



Features

- ESD protection for one line with uni-directional
- Provide transient protection for one line to
IEC 61000-4-2 (ESD) ±30kV (air/contact)
IEC 61000-4-4 (EFT) 80A (5/50ns)
IEC 61000-4-5 (Lightning) 170A (8/20µs)
- Suitable for, **15V and below**, operating voltage applications
- 2.0mm x 2.0mm DFN package saves board space
- High surge protection
- 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

- Power supply protection
- USB VBUS protection
- Cellular handsets and accessories
- Panel modules
- Portable devices
- Touch panels
- Notebooks and handhelds
- Peripherals

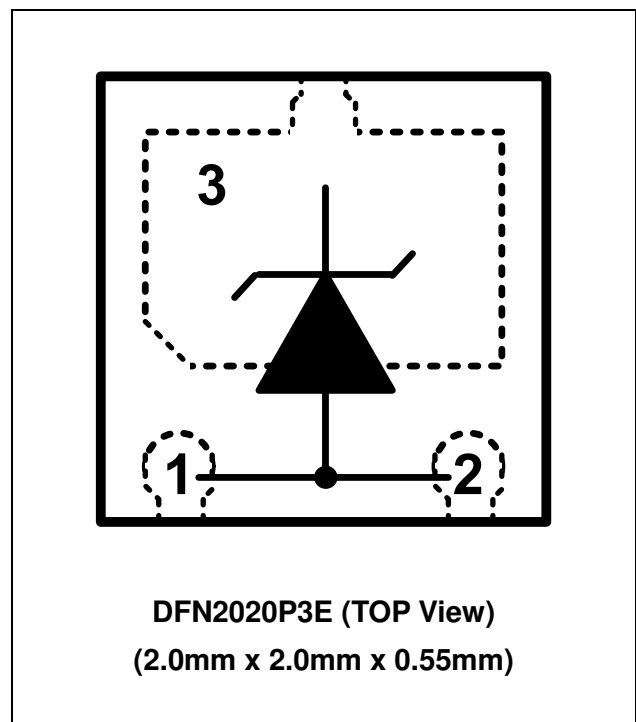
Description

AZ4715-01F is a design which includes a uni-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 AZ4715-01F 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 Transient (EFT), Lightning, and Cable Discharge Event (CDE).

AZ4715-01F 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 component.

AZ4715-01F 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





SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise specified)			
PARAMETER	SYMBOL	RATING	UNIT
Peak Pulse Current ($t_p = 8/20\mu\text{s}$)	I_{PP} (Note 1)	170	A
Operating Supply Voltage (pin-3 to pin-1 and pin-2)	V_{DC}	16.5	V
ESD per IEC 61000-4-2 (Air)	V_{ESD-1}	± 30	kV
ESD per IEC 61000-4-2 (Contact)	V_{ESD-2}	± 30	kV
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	CONDITION	MIN	TYP	MAX	UNIT
Reverse Stand-Off Voltage	V_{RWM}	pin-3 to pin-1 and pin-2, $T = 25^\circ\text{C}$.			15	V
Reverse Leakage Current	I_{Leak}	$V_{RWM} = 15\text{V}$, $T = 25^\circ\text{C}$, pin-3 to pin-1 and pin-2.			0.5	μA
Reverse Breakdown Voltage	V_{BV}	$I_{BV} = 1\text{mA}$, $T = 25^\circ\text{C}$, pin-3 to pin-1 and pin-2.	16.5		19.5	V
Forward Voltage	V_F	$I_F = 15\text{mA}$, $T = 25^\circ\text{C}$, pin-1 and pin-2 to pin-3.	0.6		1.2	V
Surge Clamping Voltage (Note 1)	$V_{CL-surge}$	$I_{PP} = 170\text{A}$, $t_p = 8/20\mu\text{s}$, $T = 25^\circ\text{C}$, pin-3 to pin-1 and pin-2.		30		V
ESD Clamping Voltage (Note 2)	V_{CL-ESD}	IEC 61000-4-2 +8kV ($I_{TLP} = 16\text{A}$), $T = 25^\circ\text{C}$, Contact mode, pin-3 to pin-1 and pin-2.		18		V
ESD Dynamic Turn-on Resistance	$R_{dynamic}$	IEC 61000-4-2 0~+8kV, $T = 25^\circ\text{C}$, Contact mode, pin-3 to pin-1 and pin-2.		0.04		Ω
Channel Input Capacitance	C_{IN}	$V_R = 0\text{V}$, $f = 1\text{MHz}$, $T = 25^\circ\text{C}$, pin-3 to pin-1 and pin-2.		0.9	1.1	nF

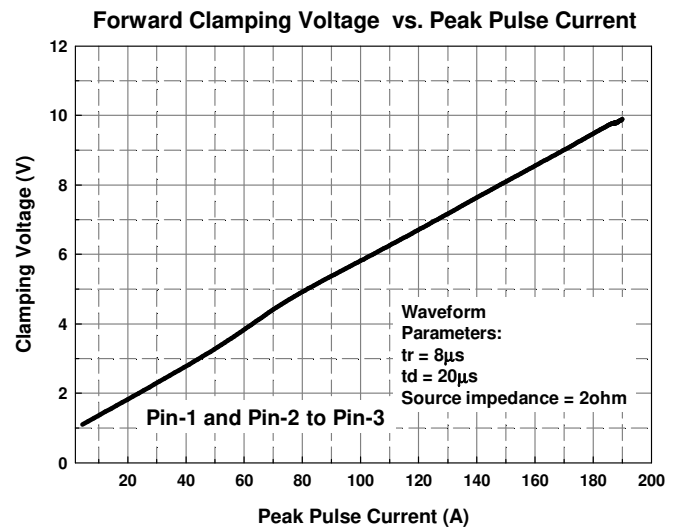
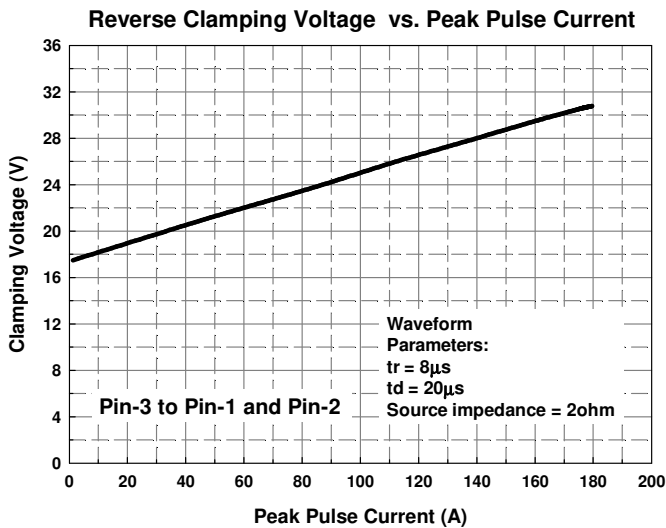
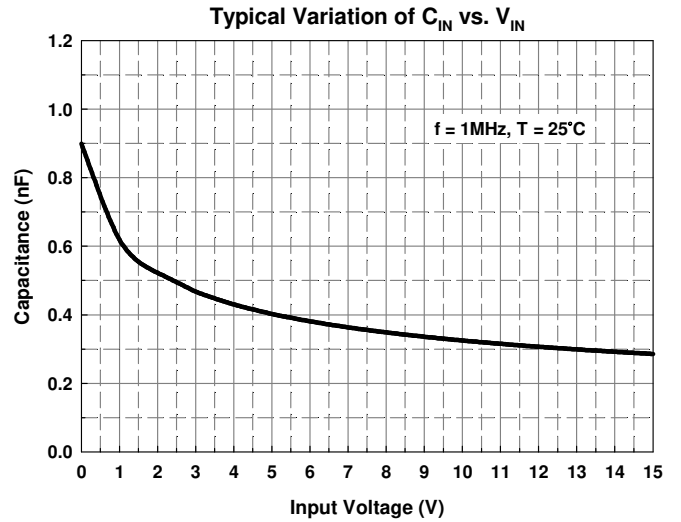
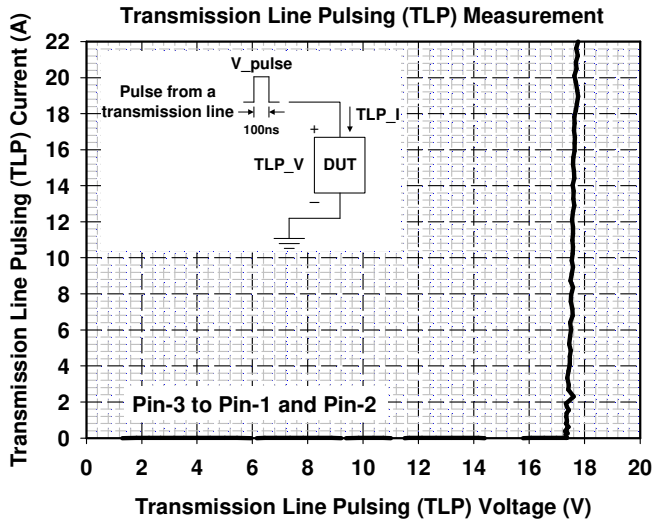
Note 1: The Peak Pulse Current measured conditions: $t_p = 8/20\mu\text{s}$, 2Ω source impedance.

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





Application Information

The AZ4715-01F is designed to protect one line against system ESD/EFT/Lightning pulses by clamping them to an acceptable reference.

The usage of the AZ4715-01F is shown in Fig. 1. Protected lines, such as data lines, control lines, or power lines, are connected to pin 3. The pin 1 and pin 2 should be connected directly to a ground plane on the board. All path lengths connected to the pins of AZ4715-01F should be kept as short as possible to minimize parasitic inductance in the board traces.

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 AZ4715-01F.
- Place the AZ4715-01F 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.

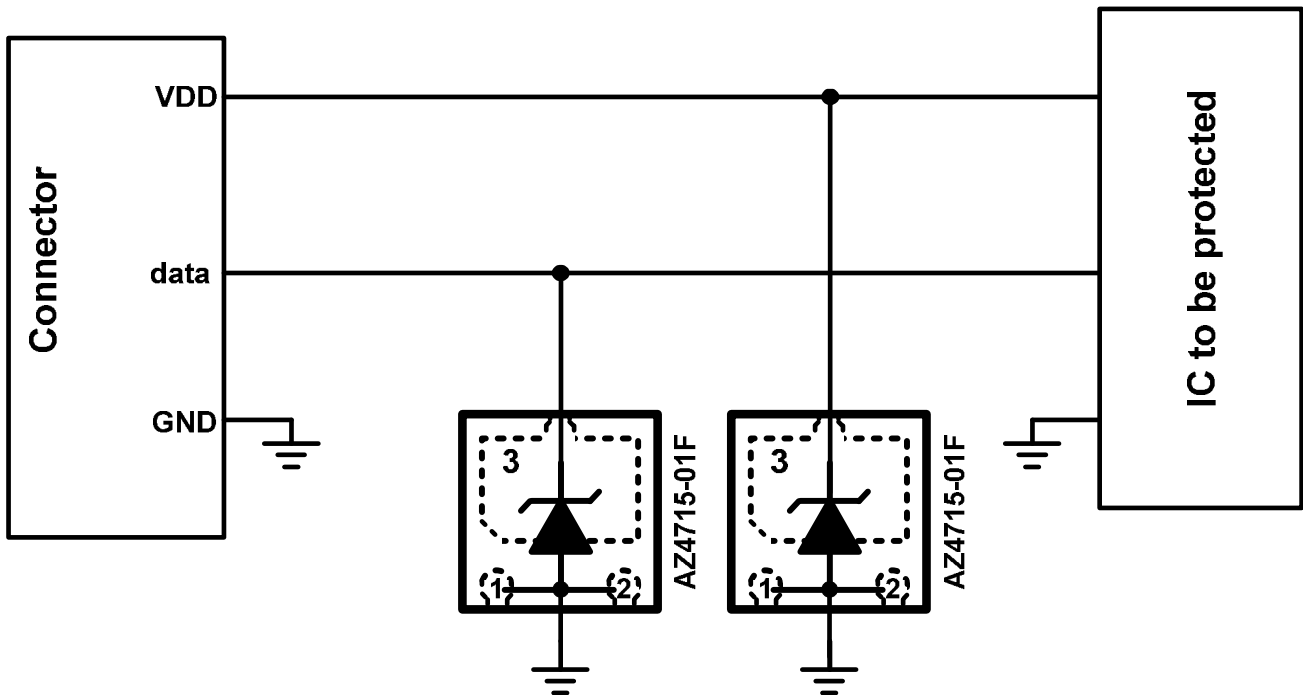


Fig. 1

Fig. 2 shows another simplified example of using low-speed data lines, and power lines from ESD AZ4715-01F to protect the control lines, transient stress.

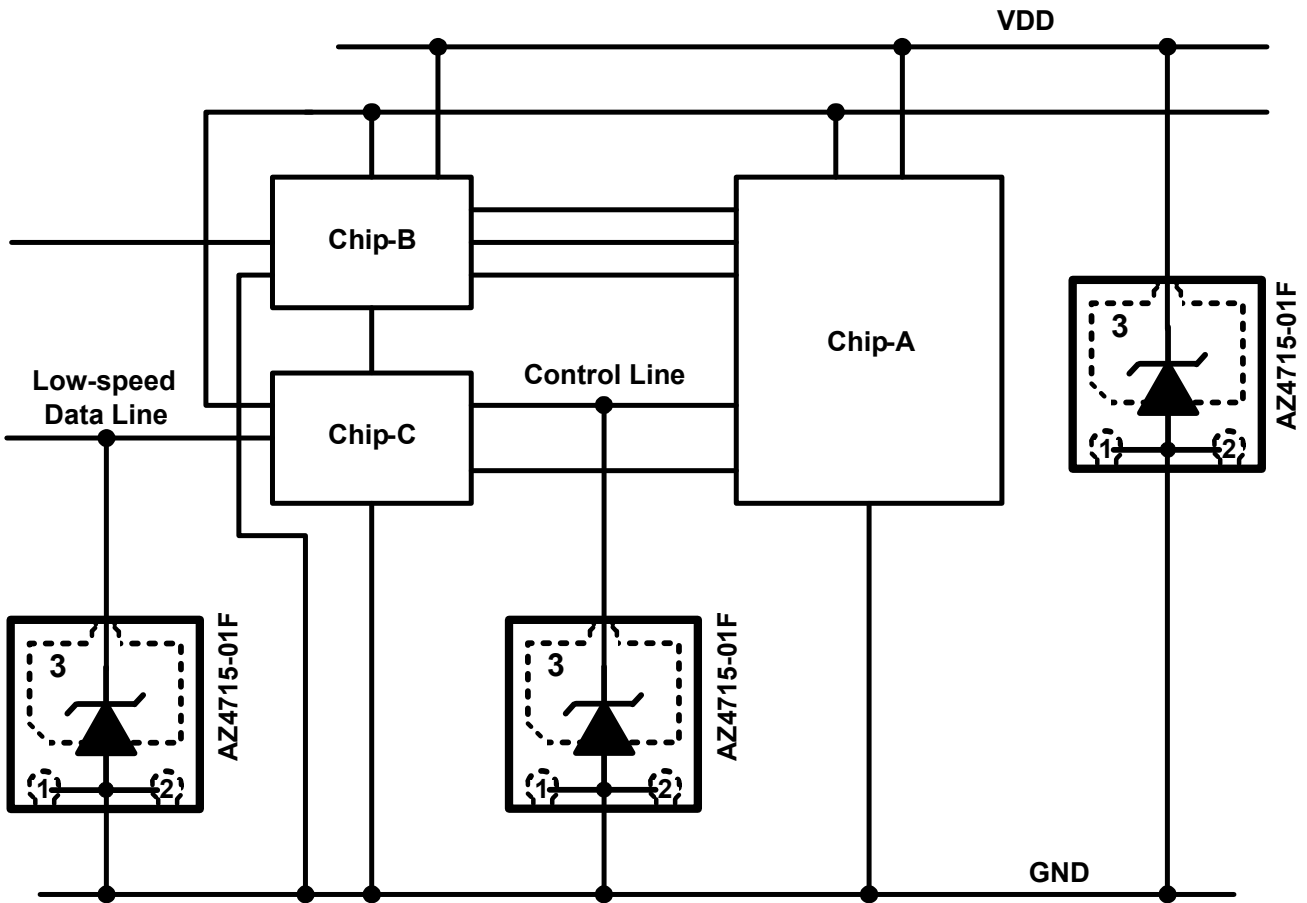
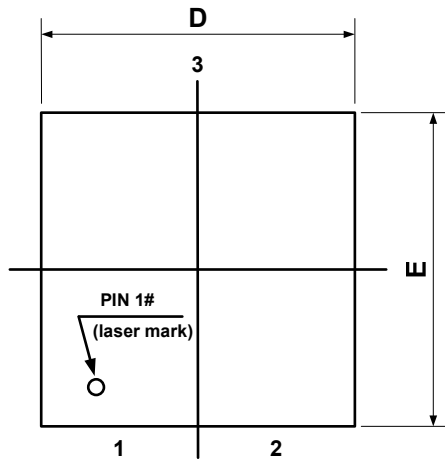


Fig. 2

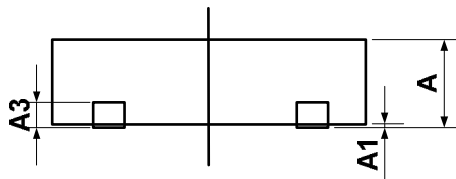


Mechanical Details

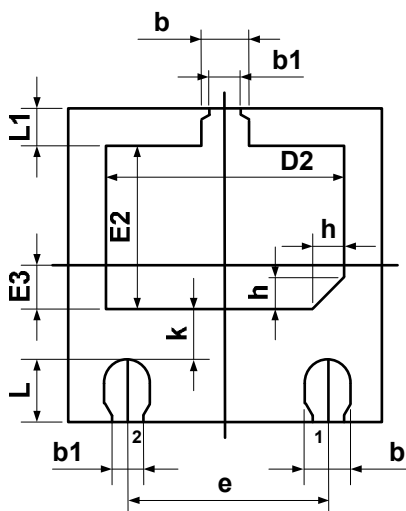
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PACKAGE DIAGRAMS



TOP VIEW



SIDE VIEW

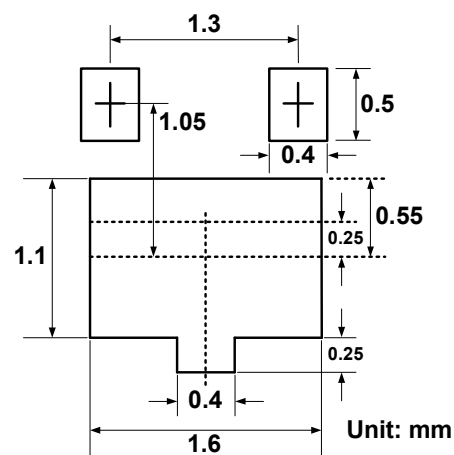


BOTTOM VIEW

PACKAGE DIMENSIONS

Symbol	Millimeters		
	MIN	NOM	MAX
A	0.50	0.55	0.60
A1	0.00	0.02	0.05
b	0.25	0.30	0.35
b1	0.20BSC		
A3	0.152BSC		
D	1.90	2.00	2.10
D2	1.40	1.50	1.60
e	1.30BSC		
E	1.90	2.00	2.10
E2	0.95	1.05	1.15
E3	0.20	0.30	0.40
L	0.35	0.40	0.45
L1	0.20	0.25	0.30
h	0.20REF		
k	0.20	0.30	0.40

LAND LAYOUT

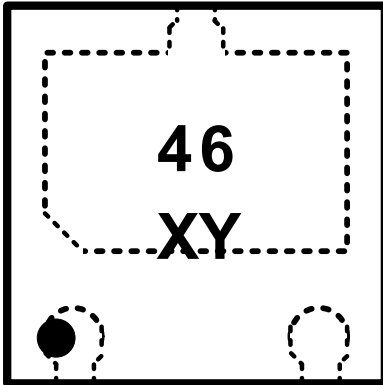


Notes:

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



46 = Device Code
X = Date Code ; Y = Control Code

Part Number	Marking Code
AZ4715-01F.R7G (Green Part)	46 XY

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

Ordering Information

PN#	Material	Type	Reel size	MOQ	MOQ/internal box	MOQ/carton
AZ4715-01F.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 2018/03/06	Formal Release.