

# AOZ8S204BLS-24

Single Channel Bidirectional 0.15pF TVS Diode

## **General Description**

The AOZ8S204BLS-24 is a single channel transient voltage suppressor designed to protect high speed data lines and voltage sensitive electronics from high transient conditions and ESD.

The AOZ8S204BLS-24 comes in an RoHS compliant package and is rated over a -40°C to +125°C ambient temperature range.

The ultra-small 0.6 mm x 0.3 mm 0201 footprint package makes the AOZ8S204BLS-24 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**

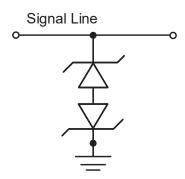
- ESD protection for high-speed data lines:
  - IEC 61000 4-2, ESD immunity:
    - Air discharge: ±20 kV
    - Contact Discharge: ±20 kV
  - IEC 61000-4-5 (Lightning 8/20 μs): 8.5 A
  - IEC 61000-4-4 EFT (5/50 ns): 40 A
  - Human Body Mode: ±8 kV
- Bidirectional TVS
- Low capacitance: 0.15 pF
- Low clamping voltage
- · Low operating voltage: 24 V

## **Applications**

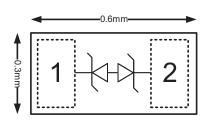
- USB 4, Thunderbolt 4, PCI Express
- Mobile phones
- Notebook computers



## **Typical Applications**



## **Pin Configuration**





## **Ordering Information**

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8S204BLS-24	-40°C to +125°C	WLCSP 0.6x0.3-2	Green Product



AOS products are offered in packages with Pb-free plating and compliant to RoHS standards. Please visit <a href="https://www.aosmd.com/media/AOSGreenPolicy.pdf">www.aosmd.com/media/AOSGreenPolicy.pdf</a> for additional information.

### **Absolute Maximum Ratings**

Exceeding the Absolute Maximum Ratings may damage the device.

Parameter	Rating
AOZ8S204BLS-24 Any Pin to Pin	24 V
Peak Pulse Current (I <sub>PP</sub> ), t <sub>P</sub> = 8/20 μs	8.5 A
Peak Pulse Power ( $P_{PP}$ ), $t_P$ = 8/20 $\mu$ s	50 W
Storage Temperature (T <sub>S</sub> )	-65°C to +150°C
ESD Rating per IEC61000-4-2, Contact <sup>(1)</sup>	±20 kV
ESD Rating per IEC61000-4-2, Air <sup>(1)</sup>	±20 kV
ESD Rating per Human Body Mode <sup>(2)</sup>	±8 kV

#### Notes:

- 1. IEC 61000-4-2 discharge with CDischarge = 150 pF, RDischarge = 330  $\Omega$ .
- 2. Human Body Discharge per MIL-STD-883, Method 3015 CDischarge = 100 pF, RDischarge = 1.5 k $\Omega$

## **Maximum Operating Ratings**

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

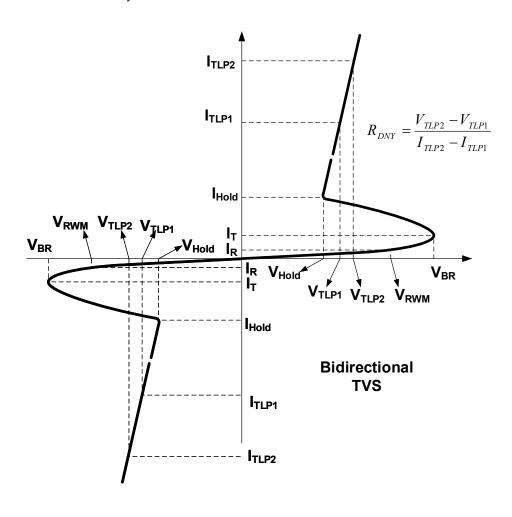
Parameter	Rating		
Junction Temperature (T <sub>J</sub> )	-40 °C to +125 °C		

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### **Electrical Characteristics**

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



Symbol	Parameter	Conditions	Min	Тур	Max	Units
$V_{RWM}$	Reverse Working Voltage				24	V
$V_{BR}$	Reverse Breakdown Voltage	I <sub>T</sub> = 100 μA	27	30	33	V
I <sub>R</sub>	Reverse Leakage Current	Max. V <sub>RWM</sub>		1	50	nA
VcL	Clamping Voltage <sup>(3)(4)</sup> (100 ns Transmission Line Pulse)	I <sub>TLP</sub> = 1 A		2.5		V
		I <sub>TLP</sub> = 16 A		6.0		
V <sub>C</sub> L	Clamping Voltage <sup>(3)</sup> (IEC61000-4-5, 8/20 µs)	I <sub>PP</sub> = 1 A		3.5		
		I <sub>PP</sub> = 8.5 A		6.5		
R <sub>DNY</sub>	Dynamic Resistance <sup>(3) (4)</sup>	I <sub>TLP</sub> = 1A to 16 A		0.23		Ω
СЈ	Junction Capacitance	V <sub>I/O</sub> = 1.0 V, f = 1MHz		0.15	0.19	pF

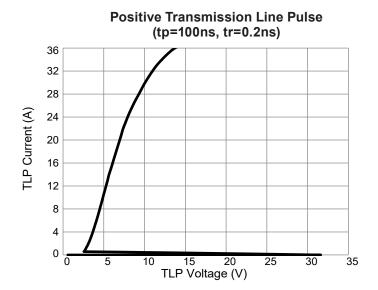
#### Notes:

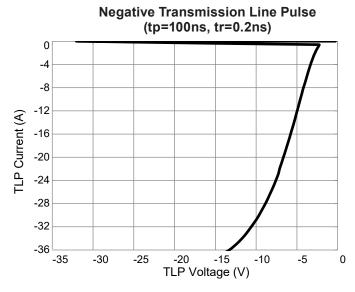
- $\ensuremath{\mathsf{3}}.$  These specifications are guaranteed by design and characterization.
- 4. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

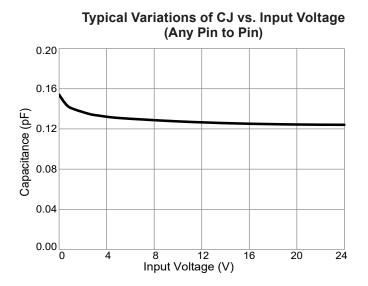
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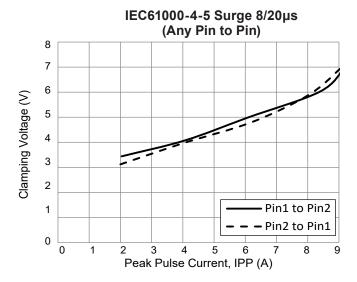


## **Typical Performance Characteristics**









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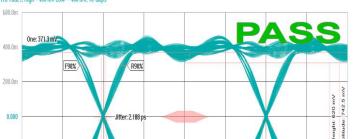
-600.0m

-50p

## **Typical Performance Characteristics** (Continued)

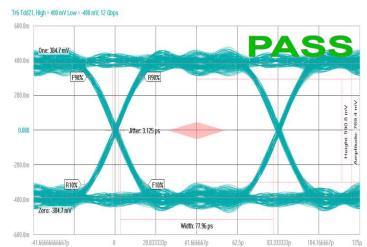
#### **USB3.2 Gen2 Eye Diagram (10 Gbps)**

# Tr6 Tdd21, High = 400 mV Low = -400 mV, 10 Gbps

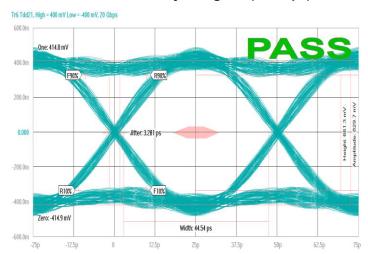


F10%

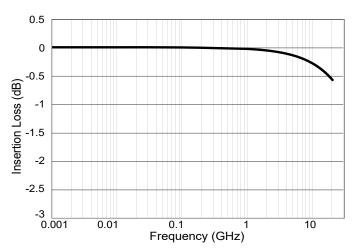
#### **HDMI2.1 Eye Diagram (12 Gbps)**



Thunderbolt 4.0 Eye Diagram (20 Gbps)



#### **S21 Insertion Loss**





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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.