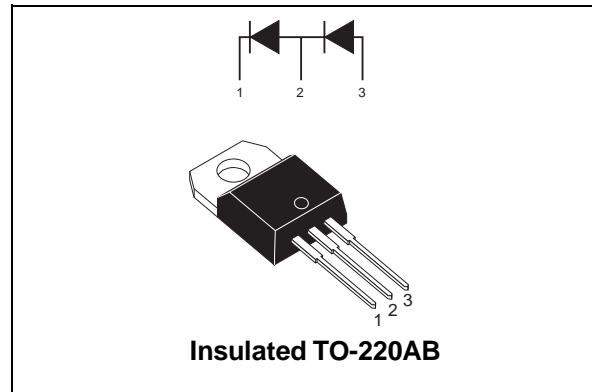




TURBOSWITCH™ Tandem 600V ULTRA-FAST BOOST DIODE

MAJOR PRODUCTS CHARACTERISTICS

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



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
T _j	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	$I_{F(AV)} = 8\text{ A}$ $\delta = 0.5$ $T_c = 80^\circ\text{C}$	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	μA
			$T_j = 125^\circ\text{C}$		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 :

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

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
	$I_F = 1\text{ A}$ $dl_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{ V}$				
I_{RM}	$V_R = 400\text{ V}$ $I_F = 8\text{ A}$ $dl_F/dt = -200\text{ A}/\mu\text{s}$		4	5.5	A
S_{factor}			0.4	-	

TURN-ON SWITCHING CHARACTERISTICS

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

Fig. 1: Conduction losses versus average current.

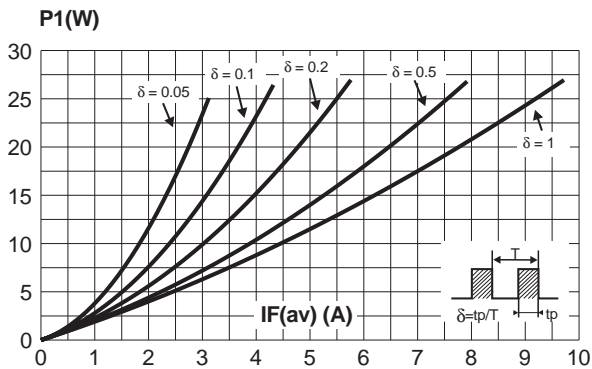


Fig. 2: Forward voltage drop versus forward current.

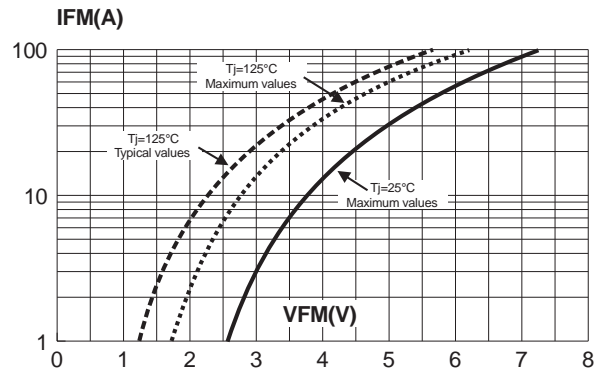


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

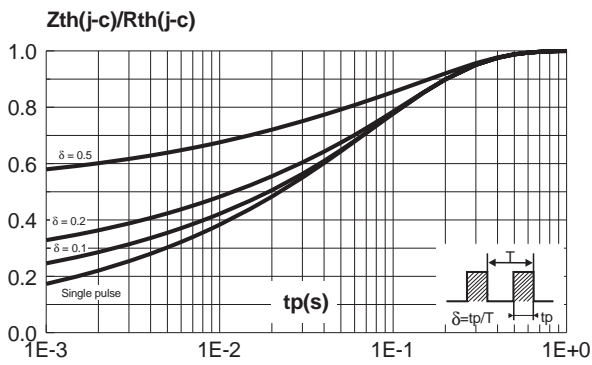


Fig. 4: Peak reverse recovery current versus dIF/dt (90% confidence).

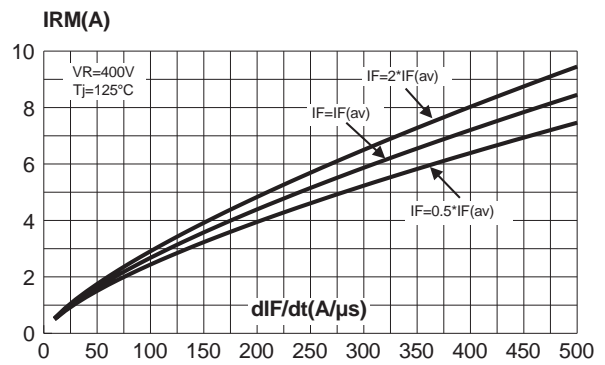


Fig. 5: Reverse recovery time versus dIF/dt (90% confidence).

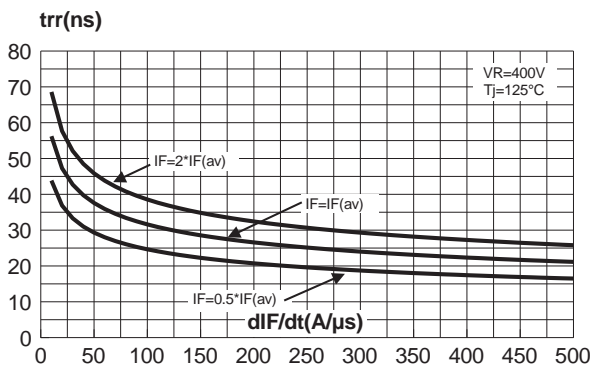
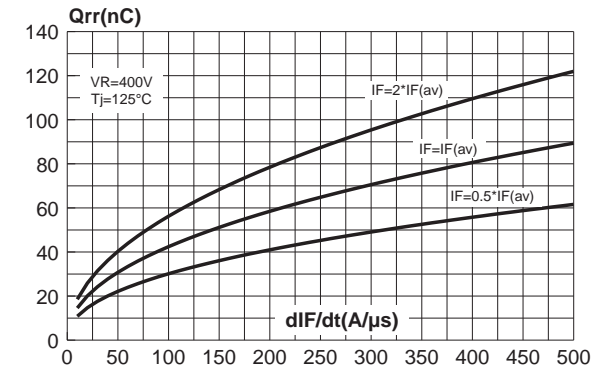


Fig. 6: Reverse charges versus dIF/dt (90% confidence).



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

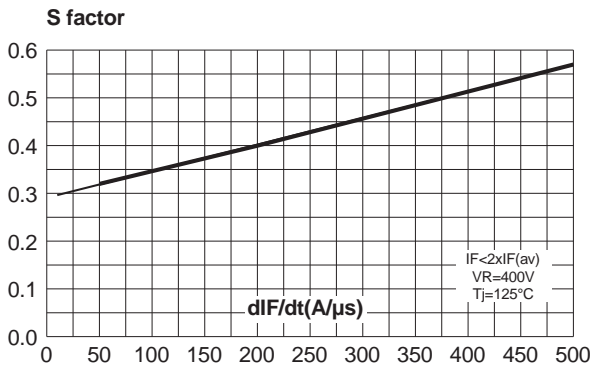


Fig. 8: Relative variation of dynamic parameters versus junction temperature (reference: $T_j = 125^\circ C$).

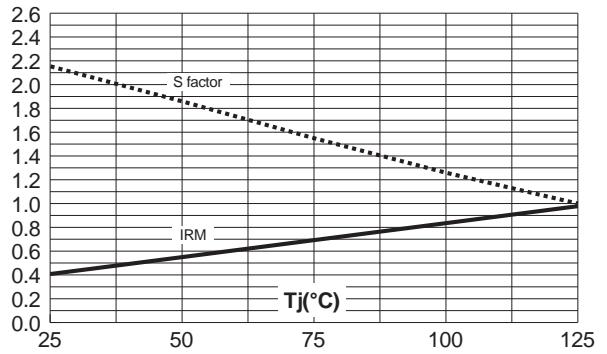


Fig. 9: Transient peak forward voltage versus di_F/dt (90% confidence).

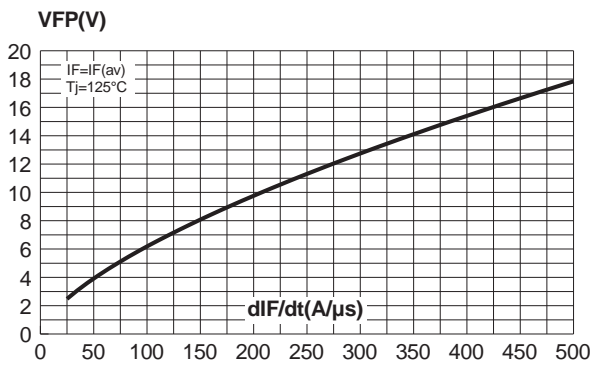
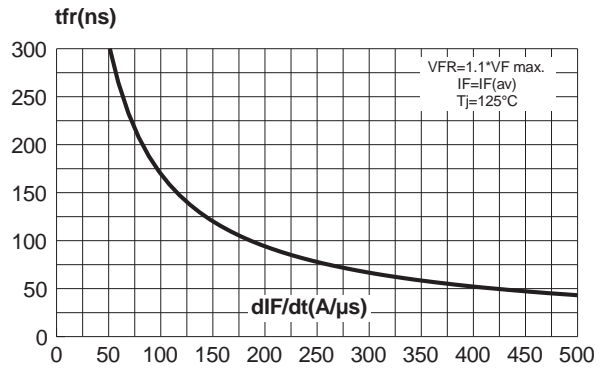


Fig. 10: Forward recovery time versus di_F/dt (90% confidence).



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
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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