1 Characteristics

Table 1. Absolute ratings (T_{amb} = 25 °C)

Symbol	Parameter			Value	Unit
V_{PP}	Peak pulse voltage	ISO 10605 - C = 150 pF, R = 330 Ω: Contact discharge Air discharge		30 30	kV
		ISO 10605 - C = 330 pF, R = 330 Ω: Contact discharge Air discharge	ESDCAN24-2BLY ESDCAN01-2BLY ESDCAN04-2BLY	30 30	
		ISO 10605 - C = 330 pF, R = 330 Ω: Contact discharge Air discharge	ESDCAN06-2BLY	22 22	
I_{PP}	Peak pulse current (8/20 µs)		ESDCAN24-2BLY ESDCAN01-2BLY	5.5	A
			ESDCAN04-2BLY	3.7	
			ESDCAN06-2BLY	3	
T_j	Operating junction temperature range			-40 to +150	°C
T_{stg}	Storage temperature range			-55 to +150	°C

Figure 1. Electrical characteristics (definitions)

Symbol		Parameter
V_{BR}	=	Breakdown voltage
V_{RM}	=	stand-off voltage
V_{CL}	=	Clamping voltage
I_{RM}	=	Leakage current at V_{RM}
I_{PP}	=	Peak pulse current
R_d	=	Dynamic impedance
C_{LINE}	=	Input capacitance per line
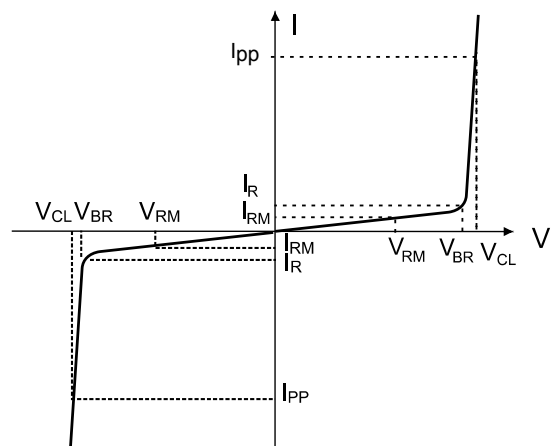
Table 2. **Electrical characteristics (values, T_{amb} = 25 °C)**

| Order code	I_{RM} max. at V_{RM}		V_{BR} at I_R			V_{CL} Pulse ISO7637-3		V_{CL} at I_{PP} (8/20 μs)		C		$\Delta C^{(1)}$	$\alpha T^{(2)}$
			Min.	Max.		3a at -150 V min.	3b at +150 V max.	Max.		Typ.	Max.	Typ.	Typ.
	μA	V	V		mA	V		V	A	pF		pF	10^{-4}/°C
ESDCAN24-2BLY	0.1	24	27	32	1	-40	40	43	5	-	30	0.1	9
ESDCAN01-2BLY	0.1	24	25	30	1	-35	35	40	5	-	30	0.1	9
ESDCAN04-2BLY	0.05	25.5	27.5	30.7	1	-35	35	43	3	17	19	0.1	9
ESDCAN06-2BLY	0.1	35	38	42.2	1	-44	44	59	3	13	15	0.1	9

1. *ΔC : capacitance variation between IO1 and IO2 versus GND*

2. *to calculate V_{BR} versus T_j: V_{BR} at T_j = V_{BR} at 25 °C x (1 + αT x (T_j - 25))*
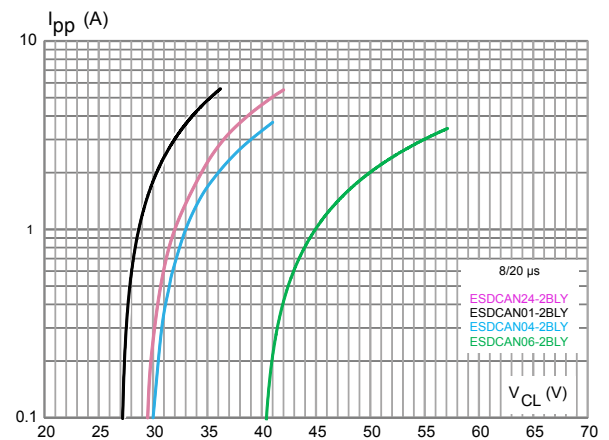
1.1 Characteristics (curves)

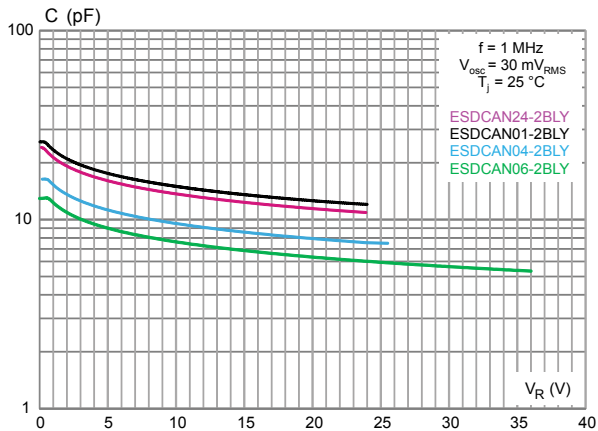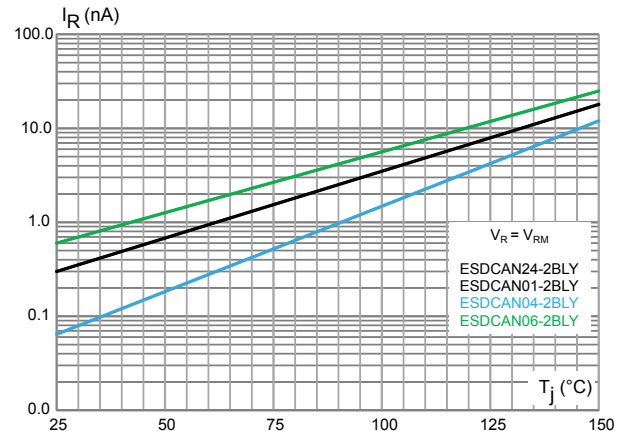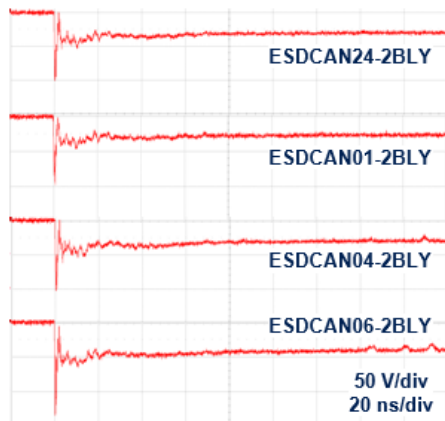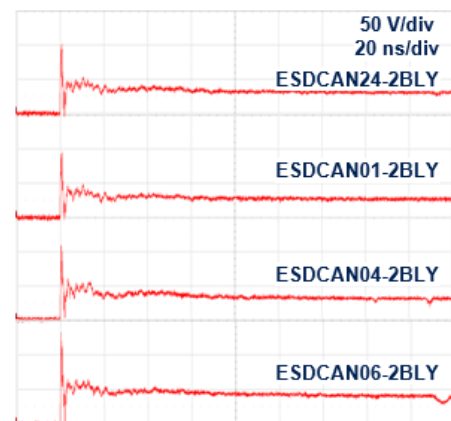**Figure 2. Maximum peak current versus initial junction temperature**
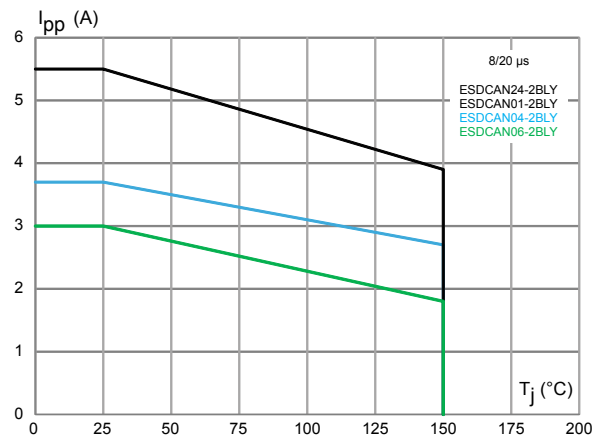
Figure 3. Maximum peak pulse current versus exponential pulse duration
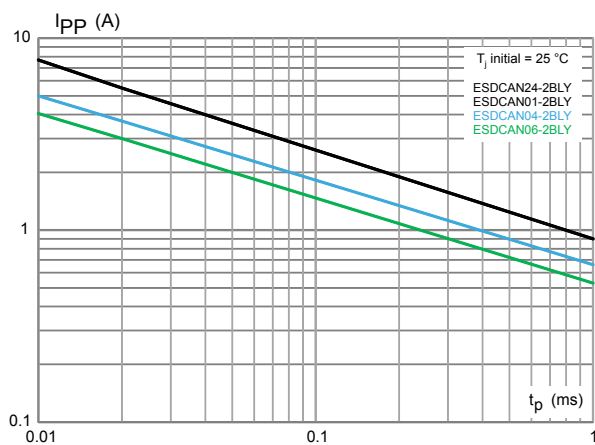
Figure 4. Clamping voltage versus peak pulse current

Figure 5. Junction capacitance versus reverse voltage

f = 1 MHz
V_{osc} = 30 mV$_{RMS}$
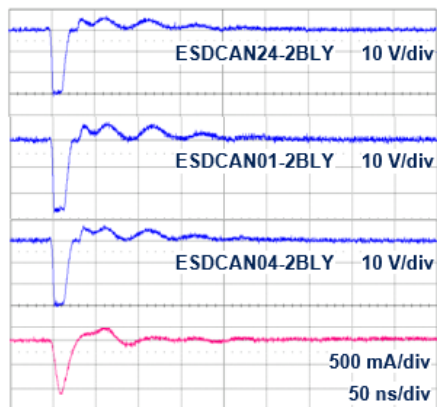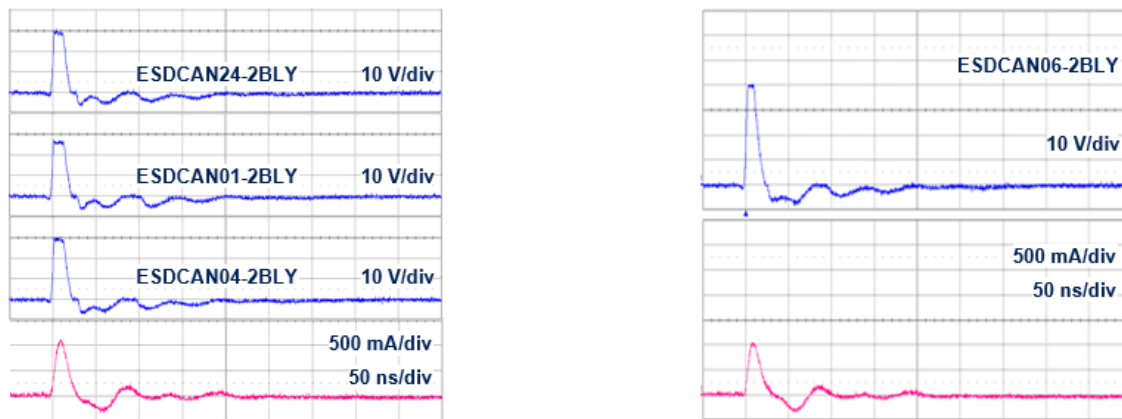T_j = 25 °C

ESDCAN24-2BLY
ESDCAN01-2BLY
ESDCAN04-2BLY
ESDCAN06-2BLY

Figure 6. Leakage current versus junction temperature

$V_R = V_{RM}$

ESDCAN24-2BLY
ESDCAN01-2BLY
ESDCAN04-2BLY
ESDCAN06-2BLY

Figure 7. Response to ISO 10605 -C = 150 pF, R = 330 Ω (-8 kV contact)

ESDCAN24-2BLY

ESDCAN01-2BLY

ESDCAN04-2BLY

ESDCAN06-2BLY

50 V/div
20 ns/div

Figure 8. Response to ISO 10605 - C = 150 pF, R = 330 Ω (+8 kV contact)

50 V/div
20 ns/div
ESDCAN24-2BLY

ESDCAN01-2BLY

ESDCAN04-2BLY

ESDCAN06-2BLY

Figure 9. Response to ISO 7637-3 Pulse 3a: -150 V

ESDCAN24-2BLY   10 V/div

ESDCAN01-2BLY   10 V/div

ESDCAN04-2BLY   10 V/div

500 mA/div
50 ns/div

ESDCAN06-2BLY

10 V/div

500 mA/div
50 ns/div
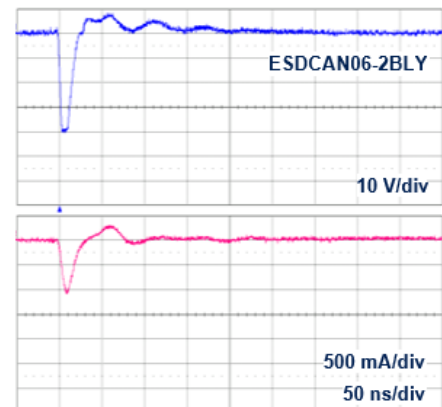
Figure 10. Response to ISO 7637-3 Pulse 3b : +150 V

Figure 11. Response to ISO 7637-3 pulse 2a: -85 V
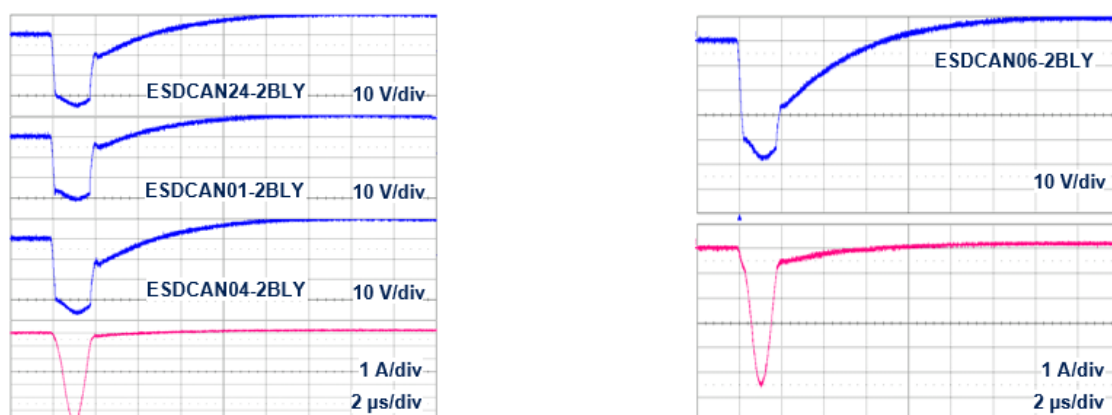
Figure 12. Response to ISO 7637-3 pulse 2a: +85 V
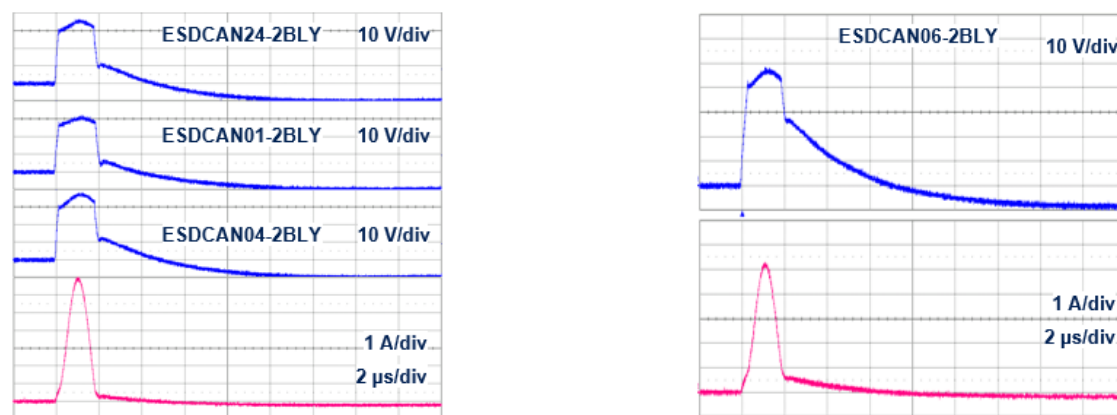
Figure 13. **S21 attenuation**
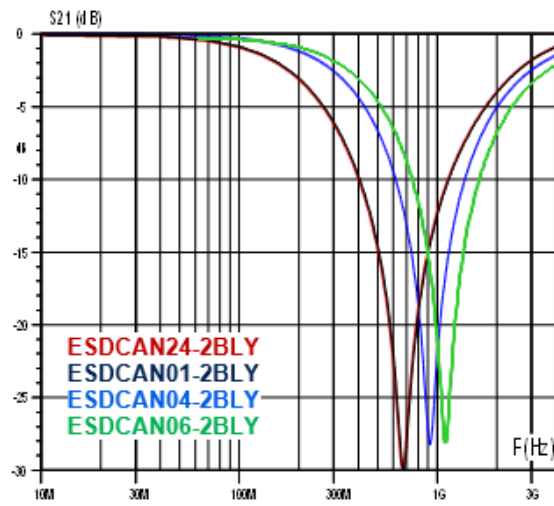
Figure 14. **TLP**
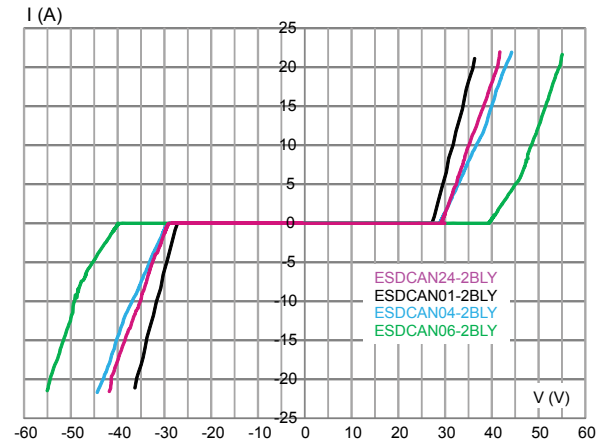
2 Package information

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. ECOPACK is an ST trademark.

## 2.1 SOT23-3L package information

Figure 15. SOT23-3L package outline
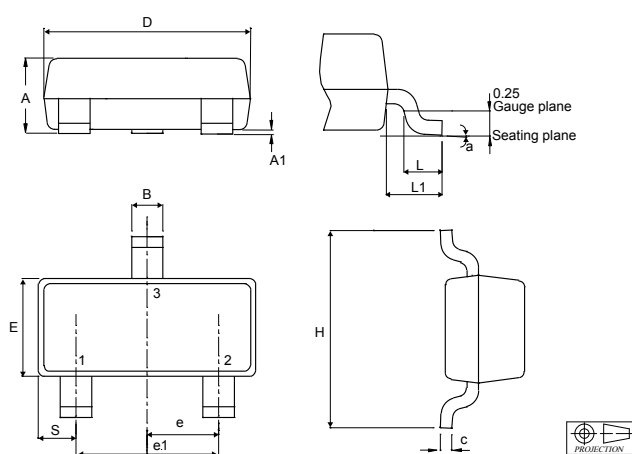

Table 3. SOT23-3L package mechanical data

Ref.	Dimensions					
	Millimeters			Inches[1]		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.89		1.25	0.0350		0.050
A1	0.00		0.15	0.0000		0.006
B	0.30		0.51	0.011		0.021
C	0.085		0.20	0.003		0.008
D	2.75		3.04	0.108		0.120
E	1.20		1.75	0.047		0.069
e	0.85	0.95	1.05	0.033	0.037	0.042
e1	1.70	1.90	2.10	0.066	0.075	0.083
H	2.10		3.00	0.082		0.119
L	0.25		0.61	0.009		0.025
L1		0.55			0.022	
S	0.35		0.65	0.013		0.026
a	0°		8°	0°		8°

1. Dimension in inches are given for reference only.

Figure 16. **SOT23-3L marking**

XXXX : Marking
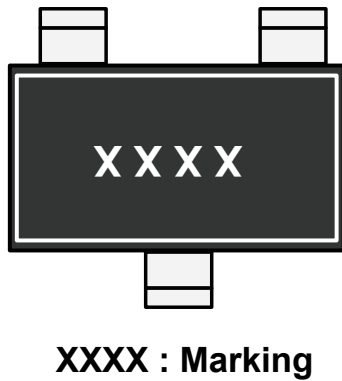
Figure 17. **SOT23-3L footprint in mm**
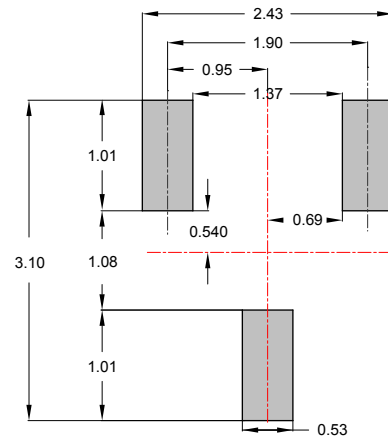
Figure 18. **Package orientation in reel**

Pin 1 located according to EIA-481

Note: Pocket dimensions are not on scale
Pocket shape may vary depending on package
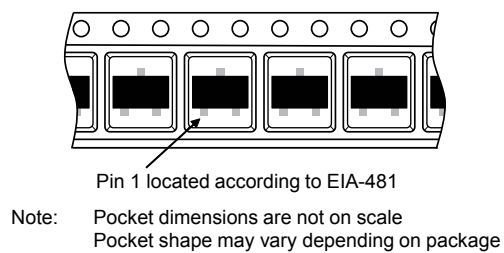
Figure 19. **Tape and reel orientation**

Maximum cover tape thickness 0.1 mm

Sprocket hole
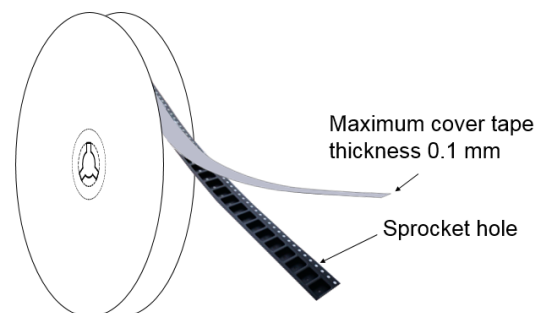
Figure 20. **7" reel dimension values**

Ø 180 max

14.4

2±0.5

Ø 13

Ø 60

Ø 20.2 min
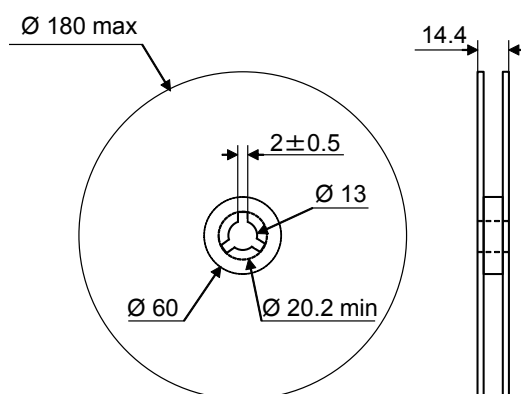
Figure 21. **Inner box dimension values**

30

205

205
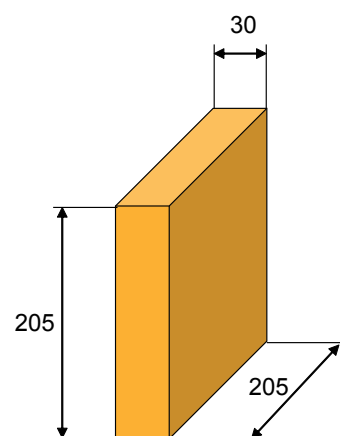
Figure 22. Tape outline
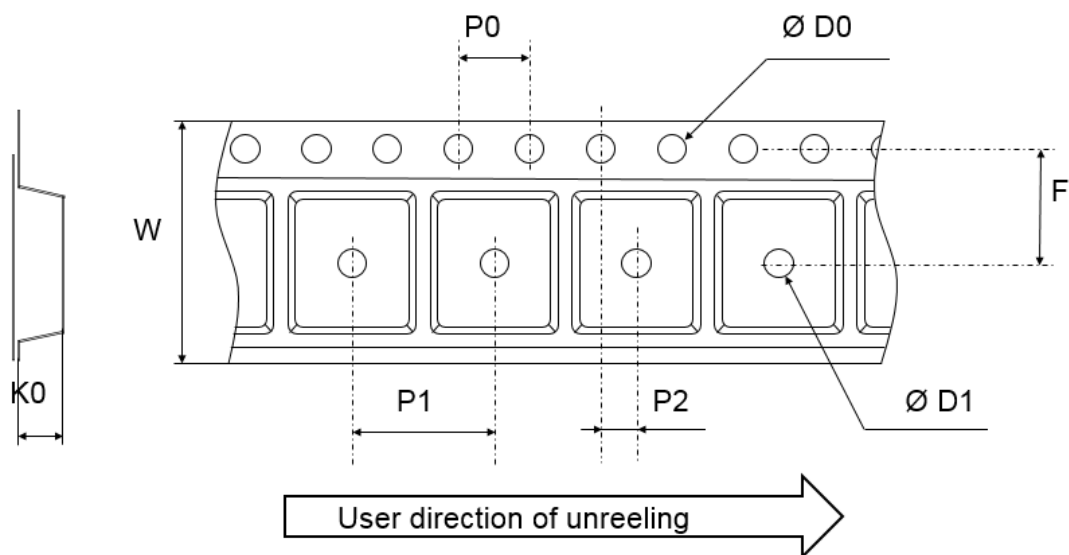
Note: Pocket dimensions are not on scale
Pocket shape may vary depending on package

Table 4. Tape dimension values

Ref.	Dimensions		
	Millimeters		
	Min.	Typ.	Max.
D0	1.45	1.5	1.6
D1	1		
F	3.45	3.5	3.55
K0	1.3	1.4	1.5
P0	3.9	4.0	4.1
P1	3.9	4.0	4.1
P2	1.95	2.0	2.05
W	7.9	8	8.3

3 Reflow profile
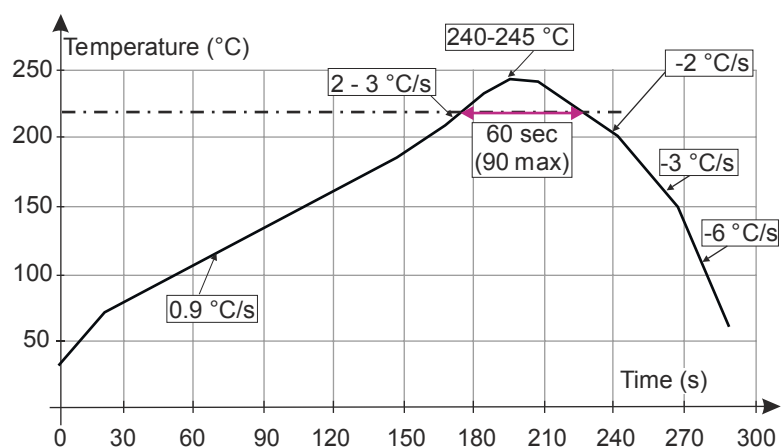
Figure 23. ST ECOPACK® recommended soldering reflow profile for PCB mounting

Note: *Minimize air convection currents in the reflow oven to avoid component movement. Maximum soldering profile corresponds to the latest IPC/JEDEC J-STD-020.*

4 Ordering information
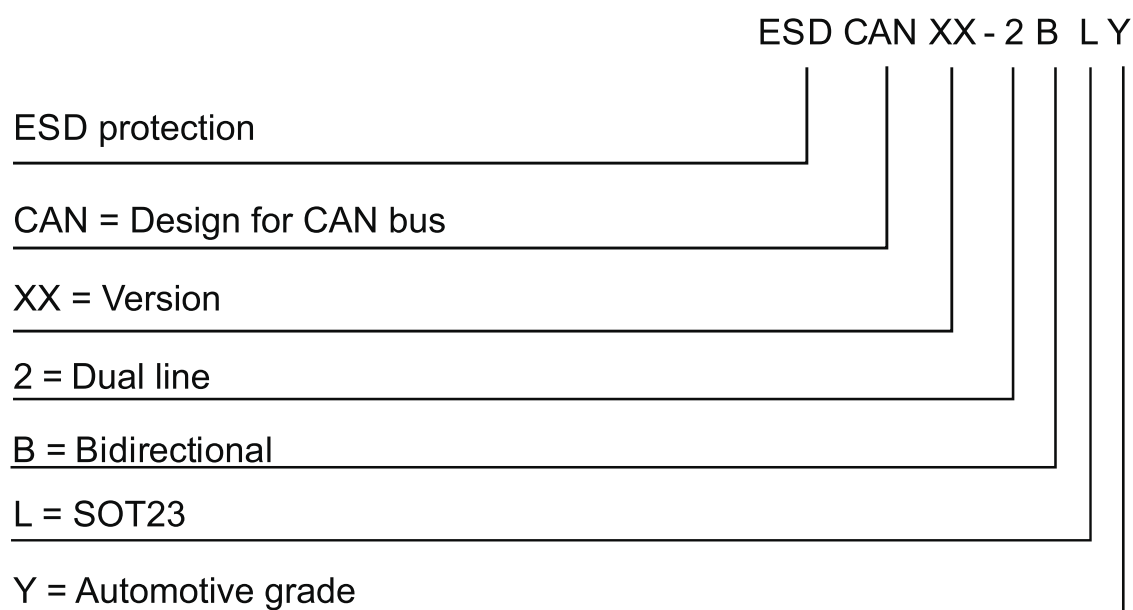
Figure 24. Ordering information scheme

ESD CAN XX - 2 B L Y

ESD protection

CAN = Design for CAN bus

XX = Version

2 = Dual line

B = Bidirectional

L = SOT23

Y = Automotive grade

Table 5. Ordering information

Order code	Marking[1]	Package	Weight	Base qty.	Delivery mode
ESDCAN24-2BLY	EL24	SOT23-3L	9.8 mg	3000	Tape and reel
ESDCAN01-2BLY	EN24				
ESDCAN04-2BLY	EC24				
ESDCAN06-2BLY	EC35				

1. *The marking can be rotated by multiples of 90° to differentiate assembly location*

Revision history

Table 6. Document revision history

Date	Revision	Changes
13-Jul-2015	1	First issue.
04-Oct-2018	2	Added RPN ESDCAN04-2BLY and ESDCAN06-2BLY. Updated cover page, Section 1 Characteristics and Section 1.1 Characteristics (curves). Added Packing information.
05-Apr-2019	3	Added typical pitch in Table 3 and updated Figure 17.

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