

## Features

- ESD/Surge protection for one line with bi-directional
- Provide transient protection for one line to  
**IEC 61000-4-2 (ESD)  $\pm 30\text{kV}$  (air / contact)**  
**IEC 61000-4-4 (EFT) 80A (5/50ns)**  
**IEC 61000-4-5 (Lightning) 180A (8/20 $\mu\text{s}$ )**
- For operating voltage of 3.3V and below
- **1.6mm x 1.0mm DFN package** saves board space
- High surge protection
- Fast turn-on and low clamping voltage
- Solid-state silicon-avalanche and active circuit triggering technology
- **Green part**

## Applications

- Power line protection
- Audio protection
- Mobile phones
- Hand held portable applications

## Description

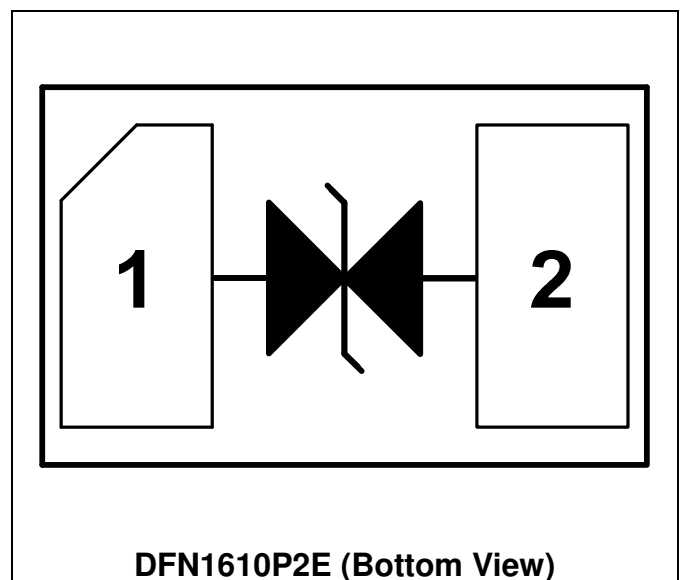
AZ3603-01F is a design which includes a bi-directional surge rated clamping cell to protect one power line, or one control line, or one low-speed data line in an electronic system. The AZ3603-01F has been specifically designed to protect sensitive components which are connected to power and control lines from over-voltage damage and latch-up caused by Electrostatic Discharging (ESD), Electrical Fast Transients (EFT), Lightning, and Cable Discharge Event (CDE).

AZ3603-01F 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.

AZ3603-01F is bi-directional and may be used on lines where the signal swings above and below ground.

AZ3603-01F 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 (T <sub>A</sub> = 25°C, unless otherwise specified)			
PARAMETER	SYMBOL	RATING	UNITS
Peak Pulse Current (tp=8/20μs)	I <sub>PP</sub> (Note 1)	180	A
Operating Supply Voltage	V <sub>DC</sub>	±3.6	V
ESD per IEC 61000-4-2 (Air)	V <sub>ESD-1</sub>	±30	kV
ESD per IEC 61000-4-2 (Contact)	V <sub>ESD-2</sub>	±30	
Lead Soldering Temperature	T <sub>SOL</sub>	260 (10 sec.)	°C
Operating Temperature	T <sub>OP</sub>	-55 to +125	°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.	-3.3		3.3	V
Reverse Leakage Current	I <sub>Leak</sub>	V <sub>RWM</sub> = ±3.3V, T=25 °C.			0.5	μA
Reverse Breakdown Voltage	V <sub>BV</sub>	I <sub>BV</sub> = 1mA, T=25 °C.	3.7		6.0	V
Surge Clamping Voltage (Note 1)	V <sub>CL-surge</sub>	I <sub>PP</sub> = 100A, tp=8/20μs, T=25 °C.		11		V
		I <sub>PP</sub> = 180A, tp=8/20μs, T=25 °C.		16.5		
ESD Clamping Voltage (Note 2)	V <sub>CL-ESD</sub>	IEC 61000-4-2 +8kV (I <sub>TLP</sub> = 16A), Contact mode, T=25 °C.		4.7		V
ESD Dynamic Turn-on Resistance	R <sub>dynamic</sub>	IEC 61000-4-2 0~+8kV, Contact mode, T=25 °C.		0.02		Ω
Channel Input Capacitance	C <sub>IN</sub>	V <sub>R</sub> = 0V, f = 1MHz, T=25 °C.		280	350	pF

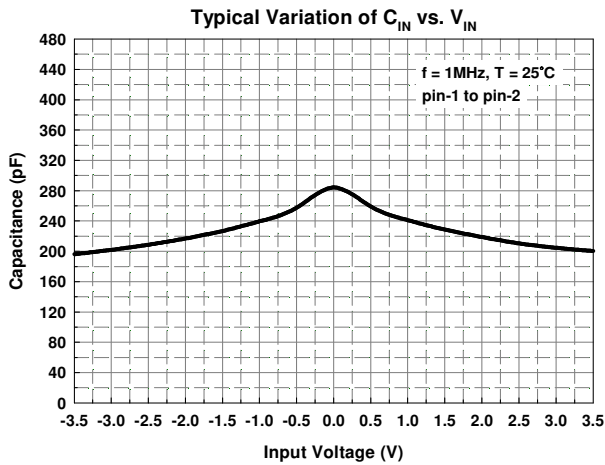
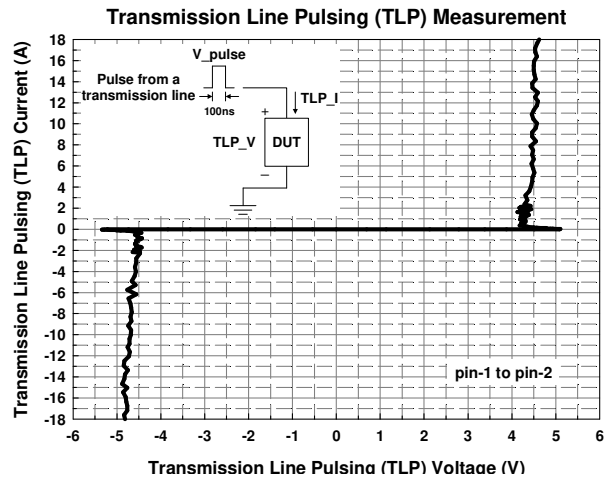
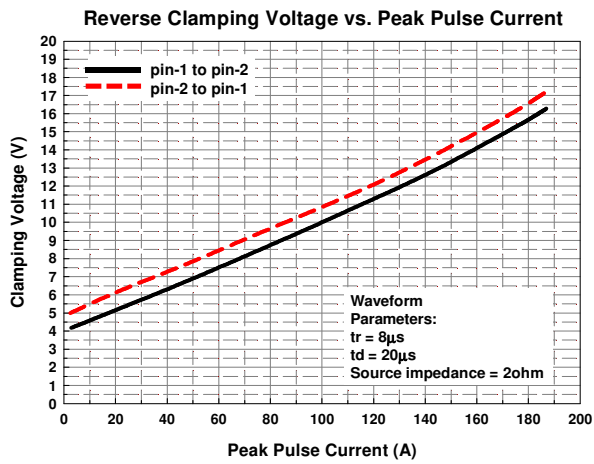
Note 1: The Peak Pulse Current measured conditions: t<sub>p</sub>= 8/20μs, 2Ω source impedance.

Note 2: 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 AZ3603-01F is designed to protect one line against system ESD/EFT/Lightning pulses by clamping them to an acceptable reference. It provides bi-directional protection.

The usage of the AZ3603-01F 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 AZ3603-01F 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 AZ3603-01F.
- Place the AZ3603-01F 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.

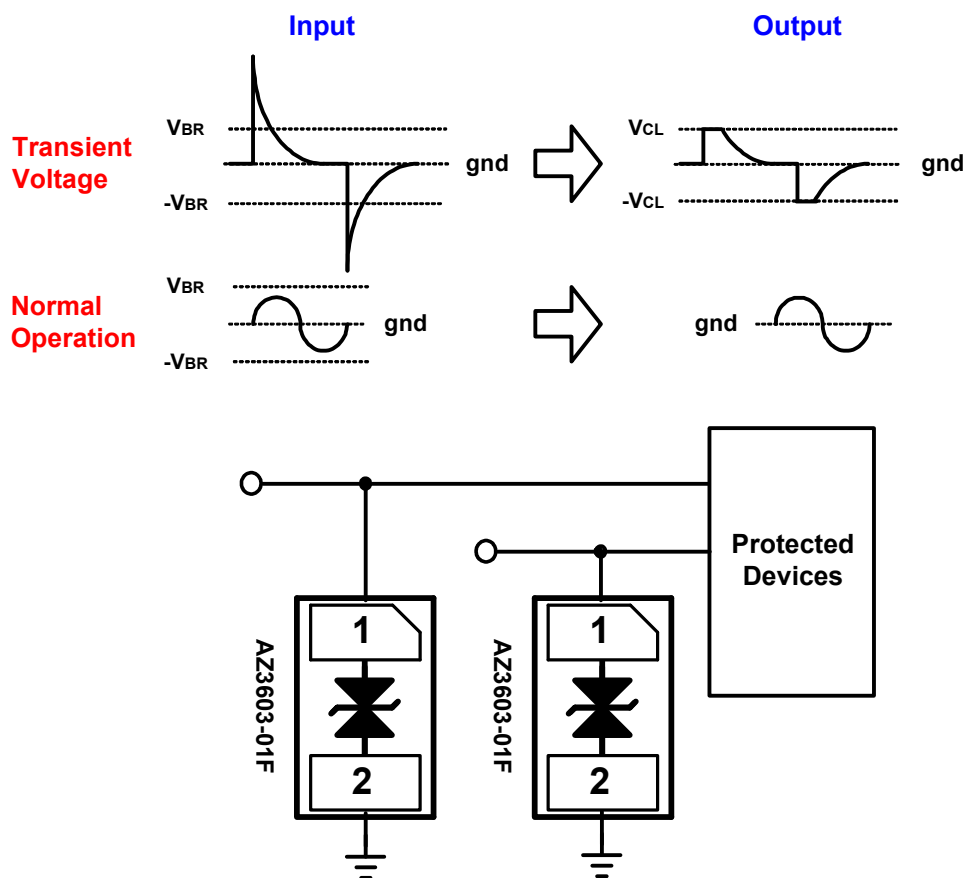
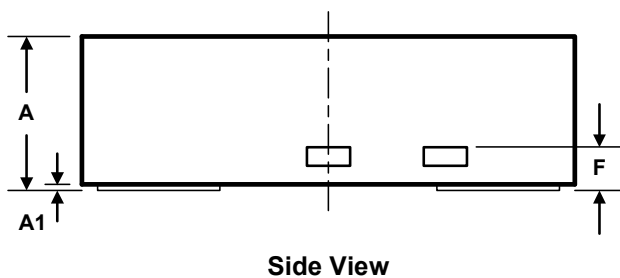
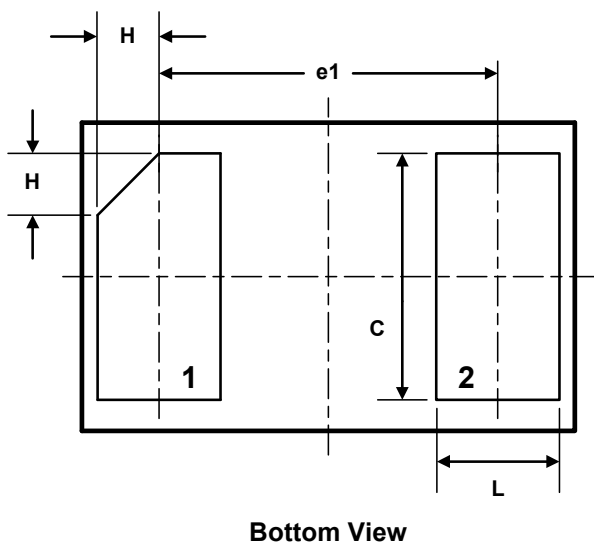
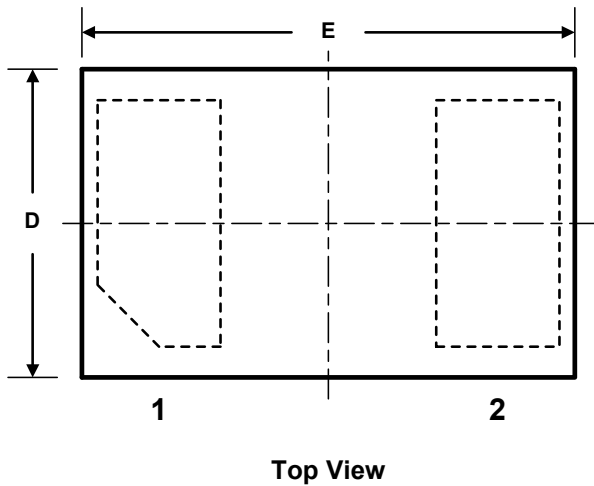


Fig. 1 ESD protection scheme by using AZ3603-01F.

## Mechanical Details

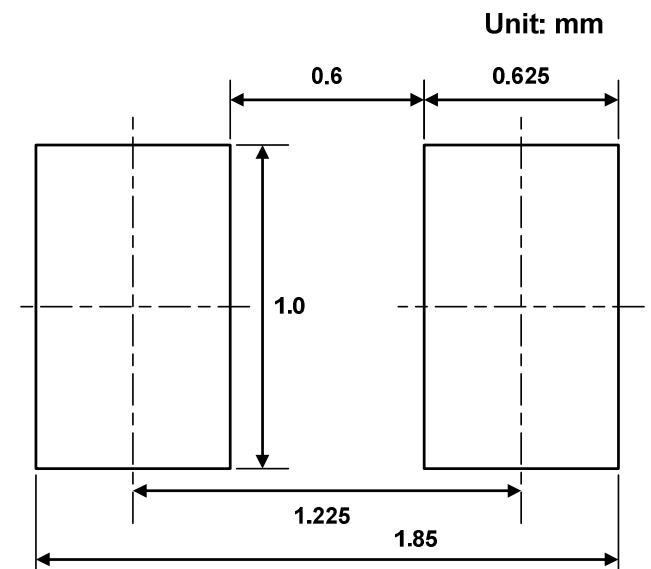
### DFN1610P2E PACKAGE DIAGRAMS



### PACKAGE DIMENSIONS

SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
D	0.95	1.00	1.05
E	1.55	1.60	1.65
C	0.75	0.80	0.85
A	0.45	0.50	0.55
A1	-	0.02	0.05
e1	1.10BSC		
F	0.10	0.15	0.20
H	0.15	0.20	0.25
L	0.35	0.40	0.45

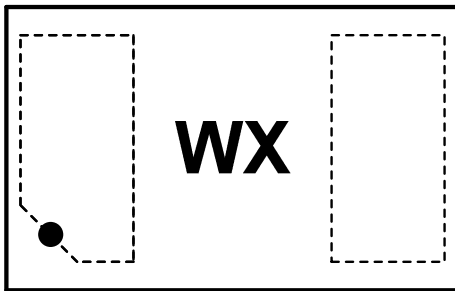
### LAND LAYOUT



#### 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



**Top View**

W = Device Code  
X = Date Code

Part Number	Marking Code
AZ3603-01F.R7G (Green Part)	WX

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

## Ordering Information

PN#	Material	Type	Reel size	MOQ	MOQ/internal box	MOQ/carton
AZ3603-01F.R7G	Green	T/R	7 inch	3,000/reel	4 reels = 12,000/box	6 boxes = 72,000/carton

## Revision History

Revision	Modification Description
Revision 2018/01/04	Formal Release.