

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°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

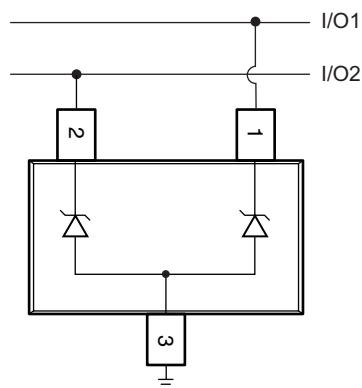
- ESD and high current surge protection:
 - AOZ8302ACI-05 (5V version):
 - Exceeds: IEC 61000-4-2 (ESD) $\pm 30\text{kV}$ (air), $\pm 30\text{kV}$ (contact)
 - Human Body Model (HBM) $\pm 30\text{kV}$
 - IEC 61000-4-5 (Lightning) 32A (8/20 μs)
 - AOZ8302ACI-12 (12V version):
 - Exceeds: IEC 61000-4-2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

Applications

- Ethernet
- Datacom Interfaces
- Telecom Interfaces

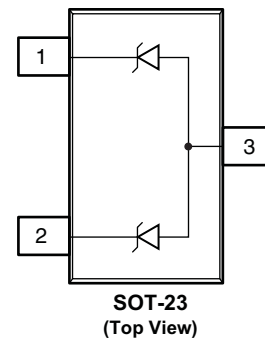


Typical Application



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 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 _{PP}), t _p = 8/20μs	32A	24A
Storage Temperature (T _S)	-65°C to +150°C	-65°C to +150°C
ESD Rating per IEC61000-4-2, Contact ⁽¹⁾	±30kV	±30kV
ESD Rating per IEC61000-4-2, Air ⁽¹⁾	±30kV	±30kV
ESD Rating per Human Body Model ⁽²⁾	±30kV	±30kV

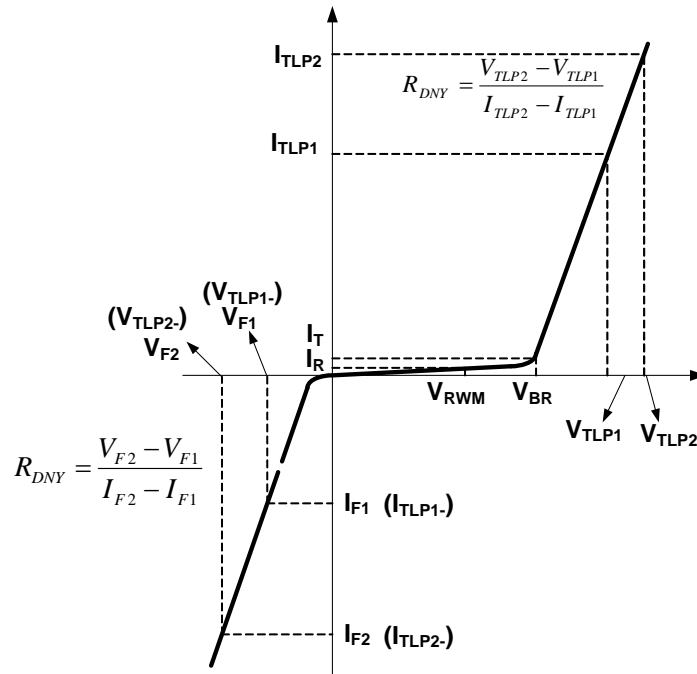
Notes:

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

Maximum Operating Ratings

Parameter	Rating
Junction Temperature (T _J)	-40°C to +85°C

Electrical Characteristics



T_A = 25°C unless otherwise noted.

AOZ8302ACI-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	6			V
I _R	Reverse Leakage Current	V _{RWM} =5V, I/O Pin to ground			1	µA
V _F	Forward Voltage	I _F =15mA		0.85		V
V _{CL}	Clamping Voltage ^(3, 4) (100ns Transmission Line Pulse, I/O Pin to ground)	I _{TLP} =1A I _{TLP} =-1A		11 -1	14 -2.5	V
		I _{TLP} =30A I _{TLP} =-30A		14 -5	17 -7	V
	Clamping Voltage ⁽³⁾ (IEC61000-4-5, 8/20µs, I/O Pin to ground)	I _{PP} =2A I _{PP} =-2A		11 -1.8	14.5 -3.5	V
		I _{PP} =32A I _{PP} =-32A		20 -7	24 -9	V
R _{DNY}	Dynamic Resistance ^(3, 4)	I _{TLP} = 1A to 30A I _{TLP} = -1A to -30A		0.1 0.1		Ω
C _J	Junction Capacitance	V _{Pin1} =0V, f=1MHz, Pin1 to ground		20		pF

Electrical Characteristics (continued)

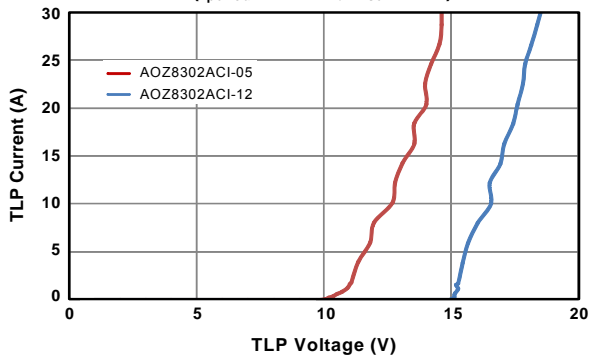
AOZ8302ACI-12						
Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
V_{RWM}	Reverse Working Voltage	I/O Pin to ground			12	V
V_{BR}	Reverse Breakdown Voltage	$I_T=1mA$, I/O Pin to ground	13			V
I_R	Reverse Leakage Current	$V_{RWM}=12V$, I/O Pin to ground			1	μA
V_F	Forward Voltage	$I_F=15mA$		0.85		V
V_{CL}	Clamping Voltage ^(3, 4) (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 ⁽³⁾ (IEC61000-4-5, 8/20 μs , 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 ^(3, 4)	$I_{TLP}= 1A$ to 30A $I_{TLP}= -1A$ to -30A		0.1 0.1		Ω
C_J	Junction Capacitance	$V_{Pin1}=0V$, $f=1MHz$, Pin1 to ground		20		pF

Notes:

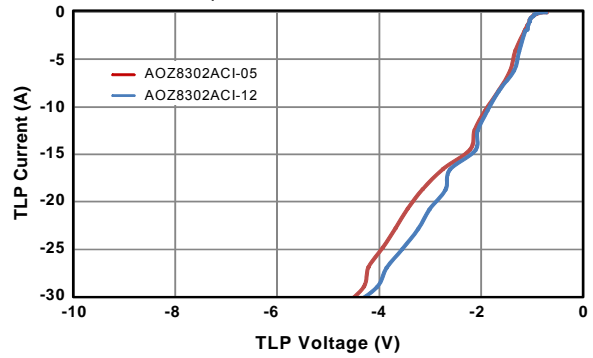
3. These specifications are guaranteed by design and characterization.
4. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

Typical Performance Characteristics

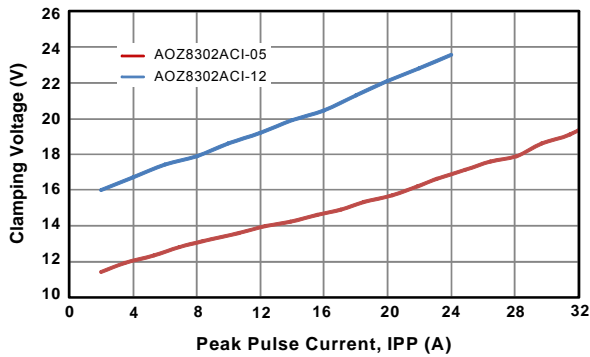
Positive TLP Clamping
($t_{\text{period}} = 100\text{ns}$, $t_{\text{rise}} = 1\text{ns}$)



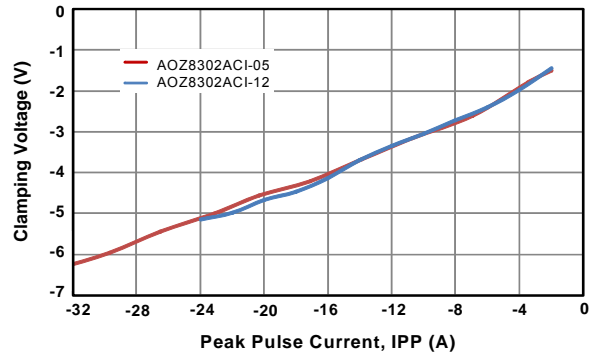
Negative TLP Clamping
($t_{\text{period}} = 100\text{ns}$, $t_{\text{rise}} = 1\text{ns}$)



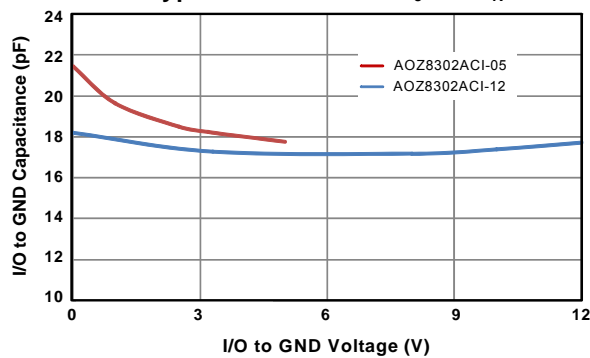
IEC61000-4-5 Surge 8/20 μ s (Positive)



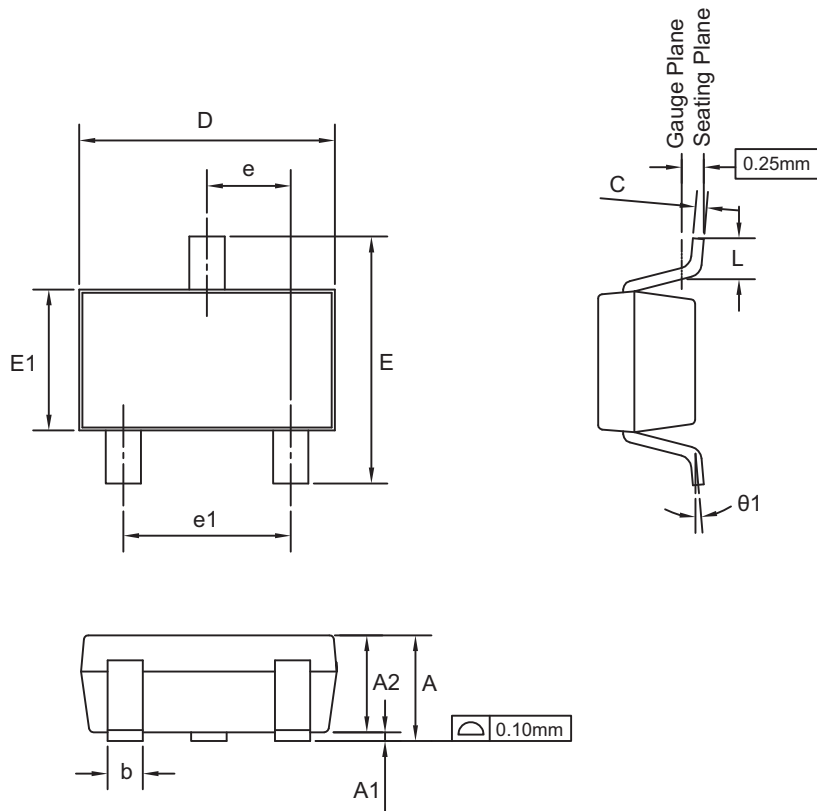
IEC61000-4-5 Surge 8/20 μ s (Negative)



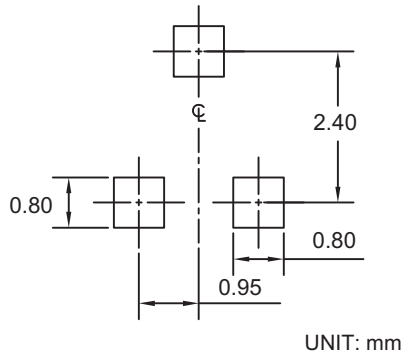
Typical Variation of C_J vs. V_R



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

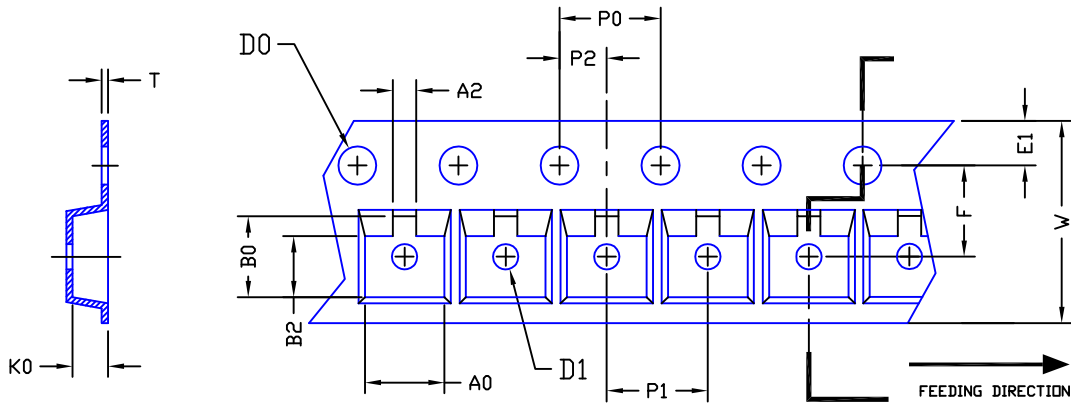
Symbols	Min.	Nom.	Max.
A	0.033	—	0.049
A1	0.000	—	0.005
A2	0.028	0.039	0.045
b	0.012	0.016	0.020
c	0.003	0.005	0.008
D	0.110	0.114	0.122
E	0.102	0.110	0.118
E1	0.055	0.063	0.071
e	0.037 BSC		
e1	0.075 BSC		
L	0.012	—	0.024
θ1	0°	5°	8°

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 ±0.100mm (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

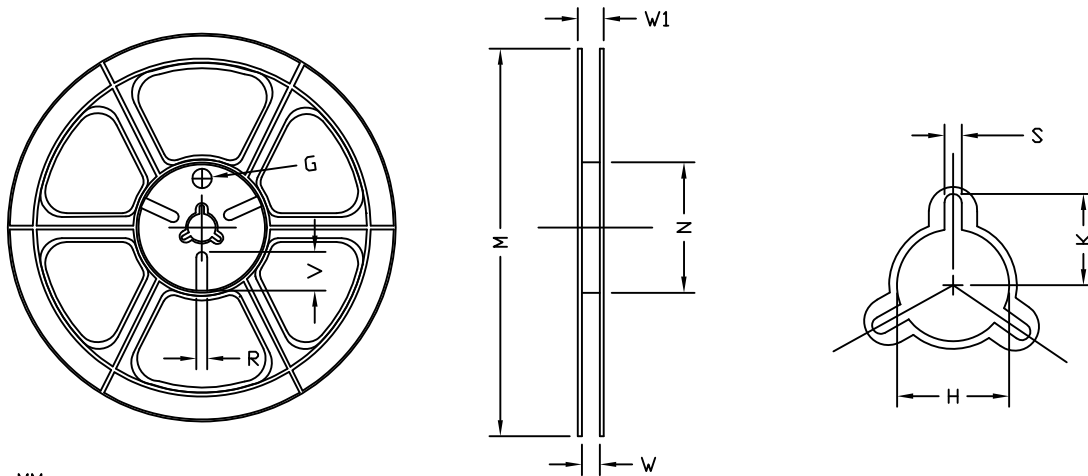
Tape



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

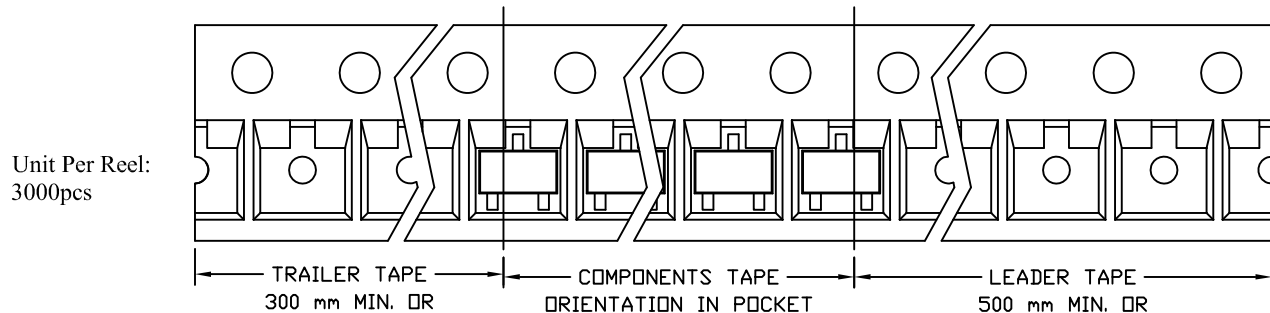
Reel



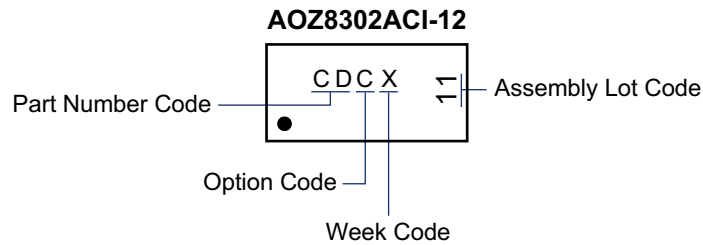
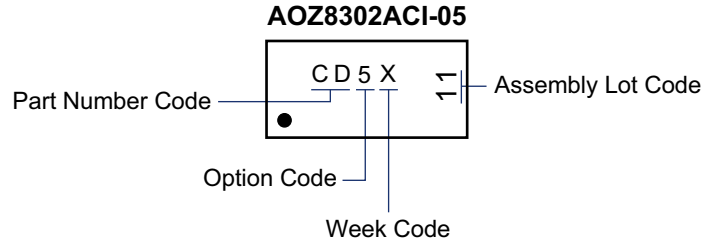
UNIT: MM

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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