

## General Description

The AOZ8302ACI is a high current surge transient voltages suppressor diode designed to protect voltage sensitive electronics from high current surge and ESD.

This device incorporates two high current surge TVS diodes in a small SOT23-3L package. It may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 ( $\pm 15\text{kV}$  air,  $\pm 8\text{kV}$  contact discharge).

The AOZ8302ACI comes in an RoHS compliant SOT23-3L package and is rated over a  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  ambient temperature range.

The small SOT23-3L 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

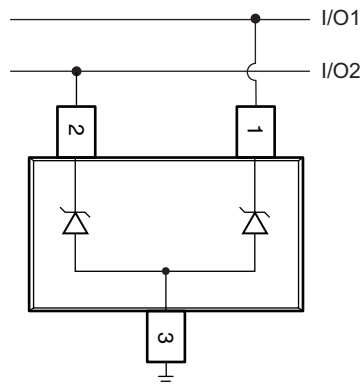
- ESD and high current surge protection:
  - AOZ8302ACI-05 (5V version):
    - Exceeds: IEC 61000-4-2 (ESD)  $\pm 30\text{kV}$  (air),  $\pm 30\text{kV}$  (contact)
    - Human Body Model (HBM)  $\pm 30\text{kV}$
    - IEC 61000-4-5 (Lightning) 32A (8/20 $\mu\text{s}$ )
  - AOZ8302ACI-12 (12V version):
    - Exceeds: IEC 61000-4-2 (ESD)  $\pm 30\text{kV}$  (air),  $\pm 30\text{kV}$  (contact)
    - Human Body Model (HBM)  $\pm 30\text{kV}$
    - IEC 61000-4-5 (Lightning) 24A (8/20 $\mu\text{s}$ )
- Low clamping voltage
- Low operating voltages: 5V, 12V

## Applications

- Ethernet
- Datacom Interfaces
- Telecom Interfaces

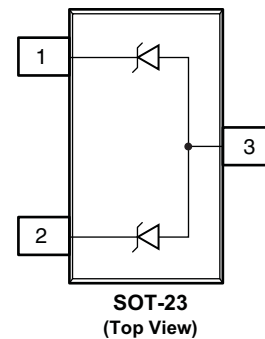


## Typical Application



Protection of Two Lines

## Pin Configuration



## Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8302ACI-05	-40°C to +85°C	SOT23-3L	Green Product
AOZ8302ACI-12			



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	
	5V	12V
VP – VN	5V	12V
Peak Pulse Current (I <sub>PP</sub> ), t <sub>P</sub> = 8/20μs	32A	24A
Storage Temperature (T <sub>S</sub> )	-65°C to +150°C	-65°C to +150°C
ESD Rating per IEC61000-4-2, Contact <sup>(1)</sup>	±30kV	±30kV
ESD Rating per IEC61000-4-2, Air <sup>(1)</sup>	±30kV	±30kV
ESD Rating per Human Body Model <sup>(2)</sup>	±30kV	±30kV

### Notes:

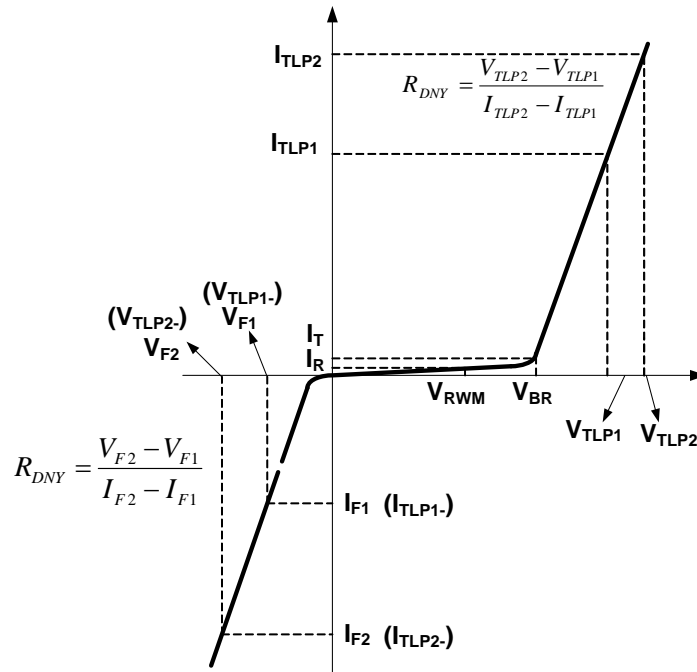
1. IEC 61000-4-2 discharge with C<sub>Discharge</sub> = 150pF, R<sub>Discharge</sub> = 330Ω.

2. 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 +85°C

Electrical Characteristics



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

AOZ8302ACI-05						
Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
V <sub>RWM</sub>	Reverse Working Voltage	I/O Pin to ground			5	V
V <sub>BR</sub>	Reverse Breakdown Voltage	I <sub>T</sub> =1mA, I/O Pin to ground	6			V
I <sub>R</sub>	Reverse Leakage Current	V <sub>RWM</sub> =5V, I/O Pin to ground			1	μA
V <sub>F</sub>	Forward Voltage	I <sub>F</sub> =15mA		0.85		V
V <sub>CL</sub>	Clamping Voltage <sup>(3, 4)</sup> (100ns Transmission Line Pulse, I/O Pin to ground)	I <sub>TLP</sub> =1A I <sub>TLP</sub> =-1A		11 -1	14 -2.5	V
		I <sub>TLP</sub> =30A I <sub>TLP</sub> =-30A		14 -5	17 -7	V
	Clamping Voltage <sup>(3)</sup> (IEC61000-4-5, 8/20μs, I/O Pin to ground)	I <sub>PP</sub> =2A I <sub>PP</sub> =-2A		11 -1.8	14.5 -3.5	V
		I <sub>PP</sub> =32A I <sub>PP</sub> =-32A		20 -7	24 -9	V
R <sub>DNY</sub>	Dynamic Resistance <sup>(3, 4)</sup>	I <sub>TLP</sub> = 1A to 30A I <sub>TLP</sub> = -1A to -30A		0.1 0.1		Ω
C <sub>J</sub>	Junction Capacitance	V <sub>Pin1</sub> =0V, f=1MHz, Pin1 to ground		20		pF

**Electrical Characteristics (continued)**

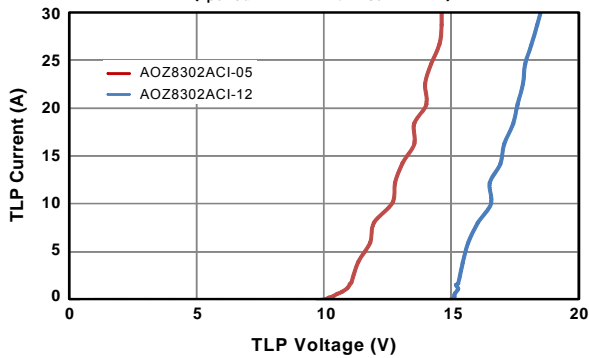
AOZ8302ACI-12						
Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
$V_{RWM}$	Reverse Working Voltage	I/O Pin to ground			12	V
$V_{BR}$	Reverse Breakdown Voltage	$I_T=1mA$ , I/O Pin to ground	13			V
$I_R$	Reverse Leakage Current	$V_{RWM}=12V$ , I/O Pin to ground			1	$\mu A$
$V_F$	Forward Voltage	$I_F=15mA$		0.85		V
$V_{CL}$	Clamping Voltage <sup>(3, 4)</sup> (100ns Transmission Line Pulse, I/O Pin to ground)	$I_{TLP}=1A$ $I_{TLP}=-1A$		16 -1	19 -2.5	V
		$I_{TLP}=30A$ $I_{TLP}=-30A$		19 -4.5	22 -6.5	V
	Clamping Voltage <sup>(3)</sup> (IEC61000-4-5, 8/20 $\mu s$ , I/O Pin to ground)	$I_{PP}=1A$ $I_{PP}=-1A$		12 -12	14 -14	V
		$I_{PP}=24A$ $I_{PP}=-24A$		23 -5	27 -7	V
$R_{DNY}$	Dynamic Resistance <sup>(3, 4)</sup>	$I_{TLP}= 1A$ to 30A $I_{TLP}= -1A$ to -30A		0.1 0.1		$\Omega$
$C_J$	Junction Capacitance	$V_{Pin1}=0V$ , $f=1MHz$ , Pin1 to ground		20		pF

**Notes:**

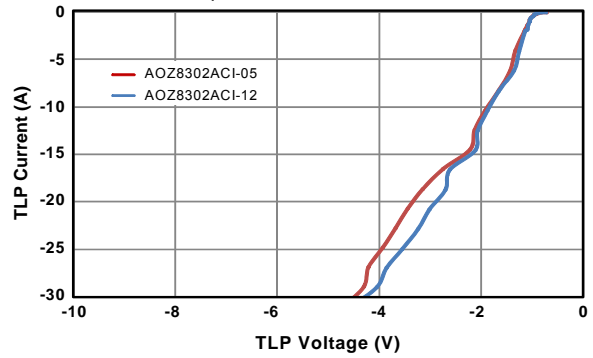
3. These specifications are guaranteed by design and characterization.
4. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

## Typical Performance Characteristics

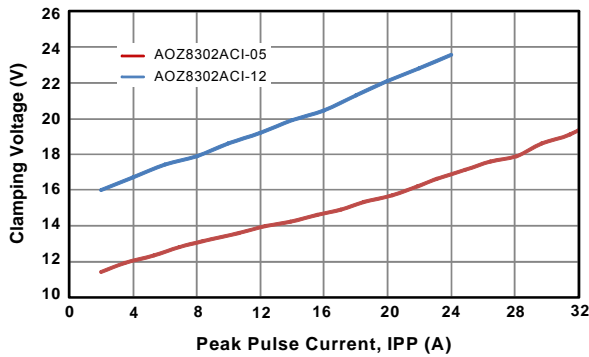
**Positive TLP Clamping**  
( $t_{\text{period}} = 100\text{ns}$ ,  $t_{\text{rise}} = 1\text{ns}$ )



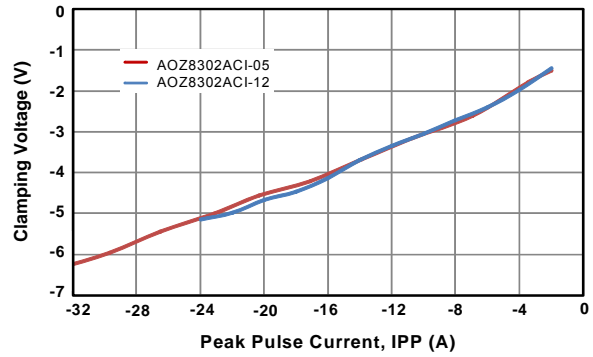
**Negative TLP Clamping**  
( $t_{\text{period}} = 100\text{ns}$ ,  $t_{\text{rise}} = 1\text{ns}$ )



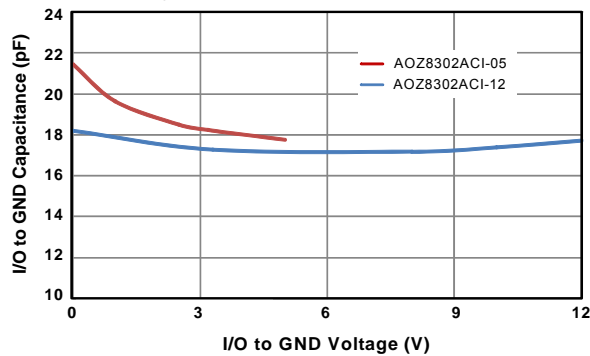
**IEC61000-4-5 Surge 8/20 $\mu$ s (Positive)**



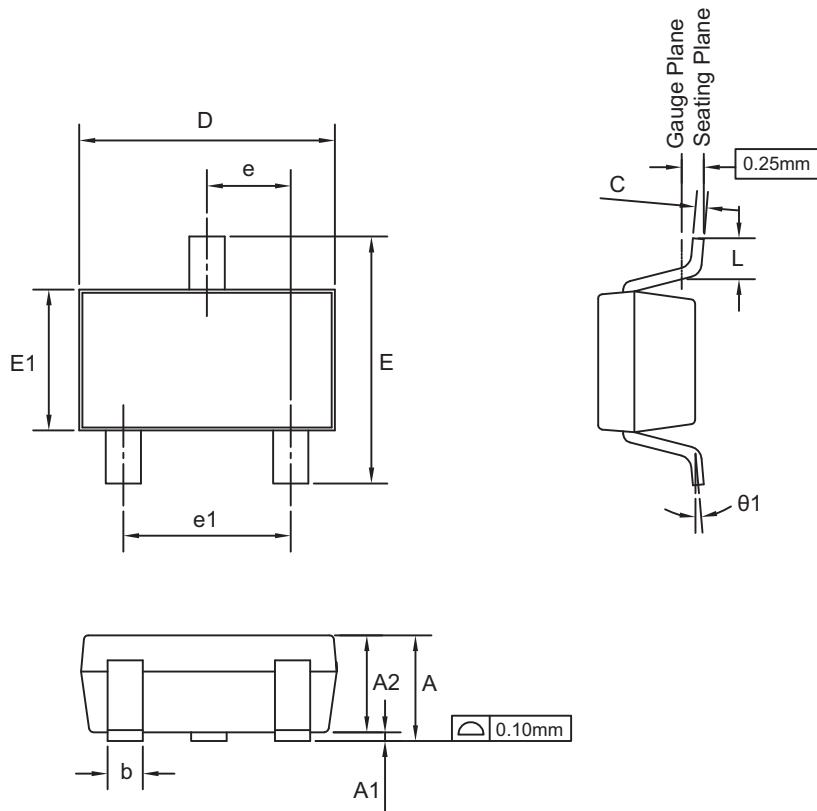
**IEC61000-4-5 Surge 8/20 $\mu$ s (Negative)**



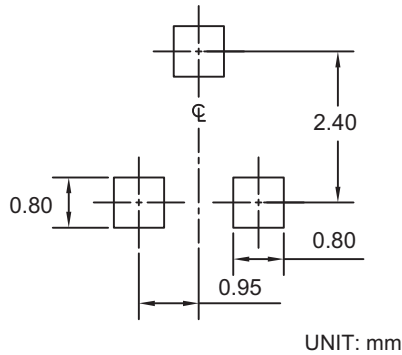
**Typical Variation of  $C_J$  vs.  $V_R$**



Package Dimensions, SOT23-3L



RECOMMENDED LAND PATTERN



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	0.85	—	1.25
A1	0.00	—	0.13
A2	0.70	1.00	1.15
b	0.30	0.40	0.50
c	0.08	0.13	0.20
D	2.80	2.90	3.10
E	2.60	2.80	3.00
E1	1.40	1.60	1.80
e	0.95 BSC		
e1	1.90 BSC		
L	0.30	—	0.60
θ1	0°	5°	8°

Dimensions in inches

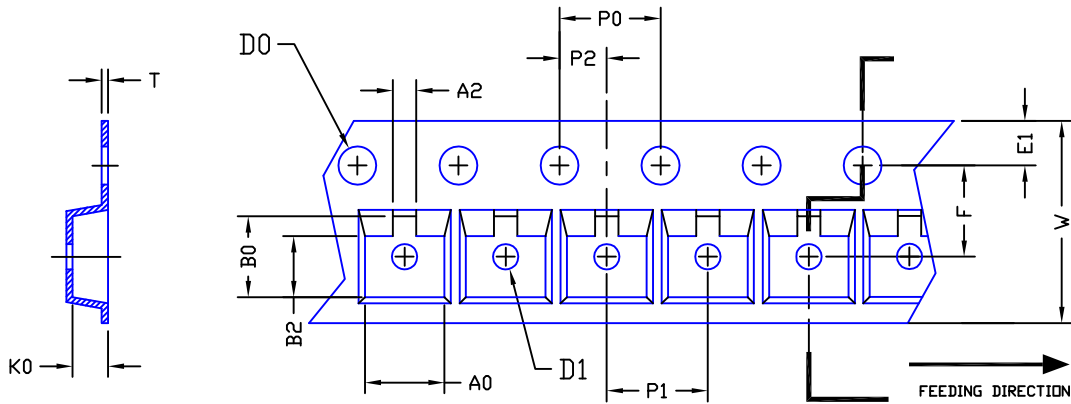
Symbols	Min.	Nom.	Max.
A	0.033	—	0.049
A1	0.000	—	0.005
A2	0.028	0.039	0.045
b	0.012	0.016	0.020
c	0.003	0.005	0.008
D	0.110	0.114	0.122
E	0.102	0.110	0.118
E1	0.055	0.063	0.071
e	0.037 BSC		
e1	0.075 BSC		
L	0.012	—	0.024
θ1	0°	5°	8°

Notes:

1. Package body sizes exclude mold flash or gate burrs. Mold flash at the non-lead sides should be less than 5mils each.
2. Tolerance  $\pm 0.100\text{mm}$  (4mils) unless otherwise specified.
3. Dimension L is measured in gauge plane.
4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.
5. All dimensions are in millimeters.

### Tape and Reel Dimensions, SOT23-3L

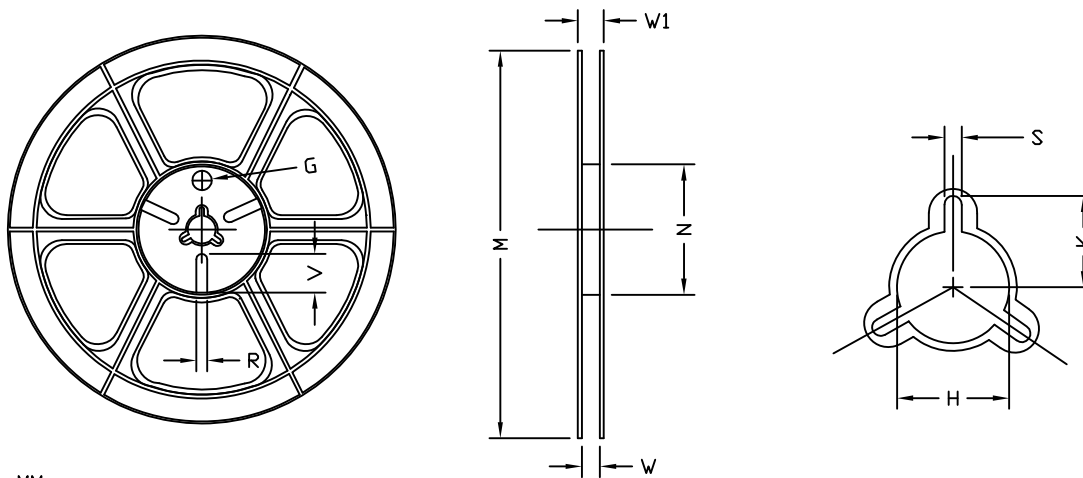
#### Tape



UNIT: MM

PACKAGE	A0	B0	K0	D0	D1	W	E1	F	P0	P1	P2	T	A2	B2
SOT23-3L (8 mm)	3.05-3.40	3.00-3.38	1.20-1.47	1.55 ±0.05	1.00 ±0.25	8.00 ±0.30	1.75 ±0.10	3.50 ±0.05	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	0.18-0.25	0.84-1.24	2.29-2.69

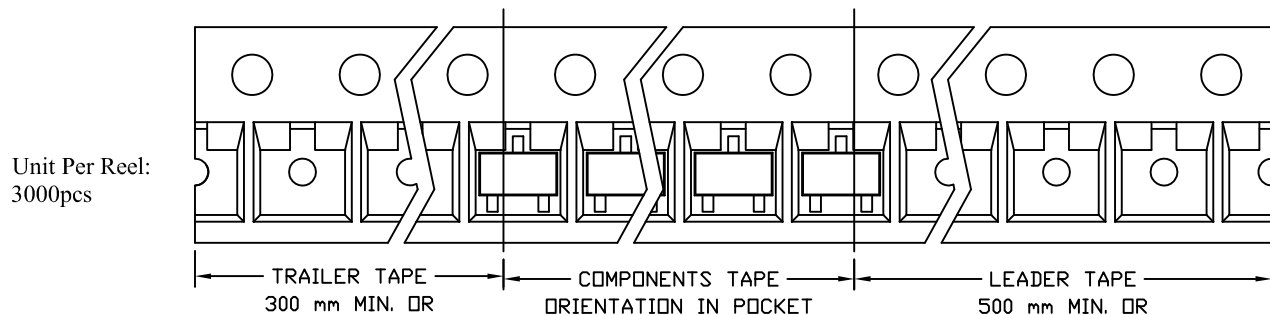
#### Reel



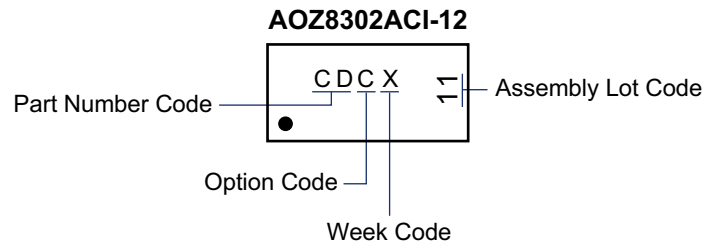
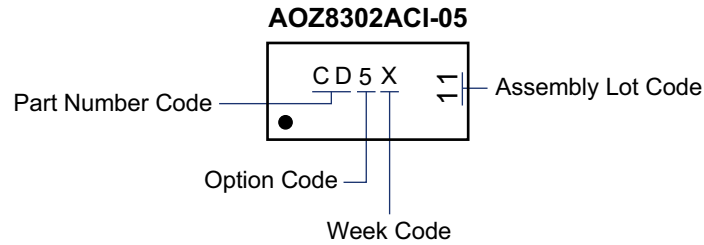
UNIT: MM

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
8 mm	φ178	φ178.00 ±1.00	φ54.00 ±0.50	9.00 ±0.30	11.40 ±1.00	φ13.00 +0.50 -0.20	10.60	2.00 ±0.50	φ9.00	5.00	18.00

#### Leader/Trailer and Orientation



## Part Marking



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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.