Features

- ESD/Surge Protection for 1 Line with Bidirectional.
- Provide ESD protection for each line to
  IEC 61000-4-2 (ESD) ±20kV (air / contact)
  IEC 61000-4-4 (EFT) 60A (5/50ns)
  IEC 61000-4-5 (Lightning) 8A (8/20μs)
- 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

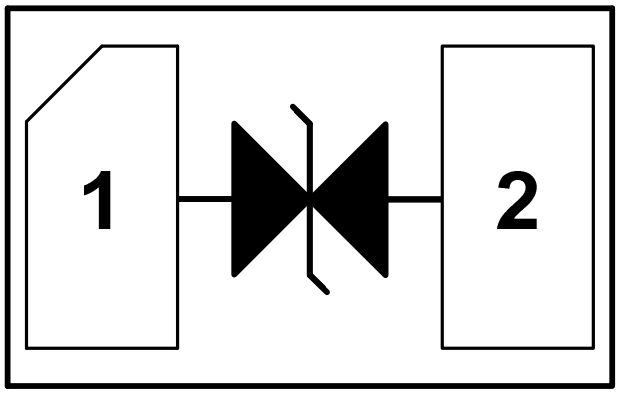
Description

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 (±15kV air, ±8kV contact discharge).

Circuit Diagram / Pin Configuration



DFN1610P2E (Bottom View)

SPECIFICATIONS

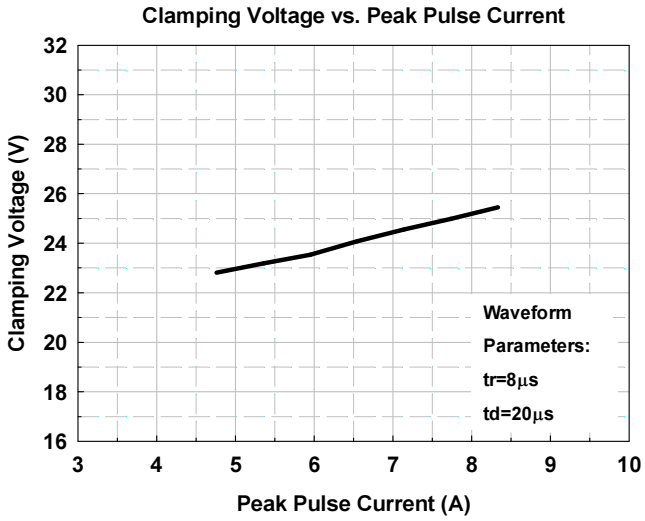
ABSOLUTE MAXIMUM RATINGS			
PARAMETER	**SYMBOL**	**RATING**	**UNITS**
Peak Pulse Current (tp=8/20μs)	I_{PP}	8	A
Operating Supply Voltage	V_{DC}	±18	V
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	±20 ±20	kV
Lead Soldering Temperature	T_{SOL}	260 (10 sec.)	℃
Operating Temperature	T_{OP}	-55 to +125	℃
Storage Temperature	T_{STO}	-55 to +150	℃

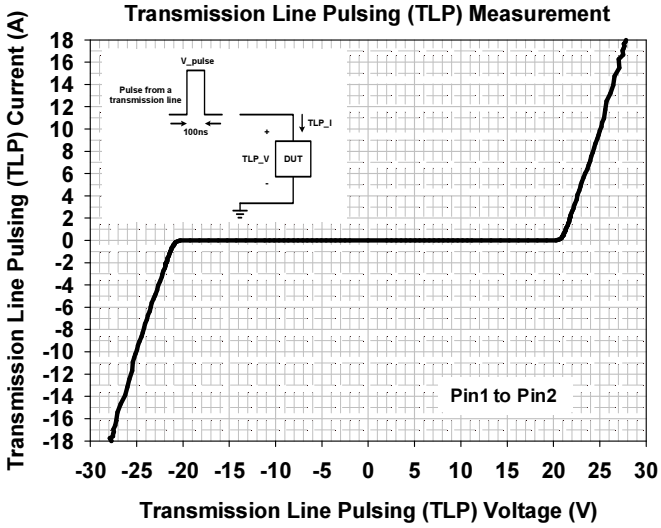
ELECTRICAL CHARACTERISTICS						
PARAMETER	**SYMBOL**	**CONDITIONS**	**MINI**	**TYP**	**MAX**	**UNITS**
Reverse Stand-Off Voltage	V_{RWM}	T=25 ℃	-16		16	V
Reverse Leakage Current	I_{Leak}	V_{RWM} = ±16V, T=25 ℃			1	μA
Reverse Breakdown Voltage	V_{BV}	I_{BV} = 1mA, T=25 ℃	18.5		23	V
Surge Clamping Voltage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

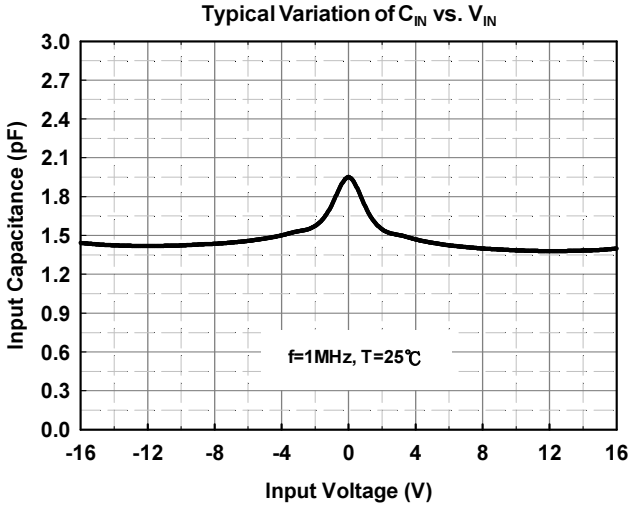
Note 1: ESD Clamping Voltage was measured by Transmission Line Pulsing (TLP) System.

TLP conditions: Z_0= 50Ω, t_p= 100ns, t_r= 1ns.

Typical Characteristics







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.

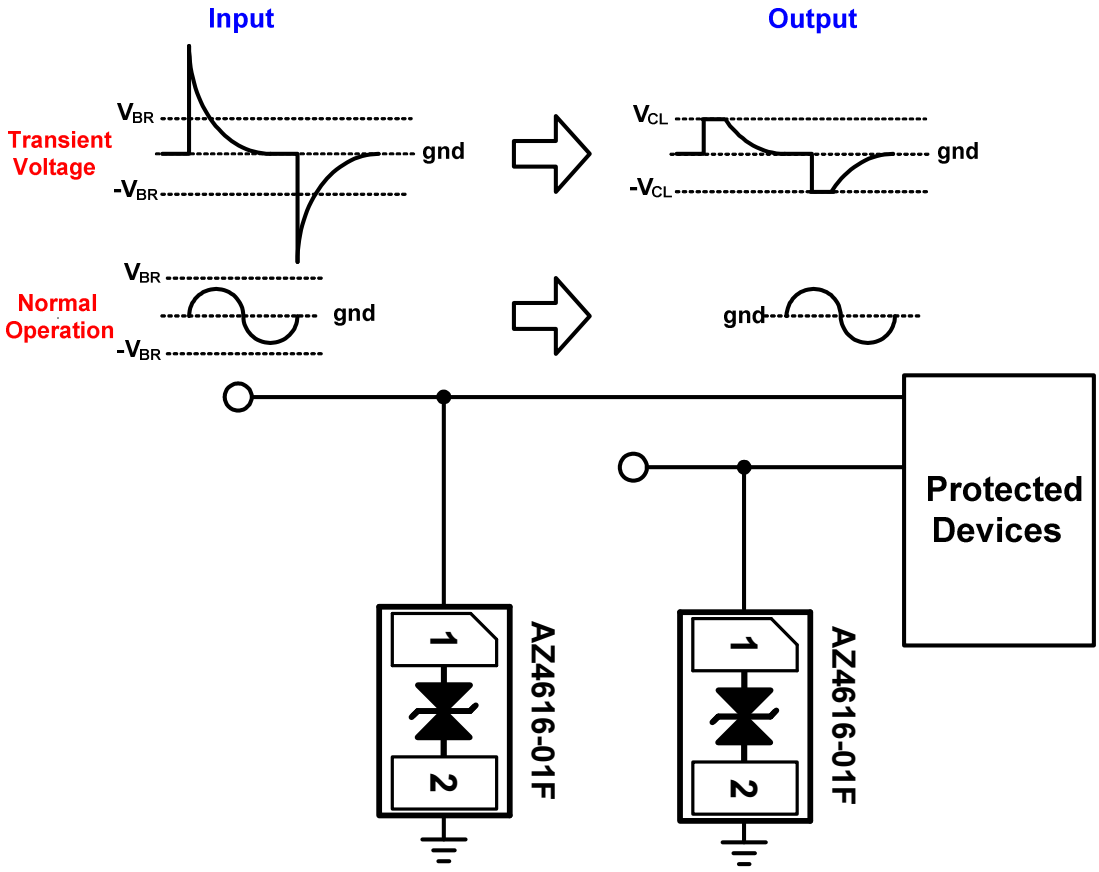


Fig. 1

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.

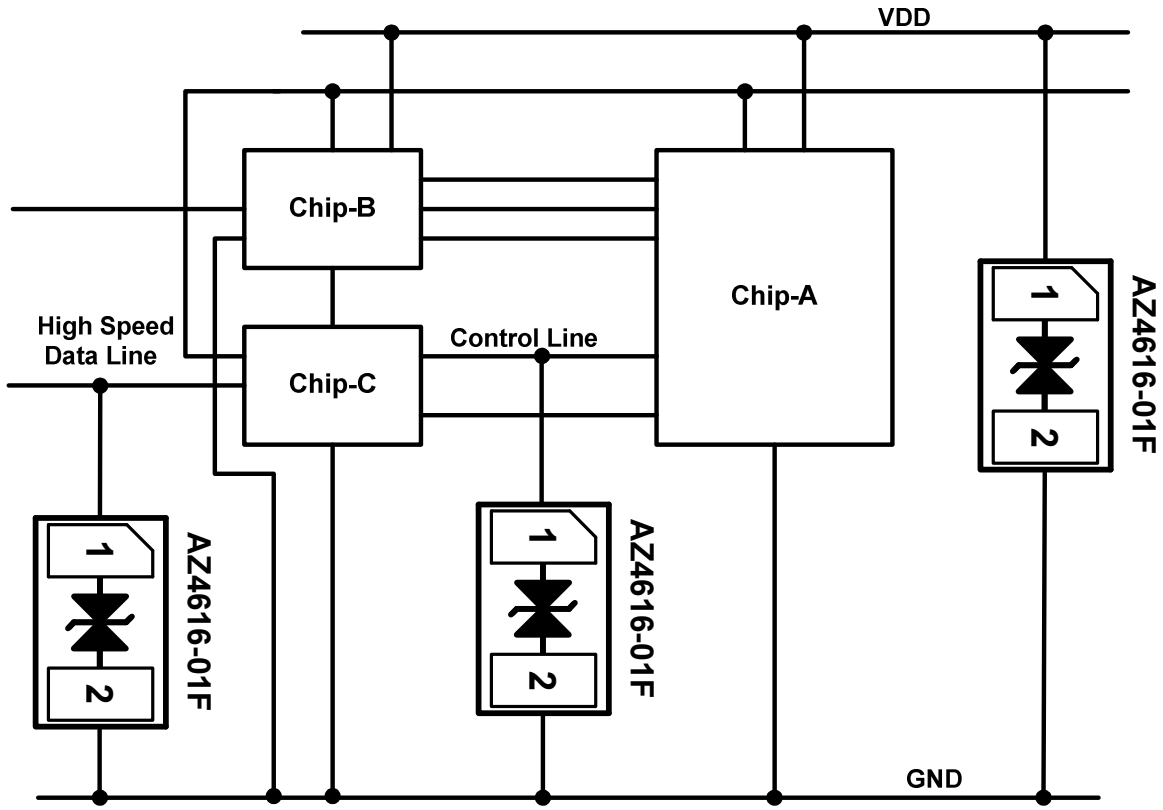
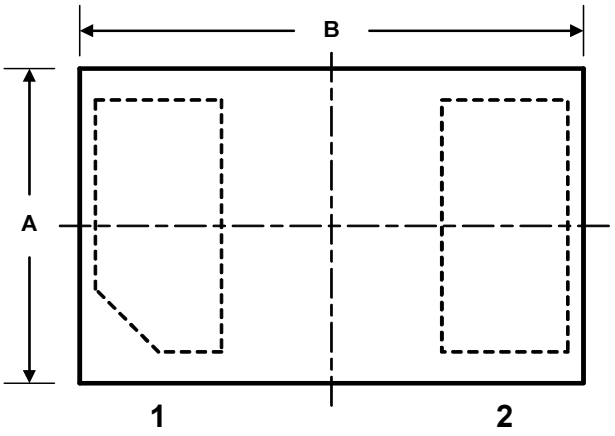


Fig. 2

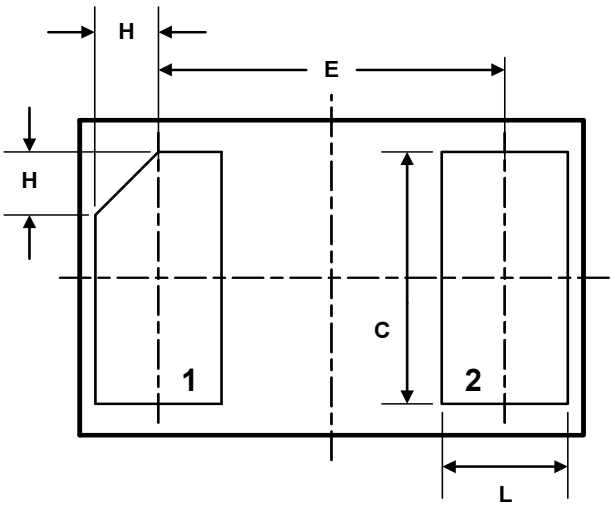
Mechanical Details

DFN1610P2E

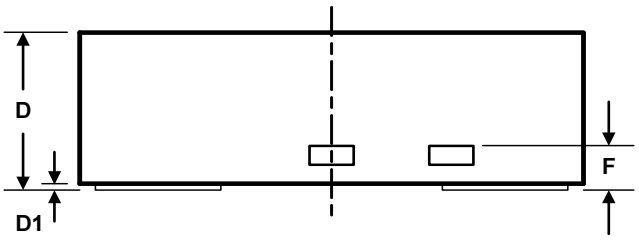
PACKAGE DIAGRAMS



Top View



Bottom View



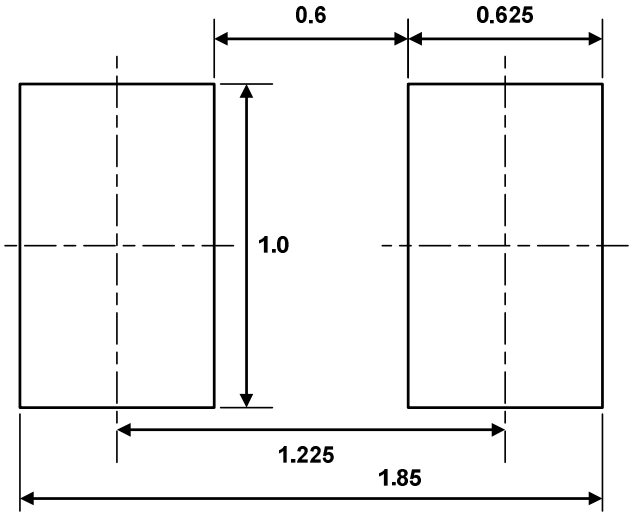
Side View

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

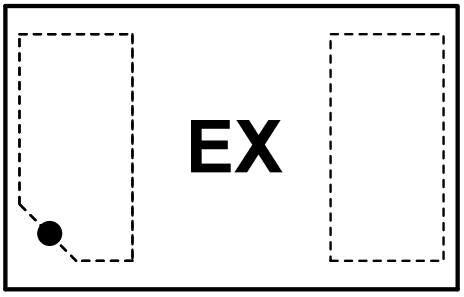
Unit: mm



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

E = Device Code
X = Date Code

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

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

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.