

General Description

The AOZ8S331BDS-05 is a single channel transient voltage suppressor designed to protect high-speed data lines.

The AOZ8S331BDS-05 provides a typical 0.5pF line to GND capacitance making it ideally suited for USB 2.0 application.

The AOZ8S331BDS-05 comes in a RoHS compliant and Halogen Free small 1.0mm x 0.6mm DFN package and is rated for -40°C to +125°C junction temperature range.

Features

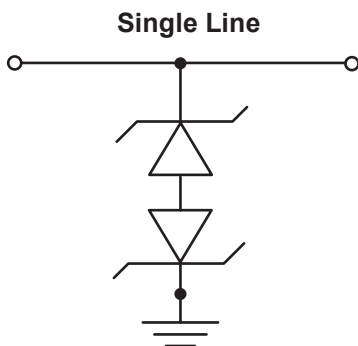
- ESD protection for high-speed data lines:
 - IEC 61000-4-2 ESD immunity
 - Air discharge: ±30kV
 - Contact discharge: ±30kV
 - IEC 61000-4-5 surge (8/20µs): 7A
- Low capacitance between any I/O pins: 0.5pF
- Low clamping voltage
- Reverse Working Voltage: 5V

Applications

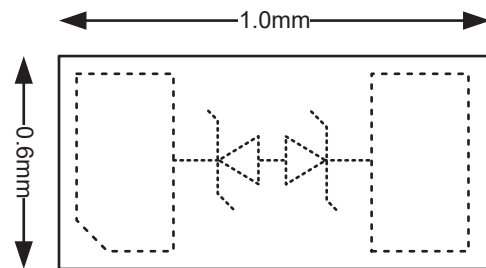
- USB 2.0
- USB Type-C
- Mobile phone
- Laptop, PC computers



Typical Application



Pin Configuration



Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8S331BDS-05	-40°C to +125°C	DFN 1.0 x 0.6-2L	Green Product



AOS Green Products use reduced levels of Halogens, and are also RoHS compliant. Please visit <https://aosmd.com/sites/default/files/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⁾	±30kV
ESD Rating per IEC61000-4-2, Air ⁽¹⁾	±30kV
ESD Rating per Human Body Mode (HBM) ⁽²⁾	±8kV
Surge Rating per IEC61000-4-5, 8/20µs	±7A

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 $C_{Discharge} = 100\text{pF}$, $R_{Discharge} = 1.5\text{k}\Omega$.

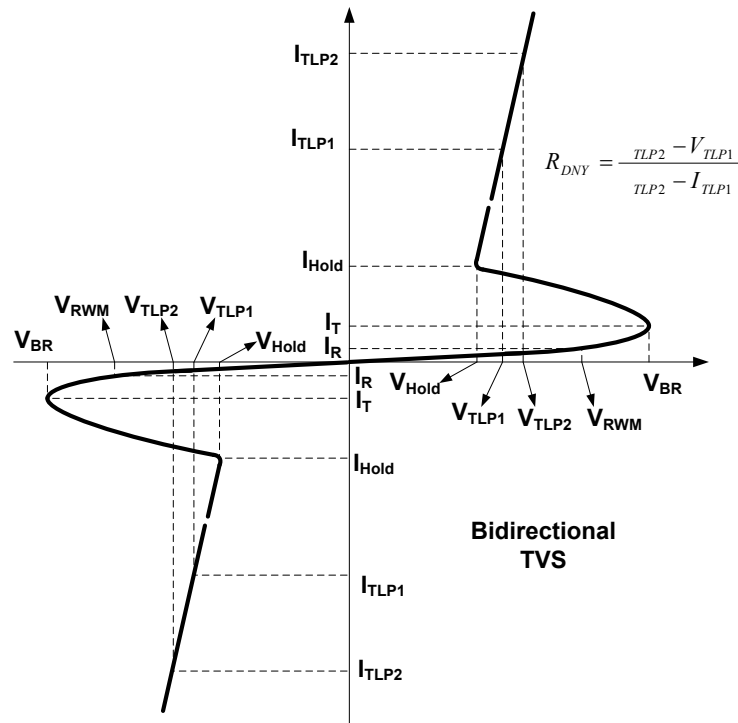
Maximum Operating Conditions

The device is not guaranteed to operate beyond the Maximum Recommended Operating Conditions.

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

Electrical Characteristics

T_A = 25°C, unless otherwise specified. Any Pin to Pin.



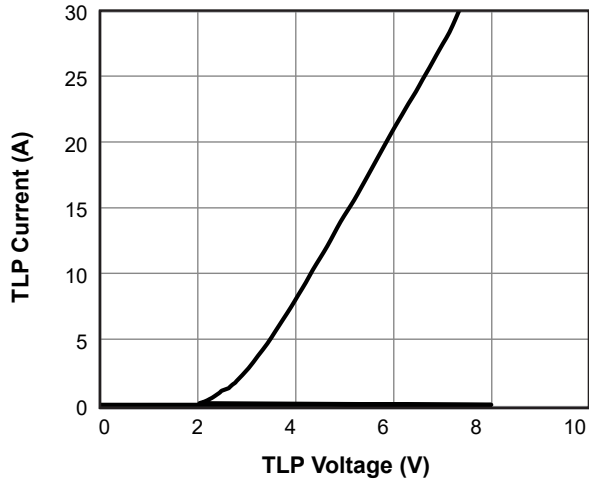
Symbol	Parameter	Conditions	Min	Typ	Max	Units
V _{RWM}	Reverse Working Voltage				5	V
V _{BR}	Reverse Breakdown Voltage	I _T = 100μA	6		9	V
I _R	Reverse Leakage Current	Max. V _{RWM}		1	100	nA
V _{CL}	Clamping Voltage ⁽³⁾⁽⁴⁾ (100ns Standard Transmission Line Pulse)	I _{TLP} = 1A		2.5		V
		I _{TLP} = 16A		5.3		
		I _{TLP} = 30A		7.4		
R _{DNY}	Dynamic Resistance ⁽³⁾⁽⁴⁾	I _{TLP} = 1 to 16A		0.18		Ω
V _{CL}	Clamping Voltage ⁽³⁾ (IEC61000-4-5 Surge 8/20μs)	I _{PP} = 2A		3		V
		I _{PP} = 7A		4.7		
C _J	Junction Capacitance	V _{I/O} = 0V, f = 1MHz		0.5	0.65	pF

Notes:

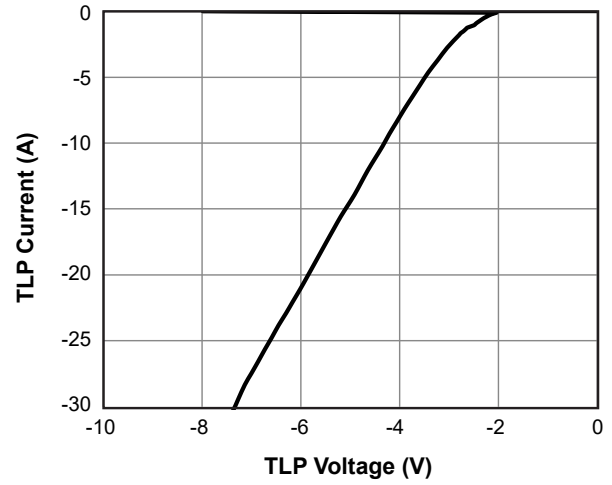
3. These specifications are guaranteed by design and characterization.
4. Measurements performed using a 100 ns Transmission Line Pulse (TLP) system.

Typical Characteristics

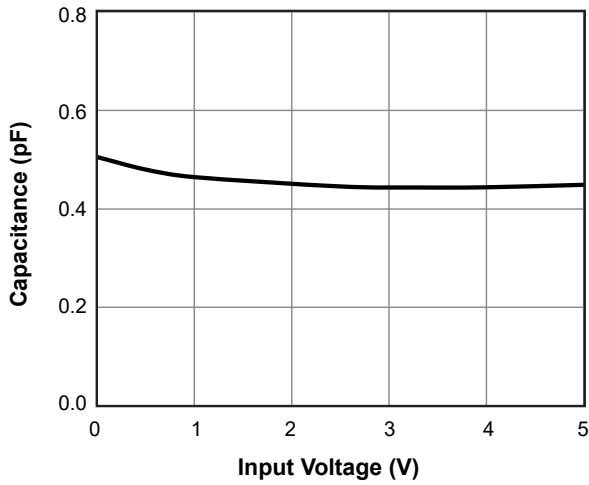
Positive Transmission Line Pulse
($t_p = 100\text{ns}$, $t_r = 0.2\text{ns}$)



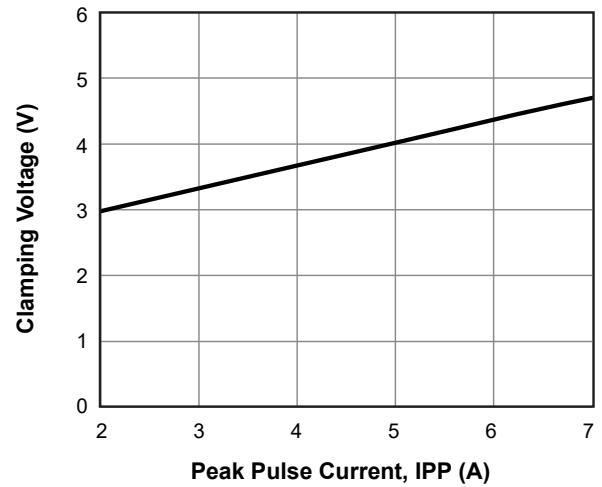
Negative Transmission Line Pulse
($t_p = 100\text{ns}$, $t_r = 0.2\text{ns}$)



Typical Variations of C_J vs. V_{IN}



IEC61000-4-5 Surge 8/20 μs



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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.