



TURBO 2 ULTRA-FAST HIGH VOLTAGE RECTIFIER

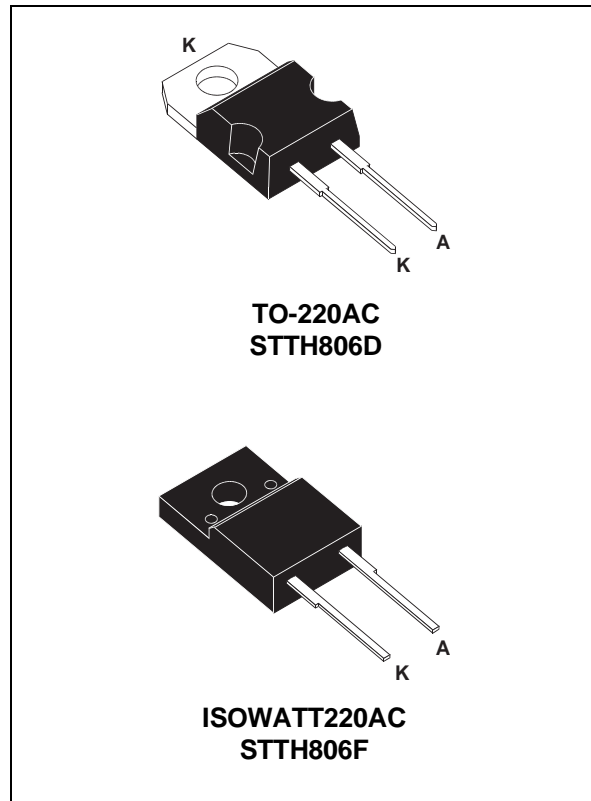
PRELIMINARY DATASHEET

MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	8 A
V_{RRM}	600 V
$T_j(\text{max})$	175 °C
$V_F(\text{max})$	1.9 V
$t_{rr}(\text{max})$	45 ns

FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND VOLTAGE PERFORMANCE.
- ULTRA-FAST, SOFT AND NOISE-FREE RECOVERY FOR LOW SIDE EFFECTS.
- LOW INDUCTANCE, LOW CAPACITANCE (ISOWATT220AC = 12 pF), 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 $\delta = 0.5$	TO-220AC ISOWATT220AC	$T_c = 110^\circ\text{C}$ $T_c = 60^\circ\text{C}$	8 A
I_{FSM}	Surge non repetitive forward current		$t_p = 10\text{ ms}$ sinusoidal	50 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	TO-220AC	3.2	°C/W
		ISOWATT220AC	5.7	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I_R^*	Reverse leakage current	$V_R = 600\text{ V}$	$T_j = 25^\circ\text{C}$			50	μA
			$T_j = 125^\circ\text{C}$		4	200	
V_F^{**}	Forward voltage drop	$I_F = 8\text{ A}$	$T_j = 25^\circ\text{C}$			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 :

$$P = 1.3 \times I_{F(AV)} + 0.075 I_{F(RMS)}^2$$

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}	$V_R = 400\text{ V}$	$I_F = 8\text{ A}$	$di_F/dt = -200\text{ A}/\mu\text{s}$	$T_j = 125^\circ\text{C}$		7.5	A
S_{factor}					1.3		-
tfr	$I_F = 8\text{ A}$	$di_F/dt = 64\text{ A}/\mu\text{s}$		$T_j = 25^\circ\text{C}$		200	ns
V_{FP}		$V_{FR} = 1.1 \times V_F\text{ max}$				6	V
Qrr	$V_R = 400\text{ V}$	$I_F = 8\text{ A}$	$di_F/dt = -200\text{ A}/\mu\text{s}$	$T_j = 125^\circ\text{C}$	260		nC

Fig. 1: Conduction losses versus average current.

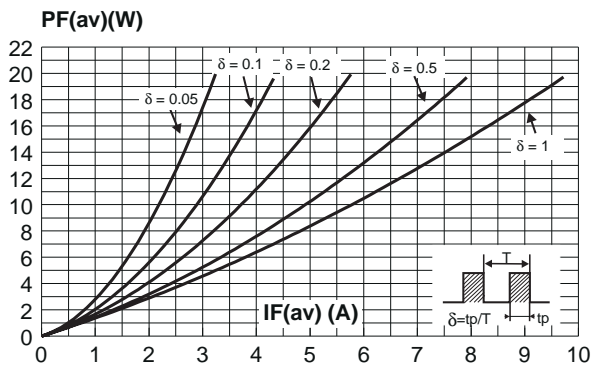


Fig. 2: Forward voltage drop versus forward current.

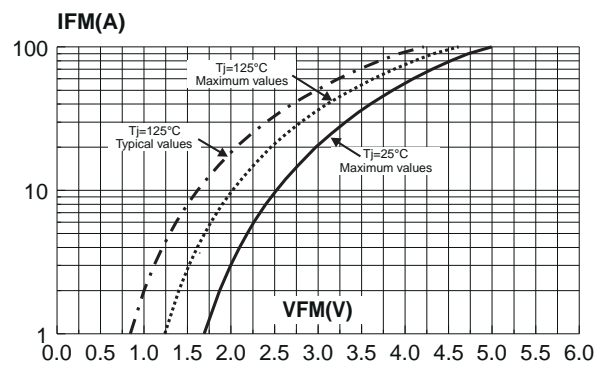


Fig. 3-1: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AC).

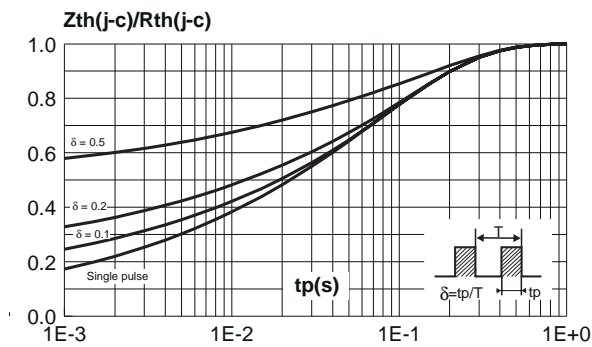


Fig. 3-2: Relative variation of thermal impedance junction to case versus pulse duration (ISOWATT220AC).

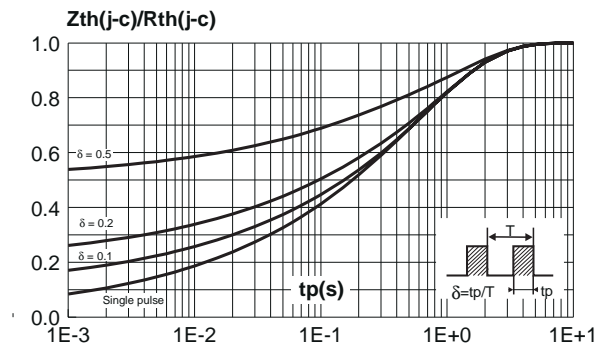


Fig. 4: Peak reverse recovery current versus dIF/dt (90% confidence).

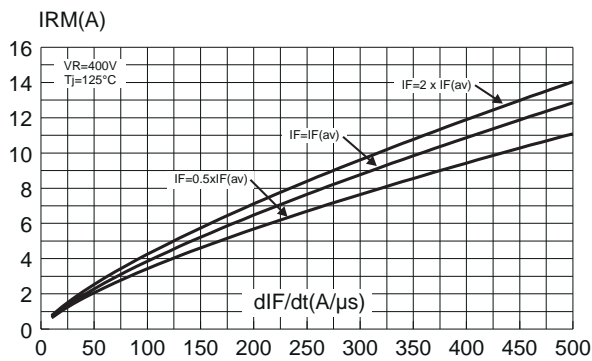
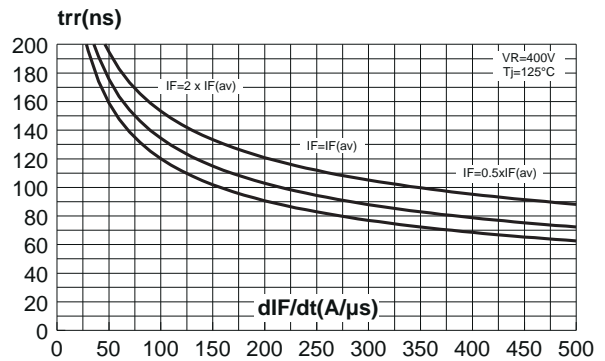


Fig. 5: Reverse recovery time versus dIF/dt (90% confidence).



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

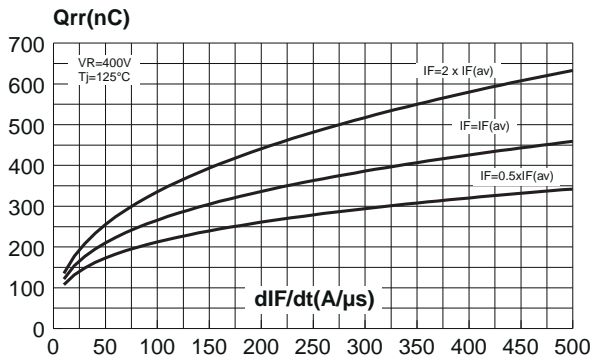


Fig. 7: Softness factor (t_b/t_a) versus dI_F/dt (typical values).

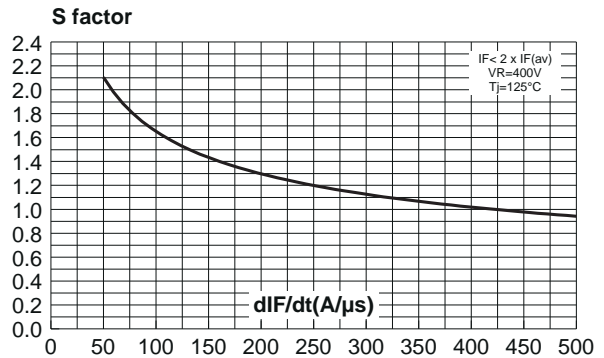


Fig. 8: Relative variation of dynamic parameters versus junction temperature (Reference: $T_j=125^\circ C$).

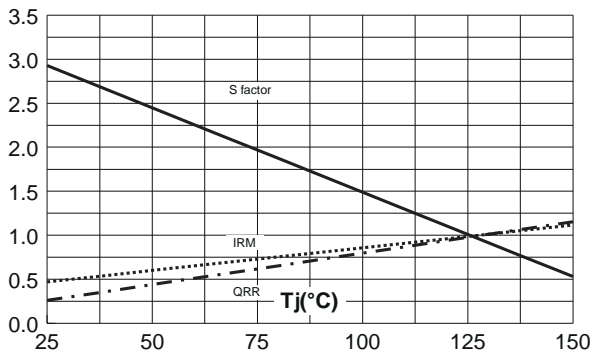


Fig. 9: Transient peak forward voltage versus dI_F/dt (90% confidence).

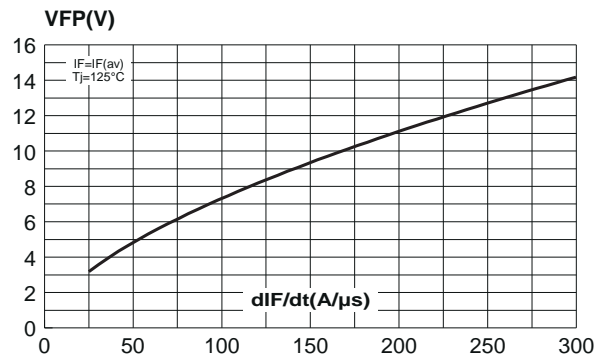
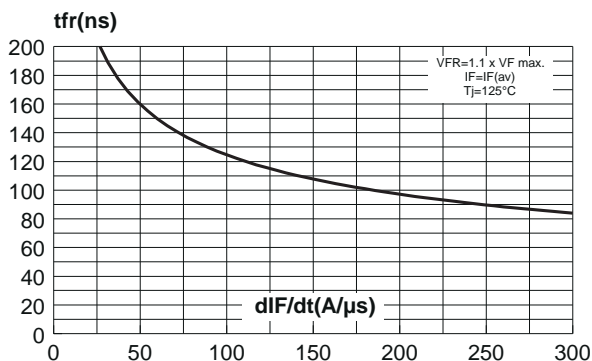
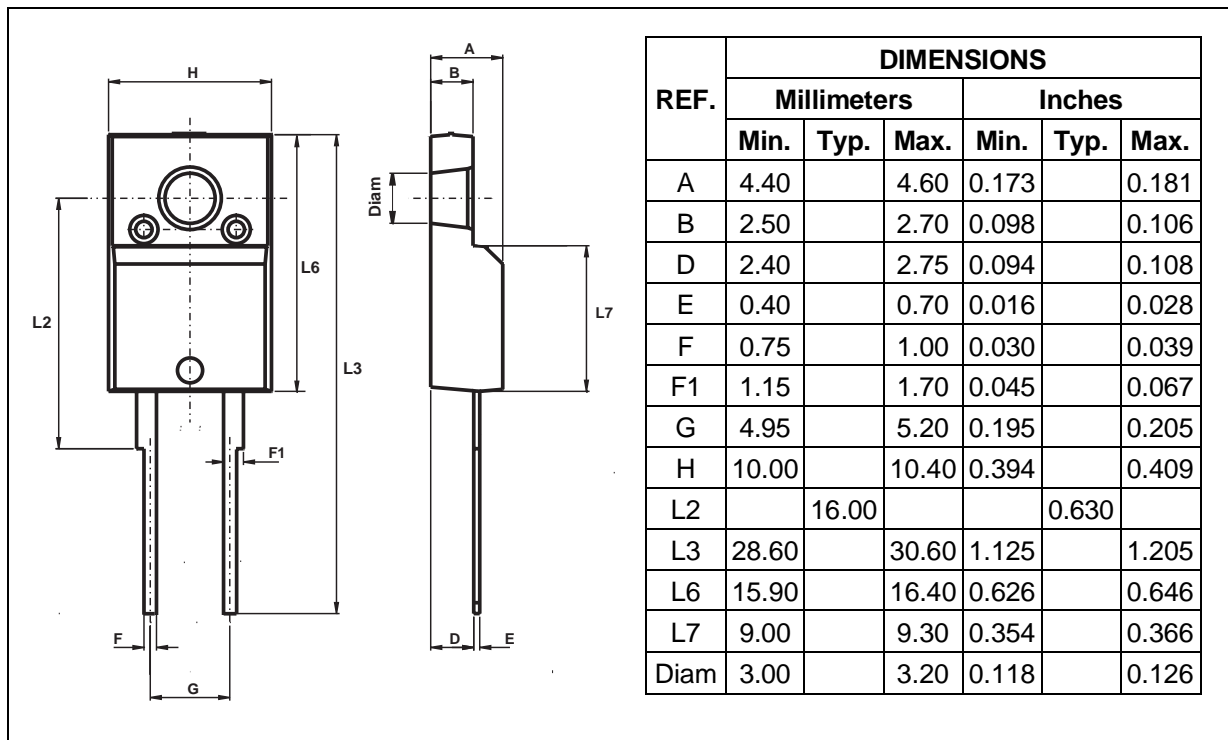


Fig. 10: Forward recovery time versus dI_F/dt (90% confidence).

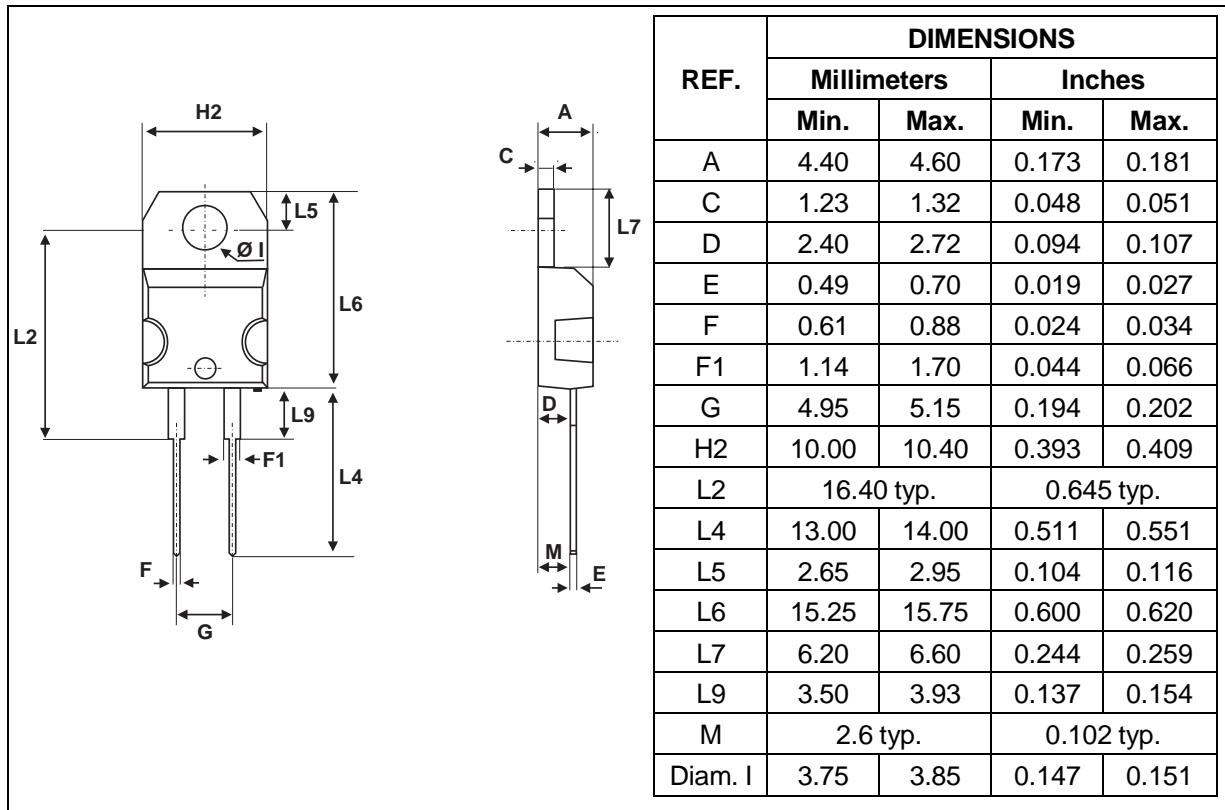


PACKAGE MECHANICAL DATA
ISOWATT220AC



STTH806D/F

PACKAGE MECHANICAL DATA TO-220AC



Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH806D	STTH806D	TO-220AC	1.86 g.	50	Tube
STTH806F	STTH806F	ISOWATT220AC	2 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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