

**STTH506D****TURBO 2 ULTRA-FAST HIGH VOLTAGE RECTIFIER**

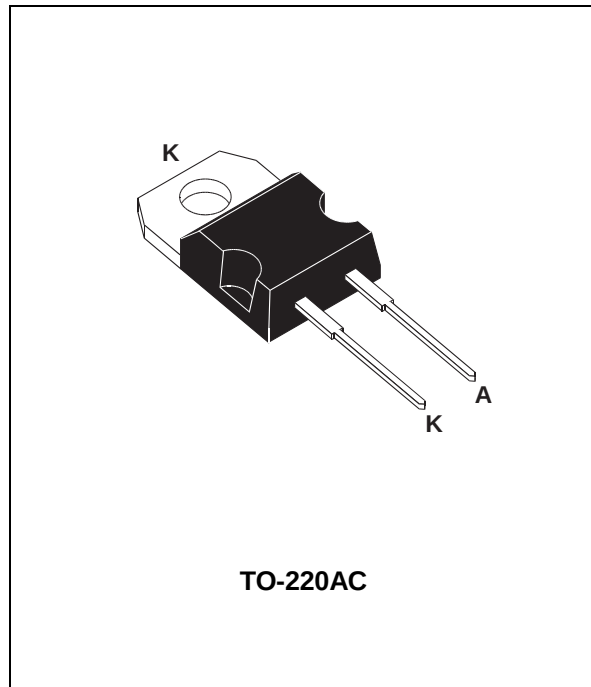
PRELIMINARY DATASHEET

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	$t_p = 10$ ms sinusoidal	35	A
T_{stg}	Storage temperature range		-65 +175	°C
T_j	Maximum operating junction temperature		+ 175	°C

STTH506D

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
trr	$I_F = 0.5\text{ A}$	$I_{rr} = 0.25\text{ A}$	$I_R = 1\text{ A}$	$T_j = 25^\circ\text{C}$		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
Sfactor					1.8		-
tfr	$I_F = 5\text{ A}$ $dI_F/dt = 40\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_F \text{ max}$			$T_j = 25^\circ\text{C}$		200	ns
V _{FP}						6	V
Qrr	$V_R = 400\text{ V}$ $I_F = 5\text{ A}$ $dI_F/dt = 200\text{ A}/\mu\text{s}$			$T_j = 125^\circ\text{C}$	180		nC

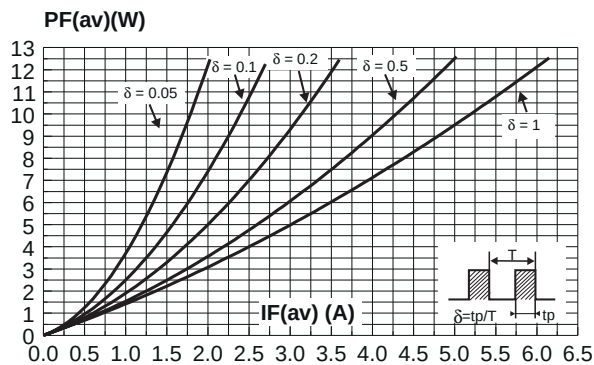
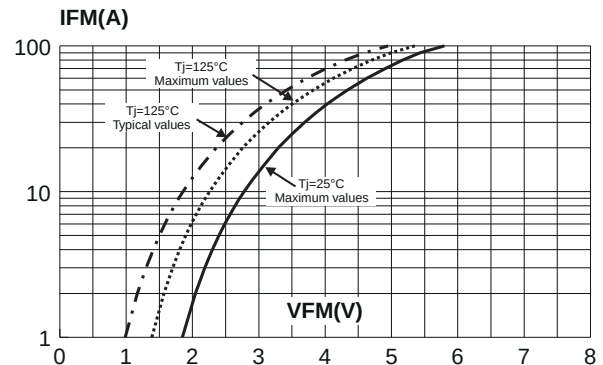
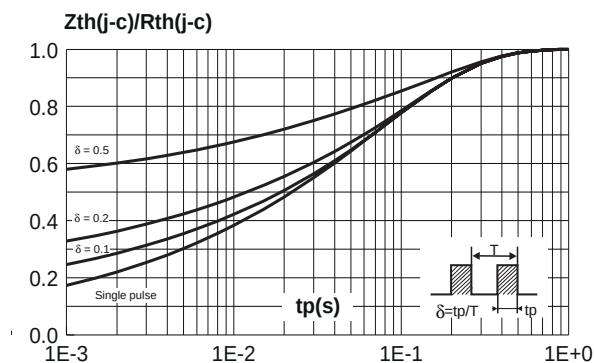
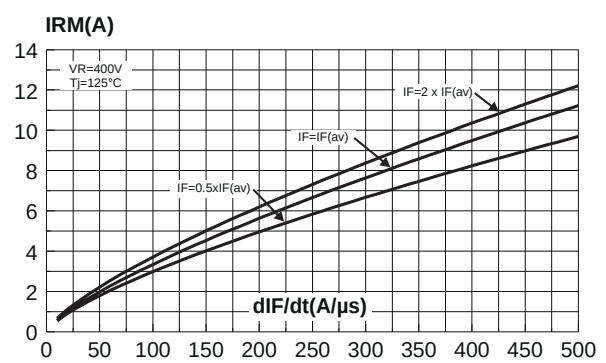
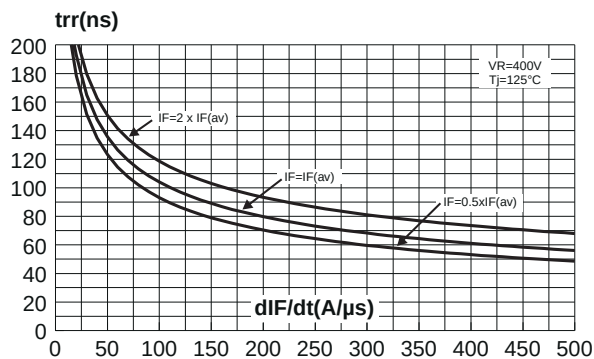
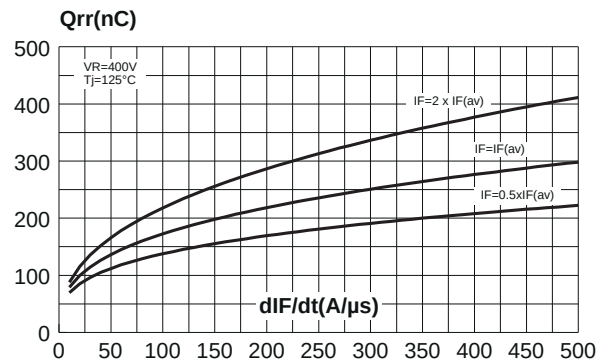
Fig. 1: Conduction losses versus average current.**Fig. 2:** Forward voltage drop versus forward current.**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration.**Fig. 4:** Peak reverse recovery current versus dI_F/dt (90% confidence).**Fig. 5:** Reverse recovery time versus dI_F/dt (90% confidence).**Fig. 6:** Reverse charges versus dI_F/dt (90% confidence).

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

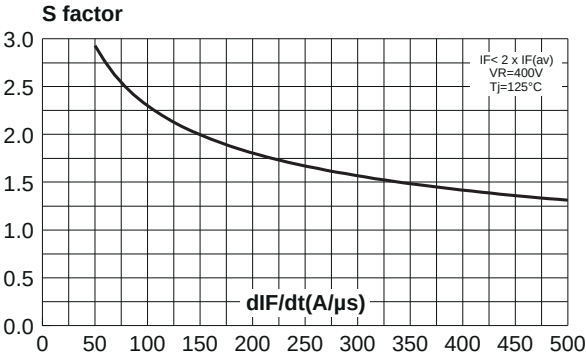


Fig. 8: Relative variation of dynamic parameters versus junction temperature (Reference: $T_J=125^\circ C$).

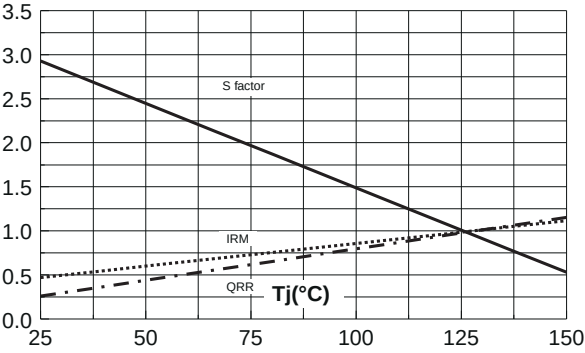


Fig. 9: Transient peak forward voltage versus dI_F/dt (90% confidence).

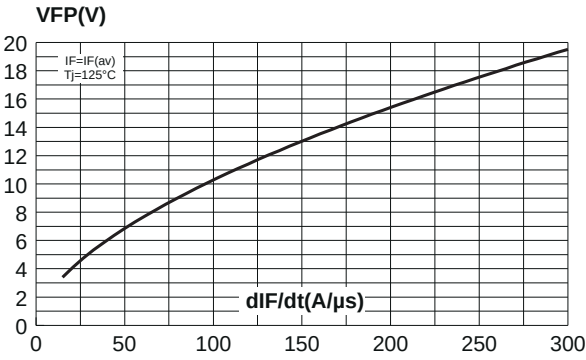
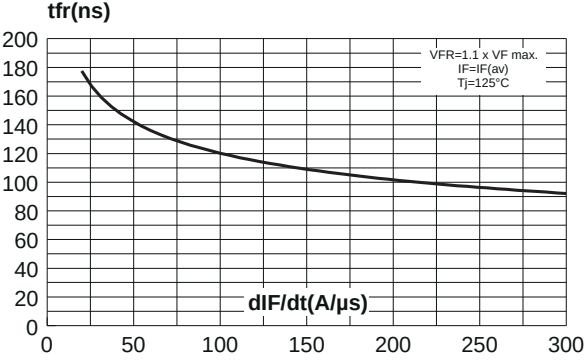


Fig. 10: Forward recovery time versus dI_F/dt (90% confidence).



PACKAGE MECHANICAL DATA
TO-220AC

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
H2	10.00	10.40	0.393	0.409
L2	16.40 typ.		0.645 typ.	
L4	13.00	14.00	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 typ.		0.102 typ.	
Diam. I	3.75	3.85	0.147	0.151

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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