

Features

- ❑ Transient protection for high-speed data lines
- ❑ IEC 61000-4-2 (ESD) $\pm 20\text{KV}$ (Air)
 $\pm 20\text{KV}$ (Contact)
- IEC 61000-4-4 (EFT) 40A (5/50ns)
- IEC 61000-4-5 (Lightning) 15A (8/20us)
- ❑ Protects one I/O line (bidirectional)
- ❑ Low clamping voltage
- ❑ Working voltages : 3.3V
- ❑ Low leakage current
- ❑ Response Time is < 1ns
- ❑ ROHS compliant

Description

TS0321 TE-BX is an ultra-low capacitance ESD and Surge Protector designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. TS0321 TE-BX 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, 5/50ns), IEC 61000-4-5 (Surge) (15A, 8/20 μs), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

TS0321 TE-BX is in an SOD-323 package. The combined features of ultra-low capacitance and high ESD robustness make TS0321 TE-BX ideal for applications where arrays not practical.

Applications

- ❑ Cell Phone Handsets and Accessories
- ❑ Microprocessor based equipment
- ❑ Personal Digital Assistants (PDA's)
- ❑ Notebooks, Desk tops, and Servers
- ❑ Portable Instrumentation Peripherals
- ❑ USB Interface

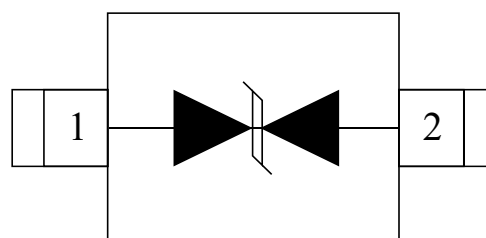
Mechanical Characteristics

- ❑ SOD-323 package
- ❑ Flammability Rating: UL 94V-0
- ❑ Packaging: Tape and Reel
- ❑ High temperature soldering guaranteed: $260^{\circ}\text{C}/10\text{s}$
- ❑ Reel size: 7 inch

Ordering Information

- ❑ Package: SOD-323
- ❑ Material: Halogen free
- ❑ Packing: Tape & Reel
- ❑ Quantity per reel: 3,000pcs

Pin Configuration

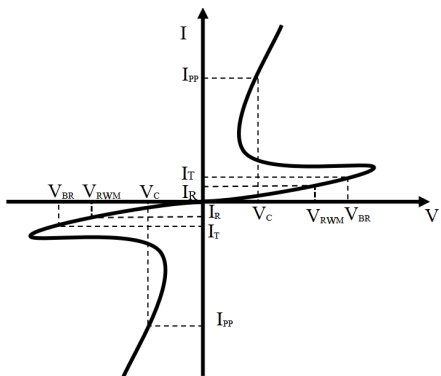


(Top View)

Absolute Maximum Rating

Symbol	Parameter	Value	Units
I_{PP}	Peak Pulse Current (8/20 μ s)	15	A
P_{PK}	Peak Pulse Power (8/20 μ s)	120	W
V_{ESD}	ESD per IEC61000-4-2 (Air) ESD per IEC61000-4-2 (Contact)	± 20 ± 20	kV
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

Electrical Characteristics (T = 25°C)

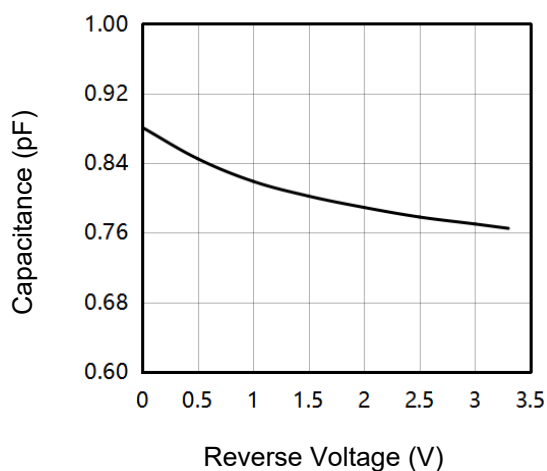
Symbol	Parameter	Diagram
V_{RWM}	Nominal Reverse Working Voltage	
I_R	Reverse Leakage Current @ V_{RWM}	
V_{BR}	Reverse Breakdown Voltage @ I_T	
I_T	Test Current for Reverse Breakdown	
V_C	Clamping Voltage @ I_{PP}	
I_{PP}	Maximum Peak Pulse Current	
C_{ESD}	Parasitic Capacitance	
R_{dyn}	Dynamic Resistance	

Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				3.3	V
I_R	$V_{RWM} = 3.3V$, $T = 25^\circ C$		0.01	0.1	μA
V_{BR}	$I_T = 1mA$	5.0	7.0		V
V_C	$I_{PP} = 15A$, $t_p = 8/20\mu s$		6.0	8.0	V
V_C	$I_{PP} = 8.0A$, $t_p = 100ns^{(1)}$		4.3		V
	$I_{PP} = 16.0A$, $t_p = 100ns^{(1)}$		5.6		V
R_{dyn}	$I_{PP} = 12.0A$, $t_p = 100ns^{(1)}$		0.16		Ω
C_{ESD}	$V_R = 0V$, $f = 1MHz$		1.0		pF

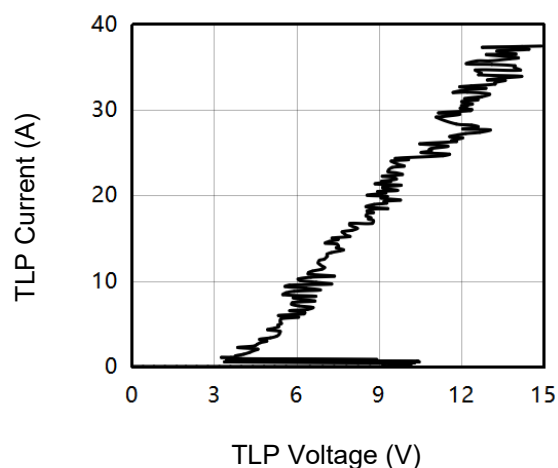
Notes: (1) Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

Typical Performance Characteristics

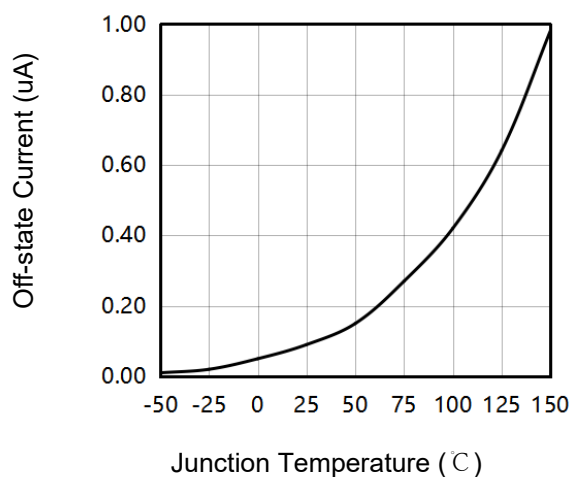
Capacitance vs Reverse Voltage I/O to I/O



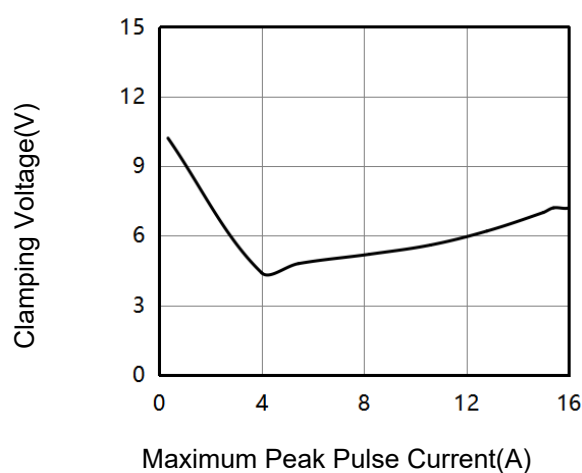
TLP Measurement of I/O to I/O



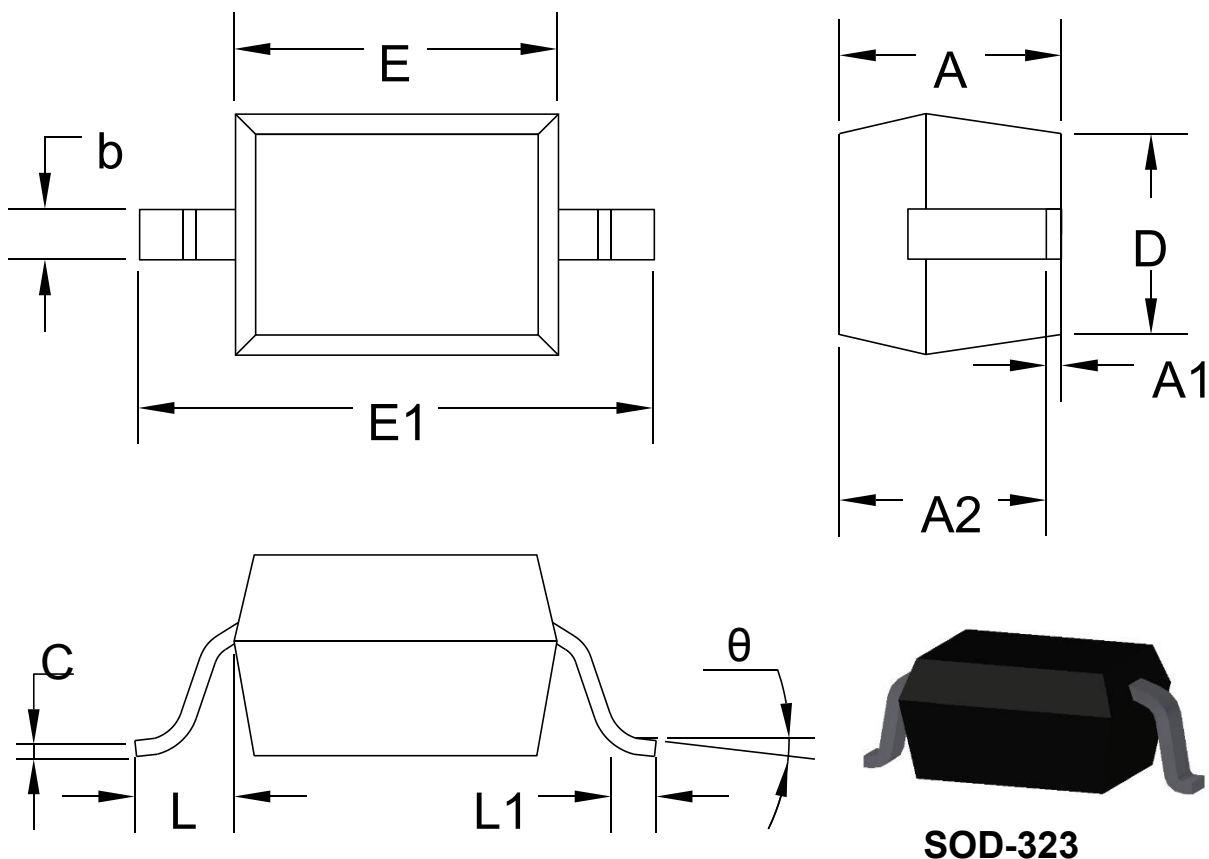
Off-state Current VS Junction Temperature



8/20us Current I/O to I/O

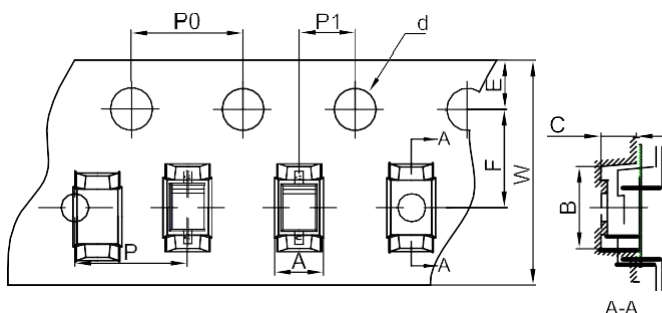


Package Outline, SOD-323



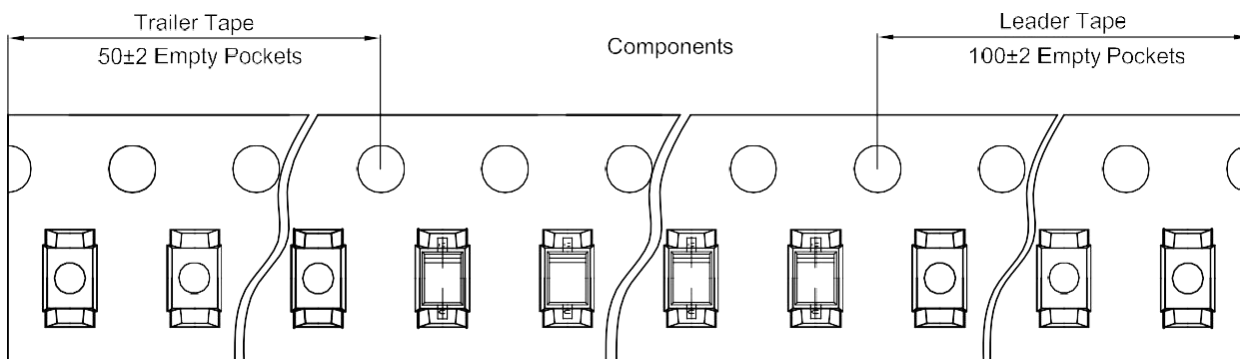
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A		1.000		0.039
A1	0.000	0.100	0.000	0.004
A2	0.800	0.900	0.031	0.035
b	0.250	0.350	0.010	0.014
C	0.080	0.150	0.003	0.006
D	1.200	1.400	0.047	0.055
E	1.600	1.800	0.063	0.071
E1	2.550	2.750	0.100	0.108
L	0.475REF		0.019REF	
L1	0.250	0.400	0.010	0.016
θ	0°	8°	0°	8°

Tape and Reel Specification

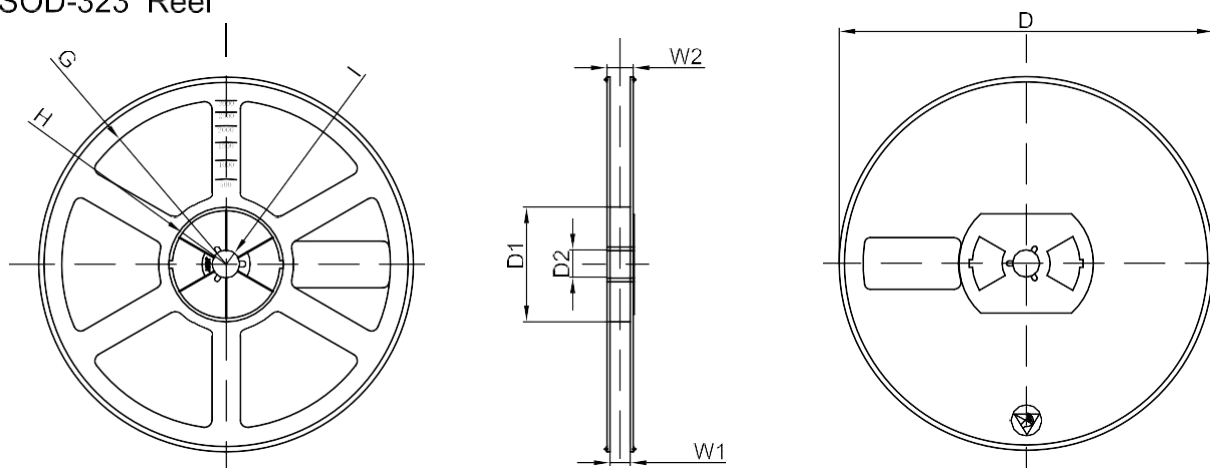


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOD-323	1.46	2.90	1.25	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00
{Tolerance}	+/-0.05	+/-0.05	+/-0.05	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+0.3/-0.1

SOD-323 Tape Leader and Trailer



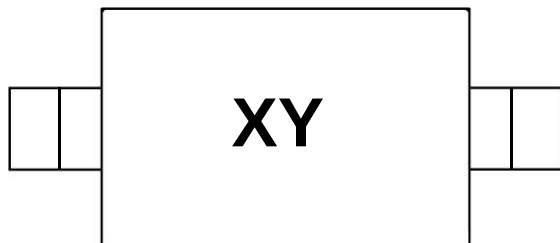
SOD-323 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30
Tolerance	+/-2	+/-1	+/-1	+/-1	+/-1	+/-1	+/-1	+/-1

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	45,000 pcs	203×203×195	180,000 pcs	438×438×220	

Marking Codes



Note:

- (1) "X" is the internal code
- (2) "Y" is the wafer Lot No

Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
TS0321TE-BX	3.3V	3,000	7 Inch