

General Description

The AOZ8201 is a one-line transient voltage suppressor diode designed to protect voltage sensitive electronics from high transient conditions and ESD. This state-of-the-art device utilizes AOS leading edge Trench Vertical Structure [TVS]²™ technology for superior clamping performance.

This device incorporates one TVS diode in an ultra-small SOD523 package. During transient conditions, the one-line TVS diode directs the transient to ground. It may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 (±15kV air, ±8kV contact discharge).

The AOZ8201 comes in an RoHS compliant SOD523 package and is rated over a -40°C to +85°C ambient temperature range.

The ultra-small 1.6 x 0.8 x 0.6mm SOD523 package makes it 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

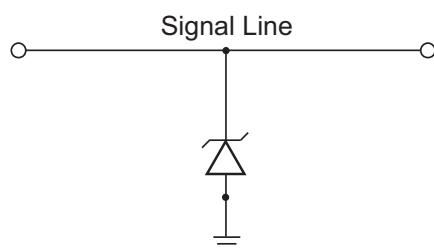
- ESD protection for high-speed data lines:
 - Exceeds: IEC 61000-4-2 (ESD) ±28kV (air), ±28kV (contact)
 - Human Body Model (HBM) ±30kV
- Trench Vertical Structure [TVS]²™ based technology used to achieve excellent ESD clamping performance
- Small package saves board space
- Low insertion loss
- Low clamping voltage
- Low operating voltage
- Green product

Applications

- Portable handheld devices
- Keypads, data lines, buttons
- Notebook computers
- Digital Cameras
- Portable GPS
- MP3 players



Typical Application



Unidirection Protection of Single Line

Pin Configuration



Ordering Information

| Part Number | Ambient Temperature Range | Package | Environmental |
|---------------|---------------------------|---------|---------------------------------|
| AOZ8201NI-05L | -40°C to +85°C | SOD523 | RoHS Compliant Green Product |
| AOZ8201NI-12L | | | |



All AOS products are offered in packages with Pb-free plating and compliant to RoHS standards. Parts marked as Green Products (with "L" suffix) use reduced levels of Halogens, and are also RoHS compliant. Please visit www.aosmd.com/web/quality/rohs_compliant.jsp for additional information.

Absolute Maximum Ratings

Exceeding the Absolute Maximum ratings may damage the device.

| Parameter | Rating |
|--|-----------------|
| VP – VN | 5V |
| Peak Pulse Current (I _{PP}), t _p = 8/20μs | 5A |
| Storage Temperature (T _S) | -65°C to +150°C |
| ESD Rating per IEC61000-4-2, Contact ⁽¹⁾ | ±28kV |
| ESD Rating per IEC61000-4-2, Air ⁽¹⁾ | ±28kV |
| ESD Rating per Human Body Model ⁽²⁾ | ±30kV |

Notes:

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

Maximum Operating Ratings

| Parameter | Rating |
|--|----------------|
| Junction Temperature (T _J) | -40°C to +85°C |

Electrical Characteristics

T_A = 25°C unless otherwise specified.

| Symbol | Parameter | Symbol | Parameter |
|------------------|------------------------------------|-----------------|--|
| I _{PP} | Maximum Reverse Peak Pulse Current | V _{BR} | Breakdown Voltage @ I _T = 1mA |
| V _{CL} | Clamping Voltage | I _T | Test Current = 1mA |
| V _{RWM} | Working Reverse Voltage | P _{pk} | Peak Power Dissipation |
| I _R | Maximum Reverse Leakage Current | C _J | Max. Capacitance @ V _R = 0 and f = 1MHz |

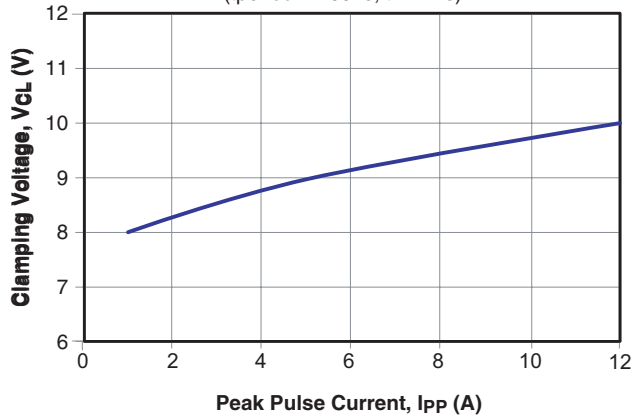
Electrical Characteristics

T_A = 25°C unless otherwise noted, V_F = 0.9V Max. @ I_F = 10mA for all types

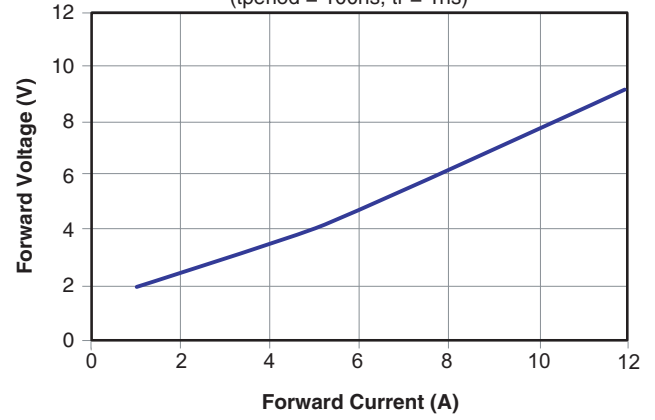
| Device | Device Marking | V _{RWM} (V) Max. | V _{BR} (V) Max. | I _R (μA) Max. | V _F (V) Typ. | V _{CL} Max. | | | C _J (pF) Max. |
|---------------|----------------|---------------------------|--------------------------|--------------------------|-------------------------|----------------------|----------------------|-----------------------|--------------------------|
| | | | | | | I _{PP} = 1A | I _{PP} = 5A | I _{PP} = 12A | |
| AOZ8201NI-05L | C | 5.0 | 6.0 | 0.1 | 0.75 | 8.00 | 9.00 | 10.00 | 16 |
| AOZ8201NI-12L | D | 12.0 | 15.0 | 0.1 | 0.75 | 18.00 | 20.00 | 21.00 | 30 |

Typical Performance Characteristics

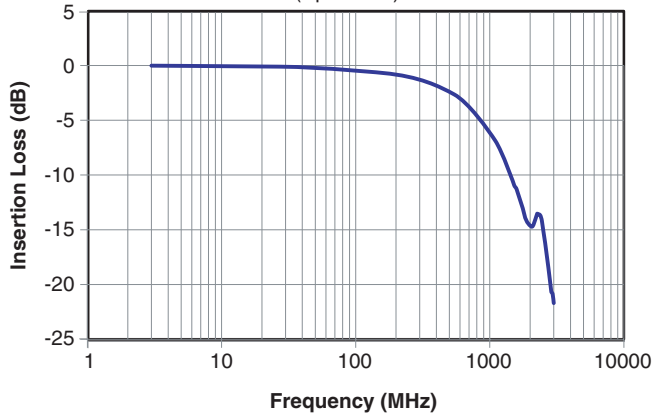
Clamping Voltage vs. Peak Pulse Current
(tperiod = 100ns, tr = 1ns)



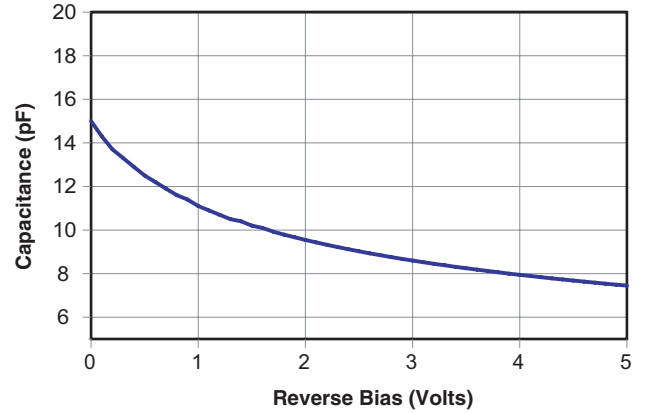
Forward Voltage vs. Forward Current
(tperiod = 100ns, tr = 1ns)



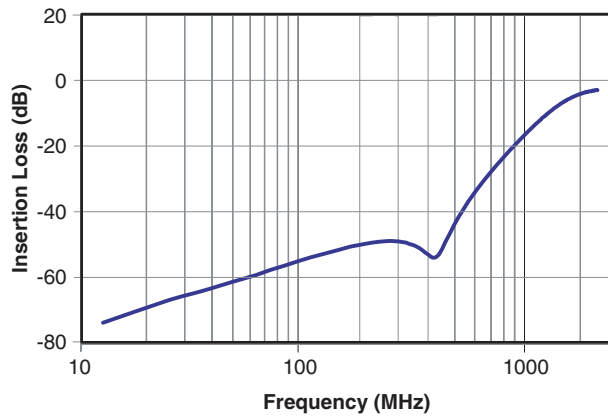
I/O – Gnd Insertion Loss (S21) vs. Frequency
(V_p = 3.3V)



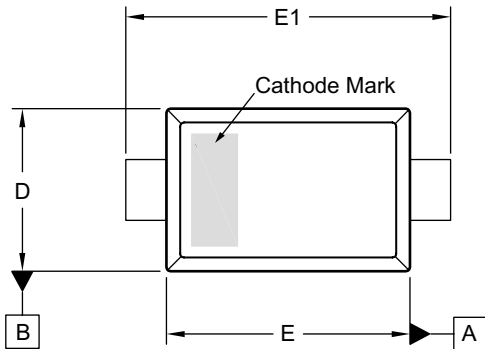
Capacitance vs. Reverse Bias



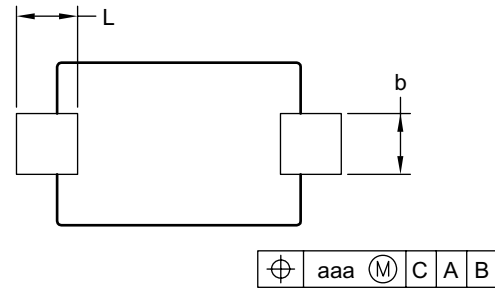
Analog Crosstalk (I/O–I/O) vs. Frequency



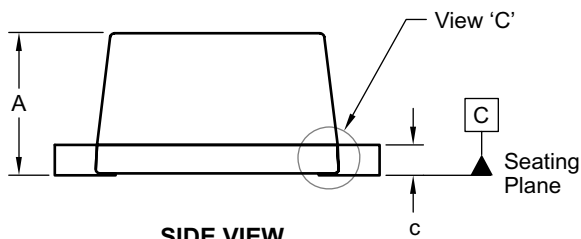
Package Dimensions, SOD523



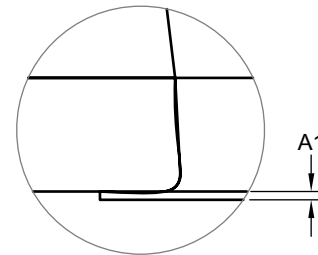
TOP VIEW



BOTTOM VIEW

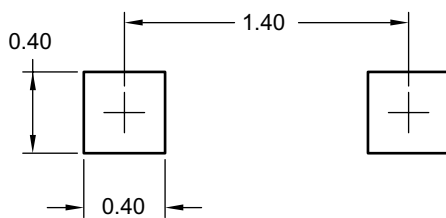


SIDE VIEW



VIEW 'C'

RECOMMENDED LAND PATTERN



UNIT: mm

Dimensions in millimeters

| Symbols | Min. | Nom. | Max. |
|---------|------|------|------|
| A | 0.50 | 0.60 | 0.70 |
| A1 | 0.00 | — | 0.05 |
| b | 0.25 | 0.30 | 0.35 |
| c | 0.07 | — | 0.20 |
| D | 0.70 | 0.80 | 0.90 |
| E | 1.10 | 1.20 | 1.30 |
| E1 | 1.50 | 1.60 | 1.70 |
| L | 0.25 | 0.30 | 0.40 |
| aaa | 0.08 | | |

Dimensions in inches

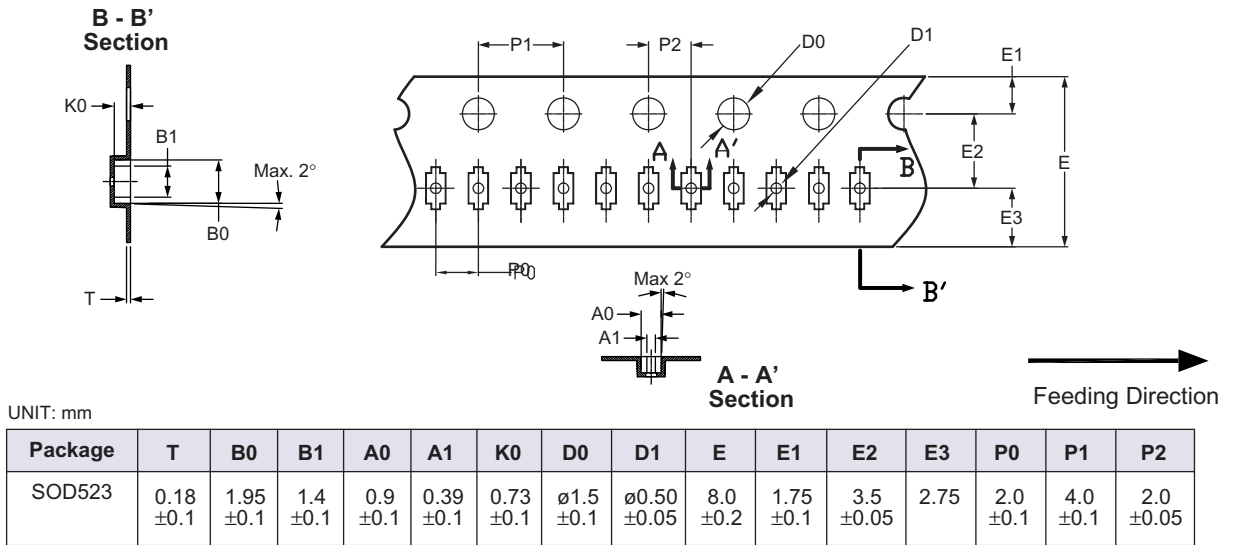
| Symbols | Min. | Nom. | Max. |
|---------|-------|-------|-------|
| A | 0.020 | 0.024 | 0.028 |
| A1 | 0.00 | — | 0.002 |
| b | 0.010 | 0.012 | 0.014 |
| c | 0.003 | — | 0.008 |
| D | 0.028 | 0.031 | 0.035 |
| E | 0.043 | 0.047 | 0.051 |
| E1 | 0.059 | 0.063 | 0.067 |
| L | 0.010 | 0.012 | 0.016 |
| aaa | 0.003 | | |

Notes:

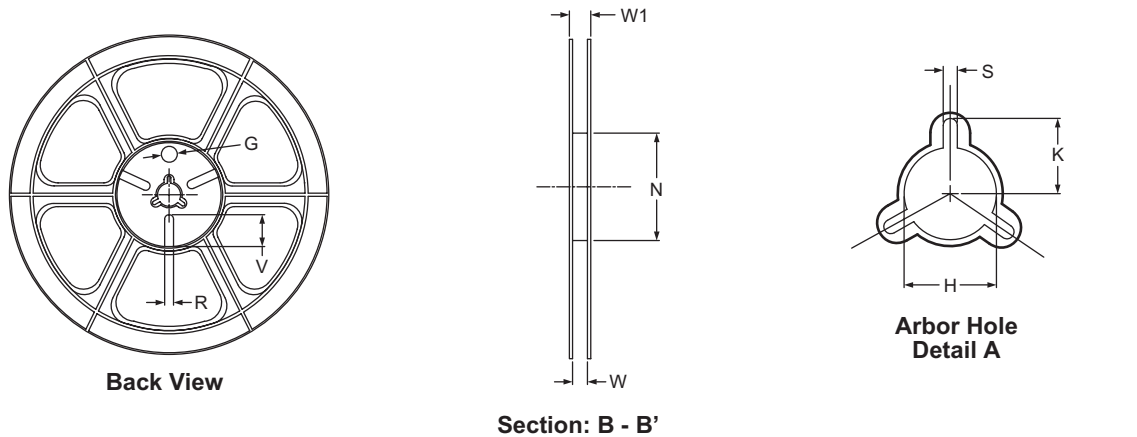
1. All Dimensions are in millimeters.
2. Dimensions are inclusive of plating.
3. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.
4. The cathode mark is optional.
5. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 3 mils each.

Tape and Reel Dimensions, SOD523

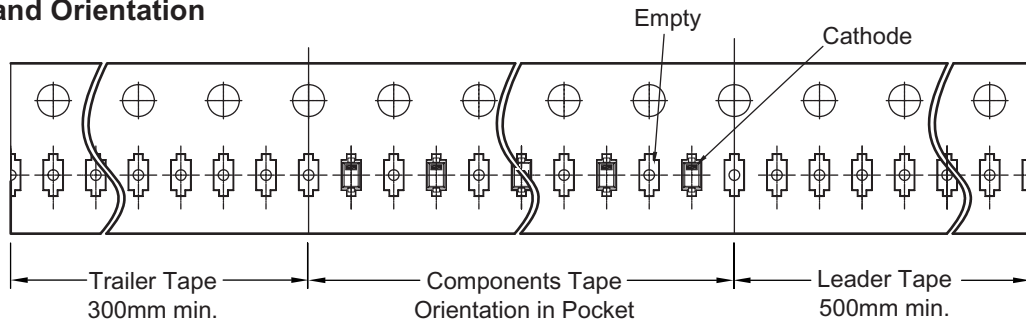
Tape



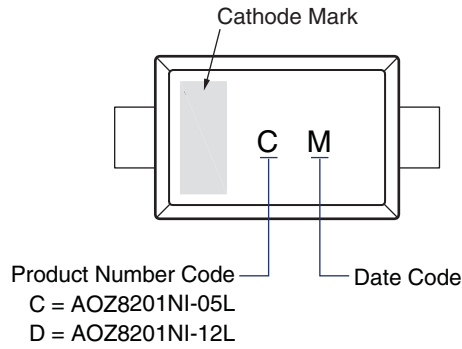
Reel



Leader/Trailer and Orientation



Part Marking



This data sheet contains preliminary data; supplementary data may be published at a later date. Alpha & Omega Semiconductor reserves the right to make changes at any time without notice.

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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.