AOZ8251BDI

One-line Bi-directional TVS Diode

General Description

The AOZ8251BDI is a one-line bi-directional transient voltage suppressor diode designed to protect voltage sensitive electronics from high transient conditions and ESD.

This device incorporates bi-directional TVS diode in an ultra-small DFN 1006 package. It may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 (±15kV air, ±8kV contact discharge).

The AOZ8251BDI comes in an RoHS compliant DFN 1.0 mm x 0.6 mm 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 0.5 mm 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

  AOZ8251BDI-05:
  - Exceeds: IEC 61000-4-2 (ESD) ± 20 kV (air), ±20 kV (contact)
  - Human Body Model (HBM) ± 30 kV
  - IEC 61000-4-5 (Lightning) 4 A (8/20 µs)

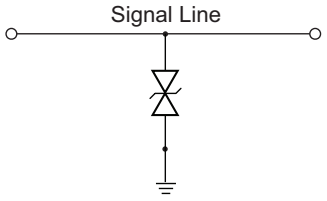
  AOZ8251BDI-12:
  - Exceeds: IEC 61000-4-2 (ESD) ± 20 kV (air), ± 20 kV (contact)
  - Human Body Model (HBM) ± 30 kV
  - IEC 61000-4-5 (Lightning) 1.5 A (8/20 µs)
- Pb-free device

Applications

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

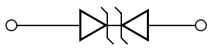
Green Product

Typical Application



Bidirection Protection of Single Line

Pin Configuration



Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8251BDI-05	-40°C to +125°C	DFN 0.62 x 0.32	Green Product
AOZ8251BDI-12			

AOS Green Products use reduced levels of Halogens, and are also RoHS compliant.
Please visit www.aosmd.com/web/quality/rohs_compliant.jsp for additional information.

Absolute Maximum Ratings

Exceeding the Absolute Maximum ratings may damage the device.

Parameter	Rating for AOZ8251BDI	
	-05	-12
VP – VN	5 V	12 V
Peak Pulse Current, t_P = 8/20 µs	4 A	1.5 A
Storage Temperature (T_S)	-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)	± 30 kV	± 30 kV

Notes:

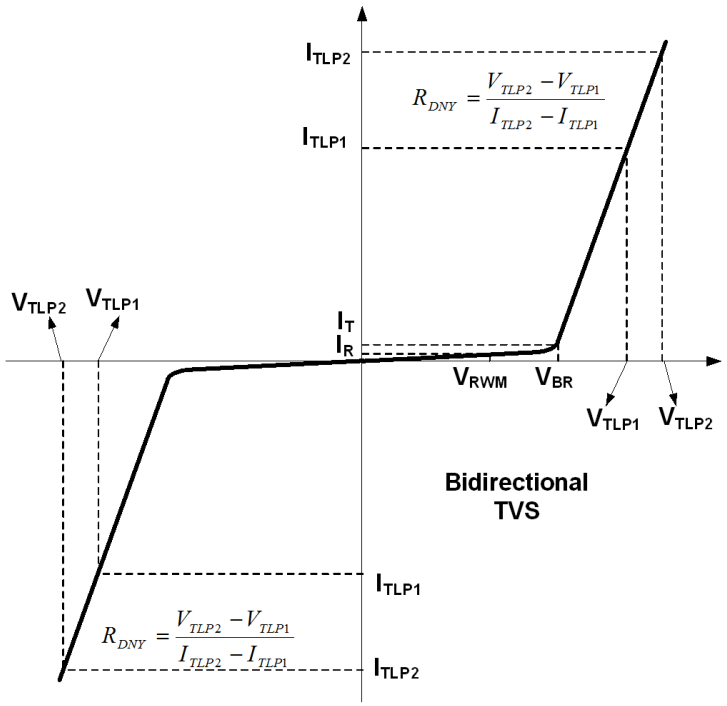
1. IEC 61000-4-2 discharge with $C_{Discharge}$ = 150 pF, $R_{Discharge}$ = 330 Ω.
2. Human Body Discharge per MIL-STD-883, Method 3015 $C_{Discharge}$ = 100 pF, $R_{Discharge}$ = 1.5 kΩ.

Maximum Operating Ratings

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

Electrical Characteristics

T_A = 25°C unless otherwise specified.



AOZ8251BDI-05						
Symbol	**Parameter**	**Condition**	**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	5.5	6	8	V
I_R	Reverse Leakage Current	V_{RWM}=5V, I/O Pin-to-Ground		1	100	nA
V_{CL}	Clamping Voltage(3) (100ns Transmission Line Pulse, I/O Pin-to-Ground)	I_{TLP}=1A		8	11	V
		I_{TLP}=16A		16.5	24	V
	Clamping Voltage(3) (IEC61000-4-5, 8/20µs, I/O Pin-to-Ground)	I_{PP}=4A		15	18	V
R_{DNY}	Dynamic Resistance(3)	I_{TLP}=1A to 12A		0.55		Ω
C_J	Junction Capacitance	$V_{I/O}$=0V, f=1MHz, I/O Pin-to-Ground		5	6.5	pF

Electrical Characteristics (continued)

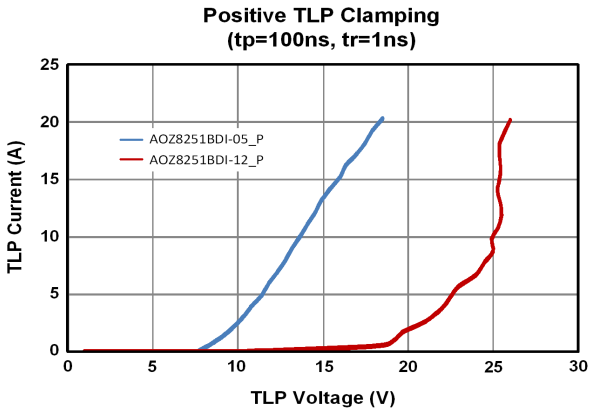
AOZ8251BDI-12						
Symbol	**Parameter**	**Condition**	**Min.**	**Typ.**	**Max.**	**Units**
V_{RWM}	Reverse Working Voltage	I/O Pin-to-Ground			12	V
V_{BR}	Reverse Breakdown Voltage	I_T=1mA, I/O Pin-to-Ground	13	14.5	16	V
I_R	Reverse Leakage Current	V_{RWM}=12V, I/O Pin-to-Ground		1	100	nA
V_{CL}	Clamping Voltage(3) (100ns Transmission Line Pulse, I/O Pin-to-Ground)	I_{TLP}=1A		18	20	V
		I_{TLP}=16A		25	33	V
	Clamping Voltage(3) (IEC61000-4-5, 8/20µs, I/O Pin-to-Ground)	I_{PP}=1.5A			25	V
R_{DNY}	Dynamic Resistance(3)	I_{TLP}=10A to 20A		0.3		Ω
C_J	Junction Capacitance	$V_{I/O}$=0V, f=1MHz, I/O Pin-to-Ground		4.5	6.5	pF

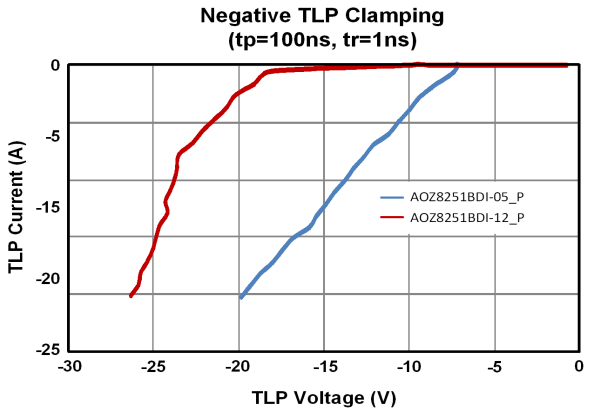
Note:

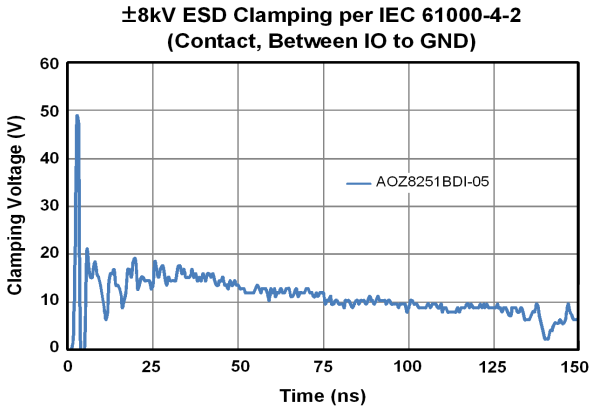
3. These specifications are guaranteed by design and characterization.

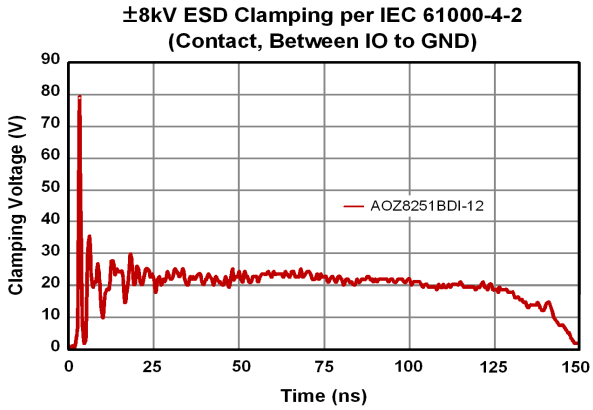
Typical Performance Characteristics

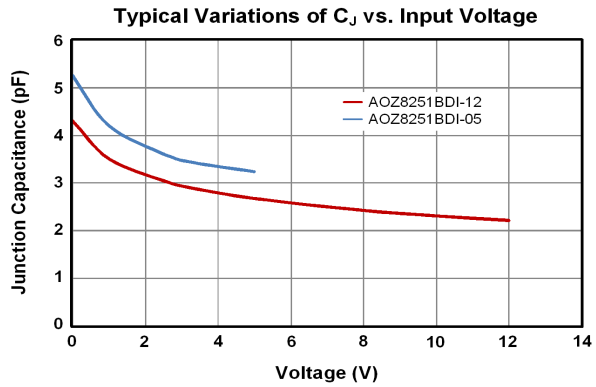
T_A = 25°C, unless otherwise specified.



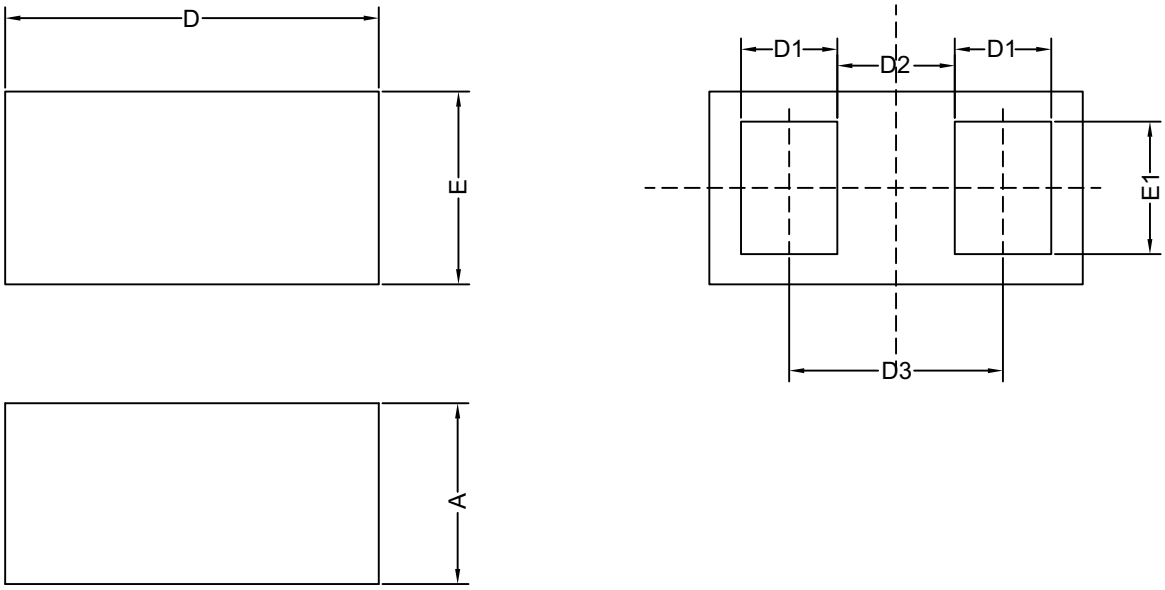




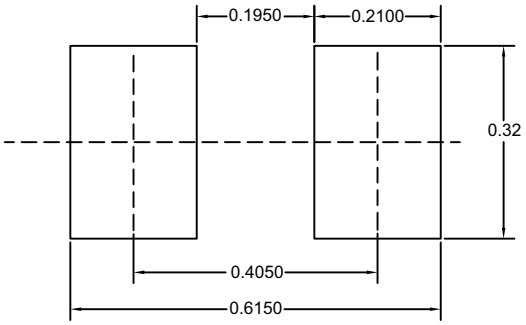




Package Dimension, DFN 0.62 x 0.32



RECOMMEND LAND PATTERN



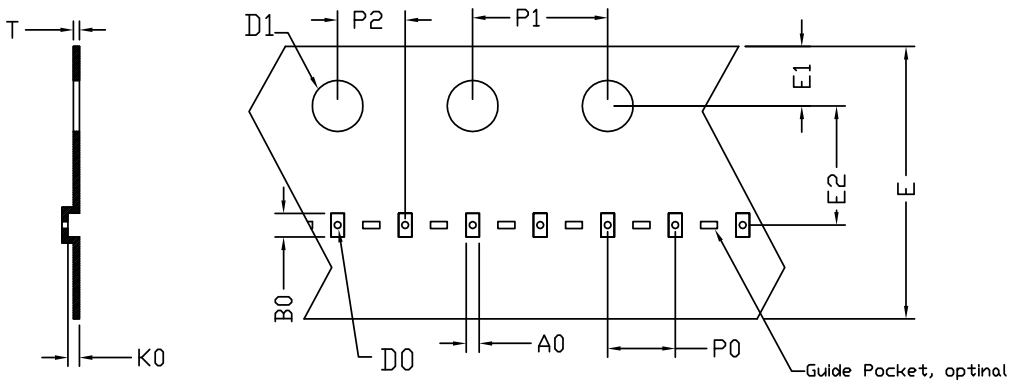
unit: mm

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.27	0.30	0.33	0.0106	0.0118	0.0130
D	0.57	0.62	0.67	0.0224	0.0244	0.0264
D1	0.11	0.16	0.21	0.0043	0.0063	0.0083
D2	0.145	0.195	0.245	0.0057	0.0077	0.0097
D3	0.305	0.355	0.405	0.0120	0.0140	0.0160
E	0.27	0.32	0.37	0.0106	0.0126	0.0146
E1	0.17	0.22	0.27	0.0067	0.0087	0.0107

NOTE
1. ALL DIMENSIONS ARE IN MILLMETERS.
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 DIMENSIONS IN MILLIMETER.
   CONVERTED INCH DIMENSTIONS ARE NOT NECESSARILY EXACT.
5. PADDLE EXPOSED ON BOTTOM.

Tape and Reel Dimensions, DFN 0.62 x 0.32

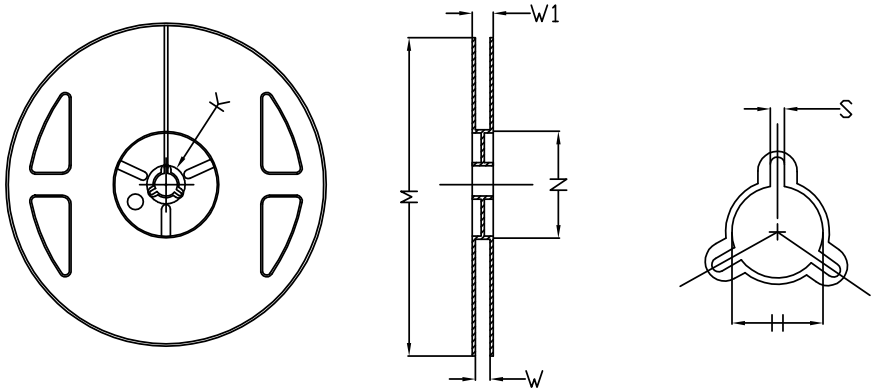
Carrier Tape



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

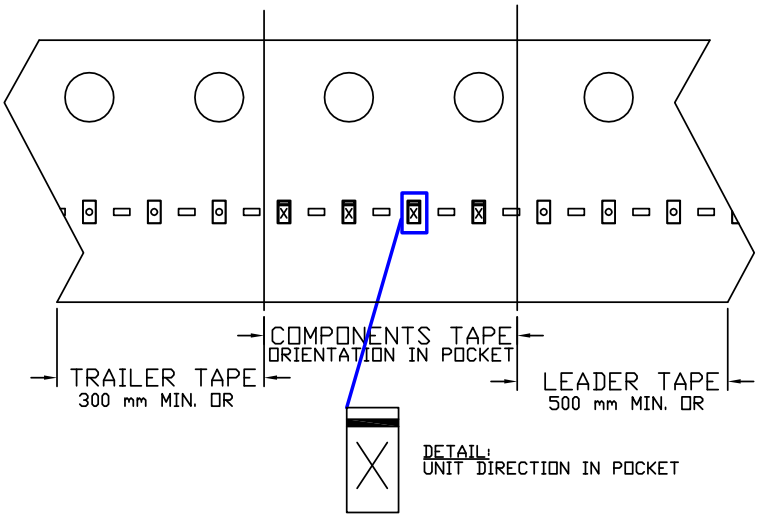


UNIT: MM

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

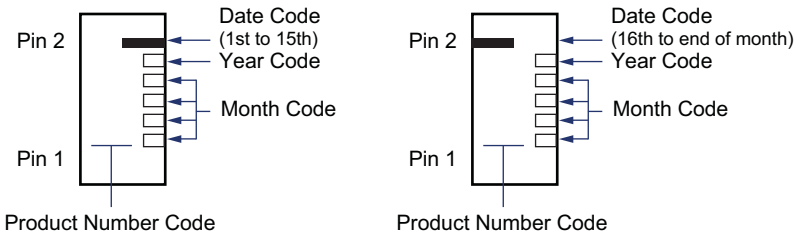
Leader / Trailer & Orientation

Unit Per Reel: 10000pcs



Part Marking

AOZ8251BDI-05
(DFN0.62x0.32)



Part Number	Product Code
AOZ8251BDI-05	J
AOZ8251BDI-12	K

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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.