

### General Description

The AOZ8849DI is a transient voltage suppressor array designed to protect high speed data lines such as HDMI 1.4/2.0, USB 3.0, V-by-one and Thunderbolt from damaging ESD events.

This device incorporates a numbers of surge rated, low capacitance steering diodes and a TVS in a single package. During transient conditions, the steering diodes direct the transient to either the positive side of the power supply line or to ground.

The AOZ8849DI provides a typical line-to-line capacitance of 0.06 pF and low insertion loss providing greater signal integrity making it ideally suited for HDMI 1.4/2.0 or USB 3.0/3.1 applications, such as Digital TVs, DVD players, computing, set-top boxes and MDDI applications in mobile computing devices.

The AOZ8849DI comes in a RoHS compliant and Halogen Free 5.5 mm x 1.5 mm x 0.5 mm DFN-18L package and is rated for -40°C to +125°C junction temperature range.

### Features

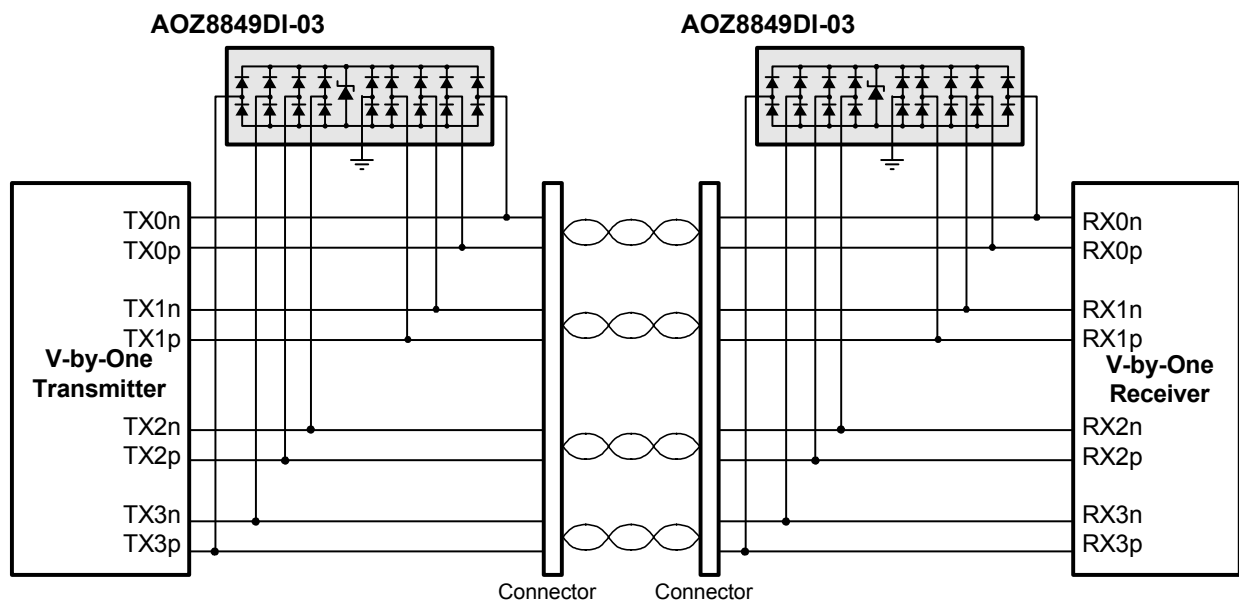
- IEC 61000-4-2 (ESD Immunity):
  - Air discharge: ±15 kV
  - Contact discharge: ±12 kV
- IEC 61000-4-5 (Lightning, 8/20 μs) 3 A
- Human Body Model (HBM) ±8 kV
- Protects eight data lines
- Low capacitance between I/O lines: 0.06 pF
- Low clamping voltage
- Low operating voltage: 3.3, 5.5 V

### Applications

- HDMI 1.4/2.0, USB 3.0/3.1, V-by-One, Thunderbolt
- Monitors and flat panel displays
- Set-top box
- Video graphics cards
- Notebook computers



### Typical Applications



## Ordering Information

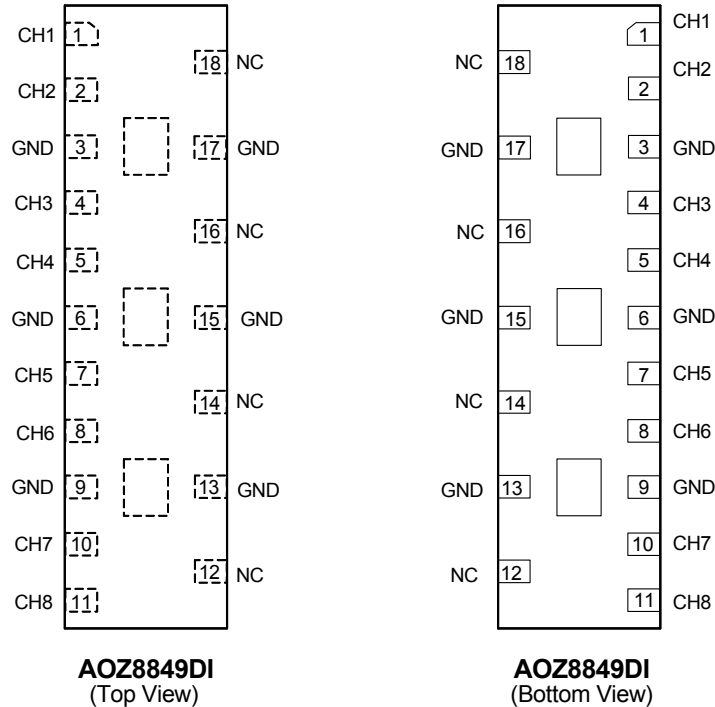
Part Number	Ambient Temperature Range	Package	Environmental
AOZ8849DI-03	-40°C to +125°C	DFN 5.5×1.5-18L	Green Product
AOZ8849DI-05			



AOS Green Products use reduced levels of Halogens, and are also RoHS compliant.

Please visit [www.aosmd.com/media/AOSGreenPolicy.pdf](http://www.aosmd.com/media/AOSGreenPolicy.pdf) for additional information.

## Pin Configuration



## 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 IEC 61000-4-2, contact <sup>(1)</sup>	±12 kV
ESD Rating per IEC 61000-4-2, air <sup>(1)</sup>	±15 kV
ESD Rating per Human Body Model <sup>(2)</sup>	±8 kV

### Notes:

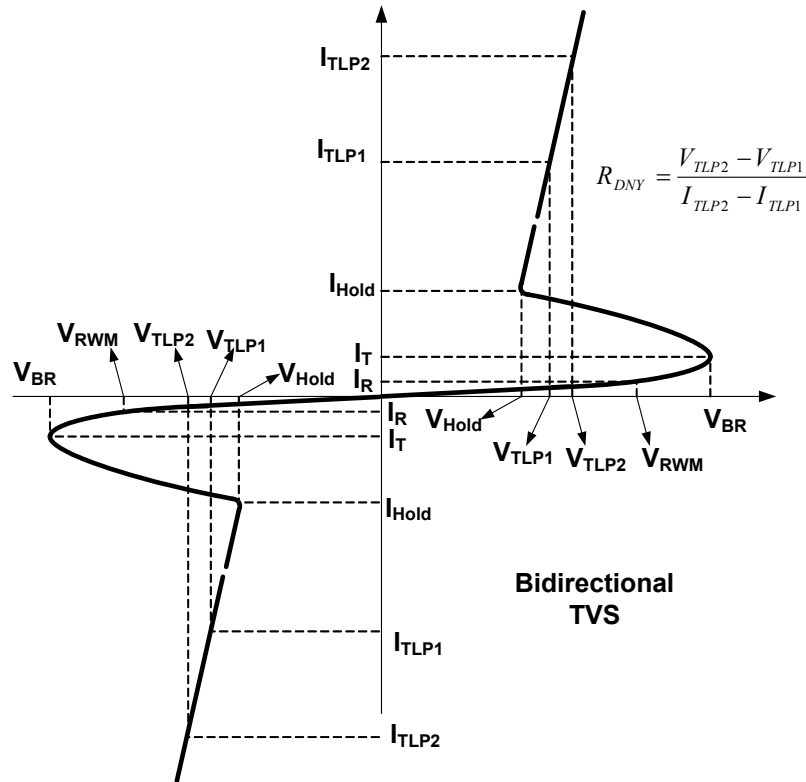
- IEC 61000-4-2 discharge with  $C_{Discharge} = 150\text{pF}$ ,  $R_{Discharge} = 330\ \Omega$ .
- Human Body Discharge per MIL-STD-883, Method 3015  $C_{Discharge} = 100\ \text{pF}$ ,  $R_{Discharge} = 1.5\ \text{k}\Omega$ .

## Maximum Operating Ratings

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

### Electrical Characteristics

T<sub>A</sub> = 25°C unless otherwise specified.



**AOZ8849DI-03**

Symbol	Parameter	Conditions	Min.	Typ.	Max	Units
V <sub>RWM</sub>	Reverse Working Voltage	I/O Pin-to-Ground			3.3	V
V <sub>BR</sub>	Reverse Breakdown Voltage	I <sub>T</sub> = 100 μA, I/O Pin-to-Ground	5		11	V
I <sub>R</sub>	Reverse Leakage Current	Max. V <sub>RWM</sub> , I/O Pin-to-Ground		1	50	nA
V <sub>HOLD</sub>	Hold Voltage of Snapback <sup>(1)</sup>		1.8			V
I <sub>HOLD</sub>	Hold Current of Snapback <sup>(1)</sup>		20			mA
V <sub>CL</sub>	Clamping Voltage <sup>(1)(2)</sup> (100 ns Transmission Line Pulse, I/O Pin to GND)	I <sub>TLP</sub> = 1 A		3		V
		I <sub>TLP</sub> = 16 A		16		V
R <sub>DNY</sub>	Dynamic Resistance <sup>(1)</sup>	I <sub>TLP</sub> = 1 to 16 A		0.5		Ω
C <sub>J</sub>	Junction Capacitance	V <sub>I/O</sub> = 0V, f = 1MHz, I/O Pin-to-Ground		0.12	0.15	pF
		V <sub>I/O</sub> = 0V, f = 1MHz, I/O Pin-to-I/O Pin		0.06		pF

**AOZ8849DI-05**

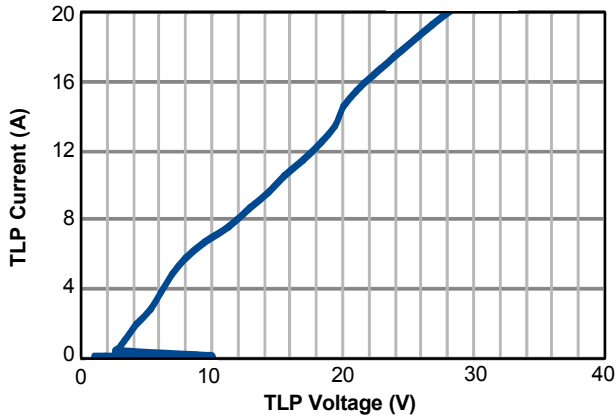
Symbol	Parameter	Conditions	Min.	Typ.	Max	Units
$V_{RWM}$	Reverse Working Voltage	I/O Pin-to-Ground			5.5	V
$V_{BR}$	Reverse Breakdown Voltage	$I_T = 100 \mu A$ , I/O Pin-to-Ground	6.5		11	V
$I_R$	Reverse Leakage Current	Max. $V_{RWM}$ , I/O Pin-to-Ground		1	50	nA
$V_{HOLD}$	Hold Voltage of Snapback <sup>(1)</sup>		1.8			V
$I_{HOLD}$	Hold Current of Snapback <sup>(1)</sup>		20			mA
$V_{CL}$	Clamping Voltage <sup>(1)(2)</sup> (100 ns Transmission Line Pulse, I/O Pin to GND)	$I_{TLP} = 1 A$		4		V
		$I_{TLP} = 16 A$		17		V
$R_{DNY}$	Dynamic Resistance <sup>(1)</sup>	$I_{TLP} = 1$ to 16 A		0.5		$\Omega$
$C_J$	Junction Capacitance	$V_{I/O} = 0V$ , $f = 1 MHz$ I/O Pin-to-I/O Pin		0.12	0.15	pF
		$V_{PIN\ 3,8} = 0 V$ , $V_{I/O} = 0 V$ , $f = 1 MHz$ , I/O Pin-to-I/O Pin		0.06		pF

**Notes:**

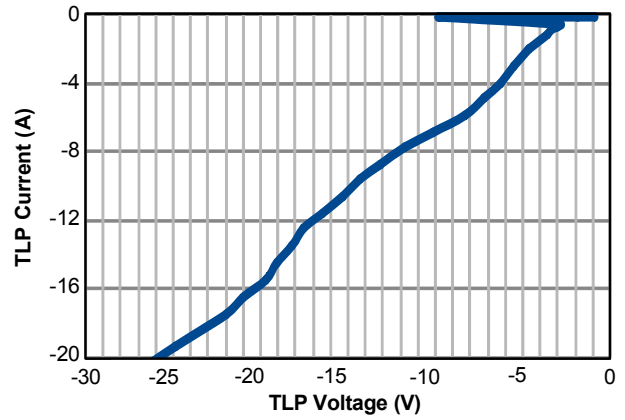
1. These specifications are guaranteed by design and characterization.
2. Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

### Typical Characteristics

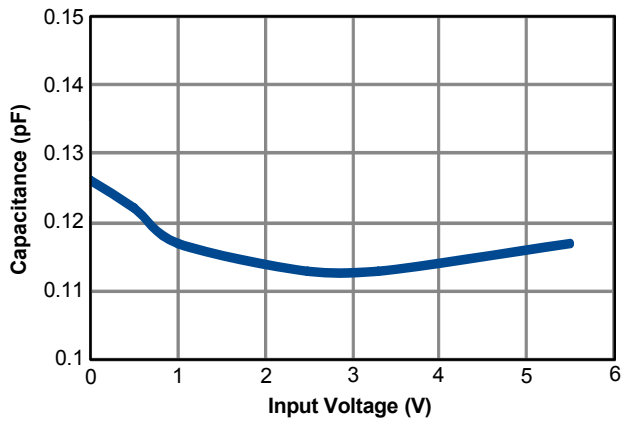
Positive TLP Curve  
( $T_P=100\text{ns}$ ,  $T_R=0.2\text{ns}$ )



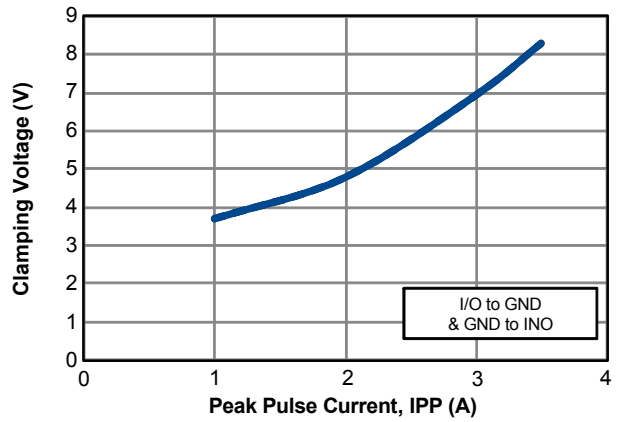
Negative Transmission Line Pulse  
( $T_P=100\text{ns}$ ,  $T_R=0.2\text{ns}$ )



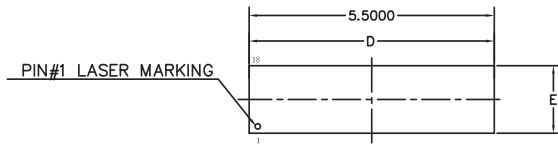
Typical Variations of  $C_J$  vs. Input Voltage



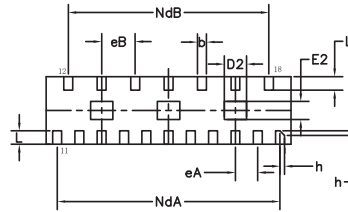
IEC61000-4-5 Surge 8/20 $\mu$ s



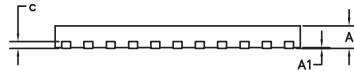
Package Dimensions, DFN 5.5mm x 1.5mm x 0.5mm, 18L, EP3 S



TOP VIEW

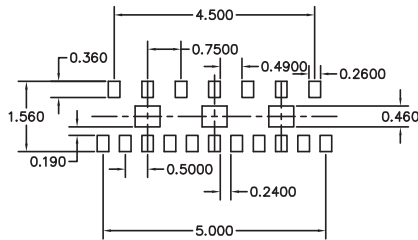


BOTTOM VIEW



SIDE VIEW

RECOMMENDED LAND PATTERN



UNIT: mm

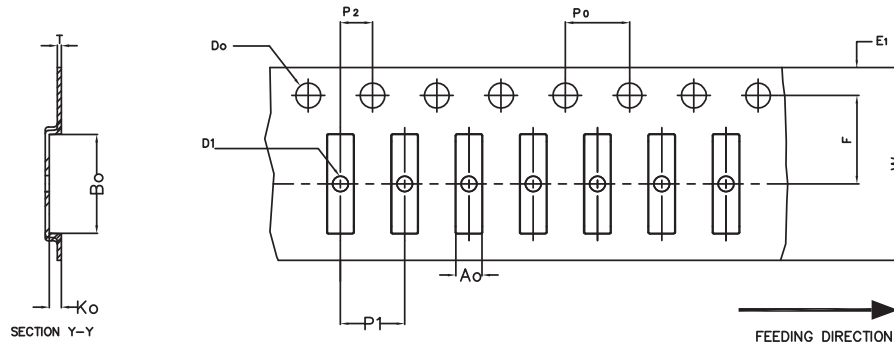
Symbol	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.45	0.50	0.55	0.018	0.020	0.022
A1	---	0.02	0.05	---	0.001	0.002
b	0.15	0.20	0.25	0.006	0.008	0.010
c	0.10	0.15	0.20	0.004	0.006	0.008
D	5.45	5.50	5.55	0.215	0.217	0.219
D2	0.45	0.50	0.55	0.018	0.020	0.022
NdA	5.00 BSC			0.197 BSC		
eA	0.50 BSC			0.020 BSC		
eB	0.75 BSC			0.030 BSC		
NdB	4.50 BSC			0.177 BSC		
E	1.45	1.50	1.55	0.057	0.059	0.061
E2	0.35	0.40	0.45	0.014	0.016	0.016
L	0.20	0.30	0.40	0.008	0.012	0.016
h	0.05	0.10	0.15	0.002	0.004	0.006

Note:

1. Dimensioning and tolerancing conform to ASME Y14.5M-1994.
2. All dimensions are in millimeters.

**Tape and Reel Dimensions, DFN 5.5mm x 1.5mm x 0.5mm, 18L, EP3 S**

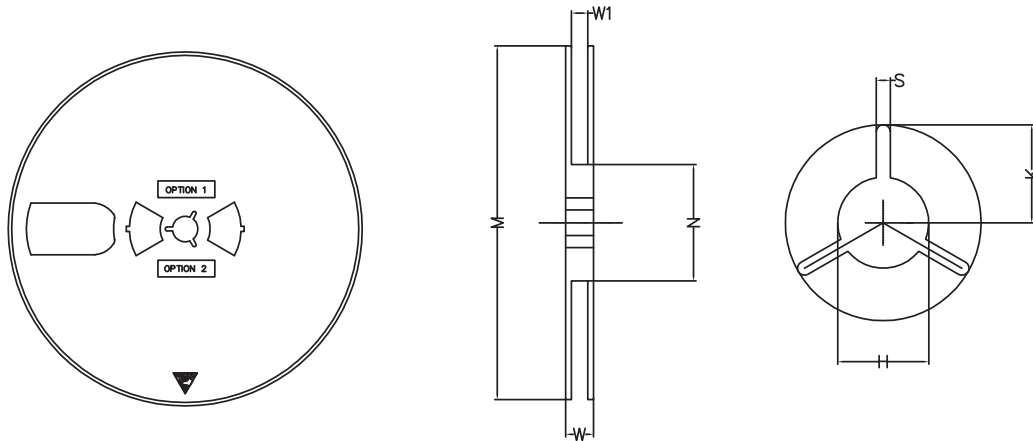
Carrier Tape



UNIT: MM

PACKAGE	A0	B0	K0	D0	D1	W	E1	F	P0	P1	P2	T
DFN5.5x1.5	1.75 ±0.10	5.75 ±0.10	0.70 ±0.10	1.50 +0.10 -0.00	1.00 MIN.	12.00 ±0.3	1.75 ±0.10	5.50 ±0.05	4.00 ±0.10	4.00 ±0.10	2.00 ±0.10	0.30 ±0.05

REEL



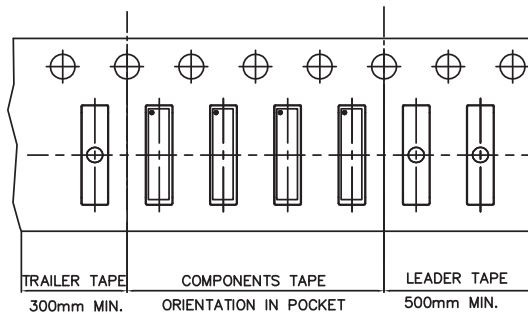
UNIT: MM

TAPE SIZE	REEL SIZE	M	N	W	W1	H	S	K
12	φ178	φ178.0 ±1.0	φ54.0 ±0.5	17.00 ±2.0	13.5 ±0.5	φ13.0 ±0.2	2.20 ±0.30	10.25 ±0.2

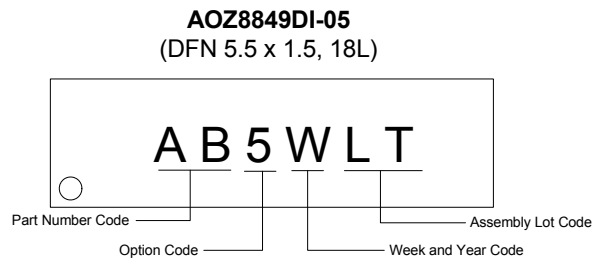
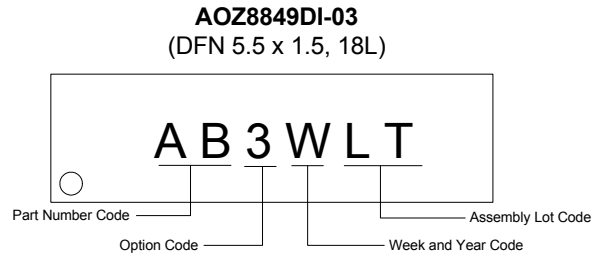
TAPE

Leader / Trailer  
& Orientation

Unit Per Reel:  
3000pcs



## Part Marking



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