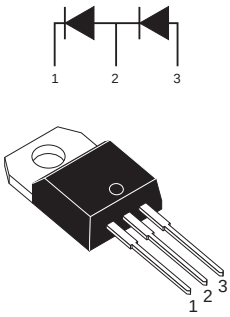
STTH806TTI

TURBOSWITCH™ Tandem 600V ULTRA-FAST BOOST DIODE

MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	8 A
V_{RRM}	600 V (in series)
Tj (max)	150 °C
V_F (max)	2.6 V
I_{RM} (typ.)	4 A



Insulated TO-220AB

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 $V_{(RMS)}$
  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_{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 sinusoidal	80	A
T_{stg}	Storage temperature range		-65 +150	°C
Tj	Maximum operating junction temperature		+ 150	°C

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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 A δ = 0.5 Tc = 80°C	27	W

STATIC ELECTRICAL CHARACTERISTICS (for both diodes)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage current	$V_R = V_{RRM}$	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%

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

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.

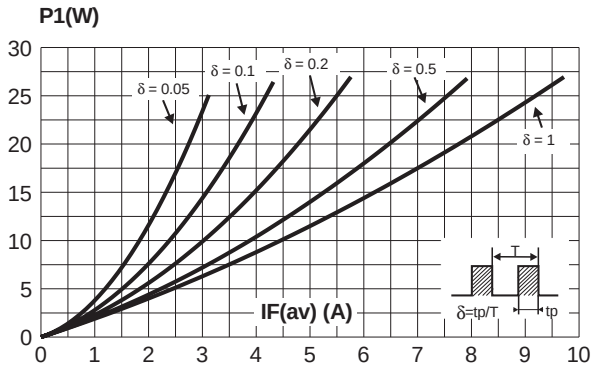


Fig. 2: Forward voltage drop versus forward current.

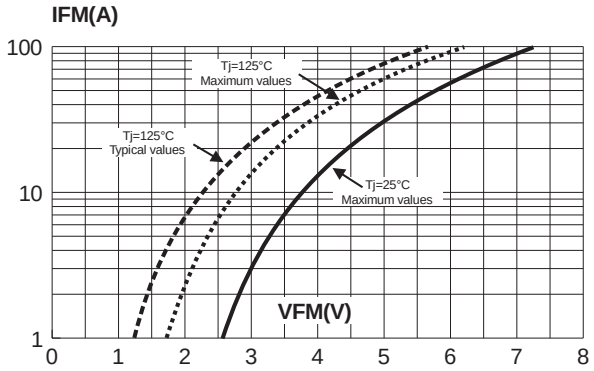


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

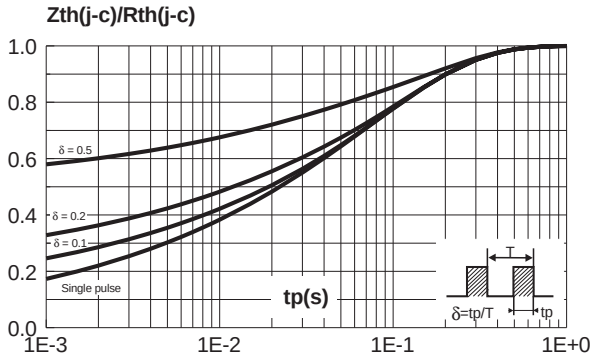


Fig. 4: Peak reverse recovery current versus dI_F/dt (90% confidence).

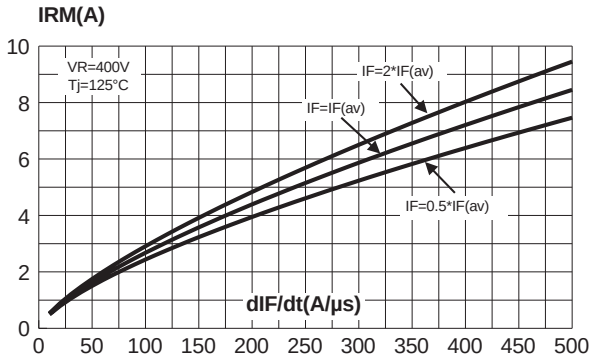


Fig. 5: Reverse recovery time versus dI_F/dt (90% confidence).

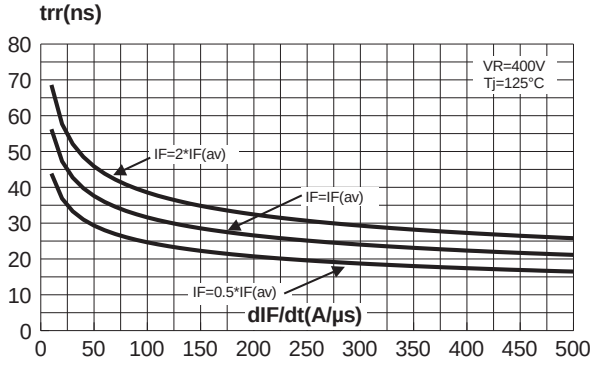


Fig. 6: Reverse charges versus dI_F/dt (90% confidence).

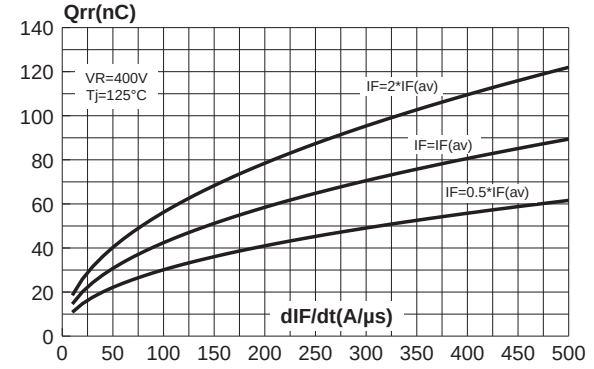


Fig. 7: Softness factor versus dI_F/dt (typical values).

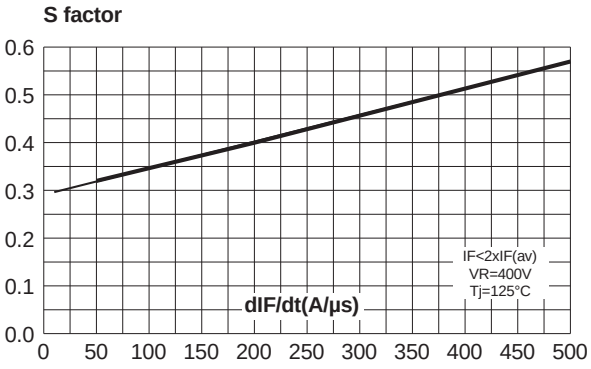


Fig. 8: Relative variation of dynamic parameters versus junction temperature (reference: Tj = 125°C).

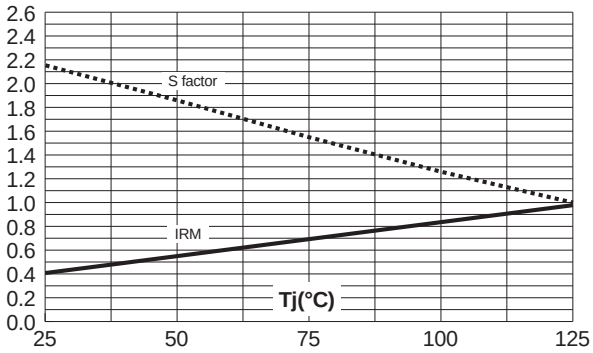


Fig. 9: Transient peak forward voltage versus dI_F/dt (90% confidence).

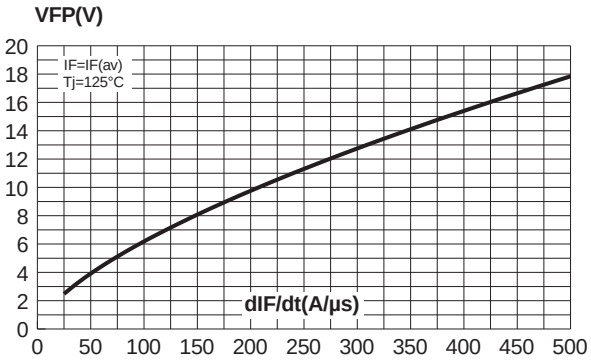
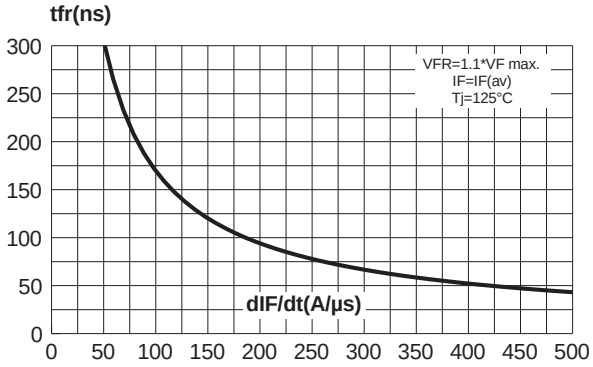
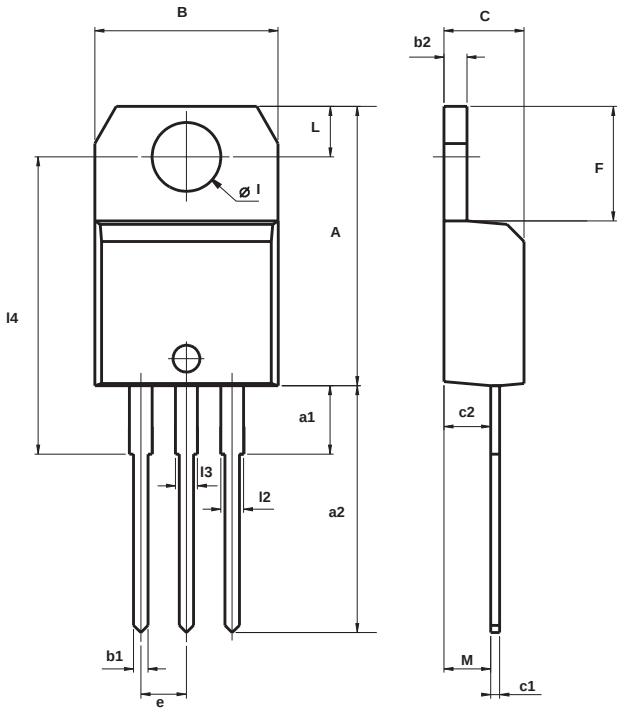


Fig. 10: Forward recovery time versus dI_F/dt (90% confidence).



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
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