

TURBO 2 ULTRAFast HIGH VOLTAGE RECTIFIER
Table 1: Main Product Characteristics

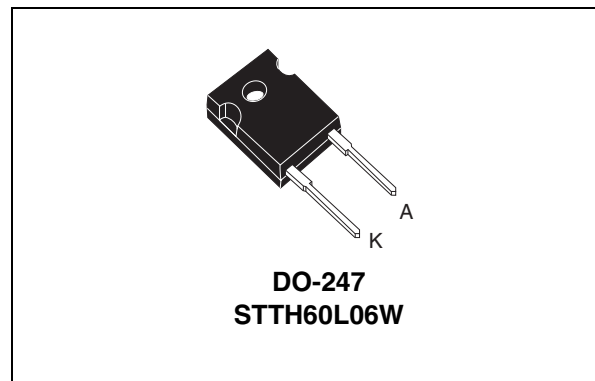
$I_{F(AV)}$	60 A
V_{RRM}	600 V
T_j	175°C
V_F (typ)	0.95 V
t_{rr} (max)	70 ns

FEATURES AND BENEFITS

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

DESCRIPTION

The STTH60L06, which is using ST Turbo 2 600V technology, is specially suited for use in switching power supplies, and industrial applications, as rectification and discontinuous mode PFC boost diode. Thanks to its low V_F characteristics, this device exhibits high performances in free-wheeling applications.


Table 2: Order Codes

Part Number	Marking
STTH60L06W	STTH60L06W

Table 3: Absolute Ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		600	V
$I_{F(RMS)}$	RMS forward current		90	A
$I_{F(AV)}$	Average forward current	$T_c = 110^\circ\text{C} \quad \delta = 0.5$	60	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ms}$ sinusoidal	400	A
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Maximum operating junction temperature		175	°C

Table 4: Thermal Resistance

Symbol	Parameter	Value (max).	Unit
$R_{th(j-c)}$	Junction to case	0.75	°C/W

Table 5: Static Electrical Characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			50	μA
		$T_j = 150^\circ\text{C}$			160	1600	
V_F^{**}	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 60\text{A}$			1.55	V
		$T_j = 150^\circ\text{C}$			0.95	1.2	

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

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

To evaluate the conduction losses use the following equation: $P = 0.93 \times I_{F(AV)} + 0.0045 I_F^2(\text{RMS})$

Table 6: Dynamic Characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
t_{rr}	Reverse recovery time	$T_j = 25^\circ\text{C}$	$I_F = 0.5\text{A}$ $I_{rr} = 0.25\text{A}$ $I_R = 1\text{A}$			70	ns
			$I_F = 1\text{A}$ $di_F/dt = 50\text{ A}/\mu\text{s}$ $V_R = 30\text{V}$		75	105	
I_{RM}	Reverse recovery current	$T_j = 125^\circ\text{C}$	$I_F = 60\text{A}$ $V_R = 400\text{V}$ $di_F/dt = 100\text{ A}/\mu\text{s}$		14	19	A
t_{fr}	Forward recovery time	$T_j = 25^\circ\text{C}$	$I_F = 60\text{A}$ $di_F/dt = 200\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$			500	ns
V_{FP}	Forward recovery voltage	$T_j = 25^\circ\text{C}$	$I_F = 60\text{A}$ $di_F/dt = 200\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$		3		V

Figure 1: Conduction losses versus average forward current

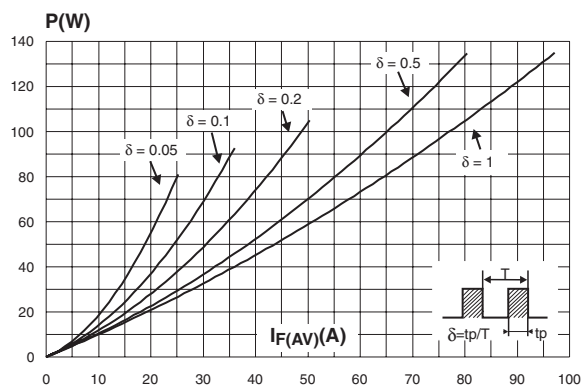


Figure 2: Forward voltage drop versus forward current

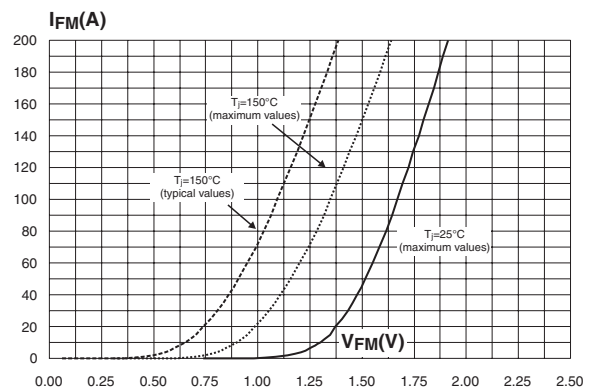


Figure 3: Relative variation of thermal impedance junction to case versus pulse duration

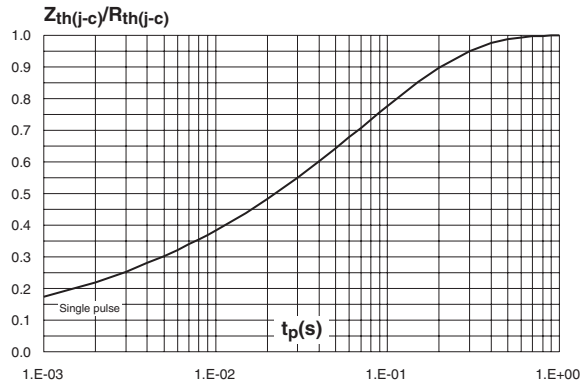


Figure 4: Peak reverse recovery current versus di_F/dt (typical values)

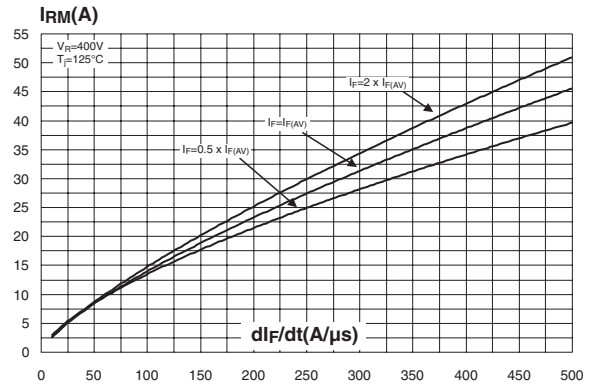


Figure 5: Reverse recovery time versus di_F/dt (typical values)

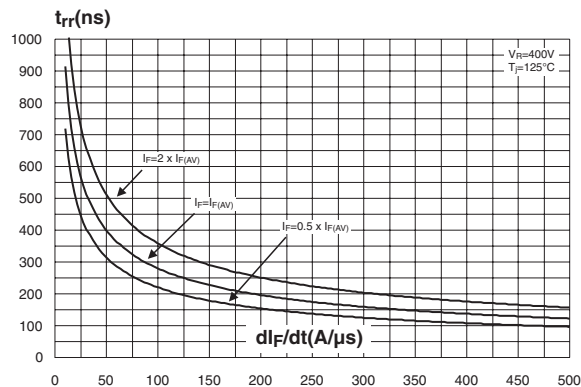


Figure 6: Reverse recovery charges versus di_F/dt (typical values)

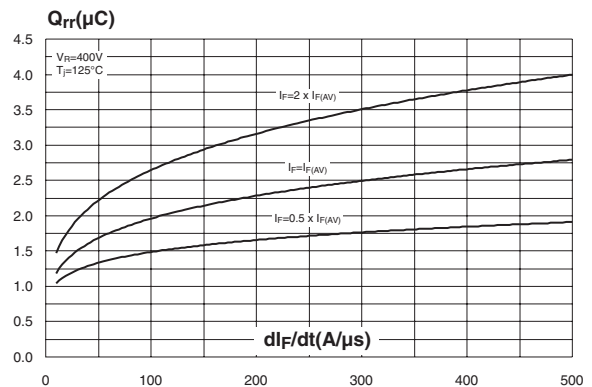


Figure 7: Reverse recovery softness factor versus di_F/dt (typical values)

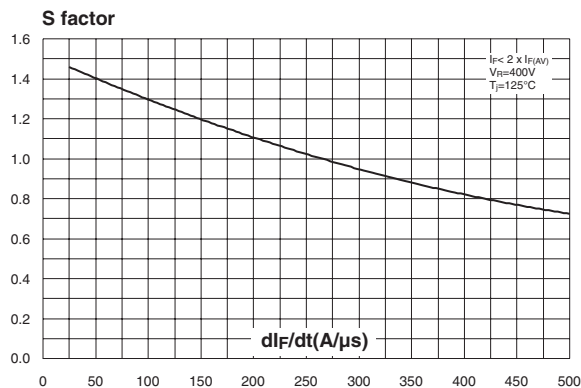


Figure 8: Relative variations of dynamic parameters versus junction temperature

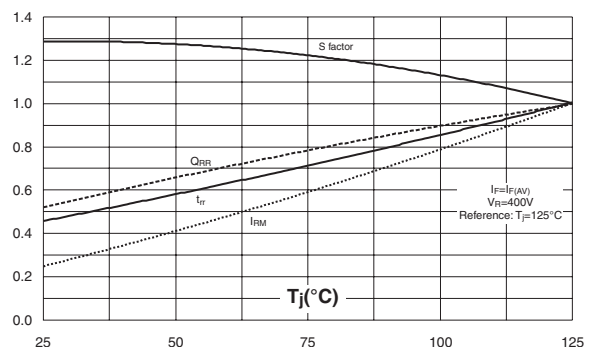


Figure 9: Transient peak forward voltage versus di_F/dt (typical values)

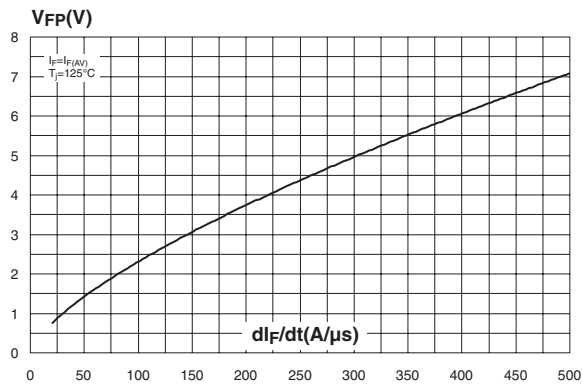


Figure 10: Forward recovery time versus di_F/dt (typical values)

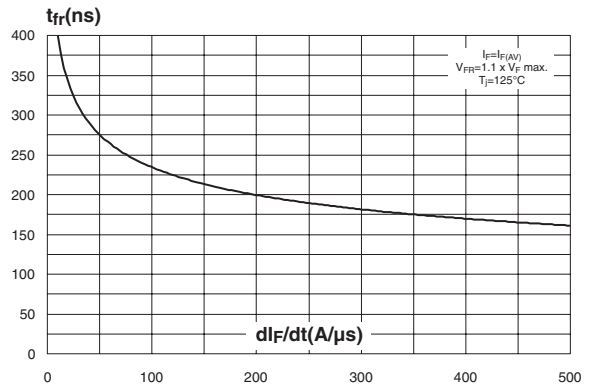


Figure 11: Junction capacitance versus reverse voltage applied (typical values)

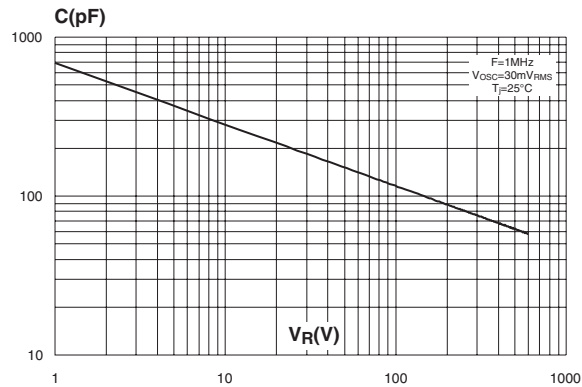


Figure 12: DO-247 Package Mechanical Data

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
D	2.20		2.60	0.086		0.102
E	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F2		2.00			0.078	
F3	2.00		2.40	0.078		0.094
G		10.90			0.429	
H	15.45		15.75	0.608		0.620
L	19.85		20.15	0.781		0.793
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
L3	14.20		14.80	0.559		0.582
L4		34.60			1.362	
L5		5.50			0.216	
M	2.00		3.00	0.078		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.139		0.143

Table 7: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STTH60L06W	STTH60L06W	DO-247	4.40 g	30	Tube

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.8 m.N.
- Maximum torque value: 1.0 m.N.

Table 8: Revision History

Date	Revision	Description of Changes
07-Sep-2004	1	First issue
10-Sep-2004	2	Junction to case value (page 2) changed from 0.70 °C/W to 0.75°C/W

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