AOZ8234

Four-line TVS Diode

General Description

The AOZ8234 is a transient voltage suppressor diode array designed to protect data lines from high transient conditions and ESD. This state-of-the-art device utilizes AOS leading edge Trench Vertical Structure $[TVS]^2$ ™ technology for superior clamping performance.

This device incorporates four TVS diodes in a single package. Due to the flexibility of the design, the package can be configured as a two channel bidirectional TVS array. During transient conditions, the TVS diodes direct the transient to ground. They may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 (±15 kV air, ±8 kV contact discharge).

The AOZ8234 comes in an RoHS compliant DFN package and is rated over a -40 °C to +85 °C ambient temperature range.

The very small 1.45 mm x 1.0 mm x 0.55 mm DFN package makes it ideal for applications where PCB space is a premium. The small size and high ESD protection makes it ideal for protecting high speed video and data communication interfaces.

Features

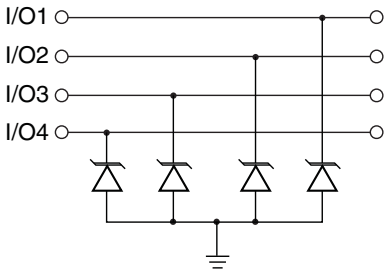
- ESD protection for high-speed data lines:
  - Exceeds: IEC 61000-4-2 (ESD) ±18 kV (air), ±18 kV (contact)
  - Human Body Model (HBM) ±30 kV
- Trench Vertical Structure $[TVS]^2$ ™ based technology used to achieve excellent ESD clamping performance
- Small package saves board space
- Low insertion loss
- Protects four unidirectional or two bidirectional I/O lines
- Low clamping voltage
- Low operating voltage: 5.0V
- Green product, Pb-free

Applications

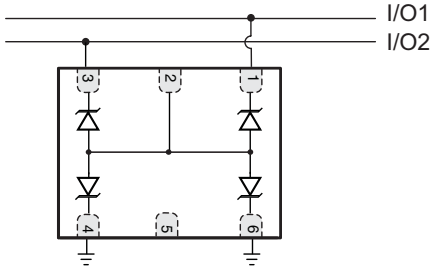
- Portable handheld devices
- Keypads, data lines
- Notebook computers
- Digital cameras
- Portable GPS
- MP3 players

Green Product

Typical Applications

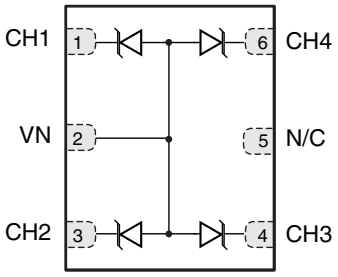


Unidirection Protection of Four Lines



Bidirection Protection of Two Lines

Pin Configuration



Top View

Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8234DI-05	-40 °C to +85 °C	DFN 1.45 x 1.0	Green Product RoHS Compliant

AOS Green Products use reduced levels of Halogens, and are also RoHS compliant.
Please visit www.aosmd.com/media/AOSGreenPolicy.pdf for additional information.

Absolute Maximum Ratings

Exceeding the Absolute Maximum ratings may damage the device.

Parameter	Rating
VP – VN	5 V
Peak Pulse Current (I_{PP}), t_P = 8/20 µs	4 A
Storage Temperature (T_S)	-65 °C to +150 °C
ESD Rating per IEC61000-4-2, Contact(1)	±18 kV
ESD Rating per IEC61000-4-2, Air(1)	±18 kV
ESD Rating per Human Body Model(2)	±30 kV

Notes:
1. IEC 61000-4-2 discharge with $C_{Discharge}$ = 150 pF, $R_{Discharge}$ = 330 Ω.
2. Human Body Discharge per MIL-STD-883, Method 3015 $C_{Discharge}$ = 100 pF, $R_{Discharge}$ = 1.5 kΩ.

Maximum Operating Ratings

Parameter	Rating
Junction Temperature (T_J)	-40 °C to +125 °C

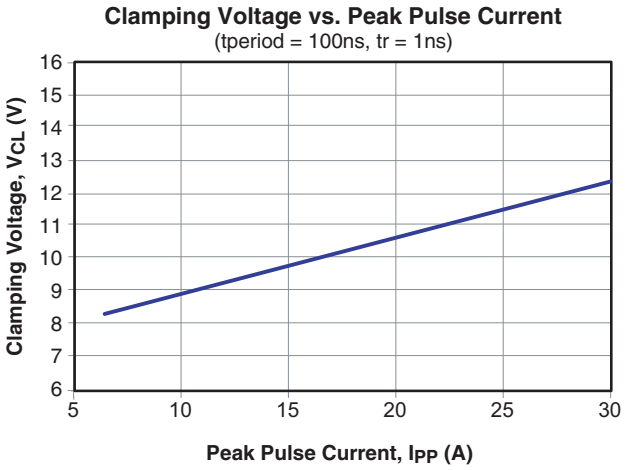
Electrical Characteristics

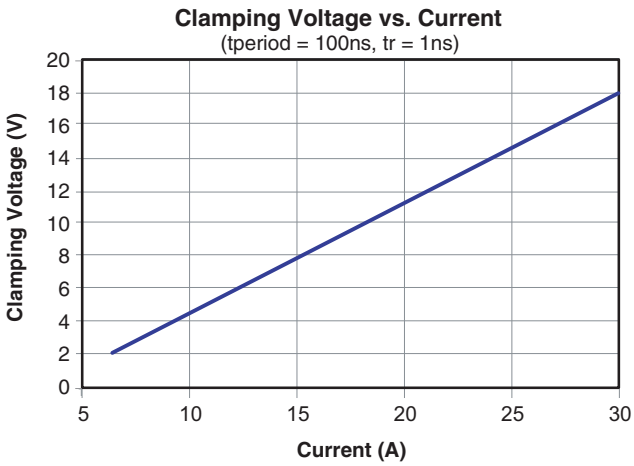
T_A = 25°C unless otherwise specified.

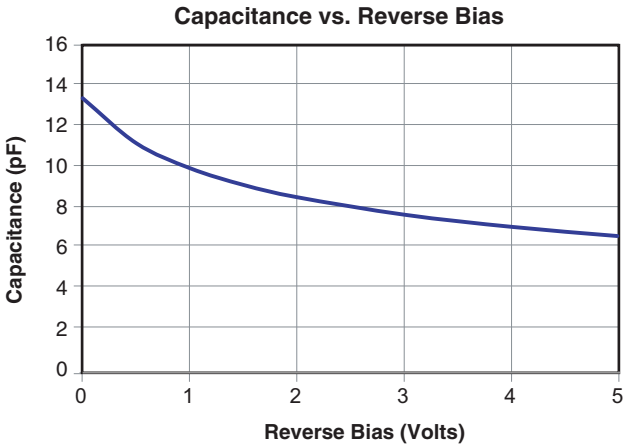
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_{RWM}	Reverse Working Voltage	Any I/O pin to Ground(3)			5.0	V
V_{BR}	Reverse Breakdown Voltage	I_T = 1 mA, any I/O pin to Ground(4)	6.0			V
I_R	Reverse Leakage Current	V_{RWM} = 5 V, any I/O pin to Ground			0.1	µA
V_F	Diode Forward Voltage	I_F = 10 mA		0.7		V
V_{CL}	Channel Clamp Voltage Positive Transients Negative Transient	I_{PP} = 15 A, tp = 100 ns, any I/O pin to Ground			 12.0 -10.0	 V V
	Channel Clamp Voltage Positive Transients Negative Transient	I_{PP} = 25 A, tp = 100 ns, any I/O pin to Ground			 15.0 -18.0	 V V
C_j	Junction Capacitance	V_R = 0 V, f = 1 MHz, any I/O pin to Ground		13.5	16.0	pF

Notes:
3. The working peak reverse voltage, V_{RWM}, should be equal to or greater than the DC or continuous peak operating voltage level.
4. V_{BR} is measured at the pulse test current I_T.

Typical Performance Characteristics





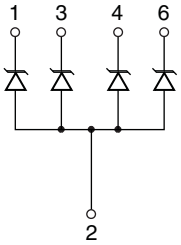


Applications Information

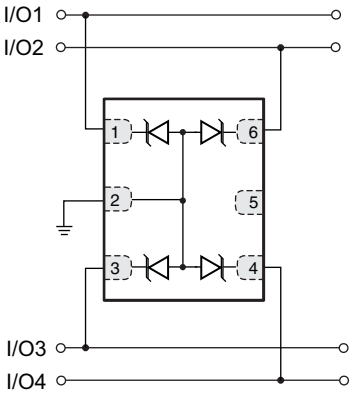
Device Connection for Protection of Four Data Lines

These devices are designed to protect up to four unidirectional data lines. The device is connected as follows.

1. Unidirectional protection of four I/O lines is achieved by connecting pins 1, 3, 4, and 6 to the data lines. Connect pin 2 to ground. The ground connection should be made directly to the ground plane for best results. The path length is kept as short as possible to reduce the effects of parasitic inductance in the board traces.



Circuit Diagram

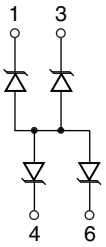


Protection of Four Unidirectional Lines

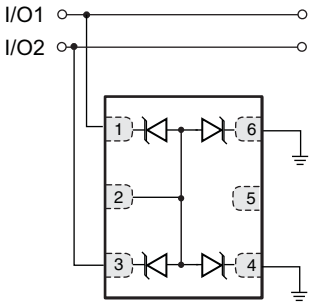
Device Connection for Protection of Two Bidirectional Data Lines

These devices are designed to protect up to two bidirectional data lines. The device is connected as follows.

1. Bidirectional protection of two I/O lines is achieved by connecting pins 1 and 3 to the data lines. Connect pin 4 and 6 to ground. The ground connection should be made directly to the ground plane for best results. The path length is kept as short as possible to reduce the effects of parasitic inductance in the board traces.



Circuit Diagram



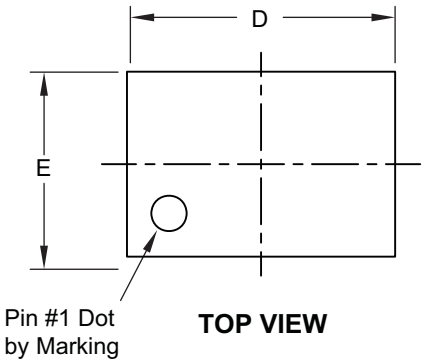
Protection of Two Bidirectional Lines

Circuit Board Layout Recommendations for Suppression of ESD

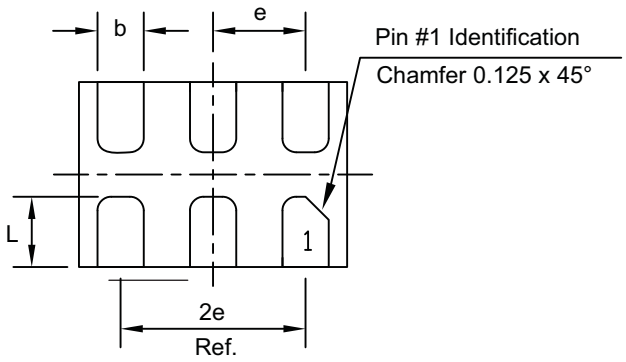
Good circuit board layout is critical for the suppression of ESD induced transients. The following guidelines are recommended:

- Place the TVS near the input terminals or connectors to restrict transient coupling.
- Minimize the path length between the TVS and the protected line.
- Minimize all conductive loops including power and ground loops.
- The ESD transient return path to ground should be kept as short as possible.
- Never run critical signals near board edges.
- Use ground planes whenever possible.

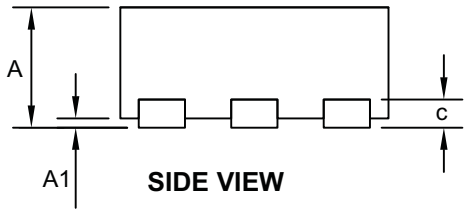
Package Dimensions, DFN 1.45 x 1.0, 6L



TOP VIEW



BOTTOM VIEW



SIDE VIEW

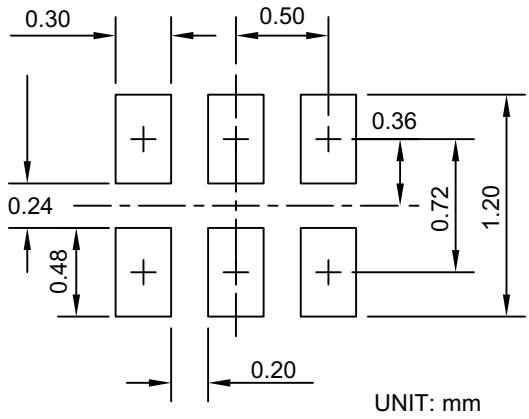
Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	0.50	0.55	0.60
A1	0.00	—	0.05
b	0.20	0.25	0.30
c		0.152 Ref.	
D	1.40	1.45	1.50
E	0.95	1.00	1.05
e		0.50 BSC	
L	0.33	0.38	0.43

Dimensions in inches

Symbols	Min.	Nom.	Max.
A	0.020	0.022	0.024
A1	0.000	—	0.002
b	0.008	0.010	0.012
c		0.006 Ref.	
D	0.055	0.057	0.059
E	0.038	0.040	0.042
e		0.020 BSC	
L	0.013	0.015	0.017

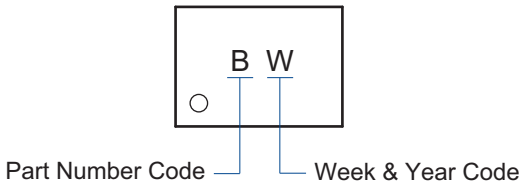
RECOMMENDED LAND PATTERN



UNIT: mm

Part Marking

AOZ8234DI-05
(DFN 1.45 x 1.0)



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