



#### **General Description**

The AOZ8251BDI is a one-line bi-directional transient voltage suppressor diode designed to protect voltage sensitive electronics from high transient conditions and ESD.

This device incorporates bi-directional TVS diode in an ultra-small DFN 1006 package. It may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 (±15kV air, ±8kV contact discharge).

The AOZ8251BDI comes in an RoHS compliant DFN 1.0 mm x 0.6 mm package and is rated over a  $-40^{\circ}$ C to  $+125^{\circ}$ C ambient temperature range.

The ultra-small 0.62 mm x 0.32 mm x 0.5 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 voltage sensitive electronics from high transient conditions and ESD.

### Features

- ESD protection for high-speed data lines
  - AOZ8251BDI-05:
  - Exceeds: IEC 61000-4-2 (ESD) ± 20 kV (air), ±20 kV (contact)
  - Human Body Model (HBM) ± 30 kV
  - IEC 61000-4-5 (Lightning) 4 A (8/20 μs)

AOZ8251BDI-12:

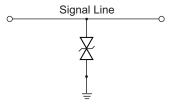
- Exceeds: IEC 61000-4-2 (ESD) ± 20 kV (air), ± 20 kV (contact)
- Human Body Model (HBM) ± 30 kV
- IEC 61000-4-5 (Lightning) 1.5 A (8/20 μs)
- Pb-free device

### Applications

- Portable hand-held devices
- Keypads, data lines, buttons
- Notebook computers
- Digital cameras
- Portable GPS



### **Typical Application**



Bidirection Protection of Single Line

## **Pin Configuration**



### **Ordering Information**

Part Number	Ambient Temperature Range	Package	Environmental		
AOZ8251BDI-05	-40°C to +125°C	DFN 0.62 x 0.32	Green Product		
AOZ8251BDI-12	-40 C 10 + 125 C		Gleen Floduct		



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.

	Rating for A	Rating for AOZ8251BDI		
Parameter	-05	-12		
VP – VN	5 V	12 V		
Peak Pulse Current, t <sub>P</sub> = 8/20 μs	4 A	1.5 A		
Storage Temperature (T <sub>S</sub> )	-65°C to	) +150°C		
ESD Rating per IEC61000-4-2, Contact <sup>(1)</sup>	± 20 kV	± 20 kV		
ESD Rating per IEC61000-4-2, Air <sup>(1)</sup>	± 20 kV	± 20 kV		
ESD Rating per Human Body Model <sup>(2)</sup>	± 30 kV	± 30 kV		

Notes:

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

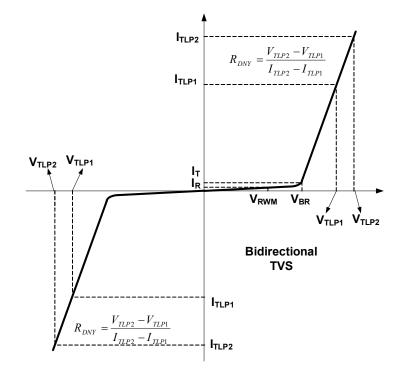
## **Maximum Operating Ratings**

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



### **Electrical Characteristics**

 $T_A$  = 25°C unless otherwise specified.



AOZ8251BDI-05						
Symbol	Parameter	Condition	Min.	Тур.	Max.	Units
V <sub>RWM</sub>	Reverse Working Voltage	I/O Pin-to-Ground			5	V
V <sub>BR</sub>	Reverse Breakdown Voltage	I <sub>T</sub> =1mA, I/O Pin-to-Ground	5.5	6	8	V
I <sub>R</sub>	Reverse Leakage Current	V <sub>RWM</sub> =5V, I/O Pin-to-Ground		1	100	nA
V <sub>CL</sub>	Clamping Voltage <sup>(3)</sup> (100ns Transmission Line Pulse, I/O Pin-to-Ground)	I <sub>TLP</sub> =1A		8	11	V
		I <sub>TLP</sub> =16A		16.5	24	V
	Clamping Voltage <sup>(3)</sup> (IEC61000-4-5, 8/20µs, I/O Pin-to-Ground)	I <sub>PP</sub> =4A		15	18	V
R <sub>DNY</sub>	Dynamic Resistance <sup>(3)</sup>	I <sub>TLP</sub> =1A to 12A		0.55		Ω
CJ	Junction Capacitance	V <sub>I/O</sub> =0V, f=1MHz, I/O Pin-to-Ground		5	6.5	pF



# Electrical Characteristics (continued)

AOZ8251BDI-12						
Symbol	Parameter	Condition	Min.	Тур.	Max.	Units
V <sub>RWM</sub>	Reverse Working Voltage	I/O Pin-to-Ground			12	V
V <sub>BR</sub>	Reverse Breakdown Voltage	I <sub>T</sub> =1mA, I/O Pin-to-Ground	13	14.5	16	V
I <sub>R</sub>	Reverse Leakage Current	V <sub>RWM</sub> =12V, I/O Pin-to-Ground		1	100	nA
V <sub>CL</sub>	Clamping Voltage <sup>(3)</sup> (100ns Transmission Line Pulse, I/O Pin-to-Ground)	I <sub>TLP</sub> =1A		18	20	V
		I <sub>TLP</sub> =16A		25	33	V
	Clamping Voltage <sup>(3)</sup> (IEC61000-4-5, 8/20µs, I/O Pin-to-Ground)	I <sub>PP</sub> =1.5A			25	V
R <sub>DNY</sub>	Dynamic Resistance <sup>(3)</sup>	I <sub>TLP</sub> =10A to 20A		0.3		Ω
CJ	Junction Capacitance	V <sub>I/O</sub> =0V, f=1MHz, I/O Pin-to-Ground		4.5	6.5	pF

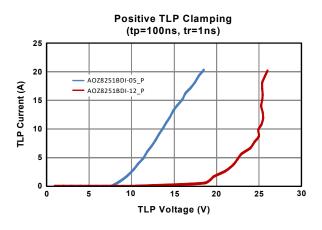
#### Note:

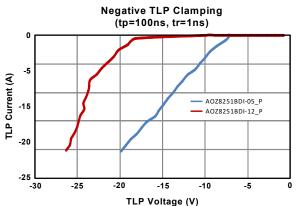
3. These specifications are guaranteed by design and characterization.

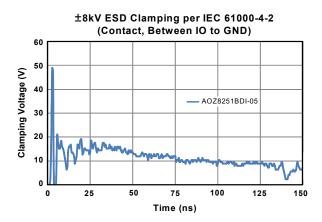


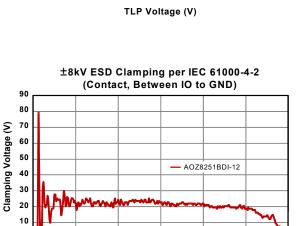
## **Typical Performance Characteristics**

 $T_A = 25^{\circ}C$ , unless otherwise specified.









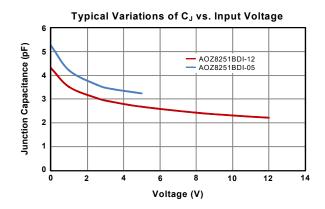
75

Time (ns)

100

125

150



Rev.2.0 September 2020

0

0

25

50



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