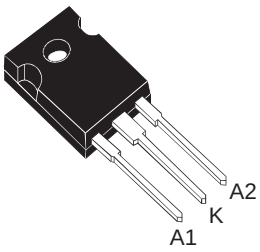
STTH30R06C

Turbo 2 ultrafast high voltage rectifier

Datasheet - production data



TO-247
STTH30R06CW

Features

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

Description

The STTH30R06C, which is using ST Turbo 2 600 V technology, is specially suited as boost diode in continuous mode power factor corrections and hard switching conditions.

The device is also intended for use as a free wheeling diode in power supplies and other power switching applications.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	2 x 15 A
V_{RRM}	600 V
I_{RM} (typ)	8 A
T_j	175 °C
V_F (typ)	1.8 V
t_{rr} (max)	50 ns

1 Characteristics

Table 2. Absolute ratings (limiting values, per diode)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			600	V
$I_{F(RMS)}$	Forward rms voltage			30	A
$I_{F(AV)}$	Average forward current		Per diode Per device	15 30	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal		120	A
T_{stg}	Storage temperature range			-65 to + 175	°C
T_j	Maximum operating junction temperature			175	°C

Table 3. Thermal parameter

Symbol	Parameter		Value (max)	Unit
$R_{th(j-c)}$	Junction to case	Per diode	1.5	°C/W
		Total	1.0	
$R_{th(c)}$	Coupling		0.5	°C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R (1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$			60	µA
		T_j = 125 °C			70	800	
V_F (2)	Forward voltage drop	T_j = 25 °C	I_F = 15A			2.9	V
		T_j = 125 °C			1.4	1.48	

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

To evaluate the maximum conduction losses use the following equation:
$P = 1.16 \times I_{F(AV)} + 0.0043\ I_F{}^2{}_{(RMS)}$

Table 5. Dynamic electrical characteristics

Symbol	Test conditions		Min.	Typ.	Max.	Unit
t_{rr}	I_F = 0.5 A, I_{rr} = 0.25 A, I_R =1 A	T_j = 25 °C			30	ns
	I_F = 1 A, dI_F/dt = -50 A/µs,V_R = 30 V				50	
I_{RM}	I_F = 15 A, V_R = 400 V, dI_F/dt = -200 A/µs	T_j = 125 °C		7.5	9.0	A
S factor				0.15		
Q_{rr}				220		nC
t_{fr}	I_F = 15 A, dI_F/dt = 120 A/µs V_{FR} = 1.1 x V_{Fmax}	T_j = 25 °C			5200	ns
V_{FP}					6	V

Figure 1. Conduction losses versus average forward current (per leg)

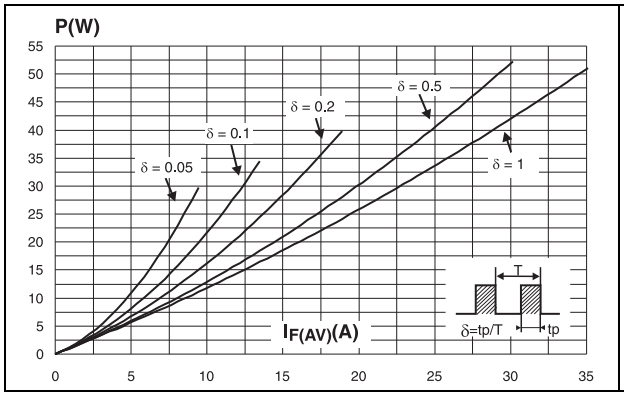


Figure 2. Forward voltage drop versus forward current (per leg)

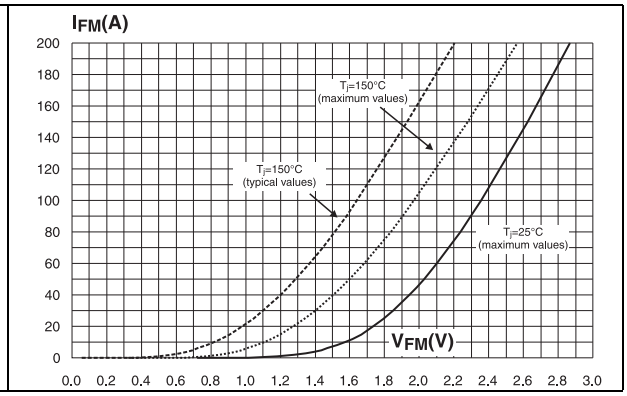


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration

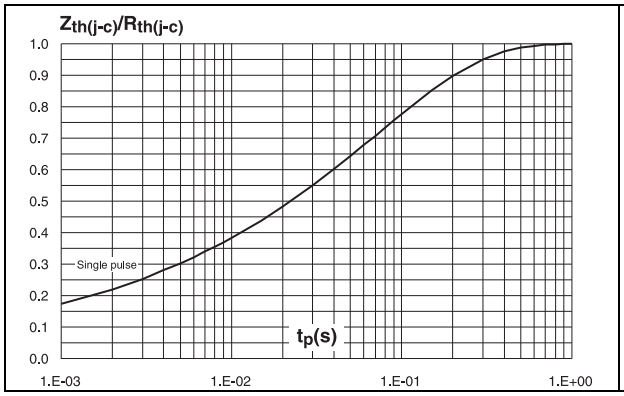


Figure 4. Peak reverse recovery current versus dI_F/dt (90% confidence, per leg)

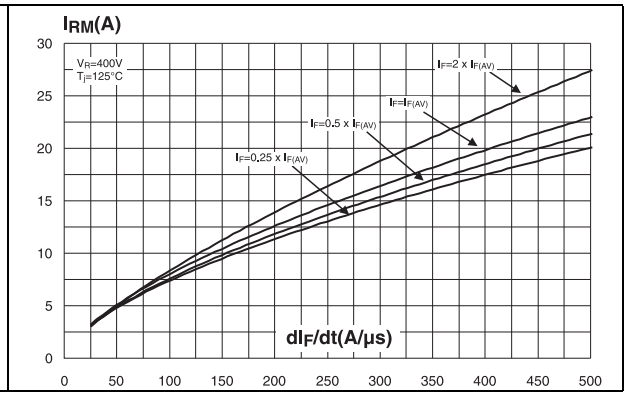


Figure 5. Reverse recovery time versus dI_F/dt (90% confidence, per leg)

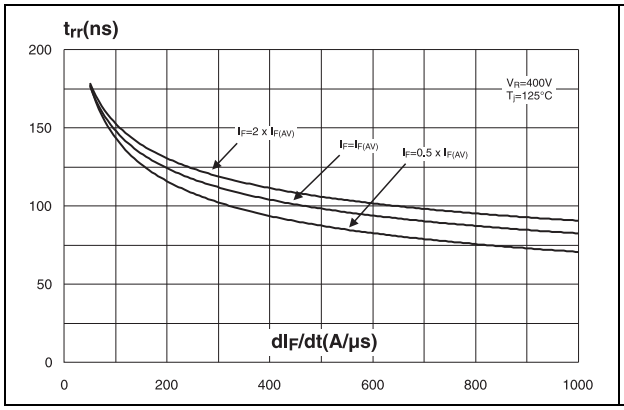


Figure 6. Reverse recovery charges versus dI_F/dt (90% confidence, per leg)

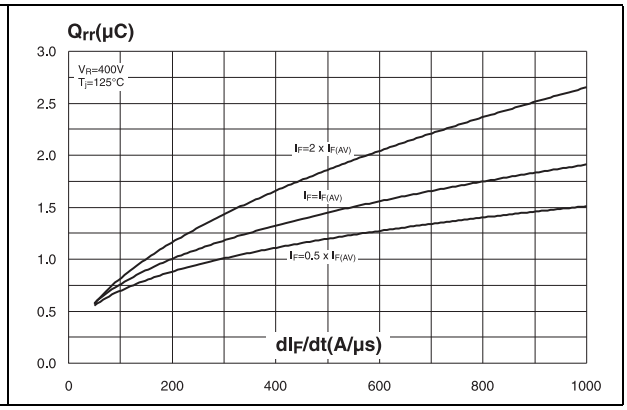


Figure 7. Softness factor versus dI_F/dt (typical values, per leg)

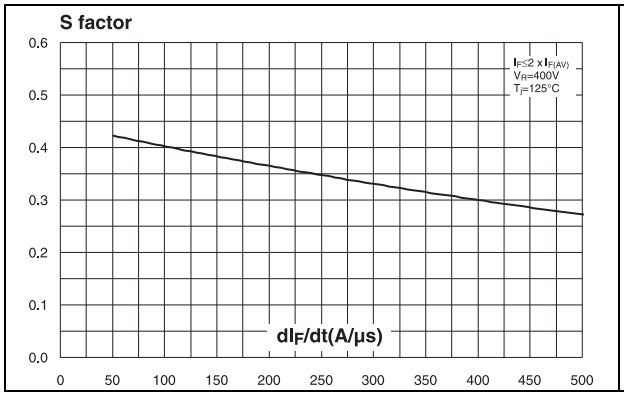


Figure 8. Relative variations of dynamic parameters versus junction temperature

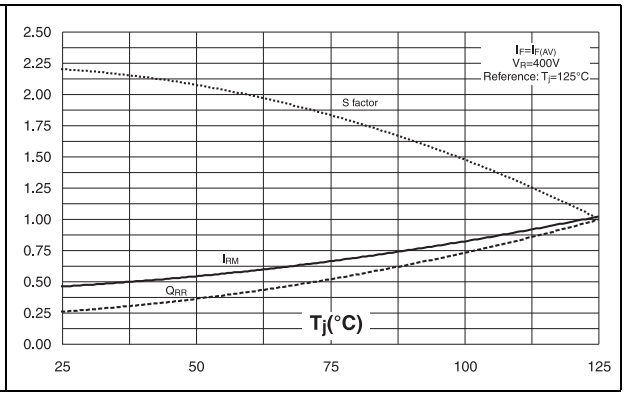


Figure 9. Transient peak forward voltage versus dI_F/dt (90% confidence, per leg)

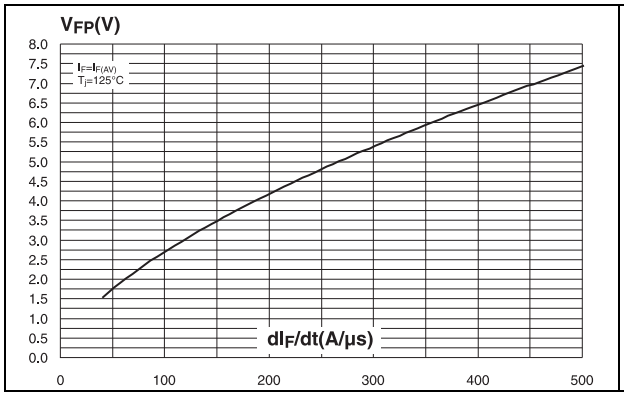


Figure 10. Forward recovery time versus dI_F/dt (90% confidence, per leg)

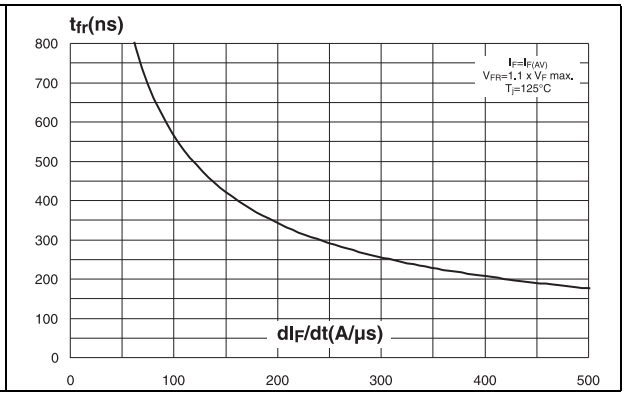
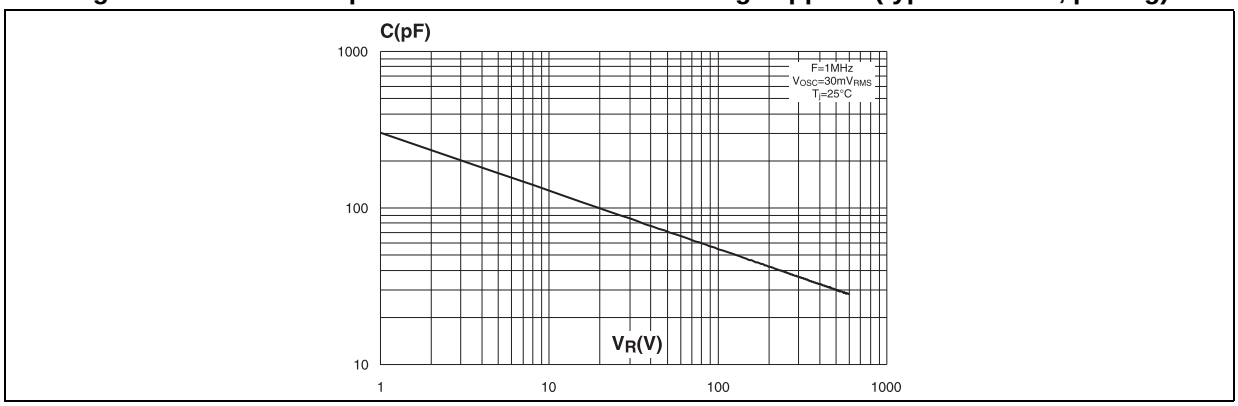


Figure 11. Junction capacitance versus reverse voltage applied (typical values, per leg)



2 Package information

- Epoxy meets UL94, V0
- Lead-free packages

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Figure 12. TO-247 drawing

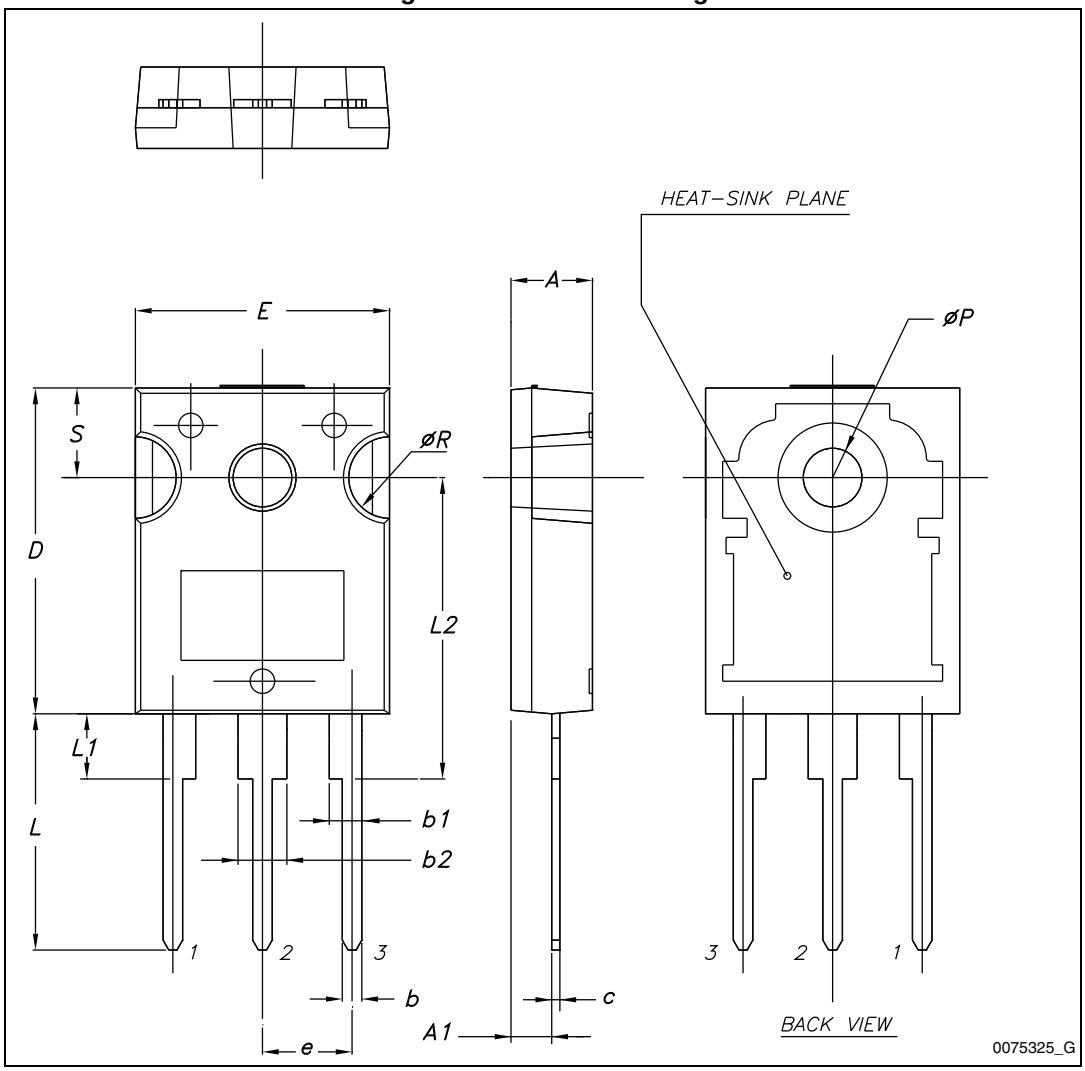


Table 6. TO-247 mechanical data

Dim.	mm.		
	Min.	Typ.	Max.
A	4.85		5.15
A1	2.20		2.60
b	1.0		1.40
b1	2.0		2.40
b2	3.0		3.40
c	0.40		0.80
D	19.85		20.15
E	15.45		15.75
e	5.30	5.45	5.60
L	14.20		14.80
L1	3.70		4.30
L2		18.50	
∅P	3.55		3.65
∅R	4.50		5.50
S	5.30	5.50	5.70

3 Ordering information

Table 7. Ordering information

Ordering code	Marking	Package	Weight	Base qty.	Delivery mode
STTH30R06CW	STTH30R06CW	TO-247	4.36 g	30	Tube

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
July-2001	1A	Last issue
18-Jun-2014	2	Updated title. ECOPACK statement updated.

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