AOZ8222DI-05

Two-line TVS Diode

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 directs the transient to ground. The AOZ8222DI-05 may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 (± 15 kV air, ± 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

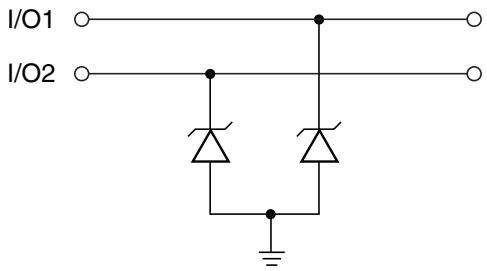
- ESD protection for high-speed data lines:
  - Exceeds IEC 61000-4-2 (ESD): ± 20 kV (air), ± 20 kV (contact)
  - Human Body Model (HBM) ± 30 kV
- Small package saves board space
- Low insertion loss
- Low clamping voltage
- Low operating voltage: 5 V

Applications

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

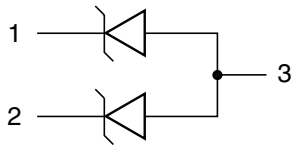
Green Product

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/web/quality/rohs_compliant.jsp for additional information.

Absolute Maximum Ratings

Exceeding the Absolute Maximum ratings may damage the device.

Parameter	Rating
Peak Pulse Current, t_P = 8/20 µs	5.5 A
Peak Pulse Power, t_P = 8/20 µs	50 W
Storage Temperature (T_S)	-65 °C to +150 °C
ESD Rating per IEC61000-4-2, Contact(1)	± 20 kV
ESD Rating per IEC61000-4-2, Air(1)	± 20 kV
ESoD Rating per Human Body Model(2)	± 30 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

Parameter	Rating
Junction Temperature (T_J)	-40 °C to +85 °C

Electrical Characteristics

T_A = 25°C unless otherwise specified. Specifications in **BOLD** indicate a temperature range of -40°C to +85°C.

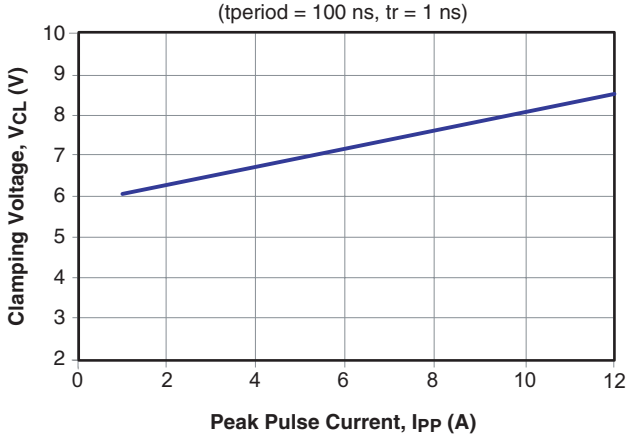
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_{RWM}	Reverse Working Voltage	Between I/O and VN[3]			5.0	V
V_{BR}	Reverse Breakdown Voltage	I_T = 100 µA, between I/O and VN[4]	6.0			V
I_R	Reverse Leakage Current	V_{RWM} = 5 V, between I/O and VN			1	µA
V_F	Diode Forward Voltage	I_F = 15 mA	0.70	0.85	1	V
V_{CL}	Channel Clamp Voltage Positive Transients Negative Transient	I_{PP} = 1 A, tp = 100 ns, any I/O pin to Ground[5]			 8.0 -2.0	 V V
	Channel Clamp Voltage Positive Transients Negative Transient	I_{PP} = 5 A, tp = 100 ns, any I/O pin to Ground[5]			 9.0 -5.0	 V V
	Channel Clamp Voltage Positive Transients Negative Transient	I_{PP} = 12 A, tp = 100 ns, any I/O pin to Ground[5]			 10.0 -10.0	 V V
C_j	Channel Input Capacitance	V_R = 0 V, f = 1 MHz, between I/O pins		8	9	pF
		V_R = 0 V, f = 1 MHz, any I/O pin to Ground		15	18	pF

Notes:

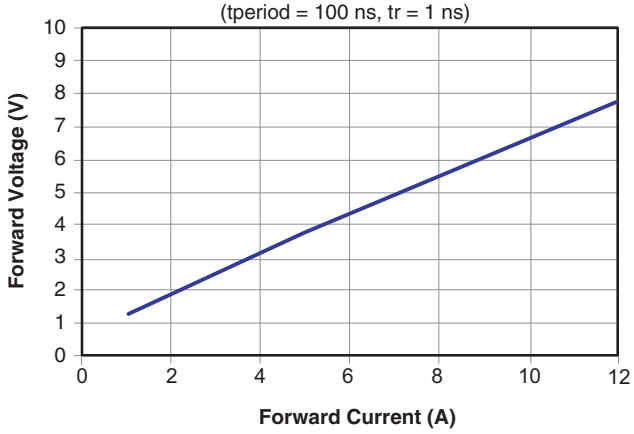
3. The working peak reverse voltage, V_{RWM}, should be equal to or greater than the DC or continuous peak operating voltage level.
4. V_{BR} is measured at the pulse test current I_T.
5. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

Typical Performance Characteristics

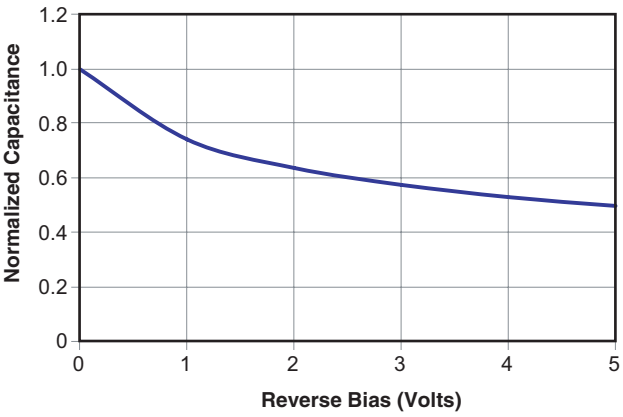
Clamping Voltage vs. Peak Pulse Current
(tperiod = 100 ns, tr = 1 ns)



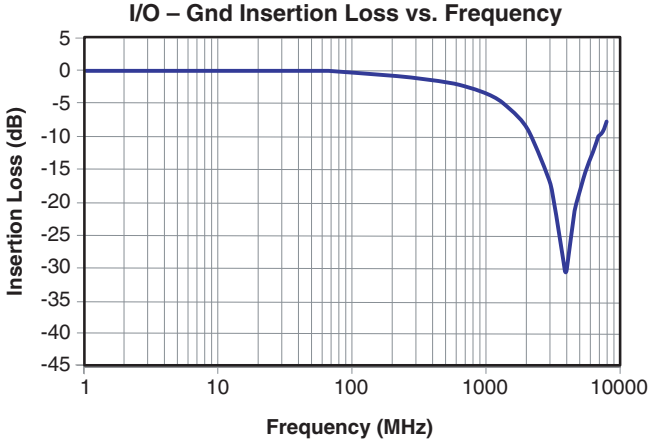
Forward Voltage vs. Forward Current
(tperiod = 100 ns, tr = 1 ns)



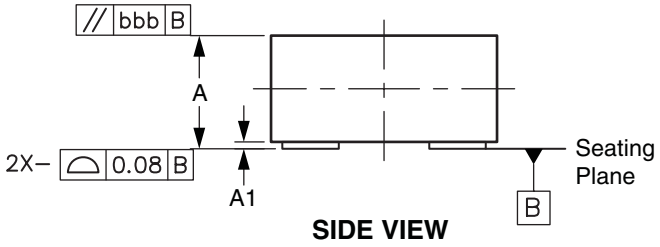
Capacitance vs. Reverse Bias



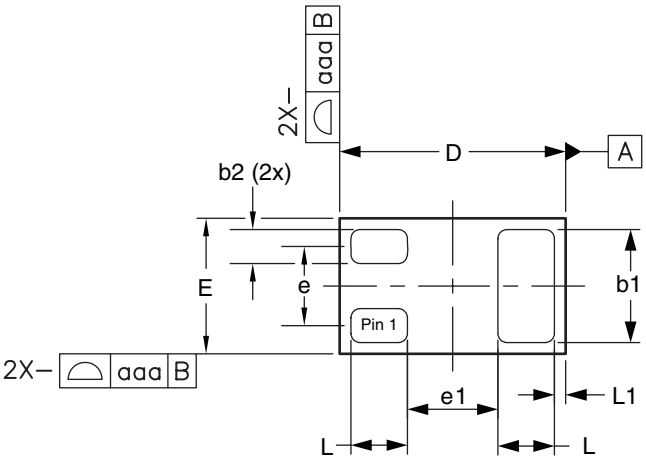
I/O – Gnd Insertion Loss vs. Frequency



Package Dimensions, DFN 1.0 x 0.6, 3L

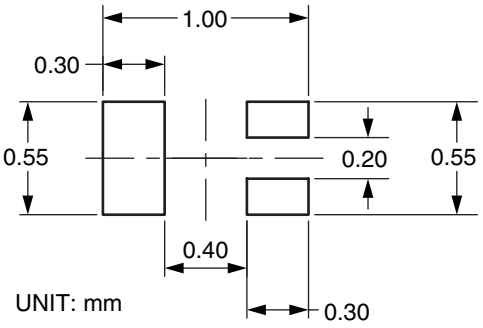


SIDE VIEW



BOTTOM VIEW

RECOMMENDED LAND PATTERN



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	0.50	0.52	0.55
A1	0.00	0.03	0.05
b1	0.45	0.50	0.55
b2	0.10	0.15	0.20
D	0.95	1.00	1.075
E	0.55	0.60	0.675
e	—	0.35	—
e1	—	0.40	—
L	0.20	0.25	0.30
L1	—	0.05	—
aaa		0.15	
bbb		0.05	

Dimensions in inches

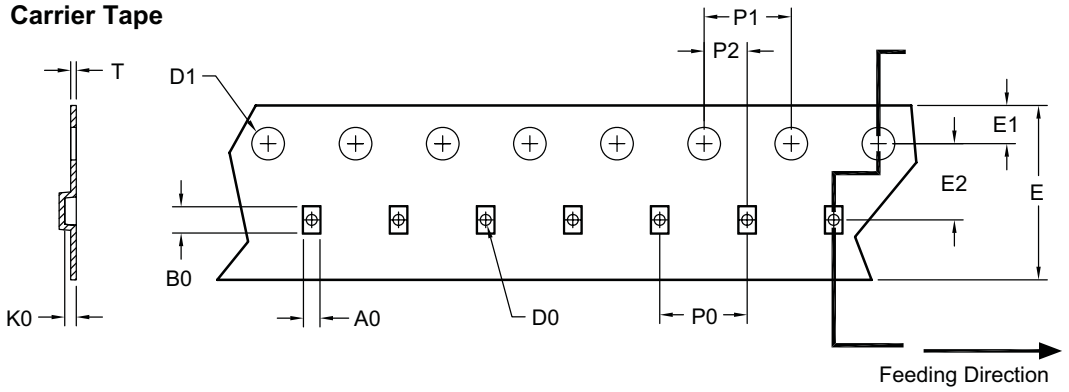
Symbols	Min.	Nom.	Max.
A	0.019	0.020	0.022
A1	0.000	0.001	0.002
b1	0.018	0.020	0.022
b2	0.004	0.006	0.008
D	0.037	0.039	0.042
E	0.022	0.024	0.027
e	—	0.014	—
e1	—	0.016	—
L	0.008	0.010	0.012
L1	—	0.002	—
aaa		0.006	
bbb		0.002	

Notes:

1. All dimensions are in millimeters, angles are in degrees.
2. Coplanarity applies to the exposed heat sink slug as well as the terminals.

Tape and Reel Dimensions, DFN 1.0 x 0.6, 3L

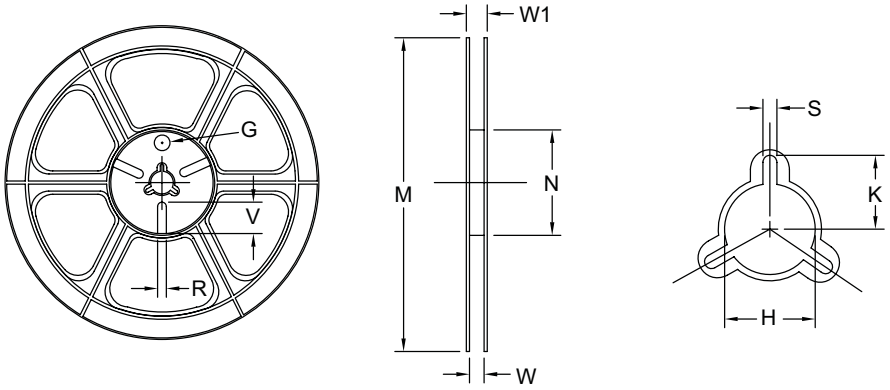
Carrier Tape



UNIT: mm

Package	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
DFN 1.0x0.6 (8 mm)	0.76 ±0.05	1.21 ±0.05	0.53 ±0.05	ø0.50 ±0.05	ø1.50 ±0.10	8.00 +0.30/-0.10	1.75 ±0.1	3.50 ±0.05	4.00 ±0.10	4.0 ±0.10	2.0 ±0.05	0.254 ±0.02

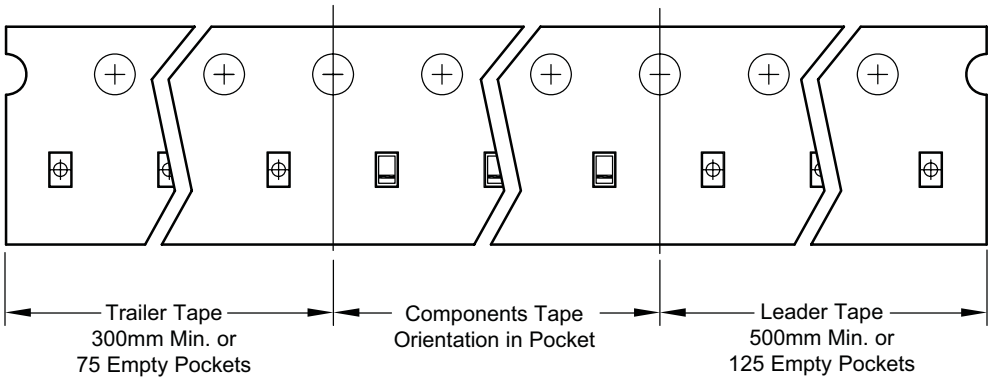
Reel



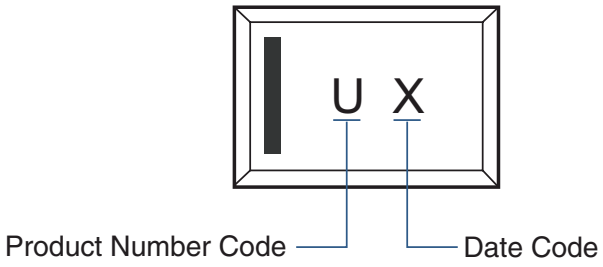
UNIT: mm

Tape Size	Reel Size	M	N	W	W1	H	K	S	G	R	V
8mm	ø178	ø178 ±0.5	ø55 ±1	8.4 +1.5/-0	14.4. Max.	ø13.0 ±0.5	2.0 ±0.5	2.0 ±0.5	N/A	N/A	N/A

Leader / Trailer & Orientation



Part Marking



This data sheet contains preliminary data; supplementary data may be published at a later date.
Alpha & Omega Semiconductor reserves the right to make changes at any time without notice.