

TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER
Table 1: Main Product Characteristics

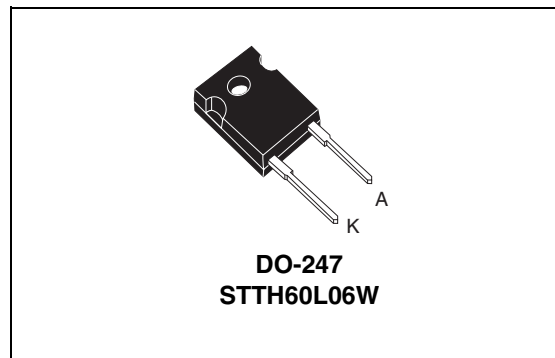
$I_{F(AV)}$	60 A
V_{RRM}	600 V
T_j	175°C
V_F (typ)	0.95 V
t_{rr} (max)	70 ns

FEATURES AND BENEFITS

- Ultrafast switching
- Low reverse current
- Low thermal resistance
- Reduces switching & conduction losses

DESCRIPTION

The STTH60L06, which is using ST Turbo 2 600V technology, is specially suited for use in switching power supplies, and industrial applications, as rectification and discontinuous mode PFC boost diode. Thanks to its low V_F characteristics, this device exhibits high performances in free-wheeling applications.


Table 2: Order Codes

Part Number	Marking
STTH60L06W	STTH60L06W

Table 3: Absolute Ratings (limiting values)

Symbol	Parameter	Value	Unit
V_{RRM}	Repetitive peak reverse voltage	600	V
$I_{F(RMS)}$	RMS forward current	90	A
$I_{F(AV)}$	Average forward current	$T_c = 110^\circ\text{C} \quad \delta = 0.5$	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ms sinusoidal}$	A
T_{stg}	Storage temperature range	-65 to + 175	°C
T_j	Maximum operating junction temperature	175	°C

Table 4: Thermal Resistance

Symbol	Parameter	Value (max).	Unit
$R_{th(j-c)}$	Junction to case	0.75	°C/W

Table 5: Static Electrical Characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			50	μA
		$T_j = 150^\circ\text{C}$			160	1600	
V_F^{**}	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 60\text{A}$			1.55	V
		$T_j = 150^\circ\text{C}$			0.95	1.2	

Pulse test: * $t_p = 5\text{ ms}$, $\delta < 2\%$
 ** $t_p = 380\ \mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation: $P = 0.93 \times I_F(AV) + 0.0045 I_F^2(RMS)$

Table 6: Dynamic Characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
t_{rr}	Reverse recovery time	$T_j = 25^\circ\text{C}$	$I_F = 0.5\text{A}$ $I_{rr} = 0.25\text{A}$ $I_R = 1\text{A}$			70	ns
			$I_F = 1\text{A}$ $di_F/dt = 50\text{ A}/\mu\text{s}$ $V_R = 30\text{V}$		75	105	
I_{RM}	Reverse recovery current	$T_j = 125^\circ\text{C}$	$I_F = 60\text{A}$ $V_R = 400\text{V}$ $di_F/dt = 100\text{ A}/\mu\text{s}$		14	19	A
t_{fr}	Forward recovery time	$T_j = 25^\circ\text{C}$	$I_F = 60\text{A}$ $di_F/dt = 200\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$			500	ns
V_{FP}	Forward recovery voltage	$T_j = 25^\circ\text{C}$	$I_F = 60\text{A}$ $di_F/dt = 200\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$		3		V

Figure 1: Conduction losses versus average forward current

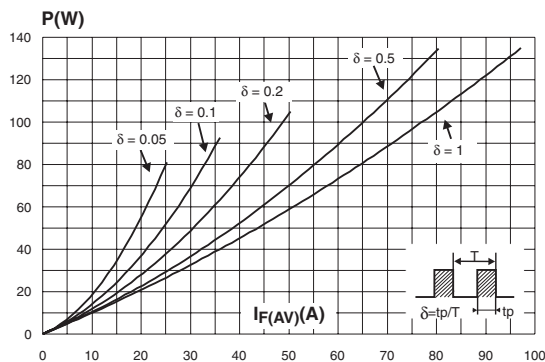


Figure 2: Forward voltage drop versus forward current

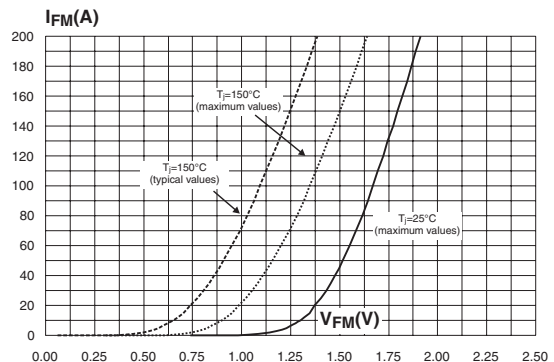


Figure 3: Relative variation of thermal impedance junction to case versus pulse duration

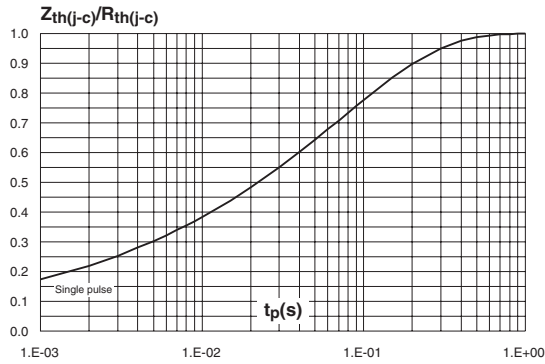


Figure 4: Peak reverse recovery current versus di_F/dt (typical values)

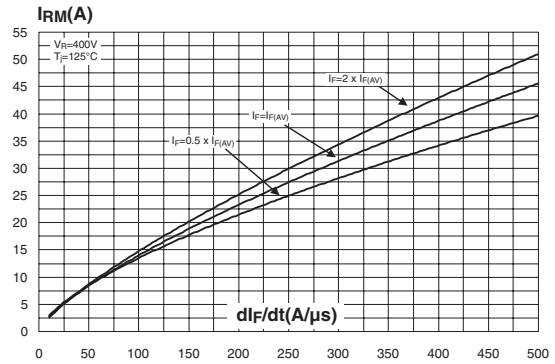


Figure 5: Reverse recovery time versus di_F/dt (typical values)

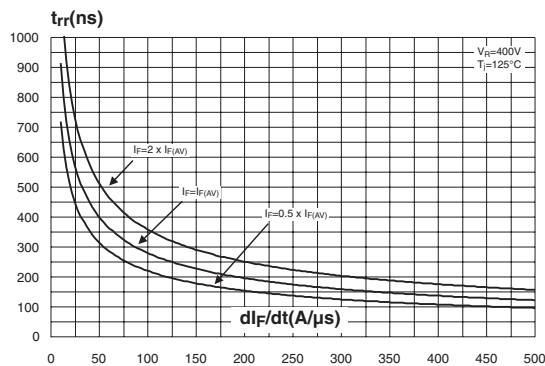


Figure 6: Reverse recovery charges versus di_F/dt (typical values)

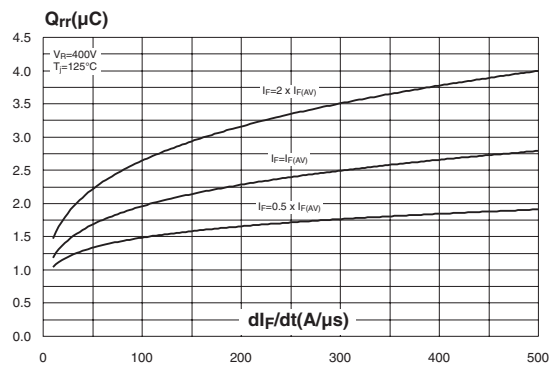


Figure 7: Reverse recovery softness factor versus di_F/dt (typical values)

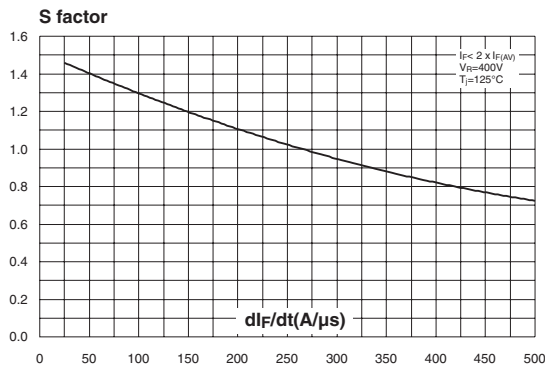


Figure 8: Relative variations of dynamic parameters versus junction temperature

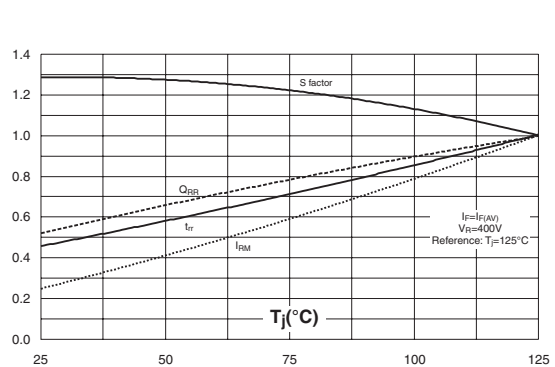


Figure 9: Transient peak forward voltage versus dI_F/dt (typical values)

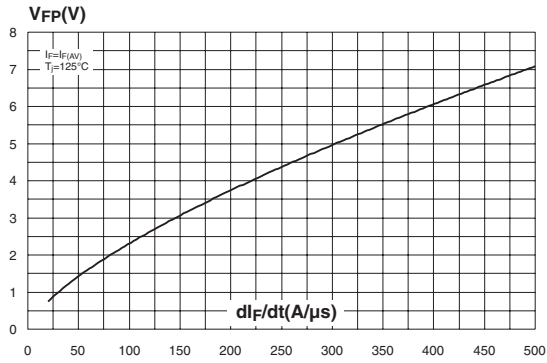


Figure 10: Forward recovery time versus dI_F/dt (typical values)

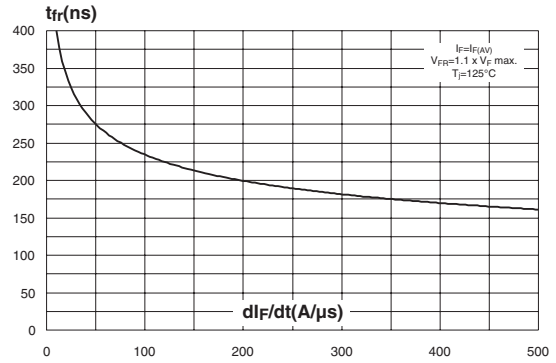


Figure 11: Junction capacitance versus reverse voltage applied (typical values)

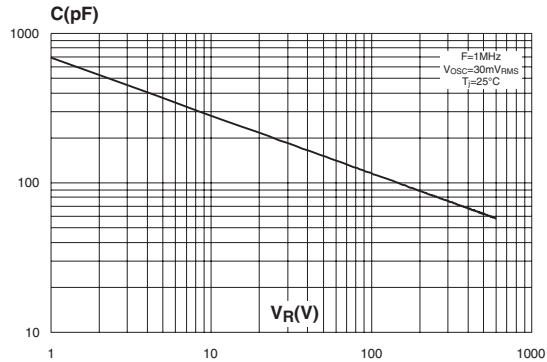


Figure 12: DO-247 Package Mechanical Data

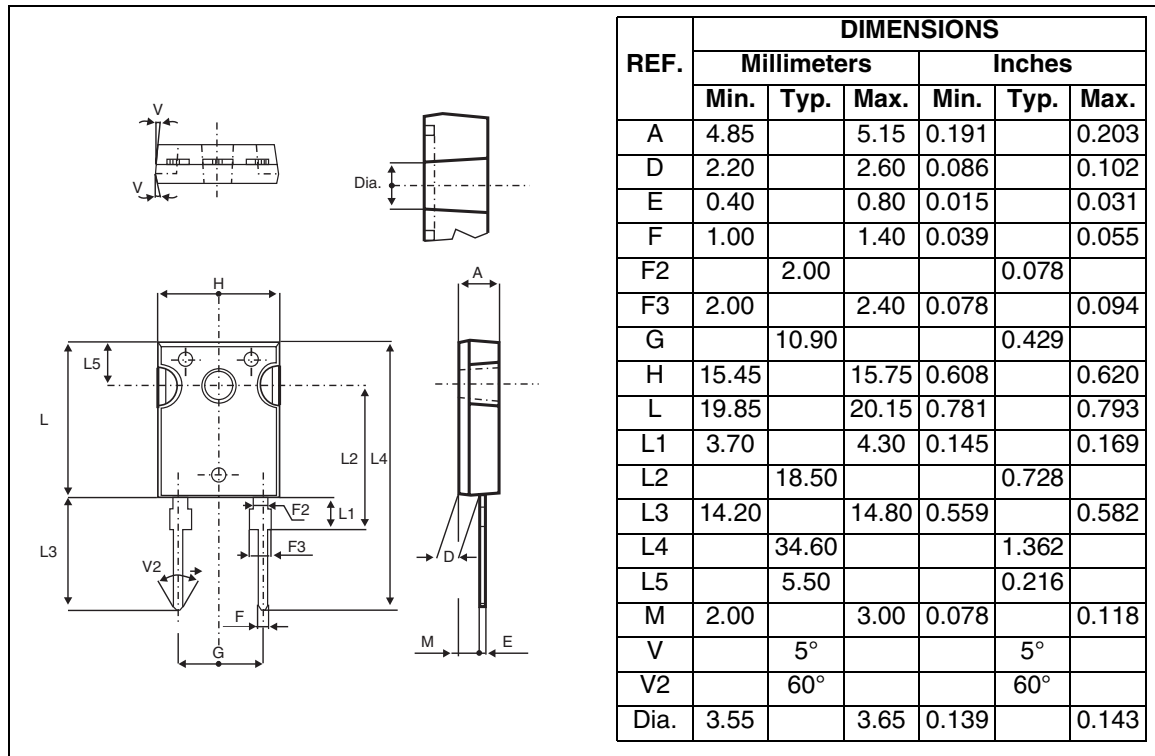


Table 7: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STTH60L06W	STTH60L06W	DO-247	4.40 g	30	Tube

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

Table 8: Revision History

Date	Revision	Description of Changes
07-Sep-2004	1	First issue
10-Sep-2004	2	Junction to case value (page 2) changed from 0.70 °C/W to 0.75°C/W

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics.
All other names are the property of their respective owners

© 2004 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan -
Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America
www.st.com