


STTH506D

TURBO 2 ULTRA-FAST HIGH VOLTAGE RECTIFIER

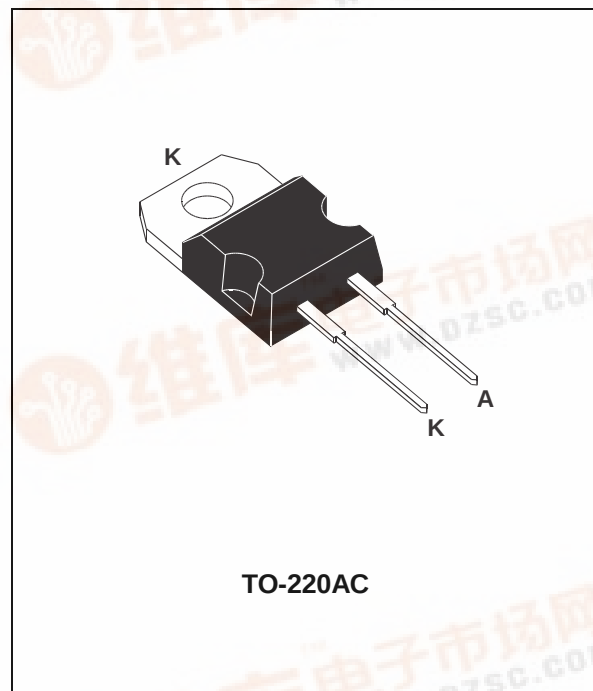
PRELIMINARY DATASHEET

MAJOR PRODUCTS CHARACTERISTICS

$I_F(AV)$	5 A
V_{RRM}	600 V
$T_j(max)$	175 °C
$V_F(max)$	1.9 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	$T_c = 120^\circ\text{C}$ $\delta = 0.5$	5	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

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THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case thermal resistance	4.2	°C/W

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests Conditions	Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$V_R = 600\text{ V}$	$T_j = 25^\circ\text{C}$		30	μA
			$T_j = 125^\circ\text{C}$	3	120	
V_F^{**}	Forward voltage drop	$I_F = 5\text{ A}$	$T_j = 25^\circ\text{C}$		2.4	V
			$T_j = 125^\circ\text{C}$	1.5	1.9	

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

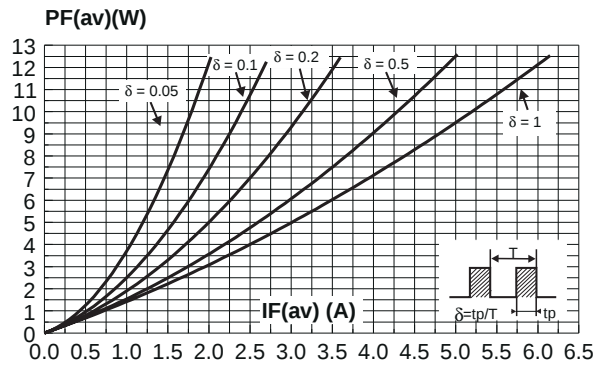
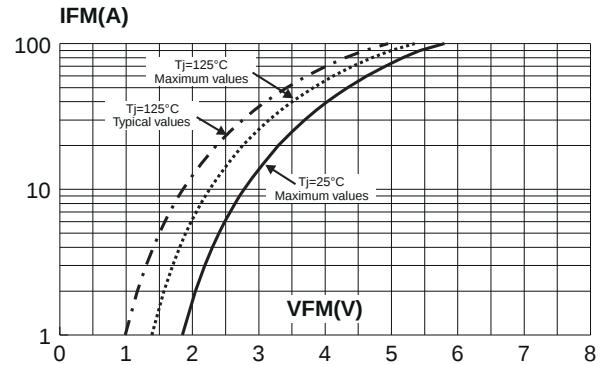
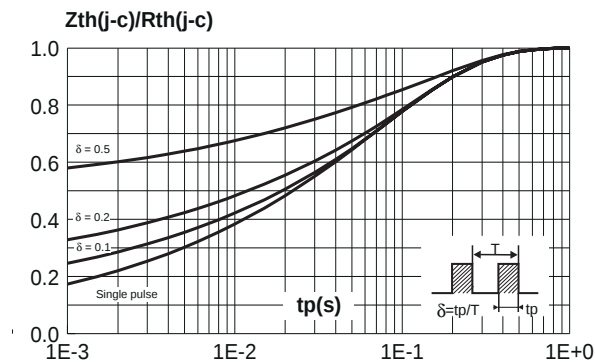
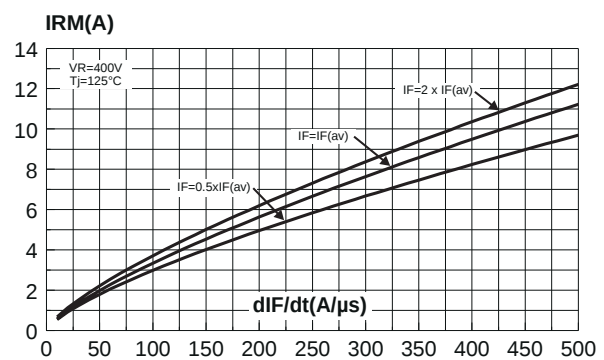
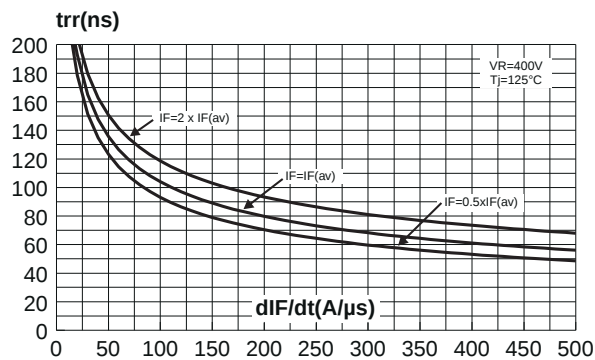
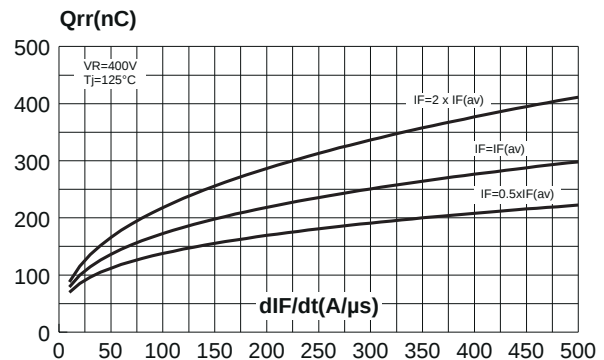
** $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation :

$$P = 1.3 \times I_{F(AV)} + 0.12 I_{F(RMS)}^2$$

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Tests Conditions	Min.	Typ.	Max.	Unit
t_{rr}	$I_F = 0.5\text{ A}$ $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$	$T_j = 25^\circ\text{C}$		30	ns
	$I_F = 1\text{ A}$ $di_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{ V}$			45	
I_{RM}	$V_R = 400\text{ V}$ $I_F = 5\text{ A}$ $di_F/dt = 200\text{ A}/\mu\text{s}$	$T_j = 125^\circ\text{C}$		6.5	A
S_{factor}			1.8		-
t_{fr}	$I_F = 5\text{ A}$ $di_F/dt = 40\text{ A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$		200	ns
V_{FP}				6	V
Q_{rr}	$V_R = 400\text{ V}$ $I_F = 5\text{ A}$ $di_F/dt = 200\text{ A}/\mu\text{s}$	$T_j = 125^\circ\text{C}$	180		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 di_F/dt (90% confidence).**Fig. 5:** Reverse recovery time versus di_F/dt (90% confidence).**Fig. 6:** Reverse charges versus di_F/dt (90% confidence).

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Fig. 7: Softness factor (t_b/t_a) versus dI_F/dt (typical values).

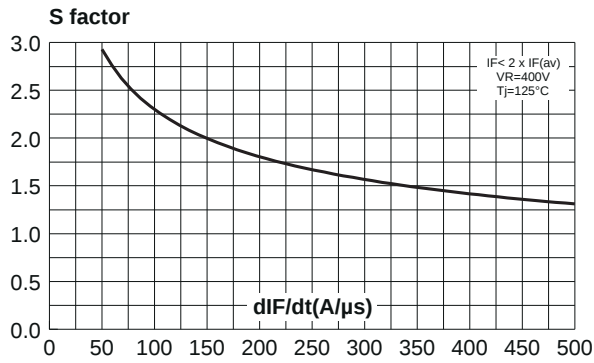


Fig. 8: Relative variation of dynamic parameters versus junction temperature (Reference: $T_J = 125^\circ C$).

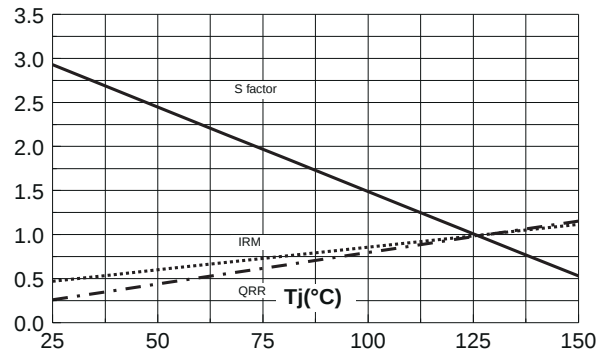


Fig. 9: Transient peak forward voltage versus dI_F/dt (90% confidence).

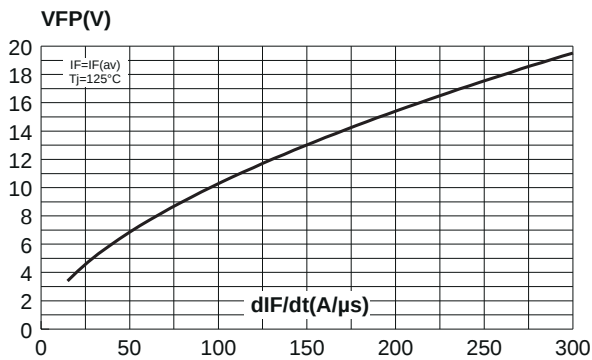
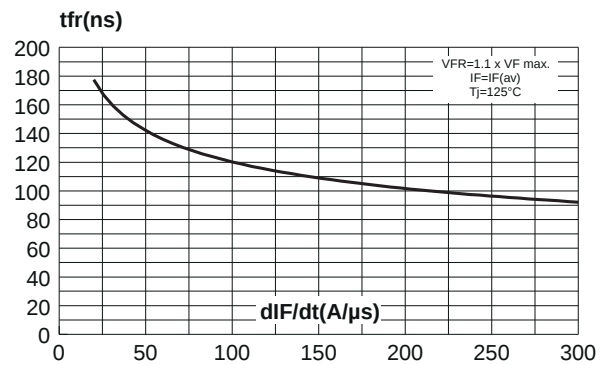
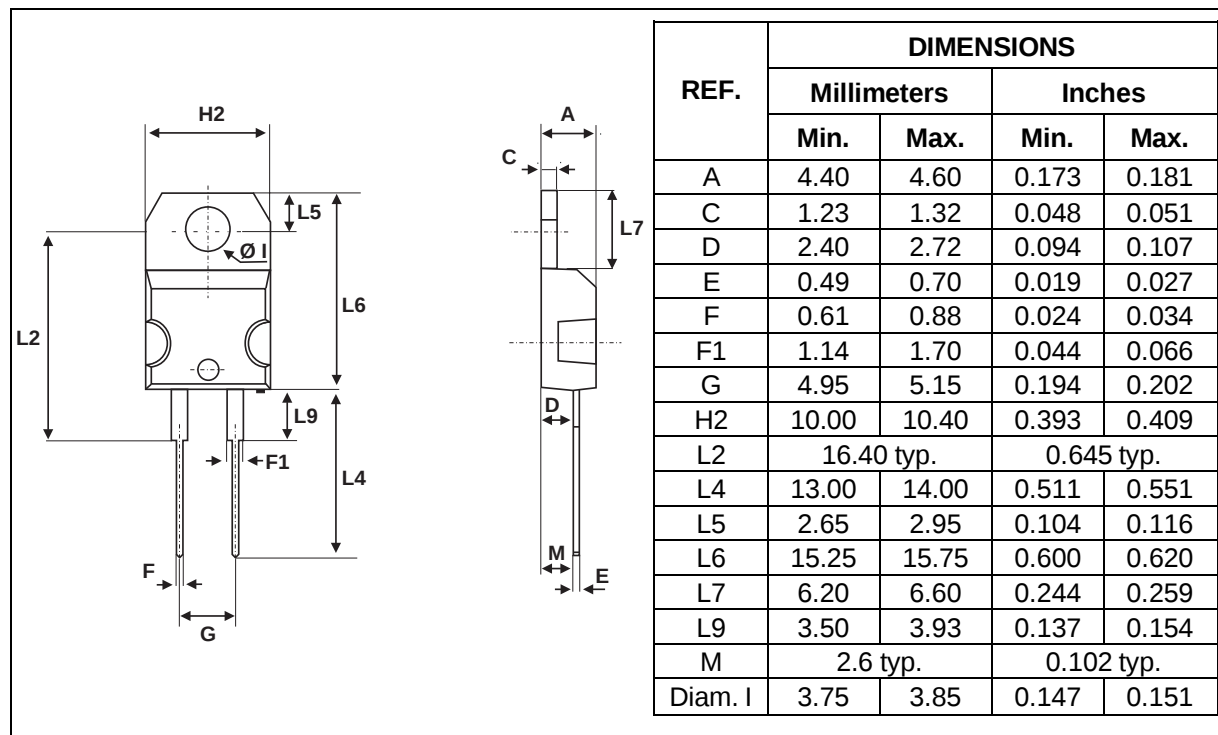


Fig. 10: Forward recovery time versus dI_F/dt (90% confidence).



PACKAGE MECHANICAL DATA
TO-220AC


Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH506D	STTH506D	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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