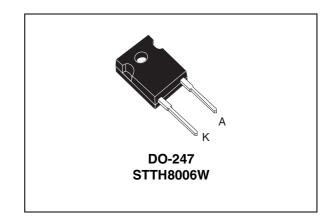


Turbo 2 ultrafast high voltage rectifier

Main product characteristics

I _{F(AV)}	80 A
V _{RRM}	600 V
Tj	175 °C
V _F (typ)	1.02 V
t _{rr} (max)	70 ns



Features and benefits

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

Description

The STTH8006, 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 freewheeling applications.

Order Code

Part number	Marking
STTH8006W	STTH8006W

Table 1. Absolute ratings (limiting values, at T_{amb} = 25 °C, unless otherwise specified)

Symbol	Parameter		Value	Unit
V _{RRM}	Repetitive peak reverse voltage		600	V
I _{F(RMS)}	RMS forward voltage		113	Α
I _{F(AV)}	Average forward current	$T_c = 75 ^{\circ}\text{C}$ $\delta = 0.5$	80	Α
I _{FSM}	Surge non repetitive forward current	t _p = 10 ms sinusoidal	500	Α
T _{stg}	Storage temperature range		-65 to + 175	°C
T _j	Maximum operating junction temperature		175	°C

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Characteristics STTH8006

1 Characteristics

Table 2. Thermal resistance

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

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Тур	Max.	Unit
I _B ⁽¹⁾	Reverse leakage current $T_j = 25 ^{\circ}\text{C}$		V - V			50	۸
'R`	neverse leakage current	$T_j = 150 ^{\circ}\text{C}$ $V_R = V_{RRM}$		160	1600	μΑ	
V _E ⁽²⁾	Forward voltage drop	T _j = 25 °C	I - 90 A			1.60	V
v _E , ′	Forward voltage drop	$T_j = 150 ^{\circ}\text{C}$ $I_F = 80 \text{A}$		1.02	1.30	V	

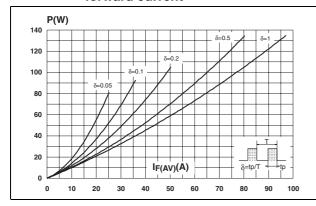
- 1. Pulse test: t_p = 5 ms, δ < 2 %
- 2. Pulse test: t_p = 380 μ s, δ < 2 %

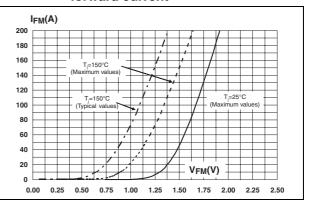
To evaluate the conduction losses use the following equation: P = 0.98 x $I_{F(AV)}$ + 0.004 $I_{F}^{2}_{(RMS)}$

Table 4. Dynamic characterstics

Symbol	Parameter	Test conditions			Тур	Max.	Unit
+	Reverse recovery	T 25°C	I _F = 0.5 A Irr = 0.25 A I _R =1 A			70	ns
'rr	l_{rr} $l_i = 25 ^{\circ} U$		$I_F = 1 \text{ A} \text{ d}I_F/\text{d}t = 50 \text{ A/}\mu\text{s} \text{ V}_R = 30 \text{ V}$		75	105	115
I _{RM}	Reverse recovery current	T _j = 125°C	$I_F = 80 \text{ A}$ $V_R = 400 \text{ V}$ $dI_F/dt = 100 \text{ A/}\mu\text{s}$		14	19	Α
t _{fr}	Forward recovery time	T _j = 25°C	$I_F = 80 \text{ A}$ $dI_F/dt = 200 \text{ A/}\mu\text{s}$ $V_{FR} = 1.1 \text{ x } V_{Fmax}$			600	ns
V _{FP}	Forward recovery voltage	T _j = 25°C	$I_F = 80 \text{ A}$ $dI_F/dt = 200 \text{ A/}\mu\text{s}$ $V_{FR} = 1.1 \text{ x } V_{Fmax}$		3.7		V

Figure 1. Conduction losses versus average Figure 2. Forward voltage drop versus forward current forward current

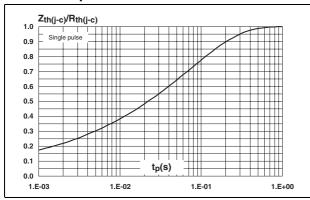




STTH8006 Characteristics

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

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



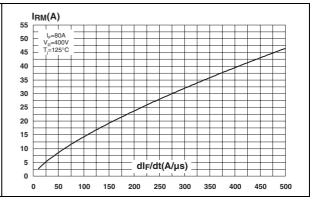
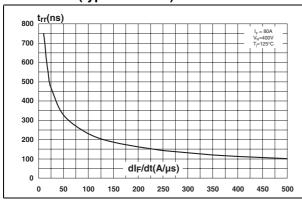


Figure 5. Reverse recovery time versus dl_F/dt Figure 6. Reverse recovery charges versus dl_F/dt (typical values)



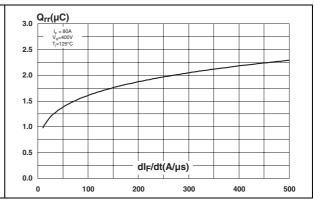
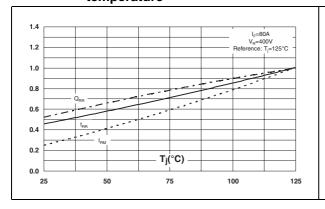
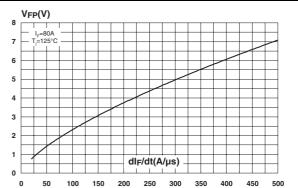


Figure 7. Relative variations of dynamic parameters versus junction temperature

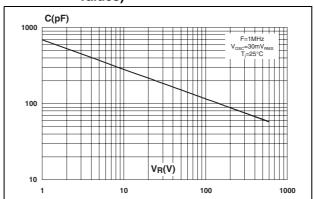
Figure 8. Transient peak forward voltage versus dl_F/dt (typical values)





Package information STTH8006

Figure 9. Junction capacitance versus reverse voltage applied (typical values)



2 Package information

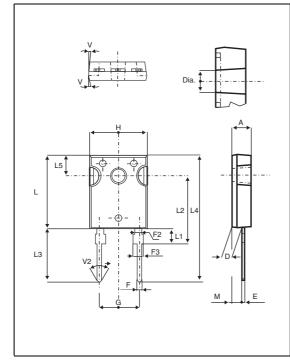
Epoxy meets UL94, V0

• Cooling method: by conduction (C)

Recommended torque value: 0.8 Nm.

Maximum torque value: 1.0 Nm.

Table 5. DO-247 dimensions



	DIMENSIONS					
REF	Mi	illimeters				
	Min	Тур	Max	Min	Тур	Max
Α	4.85		5.15	0.191		0.203
D	2.20		2.60	0.086		0.102
Е	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	
Н	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	
М	2.00		3.00	0.078		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.139		0.143

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In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

3 Ordering information

Part number	Marking	Package	Weight	Base qty	Delivery mode
STTH8006W	STTH8006W	DO-247	4.40 g	30	Tube

4 Revision history

Date	Revision	Changes
15-Dec-2006	1	Initial release.

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