

### **General Description**

The AOZ8208 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]<sup>2</sup> ™ technology for superior clamping performance.

This device incorporates eight TVS diodes in a single package. 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 (±15kV air, ±8kV contact discharge).

The AOZ8208 is RoHS compliant. The DFN-8 package is rated over a -40°C to +85°C ambient temperature range.

The very small DFN-8 1.8 x 1.2 x 0.55mm 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**

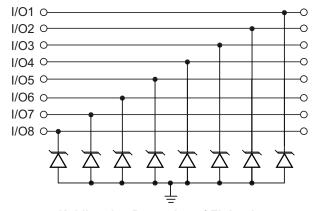
- ESD protection for high-speed data lines:
  - Exceeds: IEC 61000-4-2 (ESD) ±15kV (air),
    ±15kV (contact)
  - IEC61000-4-5 (Lightning) 5A (8/20μS)
  - Human Body Model (HBM) ±20kV
- Trench Vertical Structure [TVS]<sup>2</sup> ™ based technology used to achieve excellent ESD clamping performance
- Small package saves board space
- Low insertion loss
- Protects eight unidirectional 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

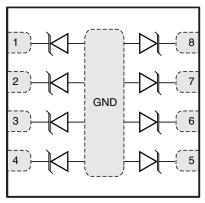


# **Typical Applications**



**Unidirection Protection of Eight Lines** 

## **Pin Configuration**



**Top View** 



#### **Ordering Information**

Part Number	Ambient Temperature Range	Package	Environmental	
AOZ8208DI-05	-40°C to +85°C	DFN-8	Green Product RoHS Compliant	



AOS Green Products use reduced levels of Halogens, and are also RoHS compliant.  $Please\ visit\ www.aosmd.com/web/quality/rohs\_compliant.jsp\ for\ additional\ information.$ 

#### **Absolute Maximum Ratings**

Exceeding the Absolute Maximum ratings may damage the device.

Parameter	Rating	
Peak Pulse Current (I <sub>PP</sub> ), t <sub>P</sub> = 8/20μs	5A	
Storage Temperature (T <sub>S</sub> )	-65°C to +150°C	
ESD Rating per IEC61000-4-2, Contact <sup>(1)</sup>	±15kV	
ESD Rating per IEC61000-4-2, Air <sup>(1)</sup>	±15kV	
ESD Rating per Human Body Model <sup>(2)</sup>	±20kV	

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

# **Maximum Operating Ratings**

Parameter	Rating	
Junction Temperature (T <sub>J</sub> )	-40°C to +125°C	

#### **Electrical Characteristics**

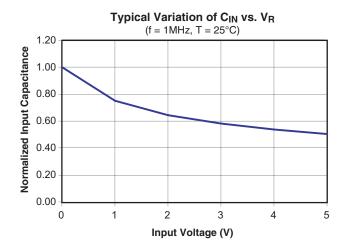
 $T_A = 25$ °C unless otherwise specified.

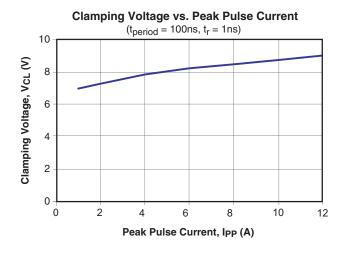
Symbol	Parameter	Diagram
I <sub>PP</sub>	Maximum Reverse Peak Pulse Current	
V <sub>CL</sub>	Clamping Voltage @ I <sub>PP</sub>	
$V_{RWM}$	Working Peak Reverse Voltage	F
I <sub>R</sub>	Maximum Reverse Leakage Current	
$V_{BR}$	Breakdown Voltage	V <sub>CL</sub> V <sub>BR</sub> V <sub>RWM</sub>
I <sub>F</sub>	Forward Current	IR VF
V <sub>F</sub>	Forward Voltage	¬  /
P <sub>PK</sub>	Peak Power Dissipation	
СЈ	Capacitance @ V <sub>R</sub> = 0 and f = 1MHz	I Ipp

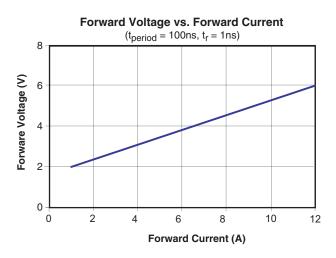
	Device	V <sub>RWM</sub> (V)	V <sub>BR</sub> (V)	Ι <sub>R</sub> (μΑ)	V <sub>E</sub> (V)	V <sub>CL</sub> Max.		C <sub>J</sub> (pF)	C <sub>1</sub> (pF)	
Device	Marking	Max.	Min.	Max.		I <sub>PP</sub> = 1A	I <sub>PP</sub> = 5A	I <sub>PP</sub> = 12A		Max.
AOZ8208DI-05	D	5	6.0	0.1	0.85	7.0	8.0	9.0	10	12

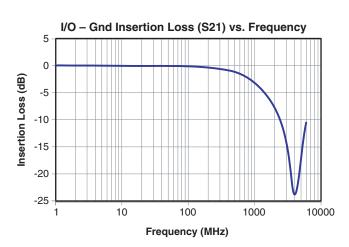


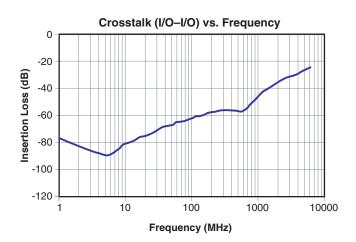
# **Typical Performance Characteristics**











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#### **Applications Information**

# **Device Connection for Protection of Eight Unidirectional Data Lines**

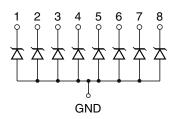
These devices are designed to protect up to eight unidirectional data lines. The device is connected as follows.

 Unidirectional protection of eight I/O lines is achieved by connecting pins 1 through 8 to the data lines.
 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.

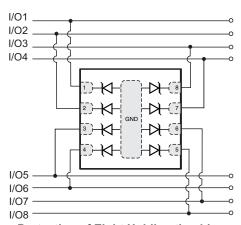
#### Circuit Board Layout Recommendations for Suppression of ESD

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.



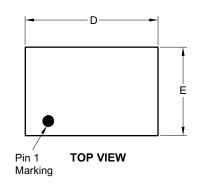
**Circuit Diagram** 

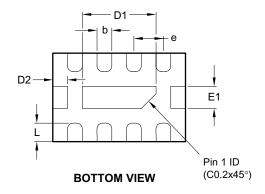


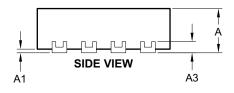
**Protection of Eight Unidirection Lines** 



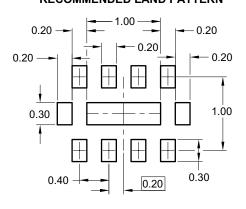
# Package Dimensions, DFN 1.8 x 1.2, 8L







#### RECOMMENDED LAND PATTERN



#### **Dimensions in millimeters**

Symbols	Min.	Nom.	Max.	
Α	0.50	0.55	0.60	
A1	0.00	_	0.05	
A3	0	.152 Re	f.	
b	0.15	0.20	0.25	
D	1.75	1.80	1.85	
D1	0.95	1.00	1.05	
D2	0.200 Ref.			
E	1.15	1.20	1.25	
E1	0.25	0.30	0.35	
е	0.40 BSC			
L	0.20	0.25	0.30	

#### **Dimensions in inches**

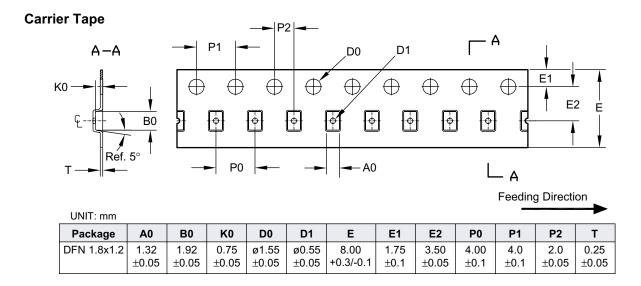
Symbols	Min.	Nom.	Max.	
Α	0.020	0.022	0.024	
A1	0.000	l —	0.002	
A3	0.006 Ref.			
b	0.006	0.008	0.010	
D	0.069	0.071	0.073	
D1	0.037	0.039	0.041	
D2	0.008 Ref.			
Е	0.045	0.047	0.049	
E1	0.010	0.012	0.014	
е	0.016 BSC			
L	0.008	0.010	0.012	

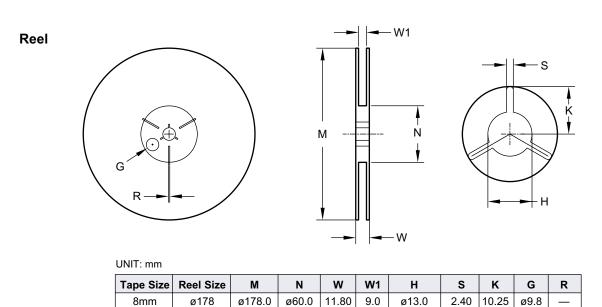
#### Notes:

- 1. Controlling dimension is millimeter, converted inch dimensions are not necessaily exact.
- 2. Warpage shall not exceed 0.10mm.
- 3. Marking is for package orientation reference only.



# Tape and Reel Dimensions, DFN 1.8 x 1.2, 8L





±1.0

±0.5

±0.5

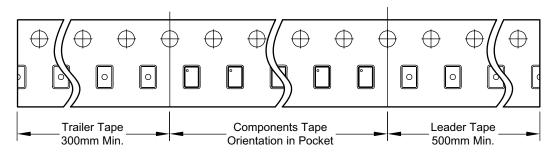
+0.5/-0.2

±0.10

±0.2

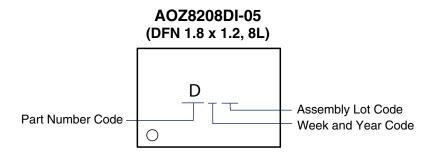
±1.0

#### Leader / Trailer & Orientation





# **Package Marking**



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#### **Revision History**

Revision	Revised Item		
Rev. 1.0	Initial release		

This data sheet contains preliminary data; supplementary data may be published at a later date. Alpha & Omega Semiconductor reserves the right to make changes at any time without notice.

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- 2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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