

1 Characteristics

Table 2: Absolute ratings (limiting values, at 25 °C, unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		400	V
$I_{F(RMS)}$	Forward rms current		20	A
$I_{F(peak)}$	Peak working forward current	$T_C = 135\text{ °C}$ $\delta = 0.5$ square wave	10	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms sinusoidal	100	A
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Maximum operating junction temperature		175	°C

Table 3: Thermal parameter

Symbol	Parameter	Max. value	Unit
$R_{th(j-c)}$	Junction to case	3.5	°C/W

Table 4: Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	-		10	μA
		$T_j = 125\text{ °C}$		-	10	100	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 10\text{ A}$	-	1.50	1.70	V
		$T_j = 125\text{ °C}$		-	1.15	1.35	

Notes:

⁽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:

$$P = 1.05 \times I_{F(AV)} + 0.03 \times I_F^2(RMS)$$

Table 5: Dynamic electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	$T_j = 25\text{ }^{\circ}\text{C}$	$I_F = 0.5\text{ A}$, $I_{rr} = 0.25\text{ A}$, $I_R = 1\text{ A}$	-	15	20	ns
			$I_F = 1\text{ A}$, $V_R = 30\text{ V}$, $di_F/dt = -50\text{ A}/\mu\text{s}$	-		40	
t_{fr}	Forward recovery time	$T_j = 25\text{ }^{\circ}\text{C}$	$I_F = 10\text{ A}$, $di_F/dt = 100\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$	-		140	ns
V_{FP}	Forward recovery voltage	$T_j = 25\text{ }^{\circ}\text{C}$	$I_F = 10\text{ A}$, $di_F/dt = 100\text{ A}/\mu\text{s}$	-		3	V
I_{RM}	Reverse recovery current	$T_j = 125\text{ }^{\circ}\text{C}$	$I_F = 10\text{ A}$, $V_R = 200\text{ V}$ $di_F/dt = 200\text{ A}/\mu\text{s}$	-	6.2	8.0	A
S_{factor}	Softness factor			-	0.3		-

1.1 Characteristics (curves)

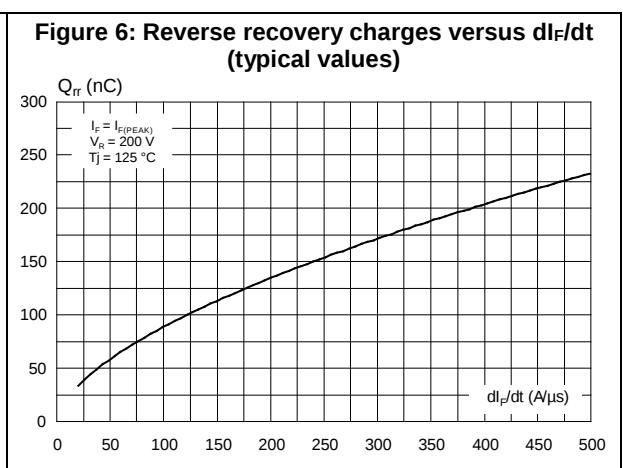
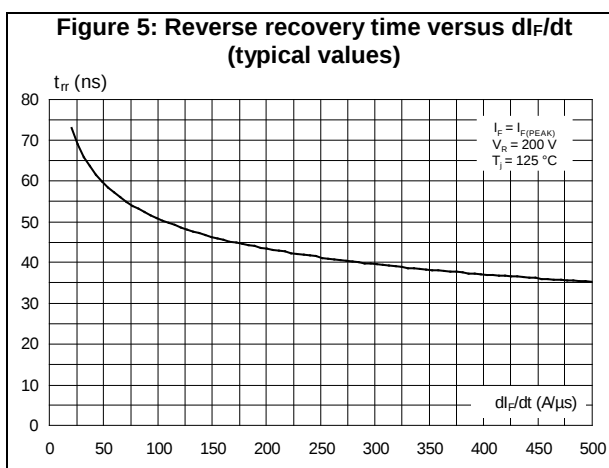
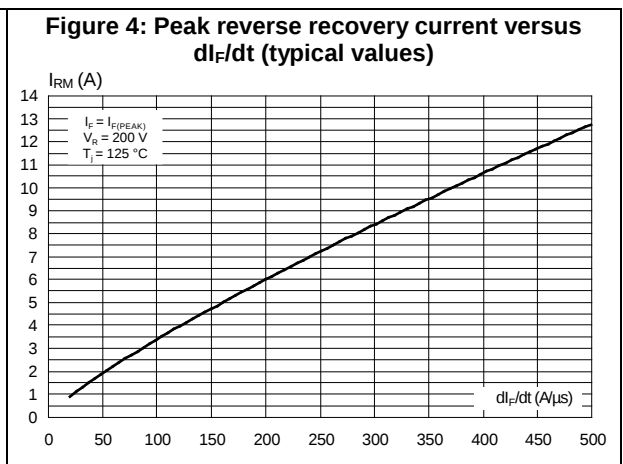
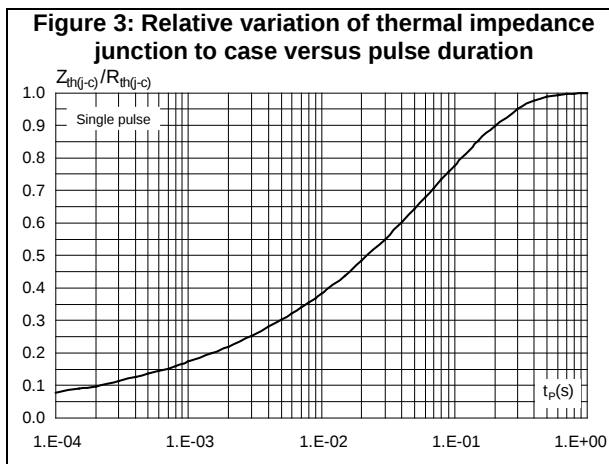
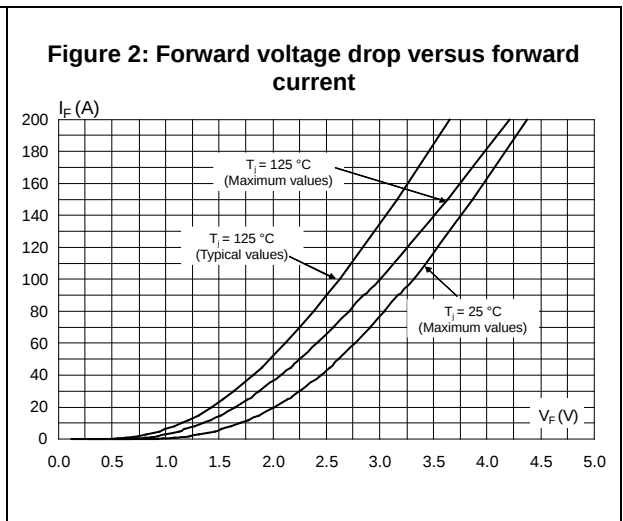
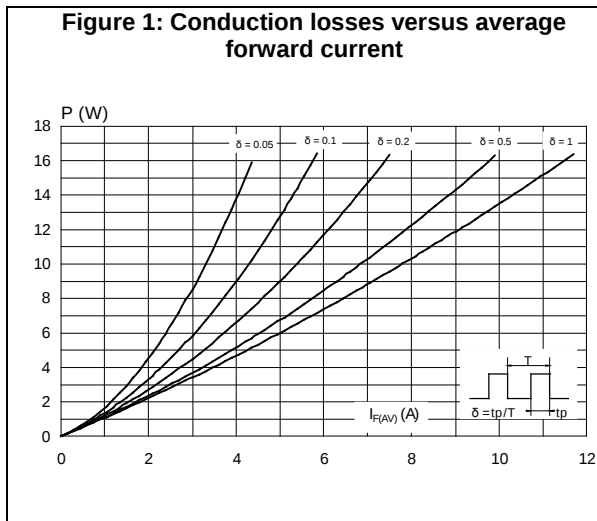
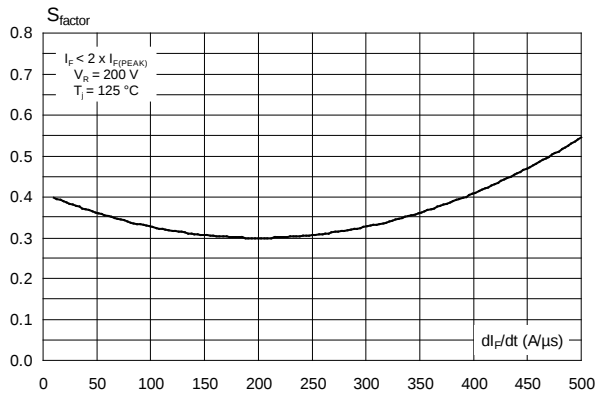
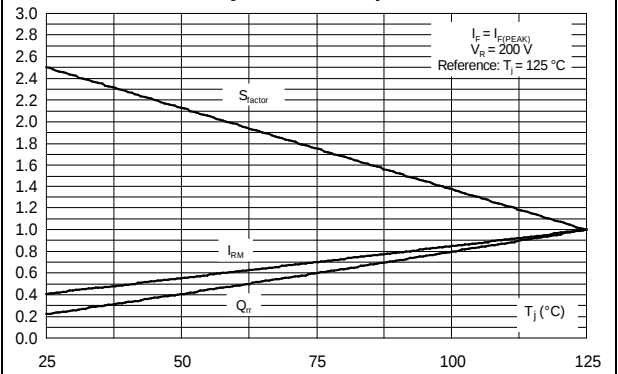
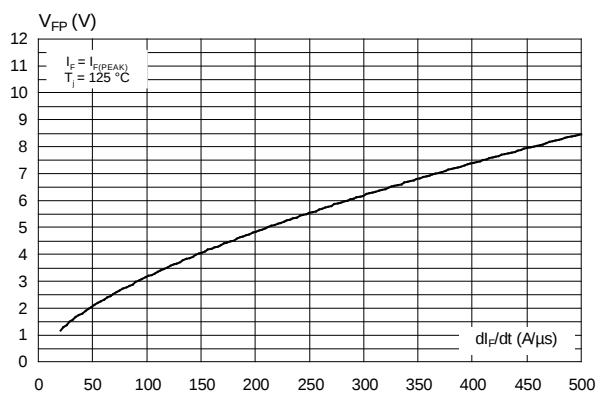
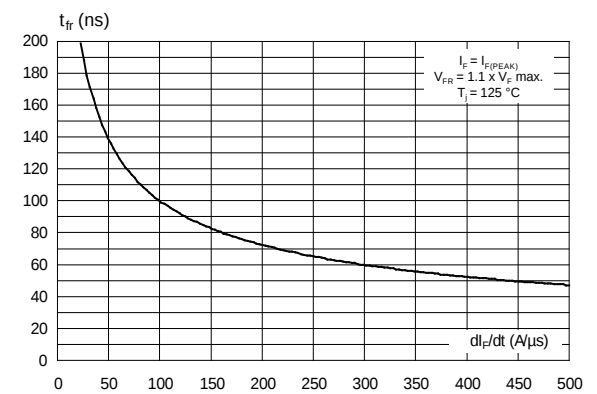
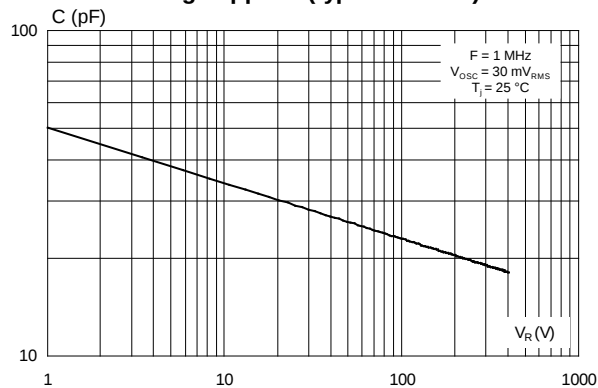
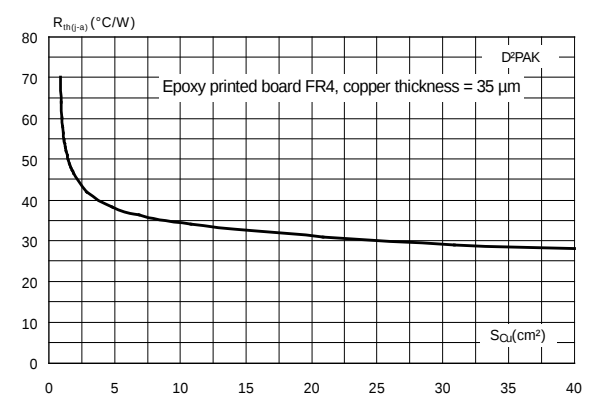


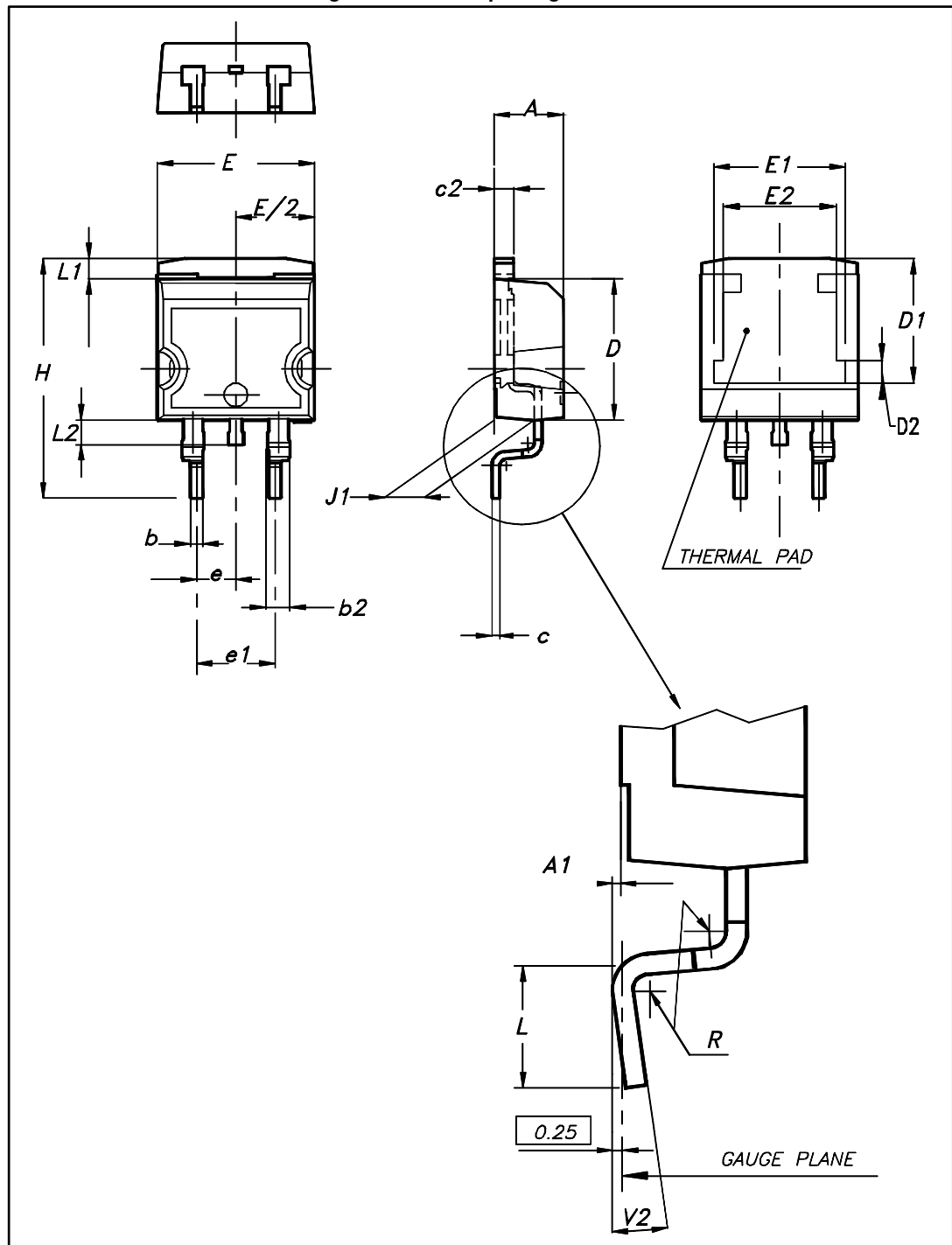
Figure 7: Reverse recovery softness factor versus di_F/dt (typical values)**Figure 8: Relative variation of dynamic parameters versus junction temperature****Figure 9: Forward recovery voltage versus di_F/dt (typical values)****Figure 10: Forward recovery time versus di_F/dt (typical values)****Figure 11: Junction capacitance versus reverse voltage applied (typical values)****Figure 12: Thermal resistance junction to ambient versus copper surface under tab**

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.

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

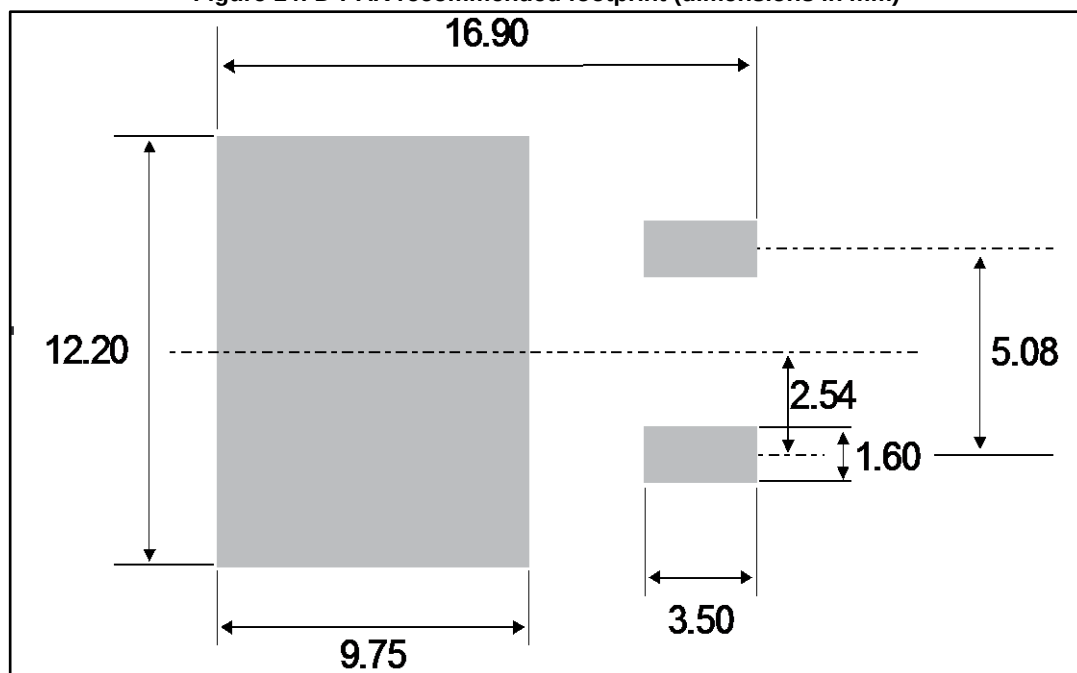
2.1 D²PAK package information

Figure 13: D²PAK package outline

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

Table 6: D²PAK package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.36	4.60	0.172	0.181
A1	0.00	0.25	0.000	0.010
b	0.70	0.93	0.028	0.037
b2	1.14	1.70	0.045	0.067
c	0.38	0.69	0.015	0.027
c2	1.19	1.36	0.047	0.053
D	8.60	9.35	0.339	0.368
D1	6.90	8.00	0.272	0.311
D2	1.10	1.50	0.043	0.060
E	10.00	10.55	0.394	0.415
E1	8.10	8.90	0.319	0.346
E2	6.85	7.25	0.266	0.282
e	2.54 typ.		0.100	
e1	4.88	5.28	0.190	0.205
H	15.00	15.85	0.591	0.624
J1	2.49	2.90	0.097	0.112
L	1.90	2.79	0.075	0.110
L1	1.27	1.65	0.049	0.065
L2	1.30	1.78	0.050	0.070
R	0.4 typ.		0.015	
V2	0°	8°	0°	8°

Figure 14: D²PAK recommended footprint (dimensions in mm)

3 Ordering information

Table 7: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STTH10R04G-TR	STTH10R04G	D ² PAK	1.38 g	1000	Tape and reel

4 Revision history

Table 8: Document revision history

Date	Revision	Changes
07-Nov-2007	1	First issue.
08-Aug-2017	2	Updated features and package silhouette. Minor text changes to improve readability. Updated Section 1: "Characteristics" , Section 1.1: "Characteristics (curves)" , Section 2: "Package information" and Section 3: "Ordering information" .

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