

General Description

The AOZ8131-06 is an ultra low capacitance one-line bi-directional 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 TVS diode in an ultra-small DFN 1006 package. It may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge).

The AOZ8131-06 comes in an RoHS compliant DFN 1006 package and is rated over a -40°C to $+85^{\circ}\text{C}$ ambient temperature range.

The ultra-small $1.0 \times 0.6 \times 0.5\text{mm}$ DFN 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

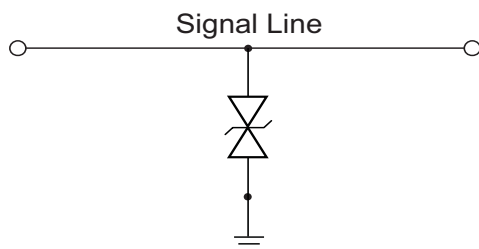
- ESD protection for high-speed data lines:
 - Exceeds:
 - IEC 61000-4-2 (ESD) $\pm 24\text{kV}$ (air), $\pm 24\text{kV}$ (contact)
 - IEC 61000-4-4 (EFT) $\pm 40\text{A}$ (5/50ns)
 - IEC 61000-4-5 (Lightning) $\pm 4\text{A}$
 - Human Body Model (HBM) $\pm 30\text{kV}$
- Small package saves board space
- Ultra low capacitance: 1.25pF
- Low clamping voltage
- Low operating voltage: 6.0V
- Pb-free device

Applications

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

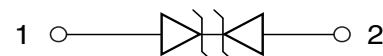


Typical Application



Bidirection Protection of Single Line

Pin Configuration



Ordering Information

| Part Number | Ambient Temperature Range | Package | Environmental |
|--------------|---------------------------|----------|---------------------------------|
| AOZ8131DI-06 | -40°C to +85°C | DFN 1006 | RoHS Compliant Green Product |



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 |
|---|-----------------|
| Peak Pulse Current (I_{PP}), $t_P = 8/20\mu s$ | 4A |
| Storage Temperature (T_S) | -65°C to +150°C |
| ESD Rating per IEC61000-4-2, Contact ⁽¹⁾ | ±24kV |
| ESD Rating per IEC61000-4-2, Air ⁽¹⁾ | ±24kV |
| ESD Rating per Human Body Model ⁽²⁾ | ±30kV |

Notes:

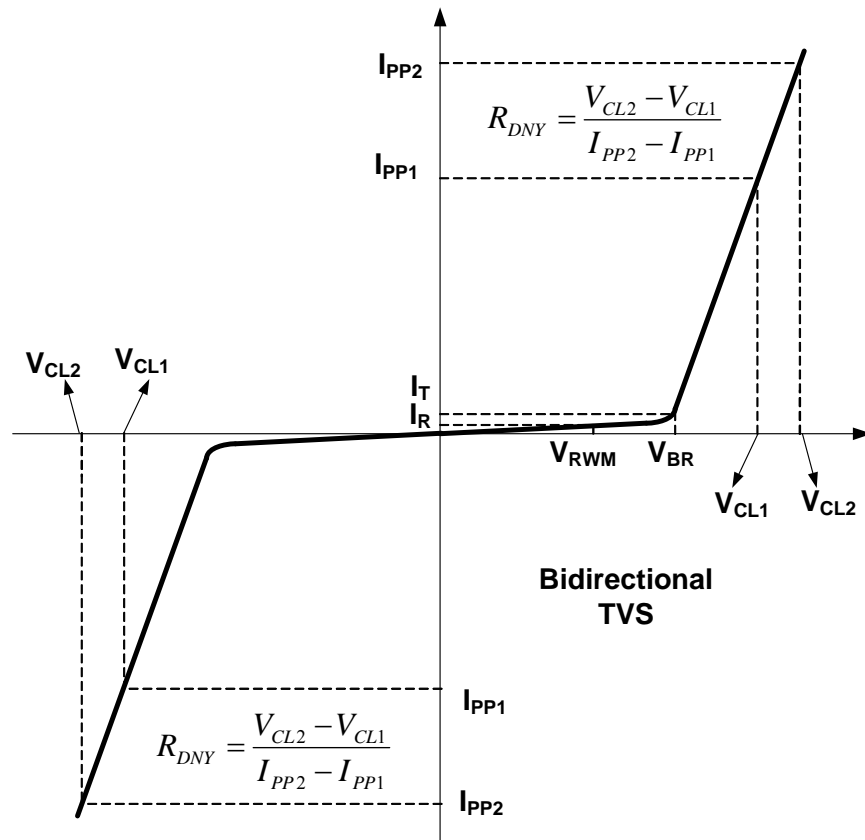
- IEC 61000-4-2 discharge with $C_{Discharge} = 150pF$, $R_{Discharge} = 330\Omega$.
- Human Body Discharge per MIL-STD-883, Method 3015 $C_{Discharge} = 100pF$, $R_{Discharge} = 1.5k\Omega$.

Maximum Operating Ratings

| Parameter | Rating |
|--------------------------------|-----------------|
| Junction Temperature (T_J) | -40°C to +125°C |

Electrical Characteristics

T_A = 25°C unless otherwise specified.



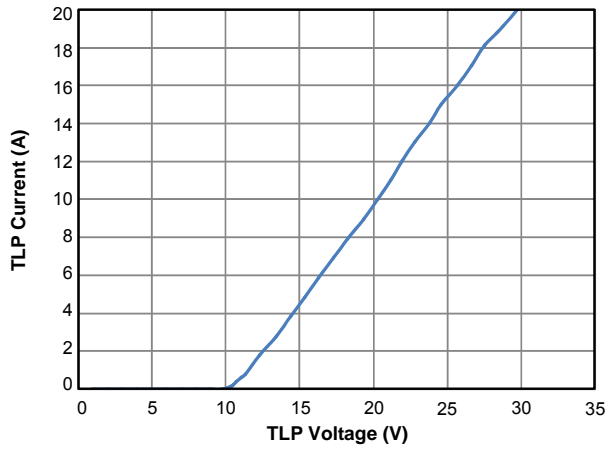
| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Units |
|------------------|--|------------------------------|------|------|------|-------|
| V _{RWM} | Reverse Working Voltage | Pin1 to Pin2 or Pin2 to Pin1 | | | 6 | V |
| V _{BR} | Reverse Breakdown Voltage | I _T =1mA | 7 | | 9.5 | V |
| I _R | Reverse Leakage Current | V _{RWM} =6V | | | 100 | nA |
| V _{CL} | Clamping Voltage ⁽³⁾ (Transmission Line Pulse, Tp=100ns, Tr=1ns)) | I _{TLP} =1A | | 12 | | V |
| | | I _{TLP} =16A | | 25 | | |
| R _{DNY} | Dynamic Resistance ⁽³⁾ | I _{TLP} = 1A to 16A | | 0.85 | | Ω |
| C _J | Junction Capacitance | V _{I/O} =0V, f=1MHz | | 1.2 | 2.0 | pF |

Note:

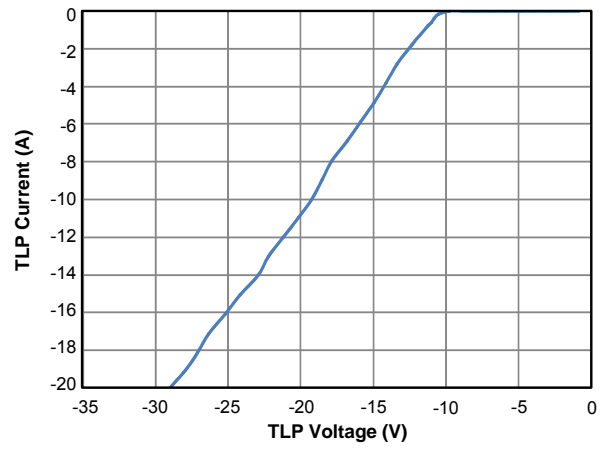
3. These specifications are guaranteed by design and characterization.

Typical Performance Characteristics

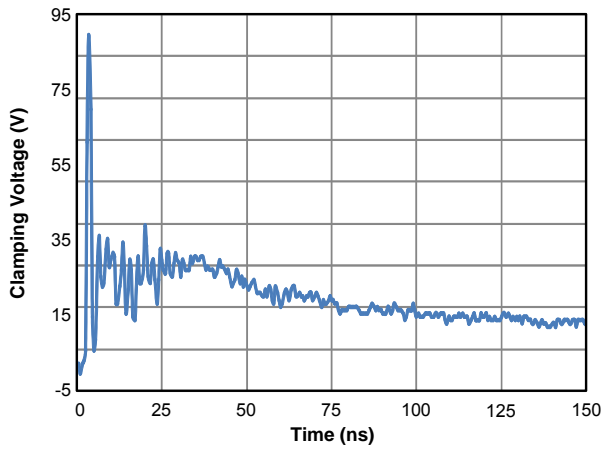
Positive TLP Clamping
($t_p = 100\text{ns}$, $t_r = 1\text{ns}$)



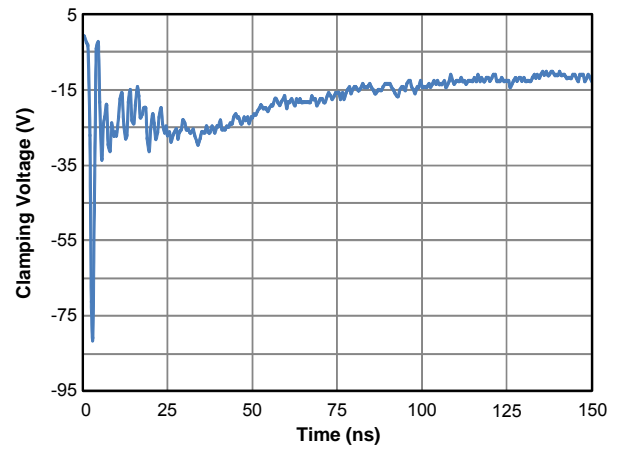
Negative TLP Clamping
($t_p = 100\text{ns}$, $t_r = 1\text{ns}$)



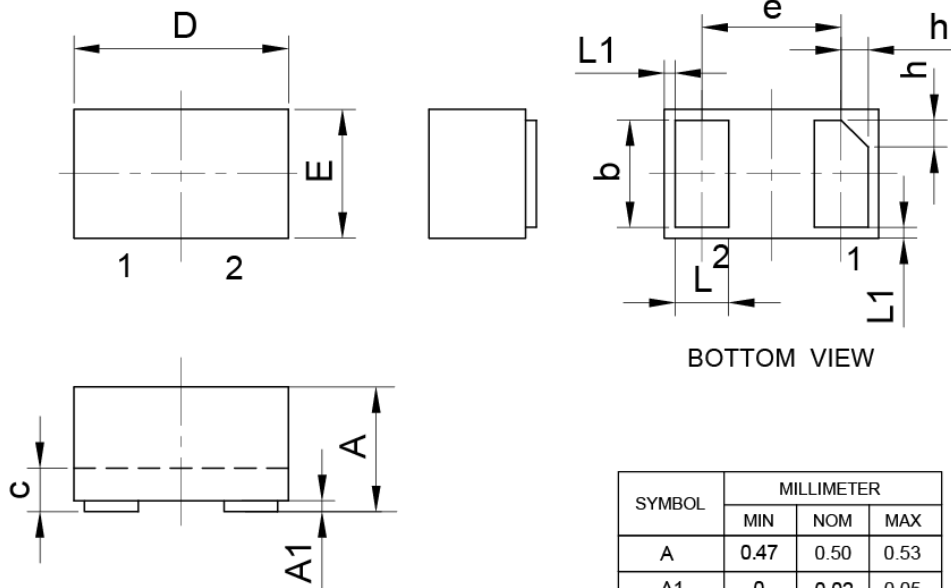
+8kV ESD Clamping Per IEC 61000-4-2
(Contact, Between IO to GND)



-8kV ESD Clamping Per IEC 61000-4-2
(Contact, Between IO to GND)



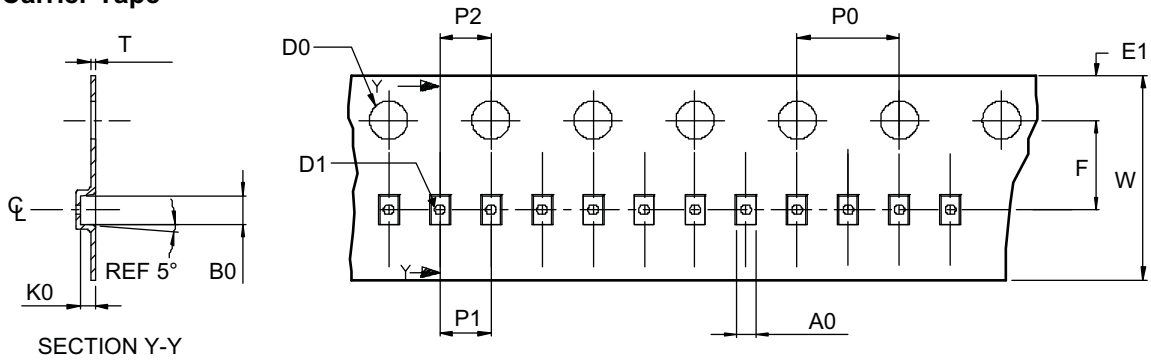
Package Dimensions, DFN 1006



| SYMBOL | MILLIMETER | | |
|--------|------------|------|------|
| | MIN | NOM | MAX |
| A | 0.47 | 0.50 | 0.53 |
| A1 | 0 | 0.02 | 0.05 |
| b | 0.45 | 0.50 | 0.55 |
| c | 0.12 | 0.15 | 0.18 |
| D | 0.95 | 1.00 | 1.05 |
| e | 0.65BSC | | |
| E | 0.55 | 0.60 | 0.65 |
| L | 0.20 | 0.25 | 0.30 |
| L1 | 0.05REF | | |
| h | 0.07 | 0.12 | 0.17 |

Tape and Reel Dimensions, DFN 1006

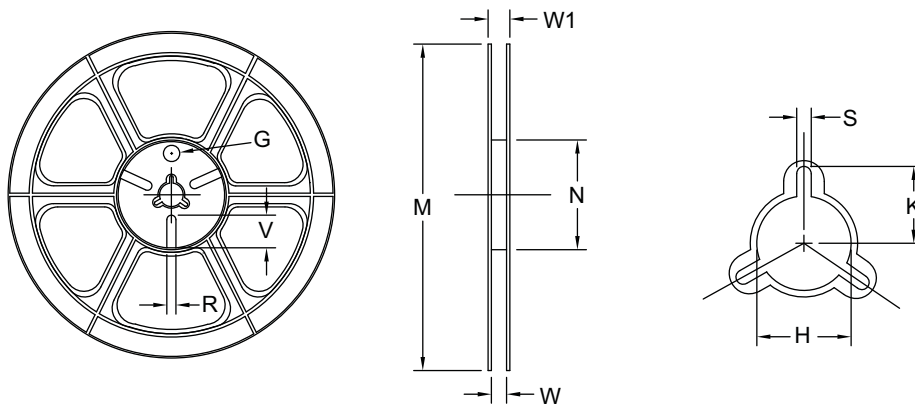
Carrier Tape



UNIT: mm

| Package | A0 | B0 | K0 | D0 | D1 | E1 | F | P0 | P1 | P2 | T | W |
|-----------------------|---------------|---------------|---------------|--------------------|----------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------------|
| DFN 1.0x0.6 (8 mm) | 0.65 ±0.04 | 1.05 ±0.04 | 0.61 ±0.04 | ø1.50 +0.1/-0.0 | ø0.40 ±0.05 | 1.75 ±0.10 | 3.50 ±0.05 | 4.00 ±0.10 | 2.00 ±0.10 | 2.00 ±0.05 | 0.20 ±0.05 | 8.00 +0.3/-0.1 |

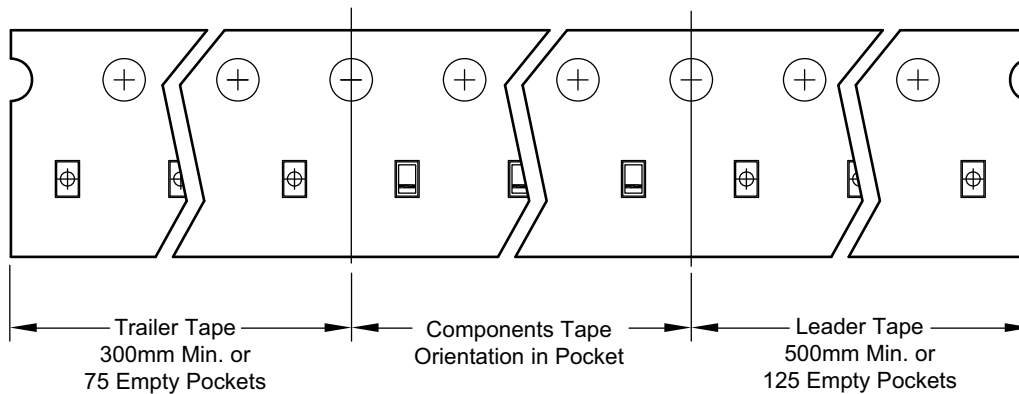
Reel



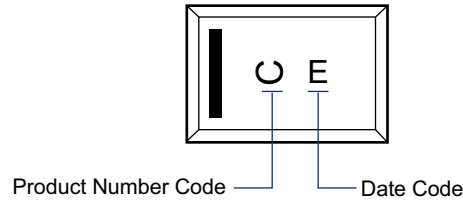
UNIT: mm

| Tape Size | Reel Size | M | N | W | W1 | H | K | S | G | R | V |
|-----------|-----------|--------------|-----------|----------------|---------------|---------------|--------------|-------------|-----|-----|-----|
| 8mm | ø178 | ø178 ±0.5 | ø55 ±1 | 8.4 +1.5/-0 | 14.4. Max. | ø13.0 ±0.5 | 10.0 ±0.5 | 2.0 ±0.5 | N/A | N/A | N/A |

Leader / Trailer & Orientation



Part Marking



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