



STTH1506D/DI

TURBO 2 ULTRA-FAST HIGH VOLTAGE RECTIFIER

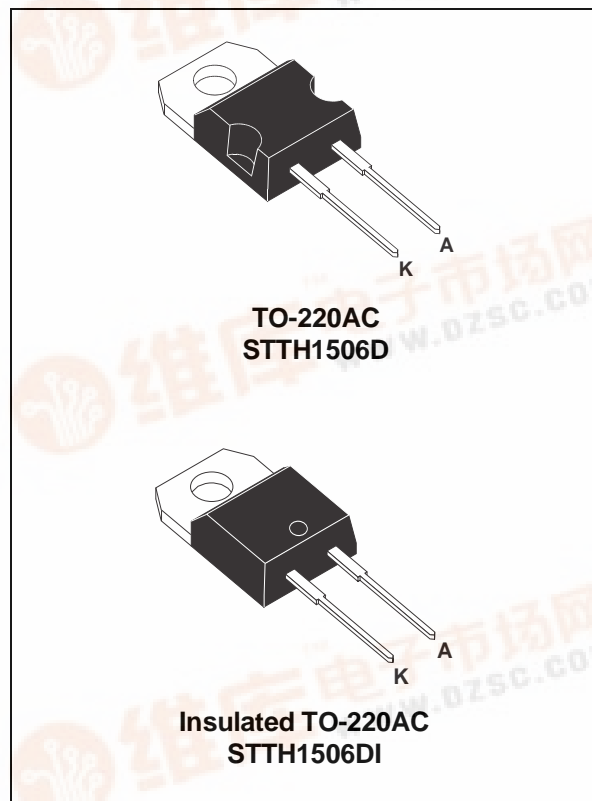
PRELIMINARY DATASHEET

MAJOR PRODUCTS CHARACTERISTICS

| | |
|----------------|--------|
| $I_{F(AV)}$ | 15 A |
| V_{RRM} | 600 V |
| T_j (max) | 175 °C |
| V_F (max) | 1.9 V |
| t_{rr} (max) | 50 ns |

FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND VOLTAGE PERFORMANCE.
- ULTRA-FAST, SOFT AND NOISE-FREE RECOVERY FOR LOW SIDE EFFECTS.
- LOW INDUCTANCE, LOW CAPACITANCE, ALLOWS SIMPLIFIED LAYOUT.
- INSULATED VERSION: TO-220AC
Insulated voltage = 2500 V_{RMS}
Capacitance = 7 pF



ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|--------------|---|--------------------------------|----------|------|
| V_{RRM} | Repetitive peak reverse voltage | | 600 | V |
| $I_{F(RMS)}$ | RMS forward current | TO-220AC Insulated TO-220AC | 30 24 | A |
| $I_{F(AV)}$ | Average forward current $\delta = 0.5$ | TO-220AC Insulated TO-220AC | 15 | A |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10$ ms sinusoidal | 85 | A |
| T_{stg} | Storage temperature range | | -65 +175 | °C |
| T_j | Maximum operating junction temperature | | + 175 | °C |

STTH1506D/DI

THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|----------------------|-------------------------------------|--------------------|-------|------|
| R _{th(j-c)} | Junction to case thermal resistance | TO-220AC | 2.2 | °C/W |
| | | Insulated TO-220AC | 3.2 | |

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests Conditions | | Min. | Typ. | Max. | Unit |
|-------------------|-------------------------|------------------------|------------------------|------|------|------|------|
| I _R * | Reverse leakage current | V _R = 600 V | T _j = 25°C | | | 100 | μA |
| | | | T _j = 125°C | | 10 | 400 | |
| V _F ** | Forward voltage drop | I _F = 15 A | T _j = 25°C | | | 2.4 | V |
| | | | T _j = 125°C | | 1.5 | 1.9 | |

Pulse test : * t_p = 5 ms, δ < 2 %

** t_p = 380 μs, δ < 2%

To evaluate the maximum conduction losses use the following equation :

$$P = 1.3 \times I_{F(AV)} + 0.04 I_{F(RMS)}^2$$

DYNAMIC ELECTRICAL CHARACTERISTICS

| Symbol | Tests Conditions | | | Min. | Typ. | Max. | Unit |
|---------------------|---|---------------------------------|-----------------------|------------------------|------|------|------|
| trr | I _F = 0.5 A | I _{rr} = 0.25 A | I _R = 1 A | T _j = 25°C | | 35 | ns |
| | I _F = 1 A | dI _F /dt = - 50 A/μs | V _R = 30 V | | | 50 | |
| I _{RM} | V _R = 400 V I _F = 15 A dI _F /dt = 200 A/μs | | | T _j = 125°C | | 9.5 | A |
| S _{factor} | | | | | | 1 | - |
| tfr | I _F = 15 A dI _F /dt = 120 A/μs | | | T _j = 25°C | | 200 | ns |
| V _{FP} | V _{FR} = 1.1 x V _F max | | | | | | 6 |
| Qrr | V _R = 400V I _F = 15 A dI _F /dt = -200 A/μs | | | T _j = 125°C | 380 | | nC |

Fig. 1: Conduction losses versus average current.

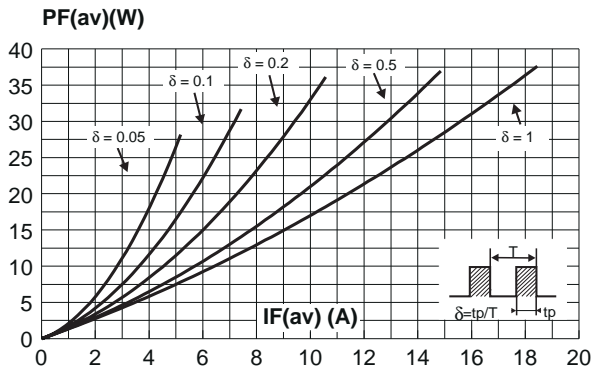


Fig. 2: Forward voltage drop versus forward current.

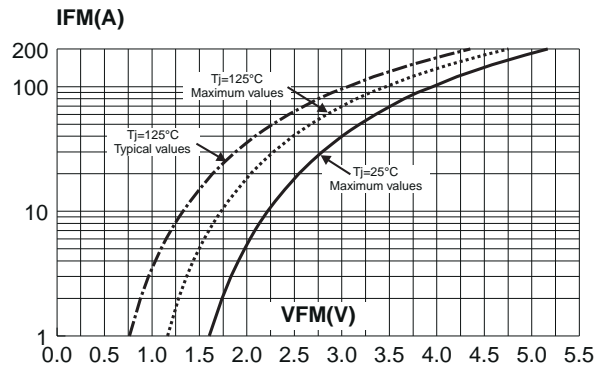


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

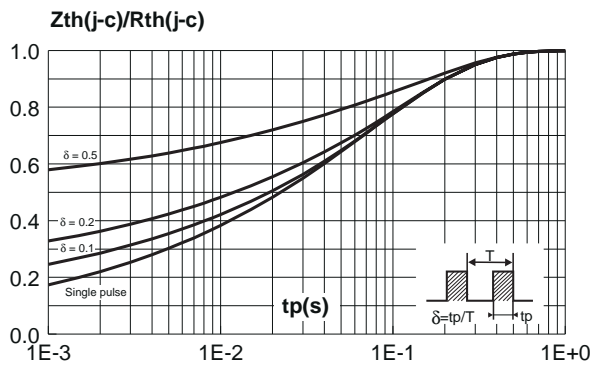


Fig. 4: Peak reverse recovery current versus dIF/dt (90% confidence).

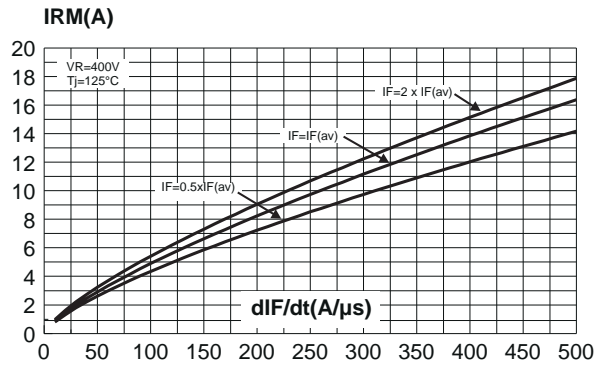


Fig. 5: Reverse recovery time dIF/dt (90% confidence).

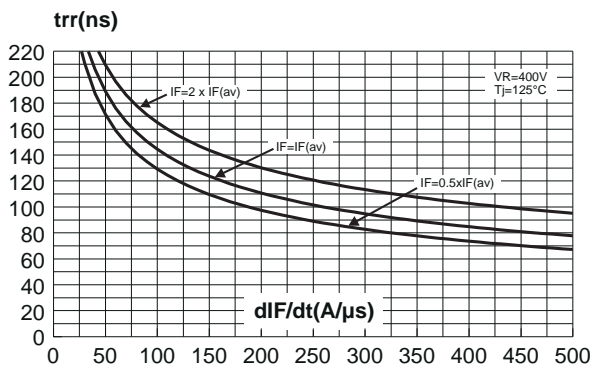


Fig. 6: Reverse charges versus dIF/dt (90% confidence).

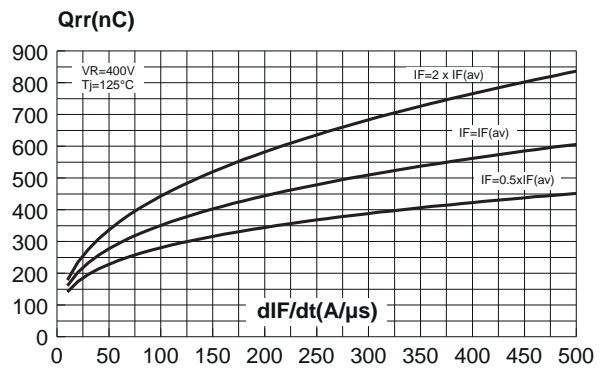


Fig. 7: Softness factor (tb/ta) versus dI_F/dt (typical values)

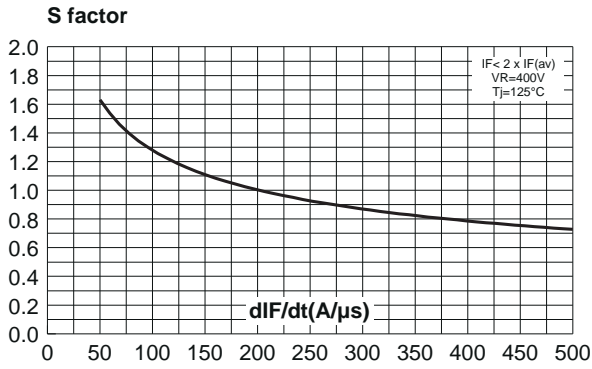


Fig. 8: Relative variation of dynamic parameters versus junction temperature (Reference: $T_j=125^\circ\text{C}$)

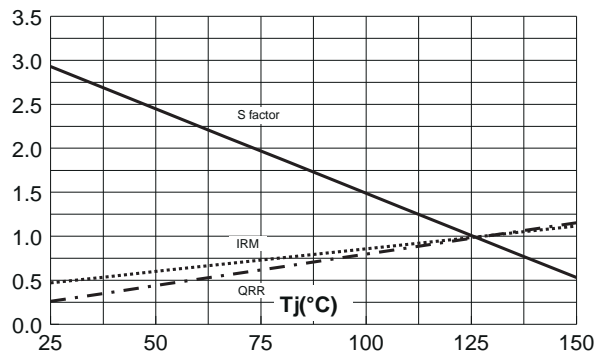


Fig. 9: Transient peak forward voltage versus dI_F/dt (90% confidence).

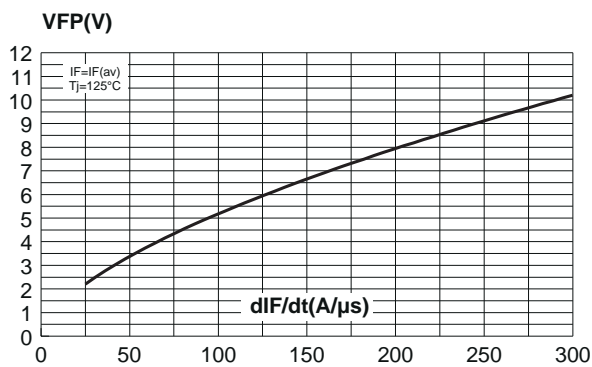
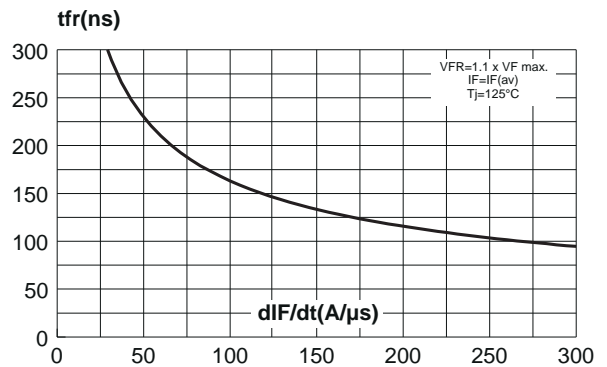
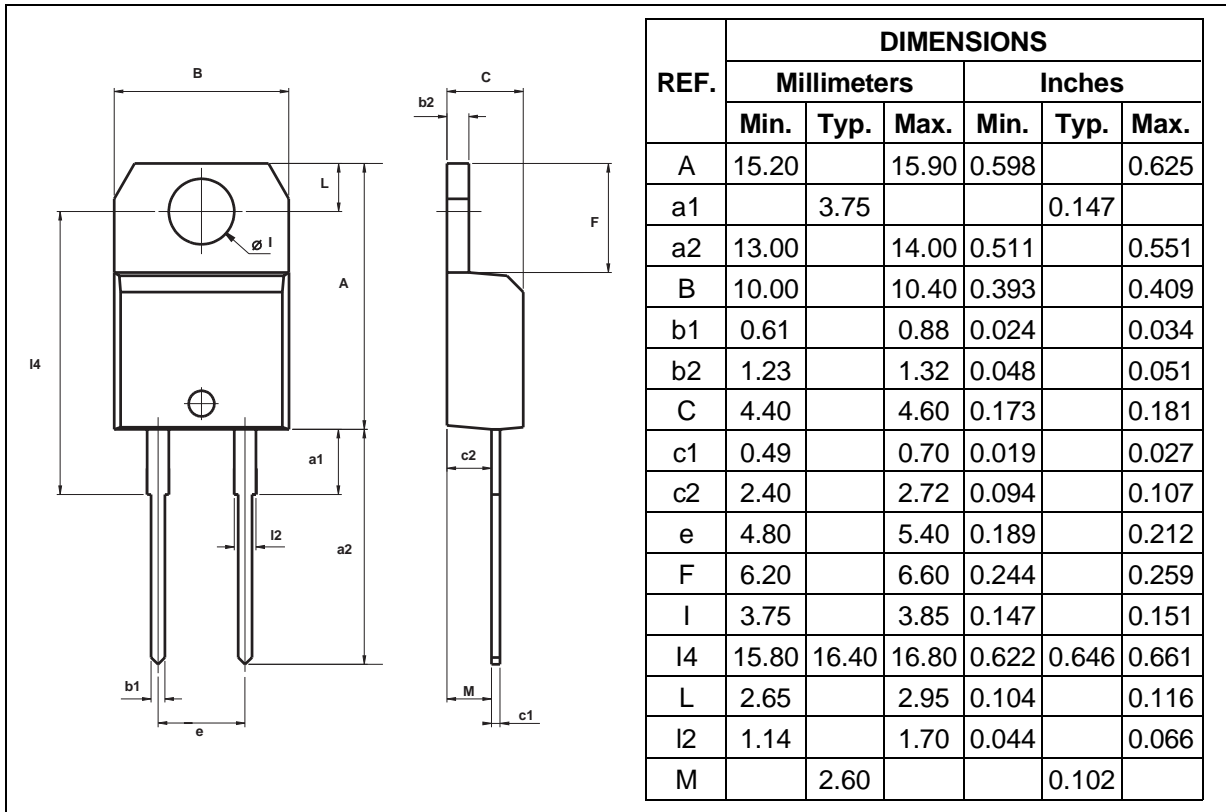


Fig. 10: Forward recovery time versus dI_F/dt (90% confidence).

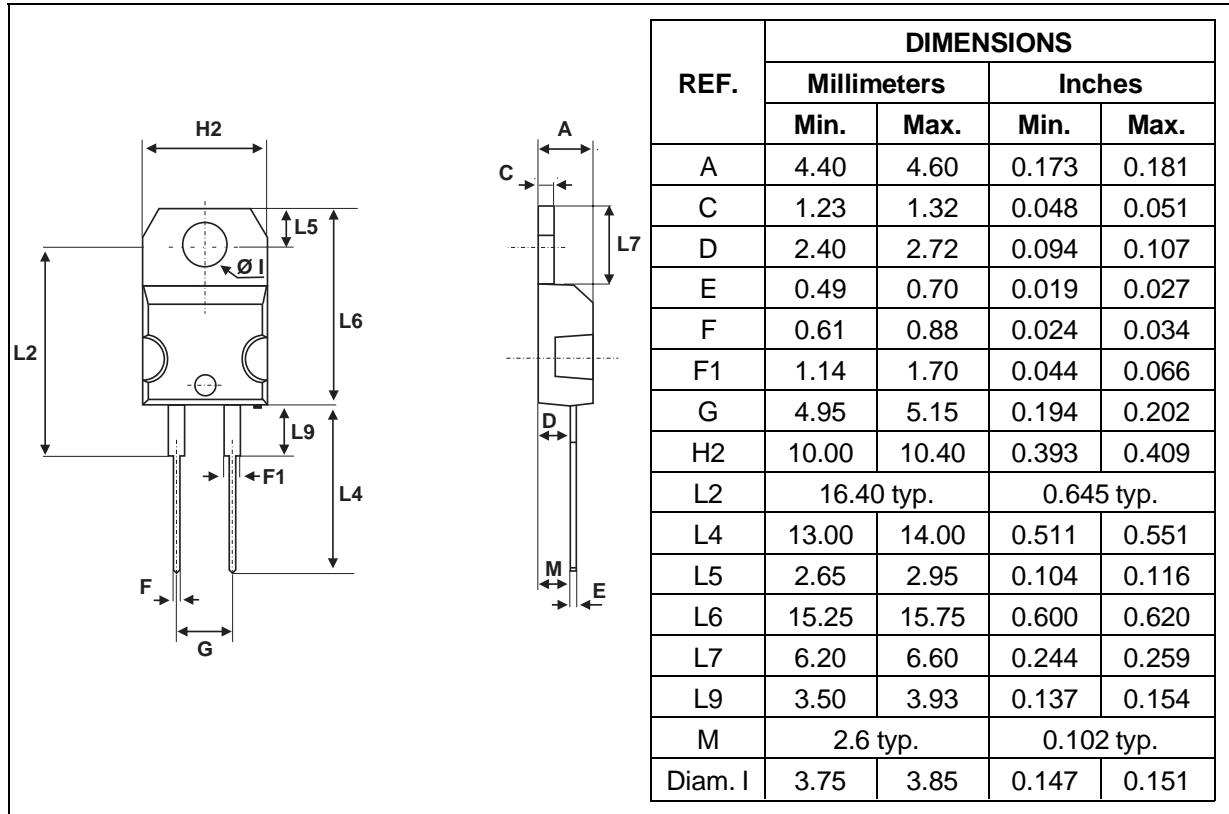


PACKAGE MECHANICAL DATA
TO-220AC (Iso.)



STTH1506D/DI

PACKAGE MECHANICAL DATA TO-220AC



| Ordering code | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|------------|--------------------|---------|----------|---------------|
| STTH1506D | STTH1506D | TO-220AC | 1.86 g. | 50 | Tube |
| STTH1506DI | STTH1506DI | Insulated TO-220AC | 1.86 g. | 50 | Tube |

- Cooling method: C
- Recommended torque value: 0.8 N.m.
- Maximum torque value: 1 N.m.
- Epoxy meets UL94,V0

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics

© 1999 STMicroelectronics - Printed in Italy - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Brazil - Canada - China - France - Germany - Italy - Japan - Korea - Malaysia - Malta - Mexico - Morocco - The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.

<http://www.st.com>