



Features

- ESD Protection for 1 Line with Bi-directional
- Provide ESD protection for the protected line to IEC 61000-4-2 (ESD) $\pm 16\text{kV}$ (air), $\pm 16\text{kV}$ (contact) IEC 61000-4-4 (EFT) 40A (5/50ns) Cable Discharged Event (CDE)
- Suitable for, **12V and below**, operating voltage applications
- **0402 small DFN 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

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

Description

AZ4212-01F 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 systems. The AZ4212-01F has been specifically designed to protect sensitive components which are connected to data and transmission lines from

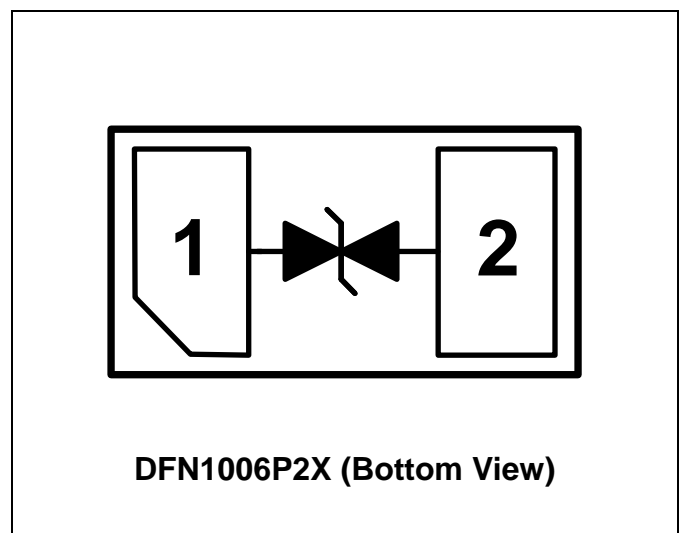
over-voltage caused by Electrostatic Discharging (ESD), Electrical Fast Transients (EFT), and Cable Discharge Event (CDE).

AZ4212-01F 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.

AZ4212-01F is bi-directional and may be used on lines where the signal swings above and below ground.

AZ4212-01F 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





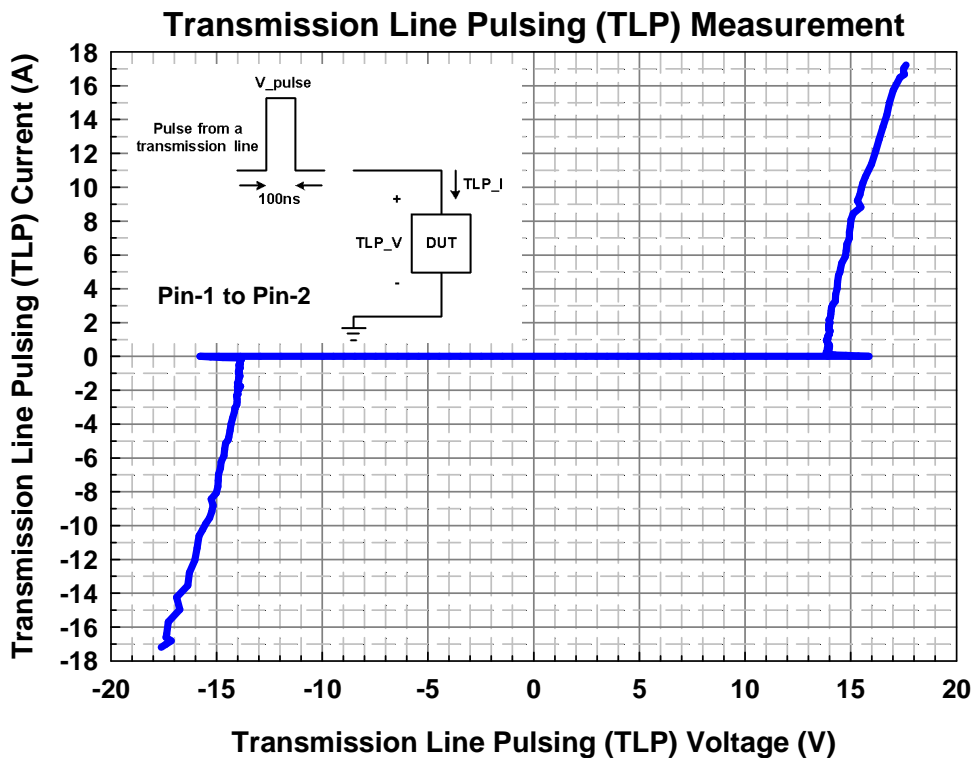
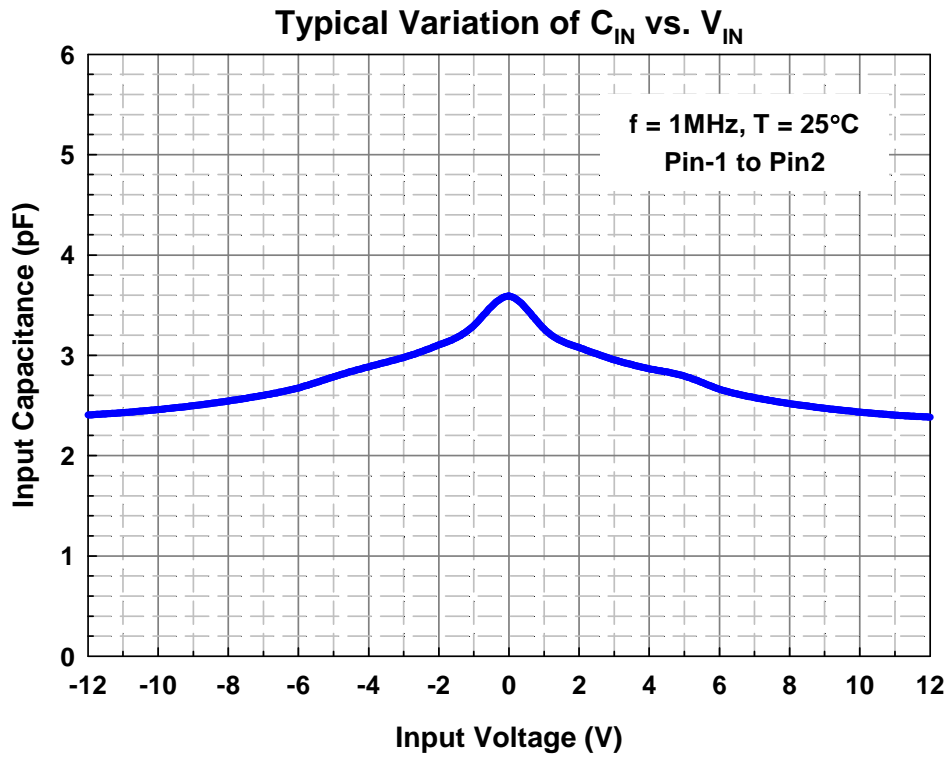
SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS			
PARAMETER	SYMBOL	RATING	UNITS
Operating Supply Voltage	V_{DC}	± 13.2	V
ESD per IEC 61000-4-2 (Air)	V_{ESD}	± 16	kV
ESD per IEC 61000-4-2 (Contact)		± 16	kV
Lead Soldering Temperature	T_{SOL}	260 (10 sec.)	$^{\circ}C$
Operating Temperature	T_{OP}	-40 to +85	$^{\circ}C$
Storage Temperature	T_{STO}	-55 to +150	$^{\circ}C$

ELECTRICAL CHARACTERISTICS						
PARAMETER	SYMBOL	CONDITIONS	MINI	TYP	MAX	UNITS
Stand-Off Voltage	V_{RWM}	$T=25^{\circ}C$	-12		12	V
Leakage Current	I_{Leak}	$V_{RWM} = \pm 12V, T=25^{\circ}C.$			0.5	μA
Breakdown Voltage	V_{BV}	$I_{BV} = 1mA, T=25^{\circ}C.$	13.7		16	V
ESD Clamping Voltage	V_{clamp}	IEC 61000-4-2 +6kV $T=25^{\circ}C, \text{Contact mode.}$		18		V
ESD Dynamic Turn-on Resistance	$R_{dynamic}$	IEC 61000-4-2 0~+6kV, $T=25^{\circ}C, \text{Contact mode.}$		0.25		Ω
Input Capacitance	C_{IN}	$V_R = 0V, f = 1MHz,$ $T=25^{\circ}C.$		3.6	5.0	pF



Typical Characteristics





Applications Information

The AZ4212-01F is designed to protect one line against System ESD / EFT / CDE pulse by clamping it to an acceptable reference. It provides bi-directional protection.

The usage of the AZ4212-01F 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 AZ4212-01F 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 AZ4212-01F.
- Place the AZ4212-01F 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.

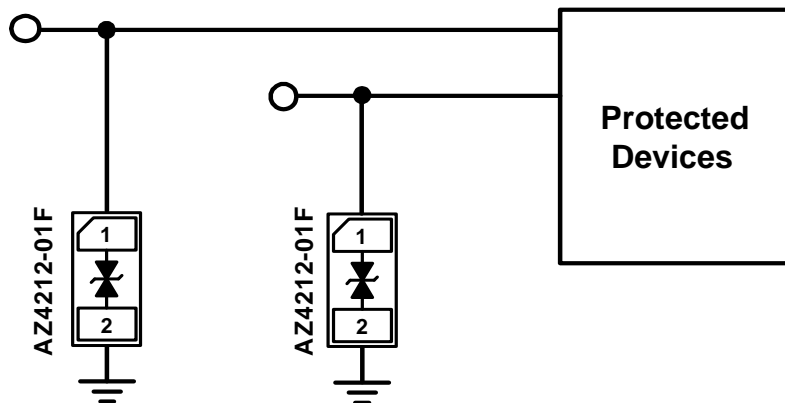
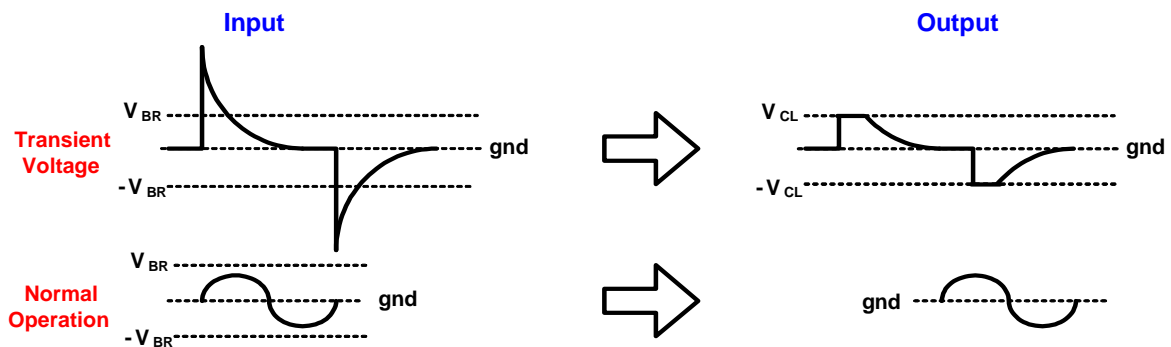


Fig. 1



Fig. 2 shows another simplified example of using AZ4212-01F to protect the control line, low speed data line, and power line from ESD transient stress.

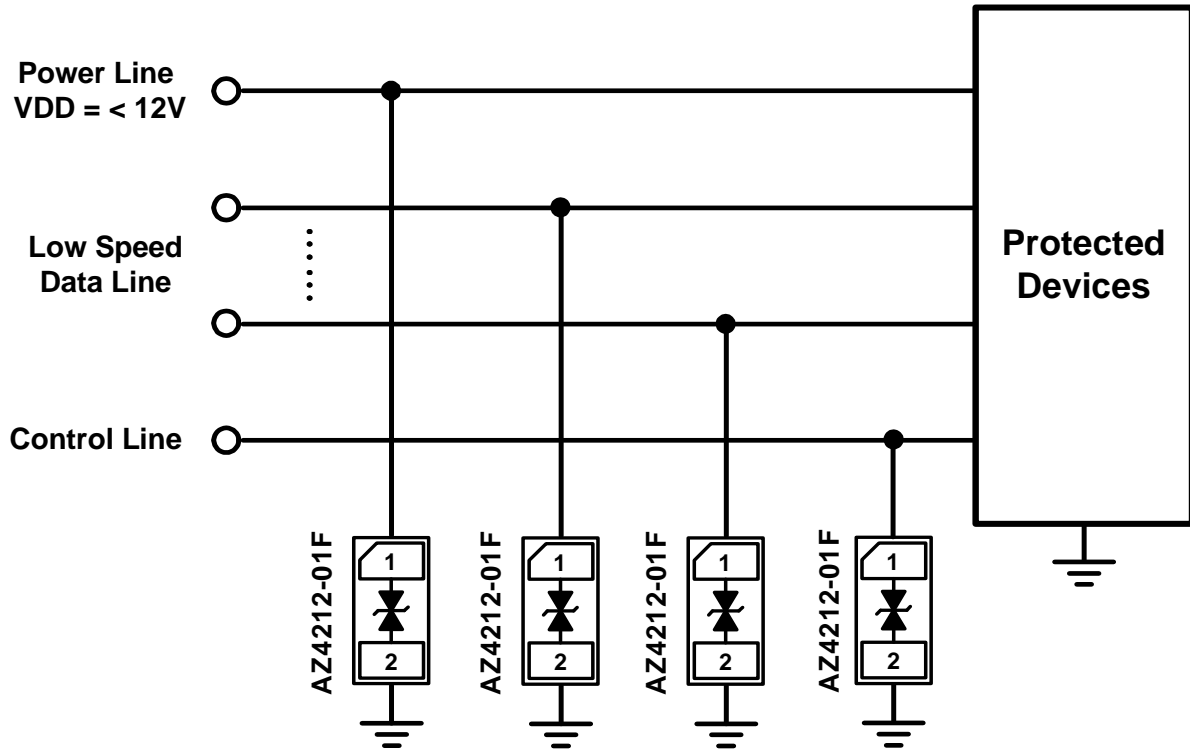
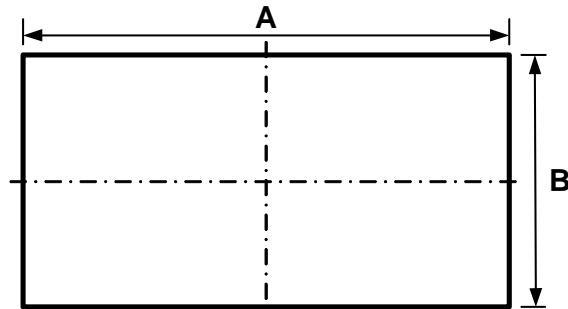


Fig. 2



Mechanical Details

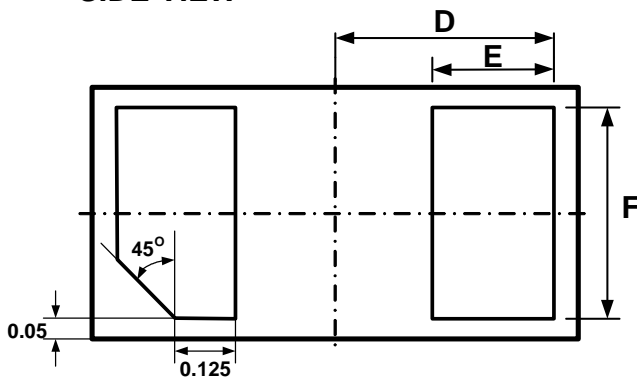
DFN1006P2X PACKAGE DIAGRAMS



TOP VIEW



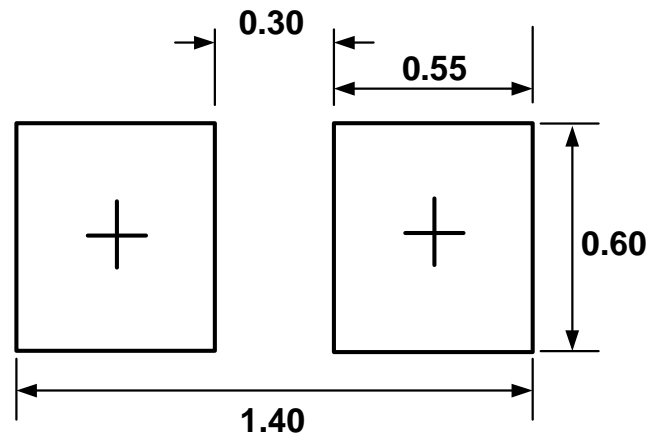
SIDE VIEW



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	0.40	0.55	0.016	0.022
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

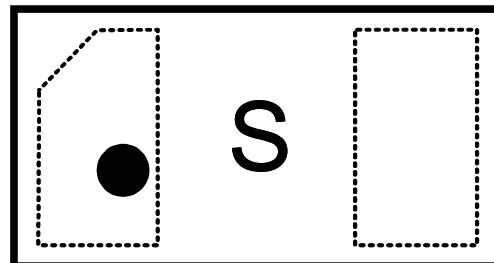


(Unit: mm)

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
AZ4212-01F (Green part)	S

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



Ordering Information

PN#	Material	Type	Reel size	MOQ	MOQ/internal box	MOQ/carton
AZ4212-01F.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 2013/09/10	Formal Release.
Revision 2013/10/14	Update the max. value of V_{BV} .
Revision 2014/05/26	Add the ordering information.
Revision 2014/12/24	Update the ordering information.