



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 μs)
- 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

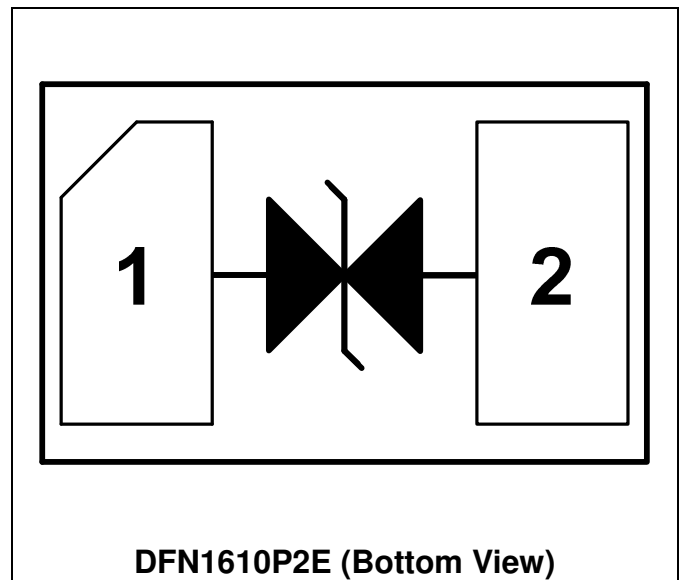
AZ3603-01F is a design which includes a bi-directional surge rated clamping cell to protect one power line, or one control line, or one low-speed data line in an electronic system. The AZ3603-01F has been specifically designed to protect sensitive components which are connected to power and control lines 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 ($T_A = 25^\circ\text{C}$, unless otherwise specified)			
PARAMETER	SYMBOL	RATING	UNITS
Peak Pulse Current ($t_p=8/20\mu\text{s}$)	I_{PP} (Note 1)	180	A
Operating Supply Voltage	V_{DC}	± 3.6	V
ESD per IEC 61000-4-2 (Air)	V_{ESD-1}	± 30	kV
ESD per IEC 61000-4-2 (Contact)	V_{ESD-2}	± 30	
Lead Soldering Temperature	T_{SOL}	260 (10 sec.)	$^\circ\text{C}$
Operating Temperature	T_{OP}	-55 to +125	$^\circ\text{C}$
Storage Temperature	T_{STO}	-55 to +150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS						
PARAMETER	SYMBOL	CONDITIONS	MINI	TYP	MAX	UNITS
Reverse Stand-Off Voltage	V_{RWM}	$T=25^\circ\text{C}$.	-3.3		3.3	V
Reverse Leakage Current	I_{Leak}	$V_{RWM} = \pm 3.3\text{V}$, $T=25^\circ\text{C}$.			0.5	μA
Reverse Breakdown Voltage	V_{BV}	$I_{BV} = 1\text{mA}$, $T=25^\circ\text{C}$.	3.7		6.0	V
Surge Clamping Voltage (Note 1)	$V_{CL-surge}$	$I_{PP} = 100\text{A}$, $t_p=8/20\mu\text{s}$, $T=25^\circ\text{C}$.		11		V
		$I_{PP} = 180\text{A}$, $t_p=8/20\mu\text{s}$, $T=25^\circ\text{C}$.		16.5		
ESD Clamping Voltage (Note 2)	V_{CL-ESD}	IEC 61000-4-2 +8kV ($I_{TLP} = 16\text{A}$), Contact mode, $T=25^\circ\text{C}$.		4.7		V
ESD Dynamic Turn-on Resistance	$R_{dynamic}$	IEC 61000-4-2 0~+8kV, Contact mode, $T=25^\circ\text{C}$.		0.02		Ω
Channel Input Capacitance	C_{IN}	$V_R = 0\text{V}$, $f = 1\text{MHz}$, $T=25^\circ\text{C}$.		280	350	pF

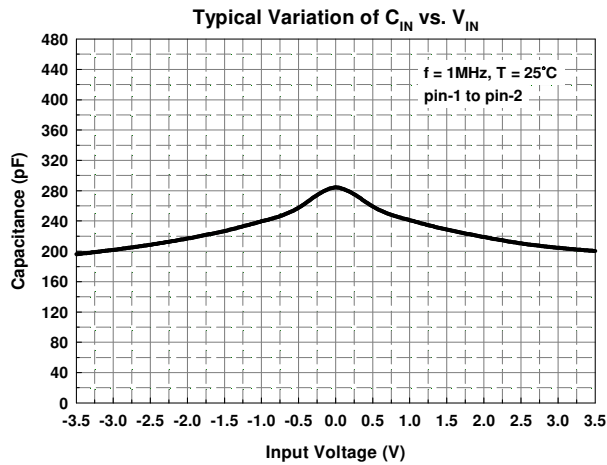
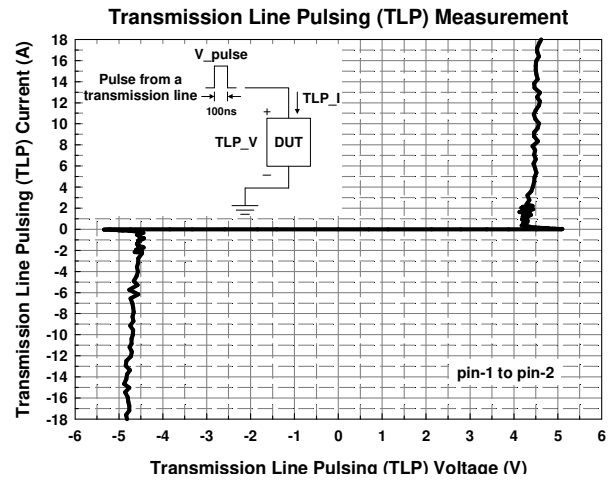
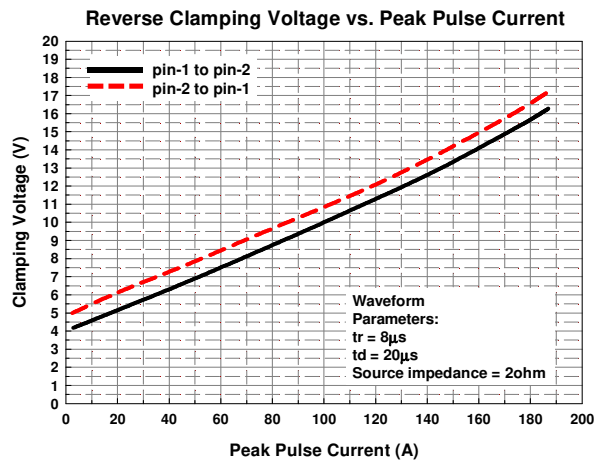
Note 1: The Peak Pulse Current measured conditions: $t_p = 8/20\mu\text{s}$, 2Ω source impedance.

Note 2: ESD Clamping Voltage was measured by Transmission Line Pulsing (TLP) System.

TLP conditions: $Z_0 = 50\Omega$, $t_p = 100\text{ns}$, $t_r = 1\text{ns}$.



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.

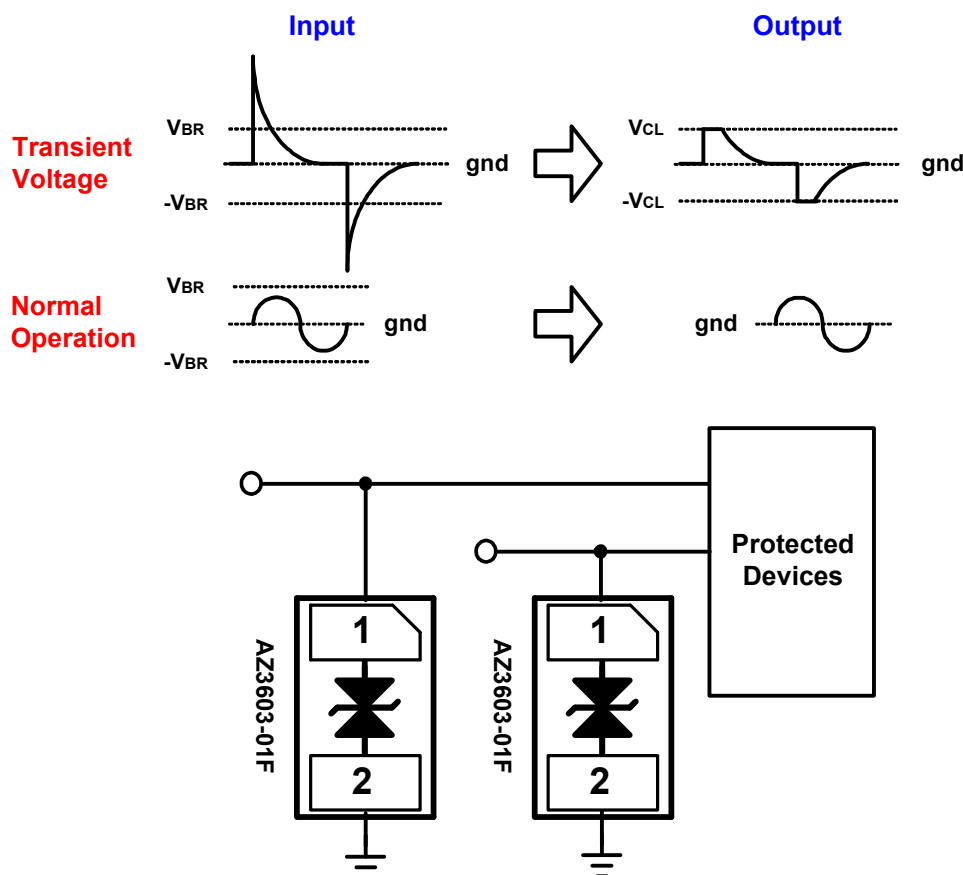
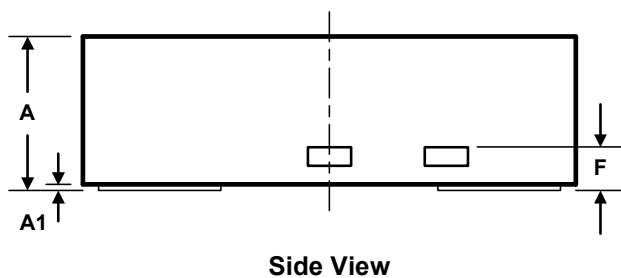
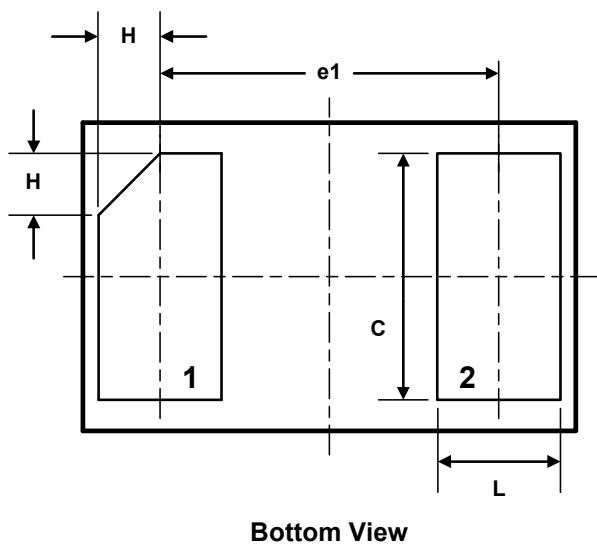
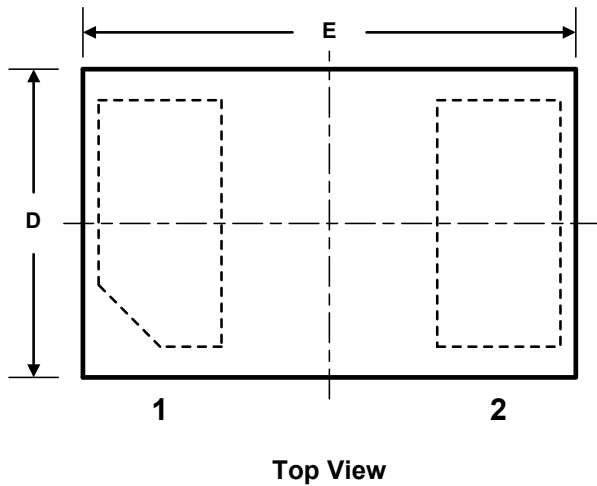


Fig. 1 ESD protection scheme by using AZ3603-01F.



Mechanical Details

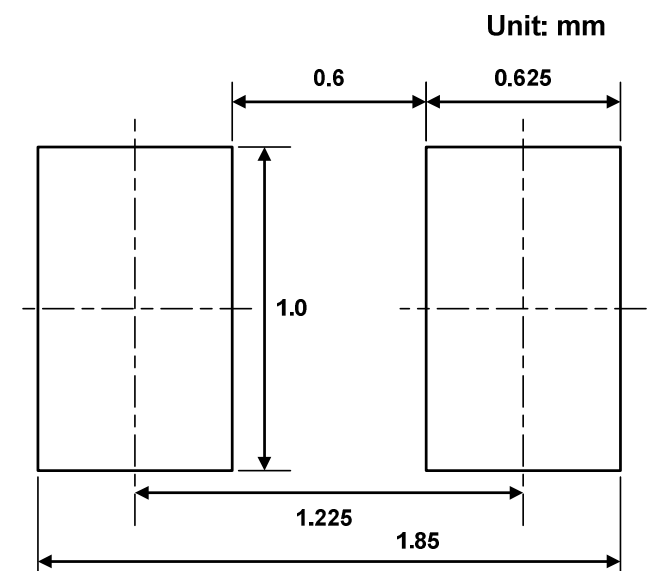
DFN1610P2E PACKAGE DIAGRAMS



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

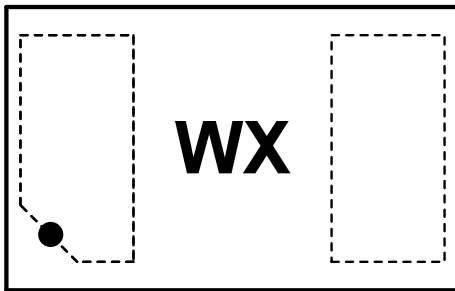


Notes:

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.