



# STTH30R06CW

## TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

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

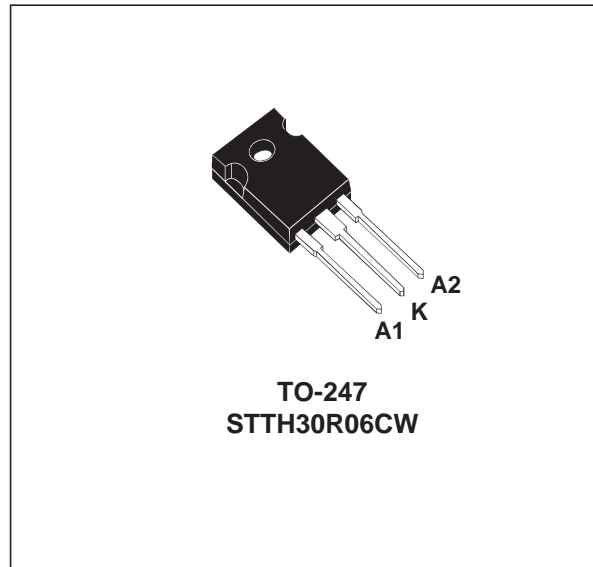
### FEATURES AND BENEFITS

- Ultrafast switching
- Low reverse recovery current
- Reduces switching losses
- Low thermal resistance

### DESCRIPTION

The STTH30R06CW, which is using ST Turbo 2 600V 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.



### ABSOLUTE RATINGS (limiting values)

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

## STTH30R06CW

### THERMAL RESISTANCES

| Symbol               | Parameter        |           | Value | Unit |
|----------------------|------------------|-----------|-------|------|
| R <sub>th(j-c)</sub> | Junction to case | Per diode | 1.5   | °C/W |
|                      |                  | Total     | 1.0   |      |
| R <sub>th(c)</sub>   |                  | Coupling  | 0.5   |      |

### STATIC ELECTRICAL CHARACTERISTICS (per diode)

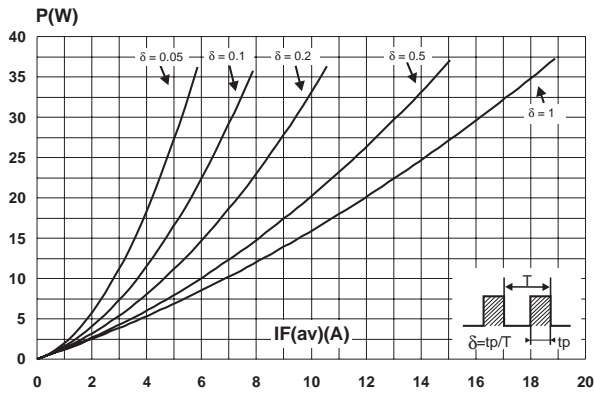
| Symbol         | Parameter               | Tests conditions      |                        | Min. | Typ. | Max. | Unit |
|----------------|-------------------------|-----------------------|------------------------|------|------|------|------|
| I <sub>R</sub> | Reverse leakage current | V <sub>R</sub> = 600V | T <sub>j</sub> = 25°C  |      |      | 60   | μA   |
|                |                         |                       | T <sub>j</sub> = 125°C |      | 70   | 800  |      |
| V <sub>F</sub> | Forward voltage drop    | I <sub>F</sub> = 15 A | T <sub>j</sub> = 25°C  |      |      | 2.9  | V    |
|                |                         |                       | T <sub>j</sub> = 125°C |      | 1.4  | 1.8  |      |

To evaluate the maximum conduction losses use the following equation :  
 $P = 1.16 \times I_{F(AV)} + 0.043 I_{F(RMS)}^2$

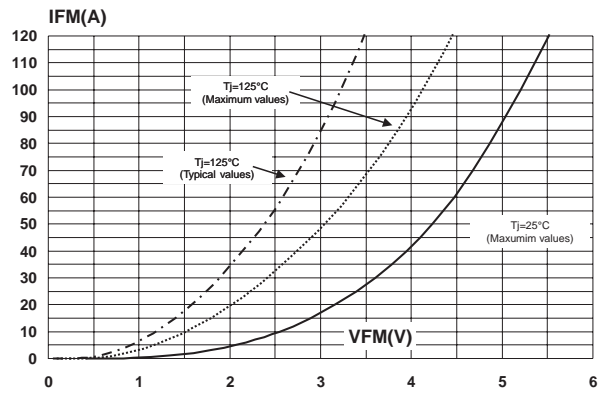
### DYNAMIC ELECTRICAL CHARACTERISTICS

| Symbol          | Tests conditions   |  | Min.                   | Typ. | Max. | Unit |    |
|-----------------|--|--|------------------------|------|------|------|----|
| trr             | I <sub>F</sub> = 0.5 A I <sub>rr</sub> = 0.25 A I <sub>R</sub> = 1A          |  | T <sub>j</sub> = 25°C  |      |      | 30   | ns |
|                 | I <sub>F</sub> = 1 A dI <sub>F</sub> /dt = - 50 A/μs<br>V <sub>R</sub> = 30V |  |                        |      |      | 50   |    |
| I <sub>RM</sub> | V <sub>R</sub> = 400 V I <sub>F</sub> = 15A                                  |  | T <sub>j</sub> = 125°C |      | 7.5  | 9.0  | A  |
| S factor        | dI <sub>F</sub> /dt = - 200A/μs  |  |                        |      | 0.15 |      |    |
| Q <sub>rr</sub> |  |  |                        |      | 220  |      |    |
| t <sub>fr</sub> | I <sub>F</sub> = 15 A dI <sub>F</sub> /dt = 120 A/μs                         |  | T <sub>j</sub> = 25°C  |      |      | 200  | ns |
| V <sub>FP</sub> | V <sub>FR</sub> = 1.1 x V <sub>Fmax</sub>                                    |  |                        |      |      | 6    |    |

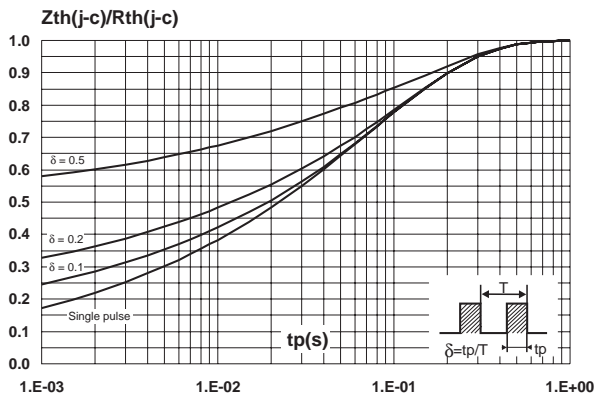
**Fig. 1:** Conduction losses versus average current (per leg).



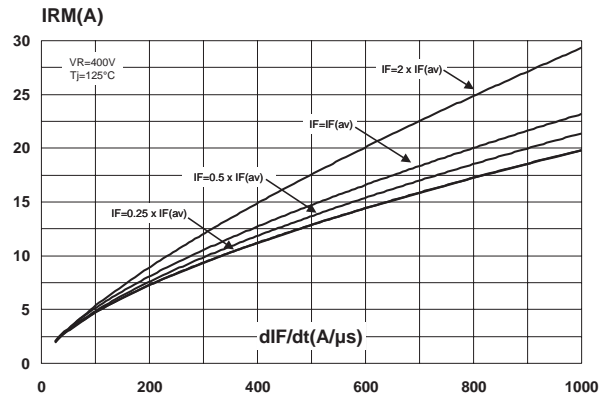
**Fig. 2:** Forward voltage drop versus forward current (per leg).



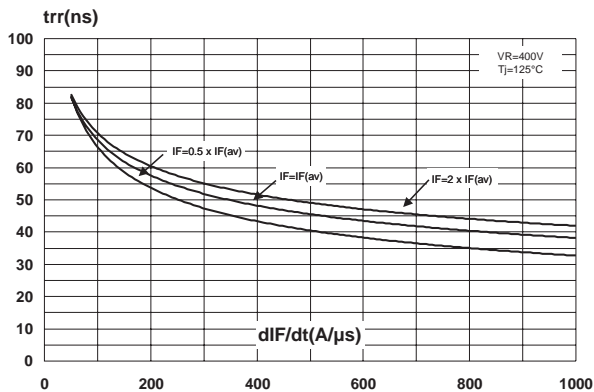
**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration.



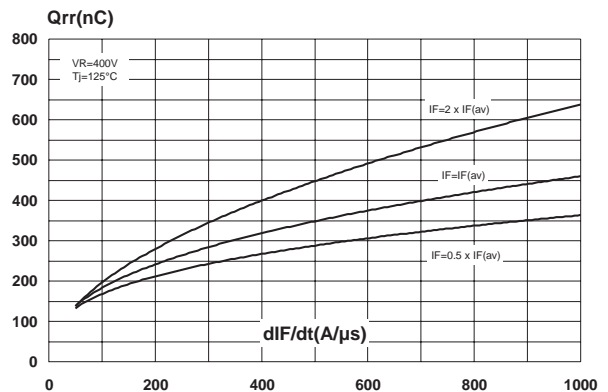
**Fig. 4:** Peak reverse recovery current versus  $di_F/dt$  (90% confidence, per leg).



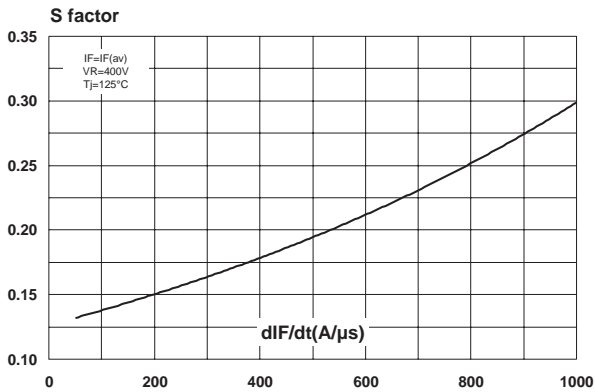
**Fig. 5:** Reverse recovery time versus  $di_F/dt$  (90% confidence, per leg).



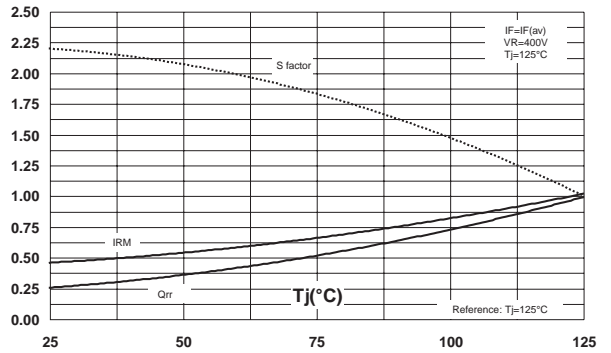
**Fig. 6:** Reverse recovery charges versus  $di_F/dt$  (90% confidence, per leg).



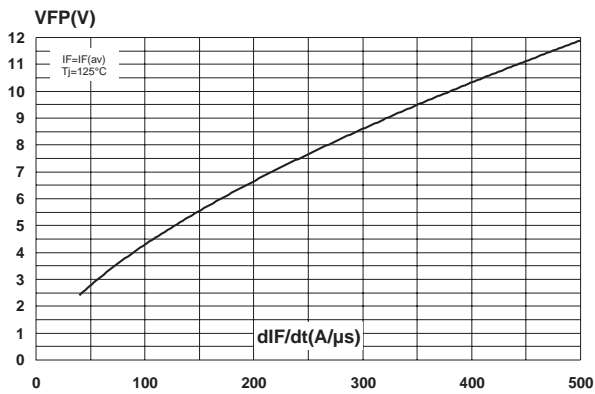
**Fig. 7:** Softness factor versus  $di_F/dt$  (typical values, per leg).



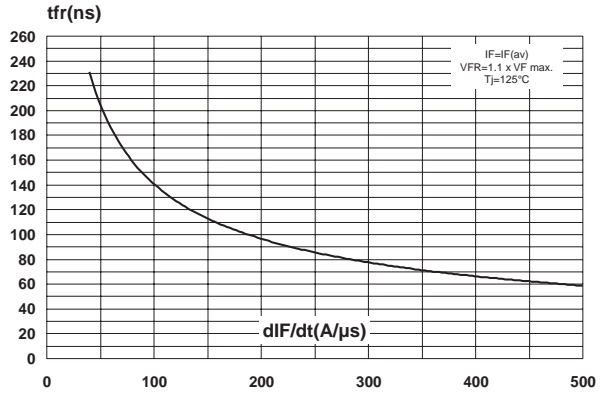
**Fig. 8:** Relative variation of dynamic parameters versus junction temperature.



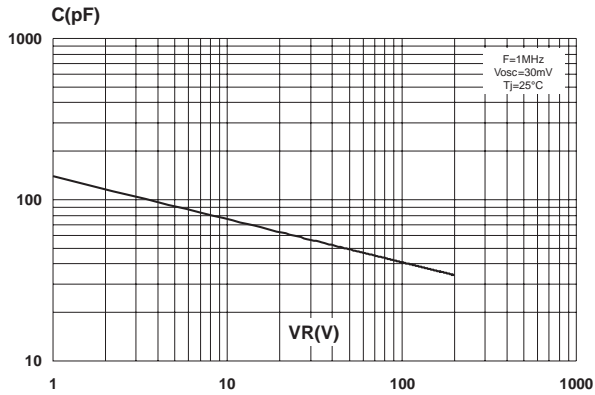
**Fig. 9:** Transient peak forward voltage versus  $di_F/dt$  (90% confidence, per leg).



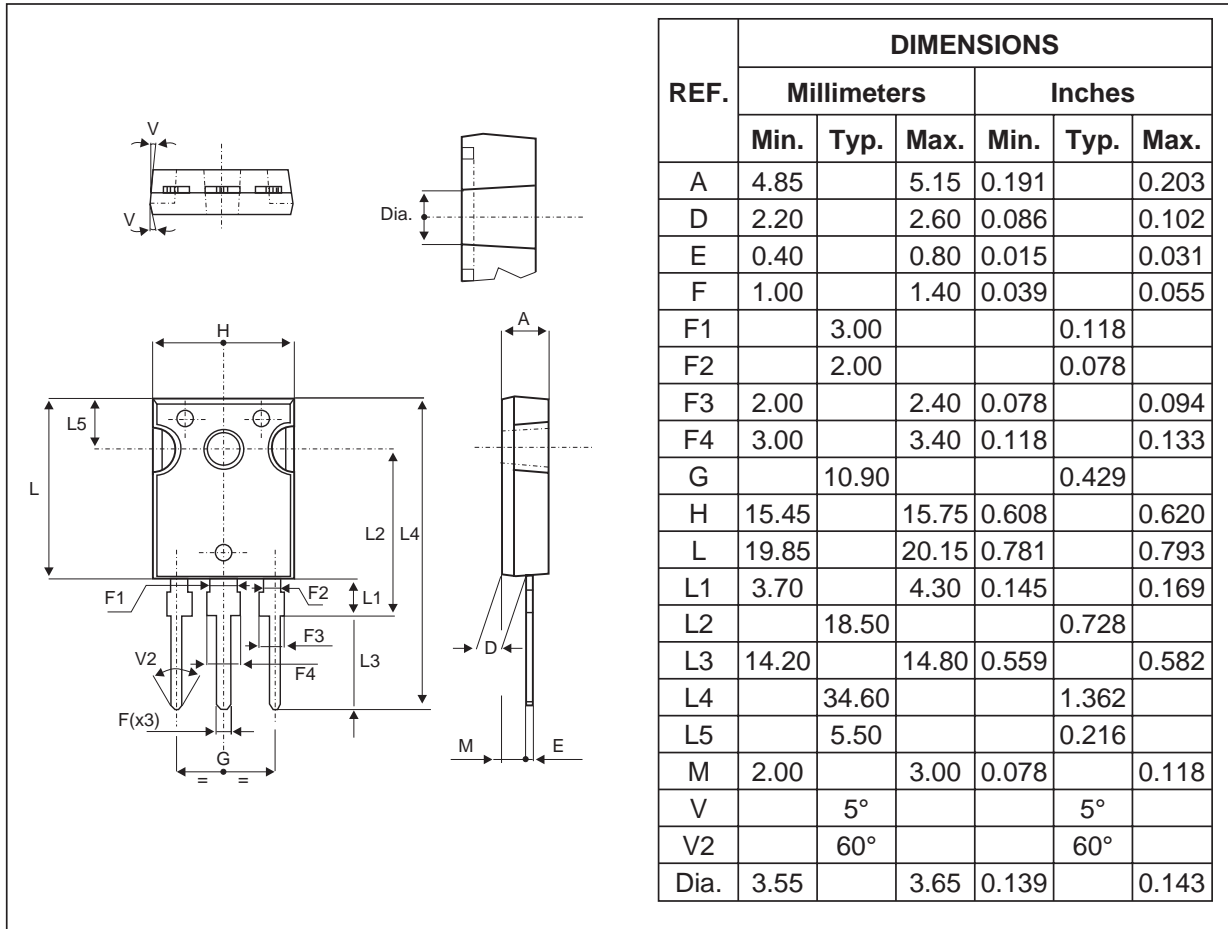
**Fig. 10:** Forward recovery time versus  $di_F/dt$  (90% confidence, per leg).



**Fig. 11:** Junction capacitance versus reverse voltage applied (typical values, per leg).



**PACKAGE MECHANICAL DATA**  
TO-247



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

- Epoxy meets UL 94,V0

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