



## Features

- ESD Protection for 1 Line with Bi-directional.
- Provide ESD protection for the protected line to **IEC 61000-4-2 (ESD)  $\pm 18\text{kV}$  (air/contact) Cable Discharge Event (CDE)**
- Ultra-small 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: 5V maximum
- Solid-state silicon-avalanche and active circuit triggering technology
- **Green Part**
- **AEC-Q101 qualified**

## Applications

- Computer Interfaces Protection
- Microprocessors Protection
- Serial and Parallel Ports Protection
- Control Signal Lines Protection
- Power lines on PCB Protection
- Latchup Protection

## Description

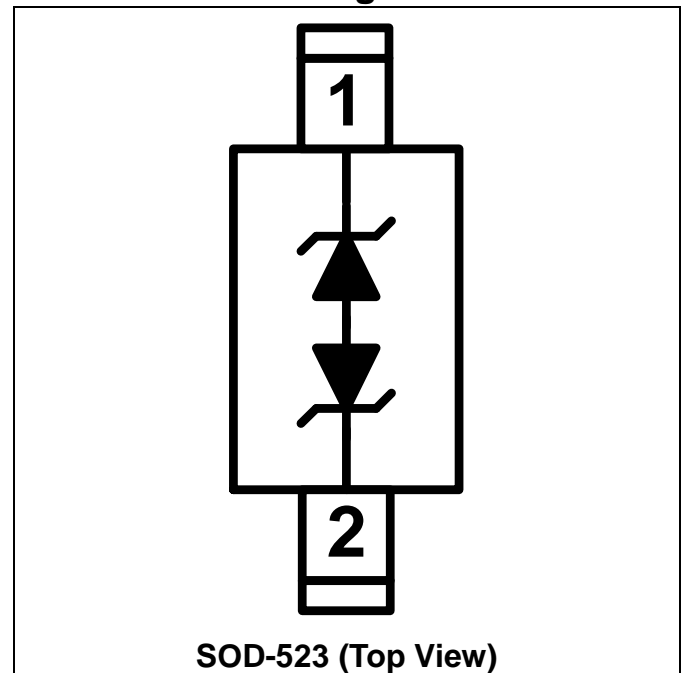
AZ9525-01H is a design which includes a bi-directional ESD rated clamping cell to protect one power line, or one control line, or one low speed data line in an electronic systems. The AZ9525-01H has been specifically designed to protect sensitive components which are connected to power and control lines from over-voltage damage and latch-up caused by Electrostatic Discharging (ESD) and Cable Discharge Event (CDE).

AZ9525-01H is a unique design which includes proprietary clamping cells in a single package. During transient conditions, the proprietary clamping cells prevent over-voltage on the power line or control/data lines, protecting any downstream components.

AZ9525-01H is bi-directional and may be used on lines where the signal swings above and below ground.

AZ9525-01H 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	UNITS
Operating Supply Voltage	$V_{DC}$	$\pm 5.5$	V
ESD per IEC 61000-4-2 (Air)	$V_{ESD}$	$\pm 18$	kV
ESD per IEC 61000-4-2 (Contact)		$\pm 18$	
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	$^{\circ}C$

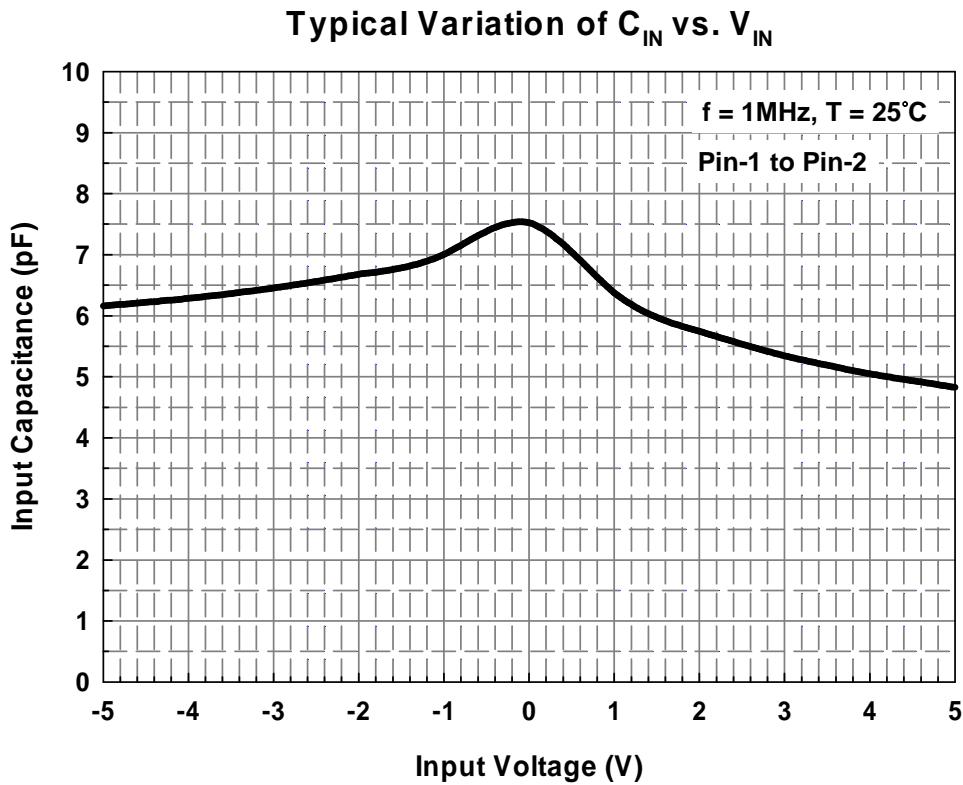
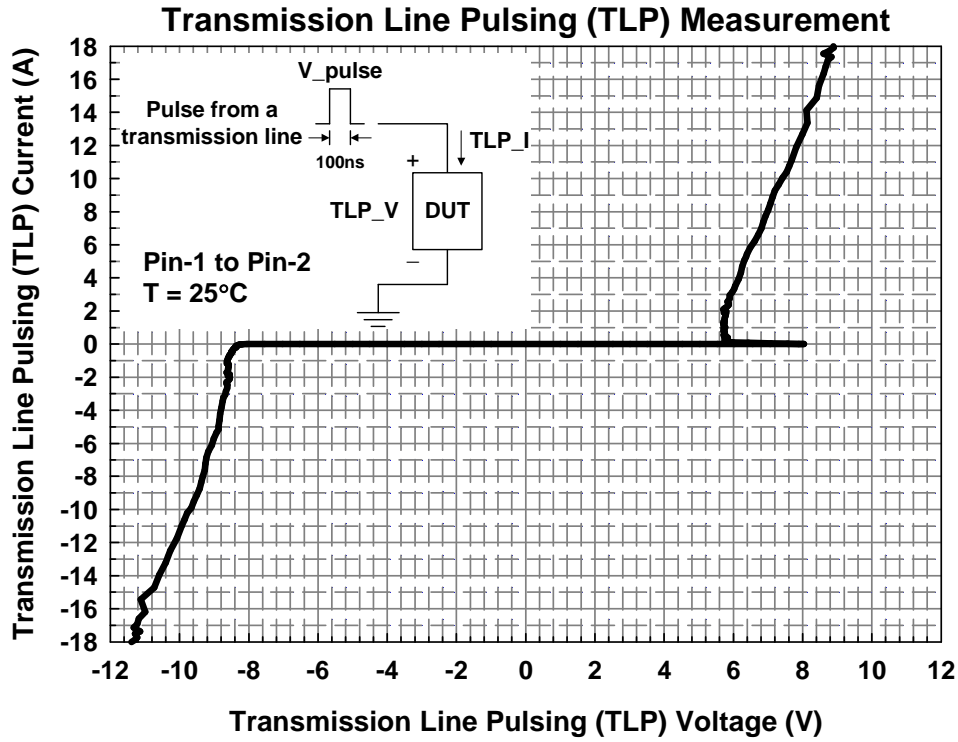
ELECTRICAL CHARACTERISTICS						
PARAMETER	SYMBOL	CONDITIONS	MINI	TYP	MAX	UNITS
Reverse Stand-Off Voltage	$V_{RWM}$	$T=25^{\circ}C$	-5		5	V
Reverse Leakage Current	$I_{Leak}$	$V_{RWM} = \pm 5V, T=25^{\circ}C$			1	$\mu A$
Reverse Breakdown Voltage	$V_{BV}$	$I_{BV} = 1mA, T=25^{\circ}C$	5.6		9	V
ESD Clamping Voltage (Note 1)	$V_{clamp}$	IEC 61000-4-2 +8kV ( $I_{TLP} = 16A$ ), Contact mode, $T=25^{\circ}C$		11		V
ESD Dynamic Turn-on Resistance	$R_{dynamic}$	IEC 61000-4-2 0~+8kV, $T=25^{\circ}C$ , Contact mode, pin-1 to pin-2		0.2		$\Omega$
Channel Input Capacitance	$C_{IN}$	$V_R = 0V, f = 1MHz, T=25^{\circ}C$		7.5	10	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



## Applications Information

The AZ9525-01H is designed to protect one line against System ESD/CDE pulses by clamping them to an acceptable reference. It provides bi-directional protection.

The usage of the AZ9525-01H is shown in Fig. 1. Protected line, such as data line, control line, or power line, 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 AZ9525-01H 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 AZ9525-01H.
- Place the AZ9525-01H 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

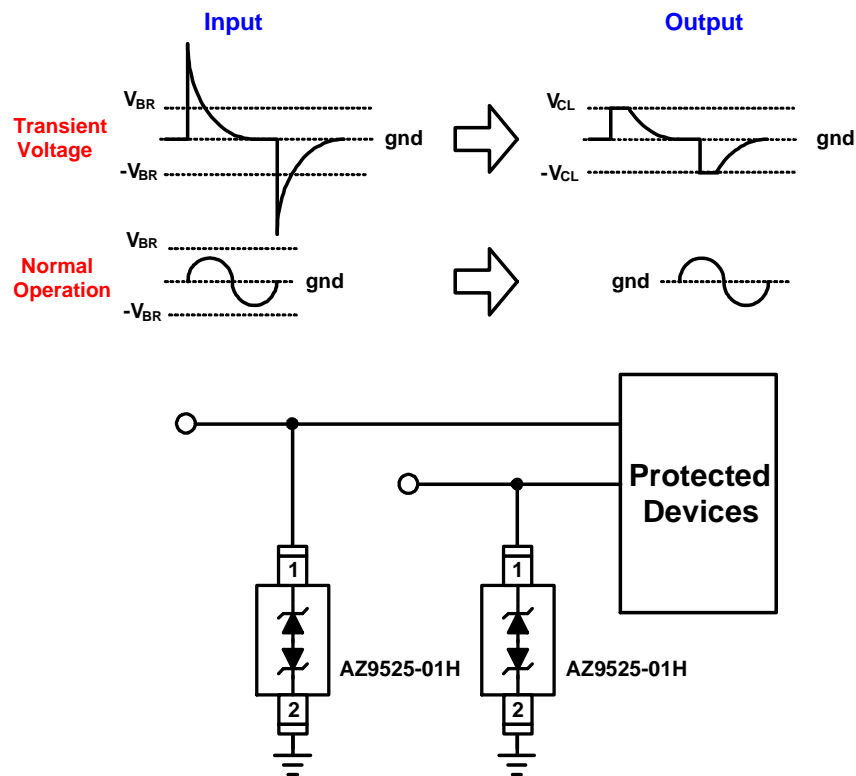


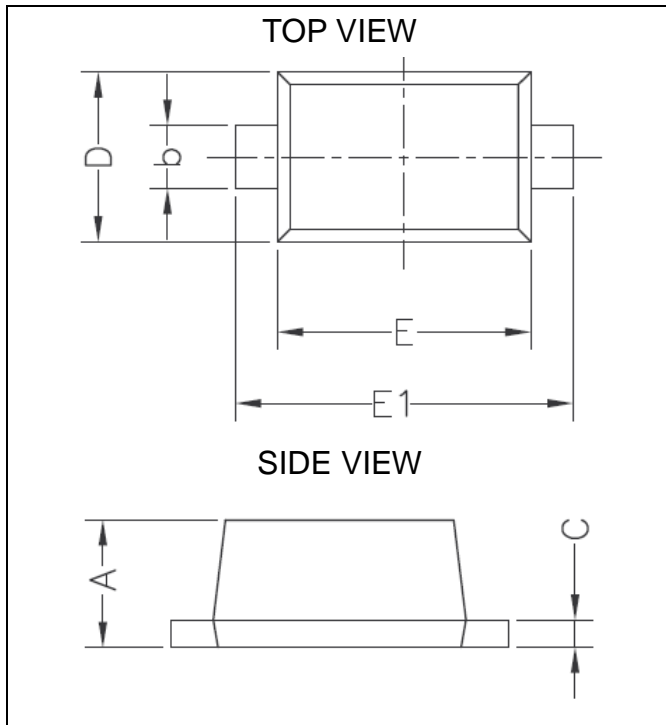
Fig. 1 ESD protection scheme by using AZ9525-01H.



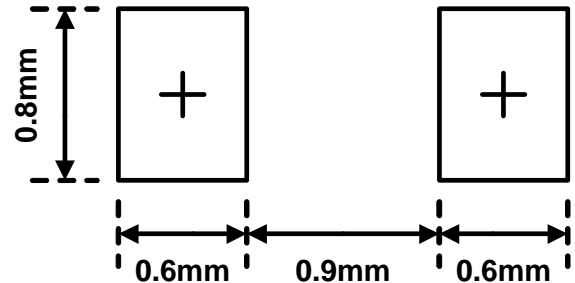
## Mechanical Details

### SOD-523

#### PACKAGE DIAGRAMS



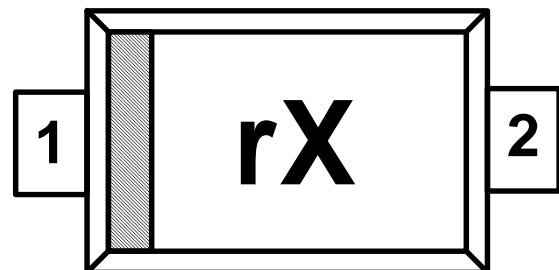
## LAND LAYOUT



### 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



r = Device Code  
X = Date Code

#### PACKAGE DIMENSIONS

Symbol	Millimeters		Inches	
	MIN.	MAX.	MIN.	MAX.
<b>A</b>	0.5	0.77	0.020	0.030
<b>b</b>	0.25	0.35	0.010	0.014
<b>C</b>	0.08	0.2	0.003	0.008
<b>D</b>	0.7	0.9	0.028	0.035
<b>E</b>	1.1	1.3	0.043	0.051
<b>E1</b>	1.5	1.7	0.059	0.067

Part Number	Marking Code
AZ9525-01H (Green Part)	rX

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



### Ordering Information

PN#	Material	Type	Reel size	MOQ	MOQ/internal box	MOQ/carton
AZ9525-01H.R7G	Green	T/R	7 inch	3,000/reel	4 reel=12,000/box	6 box=72,000/carton

### Revision History

Revision	Modification Description
Revision 2015/01/12	Preliminary Release.
Revision 2015/05/27	Formal Release.