

General Description

The AOZ8211 is a one-line transient voltage suppressor diode designed to protect voltage sensitive electronics from high transient conditions and ESD.

This device incorporates one TVS diode in an ultra-small DFN 1.0 mm x 0.6 mm package. During transient conditions, the one-line TVS diode directs the transient to ground. It may be used to meet the ESD immunity requirements of IEC 61000-4-2, Level 4 (± 15 kV air, ± 8 kV contact discharge).

The AOZ8211 comes in an RoHS compliant 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 the AOZ8211 ideal for applications where PCB space is at a premium. The small size and high ESD protection makes the AOZ8211 ideal for protecting voltage sensitive electronics from high transient conditions and ESD.

Features

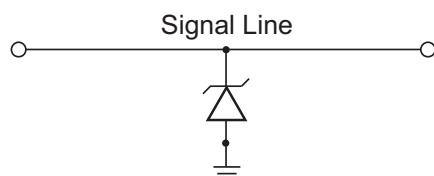
- ESD protection for high-speed data lines:
 - AOZ8211DI-02
 - Exceeds: IEC 61000-4-2 (ESD) ± 30 kV (air), ± 30 kV (contact)
 - Human Body Model (HBM) ± 30 kV
 - AOZ8211DI-03
 - Exceeds: IEC 61000-4-2 (ESD) ± 30 kV (air), ± 30 kV (contact)
 - Human Body Model (HBM) ± 30 kV
 - AOZ8211DI-05
 - Exceeds: IEC 61000-4-2 (ESD) ± 28 kV (air), ± 28 kV (contact)
 - Human Body Model (HBM) ± 30 kV
 - AOZ8211DI-12
 - Exceeds: IEC 61000-4-2 (ESD) ± 28 kV (air), ± 28 kV (contact)
 - Human Body Model (HBM) ± 30 kV
 - AOZ8211DI-24
 - Exceeds: IEC 61000-4-2 (ESD) ± 15 kV (air), ± 18 kV (contact)
 - Human Body Model (HBM) ± 30 kV
- Small package saves board space
- Low insertion loss
- Low clamping voltage
- Low operating voltage: 2.5 V, 3.3 V, 5 V, 12 V and 24 V

Applications

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

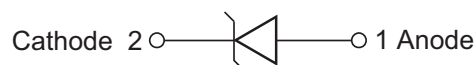


Typical Application



Unidirection Protection of Single Line

Pin Configuration



Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8211DI-02	-40 °C to +85 °C	DFN 1.0 x 0.6	Green Product RoHS Compliant
AOZ8211DI-03			
AOZ8211DI-05			
AOZ8211DI-12			
AOZ8211DI-24			



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	AOZ8211DI-02	AOZ8211DI-03	AOZ8211DI-05	AOZ8211DI-12	AOZ8211DI-24
Peak Pulse Current, $t_p = 8/20 \mu s$	6 A	6 A	5.5 A	5 A	2.5 A
Peak Pulse Power, $t_p = 8/20 \mu s$	50 W	55 W	50 W	100 W	110 W
Storage Temperature (T_S)	-65 °C to +150 °C	-65 °C to +150 °C	-65 °C to +150 °C	-65 °C to +150 °C	-65 °C to +150 °C
ESD Rating per IEC61000-4-2, Contact ⁽¹⁾	±30 kV	±30 kV	±28 kV	±28 kV	±18 kV
ESD Rating per IEC61000-4-2, Air ⁽¹⁾	±30 kV	±30 kV	±28 kV	±28 kV	±15 kV
ESD Rating per Human Body Model ⁽²⁾	±30 kV	±30 kV	±30 kV	±30 kV	±30 kV

Notes:

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

Maximum Operating Ratings

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

Electrical Characteristics

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

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	
I_F	Forward Current	
V_F	Forward Voltage	
P_{PK}	Peak Power Dissipation	
C_J	Capacitance @ $V_R = 0$ and $f = 1\text{ MHz}$	

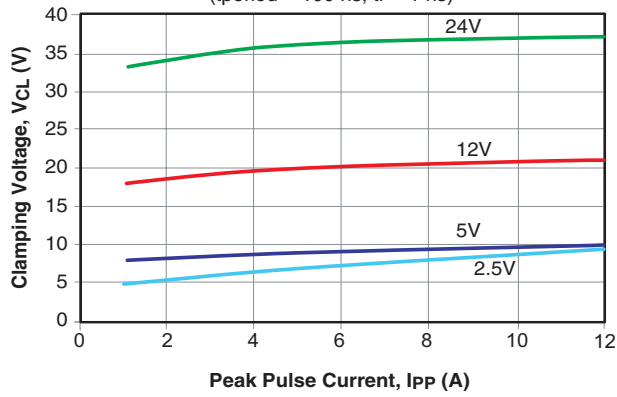
Electrical Characteristics

$T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted, $V_F = 0.9\text{ V Max.}$ @ $I_F = 10\text{ mA}$ for all types.

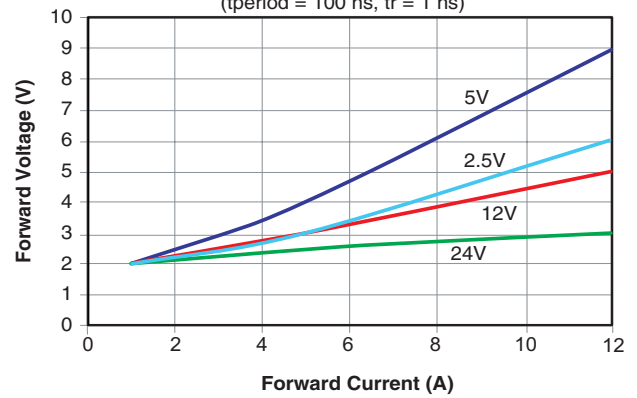
Device	Device Marking	V_{RWM} (V) Max.	I_R (μA) Max.	V_{BR} (V) Min.	I_T	V_F (V) Typ.	V_{CL} Max.			C_J (pF) Typ.
							$I_{PP} = 1\text{ A}$	$I_{PP} = 5\text{ A}$	$I_{PP} = 12\text{ A}$	
AOZ8211DI-02	Q	2.5	0.1	2.8	1 mA	0.75	5.00	7.00	9.50	11
AOZ8211DI-03	G	3.3	0.1	3.7	2 μA	0.75	5.50	7.50	9.50	11
AOZ8211DI-05	J	5.0	0.1	6.0	1 mA	0.75	8.00	9.00	10.00	16
AOZ8211DI-12	K	12.0	0.1	14.0	1 mA	0.75	18.00	20.00	21.00	30
AOZ8211DI-24	M	24.0	0.1	27.0	1 mA	0.75	33.00	36.00	37.00	20

Typical Performance Characteristics

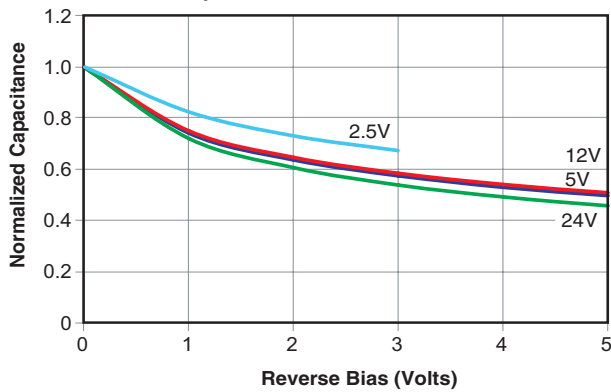
Clamping Voltage vs. Peak Pulse Current
(tperiod = 100 ns, tr = 1 ns)



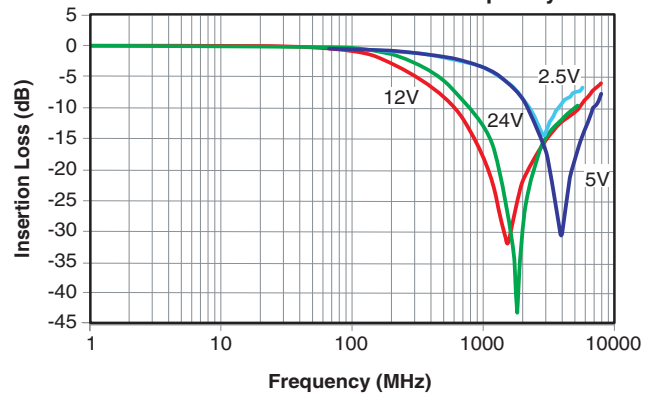
Forward Voltage vs. Forward Current
(tperiod = 100 ns, tr = 1 ns)



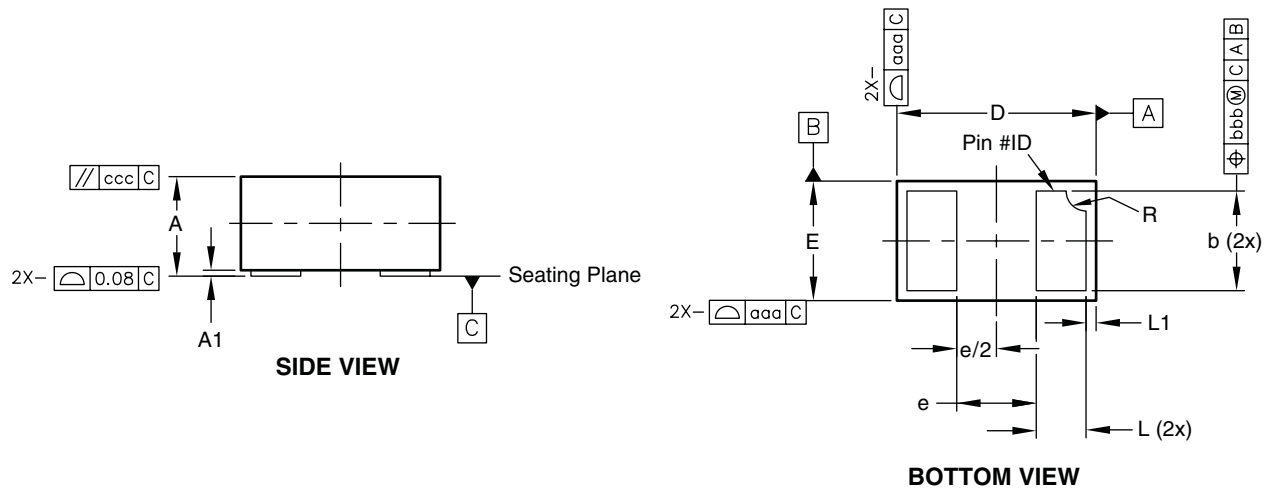
Capacitance vs. Reverse Bias



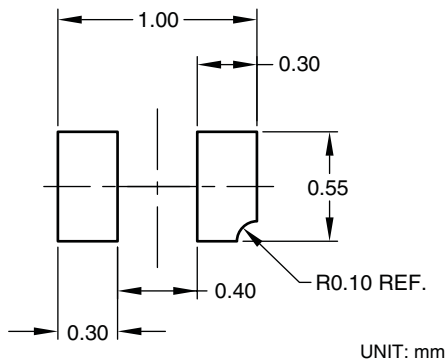
I/O – Gnd Insertion Loss vs. Frequency



Package Dimensions, DFN 1.0 x 0.6, 2L



RECOMMENDED LAND PATTERN



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	0.47	0.52	0.55
A1	0.00	0.03	0.05
b	0.45	0.50	0.55
D	0.95	1.00	1.075
E	0.55	0.60	0.675
e	—	0.40	—
L	0.20	0.25	0.30
L1	0.050.03 REF.		
R	0.05	0.10	0.15
aaa	0.15		
bbb	0.05		
ccc	0.05		

Dimensions in inches

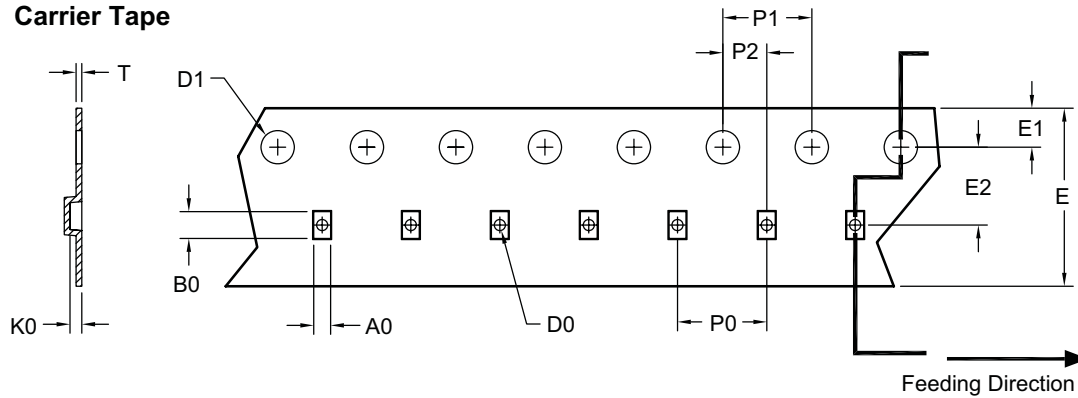
Symbols	Min.	Nom.	Max.
A	0.019	0.020	0.022
A1	0.000	0.001	0.002
b	0.018	0.020	0.022
D	0.037	0.039	0.042
E	0.022	0.024	0.027
e	—	0.016	—
L	0.008	0.010	0.012
L1	0.0020.001 REF.		
R	0.002	0.004	0.006
aaa	0.006		
bbb	0.002		
ccc	0.002		

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, 2L

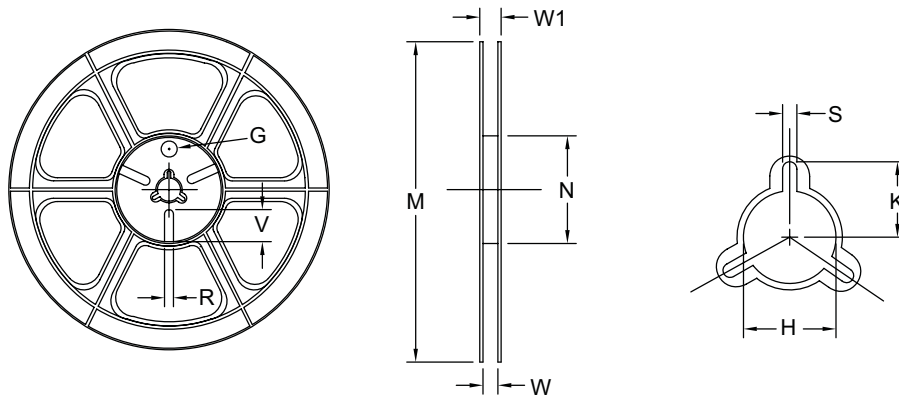
Carrier Tape



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	4.00 ±0.10	2.00 ±0.05	0.254 ±0.02

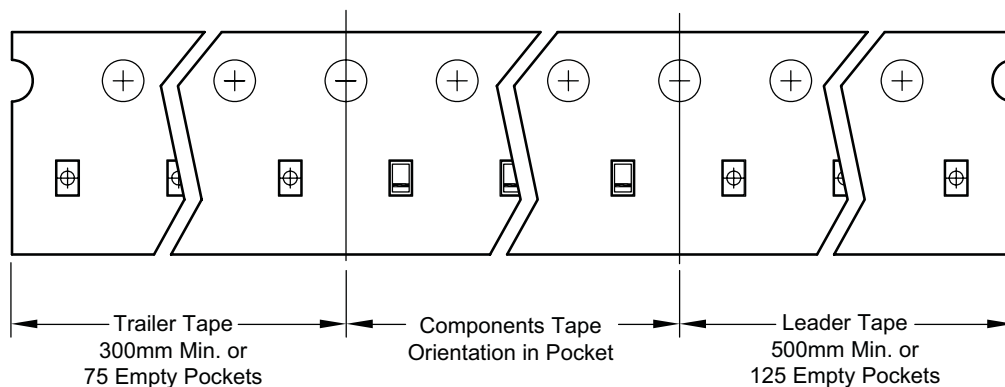
Reel



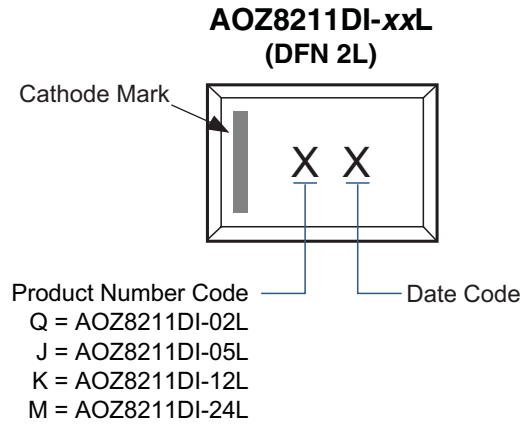
UNIT: mm

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	10.0 ±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.

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| <p>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.</p> | <p>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.</p> |
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