

## Features

- ESD protection for one line with bi-directional
- Provide transient protection for the protected line to  
**IEC 61000-4-2 (ESD)  $\pm 18\text{kV}$  (air),  $\pm 18\text{kV}$  (contact)**  
**IEC 61000-4-5 (Lightning) 4A (8/20 $\mu\text{s}$ )**
- SOD-523 package saves board space
- Protect one I/O line or one power line
- Fast turn-on and low clamping voltage
- For low operating voltage applications: 3.3V maximum
- Solid-state silicon-avalanche and active circuit triggering technology
- **Green part**
- **AEC-Q101 qualified**

## Applications

- Mobile phones
- Hand held portable applications
- Computer interfaces protection
- Microprocessor protection
- Serial and parallel ports protection
- Power lines on PCB protection

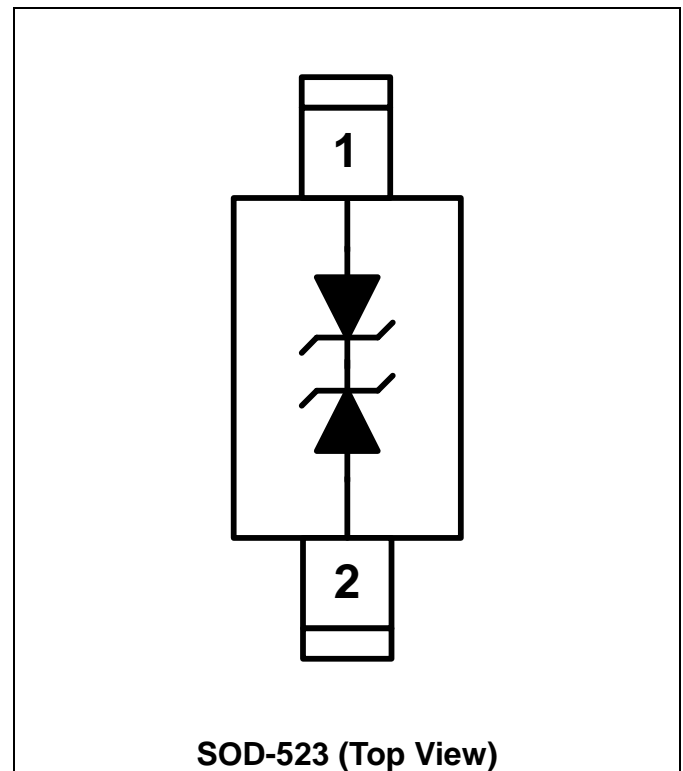
## Description

AZ9523-01H is a design which includes a bi-directional ESD rated clamping cell to protect one power line, or one control line, or one low speed data line in an electronic system. The AZ9523-01H has been specifically designed to protect sensitive components which are connected to power and control lines from over-voltage damage caused by Electrostatic Discharging (ESD) and Lightning.

AZ9523-01H is a unique design which includes proprietary clamping cells in a single package. During transient conditions, the proprietary clamping cell prevents over-voltage on the power line or control/data lines, protecting any downstream components.

AZ9523-01H may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 ( $\pm 15\text{kV}$  air,  $\pm 8\text{kV}$  contact discharge).

## Circuit Diagram / Pin Configuration



## Specifications

Absolute Maximum Ratings			
Parameter	Symbol	Rating	Unit
Peak Pulse Current ( $t_p = 8/20\mu s$ )	$I_{PP}$	4	A
Operating Voltage	$V_{DC}$	$\pm 3.6$	V
ESD per IEC 61000-4-2 (Air)	$V_{ESD-1}$	$\pm 18$	kV
ESD per IEC 61000-4-2 (Contact)	$V_{ESD-2}$	$\pm 18$	
Lead Soldering Temperature	$T_{SOL}$	260 (10 sec.)	$^{\circ}C$
Operating Temperature	$T_{OP}$	-55 to +125	$^{\circ}C$
Storage Temperature	$T_{STO}$	-55 to +150	$^{\circ}C$

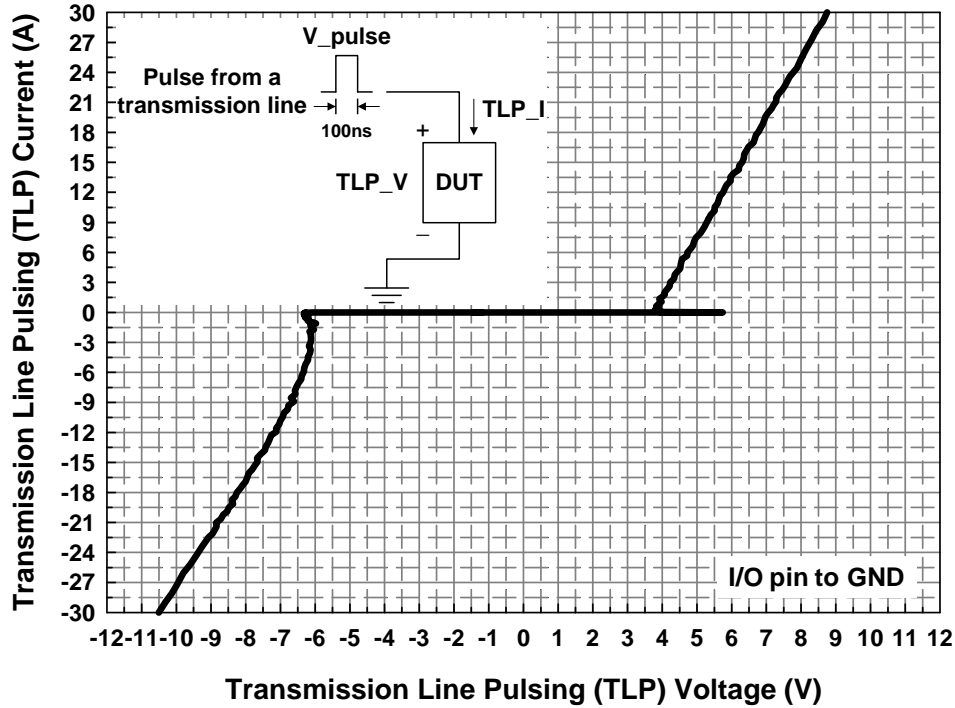
Electrical Characteristics						
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Reverse Stand-Off Voltage	$V_{RWM}$	$T = 25^{\circ}C.$	-3.3		3.3	V
Reverse Leakage Current	$I_{Leak}$	$V_{RWM} = \pm 3.3V, T = 25^{\circ}C.$			0.5	$\mu A$
Reverse Breakdown Voltage	$V_{BV}$	$I_{BV} = 1mA, T = 25^{\circ}C.$	4		6.8	V
ESD Clamping Voltage (Note 1)	$V_{CL-ESD}$	IEC 61000-4-2 +8kV ( $I_{TLP} = 16A$ ), contact mode, $T = 25^{\circ}C.$		8		V
ESD Dynamic Turn-on Resistance	$R_{dynamic}$	IEC 61000-4-2 0~+8kV, contact mode, $T = 25^{\circ}C.$		0.17		$\Omega$
Channel Input Capacitance	$C_{IN}$	$V_R = 0V, f = 1MHz, T = 25^{\circ}C.$		15	18	pF

Note 1: ESD Clamping Voltage was measured by Transmission Line Pulsing (TLP) System.

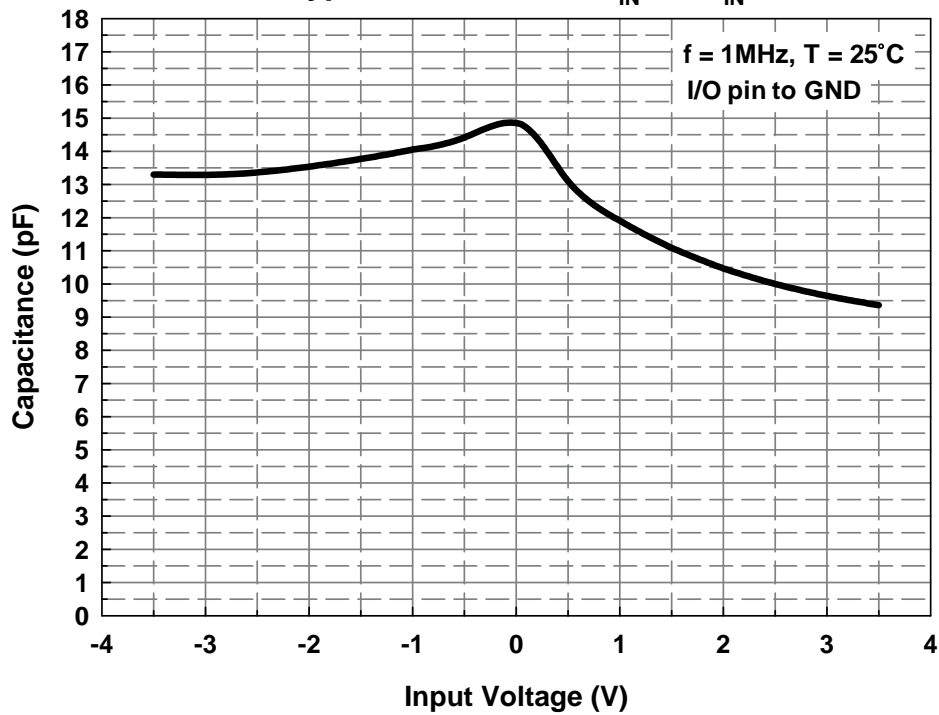
TLP conditions:  $Z_0 = 50\Omega, t_p = 100ns, t_r = 1ns$

## Typical Characteristics

### Transmission Line Pulsing (TLP) Measurement



### Typical Variation of $C_{IN}$ vs. $V_{IN}$



## Applications Information

The AZ9523-01H is designed to protect one line against system ESD pulses by clamping them to an acceptable reference. It provides bi-directional protection.

The usage of the AZ9523-01H is shown in Fig. 1. Protected line, such as data lines, control lines, or power lines, is connected at pin 1. The pin 2 is connected to a ground plane on the board. In order to minimize parasitic inductance in the board traces, all path lengths connected to the pins of AZ9523-01H 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:

- Minimize the path length between the protected lines and the AZ9523-01H.
- Place the AZ9523-01H 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.
- NEVER route critical signals near board edges and near the lines which the ESD transient easily injects to.

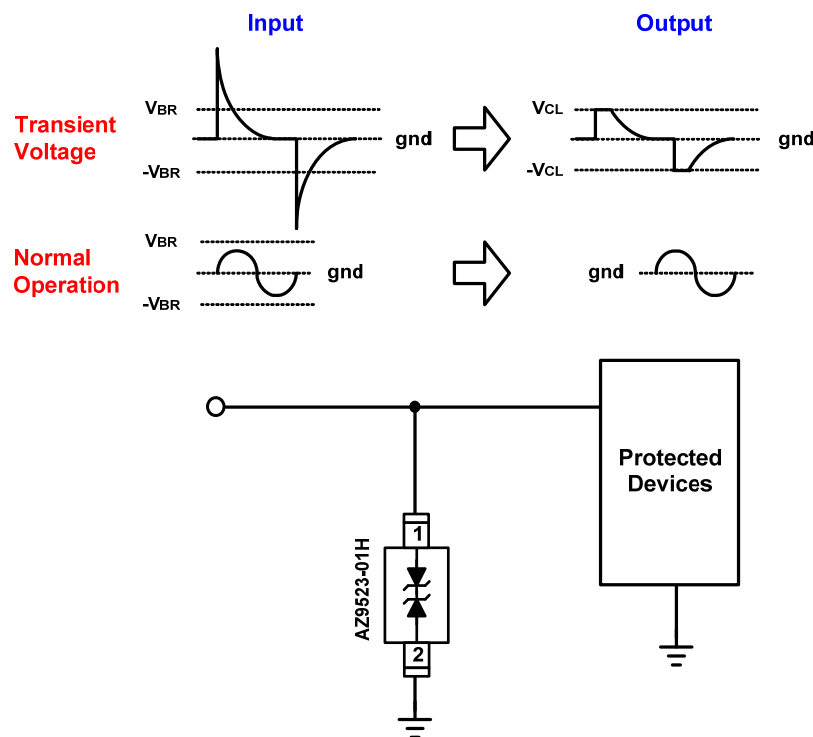
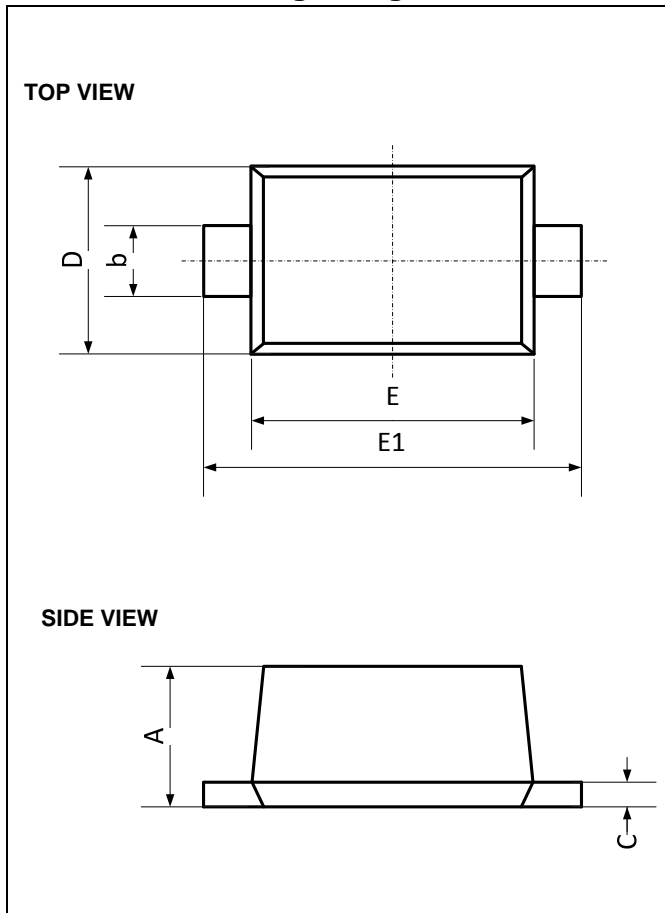


Fig. 1 ESD protection scheme by using AZ9523-01H.

## Mechanical Details

### SOD-523

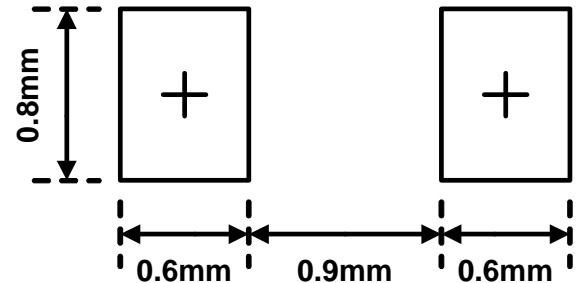
#### Package Diagrams



#### Package Dimensions

Symbol	Millimeters	
	MIN.	MAX.
A	0.50	0.77
b	0.25	0.35
C	0.08	0.20
D	0.70	0.90
E	1.10	1.30
E1	1.50	1.70

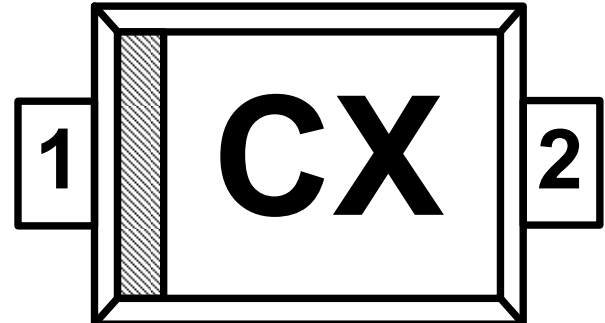
## Land Layout



#### Notes:

This LAND LAYOUT is for reference purposes only. Please consult your manufacturing partners to ensure your company's PCB design guidelines are met.

## Marking Code



C = Device Code

X = Date Code

Part Number	Marking Code
AZ9523-01H.R7G (Green Part)	CX

Note. Green means Pb-free, RoHS, and Halogen free compliant.



### Ordering Information

PN#	Material	Type	Reel size	MOQ	MOQ/internal box	MOQ/carton
AZ9523-01H.R7G	Green	T/R	7 inch	3,000/reel	4 reels = 12,000/box	6 boxes = 72,000/carton

### Revision History

Revision	Modification Description
Revision 2022/07/29	Formal Release.