

Controller Area Network (CAN) Bus Surge Protection

SALES GUIDE

Bourns® Model CDSOT23-T24CAN



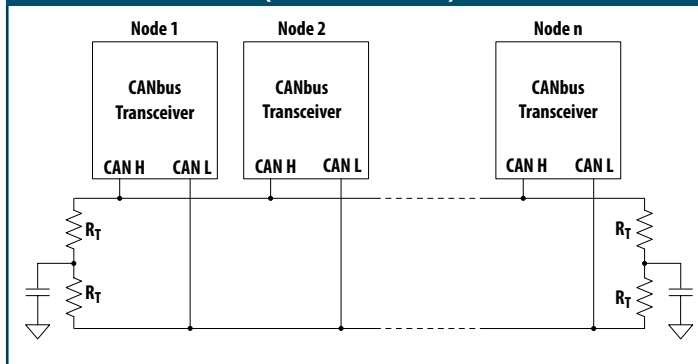
Dual, Bidirectional Transient Voltage Suppressor (TVS) Diode Array



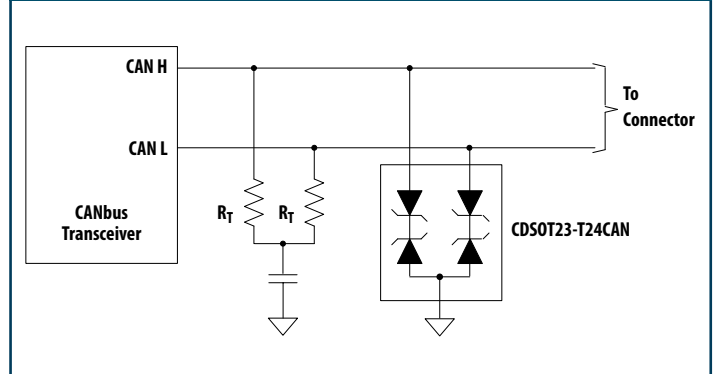
Markets	Applications	Features	Benefits
<ul style="list-style-type: none"> Automotive <ul style="list-style-type: none"> On-board diagnostics LED headlamp control Industrial automation Medical equipment <ul style="list-style-type: none"> Computer tomographs Linked equipment 	<ul style="list-style-type: none"> High-speed CANbus Industrial control networks Smart Distribution Systems (SDS) DeviceNet™ Factory & process automation systems Lift control systems 	<ul style="list-style-type: none"> Single device for two I/O lines Low capacitance for high-speed CANbus IEC 61000-4-2 30 kV ESD IEC 61000-4-5 (Level 1, CWG 1.2/50) 500 V Surge RoHS compliant* 	<ul style="list-style-type: none"> Compatible with transceivers that have internal protection against 24 V_{DC} (+ 5%) miswiring Protection capability exceeds IEC 61000-4-2 Level 4 and IEC 61000-4-5 Level 1

Application Information

CANbus Communication (n devices/nodes)

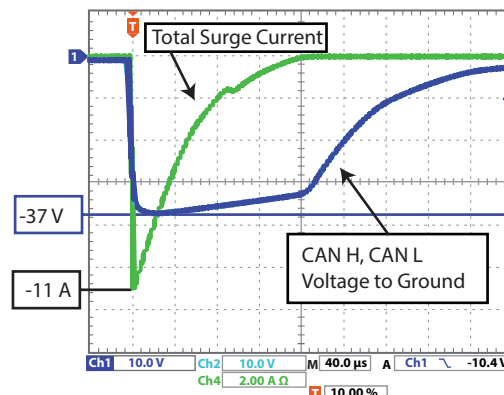
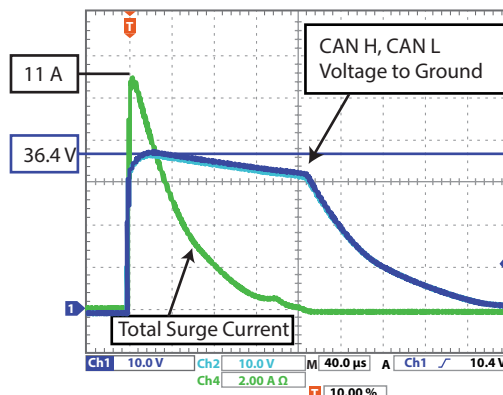


CANbus Protection Schematic



Note: Protection may not be required at every node. In many applications, protection at a subset of the total number of nodes is sufficient.

IEC 61000-4-5 Level 1 Surge Response (5.5 A per channel)



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Comparison to Devices with a Similar Surge Rating

Parameter	Units	Bourns CDSOT23-T24CAN	OnSemi NUP2105L	Littelfuse SM24CANB
V_{DRM}	V	24	24	24
I_{PPSM} (8/20 μ s Current Waveform)	A	8	8	10
ESD (Contact)	kV	30	30	30
V_{BR} min. @ $I_{BR} = 1$ mA	V	26.2	26.2	26.7
V_{BR} max. @ $I_{BR} = 1$ mA	V	32	32	Not Specified (NS)
I_R max.	μ A	0.1	0.1	0.1
Typical V_C @ I_{PPSM}	V	40	44 max.	50 max.
C (Line to GND), typical	pF	22	30 max.	30
AEC-Q101 Qualified	—	No ⁽³⁾	Yes	Yes

- NOTES
1. The CDSOT23-T24CAN has lower capacitance than the Littelfuse SM24CANB. (22 pF compared to 30 pF)
 2. All other specifications are similar.
 3. Completion of AEC-Q101 Qualification for the CDSOT23-T24CAN is planned for Q4 2017.
 4. Specifications obtained from OnSemi website on 1/27/2016.
 5. Specifications obtained from Littelfuse website on 1/27/2016.

Comparison to Devices with a Lower Surge Rating

Parameter	Units	Bourns	STM			Littelfuse	NXP		ProTek
		CDSOT23-T24CAN	ESDCAN24-2BLY	ESDCAN01-2BLY	ESDCAN03-2BLY	SM24CANA	PESD1CAN	PESD2CAN	PESD2CAN
V_{DRM}	V	24	24	24	24	24	24	24	24
I_{PPSM}	A	8	5.5	5.5	3.7	3	3	5	4
ESD (Contact)	kV	30	30	30	30	24	23	30	8
V_{BR} min. @ $I_{BR} = 1$ mA	V	26.2	27	25	26.5	26.7	25.4	26.2	25.4 @ 4 mA
V_{BR} max. @ $I_{BR} = 1$ mA	V	32	32	30	NS	NS	30.3	30.3	NS
I_R max.	μ A	0.1	0.1	0.1	0.01	1	0.01	0.01	0.05
Typical V_C @ I_{PPSM}	V	40	43 max. @ 5 A	40 max. @ 5 A	41 max. @ 3 A	50 max.	50 max.	41 max.	60 max.
C (Line to GND), typical	pF	22	30 max.	30 max.	3	11	9.3	25	11
AEC-Q101 Qualified	—	No ⁽³⁾	Yes	Yes	Yes	Yes	Yes	Yes	No

- NOTES
1. The CDSOT23-T24CAN device ESD rating is as good or better than competitive devices. Protek's ESD rating is inferior to all the other devices.
 2. The CDSOT23-T24CAN device capacitance is higher than some of the devices with a lower surge and/or ESD rating.
 3. Completion of AEC-Q101 qualification for the Model CDSOT23-T24CAN is planned for Q4 2017.

Discovery Questions

In what type of products do you use CANbus communication?

How do plan to use CANbus communication in future products?

What are your protection requirements for your CANbus designs?

What type of protection do you currently use?

How do you plan to improve your CANbus protection in the future?

*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

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