



**THE DATASHEET OF  
AZ5A85-01B**



## Features

- ESD/EFT/Surge Protection for 1 Line with Bi-directional.
- Provide ESD protection for each line to  
**IEC 61000-4-2 (ESD)  $\pm 25\text{kV}$  (air / contact)**  
**IEC 61000-4-4 (EFT) 80A (5/50ns)**  
**IEC 61000-4-5 (Lightning) 16A (8/20 $\mu\text{s}$ )**
- Suitable for, **5V and below**, operating voltage applications
- **0201 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
- Latchup Protection

## Description

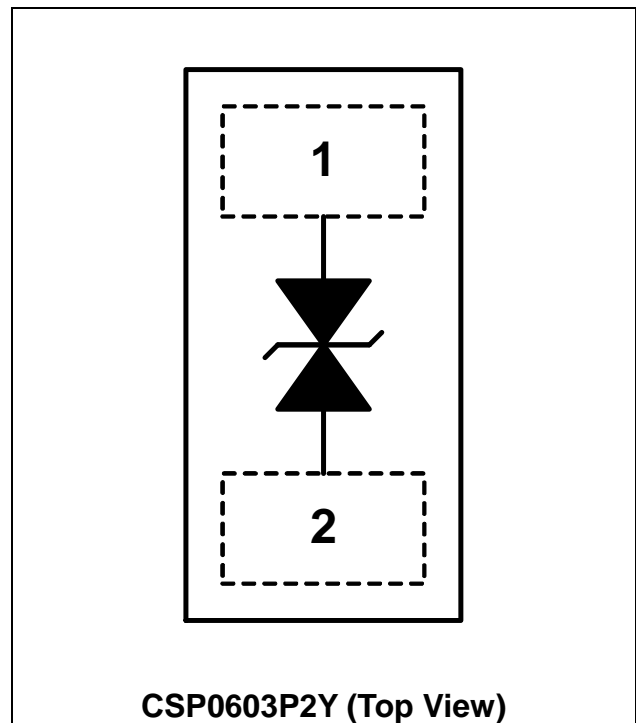
AZ5A85-01B is a design which includes a bi-directional ESD rated clamping cell to protect one power line, or one control line, or one low speed data line in an electronic systems. The AZ5A85-01B has been specifically designed to protect sensitive components which are

connected to power and control lines from over-voltage damage and latch-up caused by Electrostatic Discharging (ESD), Electrical Fast Transients (EFT), Lightning, and Cable Discharge Event (CDE).

AZ5A85-01B 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.

AZ5A85-01B 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 |
| Peak Pulse Current (tp =8/20μs)                | I <sub>PP</sub>    | 16            | A     |
| Operating Supply Voltage (pin-1 to pin-2)      | V <sub>DC</sub>    | ±5.5          | V     |
| Pin-1 to pin-2 ESD per IEC 61000-4-2 (Air)     | V <sub>ESD-1</sub> | ±25           | kV    |
| Pin-1 to pin-2 ESD per IEC 61000-4-2 (Contact) | V <sub>ESD-2</sub> | ±25           |       |
| Lead Soldering Temperature                     | T <sub>SOL</sub>   | 260 (10 sec.) | °C    |
| Operating Temperature                          | T <sub>OP</sub>    | -55 to +85    | °C    |
| Storage Temperature                            | T <sub>STO</sub>   | -55 to +150   | °C    |

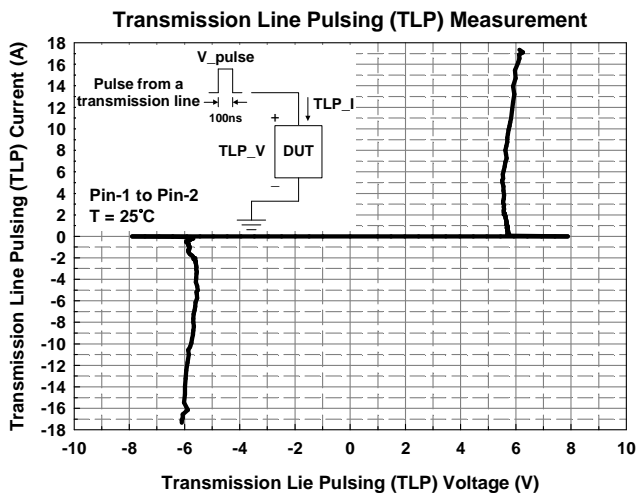
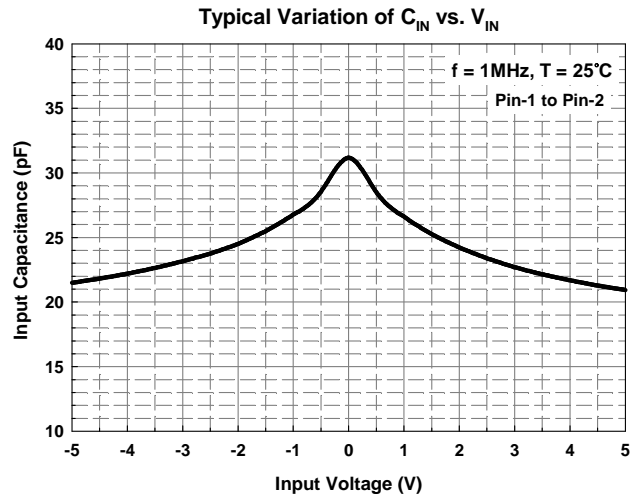
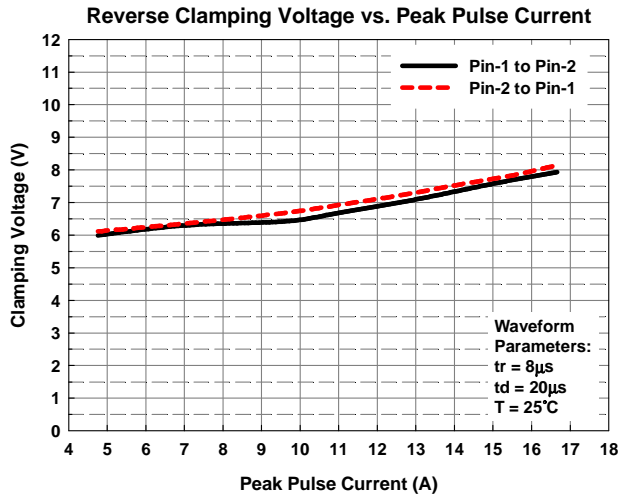
| ELECTRICAL CHARACTERISTICS     |                       |  |      |      |     |       |
|--------------------------------|-----------------------|--|------|------|-----|-------|
| PARAMETER                      | SYMBOL                | CONDITIONS   | MINI | TYP  | MAX | UNITS |
| Reverse Stand-Off Voltage      | V <sub>RWM</sub>      | T=25 °C.   | -5   |      | 5   | V     |
| Reverse Leakage Current        | I <sub>Leak</sub>     | V <sub>RWM</sub> = ±5V, T=25 °C.                                     |      |      | 100 | nA    |
| Reverse Breakdown Voltage      | V <sub>BV</sub>       | I <sub>BV</sub> = 1mA, T=25 °C.                                      | 6    |      | 9   | V     |
| Surge Clamping Voltage         | V <sub>CL-surge</sub> | I <sub>PP</sub> =5A, tp=8/20μs, T=25 °C.                             |      | 6    |     | V     |
| ESD Clamping Voltage (Note 1)  | V <sub>clamp</sub>    | IEC 61000-4-2 +8kV (I <sub>TLP</sub> = 16A), Contact mode, T=25 °C.. |      | 6    |     | V     |
| ESD Dynamic Turn-on Resistance | R <sub>dynamic</sub>  | IEC 61000-4-2 0~+8kV, T=25 °C, Contact mode.                         |      | 0.03 |     | Ω     |
| Channel Input Capacitance      | C <sub>IN</sub>       | V <sub>R</sub> = 0V, f = 1MHz, T=25 °C.                              |      | 31   | 45  | pF    |

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

TLP conditions: Z<sub>0</sub>= 50Ω, t<sub>p</sub>= 100ns, t<sub>r</sub>= 1ns.



## Typical Characteristics





### Applications Information

The AZ5A85-01B is designed to protect one line against System ESD/EFT/Lightning pulses by clamping it to an acceptable reference. It provides bi-directional protection.

The usage of the AZ5A85-01B 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 AZ5A85-01B 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 AZ5A85-01B.
- Place the AZ5A85-01B 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 PCB internal circuit.

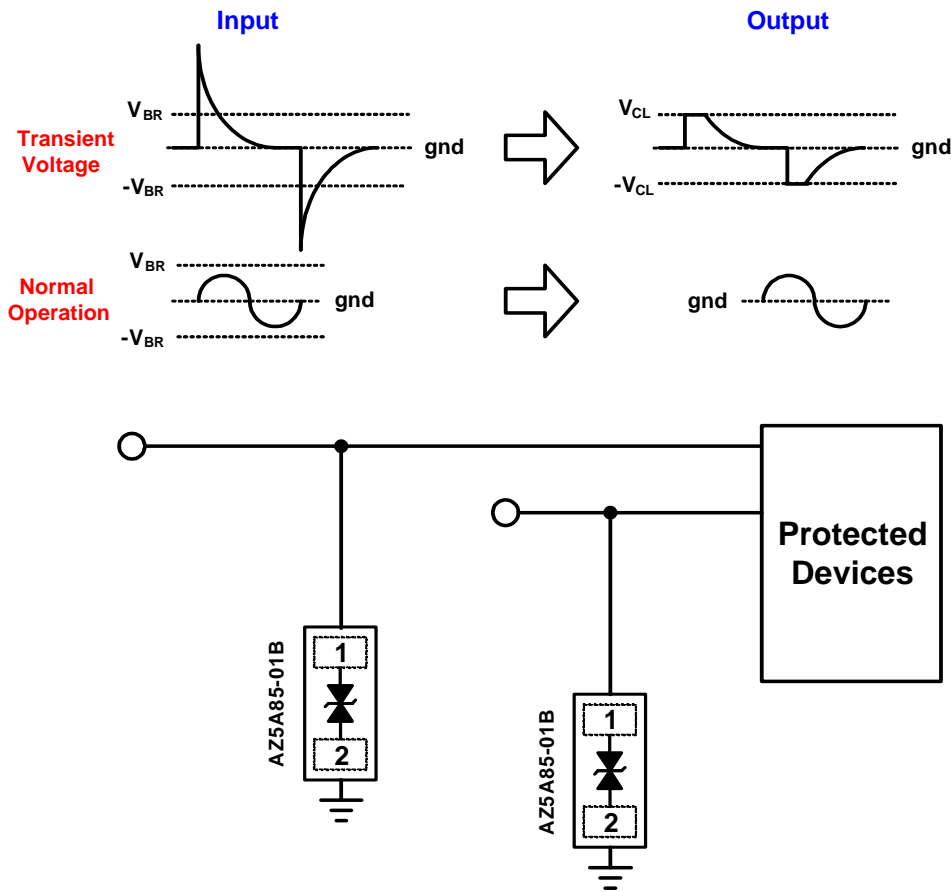


Fig. 1



Fig. 2 shows another simplified example of using AZ5A85-01B to protect the control line, low speed data line, and power line from ESD transient stress.

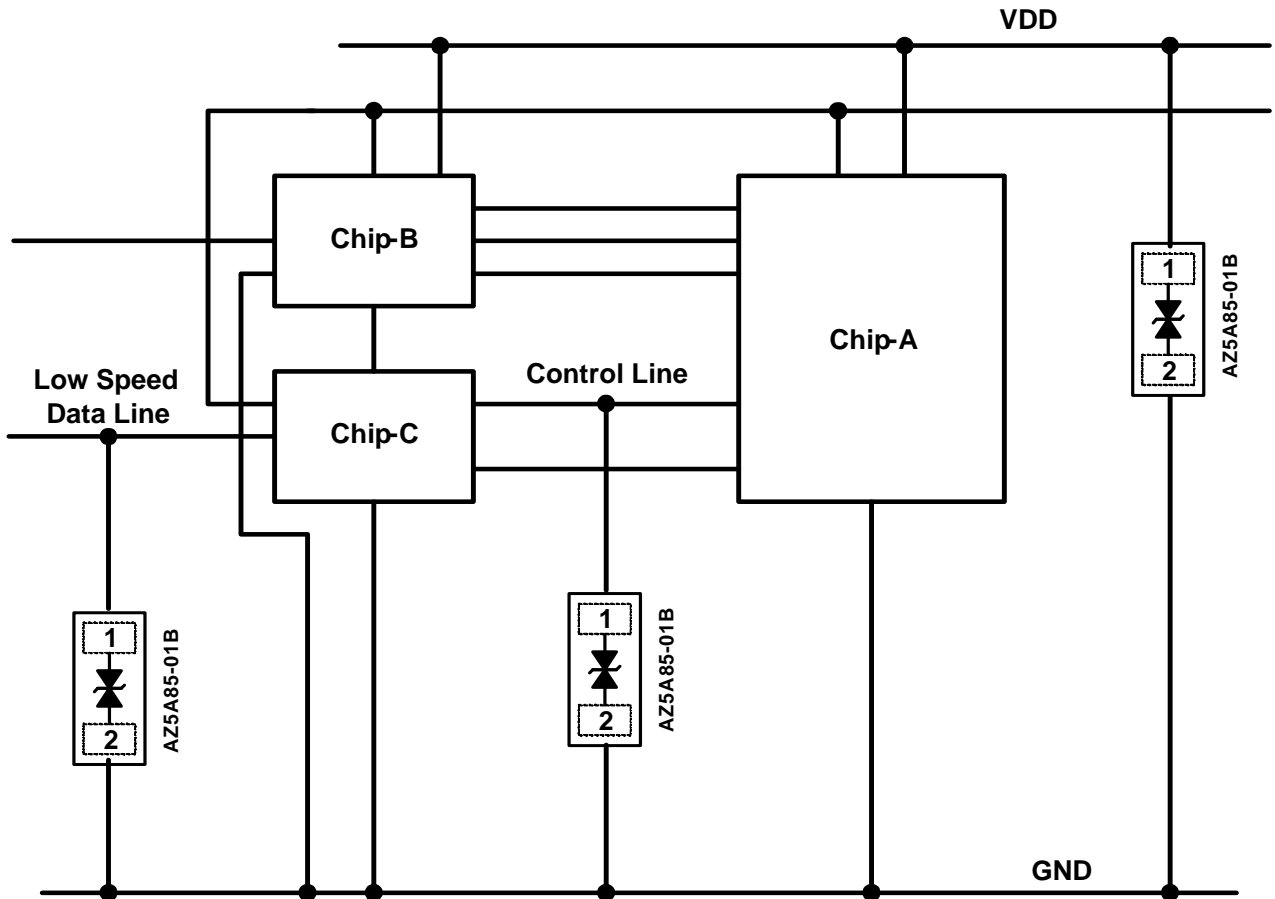


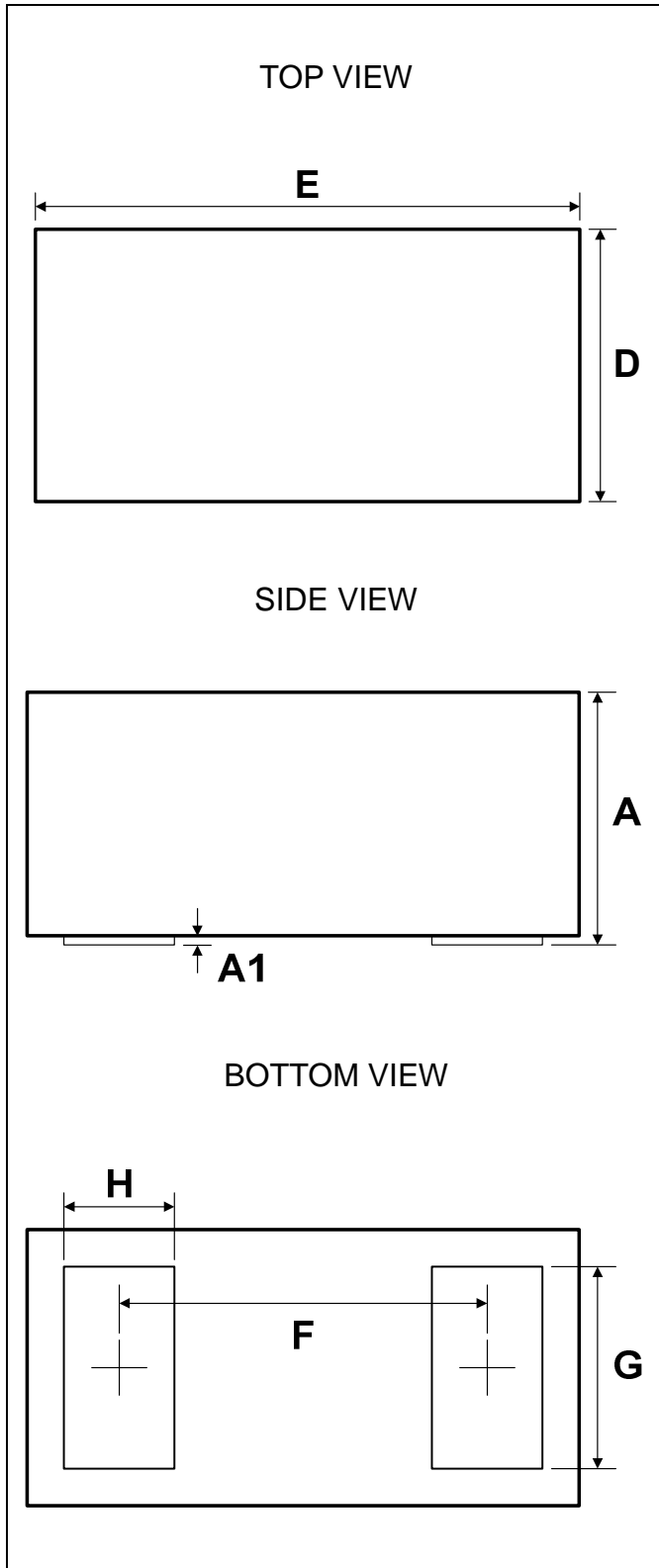
Fig. 2



## Mechanical Details

CSP0603P2Y

### PACKAGE DIAGRAMS

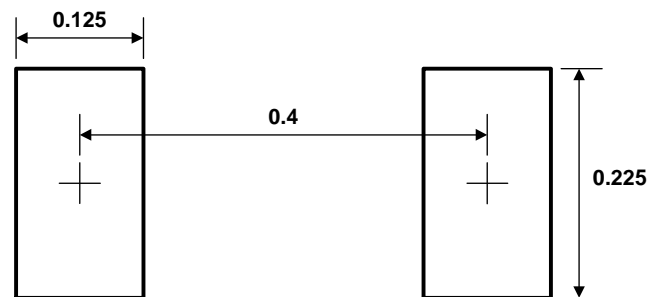


### PACKAGE DIMENSIONS

| Symbol    | Millimeters |       |       |
|-----------|-------------|-------|-------|
|           | MIN.        | TYP.  | MAX.  |
| <b>D</b>  | 0.275       | 0.300 | 0.325 |
| <b>E</b>  | 0.575       | 0.600 | 0.625 |
| <b>A</b>  | 0.256       | 0.276 | 0.296 |
| <b>A1</b> |             | 0.011 |       |
| <b>F</b>  |             | 0.400 |       |
| <b>G</b>  | 0.210       | 0.220 | 0.230 |
| <b>H</b>  | 0.110       | 0.120 | 0.130 |

### LAND LAYOUT

Unit: mm

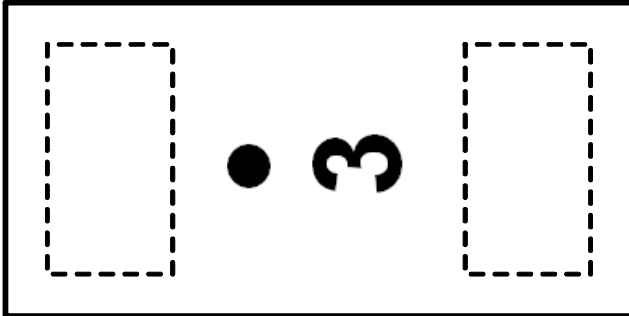


#### Notes:

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 Code |
|----------------------------|--------------|
| AZ5A85-01B<br>(Green Part) | 3            |

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

3 = Device Code

## Ordering Information



| PN#            | Material | Type | Reel size | MOQ         | MOQ/internal box    | MOQ/carton             |
|----------------|----------|------|-----------|-------------|---------------------|------------------------|
| AZ5A85-01B.R7G | Green    | T/R  | 7 inch    | 15,000/reel | 4 reel = 60,000/box | 6 box = 360,000/carton |

## Revision History

| Revision            | Modification Description                     |
|---------------------|--|
| Revision 2015/07/07 | Preliminary Release.                         |
| Revision 2015/10/06 | Update the maximum spec. of Leakage Current. |
| Revision 2016/07/15 | Revise Description.                          |
| Revision 2016/11/21 | Formal Release.                              |
|                     |  |
|                     |  |
|                     |  |

## Looking for pricing, stock, or lifecycle information?

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