AOZ8S313UDS-05

1-Channel Unidirectional Ultra Low Capacitance TVS

General Description

The AOZ8S313UDS-05 is a 1-channel unidirectional high transient voltage suppressor designed to protect data lines such as USB and power rail from damaging ESD or surge events.

During transient conditions, the diode direct the transient to either the paositive side of the power supply line or to ground.

The AOZ8S313UDS-05 provides a typical capacitance of 0.6 pF and low clamping voltage making it ideally suited for data transmission protection in mobile and computing devices.

The AOZ8S313UDS-05 comes in a RoHS compliant and Halogen Free 1.0mm × 0.6mm × 0.5mm package and is rated for -40°C to +125°C junction temperature range.

Features

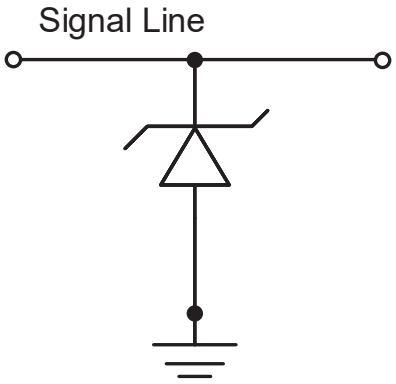
- IEC 61000-4-2, ESD immunity:
  - Air discharge: ±25 kV;
  - Contact discharge: ±22 kV
- IEC61000-4-5 (lightning,8/20 µs): 6 A
- Human Body Model (HBM) ±8 kV
- Low capacitance: 0.6 pF
- Low clamping voltage
- Reverse working voltage: 5V

Applications

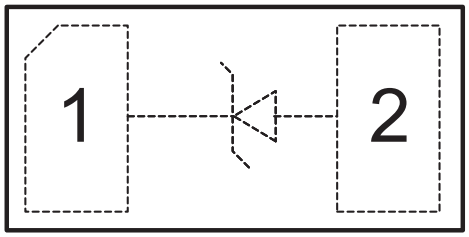
- USB2.0
- General purpose
- Mobile phone
- Notebook computers

Green Product

Typical Applications



Pin Configuration



DFN1.0x0.6_2L

Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8S313UDS-05	-40°C to +125°C	DFN1.0×0.6-2L	Green Product

AOS products are offered in packages with Pb-free plating and compliant to RoHS standards.
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 (TS)	-65 °C to +150°C
ESD Rating per IEC61000-4-2, contact(1)	±22 kV
ESD Rating per IEC61000-4-2, air(1)	±25 kV
8/20ms Surge IEC61000-4-5 Peak Pulse Current	± 6 A
EFT Rating per IEC61000-4-4 (5/50ns)	40 A
ESD Rating per Human Body Mode (HBM)(2)	±8 kV

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

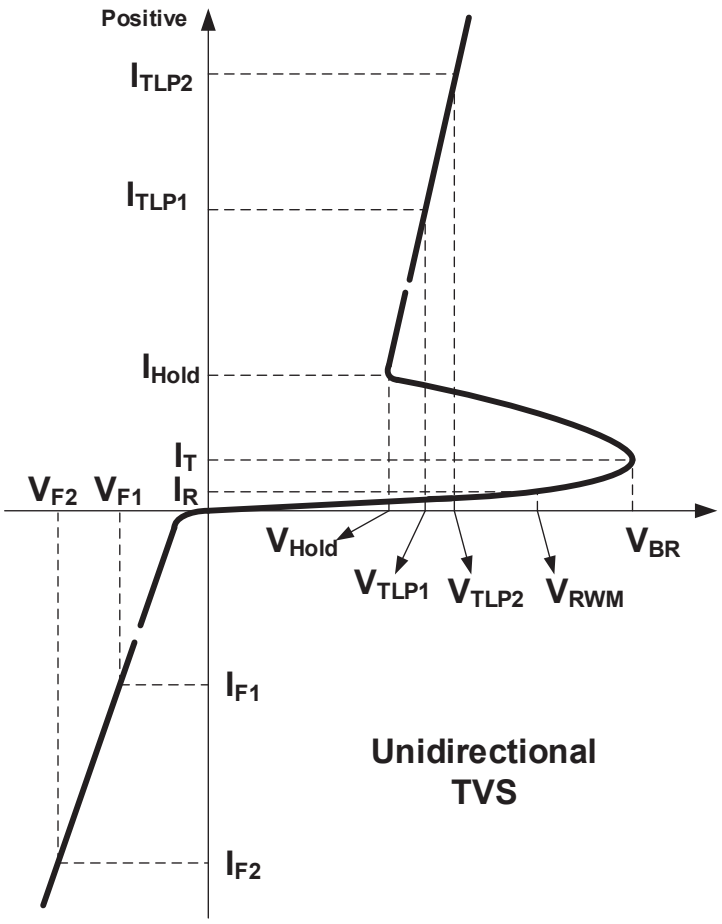
Maximum Operating Ratings

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. 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	11	12	13	
I_R	Reverse Leakage Current	Max. V_{RWM}			50	nA
V_{CL}	Clamping Voltage[3] (100 ns Transmission Line Pulse)	I_{TLP} = 1 A I_{TLP} = -1A		1.5 -1.5		V
		I_{TLP} = 16 A I_{TLP} = -16 A		5.5 -11		
		I_{TLP} = 30 A I_{TLP} = -30 A		10 -16		
	Clamping Voltage[3] (IEC61000-4-5, Surge 8/20 µs)	I_{PP} = 1 A I_{PP} = -1 A		1.5 -2		
		I_{PP} = 6 A I_{PP} = -6 A		3 -6.5		
C_J	Junction Capacitance	$V_{I/O}$ = 0V, f = 1Mhz		0.5	0.9	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

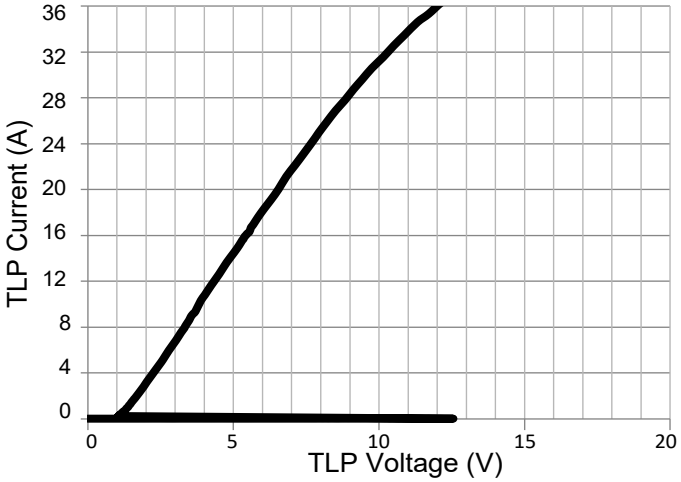


Figure 1. Positive Transmission Line Pulse (tp=100ns, tr=0.2ns)

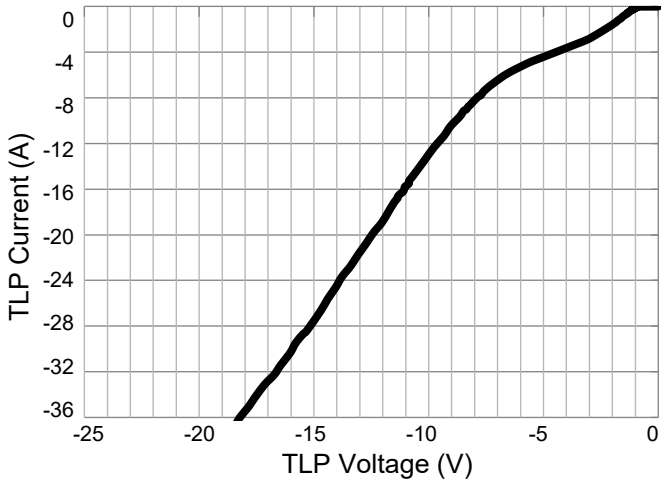


Figure 2. Negative Transmission Line Pulse (tp=100ns, tr=0.2ns)

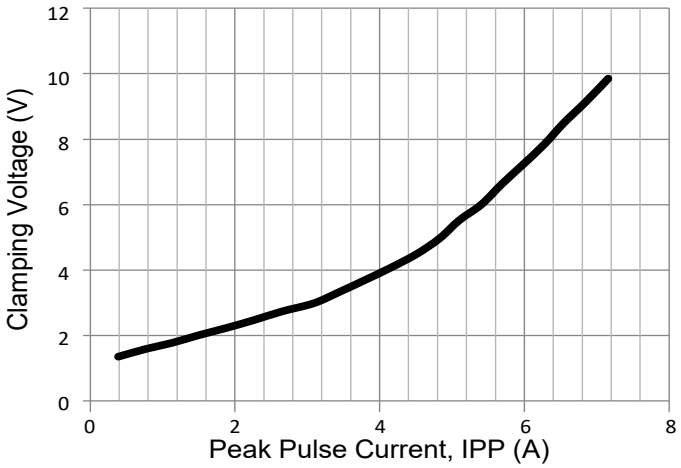


Figure 3. Negative IEC61000-4-5 Surge 8/20µs

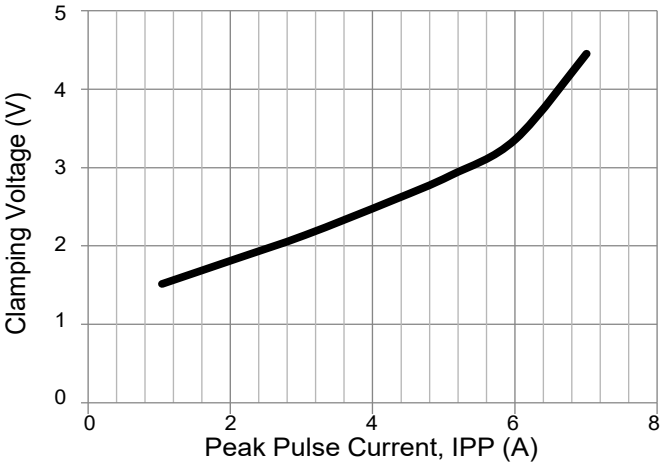


Figure 4. Positive IEC61000-4-5 Surge 8/20µs

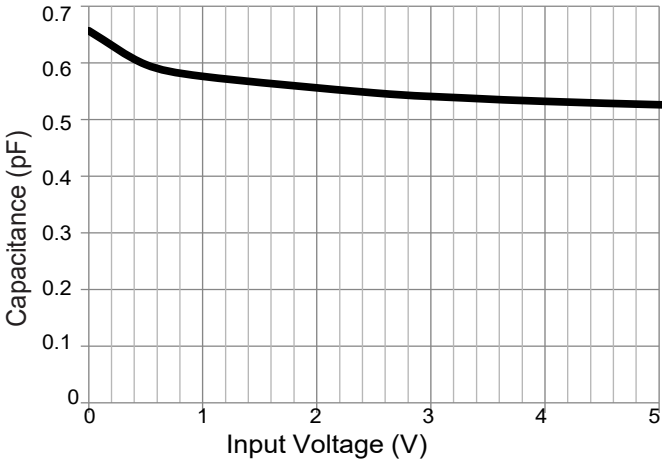


Figure 5. Typical Variations of CJ vs. Input Voltage

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As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.

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.