



# STTH5L06

## TURBO 2 ULTRAFast HIGH VOLTAGE RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	5 A
$V_{RRM}$	600 V
$I_R (max)$	150 $\mu$ A
$T_j (max)$	175 °C
$V_F (max)$	1.05 V
$trr (max)$	95 ns

### FEATURES AND BENEFITS

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

### DESCRIPTION

The STTH5L06, which is using ST Turbo 2 600V technology, is specially suited as boost diode in discontinuous or critical mode power factor corrections.

The device is also intended for use as a free wheeling diode in power supplies and other power switching applications.



### 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	$T_I = 50^\circ\text{C}$ $\delta = 0.5$	5	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10 \text{ ms}$ Sinusoidal	110	A
$T_{stg}$	Storage temperature range		- 65 + 175	°C
$T_j$	Maximum operating junction temperature		+ 175	°C

## STTH5L06

### THERMAL PARAMETERS

Symbol	Parameter		Maximum	Unit
$R_{th(j-l)}$	Junction to lead	L = 10mm	20	°C/W
$R_{th(j-a)}$	Junction to ambient (note 1)	L = 10mm	75	

**Note 1:** with recommended pad layout (see Fig. 12)

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$I_R$	Reverse leakage current	$V_R = 600V$	$T_j = 25^\circ C$			5	$\mu A$
			$T_j = 150^\circ C$		25	150	
$V_F$	Forward voltage drop	$I_F = 5 A$	$T_j = 25^\circ C$			1.3	V
			$T_j = 150^\circ C$		0.85	1.05	

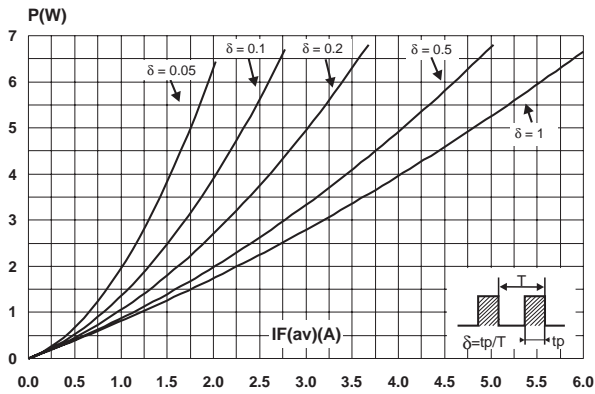
To evaluate the maximum conduction losses use the following equation :

$$P = 0.89 \times I_{F(AV)} + 0.033 I_{F(RMS)}^2$$

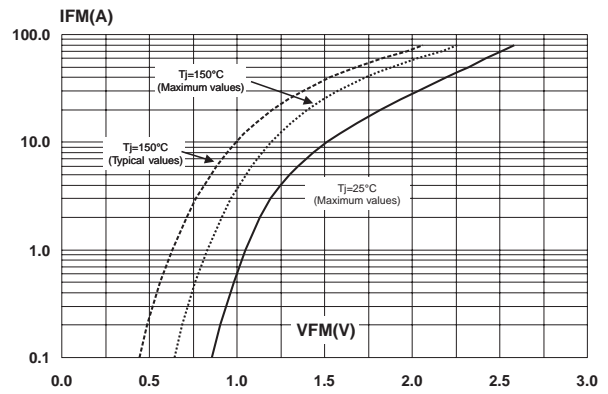
### DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$trr$	Reverse recovery time	$I_F = 1 A$ $di_F/dt = - 50 A/\mu s$ $V_R = 30V$	$T_j = 25^\circ C$		65	95	ns
$tfr$	Forward recovery time	$I_F = 5 A$ $di_F/dt = 100 A/\mu s$ $V_{FR} = 1.1 \times V_{Fmax}$	$T_j = 25^\circ C$			150	ns
$V_{FP}$	Forward recovery time	$I_F = 5 A$ $di_F/dt = 100 A/\mu s$	$T_j = 25^\circ C$			7	V

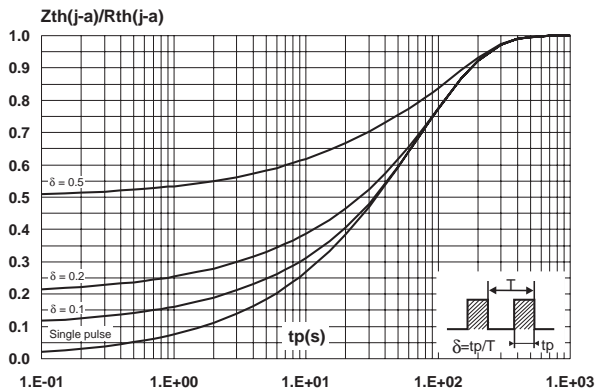
**Fig. 1:** Conduction losses versus average current.



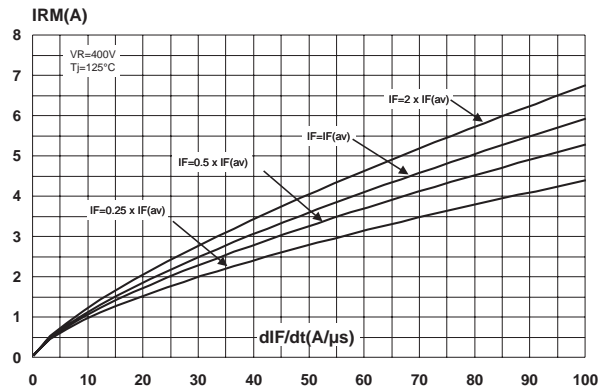
**Fig. 2:** Forward voltage drop versus forward current.



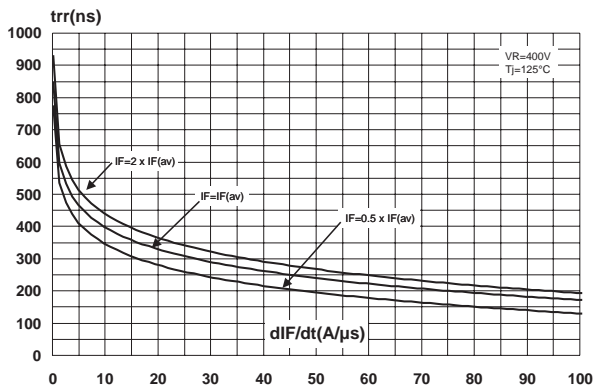
**Fig. 3:** Relative variation of thermal impedance junction ambient pulse duration (DO-201AD, epoxy FR4, Leads = 10mm).



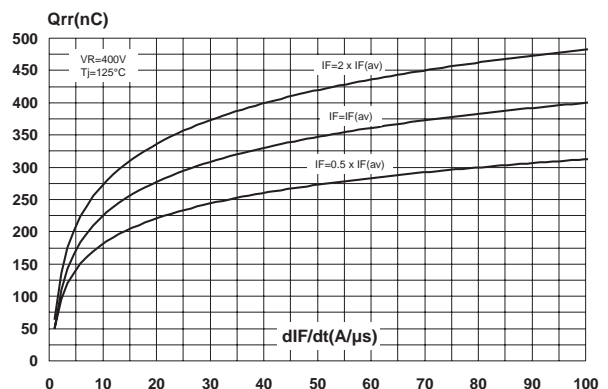
**Fig. 4:** Peak reverse recovery current versus dIF/dt (90% confidence).



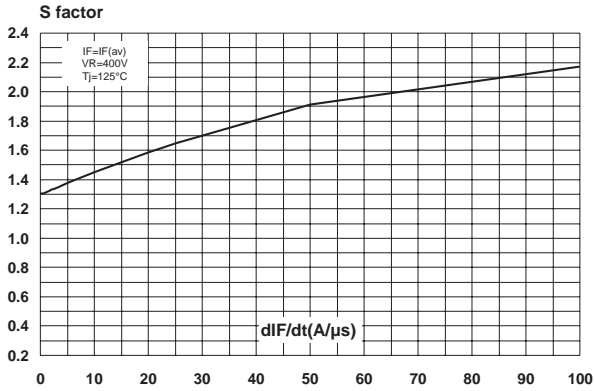
**Fig. 5:** Reverse recovery time versus dIF/dt (90% confidence).



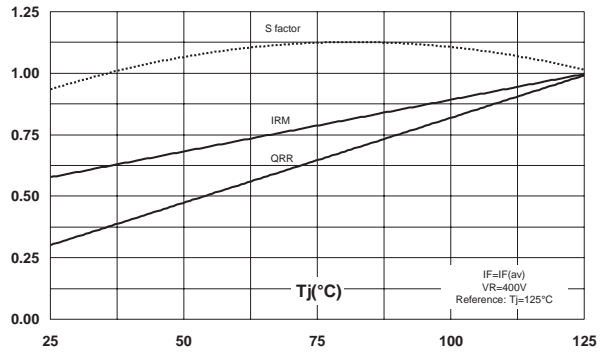
**Fig. 6:** Reverse recovery charges versus dIF/dt (90% confidence).



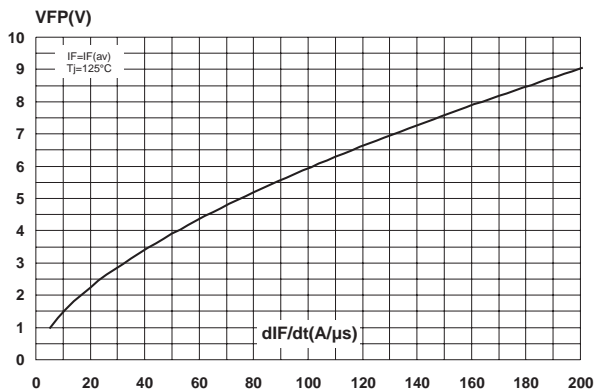
**Fig. 7:** Softness factor versus  $dI_F/dt$  (typical values).



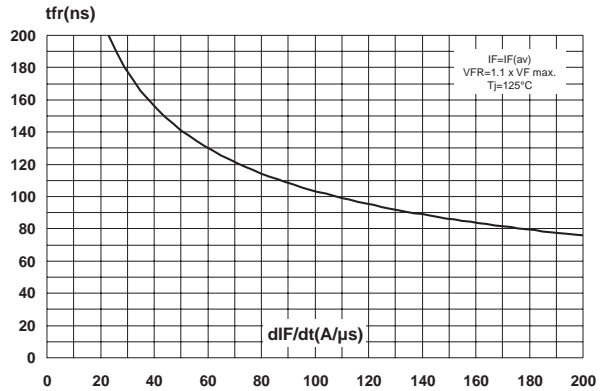
**Fig. 8:** Relative variations of dynamic parameters versus junction temperature.



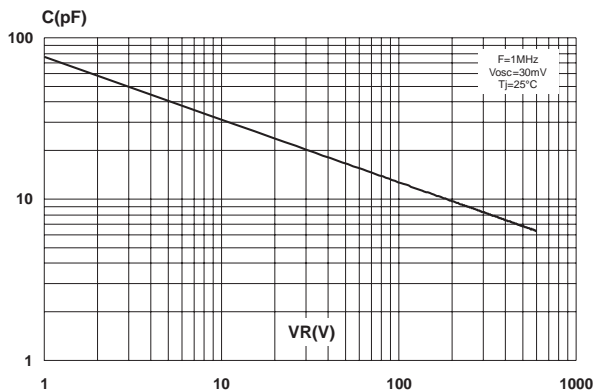
**Fig. 9:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence).



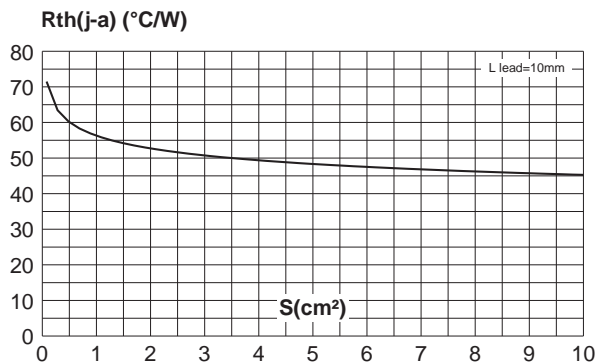
**Fig. 10:** Forward recovery time versus  $dI_F/dt$  (90% confidence).

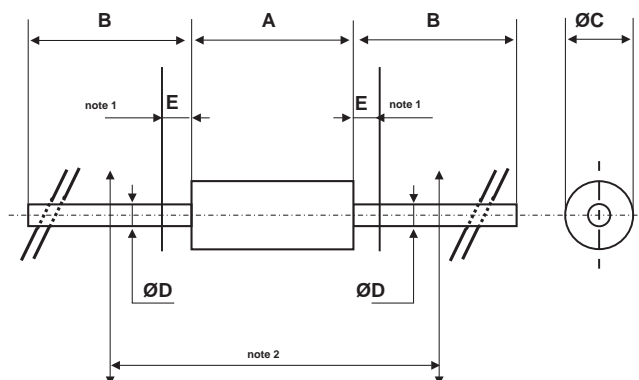


**Fig. 11:** Junction capacitance versus reverse voltage applied (typical values).



**Fig. 12:** Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35μm)



**PACKAGE MECHANICAL DATA**  
 DO-201AD


REF.	DIMENSIONS				NOTES
	Millimeters		Inches		
	Min.	Max.	Min.	Max.	
A		9.50		0.374	1 - The lead diameter $\varnothing D$ is not controlled over zone E  2 - The minimum length which must stay straight between the right angles after bending is 0.59" (15 mm)
B	25.40		1.000		
C		5.30		0.209	
D		1.30		0.051	
E		1.25		0.049	

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH5L06	STTH5L06	DO-201AD		600	Ammopack
STTH5L06RL	STTH5L06	DO-201AD		1900	Tape & reel

- Epoxy meets UL 94,V0
- Lead bending and cutting: refer to ST application note AN1471

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  
 © 2001 STMicroelectronics - Printed in Italy - All rights reserved.  
 STMicroelectronics GROUP OF COMPANIES  
 Australia - Brazil - Canada - China - Finland - France - Germany  
 Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore  
 Spain - Sweden - Switzerland - United Kingdom - United States.

<http://www.st.com>