

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

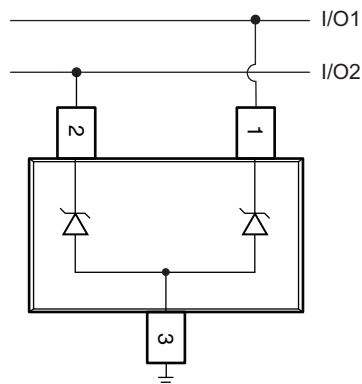
- ESD and high current surge protection:
 - AOZ8302ACI-05 (5V version):
 - Exceeds: IEC 61000-4-2 (ESD) $\pm 30\text{kV}$ (air), $\pm 30\text{kV}$ (contact)
 - Human Body Model (HBM) $\pm 30\text{kV}$
 - IEC 61000-4-5 (Lightning) 32A (8/20 μs)
 - AOZ8302ACI-12 (12V version):
 - Exceeds: IEC 61000-4-2 (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
- IEC 61000-4-4 (EFT) $\pm 40\text{A}$

Applications

- Ethernet
- Datacom Interfaces
- Telecom Interfaces

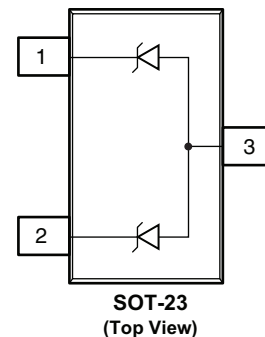


Typical Application



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

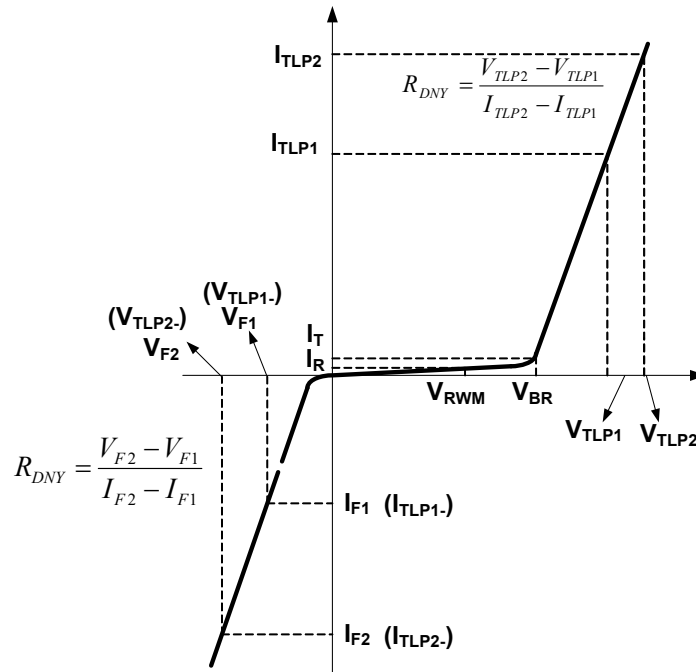
Notes:

- 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



$T_A = 25^\circ\text{C}$ 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	$I_T = 1\text{mA}$, I/O Pin to ground	6			V
I_R	Reverse Leakage Current	$V_{RWM} = 5\text{V}$, I/O Pin to ground			1	μA
V_F	Forward Voltage	$I_F = 15\text{mA}$		0.85		V
V_{CL}	Clamping Voltage ^(3, 4) (100ns Transmission Line Pulse, I/O Pin to ground)	$I_{TLP} = 1\text{A}$ $I_{TLP} = -1\text{A}$		11 -1	14 -2.5	V
		$I_{TLP} = 30\text{A}$ $I_{TLP} = -30\text{A}$		14 -5	17 -7	V
	Clamping Voltage ⁽³⁾ (IEC61000-4-5, 8/20 μs , I/O Pin to ground)	$I_{PP} = 2\text{A}$ $I_{PP} = -2\text{A}$		11 -1.8	14.5 -3.5	V
		$I_{PP} = 32\text{A}$ $I_{PP} = -32\text{A}$		20 -7	24 -9	V
R_{DNY}	Dynamic Resistance ^(3, 4)	$I_{TLP} = 1\text{A to } 30\text{A}$ $I_{TLP} = -1\text{A to } -30\text{A}$		0.1 0.1		Ω
C_J	Junction Capacitance	$V_{Pin1} = 0\text{V}$, $f = 1\text{MHz}$, Pin1 to ground		20		pF

Electrical Characteristics (continued)

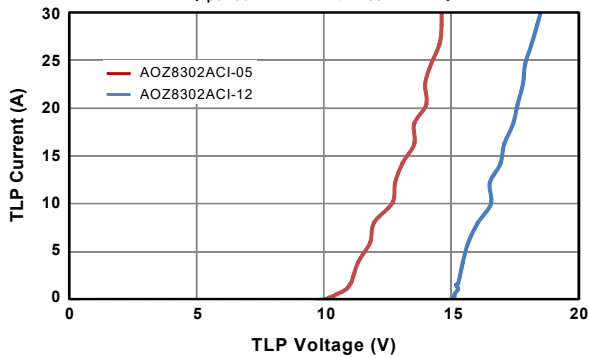
AOZ8302ACI-12						
Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
V_{RWM}	Reverse Working Voltage	I/O Pin to ground			12	V
V_{BR}	Reverse Breakdown Voltage	$I_T=1mA$, I/O Pin to ground	13			V
I_R	Reverse Leakage Current	$V_{RWM}=12V$, I/O Pin to ground			1	μA
V_F	Forward Voltage	$I_F=15mA$		0.85		V
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:

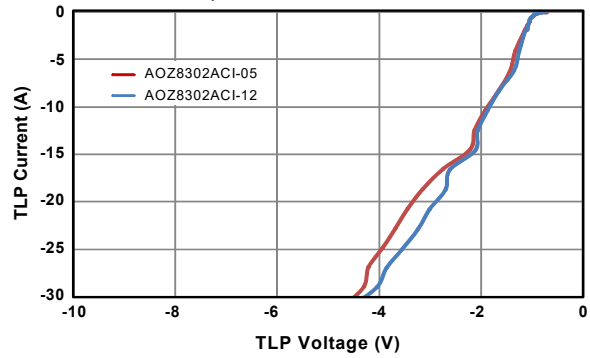
3. These specifications are guaranteed by design and characterization.
4. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

Typical Performance Characteristics

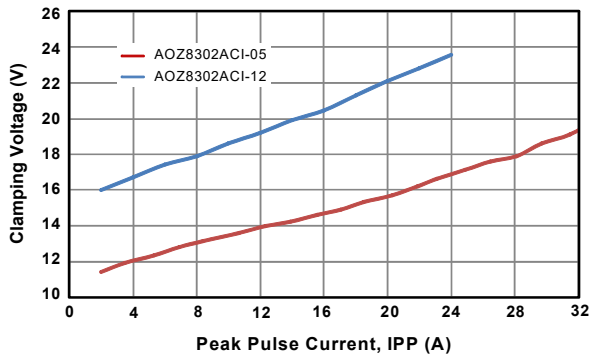
Positive TLP Clamping
($t_{\text{period}} = 100\text{ns}$, $t_{\text{rise}} = 1\text{ns}$)



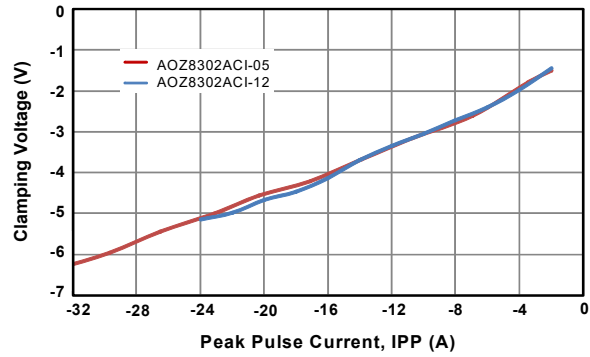
Negative TLP Clamping
($t_{\text{period}} = 100\text{ns}$, $t_{\text{rise}} = 1\text{ns}$)



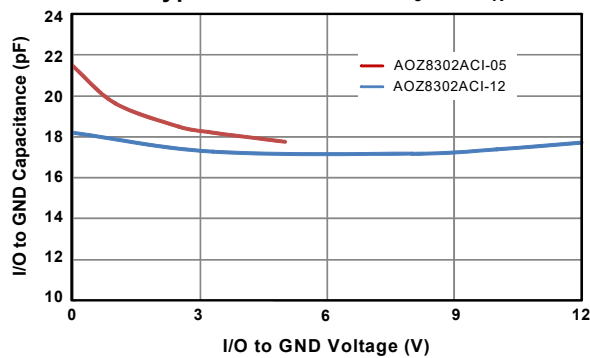
IEC61000-4-5 Surge 8/20 μ s (Positive)



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



Typical Variation of C_J vs. V_R



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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.