

# 1 Characteristics

**Table 2. Absolute ratings (limiting values at 25 °C, unless otherwise stated)**

Symbol	Parameter	Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage	1200	V
$I_{F(RMS)}$	RMS forward current	6	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$ , square wave	$T_c = 150^\circ \text{C}$ 3	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10 \text{ ms sinusoidal}$ 35	A
$T_{stg}$	Storage temperature range	-65 to + 175	°C
$T_j$	Maximum operating junction temperature	175	°C

**Table 3. Thermal resistance**

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	3.8	°C/W

**Table 4. Static electrical characteristics**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ \text{C}$	$V_R = V_{RRM}$		10	$\mu\text{A}$
		$T_j = 125^\circ \text{C}$		2	100	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ \text{C}$	$I_F = 3\text{A}$		2	V
		$T_j = 125^\circ \text{C}$		1.20	1.70	
		$T_j = 150^\circ \text{C}$		1.15	1.65	

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

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

To evaluate the conduction losses use the following equation:

$$P = 1.4 \times I_{F(AV)} + 0.1 I_{F(RMS)}^2$$

Table 5. Dynamic characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
$t_{rr}$	Reverse recovery time	$I_F = 1\text{ A}$ , $dI_F/dt = -50\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $T_j = 25\text{ }^\circ\text{C}$			115	ns
		$I_F = 1\text{ A}$ , $dI_F/dt = -100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $T_j = 25\text{ }^\circ\text{C}$		55	80	
$I_{RM}$	Reverse recovery current	$I_F = 3\text{ A}$ , $dI_F/dt = -200\text{ A}/\mu\text{s}$ , $V_R = 600\text{ V}$ , $T_j = 125\text{ }^\circ\text{C}$		9.5	14	A
S	Softness factor	$I_F = 3\text{ A}$ , $dI_F/dt = -200\text{ A}/\mu\text{s}$ , $V_R = 600\text{ V}$ , $T_j = 125\text{ }^\circ\text{C}$		2		
$t_{fr}$	Forward recovery time	$I_F = 3\text{ A}$ , $dI_F/dt = 50\text{ A}/\mu\text{s}$ , $V_{FR} = 1.5 \times V_{Fmax}$ , $T_j = 25\text{ }^\circ\text{C}$			350	ns
$V_{FP}$	Forward recovery voltage	$I_F = 3\text{ A}$ , $dI_F/dt = 50\text{ A}/\mu\text{s}$ , $T_j = 25\text{ }^\circ\text{C}$		12		V

Figure 1. Conduction losses versus average current

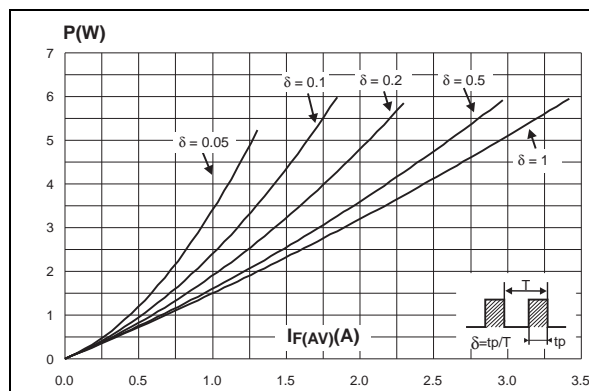


Figure 2. Forward voltage drop versus forward current

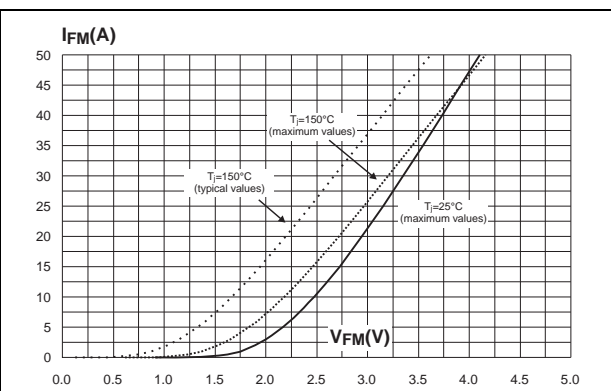


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration

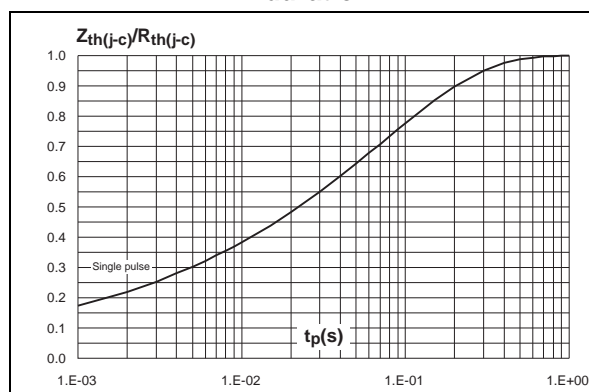


Figure 4. Peak reverse recovery current versus dI\_F/dt (typical values)

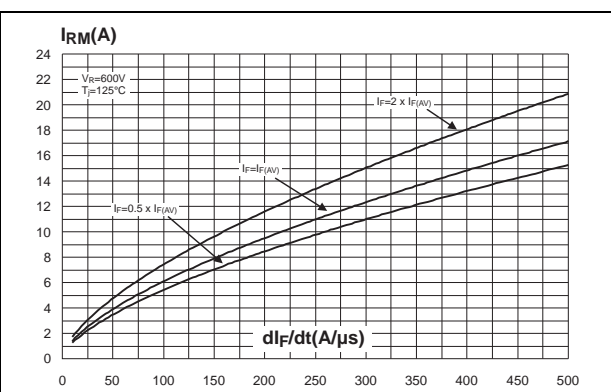


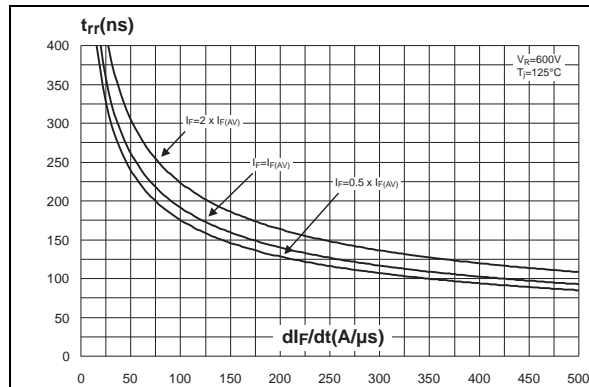
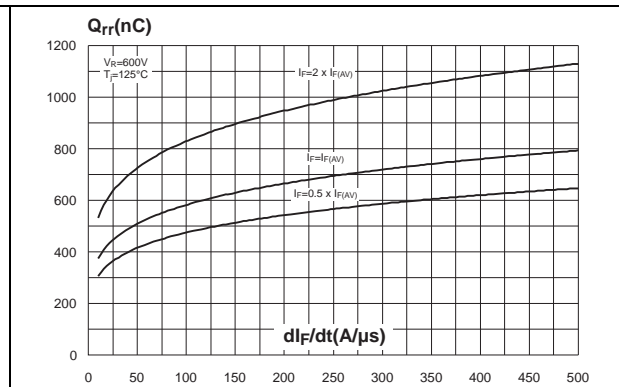
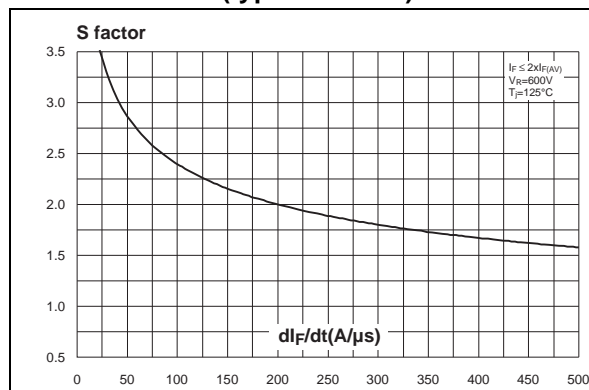
Figure 5. Reverse recovery time versus  $di_F/dt$  (typical values)Figure 6. Reverse recovery charges versus  $di_F/dt$  (typical values)Figure 7. Softness factor versus  $di_F/dt$  (typical values)

Figure 8. Relative variations of dynamic parameters versus junction temperature

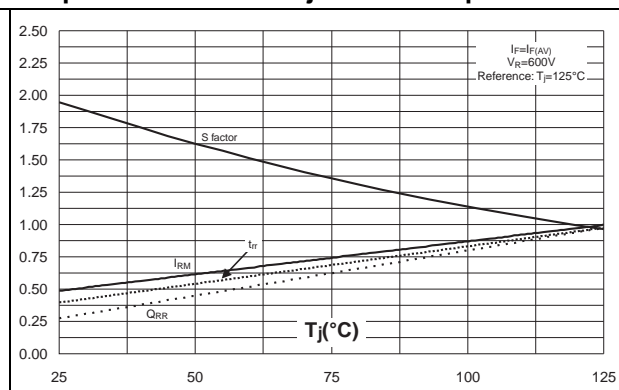
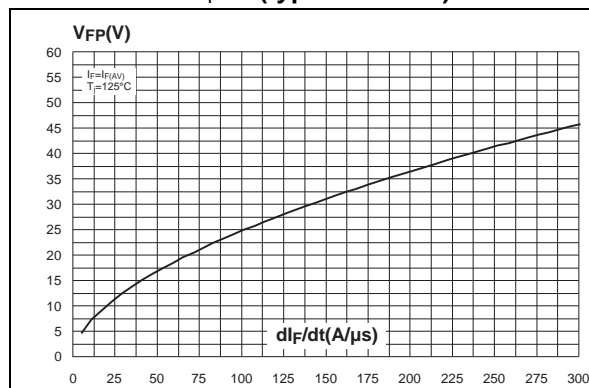
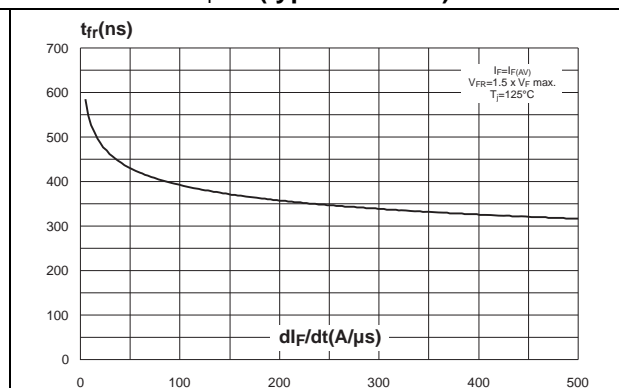
Figure 9. Transient peak forward voltage versus  $di_F/dt$  (typical values)Figure 10. Forward recovery time versus  $di_F/dt$  (typical values)

Figure 11. Junction capacitance versus reverse voltage applied (typical values)

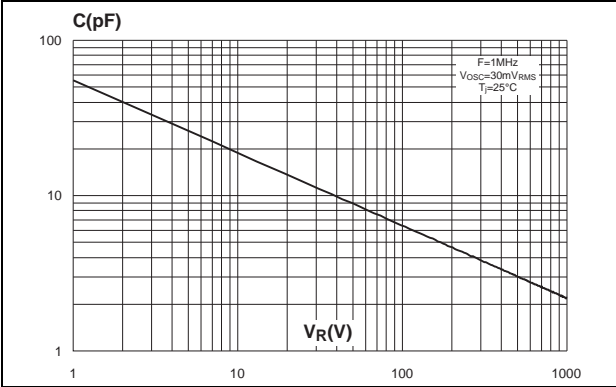
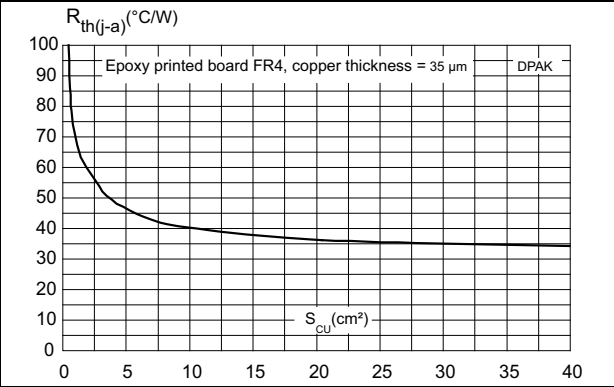


Figure 12. Thermal resistance junction to ambient versus copper surface under tab



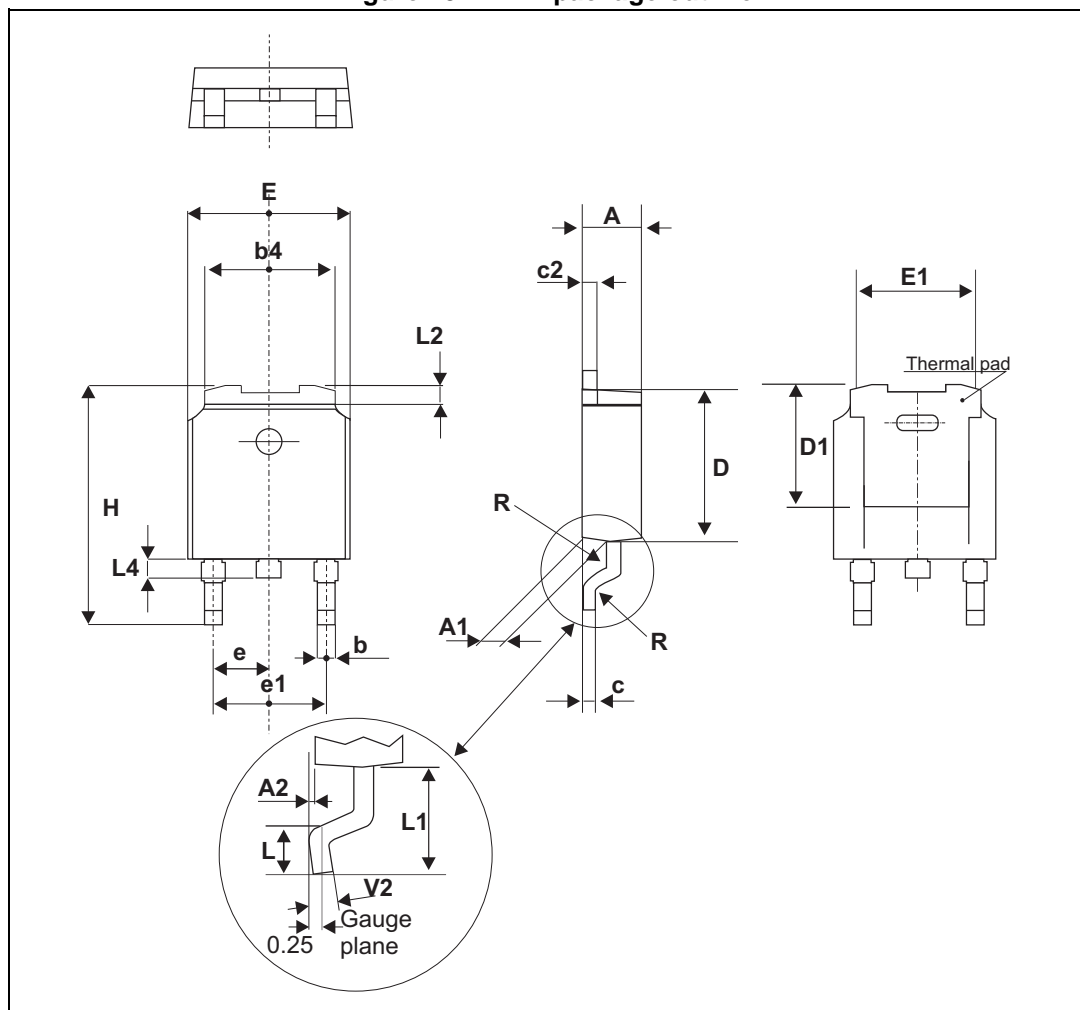
## 2 Package information

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

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> is an ST trademark.

### 2.1 DPAK package information

Figure 13. DPAK package outline

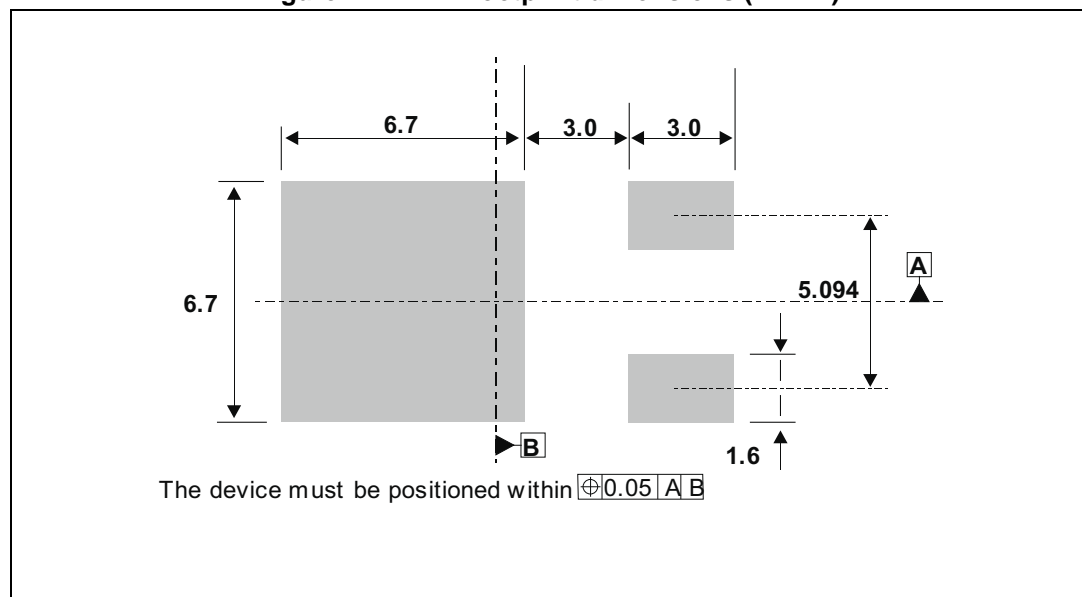


**Note:** This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

Table 6. DPAK package mechanical data

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.18		2.40	0.085		0.094
A1	0.90		1.1	0.035		0.043
A2	0.03		0.23	0.001		0.01
b	0.64		0.90	0.025		0.035
b4	4.95		5.46	0.195		0.215
c	0.46		0.61	0.018		0.024
c2	0.46		0.60	0.018		0.024
D	5.97		6.22	0.235		0.245
D1	5.10			0.201		
E	6.35		6.73	0.250		0.265
E1	4.32			0.170		
e1	4.4		4.7	0.173		0.185
H	9.35		10.40	0.368		0.407
L	1.0		1.78	0.039		0.070
L2			1.27			0.05
L4	0.6		1.02	0.024		0.040
V2	0°		8°	0°		8°

Figure 14. DPAK footprint dimensions (in mm)



### 3 Ordering information

**Table 7. Ordering information**

Order code	Marking	Package	Weight	Base qty	Delivery mode
STTH312B-TR	STTH312B	DPAK	320 mg	2500	Tape and reel

### 4 Revision history

**Table 8. Document revision history**

Date	Revision	Changes
02-Mar-2006	1	First issue.
24-Apr-2015	2	Updated DPAK package information and reformatted to current standard.

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