

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 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge).

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

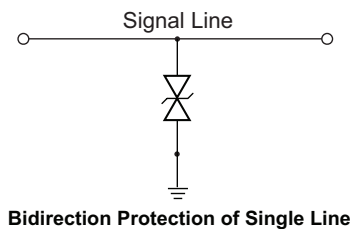
- ESD protection for high-speed data lines
 - AOZ8251BDI-05:
 - Exceeds: IEC 61000-4-2 (ESD) $\pm 20\text{ kV}$ (air), $\pm 20\text{ kV}$ (contact)
 - Human Body Model (HBM) $\pm 30\text{ kV}$
 - IEC 61000-4-5 (Lightning) 4 A (8/20 μs)
 - AOZ8251BDI-12:
 - Exceeds: IEC 61000-4-2 (ESD) $\pm 20\text{ kV}$ (air), $\pm 20\text{ kV}$ (contact)
 - Human Body Model (HBM) $\pm 30\text{ kV}$
 - 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



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			



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 for AOZ8251BDI	
	-05	-12
VP – VN	5 V	12 V
Peak Pulse Current, $t_p = 8/20 \mu s$	4 A	1.5 A
Storage Temperature (T_S)	-65°C to +150°C	
ESD Rating per IEC61000-4-2, Contact ⁽¹⁾	± 20 kV	± 20 kV
ESD Rating per IEC61000-4-2, Air ⁽¹⁾	± 20 kV	± 20 kV
ESD Rating per Human Body Model ⁽²⁾	± 30 kV	± 30 kV

Notes:

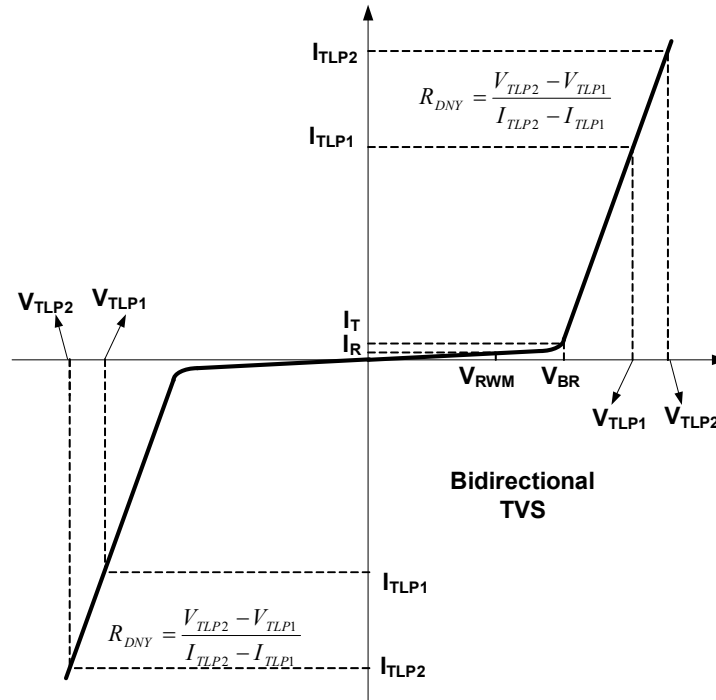
- IEC 61000-4-2 discharge with $C_{Discharge} = 150 \text{ pF}$, $R_{Discharge} = 330 \Omega$.
- Human Body Discharge per MIL-STD-883, Method 3015 $C_{Discharge} = 100 \text{ pF}$, $R_{Discharge} = 1.5 \text{ k}\Omega$.

Maximum Operating Ratings

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

Electrical Characteristics

T_A = 25°C unless otherwise specified.



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

Electrical Characteristics (continued)

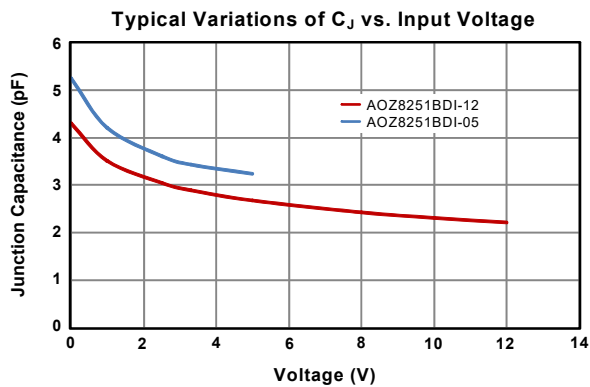
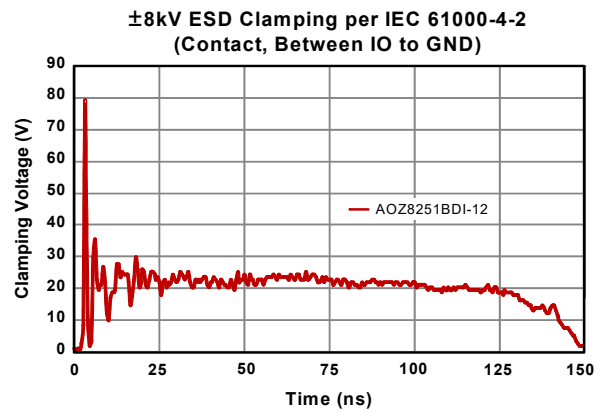
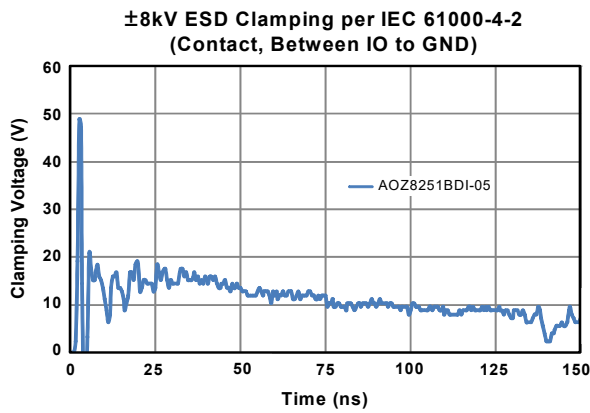
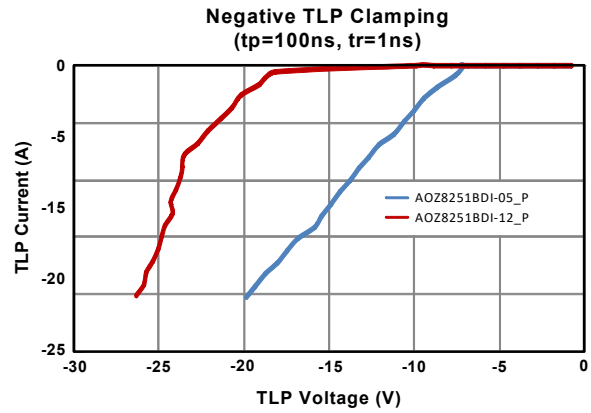
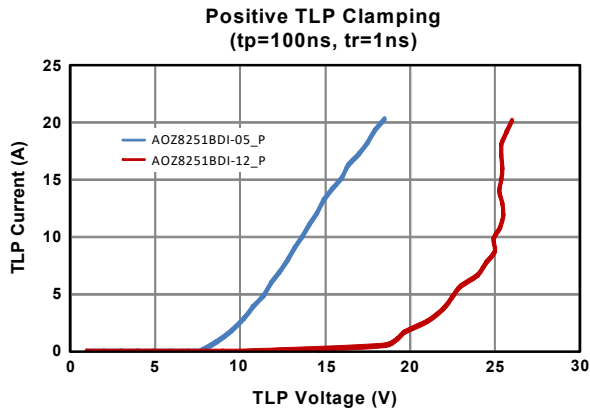
AOZ8251BDI-12						
Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
V_{RWM}	Reverse Working Voltage	I/O Pin-to-Ground			12	V
V_{BR}	Reverse Breakdown Voltage	$I_T=1mA$, I/O Pin-to-Ground	13	14.5	16	V
I_R	Reverse Leakage Current	$V_{RWM}=12V$, I/O Pin-to-Ground		1	100	nA
V_{CL}	Clamping Voltage ⁽³⁾ (100ns Transmission Line Pulse, I/O Pin-to-Ground)	$I_{TLP}=1A$		18	20	V
		$I_{TLP}=16A$		25	33	V
	Clamping Voltage ⁽³⁾ (IEC61000-4-5, 8/20 μ s, I/O Pin-to-Ground)	$I_{PP}=1.5A$			25	V
R_{DNY}	Dynamic Resistance ⁽³⁾	$I_{TLP}=10A$ to 20A		0.3		Ω
C_J	Junction Capacitance	$V_{I/O}=0V$, $f=1MHz$, I/O Pin-to-Ground		4.5	6.5	pF

Note:

3. These specifications are guaranteed by design and characterization.

Typical Performance Characteristics

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



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