

## TURBO 2 ULTRA-FAST HIGH VOLTAGE RECTIFIER

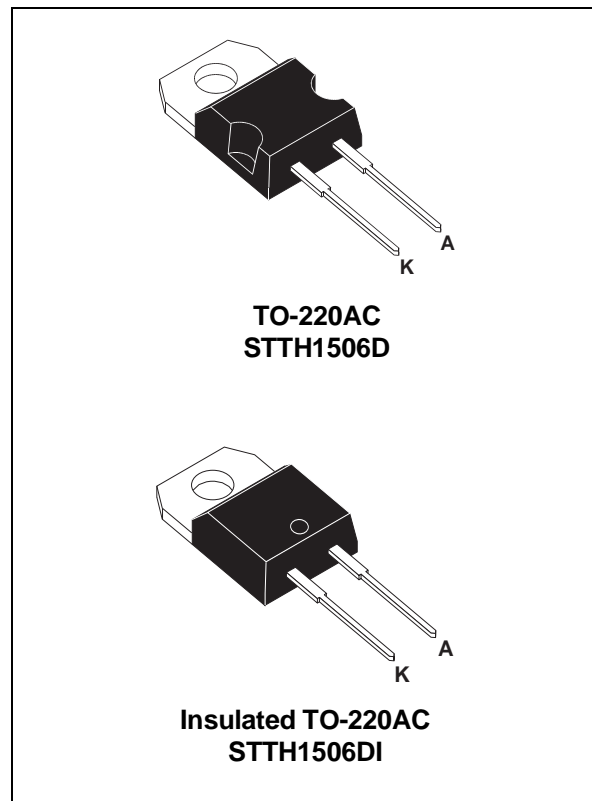
PRELIMINARY DATASHEET

### MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	15 A
$V_{RRM}$	600 V
$T_j(\text{max})$	175 °C
$V_F(\text{max})$	1.9 V
$t_{rr}(\text{max})$	50 ns

### FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND VOLTAGE PERFORMANCE.
- ULTRA-FAST, SOFT AND NOISE-FREE RECOVERY FOR LOW SIDE EFFECTS.
- LOW INDUCTANCE, LOW CAPACITANCE, ALLOWS SIMPLIFIED LAYOUT.
- INSULATED VERSION: TO-220AC  
Insulated voltage = 2500  $V_{RMS}$   
Capacitance = 7 pF



### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		600	V
$I_{F(RMS)}$	RMS forward current	TO-220AC Insulated TO-220AC	30 24	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AC Insulated TO-220AC	$T_c = 92^\circ\text{C}$ $T_c = 55^\circ\text{C}$	15 A
$I_{FSM}$	Surge non repetitive forward current		$t_p = 10 \text{ ms}$ sinusoidal	85 A
$T_{stg}$	Storage temperature range		-65 +175	°C
$T_j$	Maximum operating junction temperature		+ 175	°C

## STTH1506D/DI

### THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
R <sub>th(j-c)</sub>	Junction to case thermal resistance	TO-220AC	2.2	°C/W
		Insulated TO-220AC	3.2	

### 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		100	μA
			T <sub>j</sub> = 125°C		10	
V <sub>F</sub> **	Forward voltage drop	I <sub>F</sub> = 15 A	T <sub>j</sub> = 25°C		2.4	V
			T <sub>j</sub> = 125°C		1.5	

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

\*\* t<sub>p</sub> = 380 μs, δ < 2%

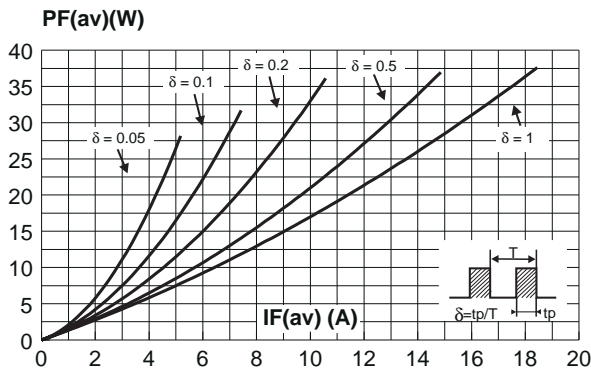
To evaluate the maximum conduction losses use the following equation :

$$P = 1.3 \times I_{F(AV)} + 0.04 I_{F(RMS)}^2$$

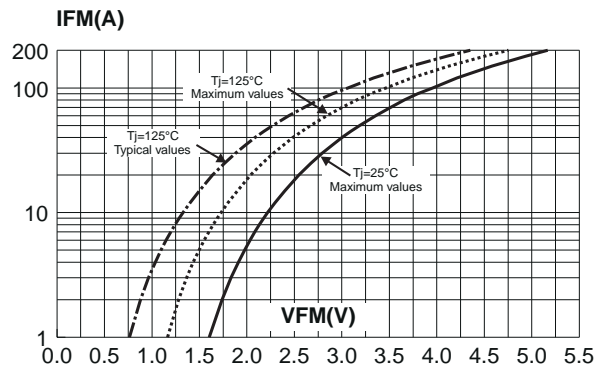
### DYNAMIC ELECTRICAL CHARACTERISTICS

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			35	ns
	I <sub>F</sub> = 1 A    dI <sub>F</sub> /dt = - 50 A/μs    V <sub>R</sub> = 30 V			50	
I <sub>RM</sub>	V <sub>R</sub> = 400 V    I <sub>F</sub> = 15 A    dI <sub>F</sub> /dt = 200 A/μs			9.5	A
S <sub>factor</sub>			1		-
tfr	I <sub>F</sub> = 15 A    dI <sub>F</sub> /dt = 120 A/μs			200	ns
V <sub>FP</sub>	V <sub>FR</sub> = 1.1 x V <sub>F</sub> max				
Qrr	V <sub>R</sub> = 400V    I <sub>F</sub> = 15 A    dI <sub>F</sub> /dt = -200 A/μs		380		nC

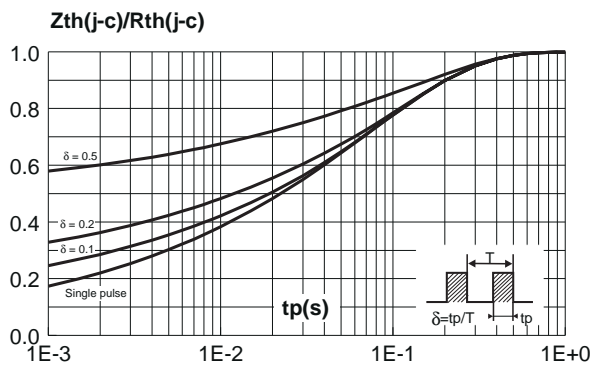
**Fig. 1:** Conduction losses versus average current.



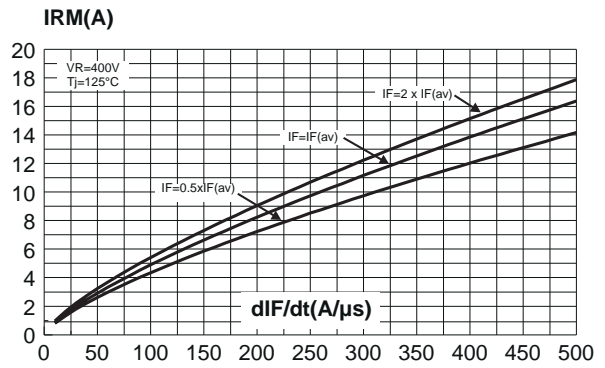
**Fig. 2:** Forward voltage drop versus forward current.



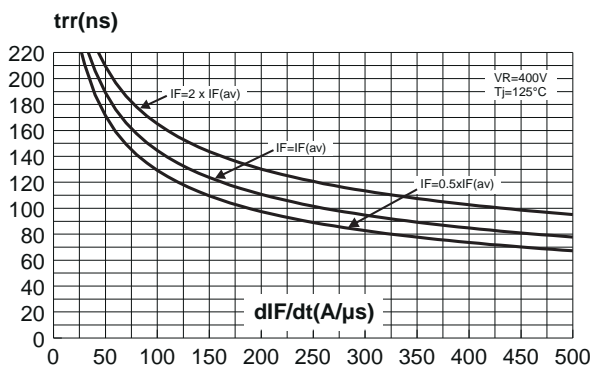
**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration.



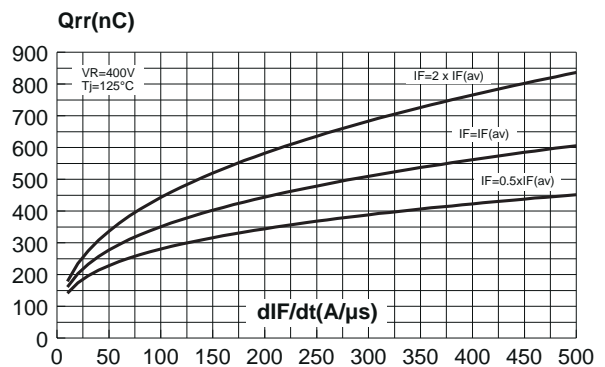
**Fig. 4:** Peak reverse recovery current versus dIF/dt (90% confidence).



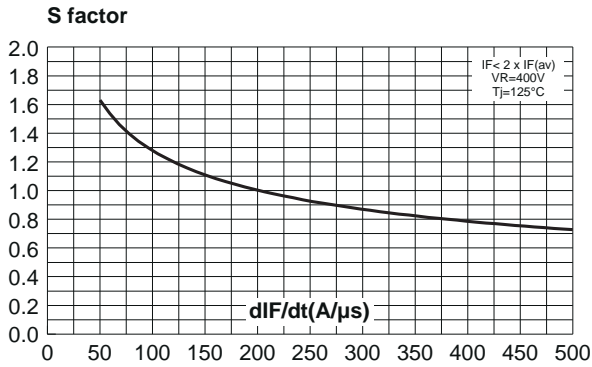
**Fig. 5:** Reverse recovery time trr versus dIF/dt (90% confidence).



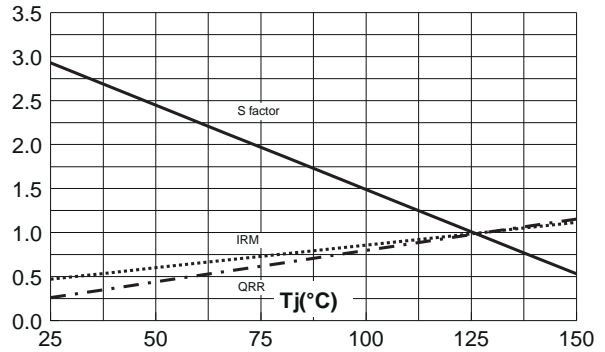
**Fig. 6:** Reverse charges versus dIF/dt (90% confidence).



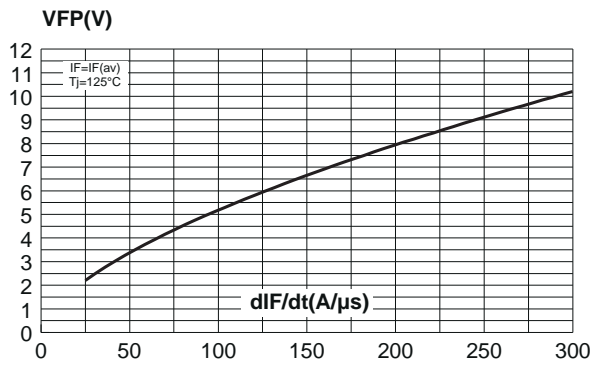
**Fig. 7:** Softness factor (tb/ta) versus  $dI_F/dt$  (typical values)



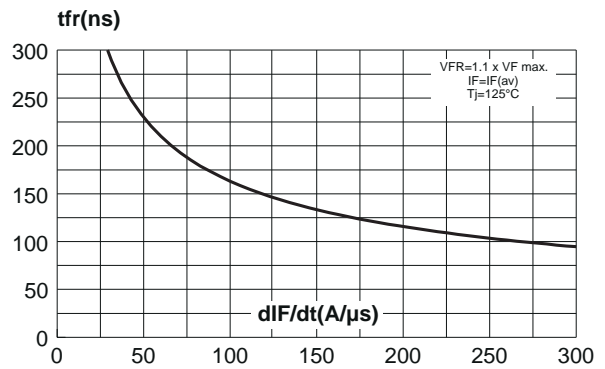
**Fig. 8:** Relative variation of dynamic parameters versus junction temperature (Reference: Tj=125°C)



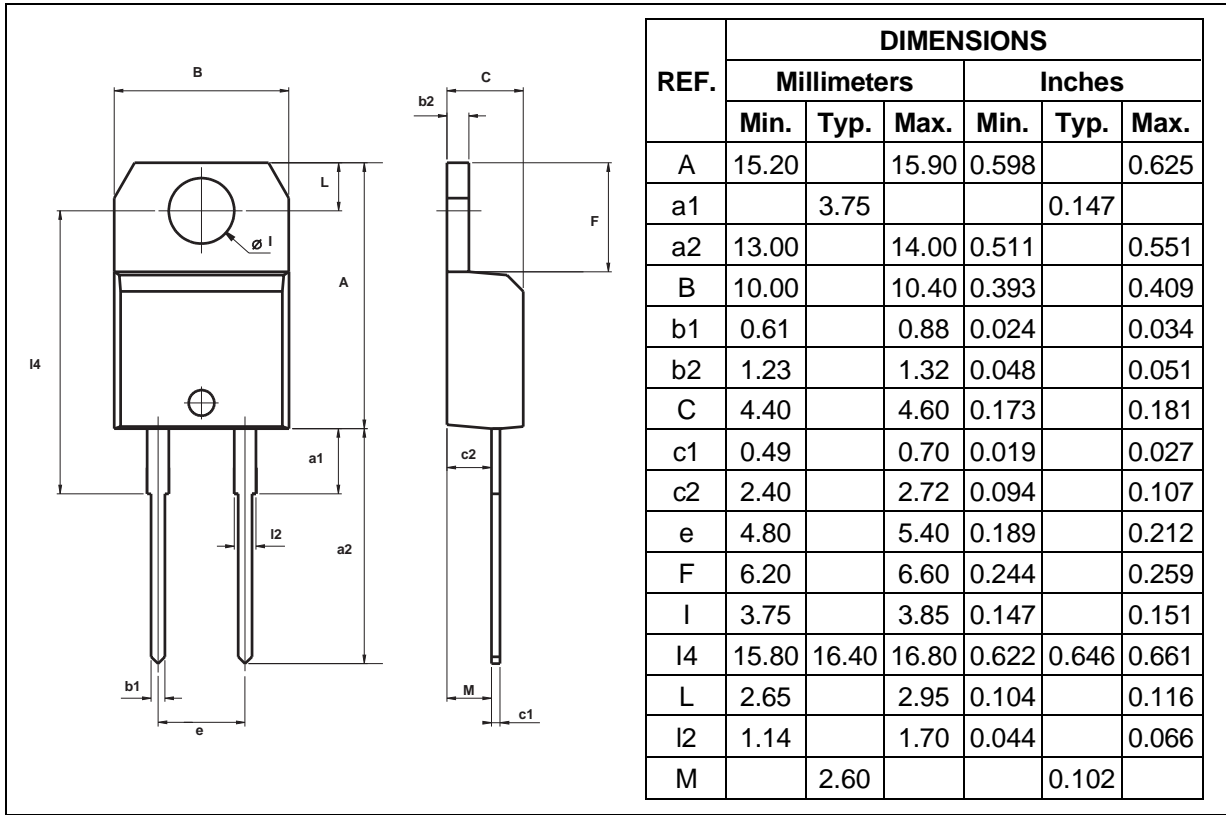
**Fig. 9:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence).



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

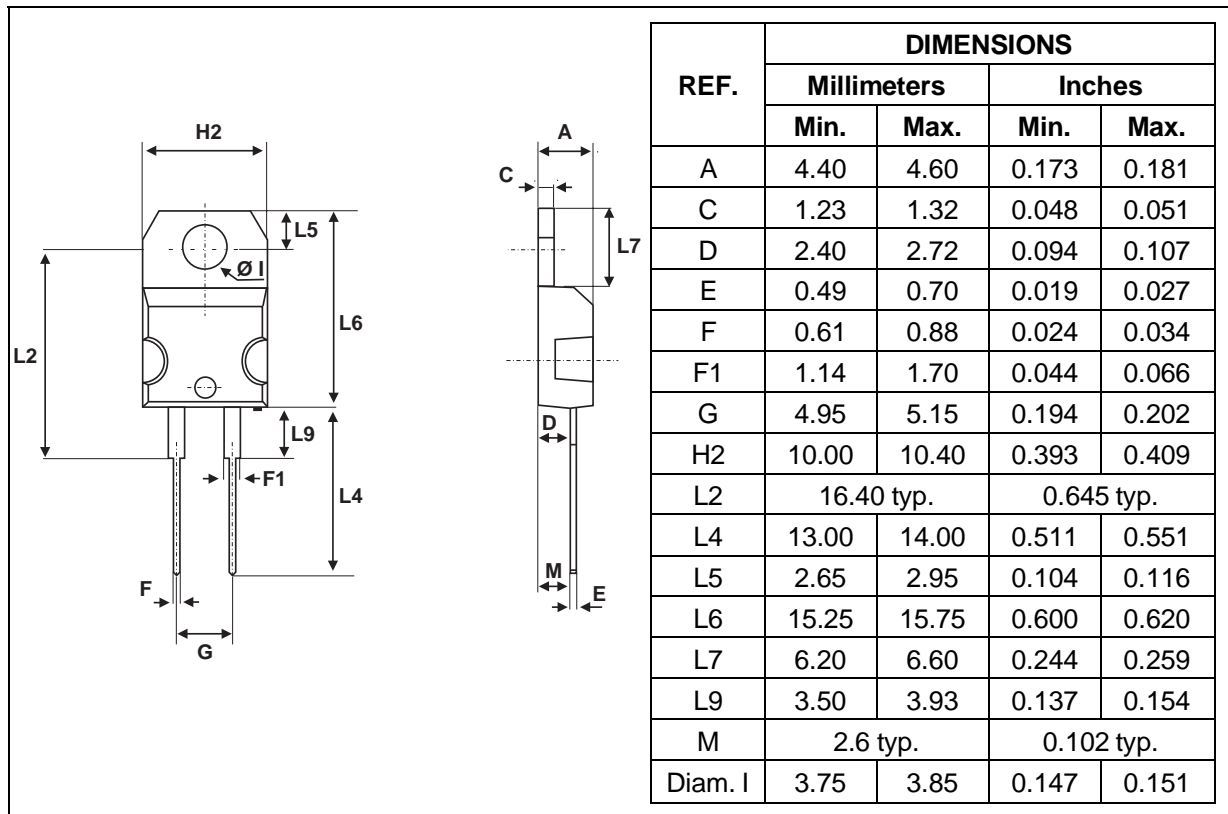


**PACKAGE MECHANICAL DATA**  
TO-220AC (Iso.)



# STTH1506D/DI

## PACKAGE MECHANICAL DATA TO-220AC



Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH1506D	STTH1506D	TO-220AC	1.86 g.	50	Tube
STTH1506DI	STTH1506DI	Insulated TO-220AC	1.86 g.	50	Tube

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

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