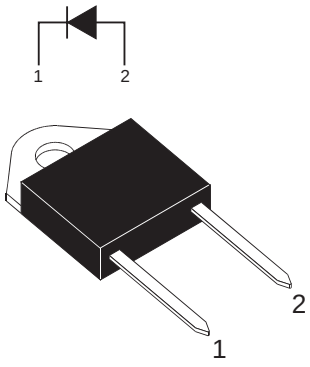
# STTH1506DPI

## Tandem 600V HYPERFAST BOOST DIODE

### MAJOR PRODUCTS CHARACTERISTICS

| | |
|---|---|
| $I_{F(AV)}$ | 15 A |
| $V_{RRM}$ | 600 V |
| Tj (max) | 150 °C |
| $V_F$ (max) | 2.4 V |
| $I_{RM}$ (typ.) | 4.8 A |
| $t_{rr}$ (typ.) | 16 ns |




**DOP3I**
**(insulated)**

### FEATURES AND BENEFITS

- ESPECIALLY SUITED AS BOOST DIODE IN CONTINUOUS MODE POWER FACTOR CORRECTORS AND HARD SWITCHING CONDITIONS
- DESIGNED FOR HIGH DI/DT OPERATION. HYPERFAST RECOVERY CURRENT TO COMPETE WITH SIC DEVICES. ALLOWS DOWNSIZING OF MOSFET AND HEATSINKS
- INTERNAL CERAMIC INSULATED DEVICES WITH EQUAL THERMAL CONDITIONS FOR BOTH 300V DIODES
- INSULATION ($2500V_{RMS}$) ALLOWS PLACEMENT ON SAME HEATSINK AS MOSFET AND FLEXIBLE HEATSINKING ON COMMON OR SEPARATE HEATSINK
- STATIC AND DYNAMIC EQUILIBRIUM OF INTERNAL DIODES ARE WARRANTED BY DESIGN
- PACKAGE CAPACITANCE: C=16pF

### DESCRIPTION

The TURBOSWITCH “H” is an ultra high performance diode composed of two 300V dice in series. TURBOSWITCH “H” family drastically cuts losses in the associated MOSFET when run at high $dI_F/dt$.

### ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | | 600 | V |
| $I_{F(RMS)}$ | RMS forward current | | 26 | A |
| $I_{FSM}$ | Surge non repetitive forward current | tp = 10 ms sinusoidal | 130 | A |
| Ipeak | Peak current waveform | $\delta$ = 0.15 Tc = 120°C | 35 | A |
| $T_{stg}$ | Storage temperature range | | -65 +150 | °C |
| Tj | Maximum operating junction temperature | | + 150 | °C |

## THERMAL AND POWER DATA

| Symbol | Parameter | Test conditions | Value | Unit |
|---|---|---|---|---|
| $R_{th\ (j-c)}$ | Junction to case | | 1.6 | °C/W |

## STATIC ELECTRICAL CHARACTERISTICS (for both diodes)

| Symbol | Parameter | Tests Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$* | Reverse leakage current | $V_R = V_{RRM}$ | Tj = 25°C | | | 20 | µA |
| | | | Tj = 125°C | | 30 | 200 | |
| $V_F$** | Forward voltage drop | $I_F$ = 15 A | Tj = 25°C | | | 3.6 | V |
| | | | Tj = 150°C | | 1.95 | 2.4 | |

Pulse test: * tp = 100ms, δ < 2%

** tp = 380µs, δ < 2%

To evaluate the maximum conduction losses use the following equation:
$P = 1.7 \times I_{F(AV)} + 0.047 \times I_F{}^2{}_{(RMS)}$

## RECOVERY CHARACTERISTICS

| Symbol | Parameter | Tests Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $t_{rr}$ | Reverse recovery time | $I_F$ = 0.5 A Irr = 0.25A $I_R$ = 1 A | Tj = 25°C | | 16 | | ns |
| | | $I_F$ = 1 A $dI_F/dt$ = - 50A/µs $V_R$ = 30 V | | | | 35 | |
| $I_{RM}$ | Reverse recovery current | $V_R$ = 400 V $I_F$ = 15 A $dI_F/dt$ = -200 A/µs | Tj = 125°C | | 4.8 | 6.0 | A |
| S | Reverse recovery softness factor | | | | 0.4 | | - |
| $Q_{rr}$ | Reverse recovery charges | | | | 80 | | nC |

## TURN-ON SWITCHING CHARACTERISTICS

| Symbol | Parameter | Tests Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $t_{fr}$ | Forward recovery time | $I_F$ = 15 A $dI_F/dt$ = 100A/µs, $V_{FR}$ = 1.1 x $V_F$max | Tj = 25°C | | | 200 | ns |
| $V_{FP}$ | Forward recovery voltage | $I_F$ = 15 A $dI_F/dt$ = 100 A/µs | Tj = 25°C | | | 6 | V |

**Fig. 1:** Conduction losses versus average current.

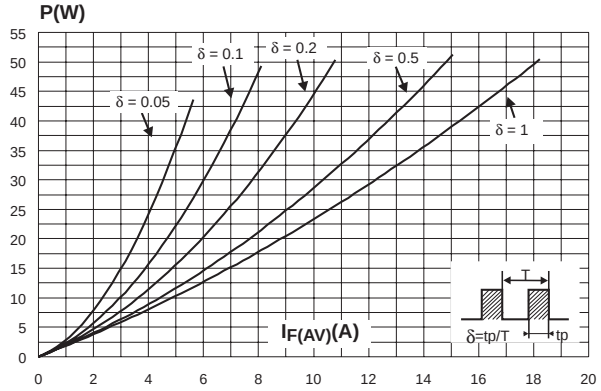



**Fig. 2:** Forward voltage drop versus forward current.

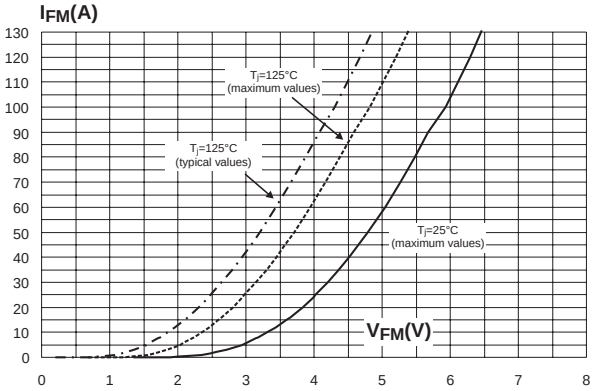



**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration.

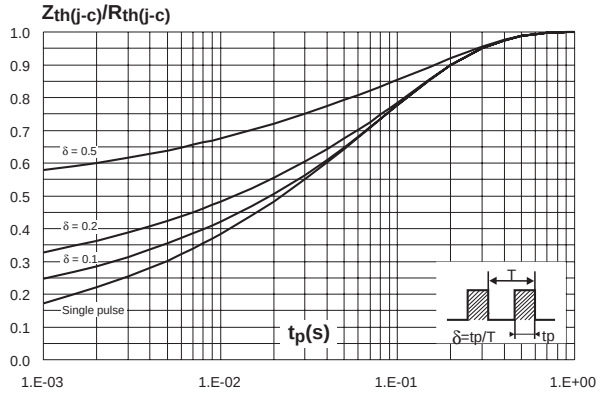



**Fig. 4:** Peak reverse recovery current versus $dI_F/dt$ (typical values).

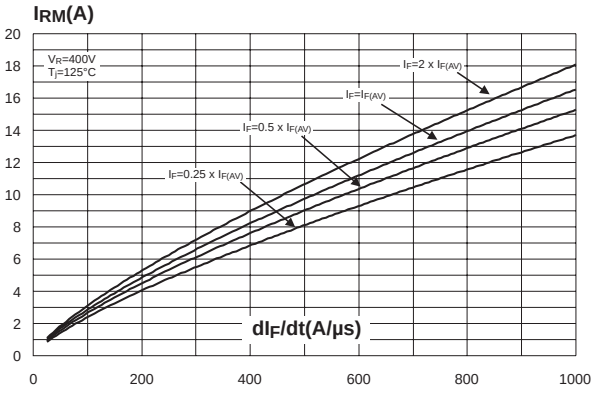



**Fig. 5:** Reverse recovery time versus $dI_F/dt$ (typical values).

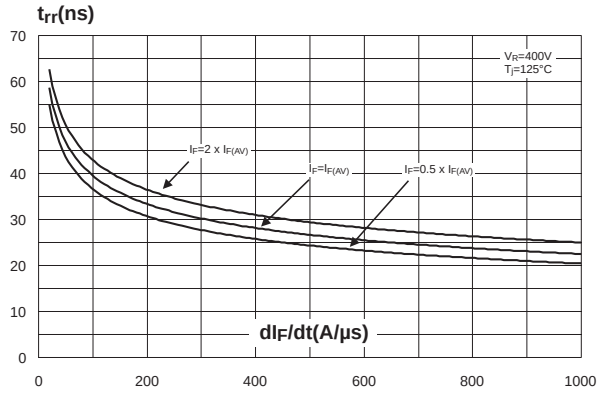



**Fig. 6:** Reverse recovery charges versus $dI_F/dt$ (typical values).

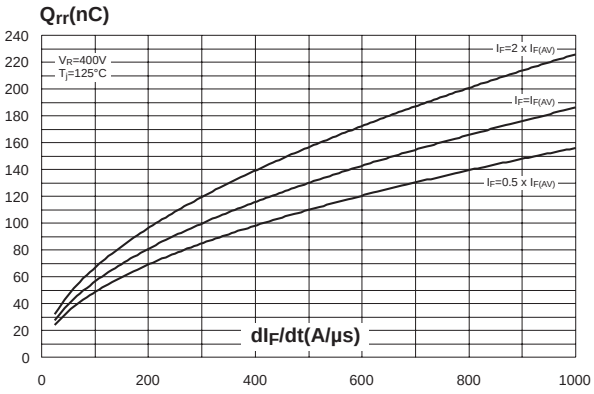


**Fig. 7:** Softness factor versus $dI_F/dt$ (typical values).

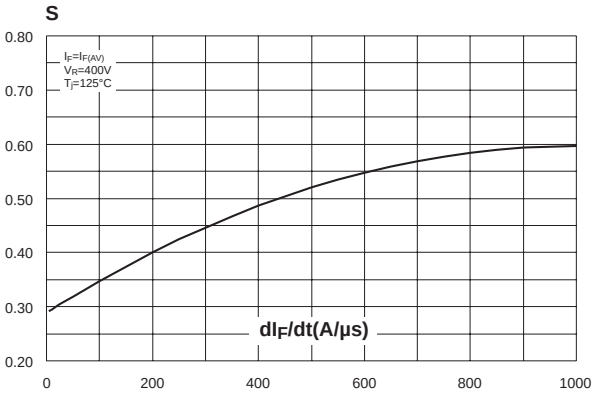



**Fig. 8:** Relative variations of dynamic parameters versus junction temperature.

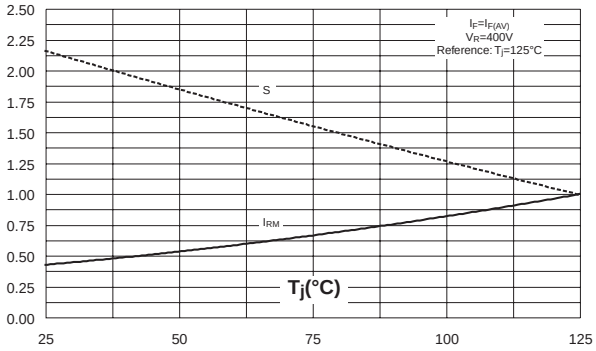



**Fig. 9:** Transient peak forward voltage versus $dI_F/dt$ (typical values).

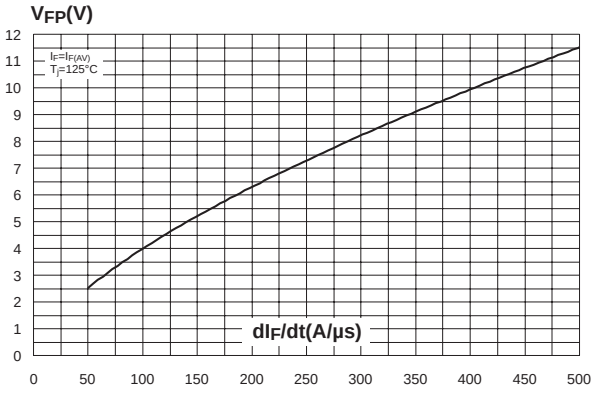



**Fig. 10:** Forward recovery time versus $dI_F/dt$ (typical values).

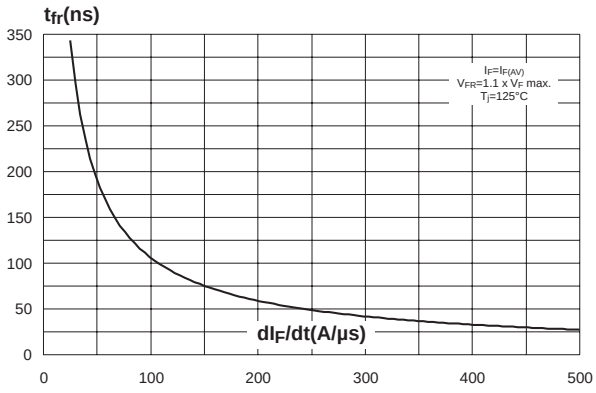
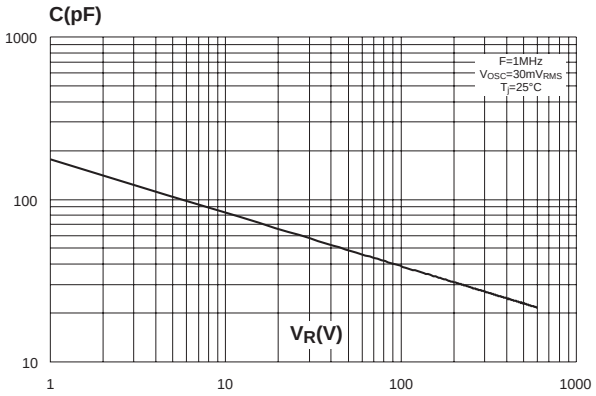
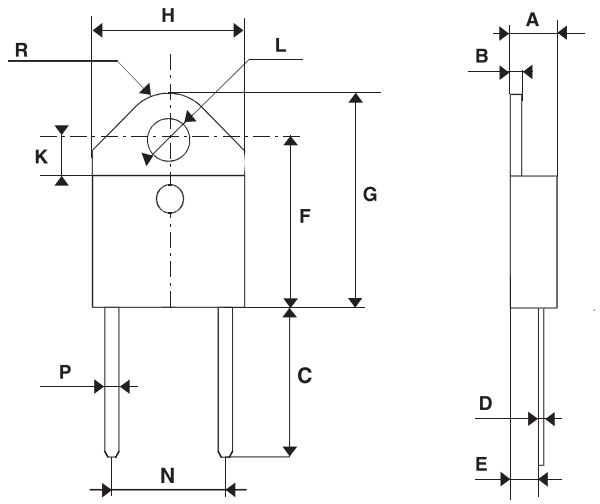



**Fig. 11:** Junction capacitance versus reverse voltage applied (typical values).



## PACKAGE MECHANICAL DATA

DOP3I




| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.4 | 4.6 | 0.173 | 0.181 |
| B | 1.45 | 1.55 | 0.057 | 0.061 |
| C | 14.35 | 15.60 | 0.565 | 0.614 |
| D | 0.5 | 0.7 | 0.020 | 0.028 |
| E | 2.7 | 2.9 | 0.106 | 0.114 |
| F | 15.8 | 16.5 | 0.622 | 0.650 |
| G | 20.4 | 21.1 | 0.815 | 0.831 |
| H | 15.1 | 15.5 | 0.594 | 0.610 |
| K | 3.4 | 3.65 | 0.134 | 0.144 |
| L | 4.08 | 4.17 | 0.161 | 0.164 |
| N | 10.8 | 11.3 | 0.425 | 0.444 |
| P | 1.20 | 1.40 | 0.047 | 0.055 |
| R | 4.60 typ. | | 0.181 typ. | |

| Ordering code | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| STTH1506DPI | STTH1506DPI | DOP3I | 4.46 g. | 30 | Tube |

- Epoxy meets UL94,V0

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