



## STTH3003CW

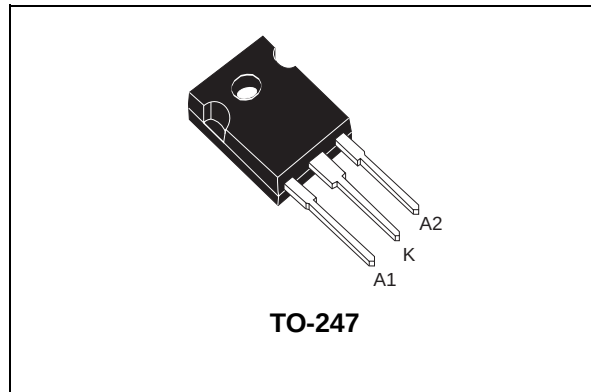
### HIGH FREQUENCY SECONDARY RECTIFIER

#### MAJOR PRODUCT CHARACTERISTICS

|                |          |
|----------------|----------|
| $I_{F(AV)}$    | 2 x 15 A |
| $V_{RRM}$      | 300 V    |
| $T_j$ (max)    | 175 °C   |
| $V_F$ (max)    | 1 V      |
| $t_{rr}$ (max) | 40 ns    |

#### FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND REVERSE VOLTAGE PERFORMANCE
- ULTRA-FAST, SOFT AND NOISE-FREE RECOVERY



#### DESCRIPTION

Dual center tap Fast Recovery Epitaxial Diodes suited for Switch Mode Power Supply and high frequency DC to DC converters.

Packaged in TO-247 this device is intended for secondary rectification.

#### ABSOLUTE RATINGS (limiting values, per diode)

| Symbol              | Parameter                              |                                   |                         | Value    | Unit |
|---------------------|----------------------------------------|-----------------------------------|-------------------------|----------|------|
| V <sub>RRM</sub>    | Repetitive peak reverse voltage        |                                   |                         | 300      | V    |
| I <sub>F(RMS)</sub> | RMS forward current                    |                                   |                         | 30       | A    |
| I <sub>F(AV)</sub>  | Average forward current                | T <sub>c</sub> = 135°C<br>δ = 0.5 | Per diode<br>Per device | 15<br>30 | A    |
| I <sub>FSM</sub>    | Surge non repetitive forward current   | tp = 10 ms sinusoidal             |                         | 140      | A    |
| I <sub>RSM</sub>    | Non repetitive peak reverse current    | tp = 20 μs square                 |                         | 7        | A    |
| T <sub>stg</sub>    | Storage temperature range              |                                   |                         | -65 +175 | °C   |
| T <sub>j</sub>      | Maximum operating junction temperature |                                   |                         | +175     | °C   |

## THERMAL RESISTANCES

| Symbol        | Parameter        |           | Value | Unit                 |
|---------------|------------------|-----------|-------|----------------------|
| $R_{th(j-c)}$ | Junction to case | Per diode | 2.0   | $^{\circ}\text{C/W}$ |
|               |                  | Total     | 1.05  |                      |
| $R_{th(c)}$   |                  | Coupling  | 0.1   |                      |

## STATIC ELECTRICAL CHARACTERISTICS (per diode)

| Symbol     | Parameter               | Tests conditions     |                             | Min. | Typ. | Max. | Unit          |
|------------|-------------------------|----------------------|-----------------------------|------|------|------|---------------|
| $I_R^*$    | Reverse leakage current | $V_R = 300\text{ V}$ | $T_j = 25^{\circ}\text{C}$  |      |      | 40   | $\mu\text{A}$ |
|            |                         |                      | $T_j = 125^{\circ}\text{C}$ |      | 40   | 400  |               |
| $V_F^{**}$ | Forward voltage drop    | $I_F = 15\text{ A}$  | $T_j = 25^{\circ}\text{C}$  |      |      | 1.25 | $\text{V}$    |
|            |                         |                      | $T_j = 125^{\circ}\text{C}$ |      | 0.85 | 1    |               |

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

\*\*  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

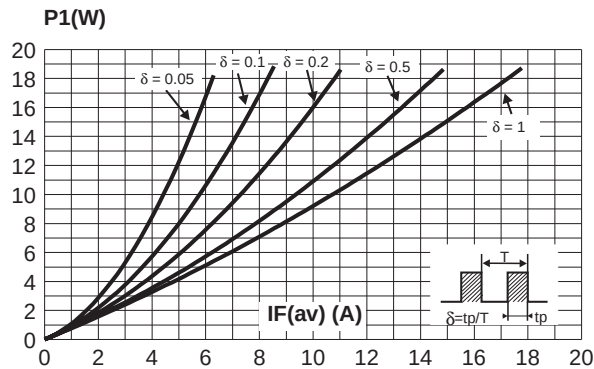
To evaluate the maximum conduction losses use the following equation :

$$P = 0.75 \times I_{F(AV)} + 0.017 I_F^2 (RMS)$$

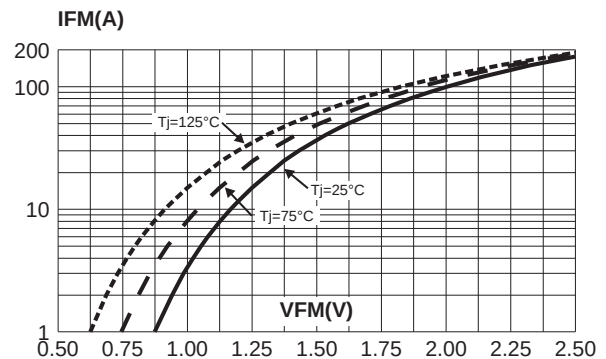
## RECOVERY CHARACTERISTICS

| Symbol       | Tests conditions                                                            |                             | Min. | Typ. | Max. | Unit        |
|--------------|-----------------------------------------------------------------------------|-----------------------------|------|------|------|-------------|
| $t_{rr}$     | $I_F = 0.5\text{ A}$ $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$            | $T_j = 25^{\circ}\text{C}$  |      |      | 30   | $\text{ns}$ |
|              | $I_F = 1\text{ A}$ $dI_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{ V}$ |                             |      |      | 40   |             |
| $t_{fr}$     | $I_F = 15\text{ A}$ $dI_F/dt = 100\text{ A}/\mu\text{s}$                    | $T_j = 25^{\circ}\text{C}$  |      |      | 300  | $\text{ns}$ |
| $V_{FP}$     | $V_{FR} = 1.1 \times V_F \text{ max.}$                                      |                             |      |      | 3.5  | $\text{V}$  |
| $S_{factor}$ | $V_{CC} = 200\text{ V}$ $I_F = 15\text{ A}$                                 | $T_j = 125^{\circ}\text{C}$ |      | 0.3  |      | -           |
| $I_{RM}$     | $dI_F/dt = 200\text{ A}/\mu\text{s}$                                        |                             |      |      | 8.5  | $\text{A}$  |

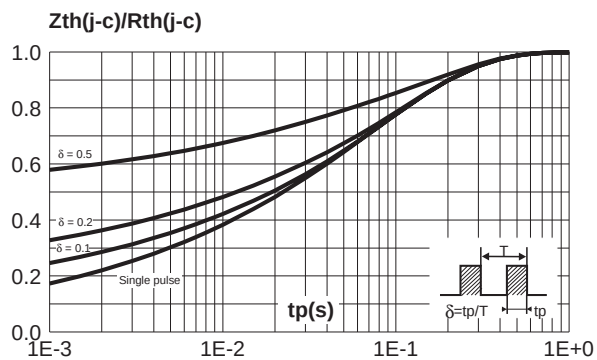
**Fig. 1:** Conduction losses versus average current (per diode).



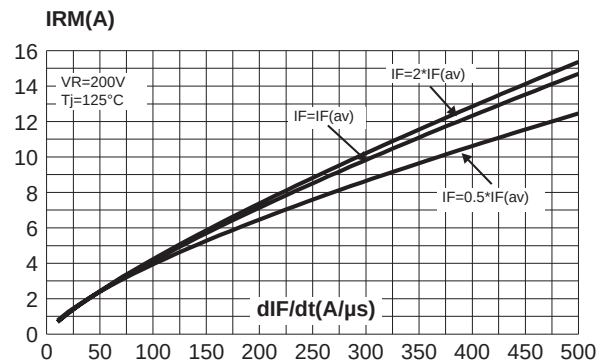
**Fig. 2:** Forward voltage drop versus forward current (maximum values, per diode).



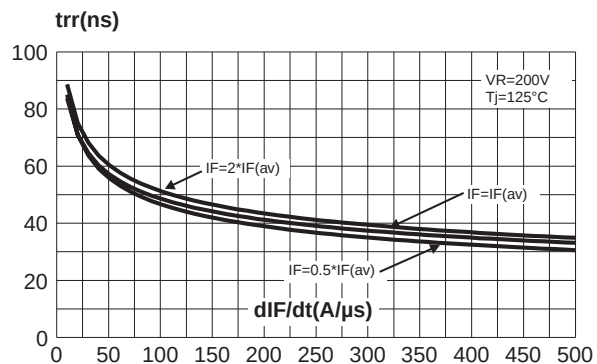
**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration.



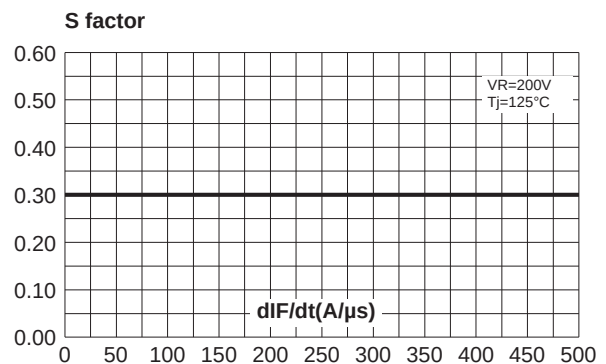
**Fig. 4:** Peak reverse recovery current versus  $dI_F/dt$  (90% confidence, per diode).



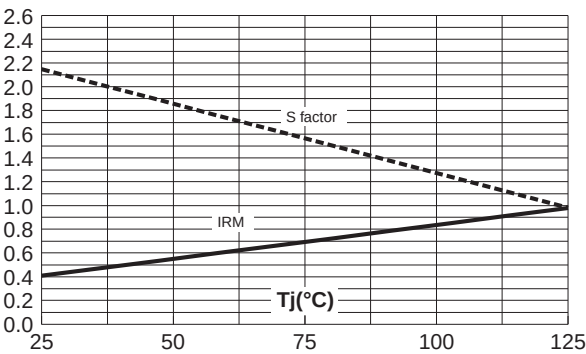
**Fig. 5:** Reverse recovery time versus  $dI_F/dt$  (90% confidence, per diode).



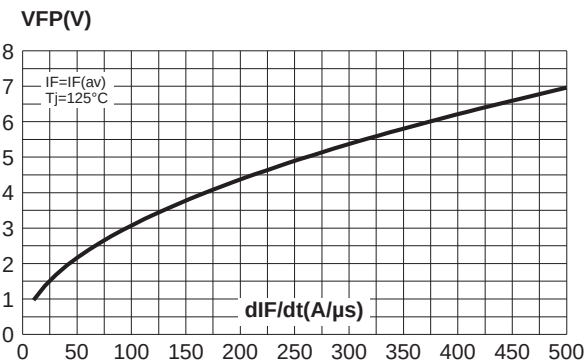
**Fig. 6:** Softness factor versus  $dI_F/dt$  (typical values, per diode).



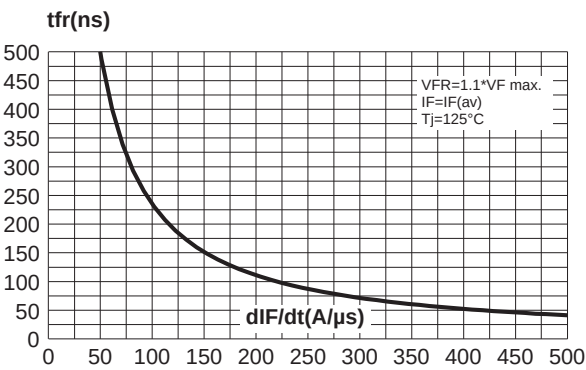
**Fig. 7:** Relative variation of dynamic parameters versus junction temperature (reference:  $T_J = 125^\circ\text{C}$ ).



**Fig. 8:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence, per diode).



**Fig. 9:** Forward recovery time versus  $dI_F/dt$  (90% confidence, per diode).



**PACKAGE MECHANICAL DATA**  
**TO-247**

| REF. | DIMENSIONS  |       |       |        |       |       |
|------|-------------|-------|-------|--------|-------|-------|
|      | Millimeters |       |       | Inches |       |       |
|      | Min.        | Typ.  | Max.  | Min.   | Typ.  | Max.  |
| A    | 4.85        |       | 5.15  | 0.191  |       | 0.203 |
| D    | 2.20        |       | 2.60  | 0.086  |       | 0.102 |
| E    | 0.40        |       | 0.80  | 0.015  |       | 0.031 |
| F    | 1.00        |       | 1.40  | 0.039  |       | 0.055 |
| F1   |             | 3.00  |       |        | 0.118 |       |
| F2   |             | 2.00  |       |        | 0.078 |       |
| F3   | 2.00        |       | 2.40  | 0.078  |       | 0.094 |
| F4   | 3.00        |       | 3.40  | 0.118  |       | 0.133 |
| G    |             | 10.90 |       |        | 0.429 |       |
| H    | 15.45       |       | 15.75 | 0.608  |       | 0.620 |
| L    | 19.85       |       | 20.15 | 0.781  |       | 0.793 |
| L1   | 3.70        |       | 4.30  | 0.145  |       | 0.169 |
| L2   |             | 18.50 |       |        | 0.728 |       |
| L3   | 14.20       |       | 14.80 | 0.559  |       | 0.582 |
| L4   |             | 34.60 |       |        | 1.362 |       |
| L5   |             | 5.50  |       |        | 0.216 |       |
| M    | 2.00        |       | 3.00  | 0.078  |       | 0.118 |
| V    |             | 5°    |       |        | 5°    |       |
| V2   |             | 60°   |       |        | 60°   |       |
| Dia. | 3.55        |       | 3.65  | 0.139  |       | 0.143 |

| Ordering code | Marking    | Package | Weight | Base qty | Delivery mode |
|---------------|------------|---------|--------|----------|---------------|
| STTH3003CW    | STTH3003CW | TO-247  | 4.36g  | 30       | Tube          |

- Cooling method: by conduction (C)
- Recommended torque value: 0.8 N.m.
- Maximum torque value: 1.0 N.m.
- Epoxy meets UL 94,V0

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