

# 1 Characteristics

**Table 1. Absolute ratings (limiting values at 25 °C, unless otherwise specified)**

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage ( $T_j = -40\text{ °C}$ to $+175\text{ °C}$ )		600	V
$I_{F(RMS)}$	Forward rms current		50	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$ , square wave	$T_c = 125\text{ °C}$	30	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms}$ sinusoidal	300	A
$T_{stg}$	Storage temperature range		-65 to +175	°C
$T_j$	Operating junction temperature range		-40 to +175	°C

**Table 2. Thermal resistance parameter**

Symbol	Parameter	Max. value	Unit
$R_{th(j-c)}$	Junction to case	1.1	°C/W

For more information, please refer to the following application note :

- **AN5088** : Rectifiers thermal management, handling and mounting recommendations

**Table 3. Static electrical characteristics**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	-		25	$\mu\text{A}$
		$T_j = 150\text{ °C}$		-	80	800	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 30\text{ A}$	-		1.55	V
		$T_j = 150\text{ °C}$		-	1.0	1.25	

1. Pulse test:  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

2. Pulse test:  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses, use the following equation:

$$P = 0.95 \times I_{F(AV)} + 0.010 \times I_{F(RMS)}^2$$

For more information, please refer to the following application notes related to the power losses :

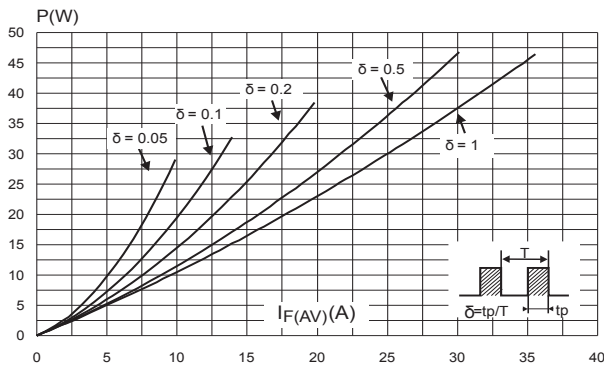
- **AN604**: Calculation of conduction losses in a power rectifier
- **AN4021**: Calculation of reverse losses on a power diode
- **AN5028**: Calculation of turn-off power losses generated by an ultrafast diode

**Table 4. Dynamic characteristics ( $T_j = 25\text{ }^{\circ}\text{C}$  unless otherwise specified)**

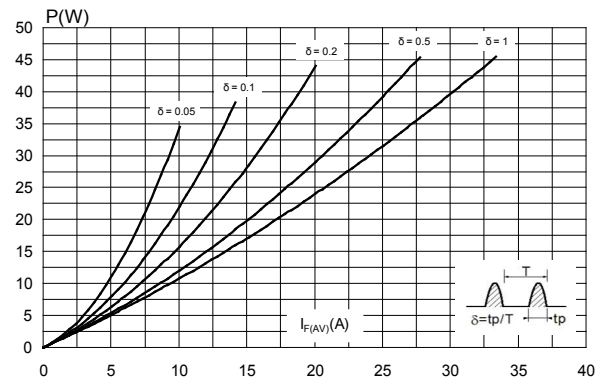
Symbol	Parameters	Test conditions	Min.	Typ.	Max.	Unit
$t_{rr}$	Reverse recovery time	$I_F = 0.5\text{ A}$ , $I_R = 1\text{ A}$ , $I_{RR} = 0.25\text{ A}$	-		65	ns
		$I_F = 1\text{ A}$ , $V_R = 30\text{ V}$ , $dI_F/dt = 50\text{ A}/\mu\text{s}$	-	65	90	
$I_{RM}$	Reverse recovery current	$I_F = 30\text{ A}$ , $V_R = 400\text{ V}$ , $dI_F/dt = 100\text{ A}/\mu\text{s}$	-	11.5	16	A
$t_{fr}$	Forward recovery time	$I_F = 30\text{ A}$ , $dI_F/dt = 100\text{ A}/\mu\text{s}$ , $V_{FR} = 1.1\text{ V}_{F(max.)}$	-		500	ns
$V_{FP}$	Forward recovery voltage	$I_F = 30\text{ A}$ , $dI_F/dt = 100\text{ A}/\mu\text{s}$ , $V_{FR} = 1.1\text{ V}_{F(max.)}$	-	2.5		V

## 1.1 Characteristics (curves)

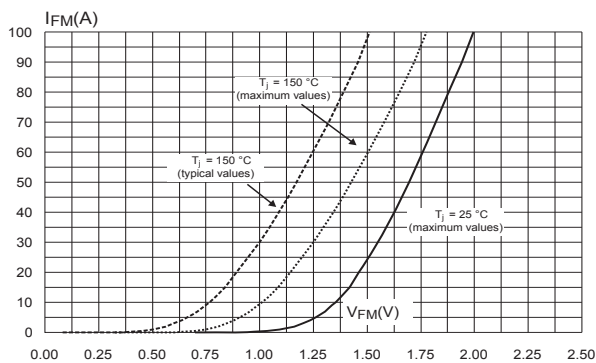
**Figure 1. Conduction losses versus average forward current (square waveform)**



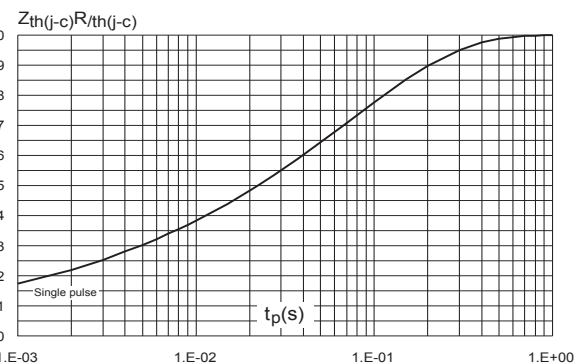
**Figure 2. Conduction losses versus average forward current (sinusoidal waveform)**



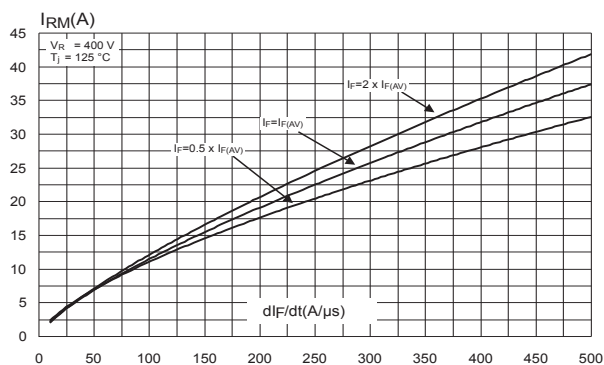
**Figure 3. Forward voltage drop versus forward current**



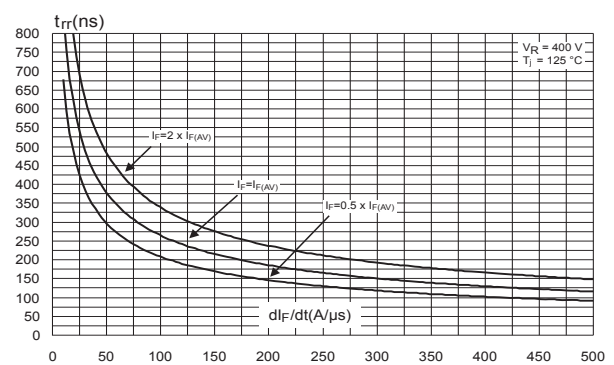
**Figure 4. Relative variation of thermal impedance junction to case versus pulse duration**

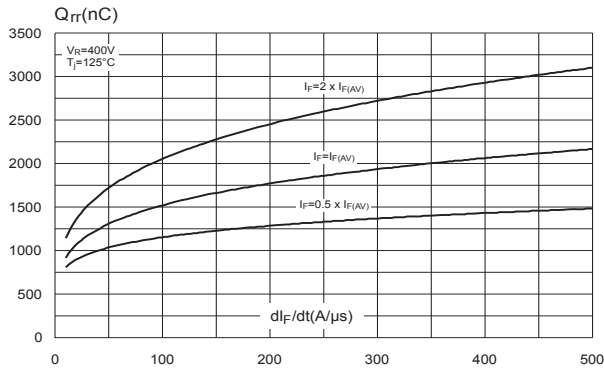
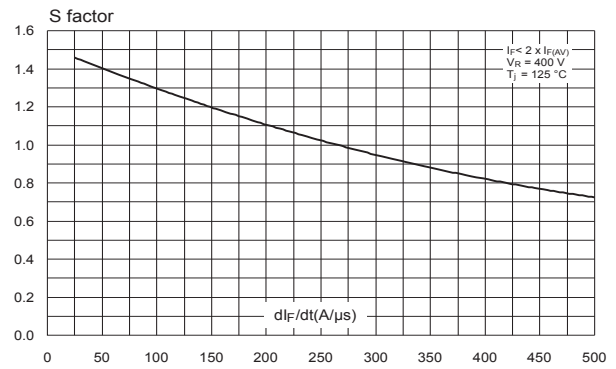
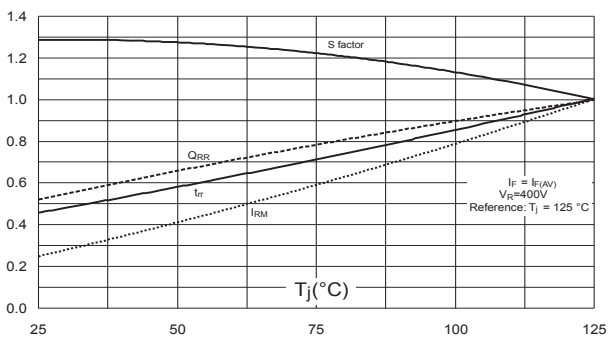
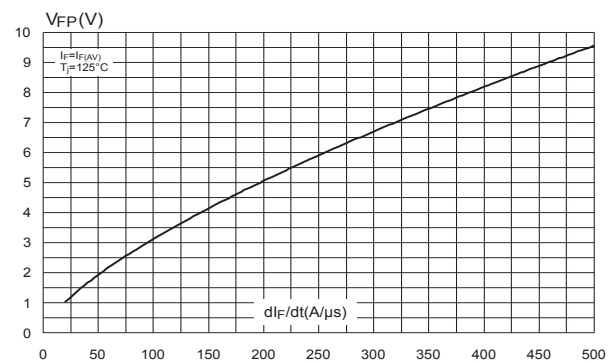
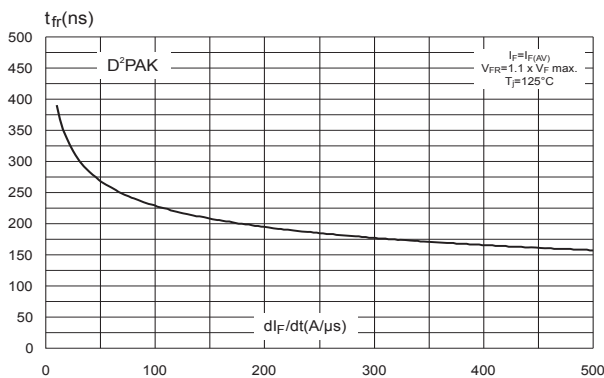
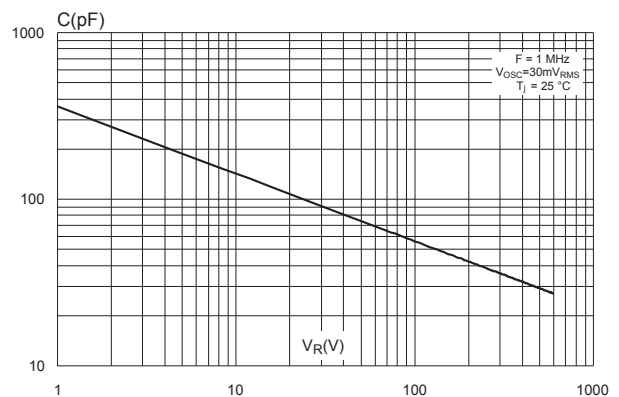


**Figure 5. Peak reverse recovery current versus  $di_F/dt$  (typical values)**

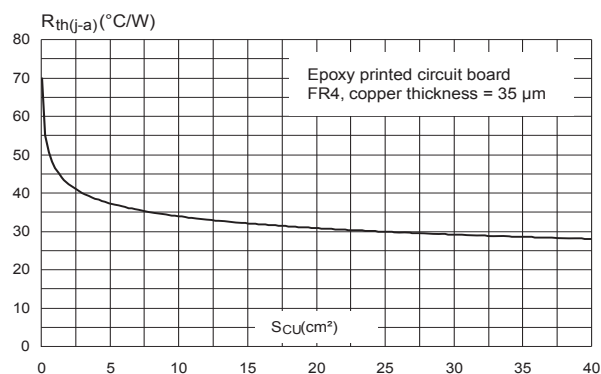


**Figure 6. Reverse recovery time versus  $di_F/dt$  (typical values)**



**Figure 7. Reverse recovery charges versus  $dl_F/dt$  (typical values)**

**Figure 8. Reverse recovery softness factor versus  $dl_F/dt$  (typical values)**

**Figure 9. Relative variations of dynamic parameters versus junction temperature**

**Figure 10. Transient peak forward voltage versus  $dl_F/dt$  (typical values)**

**Figure 11. Forward recovery time versus  $dl_F/dt$  (typical values)**

**Figure 12. Junction capacitance versus reverse voltage applied (typical values)**


**Figure 13. Thermal resistance junction to ambient versus copper surface under each lead (typical values)**



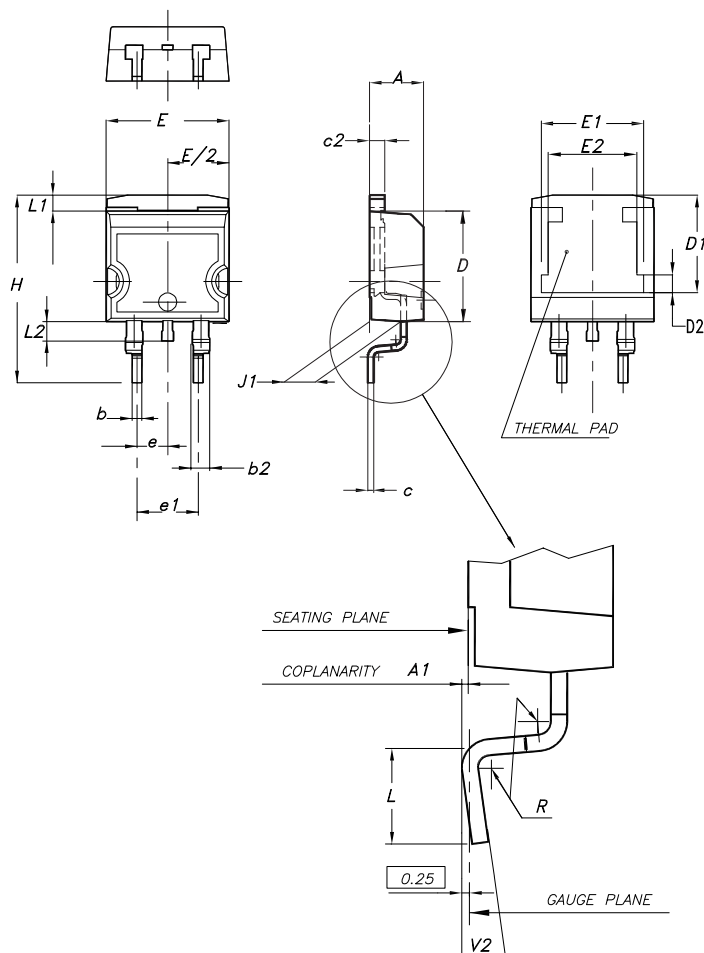
## 2 Package information

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

### 2.1 D<sup>2</sup>PAK package information

- Epoxy meets UL94, V0.
- Cooling method: by conduction (C)

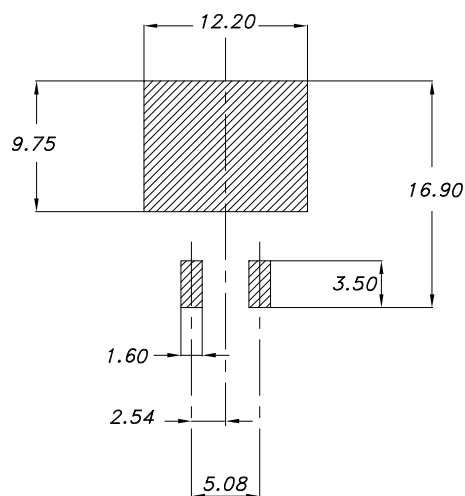
**Figure 14. D<sup>2</sup>PAK package outline**



**Note:** This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

**Table 5. D<sup>2</sup>PAK package mechanical data**

Ref.	Dimensions					
	Millimeters			Inches (for reference only)		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
A1	0.03		0.23	0.001		0.009
b	0.70		0.93	0.028		0.037
b2	1.14		1.70	0.045		0.067
c	0.45		0.60	0.018		0.024
c2	1.23		1.36	0.048		0.053
D	8.95		9.35	0.352		0.368
D1	7.50	7.75	8.00	0.295	0.305	0.315
D2	1.10	1.30	1.50	0.043	0.051	0.060
E	10.00		10.40	0.394		0.409
E1	8.30	8.50	8.70	0.335	0.343	0.346
E2	6.85	7.05	7.25	0.266	0.278	0.282
e		2.54			0.100	
e1	4.88		5.28	0.190		0.205
H	15.00		15.85	0.591		0.624
J1	2.49		2.69	0.097		0.106
L	2.29		2.79	0.090		0.110
L1	1.27		1.40	0.049		0.055
L2	1.30		1.75	0.050		0.069
R		0.40			0.015	
V2	0°		8°	0°		8°

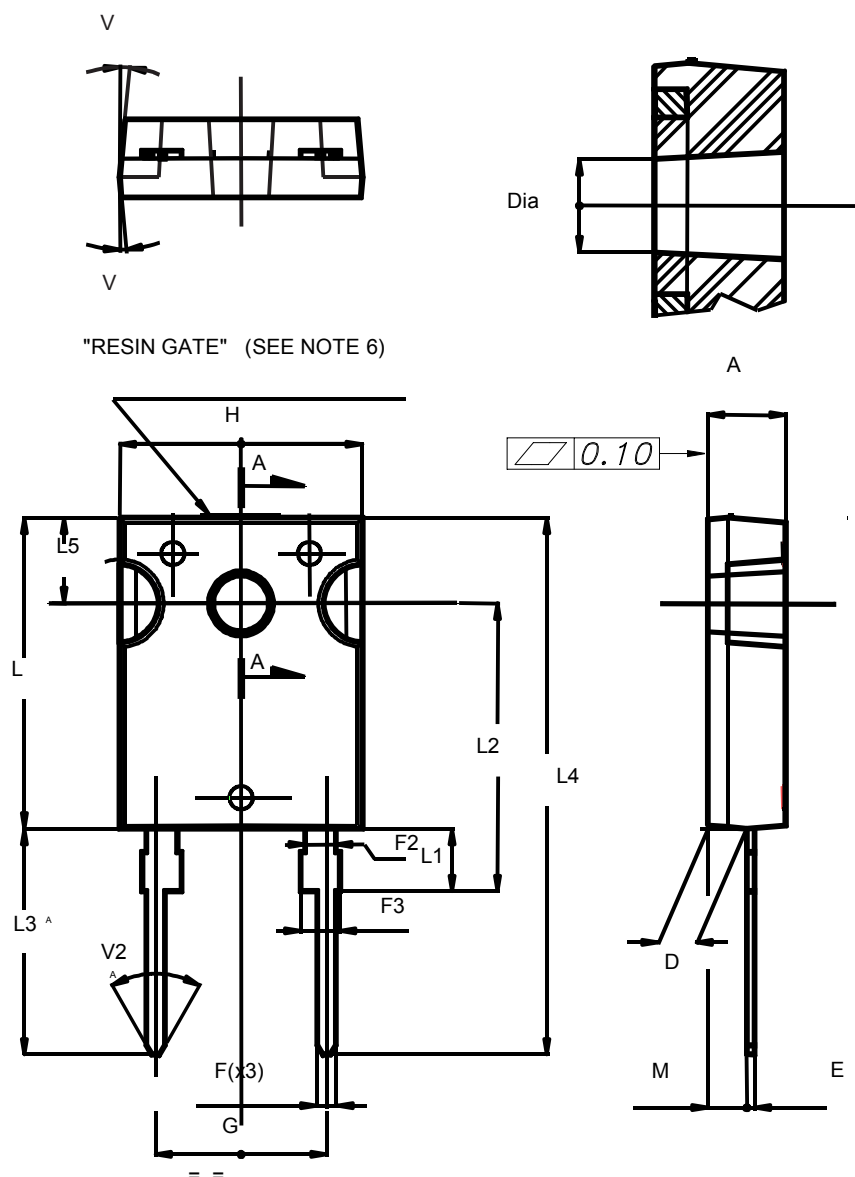
**Figure 15. D<sup>2</sup>PAK recommended footprint (dimensions are in mm)**


Footprint\_26

## 2.2 DO-247 package information

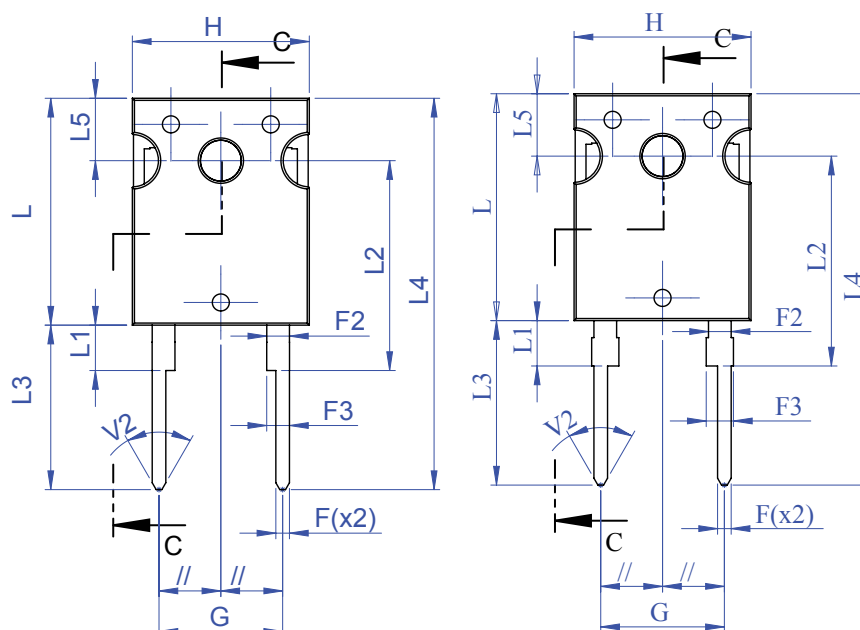
- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.8 N·m
- Maximum torque value: 1.0 N·m

Figure 16. DO-247 package outline



**Note:** This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.



**Figure 17. DO-247 package min-max drawing**

**Table 6. DO-247 package mechanical data**

Ref.	Dimensions					
	Millimeters			Inches (for reference only)		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.1909		0.2027
D	2.2		2.6	0.0866		0.1023
E	0.4		0.8	0.0157		0.0314
F	1		1.4	0.0393		0.0551
F2		2			0.0787	
F3	2		2.4	0.0787		0.0944
G		10.9			0.4291	
H	15.45		15.75	0.6082		0.6200
L	19.85		20.15	0.7814		0.7933
L1	3.7		4.3	0.1456		0.1692
L2		18.5			0.7283	
L3	14.2		14.8	0.5590		0.5826
L4		34.6			1.3622	
L5		5.5			0.2165	
M	2		3	0.0787		0.1181
V		5°			5°	
V2		60°			60°	
Diam.	3.55		3.65	0.1397		0.1437

### 3 Ordering information

**Table 7. Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STTH30L06GY-TR	STTH30L06GY	D <sup>2</sup> PAK	1.48 g	1000	Tape and reel
STTH30L06WY	STTH30L06WY	DO-247	4.36 g	30	Tube

## Revision history

**Table 8. Document revision history**

Date	Version	Changes
24-Oct-2012	1	First issue.
21-Sep-2020	2	Updated package information. Added <a href="#">Figure 2. Conduction losses versus average forward current (sinusoidal waveform)</a> .
21-Oct-2020	3	Added <a href="#">Figure 17</a> .

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