AOZ8831

Ultra Low Capacitance One-line Bi-directional TVS Diode

General Description

The AOZ8831 is an ultra low capacitance one-line bi-directional transient voltage suppressor diode designed to protect high speed data lines and voltage sensitive electronics from high transient conditions and ESD.

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

The AOZ8831 comes in an RoHS compliant DFN package and is rated over a -40°C to +85°C ambient temperature range.

The ultra-small 1.0 x 0.6 x 0.5mm DFN package makes it ideal for applications where PCB space is a premium. The small size and high ESD protection makes it ideal for protecting voltage sensitive electronics from high transient conditions and ESD.

Features

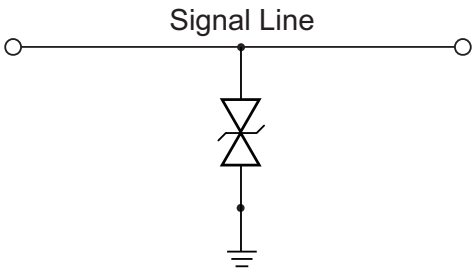
- ESD protection for high-speed data lines:
  - Exceeds: IEC 61000-4-2 (ESD) ±15kV (air), ±15kV (contact)
  - Human Body Model (HBM) ±15kV
- Small package saves board space
- Ultra low capacitance: 0.35pF
- Low clamping voltage
- Low operating voltage: 5.0V
- Pb-free device

Applications

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

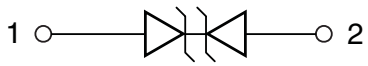
Green Product

Typical Application



Bidirection Protection of Single Line

Pin Configuration



Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ8831DI-05	-40°C to +85°C	DFN 1.0 x 0.6	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.

Absolute Maximum Ratings

Exceeding the Absolute Maximum ratings may damage the device.

Parameter	Rating
VP – VN	5V
Peak Pulse Current (I_{PP}), t_P = 8/20µs	2A
Peak Pulse Power, t_P = 8/20µs	40W
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)	±15kV

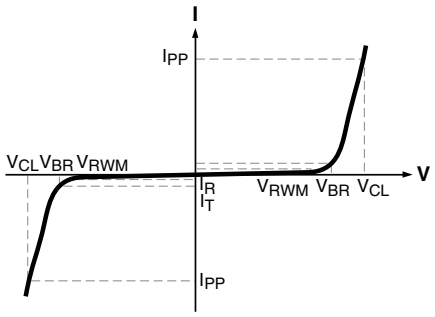
Notes:
1. IEC 61000-4-2 discharge with $C_{Discharge}$ = 150pF, $R_{Discharge}$ = 330Ω.
2. Human Body Discharge per MIL-STD-883, Method 3015 $C_{Discharge}$ = 100pF, $R_{Discharge}$ = 1.5kΩ.

Maximum Operating Ratings

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

Electrical Characteristics

T_A = 25°C unless otherwise specified.

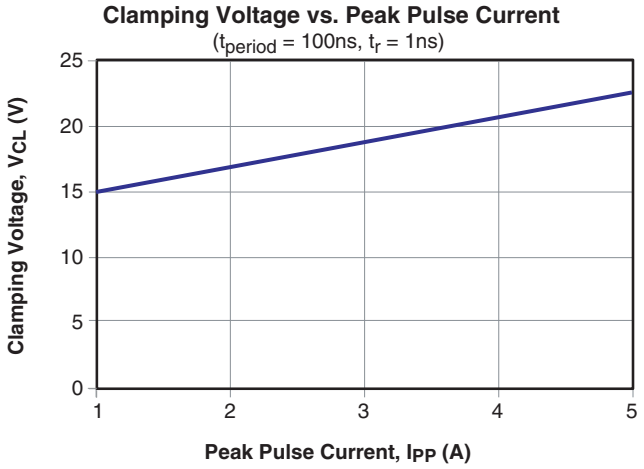
Symbol	Parameter	Diagram
I_{PP}	Maximum Reverse Peak Pulse Current[3,4]	
V_{CL}	Clamping Voltage @ I_{PP}[3,4]	
V_{RWM}	Working Peak Reverse Voltage	
I_R	Maximum Reverse Leakage Current	
V_{BR}	Breakdown Voltage	
P_{PK}	Peak Power Dissipation	
C_J	Capacitance @ V_R = 0 and f = 1MHz[3,4]	

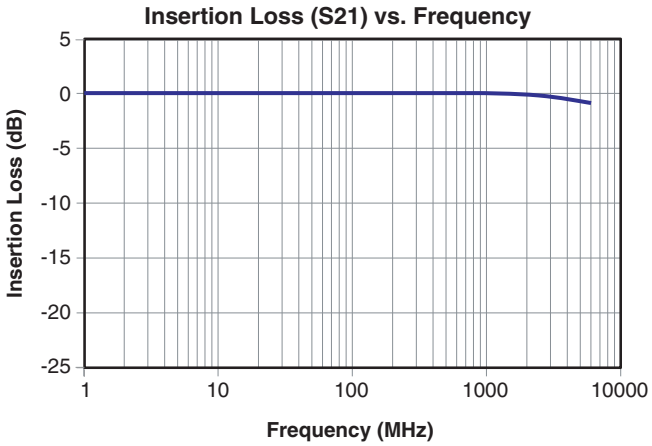
Device	Device Marking	V_{RWM} (V) Max.	V_{BR} (V) Min.	I_R (µA) Max.	V_F (V) Typ.	V_{CL} Max.			C_J (pF)		
						I_{PP} = 1A	I_{PP} = 2A	I_{PP} = 5A	Min.	Typ.	Max.
AOZ8831DI-05	A	5.0	6.0	0.1	1.0	15.00	17.00	23.00	0.2	0.35	0.5

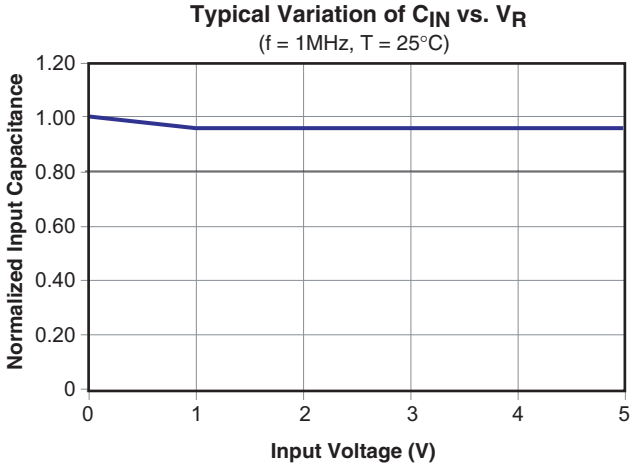
Notes:

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

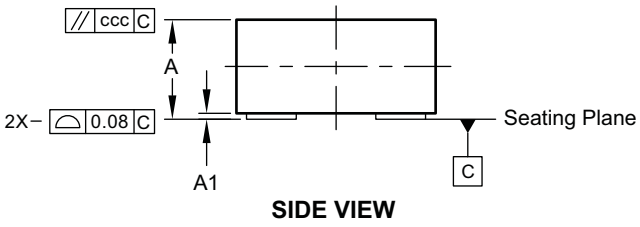
Typical Performance Characteristics



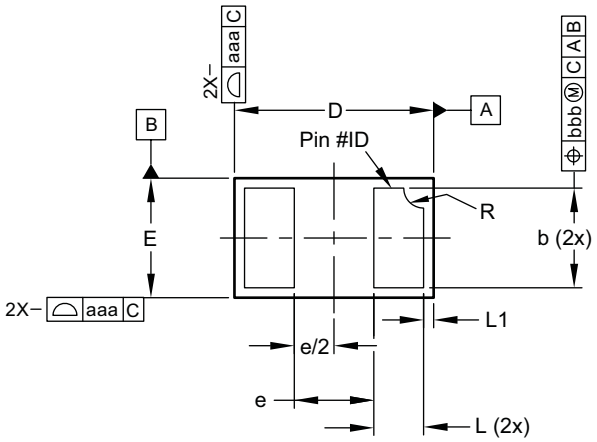




Package Dimensions, DFN 1.0 x 0.6[(1)]

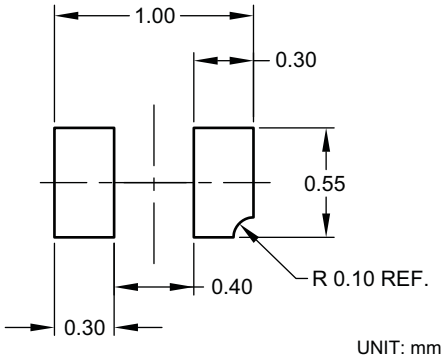


SIDE VIEW



BOTTOM VIEW

RECOMMENDED LAND PATTERN



UNIT: mm

Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	0.47	0.50	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	0.05±0.03 REF.		
R	0.05	0.10	0.15
aaa	0.15		
bbb	0.05		
ccc	0.05		

Dimensions in inches

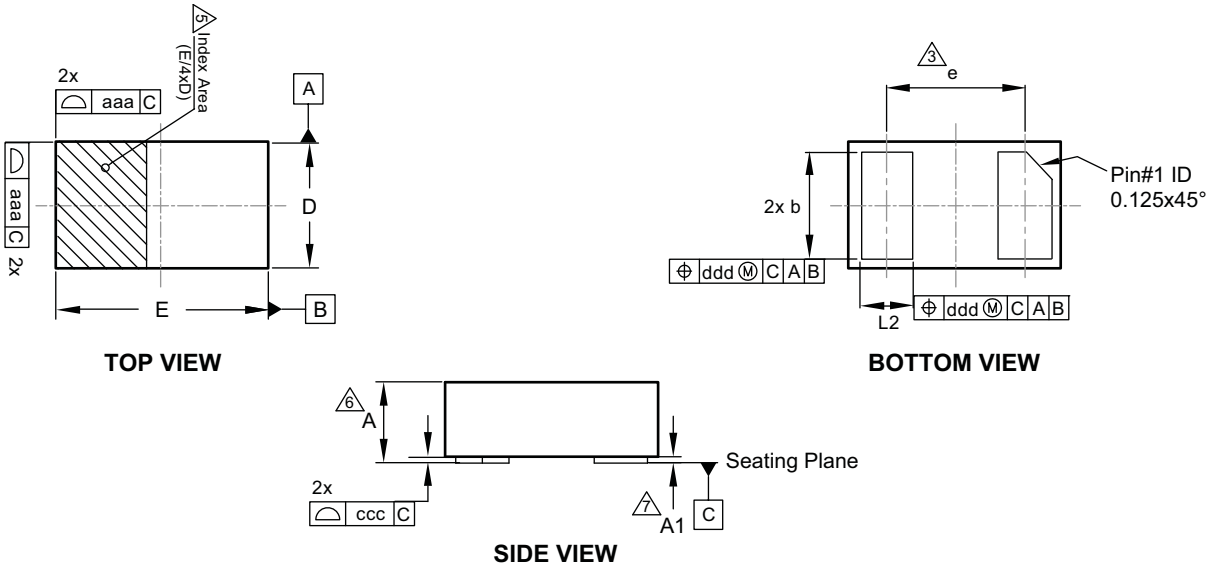
Symbols	Min.	Nom.	Max.
A	0.019	0.020	0.022
A1	0.000	0.001	0.002
b	0.018	0.020	0.022
D	0.037	0.039	0.042
E	0.022	0.024	0.027
e	---	0.016	---
L	0.008	0.010	0.012
L1	0.002±0.001 REF.		
R	0.002	0.004	0.006
aaa	0.006		
bbb	0.002		
ccc	0.002		

Notes:

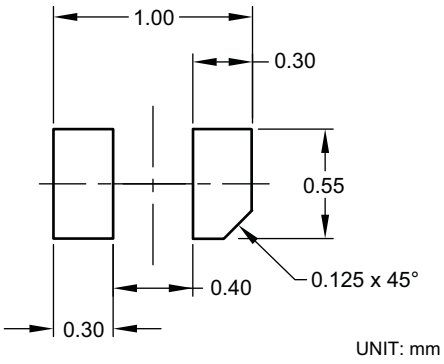
1. All dimensions are in milliteters, angles are in degrees.
2. Coplanarity applies to the exposed heat sink slug as well as the terminals.

Note 1. The package outline shown above will change as of Q4 2013 and will be replaced with the new one shown in page 6.

Package Dimensions, DFN 1.0 x 0.6(2)



RECOMMENDED LAND PATTERN



UNIT: mm

Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	0.47	0.51	0.55
A1	0.00	0.02	0.05
b	0.45	0.50	0.55
D		0.60 BSC	
E		1.00 BSC	
e		0.65 BSC	
L	0.20	0.25	0.30
aaa		0.05	
ccc		0.03	
ddd		0.10	

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		0.024	
E		0.039	
e		0.026	
L	0.008	0.010	0.012
aaa		0.002	
ccc		0.001	
ddd		0.004	

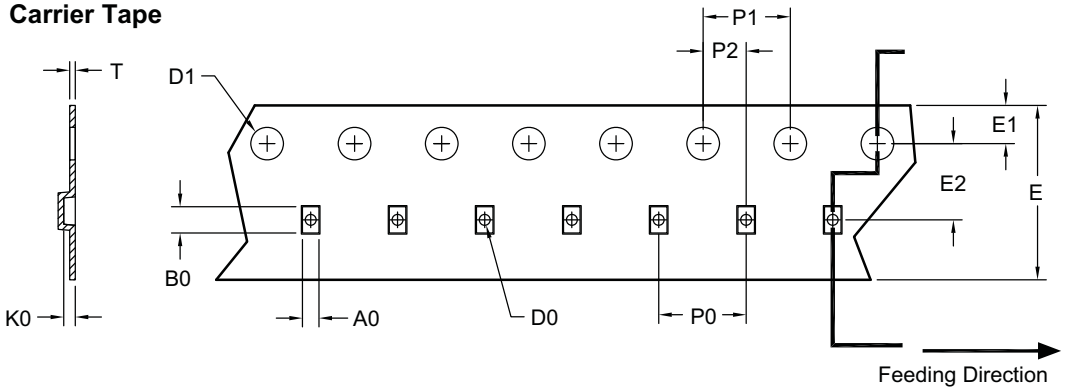
Notes:

1. Dimensions and tolerancing conform to ASME Y14.5-2009.
2. All dimensions are in milliteters.
3. “e” represents the terminal grid pitch.
4. N isthe total number of terminals.
5. A visual index feature must be located within the hatched area. Typical index feature (chamfer) must be located on the edge of the Pin#1 feature.
6. This dimension includes stand-off height “A1” and packaged body thickness, but does not include attached feature e.g. external heatsink or chip capacitors, an internal heatslug is not considered as attached feature.
7. Dimension “A1” is primarily terminal plating, and does not include small metal protrusions.

Note 2. The package outline shown above will replace the one in page 5 as of Q4 2013.

Tape and Reel Dimensions, DFN 1.0 x 0.6[3]

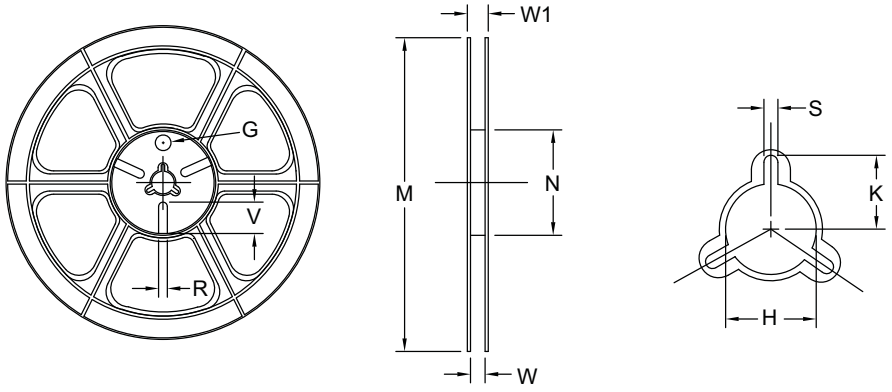
Carrier Tape



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

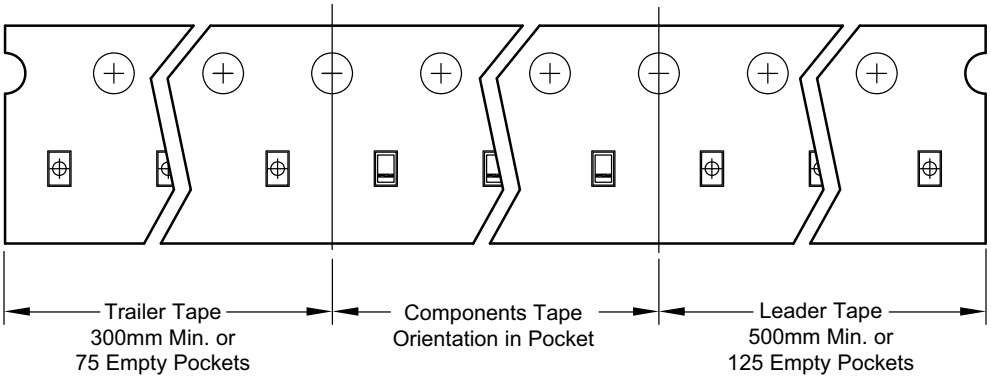
Reel



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

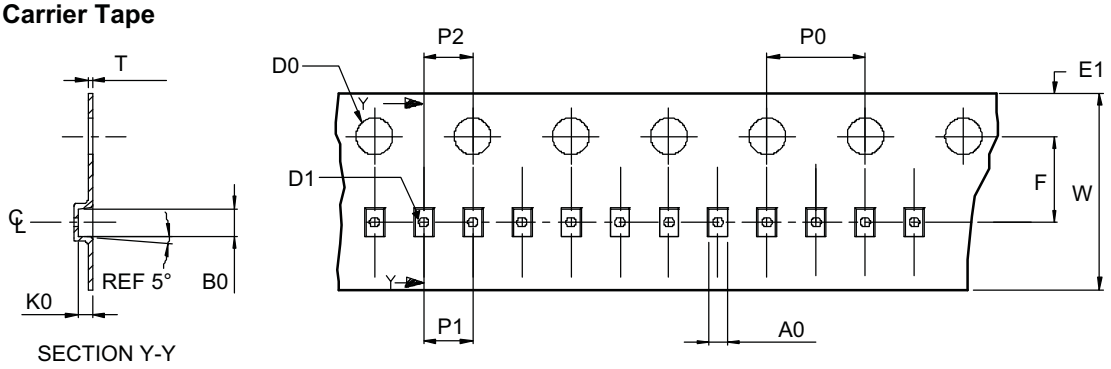
Leader / Trailer & Orientation



Note 3. The carrier tape shown above will change as of Q4 2013 and will be replaced with the new one shown in page 8.

Tape and Reel Dimensions, DFN 1.0 x 0.6[4]

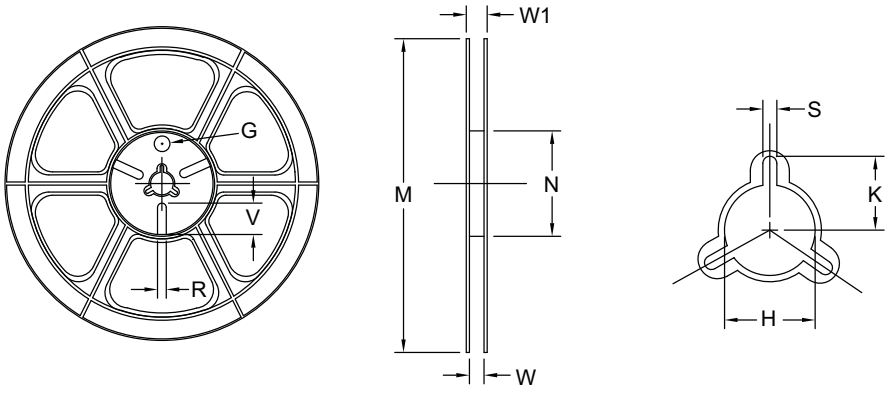
Carrier Tape



UNIT: mm

Package	A0	B0	K0	D0	D1	E1	F	P0	P1	P2	T	W
DFN 1.0x0.6 (8 mm)	0.65 ±0.04	1.05 ±0.04	0.61 ±0.04	ø1.50 +0.1/-0.0	ø0.40 ±0.05	1.75 ±0.10	3.50 ±0.05	4.00 ±0.10	2.00 ±0.10	2.00 ±0.05	0.20 ±0.05	8.00 +0.3/-0.1

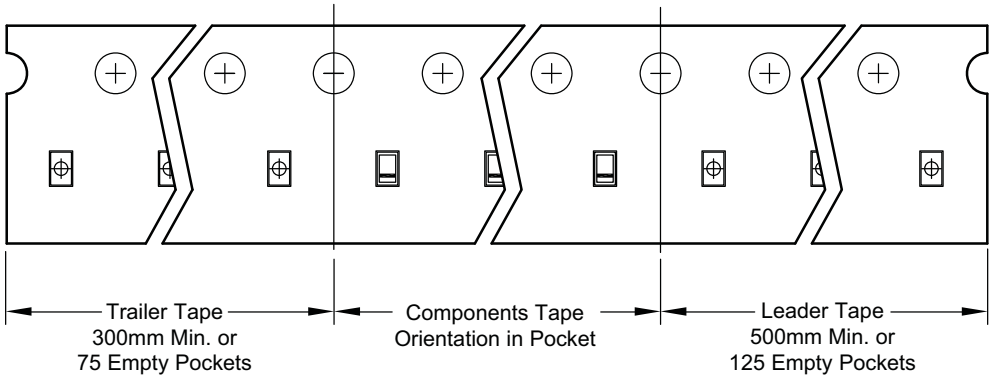
Reel



UNIT: mm

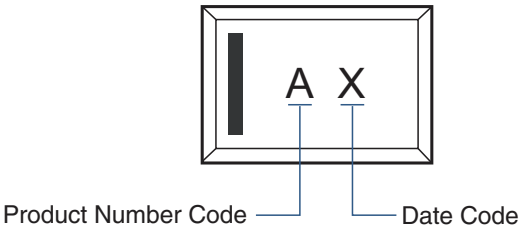
Tape Size	Reel Size	M	N	W	W1	H	K	S	G	R	V
8mm	ø178	ø178 ±0.5	ø55 ±1	8.4 +1.5/-0	14.4. Max.	ø13.0 ±0.5	10.0 ±0.5	2.0 ±0.5	N/A	N/A	N/A

Leader / Trailer & Orientation



Note 4. The carrier tape shown above will replace the one in page 7 as of Q4 2013.

Part Marking



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