

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: [info@chipsmall.com](mailto:info@chipsmall.com) Web: [www.chipsmall.com](http://www.chipsmall.com)

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

## Tandem 600V HYPERFAST BOOST DIODE

### MAJOR PRODUCTS CHARACTERISTICS

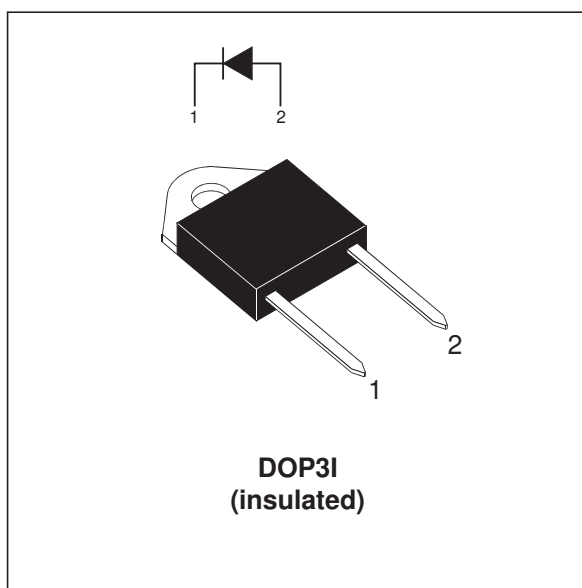
$I_{F(AV)}$	15 A
$V_{RRM}$	600 V
$T_j$ (max)	150 °C
$V_F$ (max)	2.4 V
$I_{RM}$ (typ.)	4.8 A
$t_{rr}$ (typ.)	16 ns

### FEATURES AND BENEFITS

- ESPECIALLY SUITED AS BOOST DIODE IN CONTINUOUS MODE POWER FACTOR CORRECTORS AND HARD SWITCHING CONDITIONS
- DESIGNED FOR HIGH DI/DT OPERATION. HYPERFAST RECOVERY CURRENT TO COMPETE WITH SIC DEVICES. ALLOWS DOWNSIZING OF MOSFET AND HEATSINKS
- INTERNAL CERAMIC INSULATED DEVICES WITH EQUAL THERMAL CONDITIONS FOR BOTH 300V DIODES
- INSULATION (2500V<sub>RMS</sub>) ALLOWS PLACEMENT ON SAME HEATSINK AS MOSFET AND FLEXIBLE HEATSINKING ON COMMON OR SEPARATE HEATSINK
- STATIC AND DYNAMIC EQUILIBRIUM OF INTERNAL DIODES ARE WARRANTED BY DESIGN
- PACKAGE CAPACITANCE: C=16pF

### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		600	V
$I_{F(RMS)}$	RMS forward current		26	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10$ ms sinusoidal	130	A
$I_{peak}$	Peak current waveform	$\delta = 0.15$ $T_c = 120^\circ\text{C}$	35	A
$T_{stg}$	Storage temperature range		-65 +150	°C
$T_j$	Maximum operating junction temperature		+ 150	°C



### 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  $di_F/dt$ .

**THERMAL AND POWER DATA**

Symbol	Parameter	Test conditions	Value	Unit
$R_{th(j-c)}$	Junction to case		1.6	°C/W

**STATIC ELECTRICAL CHARACTERISTICS** (for both diodes)

Symbol	Parameter	Tests Conditions	Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$V_R = V_{RRM}$	$T_j = 25^\circ\text{C}$		20	$\mu\text{A}$
			$T_j = 125^\circ\text{C}$		30	
$V_F^{**}$	Forward voltage drop	$I_F = 15\text{ A}$	$T_j = 25^\circ\text{C}$		3.6	V
			$T_j = 150^\circ\text{C}$		1.95	

Pulse test: \*  $t_p = 100\text{ms}$ ,  $\delta < 2\%$

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

To evaluate the maximum conduction losses use the following equation:

$$P = 1.7 \times I_{F(AV)} + 0.047 \times I_{F(RMS)}^2$$

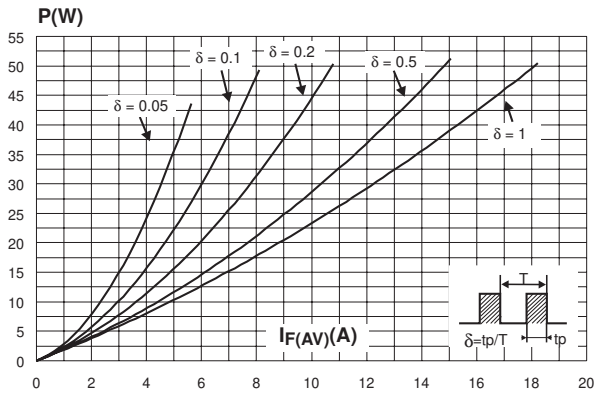
**RECOVERY CHARACTERISTICS**

Symbol	Parameter	Tests Conditions	Min.	Typ.	Max.	Unit	
$t_{rr}$	Reverse recovery time	$I_F = 0.5\text{ A}$ $I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$	$T_j = 25^\circ\text{C}$		16	ns	
		$I_F = 1\text{ A}$ $dI_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{ V}$					35
$I_{RM}$	Reverse recovery current	$V_R = 400\text{ V}$ $I_F = 15\text{ A}$ $dI_F/dt = -200\text{ A}/\mu\text{s}$	$T_j = 125^\circ\text{C}$		4.8	6.0	A
S	Reverse recovery softness factor				0.4		-
$Q_{rr}$	Reverse recovery charges				80		nC

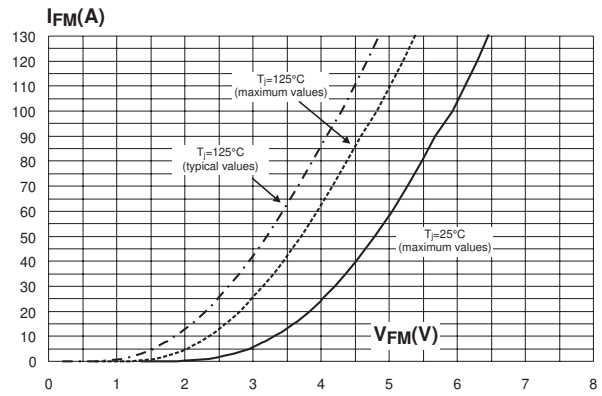
**TURN-ON SWITCHING CHARACTERISTICS**

Symbol	Parameter	Tests Conditions	Min.	Typ.	Max.	Unit
$t_{fr}$	Forward recovery time	$I_F = 15\text{ A}$ $dI_F/dt = 100\text{ A}/\mu\text{s}$ , $V_{FR} = 1.1 \times V_{Fmax}$			200	ns
$V_{FP}$	Forward recovery voltage	$I_F = 15\text{ A}$ $dI_F/dt = 100\text{ A}/\mu\text{s}$			6	V

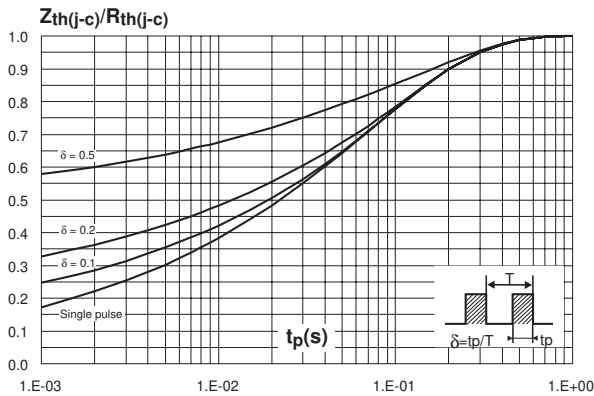
**Fig. 1:** Conduction losses versus average current.



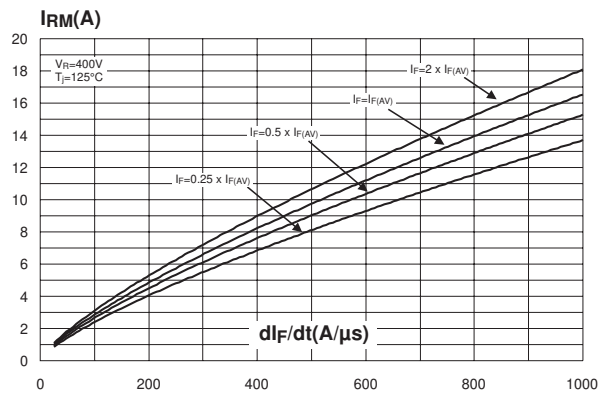
**Fig. 2:** Forward voltage drop versus forward current.



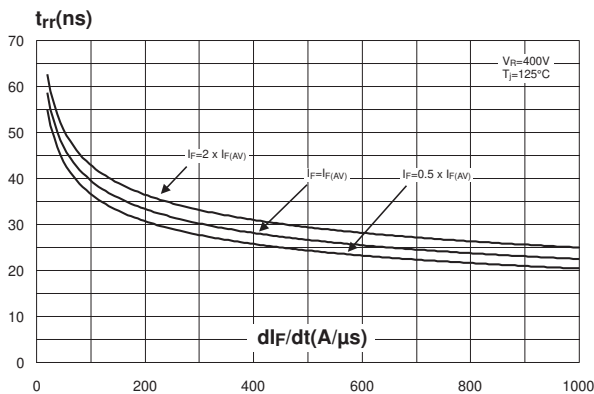
**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration.



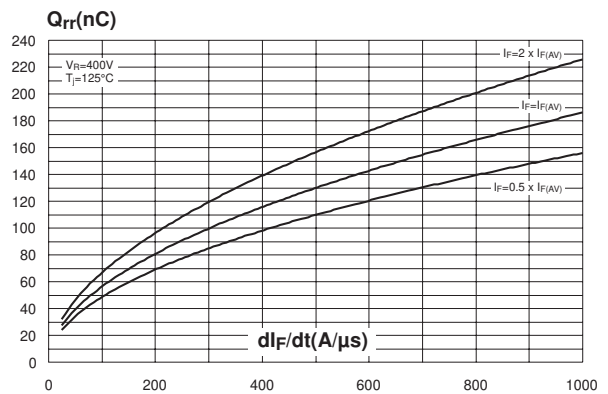
**Fig. 4:** Peak reverse recovery current versus  $di_F/dt$  (typical values).



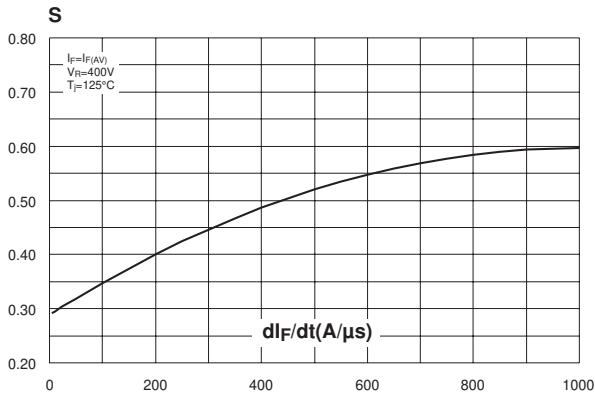
**Fig. 5:** Reverse recovery time versus  $di_F/dt$  (typical values).



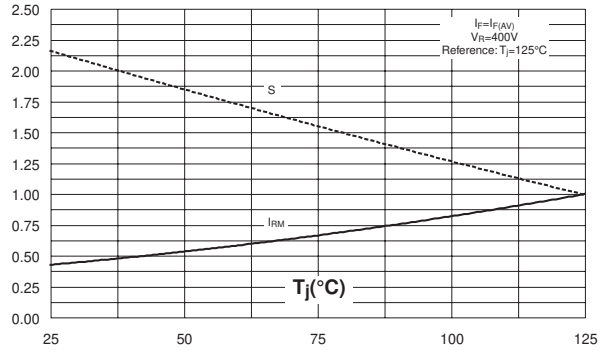
**Fig. 6:** Reverse recovery charges versus  $di_F/dt$  (typical values).



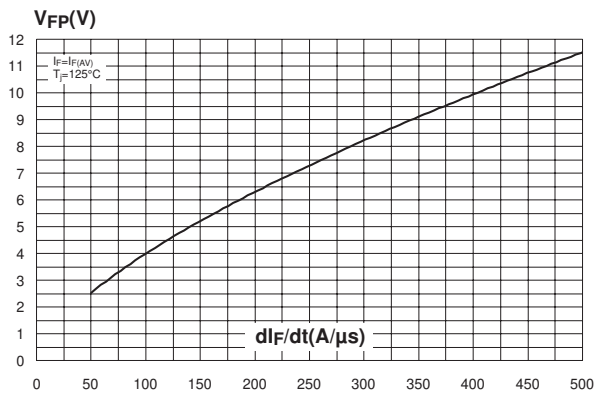
**Fig. 7:** Softness factor versus  $di_F/dt$  (typical values).



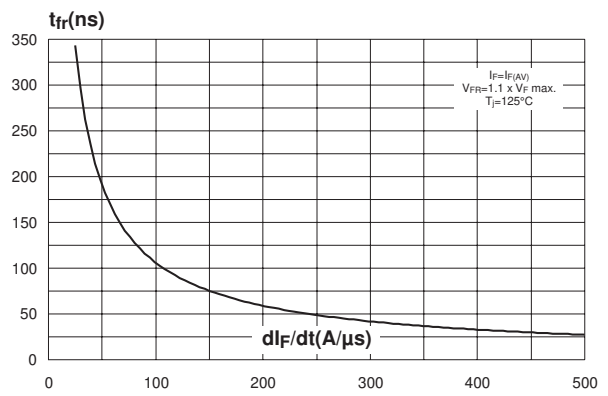
**Fig. 8:** Relative variations of dynamic parameters versus junction temperature.



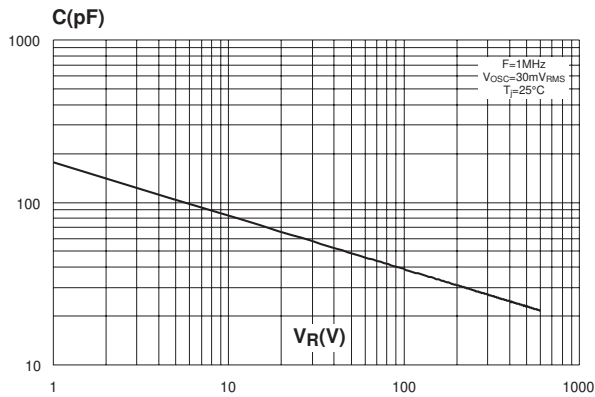
**Fig. 9:** Transient peak forward voltage versus  $di_F/dt$  (typical values).



**Fig. 10:** Forward recovery time versus  $di_F/dt$  (typical values).



**Fig. 11:** Junction capacitance versus reverse voltage applied (typical values).



**PACKAGE MECHANICAL DATA**  
 DOP3I

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.6	0.173	0.181
B	1.45	1.55	0.057	0.061
C	14.35	15.60	0.565	0.614
D	0.5	0.7	0.020	0.028
E	2.7	2.9	0.106	0.114
F	15.8	16.5	0.622	0.650
G	20.4	21.1	0.815	0.831
H	15.1	15.5	0.594	0.610
K	3.4	3.65	0.134	0.144
L	4.08	4.17	0.161	0.164
N	10.8	11.3	0.425	0.444
P	1.20	1.40	0.047	0.055
R	4.60 typ.		0.181 typ.	

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH1506DPI	STTH1506DPI	DOP3I	4.46 g.	30	Tube

- Epoxy meets UL94,V0

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics.

All other names are the property of their respective owners.

© 2003 STMicroelectronics - All rights reserved.

STMicroelectronics GROUP OF COMPANIES

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany -  
 Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain -  
 Sweden - Switzerland - United Kingdom - United States

[www.st.com](http://www.st.com)

