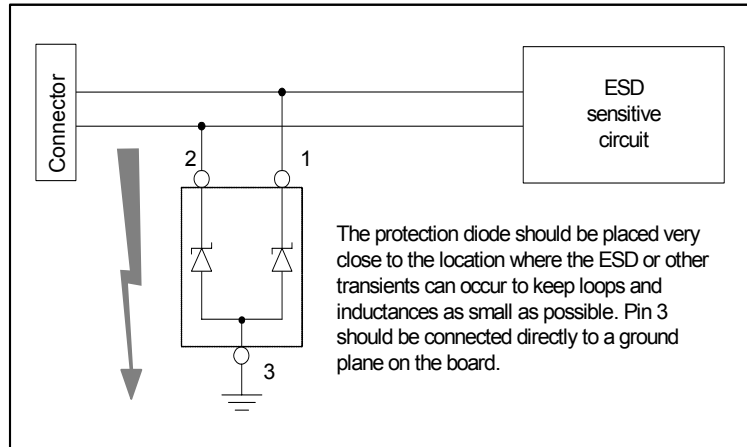


Line capacitance $C_T = f(V_R)$

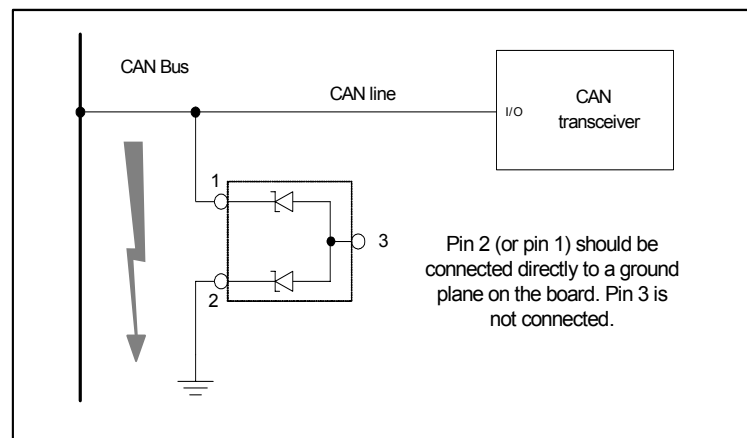
$f = 1\text{MHz}$



Application example ESD24VS2U (uni-directional)
 12V / 24V DC power supply line protection

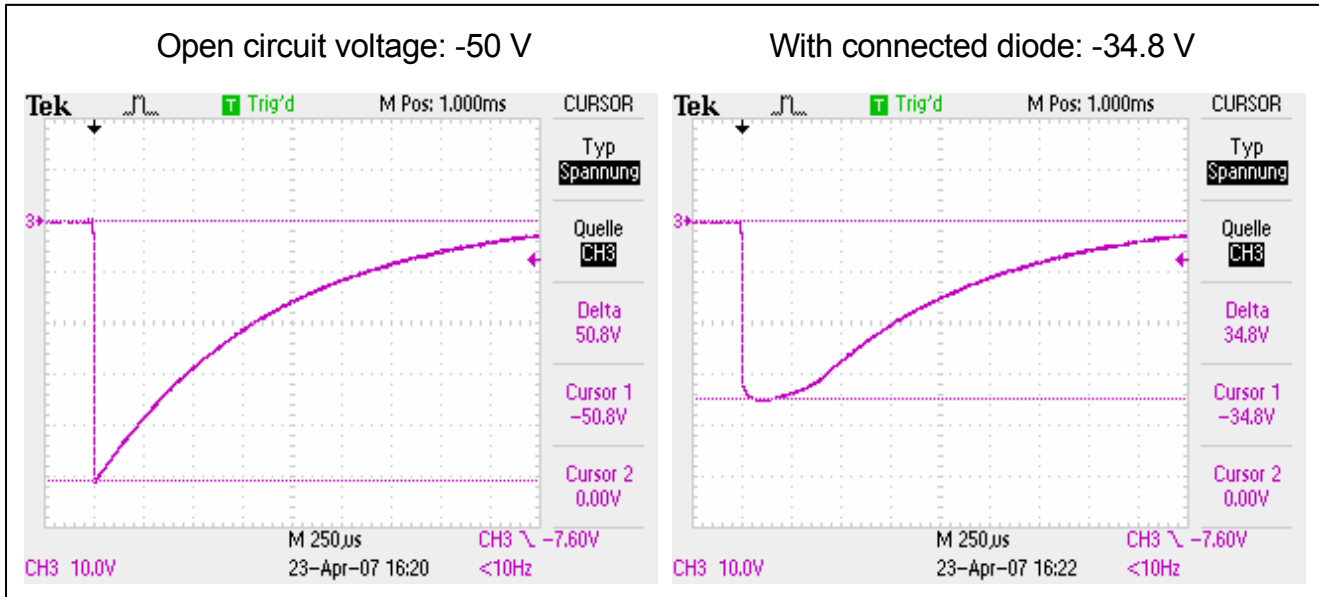


Application example ESD24VS2U (bi-directional)
 Single Wire CAN and LIN bus protection



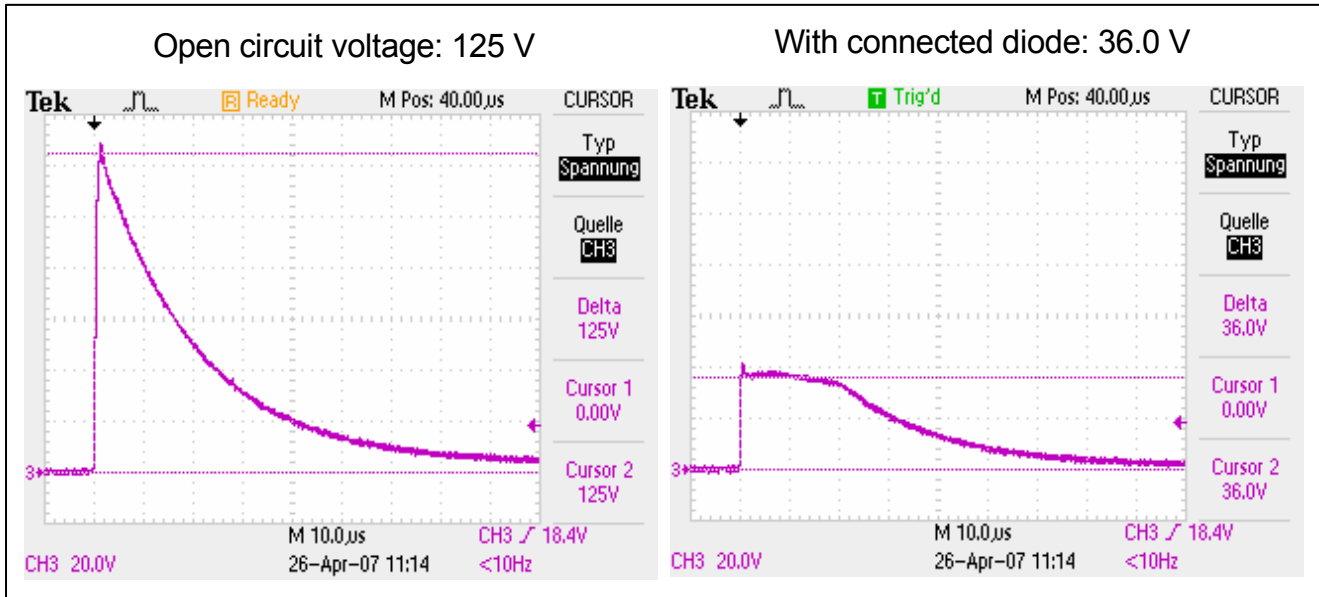
Clamping voltage according to ISO 7637-2: Pulse 1

Ri = 10 Ohm, td = 2 ms, 5000 pulses



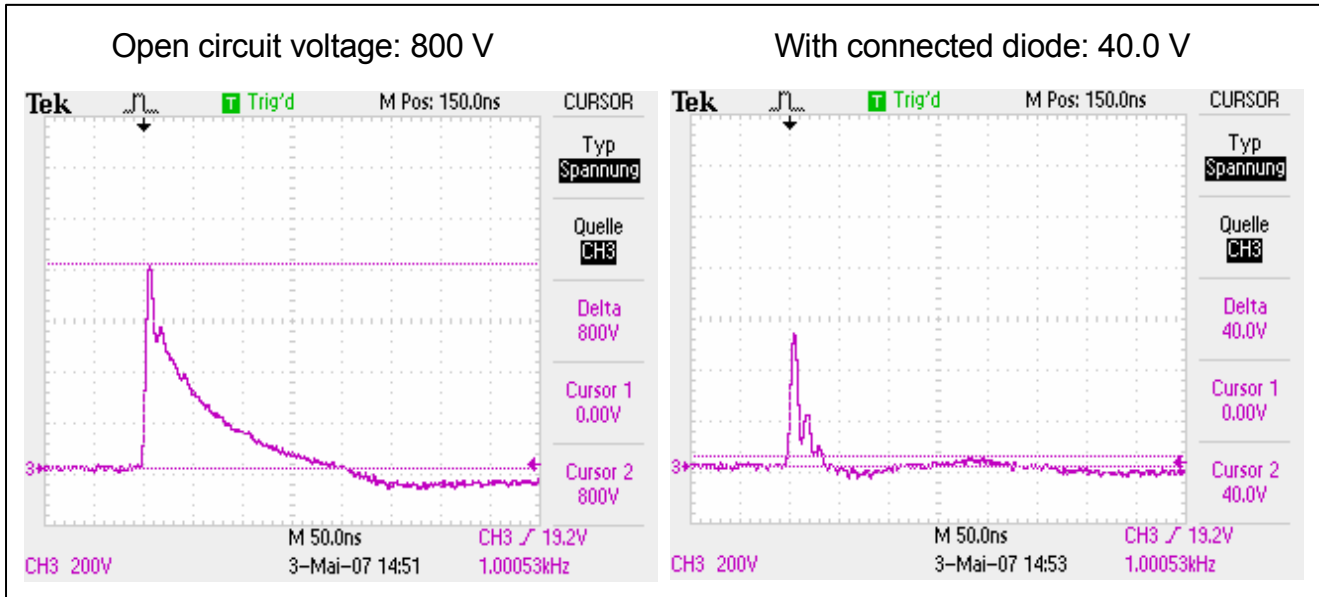
Clamping voltage according to ISO 7637-2: Pulse 2a

Ri = 10 Ohm, td = 2 us, 4000 pulses, 60 min

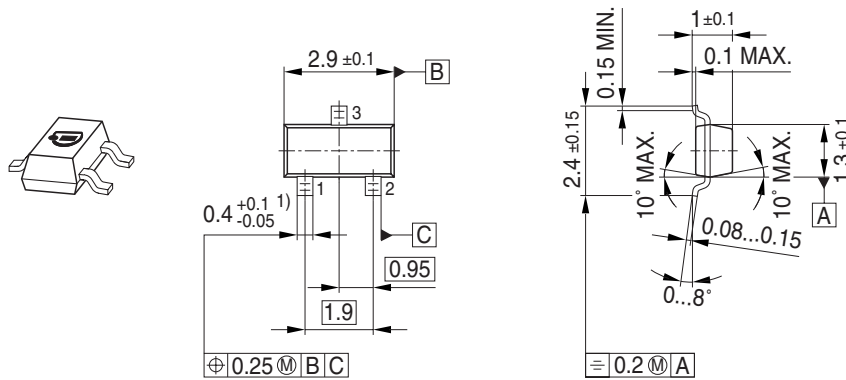


Clamping voltage according to ISO 7637-2: Pulse 3

Ri = 50 Ohm, td = 100 ns, 10 min



Package Outline



1) Lead width can be 0.6 max. in dambar area

Foot Print

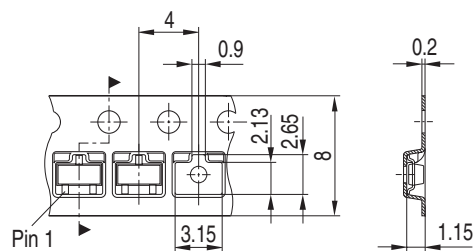


Marking Layout (Example)



Standard Packing

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



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