

## 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

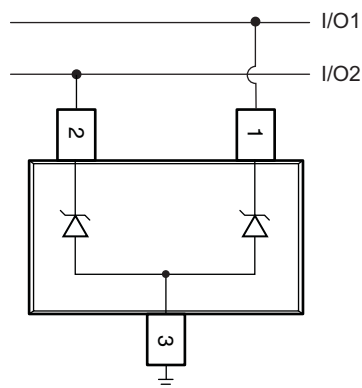
- ESD and high current surge protection:
  - AOZ8302ACI-05 (5V version):
    - Exceeds: IEC 61000-4-2 (ESD)  $\pm 30\text{kV}$  (air),  $\pm 30\text{kV}$  (contact)
    - Human Body Model (HBM)  $\pm 30\text{kV}$
    - IEC 61000-4-5 (Lightning) 32A (8/20 $\mu\text{s}$ )
  - AOZ8302ACI-12 (12V version):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

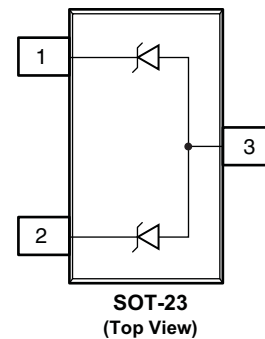


## Typical Application



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

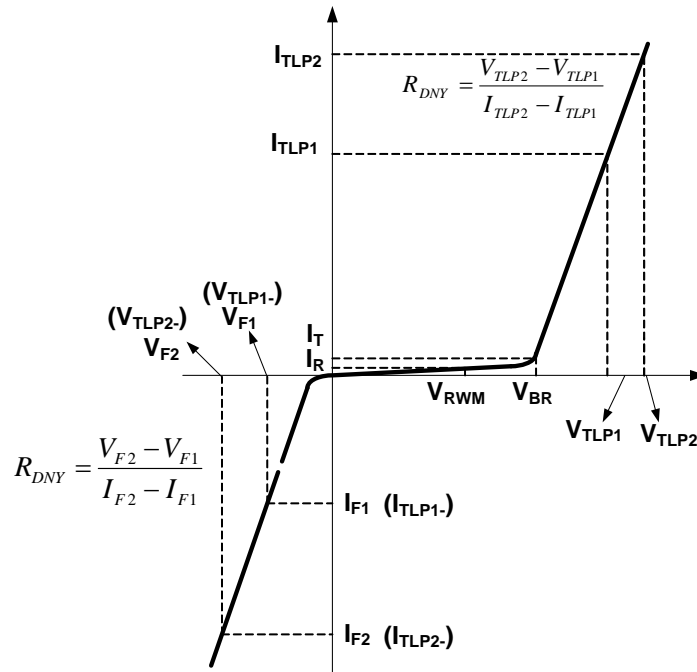
### Notes:

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

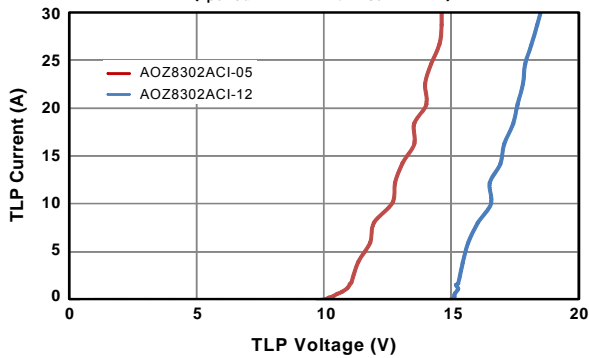
AOZ8302ACI-12						
Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
$V_{RWM}$	Reverse Working Voltage	I/O Pin to ground			12	V
$V_{BR}$	Reverse Breakdown Voltage	$I_T=1mA$ , I/O Pin to ground	13			V
$I_R$	Reverse Leakage Current	$V_{RWM}=12V$ , I/O Pin to ground			1	$\mu A$
$V_F$	Forward Voltage	$I_F=15mA$		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:**

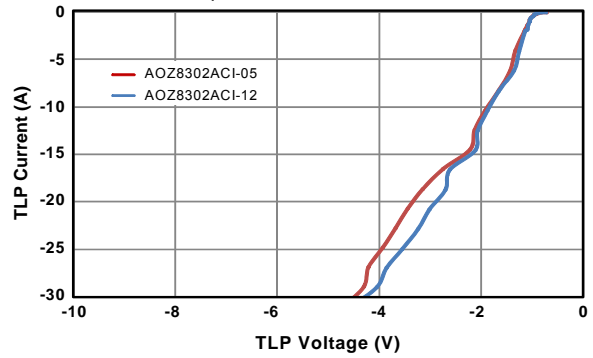
3. These specifications are guaranteed by design and characterization.
4. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

## Typical Performance Characteristics

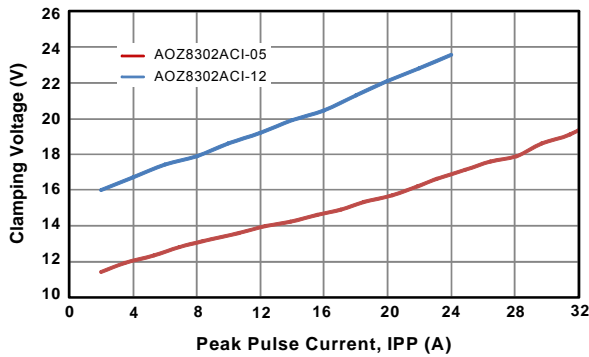
**Positive TLP Clamping**  
( $t_{\text{period}} = 100\text{ns}$ ,  $t_{\text{rise}} = 1\text{ns}$ )



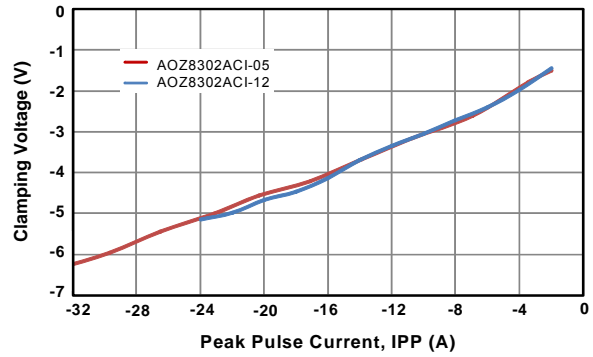
**Negative TLP Clamping**  
( $t_{\text{period}} = 100\text{ns}$ ,  $t_{\text{rise}} = 1\text{ns}$ )



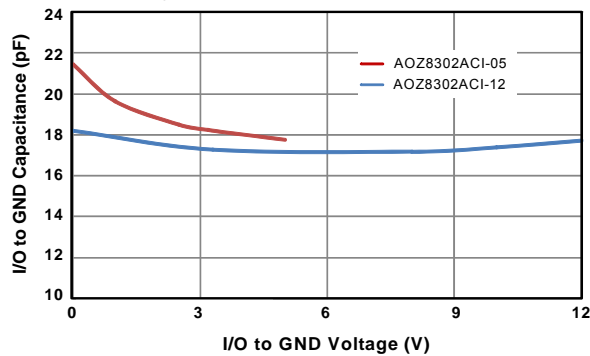
**IEC61000-4-5 Surge 8/20 $\mu$ s (Positive)**



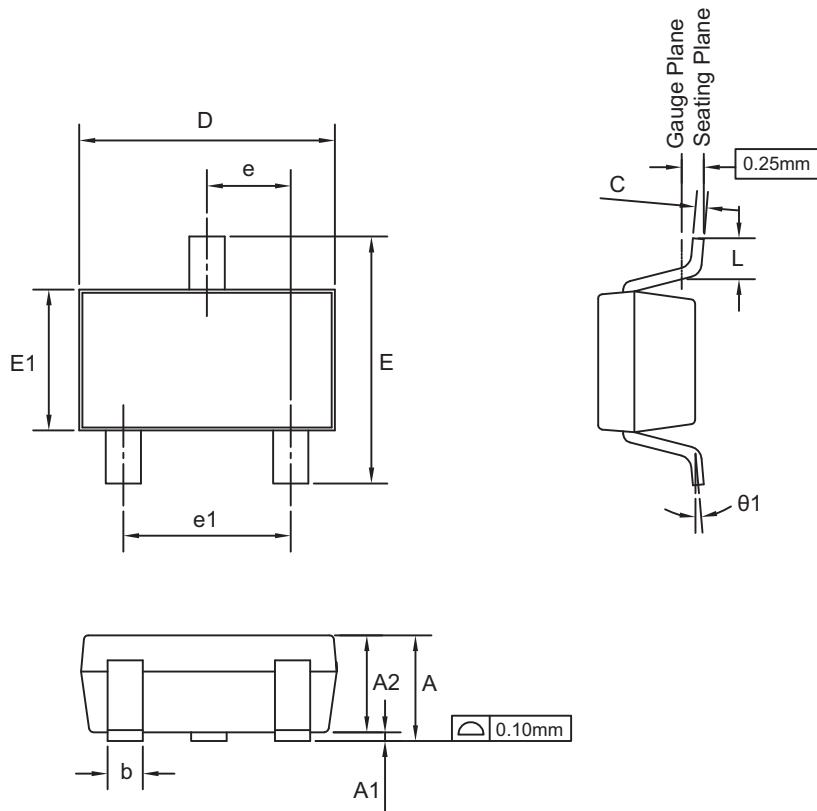
**IEC61000-4-5 Surge 8/20 $\mu$ s (Negative)**



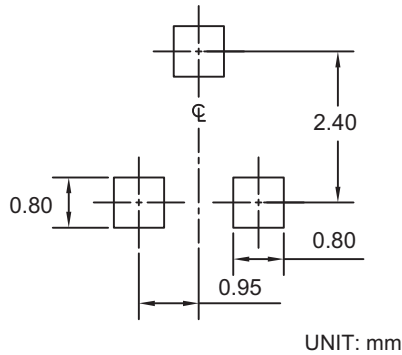
**Typical Variation of  $C_J$  vs.  $V_R$**



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

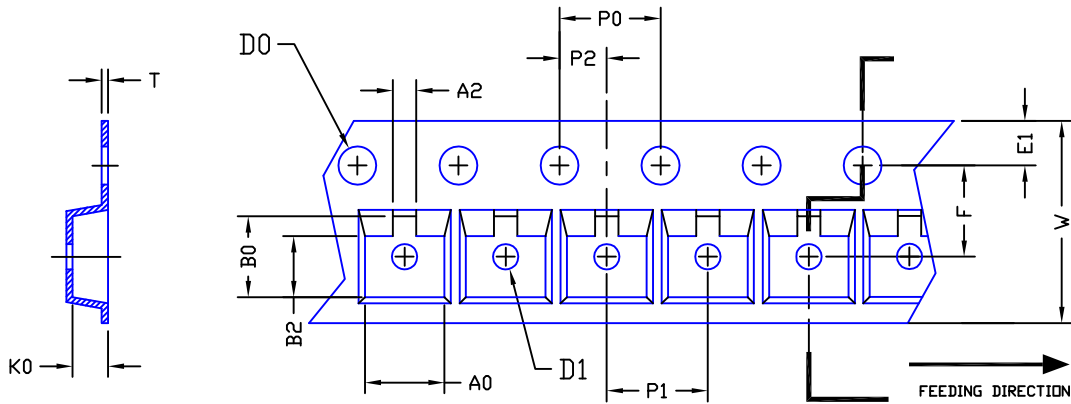
Symbols	Min.	Nom.	Max.
A	0.033	—	0.049
A1	0.000	—	0.005
A2	0.028	0.039	0.045
b	0.012	0.016	0.020
c	0.003	0.005	0.008
D	0.110	0.114	0.122
E	0.102	0.110	0.118
E1	0.055	0.063	0.071
e	0.037 BSC		
e1	0.075 BSC		
L	0.012	—	0.024
θ1	0°	5°	8°

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

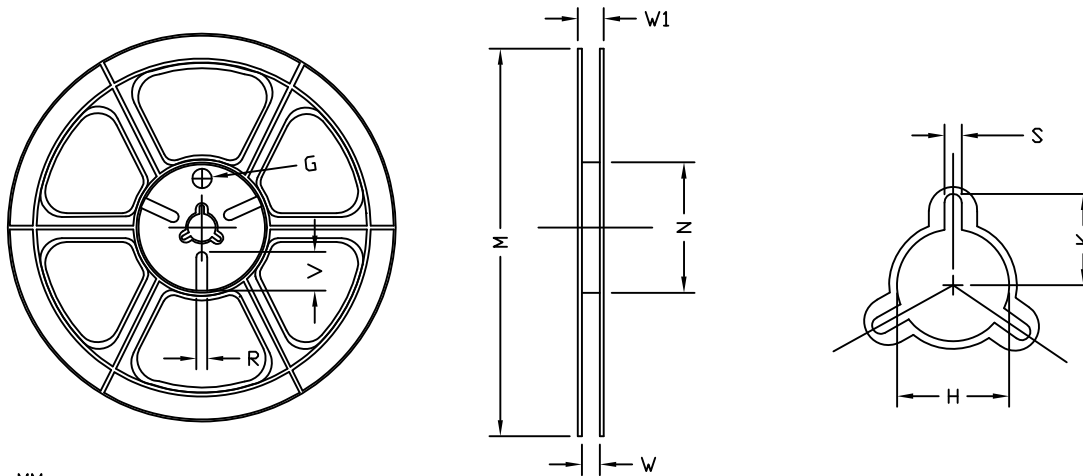
#### Tape



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

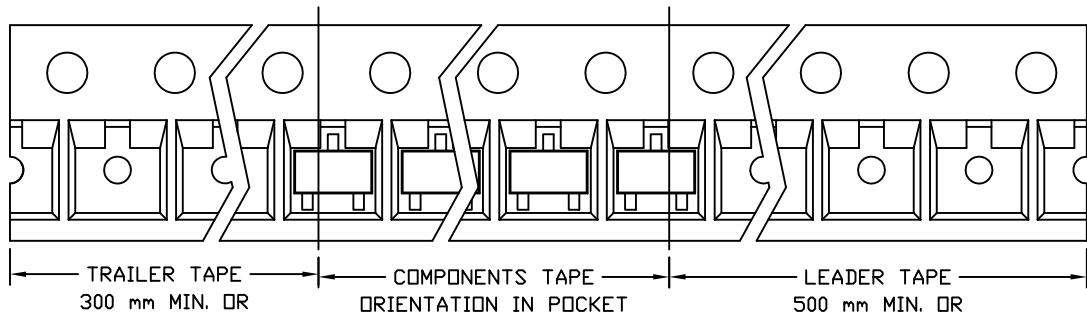


UNIT: MM

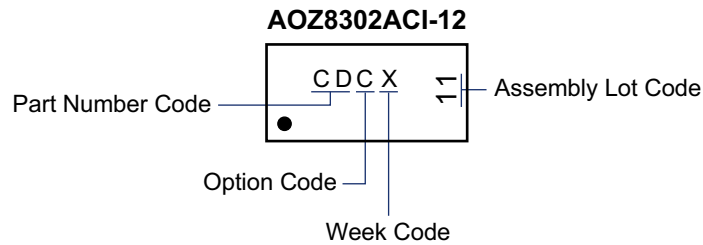
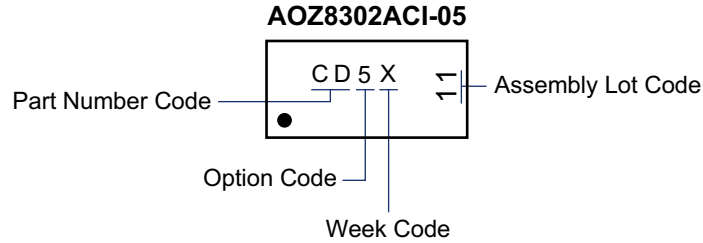
TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
8 mm	φ178	φ178.00 ±1.00	φ54.00 ±0.50	9.00 ±0.30	11.40 ±1.00	φ13.00 +0.50 -0.20	10.60	2.00 ±0.50	φ9.00	5.00	18.00

#### Leader/Trailer and Orientation

Unit Per Reel:  
3000pcs



**Part Marking**



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