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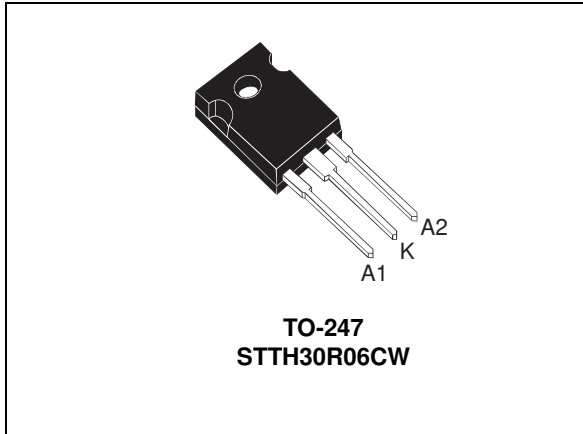
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## Turbo 2 ultrafast high voltage rectifier

Datasheet - production data



### 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	$\mu$ A
		$T_j = 125$ °C			70	800	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25$ °C	$I_F = 15$ A			2.9	V
		$T_j = 125$ °C			1.4	1.48	

1. Pulse test:  $t_p = 5$  ms,  $\delta < 2$  %

2. Pulse test:  $t_p = 380$   $\mu$ s,  $\delta < 2$  %

To evaluate the maximum conduction losses use the following equation:

$$P = 1.16 \times I_{F(AV)} + 0.0043 I_{F(RMS)}^2$$

Table 5. Dynamic electrical characteristics

Symbol	Test conditions	Min.	Typ.	Max.	Unit
$t_{rr}$	$I_F = 0.5 \text{ A}, I_{rr} = 0.25 \text{ A}, I_R = 1 \text{ A}$			30	ns
	$I_F = 1 \text{ A}, dI_F/dt = -50 \text{ A}/\mu\text{s}, V_R = 30 \text{ V}$			50	
$I_{RM}$	$I_F = 15 \text{ A}, V_R = 400 \text{ V}, dI_F/dt = -200 \text{ A}/\mu\text{s}$		7.5	9.0	A
S factor			0.15		
$Q_{rr}$			220		nC
$t_{fr}$	$I_F = 15 \text{ A}, dI_F/dt = 120 \text{ A}/\mu\text{s}$			5200	ns
$V_{FP}$	$V_{FR} = 1.1 \times V_{Fmax}$			6	V

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

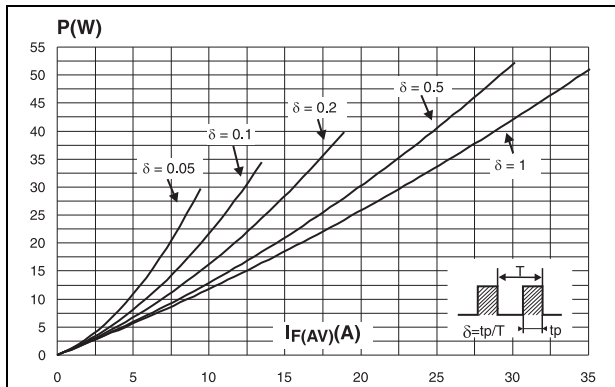


Figure 2. Forward voltage drop versus forward current (per leg)

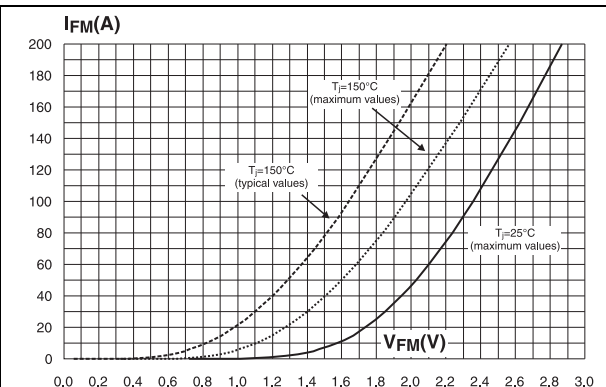


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration

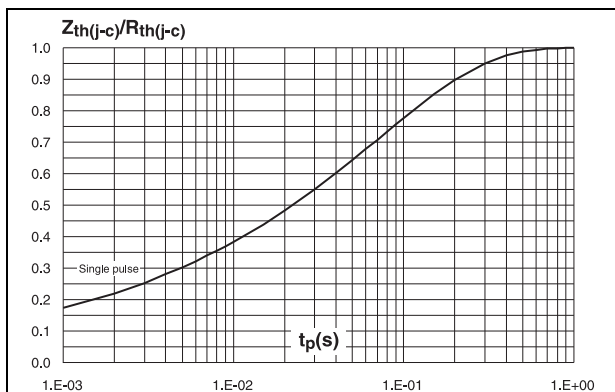


Figure 4. Peak reverse recovery current versus di\_F/dt (90% confidence, per leg)

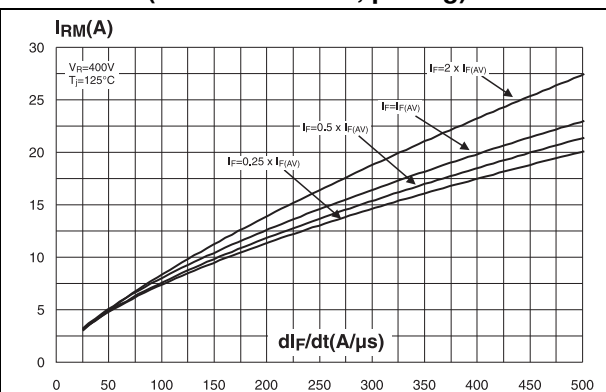


Figure 5. Reverse recovery time versus di\_F/dt (90% confidence, per leg)

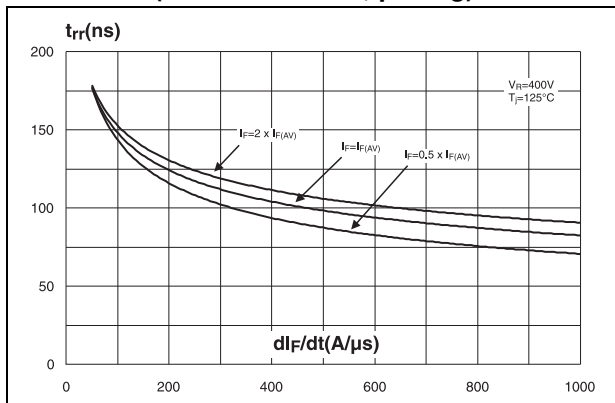


Figure 6. Reverse recovery charges versus di\_F/dt (90% confidence, per leg)

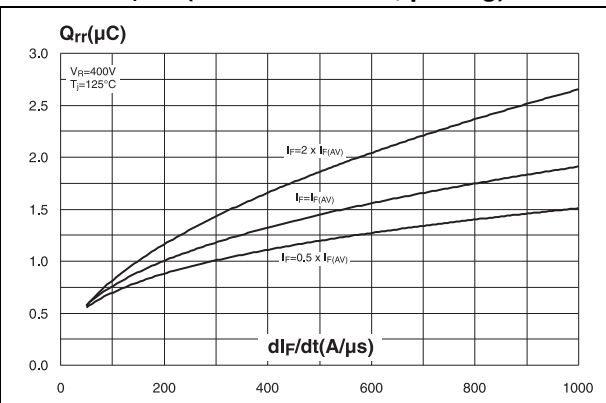


Figure 7. Softness factor versus  $di_F/dt$  (typical values, per leg)

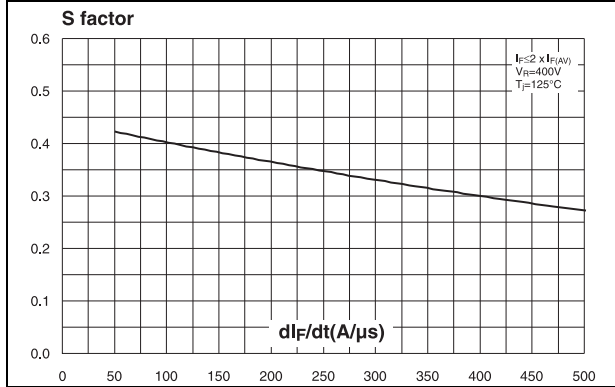


Figure 8. Relative variations of dynamic parameters versus junction temperature

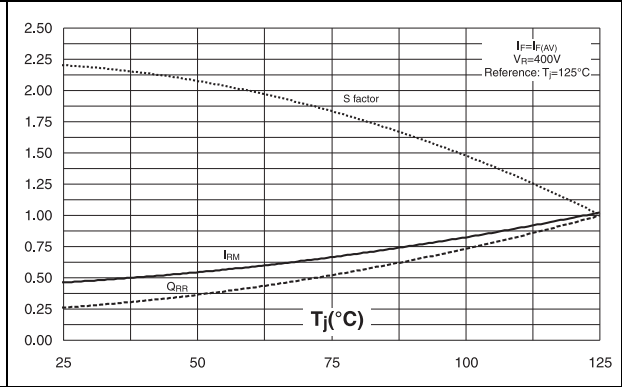


Figure 9. Transient peak forward voltage versus  $di_F/dt$  (90% confidence, per leg)

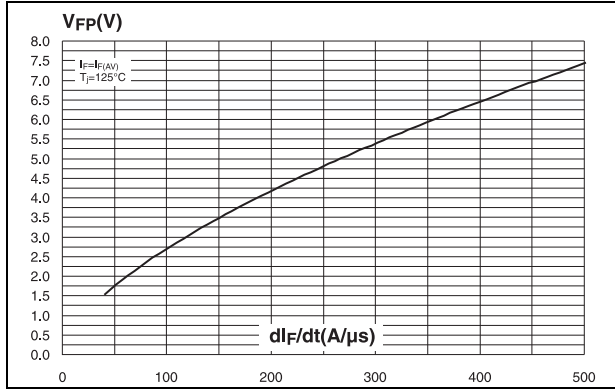


Figure 10. Forward recovery time versus  $di_F/dt$  (90% confidence, per leg)

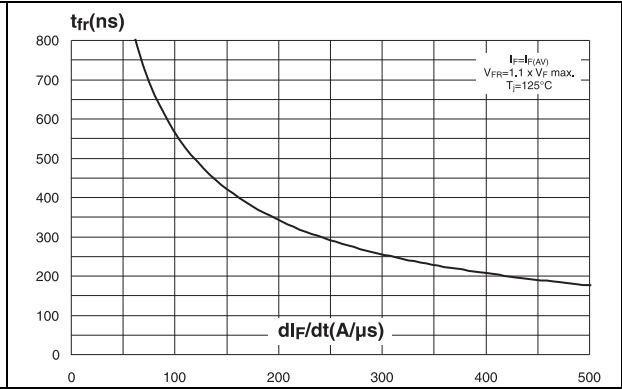
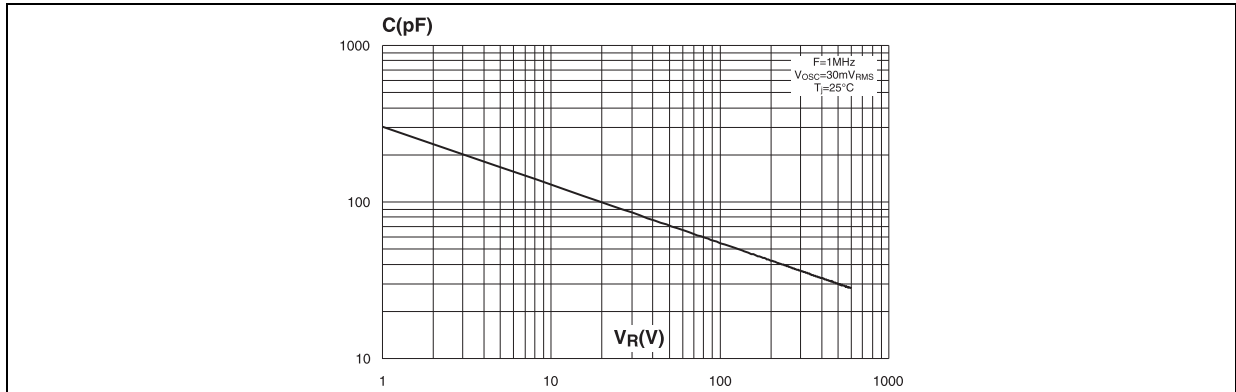


Figure 11. Junction capacitance versus reverse voltage applied (typical values, per leg)



## 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](http://www.st.com). ECOPACK® is an ST trademark.

Figure 12. TO-247 drawing

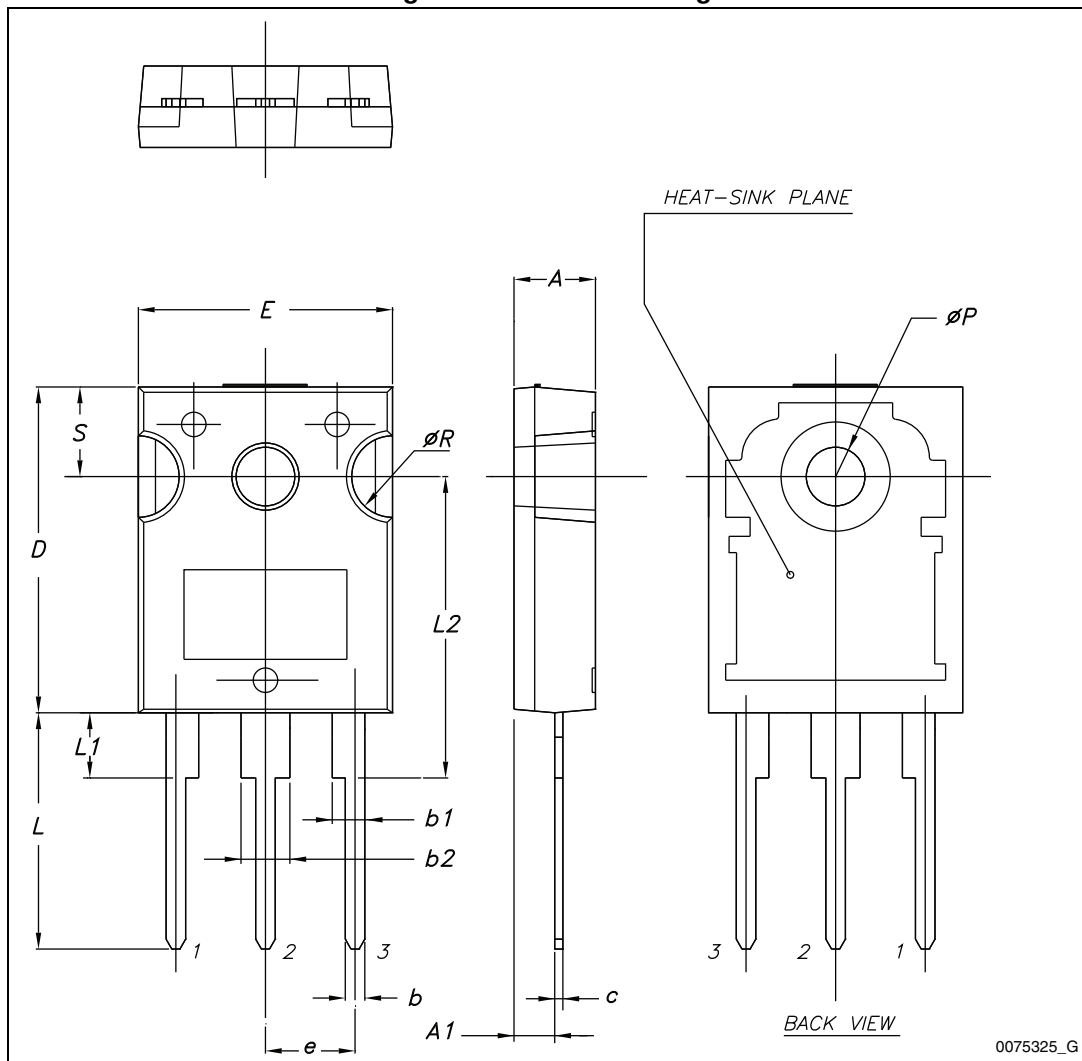


Table 6. TO-247 mechanical data

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	
ØP	3.55		3.65
ØR	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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