

## General Description

The AOZ8251 is a 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 ( $\pm 15$  kV air,  $\pm 15$  kV contact discharge).

The AOZ8251 comes in an RoHS compliant package and is rated over a  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  ambient temperature range.

The ultra-small 0.6mm x 0.3 mm x 0.3 mm 0201 footprint package makes the AOZ8251 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

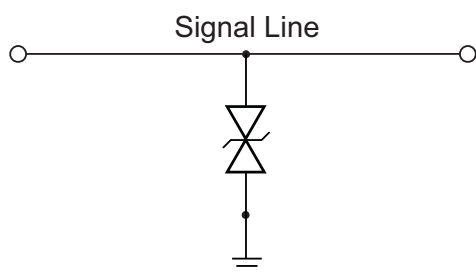
- ESD protection for high-speed data lines:
  - Exceeds: IEC 61000-4-2 (ESD)  $\pm 30$  kV (air),  $\pm 25$  kV (contact)
  - Human Body Model (HBM)  $\pm 25$  kV
- Small package saves board space
- Low capacitance: 8.0 pF
- Low clamping voltage
- Low operating voltage: 5.0 V
- Pb-free device

## Applications

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



## Typical Application



**Bidirection Protection of Single Line**

## Pin Configuration



## Ordering Information

| Part Number  | Ambient Temperature Range | Package       | Environmental |
|--------------|---------------------------|---------------|---------------|
| AOZ8251DI-05 | -40 °C to +85 °C          | DFN 0.6 x 0.3 | Green Product |



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

Please visit [www.aosmd.com/media/AOSGreenPolicy.pdf](http://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                                             | 5 V               |
| Peak Pulse Current ( $I_{PP}$ ), $t_P = 8/20\mu s$  | 2 A               |
| Peak Pulse Power, $t_P = 8/20\mu s$                 | 40 W              |
| Storage Temperature ( $T_S$ )                       | -65 °C to +150 °C |
| ESD Rating per IEC61000-4-2, Contact <sup>(1)</sup> | ±25 kV            |
| ESD Rating per IEC61000-4-2, Air <sup>(1)</sup>     | ±30 kV            |
| ESD Rating per Human Body Model <sup>(2)</sup>      | ±25 kV            |

### Notes:

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

## 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 |

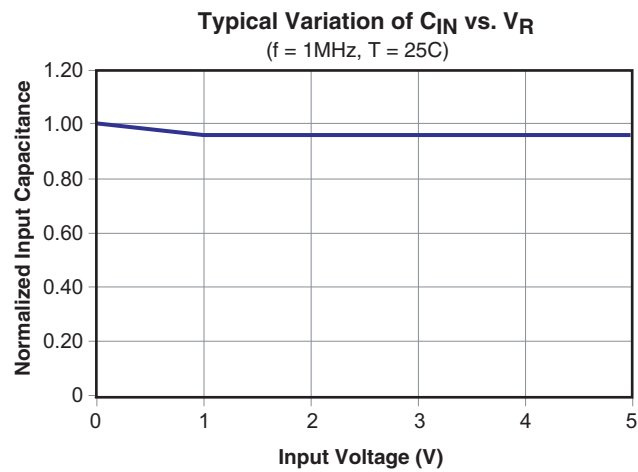
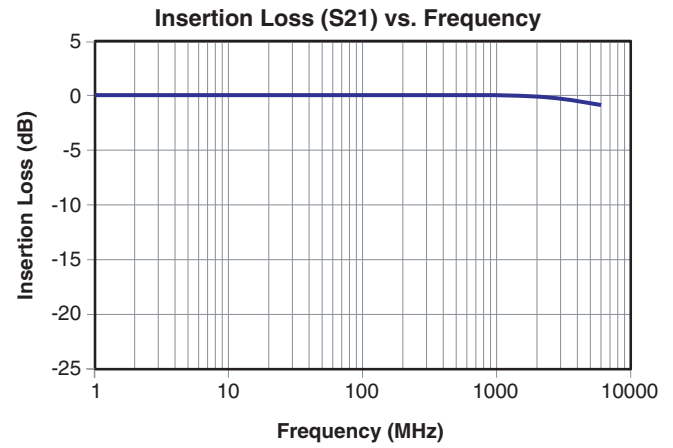
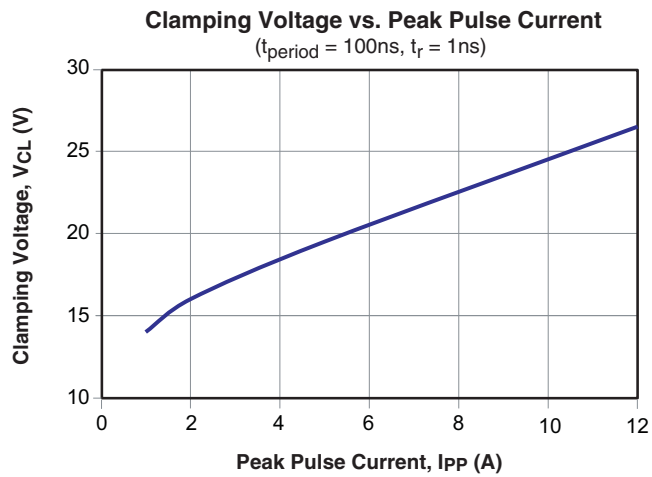
## Electrical Characteristics

$T_A = 25^\circ\text{C}$  unless otherwise specified.

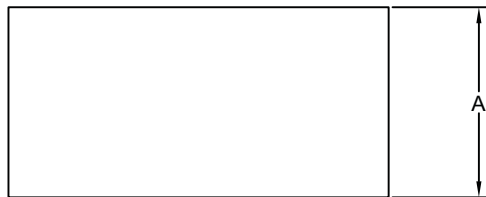
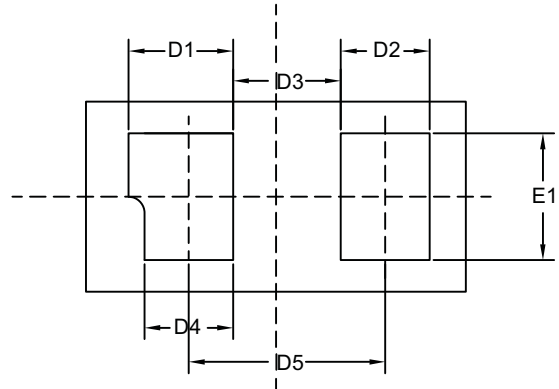
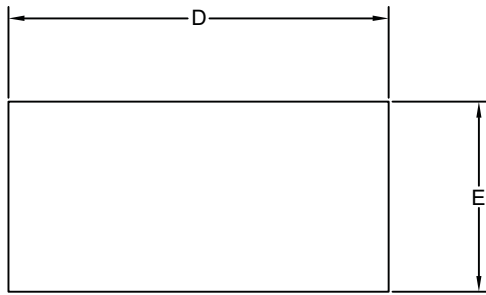
| Symbol    | Parameter                                      | Diagram |
|-----------|------------------------------------------------|---------|
| $I_{PP}$  | Maximum Reverse Peak Pulse Current             |         |
| $V_{CL}$  | Clamping Voltage @ $I_{PP}$                    |         |
| $V_{RWM}$ | Working Peak Reverse Voltage                   |         |
| $I_R$     | Maximum Reverse Leakage Current                |         |
| $V_{BR}$  | Breakdown Voltage                              |         |
| $I_F$     | Forward Current                                |         |
| $V_F$     | Forward Voltage                                |         |
| $P_{PK}$  | Peak Power Dissipation                         |         |
| $C_J$     | Capacitance @ $V_R = 0$ and $f = 1\text{ MHz}$ |         |

| Device       | Device Marking | $V_{RWM}$ (V)<br>Max. | $V_{BR}$ (V)<br>Min. | $I_R$ ( $\mu\text{A}$ )<br>Max. | $V_F$ (V)<br>Typ. | $V_{CL}$ Max.         |                       |                       | $C_J$ (pF)<br>Typ. |
|--------------|----------------|-----------------------|----------------------|---------------------------------|-------------------|-----------------------|-----------------------|-----------------------|--------------------|
|              |                |                       |                      |                                 |                   | $I_{PP} = 1\text{ A}$ | $I_{PP} = 2\text{ A}$ | $I_{PP} = 5\text{ A}$ |                    |
| AOZ8251DI-05 | B              | 5.0                   | 6.0                  | 0.1                             | 1.0               | 14.00                 | 16.00                 | 19.50                 | 8.0                |

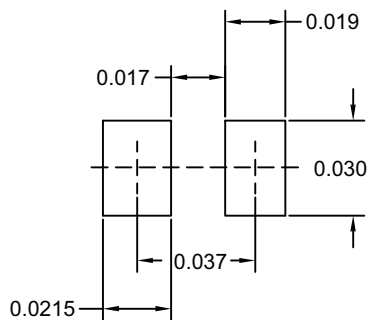
## Typical Performance Characteristics



## Package Dimensions, DFN 0.6x0.3, 2L EP2 S



### RECOMMENDED LAND PATTERN



Unit: mm

### Dimensions in millimeters

| Symbols | Min.      | Nom. | Max. |
|---------|-----------|------|------|
| A       | 0.27      | 0.30 | 0.33 |
| D       | 0.55      | 0.60 | 0.65 |
| D1      | 0.165 TYP |      |      |
| D2      | 0.14 TYP  |      |      |
| D3      | 0.17 TYP  |      |      |
| D4      | 0.14 TYP  |      |      |
| D5      | 0.31 TYP  |      |      |
| E       | 0.25      | 0.30 | 0.35 |
| E1      | 0.20 TYP  |      |      |

### Dimensions in inches

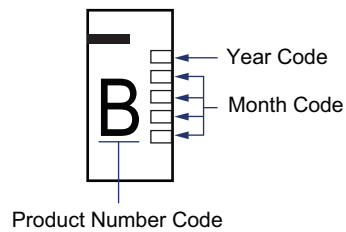
| Symbols | Min.       | Nom.   | Max.   |
|---------|------------|--------|--------|
| A       | 0.0106     | 0.0118 | 0.0130 |
| D       | 0.0216     | 0.0236 | 0.0256 |
| D1      | 0.0065 TYP |        |        |
| D2      | 0.0055 TYP |        |        |
| D3      | 0.0067 TYP |        |        |
| D4      | 0.0055 TYP |        |        |
| D5      | 0.0122 TYP |        |        |
| E       | 0.0098     | 0.0118 | 0.0138 |
| E1      | 0.0079 TYP |        |        |

### 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.

## Part Marking

**AOZ8251DI-05**  
(DFN0.6x0.3)



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