AOZ8302ACI

Two-line High Current Surge TVS Diodes

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 (±15kV air, ±8kV contact discharge).

The AOZ8302ACI comes in an RoHS compliant SOT23-3L package and is rated over a -40°C to +125°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) ±30kV (air), ±30kV (contact)
  - Human Body Model (HBM) ±30kV
  - IEC 61000-4-5 (Lightning) 32A (8/20μs)

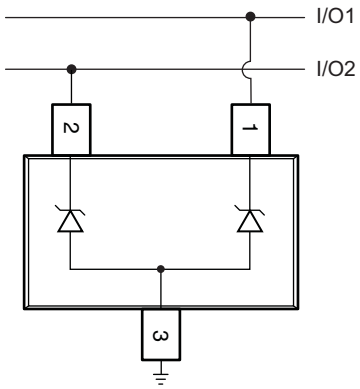
  AOZ8302ACI-12 (12V version):
  - Exceeds: IEC 61000-4-2 (ESD) ±30kV (air), ±30kV (contact)
  - Human Body Model (HBM) ±30kV
  - IEC 61000-4-5 (Lightning) 24A (8/20μs)
- Low clamping voltage
- Low operating voltages: 5V, 12V

Applications

- Ethernet
- Datacom Interfaces
- Telecom Interfaces

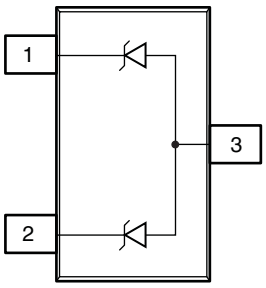
Green Product

Typical Application



Protection of Two Lines

Pin Configuration



SOT-23
(Top View)

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

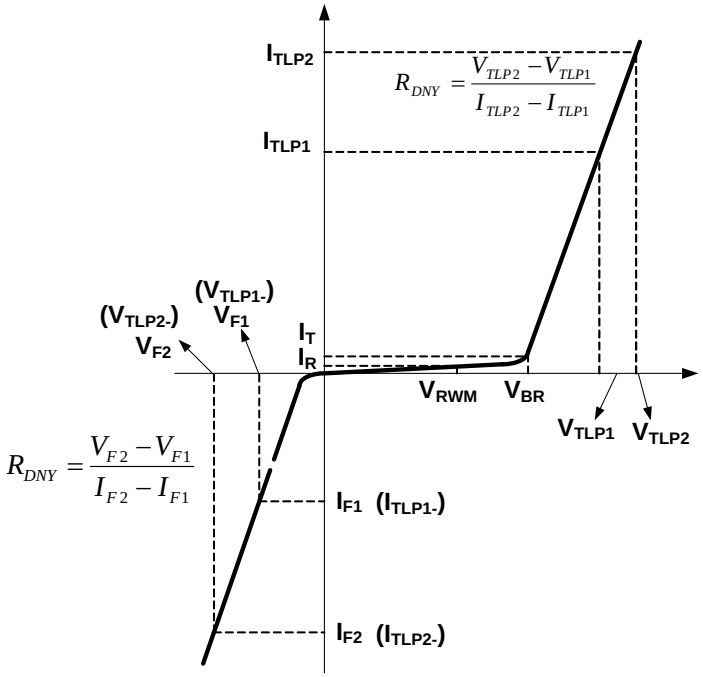
Notes:

1. IEC 61000-4-2 discharge with $C_{Discharge}$ = 150pF, $R_{Discharge}$ = 330Ω.
2. 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, 8/20µs, 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

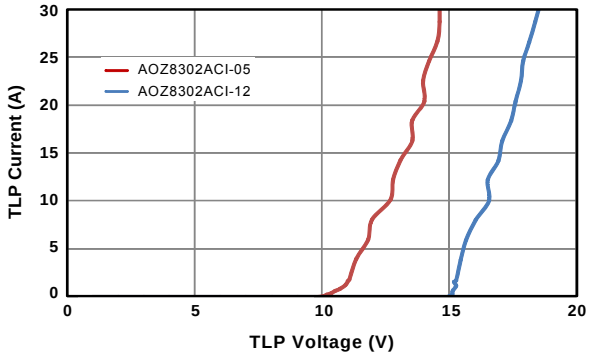
Notes:

3. These specifications are guaranteed by design and characterization.

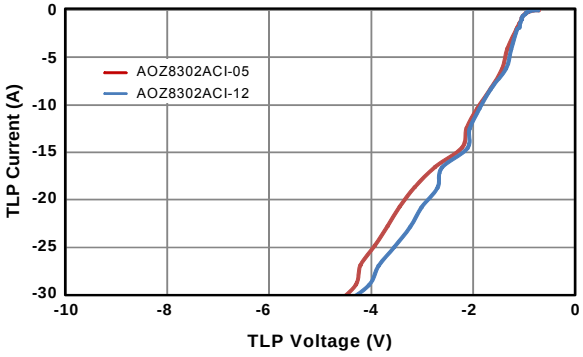
4. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

Typical Performance Characteristics

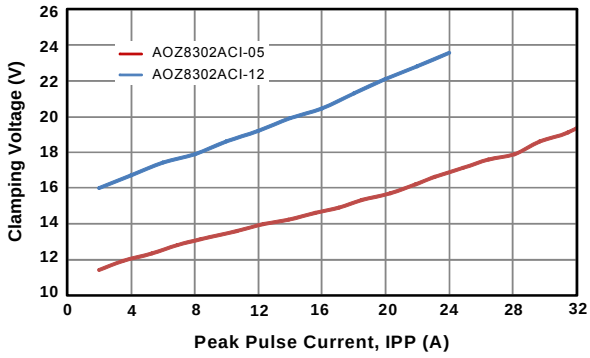
Positive TLP Clamping
(t_{period} = 100ns, t_{rise} = 1ns)



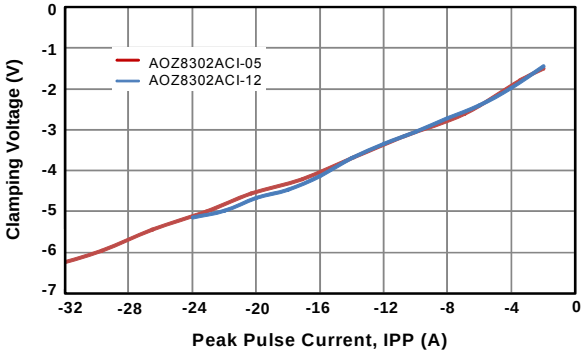
Negative TLP Clamping
(t_{period} = 100ns, t_{rise} = 1ns)



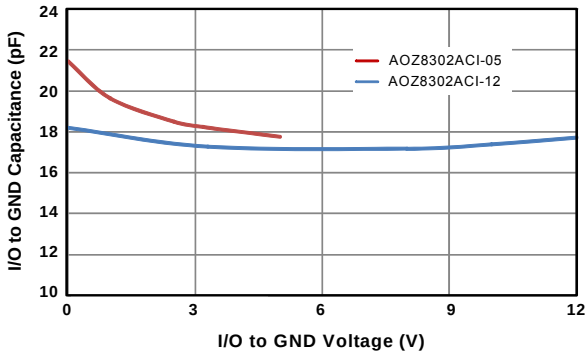
IEC61000-4-5 Surge 8/20µs (Positive)



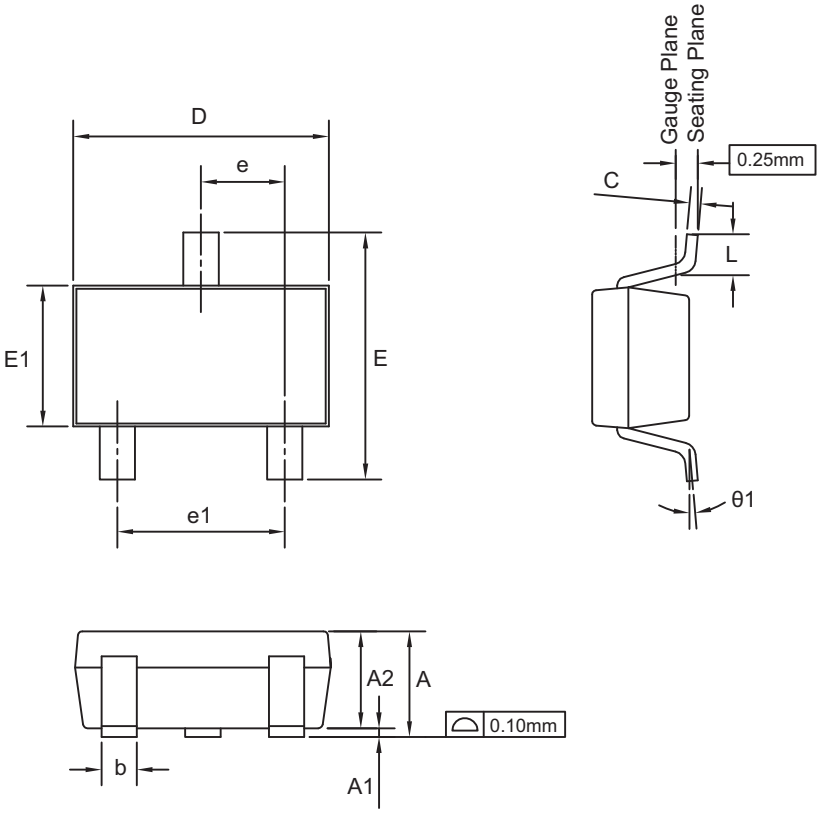
IEC61000-4-5 Surge 8/20µs (Negative)



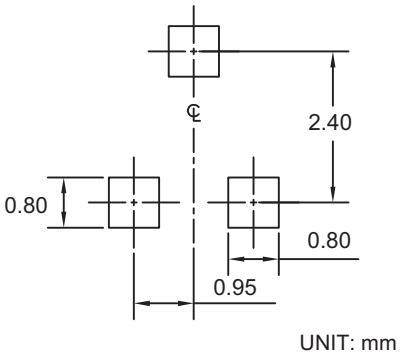
Typical Variation of C_J vs. V_R



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

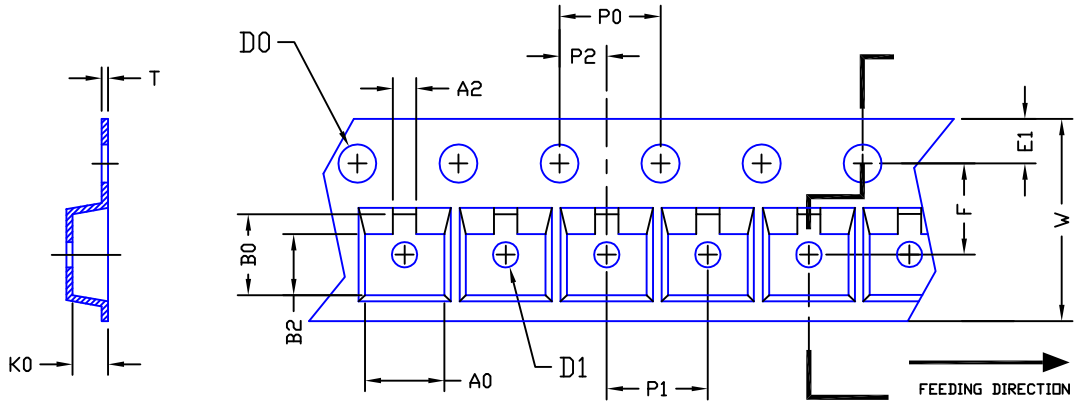
Symbols	Min.	Nom.	Max.
A	0.033	—	0.049
A1	0.000	—	0.005
A2	0.028	0.039	0.045
b	0.012	0.016	0.020
c	0.003	0.005	0.008
D	0.110	0.114	0.122
E	0.102	0.110	0.118
E1	0.055	0.063	0.071
e	0.037 BSC		
e1	0.075 BSC		
L	0.012	—	0.024
θ1	0°	5°	8°

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

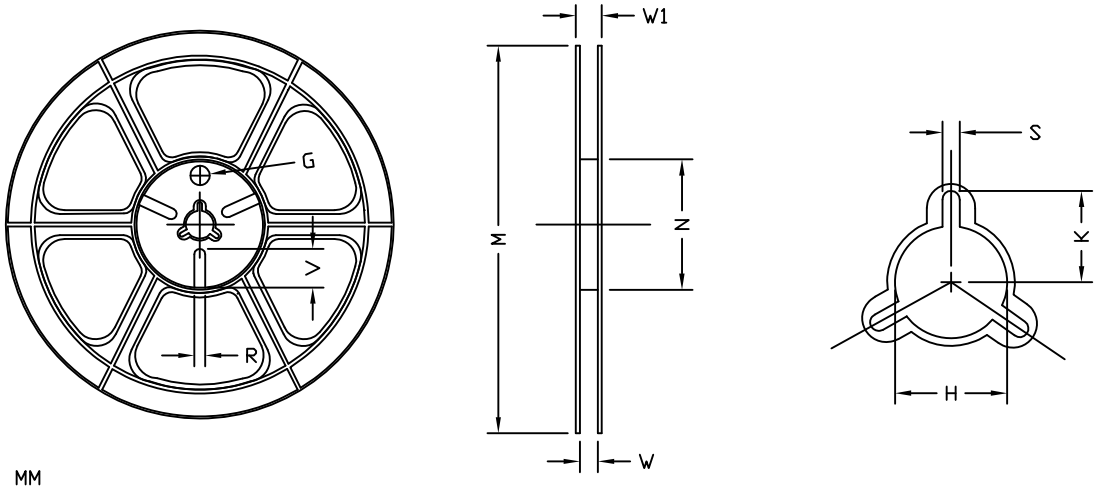
Tape



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

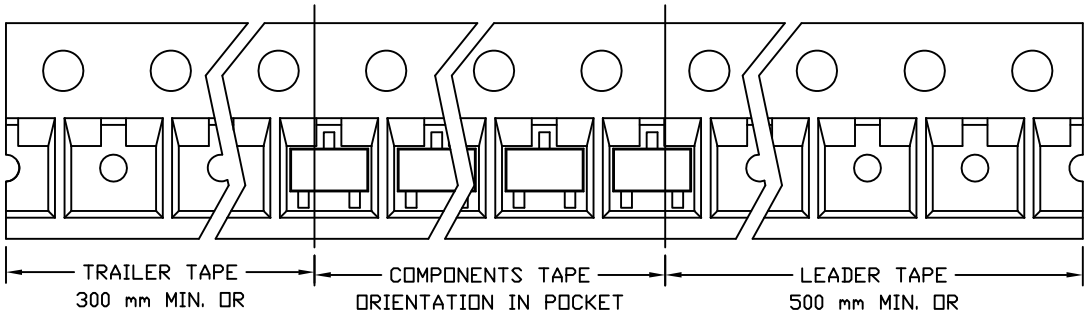


UNIT: MM

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
8 mm	ø178	ø178.00 ±1.00	ø54.00 ±0.50	9.00 ±0.30	11.40 ±1.00	ø13.00 +0.50 -0.20	10.60	2.00 ±0.50	ø9.00	5.00	18.00

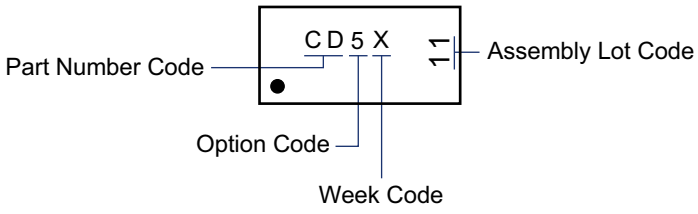
Leader/Trailer and Orientation

Unit Per Reel:
3000pcs



Part Marking

AOZ8302ACI-05



AOZ8302ACI-12