AOZ8S303BLS-05

Single Channel Bidirectional TVS Diode

General Description

The AOZ8S303BLS-05 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 AOZ8S303BLS-05 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 AOZ8S303BLS-05 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

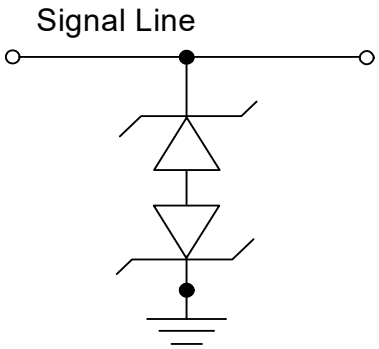
- ESD protection for high-speed data lines:
  - IEC 61000 4-2, ESD immunity:
    - Air discharge: ±20 kV
    - Contact Discharge: ±20 kV
  - IEC 61000-4-5 (Lightning 8/20 μs): 9 A
  - IEC 61000-4-4 EFT (5/50 ns): 80 A
  - Human Body Mode: ±8 kV
- Bidirectional TVS
- Low capacitance: 0.2 pF
- Low clamping voltage
- Low operating voltage: 5 V

Applications

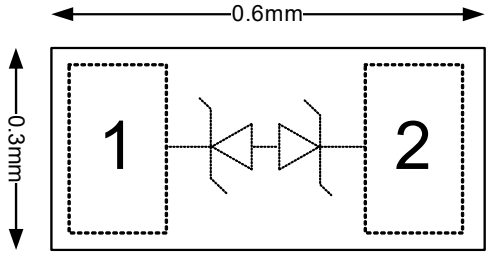
- USB3.2, Thunderbolt, PCI Express
- Mobile phones
- Notebook computers

Green Product

Typical Application



Pin Configuration



Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8S303BLS-05	-40°C to +125°C	WLCSP 0.6x0.3-2	Green Product

AOS Green Products use reduced levels of Halogens, and are also RoHS compliant.

Absolute Maximum Ratings

Exceeding the Absolute Maximum Ratings may damage the device.

Parameter	Rating
Any Pin to Pin	5 V
Peak Pulse Current (I_{PP}), t_P = 8/20 µs	9 A
Peak Pulse Power (P_{PP}), t_P = 8/20 µs	70 W
Storage Temperature (T_S)	-65°C to +150°C
ESD Rating per IEC61000-4-2, Contact(1)	±20 kV
ESD Rating per IEC61000-4-2, Air(1)	±20 kV
ESD Rating per Human Body Mode(2)	±8 kV

Notes:

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

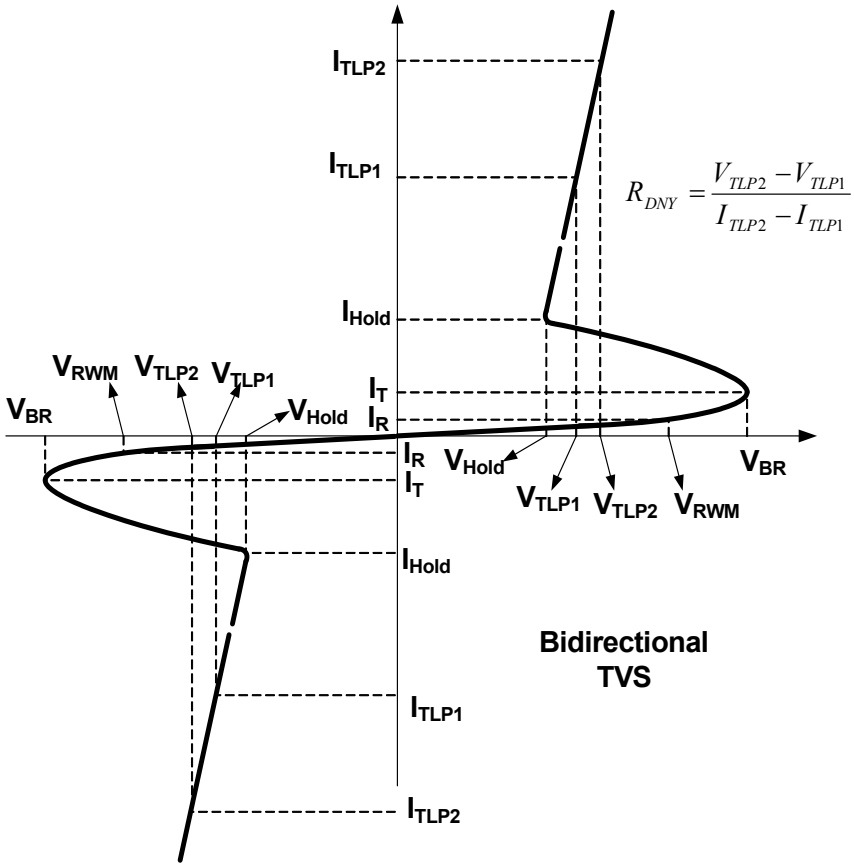
Maximum Operating Conditions

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 specified.



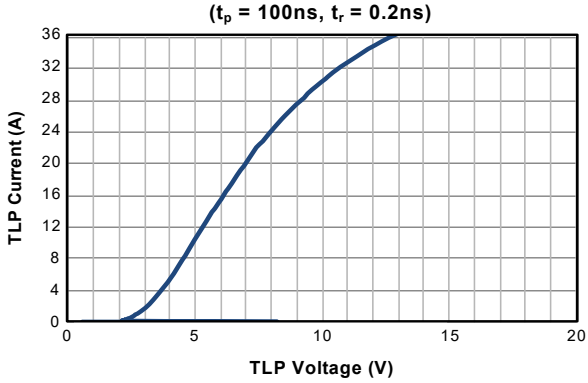
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_{RWM}	Reverse Working Voltage				5	V
V_{BR}	Reverse Breakdown Voltage	I_T = 100 µA	6	7.5	9	V
I_R	Reverse Leakage Current	Max. V_{RMW}		1	50	nA
V_{CL}	Clamping Voltage[3][4] (100ns Transmission Line Pulse)	I_{TLP} = 1 A		2.5		V
		I_{TLP} = 16 A		6		
	Clamping Voltage[3] (IEC61000-4-5, 8/20 µs)	I_{PP} = 1 A		2.5		
		I_{PP} = 9 A		6.5		
R_{DNY}	Dynamic Resistance[3][4]	I_{TLP} = 1 A to 16 A		0.25		Ω
C_J	Junction Capacitance	$V_{I/O}$ = 0 V, f = 1 MHz		0.20	0.25	pF

Notes:

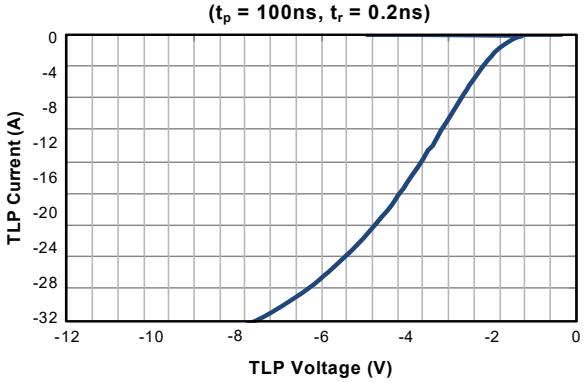
3. These specifications are guaranteed by design and characterization.
4. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

Typical Performance Characteristics

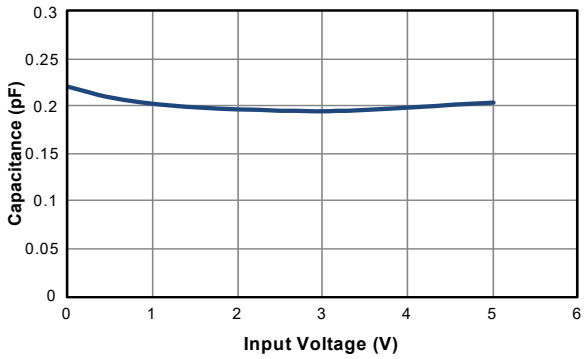
Positive TLP Curve
(t_p = 100ns, t_r = 0.2ns)



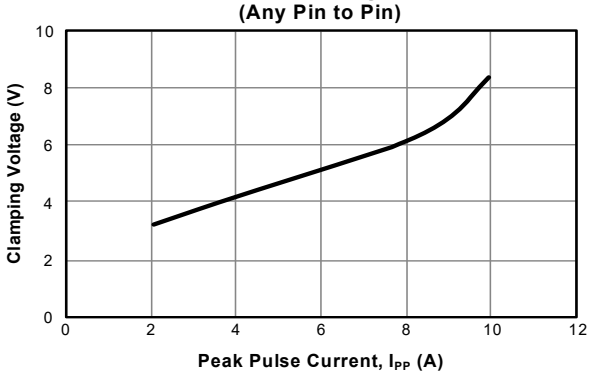
Negative TLP Curve
(t_p = 100ns, t_r = 0.2ns)



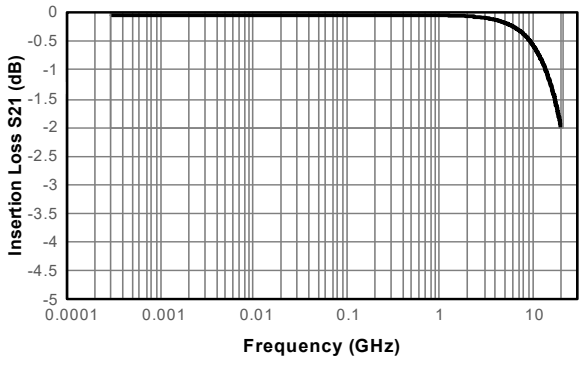
Typical Variations of CJ vs. Input Voltage



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

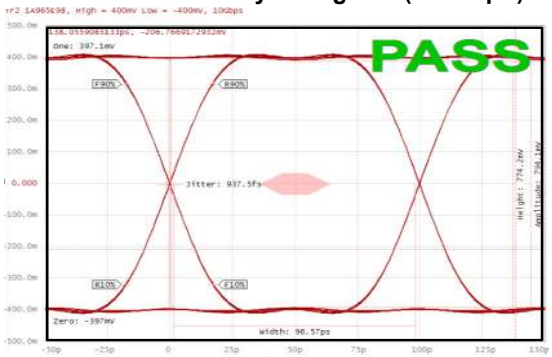


Insertion Loss S21

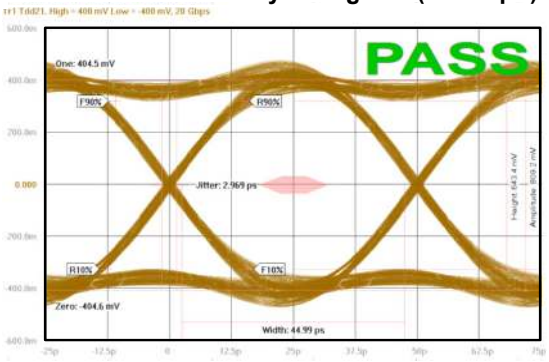


Typical Performance Characteristics (Continued)

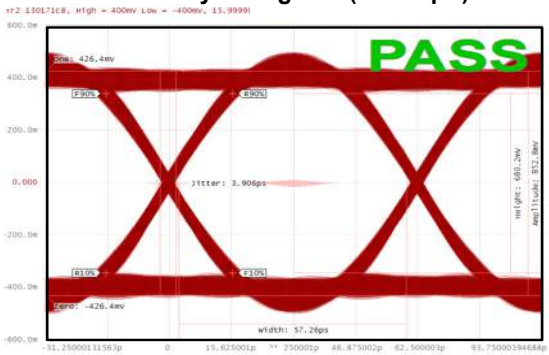
USB3.2 Gen2 Eye Diagram (10 Gbps)



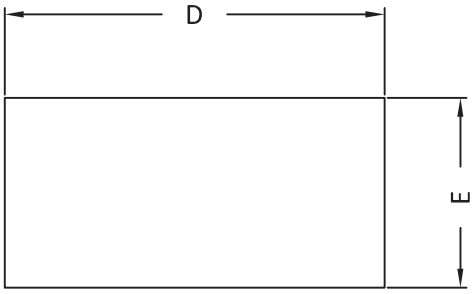
Thunderbolt 3.0 Eye Diagram (20 Gbps)



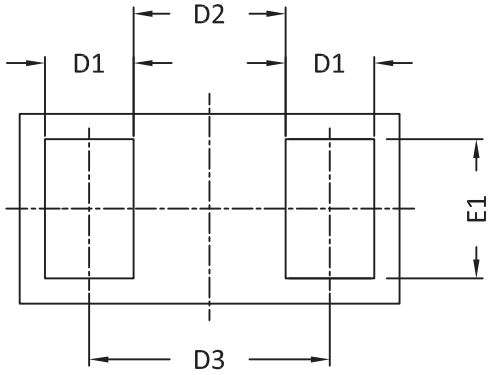
PCIE Eye Diagram (16 Gbps)



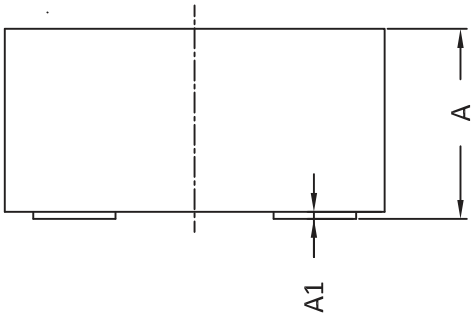
Package Dimensions, WLCSP 0.6x0.3-2



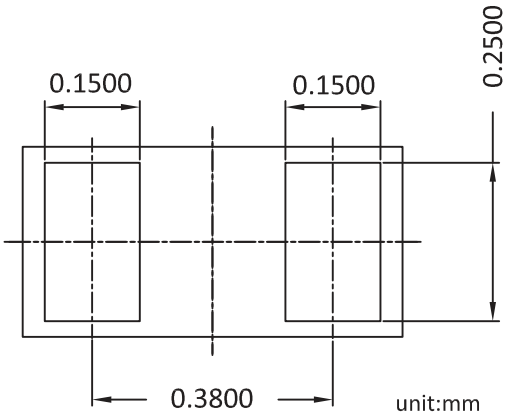
Top View



Bottom View



Side View



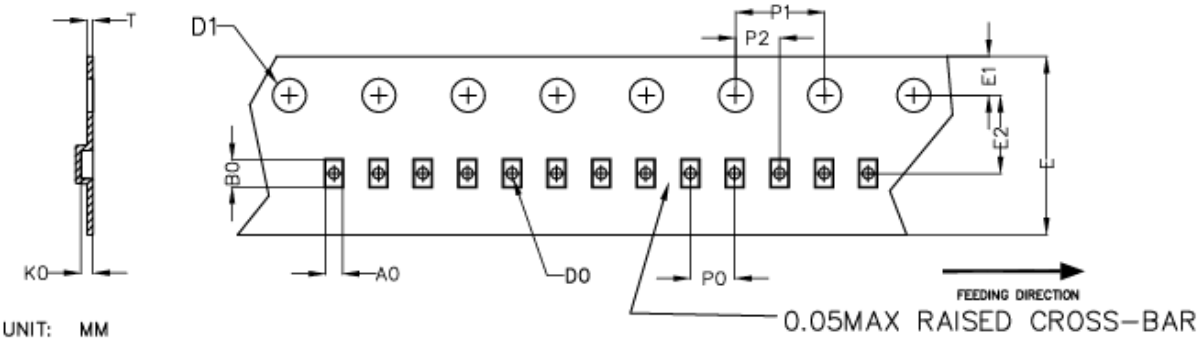
RECOMMEND LAND PATTERN

SYMBOLS	DIMENSION IN MILLIMETRES			DIMENSION IN INCHS		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.285	0.300	0.315	0.0112	0.0118	0.0124
A1	----	----	0.030	-----	-----	0.0012
D	0.575	0.600	0.625	0.0226	0.0236	0.0246
D1	0.110	0.140	0.170	0.0043	0.0055	0.0067
D2	0.190	0.240	0.290	0.0075	0.0094	0.0114
D3	----	0.380	----	-----	0.0150	-----
E	0.275	0.300	0.325	0.0108	0.0118	0.0128
E1	0.190	0.220	0.250	0.0075	0.0087	0.0098

NOTE
1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONS ARE INCLUSIVE OF PLATING.
3. CONTROLLING DIMENSION IS MILLIMETER. CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.
4. PADDLE EXPOSED ON BOTTOM.

Tape and Reel Dimensions, WLCSP 0.6x0.3-2

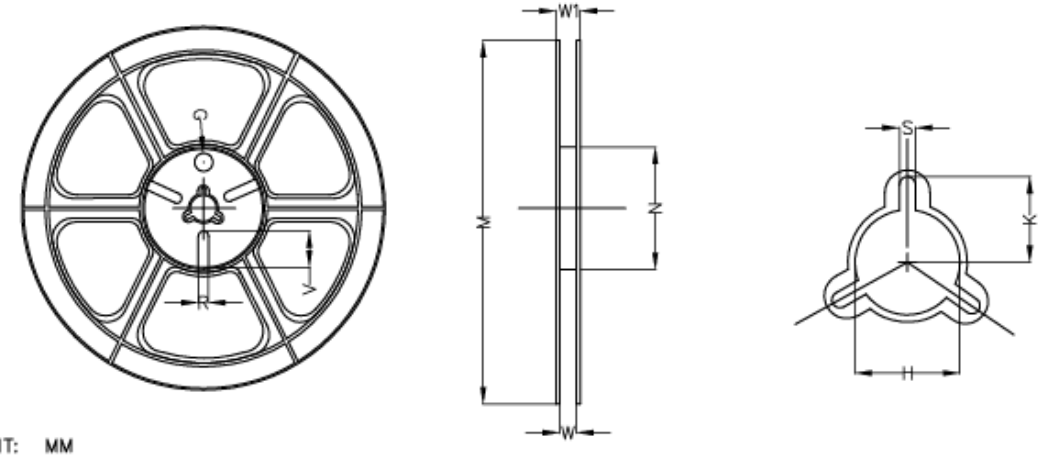
DFN0.6x0.3A_2L_EP2_S / WLCSP0.6x0.3_2_Carrier Tape



UNIT: MM

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
DFN(WLCSP)0.6x0.3	0.36 ±0.03	0.68 ±0.03	0.33 ±0.03	0.20 ±0.05	1.50 +0.10	8.00 ±0.10	1.75 ±0.10	3.50 ±0.05	2.00 ±0.10	4.00 ±0.10	2.00 ±0.05	0.20 ±0.02

DFN0.6x0.3A_2L_EP2_S / WLCSP0.6x0.3_2 REEL



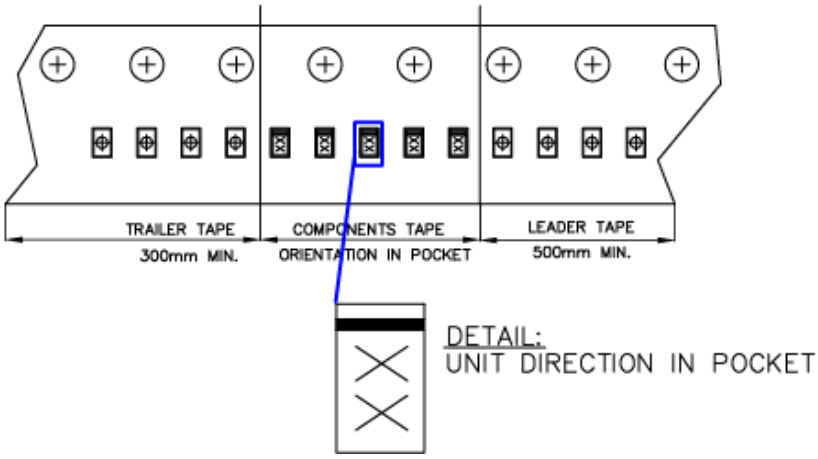
UNIT: MM

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
8 mm	ø178	ø178.00 ±1.00	ø54.00 ±0.50	9.00 ±0.30	11.40 ±1.00	ø13.00 +0.50 −0.20	10.60	2.00 ±0.50	ø9.00	5.00	18.00

DFN0.6x0.3A_2L_EP2_S / WLCSP0.6x0.3_2_TAPE

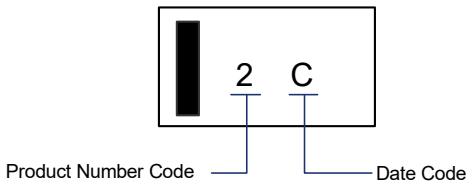
Leader / Trailer & Orientation

Unit Per Reel: 15000pcs



Part Marking

AOZ8S303BLS-05
(WLCSP 0.6x0.3 -2)



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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.