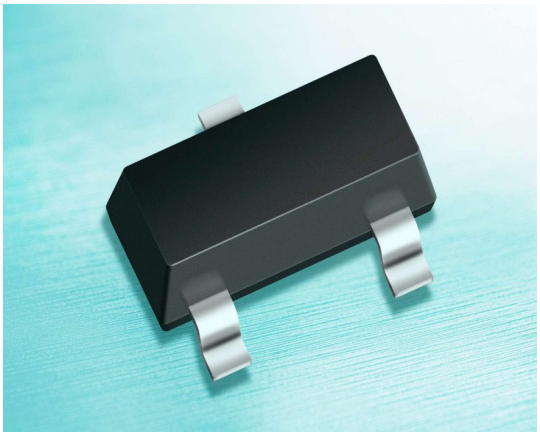
Silicon TVS diodes



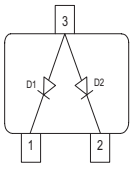
- ESD / transient protection of automotive CAN/LIN bus networks / transceivers, industrial bus systems and power supply lines according to:
  IEC61000-4-2 (ESD): ±30kV (air / contact)
  IEC61000-4-4 (EFT): 80 A (5/50 ns)
  IEC61000-4-5 (surge): 5 A (8/20µs)
  ISO7637-2: Pulse 1 (max. 50 V),
  Pulse 2 (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

RoHS

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 connested

Maximum Ratings at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Value	Unit
ESD contact discharge[1)]	V_{ESD}	30	kV
Peak pulse current (t_p = 8 / 20 µs)[2)]	I_{pp}	5	A
Peak pulse power (t_p = 8 / 20 µs)[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°C, unless otherwise specified

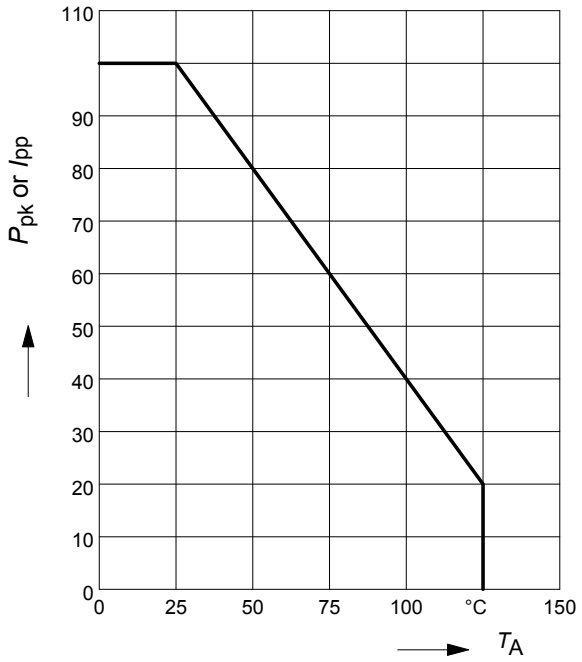
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Reverse working voltage	V_{RWM}	-	-	24	V
Breakdown voltage $I_{(BR)}$ = 1 mA	$V_{(BR)}$	26	-	32	
Reverse current V_R = 24 V	I_R	-	<1	10	nA
Clamping voltage	V_{CL}				V
I_{PP} = 1 A, t_p = 8 / 20 µs)[2)]		-	30	34	
I_{PP} = 5 A, t_p = 8 / 20 µs)[2)]		-	36	41	
Line capacitance[3)]	C_T				pF
V_R = 0 V, f = 1 MHz, (pins 1 to 2, pin 3 n.c.)		-	24	28	
V_R = 0 V, f = 1 MHz, (pins 1 or 2 to 3)		-	48	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.

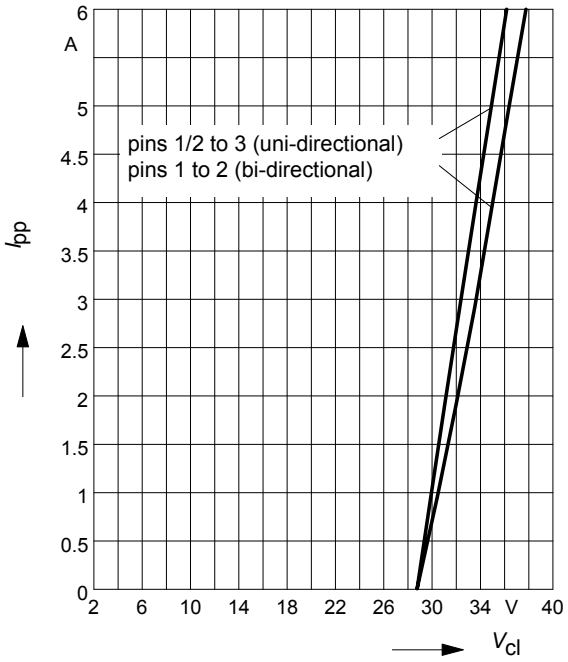
[3] Total capacitance line to ground (per linie)

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



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

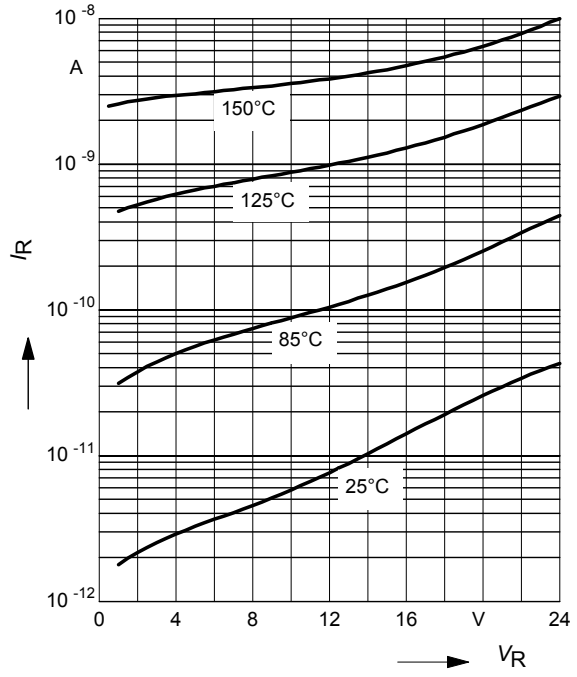
t_p = 8 / 20 µs



Reverse current $I_R = f(V_R)$

T_A = Parameter, pins 1 / 2 to 3

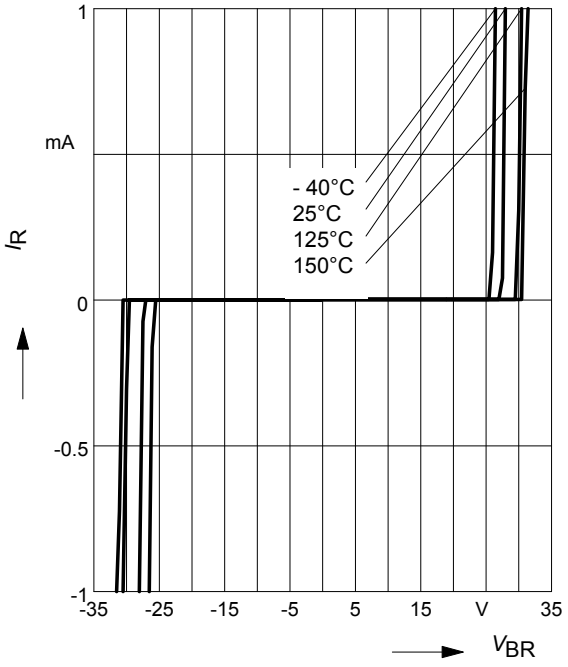
(uni-directional)



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

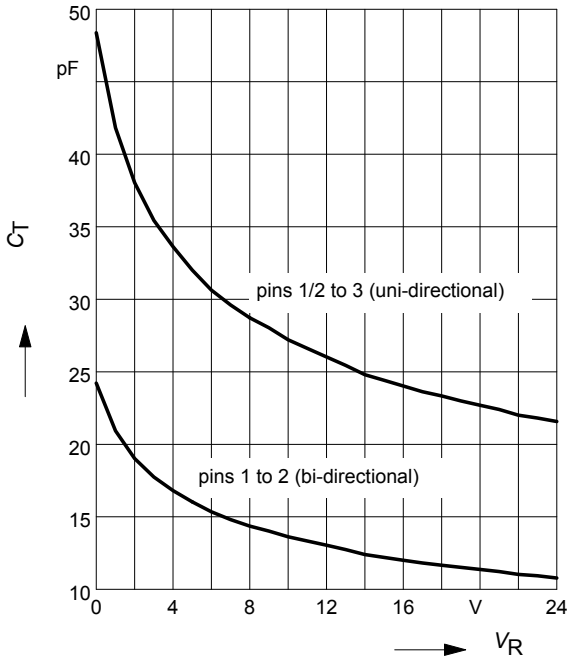
T_A = Parameter, pins 1 to 2

(bi-directional)

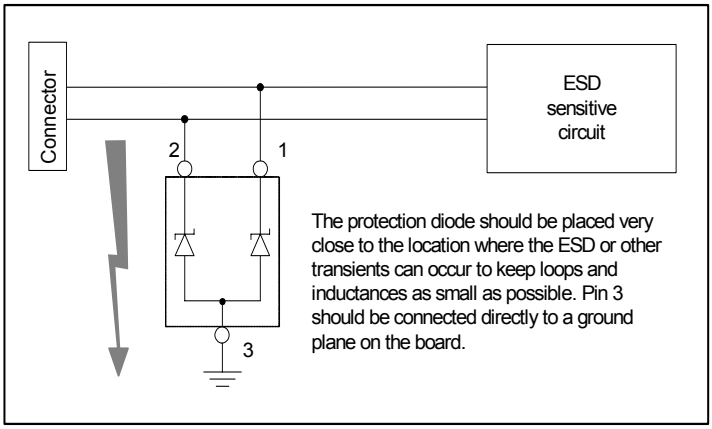


Line capacitance $C_T = f(V_R)$

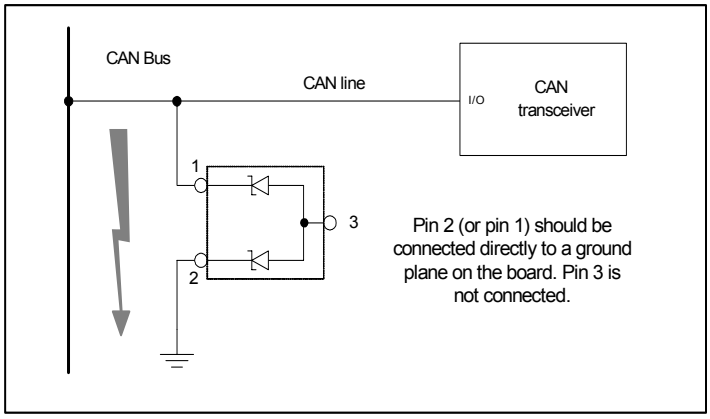
f = 1MHz



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

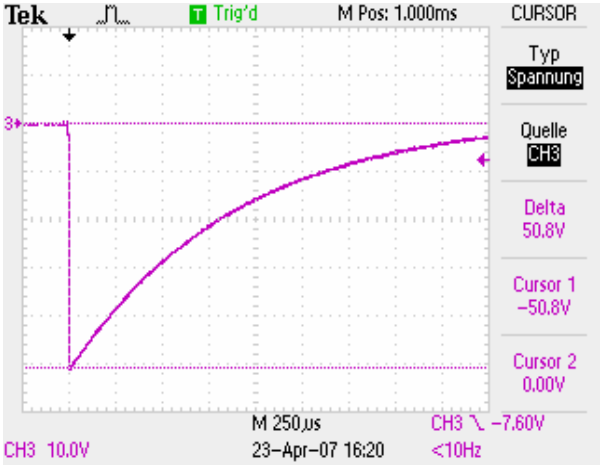


Application example ESD24VS2U (bi-directional)
Single Wire CAN and LIN bus protection

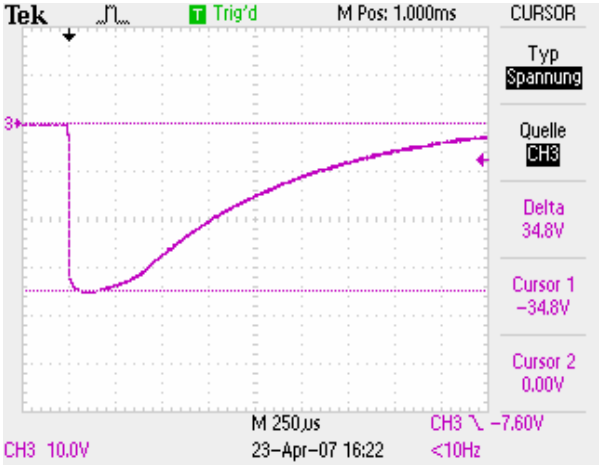


Clamping voltage according to ISO 7637-2: Pulse 1
Ri = 10 Ohm, td = 2 ms, 5000 pulses

Open circuit voltage: -50 V

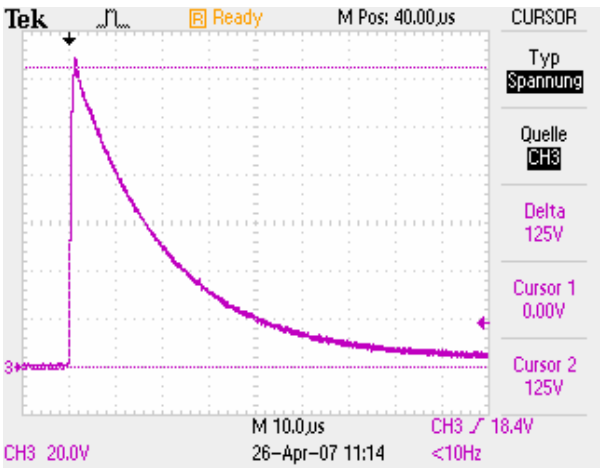


With connected diode: -34.8 V

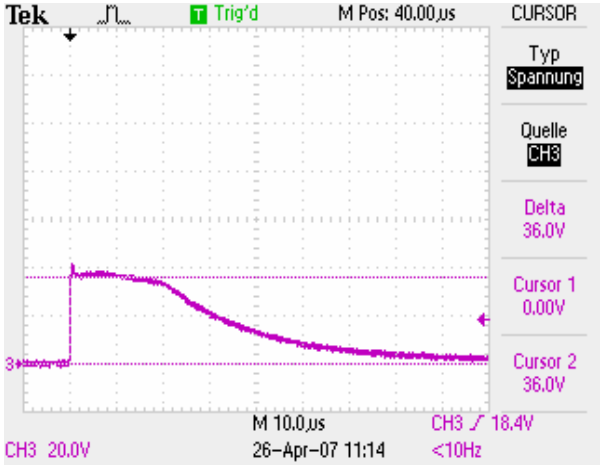


Clamping voltage according to ISO 7637-2: Pulse 2a
Ri = 10 Ohm, td = 2 us, 4000 pulses, 60 min

Open circuit voltage: 125 V

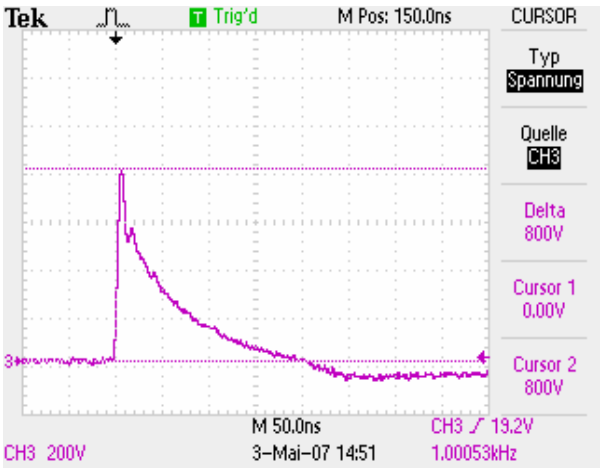


With connected diode: 36.0 V

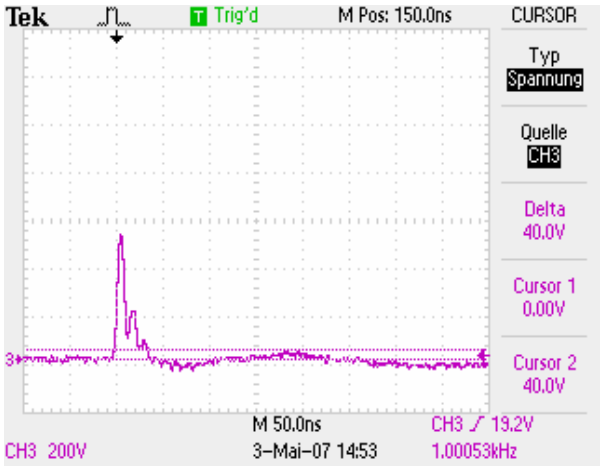


Clamping voltage according to ISO 7637-2: Pulse 3
Ri = 50 Ohm, td = 100 ns, 10 min

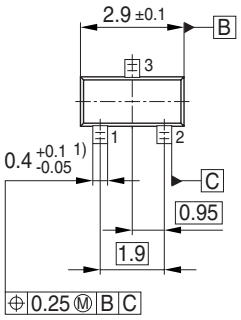
Open circuit voltage: 800 V

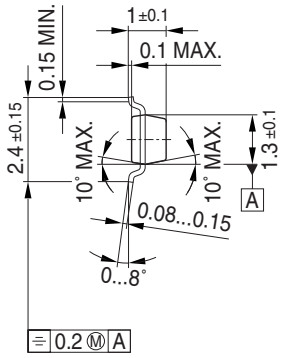


With connected diode: 40.0 V



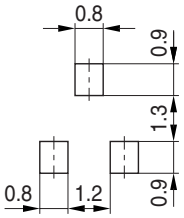
Package Outline



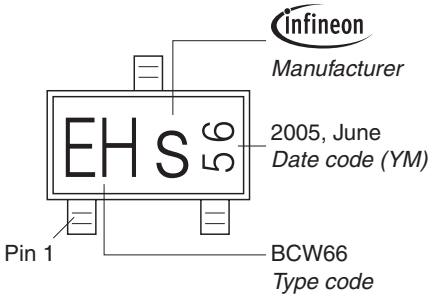


1) Lead width can be 0.6 max. in dambar area

Foot Print

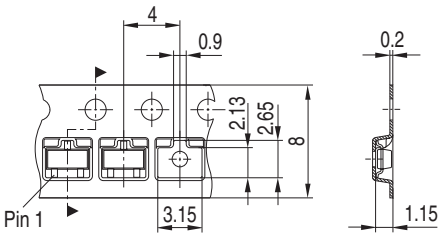


Marking Layout (Example)



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel
Reel ø330 mm = 10.000 Pieces/Reel



Edition 2009-11-16

Published by
Infineon Technologies AG
81726 Munich, Germany

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