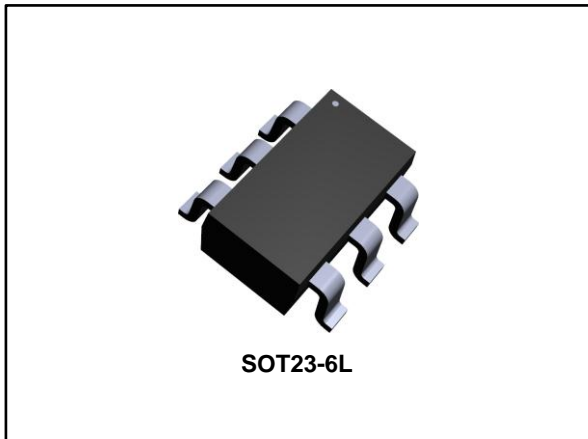


## Automotive-grade 5-line transient voltage suppressor (TVS) for ESD protection

Datasheet - production data



### Applications

This device is used to protect equipment in which ESD and EOS transient overvoltage may damage electronic circuits.

### Description

This device is a monolithic voltage suppressor designed to protect components connected to data and transmission lines against ESD.

It clamps the voltage just above the logic level supply for positive transients, and to a diode drop below ground for negative transients.

### Features

- AEC-Q101 qualified
- 5 unidirectional TVS functions
- UL 94 V-0
- J-STD-020 MSL level 1



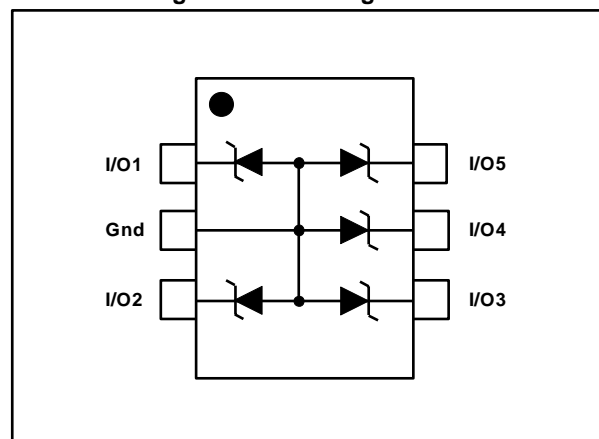
### Benefits

- Suitable for high density boards

### Complies with the following standards

- ISO 10605 / IEC 61000-4-2: C = 150 pF, R = 330 Ω
  - 30 kV (air discharge)
  - 18 kV (contact discharge)
- ISO 10605: C = 330 pF, R = 330 Ω
  - 20 kV (air discharge)
  - 13 kV (contact discharge)
- ISO 7637-3
  - Pulse 3a:  $V_s = -150\text{ V}$
  - Pulse 3b:  $V_s = +100\text{ V}$

Figure 1: Pin configuration

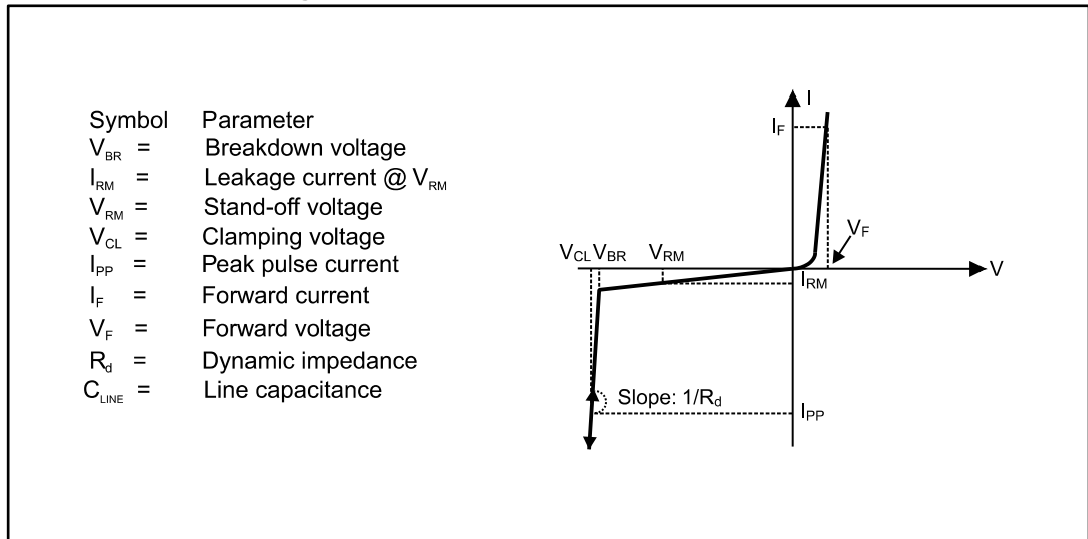


# 1 Characteristics

**Table 1: Absolute ratings (Tamb = 25 °C)**

Symbol	Parameter		Value	Unit
V <sub>pp</sub>	Peak pulse voltage	ISO 10605 / IEC 61000-4-2 (C = 150 pF, R = 330 Ω)	30	kV
		Contact discharge	18	
		Air discharge		
		ISO10605 (C = 330 pF, R = 330 Ω)	20	
		Contact discharge	13	
		Air discharge		
I <sub>pp</sub>	Peak pulse current	8/20µs	7	A
P <sub>pp</sub>	Peak pulse power		80	W
T <sub>stg</sub>	Storage temperature range		-65 to +150	°C
T <sub>j</sub>	Operating junction temperature range		-40 to +150	
T <sub>L</sub>	Maximum temperature for soldering during 10 s		260	

**Figure 2: Electrical characteristics (definitions)**



**Table 2: Electrical characteristics - values (Tamb = 25 °C)**

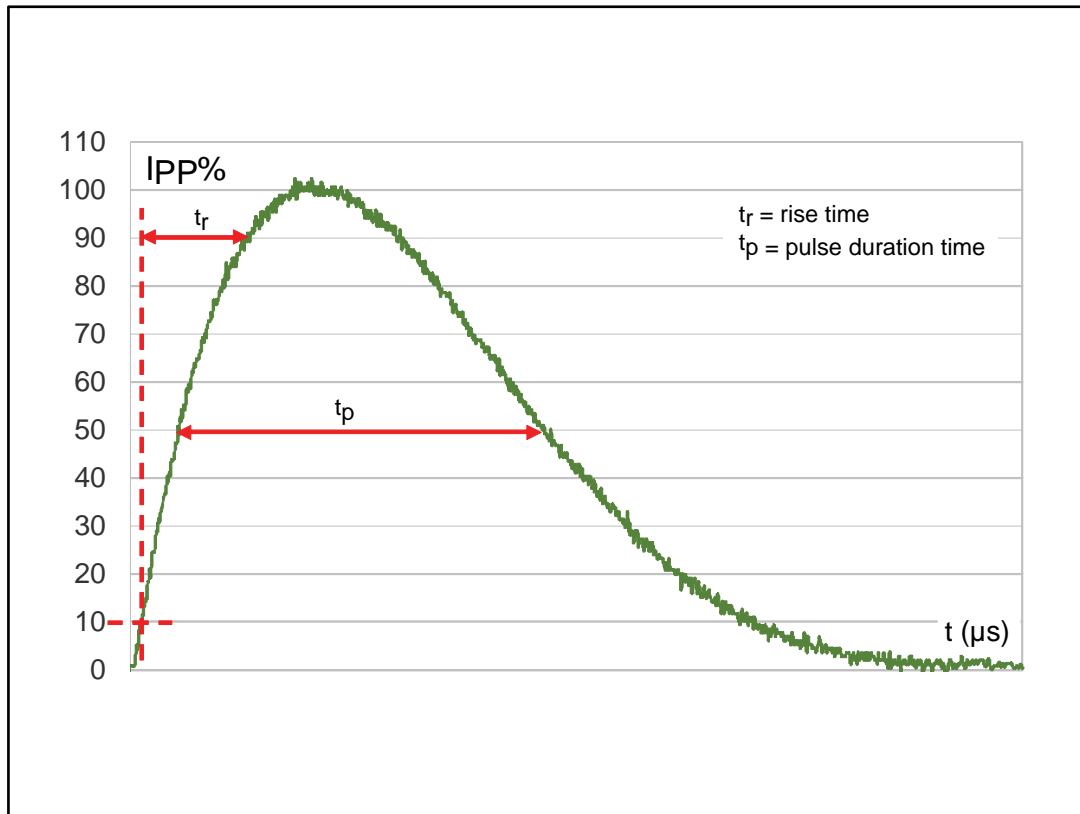
Order code	V <sub>BR</sub> at I <sub>R</sub>		I <sub>RM</sub> at V <sub>RM</sub>		V <sub>CL</sub> at I <sub>pp</sub> <sup>(1)</sup>		V <sub>F</sub> at I <sub>F</sub>		αT <sup>(2)</sup>	C <sub>line</sub>	
	Min.	Max.	Max.		Max.		Max.		Max.	Typ.	
	V	V	mA	µA	V	V	A	V	mA	10 <sup>-4</sup> /C	pF
ESDA6V1-5SC6Y	6.1	7.2	1	1	5.2	11.4	7	1.25	200	6	50

**Notes:**

<sup>(1)</sup>8/20 µs waveform

<sup>(2)</sup>V<sub>BR</sub> at T<sub>j</sub> = V<sub>BR</sub> at 25 °C x (1 + αT x (T<sub>j</sub> - 25))

Figure 3: Pulse definition for electrical characteristics



# 1.1 Characteristics (curves)

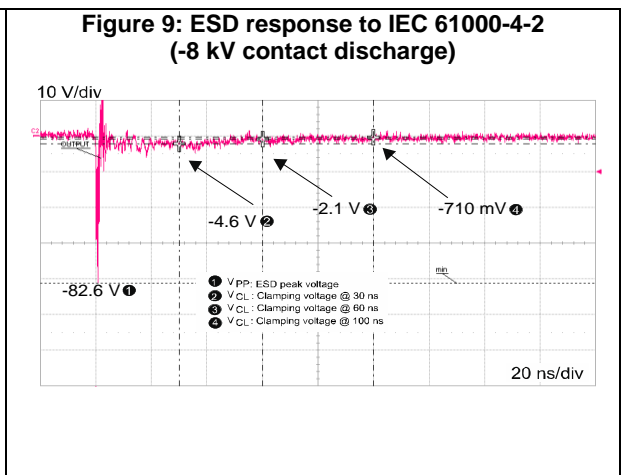
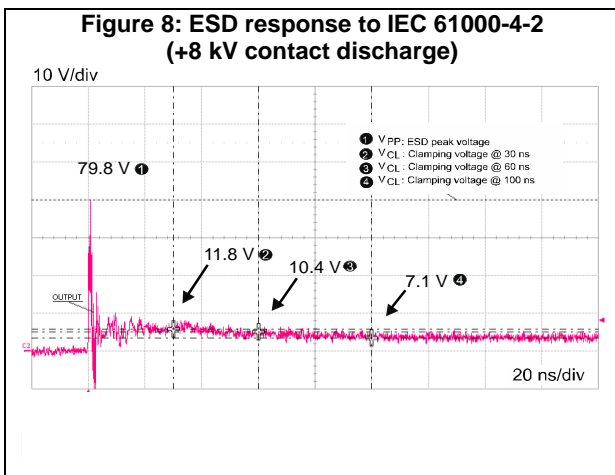
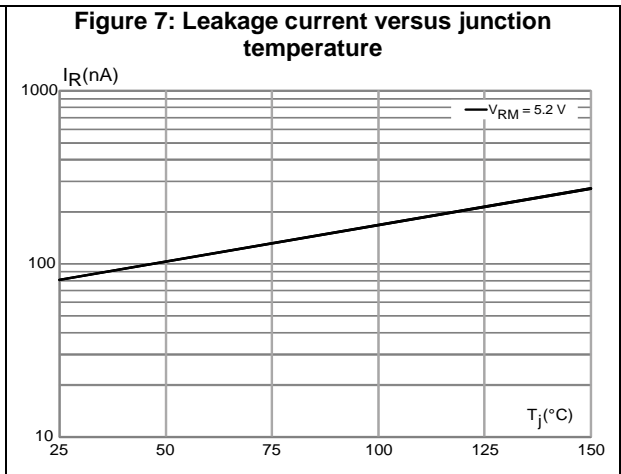
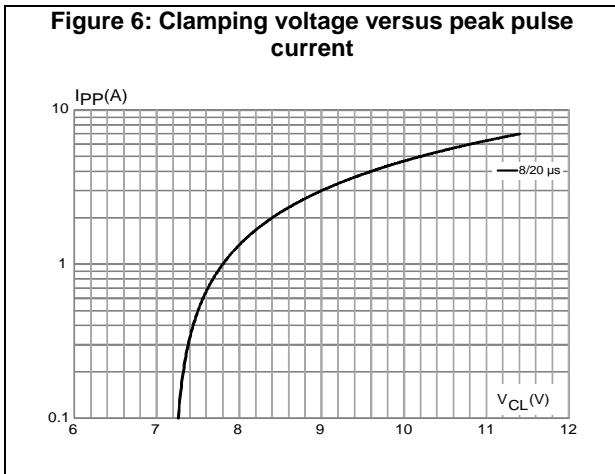
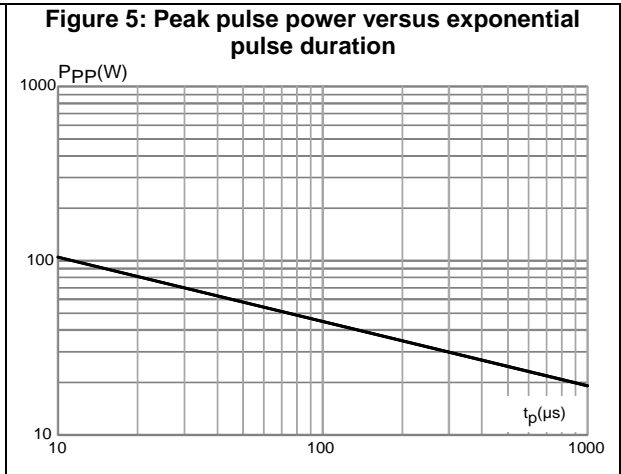
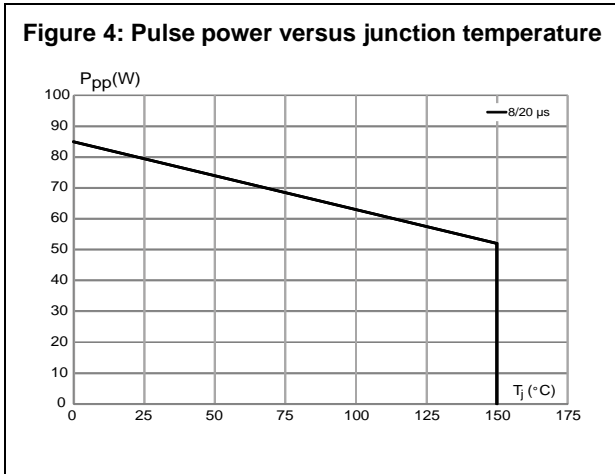


Figure 10: ISO7637-3 pulse 3a response ( $V_s = -150\text{ V}$ )

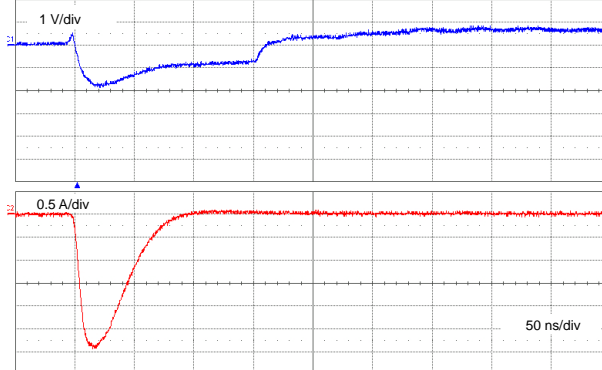
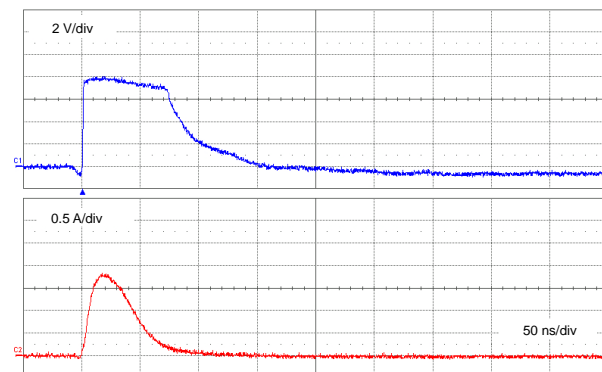


Figure 11: ISO7637-3 pulse 3b response ( $V_s = 100\text{ V}$ )



## 2 Application and design guidelines

Further information can be found in AN2689 titled: "Protection of automotive electronics from electrical hazards, guidelines for design and component selection".

### 3 Package information

In order 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](http://www.st.com). ECOPACK® is an ST trademark.

- Epoxy meets UL 94,V0
- Lead-free package

#### 3.1 SOT23-6L package information

Figure 12: SOT23-6L package outline

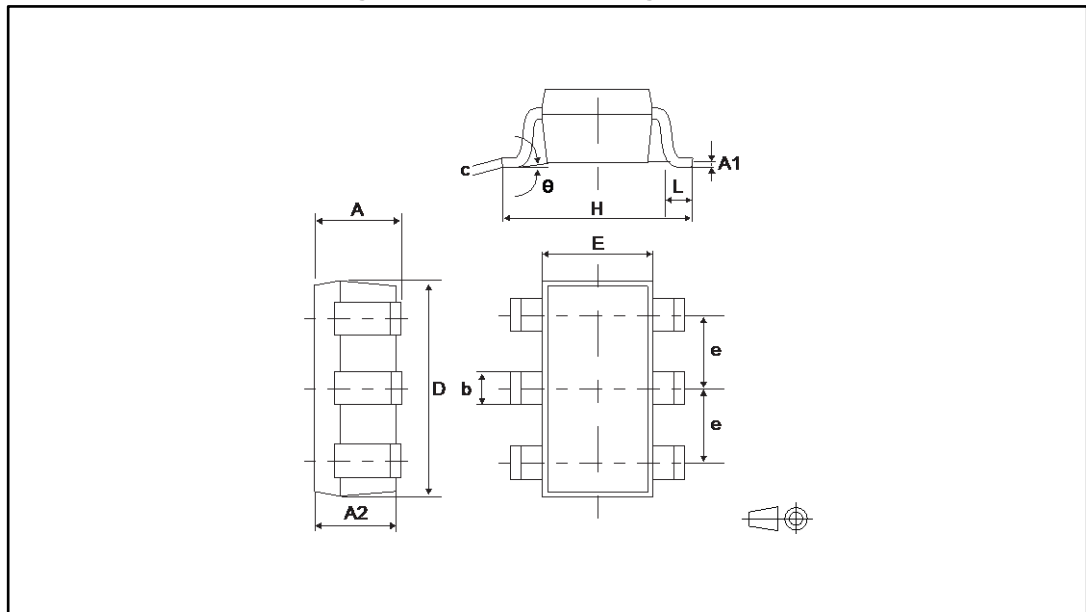


Table 3: SOT23-6L package mechanical data

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.9		1.45	0.0354		0.0571
A1	0		0.15	0		0.0059
A2	0.9		1.3	0.0354		0.0512
b	0.30		0.5	0.0118		0.0197
c	0.09		0.2	0.0035		0.0079
D	2.8		3.05	0.1102		0.1201
E	1.5		1.75	0.0591		0.0689
e		0.95			0.0374	
H	2.6		3	0.1024		0.1181
L	0.3		0.6	0.0118		0.0236
θ	0		10	0		0.3937

Figure 13: Footprint recommendations, dimensions in mm (inches)

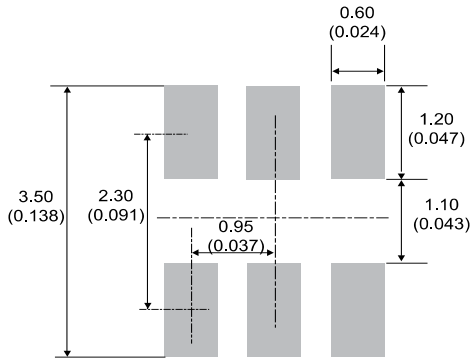


Figure 14: Marking layout (refer to ordering information table for marking)

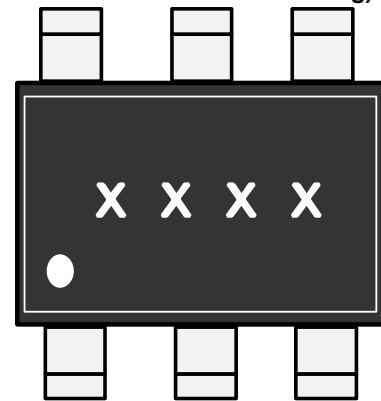
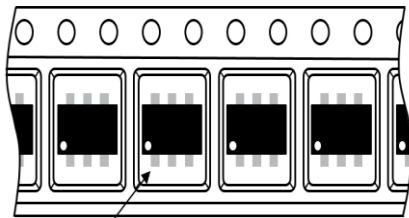


Figure 15: Package orientation in reel



Pin 1 located according to EIA-481

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

Figure 16: Tape and reel orientation

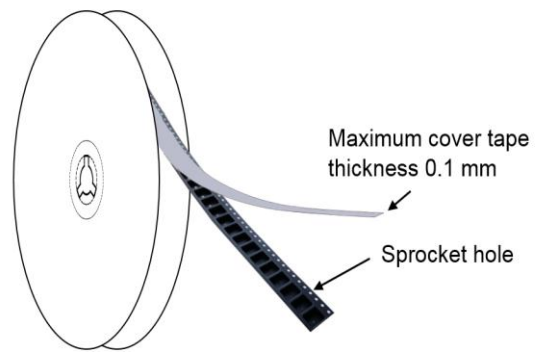


Figure 17: Reel dimensions (mm)

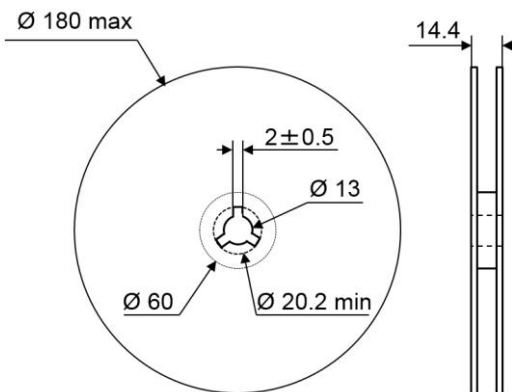


Figure 18: Inner box dimensions (mm)

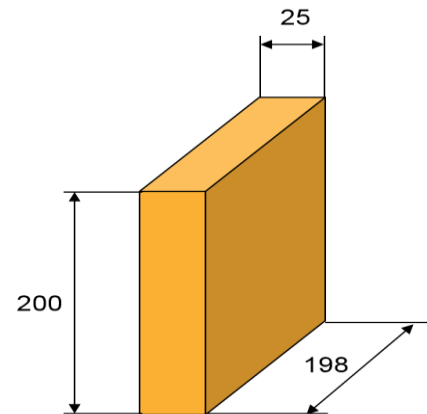




Figure 19: Tape and reel outline

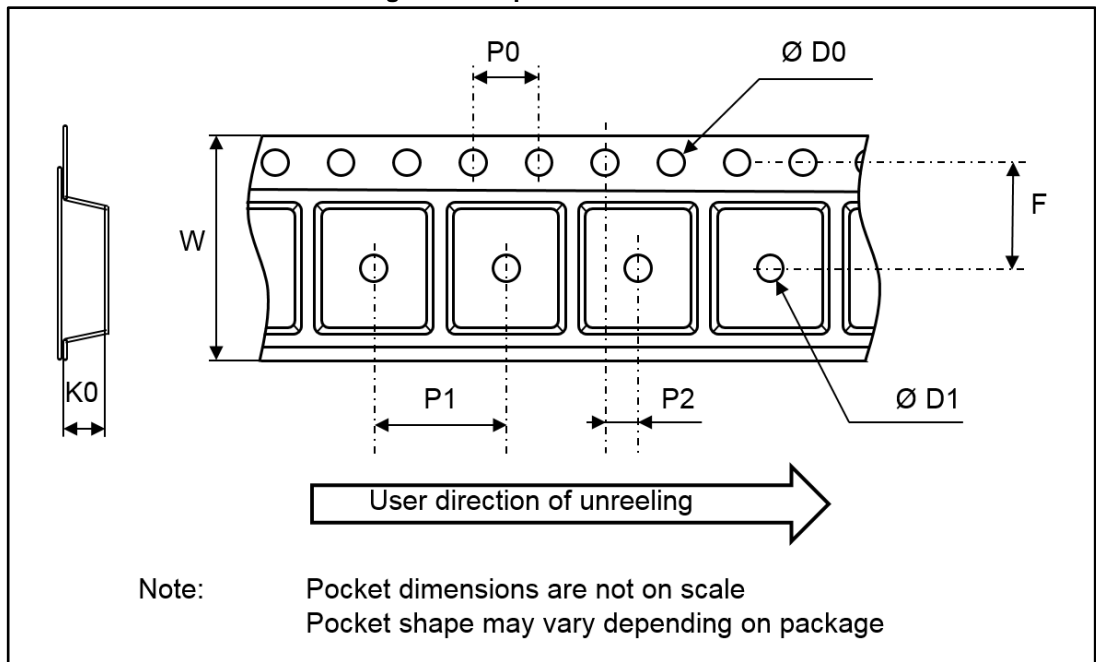


Table 4: Tape and reel mechanical data

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

## 4 Ordering information

Figure 20: Ordering information scheme

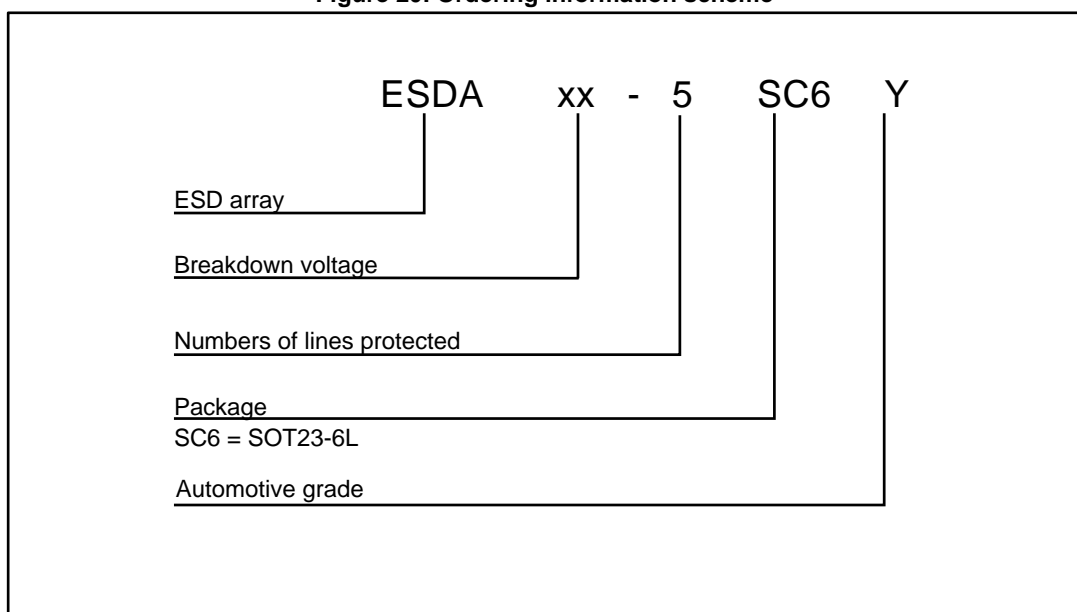


Table 5: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
ESDA6V1-5SC6Y	EC6Y	SOT23-6L	14 mg	3000	Tape and reel

## 5 Revision history

**Table 6: Document revision history**

Date	Revision	Changes
08-Nov-2016	1	Initial release.
15-Mar-2017	2	Updated title and description in cover page. Minor text changes to improve readability.
03-May-2017	3	Formatting improvement, no content changes.

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