

Features

- ❑ Transient protection for high-speed data lines
 - IEC 61000-4-2 (ESD) $\pm 25\text{kV}$ (Air)
 - $\pm 17\text{kV}$ (Contact)
 - IEC 61000-4-4 (EFT) 40A (5/50 ns)
 - Cable Discharge Event (CDE)
- ❑ Package optimized for high-speed lines
- ❑ Ultra-small package (1.6mm × 0.8mm × 0.6mm)
- ❑ Protects one data, control or power line
- ❑ Low capacitance: 4.5pF (Typical)
- ❑ Low leakage current: 0.1 μA @ V_{RWM} (Typical)
- ❑ Low clamping voltage
- ❑ Each I/O pin can withstand over 1000 ESD strikes for $\pm 8\text{kV}$ contact discharge

Description

TT0501PDX is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 4.5pF only, TT0501PDX is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A, 5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

TT0501PDX uses ultra-small SOD-523 package. Each TT0501PDX device can protect one data line. It offers system designers flexibility to protect single data line where space is a premium concern.

Applications

- ❑ Portable Electronics
- ❑ Desktops, Servers and Notebooks
- ❑ Cellular Phones
- ❑ MP3 Ports
- ❑ Digital Camera Ports

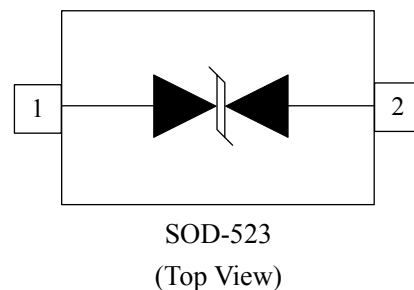
Mechanical Characteristics

- ❑ SOD-523 package
- ❑ Flammability Rating: UL 94V-0
- ❑ Packaging: Tape and Reel
- ❑ Pb-Free, Halogen Free, RoHS compliant

Circuit Diagram



Pin Configuration

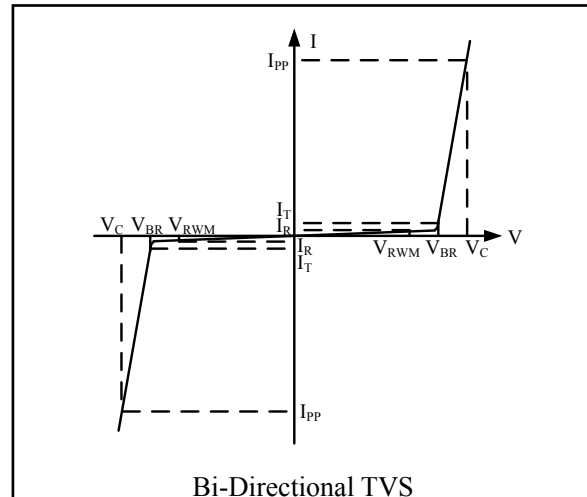


Absolute Maximum Rating

Symbol	Parameter	Value	Units
I_{PP}	Peak Pulse Current (8/20 μ s)	6	A
P_{PK}	Peak Pulse Power (8/20 μ s)	90	W
V_{ESD}	ESD per IEC61000-4-2 (Air) ESD per IEC61000-4-2 (Contact)	± 25 ± 17	kV
T_{OPT}	Operating Temperature	-55/+125	$^{\circ}$ C
T_{STG}	Storage Temperature	-55/+150	$^{\circ}$ C

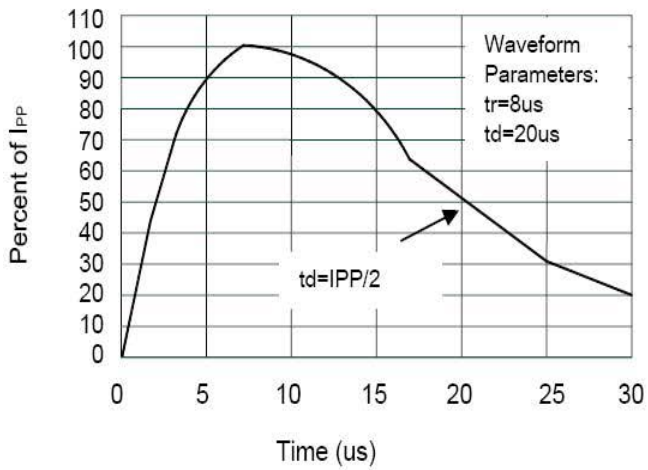
Electrical Characteristics (T = 25 $^{\circ}$ C)

Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Reverse Breakdown Voltage @ I_T
I_T	Test Current for Reverse Breakdown
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Maximum Peak Pulse Current
C_{ESD}	Parasitic Capacitance
V_R	Reverse Voltage
f	Small Signal Frequency

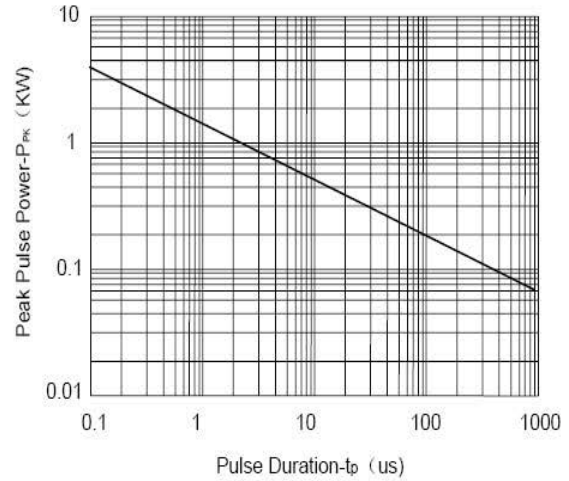


Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				5.0	V
I_R	$V_{RWM} = 5V, T = 25^{\circ}C$ Between I/O_1 and I/O_2		0.1	1.0	μ A
V_{BR}	$I_T = 1mA$ Between I/O_1 and I/O_2	6.0	7.0		V
V_C	$I_{PP} = 6A, t_p = 8/20\mu s$ Between I/O_1 and I/O_2		13		V
C_{ESD}	$V_R = 0V, f = 1MHz$ Between I/O_1 and I/O_2		4.5	6	pF

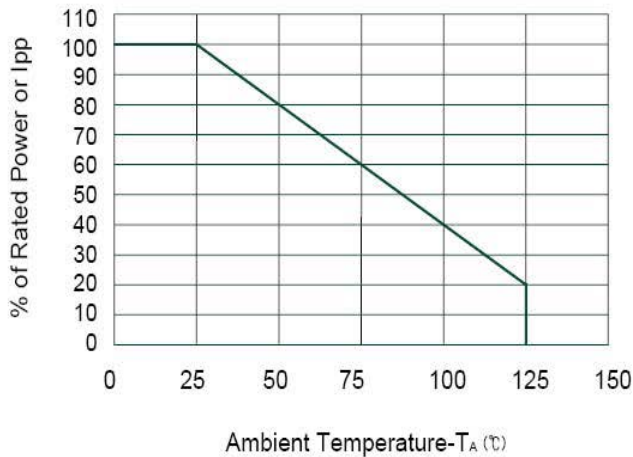
Electrical Characteristics Curve



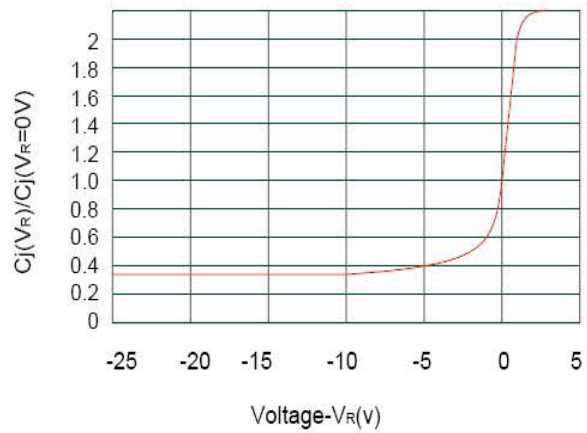
Pulse Waveform



Non-Repetitive Peak Pulse Power vs. Pulse Time



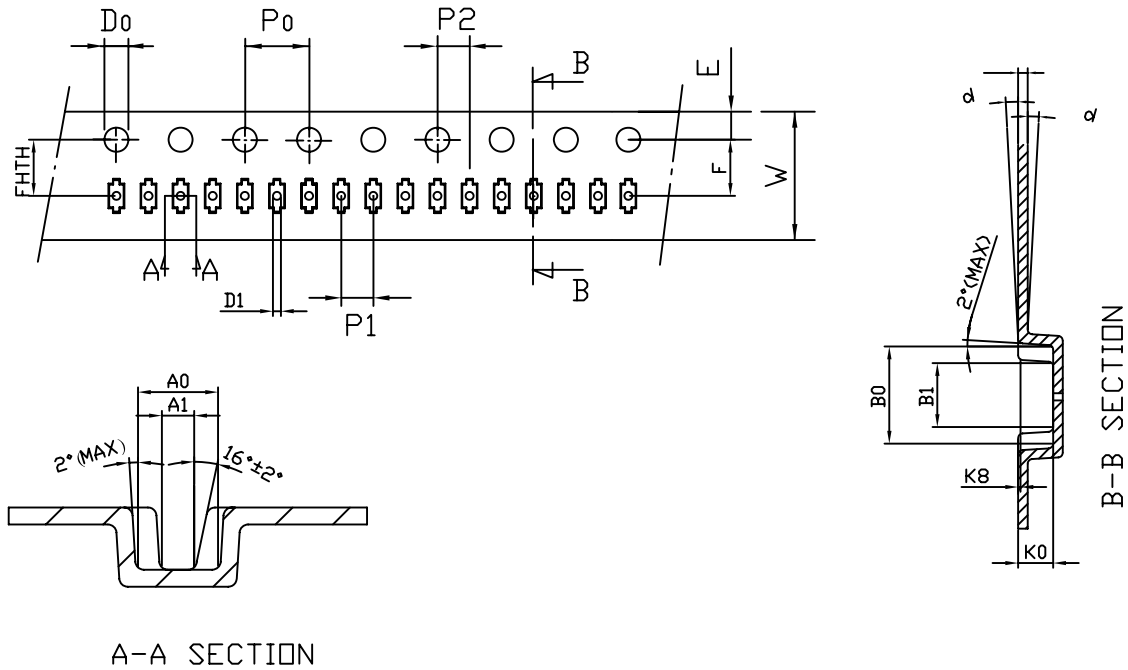
Power Derating Curve



Junction Capacitance vs. Reverse Voltage



Tape and Reel Specification

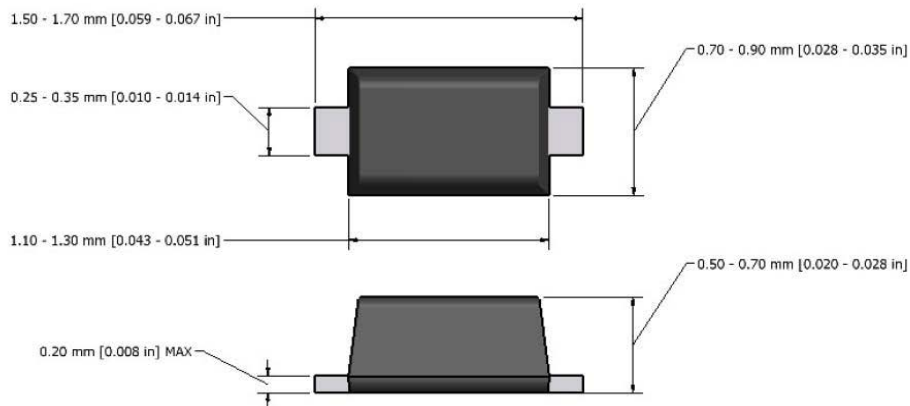


unit:mm

symbol	A0	B0	K0	P0	P1	P2	A1	T
Spec	0.90 ± 0.05	1.95 ± 0.05	0.73 ± 0.05	4.0 ± 0.10	2.0 ± 0.05	2.0 ± 0.05	0.39 ± 0.05	0.20 ± 0.02
symbol	E	F	D_0	D_1	B_2	W	$10P_0$	K8
Spec	1.75 ± 0.10	3.50 ± 0.05	$1.50^{+0.10}_{-0}$	0.50 ± 0.05	1.40 ± 0.05	$8.0^{+0.3}_{-0.1}$	40.0 ± 0.10	0.15MAX
symbol	FHTH							
Spec	3.50 ± 0.05							

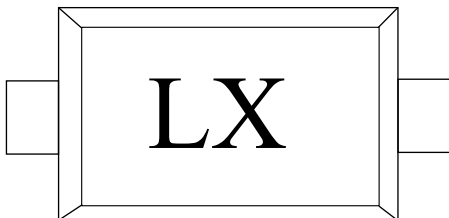
Package Outline

- ❑ SOD-523 package
- ❑ 2 leads, very small package



Note: Dimensions are exclusive of Burrs, Mold Flash & Tie Bar extrusions.

Marking Codes



Note:

- (1) "L" is part number, fixed.
- (2) "X" is the identification number.

Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
TT0501PDX	5V	3,000	7 Inch

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