

General Description

The AOZ8231A is a one-line bi-directional transient voltage suppressor diode designed to protect 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 EC 61000-4-2, Level 4 ($\pm 15\text{ kV}$ air, $\pm 8\text{ kV}$ contact discharge).

The AOZ8231A comes in a RoHS compliant, Halogen-Free DFN 1.0 mm x 0.6 mm package and is rated over a -40°C to $+85^\circ\text{C}$ ambient temperature range.

The ultra-small 1.0 mm x 0.6 mm x 0.5 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.

Applications

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

Features

- ESD protection for high-speed data lines

AOZ8231ADI-02:

- Exceeds: IEC 61000-4-2 (ESD) $\pm 30\text{ kV}$ (air), $\pm 30\text{ kV}$ (contact)
- Human Body Model (HBM) $\pm 30\text{ kV}$
- IEC 61000-4-5 (Lightning) 6 A (8/20 μs)
- IEC 61000-4-4 (EFT) 40 A

AOZ8231ADI-03:

- Exceeds: IEC 61000-4-2 (ESD) $\pm 30\text{ kV}$ (air), $\pm 30\text{ kV}$ (contact)
- Human Body Model (HBM) $\pm 30\text{ kV}$
- IEC 61000-4-5 (Lightning) 6 A (8/20 μs)
- IEC 61000-4-4 (EFT) 40 A

AOZ8231ADI-05:

- Exceeds: IEC 61000-4-2 (ESD) $\pm 30\text{ kV}$ (air), $\pm 30\text{ kV}$ (contact)
- Human Body Model (HBM) $\pm 30\text{ kV}$
- IEC 61000-4-5 (Lightning) 5 A (8/20 μs)
- IEC 61000-4-4 (EFT) 40 A

AOZ8231ADI-08:

- Exceeds: IEC 61000-4-2 (ESD) $\pm 30\text{ kV}$ (air), $\pm 30\text{ kV}$ (contact)
- Human Body Model (HBM) $\pm 30\text{ kV}$
- IEC 61000-4-5 (Lightning) 5 A (8/20 μs)
- IEC 61000-4-4 (EFT) 40 A

AOZ8231ADI-12:

- Exceeds: IEC 61000-4-2 (ESD) $\pm 30\text{ kV}$ (air), $\pm 30\text{ kV}$ (contact)
- Human Body Model (HBM) $\pm 30\text{ kV}$
- IEC 61000-4-5 (Lightning) 4 A (8/20 μs)
- IEC 61000-4-4 (EFT) 40 A

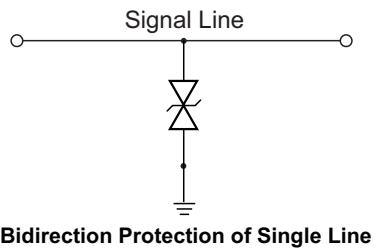
AOZ8231ADI-24:

- Exceeds: IEC 61000-4-2 (ESD) $\pm 18\text{ kV}$ (air), $\pm 15\text{ kV}$ (contact)
- Human Body Model (HBM) $\pm 15\text{ kV}$
- IEC 61000-4-5 (Lightning) 2.5 A (8/20 μs)
- IEC 61000-4-4 (EFT) 40 A

- Small package saves board space
- Low insertion loss
- Low clamping voltage
- Low operating voltage
- Pb-free device



Typical Application



Pin Configuration



Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8231ADI-02	-40 °C to +85 °C	DFN 1.0 x 0.6	
AOZ8231ADI-03			
AOZ8231ADI-05			
AOZ8231ADI-08			Green Product
AOZ8231ADI-12			
AOZ8231ADI-24			



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 for AOZ8231ADI					
	-02	-03	-05	-08	-12	-24
VP – VN	2.5 V	3.3 V	5 V	8 V	12 V	24 V
Peak Pulse Current, $t_P = 8/20 \mu s$	6 A	6 A	5 A	5 A	4 A	2.5 A
Storage Temperature (T_S)	-65 °C to +150 °C					
ESD Rating per IEC61000-4-2, Contact ⁽¹⁾	± 30 kV	± 30 kV	± 30 kV	± 30 kV	± 30 kV	± 15 kV
ESD Rating per IEC61000-4-2, Air ⁽¹⁾	± 30 kV	± 30 kV	± 30 kV	± 30 kV	± 30 kV	± 18 kV
ESD Rating per Human Body Model ⁽²⁾	± 30 kV	± 30 kV	± 30 kV	± 30 kV	± 30 kV	± 15 kV

Notes:

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

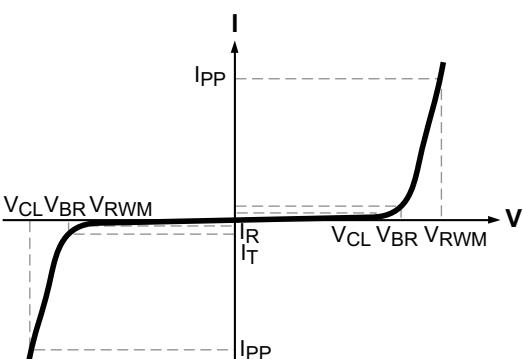
Maximum Operating Ratings

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}	Reverse Peak Pulse Current, ($t_{\text{period}} = 100\text{ ns}$, $t_r = 1\text{ ns}$)	
V_{CL}	Clamping Voltage @ I_{PP}	
V_{RWM}	Working Peak Reverse Voltage	
I_R	Maximum Reverse Leakage Current	
V_{BR}	Breakdown Voltage	
C_J	Capacitance @ $V_R = 0$ and $f = 1\text{ MHz}$	

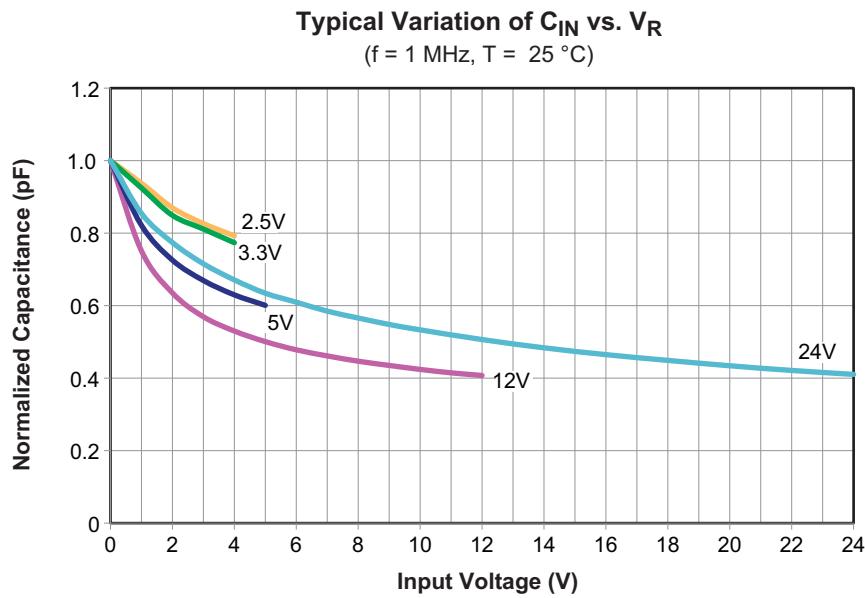
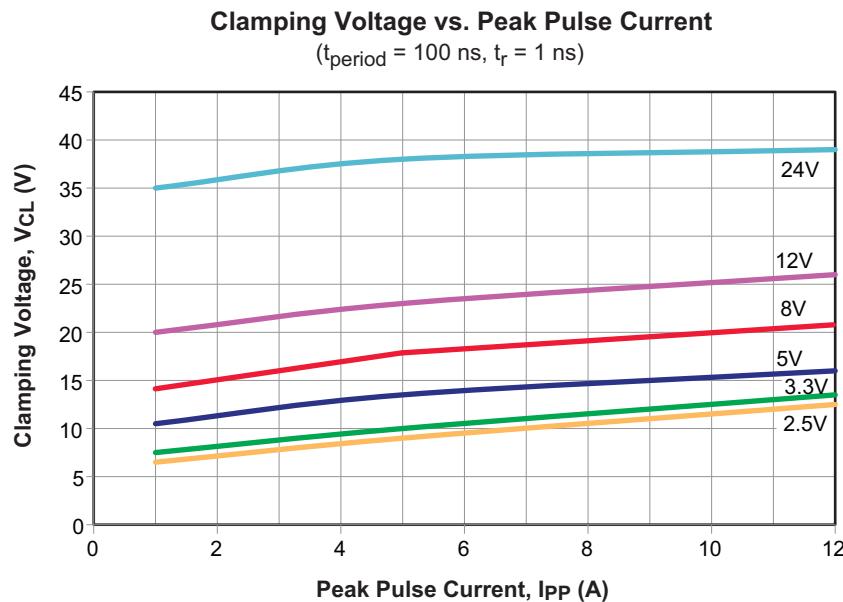


Device	Device Marking	V_{RWM} (V) Max.	V_{BR} (V) Min. @ 1mA	I_R (μA) Max.	V_{CL} Max. ⁽³⁾			C_J (pF) ⁽³⁾		
					$I_{PP} = 1\text{ A}$	$I_{PP} = 5\text{ A}$	$I_{PP} = 12\text{ A}$	Min.	Typ.	Max.
AOZ8231ADI-02	P	2.5	3.0	0.1	6.5	9.0	12.5	4.4	5.5	7.0
AOZ8231ADI-03	D	3.3	3.7	0.1	7.5	10.0	13.5	4.4	5.5	7.0
AOZ8231ADI-05	E	5.0	5.5	0.1	10.5	13.5	15.5	10.4	13.0	14.0
AOZ8231ADI-08	Y	8.0	9.5	0.1	15.0	18.0	22.5	19.0	23.0	27.0
AOZ8231ADI-12	F	12.0	13.0	0.1	20.0	23.0	26.0	10.4	13.0	14.0
AOZ8231ADI-24	R	24.0	27.0	0.1	35.0	38.0	39.0	9.6	12.0	15.0

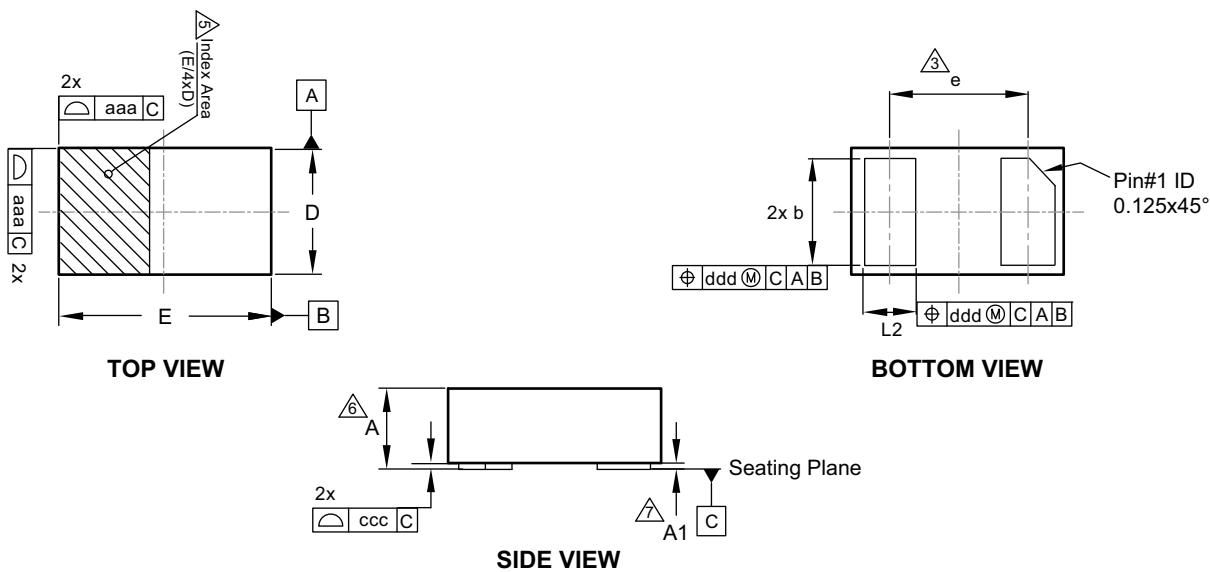
Note:

3. Guaranteed by design and characterization.

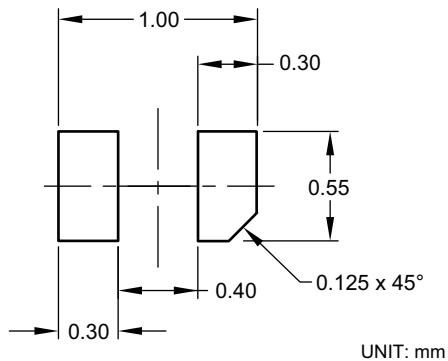
Typical Performance Characteristics



Package Dimensions, DFN 1.0 x 0.6



RECOMMENDED LAND PATTERN



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	0.47	0.51	0.55
A1	0.00	0.02	0.05
b	0.45	0.50	0.55
D	0.60 BSC		
E	1.00 BSC		
e	0.65 BSC		
L	0.20	0.25	0.30
aaa	0.05		
ccc	0.03		
ddd	0.10		

Dimensions in inches

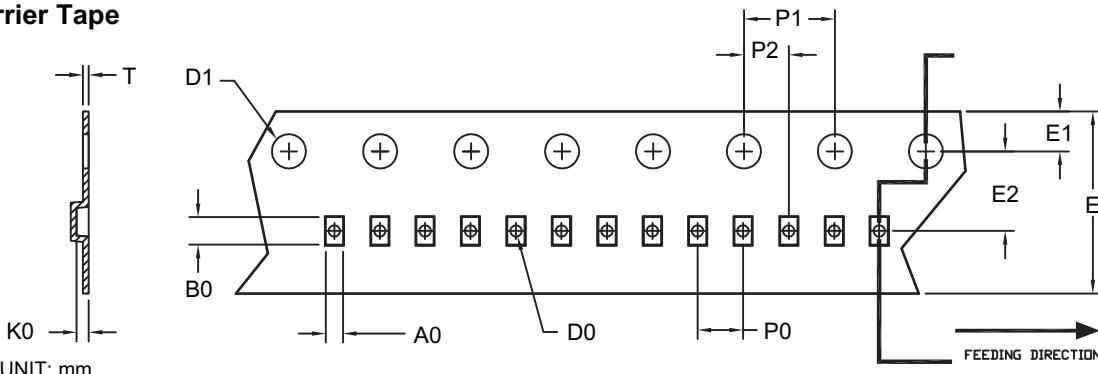
Symbols	Min.	Nom.	Max.
A	0.019	0.020	0.022
A1	0.000	0.001	0.002
b	0.018	0.020	0.022
D	0.024		
E	0.039		
e	0.026		
L	0.008	0.010	0.012
aaa	0.002		
ccc	0.001		
ddd	0.004		

Notes:

- Dimensions and tolerancing conform to ASME Y14.5-2009.
- All dimensions are in millimeters.
- ③ "e" represents the terminal grid pitch.
- N is the total number of terminals.
- ⑤ A visual index feature must be located within the hatched area. Typical index feature (chamfer) must be located on the edge of the Pin#1 feature.
- ⑥ This dimension includes stand-off height "A1" and packaged body thickness, but does not include attached feature e.g. external heatsink or chip capacitors, an internal heatslug is not considered as attached feature.
- ⑦ Dimension "A1" is primarily terminal plating, and does not include small metal protrusions.

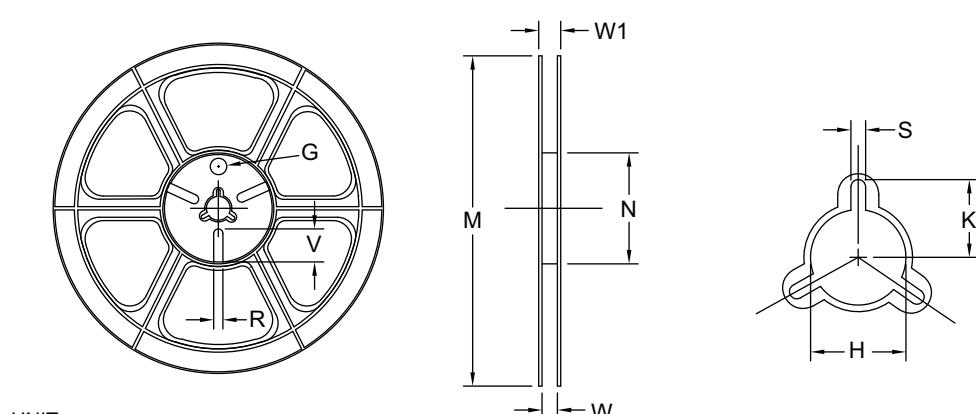
Tape and Reel Dimensions, DFN 1.0 x 0.6

Carrier Tape



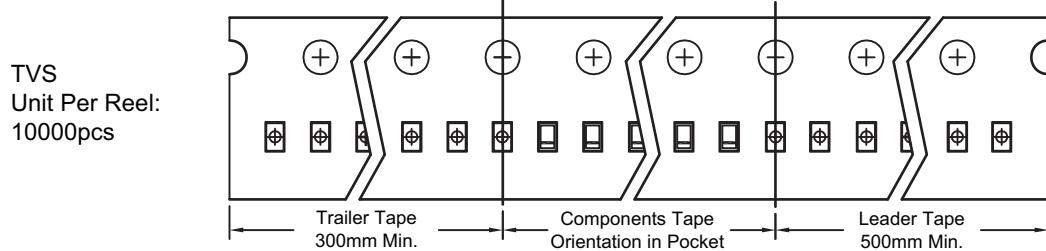
Option	Package	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
A	DFN 1.0x0.6/ DFN 1.0x0.6A (8 mm)	0.69 ±0.05	1.19 ±0.05	0.66 ±0.05	0.40 ±0.05	1.50 ±0.10	8.00 +0.3/-0.1	1.75 ±0.10	3.50 ±0.05	2.00 ±0.05	4.00 ±0.10	2.00 ±0.05	0.23 ±0.02
B	DFN 1.0x0.6/ DFN 1.0x0.6A (8 mm)	0.65 ±0.04	1.05 ±0.04	0.61 ±0.04	0.40 ±0.05	1.50 ±0.10	8.00 +0.3/-0.1	1.75 ±0.10	3.50 ±0.05	2.00 ±0.10	4.00 ±0.10	2.00 ±0.05	0.20 ±0.05

Reel

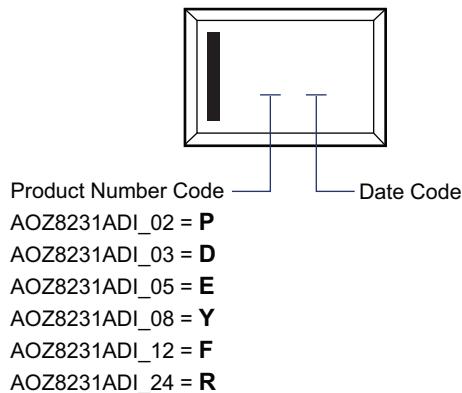


Tape Size	Reel Size	M	N	W	W1	H	K	S	G	R	V
8mm	ø178	ø178 ±0.5	ø55 ±1	8.4 +1.5/-0	Max. 14.4	ø13.0 ±0.5	Max. 10.1	2.0 ±0.5	N/A	N/A	N/A

Leader / Trailer & Orientation



Part Marking



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