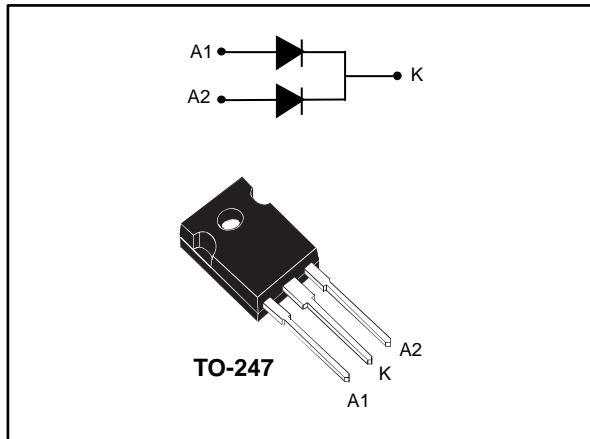


## Turbo 2 ultrafast high voltage rectifier

Datasheet - production data



### Description

This device 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
$T_j$ (max.)	175 °C
$V_F$ (typ.)	1.8 V
$t_{rr}$ (max.)	50 ns

### Features

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

# 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 current	30	A
$I_{F(AV)}$	Average forward current	$T_c = 115\text{ °C}, \delta = 0.5, \text{ per diode}$	15
		$T_c = 100\text{ °C}, \delta = 0.5, \text{ per device}$	30
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms sinusoidal}$	120
$T_{stg}$	Storage temperature range	-65 to +175	°C
$T_j$	Maximum operating junction temperature	175	°C

**Table 3: Thermal parameters**

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

**Table 4: Static electrical characteristics (per diode)**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	-		60	$\mu\text{A}$
		$T_j = 125\text{ °C}$		-	70	800	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 15\text{ A}$	-		2.9	V
		$T_j = 125\text{ °C}$		-	1.4	1.8	

**Notes:**

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

(2) Pulse test:  $t_p = 380\text{ }\mu\text{s}, \delta < 2\%$

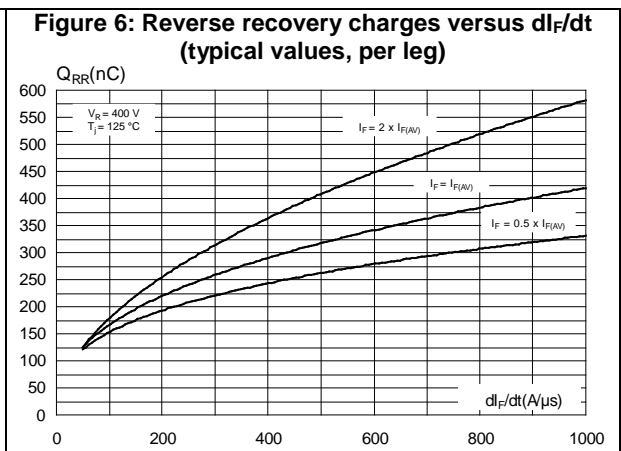
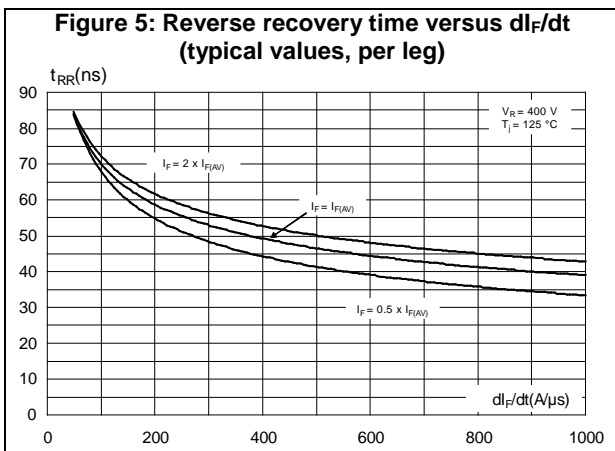
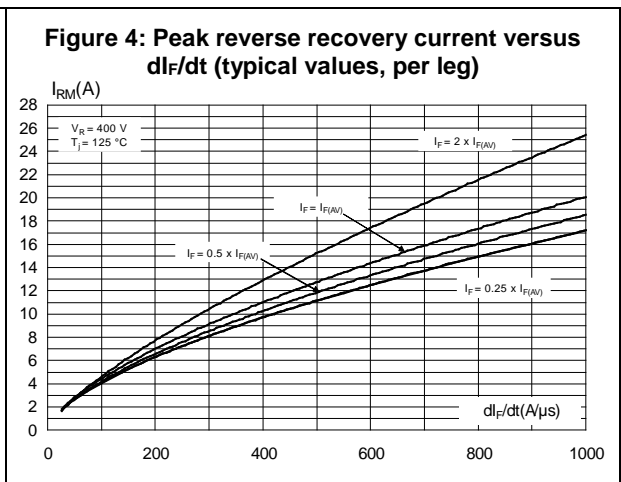
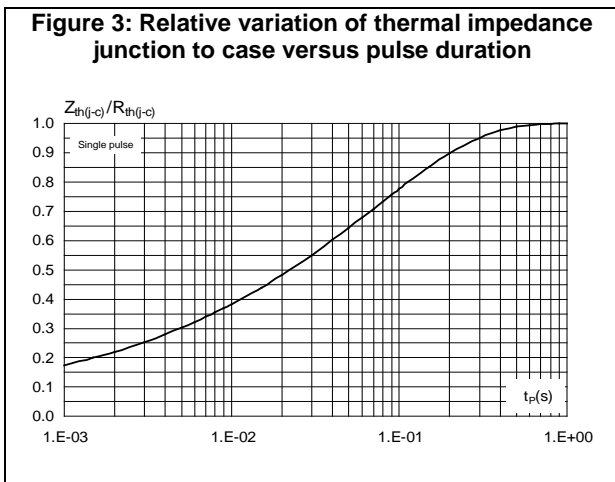
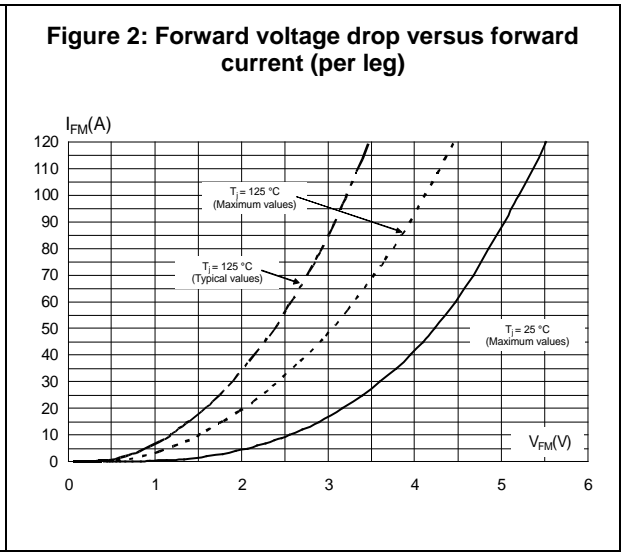
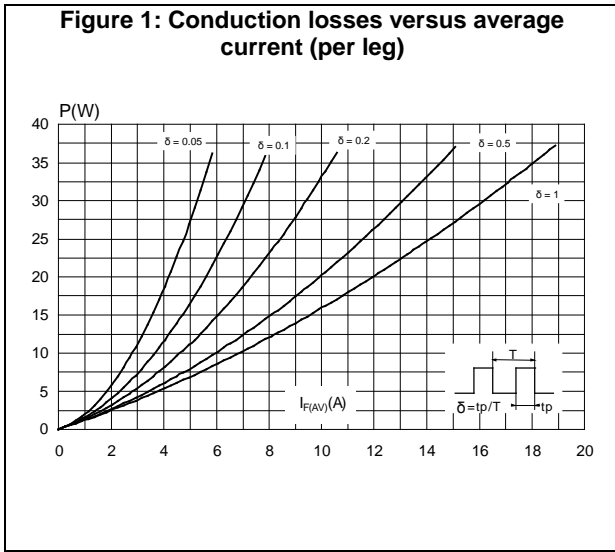
To evaluate the conduction losses, use the following equation:

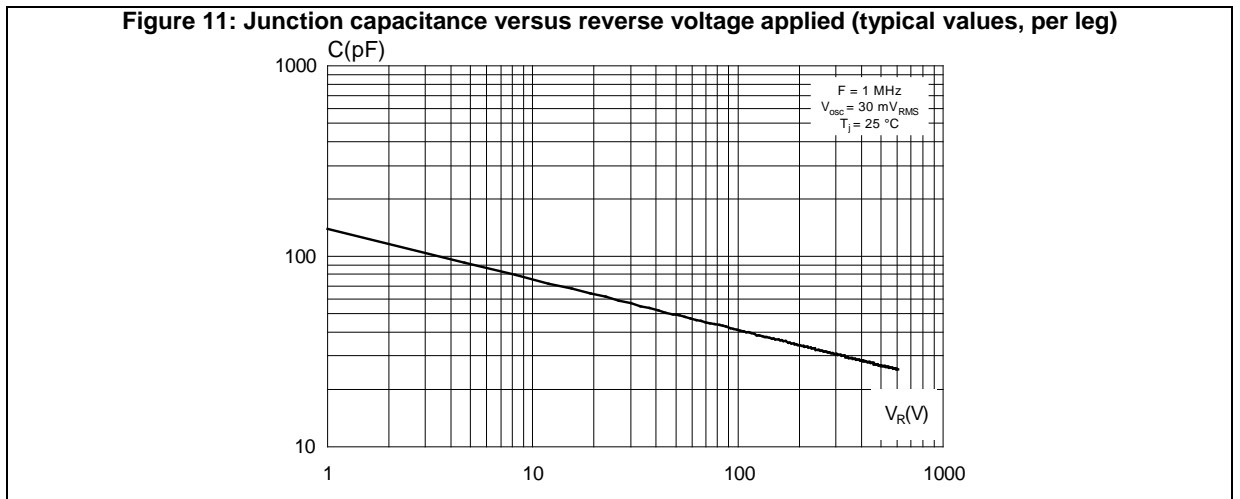
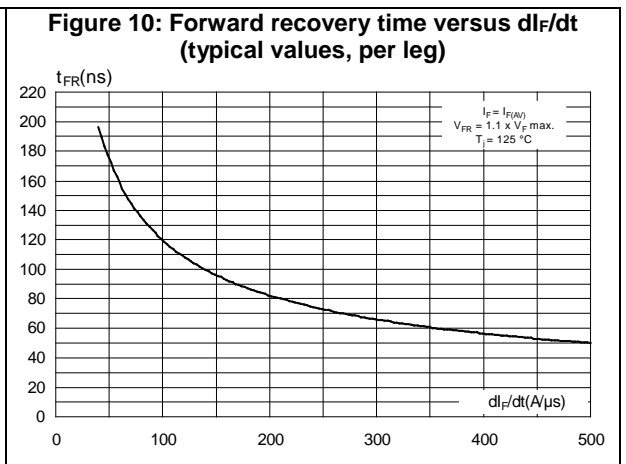
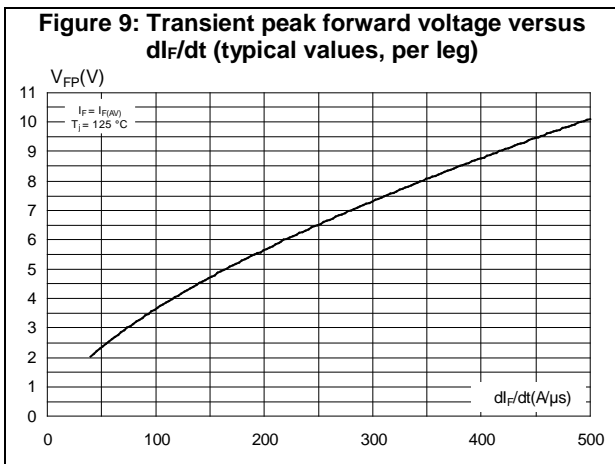
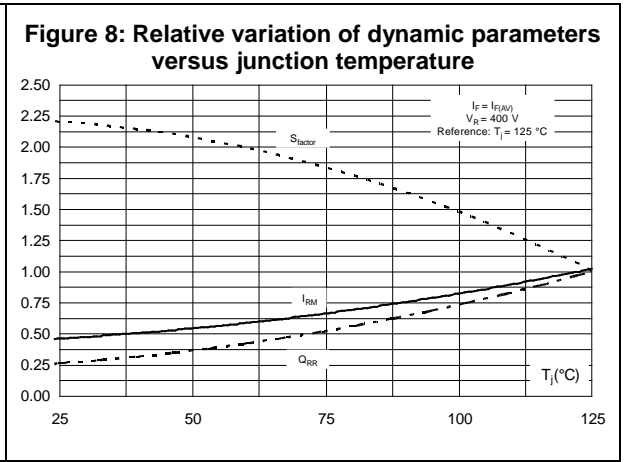
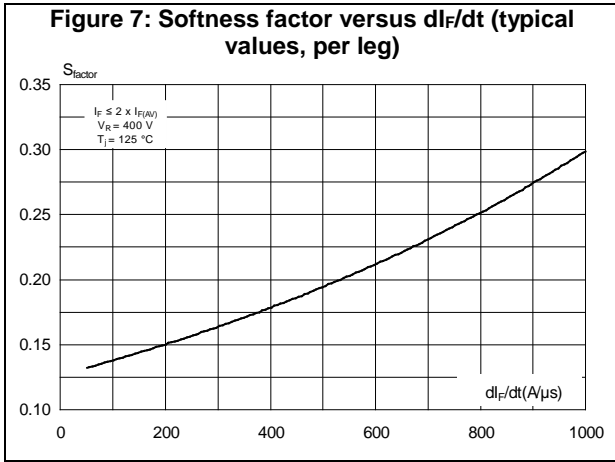
$$P = 1.16 \times I_{F(AV)} + 0.043 \times I_{F(RMS)}^2$$

Table 5: Dynamic electrical characteristics

Symbol	Parameters	Test conditions		Min.	Typ.	Max.	Unit
$t_{rr}$	Reverse recovery time	$T_j = 25\text{ °C}$	$I_F = 0.5\text{ A},$ $I_{rr} = 0.25\text{ A},$ $I_R = 1\text{ A}$	-		30	ns
			$I_F = 1\text{ A},$ $dI_F/dt = -50\text{ A}/\mu\text{s},$ $V_R = 30\text{ V}$	-		50	
$I_{RM}$	Reverse recovery current	$T_j = 125\text{ °C}$	$I_F = 15\text{ A},$ $dI_F/dt = -200\text{ A}/\mu\text{s},$ $V_R = 400\text{ V}$	-	7.5	9.0	A
S factor	Softness factor			-	0.15		
$Q_{rr}$	Reverse recovery charges			-	220		nC
$t_{fr}$	Forward recovery time	$T_j = 25\text{ °C}$	$I_F = 15\text{ A},$ $dI_F/dt = 120\text{ A}/\mu\text{s},$ $V_{FR} = 1.1 \times V_{Fmax}$	-		200	ns
$V_{FP}$	Forward recovery voltage			-		6	V

### 1.1 Characteristics (curves)





## 2 Package information

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.

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

### 2.1 TO-247 package information

Figure 12: TO-247 package outline

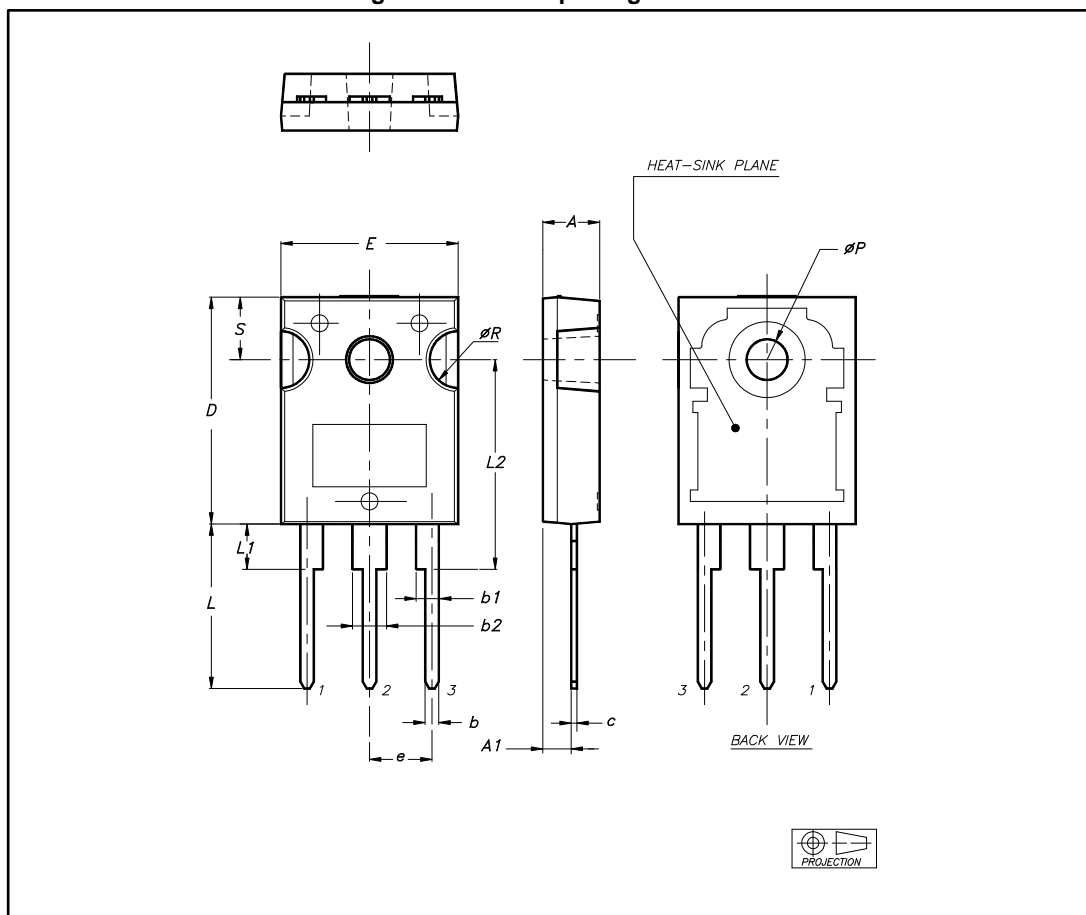


Table 6: TO-247 package mechanical data

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
A1	2.20		2.60	0.086		0.102
b	1.00		1.40	0.039		0.055
b1	2.00		2.40	0.078		0.094
b2	3.00		3.40	0.118		0.133
c	0.40		0.80	0.015		0.031
D <sup>(1)</sup>	19.85		20.15	0.781		0.793
E	15.45		15.75	0.608		0.620
e	5.30	5.45	5.60	0.209	0.215	0.220
L	14.20		14.80	0.559		0.582
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
ØP <sup>(2)</sup>	3.55		3.65	0.139		0.143
ØR	4.50		5.50	0.177		0.217
S	5.30	5.50	5.70	0.209	0.216	0.224

**Notes:**

<sup>(1)</sup>Dimension D plus gate protusion does not exceed 20.5 mm

<sup>(2)</sup>Resin thickness around the mounting hole is not less than 0.9 mm.

### 3 Ordering information

Table 7: Ordering information

Order 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	1	Last issue.
18-Jun-2014	2	Updated title. ECOPACK statement updated.
16-Feb-18	3	Updated <a href="#">Section 1.1: "Characteristics (curves)"</a> .



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