

General Description

The AOZ8510 is an 8-line device integrating EMI filtering with ESD protection for each line. It is designed to suppress unwanted EMI/RFI signals and provide electrostatic 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 AOZ8510 has been optimized for protection of color LCD displays and CCD camera lines in cellular phones and other portable consumer electronic devices.

The AOZ8510 consists of eight identical circuits comprised of TVS diodes for ESD protection, and an inductor-capacitor network for EMI/RFI filtering providing a cutoff frequency at 155MHz for high speed data lines. An inductor value of 56nH and a capacitance value of 17pF are used to achieve -40dB minimum attenuation from 800MHz to 3.0GHz. The TVS diodes provide effective suppression of ESD voltages in excess of $\pm 24\text{kV}$ (air discharge) and $\pm 18\text{kV}$ (contact discharge). This exceeds IEC 61000-4-2, level 4 ESD immunity test.

The AOZ8510 comes in an RoHS compliant, 1.6mm x 4.0mm TDFN package and is rated over a -40°C to +85°C ambient temperature range.

Features

- 8 lines for EMI filtering and ESD protection:
 - Exceeds IEC 61000-4-2, level 4 (ESD) immunity test
 - $\pm 24\text{kV}$ (air discharge) and $\pm 18\text{kV}$ (contact discharge)
- Trench Vertical Structure [TVS]²™ based technology used to achieve excellent ESD clamping & filter performance over the full operating display range
- Filter performance: -40db attenuation from 800MHz to 3.0GHz
- Low operating voltage: 5.0V
- Capacitance stability over wide range of voltages and temperatures
- TDFN package: 1.6 x 4.0mm
- 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



Typical Application

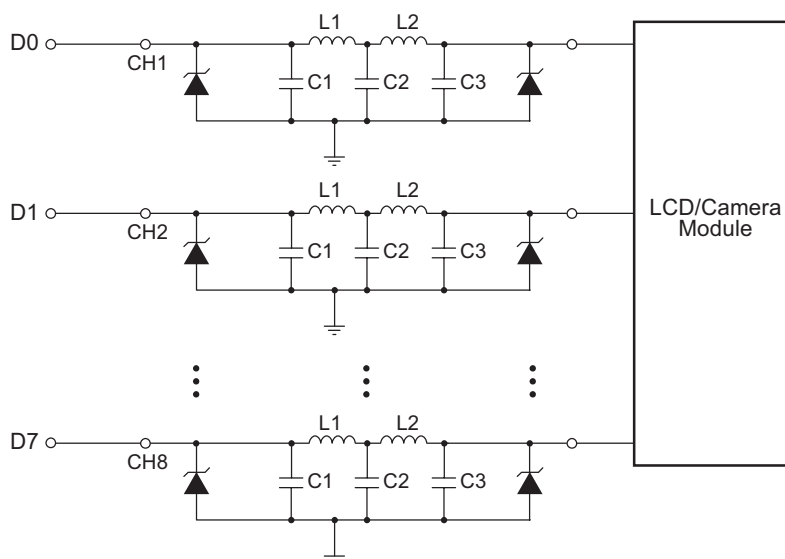


Figure 1.

Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8510DTL	-40°C to +85°C	TDFN-16	RoHS Compliant Green Product

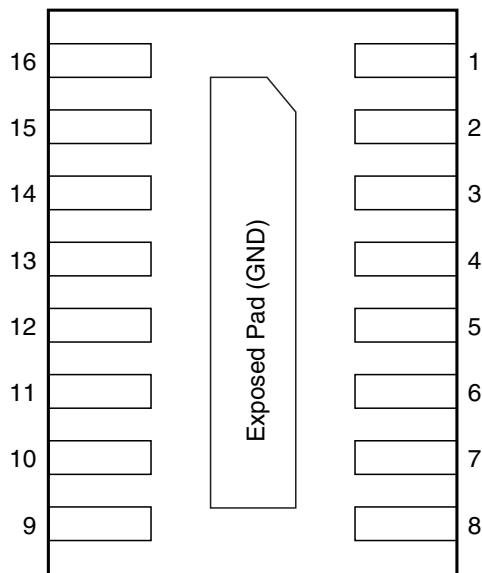


All AOS products are offered in packages with Pb-free plating and compliant to RoHS standards.

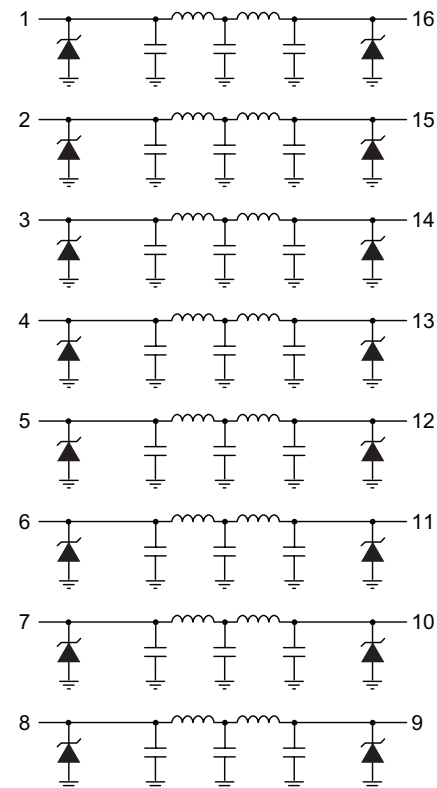
Parts marked as Green Products (with "L" suffix) use reduced levels of Halogens, and are also RoHS compliant.

Please visit www.aosmd.com/web/quality/rohs_compliant.jsp for additional information.

Pin Configuration



TDFN-16
(Bottom View)



Top View

Pin Description

Pin Number	Pin Name	Pin Function
1,16	CH 1	Channel 1 Connections
2, 15	CH 2	Channel 2 Connections
3, 14	CH 3	Channel 3 Connections
4, 13	CH 4	Channel 4 Connections
5, 12	CH 5	Channel 5 Connections
6, 11	CH 6	Channel 6 Connections
7, 10	CH 7	Channel 7 Connections
8, 9	CH 8	Channel 8 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⁾	±18kV
ESD Rating per IEC61000-4-2, air ⁽¹⁾	±24kV
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

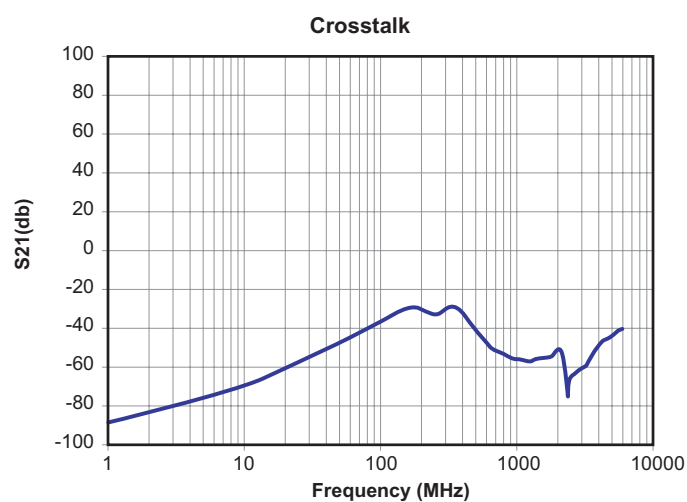
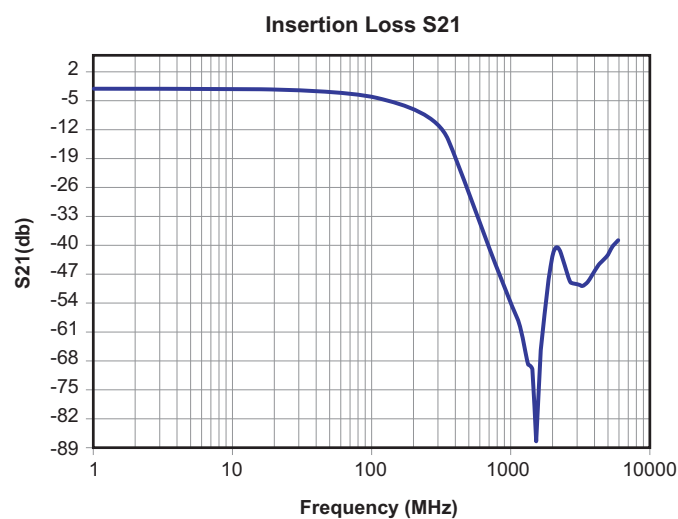
T_A = 25°C unless otherwise specified.

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⁾⁽⁶⁾		9.0		V
		I _{LOAD} = 1A, negative clamp ⁽⁵⁾⁽⁶⁾		-2.0		V
		I _{LOAD} = 5A, positive clamp ⁽⁵⁾⁽⁶⁾		10.0		V
		I _{LOAD} = 5A, negative clamp ⁽⁵⁾⁽⁶⁾		-2.5		V
L _{CH}	Inductance	I _{LOAD} = 12A, positive clamp ⁽⁵⁾⁽⁶⁾		12.0		V
		I _{LOAD} = 12A, negative clamp ⁽⁵⁾⁽⁶⁾		-3.0		V
	DC Resistance		26	28	30	Ω
C _{CH}	Capacitance	C1, C2, C3 ⁽⁷⁾	15	17	19	pF
	Total Capacitance	C1 + C2 + C3 ⁽⁷⁾		50		pF
f _C	Cut-off Frequency	Measured with 50Ω source and 50Ω load termination		155		MHz
	Attenuation from 800MHz to 3.0GHz	V _R = 0V Measured with 50Ω source and 50Ω load termination		-40		dB

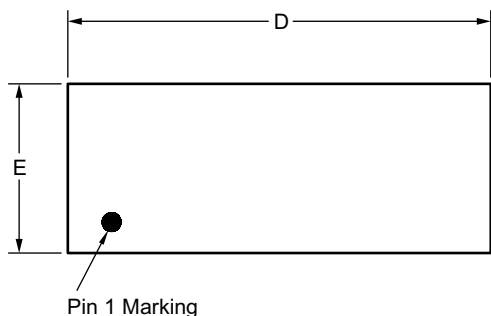
Notes:

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. Guaranteed by design.
7. V_R = 5.0V, f = 1MHz

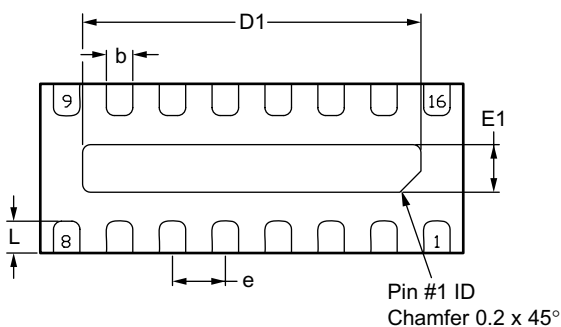
Typical Performance Characteristics



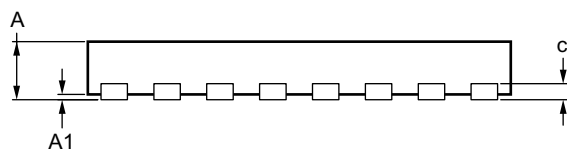
Package Dimensions, TDFN 1.6 x 4.0, 16L



TOP VIEW

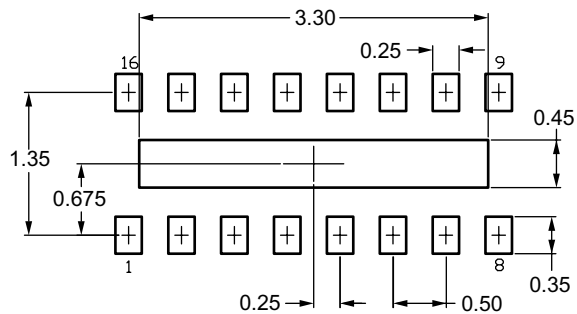


BOTTOM VIEW



SIDE VIEW

RECOMMENDED LAND PATTERN



UNIT: mm

Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	0.50	0.55	0.60
A1	0.00	—	0.05
b	0.20	0.25	0.30
c	0.152 REF.		
D	3.95	4.00	4.05
E	1.55	1.60	1.65
D1	3.15	3.20	3.25
E1	0.40	0.45	0.50
e	0.50 BSC		
L	0.25	0.30	0.35

Dimensions in inches

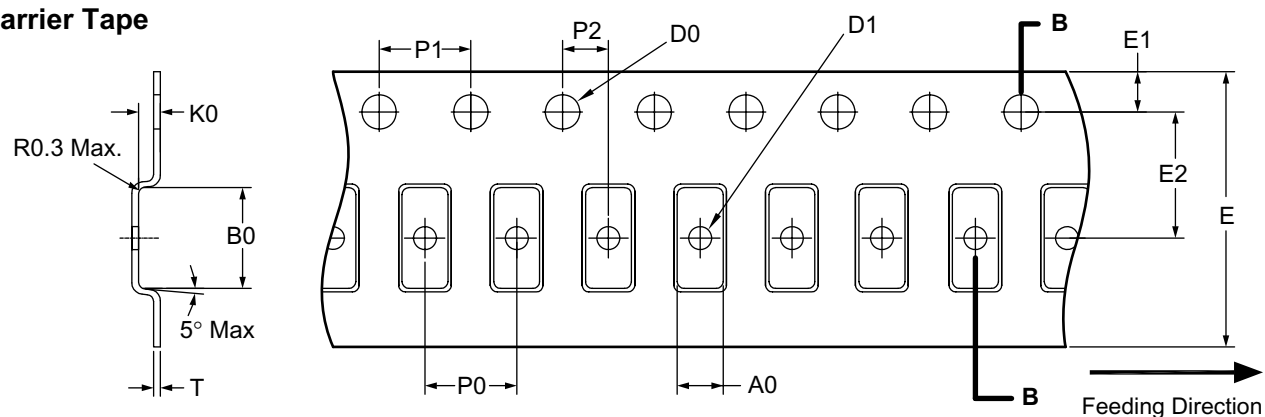
Symbols	Min.	Nom.	Max.
A	0.020	0.022	0.024
A1	0.000	—	0.002
b	0.008	0.010	0.012
c	0.006 REF.		
D	0.156	0.157	0.159
E	0.061	0.063	0.065
D1	0.124	0.126	0.128
E1	0.016	0.018	0.020
e	0.020 BSC		
L	0.010	0.012	0.014

Note:

1. Controlling dimension is millimeter. Converted inch dimensions are not necessarily exact.

Tape and Reel Dimensions, TDFN 1.6 x 4.0

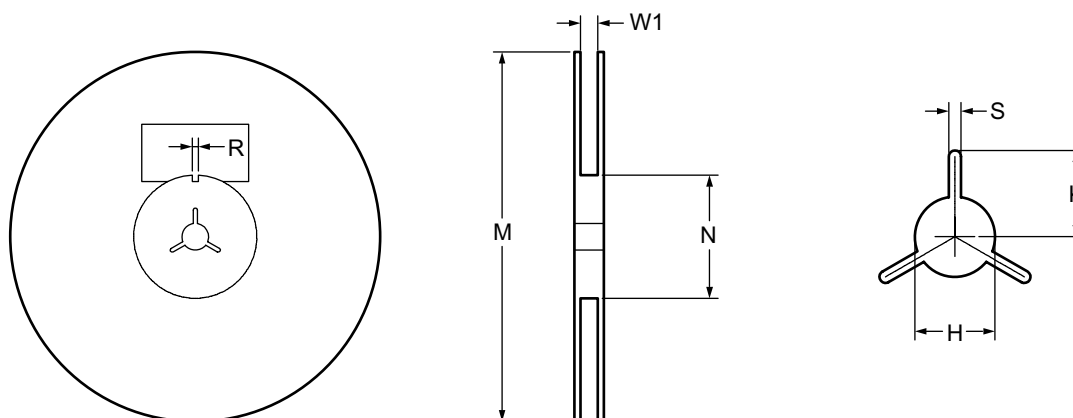
Carrier Tape



Unit: mm

Package	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
DFN 4x1.6	2.00 ±0.1	4.40 ±0.1	0.95 ±0.1	ø1.50 +0.1/-0	ø1.00 +0.1/-0	12.00 ±0.3	1.75 ±0.10	5.50 ±0.1	4.00 ±0.10	4.00 ±0.10	2.00 ±0.10	0.30 ±0.05

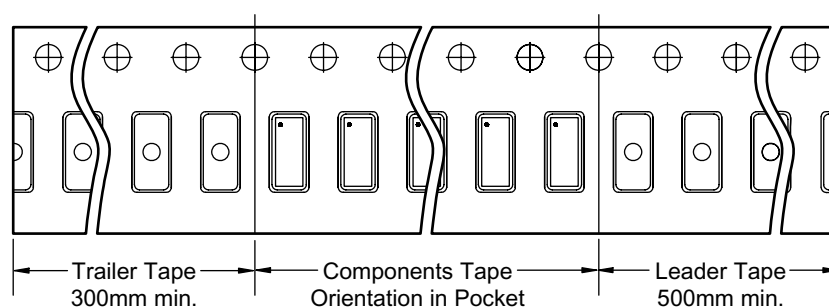
Reel



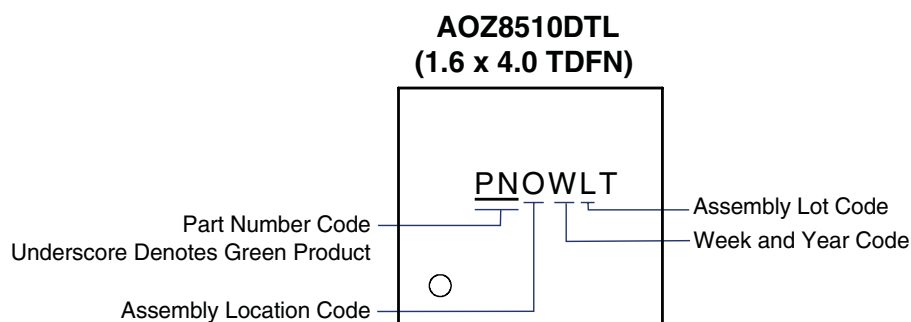
Unit: mm

Tape Size	Reel Size	M	N	W1	H	S	K	R
12mm	ø330	ø330.00 ±0.30/-4.00	55.00 ±0.40	12.4 +2.0/-0	13.00 ±0.20	2.20 ±0.20	10.60 ±0.20	—

Leader / Trailer & Orientation



Package 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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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.