



Features

- ESD Protect for 1 Line with Bi-directional
- Provide ESD protection for the protected line to
IEC 61000-4-2 (ESD) $\pm 16\text{kV}$ (air/contact)
IEC 61000-4-4 (EFT) 50A (5/50ns)
IEC 61000-4-5 (Lightning) 5A (8/20 μs)
Cable Discharge Event (CDE)
- **0402 small DFN 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

Applications

- Mobile Phones
- Hand Held Portable Applications
- Computer Interfaces Protection
- Microprocessors Protection
- Serial and Parallel Ports Protection
- Control Signal Lines Protection
- Power lines on PCB Protection
- Latchup Protection

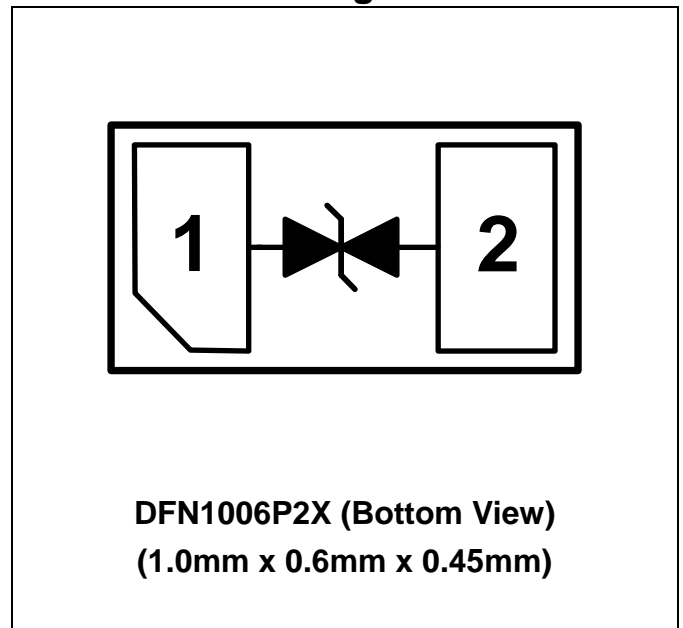
Description

AZ5123-01F is a design which includes one Bi-directional surge rated clamping cell to protect one power line, or one control line, or one low speed data line in an electronic systems. The AZ5123-01F 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).

AZ5123-01F 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.

AZ5123-01F 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





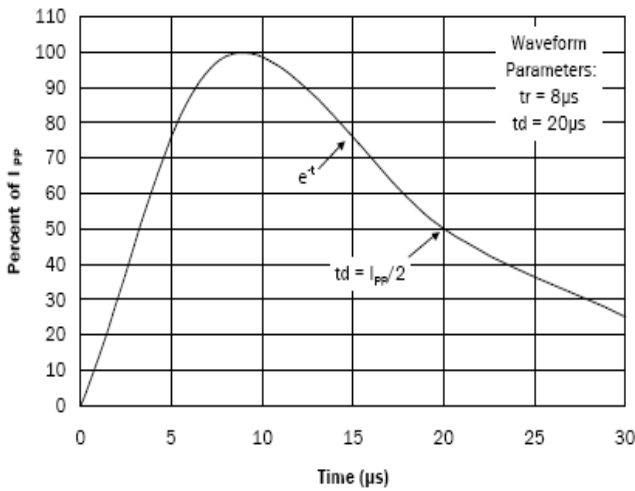
SPECIFICATIONS

| ABSOLUTE MAXIMUM RATINGS | | | |
|---------------------------------|------------------|---------------|-------|
| PARAMETER | SYMBOL | RATING | UNITS |
| Peak Pulse Current (tp =8/20us) | I _{PP} | 5 | A |
| Operating Supply Voltage | V _{DC} | ±3.6 | V |
| ESD per IEC 61000-4-2 (Air) | V _{ESD} | ±16 | kV |
| ESD per IEC 61000-4-2 (Contact) | | ±16 | |
| Lead Soldering Temperature | T _{SOL} | 260 (10 sec.) | °C |
| Operating Temperature | T _{OP} | -55 to +85 | °C |
| Storage Temperature | T _{STO} | -55 to +150 | °C |

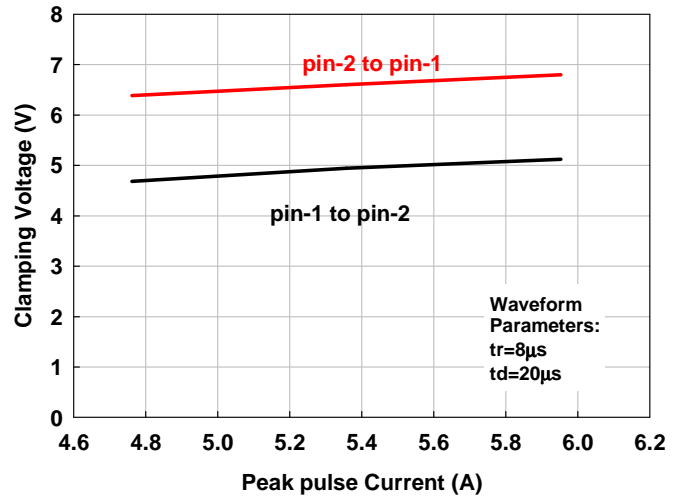
| ELECTRICAL CHARACTERISTICS | | | | | | |
|----------------------------|-----------------------|--|------|------|------|-------|
| PARAMETER | SYMBOL | CONDITIONS | MINI | TYP | MAX | UNITS |
| Stand-Off Voltage | V _{RVM} | T=25 °C. | -3.3 | | 3.3 | V |
| Leakage Current | I _{Leak} | V _{RVM} = ±3.3V, T=25 °C. | | | 1.0 | μA |
| Breakdown Voltage | V _{BV} | I _{BV} = 1mA, T=25 °C. | 4 | | 6.5 | V |
| Surge Clamping Voltage | V _{surge_CL} | I _{pp} =5A, tp=8/20μs, T=25 °C. | | 6.5 | 8 | V |
| ESD Clamping Voltage | V _{ESD_CL} | IEC 61000-4-2 +6kV, T=25 °C, Contact mode. | | 7 | | V |
| Channel Input Capacitance | C _{IN} | V _R = 0V, f = 1MHz, T=25 °C. | | 13.5 | 16.5 | pF |

Typical Characteristics

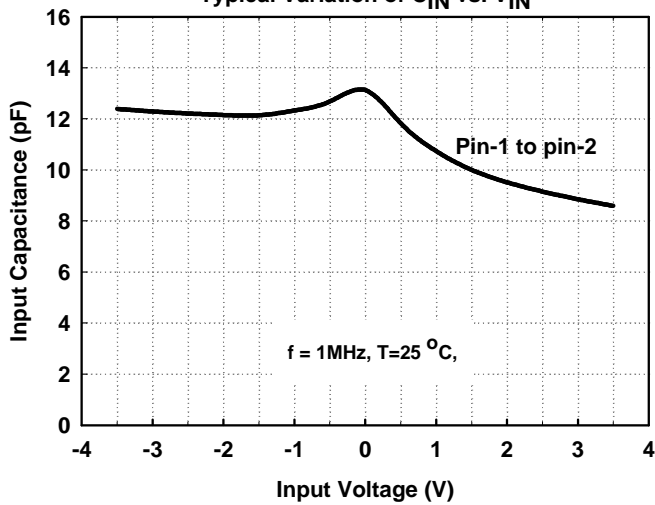
Pulse Waveform



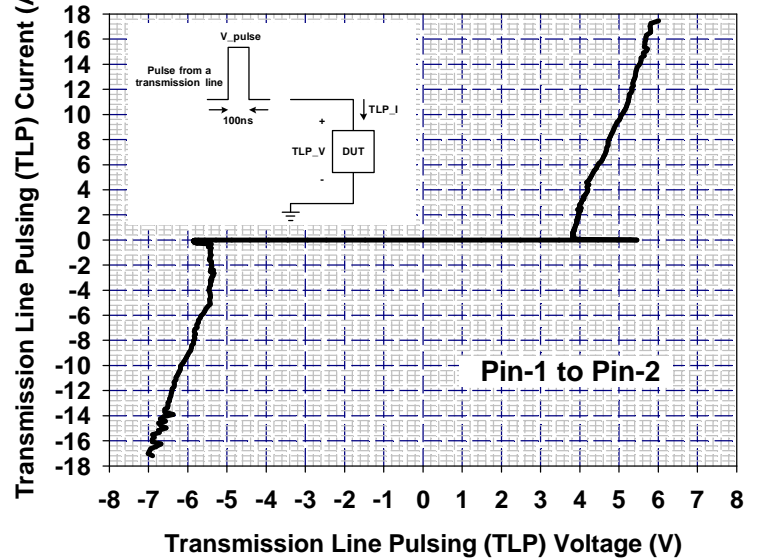
Clamping Voltage vs. Peak Pulse Current



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



Transmission Line Pulsing (TLP) Measurement





Applications Information

The AZ5123-01F 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 AZ5123-01F 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 AZ5123-01F 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 AZ5123-01F.
- Place the AZ5123-01F 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.

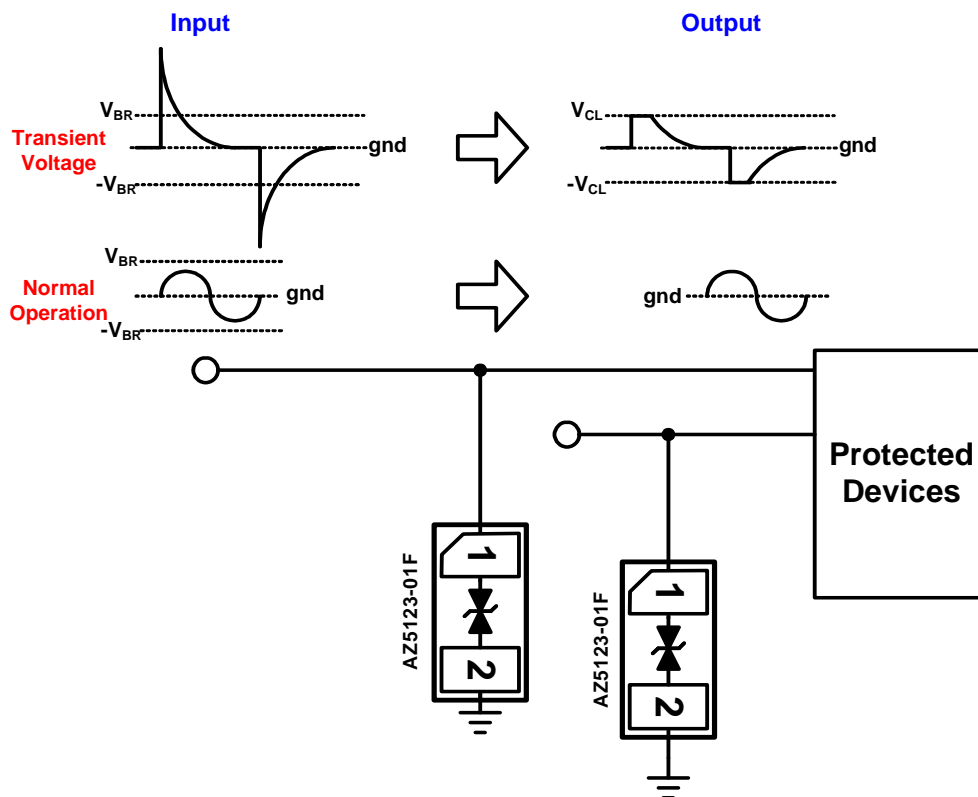


Fig. 1



Fig. 2 shows another simplified example of using AZ5123-01F to protect the control line, low speed data line, and power line from ESD transient stress.

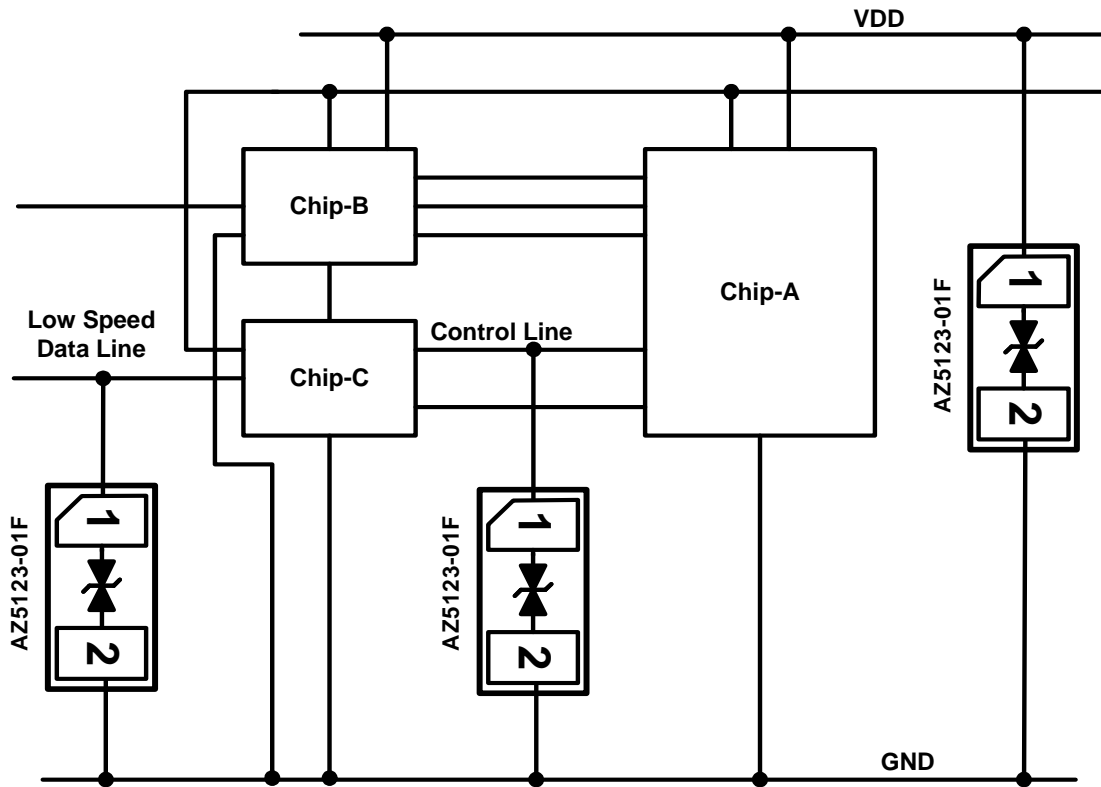
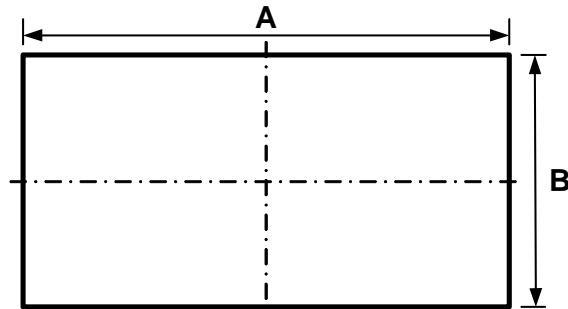


Fig. 2



Mechanical Details

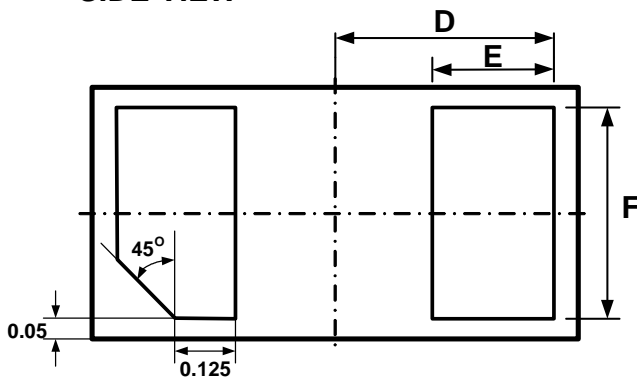
DFN1006P2X PACKAGE DIAGRAMS



TOP VIEW



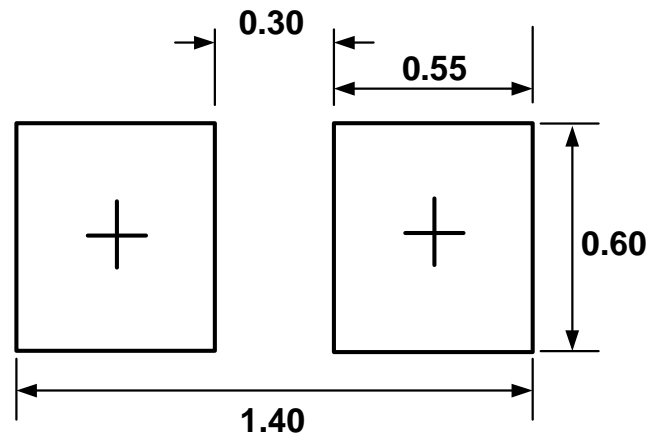
SIDE VIEW



BOTTOM VIEW

| Symbol | Millimeters | | Inches | |
|--------|-------------|------|--------|-------|
| | min | max | min | max |
| A | 0.95 | 1.05 | 0.037 | 0.041 |
| B | 0.55 | 0.65 | 0.022 | 0.026 |
| C | 0.41 | 0.50 | 0.016 | 0.020 |
| D | 0.45 | | 0.018 | |
| E | 0.20 | 0.30 | 0.008 | 0.012 |
| F | 0.45 | 0.55 | 0.018 | 0.022 |

LAND LAYOUT

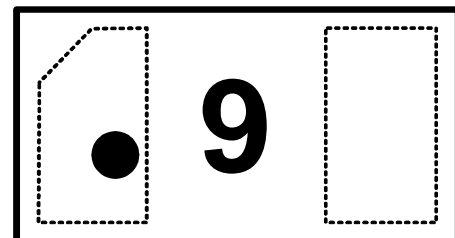


(Unit: mm)

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



Top View

| Part Number | Marking Code |
|----------------------------|--------------|
| AZ5123-01F (Green part) | 9 |

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



Ordering Information

| PN# | Material | Type | Reel size | MOQ | MOQ/internal box | MOQ/carton |
|-----------------|----------|------|-----------|-------------|-------------------|----------------------|
| AZ5123-01F.R7GR | Green | T/R | 7 inch | 12,000/reel | 4 reel=48,000/box | 6 box=288,000/carton |

Revision History

| Revision | Modification Description |
|---------------------|---|
| Revision 2011/11/09 | Formal Release. |
| Revision 2013/03/20 | Update the ESD level from 15kV to 16kV. |
| Revision 2014/05/23 | Add the ordering information. |
| Revision 2015/01/26 | Update the ordering information. |
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