

Features

- ESD/Surge Protection for 1 Line with Bidirectional.
- Provide ESD protection for each line to
IEC 61000-4-2 (ESD) $\pm 20\text{kV}$ (air / contact)
IEC 61000-4-4 (EFT) 60A (5/50ns)
IEC 61000-4-5 (Lightning) 8A (8/20 μs)
- Suitable for, **16V** and below, operating voltage applications
- Low capacitance : 1.9pF typical
- High surge protection
- Fast turn-on and low clamping voltage
- Solid-state silicon-avalanche and active circuit triggering technology
- **Green Part**

Applications

- xDSL Line Protection
- WAN/LAN Device
- 10/100/1000 Ethernet
- Power Supply Protection
- USB Interface Protection
- RF Interface Protection
- Peripherals

Description

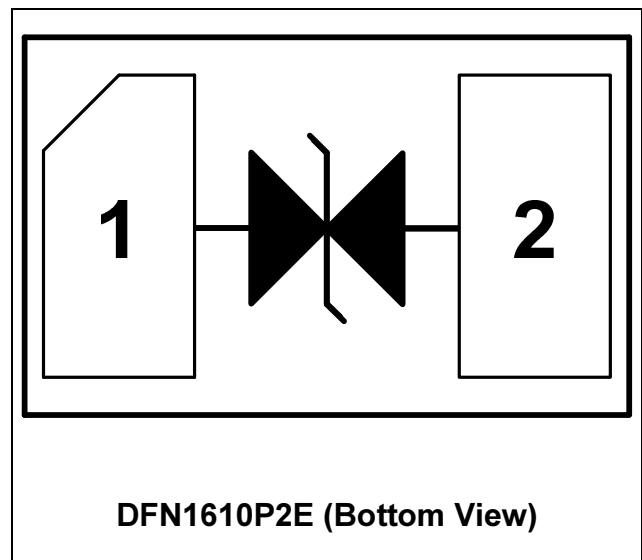
AZ4616-01F is a design which includes a bi-directional ESD rated clamping cell to protect one power line, or one control line, or one high speed data line in an electronic system. The AZ4616-01F has been specifically designed to protect sensitive components which are

connected to data and transmission lines from over-voltage caused by Electrostatic Discharging (ESD), Electrical Fast Transients (EFT), Lightning, and Cable Discharge Event (CDE).

AZ4616-01F 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.

AZ4616-01F 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=8/20μs)	I _{PP}	8	A
Operating Supply Voltage	V _{DC}	±18	V
ESD per IEC 61000-4-2 (Air)	V _{ESD}	±20	kV
ESD per IEC 61000-4-2 (Contact)		±20	
Lead Soldering Temperature	T _{SOL}	260 (10 sec.)	°C
Operating Temperature	T _{OP}	-55 to +125	°C
Storage Temperature	T _{STO}	-55 to +150	°C

ELECTRICAL CHARACTERISTICS						
PARAMETER	SYMBOL	CONDITIONS	MINI	TYP	MAX	UNITS
Reverse Stand-Off Voltage	V _{RWM}	T=25 °C	-16		16	V
Reverse Leakage Current	I _{Leak}	V _{RWM} = ±16V, T=25 °C			1	μA
Reverse Breakdown Voltage	V _{BV}	I _{BV} = 1mA, T=25 °C	18.5		23	V
Surge Clamping Voltage	V _{CL-surge}	I _{PP} = 5A, tp=8/20μs, T=25 °C		23		V
ESD Clamping Voltage (Note 1)	V _{clamp}	IEC 61000-4-2, +8kV (I _{TLP} = 16A), Contact mode, T=25 °C		28		V
ESD Dynamic Turn-on Resistance	R _{dynamic}	IEC 61000-4-2, 0~+8kV, T=25 °C, Contact mode		0.4		Ω
Channel Input Capacitance	C _{IN}	V _R = 0V, f = 1MHz, T=25 °C		1.9	3	pF

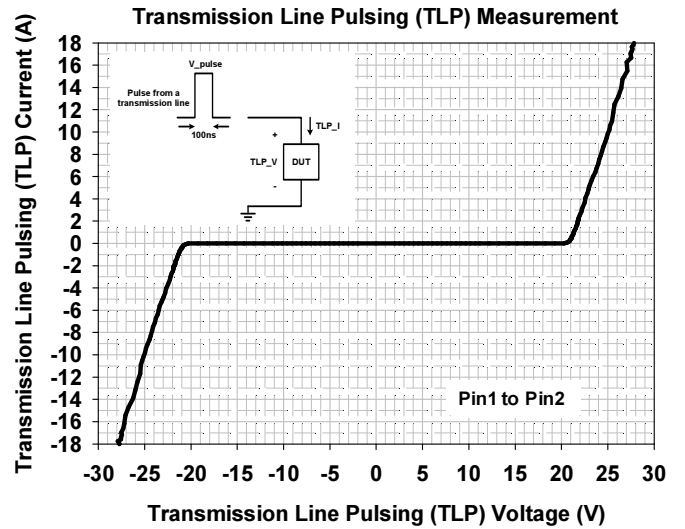
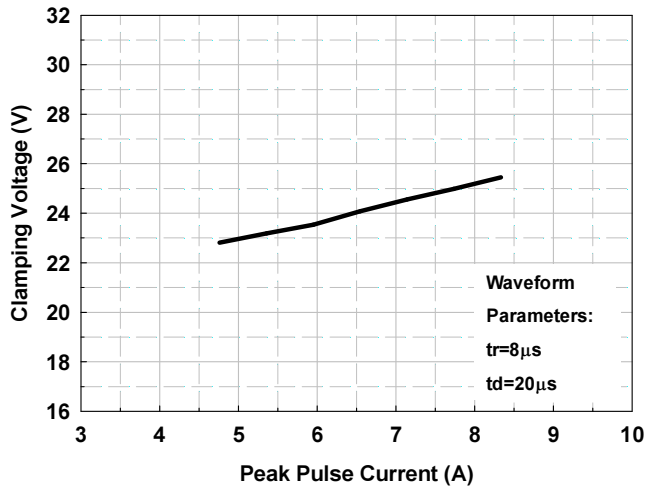
Note 1: ESD Clamping Voltage was measured by Transmission Line Pulsing (TLP) System.

TLP conditions: Z₀= 50Ω, t_p= 100ns, t_r= 1ns.

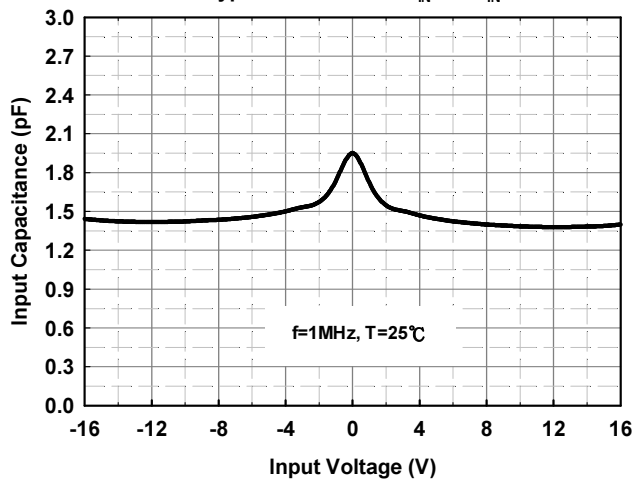


Typical Characteristics

Clamping Voltage vs. Peak Pulse Current



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





Applications Information

The AZ4616-01F is designed to protect one line against System ESD/EFT/Lightning pulses by clamping it to an acceptable reference. It provides bidirectional protection.

The usage of the AZ4616-01F 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 AZ4616-01F 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 AZ4616-01F.
- Place the AZ4616-01F 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.

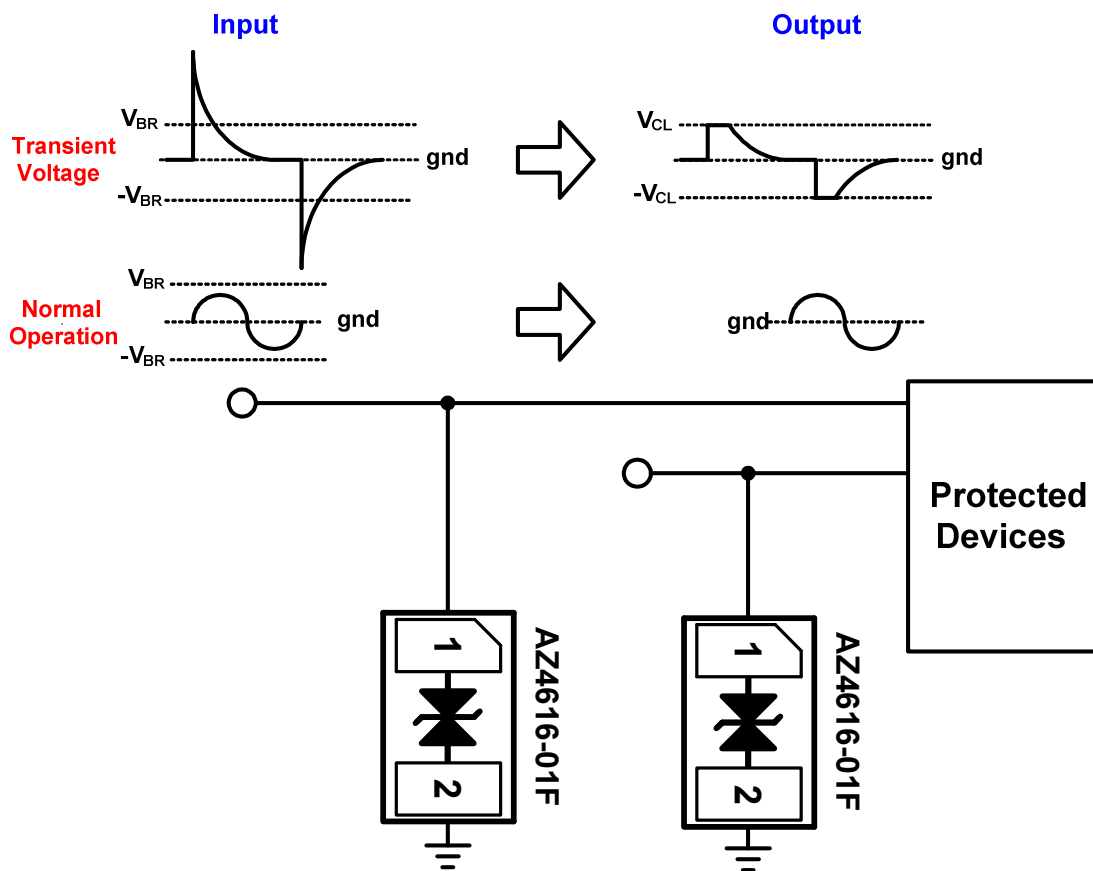


Fig. 1



Fig. 2 shows another simplified example of using AZ4616-01F to protect the control line, high speed data line, and power line from ESD transient stress.

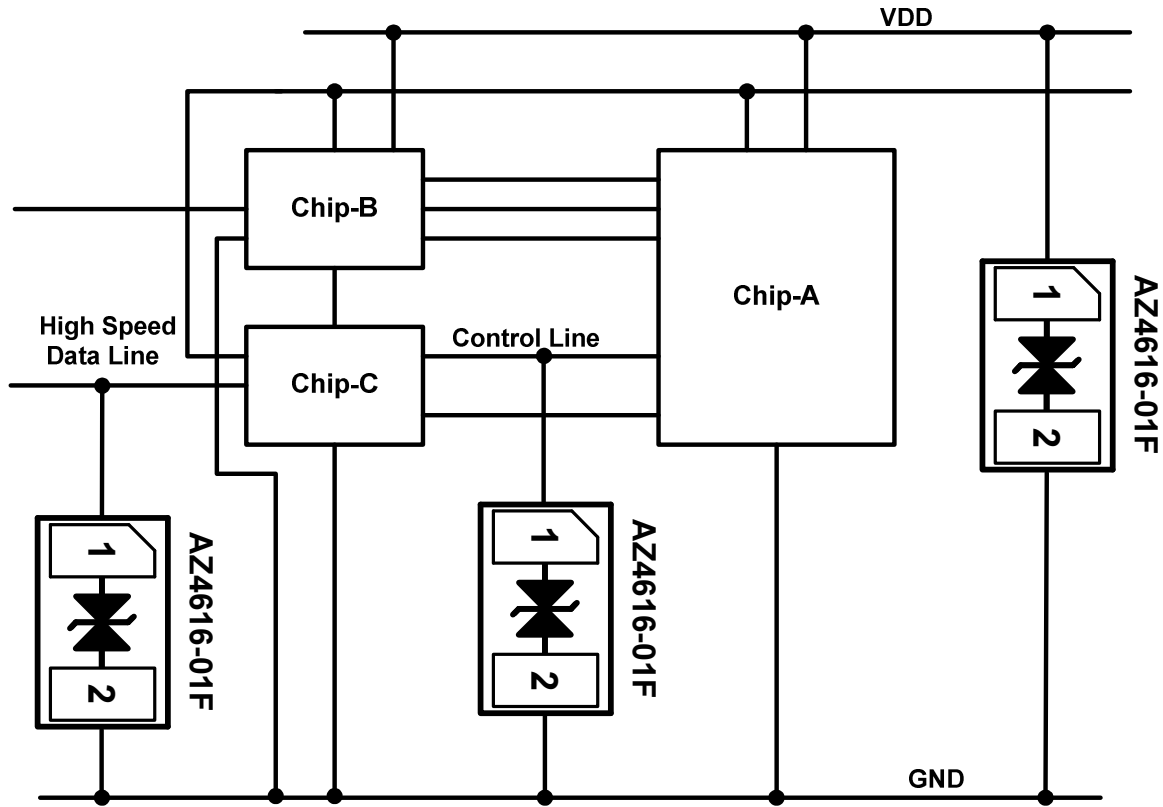
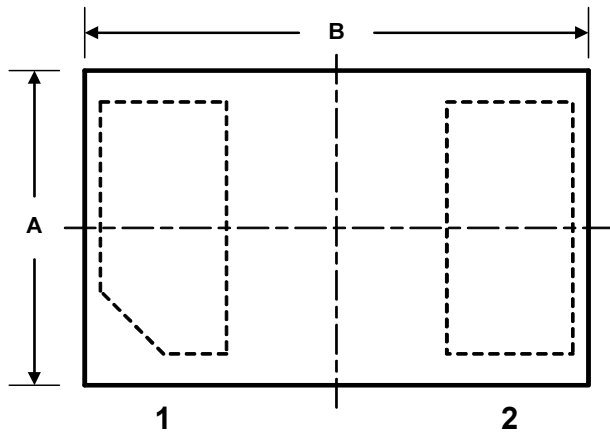


Fig. 2

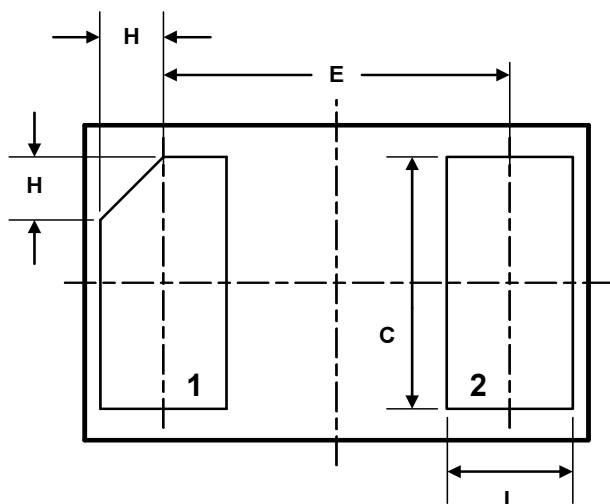
Mechanical Details

DFN1610P2E

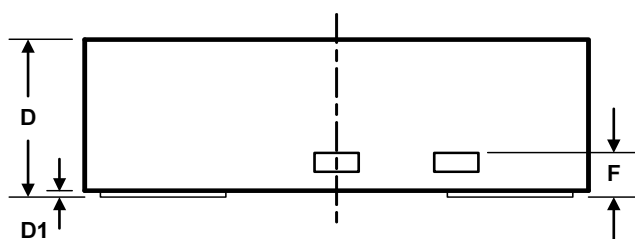
PACKAGE DIAGRAMS



Top View



Bottom View

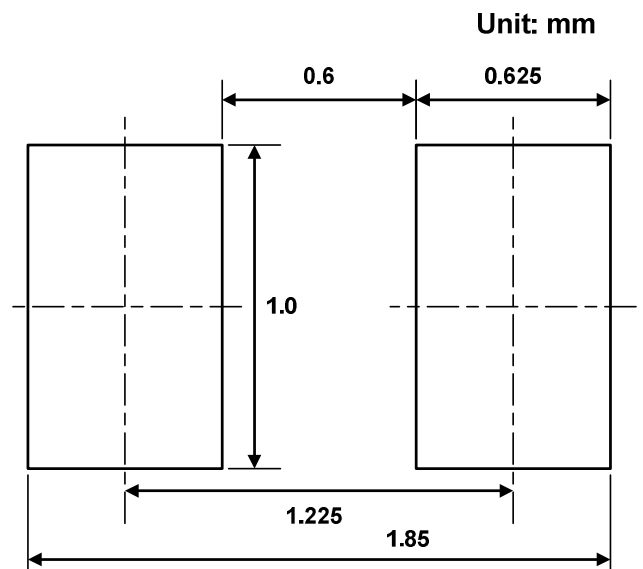


Side View

PACKAGE DIMENSIONS

SYMBOL	Millimeter		
	Min.	Typ.	Max.
A	0.95	1.00	1.05
B	1.55	1.60	1.65
C	0.75	0.80	0.85
D	0.45	0.50	0.55
D1	-	0.02	0.05
E	1.10BSC		
F	0.10	0.15	0.20
H	0.15	0.20	0.25
L	0.35	0.40	0.45

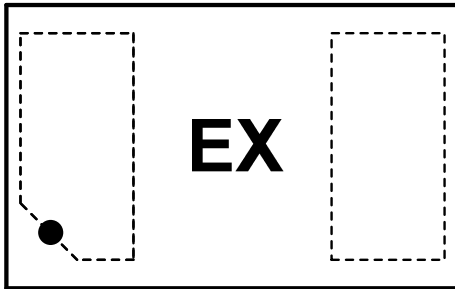
LAND LAYOUT



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

Part Number	Marking Code
AZ4616-01F.R7G (Green Part)	EX

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

E = Device Code

X = Date Code

Ordering Information

PN#	Material	Type	Reel size	MOQ	MOQ/internal box	MOQ/carton
AZ4616-01F.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 2016/02/24	Preliminary Release.
Revision 2017/05/11	Formal Release.