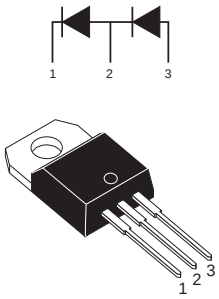
STTH806TTI

TURBOSWITCH™ Tandem 600V ULTRAFAST BOOST DIODE

MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	8 A
V_{RRM}	600 V (in series)
V_F (max)	2.6 V
I_{RM} (typ.)	4 A



TO-220I

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 = 2500$V_{(RMS)}$.

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 d_{IF}/dt.

ABSOLUTE RATINGS (limiting values for both diodes in series)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		600	V
$I_{F(RMS)}$	RMS forward current		14	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms Sine wave	80	A
T_{stg}	Storage temperature range		-65 +150	°C
Tj	Maximum operating junction temperature		+ 150	°C

TM: TURBOSWITCH is a trademark of STMicroelectroics

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 thermal resistance		0.2	
$R_{th\ (j-c)}$	Total junction to case thermal resistance		2.6	
P_1	Conduction power dissipation for both diode	$I_{F(AV)}$ = 8 A δ = 0.5 Tc = 80°C	27	W

To evaluate the maximum conduction losses use the following equation :
$P = 1.8 \times I_{F(AV)} + 0.1\ I_F{}^2{}_{(RMS)}$

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			10	µA
			Tj = 125°C		15	100	
V_F **	Forward voltage drop	I_F = 8 A	Tj = 25°C			3.6	V
			Tj = 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
trr	I_F = 0.5 A Irr = 0.25 A I_R = 1 A	Tj = 25°C		13		ns
	I_F = 1 A dI_F/dt = - 50 A/µs V_R = 30 V				30	
I_{RM}	V_R = 400 V I_F = 8 A dI_F/dt = -200 A/µs	Tj = 125°C		4	5.5	A
S_{factor}				0.4		-

TURN-ON SWITCHING CHARACTERISTICS

Symbol	Tests Conditions		Min.	Typ.	Max.	Unit
tfr	I_F = 8 A dI_F/dt = 100 A/µs, measured at 1.1 x V_F max	Tj = 25°C			200	ns
V_{FP}	I_F = 8 A dI_F/dt = 100 A/µs	Tj = 25°C			7	V

Fig. 1: Conduction losses versus average current.

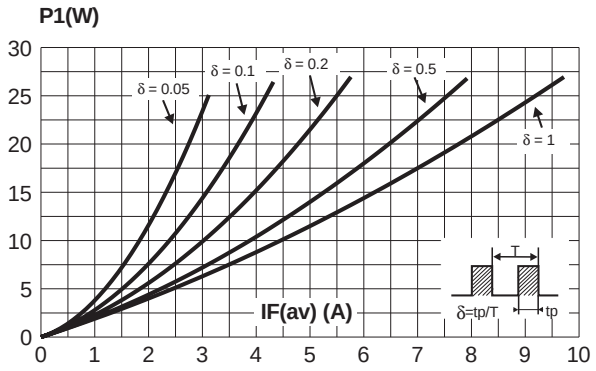


Fig. 2: Forward voltage drop versus forward current.

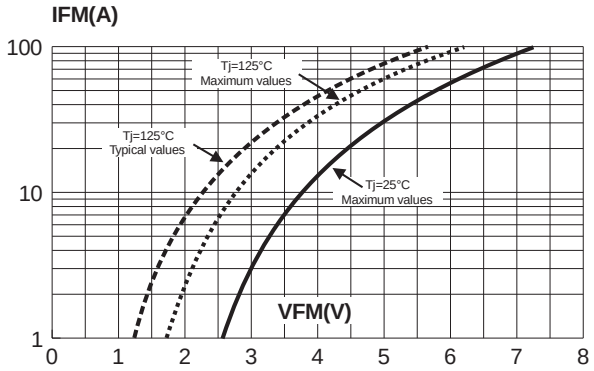


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

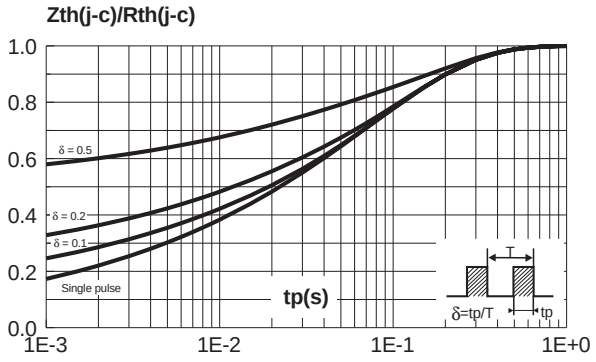


Fig. 4: Peak reverse recovery current versus d_{IF}/dt (90% confidence).

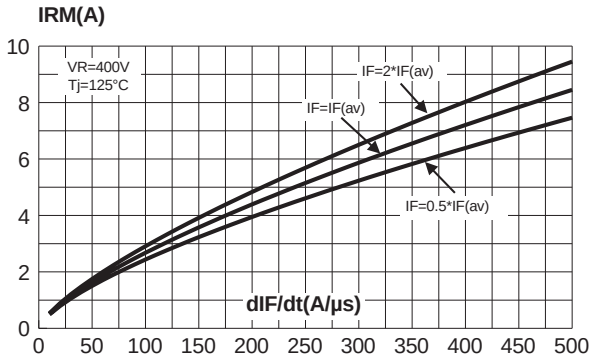


Fig. 5: Reverse recovery time versus d_{IF}/dt (90% confidence).

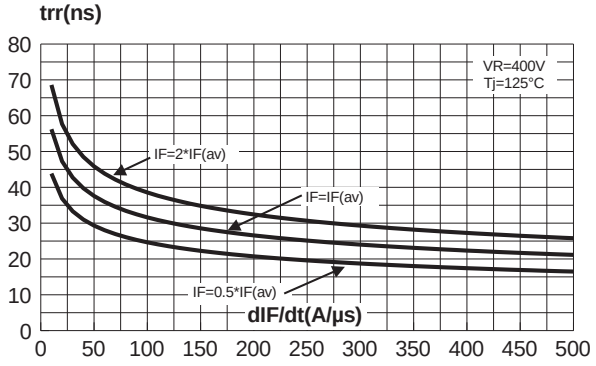


Fig. 6: Reverse charges versus dIF/dt (90% confidence).

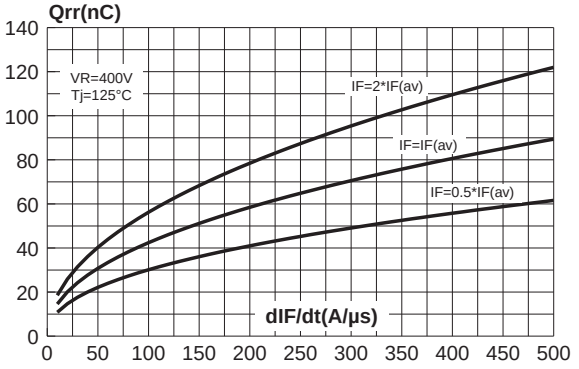


Fig. 7: Softness factor versus d_{IF}/dt (typical values).

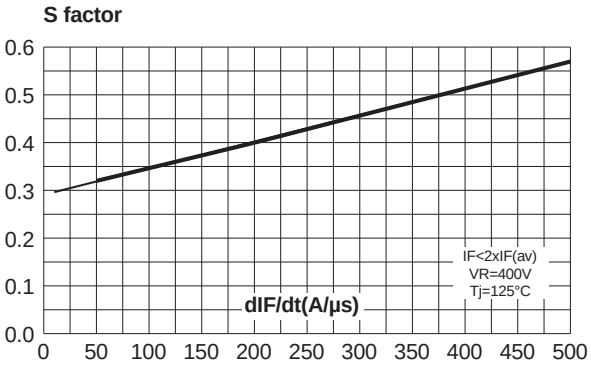


Fig. 8: Relative variation of dynamic parameters versus junction temperature (reference: Tj = 125°C).

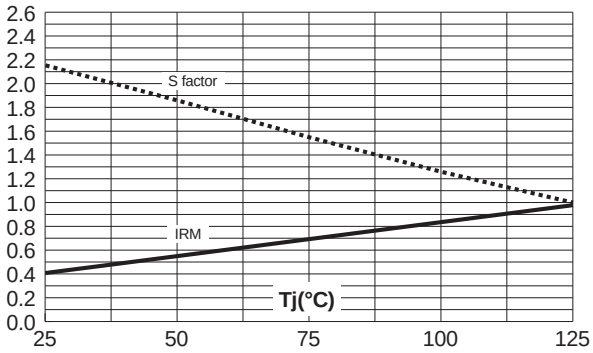


Fig. 9: Transient peak forward voltage versus d_{IF}/dt (90% confidence).

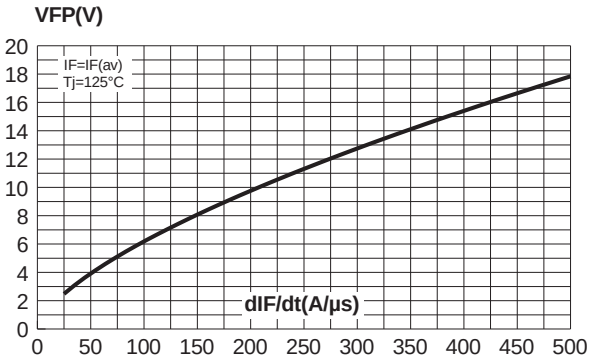
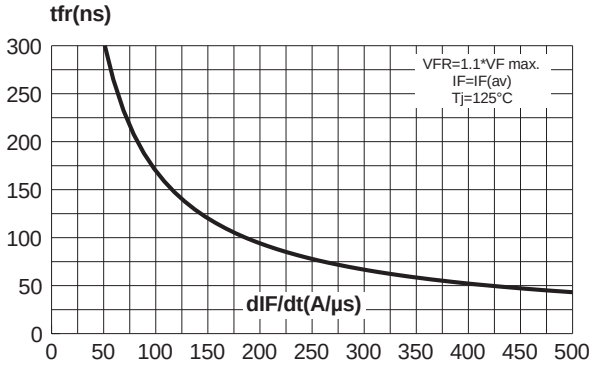
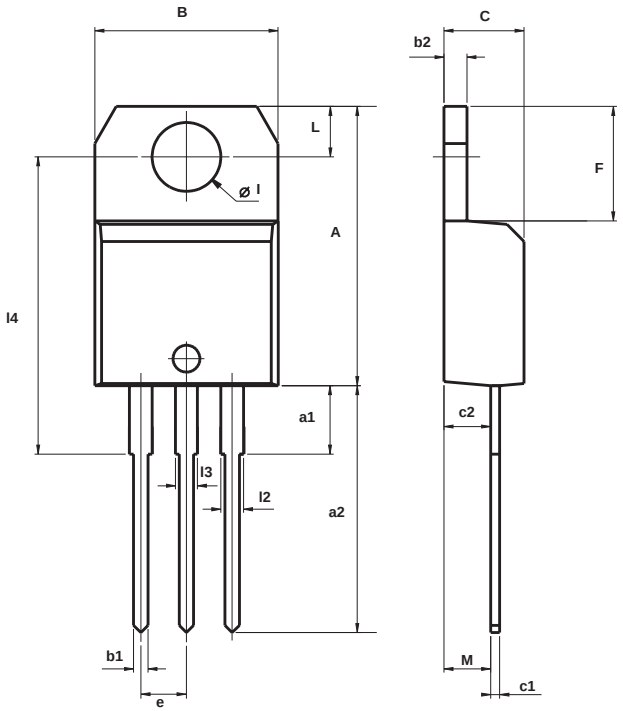


Fig. 10: Forward recovery time versus d_{IF}/dt (90% confidence).



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
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	

- 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