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STTH3003CW

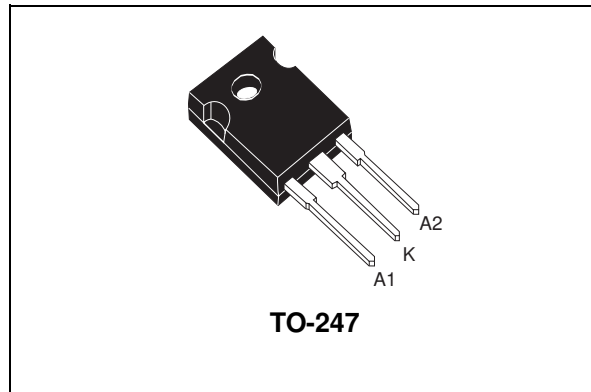
HIGH FREQUENCY SECONDARY RECTIFIER

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_{RRM} | Repetitive peak reverse voltage | | 300 | V | |
| $I_{F(RMS)}$ | RMS forward current | | 30 | A | |
| $I_{F(AV)}$ | Average forward current | $T_c = 135^\circ\text{C}$ $\delta = 0.5$ | Per diode Per device | 15 30 | A |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10$ ms sinusoidal | 140 | A | |
| I_{RSM} | Non repetitive peak reverse current | $t_p = 20$ μs square | 7 | A | |
| T_{stg} | Storage temperature range | | -65 +175 | °C | |
| T_j | Maximum operating junction temperature | | +175 | °C | |

STTH3003CW

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 | μA |
| | | | $T_j = 125^{\circ}\text{C}$ | | 40 | 400 | |
| V_F^{**} | Forward voltage drop | $I_F = 15\text{ A}$ | $T_j = 25^{\circ}\text{C}$ | | | 1.25 | V |
| | | | $T_j = 125^{\circ}\text{C}$ | | 0.85 | 1 | |

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

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

To evaluate the maximum conduction losses use the following equation :

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

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 | 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 | ns |
| V_{FP} | $V_{FR} = 1.1 \times V_F \text{ max.}$ | | | | 3.5 | 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 | A |

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

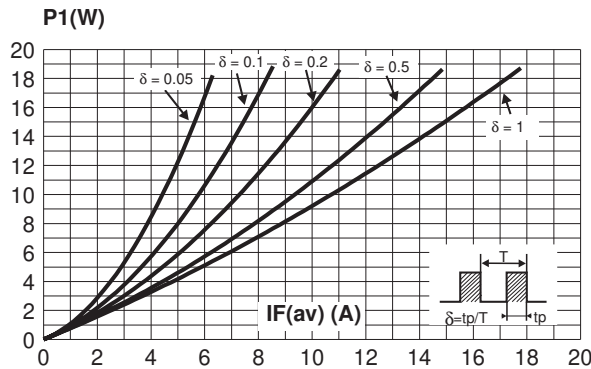


Fig. 2: Forward voltage drop versus forward current (maximum values, per diode).

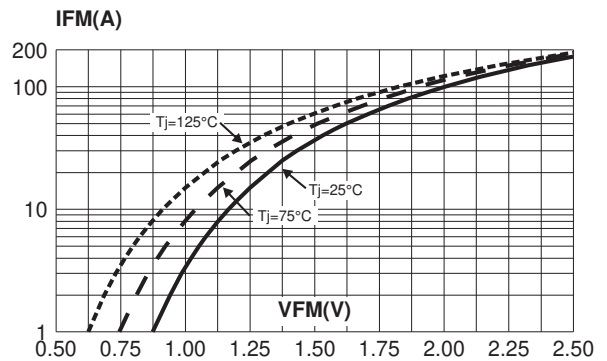


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

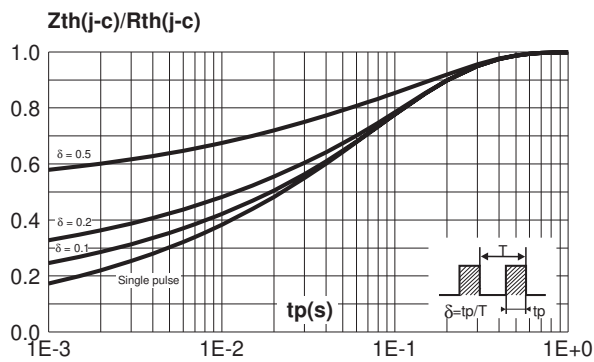


Fig. 4: Peak reverse recovery current versus dI_F/dt (90% confidence, per diode).

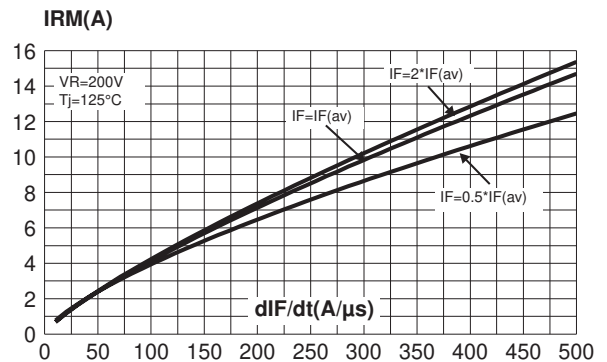


Fig. 5: Reverse recovery time versus dI_F/dt (90% confidence, per diode).

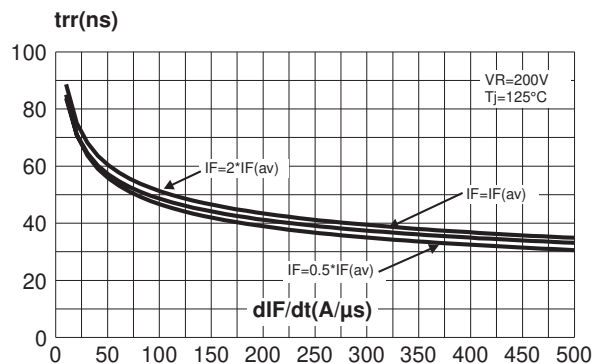
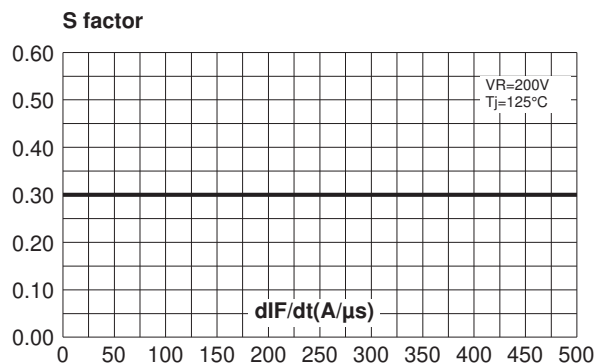


Fig. 6: Softness factor versus dI_F/dt (typical values, per diode).



STTH3003CW

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

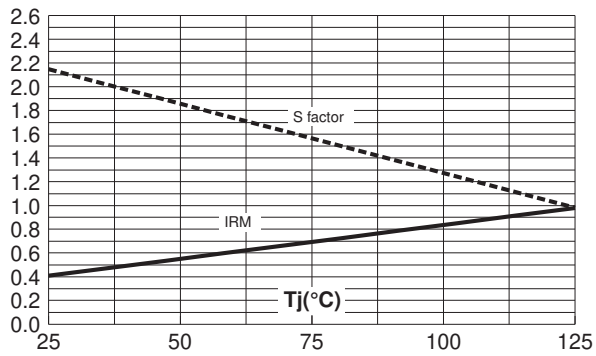


Fig. 8: Transient peak forward voltage versus dI_F/dt (90% confidence, per diode).

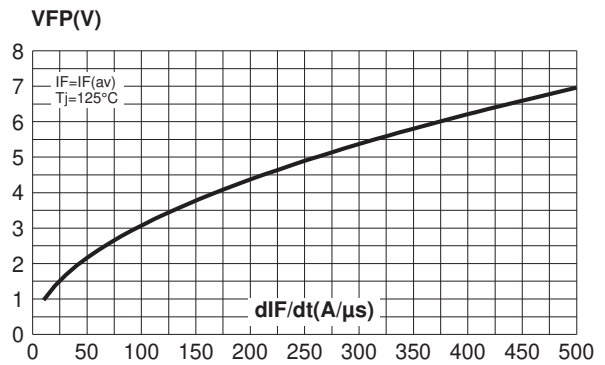
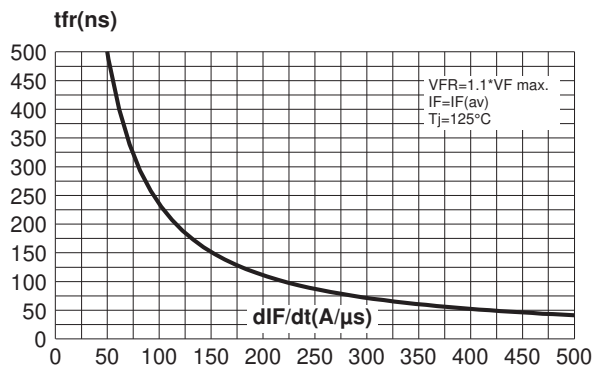
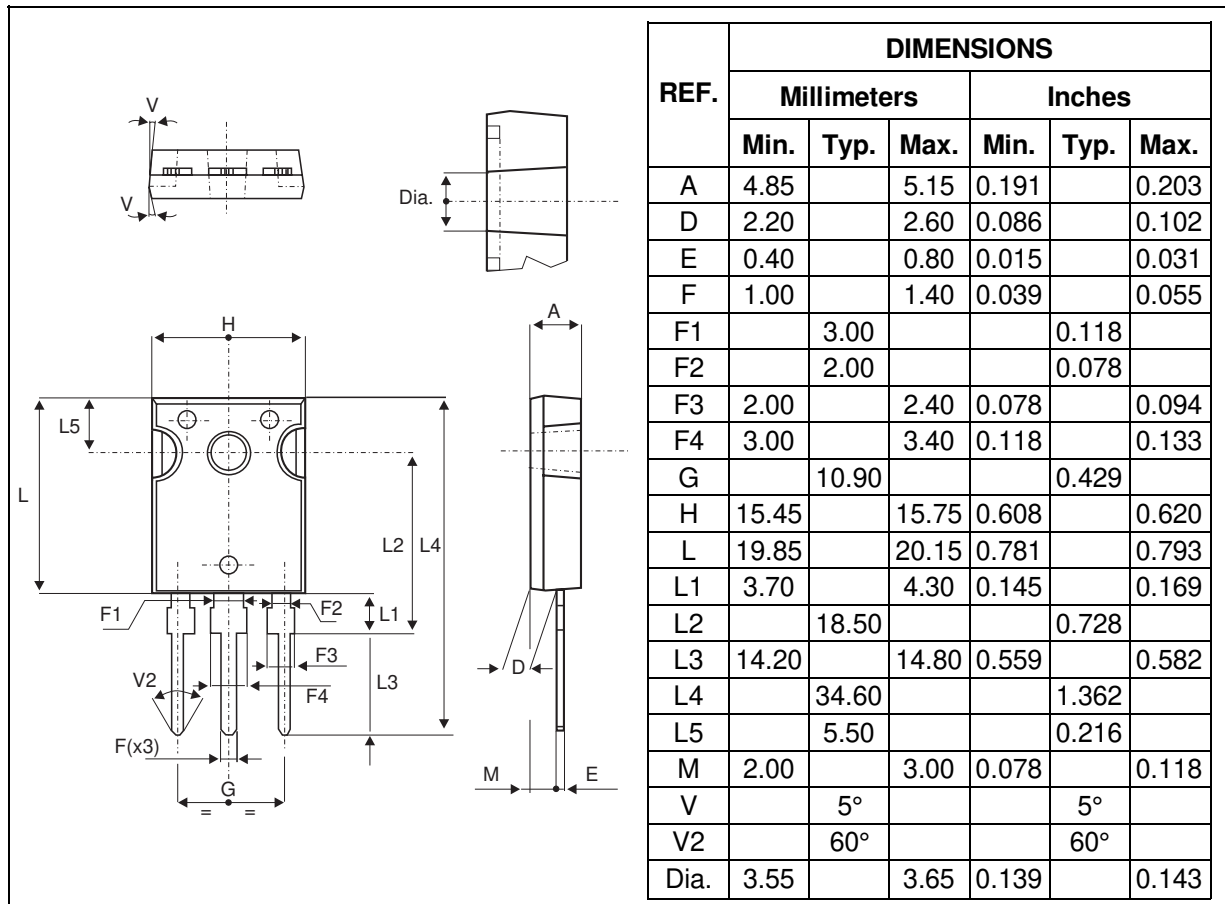


Fig. 9: Forward recovery time versus dI_F/dt (90% confidence, per diode).



PACKAGE MECHANICAL DATA
 TO-247


| 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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