Features

- ESD protection for 1 line with uni-directional
- Provide transient protection for each line to
  IEC 61000-4-2 (ESD) ±30kV (air / contact)
  IEC 61000-4-4 (EFT) ±80A (5/50ns)
  IEC 61000-4-5 (Lightning) 22A (8/20μs)
- Suitable for, **2.1V 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***

Applications

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

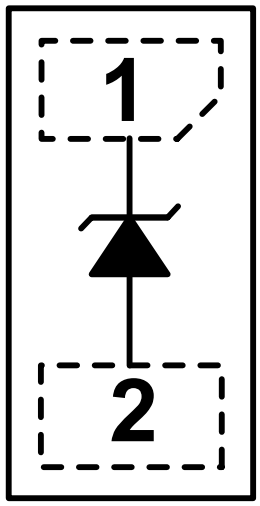
Description

AZ6A21-01M 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 AZ6A21-01M 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), Electrical Fast Transients (EFT), Lightning, and Cable Discharge Event (CDE).

AZ6A21-01M 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.

AZ6A21-01M 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



MCSP0603P2YS (Top View)

Specifications

Absolute Maximum Ratings (T_A= 25°C, unless otherwise specified)			
Parameter	**Symbol**	**Rating**	**Unit**
Peak Pulse Power (t_p =8/20μs)	P_{PP} (Note 1)	130	W
Peak Pulse Current (t_p =8/20μs)	I_{PP} (Note 1)	22	A
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD-1} V_{ESD-2}	±30 ±30	kV
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**	**Condition**	**Min**	**Typ**	**Max**	**Unit**
Reverse Stand-Off Voltage	V_{RWM}	Pin-1 to pin-2, T=25 °C.			2.1	V
Reverse Leakage Current	I_{Leak}	V_{RWM} = 2.1V, T=25 °C, pin-1 to pin-2.		0.01	0.1	μA
Reverse Breakdown Voltage	V_{BV}	I_{BV} = 1mA, T=25 °C, pin-1 to pin-2.	2.2		3.6	V
Forward Voltage	V_F	I_F = 15mA, T=25 °C, pin-2 to pin-1.	0.6		1.2	V
Surge Clamping Voltage (Note 1)	$V_{CL-surge}$	I_{PP} = 10A, t_p = 8/20μs, T=25°C.		4		V
		I_{PP} = 13A, t_p = 8/20μs, T=25°C.		4.3		
		I_{PP} = 22A, t_p = 8/20μs, T=25°C.		5.5		
ESD Clamping Voltage (Note 2)	V_{clamp}	IEC 61000-4-2 +8kV (I_{TLP} = 16A), contact mode, T=25 °C, pin-1 to pin-2.		4.4		V
ESD Dynamic Turn-on Resistance	$R_{dynamic}$	IEC 61000-4-2 0~+8kV, T=25 °C, contact mode, pin-1 to pin-2.		0.1		Ω
Channel Input Capacitance	C_{IN}	V_R = 0V, f = 1MHz, pin-1 to pin-2, T=25 °C.		105	135	pF

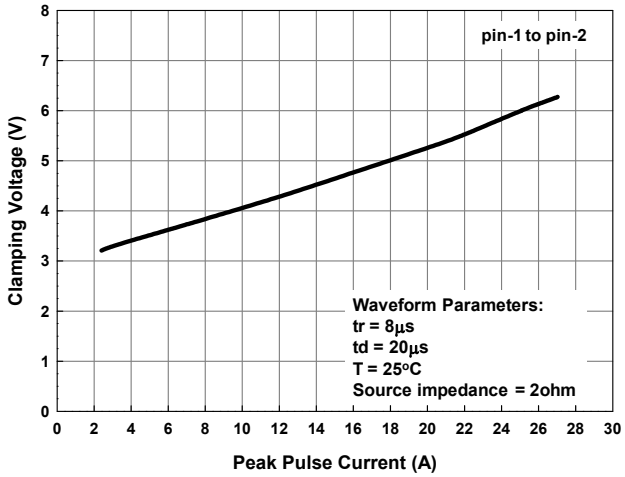
Note 1: The Peak Pulse Current and Peak Pulse Power measured conditions: t_p = 8/20μs, 2Ω source impedance.

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

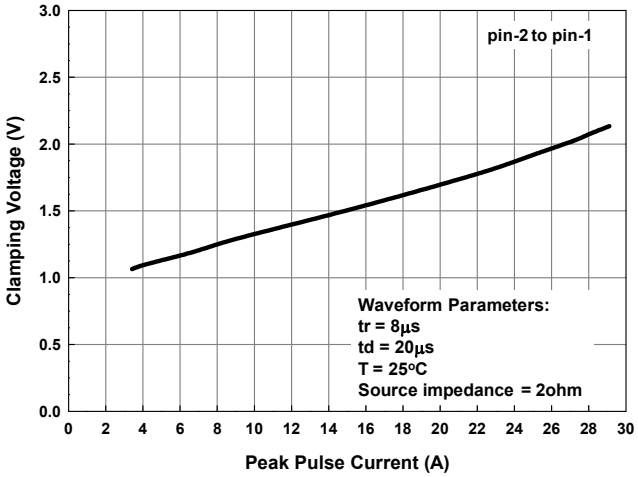
TLP conditions: Z_0= 50Ω, t_p= 100ns, t_r= 1ns.

Typical Characteristics

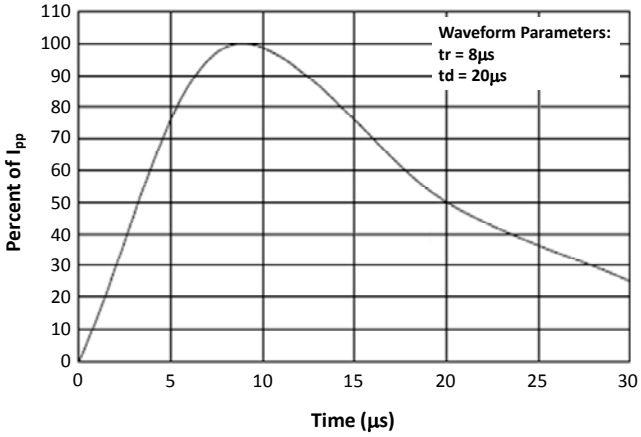
Reverse Clamping Voltage vs. Peak Pulse Current



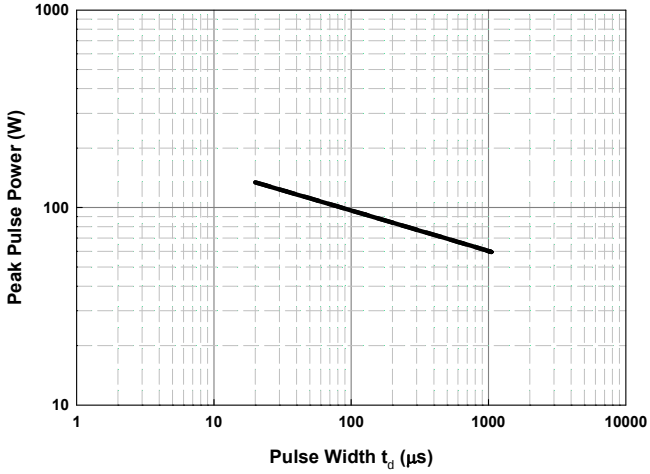
Forward Clamping Voltage vs. Peak Pulse Current



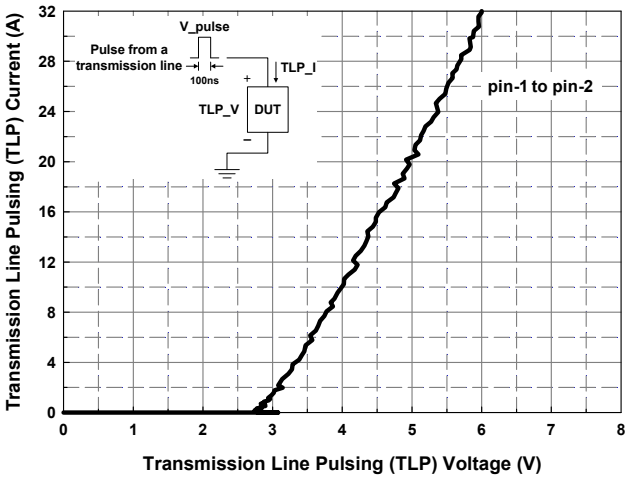
Pulse Waveform



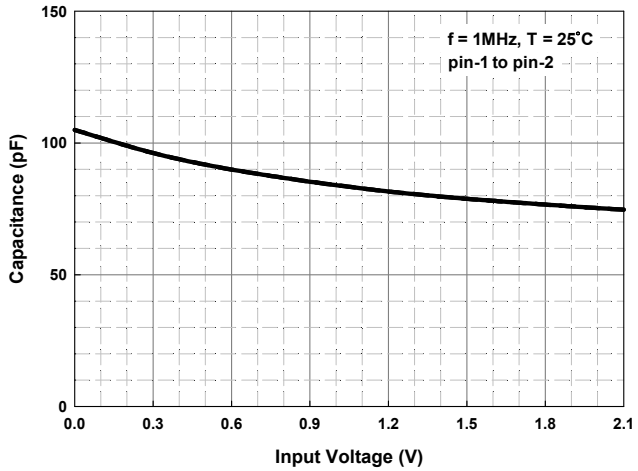
Peak Pulse Power Rating Curve



Transmission Line Pulsing (TLP) Measurement



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



Applications Information

The AZ6A21-01M is designed to protect one line against system ESD / EFT / Lightning pulses by clamping it to an acceptable reference.

The usage of the AZ6A21-01M is shown in Fig. 1. Protected lines, such as data lines, control lines, or power lines, are connected to pin 1. The pin 2 should be connected directly to a ground plane on the board. All path lengths connected to the pins of AZ6A21-01M 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 AZ6A21-01M.
- Place the AZ6A21-01M 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.

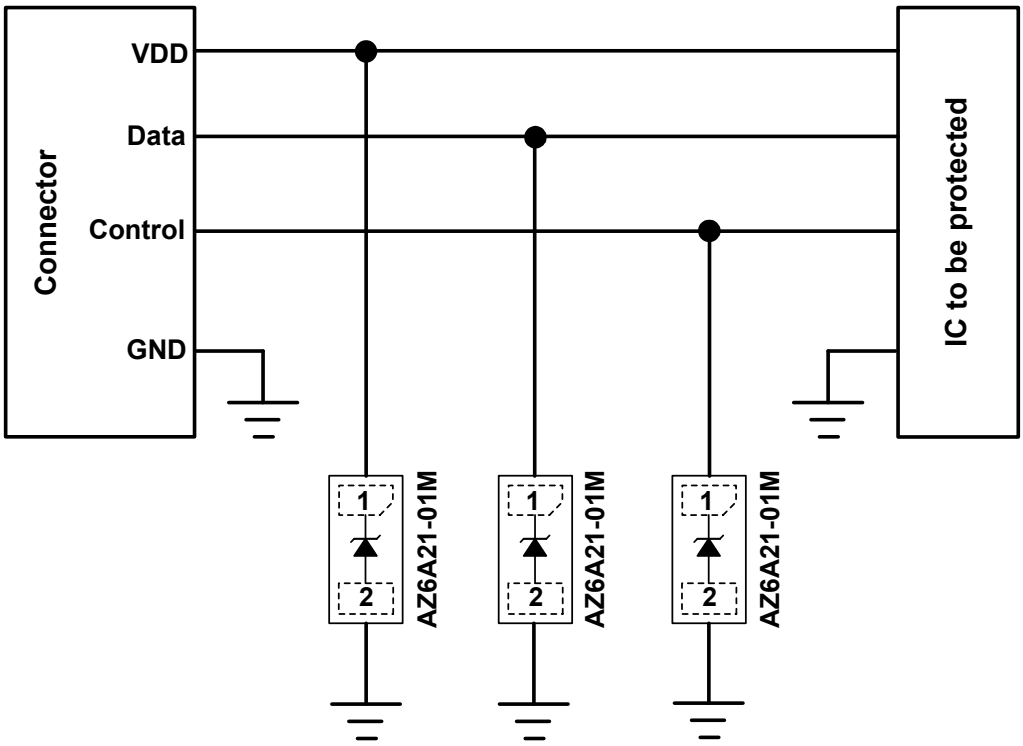
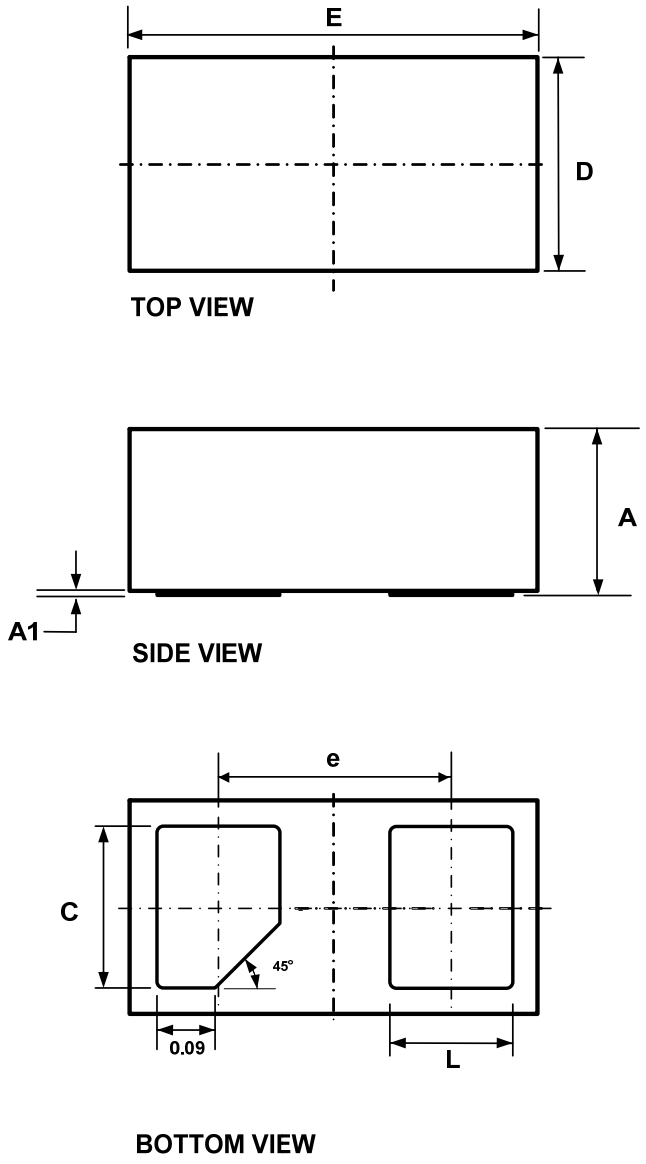


Fig. 1

Mechanical Details

MCSP0603P2YS

Package Diagrams

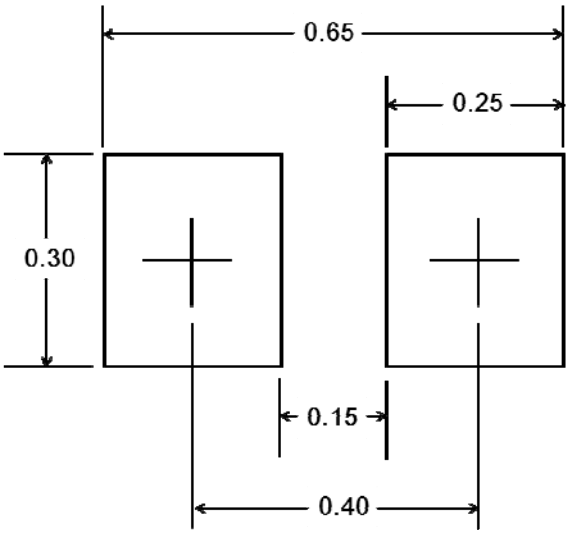


Package Dimensions

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

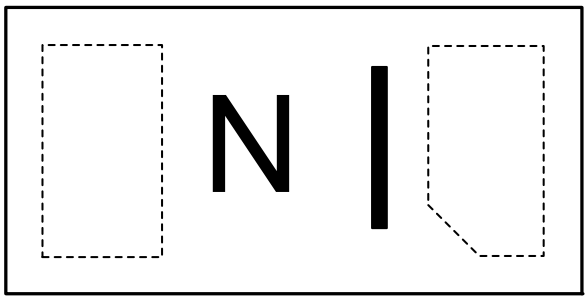
Unit: mm



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



N= Device Code

Part Number	Marking Code
AZ6A21-01M.R7G (Green Part)	N

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

Ordering Information

PN#	Material	Type	Reel size	MOQ	MOQ/internal box	MOQ/carton
AZ6A21-01M.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 2022/03/02	Preliminary Release.
Revision 2022/07/07	Formal Release.