

Transient Voltage Suppressors for ESD Protection

General Description

The ESD5Zxx Series is designed to protect voltage sensitive components from ESD and transient voltage events. Excellent clamping capability, low leakage, and fast response time, make these parts ideal for ESD protection on designs where board space is at a premium.

Features

- Small Body Outline Dimensions
- Low Body Height
- Working Peak Reverse Voltage: 2.5 V- 7.0 V
- Peak Power up to 200 Watts @ 8 x 20µs Pulse
- Low Leakage
- Response Time is Typically < 1 ns
- ESD Rating of Class 3 (> 16 kV) per Human Body Model

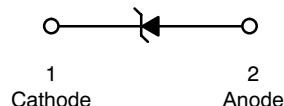
Applications

- Cellular phones
- Portable devices
- Digital cameras
- Power supplies

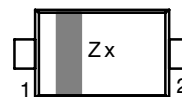


SOD-523

PIN CONFIGURATION



MARKING DIAGRAM



Z = Date Code
x = Specific Device Code

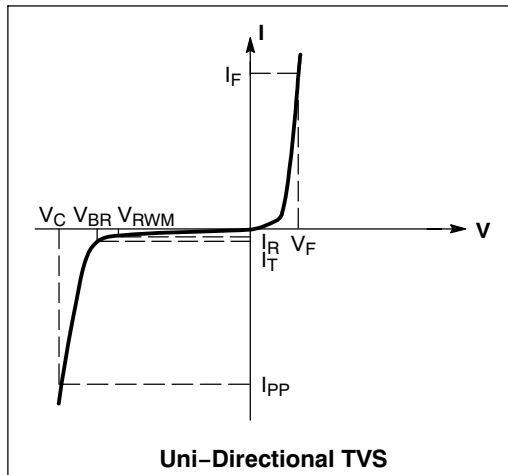
Order Information

Part Number	Package	Shipping
ESD5Zxx-2/TR	SOD-523	3000 Tape & Reel

Absolute Ratings (Tamb=25°C)				
Symbol	Parameter	Value	Units	
P _{pp}	Peak Pulse Power (tp = 8/20µs)	200	W	
T _L	Maximum lead temperature for soldering during 10s	260	°C	
T _{stg}	Storage Temperature Range	-55 to +155	°C	
T _{op}	Operating Temperature Range	-40 to +125	°C	
T _j	Maximum junction temperature	150	°C	
	IEC61000-4-2 (ESD)	Air discharge Contact discharge	±25 ±25	KV
	IEC61000-4-4 (EFT)		40	A
	ESD Voltage	Per Human Body Model Per Machine Model	16 400	KV V

Electrical Parameter

Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @ V_{RWM}
I_T	Test Current
V_{BR}	Breakdown Voltage @ I_T
I_F	Forward Current
V_F	Forward Voltage @ I_F



Electrical Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified. $V_F = 0.9V$ at $I_F = 10mA$

Device	Device Marking	V_{RWM}	$I_R(\mu A)$	$V_{BR}(V)$	$V_{BR}(V)$	$V_{BR}(V)$	I_T	$V_C(V)$	$V_C(V)$	I_{PP}	P_{PK}	C
		(V)	@ V_{RWM}	@ I_T	@ I_T	@ I_T	(mA)	@ $I_{PP}=5A^*$	@ Max I_{PP}^*	(A)*	(W)*	(pF)
		Max	Max	Min	Typ	Max	Typ	Typ	Max	Max	Max	Typ
ESD5Z5V-2/TR	Z*H	5	0.05	6.2	6.8	7.8	1	11.6	18.6	9.4	174	50
ESD5Z7V-2/TR	Z*J	7	0.01	7.5	8.2	9.2	1	13.5	22.7	8.8	200	40

* Surge current waveform per Figure 1.

Note1: V_{BR} is measured with a pulse test current I_T at an ambient temperature of 25°C.

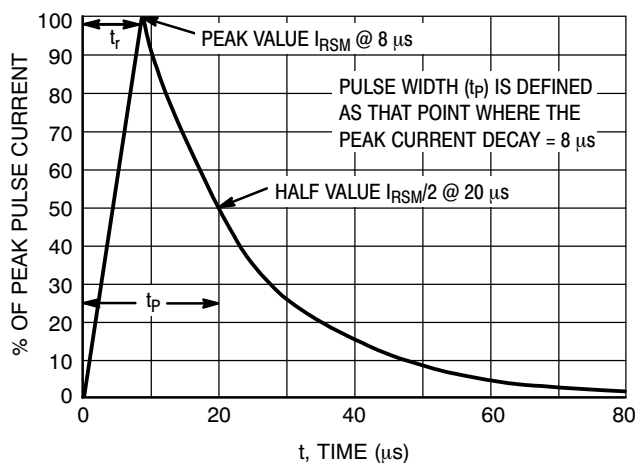


Figure 1. 8 x 20 μs Pulse Waveform

Application Note

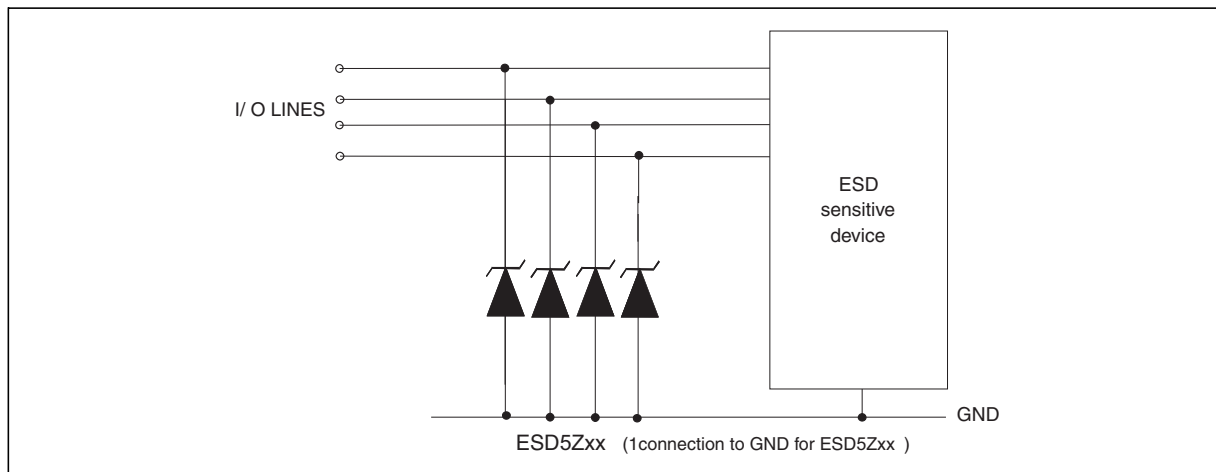
Electrostatic discharge (ESD) is a major cause of failure in electronic systems. Transient Voltage Suppressors (TVS) are an ideal choice for ESD protection. They are capable of clamping the incoming transient to a low enough level such that damage to the protected semiconductor is prevented.

Surface mount TVS offers the best choice for minimal lead inductance. They serve as parallel protection elements, connected between the signal line

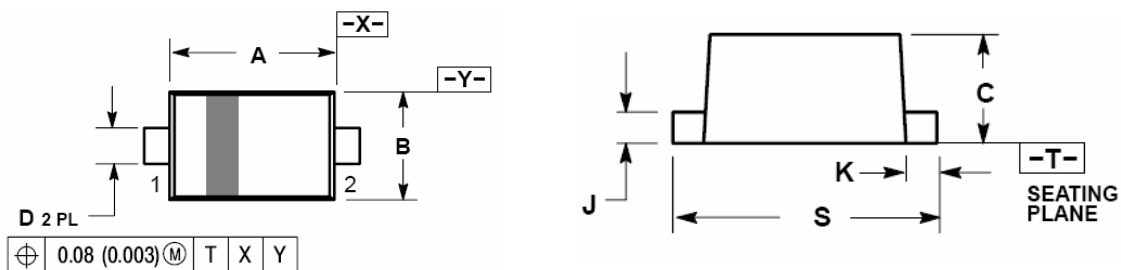
and ground. As the transient rises above the operating voltage of the device, the TVS becomes a low impedance path diverting the transient current to ground. The ESD5Zxx is the ideal board level protection of ESD sensitive semiconductor components.

The tiny SOD-523 package allows design flexibility in the design of high density boards where the space saving is at a premium. This enables to shorten the routing and contributes to hardening against ESD.

Figure4: ESD5Zxx protection against ESD



Package mechanical data



Dim	Millimeters				Inches			
	Min	Nom	Max	Min	Nom	Max	Min	Nom
A	1.10	1.20	1.30	0.043	0.047	0.051	A	1.10
B	0.70	0.80	0.90	0.028	0.032	0.035	B	0.70
C	0.50	0.60	0.70	0.020	0.024	0.028	C	0.50
D	0.25	0.30	0.35	0.010	0.012	0.014	D	0.25
J	0.07	0.14	0.20	0.0028	0.0055	0.0079	J	0.07
K	0.15	0.20	0.25	0.006	0.008	0.010	K	0.15
S	1.50	1.60	1.70	0.059	0.063	0.067	S	1.50