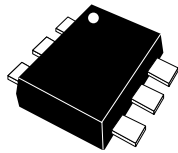
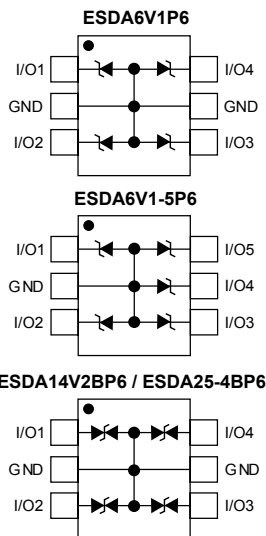


4 and 5 line ESD protection in SOT666


SOT666 / SOT666IP


Features

- Stand-off voltage range from 3 V to 24 V
- Unidirectional and bidirectional devices: Unidirectional can be connected as bidirectional by using one or more I/O as GND
- Operating T_j max.: 150 °C
- Lead finishing: matte tin plating
- **Complies with the following standards:**
 - UL94, V0
 - J-STD-020 MSL level 1
 - J-STD-002, JESD 22-B102 E3 and MIL-STD-750, method 2026
 - JESD-201 class 2 whisker test
 - IPC7531 footprint and JEDEC registered package outline
- **Complies with IEC 61000-4-2 level 4:**
 - 15 kV (air discharge)
 - 8 kV (contact discharge)
- **Complies with MIL STD 883E - method 3015-7, Class3:**
 - 25 kV

Applications

All industrial and consumer applications which can be subjected to electro-static discharge according to IEC 61000-4-2.

They can be used on positive signals or on symmetrical signals.

Description

This series is made with a monolithic die designed to protect four and five lines of electronic circuits in industrial and consumer applications, which can be subjected to electrostatic discharge according to IEC 61000-4-2. The devices are suitable for protecting positive signals or symmetrical signals, thanks to the flexibility in terms of connection.

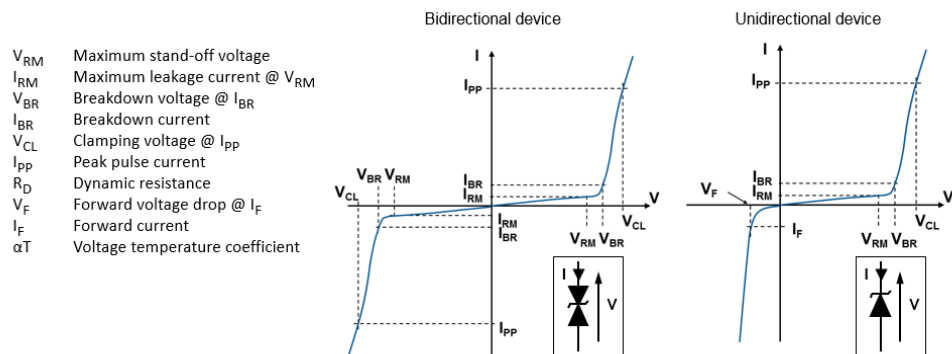
Product status link

[ESDA6V1P6](#)
[ESDA6V1-5P6](#)
[ESDA14V2BP6](#)
[ESDA25-4BP6](#)

1 Characteristics

Table 1. Absolute ratings ($T_{amb} = 25\text{ }^{\circ}\text{C}$)

Symbol	Parameter			Value	Unit
V_{PP}	Peak pulse voltage	ESDA6V1P6	IEC 61000-4-2:		kV
		ESDA14V2BP6	Contact discharge	± 8	
		ESDA25-4BP6	Air discharge	± 15	
		ESDA6V1-5P6	IEC 61000-4-2:		
P_{PP}	Peak pulse power dissipation (8/20 μs), T_j initial = T_{amb}	ESDA6V1P6 / ESDA6V1-5P6	Contact discharge	± 20	W
		ESDA14V2BP6 / ESDA25-4BP6	Air discharge	± 25	
T_{stg}	Storage temperature range			-55 to +150	$^{\circ}\text{C}$
T_j	Operating junction temperature range			-40 to +150	$^{\circ}\text{C}$
T_L	Maximum lead temperature for soldering during 10 s			260	$^{\circ}\text{C}$

Figure 1. Electrical characteristics - parameter definitions

Table 2. Electrical characteristics - values ($T_{amb} = 25\text{ }^{\circ}\text{C}$)

Order code	V_{BR} at I_{BR}			I_{RM} at V_{RM}		R_d	αT	C_{line}
	Min.	Max.		Max.		Max.	Typ.	Typ. at 0 V
	V	V	mA	μA	V	Ω	$10^{-4}/^{\circ}\text{C}$	pF
ESDA6V1P6	6.1	7.2	1	0.5	3	1.5	4	70
ESDA6V1-5P6								
ESDA14V2BP6	14.2	18	1	1	12	1.5	5.8	25
ESDA25-4BP6	25	30	1	1	24	1.7	7.3	22

1.1 Characteristics (curves)

Figure 2. Peak power dissipation versus initial junction temperature

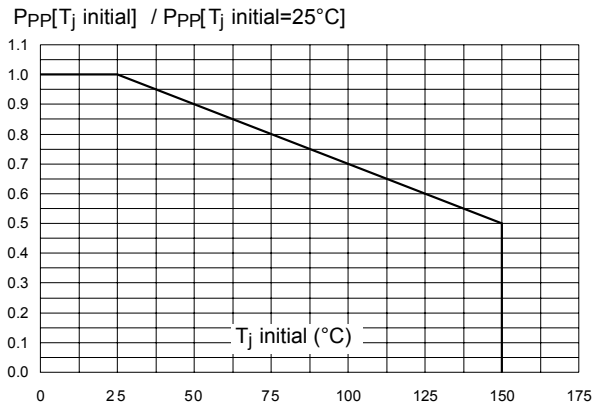


Figure 3. Maximum peak pulse power versus exponential pulse duration ($T_j \text{ initial} = 25^\circ\text{C}$)

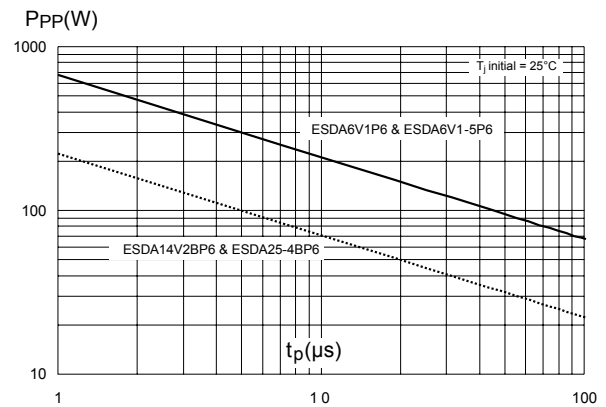


Figure 4. Clamping voltage versus peak pulse current

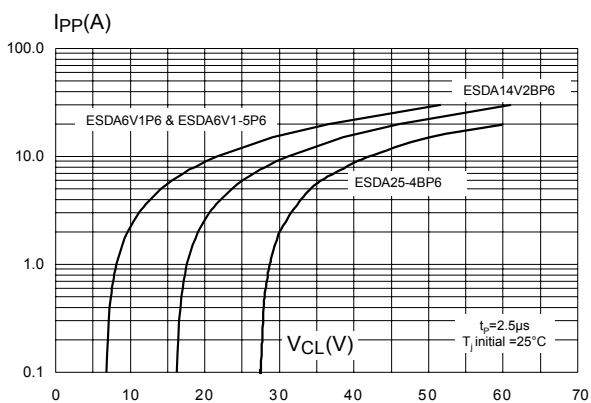


Figure 5. Junction capacitance versus reverse applied voltage

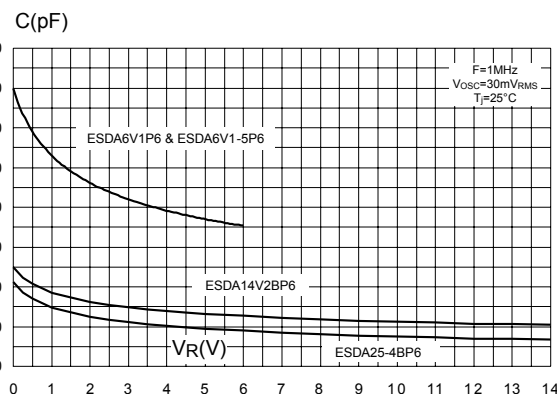


Figure 6. Relative variation of leakage current versus junction temperature

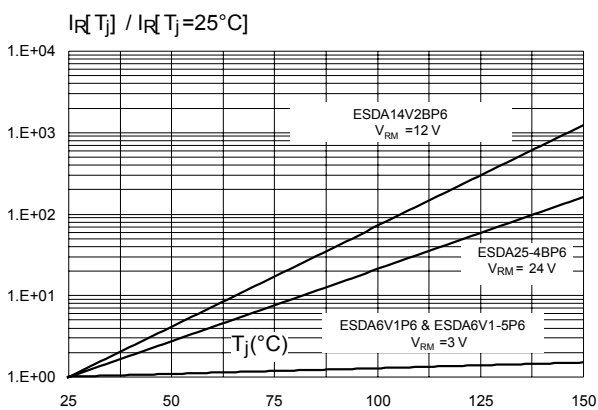


Figure 7. Peak forward voltage drop versus peak forward current

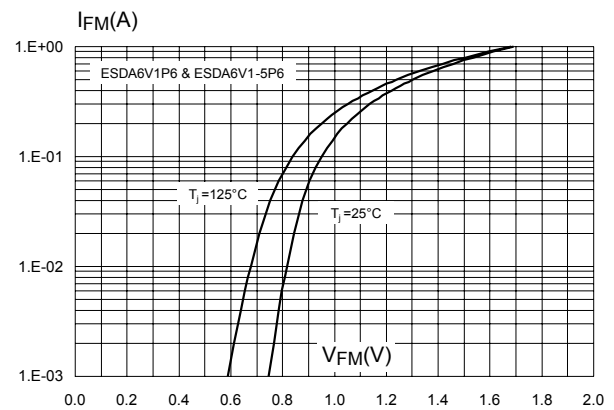


Figure 8. ESD response at $V_{PP} = 15$ kV air discharge (ESDA6V1-5P6)

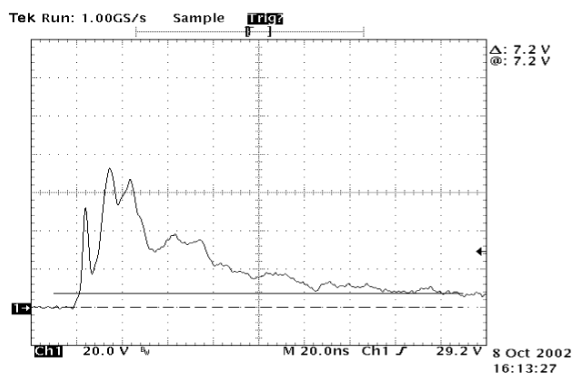
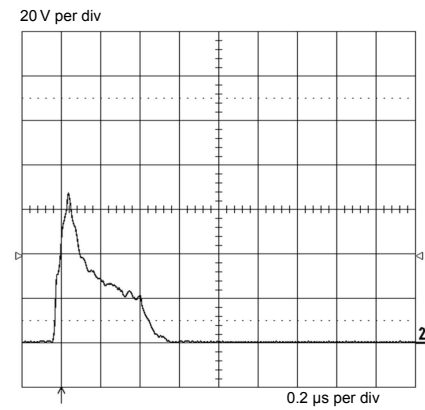


Figure 9. ESD response at $V_{PP} = 15$ kV air discharge (ESDA25-4BP6)

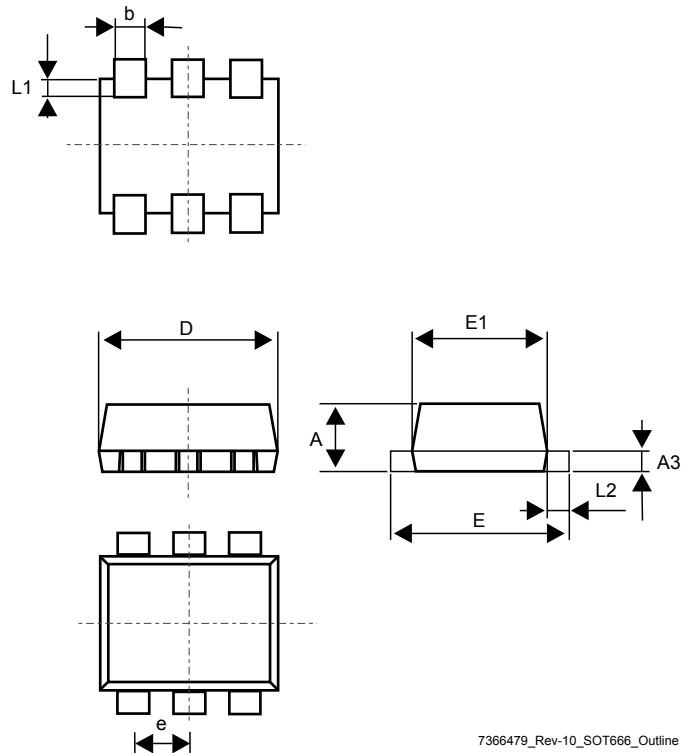


2 Package information

To meet environmental requirements, ST offers these devices in different grades of **ECOPACK** packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions, and product status are available at: www.st.com. ECOPACK is an ST trademark.

2.1 SOT666 package information

Figure 10. SOT666 package outline



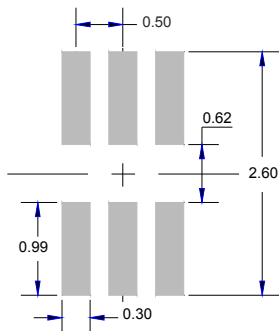
7366479_Rev-10_SOT666_Outline

Table 3. SOT666 package mechanical data

Ref.	Dimensions					
	Millimeters			Inches ⁽¹⁾		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.45		0.62	0.018		0.025
A3	0.08		0.18	0.003		0.007
b	0.17		0.34	0.007		0.013
D	1.50		1.70	0.059		0.067
E	1.50		1.70	0.059		0.067
E1	1.10		1.30	0.043		0.051
e		0.50			0.020	
L1		0.19			0.007	
L2	0.10		0.30	0.004		0.012

1. Value in inches are converted from mm and rounded to 3 decimal digits

Figure 11. Footprint recommendations, dimensions in mm



7365479_Rev-10_SOT666_Sts-Footprint

Figure 12. Marking layout (refer to ordering information table for marking)

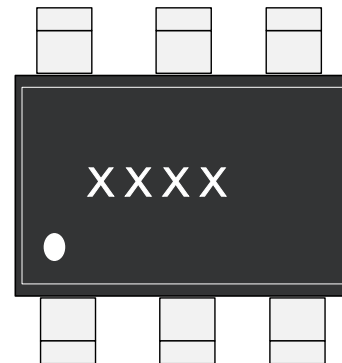
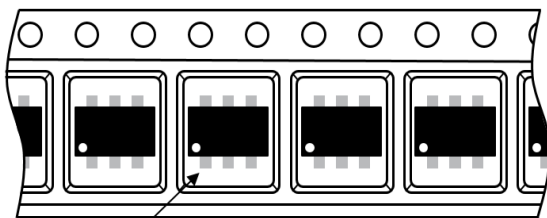


Figure 13. Package orientation in reel



Pin1 located according to EIA-481

Note: Pocket dimensions are not on scale
Pocket shape may vary depending on package

Figure 14. Tape and reel orientation

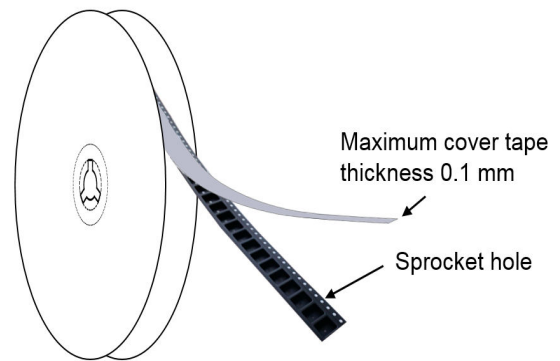


Figure 15. Reel dimensions (mm)

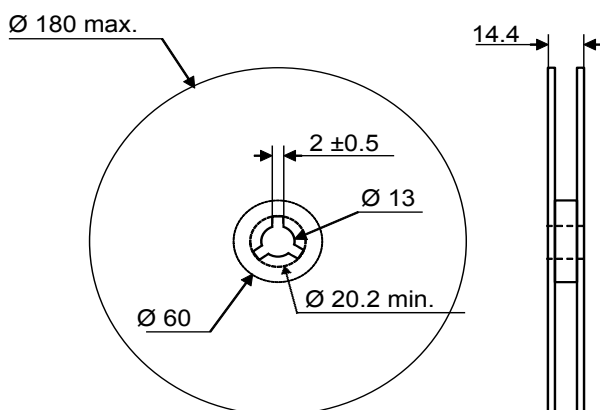


Figure 16. Inner box dimensions (mm)

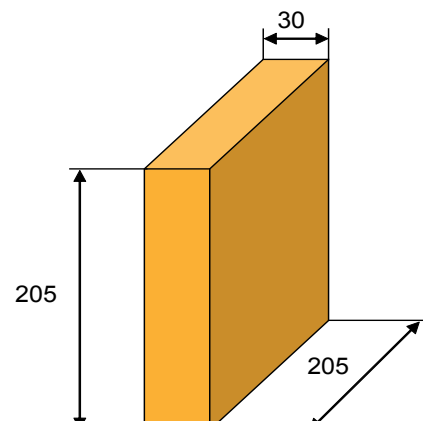
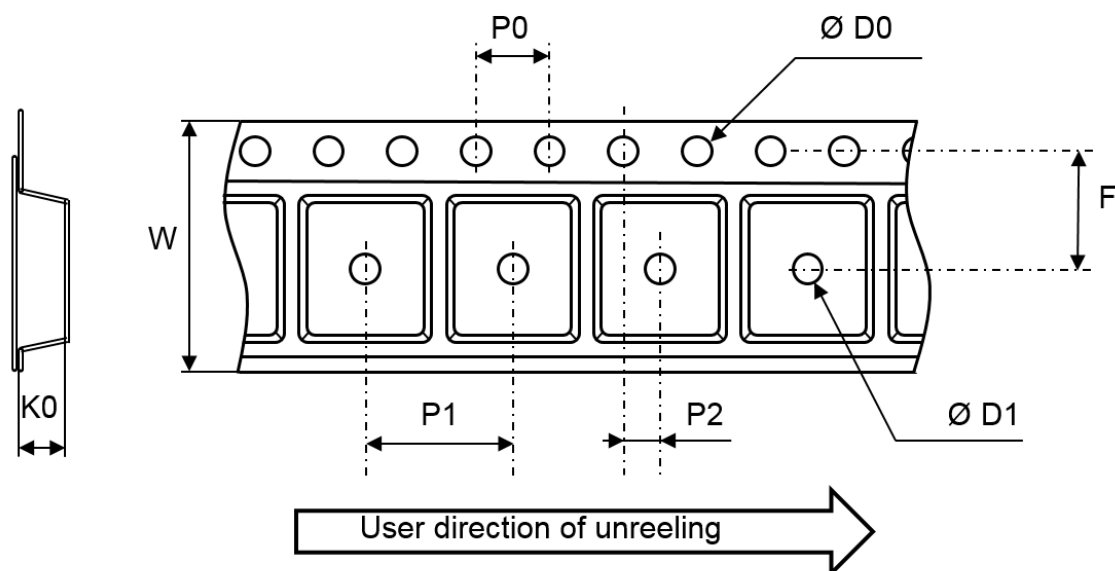


Figure 17. Tape and reel outline


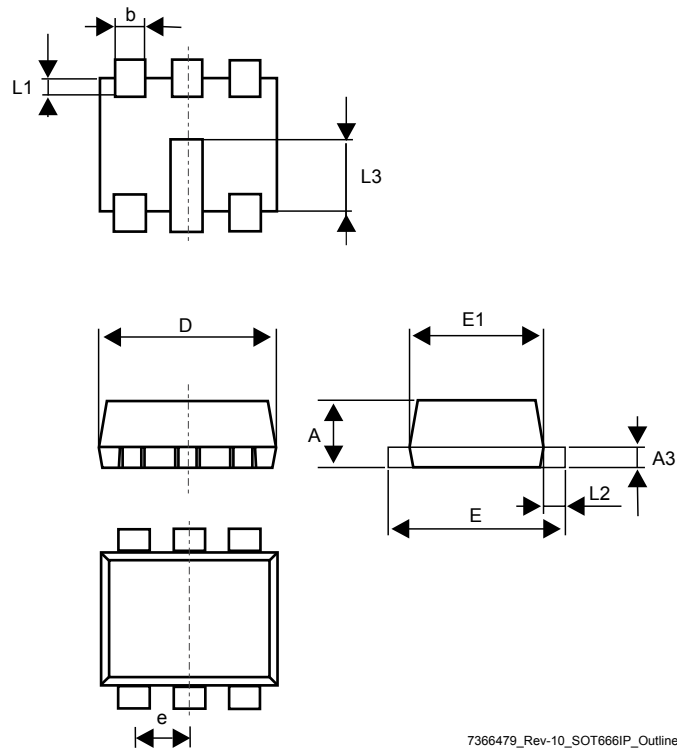
Note: Pocket dimensions are not on scale
 Pocket shape may vary depending on package

Table 4. Tape and reel mechanical data

Ref.	Dimensions		
	Millimeters		
	Min.	Typ.	Max.
P1	3.9	4	4.1
P0	3.9	4	4.1
D0	1.45	1.5	1.6
D1	1		
F	3.45	3.5	3.55
K0	1.3	1.4	1.6
P2	1.95	2	2.05
W	7.9	8	8.3

2.2 SOT666IP package information

Figure 18. SOT666IP package outline



7366479_Rev-10_SOT666IP_Outline

Table 5. SOT666 package mechanical data

Ref.	Dimensions					
	Millimeters			Inches ⁽¹⁾		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.45		0.62	0.018		0.025
A3	0.08		0.18	0.003		0.007
b	0.17		0.34	0.007		0.013
D	1.50		1.70	0.059		0.067
E	1.50		1.70	0.059		0.067
E1	1.10		1.30	0.043		0.051
e		0.50			0.020	
L1		0.19			0.007	
L2	0.10		0.30	0.004		0.012
L3		0.6			0.024	

1. Value in inches are converted from mm and rounded to 3 decimal digits

Figure 19. Footprint recommendations, dimensions in mm

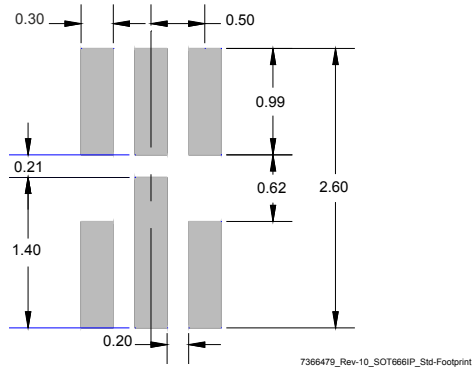


Figure 20. Marking layout (refer to ordering information table for marking)

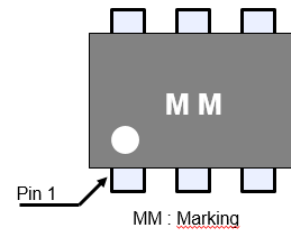
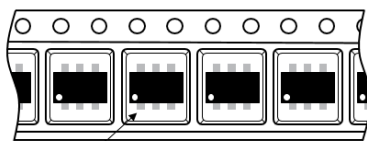


Figure 21. Package orientation in reel



Note:
Pin 1 located according to EIA-481
Pocket dimensions are not on scale
Pocket shape may vary depending on package

Figure 22. Tape and reel orientation

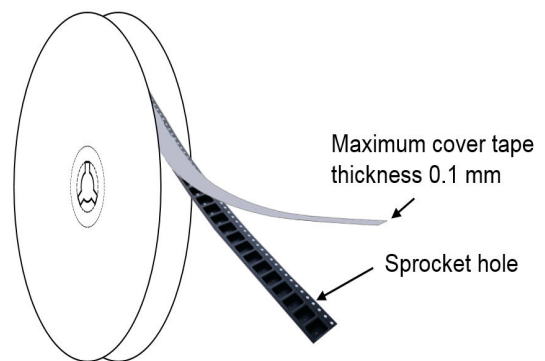


Figure 23. Reel dimensions (mm)

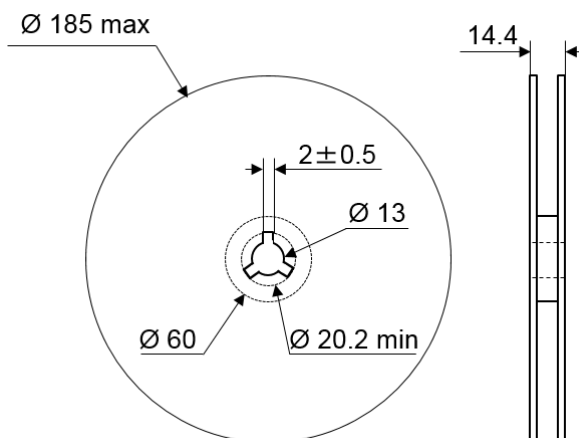


Figure 24. Inner box dimensions (mm)

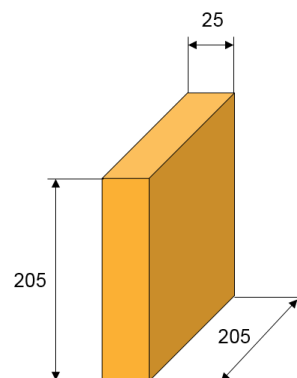
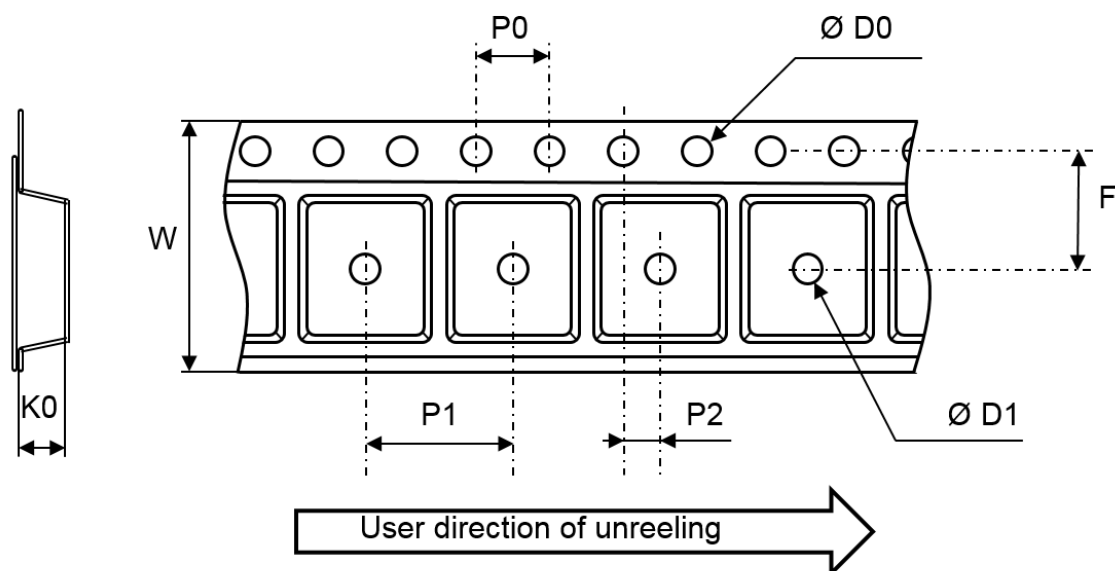


Figure 25. Tape and reel outline


Note: Pocket dimensions are not on scale
 Pocket shape may vary depending on package

Table 6. Tape and reel mechanical data

Ref.	Dimensions		
	Millimeters		
	Min.	Typ.	Max.
D0	1.5	1.55	1.6
D1	1		
F	3.45	3.5	3.55
K0	0.64	0.69	0.73
P0	3.9	4	4.1
P1	3.9	4	4.1
P2	1.95	2	2.05
W	7.9	8	8.3

3 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
ESDA6V1P6	B	SOT666IP	2.9 mg	3000	Tape and reel
ESDA6V1-5P6	C				
ESDA14V2BP6	A	SOT666			
ESDA25-4BP6	V				

Revision history

Table 8. Document revision history

Date	Version	Changes
07-Feb-2006	1	ESDA6V1P6, ESDA6V1-5P6 and ESDA14V2BP6: datasheets merged. ECOPACK statement added. Some curves combined.
26-Jun-2006	2	Reformatted to current standards. Modified package information to show both SOT666 and SOT666IP.
22-May-2007	3	Added product ESDA25-4BP6.
25-Sep-2019	4	Updated <i>Table 1</i> and title description.
22-Jun-2020	5	Updated <i>Table 2</i> .
26-Aug-2022	6	Updated <i>Table 2</i> .
16-Jun-2025	7	Updated Section Description . Updated , Section 2.1: SOT666 package information and Section 2.2: SOT666IP package information . Document reworked to improve readability.

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