AOZ8231ADI

One-line Bi-directional TVS Diode

General Description

The AOZ8231ADI 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 (±15kV air, ±8kV contact discharge).

The AOZ8231ADI 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 °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) ± 30 kV (air), ± 30 kV (contact)
  - Human Body Model (HBM) ± 30 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) ± 30 kV (air), ± 30 kV (contact)
  - Human Body Model (HBM) ± 30 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) ± 30 kV (air), ±30 kV (contact)
  - Human Body Model (HBM) ± 30 kV
  - IEC 61000-4-5 (Lightning) 5 A (8/20 µS)
  - IEC 61000-4-4 (EFT) 40 A

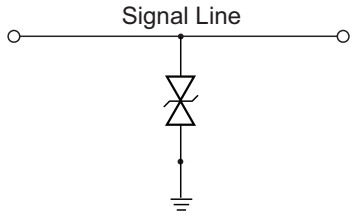
  AOZ8231ADI-08:
  - Exceeds: IEC 61000-4-2 (ESD) ± 30 kV (air), ± 30 kV (contact)
  - Human Body Model (HBM) ± 30 kV
  - IEC 61000-4-5 (Lightning) 5 A (8/20 µS)
  - IEC 61000-4-4 (EFT) 40 A

  AOZ8231ADI-12:
  - Exceeds: IEC 61000-4-2 (ESD) ± 30 kV (air), ± 30 kV (contact)
  - Human Body Model (HBM) ± 30 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) ± 18 kV (air), ± 15 kV (contact)
  - Human Body Model (HBM) ± 15 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

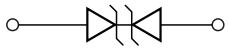
Green Product

Typical Application



Bidirection Protection of Single Line

Pin Configuration



Ordering Information

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

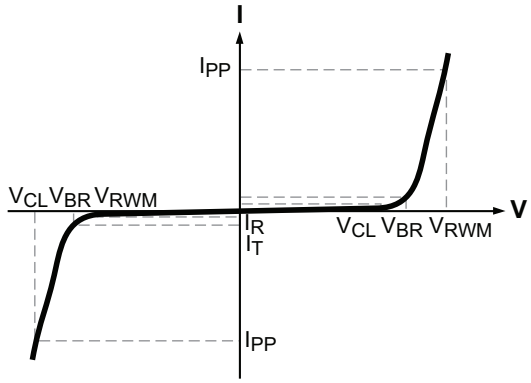
Notes:
1. IEC 61000-4-2 discharge with $C_{Discharge}$ = 150 pF, $R_{Discharge}$ = 330 Ω.
2. Human Body Discharge per MIL-STD-883, Method 3015 $C_{Discharge}$ = 100 pF, $R_{Discharge}$ = 1.5 kΩ.

Maximum Operating Ratings

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

Electrical Characteristics

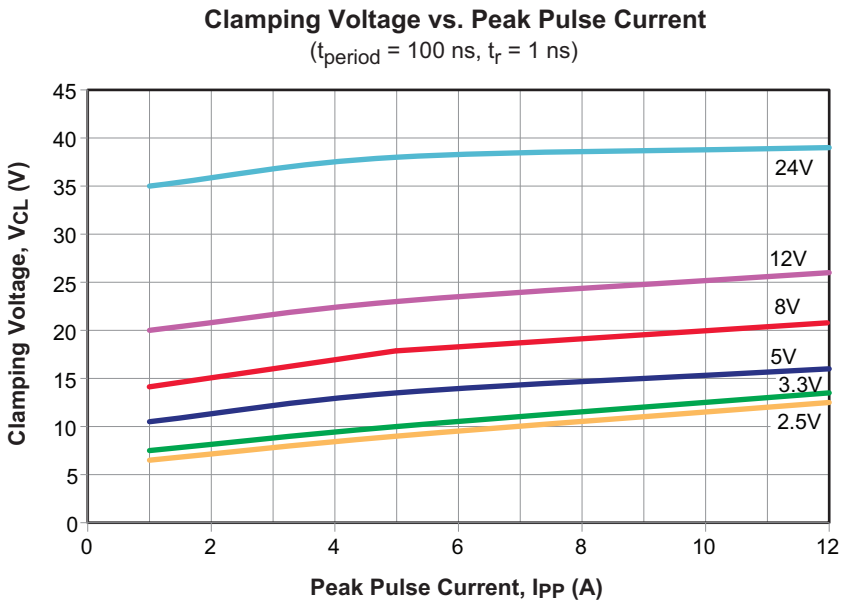
T_A = 25 °C unless otherwise specified.

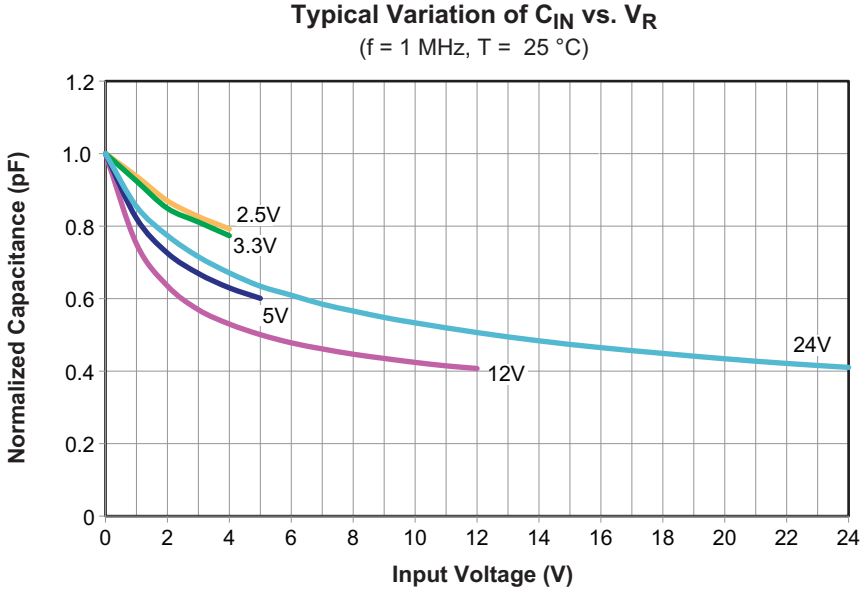
Symbol	Parameter	Diagram
I_{PP}	Reverse Peak Pulse Current, (t_{period} = 100 ns, t_r = 1 ns)	
V_{CL}	Clamping Voltage @ I_{PP}	
V_{RWM}	Working Peak Reverse Voltage	
I_R	Maximum Reverse Leakage Current	
V_{BR}	Breakdown Voltage	
C_J	Capacitance @ V_R = 0 and f = 1 MHz	

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 A	I_{PP} = 5 A	I_{PP} = 12 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





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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.