

## General Description

The AOZ8222DI-05 is a two-line transient voltage suppressor diode designed to protect voltage sensitive electronics from high transient conditions and ESD.

This device incorporates two TVS diodes in an ultra-small DFN 1.0 x 0.6 package. During transient conditions, the TVS diodes direct the transient to ground. The AOZ8222DI-05 may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 ( $\pm 15$  kV air,  $\pm 8$  kV contact discharge).

The AOZ8222DI-05 comes in an RoHS compliant 3-lead DFN package and is rated over a  $-40$  °C to  $+85$  °C ambient temperature range.

The ultra-small 1.0 mm x 0.6 mm x 0.5 mm DFN 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

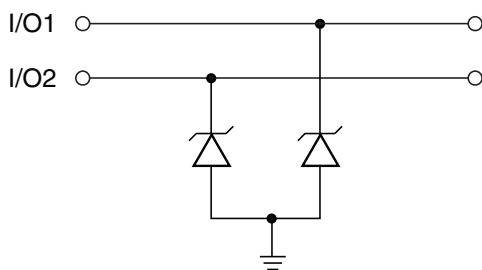
- ESD protection for high-speed data lines:
  - Exceeds IEC 61000-4-2 (ESD):  $\pm 20$  kV (air),  $\pm 20$  kV (contact)
  - Human Body Model (HBM)  $\pm 30$  kV
- Small package saves board space
- Low insertion loss
- Low clamping voltage
- Low operating voltage: 5 V

## Applications

- Portable handheld devices
- Keypads, data lines, buttons
- Notebook computers
- Digital Cameras
- Portable GPS
- MP3 players

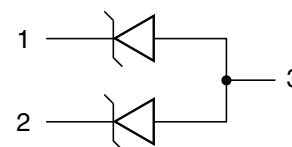


## Typical Application



Unidirection Protection of Two Line

## Pin Configuration



## Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8222DI-05	-40 °C to +85 °C	DFN 1.0 x 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](http://www.aosmd.com/media/AOSGreenPolicy.pdf) for additional information.

## Absolute Maximum Ratings

*Exceeding the Absolute Maximum ratings may damage the device.*

Parameter	AOZ8222DI-05
Peak Pulse Current, $t_p = 8/20 \mu s$	5.5 A
Peak Pulse Power, $t_p = 8/20 \mu s$	50 W
Storage Temperature ( $T_S$ )	-65 °C to +150 °C
ESD Rating per IEC61000-4-2, Contact <sup>(1)</sup>	± 20 kV
ESD Rating per IEC61000-4-2, Air <sup>(1)</sup>	± 20 kV
ESD Rating per Human Body Model <sup>(2)</sup>	± 30 kV

### Notes:

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

## Maximum Operating Ratings

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

## Electrical Characteristics

$T_A = 25\text{ }^\circ\text{C}$  unless otherwise specified.

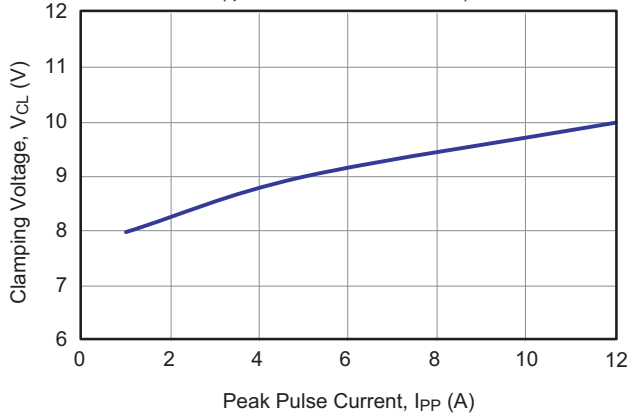
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
$V_{RWM}$	Reverse Working Voltage	Between I/O and VN <sup>(3)</sup>			5.0	V
$V_{BR}$	Reverse Breakdown Voltage	$I_T = 1\text{ mA}$ , between I/O and VN <sup>(4)</sup>	6.0			V
$I_R$	Reverse Leakage Current	$V_{RWM} = 5\text{ V}$ , between I/O and VN			1	$\mu\text{A}$
$V_F$	Diode Forward Voltage	$I_F = 10\text{ mA}$	0.6	0.7	0.9	V
$V_{CL}$	Channel Clamp Voltage Positive Transients Negative Transients	$I_{PP} = 1\text{ A}$ , $t_p = 100\text{ ns}$ , any I/O pin to Ground <sup>(5)(6)</sup>			8.0 -2.0	V V
	Channel Clamp Voltage Positive Transients Negative Transients	$I_{PP} = 5\text{ A}$ , $t_p = 100\text{ ns}$ , any I/O pin to Ground <sup>(5)(6)</sup>			9.0 -5.0	V V
	Channel Clamp Voltage Positive Transients Negative Transients	$I_{PP} = 12\text{ A}$ , $t_p = 100\text{ ns}$ , any I/O pin to Ground <sup>(5)(6)</sup>			10.0 -10.0	V V
$C_J$	Channel Input Capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , between I/O pins <sup>(6)</sup>		8	9	pF
		$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , any I/O pin to Ground <sup>(6)</sup>		15	18	pF

### Notes:

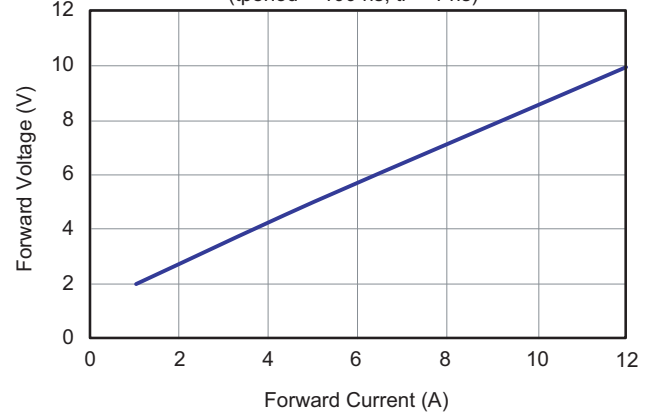
3. The working peak reverse voltage,  $V_{RWM}$ , should be equal to or greater than the DC or continuous peak operating voltage level.
4.  $V_{BR}$  is measured at the pulse test current  $I_T$ .
5. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.
6. Guaranteed by design and characterization.

## Typical Performance Characteristics

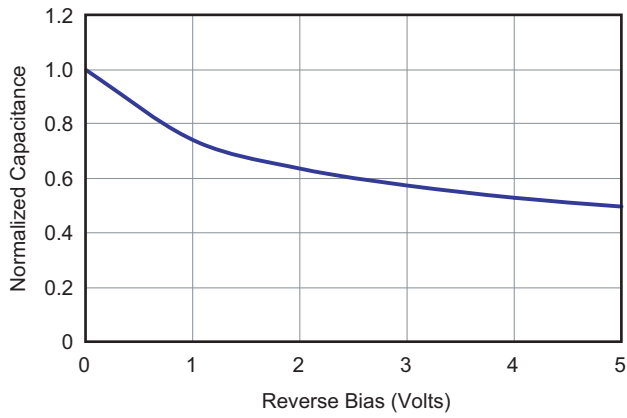
**Clamping Voltage vs. Peak Pulse Current**  
(tperiod = 100 ns, tr = 1 ns)



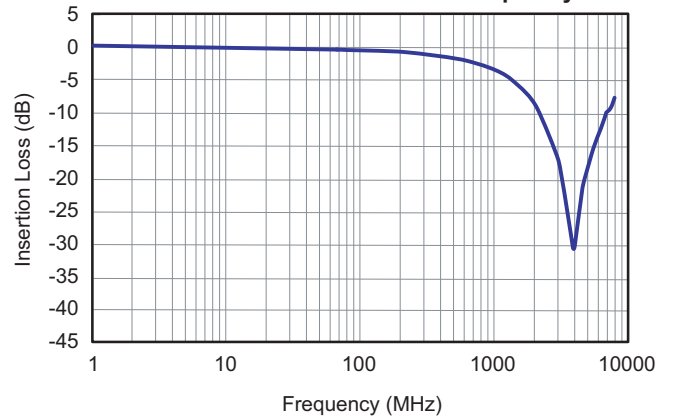
**Forward Voltage vs. Forward Current**  
(tperiod = 100 ns, tr = 1 ns)



**Capacitance vs. Reverse Bias**



**I/O – Gnd Insertion Loss vs. Frequency**



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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.