

Features

- ESD protection for 1 line with bi-directional
- Provide transient protection for each line to IEC 61000-4-2 (ESD) $\pm 30\text{kV}$ (air / contact) IEC 61000-4-5 (Lightning) 30A (8/20 μs)
- Suitable for, **3.3V and below**, operating voltage applications
- **0201 small MCSP 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**
- **AEC-Q101 qualified**

Applications

- Power supply protection
- OLED
- Small panel modules
- Handheld portable applications
- Low speed data or control line protection
- Peripherals
- Consumer electronics

Description

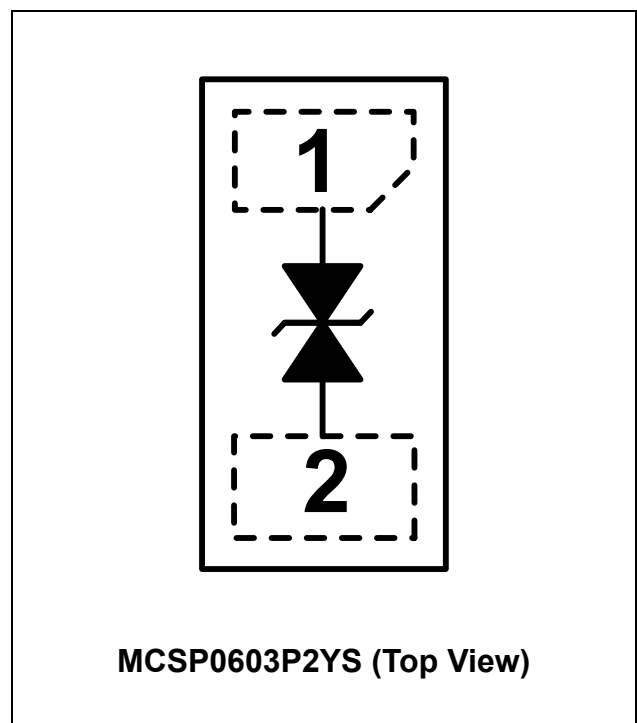
AZ9543-01M is a design which includes a bi-directional surge rated clamping cell to protect one power line, or one control line, or one low speed data line in an electronic system. The AZ9543-01M has been specifically designed to protect sensitive components which are

connected to power and control lines from over-voltage damage caused by Electrostatic Discharging (ESD), Lightning, and Cable Discharge Event (CDE).

AZ9543-01M 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.

AZ9543-01M 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	Unit
Peak Pulse Current ($t_p = 8/20\mu s$)	I_{PP}	30	A
Operating 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.)	$^{\circ}C$
Operating Temperature	T_{OP}	-55 to +125	$^{\circ}C$
Storage Temperature	T_{STO}	-55 to +150	$^{\circ}C$

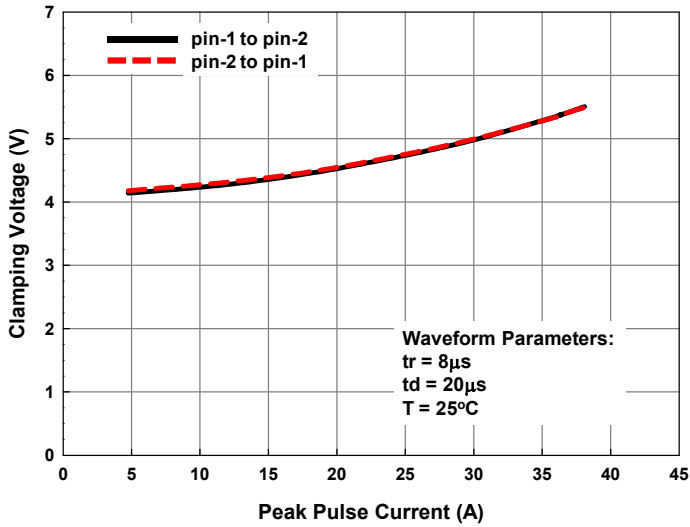
Electrical Characteristics						
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Reverse Stand-Off Voltage	V_{RWM}	$T=25^{\circ}C$.	-3.3		3.3	V
Reverse Leakage Current	I_{Leak}	$V_{RWM} = \pm 3.3V, T=25^{\circ}C$.			0.5	μA
Reverse Breakdown Voltage	V_{BV}	$I_{BV} = 1mA, T=25^{\circ}C$.	3.8		7	V
Surge Clamping Voltage	$V_{CL-surge}$	$I_{PP} = 5A, t_p = 8/20\mu s, T=25^{\circ}C$.		4.5	5.5	V
		$I_{PP} = 30A, t_p = 8/20\mu s, T=25^{\circ}C$.		5	6	
ESD Clamping Voltage (Note 1)	V_{clamp}	IEC 61000-4-2 +8kV ($I_{TLP} = 16A$), contact mode, $T=25^{\circ}C$.		4.5		V
ESD Dynamic Turn-on Resistance	$R_{dynamic}$	IEC 61000-4-2 0~+8kV, $T=25^{\circ}C$, contact mode.		0.015		Ω
Channel Input Capacitance	C_{IN}	$V_R = 0V, f = 1MHz, T=25^{\circ}C$.		60	80	pF

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

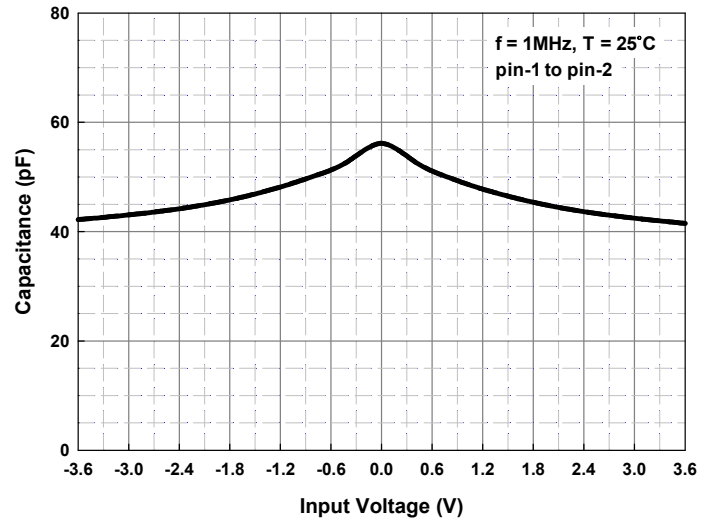
TLP conditions: $Z_0 = 50\Omega, t_p = 100ns, t_r = 1ns$.

Typical Characteristics

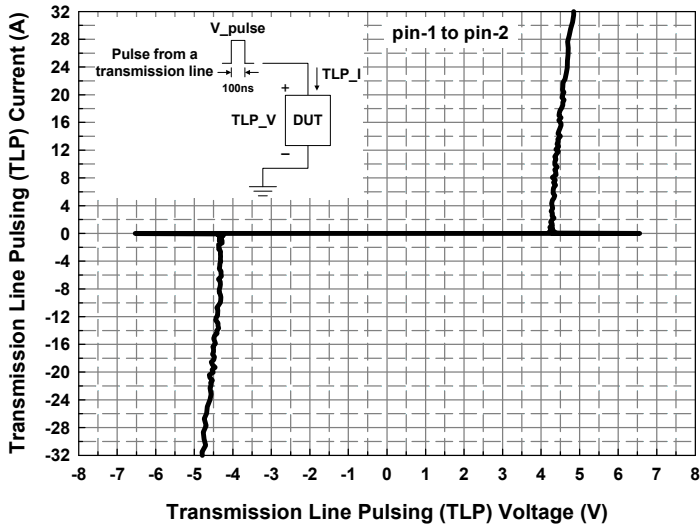
Reverse Clamping Voltage vs. Peak Pulse Current



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



Transmission Line Pulsing (TLP) Measurement



Applications Information

The AZ9543-01M is designed to protect one line against system ESD/Lightning pulses by clamping it to an acceptable reference. It provides bi-directional protection.

The usage of the AZ9543-01M 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 AZ9543-01M 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 AZ9543-01M.
- Place the AZ9543-01M 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.

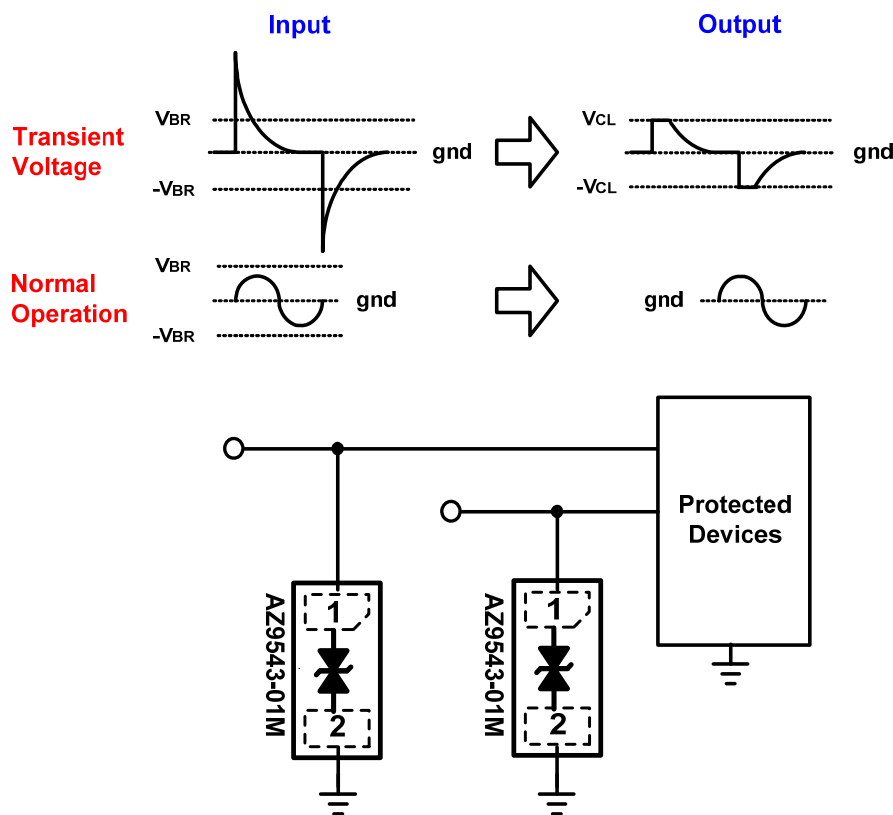


Fig. 1

Fig. 2 shows another simplified example of using AZ9543-01M to protect the control line, low speed data line, and power line from ESD transient stress.

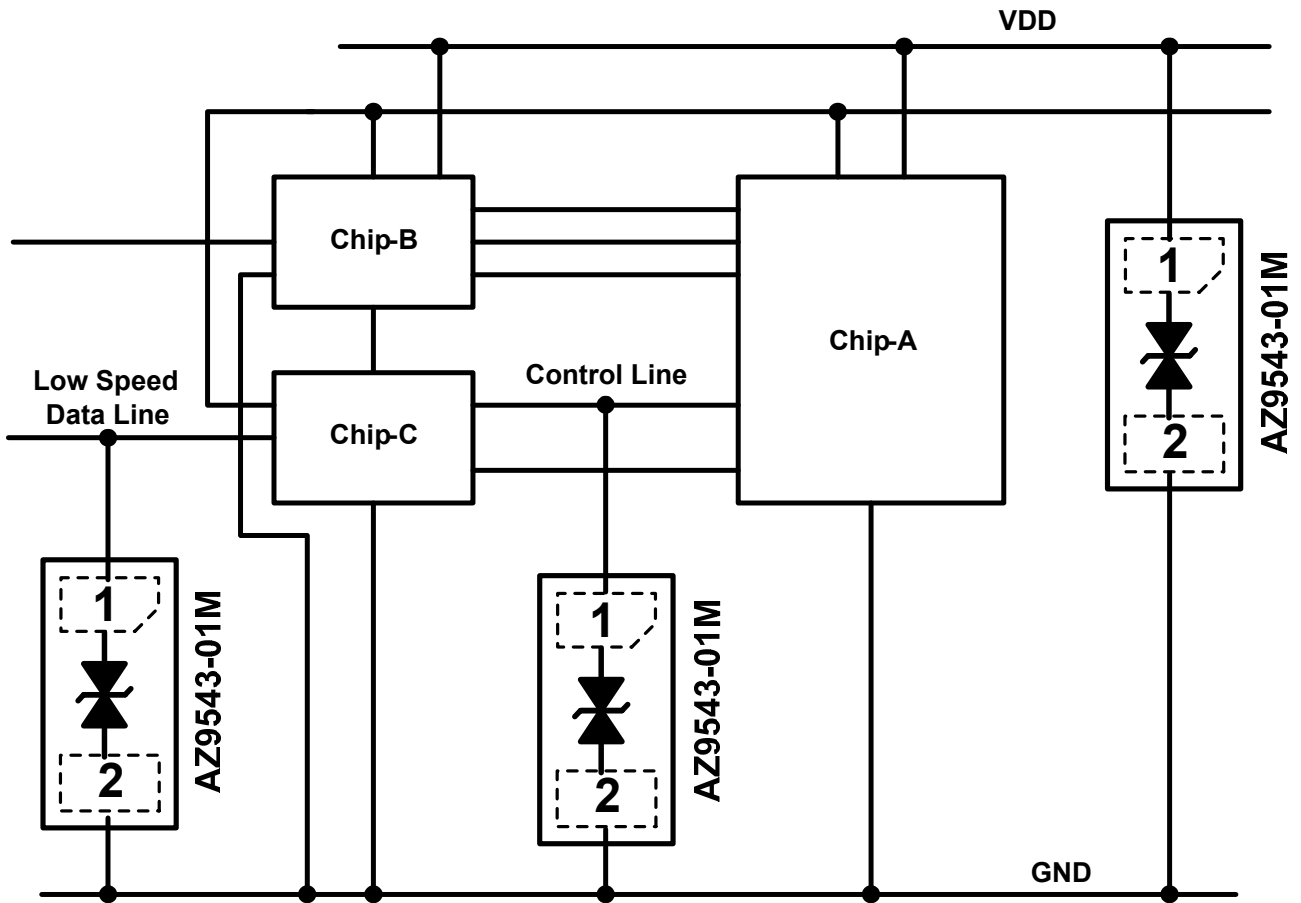
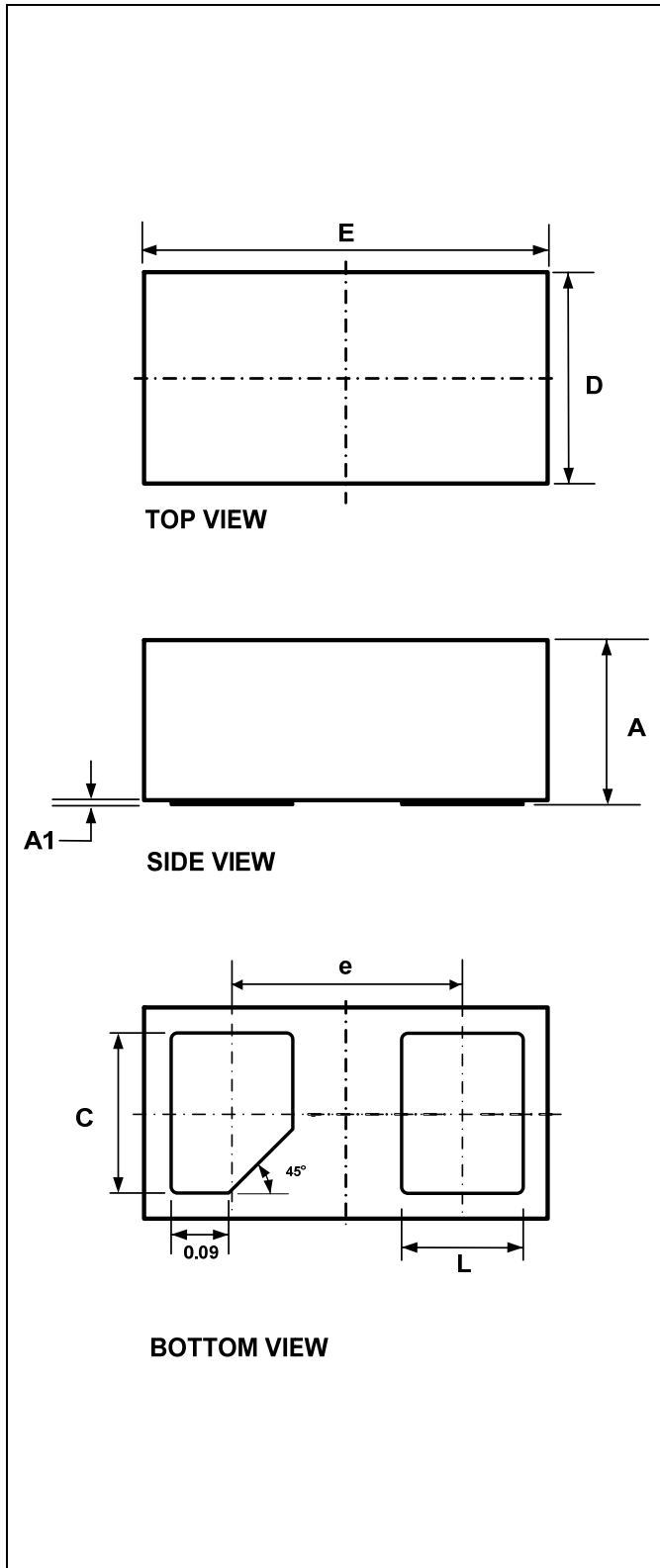


Fig. 2

Mechanical Details

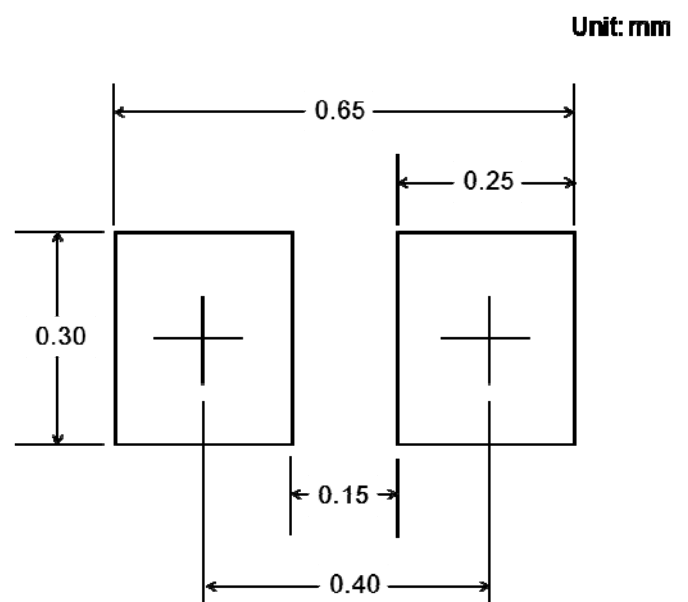
MCSP0603P2YS Package Diagrams



Package Dimensions

SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
E	0.615	0.630	0.645
D	0.315	0.330	0.345
A	0.235	0.250	0.265
A1	0.005	0.015	0.050
L	0.170	0.190	0.210
C	0.230	0.250	0.270
e	0.360 BSC		

Land Layout

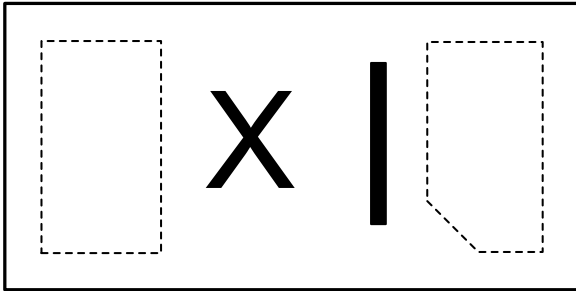


Notes:

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



Part Number	Marking Code
AZ9543-01M.R7G (Green Part)	X

X= Device Code

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

Ordering Information

PN#	Material	Type	Reel size	MOQ	MOQ/internal box	MOQ/carton
AZ9543-01M.R7G	Green	T/R	7 inch	15,000/reel	4 reels = 60,000/box	6 boxes = 360,000/carton

Revision History

Revision	Modification Description
Revision 2023/02/08	Formal Release.