

General Description

The AOZ8937DI is a 7-channel combo transient voltage suppressor array designed to protect high-speed data lines such as USB3.1, Thunderbolt, Displayport, and VBUS from damaging ESD events.

This device incorporates 6 channels for high speed data lines and 1 channel for VBUS.

The AOZ8937DI comes in a RoHS compliant and Halogen Free DFN4.1x2.0 package and is rated for -40°C to +125°C junction temperature range.

Features

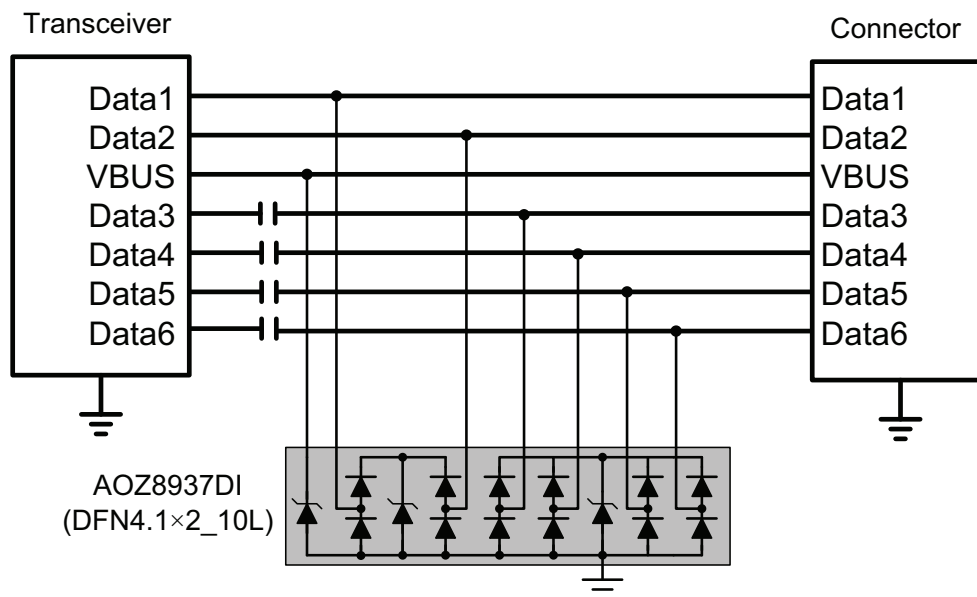
- IEC61000-4-2, ESD immunity (Contact/Air)
 - ± 12/15 kV (High Speed Data lines)
 - ± 30/30 kV (VBUS)
- IEC61000-4-5, Surge Immunity (8/20µs)
 - ± 3 A (High Speed Data lines)
 - ± 5 A (VBUS).
- Capacitance between I/O to GND
 - 0.3 pF (High Speed Data lines)
 - 16 pF (VBUS)

Applications

- USB3.1/3.2&USB2.0
- Thunderbolt
- Displayport
- Notebook computers



Typical Application



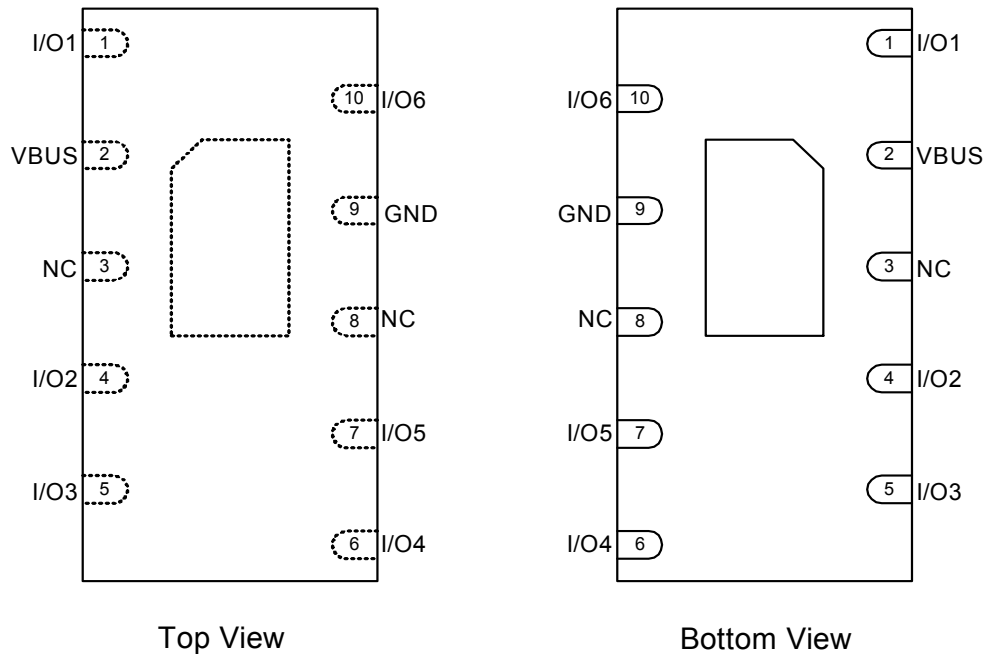
Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8937DI	-40°C to +125°C	DFN4.1X2_10L	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.

Pin Configuration



Absolute Maximum Ratings

Exceeding the Absolute Maximum ratings may damage the device.

Parameter	Rating	
	I/O1 to I/O6 (Pin 1, 4, 5, 6, 7,10)	VBUS (Pin2)
Storage Temperature (T _S)	-65°C to +150°C	-65 °C to +150°C
ESD Rating per IEC61000-4-2, contact ⁽¹⁾	±12kV	±30kV
ESD Rating per IEC61000-4-2, air ⁽¹⁾	±15kV	±30kV
8/20µs Surge IEC61000-4-5	±3 A	±5 A

Notes:

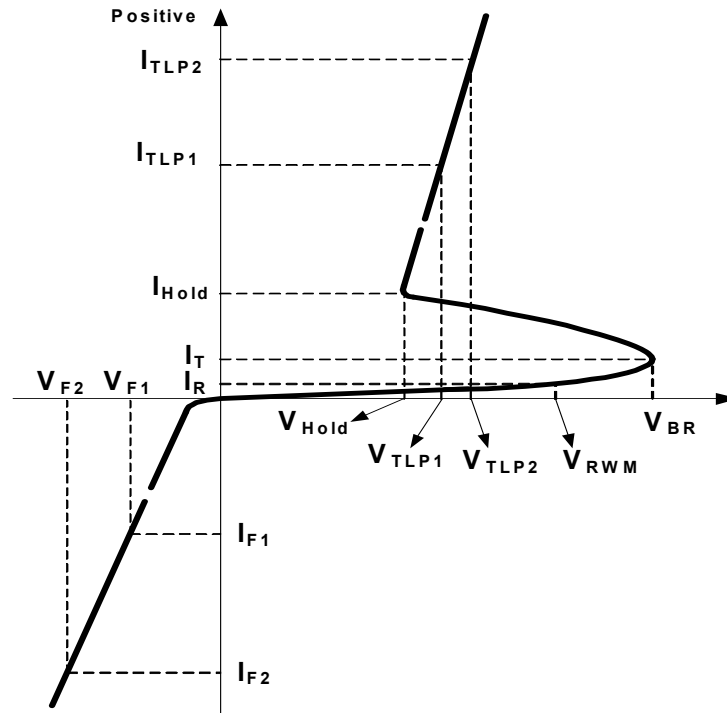
- IEC 61000-4-2 discharge with C_{Discharge} = 150pF, R_{Discharge} = 330Ω.
- Human Body Discharge per MIL-STD-883, Method 3015 C_{Discharge} = 100pF, R_{Discharge} = 1.5kΩ.

Maximum Operating Ratings

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

Electrical Characteristics

T_A = 25°C unless otherwise specified. Any I/O Pin to GND.



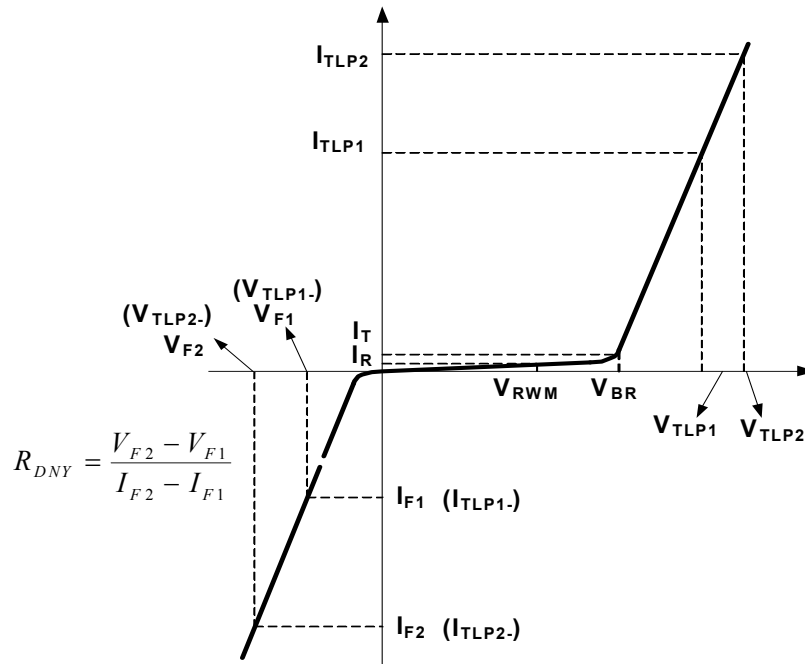
I/O1 to I/O6 (Pin 1, 4, 5, 6, 7, 10)						
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V _{RWM}	Reverse Working Voltage				5.5	V
V _{BR}	Reverse Breakdown Voltage	I _T = 100μA	6.5			V
I _R	Reverse Leakage Current	V _T = Max. V _{RWM}			100	μA
V _F	Forward Voltage		0.7	0.85	0.95	V
V _{CL}	Clamping Voltage ⁽³⁾⁽⁴⁾ (100ns Transmission Line Pulse)	I _{TLP} = 1A I _{TLP} = -1A		3 -1	4 -2	V
		I _{TLP} = 16A I _{TLP} = -16A		12 -8	15 -10	
R _{DYN}	Dynamic Resistance ⁽³⁾⁽⁴⁾	I _{TLP} = 8A to 16A I _{TLP} = -8A to -16A		0.35 0.40		Ω
I _{PP}	Peak Pulse Current ⁽³⁾ IEC61000-4-5 Surge 8/20μs				±3	A
V _{CL}	Clamping Voltage ⁽³⁾ IEC61000-4-5 Surge 8/20μs	I _{PP} = 1A I _{PP} = -1A		2 -1.8		V
		I _{PP} = 3A I _{PP} = -3A		3.7 -3		
C _j	Junction Capacitance	V _{I/O} = 0V, f = 1MHz		0.3	0.45	pF

Notes:

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

Electrical Characteristics

T_A = 25°C unless otherwise specified. Any I/O Pin to GND.



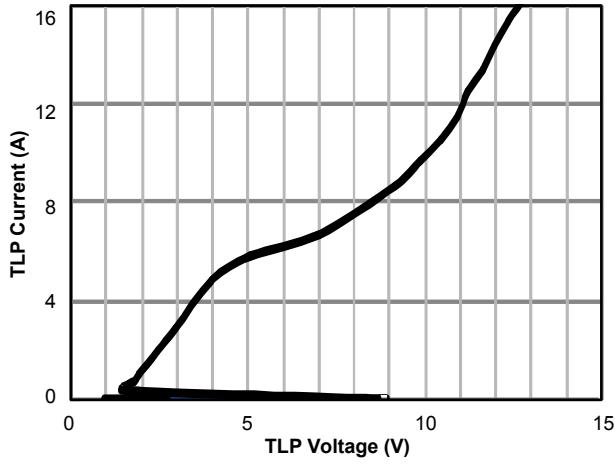
VBUS (Pin 2)						
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
V _{RWM}	Reverse Working Voltage				5.5	V
V _{BR}	Reverse Breakdown Voltage	I _T = 1mA	6			V
I _R	Reverse Leakage Current	V _T = Max, V _{RWM}			1	μA
V _F	Forward Voltage		0.65	0.85	0.95	V
V _{CL}	Clamping Voltage ⁽³⁾⁽⁴⁾ (100ns Transmission Line Pulse)	I _{TLP} = 1A I _{TLP} = -1A		8 -1	10 -2	V
		I _{TLP} = 16A I _{TLP} = -16A		10 -10	12 -15	
I _{PP}	Peak Pulse Current ⁽³⁾ IEC61000-4-5 Surge 8/20μs				±5	A

Notes:

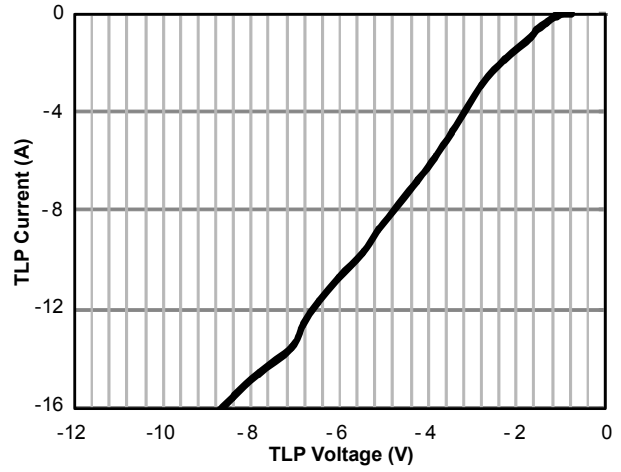
- These specifications are guaranteed by design and characterization.
- Measurements performed using a 100ns Transmission Line Pulse (TLP) system.

Typical Performance Characteristics (I/O1 to I/O6)

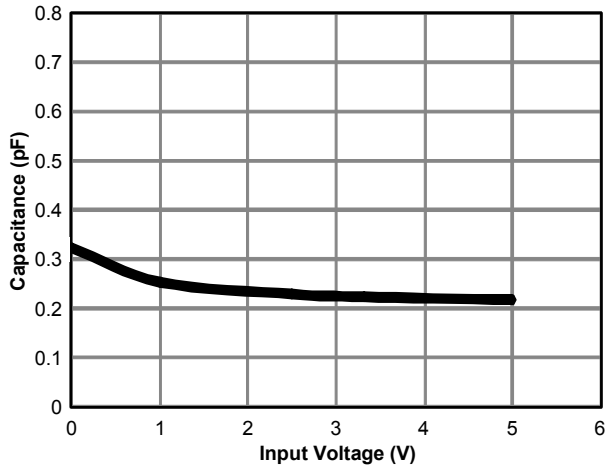
Positive Transmission Line Pulse
($t_p=100\text{ns}$, $t_r=0.2\text{ns}$)



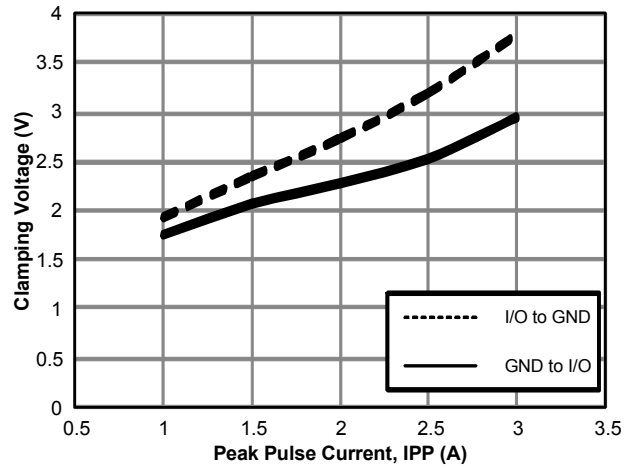
Negative Transmission Line Pulse
($t_p=100\text{ns}$, $t_r=0.2\text{ns}$)



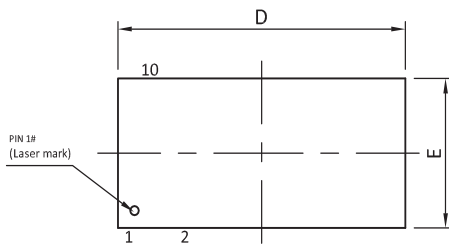
Typical Variations of CJ vs. Input Voltage



IEC61000-4-5 Surge 8/20 μ s



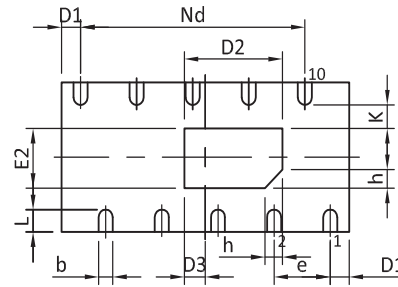
Package Dimensions, DFN4.1x2.0-10L, EP1_S



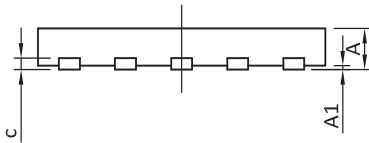
TOP VIEW



SIDE VIEW



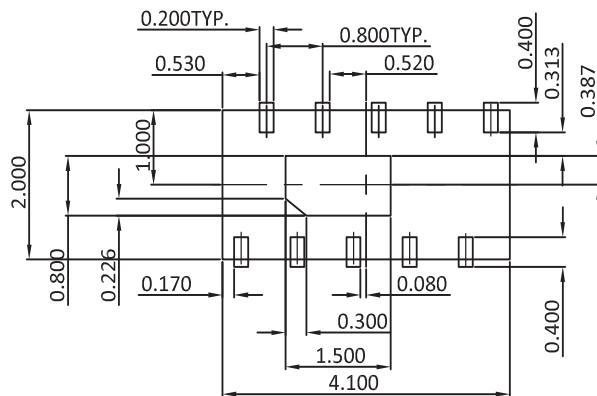
BOTTOM VIEW



SIDE VIEW

SYMBOLS	DIMENSION IN MILLIMETRES			DIMENSION IN INCHS		
	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	4.00	4.10	4.20	0.157	0.161	0.165
D1	0.20	0.25	0.30	0.008	0.010	0.012
D2	1.30	1.40	1.50	0.051	0.055	0.059
D3	0.25	0.30	0.35	0.010	0.012	0.014
e	0.80 BSC			0.031 BSC		
Nd	3.20 BSC			0.126 BSC		
E	1.90	2.00	2.10	0.075	0.079	0.083
E2	0.70	0.80	0.90	0.028	0.031	0.035
K	0.20	---	---	0.008	----	----
L	0.25	0.30	0.35	0.010	0.012	0.014
h	0.15	0.20	0.25	0.006	0.008	0.010

LAND PATTERN RECOMMENDATIONS



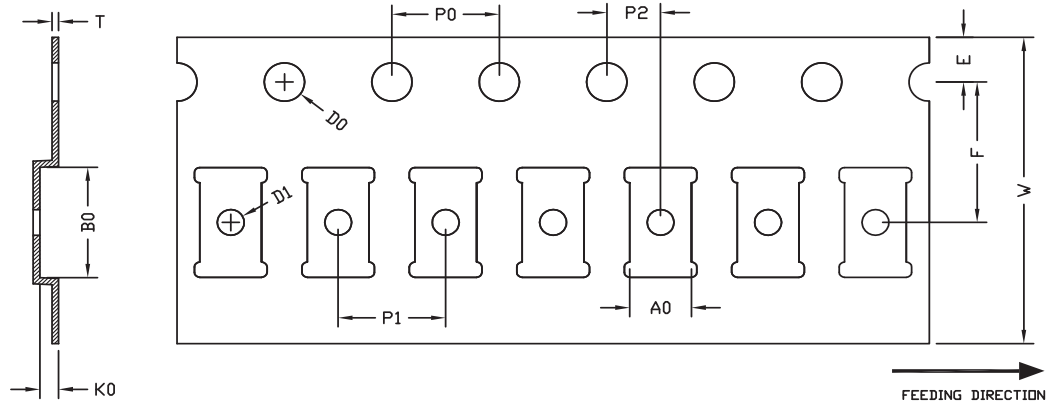
UNIT: mm

NOTES

1. CONTROLLING DIMENSION IS MILLIMETER.
CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.

Tape and Reel Dimensions, DFN4.1x2.0-10L, EP1_S

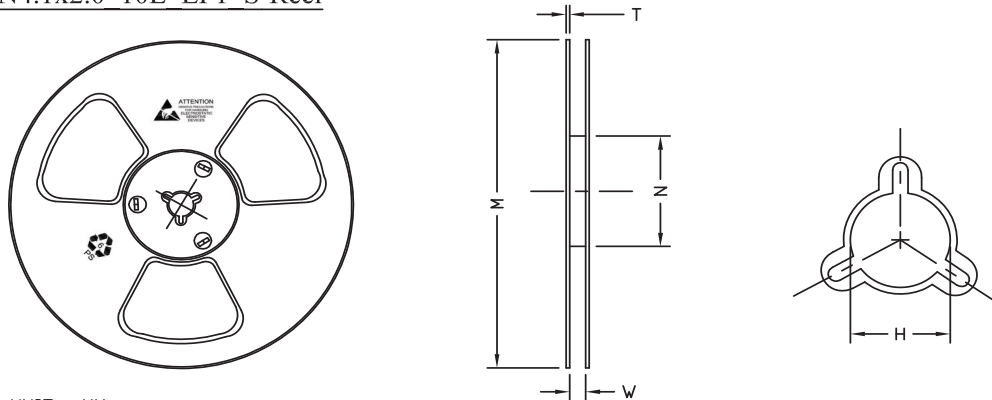
DFN4.1x2.0 10L EP1 S Carrier Tape



UNIT: MM

PACKAGE	A0	B0	K0	D0	D1	W	E	F	P0	P1	P2	T
DFN4.1x2.0	2.30 ±0.05	4.30 ±0.05	0.70 ±0.05	1.50 ^{+0.1} _{-0.0}	1.00 Min.	12.00 ^{+0.30} _{-0.10}	1.75 ±0.10	5.50 ±0.05	4.00 ±0.10	4.00 ±0.10	2.00 ±0.05	0.25 ±0.03

DFN4.1x2.0 10L EP1 S Reel



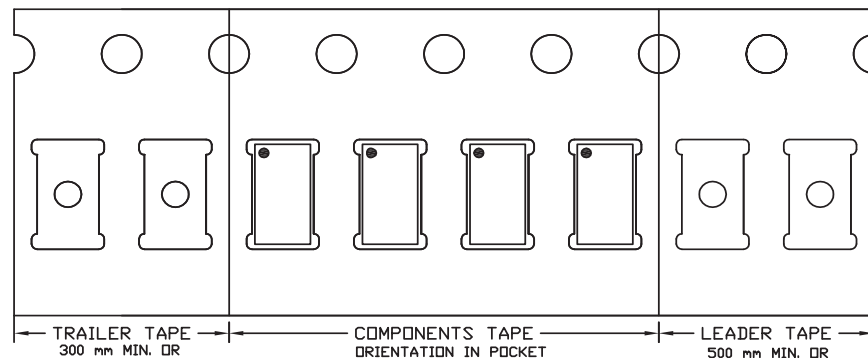
UNIT: MM

TAPE SIZE	REEL SIZE	M	N	W	T	H	K	S	G	R	V
12 mm	φ329	φ329.00 ±1.00	φ100.00 ±1.00	12.80 ±1.00	2.00 ±0.30	φ13.30 ±0.30	---	---	---	---	---

DFN4.1x2.0 10L EP1 S Package Tape

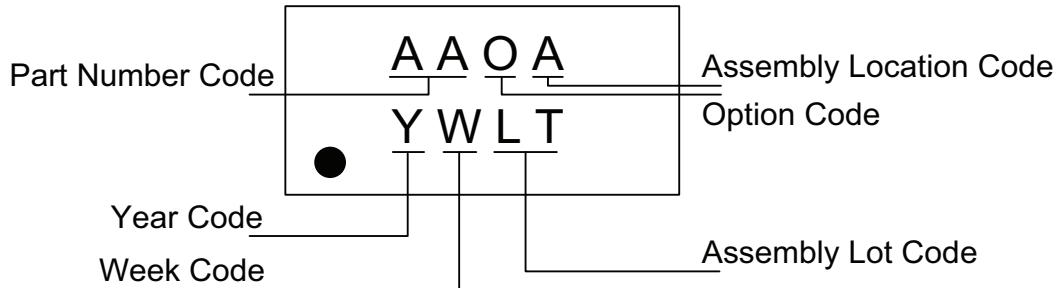
Leader / Trailer
& Orientation

Unit Per Reel:
6000pcs



Part Marking

AOZ8937DI
(DFN4.1x2.0_10L)



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