ALPHA & OMEGA SEMICONDUCTOR

AOZ8S322UD2-05

-Channel Unidirectional Low Capacitance TVS

General Description

The AOZ8S322UD2-05 is a 2-channel unidirectional low capacitance transient voltage suppressor designed to protect data lines such as USB2.0 and low speed signal lines from damaging ESD or surge events.

This device incorporates two unidirectional TVS diodes in a single package. During transient conditions, the TVS diodes direct the transient to either the positive side of the power supply line or to ground.

The AOZ8S322UD2-05 provides a typical I/O to GND capacitance of 0.55 pF and low clamping voltage making it ideally suited for data transmission protection in mobile and computing devices.

The AOZ8S322UD2-05 comes in a RoHS compliant and Halogen Free 1.0 mmx0.6 mm package and is rated for -40°C to +125°C junction temperature range.

Features

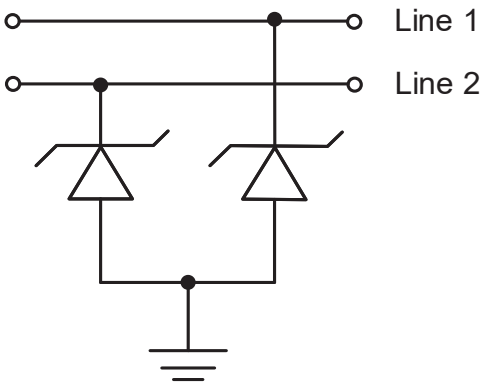
- ESD protection for high-speed data lines:
  - IEC 61000-4-2 (ESD) immunity:
    - Air discharge: ±30 kV
    - Contact discharge: ±30 kV
  - IEC 61000-4-5 (Lightning, 8/20 µs) 8 A
- Low capacitance between I/O to GND: 0.55 pF
- Low surge clamping voltage
- Low operating voltage: 5V

Applications

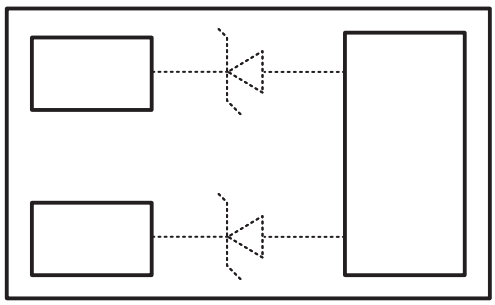
- USB2.0
- USB Type-C
- Mobile Phone
- Notebook computers

Green Product

Typical Applications



Pin Configuration



DFN1.0x0.6_3L

Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8S322UD2-05	-40°C to +125°C	DFN1.0×0.6_3L	Green Product

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
Storage Temperature (T_S)	-65 °C to +150°C
ESD Rating per Human Body Mode (HMB)	±8 kV
ESD Rating per IEC61000-4-2, contact(1)	±30 kV
ESD Rating per IEC61000-4-2, air(1)	±30 kV
Surge Rating per IEC61000-4-5, 8/20µs	±8 A

Notes:

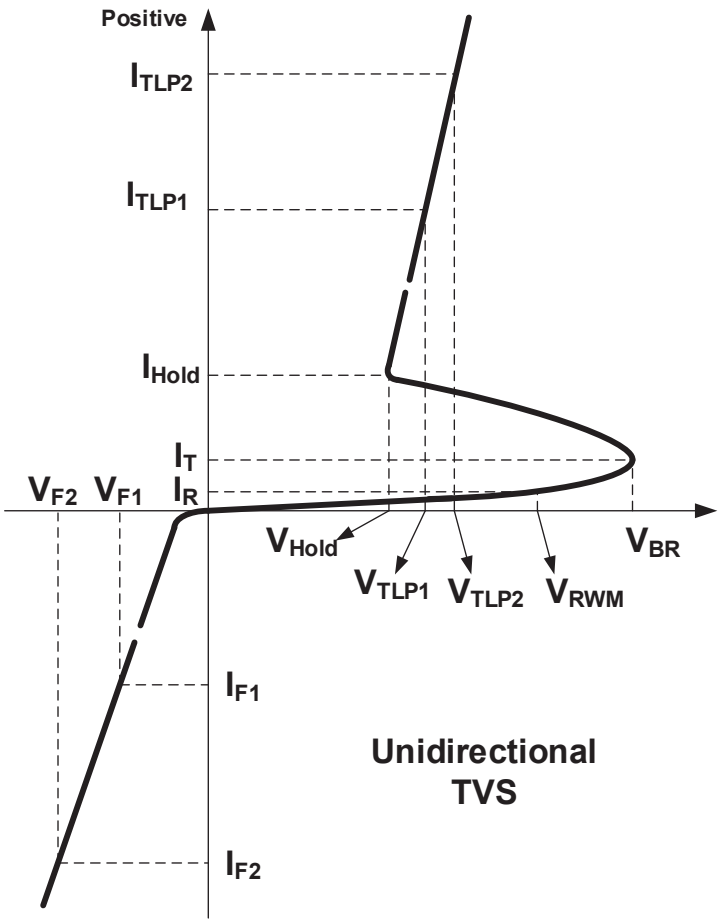
1. IEC 61000-4-2 discharge with $C_{Discharge}$ = 150 pF, $R_{Discharge}$ = 330 Ω.
2. Human Body Discharge per MIL-STD-883, Method 3015 $C_{Discharge}$ = 100 pF, $R_{Discharge}$ = 1.5 kΩ

Maximum Operating Ratings

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

Electrical Characteristics

T_A = 25°C, unless otherwise noted. I/O Pin to GND.



Symbol	Parameter	Conditions	Min	Typ	Max	Units
V_{RWM}	Reverse Working Voltage				5	V
V_{BR}	Reverse Breakdown Voltage	I_T = 100 µA	6	9	12	
I_R	Reverse Leakage Current	V_T=Max. V_{RWM}		1	100	nA
V_{CL}	Clamping Voltage[3] (100 ns Transmission Line Pulse)	I_{TLP} = 1 A I_{TLP} = -1A		1.5 -1.5	2 -2	V
		I_{TLP} = 16 A I_{TLP} = -16 A		4.5 -6	5.5 -7	
		I_{TLP} = 30 A I_{TLP} = -30 A		7.5 -10.5	8.5 -11.5	
	Clamping Voltage[3] IEC61000-4-5 Surge 8/20us	I_{PP} = 1 A I_{PP} = -1 A		2 -2	2 -2	V
		I_{PP} = 8 A I_{PP} = -8 A		4.5 -5	5.5 -6	
C_J	Junction Capacitance	$V_{I/O}$ = 1.5 V, f = 1 MHz		0.55	0.95	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

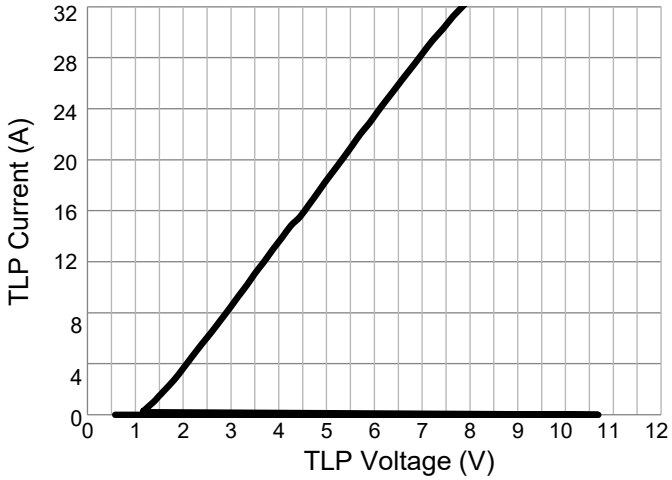


Figure 1. Positive Transmission Line Pulse (tp=100ns, tr=0.2ns)

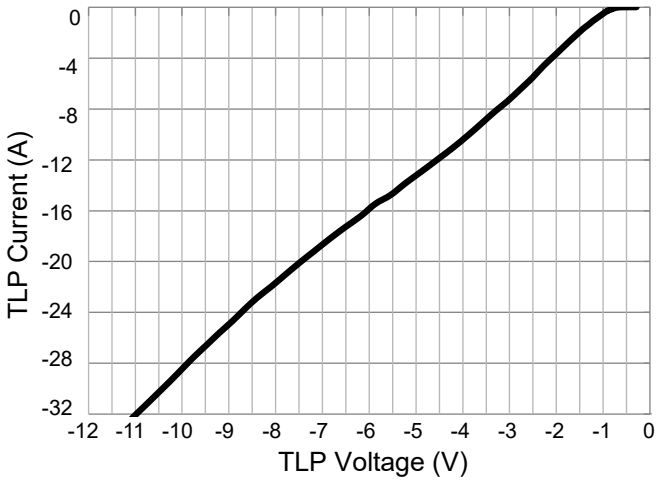


Figure 2. Negative Transmission Line Pulse (tp=100ns, tr=0.2ns)

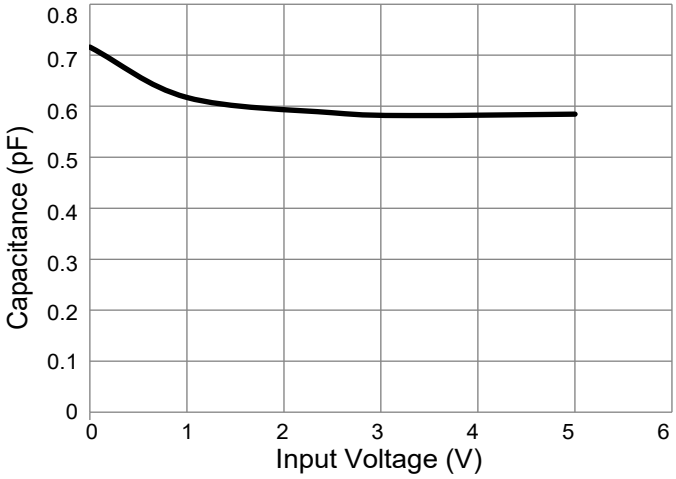


Figure 3. Typical Variations of CJ vs. Input Voltage

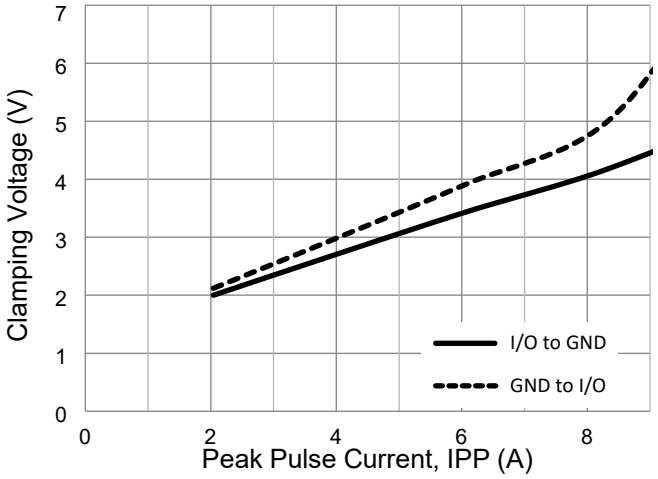


Figure 4. IEC61000-4-5 Surge 8/20us

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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.