

## General Description

The AOZ8224 is a four-line bi-directional transient voltage suppressor diode designed to protect voltage sensitive electronics from high transient conditions and ESD.

This device incorporates eight TVS diodes in a small SOT-23 package. It may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 ( $\pm 15$  kV air,  $\pm 8$  kV contact discharge).

The AOZ8224 comes in a SOT-23 package and is rated over a  $-40$  °C to  $+85$  °C ambient temperature range.

The small SOT-23 package makes the AOZ8224 ideal for applications where PCB space is a premium. The small size and high ESD protection is ideal for protecting voltage sensitive electronics from high transient conditions and ESD.

## Features

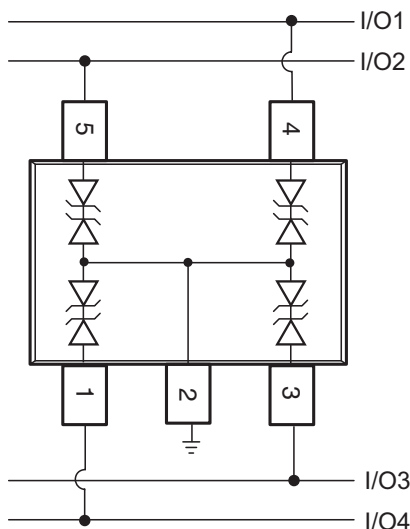
- ESD protection for high-speed data lines:
  - Exceeds IEC 61000-4-2 (ESD)  $\pm 30$  kV (air),  $\pm 30$  kV (contact)
  - Human Body Model (HBM)  $\pm 30$  kV
  - IEC 61000-4-5 (Lightning) 5 A (8/20  $\mu$ s)
- IEC 61000-4-4 (EFT)  $\pm 40$ A
- Small package saves board space
- Low insertion loss
- Low clamping voltage
- Low operating voltages: 5.0 V

## Applications

- Portable handheld devices
- Keypads, data lines, buttons
- Notebook computers
- Digital cameras
- Portable GPS
- MP3 players

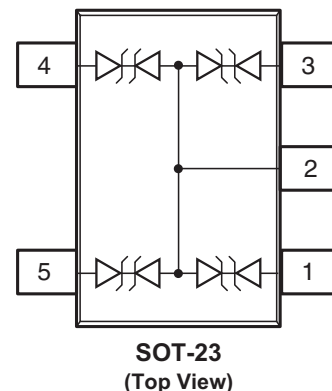


## Typical Application



**Bidirection Protection of Four Lines**

## Pin Configuration



## Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8224CI-05	-40 °C to +85 °C	SOT-23-5L	Green Product RoHS Compliant



AOS Green Products use reduced levels of Halogens, and are also RoHS compliant.  
Please visit [www.aosmd.com/web/quality/rohs\\_compliant.jsp](http://www.aosmd.com/web/quality/rohs_compliant.jsp) for additional information.

## Absolute Maximum Ratings

Exceeding the Absolute Maximum Ratings may damage the device.

Parameter	AOZ8224CI-05
Peak Pulse Current, $t_p = 8/20 \mu s$	5 A
Peak Pulse Power, $t_p = 8/20 \mu s$	70 W
Storage Temperature ( $T_S$ )	-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
ESD Rating per Human Body Model <sup>(2)</sup>	± 30 kV

### Notes:

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

## Maximum Operating Ratings

The device is not guaranteed to operate beyond the Maximum Operating Conditions.

Parameter	Rating
Junction Temperature ( $T_J$ )	-4 0°C to +85 °C

## Electrical Characteristics

$T_A = 25^\circ\text{C}$  unless otherwise specified.

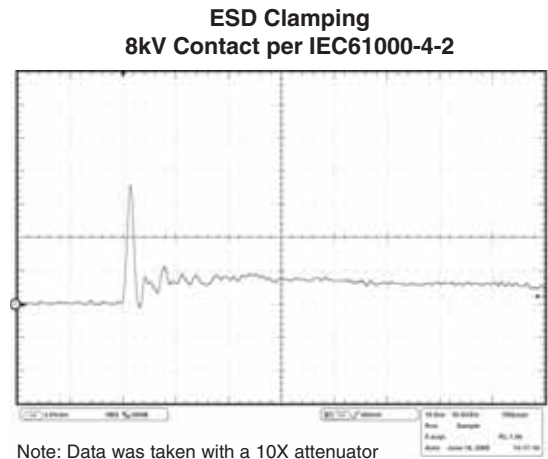
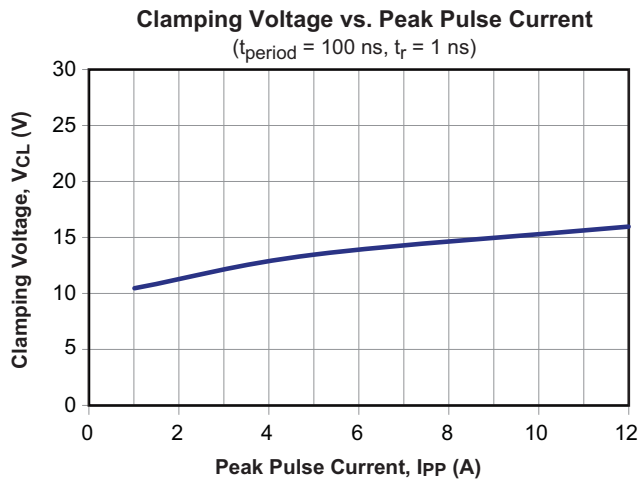
Symbol	Parameter	Symbol	Parameter
$I_{PP}$	Maximum Reverse Peak Pulse Current	$I_F$	Forward Current
$V_{CL}$	Clamping Voltage @ $I_{PP}$	$V_F$	Forward Voltage
$V_{RWM}$	Working Peak Reverse Voltage	$P_{pk}$	Peak Power Dissipation
$I_R$	Maximum Reverse Leakage Current	$C_J$	Max. Capacitance @ $V_R = 0$ and $f = 1 \text{ MHz}$
$V_{BR}$	Breakdown Voltage		

## Electrical Characteristics

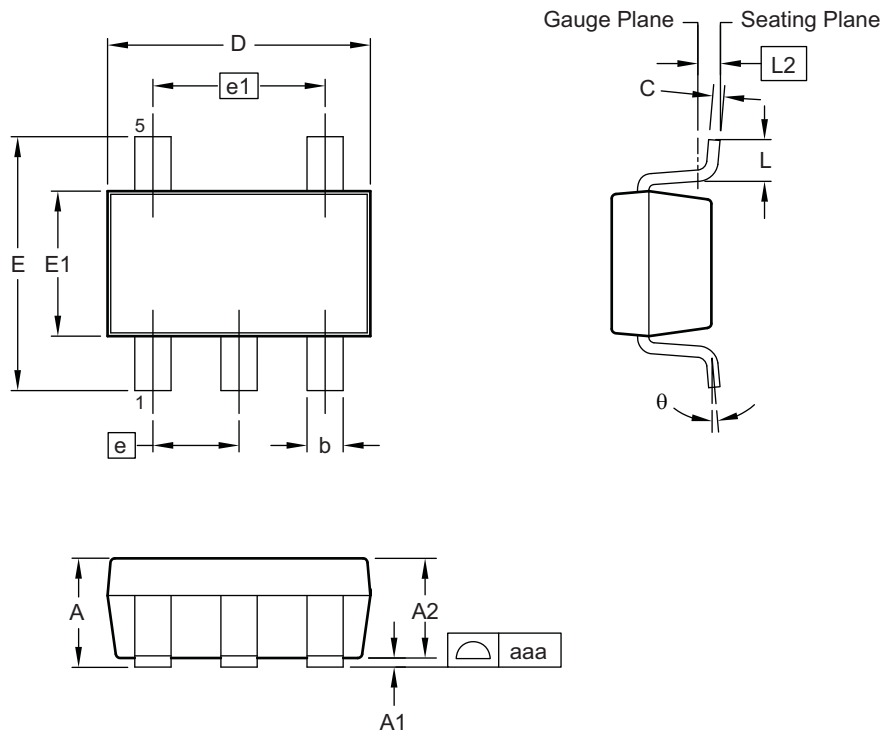
$T_A = 25^\circ\text{C}$  unless otherwise noted,  $V_F = 1 \text{ V Max.}$  @  $I_F = 15 \text{ mA}$  for all types

Device	Device Marking	$V_{RWM} \text{ (V) Max.}$	$V_{BR} \text{ (V) Min @ 5mA}$	$I_R \text{ (}\mu\text{A) Max.}$	$V_F \text{ (V) Typ.}$	$V_{CL} \text{ Max.}$		$C_J \text{ (pF) Typ.}$	$C_J \text{ (pF) Max.}$
						$I_{PP} = 1 \text{ A}$	$I_{PP} = 10 \text{ A}$		
AOZ8224CI-05	AZ	5.0	5.5	0.1	0.75	11.0	15.0	13.0	14.0

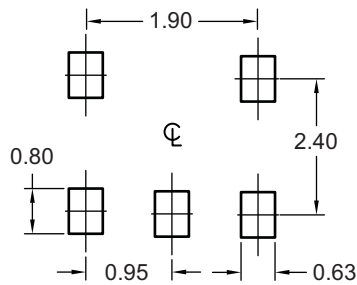
## Typical Performance Characteristics



Package Dimensions, SOT-23-5L



RECOMMENDED LAND PATTERN



UNIT: mm

Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	—	—	1.00
A1	0.00	—	0.10
A2	0.70	0.88	0.95
b	0.35	0.40	0.50
C	0.10	0.13	0.20
D	2.80	2.90	3.00
E	2.60	2.80	3.00
E1	1.50	1.60	1.70
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	0.40	0.60
L2	0.25 BSC		
aaa	0.10		
θ	0°	—	8°

Dimensions in inches

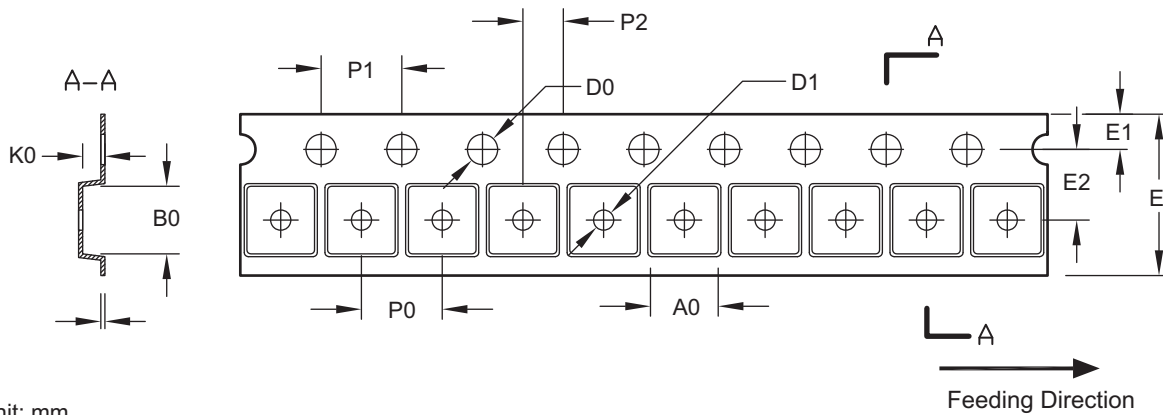
Symbols	Min.	Nom.	Max.
A	—	—	0.039
A1	0.00	—	0.004
A2	0.028	0.035	0.037
b	0.014	0.016	0.020
C	0.004	0.005	0.008
D	0.110	0.114	0.118
E	0.102	0.110	0.118
E1	0.059	0.063	0.067
e	0.037 BSC		
e1	0.075 BSC		
L	0.012	0.016	0.024
L2	0.010 BSC		
aaa	0.004		
θ	0°	—	8°

Notes:

1. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
2. Dimension "L" is measured in gauge plane.
3. Tolerance 0.10mm (4 mil) unless otherwise specified
4. Refer to JEDEC MO-193C AB.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.

### Tape and Reel Dimensions, SOT-23

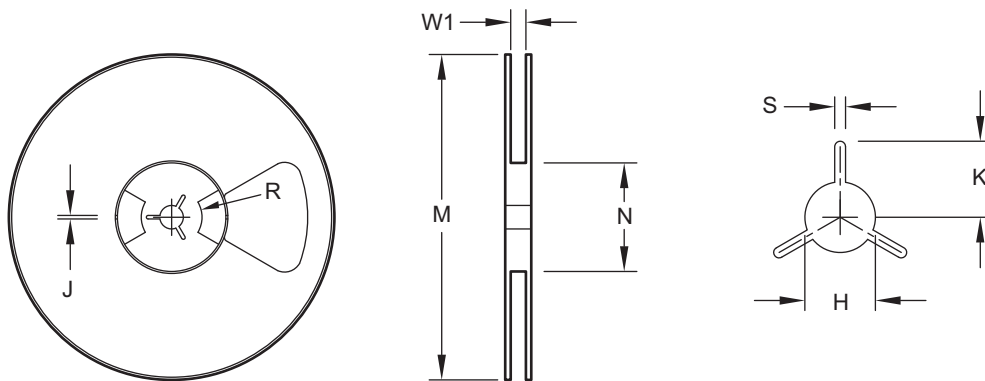
#### Tape



Unit: mm

Package	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOT23-5/6L LP	3.15 ±0.10	3.20 ±0.10	1.40 ±0.10	1.50 ±0.05	1.00 +0.10 / -0	8.00 ±0.30	1.75 ±0.10	3.50 ±0.05	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	0.23 ±0.03

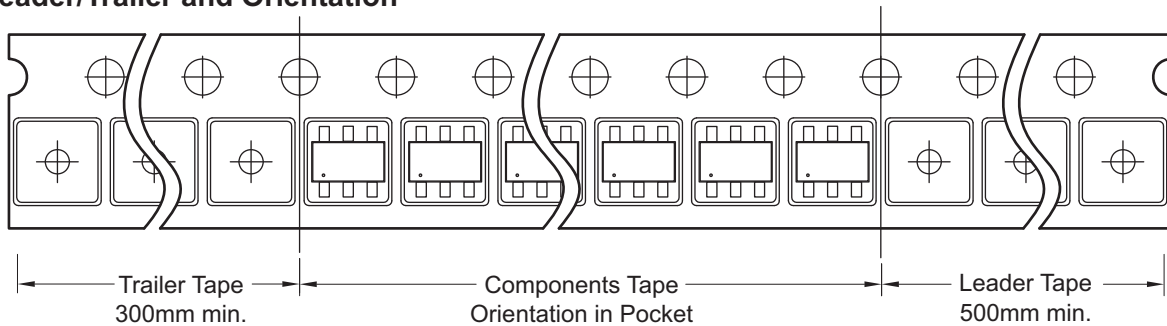
#### Reel



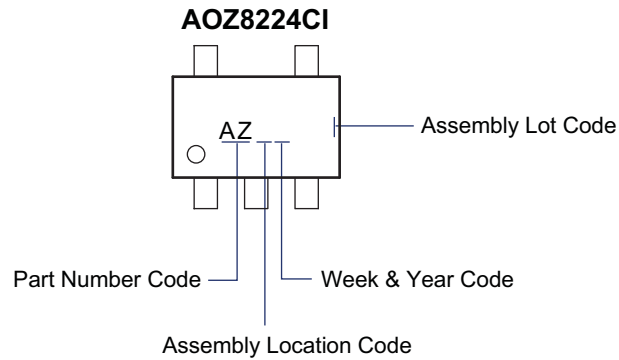
Unit: mm

Tape Size	Reel Size	M	N	W1	H	S	K	R	J
8mm	ø177.8	ø177.8 Max.	55.0 Min.	8.4 +1.50 / -0.0	13.0 +0.5 / -0.2	1.5 Min.	10.1 Min.	12.7	4.0 ±0.1

#### Leader/Trailer and Orientation



## Part Marking



**This datasheet contains preliminary data; supplementary data may be published at a later date. Alpha & Omega Semiconductor reserves the right to make changes at any time without notice.**

### LIFE SUPPORT POLICY

ALPHA & OMEGA SEMICONDUCTOR PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS.

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.