Features

- ESD Protection for 1 Line with Bi-directional
- Provide ESD protection for the protected line to
  IEC 61000-4-2 (ESD) ±15kV (air / contact)
  IEC 61000-4-5 (Lightning) 5A (8/20μs)
- **Ultra low capacitance: 0.3pF typical**
- For low operating voltage applications: **5V and below**
- **0201 small DFN package** saves board space
- 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

- Mobile Phones
- Antenna applications
- Hand Held Portable Applications
- USB3.0 and USB2.0
- High Definition Multi-media Interface (HDMI)
- Display Port
- Serial ATA
- Consumer Applications

Description

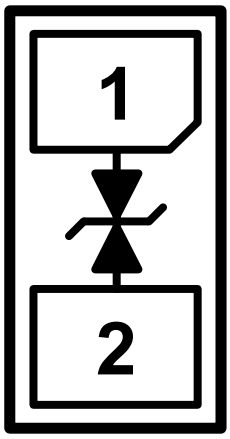
AZ5B65-01F is a design which includes a bi-directional ESD rated clamping cell to protect high speed data interfaces in an electronic system. The AZ5B65-01F has been specifically designed to protect sensitive components which are connected to data and transmission lines from over-voltage caused by Electrostatic Discharging (ESD), Lightning, and Cable Discharge Event (CDE).

AZ5B65-01F is a unique design which includes proprietary clamping cell with ultra low capacitance in a small package. During transient conditions, the proprietary clamping cell prevents over-voltage on the control/data lines, protecting any downstream components.

AZ5B65-01F is bi-directional and may be used on lines where the signal swings above and below ground.

AZ5B65-01F 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



DFN0603P2Y (Bottom View)
(0.6mm x 0.3mm x 0.3mm)

SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS			
PARAMETER	**SYMBOL**	**RATING**	**UNITS**
Peak Pulse Current (tp=8/20μs) (Note 1)	I_{pp}	5	A
Operating Supply Voltage	V_{DC}	±5.5	V
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD}	±15 ±15	kV
Lead Soldering Temperature	T_{SOL}	260 (10 sec.)	°C
Operating Temperature	T_{OP}	-55 to +85	°C
Storage Temperature	T_{STO}	-55 to +150	°C

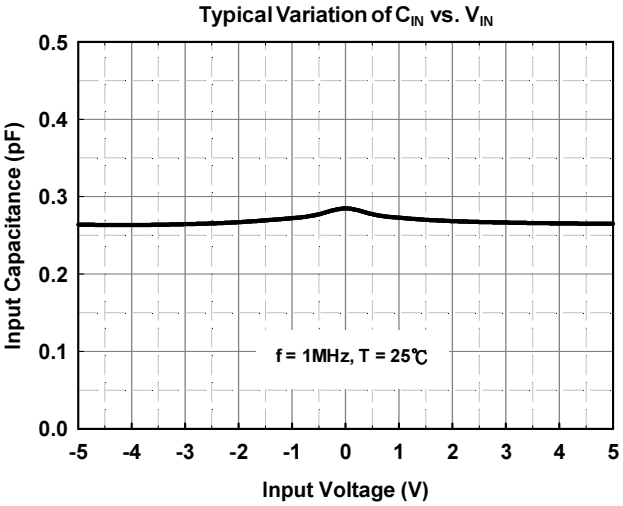
ELECTRICAL CHARACTERISTICS						
PARAMETER	**SYMBOL**	**CONDITIONS**	**MINI**	**TYP**	**MAX**	**UNITS**
Reverse Stand-Off Voltage	V_{RWM}	T=25 °C.	-5		5	V
Reverse Leakage Current	I_{Leak}	V_{RWM} = ±5V, T=25 °C.			100	nA
Reverse Breakdown Voltage	V_{BV}	I_{BV} = 1mA, T=25 °C.	6		10	V
Surge Clamping Voltage (Note 1)	$V_{CL-Surge}$	I_{PP}=5A, tp=8/20μs, T=25 °C.		11		V
ESD Clamping Voltage (Note 2)	V_{clamp}	IEC 61000-4-2 +8kV (I_{TLP} = 16A), Contact mode, T=25 °C.		20		V
ESD Dynamic Turn on Resistance	$R_{dynamic}$	IEC 61000-4-2 0~+8kV, Contact mode, T=25 °C.		0.7		Ω
Channel Input Capacitance	C_{IN}	V_R = 0V, f = 1MHz, T=25 °C.		0.3	0.45	pF

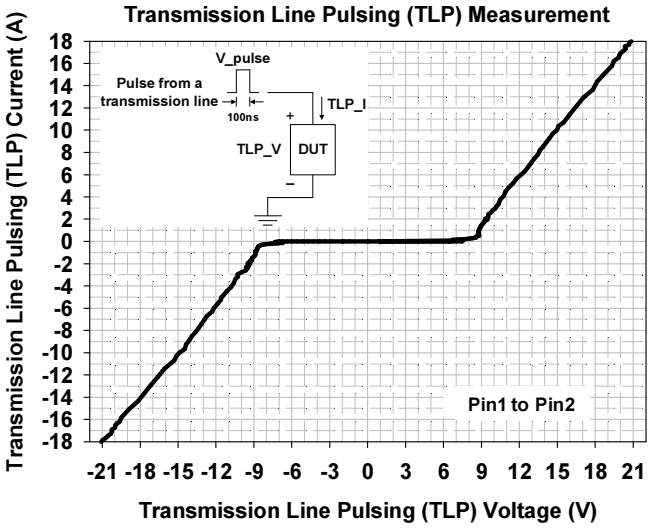
Note 1: The Peak Pulse Current measured conditions: t_p =8/20μs, 2Ω source impedance.

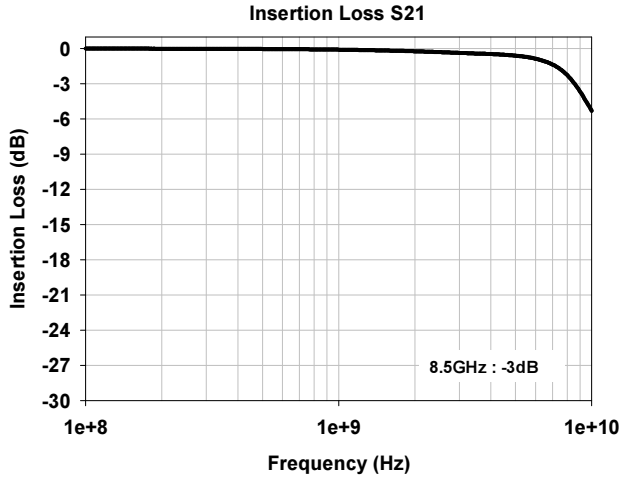
Note 2: ESD Clamping Voltage was measured by Transmission Line Pulsing (TLP) System.

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

Typical Characteristics







Applications Information

The AZ5B65-01F is designed to protect one line against System ESD pulse by clamping it to an acceptable reference. It provides bi-directional protection.

The usage of the AZ5B65-01F 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 AZ5B65-01F 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 AZ5B65-01F.
- Place the AZ5B65-01F 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.

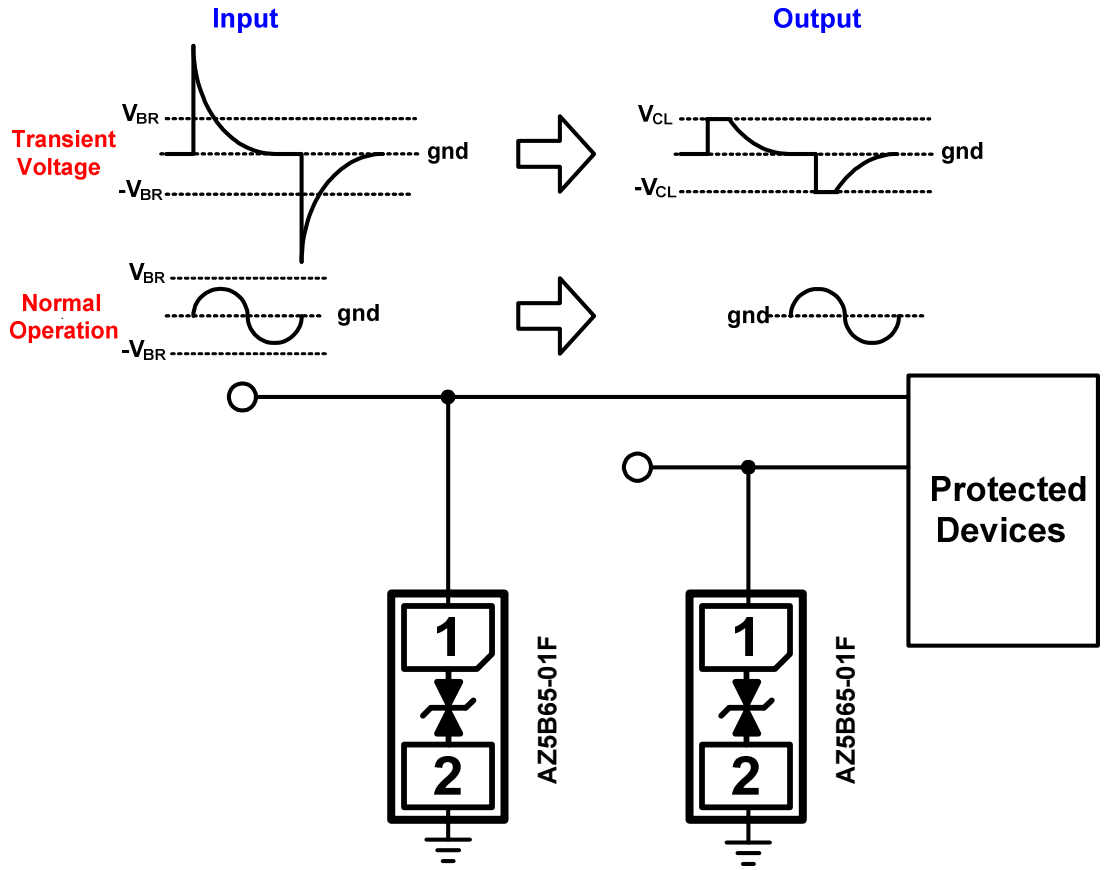


Fig. 1

Fig. 2 shows another simplified example of using AZ5B65-01F to protect the control line, high speed data line, and power line from ESD transient stress.

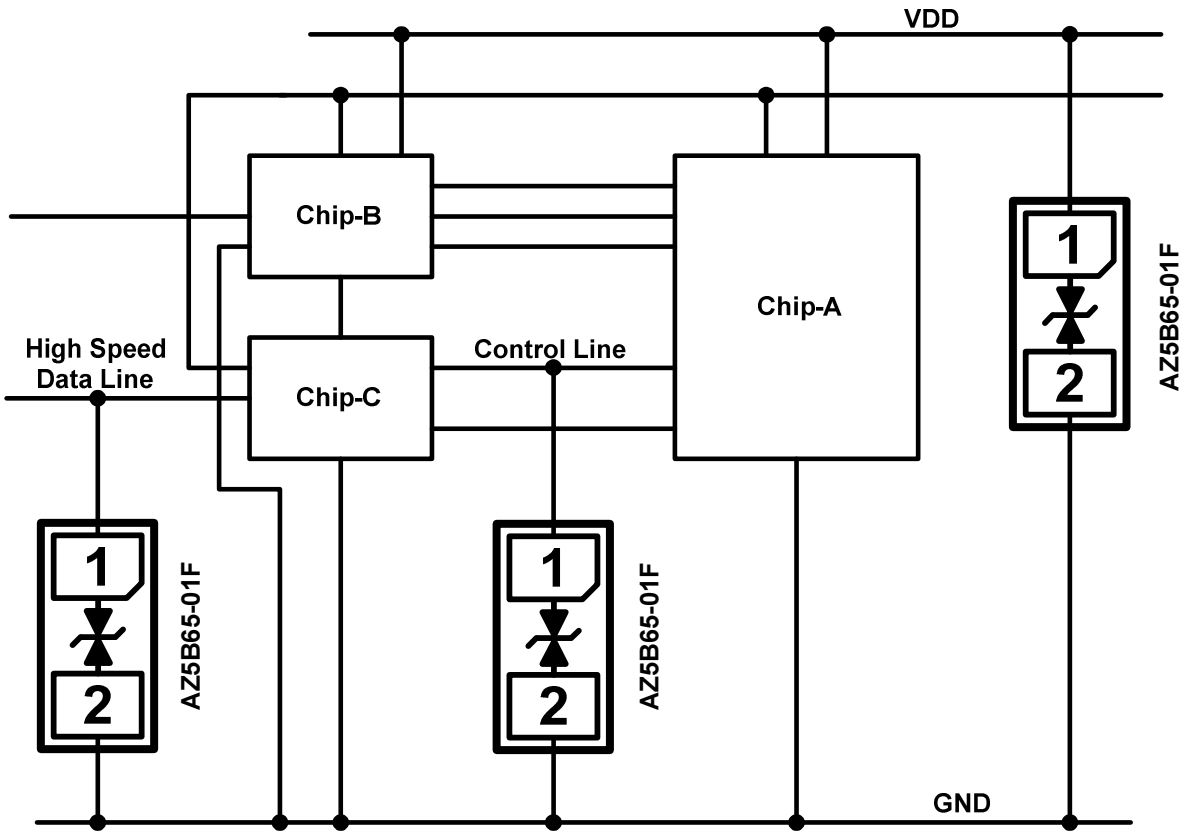
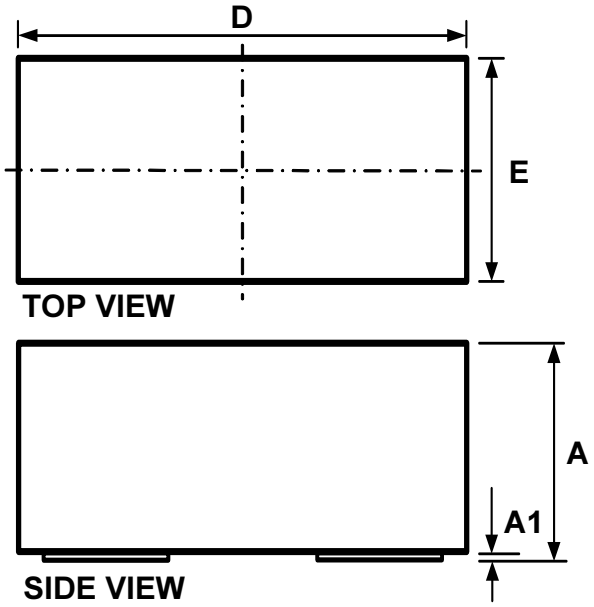
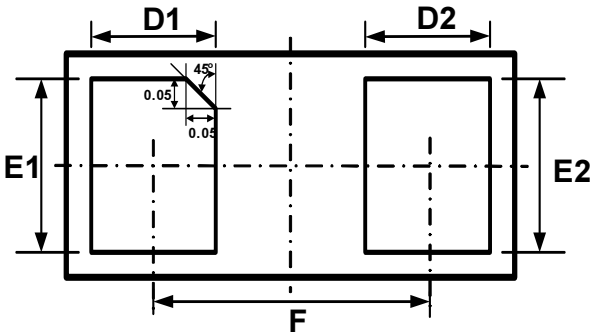


Fig. 2

Mechanical Details

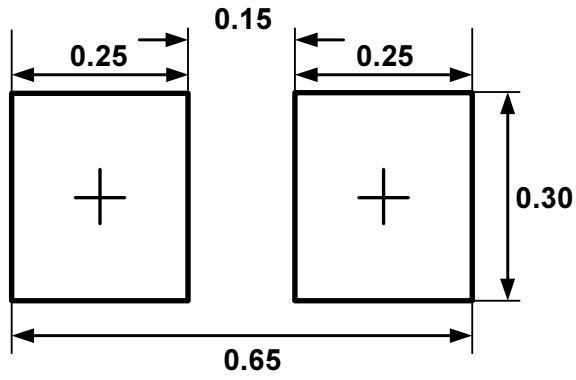
DFN0603P2Y PACKAGE DIAGRAMS





SYMBOL	Millimeters		
	MIN.	NOM.	MAX.
D	0.55	0.60	0.65
E	0.25	0.30	0.35
A	0.28	0.30	0.32
A1	0.00	0.02	0.05
D1	0.13	0.18	0.23
D2	0.14	0.19	0.24
E1/E2	0.20	0.25	0.30
F	0.35		

LAND LAYOUT

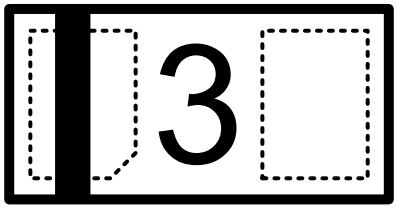


(Unit: mm)

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



3 = Device Code

Part Number	Marking Code
AZ5B65-01F.R7G (Green Part)	3

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

Ordering Information

PN#	Material	Type	Reel size	MOQ	MOQ/internal box	MOQ/carton
AZ5B65-01F.R7G	Green	T/R	7 inch	12,000/reel	4 reels= 48,000/box	6 boxes =288,000/carton

Revision History

Revision	Modification Description
Revision 2017/03/01	Preliminary Release.
Revision 2017/05/16	Formal Release.