

## General Description

The AOZ8212 is a two-line bi-directional transient voltage suppressor diode designed to protect voltage sensitive electronics from high transient conditions and ESD.

This device incorporates two 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 AOZ8212 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 AOZ8212 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.

## Applications

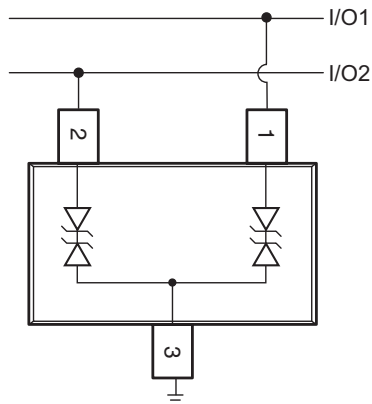
- Portable handheld devices
- Keypads, data lines, buttons
- Notebook computers
- Digital Cameras
- Portable GPS
- MP3 players

## Features

- ESD protection for high-speed data lines:
  - AOZ8212CI-05L
    - 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) 9 A (8/20  $\mu$ s)
  - AOZ8212CI-12
    - 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)
  - AOZ8212CI-24
    - Exceeds: IEC 61000-4-2 (ESD)  $\pm 18$  kV (air),  $\pm 15$  kV (contact)
    - Human Body Model (HBM)  $\pm 15$  kV
    - IEC 61000-4-5 (Lightning) 2.5A (8/20  $\mu$ s)
- Small package saves board space
- IEC 61000-4-4 (EFT)  $\pm 40$ A
- Low insertion loss
- Low clamping voltage
- Low operating voltages: 5 V, 12 V, 24 V

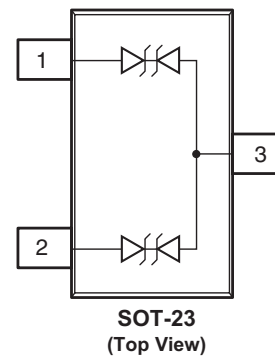


## Typical Application



Bidirection Protection of Two Lines

## Pin Configuration



## Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8212CI-05L	-40 °C to +85 °C	SOT-23A	Green Product
AOZ8212CI-12			
AOZ8212CI-24			



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	AOZ8212CI-05L	AOZ8212CI-12	AOZ8212CI-24
Peak Pulse Current, $t_p = 8/20 \mu s$	9 A	5 A	2.5 A
Peak Pulse Power, $t_p = 8/20 \mu s$	125 W	100 W	100 W
Storage Temperature ( $T_S$ )	-65 °C to +150 °C	-65 °C to +150 °C	-65 °C to +150 °C
ESD Rating per IEC61000-4-2, Contact <sup>(1)</sup>	± 30 kV	± 30 kV	± 15 kV
ESD Rating per IEC61000-4-2, Air <sup>(1)</sup>	± 30 kV	± 30 kV	± 18 kV
ESD Rating per Human Body Model <sup>(2)</sup>	± 30 kV	± 30 kV	± 15 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

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

## Electrical Characteristics

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

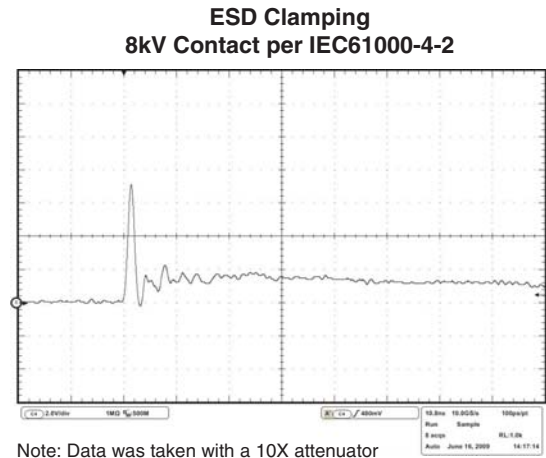
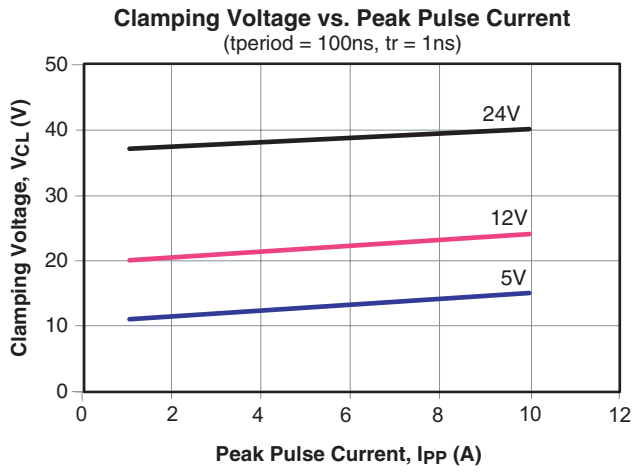
Symbol	Parameter	Symbol	Parameter
$I_{PP}$	Maximum Reverse Peak Pulse Current	$I_F$	Forward Current
$V_{CL}$	Clamping Voltage @ $I_{PP}$	$V_F$	Forward Voltage
$V_{RWM}$	Working Peak Reverse Voltage	$P_{pk}$	Peak Power Dissipation
$I_R$	Maximum Reverse Leakage Current	$C_J$	Max. Capacitance @ $V_R = 0$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

## Electrical Characteristics

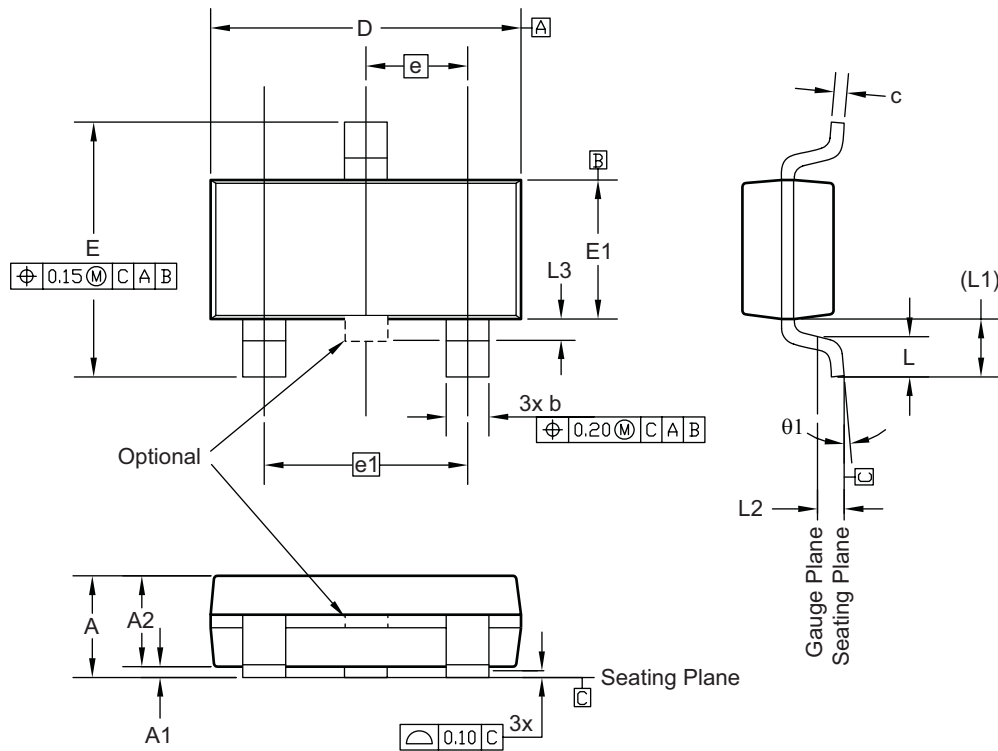
$T_A = 25^\circ\text{C}$  unless otherwise noted,  $V_F = 1 \text{ V Max.}$  @  $I_F = 15 \text{ mA}$  for all types

Device	Device Marking	$V_{RWM} \text{ (V) Max.}$	$V_{BR} \text{ (V) Min @ 5mA}$	$I_R \text{ (}\mu\text{A) Max.}$	$V_F \text{ (V) Typ.}$	$V_{CL} \text{ Max.}$		$C_J \text{ (pF) Typ.}$	$C_J \text{ (pF) Max.}$
						$I_{PP} = 1 \text{ A}$	$I_{PP} = 10 \text{ A}$		
AOZ8212CI-05L	AH5	5.0	7.0	1.0	0.75	11.0	15.0	3.5	5.0
AOZ8212CI-12	AHC	12.0	15.0	1.0	0.75	20.0	24.0	10.0	12.5
AOZ8212CI-24	AHT	24.0	29.0	1.0	0.75	37.0	40.0	11.0	15.0

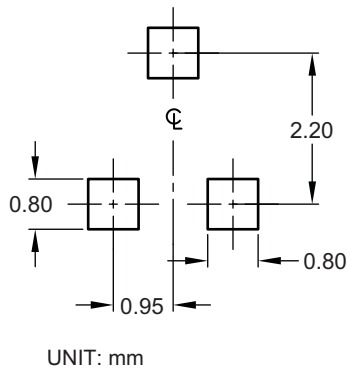
## Typical Performance Characteristics



Package Dimensions, SOT-23A, 3L



RECOMMENDED LAND PATTERN



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	0.713	—	1.17
A1	0.013	—	0.15
A2	0.70	0.85	1.02
b	0.30	—	0.51
c	0.08	—	0.20
D	2.80	2.90	3.04
E	2.10	—	2.64
E1	1.20	1.30	1.40
e	0.95 BSC		
e1	1.90 BSC		
L	0.40	0.50	0.60
L1	0.54 REF.		
L2	0.25		
L3	—	—	0.20
θ1	0°	—	8°

Dimensions in inches

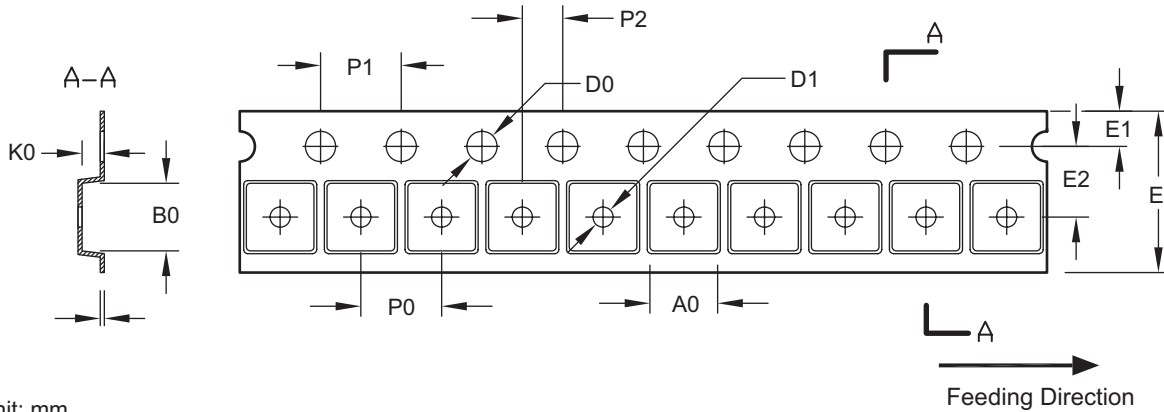
Symbols	Min.	Nom.	Max.
A	0.028	—	0.046
A1	0.001	—	0.006
A2	0.028	0.033	0.040
b	0.012	—	0.020
c	0.003	—	0.008
D	0.110	0.114	0.120
E	0.083	—	0.104
E1	0.047	0.051	0.055
e	0.037 BSC		
e1	0.075 BSC		
L	0.016	0.20	0.024
L1	0.021 REF.		
L2	0.010		
L3	—	—	0.008
θ1	0°	—	8°

Notes:

- All dimensions are in millimeters.
- Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.
- Dimension D does not include mold flash, protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.25mm per end. Dimension E1 does not include interlead flash or protrusion. Interlead flash or protrusion shall not exceed 0.25mm per side.
- The package top may be smaller than the package bottom. Dimensions D and E1 are determined at the outermost extremes of the plastic body exclusive of mold flash, tie bar burrs, gate burrs and interlead flash, but including any mismatch between the top and bottom of the plastic body.
- Follow JEDEC TO-236HAA.

### Tape and Reel Dimensions, SOT-23A, 3L

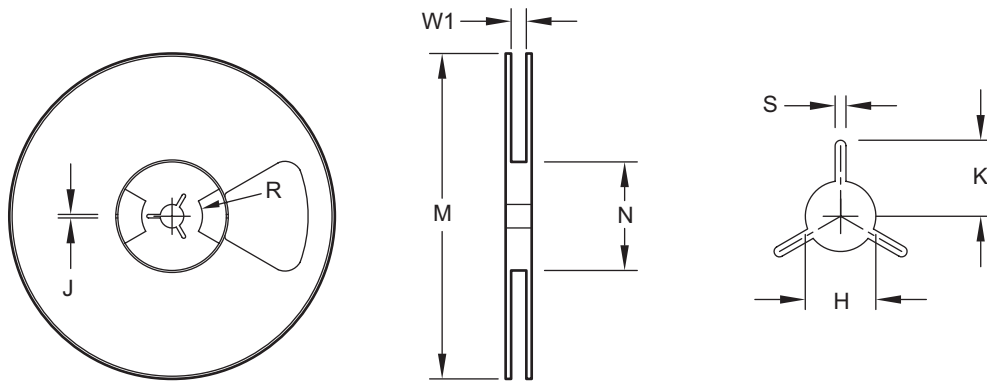
#### Tape



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

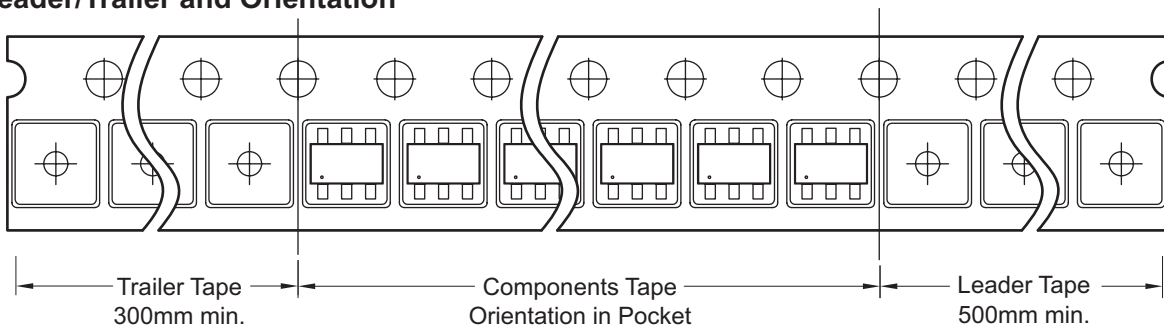
#### Reel



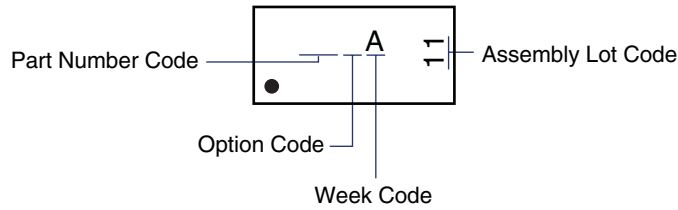
Unit: mm

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.**

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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.