

ESDONCAN1, SESDONCAN1

CAN/CAN-FD Bus Protector

Low Capacitance ESD Protection Diode for CAN/CAN-FD Bus

The S/ESDONCAN1 has been designed to protect the CAN transceiver from ESD and other harmful transient voltage events. This device provides bidirectional protection for each data line with a single compact SOT-23 package, giving the system designer a low cost option for improving system reliability and meeting stringent EMI requirements.

Features

- 200 W Peak Power Dissipation per Line (8 x 20 μ sec Waveform)
- Diode Capacitance Matching
- Low Reverse Leakage Current (< 100 nA)
- Low Capacitance High-Speed FlexRay Data Rates
- IEC Compatibility:
 - IEC 61000-4-2 (ESD): Level 4
 - IEC 61000-4-4 (EFT): 50 A – 5/50 ns
 - IEC 61000-4-5 (Lighting) 3.0 A (8/20 μ s)
- ISO 7637-1, Nonrepetitive EMI Surge Pulse 2, 8.0 A (1 x 50 μ s)
- ISO 7637-3, Repetitive Electrical Fast Transient (EFT) EMI Surge Pulses, 50 A (5 x 50 ns)
- Flammability Rating UL 94 V-0
- S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These are Pb-Free Devices

Typical Applications

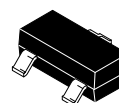
- Industrial
 - ◆ Smart Distribution Systems (SDS)
 - ◆ DeviceNet
- Automotive
 - ◆ Controlled Area Network – CAN 2.1 / CAN FD
 - ◆ Low and High Speed CAN



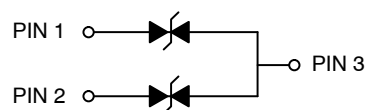
ON Semiconductor®

<http://onsemi.com>

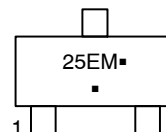
**SOT-23
DUAL BIDIRECTIONAL
VOLTAGE SUPPRESSOR
200 W PEAK POWER**



**SOT-23
CASE 318
STYLE 27**



MARKING DIAGRAM



25E = Device Code
M = Date Code
■ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 2 of this data sheet.

ESDONCAN1, SESDONCAN1

MAXIMUM RATINGS (T_J = 25°C, unless otherwise specified)

Symbol	Rating	Value	Unit
PPK	Peak Power Dissipation, 8 x 20 μs Double Exponential Waveform (Note 1)	200	W
T _J	Operating Junction Temperature Range	-55 to 150	°C
T _J	Storage Temperature Range	-55 to 150	°C
T _L	Lead Solder Temperature (10 s)	260	°C
ESD	Human Body Model (HBM)	8.0	kV
	Machine Model (MM)	400	V
	IEC 61000-4-2 Specification (Contact)	23	kV

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Non-repetitive current pulse per Figure 1.

ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V _{RWM}	Reverse Working Voltage	(Note 2)	24	-	-	V
V _{BR}	Breakdown Voltage	I _T = 1 mA (Note 3)	26.2	-	32	V
I _R	Reverse Leakage Current	V _{RWM} = 24 V	-	15	100	nA
V _C	Clamping Voltage	I _{PP} = 1 A (8 x 20 μs Waveform) (Note 4)	-	33.4	36.6	V
V _C	Clamping Voltage	I _{PP} = 3 A (8 x 20 μs Waveform) (Note 4)	-	44	50	V
I _{PP}	Maximum Peak Pulse Current	8 x 20 μs Waveform (Note 4)	-	-	3.0	A
C _J	Capacitance	V _R = 0 V, f = 1 MHz (Line to GND)	-	-	10	pF
ΔC	Diode Capacitance Matching	V _R = 0 V, 5 MHz (Note 5)	-	0.26	2	%

2. TVS devices are normally selected according to the working peak reverse voltage (V_{RWM}), which should be equal or greater than the DC or continuous peak operating voltage level.
3. V_{BR} is measured at pulse test current I_T.
4. Pulse waveform per Figure 1.
5. ΔC is the percentage difference between C_J of lines 1 and 2 measured according to the test conditions given in the electrical characteristics table.

ORDERING INFORMATION

Device	Package	Shipping [†]
ESDONCAN1LT1G	SOT-23 (Pb-Free)	3,000 / Tape & Reel
SESDONCAN1LT1G*	SOT-23 (Pb-Free)	3,000 / Tape & Reel
ESDONCAN1LT3G	SOT-23 (Pb-Free)	10,000 / Tape & Reel
SESDONCAN1LT3G*	SOT-23 (Pb-Free)	10,000 / Tape & Reel

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

*S Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

ESDONCAN1, SESDONCAN1

TYPICAL PERFORMANCE CURVES

($T_J = 25^\circ\text{C}$ unless otherwise noted)

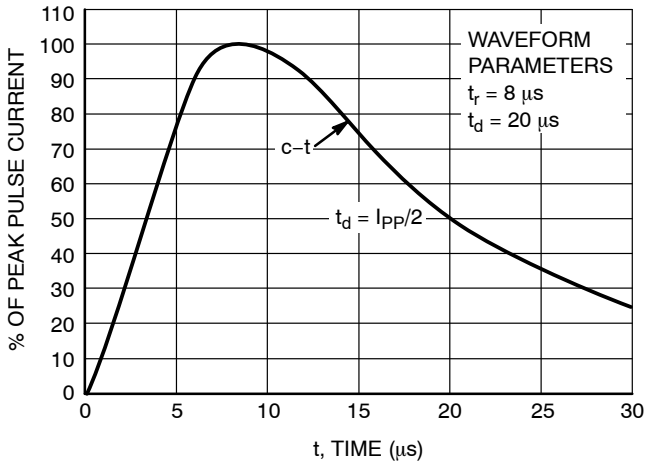


Figure 1. Pulse Waveform, $8 \times 20 \mu\text{s}$

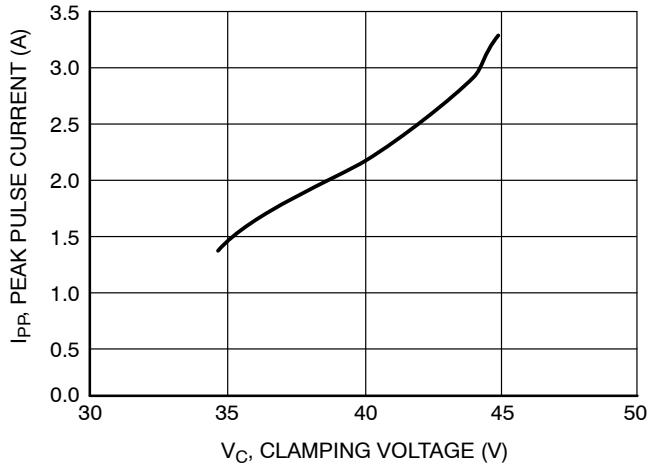


Figure 2. Clamping Voltage vs Peak Pulse Current

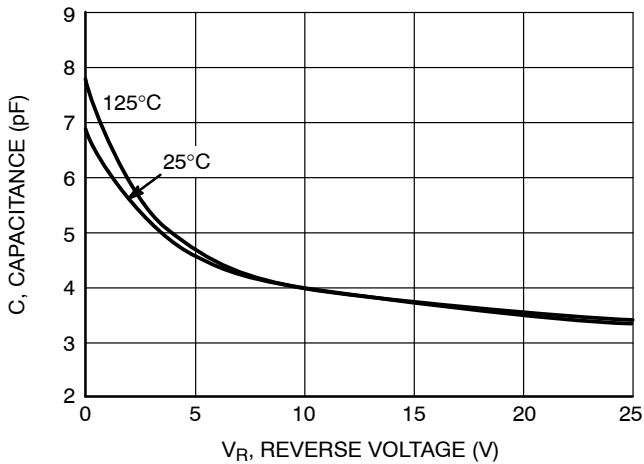


Figure 3. Typical Junction Capacitance vs Reverse Voltage

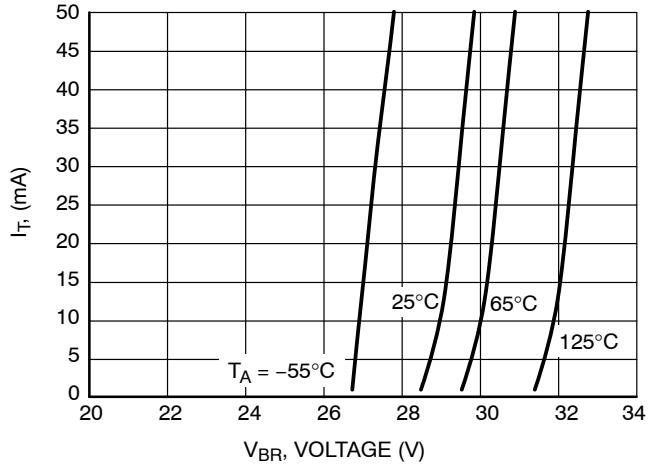


Figure 4. V_{BR} versus I_T Characteristics

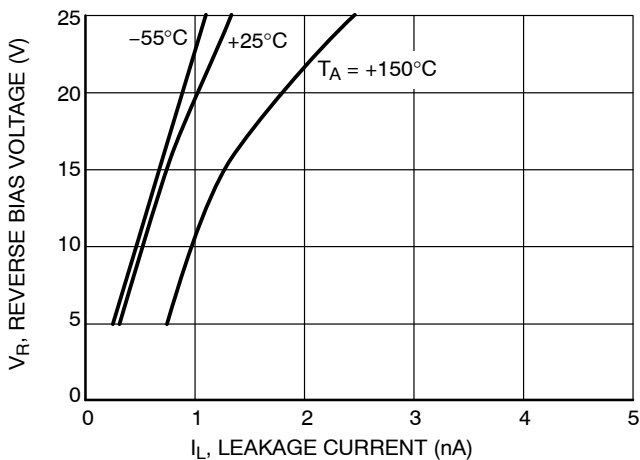


Figure 5. I_R versus Temperature Characteristics

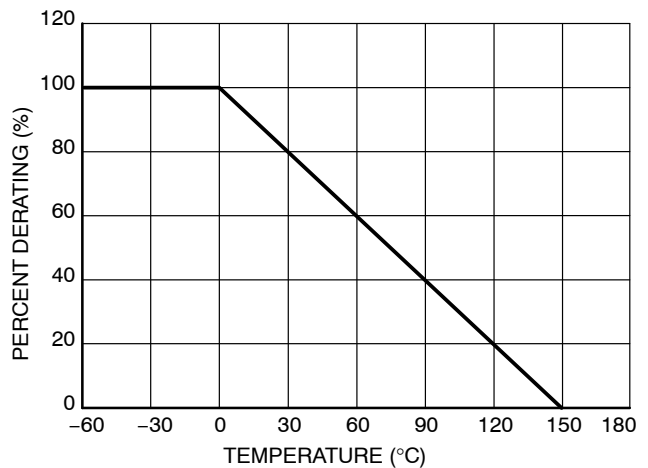


Figure 6. Temperature Power Dissipation Derating

ESDONCAN1, SESDONCAN1

APPLICATIONS

Background

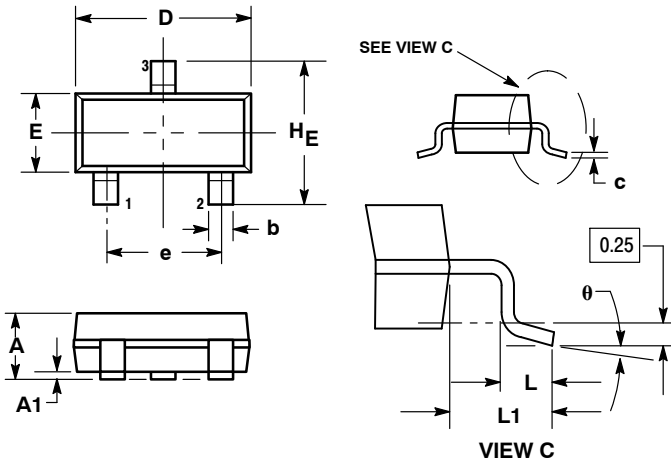
The Controller Area Network (CAN) is a serial communication protocol designed for providing reliable high speed data transmission in harsh environments. TVS diodes provide a low cost solution to conducted and radiated Electromagnetic Interference (EMI) and Electrostatic Discharge (ESD) noise problems. The noise immunity level and reliability of CAN transceivers can be easily increased by adding external TVS diodes to prevent transient voltage failures. The ESDONCAN1 provides a transient voltage

suppression solution for CAN data communication lines. The ESDONCAN1 is a low capacitance dual bidirectional TVS device in a compact SOT-23 package especially suitable for CAN2.1 (CAN-FD). This device is based on Zener technology that optimizes the active area of a PN junction to provide robust protection against transient EMI surge voltage and ESD. The ESDONCAN1 has been tested to EMI and ESD levels that exceed the specifications of popular high speed CAN networks.

ESDONCAN1, SESDONCAN1

PACKAGE DIMENSIONS

SOT-23 (TO-236)
CASE 318-08
ISSUE AP



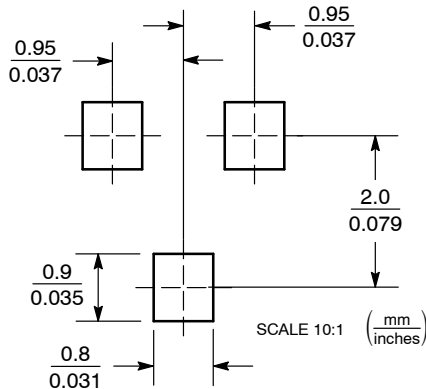
NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1.00	1.11	0.035	0.040	0.044
A1	0.01	0.06	0.10	0.001	0.002	0.004
b	0.37	0.44	0.50	0.015	0.018	0.020
c	0.09	0.13	0.18	0.003	0.005	0.007
D	2.80	2.90	3.04	0.110	0.114	0.120
E	1.20	1.30	1.40	0.047	0.051	0.055
e	1.78	1.90	2.04	0.070	0.075	0.081
L	0.10	0.20	0.30	0.004	0.008	0.012
L1	0.35	0.54	0.69	0.014	0.021	0.029
HE	2.10	2.40	2.64	0.083	0.094	0.104
θ	0°	---	10°	0°	---	10°

STYLE 27:
PIN 1. CATHODE
2. CATHODE
3. CATHODE

SOLDERING FOOTPRINT*



*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

Honeywell and SDS are registered trademarks of Honeywell International Inc.
DeviceNet is a trademark of Rockwell Automation.

ON Semiconductor and are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.