



TURBOSWITCH™ Tandem 600V ULTRAFAST BOOST DIODE

MAJOR PRODUCTS CHARACTERISTICS

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

FEATURES AND BENEFITS

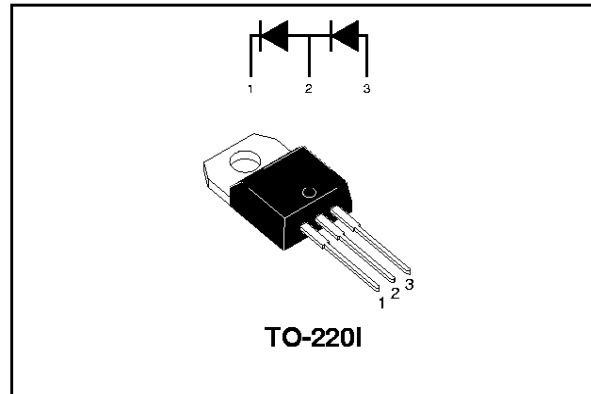
- ESPECIALLY SUITED AS BOOST DIODE IN CONTINUOUS MODE POWER FACTOR CORRECTORS AND HARD SWITCHING CONDITIONS.
- DESIGNED FOR HIGH dI/dt OPERATION.
- ULTRAFAST RECOVERY CURRENT TO COMPETE WITH GaAs DEVICES. SIZE DIMINUTION OF MOSFET AND HEATSINKS ALLOWED.
- INTERNAL CERAMIC INSULATED PACKAGE ALLOWS FLEXIBLE 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_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	80	A
	$t_p = 10 \text{ ms}$ Sine wave		
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 thermal resistance		0.2	
$R_{th(j-c)}$	Total junction to case thermal resistance		2.6	
P_1	Conduction power dissipation for both diode	$I_{F(AV)} = 8\text{ A}$ $\delta = 0.5$ $T_c = 80^\circ\text{C}$	27	W

To evaluate the maximum conduction losses use the following equation :

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

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 : * $t_p = 5\text{ ms}$, $\delta < 2\%$

** $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

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.

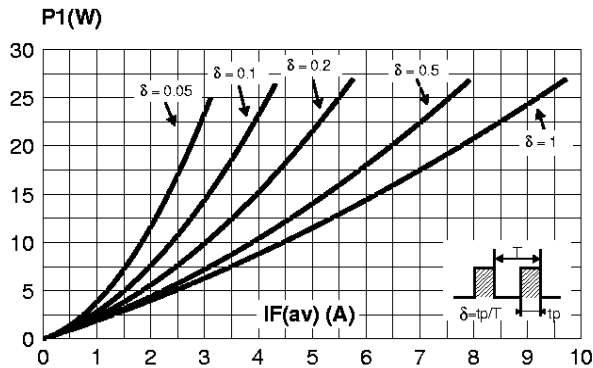


Fig. 2: Forward voltage drop versus forward current.

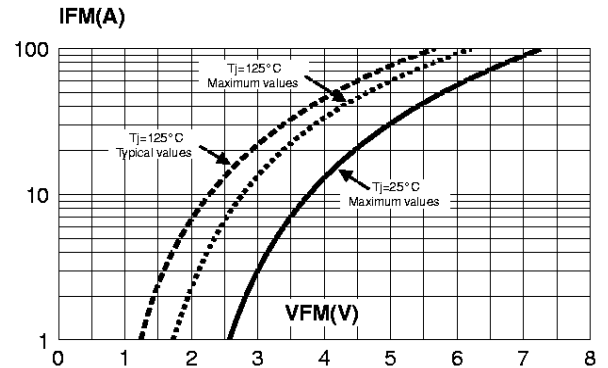


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

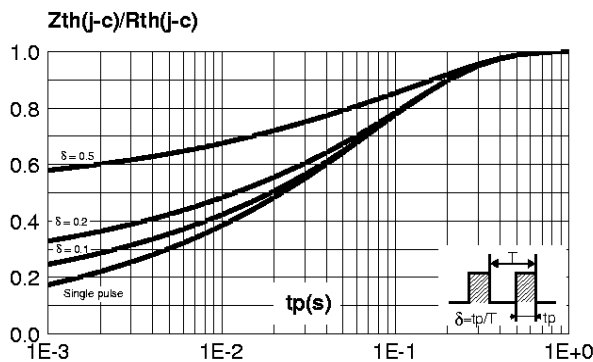


Fig. 4: Peak reverse recovery current versus diF/dt (90% confidence).

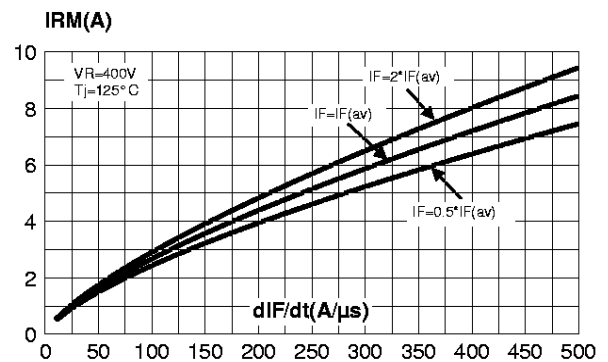


Fig. 5: Reverse recovery time versus diF/dt (90% confidence).

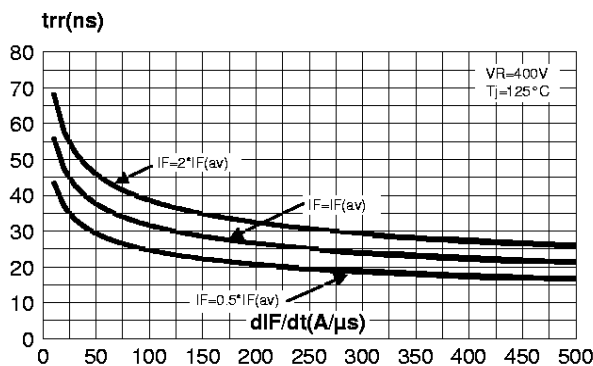


Fig. 6: Reverse charges versus diF/dt (90% confidence).

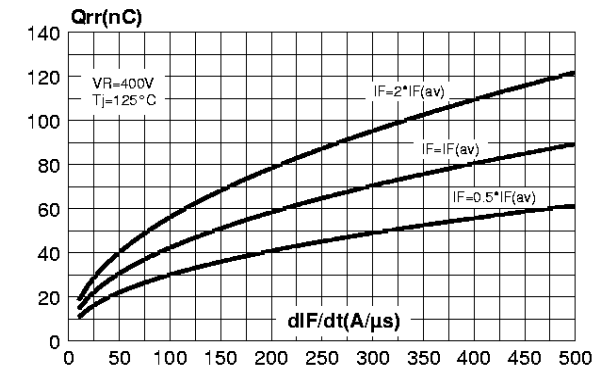


Fig. 7: Softness factor versus dI_F/dt (typical values).

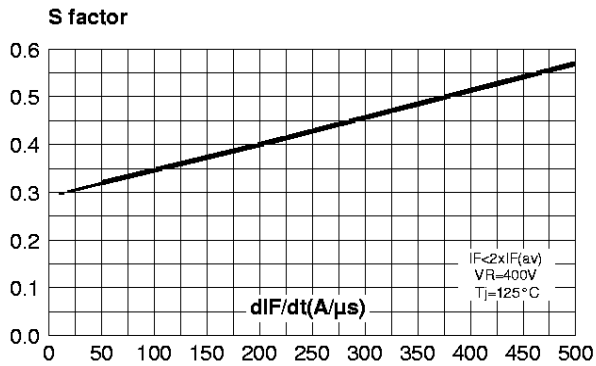


Fig. 8: Relative variation of dynamic parameters versus junction temperature (reference: $T_J = 125^\circ C$).

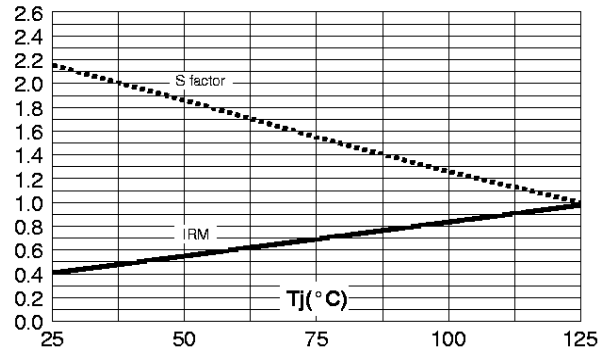


Fig. 9: Transient peak forward voltage versus dI_F/dt (90% confidence).

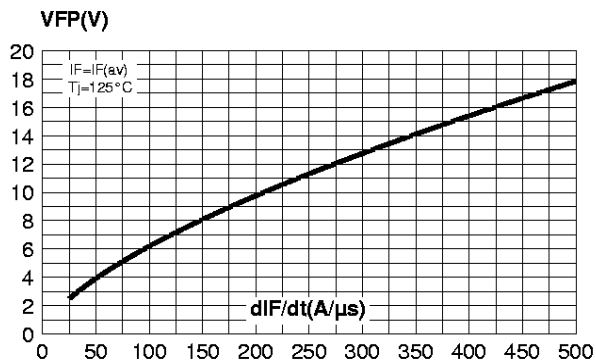
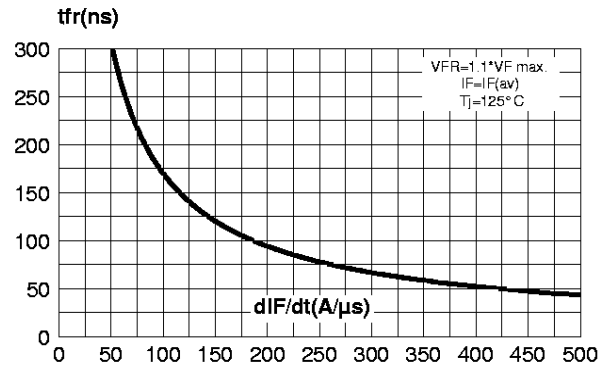
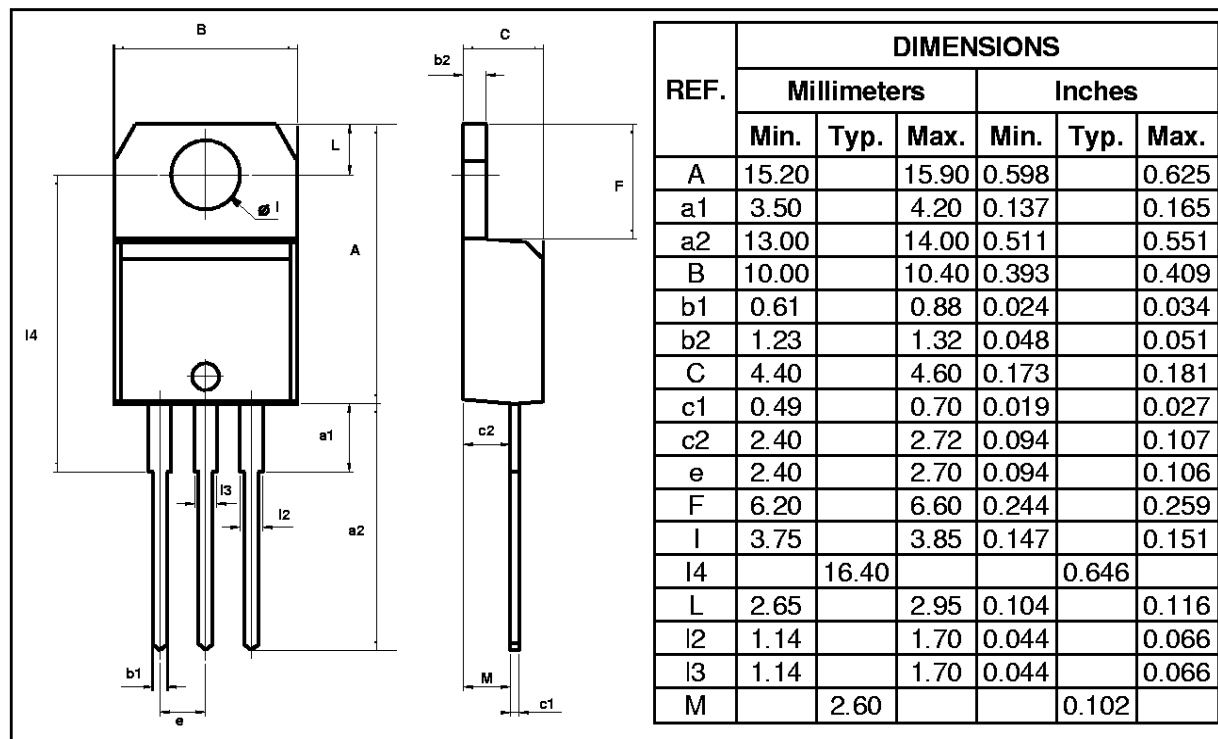


Fig. 10: Forward recovery time versus dI_F/dt (90% confidence).



PACKAGE MECHANICAL DATA
 TO-220AB


- 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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