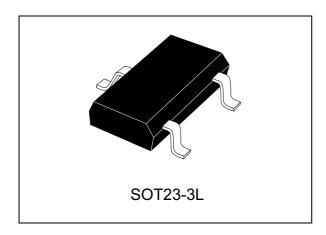


ESDCAN01-2BLY, ESDCAN24-2BLY

Automotive dual-line Transil™, transient voltage suppressor (TVS) for CAN bus

Datasheet - production data



Features

Dual-line ESD and EOS protection

Breakdown voltage: V_{BR}
 ESDCAN24-2BLY: 27 V
 ESDCAN01-2BLY: 25 V

Bidirectional device

• Max pulse power: 230 W (8/20 μs)

• Low clamping factor V_{CL} / V_{BR}

· Low leakage current

ECOPACK[®]2 compliant component

· AEC-Q101 qualified

Complies with the following standards

• ISO 10605 - C = 150 pF, R = 330 Ω :

- ±30 kV (air discharge)
- ±30 kV (contact discharge)
- ISO 10605 C = 330 pF, R = 330 Ω :
 - ±30 kV (air discharge)
 - ±30 kV (contact discharge)

ISO 7637-3:

- Pulse 3a: $V_s = -150 \text{ V}$

- Pulse 3b: $V_s = +100 \text{ V}$

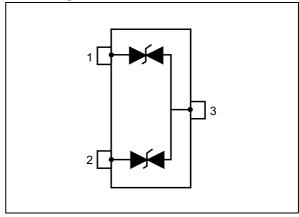
Application

Automotive controller area network (CAN) bus lines where electrostatic discharge and other transients must be suppressed.

Description

The ESDCAN01-2BLY and ESDCAN24-2BLY are dual-line Transils specifically designed for the protection of the automotive CAN bus lines against electrostatic discharge (ESD).

Figure 1. Functional schematic



TM: Transil is a trademark of STMicroelectronics

1 Characteristics

Table 1. Absolute maximum ratings $(T_{amb} = 25^{\circ}C)$

Symbol	Parameter Value				
		ISO 10605 - C = 150 pF, F Contact discharge Air discharge	R = 330 Ω:	30 30	
V _{PP}	Peak pulse voltage	ISO 10605 - C = 330 pF, F Contact discharge Air discharge	R = 330 Ω:	30 30	kV
		HBM MIL STD 883	10		
P _{PP}	Peak pulse power dissipation (8/2	230	W		
I _{PP}	Peak pulse current (8/20 μs)	5.5	Α		
T _j	Operating junction temperature ra	-40 to +150	°C		
T _{stg}	Storage temperature range	-55 to +150	°C		

Figure 2. Electrical characteristics (definitions)

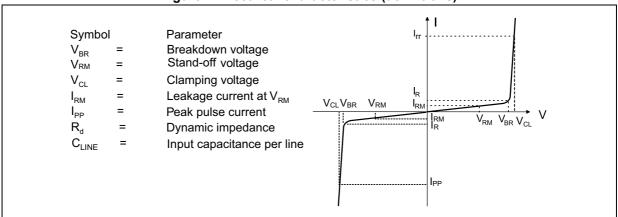


Table 2. Electrical characteristics (values, T_{amb} = 25 °C)

		max V _{RM}	V	_{BR} at I _F	t	V _{CL} Pulse ISO7637-3		V _{CL} at I _{PP} (8/20μs)		С		∆C (1)	αT ⁽²⁾
Order code			min.	max.		3a at -150 V	3b at +100 V	max.		typ.	max.		
	μΑ	٧	٧	v	mA	V	V	V	Α	pF	pF	рF	10 ⁻⁴ /°C
ESDCAN24-2BLY	0.1	24	27	32	1	-40	40	43	5	-	30	0.1	9
ESDCAN01-2BLY	0.1	24	25	30	1	-35	35	40	5	-	30	0.1	9

^{1.} ΔC : capacitance variation between IO1 and IO2 versus GND

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^{2.} $\Delta V_{BR} = \alpha T x (T_{amb} -25) x V_{BR} (25 °C)$

Figure 3. Response to ISO 7637-3 Pulse 3a
(Us = -150 V) ESDCAN24-2BLY

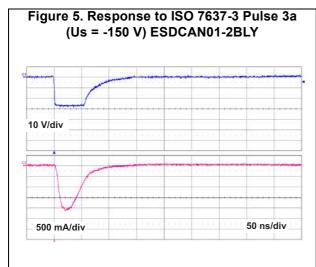
Voltage (10 V/div)

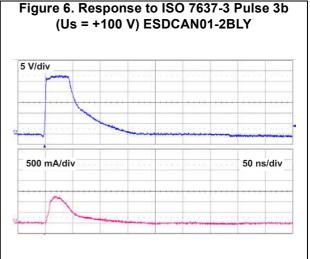
Current (0.5 A/div)

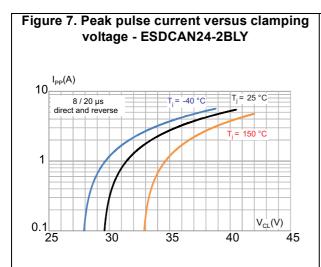
Figure 4. Response to ISO 7637-3 Pulse 3b
(Us = +100 V) ESDCAN24-2BLY

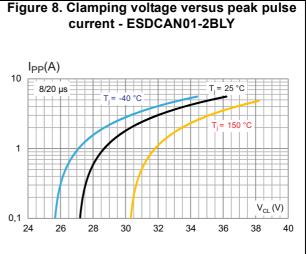
Voltage (10 V/div)

Current (0.5 A/div)
100 ns/div









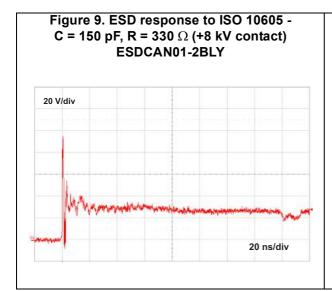


Figure 10. ESD response to ISO 10605 C = 150 pF, R = 330 Ω (-8 kV contact)
ESDCAN01-2BLY

Figure 11. Leakage current versus junction temperature

I_R(nA)

10

1

0,1

25

50

75

100

125

150

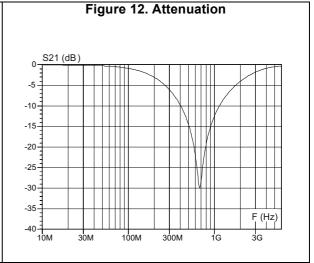


Figure 13. Peak pulse power versus initial junction temperature (maximum values) $P_{PP}(W)$ 400 350 300 250 200 150 100 50 $T_j(^{\circ}C)$ 0 100 125 150

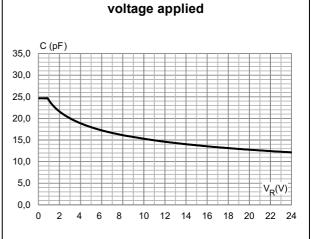
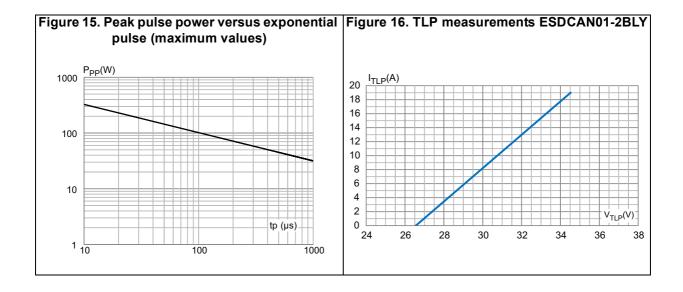


Figure 14. Junction capacitance versus reverse

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2 Package information

- Epoxy meets UL94, V0
- Lead-free packages

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: www.st.com. ECOPACK[®] is an ST trademark.

2.1 SOT23-3L package information

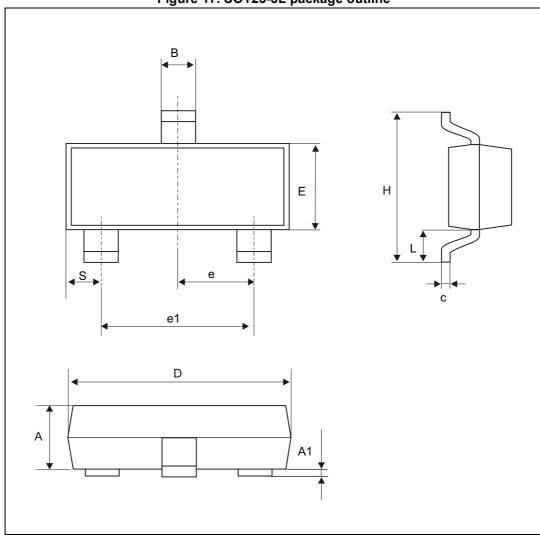


Figure 17. SOT23-3L package outline

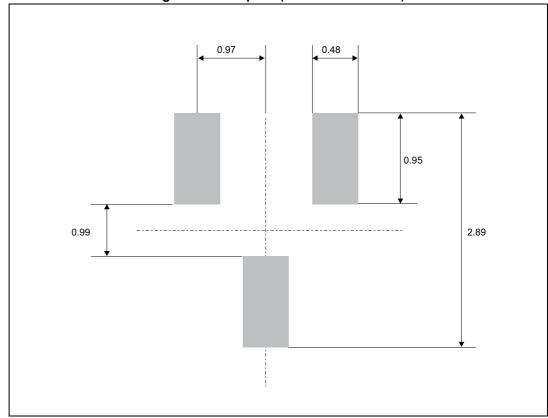
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^{1.} The marking codes can be rotated by 90 ° or 180° to differentiate assembly location. In no case should this product marking be used to orient the component for its placement on a PCB. Only pin 1 mark is to be used for this purpose.

Table 3. SOT23-3L package mechanical data

	Dimensions							
Ref.	Millim	neters	Inches					
	Min.	Max.	Min.	Max.				
Α	0.89	1.4	0.035	0.055				
A1	0	0.1	0	0.004				
В	0.3	0.51	0.012	0.02				
С	0.085	0.18	0.003	0.007				
D	2.75	3.04	0.108	0.12				
е	0.85	1.05	0.033	0.041				
e1	1.7	2.1	0.067	0.083				
Е	1.2	1.75	0.047	0.069				
Н	2.1	3.00	0.083	0.118				
L	0.6	typ.	0.024 typ.					
S	0.35	0.65	0.013	0.026				

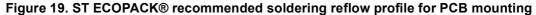
Figure 18. Footprint (dimensions in mm)

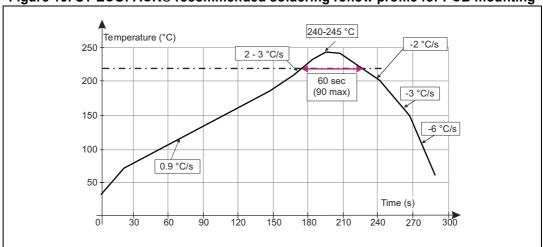


2.2 PCB design preference

- 1. To control the solder paste amount, the closed via is recommended instead of open vias.
- 2. The position of tracks and open vias in the solder area should be well balanced. The symmetrical layout is recommended, in case any tilt phenomena caused by asymmetrical solder paste amount due to the solder flow away.

2.3 Reflow profile.





Minimize air convection currents in the reflow oven to avoid component movement. Maximum soldering profile corresponds to the latest IPC/JEDEC J-STD-020.

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3 Ordering information

Figure 20. Ordering information scheme

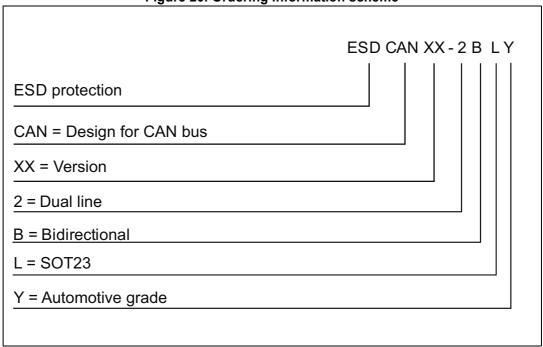


Table 4. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
ESDCAN24-2BLY	EL24	SOT23-3L	9.794 mg	3000	Tape and reel
ESDCAN01-2BLY	EN24	SOT23-3L	9.794 mg	3000	Tape and reel

4 Revision history

Table 5. Document revision history

Date	Revision	Changes
13-Jul-2015	1	First issue.

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