1 Characteristics

Table 2: Absolute maximum ratings (limiting values at T_{amb} = 25 °C unless otherwise specified)

Symbol	Parameter		Value	Unit
I_{pp}	Peak pulse current (8/20 µs)	T_j initial = T_{amb}	500	A
T_{stg}	Storage temperature range		-65 to +150	°C
T_j	Operating junction temperature range		-55 to +150	°C
T_L	Maximum lead temperature for soldering during 10 s.		260	°C

Table 3: Thermal resistances

Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction to leads	15	°C/W
$R_{th(j-a)}$	Junction to ambient on printed circuit on recommended pad layout	90	°C/W

Figure 1: Electrical characteristics (definitions)

Symbol Parameter
V_{RM} Stand-off voltage
V_{BR} Breakdown voltage at I_R
V_{CL} Clamping voltage
I_{RM} Leakage current at V_{RM}
I_{PP} Peak pulse current
αT Voltage temperature coefficient
V_F Forward voltage drop at I_F
R_D Dynamic resistance

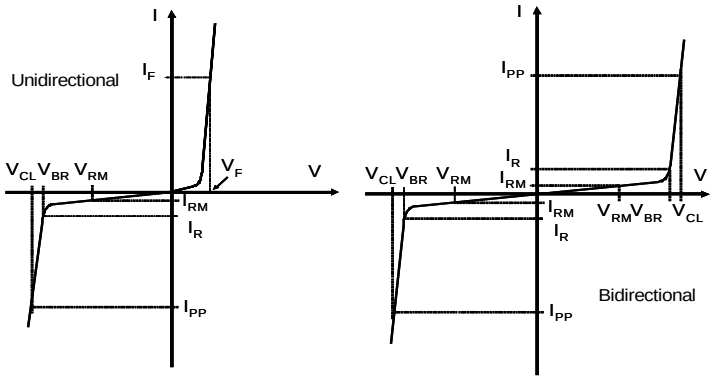


Table 4: Electrical characteristics (T_{amb} = 25 °C)

Order code	I_{RM} at V_{RM}			V_{BR} at I_R(1)				V_{CL} at I_{PP}(2) 1.2/50 µs - 8/20 µs		R_D(3) 8/20 µs	αT (4)
	25 °C	85 °C		Min.	Typ.	Max.		Max.		Typ.	Max.
	µA		V	V			mA	V	A	Ω	10-4/ °C
STIEC45-24AS/ACS	0.2	1	24	26.7	28.2	29.5	1	42	500	0.025	9.6
STIEC45-26AS/ACS	0.2	1	26	28.9	30.3	31.9	1	45	500	0.026	9.7
STIEC45-28AS/ACS	0.2	1	28	31.1	32.6	34.3	1	49	500	0.029	9.8
STIEC45-30AS/ACS	0.2	1	30	33.3	35	36.8	1	55	500	0.036	9.9
STIEC45-33AS/ACS	0.2	1	33	36.7	38.6	40.6	1	59	500	0.036	10

Notes:

(1)Pulse test : t_p < 50 ms.

(2)Surge capability given for both directions (unidirectional and bidirectional types).

(3)To calculate maximum clamping voltage at other surge levels: V_{CL}max = R_D x I_{PP} + V_{BR}max

(4)To calculate V_{BR} versus junction temperature: V_{BR} at T_j = V_{BR} at 25 °C x (1 + αT x (T_j – 25))

1.1 Characteristics (curves)

Figure 2: Pulse form

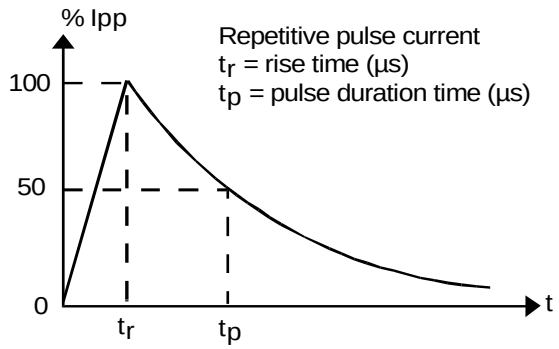


Figure 3: Peak pulse current versus initial junction temperature

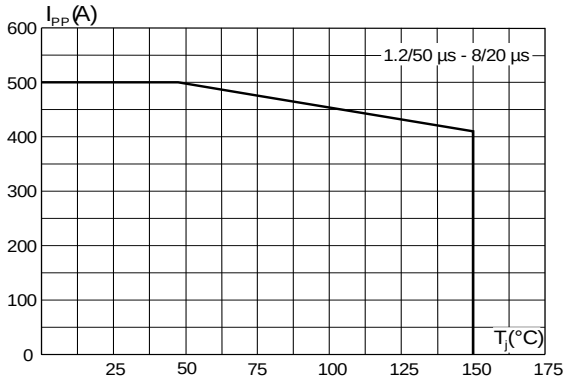


Figure 4: Clamping voltage at 500 A (1.2/50 µs - 8/20 µs)

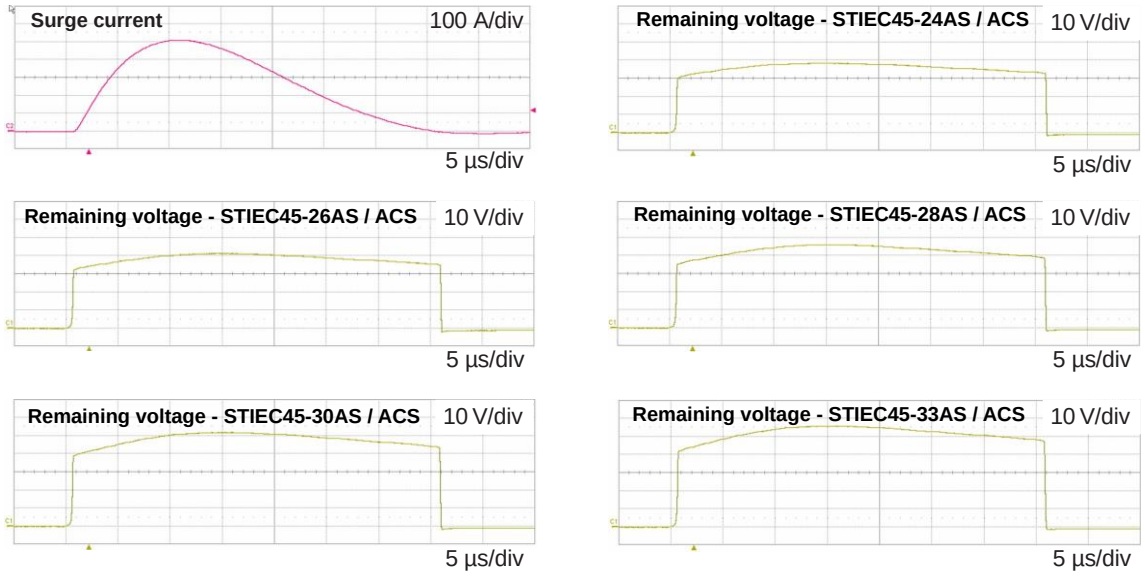


Figure 5: Junction capacitance versus reverse applied voltage (unidirectional devices)

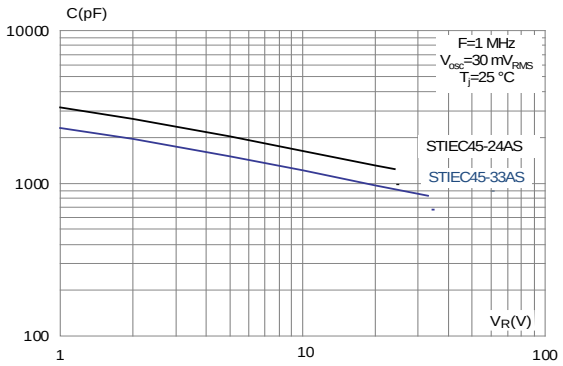


Figure 6: Junction capacitance versus reverse applied voltage (bidirectional devices)

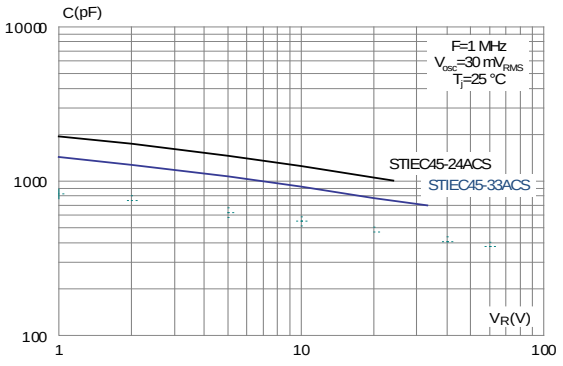


Figure 7: Peak forward voltage drop versus peak forward current (unidirectional devices)

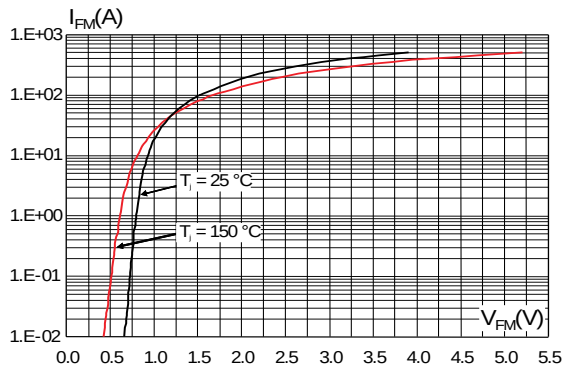


Figure 8: Leakage current versus junction temperature

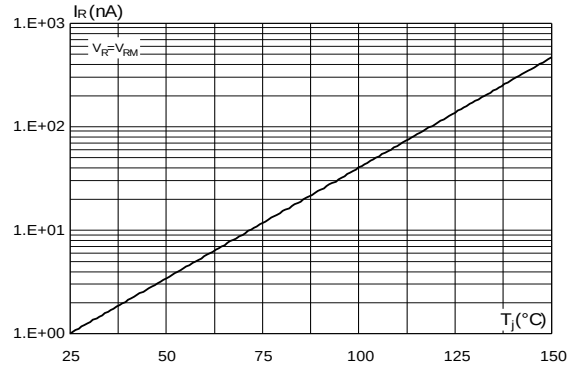


Figure 9: Relative variation of thermal impedance, junction to ambient, versus pulse duration

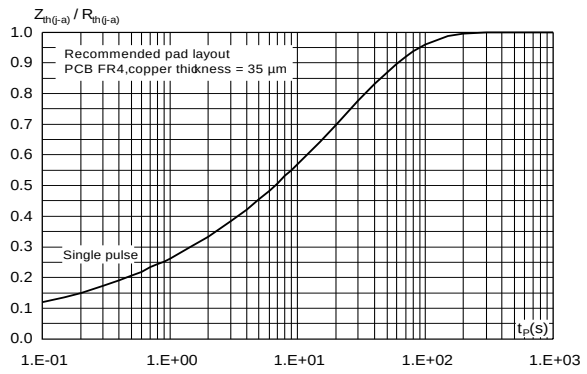
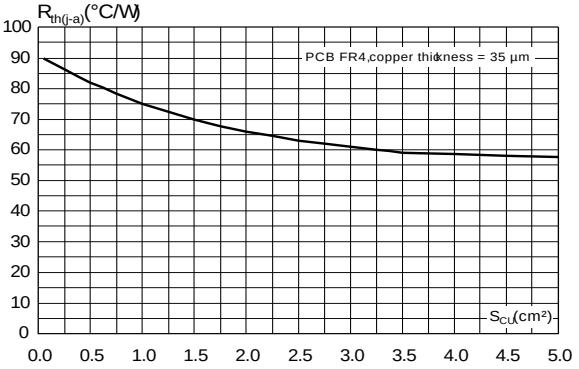


Figure 10: Thermal resistance junction to ambient versus copper surface under each lead



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 SMC package information

Figure 11: SMC package outline

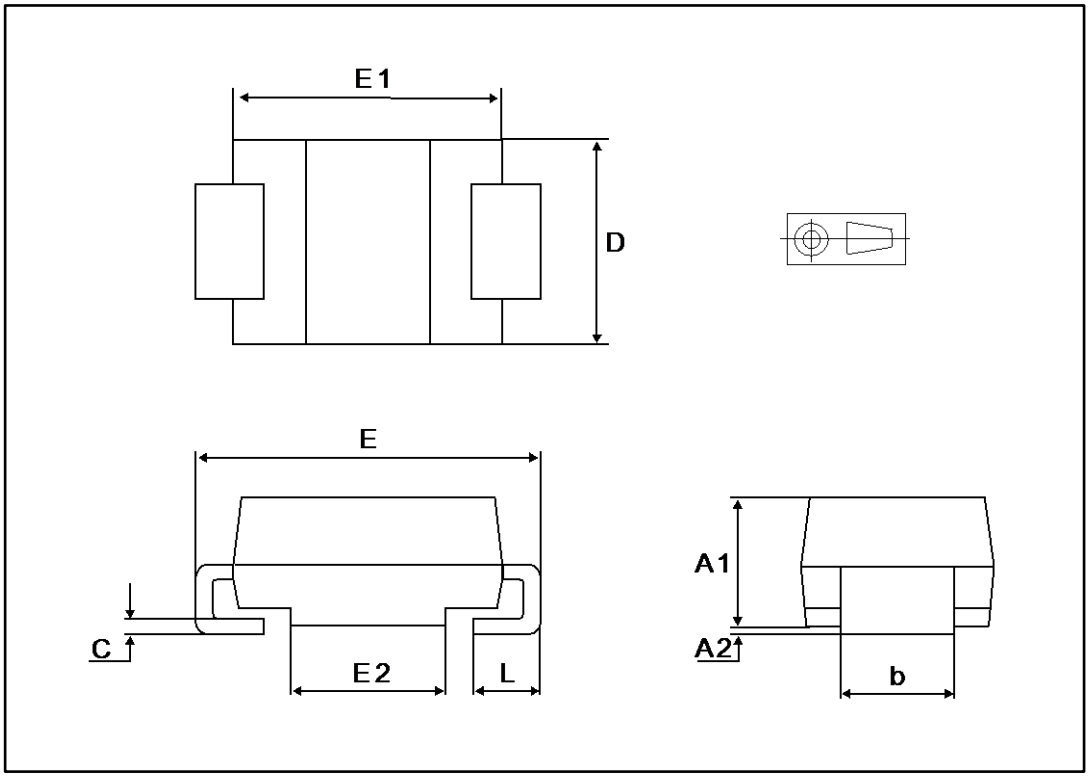


Table 5: SMC package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	2.90	3.20	0.114	0.126
c	0.15	0.40	0.006	0.016
D	5.55	6.25	0.218	0.246
E	7.75	8.15	0.305	0.321
E1	6.60	7.15	0.260	0.281
E2	4.40	4.70	0.173	0.185
L	0.75	1.50	0.030	0.060

Figure 12: Footprint recommendation, dimensions in mm (inches)

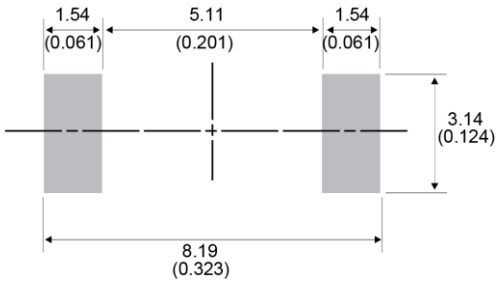
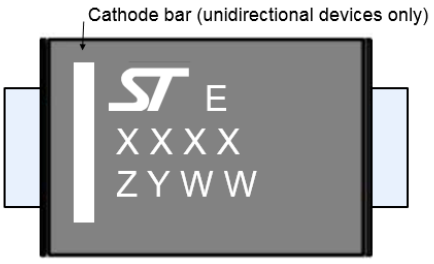
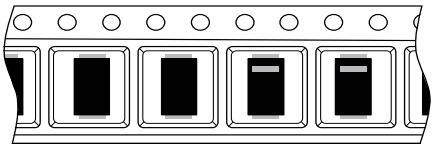


Figure 13: Marking layout



E : ECOPACK grade
XXXX : Marking
Z : Manufacturing location
Y : Year
WW : week

Figure 14: Package orientation in reel



Taped according to EIA-481
Note: Pocket dimensions are not on scale
Pocket shape may vary depending on package
On bidirectional devices, marking and logo may be not always in the same direction

Figure 15: Tape and reel orientation

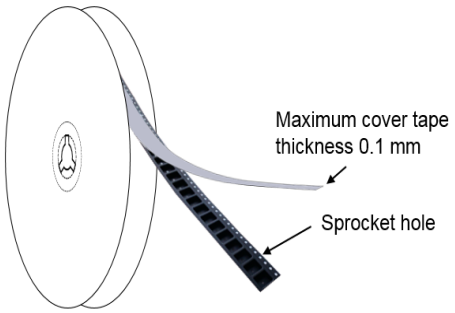


Figure 16: 13''reel dimensions (mm)

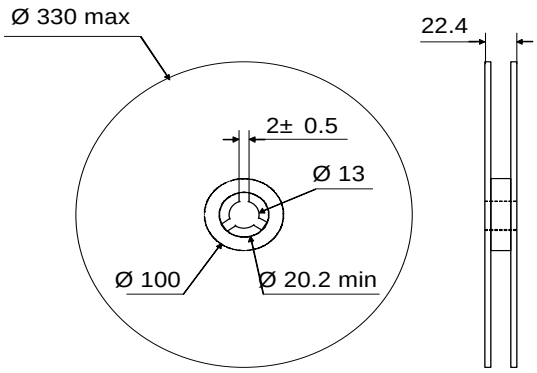


Figure 17: Inner box dimensions (mm)

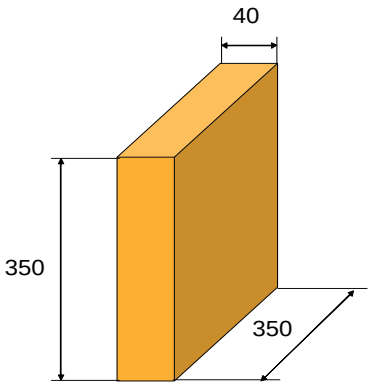
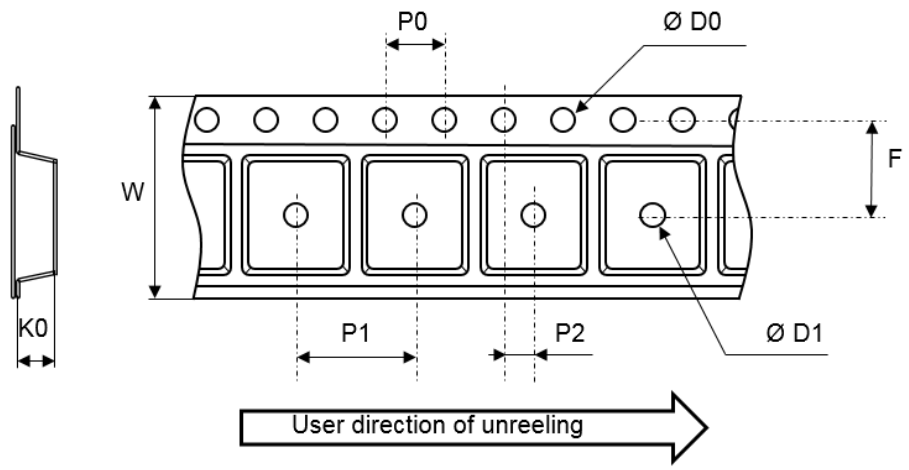


Figure 18: Tape and reel outline

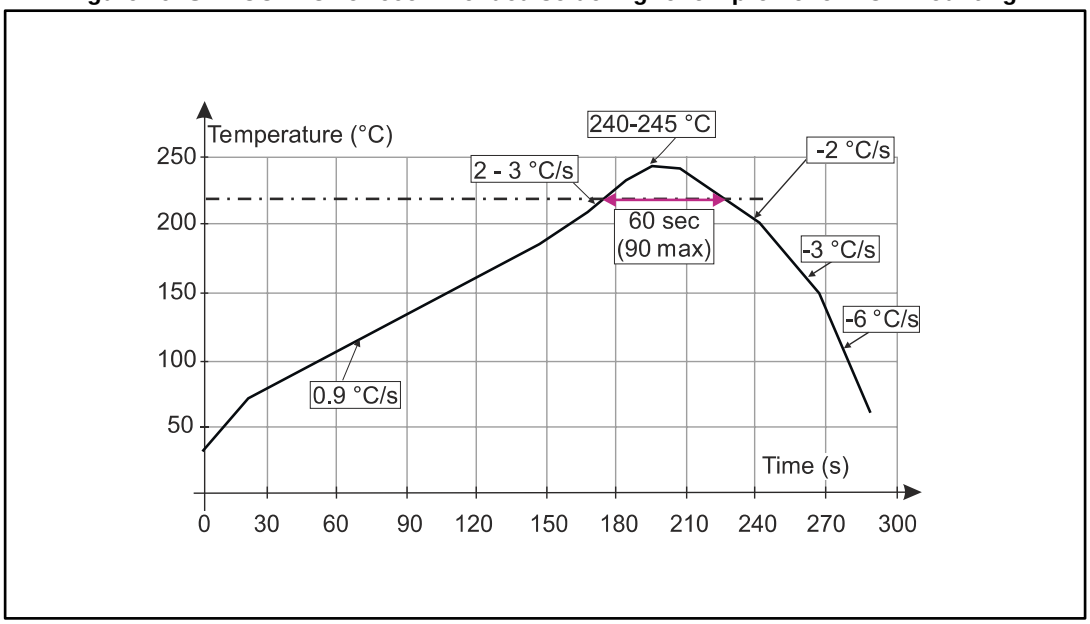


Note: Pocket dimensions are not on scale
Pocket shape may vary depending on package

Table 6: Tape and reel mechanical data

Ref.	Dimensions		
	Millimeters		
	Min.	Typ.	Max.
Ø D0	1.4	1.5	1.6
Ø D1	1.5	-	-
F	7.4	7.5	7.6
K0	2.39	2.49	2.59
P0	3.9	4.0	4.1
P1	7.9	8	8.1
P2	1.9	2	2.1
W	15.7	16	16.3

Figure 19: ST ECOPACK® recommended soldering reflow profile for PCB mounting



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

3 Ordering information

Figure 20: Ordering information scheme

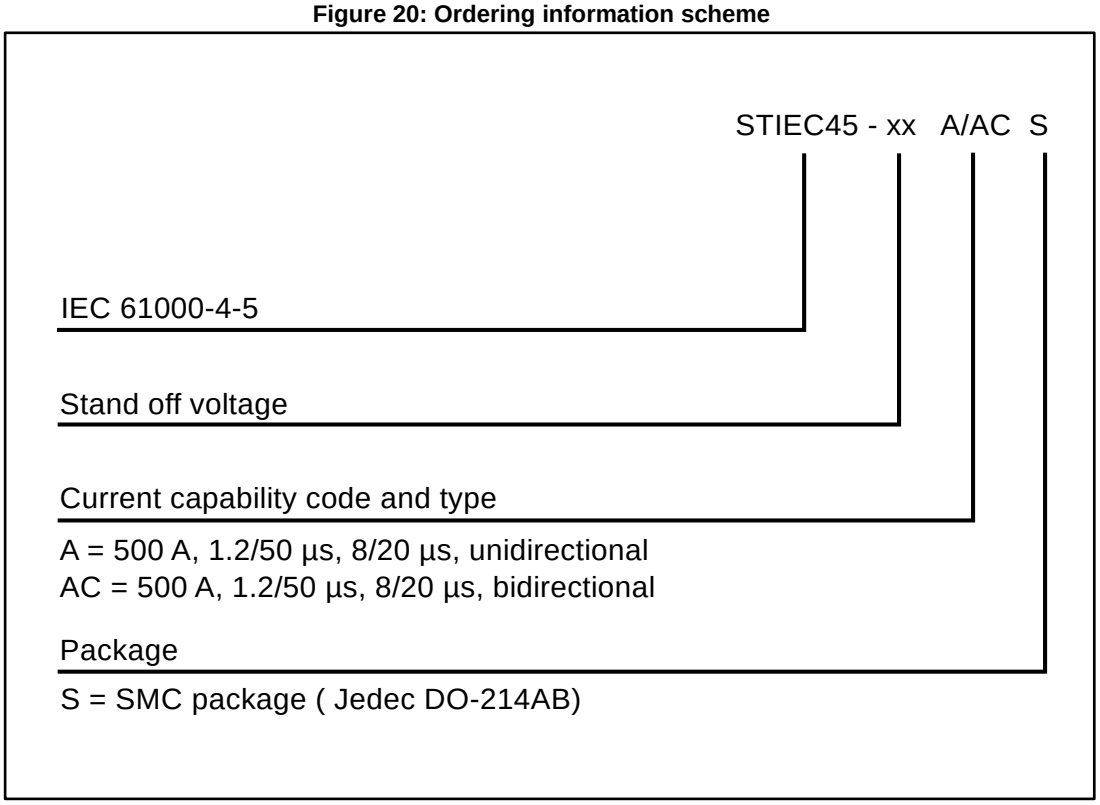


Table 7: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STIEC45-24AS	4524A	SMC	0.25 g	2500	Tape and reel
STIEC45-26AS	4526A				
STIEC45-28AS	4528A				
STIEC45-30AS	4530A				
STIEC45-33AS	4533A				
STIEC45-24ACS	4524C				
STIEC45-26ACS	4526C				
STIEC45-28ACS	4528C				
STIEC4530ACS	4530C				
STIEC45-33ACS	4533C				

4 Revision history

Table 8: Document revision history

Date	Revision	Changes
07-Dec-2017	1	First issue
11-Jan-2017	2	Added bidirectional types and updated stand-off voltage range from 24 V to 68 V.
13-Nov-2017	3	Updated SMC package information. Updated V_{RM} range from 24 V to 33 V.

5 Disclaimer

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