AOZ8822

Ultra-Low Capacitance Two-line TVS Diode

General Description

The AOZ8822 is an ultra-low capacitance two-line transient voltage suppressor diode designed to protect very high-speed data lines and 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 ultra-low capacitance TVS diodes directs the transient to ground. The AOZ8822 may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 (± 15 kV air, ± 15 kV contact discharge).

The AOZ8822 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

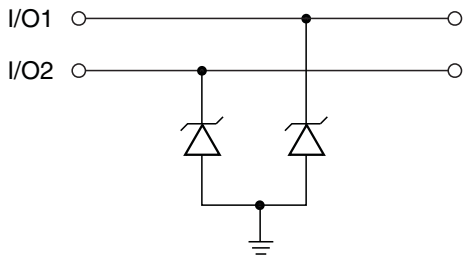
- ESD protection for high-speed data lines:
  - Exceeds: IEC 61000-4-2 (ESD) ± 15 kV (air), ± 15 kV (contact)
  - Human Body Model (HBM) ± 15 kV
- Ultra-low capacitance: 0.55 pF
- Low clamping voltage
- Low operating voltage: 5 V
- Green product

Applications

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

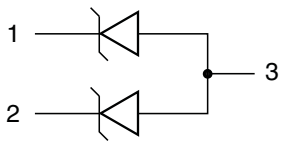
Green Product

Typical Application



Unidirection Protection of Two Line

Pin Configuration



Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8822DI-05	-40 °C to +85 °C	DFN 1.0 x 0.6	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
VP – VN	5 V
Peak Pulse Current (I_{PP}), t_P = 8/20µs	2 A
Storage Temperature (T_S)	-65 °C to +150 °C
ESD Rating per IEC61000-4-2, Contact(1)	± 15 kV
ESD Rating per IEC61000-4-2, Air(1)	± 15 kV
ESD Rating per Human Body Model(2)	± 15 kV

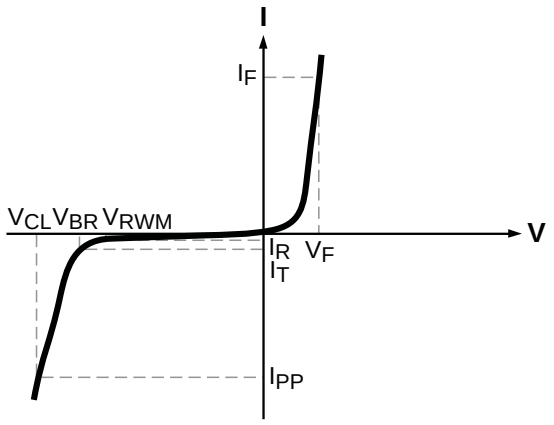
Notes:
1. IEC 61000-4-2 discharge with $C_{Discharge}$ = 150 pF, $R_{Discharge}$ = 330 Ω.
2. Human Body Discharge per MIL-STD-883, Method 3015 $C_{Discharge}$ = 100pF, $R_{Discharge}$ = 1.5 kΩ.

Maximum Operating Ratings

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

Electrical Characteristics

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

Symbol	Parameter	Diagram
I_{PP}	Maximum Reverse Peak Pulse Current	
V_{CL}	Clamping Voltage @ I_{PP}	
V_{RWM}	Working Peak Reverse Voltage	
I_R	Maximum Reverse Leakage Current	
V_{BR}	Breakdown Voltage	
I_T	Test Current	
I_F	Forward Current	
V_F	Forward Voltage	
P_{PK}	Peak Power Dissipation	
C_J	Capacitance @ V_R = 0 and f = 1MHz	

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_{RWM}	Reverse Working Voltage[3]	I/O pin to ground			5.0	V
V_{BR}	Reverse Breakdown Voltage[4]	I_T = 1 mA, I/O pin to ground	6.0		10.0	V
I_R	Reverse Leakage Current	V_{RWM} = 5 V, between I/O pin to ground			0.1	µA
V_{CL}	Channel Clamp Voltage	I_{PP} = 1 A, t_P = 100 ns, I/O pin to ground			13	V
		I_{PP} = 2 A, t_P = 100 ns, I/O pin to ground			14	V
		I_{PP} = 5 A, t_P = 100 ns, I/O pin to ground			17	V
		I_{PP} = 1 A, IEC61000-4-5, 8/20 µs, I/O pin to ground			14.5	V
		I_{PP} = 2 A, IEC61000-4-5, 8/20 µs, I/O pin to ground			19	V
C_J	Junction Capacitance	V_R = 0 V, f = 1 MHz, I/O pin to ground		0.55	0.75	pF

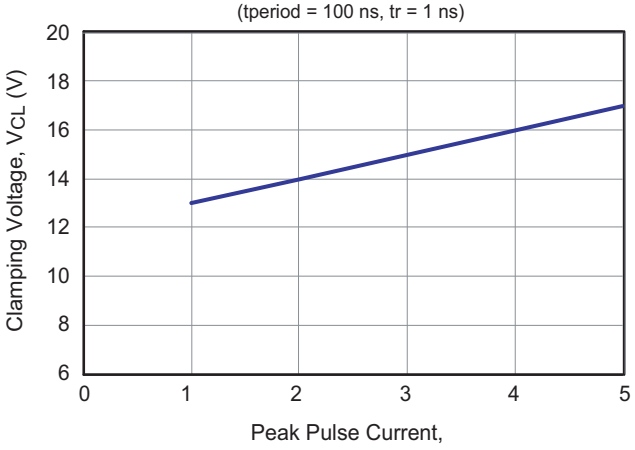
Notes:

3. The working peak reverse voltage (V_{RWM}) should be equal to or greater than the DC or continuous peak operating voltage level.

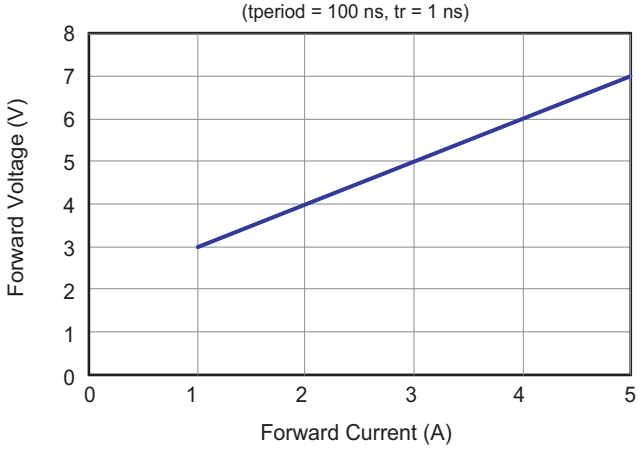
4. V_{BR} is measured at the pulse test current I_T.

Typical Performance Characteristics

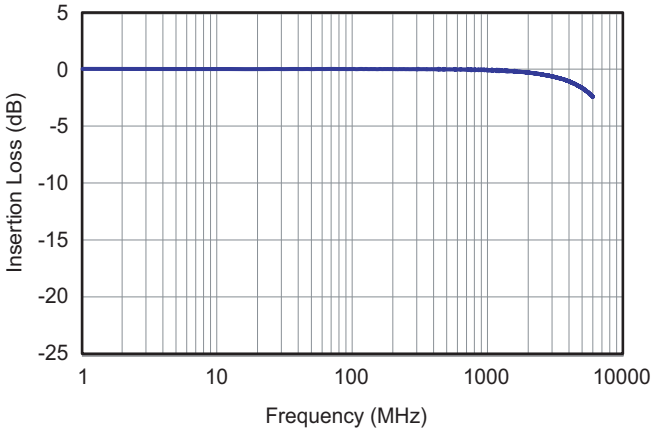
Clamping Voltage vs. Peak Pulse Current
(tperiod = 100 ns, tr = 1 ns)



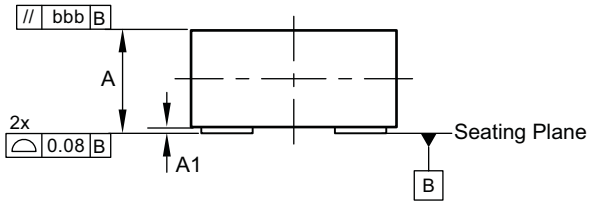
Forward Voltage vs. Forward Current
(tperiod = 100 ns, tr = 1 ns)



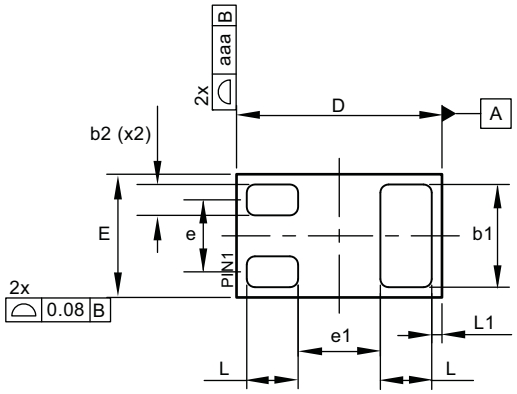
I/O – Gnd Insertion Loss (S21) vs. Frequency



Package Dimensions, DFN 1.0 x 0.6

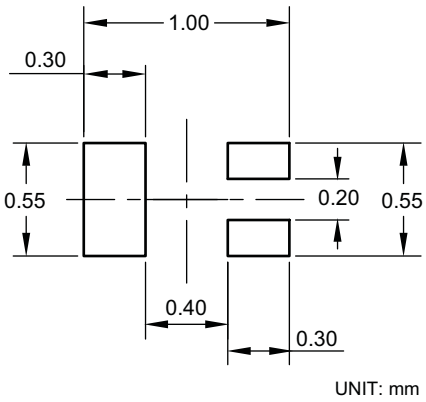


SIDE VIEW



BOTTOM VIEW

RECOMMENDED LAND PATTERN



UNIT: mm

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

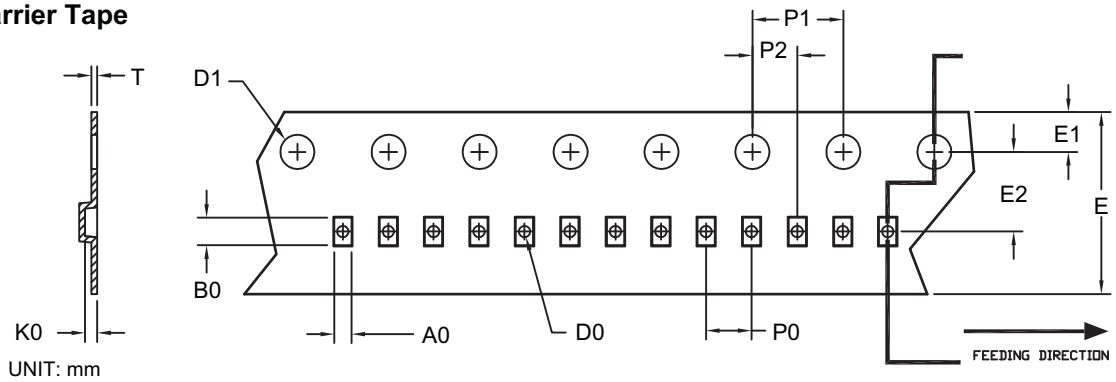
Symbols	Min.	Nom.	Max.
A	0.019	0.020	0.022
A1	0.000	0.001	0.002
b	0.018	0.020	0.022
b2	0.004	0.006	0.008
D	0.037	0.039	0.042
E	0.022	0.024	0.027
e	---	0.014	---
e1	---	0.016	---
L	0.008	0.010	0.012
L1	---	0.002	---
aaa		0.006	
bbb		0.002	

Notes:

1. All dimensions are in milliteters. 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

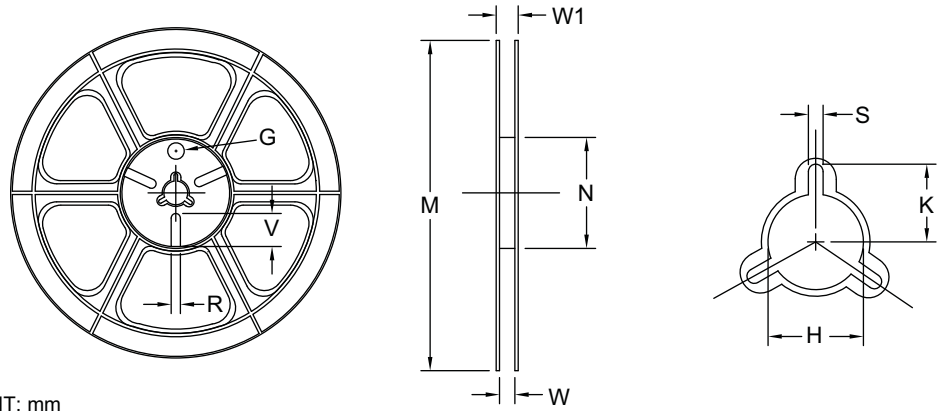
Carrier Tape



UNIT: mm

Option	Package	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
A	DFN 1.0x0.6/ DFN 1.0x0.6A (8 mm)	0.69 ±0.05	1.19 ±0.05	0.66 ±0.05	0.40 ±0.05	1.50 ±0.10	8.00 +0.3/-0.1	1.75 ±0.10	3.50 ±0.05	2.00 ±0.05	4.00 ±0.10	2.00 ±0.05	0.23 ±0.02
B	DFN 1.0x0.6/ DFN 1.0x0.6A (8 mm)	0.65 ±0.04	1.05 ±0.04	0.61 ±0.04	0.40 ±0.05	1.50 ±0.10	8.00 +0.3/-0.1	1.75 ±0.10	3.50 ±0.05	2.00 ±0.10	4.00 ±0.10	2.00 ±0.05	0.20 ±0.05

Reel

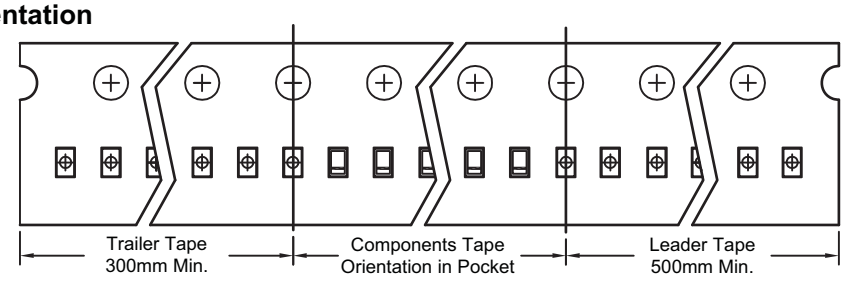


UNIT: mm

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	Max. 14.4	ø13.0 ±0.5	Max. 10.1	2.0 ±0.5	N/A	N/A	N/A

Leader / Trailer & Orientation

TVS
Unit Per Reel:
10000pcs



Part Marking