

## General Description

The AOZ8331DI-04 is a 1-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 incorporates two unidirectional 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-04 provides a typical capacitance of 100 pF and low clamping voltage making it ideally suited for data transmission protection in mobile and computing devices.

The AOZ8331DI-04 comes in a RoHS compliant and Halogen Free 1.0mm × 0.6mm × 0.5mm package and is rated for -40°C to +125°C junction temperature range.

## Features

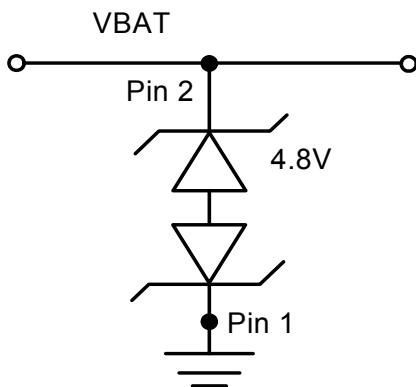
- IEC 61000-4-2, ESD immunity:
  - Air discharge: ±30kV
  - Contact discharge: ±30kV
- IEC 61000-4-5, Surge immunity (8/20 μs): 50A
- Junction Capacitance: 100 pF
- Low clamping voltage
- Reverse Working Voltage:
  - Pin2 to Pin1: 4.8 V
  - Pin1 to Pin2: 3.3 V

## Applications

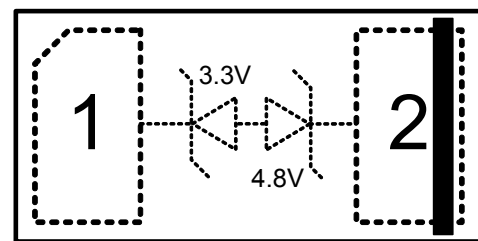
- VBAT
- Audio Lines
- General Purpose
- Mobile Phone
- Notebook computers



## Typical Application



## Pin Configuration



DFN1.0x0.6\_2L  
(Top View)

## Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8331DI-04	-40°C to +125°C	DFN1.0×0.6-2L	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 <sub>S</sub> )	-65 °C to +150°C
ESD Rating per IEC61000-4-2, contact <sup>(1)</sup>	±30 kV
ESD Rating per IEC61000-4-2, air <sup>(1)</sup>	±30 kV
8/20µs Surge IEC61000-4-5 Peak Pulse Current	± 50 A

### Notes:

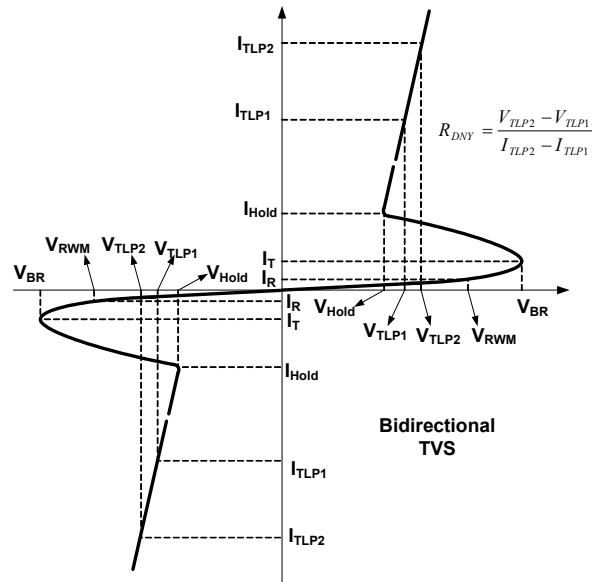
- IEC 61000-4-2 discharge with C<sub>Discharge</sub> = 150pF, R<sub>Discharge</sub> = 330Ω.
- Human Body Discharge per MIL-STD-883, Method 3015 C<sub>Discharge</sub> = 100pF, R<sub>Discharge</sub> = 1.5kΩ.

## Maximum Operating Ratings

Parameter	Rating
Junction Temperature (T <sub>J</sub> )	-40°C to +125°C

## Electrical Characteristics

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



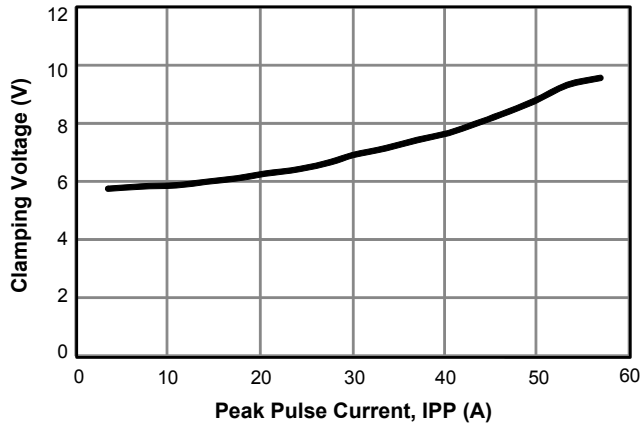
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>RWM</sub>	Reverse Working Voltage	Pin 2 to Pin 1			4.8	V
		Pin 1 to Pin 2			3.3	
V <sub>BR</sub>	Reverse Breakdown Voltage	I <sub>T</sub> = 1mA, Pin 2 to Pin 1	5	7	8.5	V
		I <sub>T</sub> = 1mA, Pin 1 to Pin 2	3.6	4.8	8	
I <sub>R</sub>	Reverse Leakage Current	V <sub>T</sub> = Max. V <sub>RWM</sub>		100	500	nA
V <sub>HOLD</sub>	Hold Voltage of Snapback <sup>(3)</sup>	Pin 2 to Pin 1	4.8			V
		Pin 1 to Pin 2	3.3			
V <sub>CL</sub>	Clamping Voltage IEC61000-4-5 Surge 8/20μs	I <sub>PP</sub> = 2A, Pin 2 to Pin 1 I <sub>PP</sub> = 2A, Pin 1 to Pin 2		5.3 -4	6 -5	V
		I <sub>PP</sub> = 50A, Pin 2 to Pin 1 I <sub>PP</sub> = 50A, Pin 1 to Pin 2		7.5 -6.5	8.5 -7.5	
C <sub>J</sub>	Junction Capacitance	V <sub>I/O</sub> = 0V, f = 1MHz, Any Pin to Pin		100	120	pF

**Notes:**

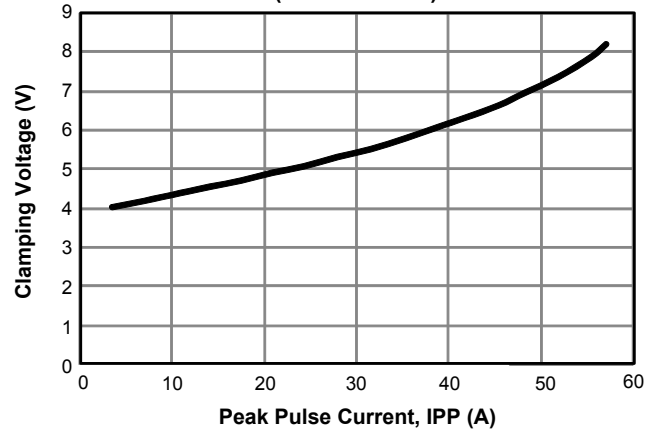
- 3. These specifications are guaranteed by design and characterization.
- 4. Per IEC61000-4-5 Surge 1.2/50μs (8/20μs).

## Typical Characteristics

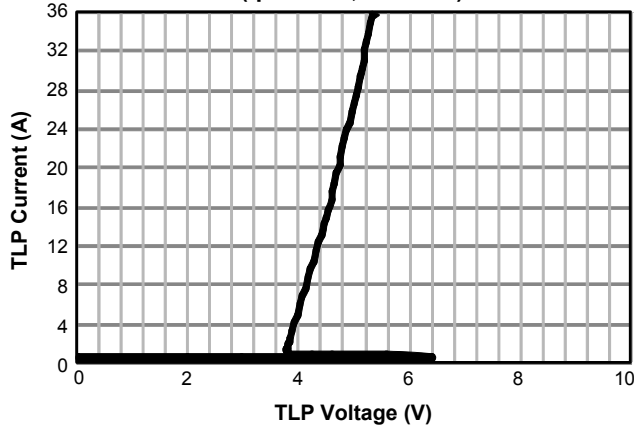
IEC61000-4-5 Surge 8/20 $\mu$ S  
(Pin 2 to Pin 1)



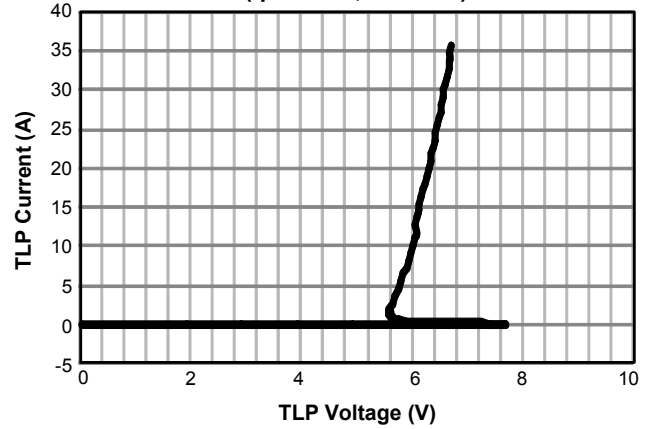
IEC61000-4-5 Surge 8/20 $\mu$ S  
(Pin 1 to Pin 2)



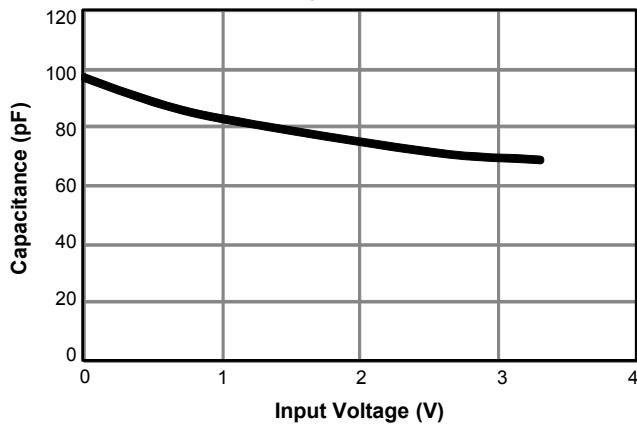
Transmission Line Pulse (Pin 1 to Pin 2)  
(tp=100ns, tr=0.2ns)



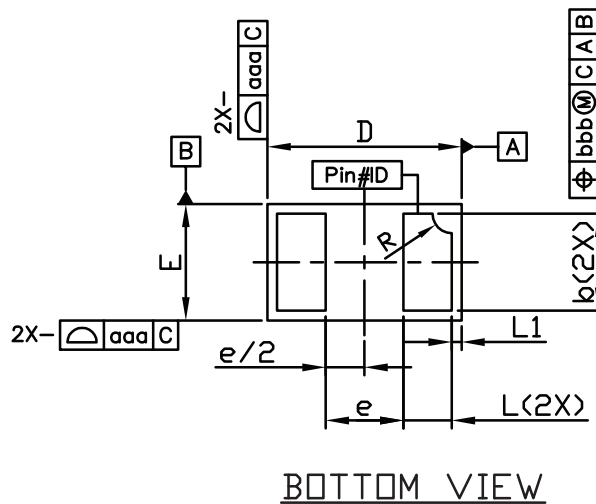
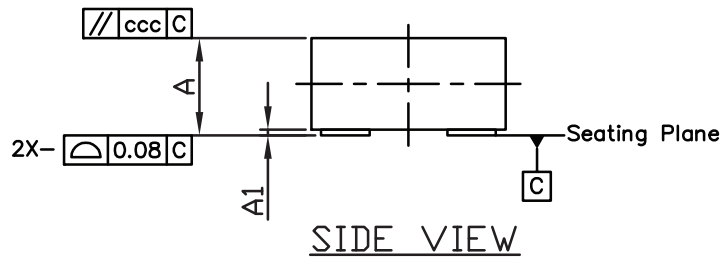
Transmission Line Pulse (Pin 2 to Pin 1)  
(tp=100ns, tr=0.2ns)



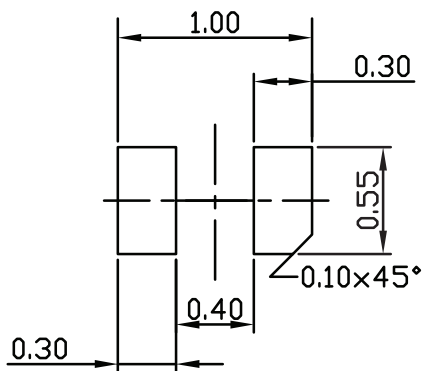
Typical Variations of CJ vs. Input Voltage  
(Any Pin to Pin)



Package Dimensions, DFN1.0x0.6-2L



RECOMMENDED LAND PATTERN



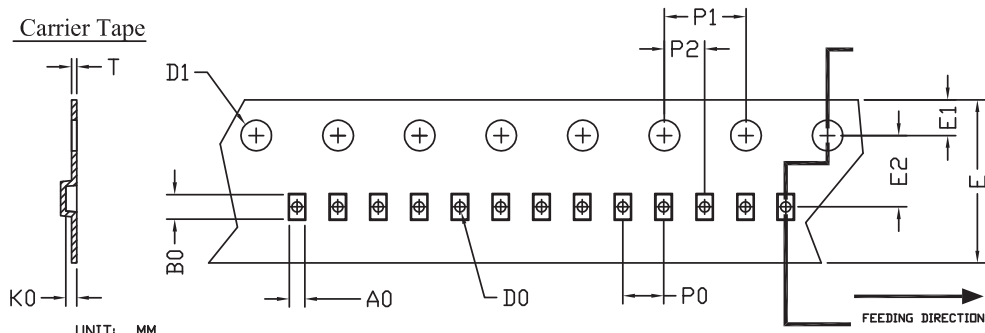
UNIT: mm

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.47	0.50	0.53	0.019	0.020	0.021
A1	0.00	0.03	0.05	0.000	0.001	0.002
b	0.45	0.50	0.55	0.018	0.020	0.022
D	0.95	1.00	1.05	0.037	0.039	0.041
E	0.55	0.60	0.65	0.022	0.024	0.026
e	---	0.40	---	---	0.016	---
L	0.20	0.25	0.30	0.008	0.010	0.012
L1	0.05±0.03 Ref.			0.002±0.001 Ref.		
R	0.05	0.10	0.15	0.002	0.004	0.006
aaa	0.15			0.006		
bbb	0.05			0.002		
ccc	0.05			0.002		

NOTE

1. ALL DIMENSION ARE IN MILLIMETERS.ANGLES ARE IN DEGREES.
2. COPLANARITY APPLIES TO THE EXPOSED HEAT SINK SLUG AS WELL AS THE TERMINALS.
3. THE SHAPE OF PIN ID CAN BE DIFFERENT PER MANUFACTURING LOCATION

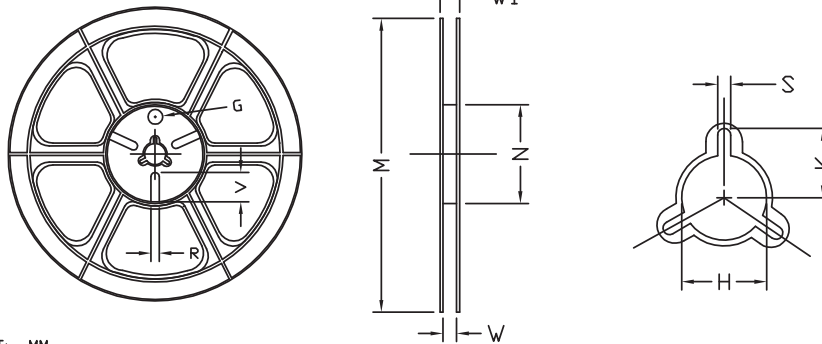
### Tape and Reel Dimension, DFN1.0x0.6-2L



UNIT: MM

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
DFN1.0x0.6/ DFN1.0x0.6A (8 mm)	0.65 ±0.04	1.05 ±0.04	0.61 ±0.04	0.40 ±0.05	1.50 +0.10	8.00 +0.30 -0.10	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



UNIT: MM

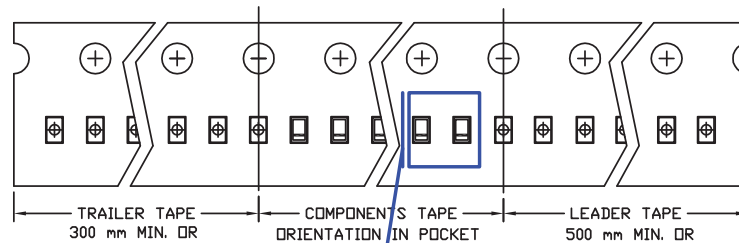
TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
8 mm	φ178	φ178 ±0.5	φ55 ±1	8.4 +1.5 -0	MAX. 14.4	φ13.0 ±0.5	MAX. 10.1	2.0 ±0.5	N/A	N/A	N/A

### Tape

Leader / Trailer  
& Orientation

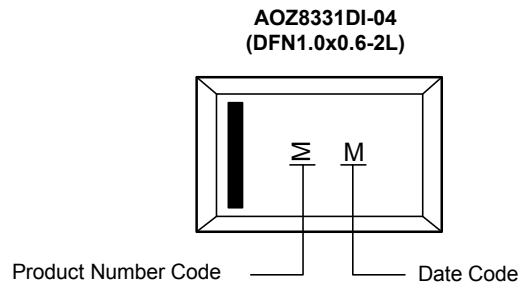
TVS

Unit Per Reel:  
10000pcs



DETAIL:  
UNIT DIRECTION IN POCKET

## Part Marking



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As used herein:

- |   |   |
|---|---|
| <p>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.</p> | <p>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.</p> |
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