



## Features

- ESD Protect for 5 Lines with Unidirectional.
- Provide Transient protection for each line directly to  
IEC 61000-4-2 (ESD)  $\pm 16\text{kV}$  (air),  $\pm 10\text{kV}$  (contact)  
IEC 61000-4-4 (EFT) 35A (5/50ns)  
IEC 61000-4-5 (Lightning) 3.5~6A (8/20 $\mu\text{s}$ )
- For low operating voltage applications: 5V, 4.2V, 3.3V, and 2.5V etc.
- Fast turn-on and Low clamping voltage
- Array of surge rated equivalent TVS diodes
- Small package saves board space
- Solid-state silicon-avalanche and active circuit triggering technology
- Green part available

## Applications

- Cellular Handsets and Accessories
- Small Panel Modules
- PDA's
- Portable Devices
- Digital Cameras
- Touch Panels
- Notebooks and Handhelds
- MP3 Players
- Peripherals

## Description

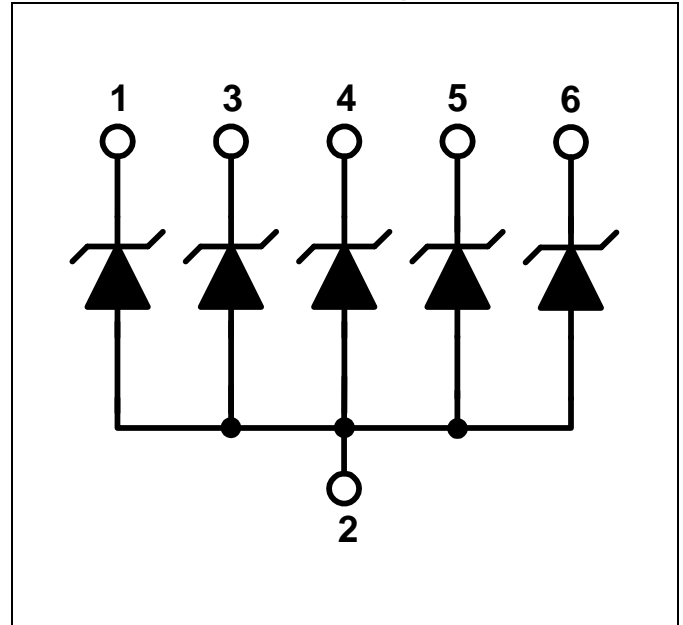
AZ2115-05C is a design which includes surge rated clamping cell arrays to protect the power lines or data/control lines in an electronic systems. The AZ2115-05C has been specifically designed to protect sensitive components which are connected to power and control lines from over-voltage caused by Electrostatic Discharging (ESD), Electrical Fast Transients (EFT), and Lightning.

AZ2115-05C 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 lines or control lines, protecting any downstream components.

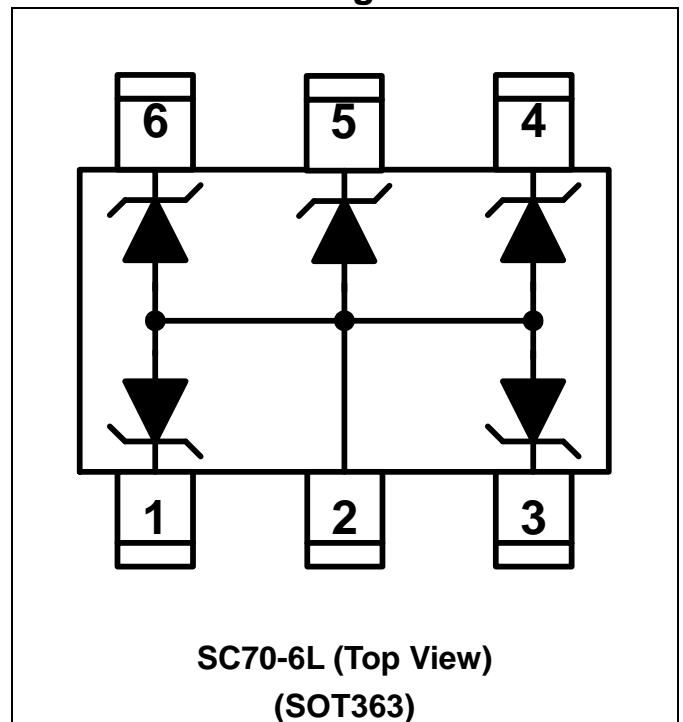
AZ2115-05C may be used to meet the ESD

immunity requirements of IEC 61000-4-2, Level 4 ( $\pm 15\text{kV}$  air,  $\pm 8\text{kV}$  contact discharge).

## Circuit Diagram



## Pin Configuration



**SC70-6L (Top View)**  
**(SOT363)**



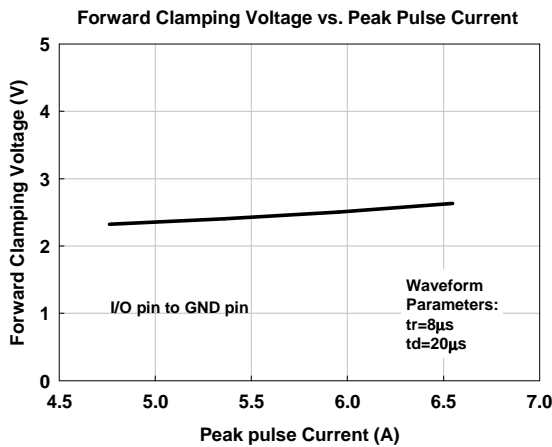
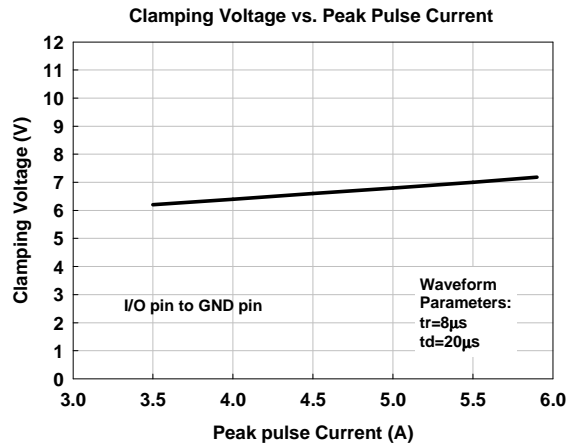
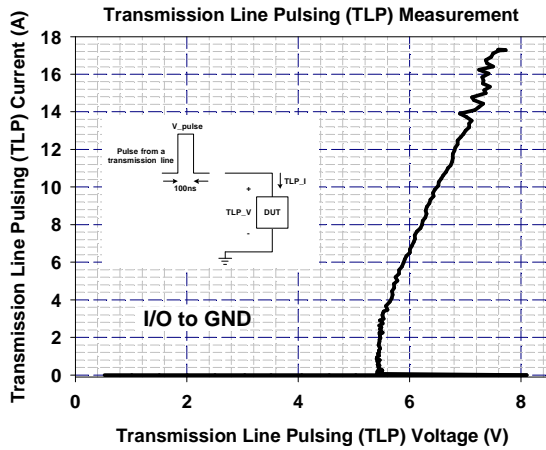
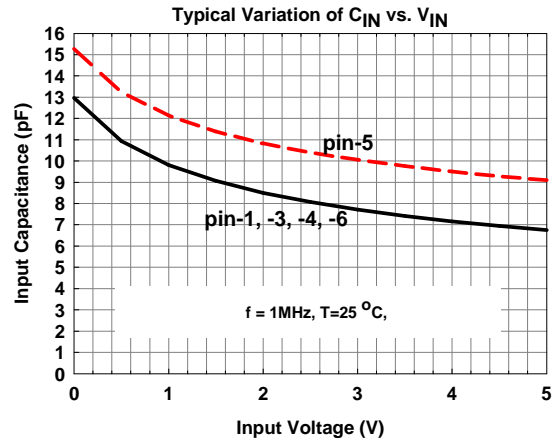
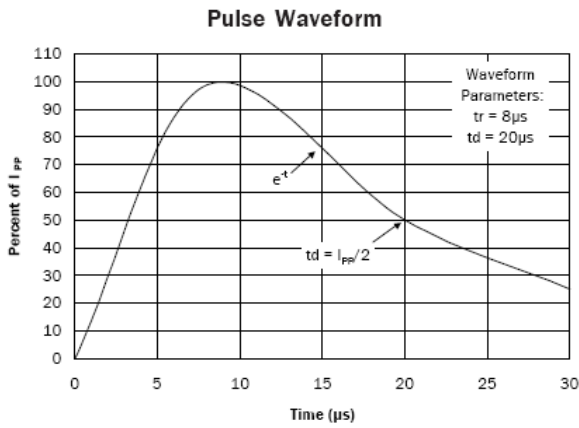
## SPECIFICATIONS

| ABSOLUTE MAXIMUM RATINGS                                      |                    |                  |       |
|---------------------------------------------------------------|--------------------|------------------|-------|
| PARAMETER                                                     | PARAMETER          | RATING           | UNITS |
| Peak Pulse Current (tp =8/20us)                               | I <sub>PP</sub>    | 6 (pin-1, 3,4,6) | A     |
|                                                               |                    | 3.5 (pin-5)      |       |
| Operating Supply Voltage (pin-1,-3, -4, -5, -6 to pin-2)      | V <sub>DC</sub>    | 6                | V     |
| pin-1,-3, -4, -5, -6 to pin-2 ESD per IEC 61000-4-2 (Air)     | V <sub>ESD-1</sub> | 16               | kV    |
| pin-1,-3, -4, -5, -6 to pin-2 ESD per IEC 61000-4-2 (Contact) |                    | 10               |       |
| 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>      | pin-1,-3, -4, -5, -6 to pin-2, T=25 °C.                                     |      |      | 5   | V     |
| Reverse Leakage Current        | I <sub>Leak</sub>     | V <sub>RWM</sub> = 5V, T=25 °C, pin-1,-3, -4, -5, -6 to pin-2.              |      |      | 2.5 | μA    |
| Reverse Breakdown Voltage      | V <sub>BV</sub>       | I <sub>BV</sub> = 1mA, T=25 °C, pin-1,-3, -4, -5, -6 to pin-2               | 6    |      | 9   | V     |
| Forward Voltage                | V <sub>F</sub>        | I <sub>F</sub> = 15mA, T=25 °C, pin-2 to pin-1,-3, -4, -5, -6               | 0.6  | 0.85 | 1   | V     |
| Surge Clamping Voltage         | V <sub>CL-surge</sub> | I <sub>PP</sub> =5A, tp=8/20us, T=25 °C, pin-1, -3, -4, -6 to pin-2.        |      | 6.8  |     | V     |
|                                |                       | I <sub>PP</sub> =3.5A, tp=8/20us, T=25 °C, pin-5 to pin-2.                  |      | 6.2  |     |       |
| ESD Clamping Voltage           | V <sub>clamp</sub>    | IEC 61000-4-2 +6kV, T=25 °C, Contact mode, pin-1,-3, -4, -5, -6 to pin-2.   |      | 7.8  |     | V     |
| ESD Dynamic Turn-on Resistance | R <sub>dynamic</sub>  | IEC 61000-4-2 0~+6kV, T=25 °C, Contact mode, pin-1,-3, -4, -5, -6 to pin-2. |      | 0.15 |     | Ω     |
| Channel Input Capacitance      | C <sub>N</sub>        | V <sub>R</sub> = 0V, f = 1MHz, T=25 °C, pin-1,-3, -4, -6 to pin-2.          |      | 13   | 15  | pF    |
|                                |                       | V <sub>R</sub> = 0V, f = 1MHz, T=25 °C, pin-5 to pin-2.                     |      | 15   | 17  |       |



## Typical Characteristics





## Applications Information

The AZ2115-05C is designed to protect five lines against System ESD/EFT/Lightning pulses by clamping them to an acceptable reference.

The usage of the AZ2115-05C is shown in Fig. 1. Protected lines, such as data lines, control lines, or power lines, are connected at pin 1, 3, 4, 5 and 6. The pin 2 should be connected directly to a ground plane on the board. All path lengths connected to the pins of AZ2115-05C should be kept as short as possible to minimize parasitic inductance in the board traces.

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 AZ2115-05C.
- Place the AZ2115-05C 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. 2 shows an example of PCB layout with the AZ2115-05C.

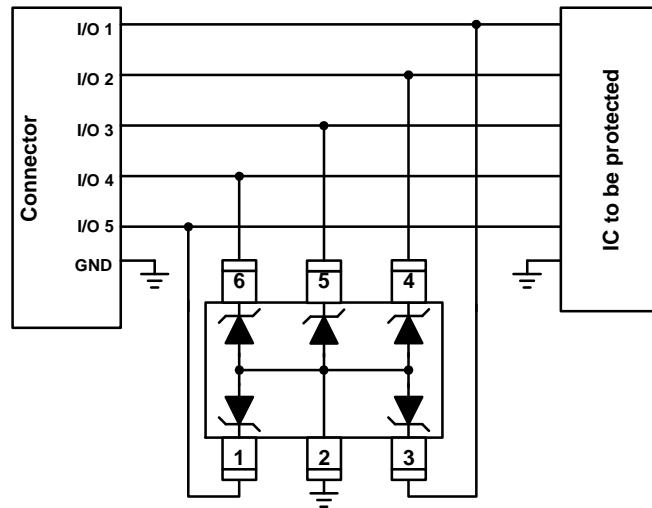


Fig. 1

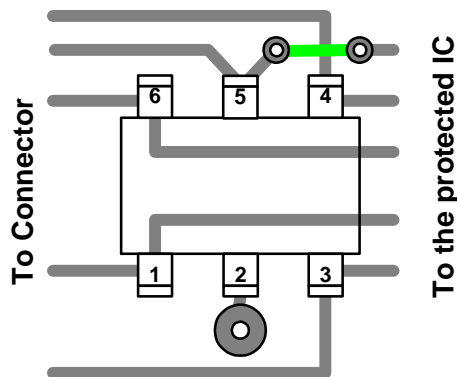


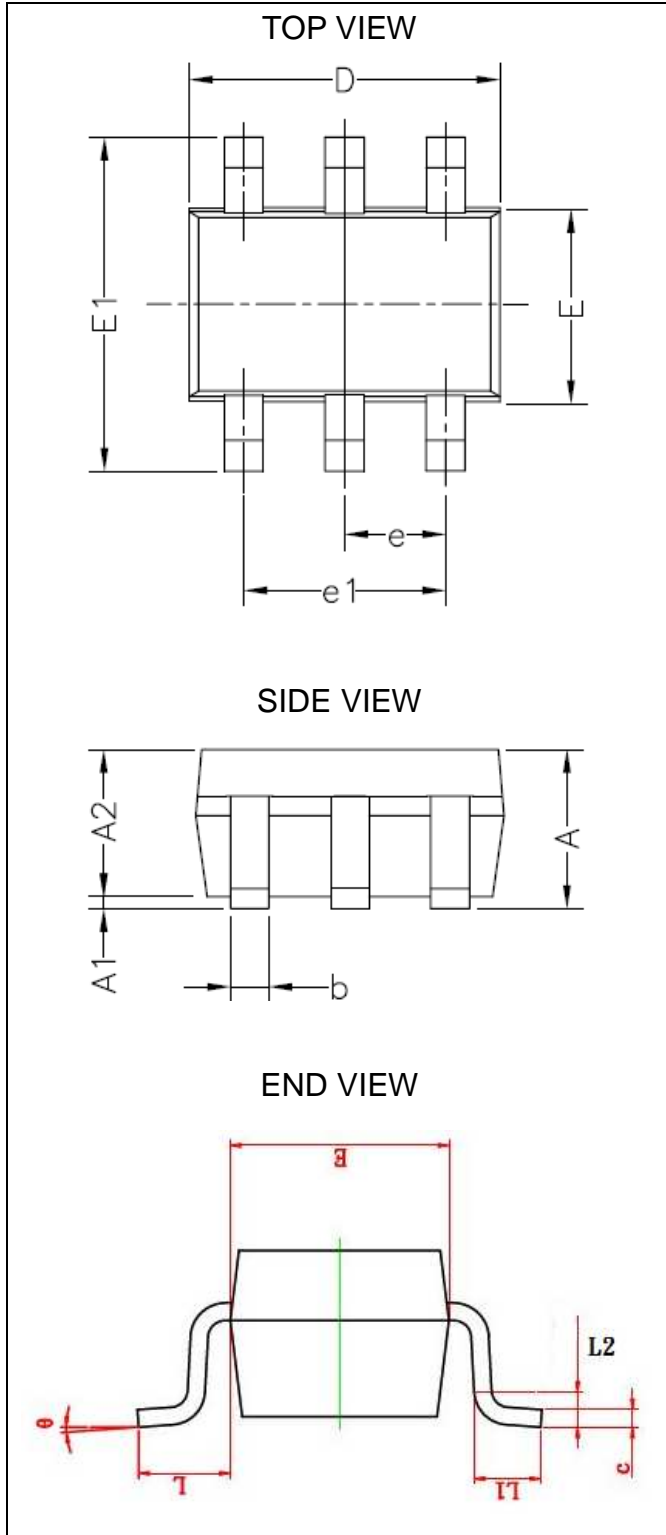
Fig. 2



## Mechanical Details

### SC70-6L

#### PACKAGE DIAGRAMS



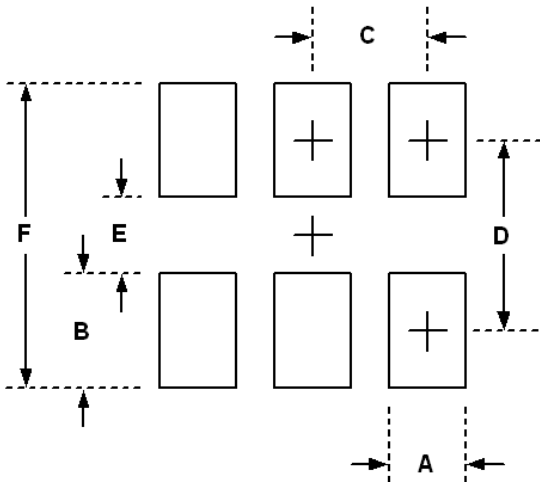
#### PACKAGE DIMENSIONS

| Symbol   | Millimeters |      | Inches    |       |
|----------|-------------|------|-----------|-------|
|          | min         | max  | min       | max   |
| A        | 0.90        | 1.10 | 0.036     | 0.044 |
| A1       | 0.00        | 0.10 | 0.000     | 0.004 |
| A2       | 0.875       | 1.00 | 0.035     | 0.040 |
| b        | 0.15        | 0.40 | 0.006     | 0.016 |
| C        | 0.08        | 0.15 | 0.003     | 0.006 |
| D        | 1.90        | 2.20 | 0.076     | 0.087 |
| E        | 1.15        | 1.35 | 0.046     | 0.054 |
| E1       | 2.00        | 2.45 | 0.080     | 0.096 |
| e        | 0.65 BSC    |      | 0.026 BSC |       |
| e1       | 1.30 BSC    |      | 0.052 BSC |       |
| L        | 0.475 REF   |      | 0.019 REF |       |
| L1       | 0.300 REF   |      | 0.012 REF |       |
| L2       | 0.200 REF   |      | 0.007 REF |       |
| $\theta$ | 0°          | 8°   | 0°        | 8°    |

Note:

1. All dimensions are in millimeters, and the dimensions in inches are for reference only.
2. 1mm = 40 mils = 0.04 inches.

## LAND LAYOUT

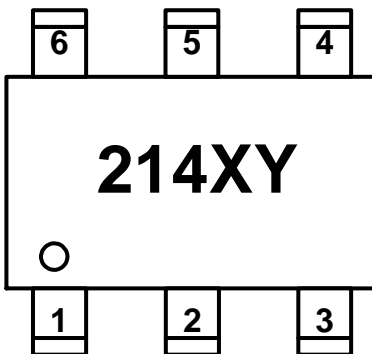


| Dimensions |            |        |
|------------|------------|--------|
| Index      | Millimeter | Inches |
| A          | 0.40       | 0.016  |
| B          | 0.85       | 0.033  |
| C          | 0.65       | 0.026  |
| D          | 1.85       | 0.073  |
| E          | 1.00       | 0.039  |
| F          | 2.70       | 0.106  |

### 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 |
|----------------------------|--------------|
| AZ2115-05C                 | 214XY        |
| AZ2115-05C<br>(Green part) | 224XY        |

214 = Device Code  
X = Date Code  
Y = Control Code

## Ordering Information

| PN#            | Material | Type | Reel size | MOQ/interal box   | MOQ/carton          |
|----------------|----------|------|-----------|-------------------|---------------------|
| AZ2115-05C.R7G | Green    | T/R  | 7 inch    | 4 reel=12,000/box | 6 box=72,000/carton |



## Revision History

| Revision            | Modification Description                                        |
|---------------------|-----------------------------------------------------------------|
| Revision 2008/03/28 | Original Formal Release.                                        |
| Revision 2008/09/29 | Add the marking code for Green part.                            |
| Revision 2008/12/26 | Update the PACKAGE DIMENSIONS.                                  |
| Revision 2011/03/02 | Update the package drawing of END VIEW.                         |
| Revision 2011/06/18 | 1. Update the Company Logo.<br>2. Add the Ordering Information. |
|                     |                                                                 |