

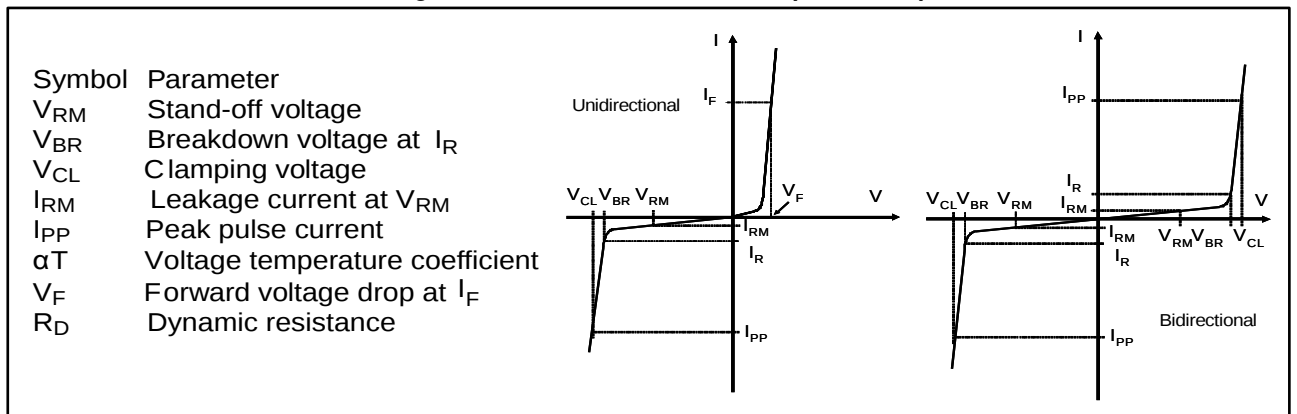
1 Characteristics

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

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

Table 3: Thermal resistances

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

Figure 1: Electrical characteristics (definitions)

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

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	$\alpha T^{(4)}$
	25 $^{\circ}\text{C}$	85 $^{\circ}\text{C}$		Min.	Typ.	Max.		Max.		Typ.	Max.
	μA		V	V			mA	V	A	Ω	10-4/ $^{\circ}\text{C}$
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 : $t_p < 50\text{ ms}$.

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

(3) To calculate maximum clamping voltage at other surge levels: $V_{CLmax} = R_D \times I_{PP} + V_{BRmax}$

(4) To calculate V_{BR} versus junction temperature: V_{BR} at $T_j = V_{BR}$ at $25\text{ °C} \times (1 + \alpha T \times (T_j - 25))$

1.1 Characteristics (curves)

Figure 2: Pulse form

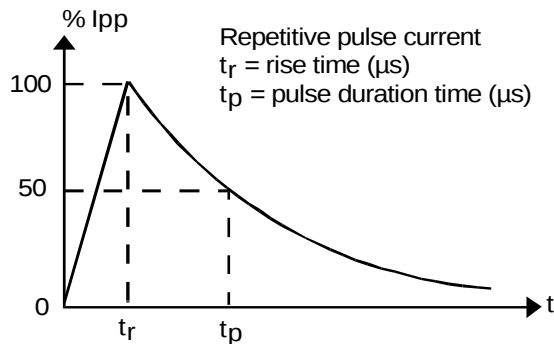
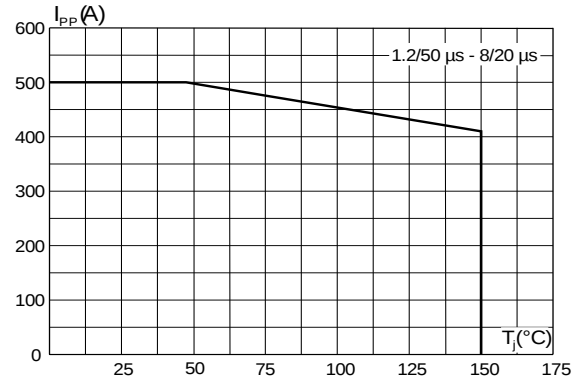
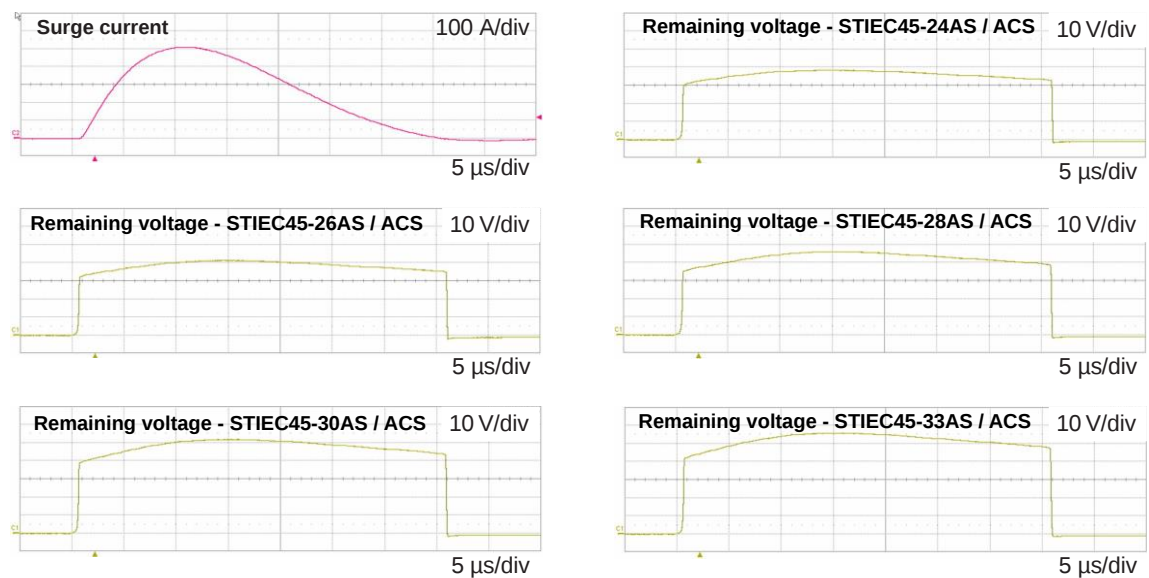


Figure 3: Peak pulse current versus initial junction temperature

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

Characteristics

STIEC45-xxAS, STIEC45-xxACS

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

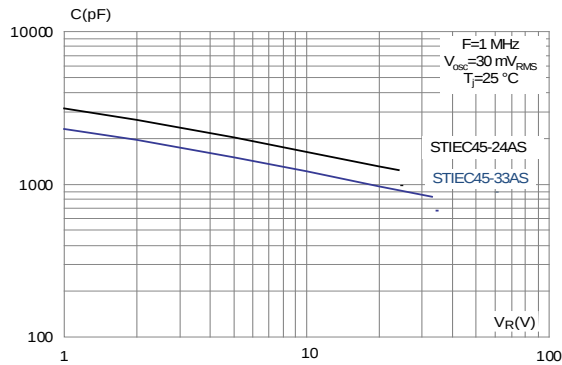


Figure 6: Junction capacitance versus reverse applied voltage (bidirectional devices)

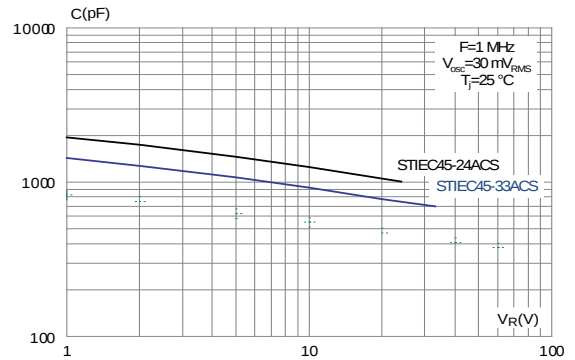


Figure 7: Peak forward voltage drop versus peak forward current (unidirectional devices)

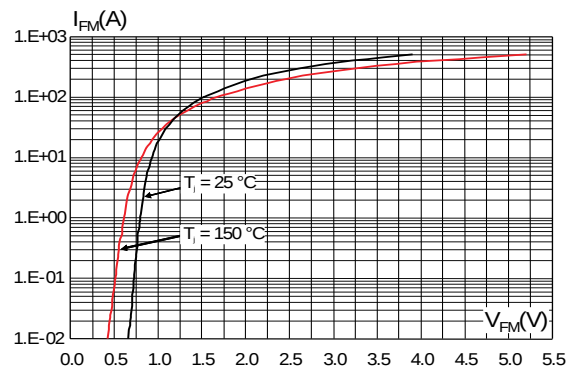


Figure 8: Leakage current versus junction temperature

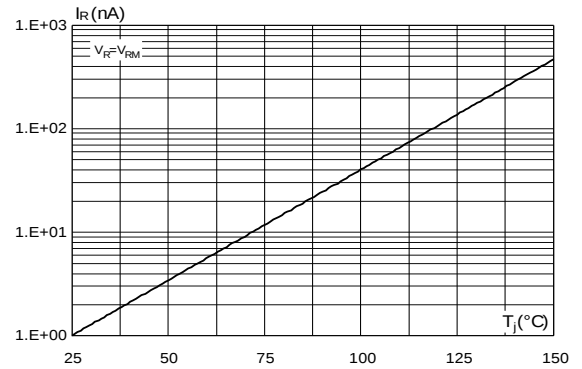


Figure 9: Relative variation of thermal impedance, junction to ambient, versus pulse duration

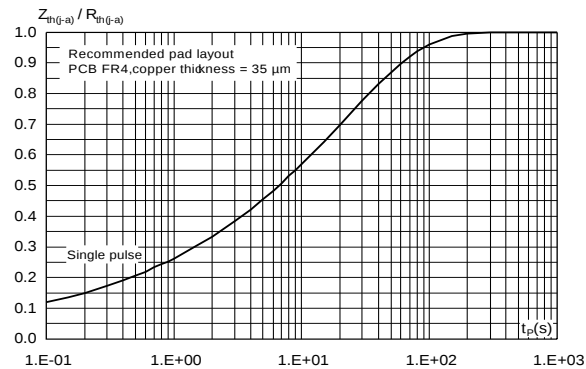
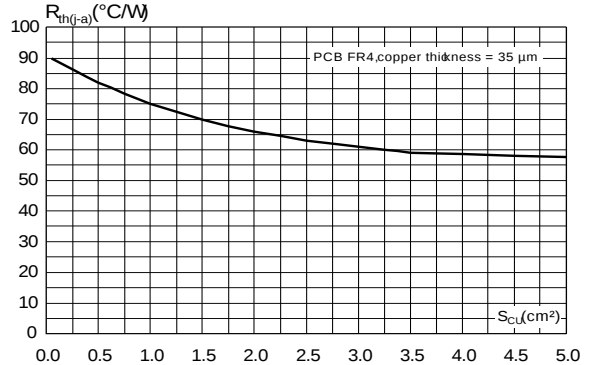


Figure 10: Thermal resistance junction to ambient versus copper surface under each lead



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

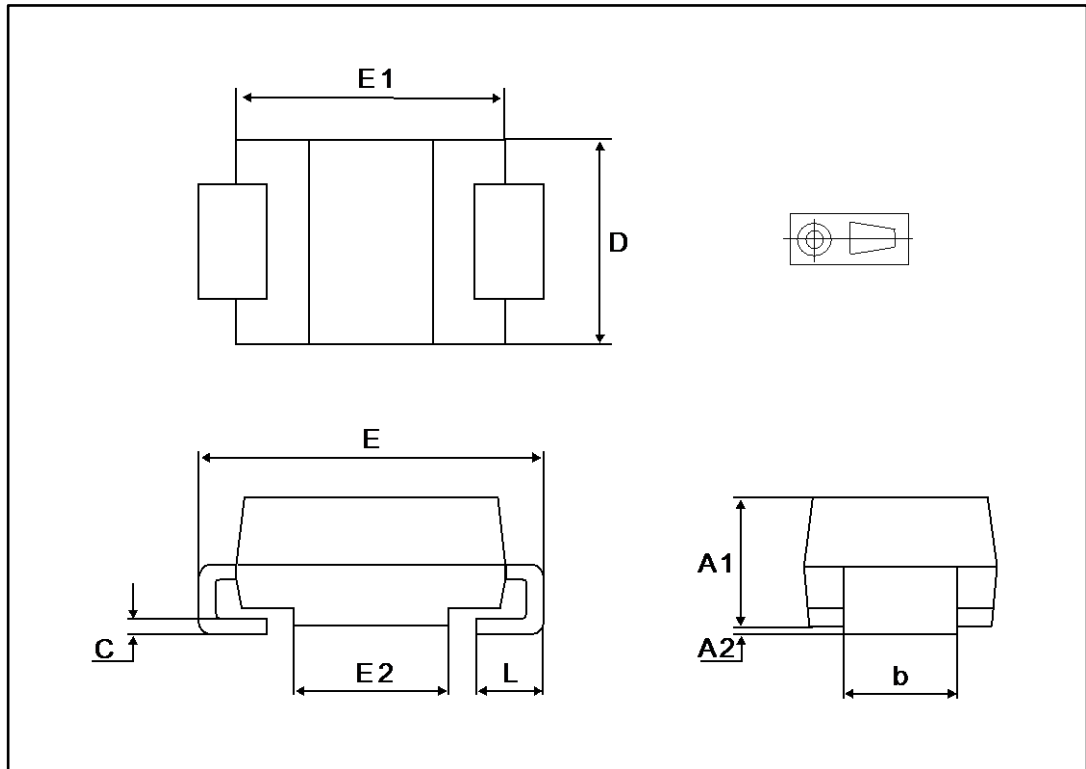
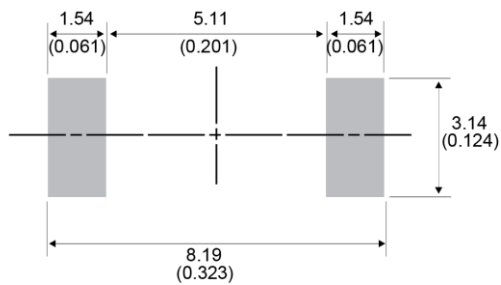
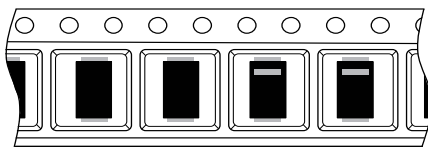


Table 5: SMC package mechanical data

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

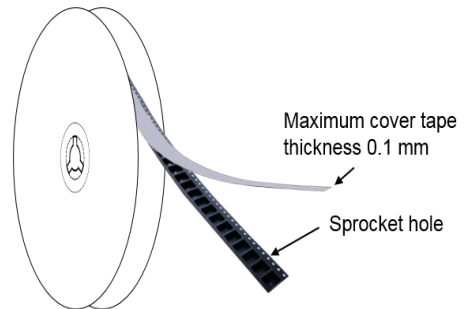
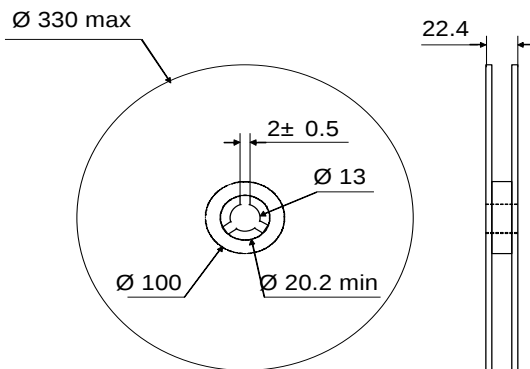
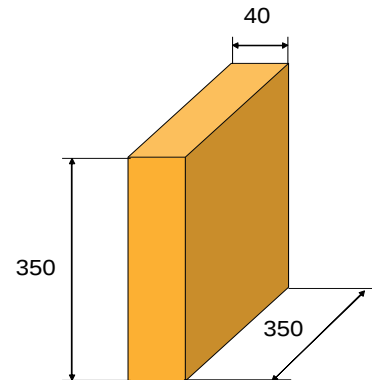
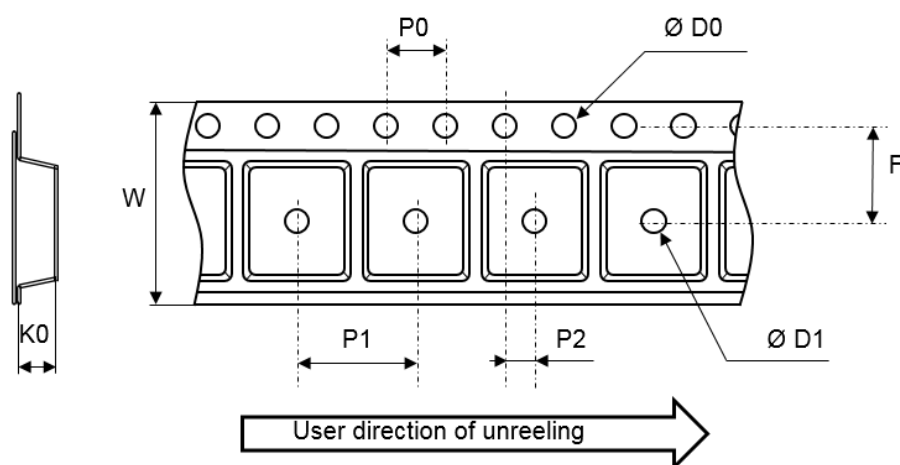
Figure 15: Tape and reel orientation**Figure 16: 13" reel dimensions (mm)****Figure 17: Inner box dimensions (mm)**

Figure 18: Tape and reel outline

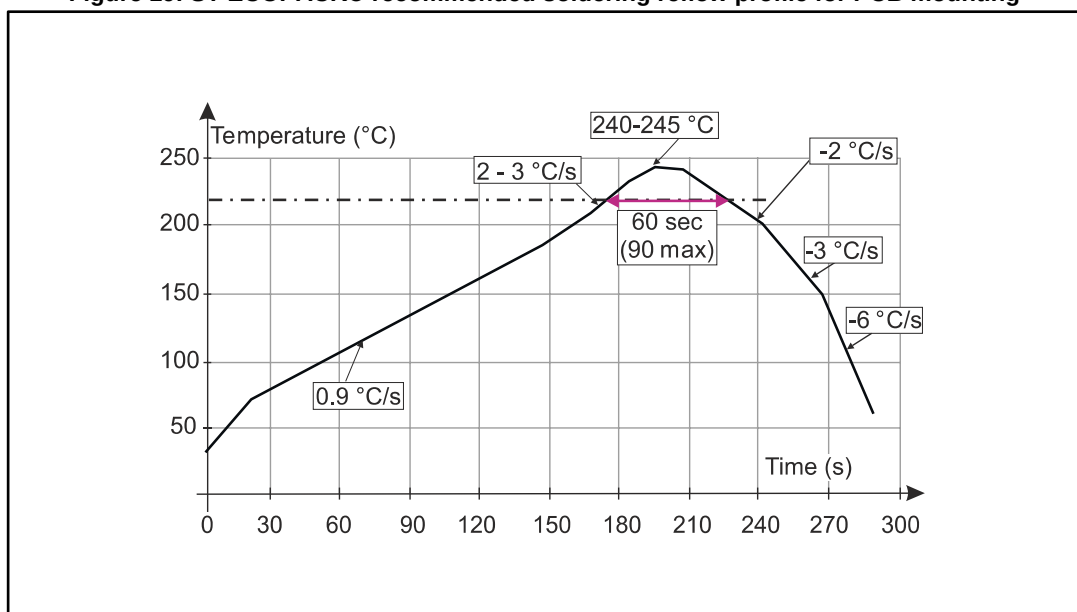


Note: Pocket dimensions are not on scale
Pocket shape may vary depending on package

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

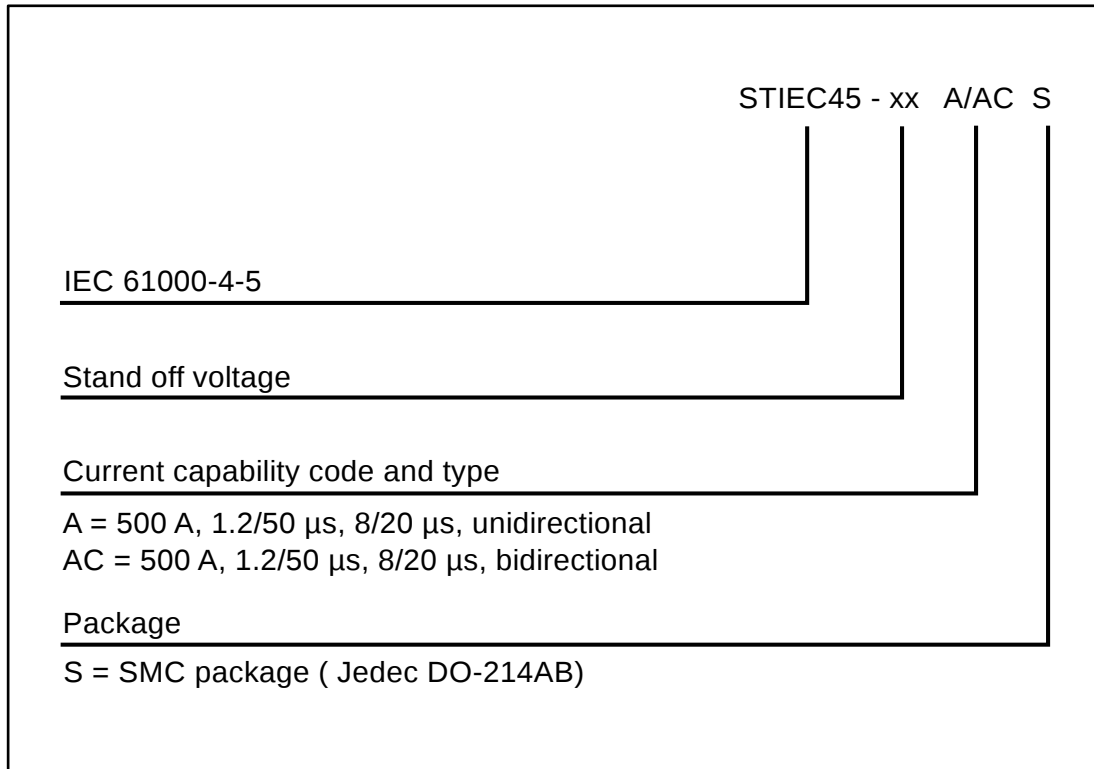


Table 7: Ordering information

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

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2017 STMicroelectronics – All rights reserved