AOZ8851ADI

Single Channel Ultra-Low Capacitance TVS

General Description

The AOZ8851ADI 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.

The AOZ8851ADI comes in an RoHS compliant DFN package and is rated over a -40°C to +125°C ambient temperature range.

The ultra-small 0.62 x 0.32 x 0.3mm 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

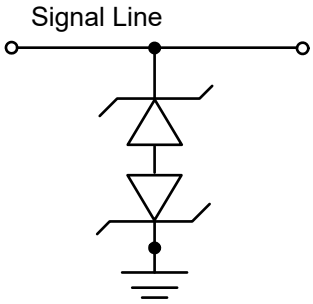
- ESD protection for high-speed data lines:
  - IEC 61000-4-2 (ESD) immunity:
    Air discharge: ±15 kV
    Contact discharge: ±8 kV
  - IEC61000-4-5 (Surge 8/20 µs)
    1.5 A (VRWM=18V)
    1.3 A (VRWM=20V)
    1.2 A (VRWM=24V)
- Human Body Model (HBM) ±8 kV
- Bidirectional TVS
- Ultra low capacitance: 0.4 pF
- Maximum reverse working voltage: 18 V, 20 V, 24V
- Pb-free device

Applications

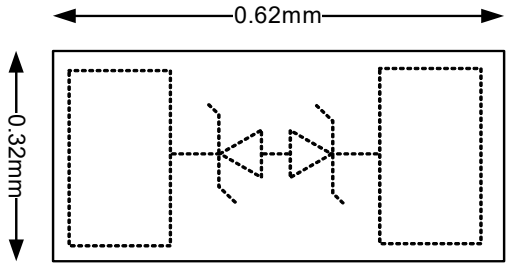
- USB Type-C
- Mobile phone
- Notebook computers
- Portable devices
- Digital cameras

Green Product

Typical Application



Pin Configuration



Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8851ADI-18	-40 °C to +125 °C	DFN 0.62 x 0.32	Green Product
AOZ8851ADI-20			
AOZ8851ADI-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		
	AOZ8851ADI-18	AOZ8851ADI-20	AOZ8851ADI-24
Any Pin to Pin	18 V	20 V	24 V
Peak Pulse Current (I_{PP}), t_P = 8/20µs	1.5 A	1.3 A	1.2 A
Peak Pulse Power (P_{PP}), t_P = 8/20µs	50 W	50 W	50 W
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)	±8 kV	±8 kV	±8 kV
ESD Rating per IEC61000-4-2, Air(1)	±15 kV	±15 kV	±15 kV
ESD Rating per Human Body Model(2)	±8 kV	±8 kV	±8 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.

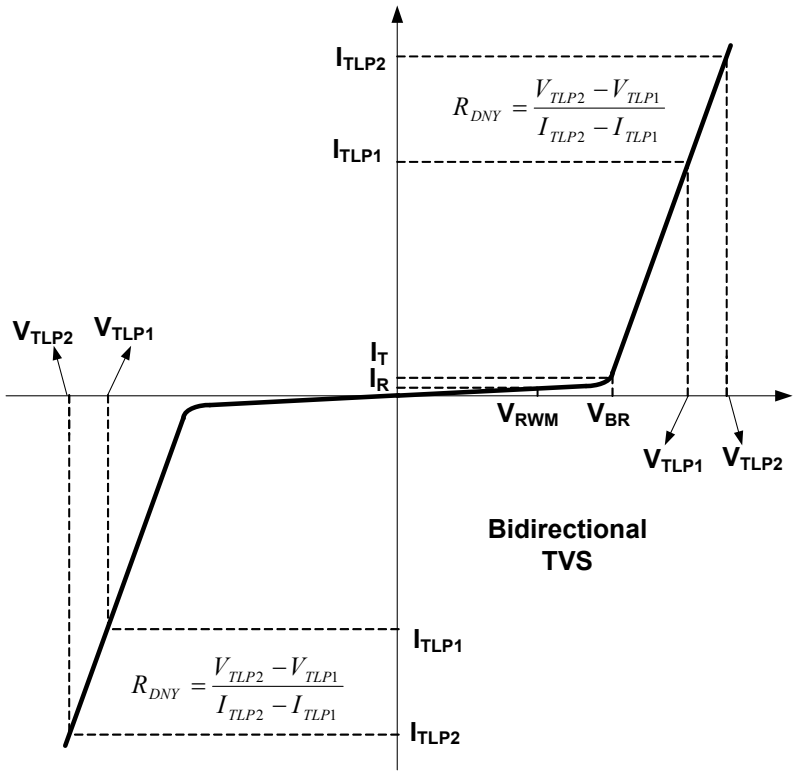
Maximum Operating Conditions

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-18						
Symbol	**Parameter**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Units**
V_{RWM}	Reverse Working Voltage				18	V
V_{BR}	Reverse Breakdown Voltage	I_T = 1mA	20	23	25	V
I_R	Reverse Leakage Current	Max. V_{RWM}		1	100	nA
V_{CL}	Clamping Voltage(3,4) (100ns Transmission Line Pulse)	I_{TLP}=1A		26	30	V
		I_{TLP}=14A		76	88	
	Clamping Voltage(3) (IEC61000-4-5 Surge 8/20µs)	I_{PP}=1A		30	35	
R_{DNY}	Dynamic Resistance(3,4)	I_{TLP}=1 to 14A		4		Ω
C_J	Junction Capacitance	$V_{I/O}$=0V, f=1MHz		0.4	0.7	pF

Electrical Characteristics *(Continued)*

T_A = 25°C unless otherwise specified.

AOZ8851ADI-20						
Symbol	**Parameter**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Units**
V_{RWM}	Reverse Working Voltage				20	V
V_{BR}	Reverse Breakdown Voltage	I_T = 1mA	22	25	28	V
I_R	Reverse Leakage Current	Max. V_{RWM}		1	100	nA
V_{CL}	Clamping Voltage(3,4) (100ns Transmission Line Pulse)	I_{TLP}=1A		30	35	V
		I_{TLP}=10A		70	77	
	Clamping Voltage(3) (IEC61000-4-5 Surge 8/20µs)	I_{PP}=1A		36	42	
R_{DNY}	Dynamic Resistance(3,4)	I_{TLP}=1 to 10A		4		Ω
C_J	Junction Capacitance	$V_{I/O}$=0V, f=1MHz		0.4	0.7	pF

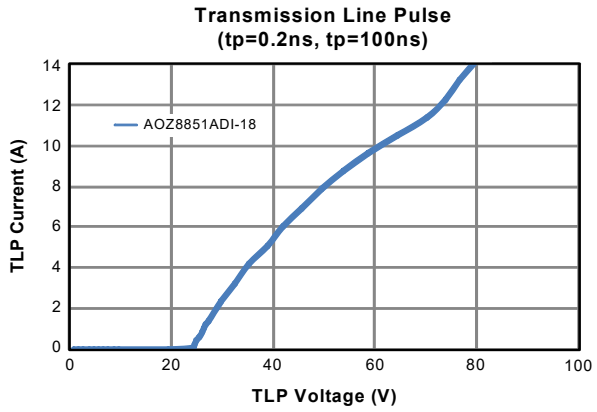
AOZ8851ADI-24						
Symbol	**Parameter**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Units**
V_{RWM}	Reverse Working Voltage				24	V
V_{BR}	Reverse Breakdown Voltage	I_T = 1mA	26.2	30	33	V
I_R	Reverse Leakage Current	Max. V_{RWM}		1	100	nA
V_{CL}	Clamping Voltage(3,4) (100ns Transmission Line Pulse)	I_{TLP}=1A		34	40	V
		I_{TLP}=8A		70	80	
	Clamping Voltage(3) (IEC61000-4-5 Surge 8/20µs)	I_{PP}=1A		42	49	
R_{DNY}	Dynamic Resistance(3,4)	I_{TLP}=1 to 8A		5		Ω
C_J	Junction Capacitance	$V_{I/O}$=0V, f=1MHz		0.4	0.7	pF

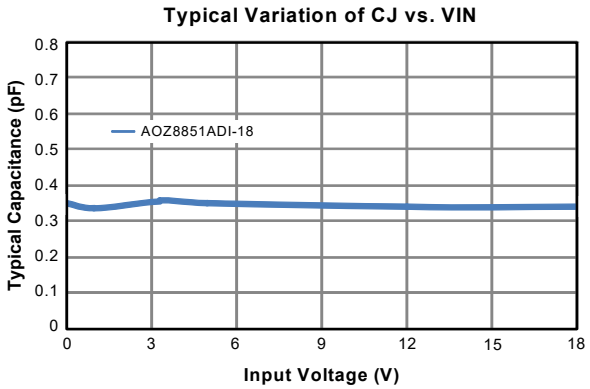
Notes:

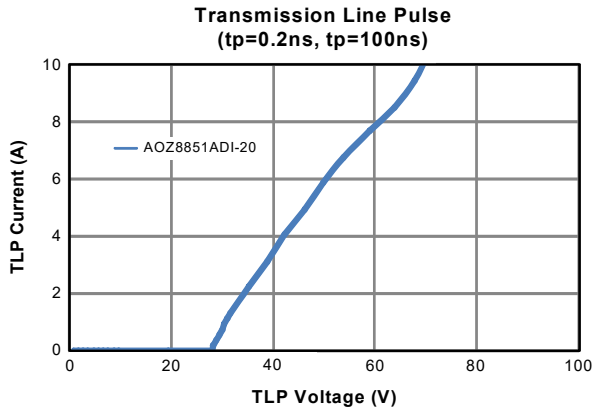
3. These specifications are guaranteed by design and characterization.

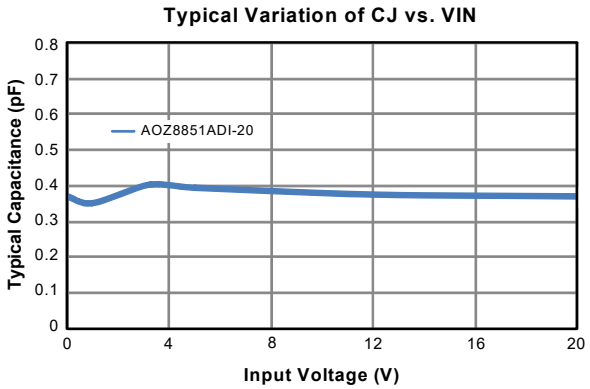
4. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

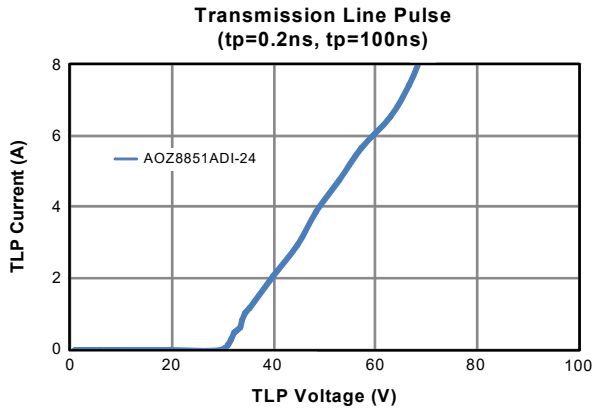
Typical Performance Characteristics

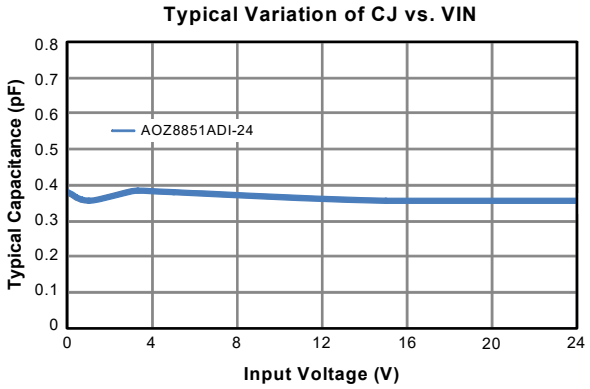












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2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.