

## General Description

The AOZ8331DI-05 is a single channel bidirectional high surge transient voltage suppressor designed to protect data lines such as audio line and power rail from damaging ESD or surge events.

This device consists of a bidirectional TVS diodes in a single package. During transient conditions, the bidirectional diodes direct the transient to either the positive side of the power supply line or to ground.

The AOZ8331DI-05 provides a typical capacitance of 55 pF and low clamping voltage making it ideally suited for data transmission protection in mobile and computing devices.

The AOZ8331DI-05 comes in a RoHS compliant and Halogen Free 1.0 mm×0.6 mm×0.5 mm package and is rated for -40°C to +125°C junction temperature range.

## Features

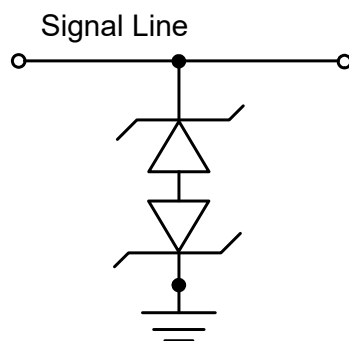
- ESD protection for high-speed data lines:
  - IEC 61000-4-2, ESD immunity:
    - Air discharge: ±30kV
    - Contact discharge: ±30kV
  - IEC 61000-4-5 (Lightning, 8/20µs) 35A
- Capacitance between I/O to GND: 55 pF
- Low clamping voltage
- Low operating voltage: 5.5 V

## Applications

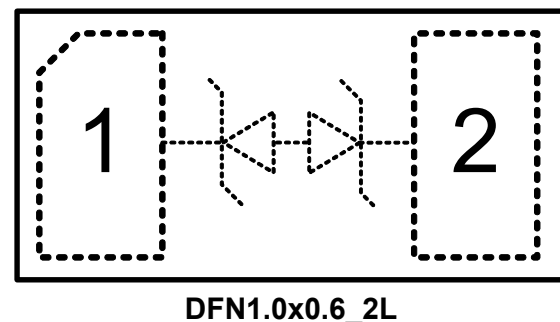
- Audio lines
- 5V Power Rail
- Mobile Phone
- Notebook Computers



## Typical Application



## Pin Configuration



## Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8331DI-05	-40°C to +125°C	DFN1.0 x0.6-2L	Green Product



AOS Green Products use reduced levels of Halogens, and are also RoHS compliant. Please visit [www.aosmd.com/media/AOSGreenPolicy.pdf](http://www.aosmd.com/media/AOSGreenPolicy.pdf) for additional information.

## Absolute Maximum Ratings

*Exceeding the Absolute Maximum ratings may damage the device.*

Parameter	Rating
Storage Temperature ( $T_S$ )	-65°C to +150°C
ESD Rating per IEC61000-4-2, contact <sup>(1)</sup>	±30kV
ESD Rating per IEC61000-4-2, air <sup>(1)</sup>	±30kV
8/20µs Surge IEC61000-4-5	±35A

### Notes:

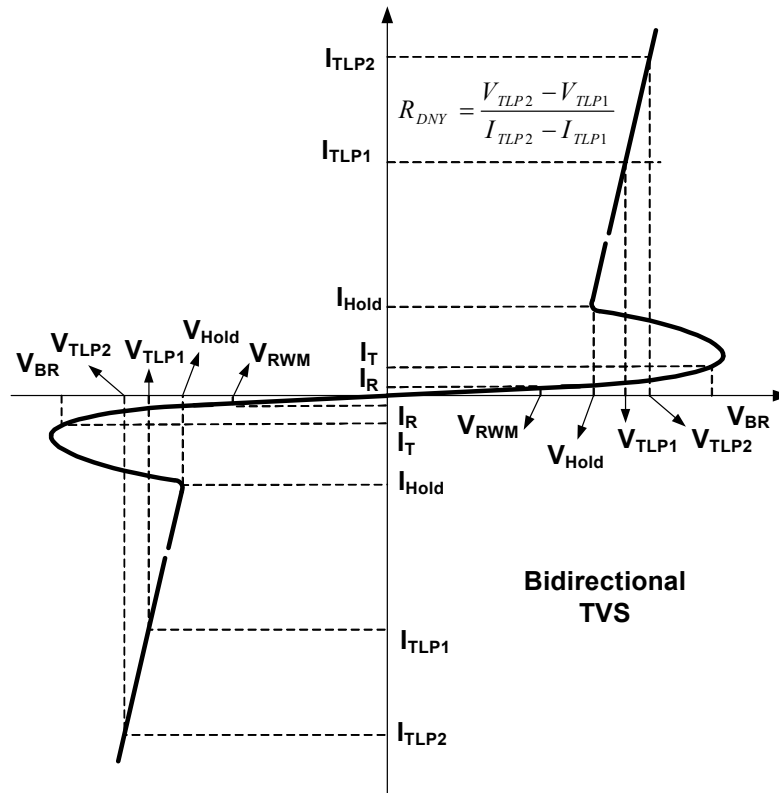
- IEC 61000-4-2 discharge with  $C_{Discharge} = 150pF$ ,  $R_{Discharge} = 330\Omega$ .
- Human Body Discharge per MIL-STD-883, Method 3015  $C_{Discharge} = 100pF$ ,  $R_{Discharge} = 1.5k\Omega$ .

## Maximum Operating Ratings

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

## Electrical Characteristics

T<sub>A</sub> = 25°C unless otherwise specified.



Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V <sub>RWM</sub>	Reverse Working Voltage				5.5	V
V <sub>BR</sub>	Reverse Breakdown Voltage	I <sub>T</sub> =1mA	6	7.5	9	V
I <sub>R</sub>	Reverse Leakage Current	V <sub>T</sub> =Max. V <sub>RWM</sub>		0.1	100	nA
V <sub>HOLD</sub>	Hold Voltage of Snapback <sup>(3)</sup>	I <sub>T</sub> =100mA	5.0			V
V <sub>CL</sub>	Clamping Voltage <sup>(3)(4)</sup> (100ns Transmission Line Pulse)	I <sub>TLP</sub> =1A		6.5	8	V
		I <sub>TLP</sub> =16A		7.5	9	
		I <sub>TLP</sub> =30A		8.5	10	
R <sub>DNY</sub>	Dynamic Resistance <sup>(3)</sup>	I <sub>TLP</sub> =1 to 30A		0.07		Ω
V <sub>CL</sub>	Clamping Voltage <sup>(3)</sup> IEC61000-4-5 Surge 8/20μs	I <sub>PP</sub> =2A		6.3	7.6	V
		I <sub>PP</sub> =30A		10.5	12	
C <sub>J</sub>	Junction Capacitance	V <sub>IO</sub> = 0V, f = 1MHz		55	75	pF

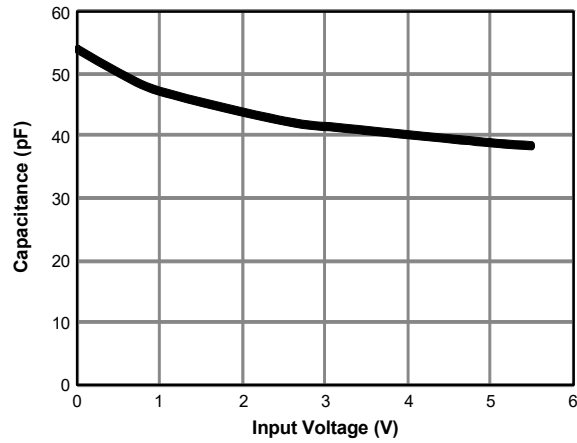
**Note:**

- 3. These specifications are guaranteed by design and characterization.
- 4. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

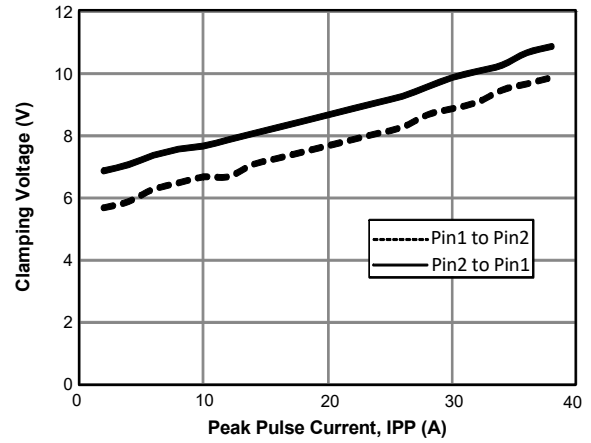
## Typical Characteristics

$T_A = 25^\circ\text{C}$ ,  $V_{IN} = 5\text{V}$  unless otherwise specified.

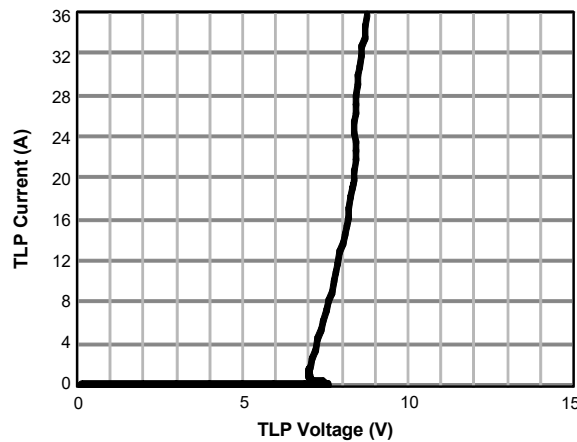
Typical Variations of CJ vs. Input Voltage



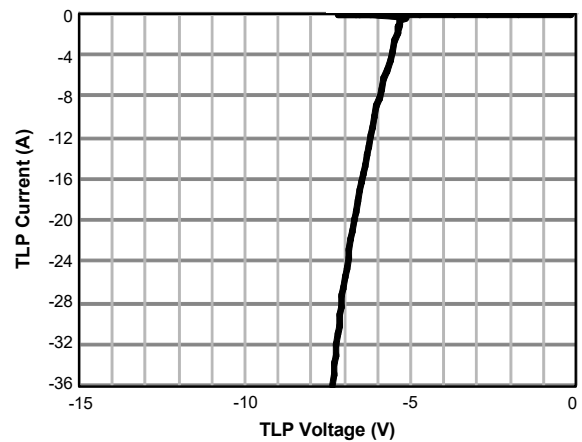
IEC61000-4-5 Surge 8/20us



Positive Transmission Line Pulse  
( $t_p=100\text{ns}$ ,  $t_r=0.2\text{ns}$ , Pin1 to Pin2)



Negative Transmission Line Pulse  
( $t_p=100\text{ns}$ ,  $t_r=0.2\text{ns}$ , Pin1 to Pin2)



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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.