

General Description

The AOZ8851ADI is an ultra low capacitance one-line bidirectional transient voltage suppressor diode designed to protect high speed data lines and voltage sensitive electronics from high transient conditions and ESD.

This device incorporates one bidirectional TVS diode in an ultra-small 0201 footprint package. It may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 (± 15 kV air, ± 15 kV contact discharge).

The AOZ8851ADI comes in an RoHS compliant package and is rated over a -40 °C to $+85$ °C ambient temperature range.

The ultra-small 0.62 mm x 0.32 mm x 0.3 mm 0201 footprint package makes the AOZ8851ADI 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

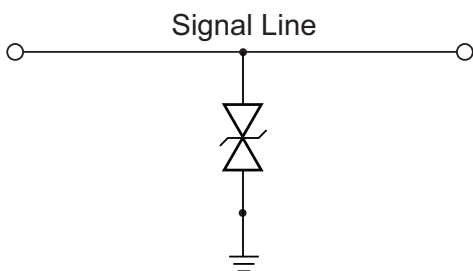
- ESD protection for high-speed data lines:
 - Exceeds: IEC 61000-4-2 (ESD) ± 20 kV (air), ± 20 kV (contact)
 - Human Body Model (HBM) ± 25 kV
- Small package saves board space
- Ultra low capacitance: 0.22 pF
- Low clamping voltage
- Low operating voltage: 3.3 V, 5 V
- Pb-free device

Applications

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



Typical Application



Bidirection Protection of Single Line

Pin Configuration



Ordering Information

| Part Number | Ambient Temperature Range | Package | Environmental |
|---------------|---------------------------|-----------------|---------------------------------|
| AOZ8851ADI-03 | -40 °C to +85 °C | DFN 0.62 x 0.32 | Green Product RoHS Compliant |
| AOZ8851ADI-05 | | | |



AOS Green Products use reduced levels of Halogens, and are also RoHS compliant. Please visit www.aosmd.com/media/AOSGreenPolicy.pdf for additional information.

Absolute Maximum Ratings

Exceeding the Absolute Maximum Ratings may damage the device.

| Parameter | Rating | |
|--|-------------------|-------------------|
| VP – VN | 3.3 V | 5 V |
| Peak Pulse Current (I _{PP}), t _p = 8/20μs | 4 A | 4 A |
| Storage Temperature (T _S) | -65 °C to +150 °C | -65 °C to +150 °C |
| ESD Rating per IEC61000-4-2, Contact ⁽¹⁾ | ±20 kV | ±20 kV |
| ESD Rating per IEC61000-4-2, Air ⁽¹⁾ | ±20 kV | ±20 kV |
| ESD Rating per Human Body Model ⁽²⁾ | ±15 kV | ±15 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.

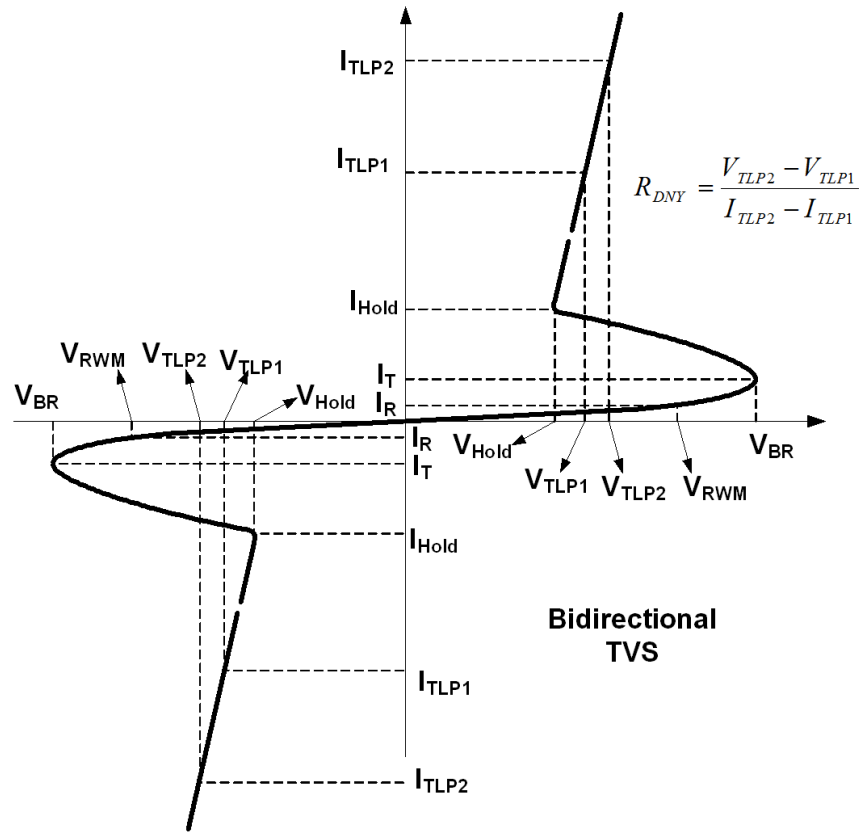
Maximum Operating Conditions

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.



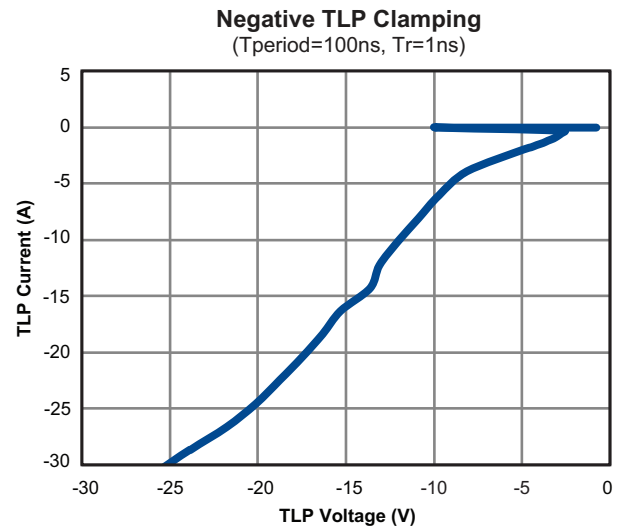
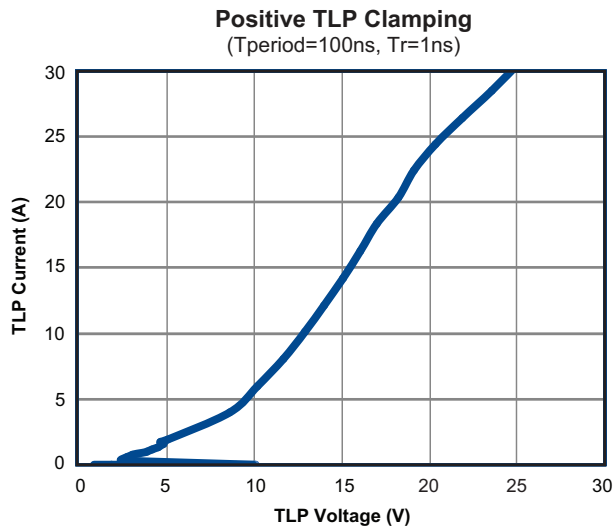
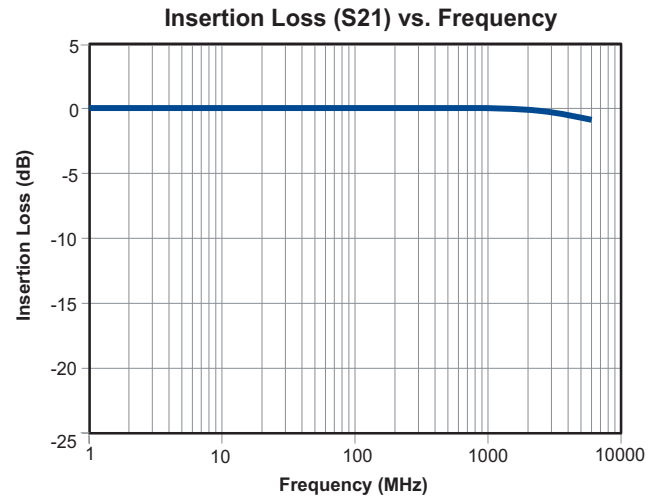
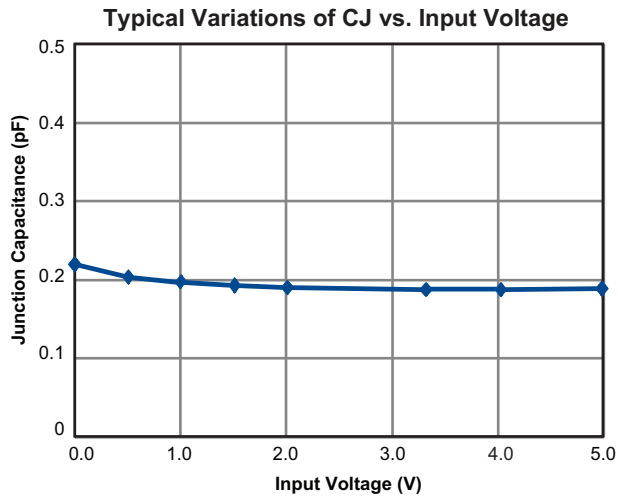
| AOZ8851ADI-03 | | | | | | |
|------------------|--|--|------|------------|-----------|-------|
| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Units |
| V _{RWM} | Reverse Working Voltage | I/O Pin to ground | | | 3.3 | V |
| V _{BR} | Reverse Breakdown Voltage | I _T =1mA, I/O Pin to ground | 4.6 | | | V |
| I _R | Reverse Leakage Current | V _{RWM} =3.3V, I/O Pin to ground | | | 100 | nA |
| V _{CL} | Clamping Voltage ⁽³⁾ (100ns Transmission Line Pulse, I/O Pin to ground) | I _{TLP} =16A I _{TLP} =-16A | | 16 -16 | 20 -20 | V |
| | | I _{TLP} =30A I _{TLP} =-30A | | 23 -23 | 28 -28 | V |
| | Clamping Voltage ⁽³⁾ (IEC61000-4-5, 8/20μs, I/O Pin to ground) | I _{PP} =4A I _{PP} =-4A | | 11 -11 | 13 -13 | V |
| R _{DNY} | Dynamic Resistance ⁽³⁾ | I _{TLP} = 10A to 30A I _{TLP} = -10A to -30A | | 0.5 0.5 | | Ω |
| C _J | Junction Capacitance | V _{I/O} =0V, f=1MHz, I/O Pin to ground | | 0.22 | 0.35 | pF |
| | | V _{I/O} =0V, f=1GHz, I/O Pin to ground | | 0.19 | 0.29 | pF |

| AOZ8851ADI-05 | | | | | | |
|------------------|--|--|------|---------------|-----------|-------|
| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Units |
| V _{RWM} | Reverse Working Voltage | I/O Pin to ground | | | 5 | V |
| V _{BR} | Reverse Breakdown Voltage | I _T =1mA, I/O Pin to ground | 6.5 | | | V |
| I _R | Reverse Leakage Current | V _{RWM} =5V, I/O Pin to ground | | | 100 | nA |
| V _{CL} | Clamping Voltage ⁽³⁾ (100ns Transmission Line Pulse, I/O Pin to ground) | I _{TLP} =16A I _{TLP} =-16A | | 17 -17 | 20 -20 | V |
| | | I _{TLP} =30A I _{TLP} =-30A | | 25 -25 | 28 -28 | V |
| | Clamping Voltage ⁽³⁾ (IEC61000-4-5, 8/20μs, I/O Pin to ground) | I _{PP} =4A I _{PP} =-4A | | 11.5 -11.5 | 13 -13 | V |
| R _{DNY} | Dynamic Resistance ⁽³⁾ | I _{TLP} = 10A to 30A I _{TLP} = -10A to -30A | | 0.5 0.5 | | Ω |
| C _J | Junction Capacitance | V _{I/O} =0V, f=1MHz, I/O Pin to ground | | 0.22 | 0.35 | pF |
| | | V _{I/O} =0V, f=1GHz, I/O Pin to ground | | 0.19 | 0.29 | pF |

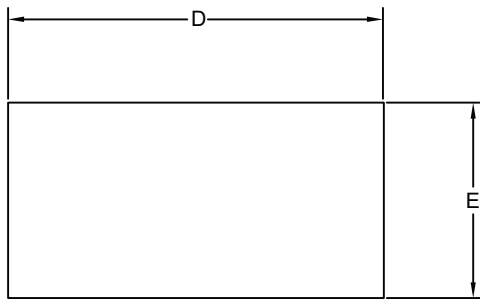
Note:

3. These specifications are guaranteed by design and characterization.

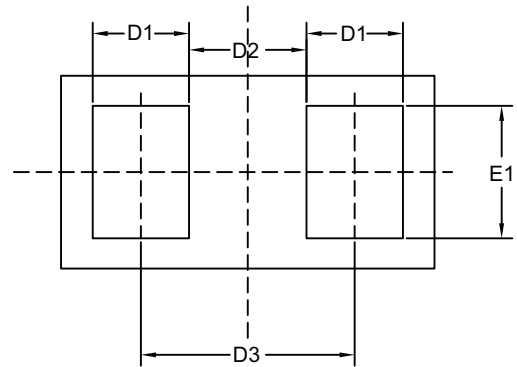
Typical Performance Characteristics



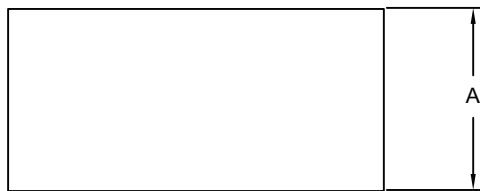
Package Dimensions, DFN 0.62x0.32, 2L EP2 S



TOP VIEW

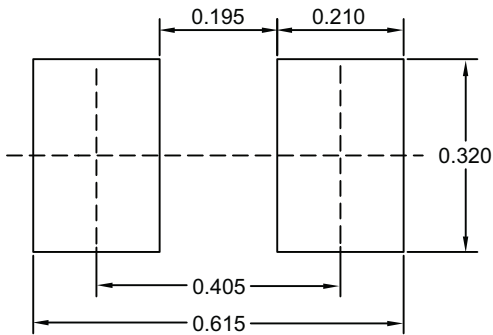


BOTTOM VIEW



SIDE VIEW

RECOMMENDED LAND PATTERN



Unit: mm

Dimensions in millimeters

| Symbols | Min. | Nom. | Max. |
|---------|-------|-------|-------|
| A | 0.27 | 0.30 | 0.33 |
| D | 0.57 | 0.62 | 0.67 |
| D1 | 0.11 | 0.16 | 0.21 |
| D2 | 0.145 | 0.195 | 0.245 |
| D3 | 0.305 | 0.355 | 0.405 |
| E | 0.27 | 0.32 | 0.37 |
| E1 | 0.17 | 0.22 | 0.27 |

Dimensions in inches

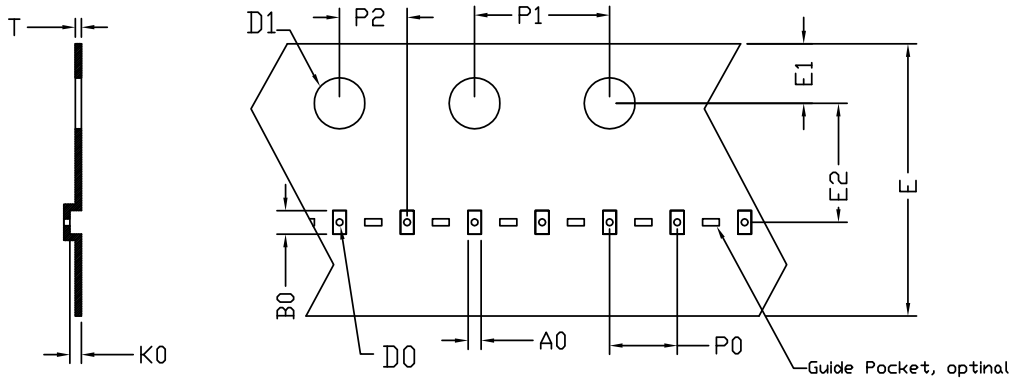
| Symbols | Min. | Nom. | Max. |
|---------|--------|--------|--------|
| A | 0.0106 | 0.0118 | 0.0130 |
| D | 0.0224 | 0.0244 | 0.0264 |
| D1 | 0.0043 | 0.0063 | 0.0083 |
| D2 | 0.0057 | 0.0077 | 0.0097 |
| D3 | 0.0120 | 0.0140 | 0.0167 |
| E | 0.0106 | 0.0126 | 0.0146 |
| E1 | 0.0067 | 0.0087 | 0.0107 |

Notes:

1. All dimensions are in millimeters.
2. Dimensions are inclusive of plating.
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 6mil each.
4. Controlling dimension is millimeter. Converted inch dimensions are not necessarily exact.
5. Paddle exposed on bottom.

Tape and Reel Dimensions, DFN 0.62x0.32

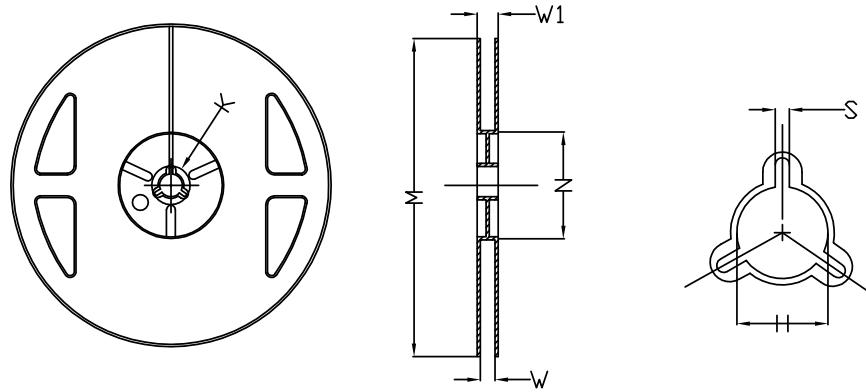
Carrier Tape



UNIT: MM

| PACKAGE | A0 | B0 | K0 | D0 | D1 | E | E1 | E2 | P0 | P1 | P2 | T |
|------------------------|---------------|---------------|------------------------|---------------|----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| DFN0.62x0.32 (8 mm) | 0.39 ±0.03 | 0.69 ±0.03 | 0.34 +0.03 -0.01 | 0.20 ±0.05 | 1.50 +0.1 -0.0 | 8.00 ±0.10 | 1.75 ±0.10 | 3.50 ±0.03 | 2.00 ±0.05 | 4.00 ±0.05 | 2.00 ±0.05 | 0.20 ±0.05 |

Reel

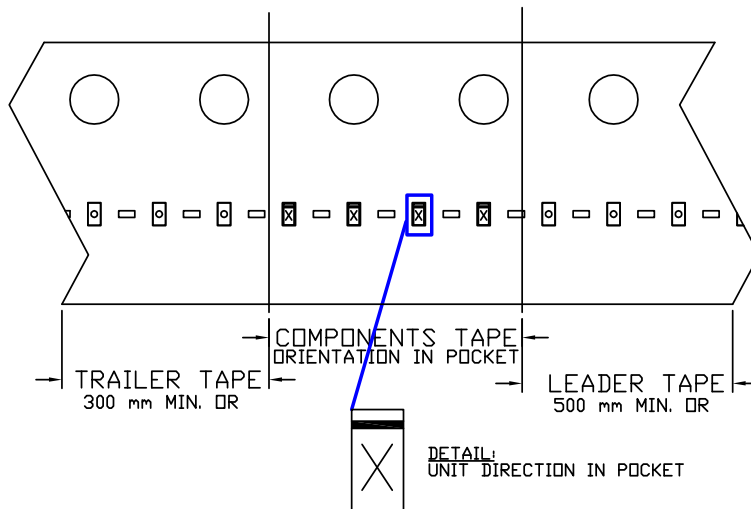


UNIT: MM

| TAPE SIZE | REEL SIZE | M | N | W | W1 | H | K | S |
|-----------|-----------|------------------|-----------------|-------------|--------------|---------------|---------------|-------------|
| 8 mm | ø180 | ø180 +0 -3 | ø60 +1 -0 | 9.0 ±0.3 | 11.4 ±1.0 | ø13.0 ±0.2 | ø21.0 ±0.5 | 2.0 ±0.5 |

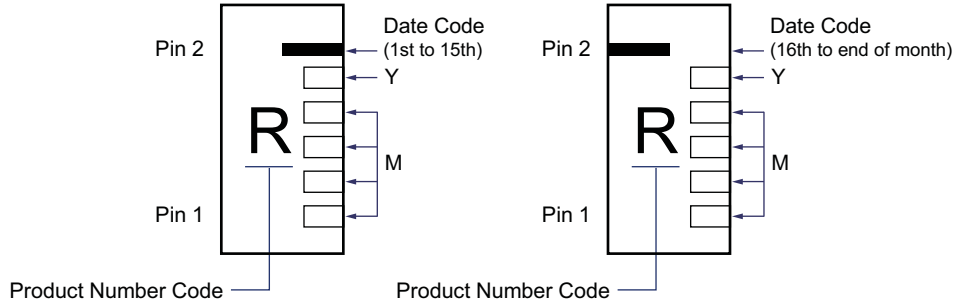
Leader / Trailer & Orientation

Unit Per Reel: 10000pcs

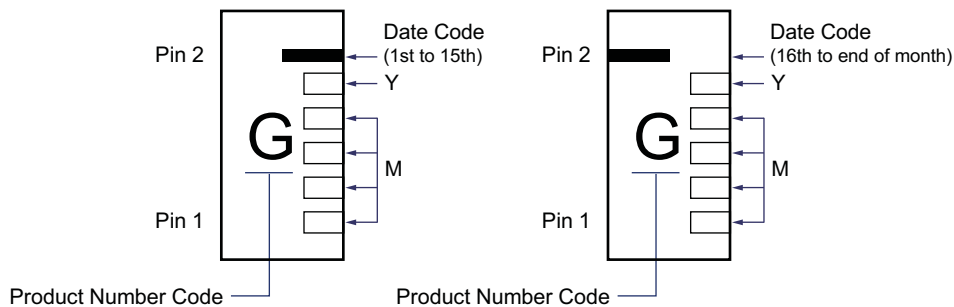


Part Marking

**AOZ8851ADI-03
(DFN0.62x0.32)**



**AOZ8851ADI-05
(DFN0.62x0.32)**



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