AOZ8251ADI

Single Channel Bidirectional TVS Diode

General Description

The AOZ8251ADI is an one-line bidirectional transient voltage suppressor diode designed to protect 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 AOZ8251ADI comes in an RoHS compliant package and is rated over a -40°C to +85°C ambient temperature range.

The ultra-small 0.62 mm x 0.32 mm x 0.3 mm 0201 footprint package makes the AOZ8251ADI 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

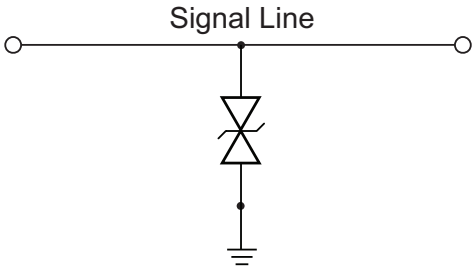
- ESD protection for high-speed data lines:
  - Exceeds: IEC 61000-4-2 (ESD) ±20 kV (air), ±20 kV (contact)
  - Human Body Model (HBM) ±25 kV
- Small package saves board space
- Capacitance: 10 pF
- Low clamping voltage
- Low operating voltage: 3.3 V, 5 V
- Pb-free device

Applications

- Portable handheld devices
- Keypads, data lines, buttons
- Notebook computers
- Digital cameras
- Portable GPS

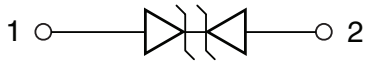
Green Product

Typical Application



Bidirection Protection of Single Line

Pin Configuration



Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8251ADI-03	-40°C to +85°C	DFN 0.62 x 0.32	Green Product RoHS Compliant
AOZ8251ADI-05			

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
Peak Pulse Current (I_{PP}), t_P = 8/20µs	4 A	4 A
Storage Temperature (T_S)	-65 °C to +150 °C	-65 °C to +150 °C
ESD Rating per IEC61000-4-2, Contact(1)	±20 kV	±20 kV
ESD Rating per IEC61000-4-2, Air(1)	±20 kV	±20 kV
ESD Rating per Human Body Model(2)	±15 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.

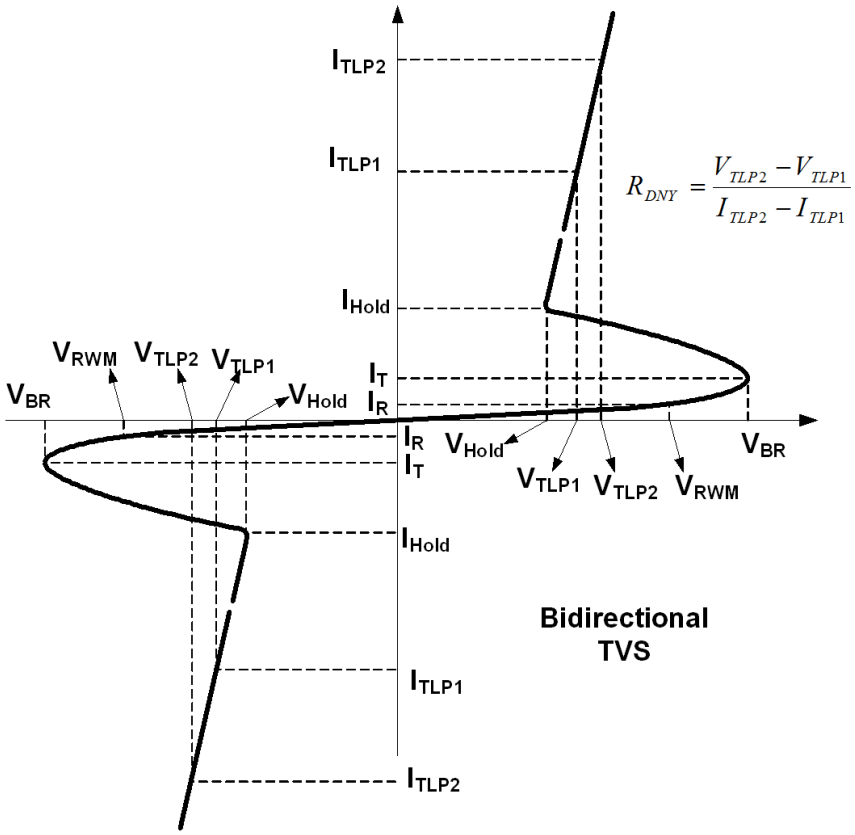
Maximum Operating Conditions

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.



AOZ8251ADI-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		10	12	pF

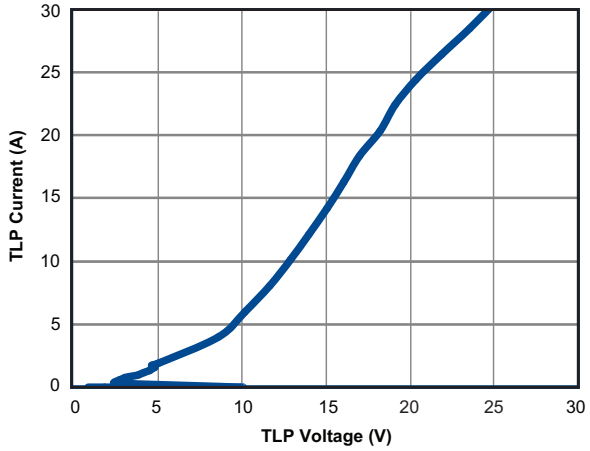
AOZ8251ADI-05						
Symbol	**Parameter**	**Conditions**	**Min.**	**Typ.**	**Max.**	**Units**
V_{RWM}	Reverse Working Voltage	I/O Pin to ground			5	V
V_{BR}	Reverse Breakdown Voltage	I_T=1mA, I/O Pin to ground	6.5			V
I_R	Reverse Leakage Current	V_{RWM}=5V, I/O Pin to ground			100	nA
V_{CL}	Clamping Voltage(3) (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		10	12	pF

Note:

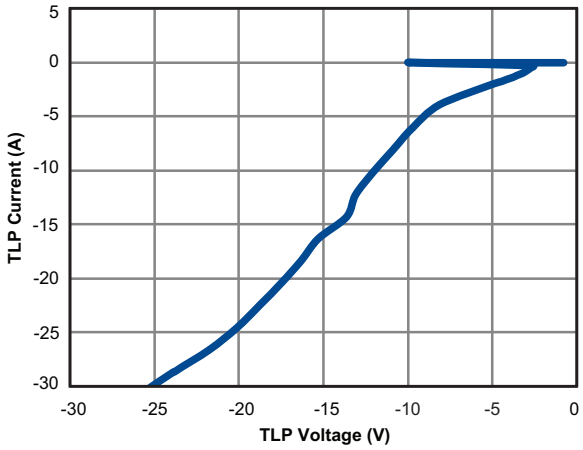
3. These specifications are guaranteed by design and characterization.

Typical Performance Characteristics

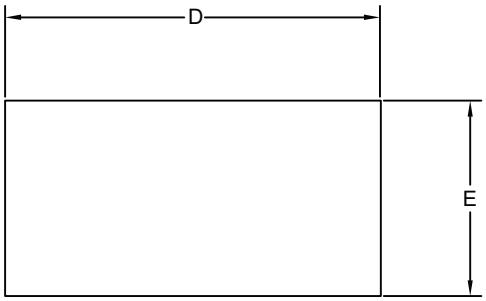
Positive TLP Clamping
(Tperiod=100ns, Tr=1ns)



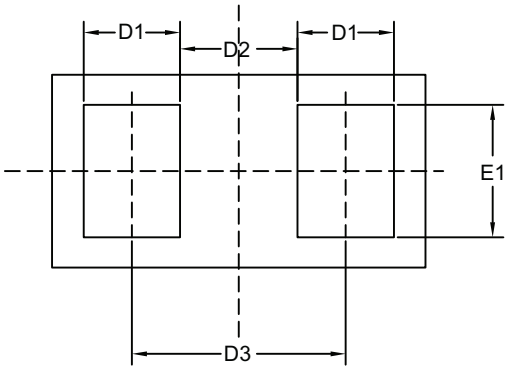
Negative TLP Clamping
(Tperiod=100ns, Tr=1ns)



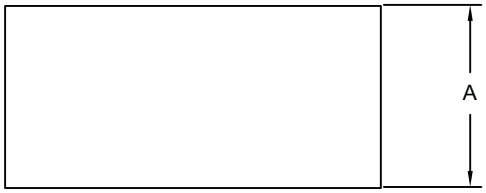
Package Dimensions, DFN 0.62x0.32, 2L EP2 S



TOP VIEW

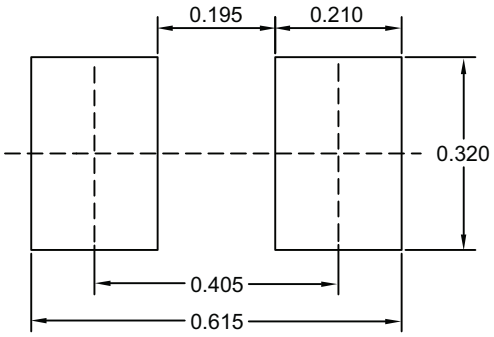


BOTTTOM VIEW



SIDE VIEW

RECOMMENDED LAND PATTERN



Unit: mm

Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	0.27	0.30	0.33
D	0.57	0.62	0.67
D1	0.11	0.16	0.21
D2	0.145	0.195	0.245
D3	0.305	0.355	0.405
E	0.27	0.32	0.37
E1	0.17	0.22	0.27

Dimensions in inches

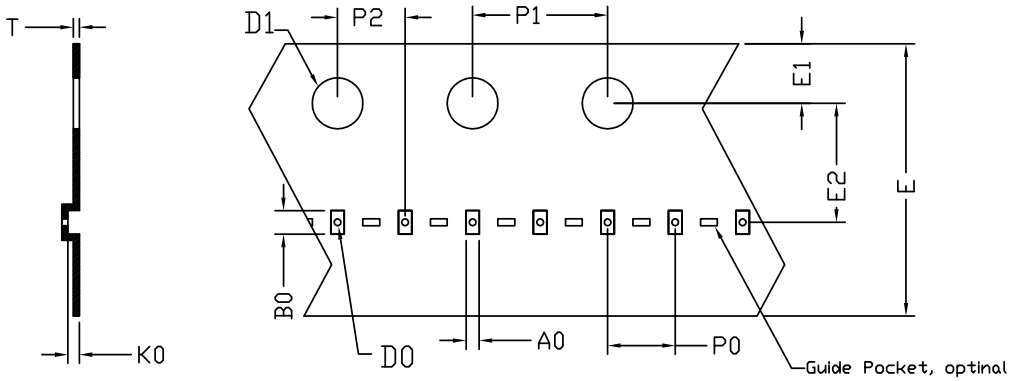
Symbols	Min.	Nom.	Max.
A	0.0106	0.0118	0.0130
D	0.0224	0.0244	0.0264
D1	0.0043	0.0063	0.0083
D2	0.0057	0.0077	0.0097
D3	0.0120	0.0140	0.0167
E	0.0106	0.0126	0.0146
E1	0.0067	0.0087	0.0107

Notes:

1. All dimensions are in millimeters.
2. Dimensions are inclusive of plating.
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 6mil each.
4. Controlling dimension is millimeter. Converted inch dimensions are not necessarily exact.
5. Paddle exposed on bottom.

Tape and Reel Dimensions, DFN 0.62x0.32

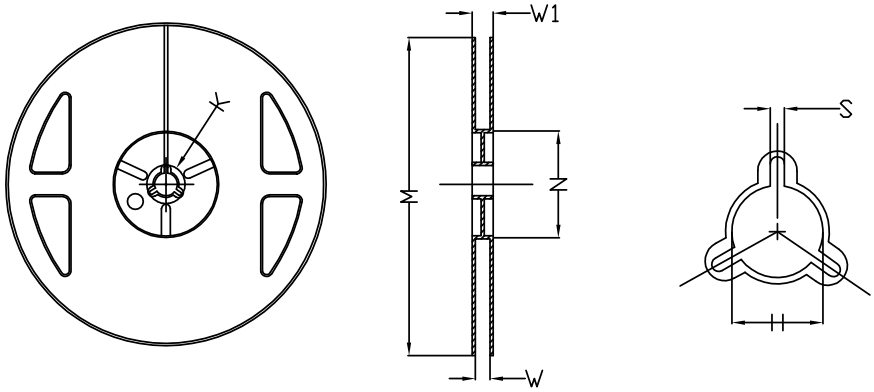
Carrier Tape



UNIT: MM

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
DFN0.62x0.32 (8 mm)	0.39 ±0.03	0.69 ±0.03	0.34 +0.03 −0.01	0.20 ±0.05	1.50 +0.1 −0.0	8.00 ±0.10	1.75 ±0.10	3.50 ±0.03	2.00 ±0.05	4.00 ±0.05	2.00 ±0.05	0.20 ±0.05

Reel

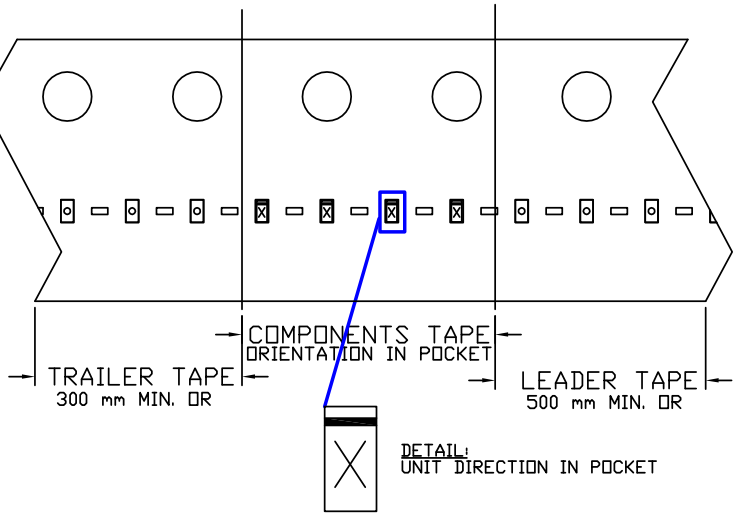


UNIT: MM

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S
8 mm	ø180	ø180 +0 −3	ø60 +1 −0	9.0 ±0.3	11.4 ±1.0	ø13.0 ±0.2	ø21.0 ±0.5	2.0 ±0.5

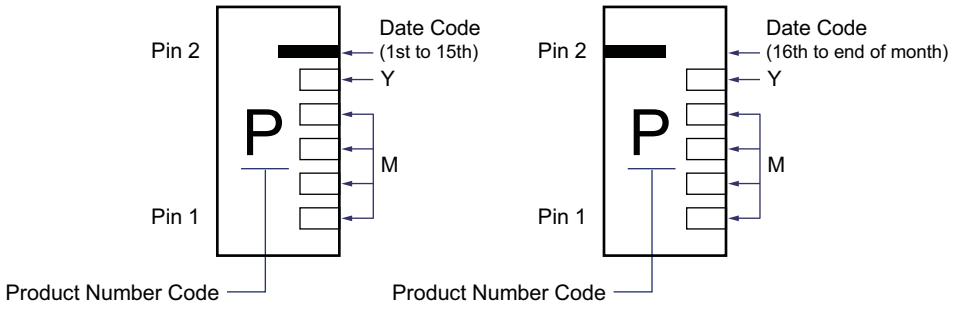
Leader / Trailer & Orientation

Unit Per Reel: 10000pcs

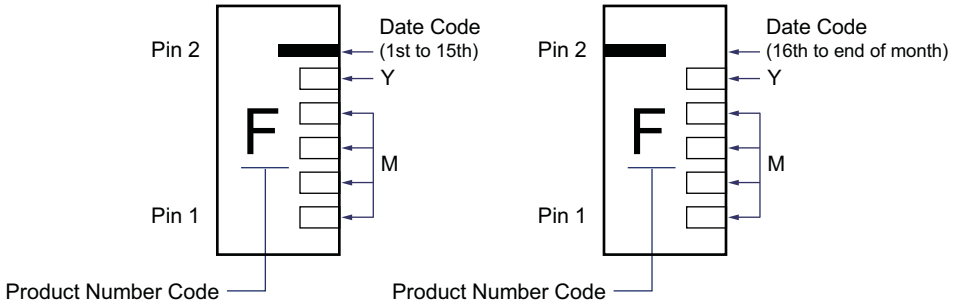


Part Marking

AOZ8251ADI-03
(DFN0.62x0.32)



AOZ8251ADI-05
(DFN0.62x0.32)



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