

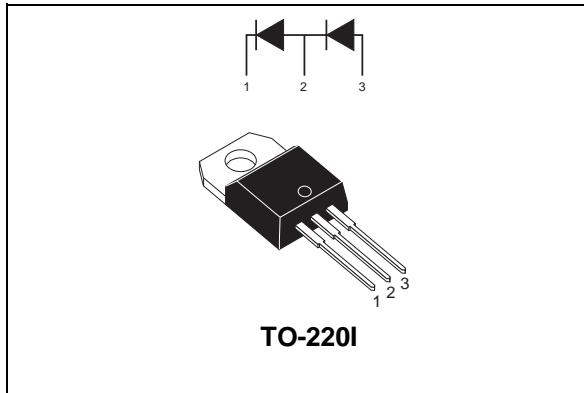
## TURBOSWITCH™ Tandem 600V ULTRAFAST BOOST DIODE

### 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>V<sub>F</sub>(max)</b>	<b>2.6 V</b>
<b>I<sub>RM</sub> (typ.)</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.
- ULTRAFAST 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.
- UL PENDING DEVICE : INSULATED VOLTAGE = 2500V(RMS).



### 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<sub>F</sub>/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 Sine wave	80	A
T <sub>stg</sub>	Storage temperature range	-65 +150	°C
T <sub>j</sub>	Maximum operating junction temperature	+ 150	°C

# STTH806TTI

## THERMAL AND POWER DATA

Symbol	Parameter	Test conditions	Value	Unit
R <sub>th</sub> (j-c)	Junction to case thermal resistance	per diode	5	°C/W
R <sub>th</sub> (c)	Coupling thermal resistance		0.2	
R <sub>th</sub> (j-c)	Total junction to case thermal resistance		2.6	
P <sub>1</sub>	Conduction power dissipation for both diode	I <sub>F(AV)</sub> = 8 A   δ = 0.5 T <sub>c</sub> = 80°C	27	W

To evaluate the maximum conduction losses use the following equation :

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

## STATIC ELECTRICAL CHARACTERISTICS (for both diodes)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> *	Reverse leakage current	V <sub>R</sub> = V <sub>RRM</sub>	T <sub>j</sub> = 25°C			10	μA
			T <sub>j</sub> = 125°C		15	100	
V <sub>F</sub> **	Forward voltage drop	I <sub>F</sub> = 8 A	T <sub>j</sub> = 25°C			3.6	V
			T <sub>j</sub> = 125°C		2.1	2.6	

Pulse test : \* tp = 5 ms, δ < 2 %

\*\* tp = 380 μs, δ < 2%

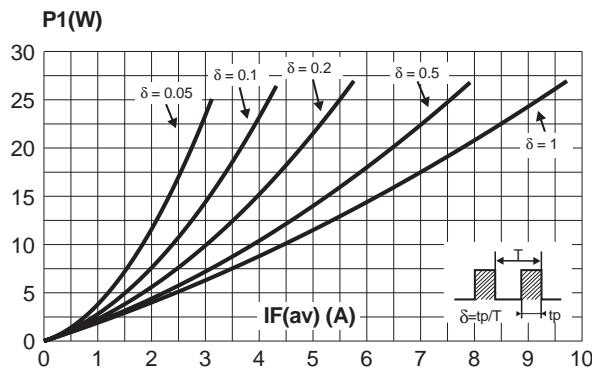
## RECOVERY CHARACTERISTICS

Symbol	Tests Conditions			Min.	Typ.	Max.	Unit
t <sub>rr</sub>	I <sub>F</sub> = 0.5 A	I <sub>rr</sub> = 0.25 A	I <sub>R</sub> = 1 A	T <sub>j</sub> = 25°C		13	ns
	I <sub>F</sub> = 1 A	dI <sub>F</sub> /dt = - 50 A/μs	V <sub>R</sub> = 30 V			30	
I <sub>RM</sub>	V <sub>R</sub> = 400 V   I <sub>F</sub> = 8 A   dI <sub>F</sub> /dt = -200 A/μs		T <sub>j</sub> = 125°C		4	5.5	A
Sfactor					0.4		-

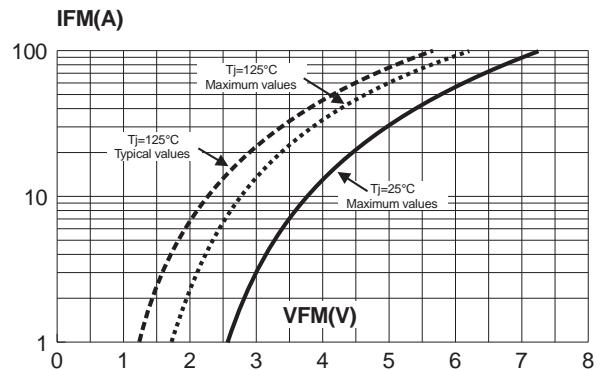
## TURN-ON SWITCHING CHARACTERISTICS

Symbol	Tests Conditions		Min.	Typ.	Max.	Unit
t <sub>f</sub>	I <sub>F</sub> = 8 A   dI <sub>F</sub> /dt = 100 A/μs, measured at 1.1 x V <sub>F</sub> max	T <sub>j</sub> = 25°C			200	ns
V <sub>FP</sub>	I <sub>F</sub> = 8 A   dI <sub>F</sub> /dt = 100 A/μs	T <sub>j</sub> = 25°C			7	V

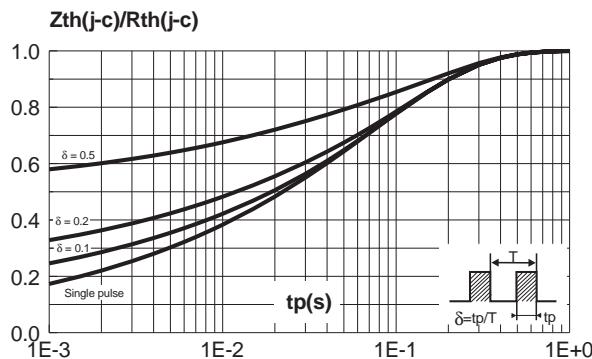
**Fig. 1:** Conduction losses versus average current.



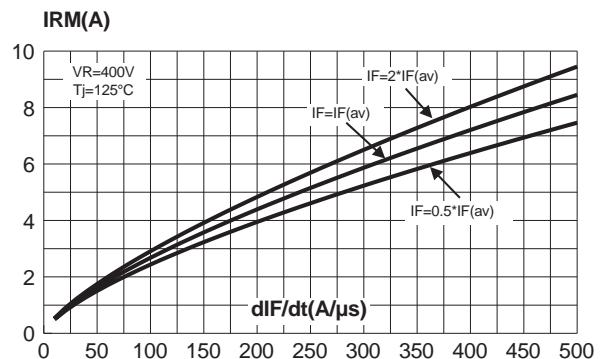
**Fig. 2:** Forward voltage drop versus forward current.



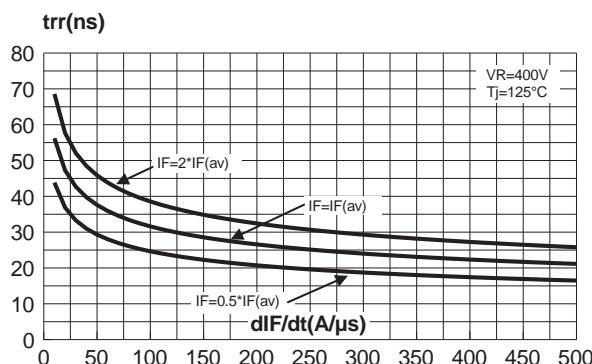
**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration.



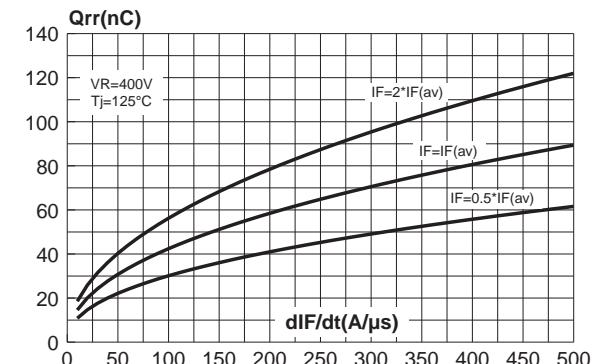
**Fig. 4:** Peak reverse recovery current versus  $dI_F/dt$  (90% confidence).



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

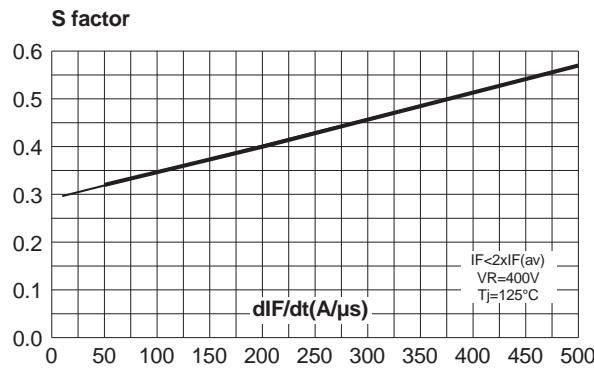


**Fig. 6:** Reverse charges versus  $dI_F/dt$  (90% confidence).

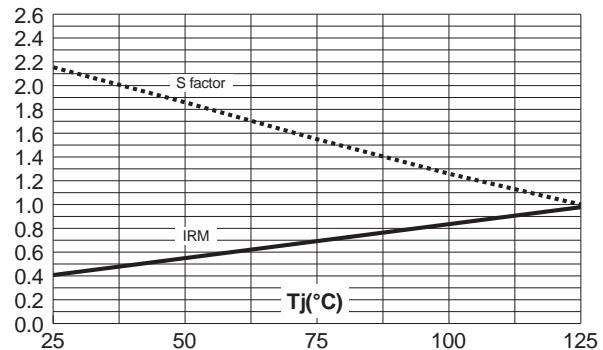


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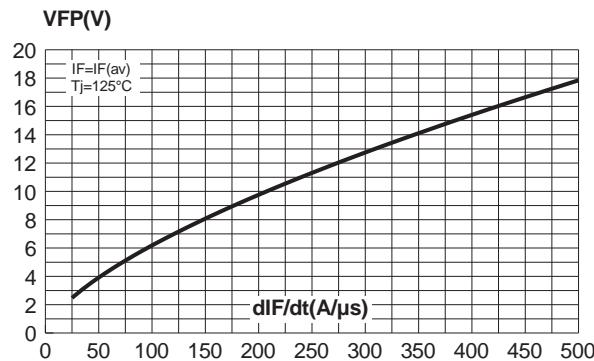
**Fig. 7:** Softness factor versus  $dI_F/dt$  (typical values).



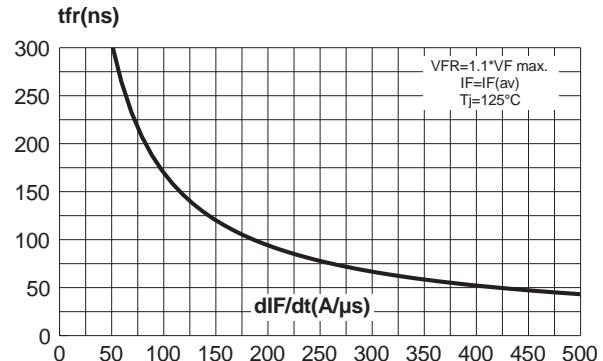
**Fig. 8:** Relative variation of dynamic parameters versus junction temperature (reference:  $T_j = 125^\circ C$ ).



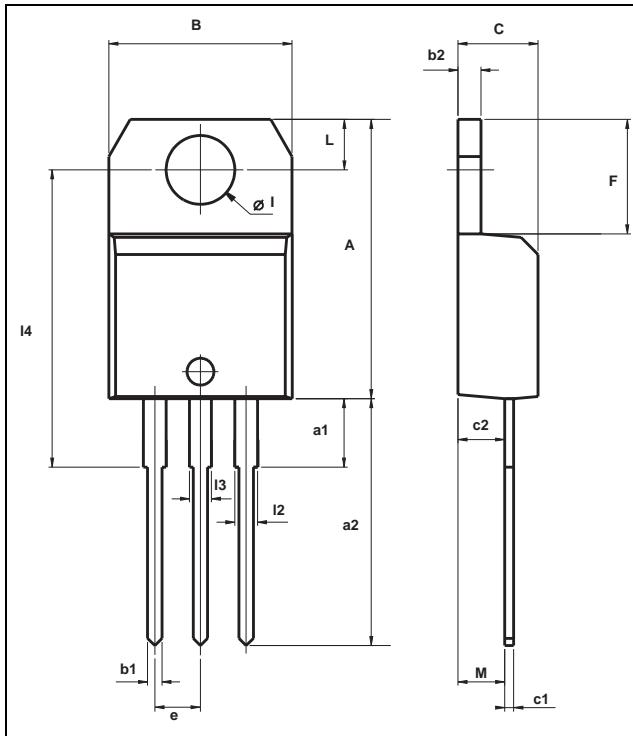
**Fig. 9:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence).



**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
I	3.75		3.85	0.147		0.151
I4		16.40			0.646	
L	2.65		2.95	0.104		0.116
I2	1.14		1.70	0.044		0.066
I3	1.14		1.70	0.044		0.066
M		2.60			0.102	

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

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

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