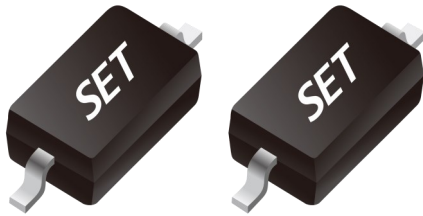


# ESD Protection Diodes

Ultra-Low Capacitance ESD and Transient Voltage Protection

SDxxxxD32U1 SOD323

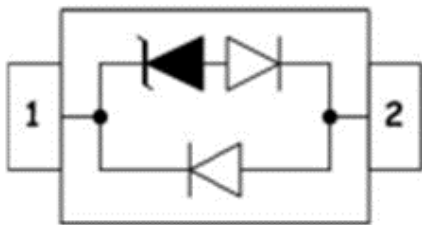


## Description

The SDxxxxD32U1 Series are ultra low capacitance transient voltage suppressor arrays, designed to protect applications such as portable electronics and SMART phones. This series is available in both unidirectional and bidirectional configurations and is rated at 350 Watts for an 8 / 20  $\mu$ s wave shape.

This device meets IEC 61000-4-2 (ESD) and IEC 61000-4-4 (EFT) requirements. At higher operating frequencies or faster edge rates, insertion loss and signal integrity are a major concern. This series offers a ultra low capacitance and low leakage current in a miniature SOD-323 package.

## Pinout and Functional Block Diagram



## Applications

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

## Features

- IEC61000-4-2 (ESD)  $\pm$  30 kV (Air),  $\pm$  30 kV (Contact)
- IEC61000-4-4 (EFT) 40 A (5 / 50 ns)
- IEC61000-4-5 (Lightning)
- Protects One I/O Line (Unidirectional)
- Low Clamping Voltage
- Working Voltages : 3 V to 24 V
- Low Leakage Current
- High Temperature to Reflow Soldering Guaranteed: 260  $^{\circ}$ C/10 sec
- MSL1
- Flammability Rating: UL 94 V-0
- Halogen Free and RoHS Compliant

## Order Information

Type	Package	Marking Code	Delivery Form	Delivery Quantity
SDxxxxD32U1	SOD323	Refer to next page	7" T&R	3000 PCS

## Limiting Values

( $T_A = 25^{\circ}$ C, unless otherwise specified)

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{ESD}$	Electrostatic Discharge Voltage	IEC 61000-4-2; Contact Discharge	-	30	kV
		IEC 61000-4-2; Air Discharge	-	30	kV
$P_{PP}$	Peak Pulse Power (8 / 20 $\mu$ s)	-	-	350	W
$T_A$	Operating Temperature Range	-	-55	150	$^{\circ}$ C
$T_{stg}$	Storage Temperature Range	-	-55	150	$^{\circ}$ C

# ESD Protection Diodes

Ultra-Low Capacitance ESD and Transient Voltage Protection

**SDxxxxD32U1 SOD323**

## Electrical Characteristics

(T<sub>A</sub> = 25 °C, unless otherwise specified)

Part Number	Device Marking Code	V <sub>RWM</sub>	V <sub>B</sub>	I <sub>T</sub>	V <sub>C@1A</sub>	V <sub>C</sub>		V <sub>C</sub>		I <sub>R</sub>	C <sub>J</sub>
		(V)	(V)	(mA)	(V)	(max.)	(@A)	(max.)	(@A)	(μA)	(pF)
		(max.)	(min.)		(max.)	(max.)		(max.)		(max.)	(max.)
SD0320D32U1	C	3.0	4.0	1	7.0	13.9	8	20.0	20	5	0.8
SD0518D32U1	A	5.0	6.0	1	9.8	18.3	8	20.0	18	1	0.8
SD0818D32U1	B	8.0	8.5	1	13.4	18.5	8	24.0	18	1	0.8
SD1212D32U1	D	12.0	13.3	1	19.0	24.0	6	28.6	12	1	0.8
SD1510D32U1	E	15.0	16.7	1	24.0	29.0	5	31.8	10	1	0.8
SD2406D32U1	H	24.0	26.7	1	43.0	45.0	3	56.0	6	1	0.8

ESD TVS

ESD TVS

# ESD Protection Diodes

Ultra-Low Capacitance ESD and Transient Voltage Protection

SDxxxxD32U1 SOD323

## Performance Curve for Reference

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

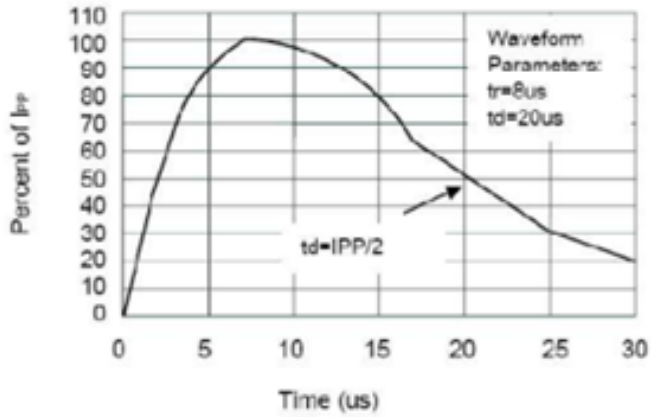


FIGURE 1  
Pulse Waveform

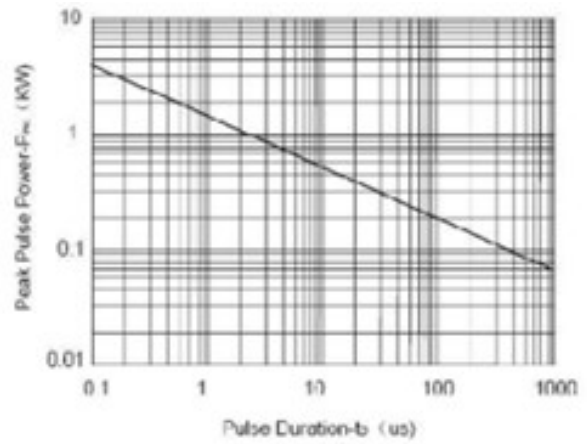


FIGURE 2  
Non-Repetitive Peak Pulse Power VS. Pulse Time

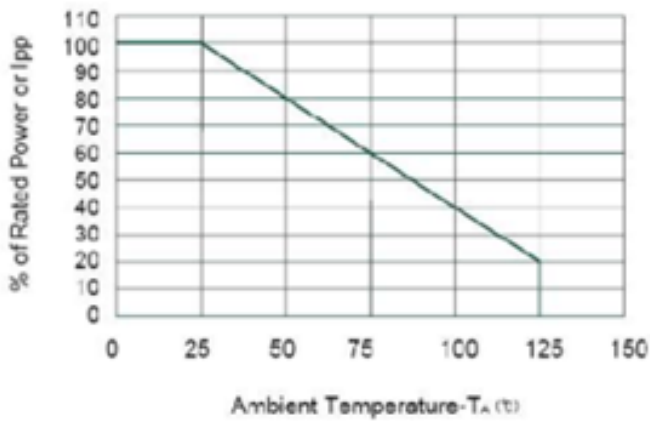


FIGURE 3  
Power Derating Curve

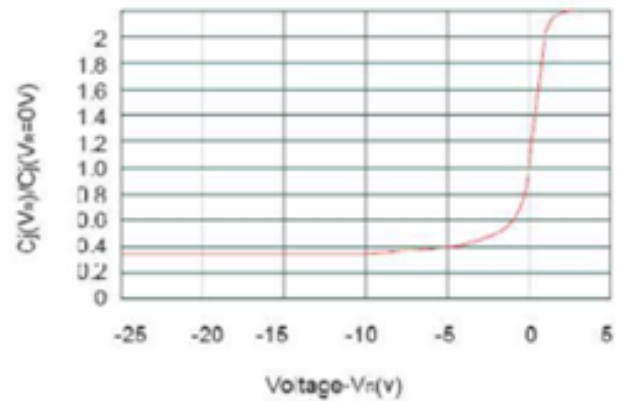


FIGURE 4  
Junction Capacitance VS. Reverse Voltage

ESD TVS

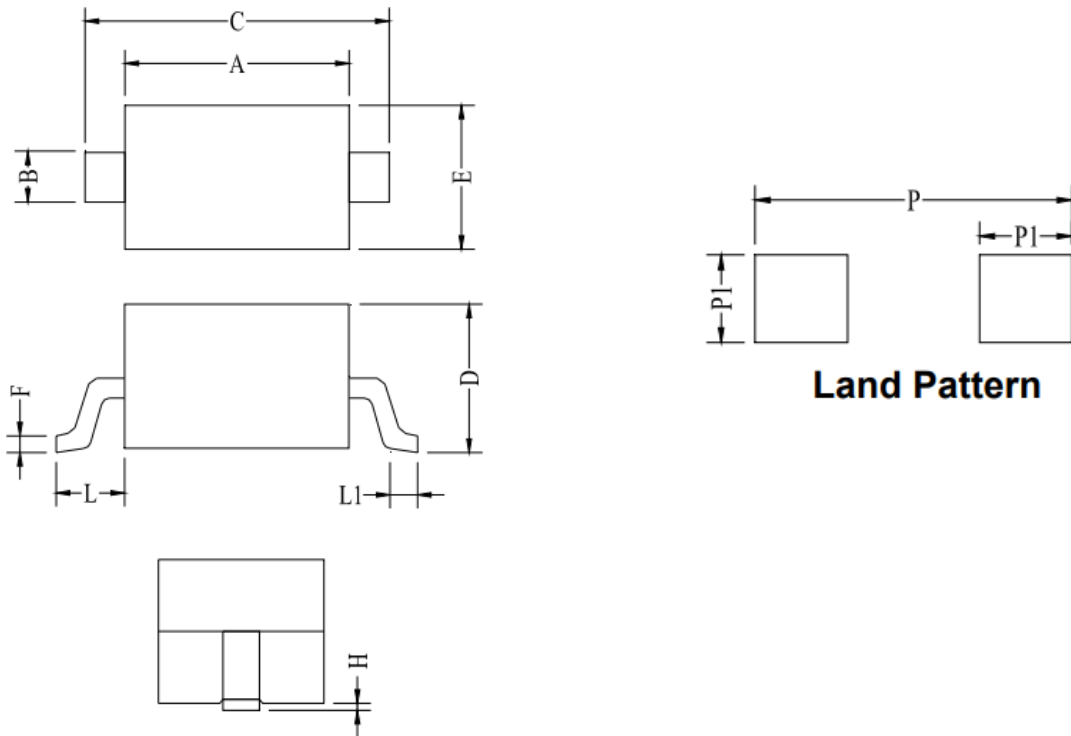
ESD TVS

# ESD Protection Diodes

Ultra-Low Capacitance ESD and Transient Voltage Protection

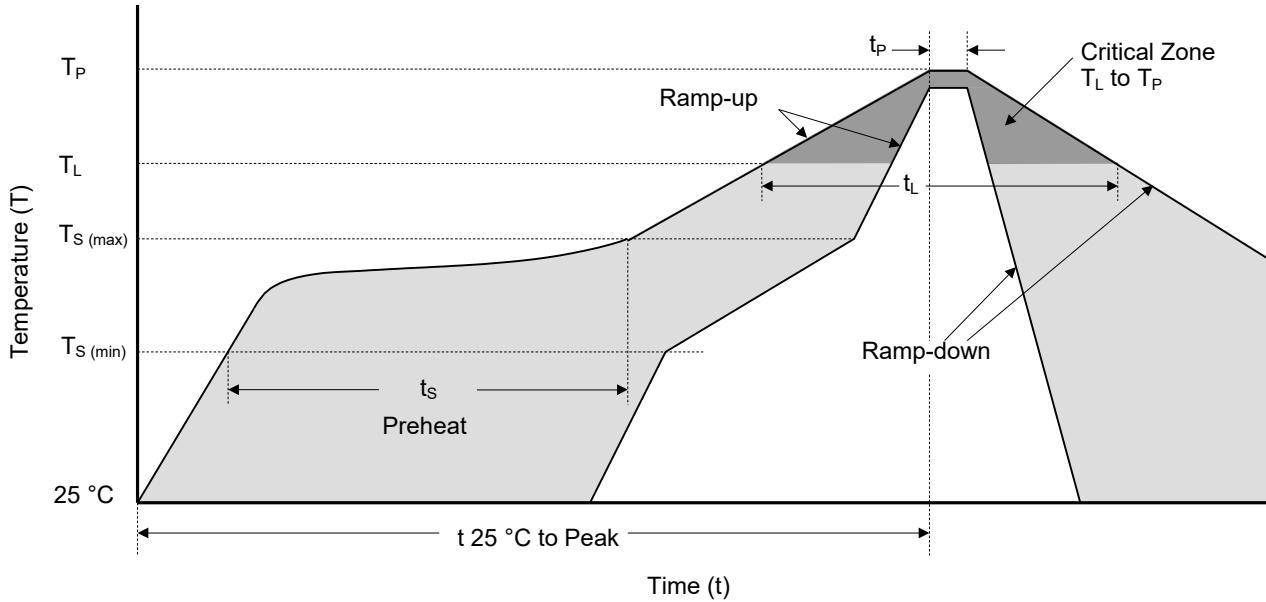
SDxxxxD32U1 SOD323

## Package Dimensions - SOD323



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.60	1.80	0.063	0.071
B	0.25	0.40	0.010	0.016
C	2.30	2.80	0.091	0.110
D	0.80	1.10	0.031	0.043
E	1.20	1.40	0.047	0.055
F	0.08	0.18	0.003	0.007
L	0.475 Ref.		0.019 Ref.	
L1	0.25	0.40	0.010	0.016
H	0.00	0.14	0.000	0.006
P	3.00		0.118	
P1	0.80		0.031	

## Soldering Parameters



Reflowing Condition

Reflow Soldering Parameters		Lead-Free Assembly
Pre-heat	Temperature Min ( $T_{S(min)}$ )	150 °C
	Temperature Max ( $T_{S(max)}$ )	200 °C
	Time (min to max) ( $t_s$ )	60 ~ 120 seconds
Average Ramp Up Rate (Liquidus Temp ( $T_L$ ) to Peak)		3 °C / second max.
$T_{S(max)}$ to $T_L$ Ramp-up Rate		3 °C / second max.
Reflow	Temperature ( $T_L$ ) (Liquidus)	217 °C
	Time (min to max) ( $t_L$ )	60 ~ 150 seconds
Peak Temperature ( $T_P$ )		260 <sup>+0/-5</sup> °C
Time of within 5 °C of Actual Peak Temperature ( $t_p$ )		20 ~ 40 seconds
Ramp-down Rate		6 °C / second max.
Time from 25 °C to Peak Temperature		8 Minutes max.
Do Not Exceed		260 °C

ESD TVS

ESD TVS



# ATTENTION

## Usage

1. TVS must be operated in the specified ambient temp.
2. Do not clean the TVS with strong polar solvent such as ketone, esters, benzene and halogenated hydrocarbon, to avoid damaging the encapsulating layer.
3. Please do not apply severe vibration, shock or pressure to TVS, to avoid element cracking.

## Replacement

1. If TVS is visually damaged, please replace it.
2. TVS is a non-repairable product. For safety sake, please use equivalent TVS for replacement.

## Storage

1. Storage Temp. Range: (-55 to 150) °C.
2. Do not store the TVS at the high temp., high humidity or corrosive gas environment, to avoid influencing the solder- ability of the lead wires. The product shall be used up within 1 year after receiving the goods.

## Environmental Conditions

1. TVS should not be exposed to the open air, nor direct sunshine.
2. TVS should avoid rain, water vapor or other condition of high temp. and high humidity.
3. TVS should avoid sand dust, salt mist, or other harmful gases.

## Max. Typical Capacitance of TVS

1. The typical capacitance of TVS is listed in the specifications. Designers may refer to it when designing TVS in High frequency circuit.

## Installation Mechanical Stress

1. Do not knock TVS when installing, to avoid mechanical damage.
2. Please do not apply severe vibration, shock or pressure to TVS, to avoid surface resin or element cracking.