

## Features

- ESD protection for one line with bi-directional
- Provide transient protection for one line to  
**IEC 61000-4-2 (ESD) ±18kV (air), ±18kV (contact)**  
**IEC 61000-4-4 (EFT) 50A (5/50ns)**  
**Cable Discharge Event (CDE)**
- Suitable for, **3.3V and below**, operating voltage applications
- **01005 small CSP package** saves board space
- Protect one I/O line or one power line
- Fast turn-on and low clamping voltage
- Solid-state silicon-avalanche and active circuit triggering technology
- **Green part**

## Applications

- Mobile phones
- Hand held portable applications
- Computer interfaces protection
- Microprocessors protection
- Serial and parallel port protection
- Control signal lines protection
- Power lines on PCB protection
- Fingerprint

## Description

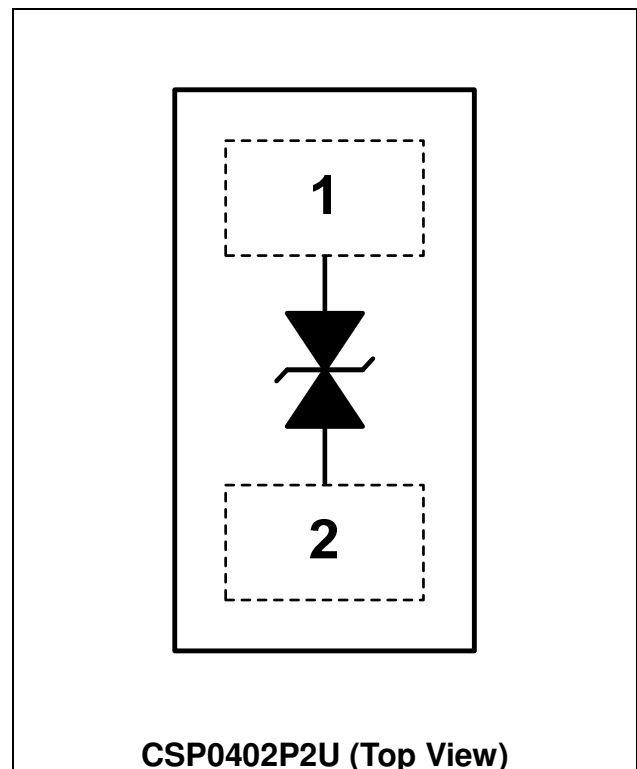
AZ5C23-01B is a design which includes one bi-directional ESD rated clamping cell to protect one power line, or one control line, or one low-speed data line in an electronic system. The AZ5C23-01B has been specifically designed to protect sensitive components which are connected to power and control lines from over-voltage damage and latch-up caused by Electrostatic Discharging (ESD), Electrical Fast

Transients (EFT), and Cable Discharge Event (CDE).

AZ5C23-01B is a unique design which includes proprietary clamping cell 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.

AZ5C23-01B may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 (±15kV air, ±8kV contact discharge).

## Circuit Diagram / Pin Configuration





## SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)			
PARAMETER	SYMBOL	RATING	UNIT
Operating Supply 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.)	$^\circ\text{C}$
Operating Temperature	$T_{OP}$	-55 to +125	$^\circ\text{C}$
Storage Temperature	$T_{STO}$	-55 to +150	$^\circ\text{C}$

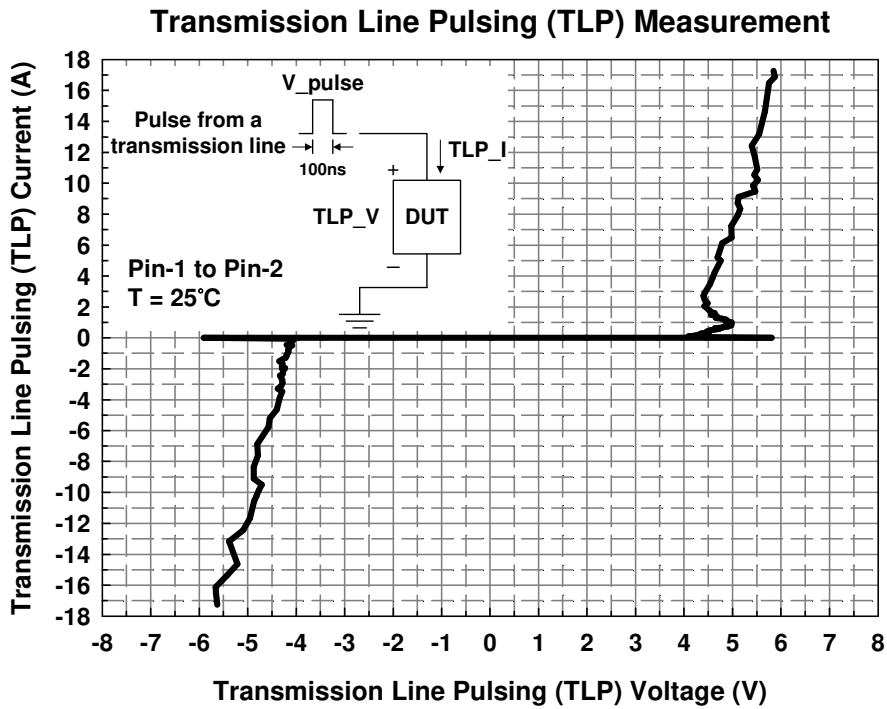
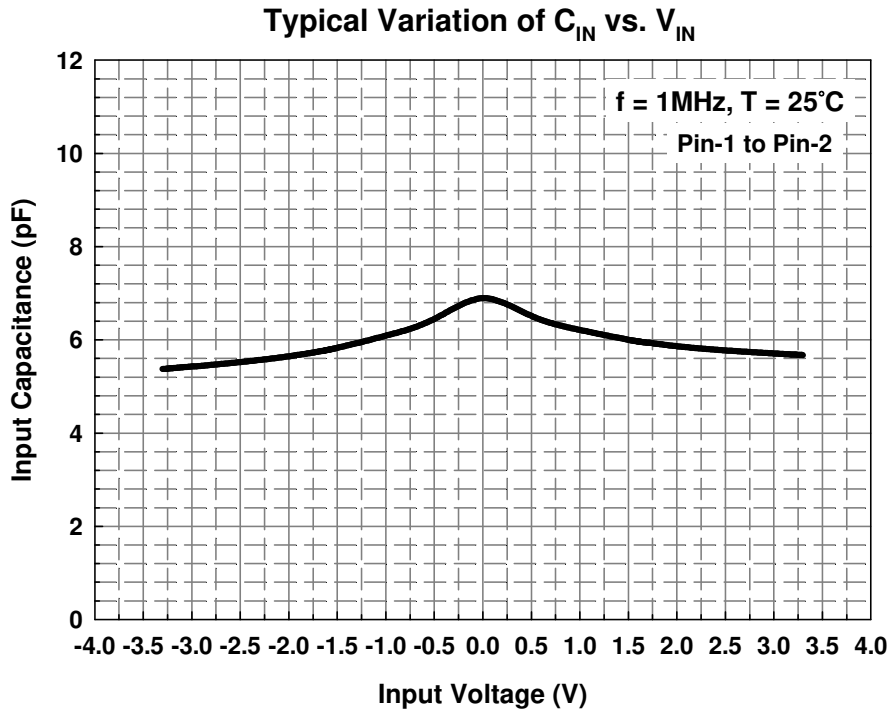
ELECTRICAL CHARACTERISTICS						
PARAMETER	SYMBOL	CONDITION	MIN	TYP	MAX	UNIT
Reverse Stand-Off Voltage	$V_{RWM}$	$T = 25^\circ\text{C}$ .	-3.3		3.3	V
Reverse Leakage Current	$I_{Leak}$	$V_{RWM} = \pm 3.3\text{V}$ , $T = 25^\circ\text{C}$ .			100	nA
Reverse Breakdown Voltage	$V_{BV}$	$I_{BV} = 1\text{mA}$ , $T = 25^\circ\text{C}$ .	4.0		6.8	V
ESD Clamping Voltage (Note 1)	$V_{CL-ESD}$	IEC 61000-4-2 +8kV ( $I_{TLP} = 16\text{A}$ ), Contact mode, $T = 25^\circ\text{C}$ .		5.8		V
ESD Dynamic Turn-on Resistance	$R_{dynamic}$	IEC 61000-4-2 0~+8kV, Contact mode, $T = 25^\circ\text{C}$ .		0.1		$\Omega$
Channel Input Capacitance	$C_{IN}$	$V_R = 0\text{V}$ , $f = 1\text{MHz}$ , $T = 25^\circ\text{C}$ .		7	10	pF

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

TLP conditions:  $Z_0 = 50\Omega$ ,  $t_p = 100\text{ns}$ ,  $t_r = 1\text{ns}$ .



## Typical Characteristics



## Application Information

The AZ5C23-01B is designed to protect one line against system ESD/EFT/Cable Discharge pulses by clamping it to an acceptable reference. It provides bi-directional protection.

The usage of the AZ5C23-01B 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 AZ5C23-01B should be kept as short as possible.

In order to obtain enough suppression of ESD induced transient, a good circuit board is critical. Thus, the following guidelines are recommended:

- Minimize the path length between the protected lines and the AZ5C23-01B.
- Place the AZ5C23-01B 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.

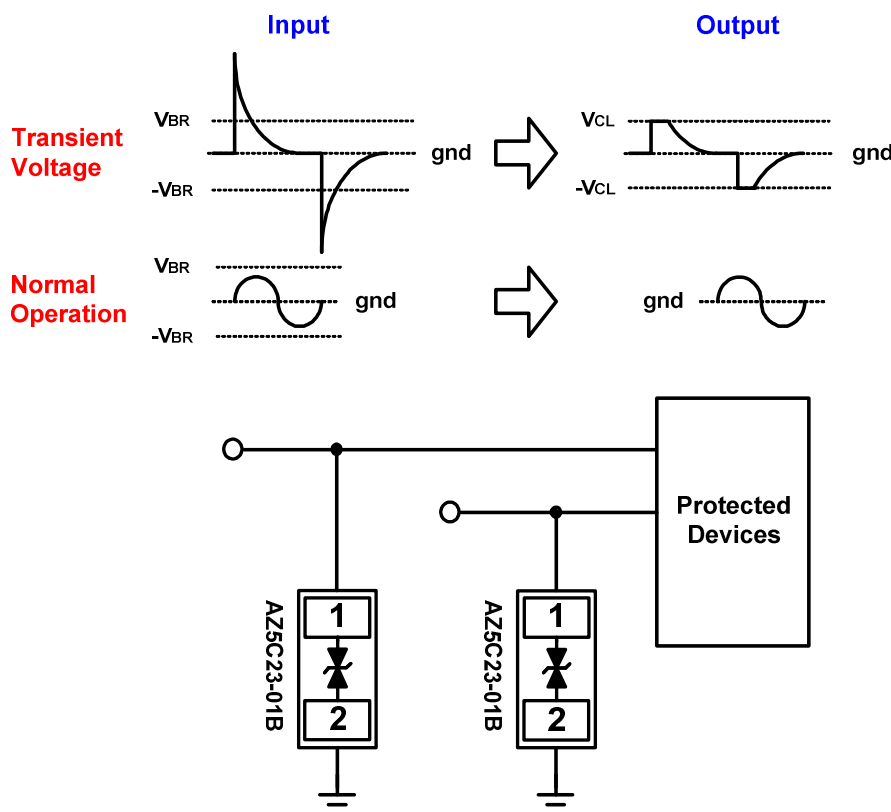
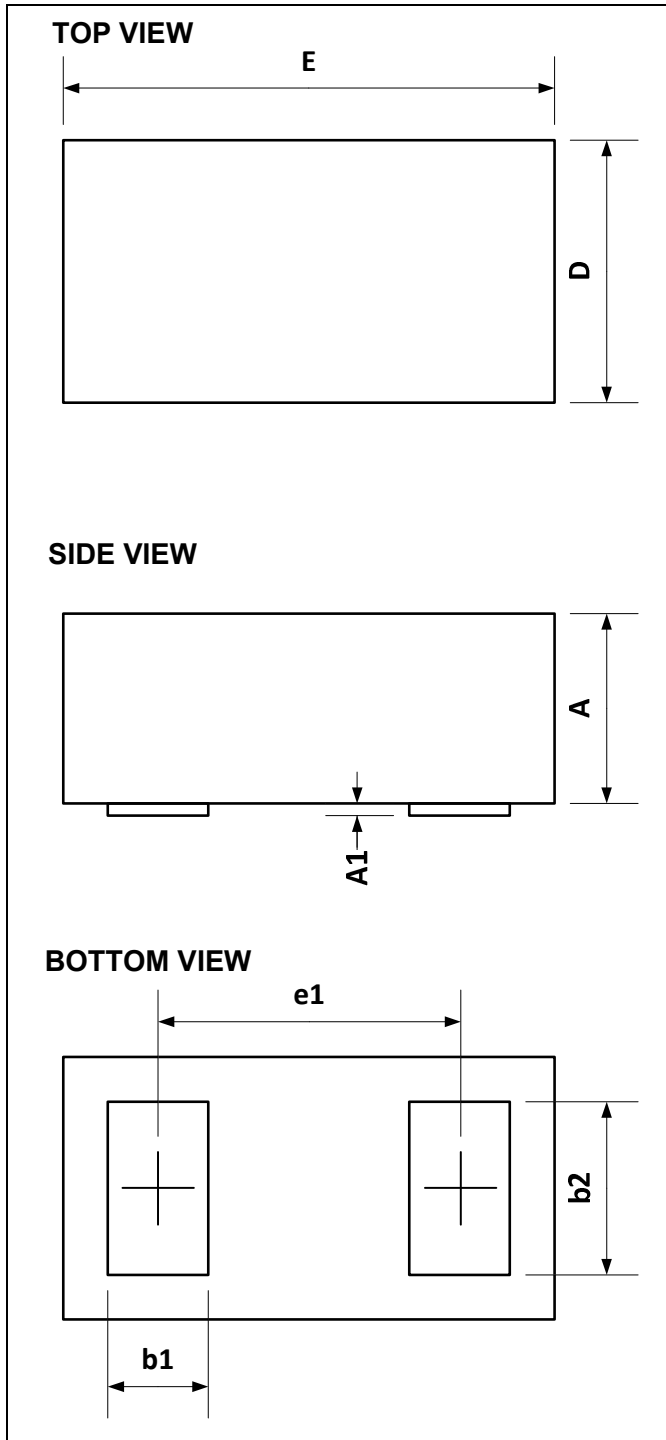


Fig. 1 ESD protection scheme by using AZ5C23-01B

## Mechanical Details

CSP0402P2U

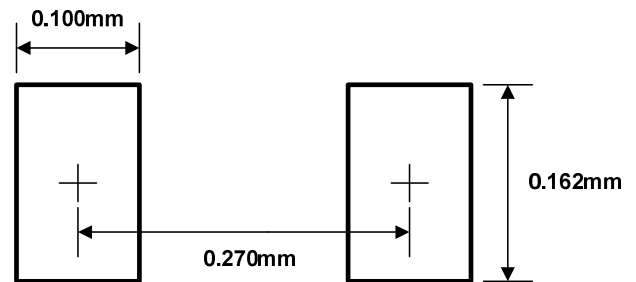
### PACKAGE DIAGRAMS



## PACKAGE DIMENSIONS

SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
<b>E</b>	0.415	0.440	0.465
<b>D</b>	0.210	0.235	0.260
<b>A</b>	0.145	0.170	0.195
<b>A1</b>	0.008	0.011	0.014
<b>b1</b>	0.084	0.090	0.096
<b>b2</b>	0.149	0.155	0.161
<b>e1</b>	0.270BSC		

## LAND LAYOUT


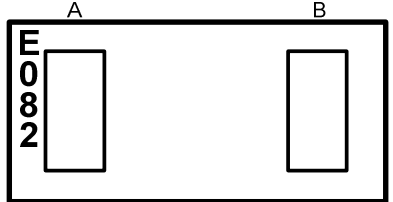


### Notes:

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

Part Number	Marking Index	Device Code and Location
AZ5C23-01B.R7G (Green Part)	 <p>(Top View Side)</p>	 <p>(Bottom View Side)</p>

Notes

- Green means Pb-free, RoHS, and Halogen free compliant.
- The marking index is on the top view side of the device. The device code is on the pad side (bottom view side).

### Ordering Information

PN#	Material	Type	Reel size	MOQ	MOQ/internal box	MOQ/carton
AZ5C23-01B.R7G	Green	T/R	7 inch	15,000/reel	4 reels = 60,000/box	6 boxes = 360,000/carton

### Revision History

Revision	Modification Description
Revision 2018/03/13	Formal Release.