Features

- ESD/Surge protection for two lines with bi-directional
- Provide transient protection for each line to
  IEC 61000-4-2 (ESD) ±30kV (air), ±30kV (contact)
  IEC 61000-4-5 (Lightning) 6A (8/20μs)
  Cable Discharge Event (CDE)
- Provide ISO 7637-3
  Pulse 3a: -200V
  Pulse 3b: +200V
- Suitable for, 24V and below, operating voltage applications
- Fast turn-on and low clamping voltage
- Array of ESD rated equivalent TVS diodes
- Small package saves board space
- Solid-state silicon-avalanche and active circuit triggering technology
- ***Green part***
- ***AEC-Q101 qualified***

Applications

- CAN bus protection
- Automotive application
- Industrial control
- Power management system
- Set-top box
- Notebooks, desktops, and servers
- Portable instrumentation
- Peripherals

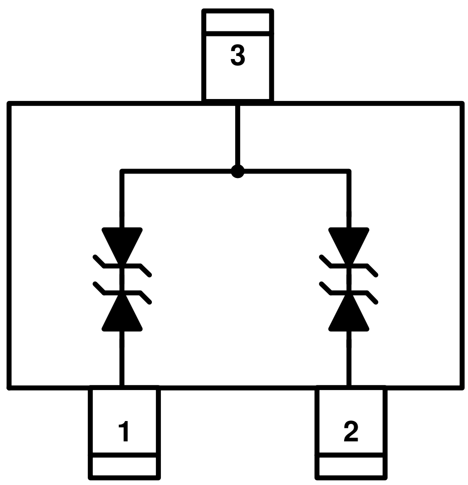
Description

AZ9424-02S is a design which includes ESD /surge rated clamping cell arrays to protect the power lines or control lines in an electronic system. The AZ9424-02S has been specifically designed to protect sensitive components which are connected to power and control lines from over-voltage caused by Electrostatic Discharging (ESD), Lightning, and Cable Discharge Event (CDE).

AZ9424-02S is a unique design which includes proprietary clamping cells in a single package. During transient conditions, the proprietary clamping cells prevent over-voltage on the power lines or control lines, protecting any downstream components.

AZ9424-02S 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



JEDEC SOT23-3L (Top View)

SPECIFICATIONS

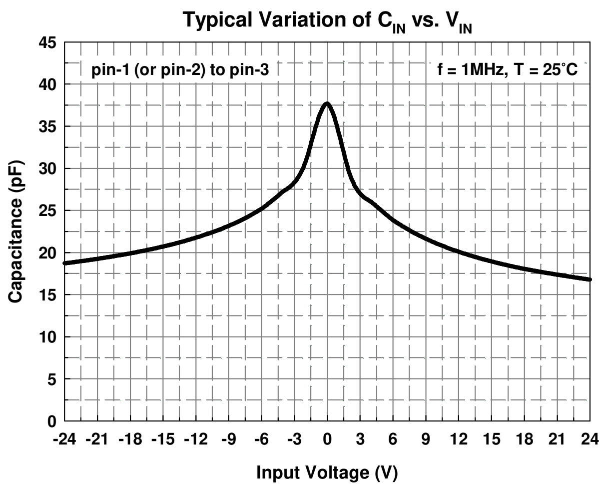
ABSOLUTE MAXIMUM RATINGS			
PARAMETER	SYMBOL	RATING	UNIT
Peak Pulse Current (tp=8/20μs)	I_{PP}	6	A
Operating Supply Voltage (I/O pin-GND)	V_{DC}	±26	V
ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	V_{ESD-1} V_{ESD-2}	±30 ±30	kV
Lead Soldering Temperature	T_{SOL}	260 (10 sec.)	°C
Operating Temperature	T_{OP}	-55 to +125	°C
Storage Temperature	T_{STO}	-55 to +150	°C

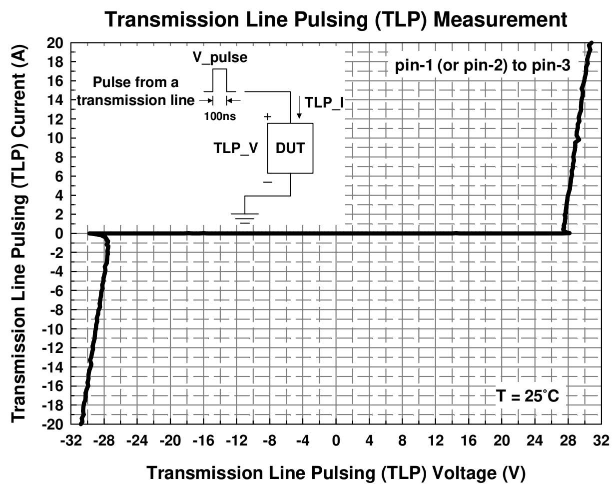
ELECTRICAL CHARACTERISTICS						
PARAMETER	**SYMBOL**	**CONDITION**	**MIN**	**TYP**	**MAX**	**UNIT**
Reverse Stand-Off Voltage	V_{RWM}	Pin-1, -2 to pin-3, T=25°C	-24		24	V
Reverse Leakage Current	I_{Leak}	V_{RWM} = ±24V, pin-1, -2 to pin-3, T=25°C			100	nA
Reverse Breakdown Voltage	V_{BV}	I_{BV} = 1mA, pin-1, -2 to pin-3,T=25°C	26.2		33.5	V
Surge Clamping Voltage	$V_{CL-surge}$	I_{PP} = 5A, tp = 8/20μs, pin-1, -2 to pin-3, T = 25°C		31		V
ESD Clamping Voltage (Note 1)	V_{CL-ESD}	IEC 61000-4-2 +8kV (I_{TLP} = 16A), contact mode, pin-1, -2 to pin-3, T=25°C		31		V
ESD Dynamic Turn-on Resistance	$R_{dynamic}$	IEC 61000-4-2 0~+8kV, contact mode, pin-1, -2 to pin-3, T=25°C		0.2		Ω
Channel Input Capacitance	C_{IN}	V_R = 0V, f = 1MHz, pin-1, -2 to pin-3, T=25°C		38	45	pF

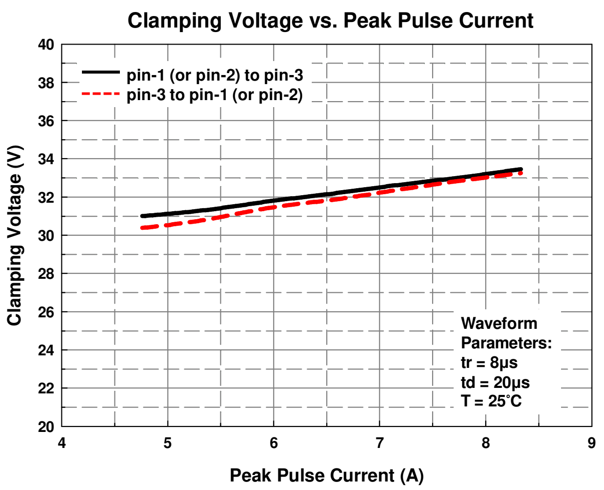
Note 1: ESD Clamping Voltage was measured by Transmission Line Pulsing (TLP) System.

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

Typical Characteristics







Application Information

The AZ9424-02S is designed to protect two lines against system ESD/Lightning pulses by clamping it to an acceptable reference. It provides bi-directional protection.

The usage of the AZ9424-02S is shown in Fig. 1. Protected lines, such as data lines, control lines, or power lines, are connected at pin 1 and pin 2, respectively. The pin 3 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 AZ9424-02S should be kept as short as possible.

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 AZ9424-02S.
- Place the AZ9424-02S 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.

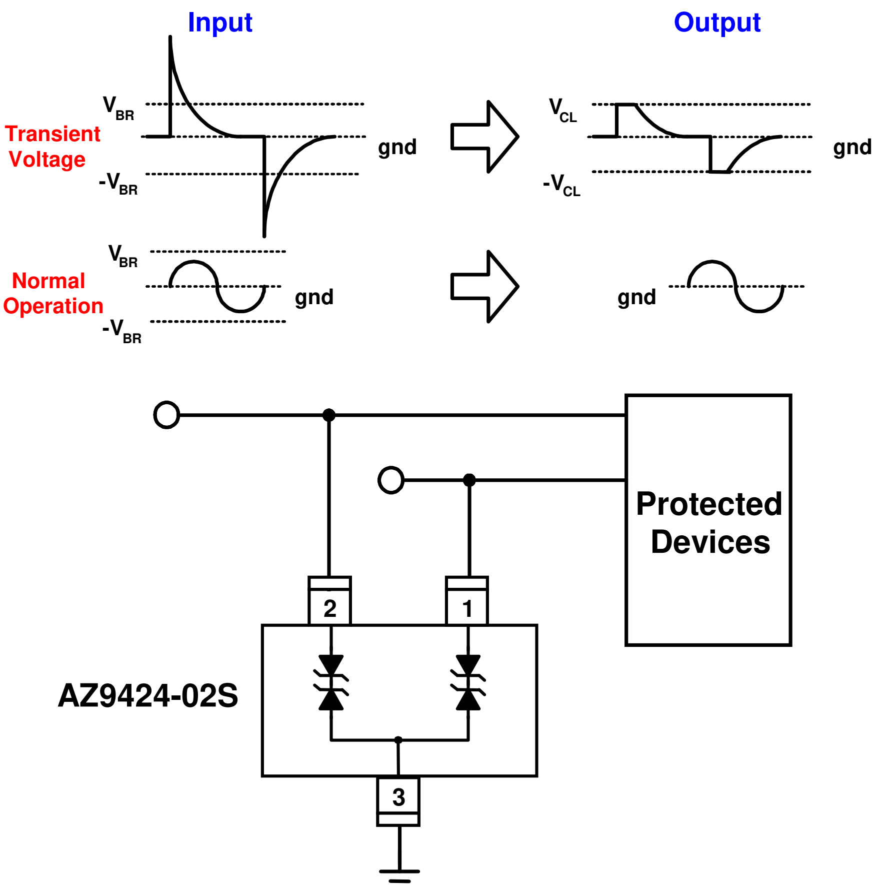
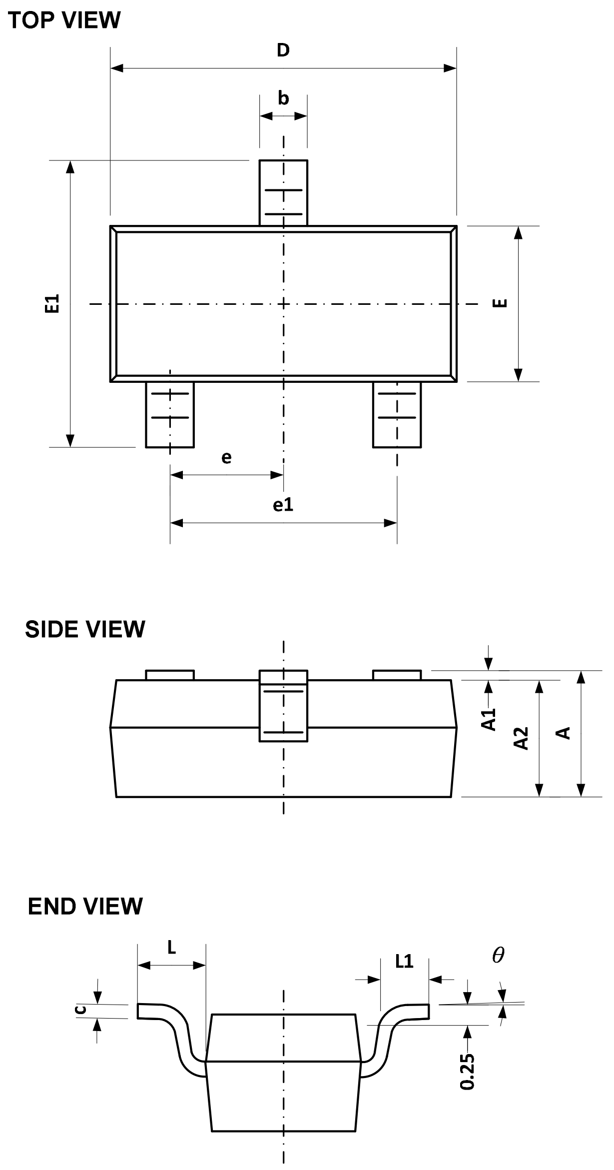


Fig. 1 The ESD protection scheme by using AZ9424-02S.

Mechanical Details

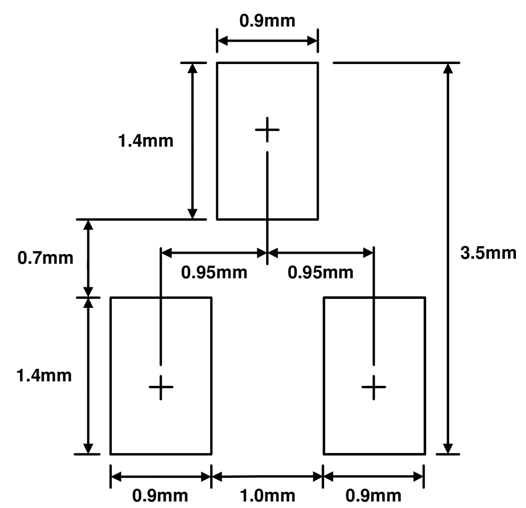
SOT23-3L
PACKAGE DIAGRAMS



PACKAGE DIMENSIONS

SYMBOL	MILLIMETERS	
	MIN.	MAX.
A	0.90	1.15
A1	0.00	0.10
A2	0.90	1.05
b	0.30	0.50
c	0.08	0.15
D	2.80	3.00
E	1.20	1.40
E1	2.25	2.55
e	0.95 TYP	
e1	1.80	2.00
L	0.55 REF	
L1	0.30	0.50
θ	0	8

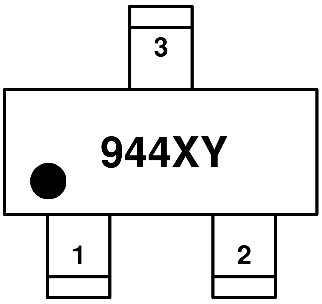
LAND LAYOUT



Notes:
This LAND LAYOUT is for reference purposes only. Please consult your manufacturing partners to ensure your company's PCB design guidelines are met.

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

MARKING CODE



944 = Device Code
X = Date Code
Y = Control Code

Part Number	Marking Code
AZ9424-02S.R7G (Green Part)	**944XY**

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

Ordering Information

PN#	Material	Type	Reel size	MOQ	MOQ/internal box	MOQ/carton
AZ9424-02S.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 2018/11/07	Preliminary Release.
Revision 2019/04/26	Formal Release.