Bi-directional ESD Protection Diode

DESCRIPTIONS

The TESDA24VB30P2CX is Bidirectional ESD rated clamping cell to protect power interfaces, or control line, or low speed data line in an electronic system. It has been specifically designed to protect sensitive electronic components which are connected to power and control lines from over-voltage damage by Electrostatic Discharging (ESD), and Lightning.

ESD protection device in a small SOT-23 Surface-Mounted Device (SMD) plastic package designed to protect two automotive In-vehicle network bus lines from the damage caused by Electrostatics discharge (ESD) and other transients.

The TESDA24VB30P2CX may be used to provide ESD protection up to ±30kV(contact and air discharge) according to IEC61000-4-2, and withstand peak pulse current up to 5A (8/20μs) according to IEC61000-4-5.

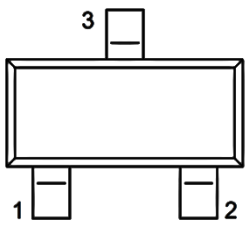
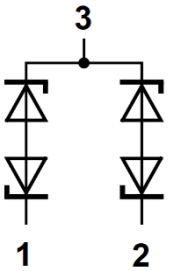
FEATURES

- AEC-Q101 qualified
- ESD protect for 2 line with bidirectional.
- Provide ESD protection for each channel to
  IEC61000-4-2 (ESD) ±30kV (air), ±30kV (contact)
  IEC61000-4-4 (EFT) 4kV (5/50ns)
  IEC61000-4-5 (Lightning) 5A (8/20μs)
- Suitable for 24V and below, operating voltage applications
- Protect I/O line or power line.
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-Free

APPLICATION

- ESD protection for In-vehicle network lines in automotive environments
- CAN Bus
- General Purpose I/O
- Portable Instrumentation
- Mobile & Handhelds

Pb-Free RoHS COMPLIANT HALOGEN FREE

PACKAGE: SOT-23	PIN CONFIGURATION	CIRCUIT DIAGRAM
		

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Peak pulse power (tp = 8/20us)	P_{PK}	210	W
Peak pulse current (tp = 8/20us)	I_{PP}	5	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	±30	kV
ESD according to IEC61000-4-2 contact discharge		±30	kV
Junction temperature range	T_J	-55 to +175	°C
Storage temperature range	T_{STG}	-55 to +175	°C

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)						
PARAMETER	**CONDITIONS**	**SYMBOL**	**MIN**	**TYP**	**MAX**	**UNIT**
Reverse working voltage		V_{RWM}	-	-	24	V
Reverse breakdown voltage	I_R = 1mA, T_J = 25°C	V_{BR}	24.7	-	32.9	V
Reverse leakage current	V_{RWM} = 24V	I_R	-	-	100	nA
Clamping voltage(1)	I_{PP} = 1A, tp = 8/20us	V_C	-	-	34	V
	I_{PP} = 5A, tp = 8/20us		-	-	42	V
Clamping voltage(2)	I_{TLP} = 4A, tp = 100ns	V_{CL}	-	33.7	-	V
	I_{TLP} = 16A, tp = 100ns		-	38.3	-	V
Junction capacitance	1MHz, V_R = 0V	C_J	-	24.5	30	pF
Dynamic resistance(2)		R_{DYN}	-	0.38	-	Ω

Notes:

1. Non-repetitive current pulse, according to IEC61000-4-5.
2. TLP parameter: Z_0 = 50 Ω, tp = 100ns, tr = 2ns, averaging window from 60ns to 80ns. RDYN is calculated from 4A to 16A.

ORDERING INFORMATION		
ORDERING CODE	**PACKAGE**	**PACKING**
TESDA24VB30P2CX RFG	SOT-23	3,000 / 7" Tape & Reel

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Peak Pulse Power vs. Junction Temperature

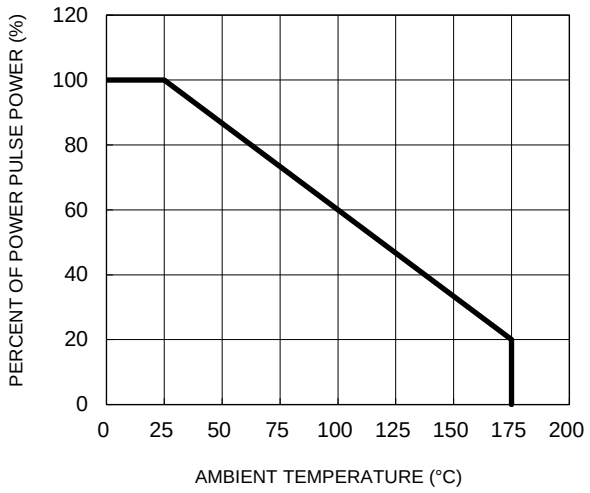


Fig.2 Non-Repetitive Peak Pulse Power vs. Pulse Time

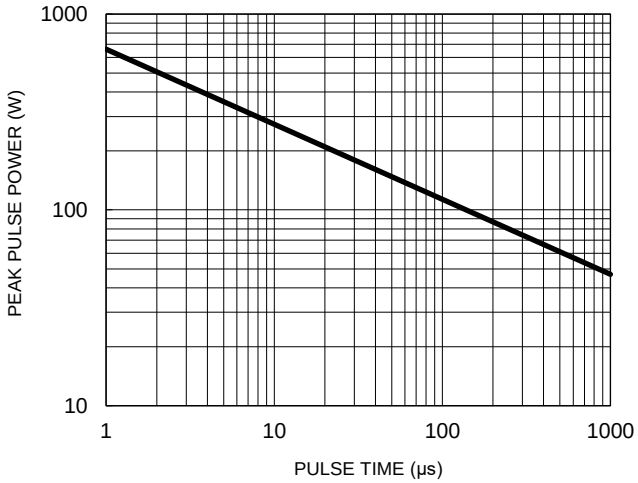


Fig.3 Clamping Voltage vs. Peak Pulse Current

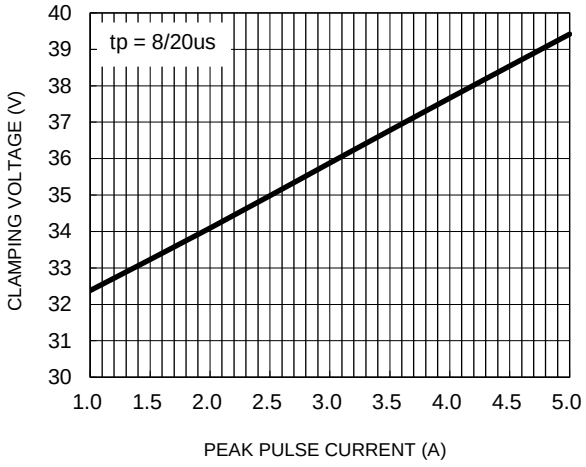


Fig.4 Capacitance vs. Reverse Voltage

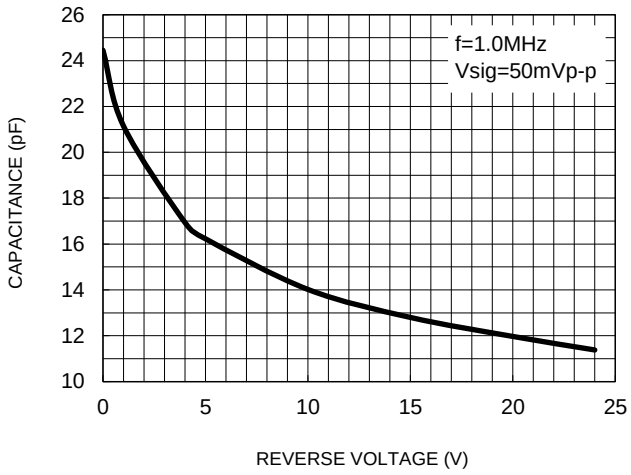
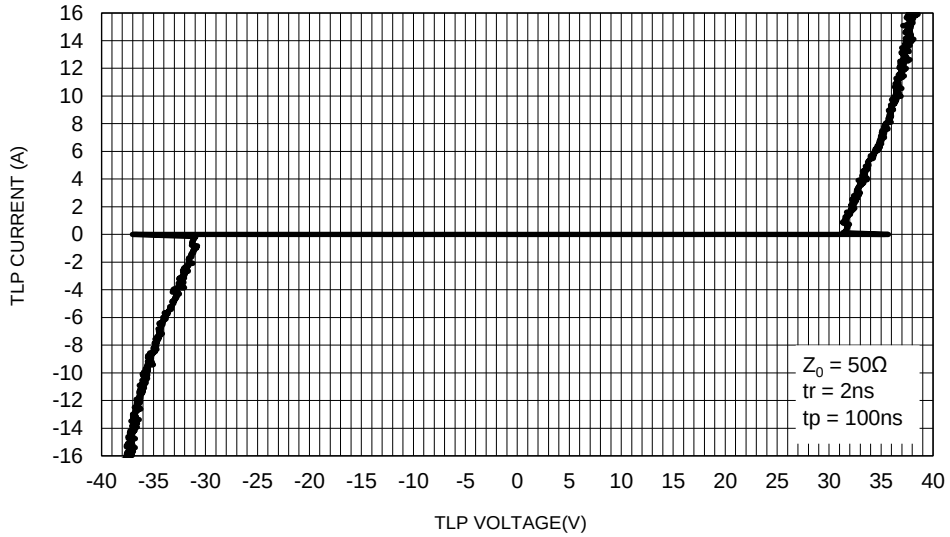


Fig.5 TLP Curve



CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.6 8/20μs pulse waveform per IEC61000-4-5

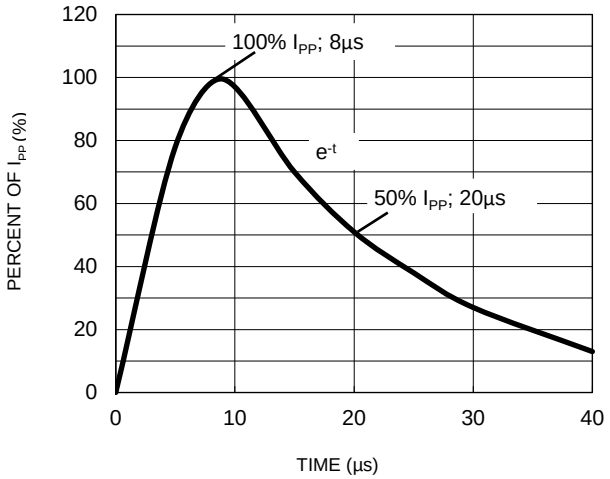
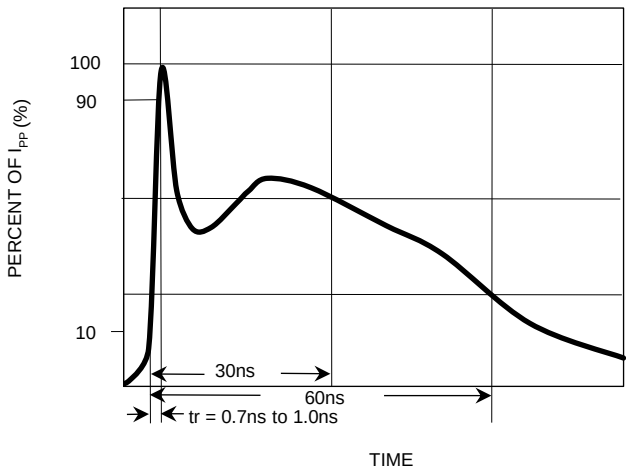


Fig.7 ESD pulse waveform per IEC61000-4-2



APPLICATION INFORMATION

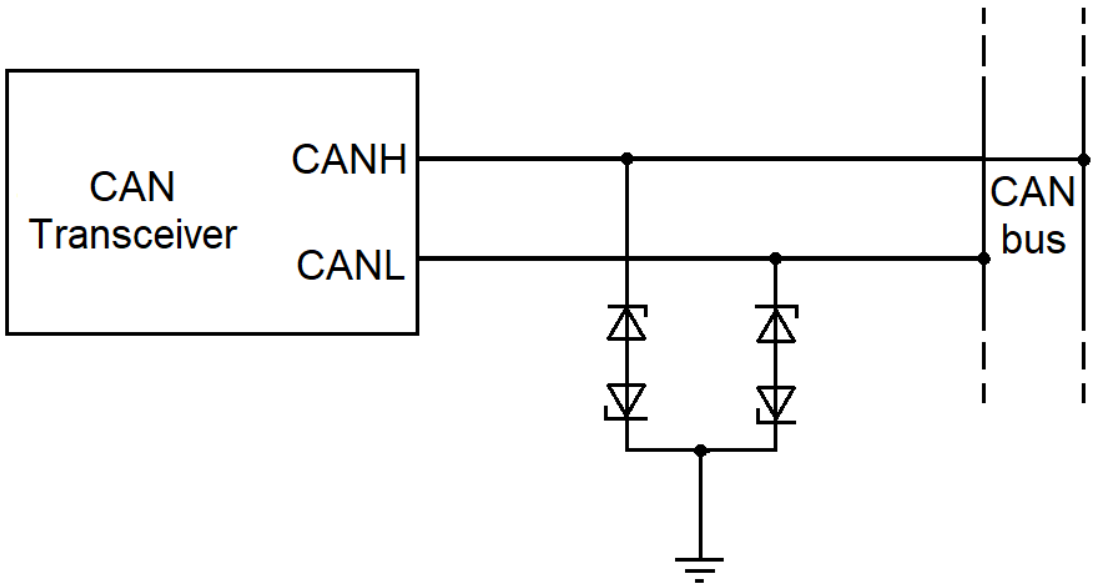
Device Connection

The TESDA24VB30P2CX is designed for the protection of two automotive IVN bus lines from the damage caused by ESD and surge pulses. It provides bidirectional protection.
The usage of the TESDA24VB30P2CX is shown in Fig1.Protected line. In order to minimize parasitic inductance in the board traces, all path lengths connected to the pins of TESDA24VB30P2CX should be kept as short as possible.

In order to obtain enough suppression of ESD induced transient, good circuit board is critical. Thus, the following guidelines are recommended:

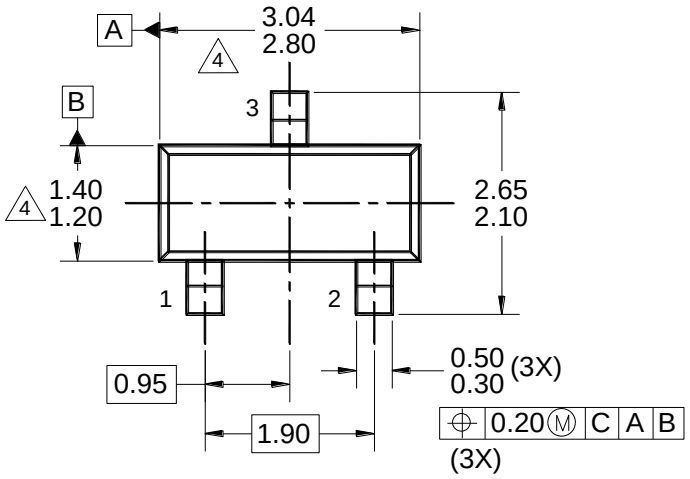
- Let the path length between the protected lines and the TESDA24VB30P2CX minimize.
- Place the TESDA24VB30P2CX near the input terminals or connectors to restrict transient coupling.
- The ESD current return path to ground should be kept as short as possible.
- Use ground planes whenever possible.

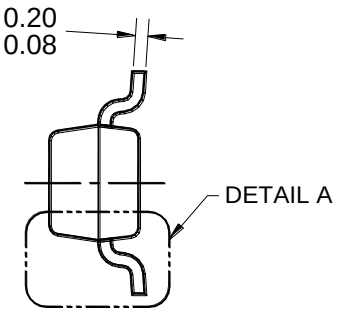
Fig.1 ESD protection of two automotive CAN bus lines by TESDA24VB30P2CX

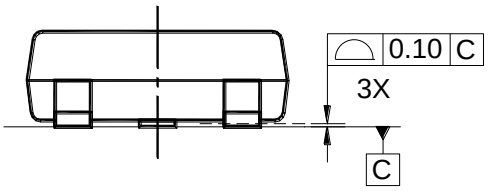


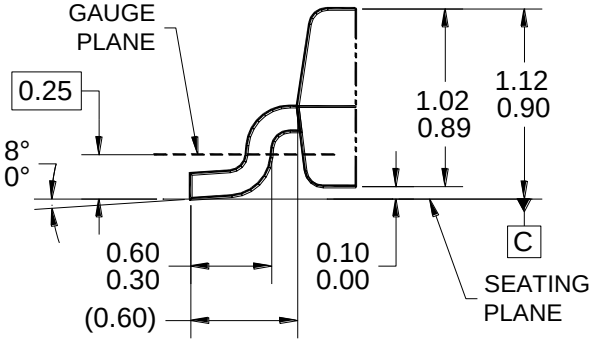
PACKAGE OUTLINE DIMENSIONS

SOT-23

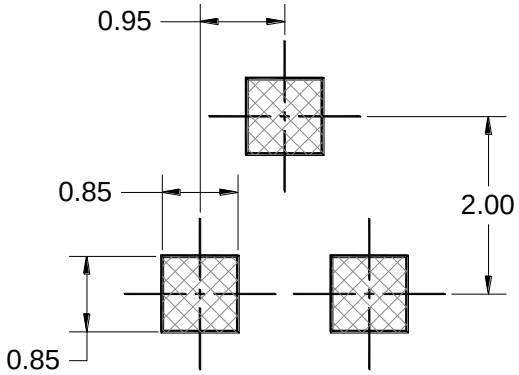




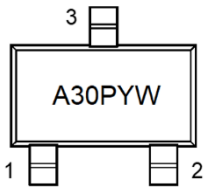




DETAIL A, ROTATED -90°
(SCALE 2:1)



SUGGESTED PAD LAYOUT



MARKING DIAGRAM

A30P = Device Code
Y = Year code
W = Bi-Week Code (A~Z)

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. PACKAGE OUTLINE REFERENCE: JEDEC TO-236, ISSUE H, VARIATION AB.
4. MOLDED PLASTIC BODY DIMENSIONS DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
5. DWG NO. REF: HQ2SD07-SOT23SSD-105 REV A.

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