



# STTH806CT

## TURBO 2 ULTRA-FAST HIGH VOLTAGE RECTIFIER

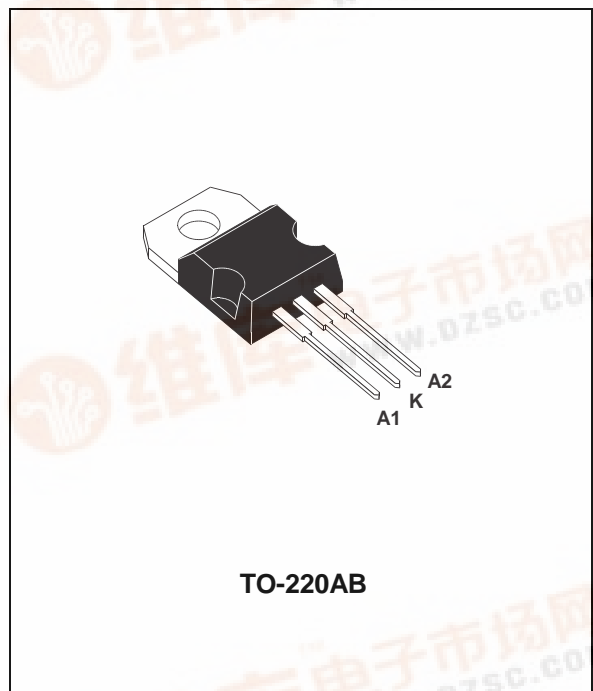
PRELIMINARY DATASHEET

### MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	2x4 A
$V_{RRM}$	600 V
$T_j (max)$	175 °C
$V_F (max)$	1.8 V
$t_{rr} (max)$	45 ns

### FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND VOLTAGE PERFORMANCE.
- ULTRA-FAST, SOFT AND NOISE-FREE RECOVERY FOR LOW SIDE EFFECTS.
- LOW INDUCTANCE, ALLOWS SIMPLIFIED LAYOUT.



### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter			Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage			600	V
$I_{F(RMS)}$	RMS forward current			20	A
$I_{F(AV)}$	Average forward current	$T_c = 138^\circ\text{C}$ $\delta = 0.5$	Per diode Per device	4 8	A
$I_{FSM}$	Surge non repetitive forward current		$t_p = 10 \text{ ms}$ sinusoidal	35	A
$T_{stg}$	Storage temperature range			-65 +175	°C
$T_j$	Maximum operating junction temperature			+ 175	°C

## STTH806CT

### THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
R <sub>th(j-c)</sub>	Junction to case thermal resistance	Per diode	3.9	°C/W
		Total	2.45	

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> *	Reverse leakage current	V <sub>R</sub> = 600 V	T <sub>j</sub> = 25°C			30	μA
			T <sub>j</sub> = 125°C		3	120	
V <sub>F</sub> **	Forward voltage drop	I <sub>F</sub> = 4 A	T <sub>j</sub> = 25°C			2.3	V
			T <sub>j</sub> = 125°C		1.4	1.8	

Pulse test : \* t<sub>p</sub> = 5 ms, δ < 2 %

\*\* t<sub>p</sub> = 380 μs, δ < 2%

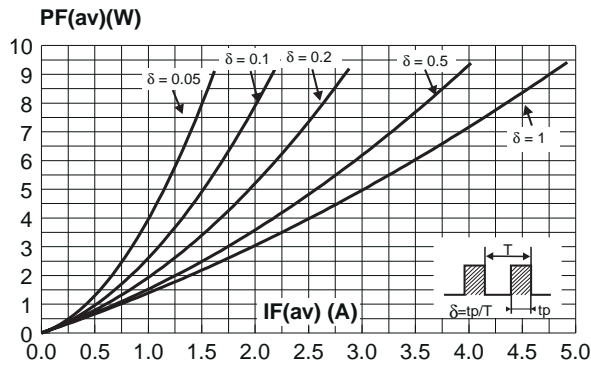
To evaluate the maximum conduction losses use the following equation :

$$P = 1.25 \times I_{F(AV)} + 0.135 I_{F(RMS)}^2$$

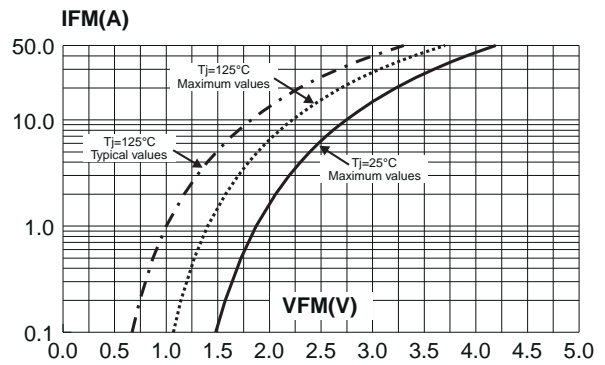
### DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Tests Conditions		Min.	Typ.	Max.	Unit
trr	I <sub>F</sub> = 0.5 A    I <sub>rr</sub> = 0.25 A    I <sub>R</sub> = 1 A	T <sub>j</sub> = 25°C			30	ns
	I <sub>F</sub> = 1 A    dI <sub>F</sub> /dt = - 50 A/μs    V <sub>R</sub> = 30 V				45	
I <sub>RM</sub>	V <sub>R</sub> = 400 V    I <sub>F</sub> = 4 A    dI <sub>F</sub> /dt = -200 A/μs	T <sub>j</sub> = 125°C			6.5	A
S <sub>factor</sub>				1.5		-
tfr	I <sub>F</sub> = 4 A    dI <sub>F</sub> /dt = 40 A/μs	T <sub>j</sub> = 25°C			200	ns
V <sub>FP</sub>	V <sub>FR</sub> = 1.1 x V <sub>F</sub> max				6	
Qrr	V <sub>R</sub> = 400V    I <sub>F</sub> = 4 A    dI <sub>F</sub> /dt = -200 A/μs	T <sub>j</sub> = 125°C		175		nC

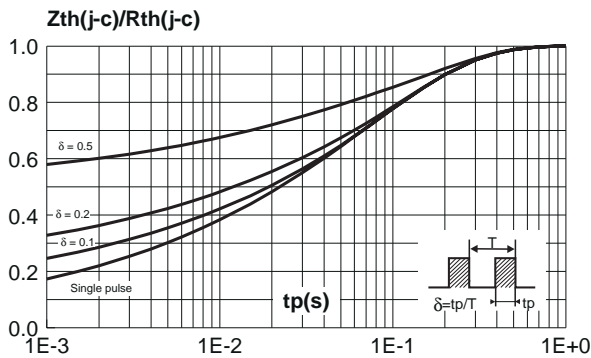
**Fig. 1:** Conduction losses versus average current (per diode).



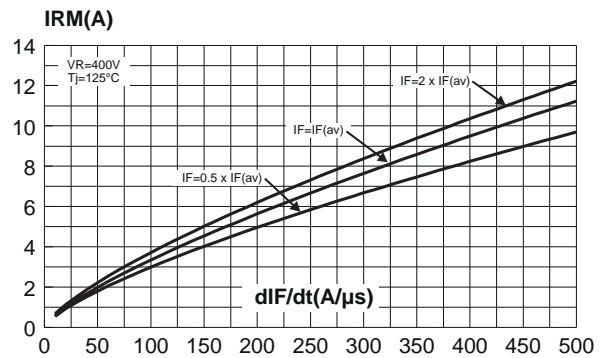
**Fig. 2:** Forward voltage drop versus forward current (per diode).



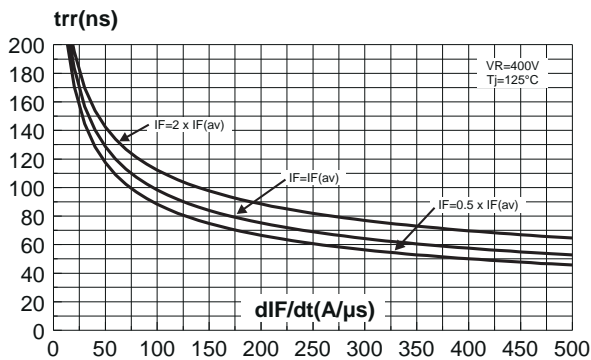
**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration.



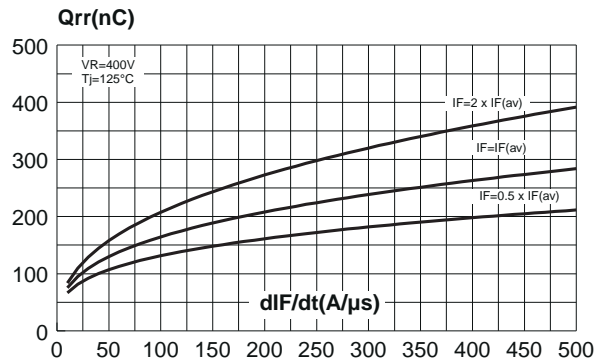
**Fig. 4:** Peak reverse recovery current versus  $dI_F/dt$  (90% confidence, per diode).



**Fig. 5:** Reverse recovery time versus  $dI_F/dt$  (90% confidence, per diode).

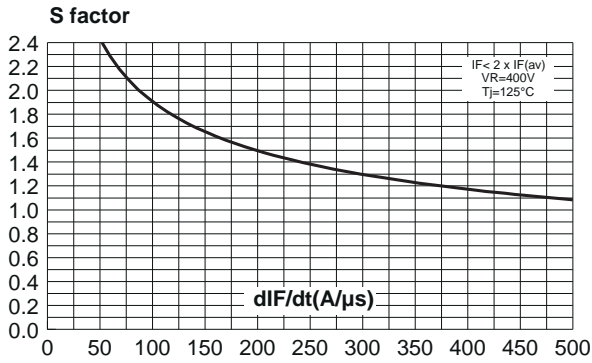


**Fig. 6:** Reverse charges versus  $dI_F/dt$  (90% confidence, per diode).

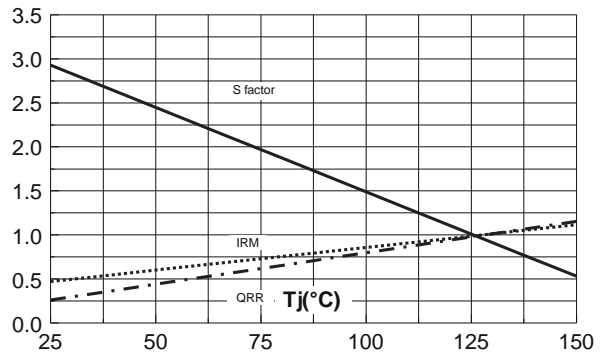


## STTH806CT

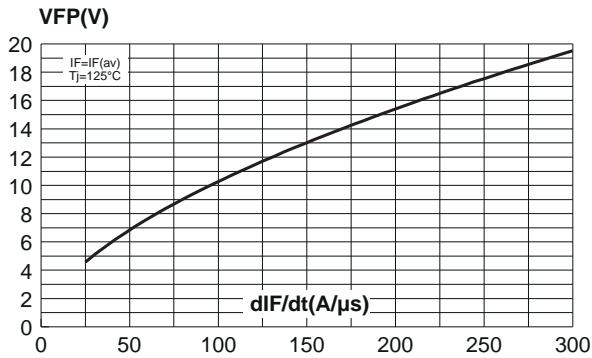
**Fig. 7:** Softness factor ( $t_b/t_a$ ) versus  $di_F/dt$  (typical values, per diode).



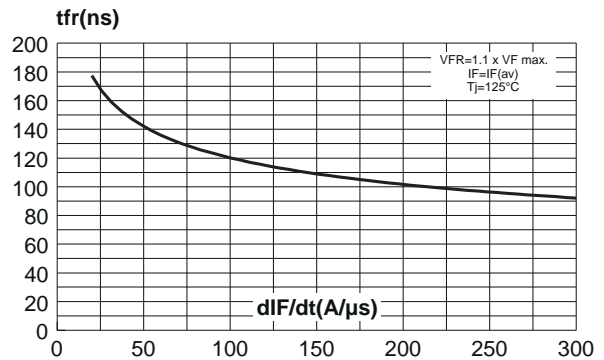
**Fig. 8:** Relative variation of dynamic parameters versus junction temperature (Reference:  $T_J = 125^\circ C$ ).

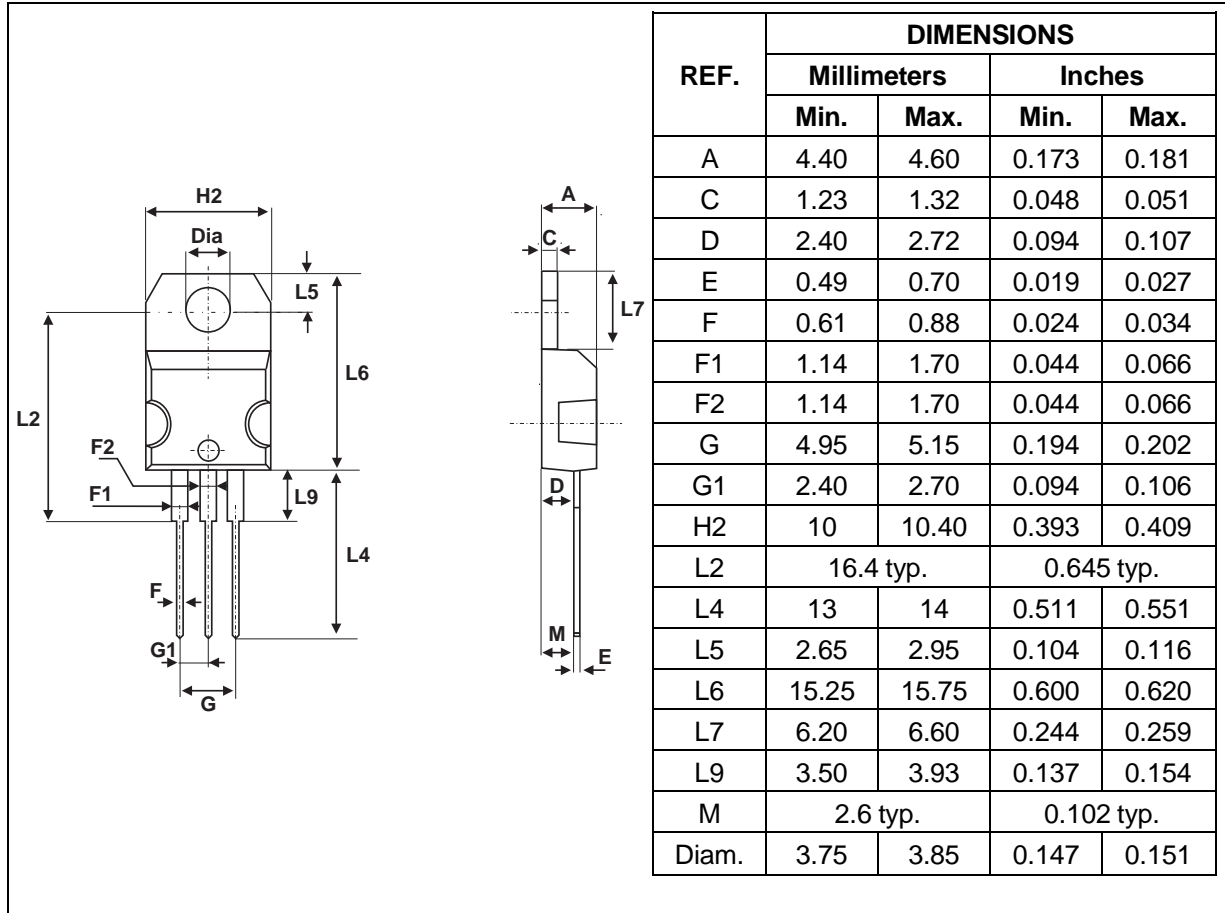


**Fig. 9:** Transient peak forward voltage versus  $di_F/dt$  (90% confidence, per diode).



**Fig. 10:** Forward recovery time versus  $di_F/dt$  (90% confidence, per diode).



**PACKAGE MECHANICAL DATA**  
 TO-220AB


Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH806CT	STTH806CT	TO-220AB	2.2 g.	50	Tube

- Cooling method: C
- Recommended torque value: 0.8 N.m.
- Maximum torque value: 1 N.m.
- Epoxy meets UL94,V0

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

© 1999 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - France - Germany - Italy - Japan - Korea - Malaysia - Malta - Mexico - Morocco -  
 The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.

<http://www.st.com>