

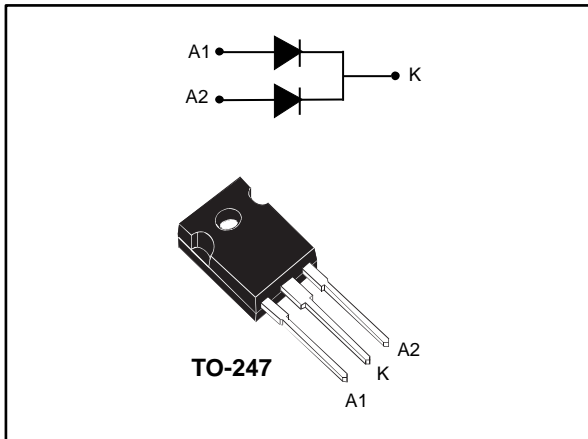


**THE DATASHEET OF
STTH30R06CW**



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 | A |
| | | $T_c = 100\text{ °C}, \delta = 0.5, \text{ per device}$ | 30 | |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10\text{ ms sinusoidal}$ | 120 | A |
| 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 | °C/W |
| | | Total | 1.0 | |
| $R_{th(c)}$ | Coupling | 0.5 | | |

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 | μA |
| | | $T_j = 125\text{ °C}$ | | - | 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: $t_p = 380\text{ }\mu\text{s}, \delta < 2\%$

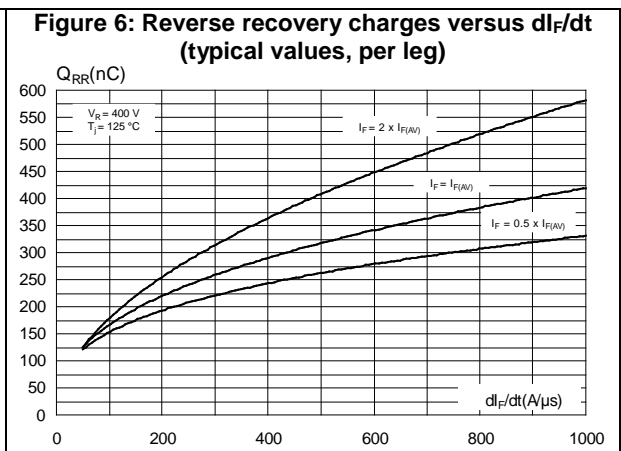
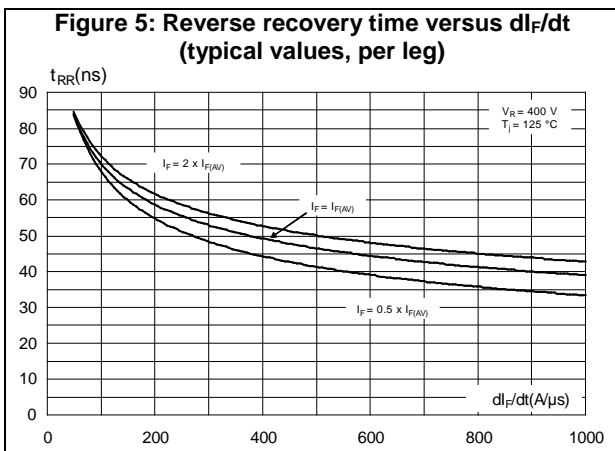
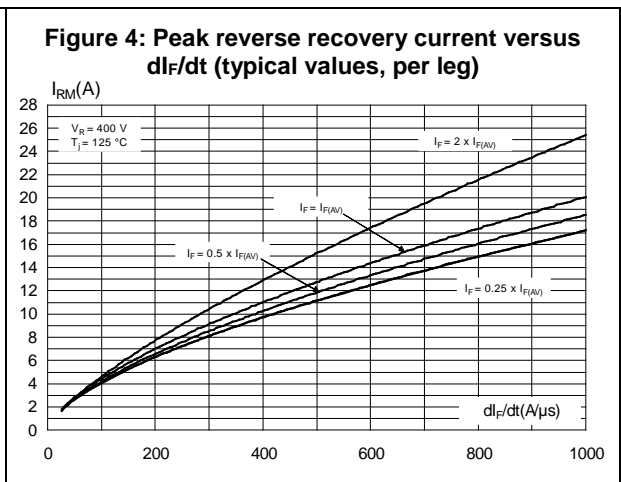
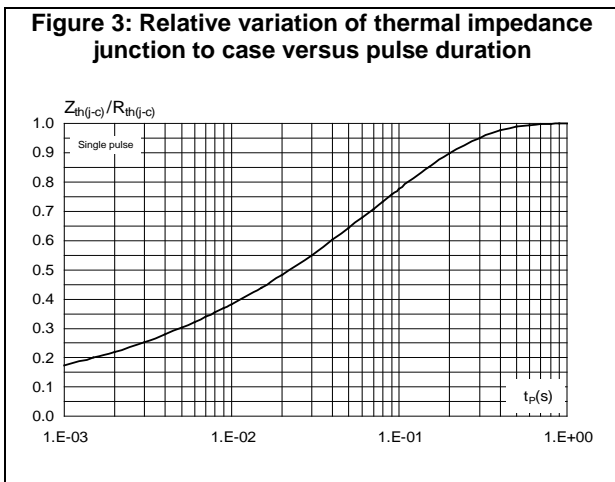
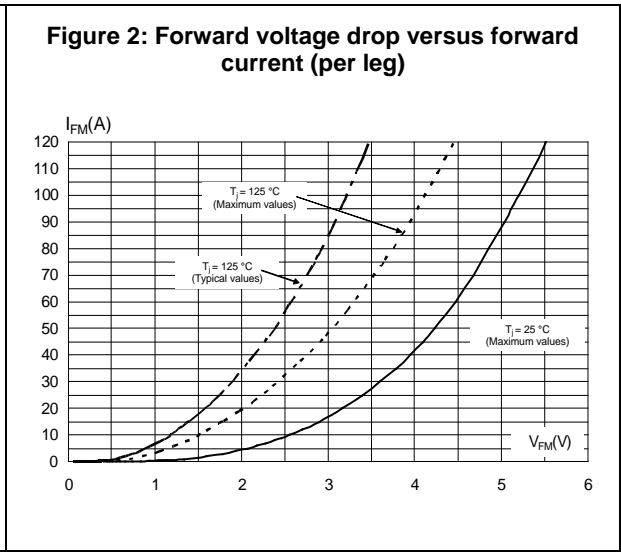
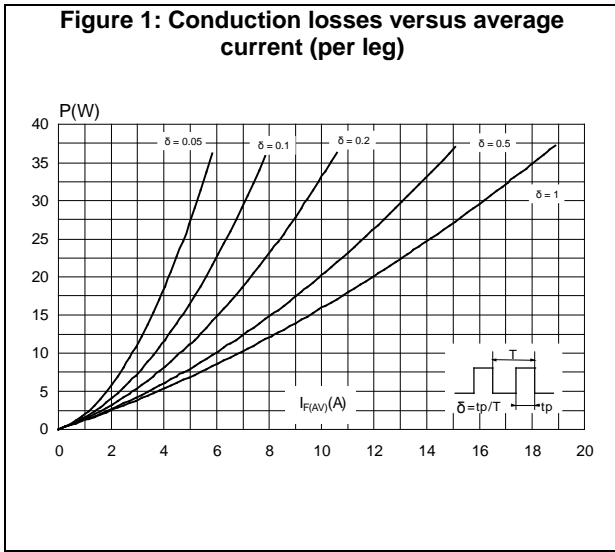
To evaluate the conduction losses, use the following equation:

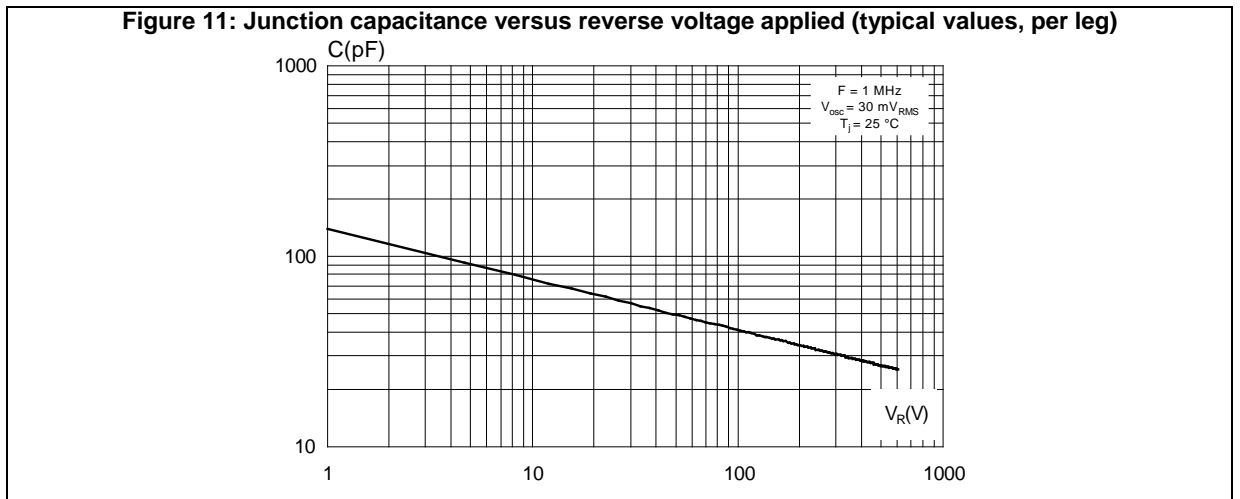
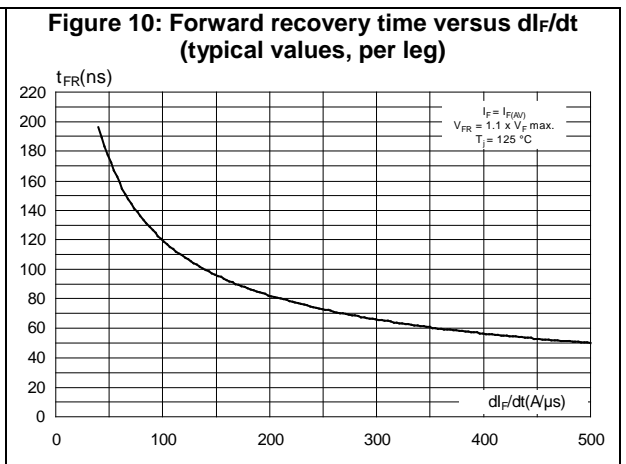
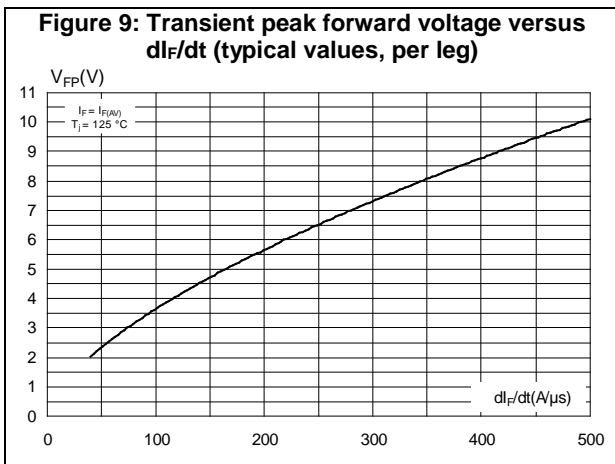
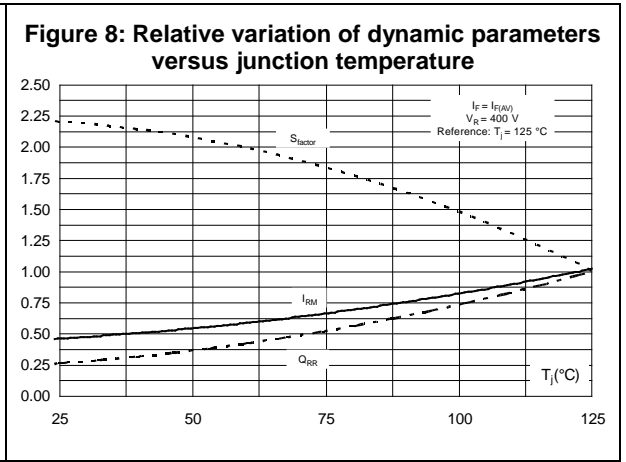
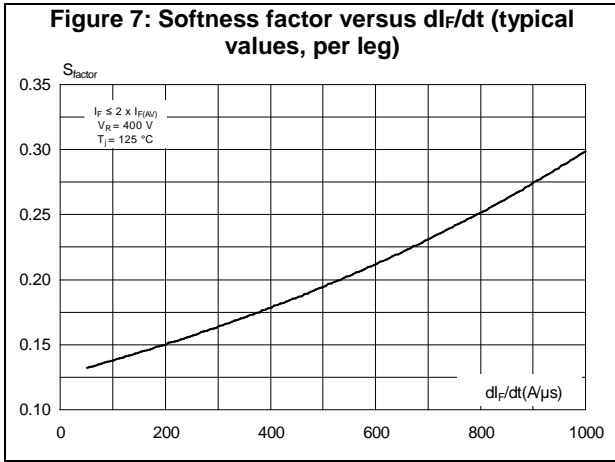
$$P = 1.16 \times I_{F(AV)} + 0.043 \times I_{F(RMS)}^2$$

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. 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

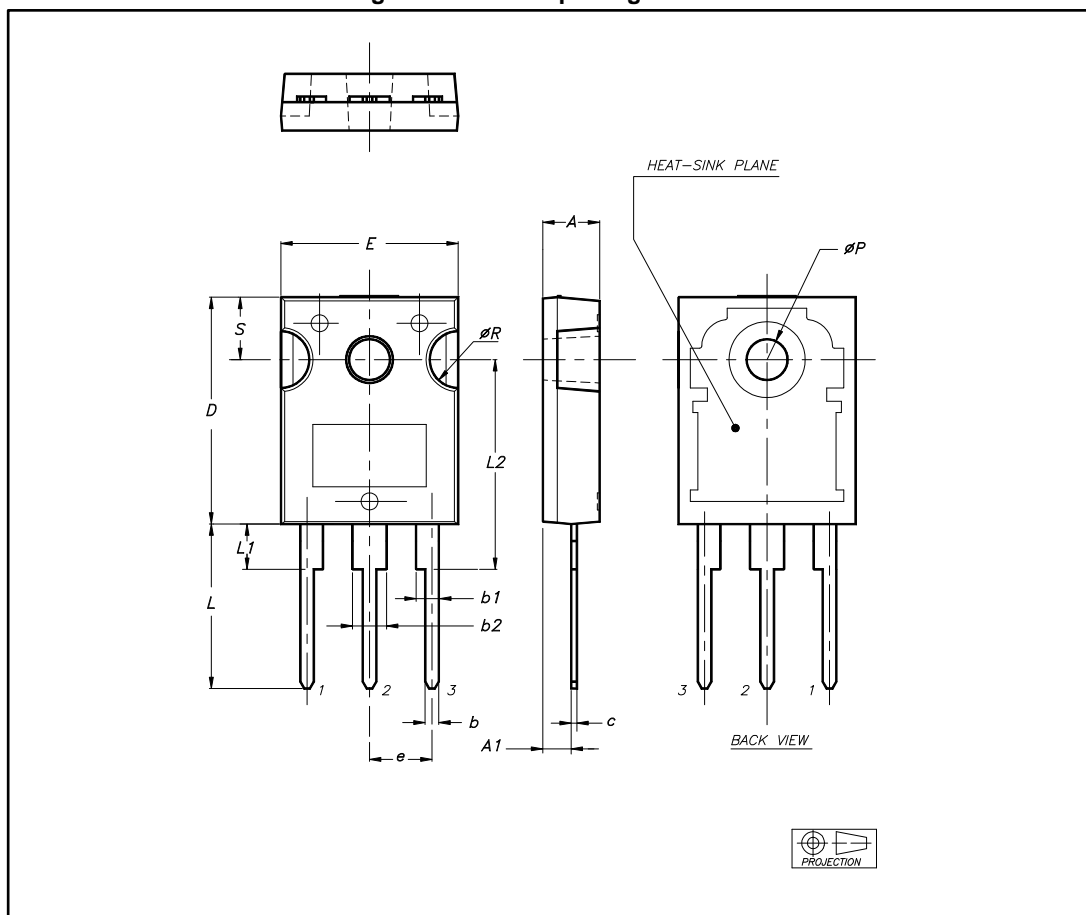


Table 6: TO-247 package mechanical data

| 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 ⁽¹⁾ | 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 ⁽²⁾ | 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:

⁽¹⁾Dimension D plus gate protusion does not exceed 20.5 mm

⁽²⁾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 Section 1.1: "Characteristics (curves)" . |

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