

General Description

The AOZ8251BDI-16 is a single channel bi-directional transient voltage suppressor diode designed to protect data transmission lines from ESD.

This device incorporates two unidirectional TVS diodes in a single package. During transient conditions, the TVS diodes direct the transient energy to either the positive side of the data line or to ground.

The AOZ8251BDI-16 comes in a RoHS compliant and Halogen Free 0.62 mm x 0.32 mm x 0.3 mm package and is rated for -40°C to +125°C junction temperature range.

Features

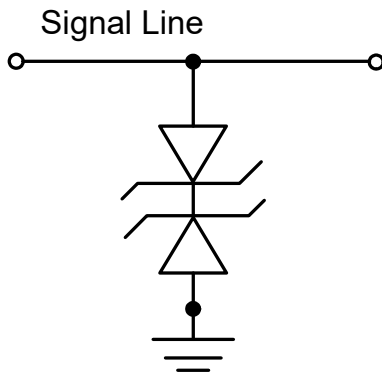
- ESD protection for high-speed data lines:
 - IEC 61000-4-2 (ESD) ± 15 kV (air), ± 15 kV (contact)
 - Human Body Model (HBM) ± 8 kV
 - IEC 61000-4-5 (Lightning) 1.2 A (8/20 μ s)
- Protects four I/O lines
- Capacitance between I/O to GND: 3 pF
- Max. reverse working voltage: 16 V

Applications

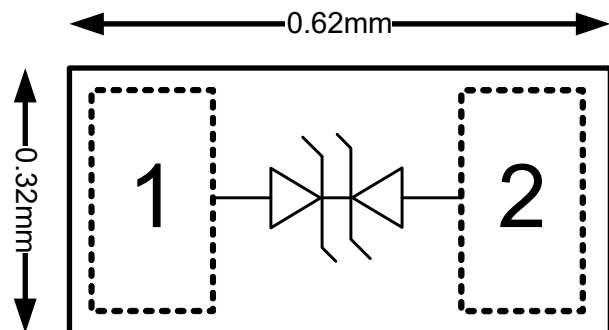
- USB2.0 (Type-A, Type-B, Type-C)
- Mobile Phones
- Notebook Computers



Typical Application



Pin Configuration



Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8251BDI-16	-40°C to +125°C	DFN 0.62 x 0.32	Green Product



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
Storage Temperature (T_S)	-65°C to +150°C
ESD Rating per IEC61000-4-2, Contact ⁽¹⁾	±15 kV
ESD Rating per IEC61000-4-2, Air ⁽¹⁾	±15 kV
ESD Rating per Human Body Model ⁽²⁾	±8 kV

Notes:

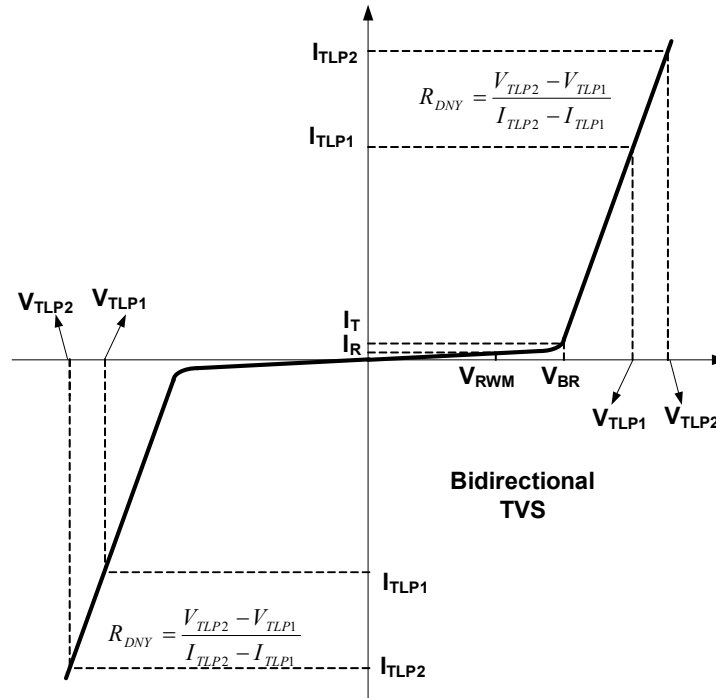
- IEC 61000-4-2 discharge with $C_{Discharge} = 150$ pF, $R_{Discharge} = 330$ Ω.
- Human Body Discharge per MIL-STD-883, Method 3015 $C_{Discharge} = 100$ pF, $R_{Discharge} = 1.5$ kΩ.

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	Condition	Min.	Typ.	Max.	Units
V _{RWM}	Reverse Working Voltage	I/O Pin-to-Ground			16	V
V _{BR}	Reverse Breakdown Voltage	I _T =100μA, I/O Pin-to-Ground	17	20	23	V
I _R	Reverse Leakage Current	Max. V _{RWM} , I/O Pin-to-Ground		1	100	nA
V _{CL}	Clamping Voltage ⁽³⁾⁽⁴⁾ (100ns Transmission Line Pulse, I/O Pin-to-Ground)	I _{TLP} =1A		21	25	V
		I _{TLP} =16A		28	32	V
R _{DNY}	Dynamic Resistance ⁽³⁾⁽⁴⁾	I _{TLP} =8A to 16A		0.4		Ω
I _{PP}	Peak Pulse Current ⁽³⁾ (IE61000-4-5 Surge 8/20μs)				1.2	A
V _{CL}	Clamping Voltage ⁽³⁾ (IE61000-4-5 Surge 8/20μs)	I _{PP} = 1A		26	31	V
		I _{PP} = 1.2A		27	32	
C _J	Junction Capacitance	V _{I/O} = 0V, f = 1MHz, I/O Pin-to-Ground		3	4.5	pF

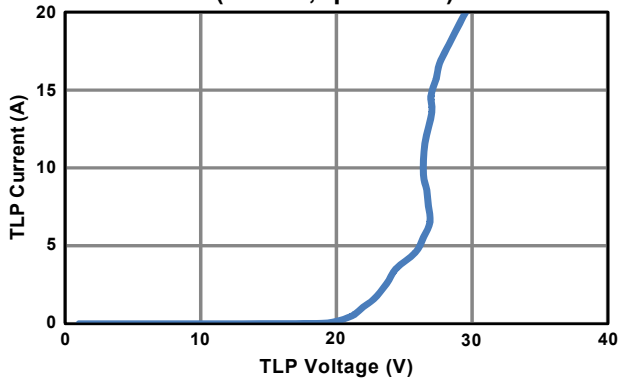
Note:

- 3. These specifications are guaranteed by design and characterization.
- 4. Measurements performed using 100ns Transmission Line Pulse (TLP) system.

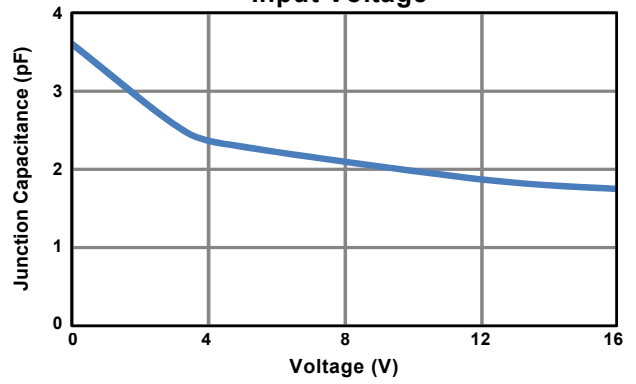
Typical Performance Characteristics

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

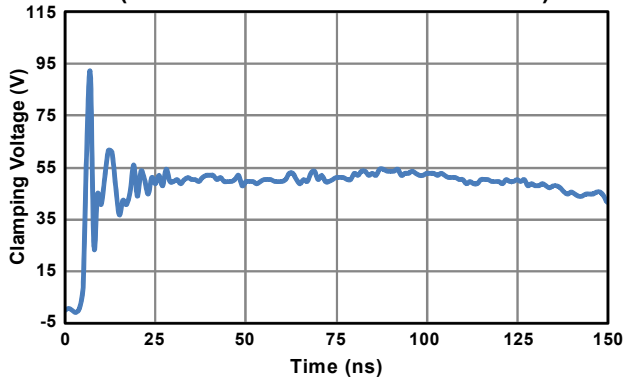
TLP Clamping Curve
($t_r=1\text{ns}$, $t_p=100\text{ns}$)



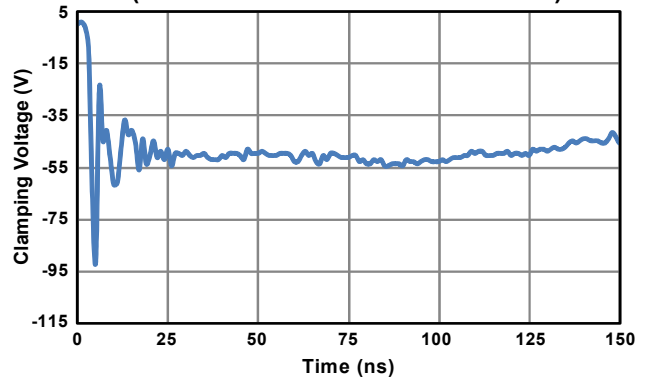
Typical Variations of CJ vs. Input Voltage



+8kV ESD Clamping per IEC 61000-4-2
(Connection between IO to GND)



-8kV ESD Clamping per IEC 61000-4-2
(Connection between IO to GND)



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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.