

## TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

<b>I<sub>F(AV)</sub></b>	<b>1 A</b>
<b>V<sub>RRM</sub></b>	<b>600 V</b>
<b>T<sub>j</sub> (max)</b>	<b>175 °C</b>
<b>V<sub>F</sub> (max)</b>	<b>1.25 V</b>
<b>trr (max)</b>	<b>25 ns</b>

### FEATURES AND BENEFITS

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

### DESCRIPTION

The STTH106, which is using ST Turbo 2 600V technology, is specially suited for use in switching power supplies, inverters and as a free wheeling diode.



**DO-41**  
**STTH106**

### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage		600	V
I <sub>F(RMS)</sub>	RMS forward current		6	A
I <sub>F(AV)</sub>	Average forward current	T <sub>I</sub> = 100°C    δ = 0.5	1	A
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms    Sinusoidal	25	A
T <sub>stg</sub>	Storage temperature range		- 65 + 175	°C
T <sub>j</sub>	Maximum operating junction temperature		+ 175	°C

## THERMAL PARAMETERS

Symbol	Parameter	Maximum	Unit
$R_{th(j-l)}$	Junction to lead	45	°C/W
$R_{th(j-a)}$	Junction to ambient	110	

## STATIC ELECTRICAL CHARACTERISTICS

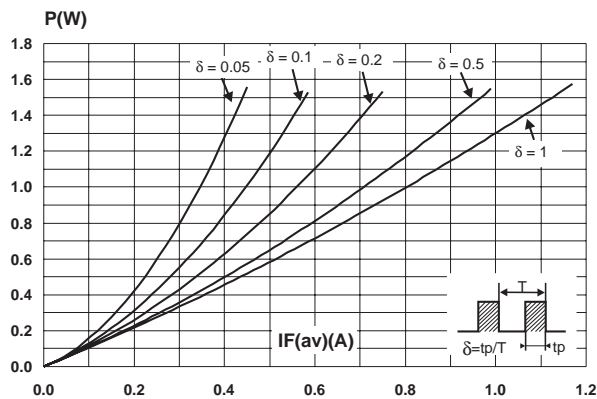
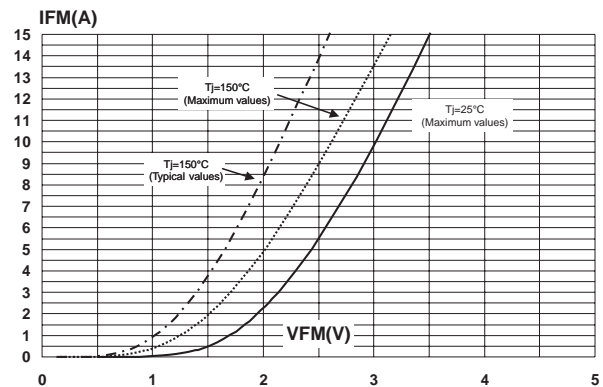
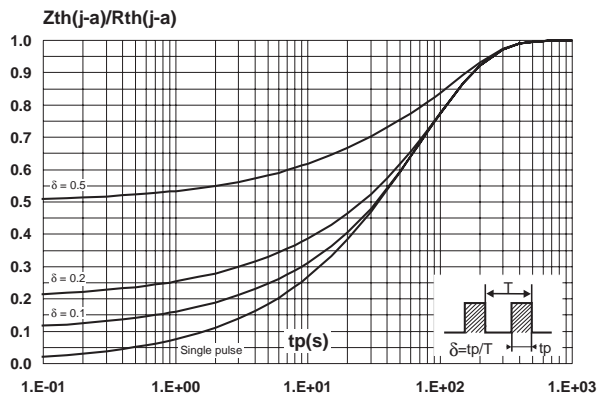
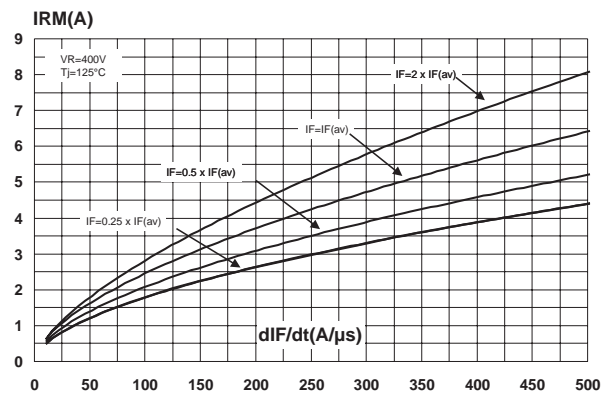
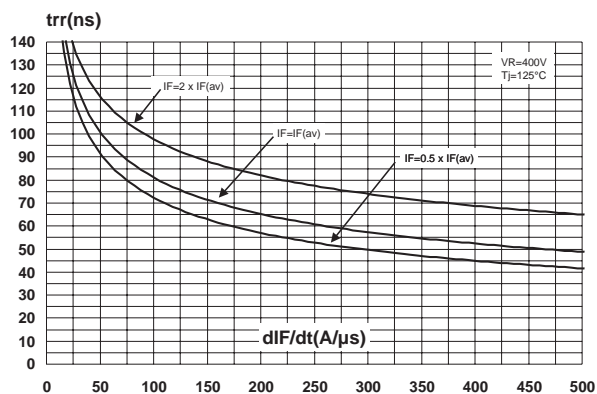
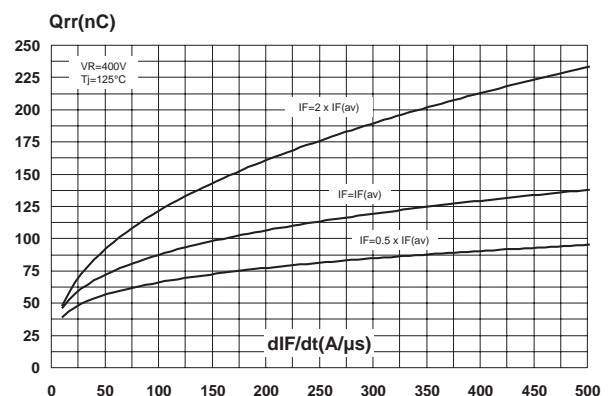
Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$I_R$	Reverse leakage current	$V_R = 600V$	$T_j = 25^\circ C$			1	$\mu A$
			$T_j = 150^\circ C$		10	75	
$V_F$	Forward voltage drop	$I_F = 1 A$	$T_j = 25^\circ C$			1.7	V
			$T_j = 150^\circ C$		1.0	1.25	

To evaluate the maximum conduction losses use the following equation :

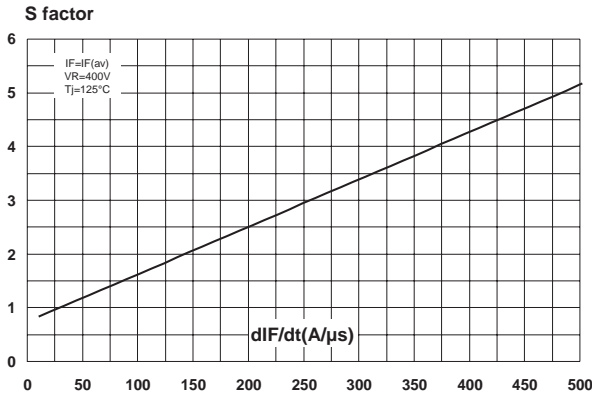
$$P = 1.03 \times I_{F(AV)} + 0.27 I_{F(RMS)}^2$$

## DYNAMIC ELECTRICAL CHARACTERISTICS

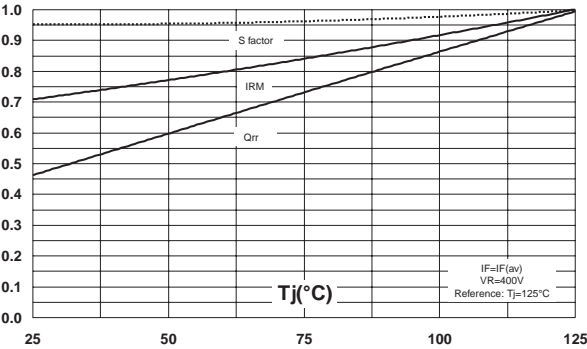
Symbol	Tests conditions		Min.	Typ.	Max.	Unit
trr	$I_F = 0.5 A$ $I_{rr} = 0.25 A$ $I_R = 1 A$	$T_j = 25^\circ C$			25	ns
	$I_F = 1 A$ $dI_F/dt = - 50 A/\mu s$ $V_R = 30V$			30	45	
tfr	$I_F = 1 A$ $dI_F/dt = 100 A/\mu s$ $V_{FR} = 1.1 \times V_{Fmax}$	$T_j = 25^\circ C$			100	ns
$V_{FP}$					10	V

**Fig. 1:** Conduction losses versus average current.**Fig. 2:** Forward voltage drop versus forward current.**Fig. 3:** Relative variation of thermal impedance junction ambient versus pulse duration (epoxy FR4, Leads = 10mm)**Fig. 4:** Peak reverse recovery current versus  $dI_F/dt$  (90% confidence).**Fig. 5:** Reverse recovery time versus  $dI_F/dt$  (90% confidence).**Fig. 6:** Reverse recovery charges versus  $dI_F/dt$  (90% confidence).

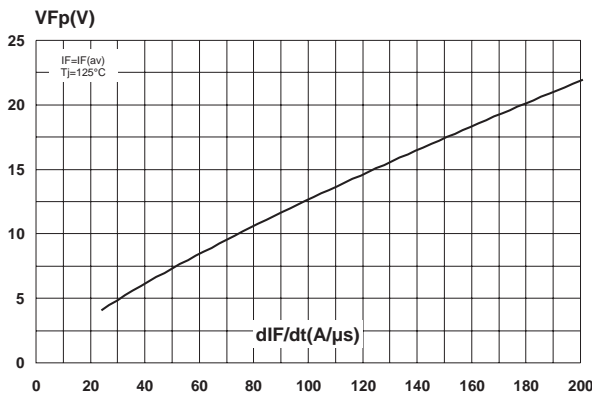
**Fig. 7:** Softness factor versus  $dI_F/dt$  (typical values).



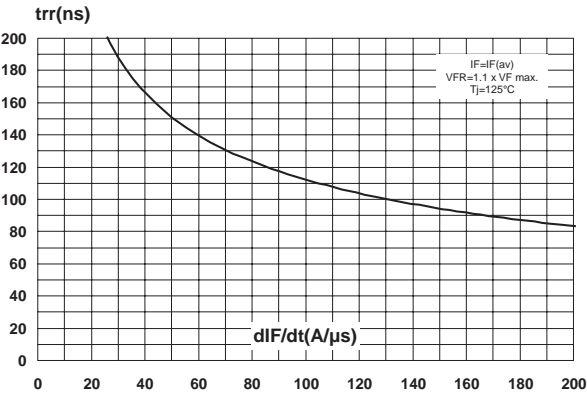
**Fig. 8:** Relative variation of dynamic parameters versus junction temperature.



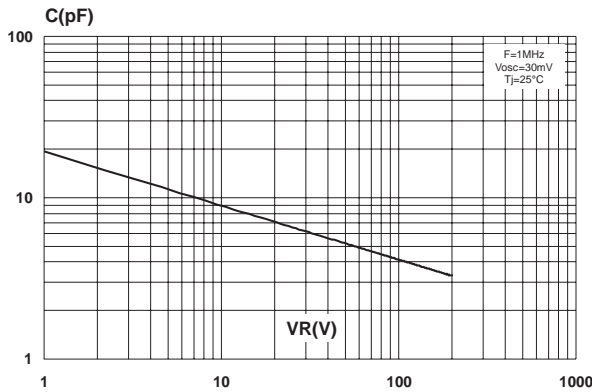
**Fig. 9:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence).



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



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



**PACKAGE MECHANICAL DATA**  
**DO41**

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.07	5.20	0.160	0.205
B	2.04	2.71	0.080	0.107
C	28		1.102	
D	0.712	0.863	0.028	0.034

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH106	STTH106	DO-41	0.34 g	2000	Ammopack
STTH106RL	STTH106	DO-41	0.34 g	5000	Tape & reel

- Epoxy meets UL 94,V0

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