



STTH803D/G

HIGH FREQUENCY SECONDARY RECTIFIER

MAJOR PRODUCTS CHARACTERISTICS

| | |
|----------------------|--------|
| $I_{F(AV)}$ | 8 A |
| V_{RRM} | 300 V |
| $T_j(\text{max})$ | 175 °C |
| $V_F(\text{max})$ | 1 V |
| $t_{rr}(\text{max})$ | 35 ns |

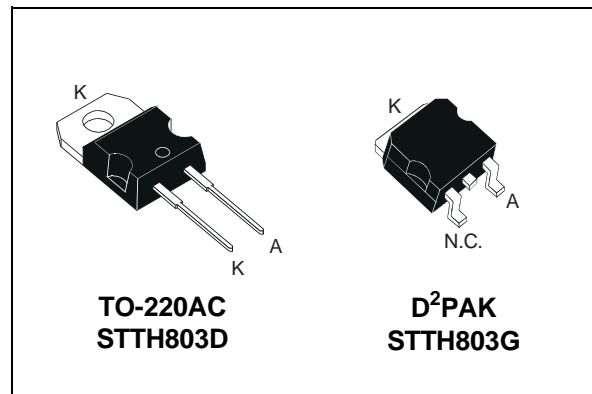
FEATURES AND BENEFITS

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

DESCRIPTION

Single Fast Recovery Epitaxial Diode suited for Switch Mode Power Supply and high frequency DC/DC converters.

Packaged in TO-220AC or D²PAK this device is especially intended for secondary rectification.



ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|--------------|--|--|----------|------|
| V_{RRM} | Repetitive peak reverse voltage | | 300 | V |
| $I_{F(RMS)}$ | RMS forward current | | 20 | A |
| $I_{F(AV)}$ | Average forward current | $T_c = 150^\circ\text{C} \quad \delta = 0.5$ | 8 | A |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10 \text{ ms}$ sinusoidal | 100 | A |
| I_{RSM} | Non repetitive avalanche current | $t_p = 20 \mu\text{s}$ square | 4 | A |
| T_{stg} | Storage temperature range | | -65 +175 | °C |
| T_j | Maximum operating junction temperature | | + 175 | °C |

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THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---------------|------------------|-------|------|
| $R_{th(j-c)}$ | Junction to case | 2.5 | °C/W |

STATIC ELECTRICAL CHARACTERISTICS (per diode)

| Symbol | Parameter | Tests conditions | | Min. | Typ. | Max. | Unit |
|------------|-------------------------|----------------------|---------------------------|------|------|------|---------------|
| I_R^* | Reverse leakage current | $V_R = 300\text{ V}$ | $T_j = 25^\circ\text{C}$ | | | 20 | μA |
| | | | $T_j = 125^\circ\text{C}$ | | 20 | 200 | |
| V_F^{**} | Forward voltage drop | $I_F = 8\text{ A}$ | $T_j = 25^\circ\text{C}$ | | | 1.25 | V |
| | | $I_F = 8\text{ A}$ | $T_j = 125^\circ\text{C}$ | | 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 :

$$P = 0.75 \times I_{F(AV)} + 0.031 I_{F(RMS)}^2$$

RECOVERY CHARACTERISTICS

| Symbol | Tests conditions | | | Min. | Typ. | Max. | Unit |
|--------------|--------------------------------------|--------------------------------------|--|---------------------------|------|------|------|
| trr | $I_F = 0.5\text{ A}$ | $I_{rr} = 0.25\text{ A}$ | $I_R = 1\text{ A}$ | $T_j = 25^\circ\text{C}$ | | 25 | ns |
| | $I_F = 1\text{ A}$ | $di_F/dt = -50\text{ A}/\mu\text{s}$ | $V_R = 30\text{ V}$ | | | | |
| tfr | $I_F = 8\text{ A}$ | $di_F/dt = 100\text{ A}/\mu\text{s}$ | $V_{FR} = 1.1 \times V_F \text{ max.}$ | $T_j = 25^\circ\text{C}$ | | 200 | ns |
| V_{FP} | | | | $T_j = 25^\circ\text{C}$ | | 3.5 | V |
| S_{factor} | $V_{CC} = 200\text{ V}$ | $I_F = 8\text{ A}$ | | $T_j = 125^\circ\text{C}$ | 0.3 | 8 | - |
| I_{RM} | $di_F/dt = 200\text{ A}/\mu\text{s}$ | | | | | | A |

Fig. 1: Conduction losses versus average current.

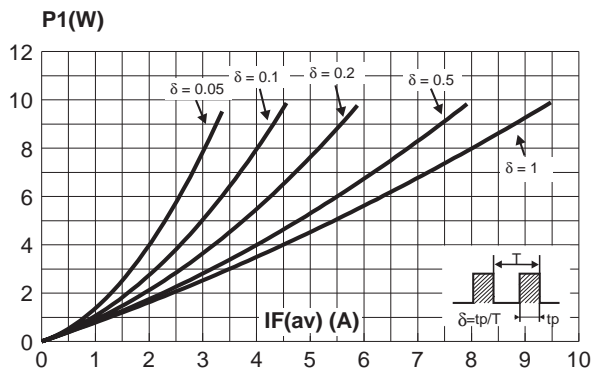


Fig. 2: Forward voltage drop versus forward current (maximum values).

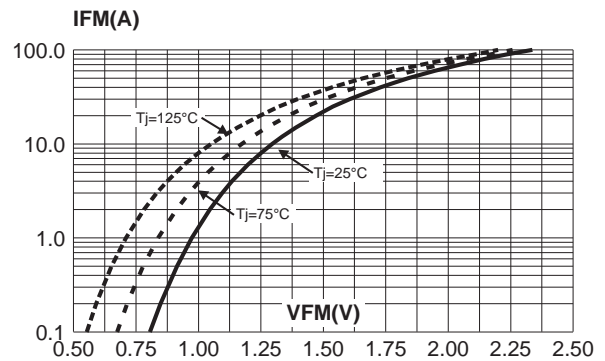


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

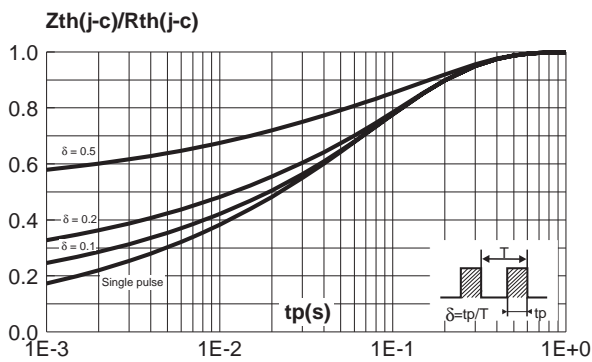


Fig. 4: Peak reverse recovery current versus dI_F/dt (90% confidence).

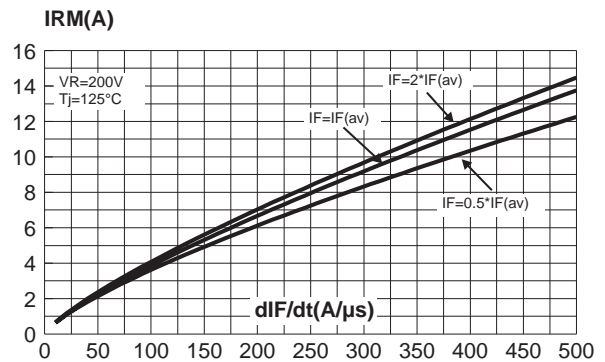


Fig. 5: Reverse recovery time versus dI_F/dt (90% confidence).

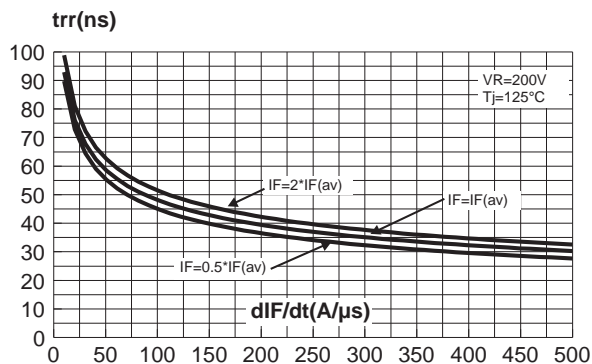
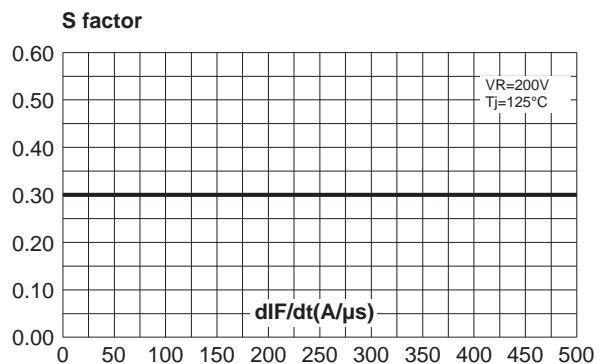


Fig. 6: Softness factor versus dI_F/dt (typical values).



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

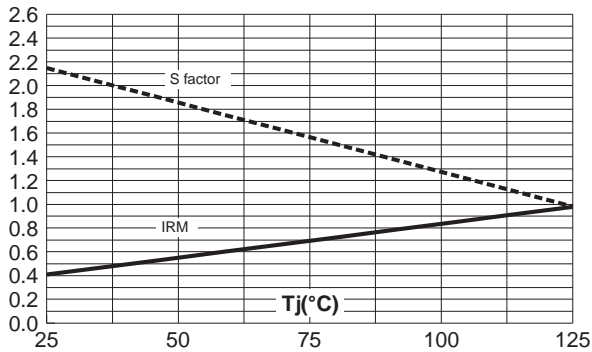


Fig. 8: Transient peak forward voltage versus dI_F/dt (90% confidence).

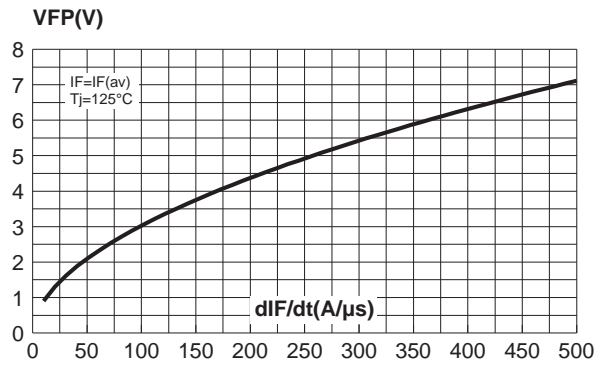
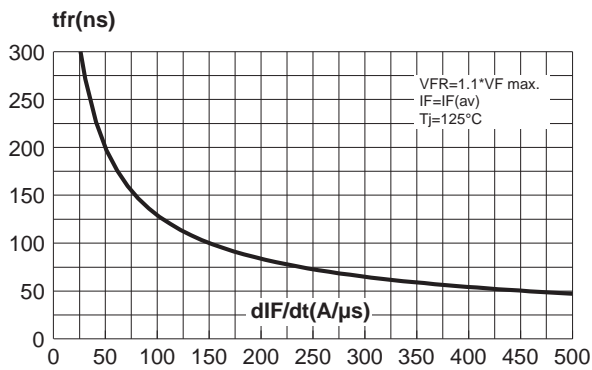
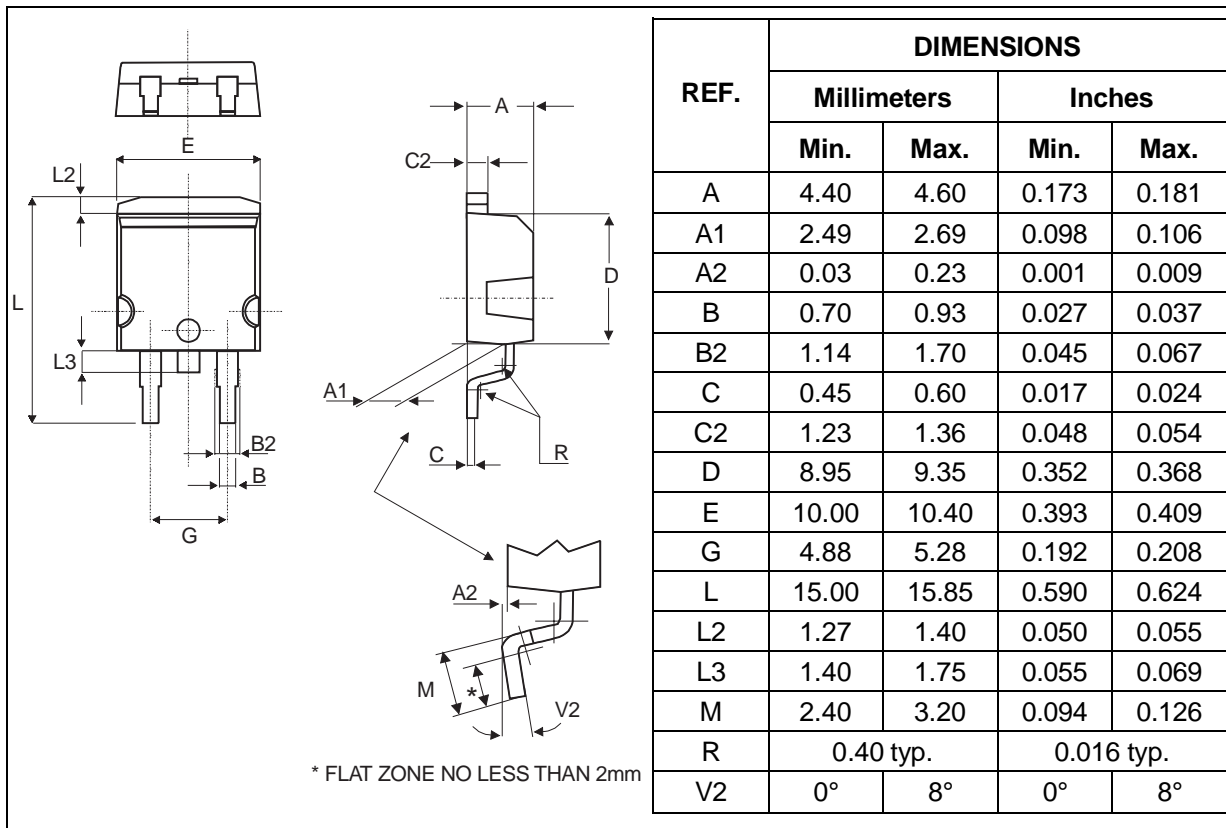


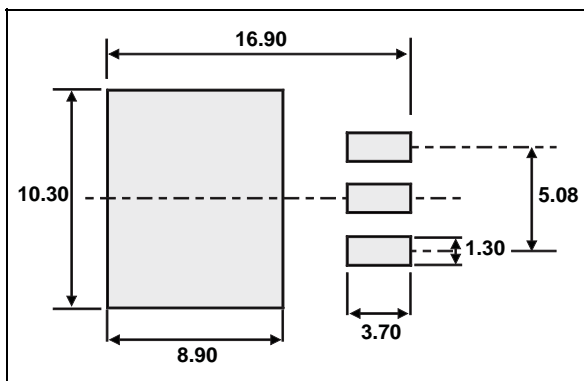
Fig. 9: Forward recovery time versus dI_F/dt (90% confidence).



PACKAGE MECHANICAL DATA
D²PAK

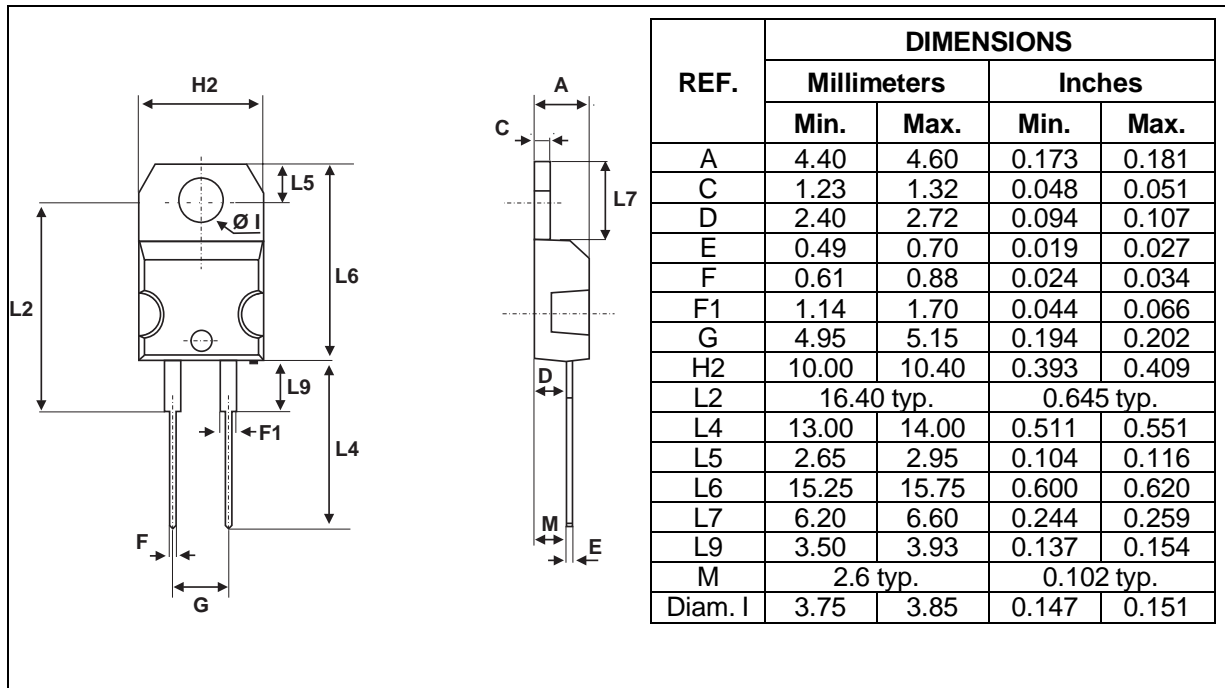


FOOT PRINT DIMENSIONS (in millimeters)
D²PAK



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PACKAGE MECHANICAL DATA TO-220AC



| Ordering code | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|----------|--------------------|--------|----------|---------------|
| STTH803D | STTH803D | TO-220AC | 1.86g | 50 | Tube |
| STTH803G | STTH803G | D ² PAK | 1.48g | 50 | Tube |

- Cooling method: by conduction (C)
- Recommended torque value (TO-220AC): 0.55 N.m.
- Maximum torque value (TO-220AC): 0.70 N.m.
- Epoxy meets UL 94,V0

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