AOZ8S411ULS-24

1CH 24V 1.2pF Uni-directional TVS

General Description

The AOZ8S411ULS-24 is a single channel transient voltage suppressor designed to protect data lines such as CC & SBU from damaging ESD events.

The AOZ8S411ULS-24 provides a ultra low capacitance of 1.2pF, high allowable reverse working voltage up to 24V and low insertion loss providing greater signal integrity making it ideally suited for low speed data transmission applications in mobile and computing Type-C applications.

The AOZ8S411ULS-24 comes in a RoHS compliant and Halogen Free 0.6mm x 0.3mm x 0.3mm package and is rated for -40°C to +125°C junction temperature range.

Features

- ESD protection for high-speed data lines:
  - IEC 61000 4-2, ESD immunity:
    - Air discharge: ±30kV
    - Contact Discharge: ±30kV
- IEC 61000-4-5 (Lightning 8/20μs): ±21A
- IEC 61000-4-4 EFT (5/50ns): 40A
- Human Body Mode: ±8kV
- Uni-directional TVS
- Low capacitance: 1.2pF
- Low clamping voltage
- Operating voltage: 24V

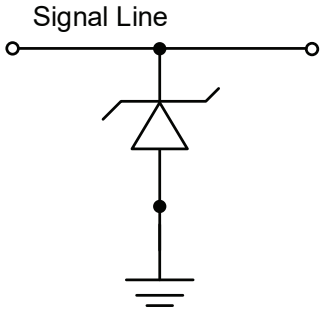
Applications

- Type-C CC & SBU Pins
- Low speed data lines
- Mobile phone
- Notebook computers
- Docking station

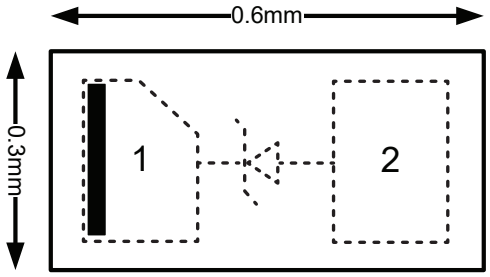
GREEN Product

PFAS Free

Typical Application



Pin Configuration



Top View

Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8S411ULS-24	-40°C to +85°C	WLCSP0.6x0.3B-2	Green Product

AOS products are offered in packages with Pb-free plating and compliant to RoHS standards.
Please visit https://aosmd.com/sites/default/files/media/AOSGreenPolicy.pdf for additional information.

Absolute Maximum Ratings

Exceeding the Absolute Maximum Ratings may damage the device.

Parameter	Rating
Pin 2 as ground	24V
Peak Pulse Current (I_{PP}), t_P = 8/20µs	±21A
Peak Pulse Power (P_{PP}), t_P = 8/20µs. Pin 2 as ground	66W
Storage Temperature (T_S)	-65°C to +150°C
ESD Rating per IEC61000-4-2, Contact(1)	±30kV
ESD Rating per IEC61000-4-2, Air(1)	±30kV
ESD Rating per Human Body Mode(2)	±8kV

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

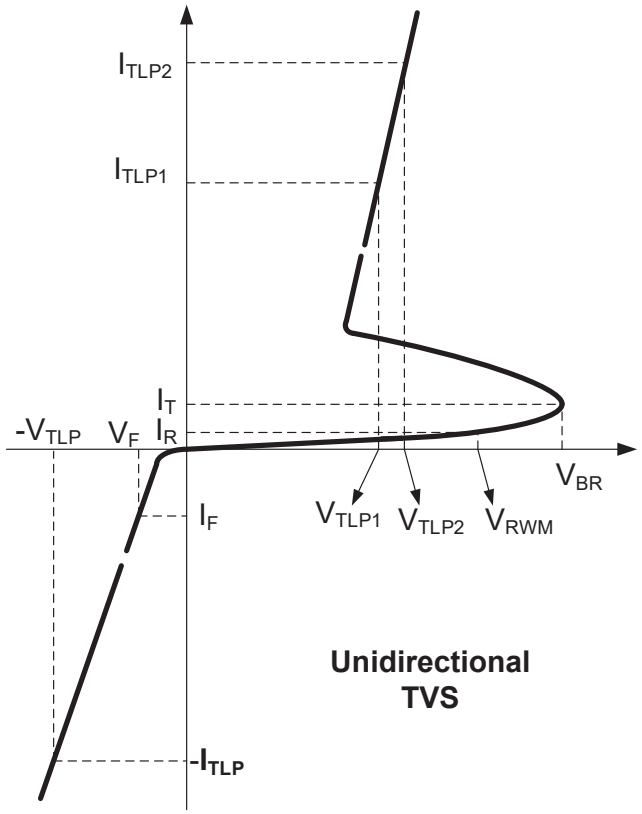
Maximum Operating Ratings

The device is not guaranteed to operate beyond the Maximum Operating Conditions.

Parameter	Rating
Junction Temperature (T_J)	-40°C to +125°C

Electrical Characteristics

T_A = 25°C, unless otherwise noted. Pin 2 as ground.



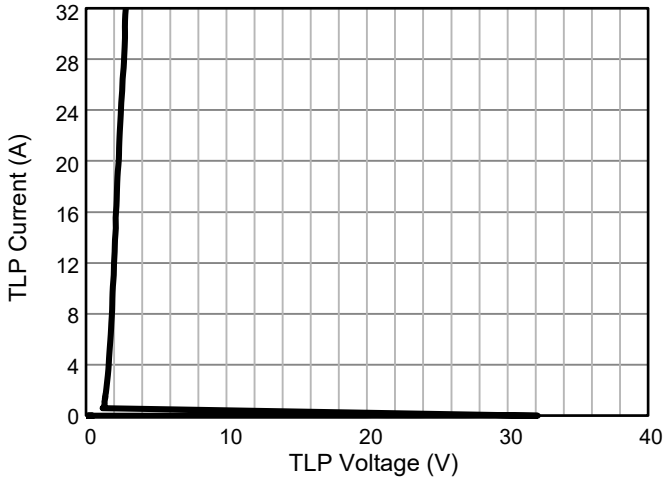
Symbol	Parameter	Conditions	Min	Typ	Max	Units
V_{RWM}	Reverse Working Voltage				24	V
V_{BR}	Reverse Breakdown Voltage	I_T = 10µA	26			
I_R	Reverse Leakage Current	V_T = Max V_{RWM}		1	100	nA
V_F	Forward Voltage	I_F = 15mA		0.7		V
V_{CL}	Clamping Voltage(3)(4) (100ns Transmission Line Pulse)	I_{TLP} = 1A I_{TLP} = -1A		1.3 -1		
		I_{TLP} = 30A I_{TLP} = -30A		2.7 -2.6		
	Clamping Voltage(3) IEC61000-4-5 Surge 8/20µs	I_{PP} = 1A I_{PP} = -1A		1.3 -1.1		
		I_{PP} = 21A I_{PP} = -21A		2.9 -2.7		
R_{DNY}	Dynamic Resistance(3)(4)	I_{TLP} = 1A to 30A		0.05		Ω
C_J	Clamping Voltage(3)	$V_{I/O}$ = 0V, f = 1MHz		1.2		pF

Notes:

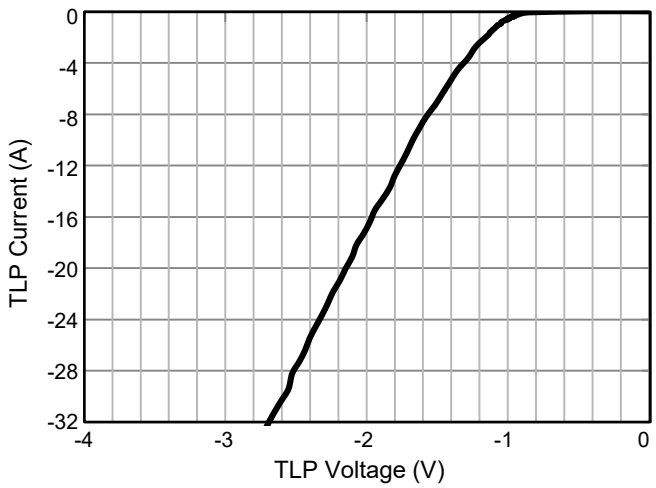
3. These specifications are guaranteed by design and characterization.
4. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

Typical Performance Characteristics

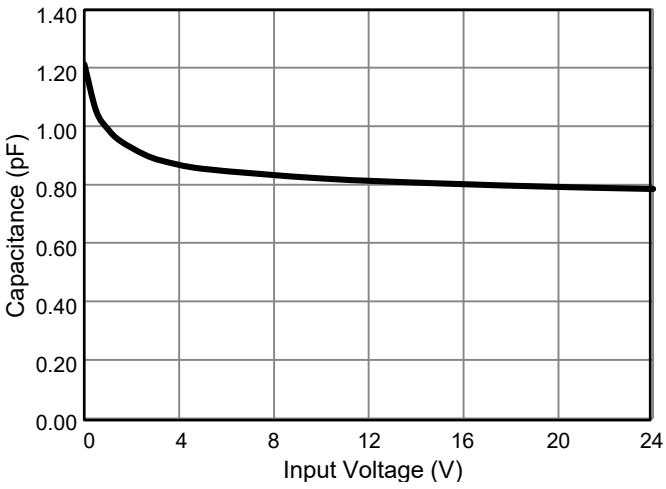
Positive Transmission Line Pulse (tp = 100ns, tr = 10ns)



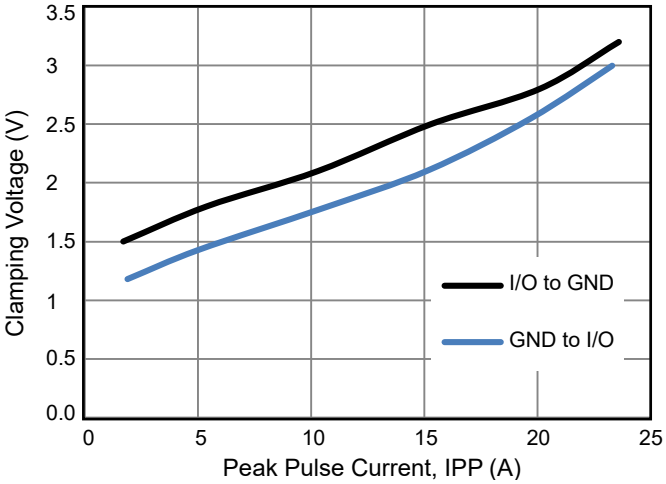
Negative Transmission Line Pulse (tp = 100ns, tr = 10ns)



Typical Variations of CJ vs. Input Voltage



IEC61000-4-5 Surge 8/20µs



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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.