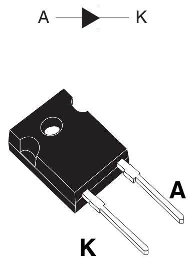
STTH6006W

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)	1.1 V
t_{rr} (max)	60 ns



DO-247
STTH6006W

Features and benefits

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

Description

The STTH6006W uses ST Turbo 2 600 V technology. This device is specially suited for use in switching power supplies, and industrial applications. The V_F / T_{rr} trade-off has been specially established to increase the performance in welding applications.

Table 2. Order code

Part number	Marking
STTH6006W	STTH6006W

Table 3. Absolute ratings (limiting values per diode at 25° C, unless otherwise specified)

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, $\delta = 0.5$	$T_c = 95°$ C	60	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10$ ms Sinusoidal	400	A
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Maximum operating junction temperature(1)		175	°C

1. $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ to avoid thermal runaway for a diode on its own heatsink

1 Characteristics

Table 4. Thermal parameters

Symbol	Parameter	Value	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(1)	Reverse leakage current	T_j = 25° C	$V_R = V_{RRM}$			50	µA
		T_j = 125° C			160	1600	
V_F(2)	Forward voltage drop	T_j = 25° C	I_F = 60 A			1.85	V
		T_j = 150° C			1.10	1.40	

1. Pulse test: t_p = 5 ms, δ < 2 %
2. Pulse test: t_p = 380 µs, δ < 2 %

To evaluate the conduction losses use the following equation:
$P = 1.07 \times I_{F(AV)} + 0.006\ I_F{}^2{}_{(RMS)}$

Table 6. Dynamic characteristics

Symbol	Parameter	Test conditions	Min.	Typ	Max.	Unit
t_{rr}	Reverse recovery time	I_F = 0.5 A, I_{rr} = 0.25 A, I_R = 1 A, T_j = 25° C			60	ns
		I_F = 1 A, dI_F/dt = -50 A/µs, V_R = 30 V, T_j = 25° C		60	85	
I_{RM}	Reverse recovery current	I_F = 60 A, dI_F/dt = -100 A/µs, V_R = 400 V, T_j = 150° C		10.5	14	
t_{fr}	Forward recovery time	I_F = 60 A dI_F/dt = 200 A/µs $V_{FR} = 1.1 \times V_{Fmax}$, T_j = 25° C			500	ns
V_{FP}	Forward recovery voltage	I_F = 60 A dI_F/dt = 200 A/µs $V_{FR} = 1.1 \times V_{Fmax}$, T_j = 25° C		3		V

Figure 1. **Conduction losses versus average current**

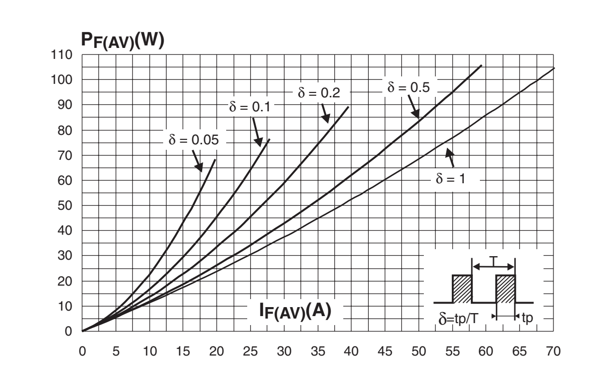


Figure 2. **Forward voltage drop versus forward current**

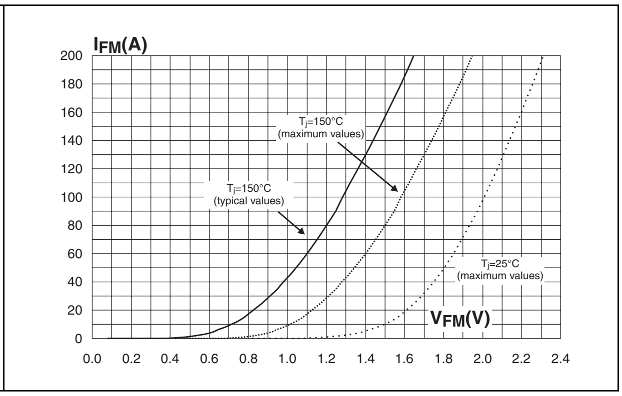


Figure 3. **Relative variation of thermal impedance junction to case versus pulse duration**

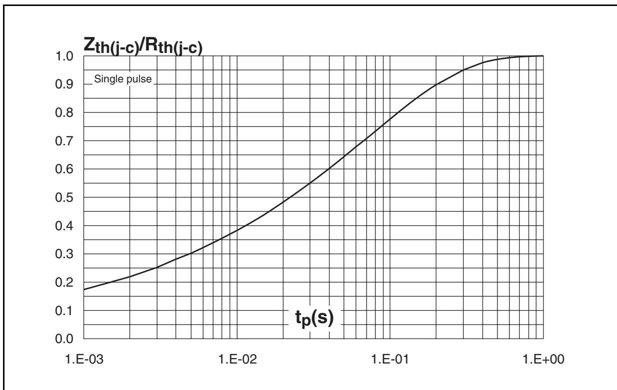


Figure 4. **Peak reverse recovery current versus dI_F/dt (typical values)**

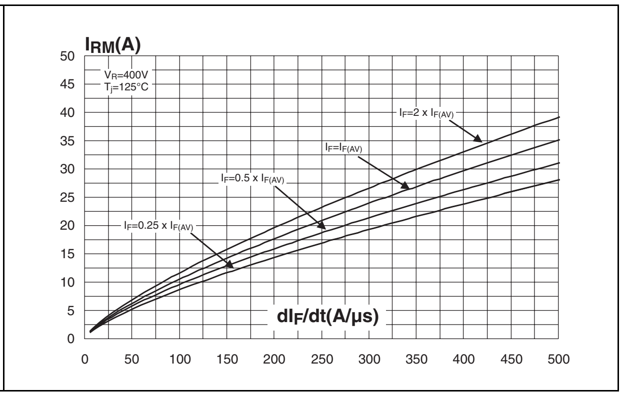


Figure 5. **Reverse recovery time versus dI_F/dt (typical values)**

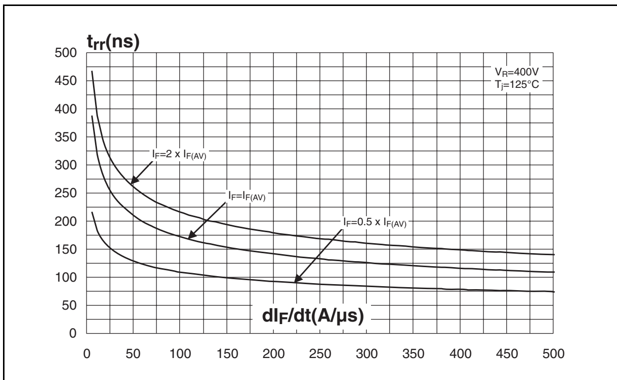


Figure 6. **Reverse recovery charges versus dI_F/dt (typical values)**