

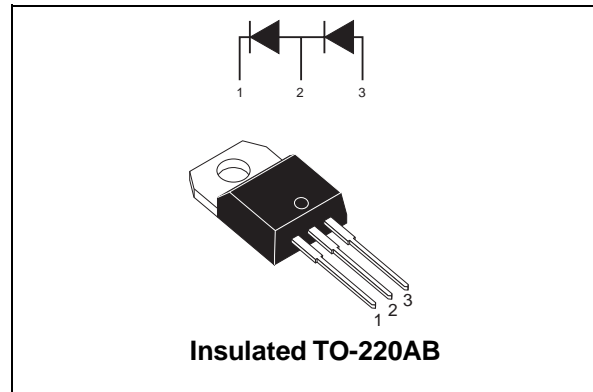


# STTH806TTI

## TURBOSWITCH™ Tandem 600V ULTRA-FAST BOOST DIODE

### MAJOR PRODUCTS CHARACTERISTICS

<b>I<sub>F(AV)</sub></b>	<b>8 A</b>
<b>V<sub>RRM</sub></b>	<b>600 V (in series)</b>
<b>T<sub>j (max)</sub></b>	<b>150 °C</b>
<b>V<sub>F (max)</sub></b>	<b>2.6 V</b>
<b>I<sub>RM (typ.)</sub></b>	<b>4 A</b>



### FEATURES AND BENEFITS

- ESPECIALLY SUITED AS BOOST DIODE IN CONTINUOUS MODE POWER FACTOR CORRECTORS AND HARD SWITCHING CONDITIONS.
- DESIGNED FOR HIGH DI/DT OPERATION.
- ULTRA-FAST RECOVERY CURRENT TO COMPETE WITH GaAs DEVICES. SIZE DIMINUTION OF MOSFET AND HEATSINKS ALLOWED.
- INTERNAL CERAMIC INSULATED PACKAGE ALLOWS FLEXIBLE HEATSINKING ON COMMON OR SEPARATE HEATSINK.
- MATCHED DIODES FOR TYPICAL PFC APPLICATION WITHOUT VOLTAGE BALANCE NETWORK.
- INSULATED VERSION: :  
Insulated voltage = 2500 V<sub>(RMS)</sub>  
Capacitance = 7 pF

### 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 for both diodes in series)

Symbol	Parameter	Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage	600	V
I <sub>F(RMS)</sub>	RMS forward current	14	A
I <sub>FSM</sub>	Surge non repetitive forward current	tp = 10 ms sinusoidal 80	A
T <sub>stg</sub>	Storage temperature range	-65 +150	°C
T <sub>j</sub>	Maximum operating junction temperature	+ 150	°C

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## STTH806TTI

### THERMAL AND POWER DATA

Symbol	Parameter	Test conditions	Value	Unit
$R_{th(j-c)}$	Junction to case thermal resistance	Per diode	5	°C/W
$R_{th(c)}$		Coupling	0.2	
$R_{th(j-c)}$	Junction to case thermal resistance	Total	2.6	
$P_1$	Conduction power dissipation for both diodes	$I_{F(AV)} = 8\text{ A}$ $\delta = 0.5$ $T_c = 80^\circ\text{C}$	27	W

### STATIC ELECTRICAL CHARACTERISTICS (for both diodes)

Symbol	Parameter	Tests Conditions	Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$V_R = V_{RRM}$	$T_j = 25^\circ\text{C}$		10	$\mu\text{A}$
			$T_j = 125^\circ\text{C}$		15	
$V_F^{**}$	Forward voltage drop	$I_F = 8\text{ A}$	$T_j = 25^\circ\text{C}$		3.6	V
			$T_j = 125^\circ\text{C}$		2.1	

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 :

$$P = 1.8 \times I_{F(AV)} + 0.1 I_F^2(\text{RMS})$$

### RECOVERY CHARACTERISTICS

Symbol	Tests Conditions	Min.	Typ.	Max.	Unit
$t_{rr}$	$I_F = 0.5\text{ A}$ $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$		13	30	ns
	$I_F = 1\text{ A}$ $di_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{ V}$				
$I_{RM}$	$V_R = 400\text{ V}$ $I_F = 8\text{ A}$ $di_F/dt = -200\text{ A}/\mu\text{s}$		4	5.5	A
$S_{factor}$			0.4		-

### TURN-ON SWITCHING CHARACTERISTICS

Symbol	Tests Conditions	Min.	Typ.	Max.	Unit
$t_{fr}$	$I_F = 8\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$ , measured at $1.1 \times V_F \text{ max}$			200	ns
$V_{FP}$	$I_F = 8\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$			7	V

Fig. 1: Conduction losses versus average current.

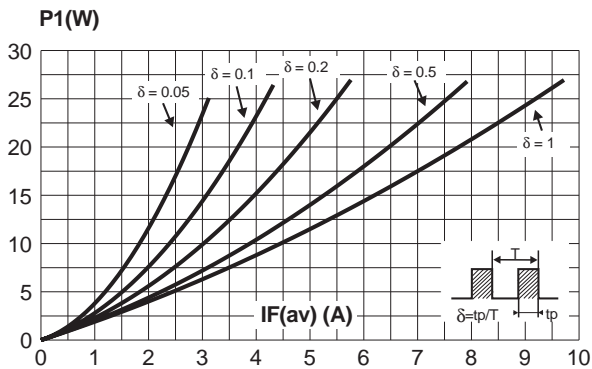


Fig. 2: Forward voltage drop versus forward current.

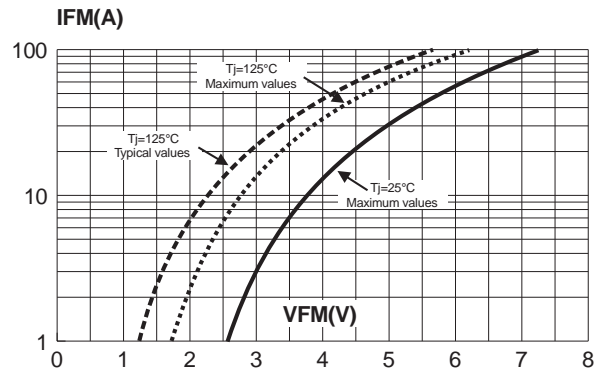


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

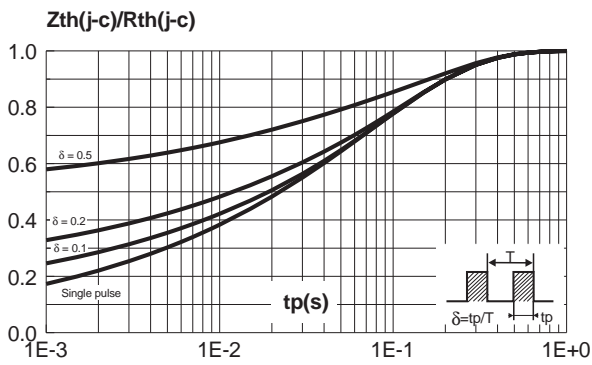


Fig. 4: Peak reverse recovery current versus  $dIF/dt$  (90% confidence).

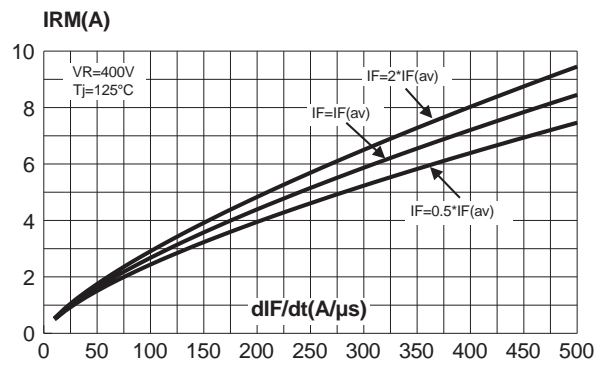


Fig. 5: Reverse recovery time versus  $dIF/dt$  (90% confidence).

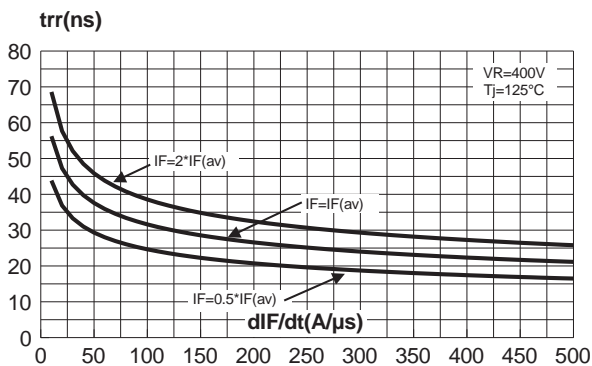
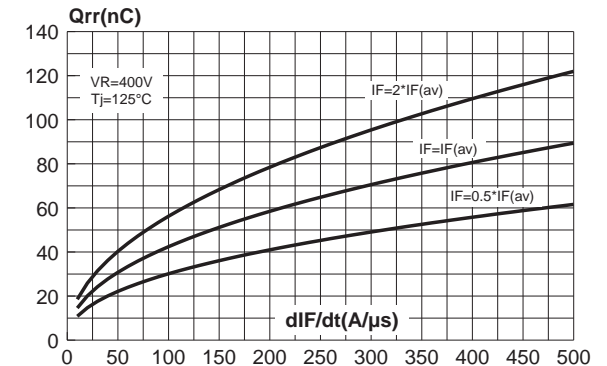
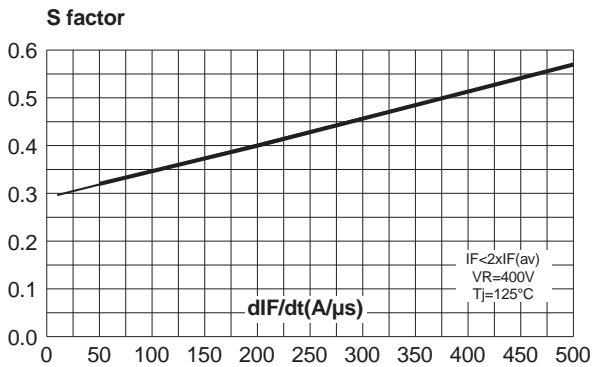


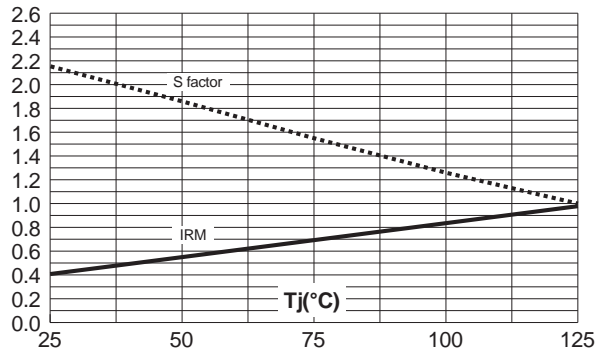
Fig. 6: Reverse charges versus  $dIF/dt$  (90% confidence).



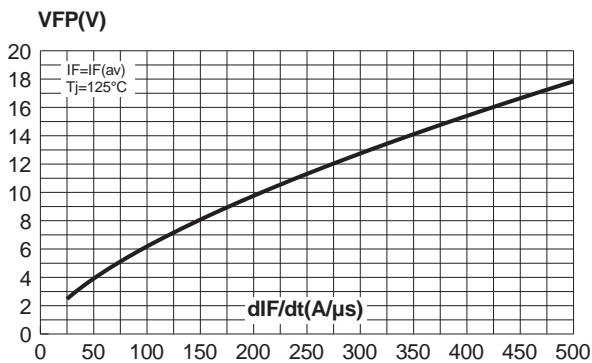
**Fig. 7:** Softness factor versus  $di_F/dt$  (typical values).



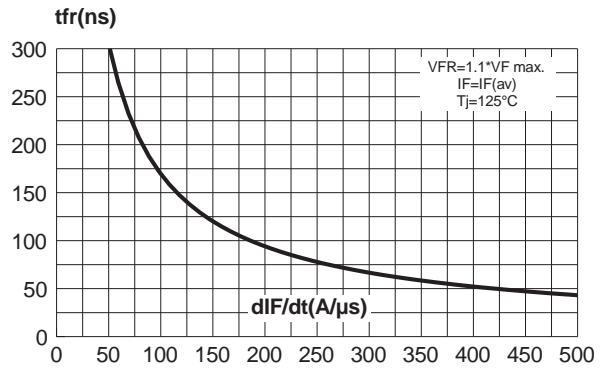
**Fig. 8:** Relative variation of dynamic parameters versus junction temperature (reference:  $T_j = 125^\circ C$ ).



**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-220AB

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.20		15.90	0.598		0.625
a1	3.50		4.20	0.137		0.165
a2	13.00		14.00	0.511		0.551
B	10.00		10.40	0.393		0.409
b1	0.61		0.88	0.024		0.034
b2	1.23		1.32	0.048		0.051
C	4.40		4.60	0.173		0.181
c1	0.49		0.70	0.019		0.027
c2	2.40		2.72	0.094		0.107
e	2.40		2.70	0.094		0.106
F	6.20		6.60	0.244		0.259
l	3.75		3.85	0.147		0.151
l4		16.40			0.646	
L	2.65		2.95	0.104		0.116
l2	1.14		1.70	0.044		0.066
l3	1.14		1.70	0.044		0.066
M		2.60			0.102	

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH806TTI	STTH806TTI	TO-220AB	2.3 g.	50	Tube

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

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