AOZ8S205BL2

Dual Channel Bidirectional 0.075pF TVS Diode

General Description

The AOZ8S205BL2 is a dual channel transient voltage suppressor designed to protect high speed data lines and voltage sensitive electronics from high transient conditions and ESD.

The AOZ8S205BL2 comes in an RoHS compliant package and is rated over a -40°C to +125°C ambient temperature range.

The ultra-small 0.63 mm x 0.33 mm 0201 footprint package makes the AOZ8S205BL2 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.

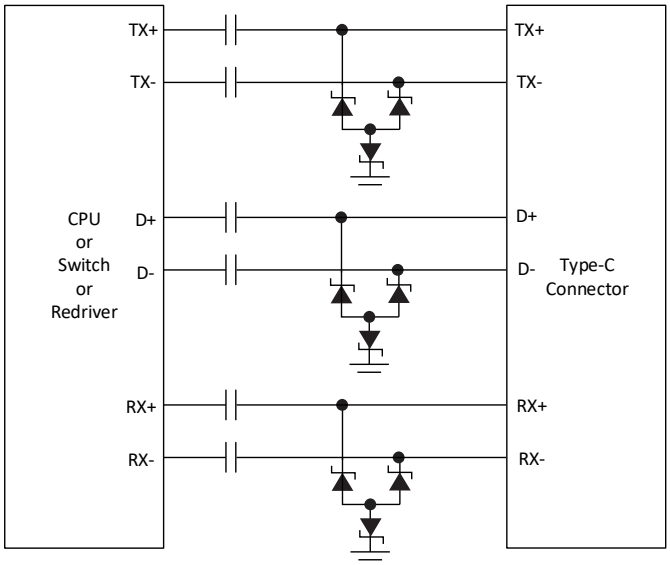
Features

- ESD protection for high-speed data lines:
  - IEC 61000 4-2, ESD immunity:
  - Air discharge: ±9kV
  - Contact discharge: ±9kV
  - IEC 61000-4-5 (Lightning 8/20µs): 3A
  - IEC 61000-4-4 EFT (5/50 ns): 40A
  - Human Body Mode: ±8kV
- Bidirectional TVS
- Low capacitance: 0.075 pF
- Low clamping voltage
- Low operating voltage: 3.3V, 5V

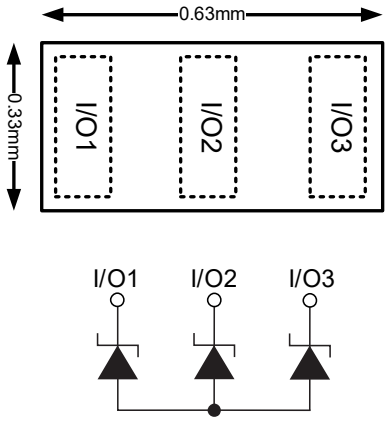
Applications

- USB4, Thunderbolt 4, PCI Express
- Mobile phones
- Notebook computers

Typical Applications



Pin Configuration



Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8S205BL2-03	-40°C to +125°C	WLCSP0.63x0.33A-3	Green Product
AOZ8S205BL2-05	-40°C to +125°C	WLCSP0.63x0.33A-3	Green Product

AOS products are offered in packages with Pb-free plating and compliant to RoHS standards.
Please visit https://aosmd.com/sites/default/files/media/AOSGreenPolicy.pdf for additional information.

Absolute Maximum Ratings

(T_A = 25°C, unless otherwise noted) Exceeding the Absolute Maximum Ratings may damage the device.

Parameter	Rating
AOZ8S205BL2-03Any Pin to Pin AOZ8S205BL2-05Any Pin to Pin	3.3V 5.5V
Peak Pulse Current (I_{PP}), t_P = 8/20µs	3A
Peak Pulse Power (P_{PP}), t_P = 8/20µs	16 W
Storage Temperature (T_S)	-65°C to +150°C
ESD Rating per IEC61000-4-2, Contact(1)	±9kV
ESD Rating per IEC61000-4-2, Air(1)	±9kV
ESD Rating per Human Body Mode(2)	±8kV

Notes:

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

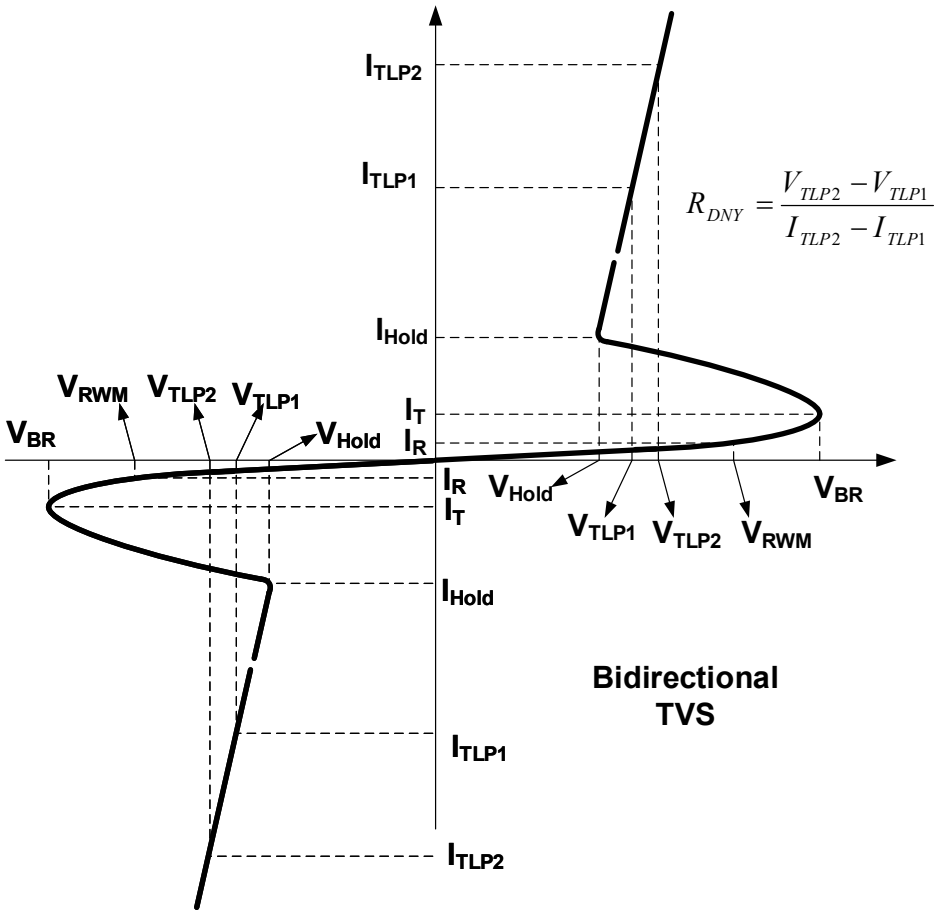
Maximum Operating Ratings

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

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

Electrical Characteristics

T_A = 25°C, unless otherwise noted. Pin 2 as GND.



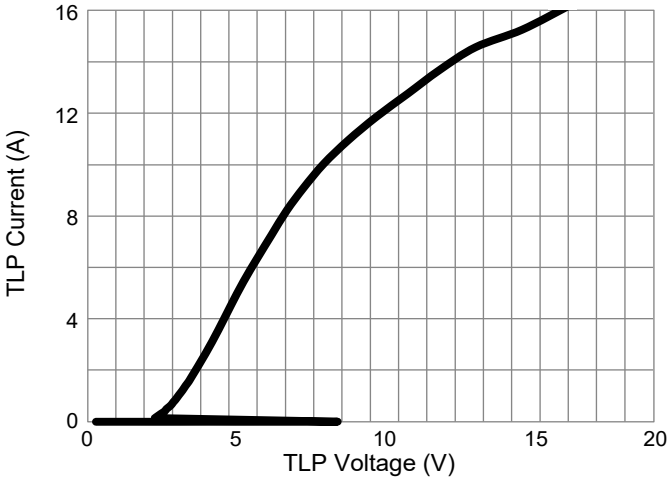
Symbol	Parameter	Conditions	Min	Typ	Max	Units
V_{RWM}	Reverse Working Voltage	AOZ8S205BL2-03 AOZ8S205BL2-05			3.3 5	V
V_{BR}	Reverse Breakdown Voltage	I_T = 100µA	6	7.5	9	V
I_R	Reverse Leakage Current	Max. V_{RWM}		1	50	nA
V_{CL}	Clamping Voltage(3)(4) (100 ns Transmission Line Pulse)	I_{TLP} = 1A		2.5		V
		I_{TLP} = 13A		13		
V_{CL}	Clamping Voltage(3) (IEC61000-4-5, 8/20 µs)	I_{PP} = 1A		3		
		I_{PP} = 3A		5.5		
R_{DNY}	Dynamic Resistance(3) (4)	I_{TLP} = 1A to 13A		0.9		Ω
C_J	Junction Capacitance	$V_{I/O}$ = 0V, f = 1MHz		0.075	0.095	pF

Notes:

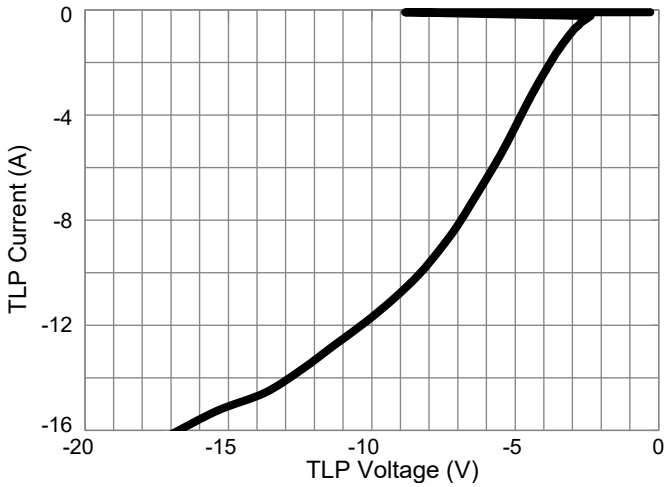
3. These specifications are guaranteed by design and characterization.
4. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

Typical Performance Characteristics

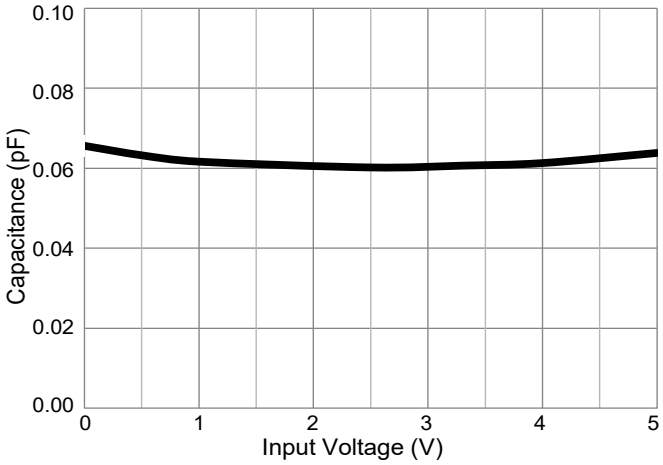
Positive Transmission Line Pulse (tp=100ns, tr=0.2ns)



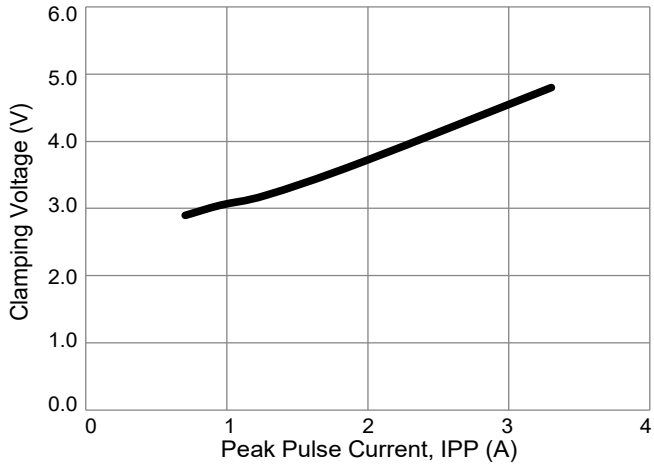
Negative Transmission Line Pulse (tp=100ns, tr=0.2ns)



Typical Variations of CJ vs. Input Voltage (Any Pin to Pin)

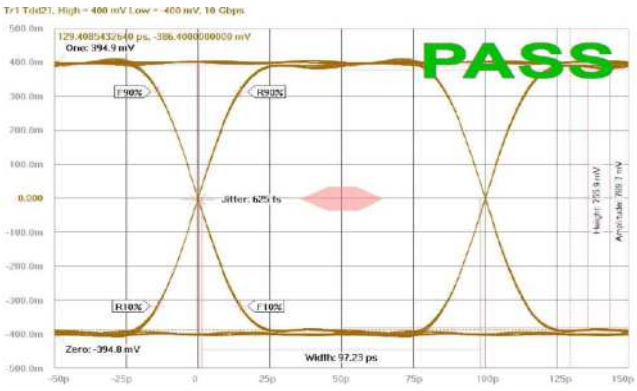


IEC61000-4-5 Surge 8/20µs (Any Pin to Pin)

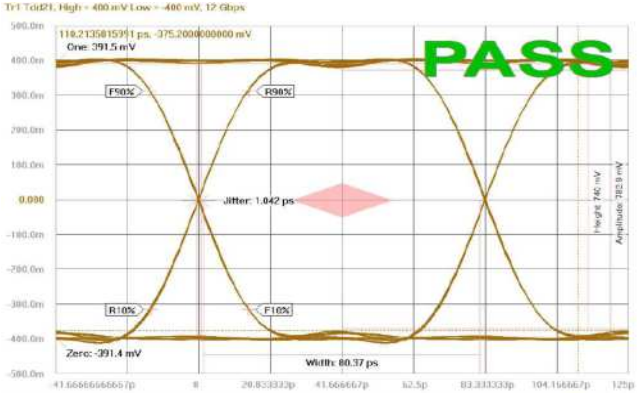


Typical Performance Characteristics *(Continued)*

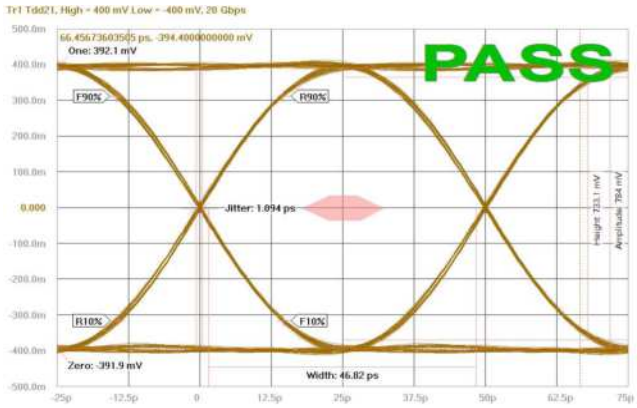
USB3.2 Gen2 Eye Diagram (10 Gbps)



HDMI2.1 Eye Diagram (12 Gbps)



Thunderbolt 3.0 Eye Diagram (20 Gbps)



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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.