AOZ8175

6-Line EMI Filter with Integrated ESD Protection

General Description

The AOZ8175 is a 6-line device integrating EMI filtering with ESD protection for each line. It is designed to suppress unwanted EMI/RFI signals and provide electro-static discharge (ESD) protection in portable electronic equipment. This state-of-the-art device utilizes AOS leading edge Trench Vertical Structure [TVS]^2 ™ technology for superior clamping performance and filter attenuation over the full operating display range. The AOZ8175 has been optimized for protection of color LCD displays and CCD camera lines in cellular phones and other portable consumer electronic devices.

The AOZ8175 consists of six identical circuits comprised of TVS diodes for ESD protection, and a resistor–capacitor network for EMI/RFI filtering. A series resistor value of 100Ω and a capacitance value of 8pF are used to achieve -20dB minimum attenuation from 700MHz to 3.0GHz. The TVS diodes provide effective suppression of ESD voltages in excess of ±15kV (contact discharge) and ±15kV (air discharge). This exceeds IEC 61000-4-2, level 4 ESD immunity test.

The AOZ8175 comes in an RoHS compliant, 3.0mm x 1.35mm DFN package and is rated over a -40°C to +85°C ambient temperature range.

Features

- 6 lines for EMI filtering and ESD protection:
  - Exceeds IEC 61000-4-2, level 4 (ESD) immunity test
  - ±15kV (contact discharge) and ±15kV (air discharge)
- Trench Vertical Structure [TVS]^2 ™ based technology used to achieve excellent ESD clamping and filter performance over the full operating display range
- Filter performance: -20db attenuation from 700MHz to 3.0GHz
- Low operating voltage: 5.0V
- Capacitance stability over wide range of voltages and temperatures
- DFN package 3.0mm x 1.35mm
- Pb-Free device

Applications

- EMI filtering and ESD protection for data lines
- LCD displays, camera interface, I/O interface
- Portable handheld devices, cell phones, PDA phones

Green Product

Electrical Schematic

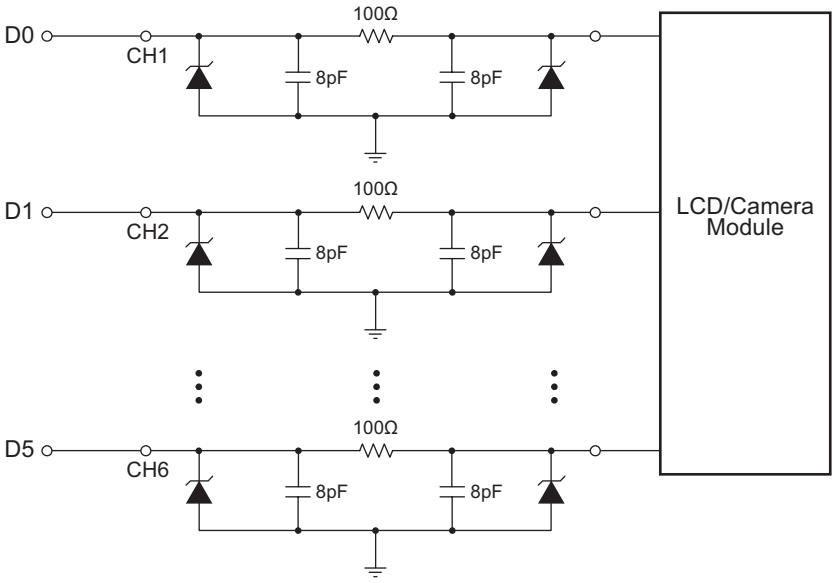


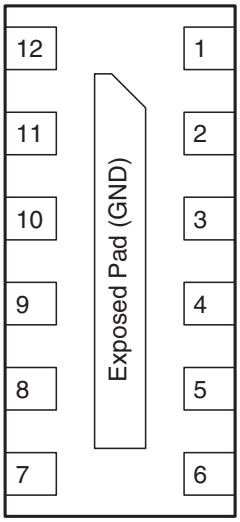
Figure 1.

Ordering Information

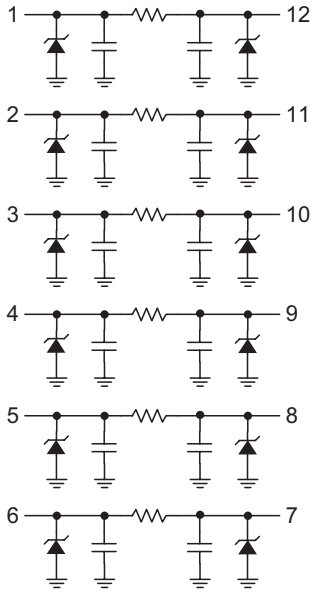
Part Number	Ambient Temperature Range	Package	Environmental
AOZ8175DI	-40°C to +85°C	DFN-12	Green Product

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.

Pin Configuration



DFN-12
(Bottom View)



Top View

Pin Description

Pin Number	Pin Name	Pin Function
1,12	CH 1	Channel 1 Connections
2, 11	CH 2	Channel 2 Connections
3, 10	CH 3	Channel 3 Connections
4, 9	CH 4	Channel 4 Connections
5, 8	CH 5	Channel 5 Connections
6, 7	CH 6	Channel 6 Connections
Exposed Pad	GND	Common Ground Connection

Absolute Maximum Ratings

Exceeding the Absolute Maximum ratings may damage the device.

Parameter	Rating
Storage Temperature (T_S)	-65°C to +150°C
ESD Rating per IEC61000-4-2, contact(1)	±15kV
ESD Rating per IEC61000-4-2, air(1)	±15kV
ESD Rating per Human Body Model(2)	±30kV

Notes:

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

Electrical Characteristics

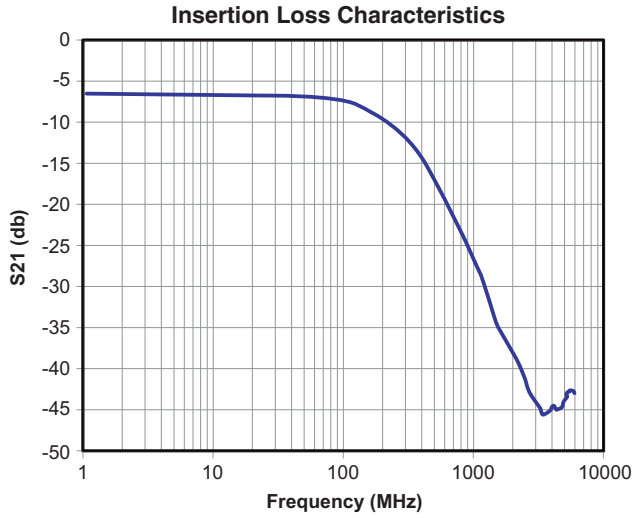
T_A = 25°C unless otherwise specified.

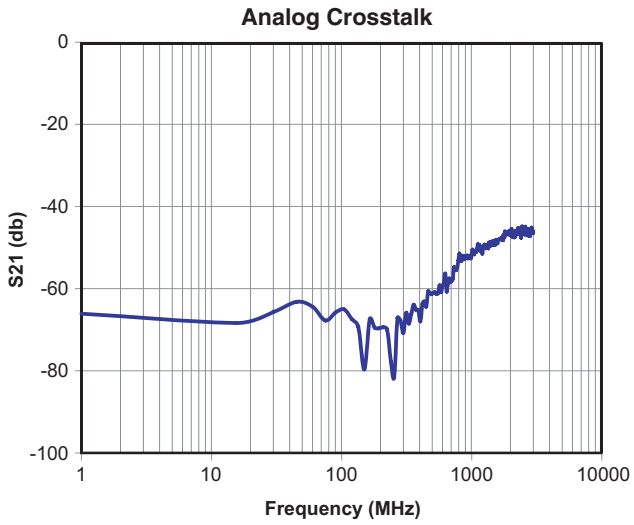
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V_{RWM}	Reverse Working Voltage	(3)			5.0	V
V_{BR}	Reverse Breakdown Voltage	I_T = 1mA(4)	6	7	8	V
I_R	Reverse Leakage Current	V_{RWM} = 3.3V			0.1	µA
V_{CL}	Signal Clamp Voltage	I_{LOAD} = 1A, positive clamp(5)(8) I_{LOAD} = 1A, negative clamp(5)(8)			9.0 -2.5	V
		I_{LOAD} = 5A, positive clamp(5)(8) I_{LOAD} = 5A, negative clamp(5)(8)			11.5 -3.5	
		I_{LOAD} = 12A, positive clamp(5)(8) I_{LOAD} = 12A, negative clamp(5)(8)			14.0 -5.0	
R_{CH}	Total Series Resistance	I_R = 20mA	90	100	110	Ω
C_{CH}	Channel Capacitance	Input to Ground(6)(7)(8)	7	8	9	pF
f_C	Cut-off Frequency	Measured with 50Ω source and 50Ω load termination		220		MHz
	Attenuation from 700MHz to 3.0GHz	V_R = 0V Measured with 50Ω source and 50Ω load termination		-20		dB

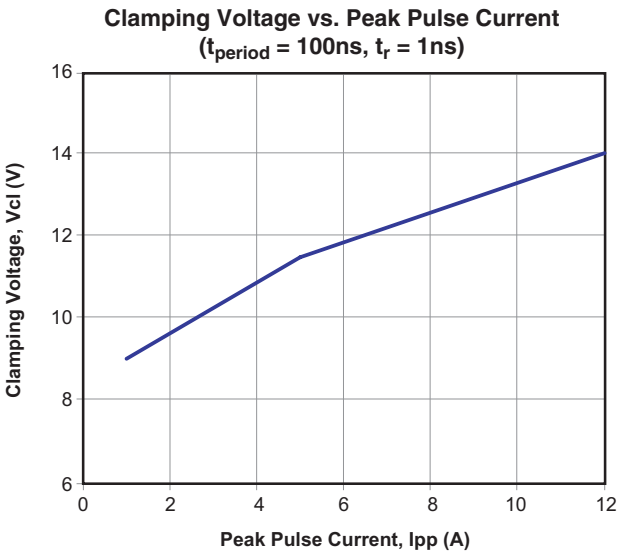
Notes:

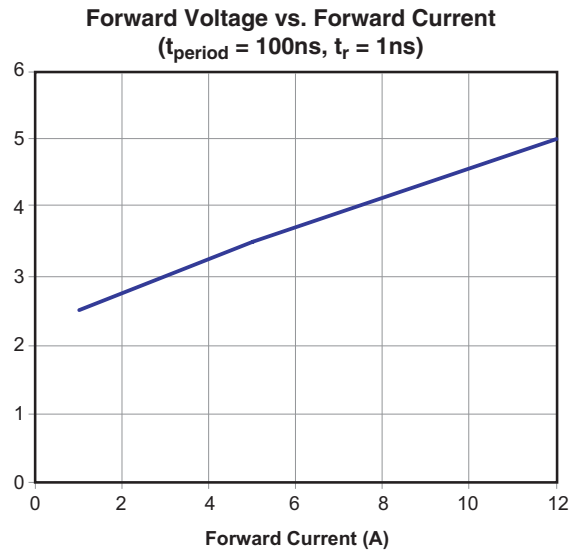
3. The working peak reverse voltage, V_{RWM}, should be equal to or greater than the DC or continuous peak operating voltage level.
4. V_{BR} is measured at the pulse test current I_T.
5. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.
6. Total capacitance is equal to 2 x C_{CH}.
7. Measured at 25°C, V_R = 2.5V, f = 1.0MHz.
8. Guaranteed by design.

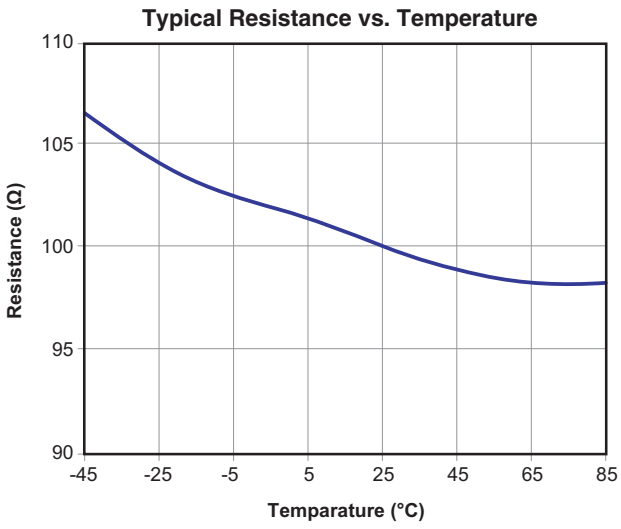
Typical Performance Characteristics



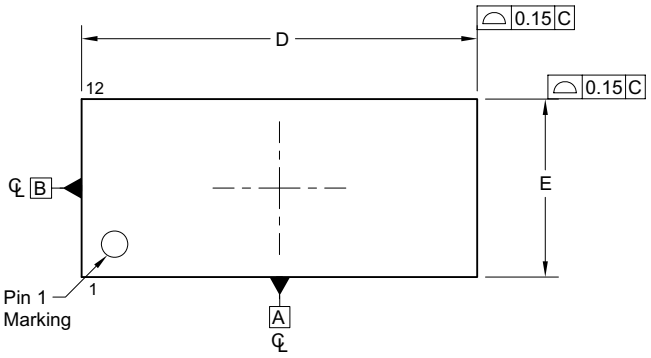




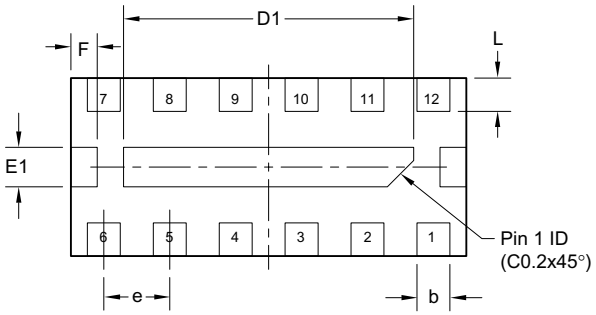




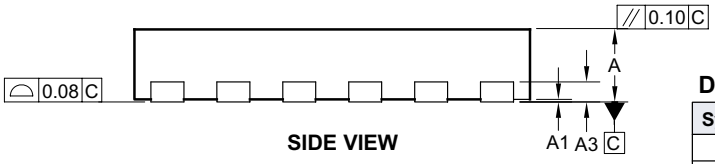
Package Dimensions, DFN 3 x 1.35A



TOP VIEW



BOTTOM VIEW



SIDE VIEW

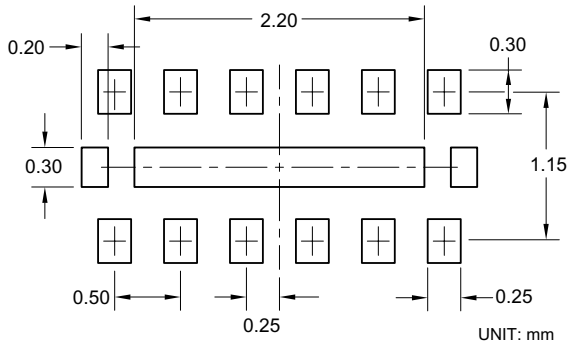
Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	0.50	0.55	0.60
A1	0.00	—	0.05
A3		0.152 REF	
b	0.20	0.25	0.30
D	2.95	3.00	3.05
D1	2.15	2.20	2.25
E	1.30	1.35	1.40
E1	0.25	0.30	0.35
e		0.50 BSC	
L	0.20	0.25	0.35
F		0.20 REF	

Dimensions in inches

Symbols	Min.	Nom.	Max.
A	0.020	0.022	0.024
A1	0.000	—	0.002
A3		0.006 REF	
b	0.008	0.010	0.012
D	0.116	0.118	0.120
D1	0.085	0.087	0.089
E	0.051	0.053	0.055
E1	0.010	0.012	0.014
e		0.020 BSC	
L	0.008	0.010	0.012
F		0.008 REF	

RECOMMENDED LAND PATTERN

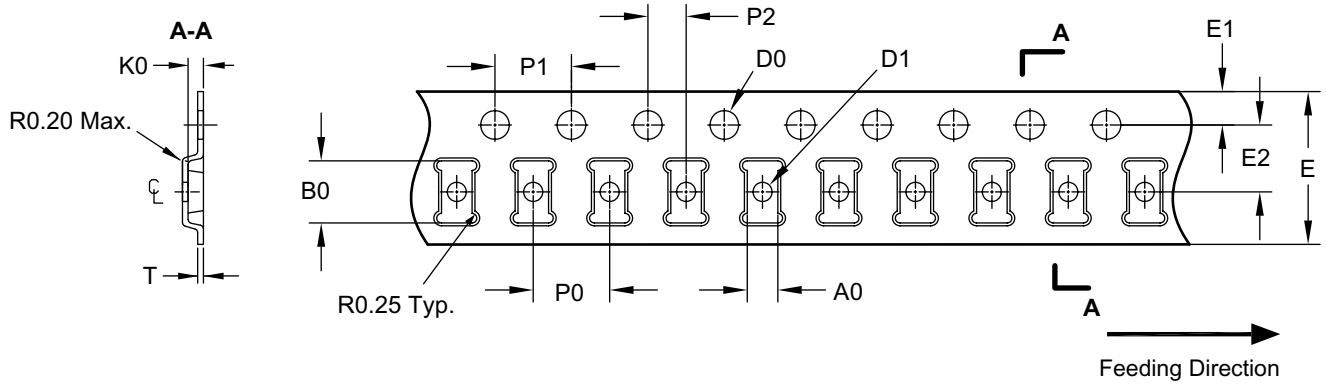


Notes:

1. All dimensions are in millimeters. Angles is degree.
2. Coplanarity applies to the exposed pad as well as the terminals. Coplanarity shall not exceed 0.08mm.
3. Warpage shall not exceed 0.10mm.
4. Package length/package width are not considered as special characteristic.
5. Refer JEDEC MO-229.
6. Marking is for package orientation reference only.

Tape and Reel Dimensions, DFN 3 x 1.35A

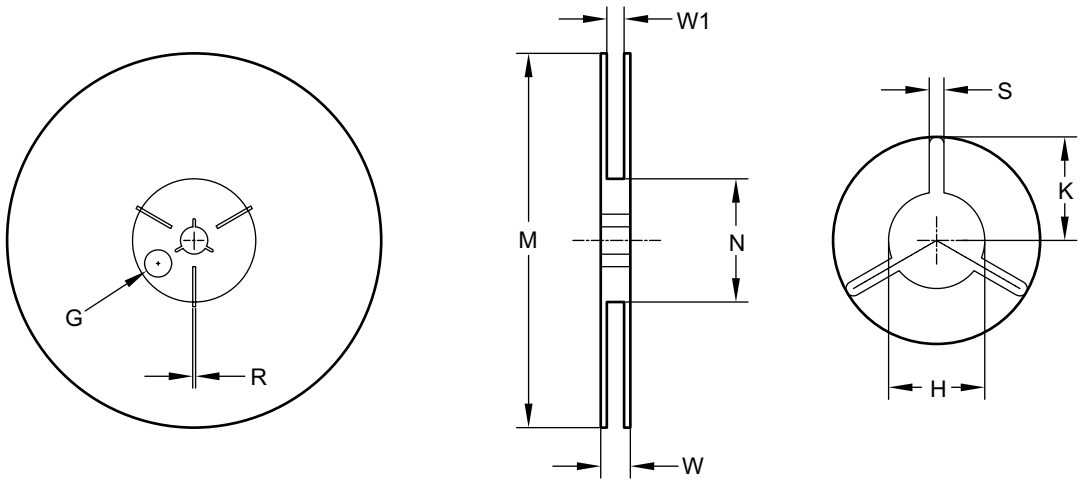
Carrier Tape



Unit: mm

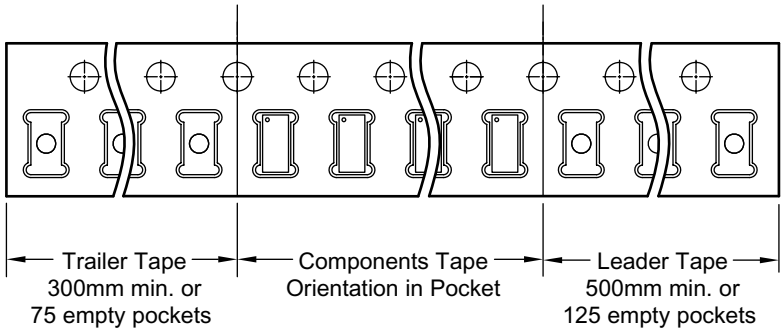
Package	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
DFN 3x1.35	1.60 ±0.10	3.25 ±0.10	0.80 ±0.10	ø1.5 +0.1/-0.0	ø1.00 Min.	8.0 +0.3/-0.1	1.75 ±0.10	3.50 ±0.05	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	0.30 ±0.05

Reel



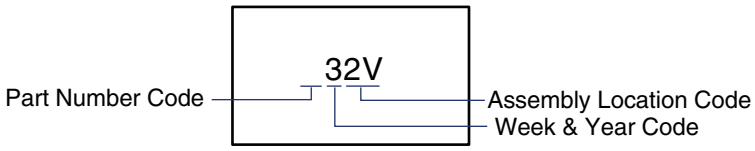
Tape Size	Reel Size	M	N	W	W1	H	S	K	G	R
8mm	ø178	ø178.0 ±1.0	ø60.0 ±1.0	11.80 +0.5	9.0 ±0.5	ø13.0 +0.5/-0.2	2.40 ±0.10	10.25 ±0.2	ø9.8	—

Leader / Trailer & Orientation



Part Marking

AOZ8175DI
(DFN-12)



This data sheet contains preliminary data; supplementary data may be published at a later date.
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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.