

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 $+125$ °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

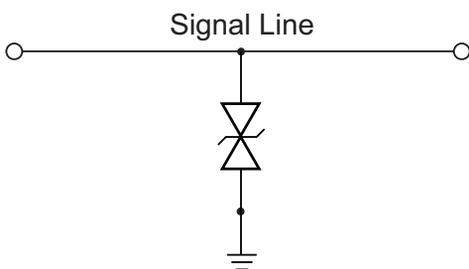
- ESD protection for high-speed data lines:
 - Exceeds: IEC 61000-4-2 (ESD) ± 20 kV (air), ± 20 kV (contact)
 - Human Body Model (HBM) ± 25 kV
- Small package saves board space
- Ultra low capacitance: 0.22 pF
- Low clamping voltage
- Low operating voltage: 3.3 V, 5 V, 7V
- Pb-free device

Applications

- Portable hand-held 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 +125 °C	DFN 0.62 x 0.32	Green Product RoHS Compliant
AOZ8851ADI-05			
AOZ8851ADI-07			



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	7V
Peak Pulse Current (I _{PP}), t _P = 8/20µs	4 A	4 A	4A
Storage Temperature (T _S)	-65 °C to +150 °C	-65 °C to +150 °C	-65 °C to +150 °C
ESD Rating per IEC61000-4-2, Contact ⁽¹⁾	±20 kV	±20 kV	±20 kV
ESD Rating per IEC61000-4-2, Air ⁽¹⁾	±20 kV	±20 kV	±20 kV
ESD Rating per Human Body Model ⁽²⁾	±15 kV	±15 kV	±15 kV

Notes:

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

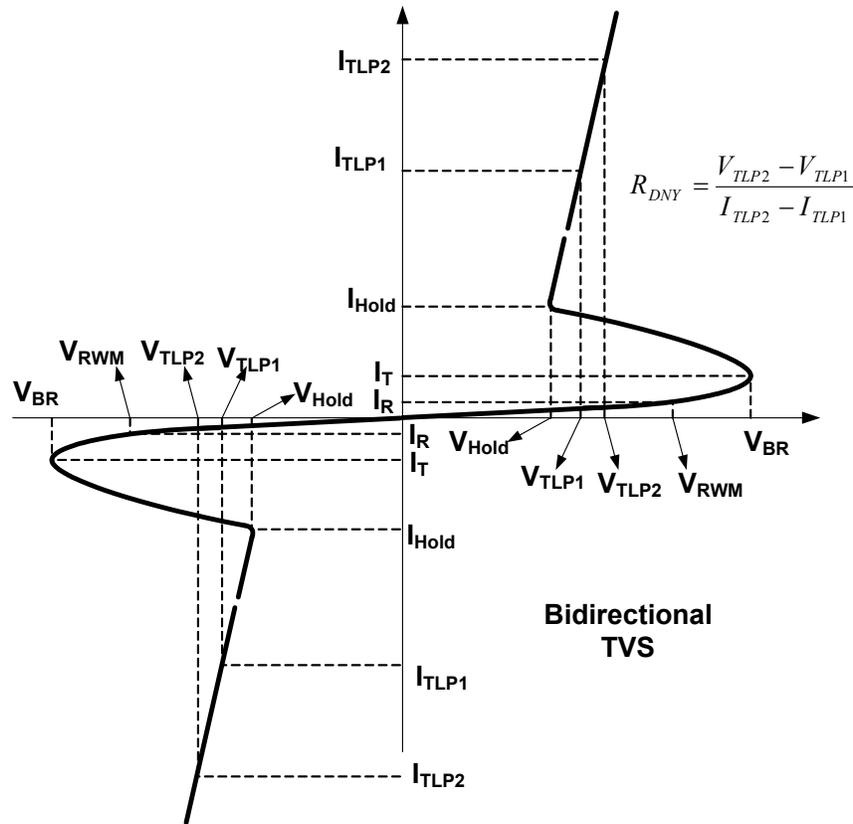
Maximum Operating Conditions

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

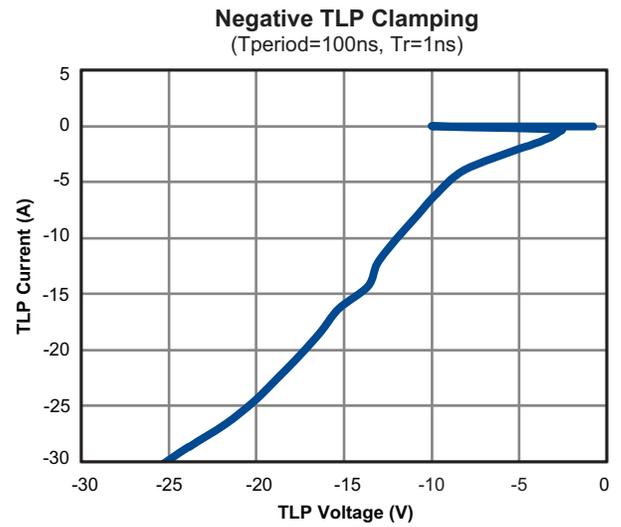
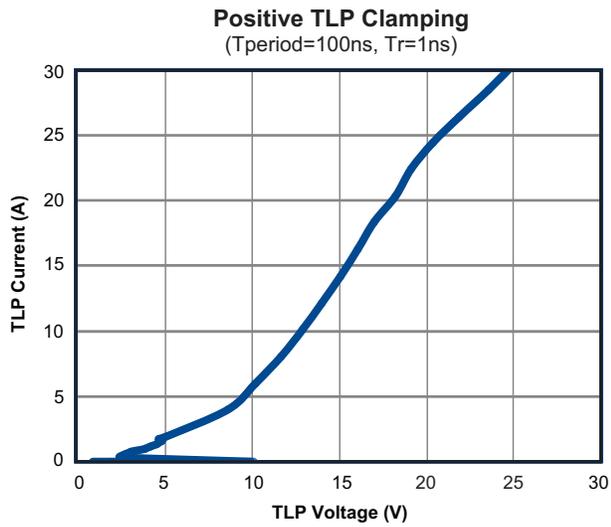
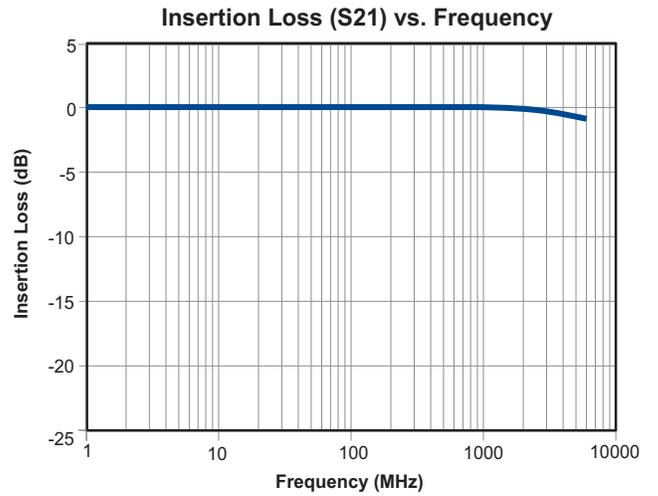
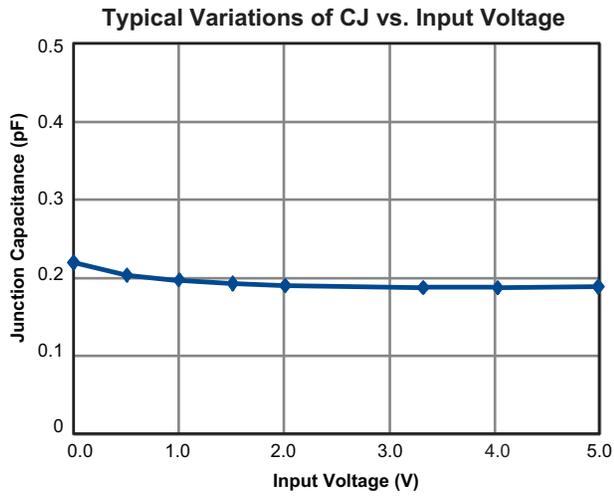
AOZ8851ADI-05						
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V _{RWM}	Reverse Working Voltage	I/O Pin to ground			5	V
V _{BR}	Reverse Breakdown Voltage	I _T =1mA, I/O Pin to ground	6.5			V
I _R	Reverse Leakage Current	V _{RWM} =5V, I/O Pin to ground			100	nA
V _{CL}	Clamping Voltage ⁽³⁾ (100ns 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

AOZ8851ADI-07						
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V _{RWM}	Reverse Working Voltage	I/O Pin to ground			7	V
V _{BR}	Reverse Breakdown Voltage	I _T =1mA, I/O Pin to ground	6.5			V
I _R	Reverse Leakage Current	V _{RWM} =7V, 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



LEGAL DISCLAIMER

Applications or uses as critical components in life support devices or systems are not authorized. AOS does not assume any liability arising out of such applications or uses of its products. AOS reserves the right to make changes to product specifications without notice. It is the responsibility of the customer to evaluate suitability of the product for their intended application. Customer shall comply with applicable legal requirements, including all applicable export control rules, regulations and limitations.

AOS' products are provided subject to AOS' terms and conditions of sale which are set forth at:
http://www.aosmd.com/terms_and_conditions_of_sale

LIFE SUPPORT POLICY

ALPHA AND OMEGA SEMICONDUCTOR PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
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.