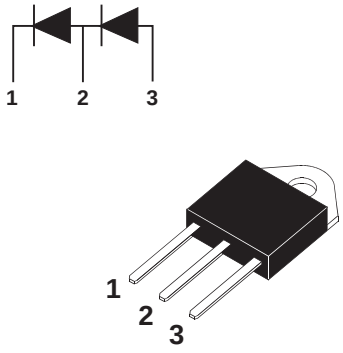
STTH1506TPI

Tandem 600V Hyperfast Rectifer

MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	15 A
V_{RRM}	600 V (in series)
Tj (max)	150 °C
V_F (max)	2.6 V
I_{RM} (typ.)	4.8 A



TOP3I
(insulated)

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 GaAs devices. Allows downsizing of mosfet and heatsinks.
- Internal ceramic insulated devices with equal thermal conditions for both 300V diodes.
- Insulation (2500V RMS) allows placement on same heatsink as mosfet and flexible heatsinking on common or separate heatsink.
- Matched diodes for typical PFC application without need for voltage balance network.
- C = 7pF

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		26	A
I_{FSM}	Surge non repetitive forward current	tp = 10 ms sinusoidal	130	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	Per diode	2.9	°C/W
$R_{th\ (c)}$		Coupling	0.3	
$R_{th\ (j-c)}$	Junction to case	Total	1.6	
P_1	Conduction power dissipation for both diodes	$I_{F(AV)}$ = 15 A δ = 0.5 Tc = 70°C	50	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			20	µA
			Tj = 125°C		30	200	
V_F**	Forward voltage drop	I_F = 15 A	Tj = 25°C			3.6	V
			Tj = 125°C		2.1	2.6	

Pulse test: * tp = 5ms, δ < 2%

** tp = 380µs, δ < 2%

To evaluate the maximum conduction losses use the following equation:
$P = 1.8 \times I_{F(AV)} + 0.053 \times I_F{}^2{}_{(RMS)}$

RECOVERY CHARACTERISTICS

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
trr	Reverse recovery time	I_F = 0.5 A Irr = 0.25A I_R = 1 A	Tj = 25°C		16		ns
		I_F = 1 A dI_F/dt = - 50A/µs V_R = 30 V				35	
I_{RM}	Reverse recovery current	V_R = 400 V I_F = 15 A dI_F/dt = -200 A/µs	Tj = 125°C		4.8	6.0	A
S_{factor}					0.4		-

TURN-ON SWITCHING CHARACTERISTICS

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
tfr	Forward recovery time	I_F = 15 A dI_F/dt = 100A/µs, V_{FR} = 1.1 x $V_F$max	Tj = 25°C			200	ns
V_{FP}	Forward recovery voltage	I_F = 15 A dI_F/dt = 100 A/µs	Tj = 25°C			6	V

Fig. 1: Conduction losses versus average current.

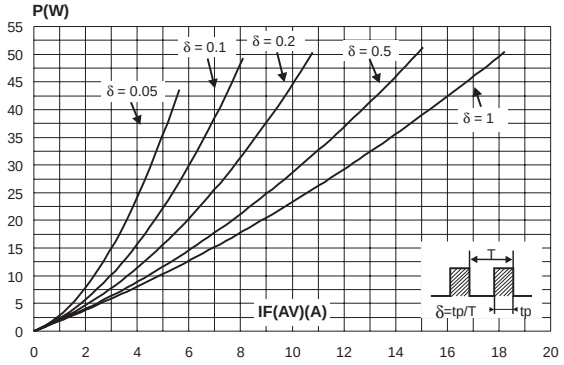


Fig. 2: Forward voltage drop versus forward current.

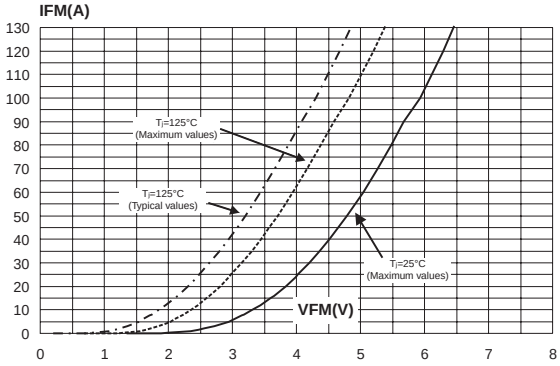


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

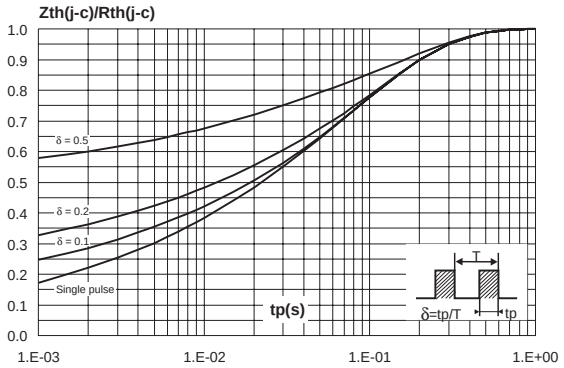


Fig. 4: Peak reverse recovery current versus dI_F/dt (90% confidence).

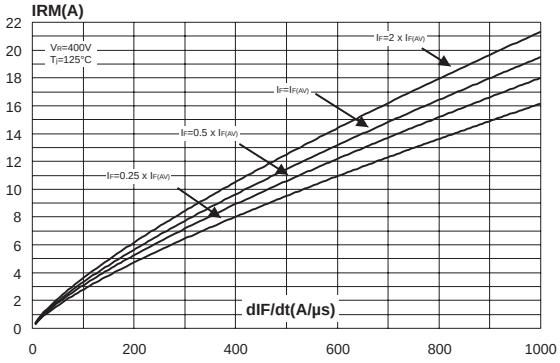


Fig. 5: Reverse recovery time versus dI_F/dt (90% confidence).

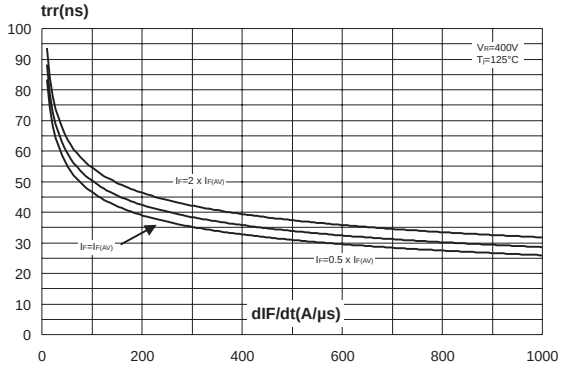


Fig. 6: Reverse recovery charges versus dI_F/dt (90% confidence).

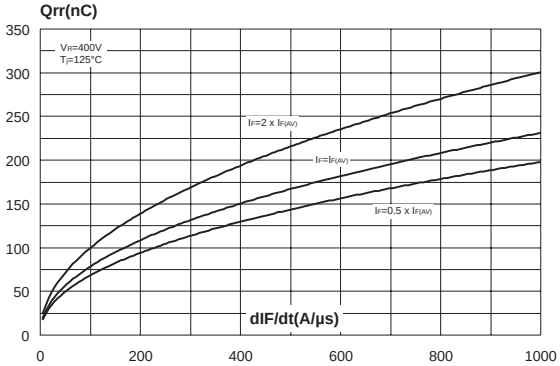


Fig. 7: Softness factor versus dI_F/dt (typical values).

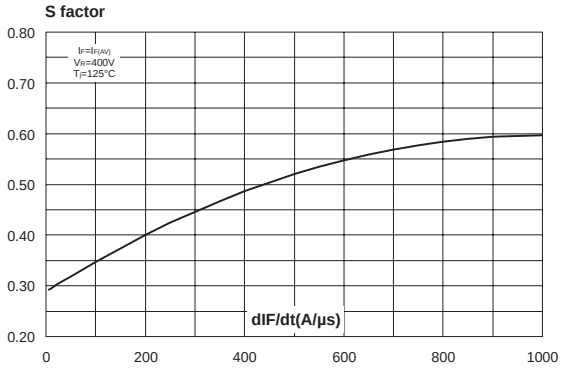


Fig. 8: Relative variations of dynamic parameters versus junction temperature.

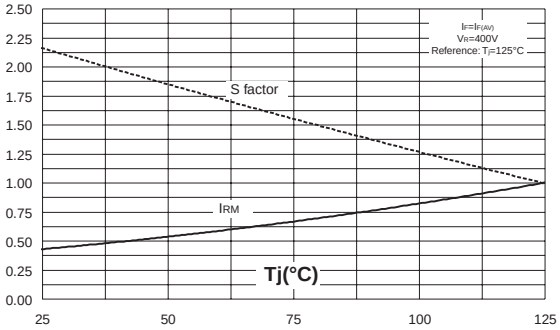


Fig. 9: Transient peak forward voltage versus dI_F/dt (90% confidence).

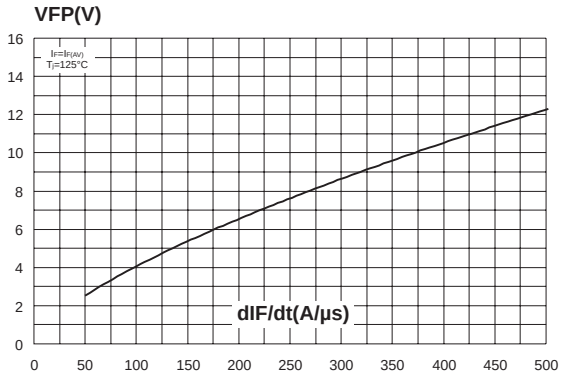


Fig. 10: Forward recovery time versus dI_F/dt (90% confidence).

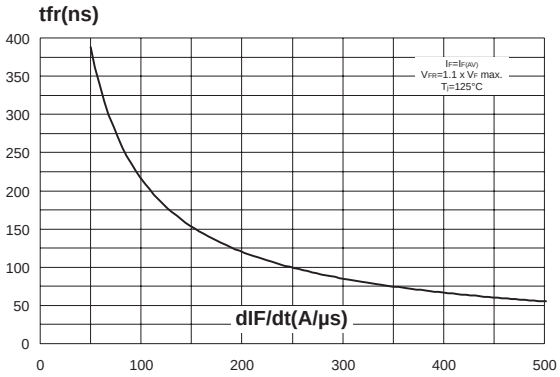
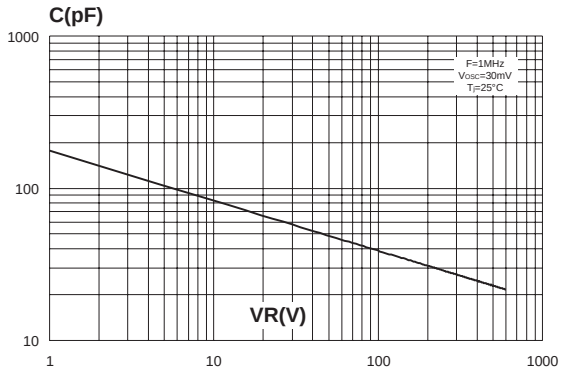
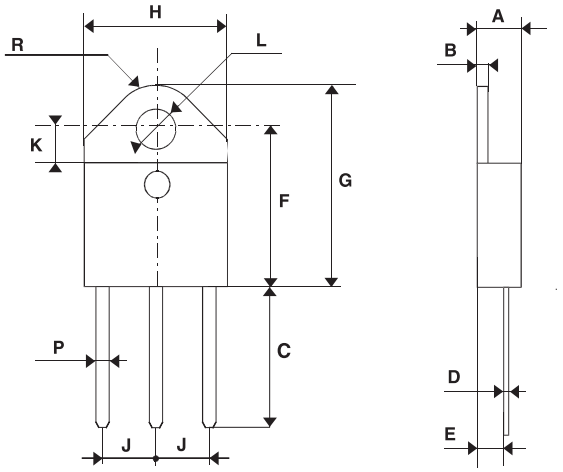


Fig. 11: Junction capacitance versus reverse voltage applied (typical values).



PACKAGE MECHANICAL DATA

TOP3I



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	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
J	5.4		5.65	0.213		0.222
K	3.4		3.65	0.134		0.144
L	4.08		4.17	0.161		0.164
P	1.20		1.40	0.047		0.055
R		4.60			0.181	

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH1506TPI	STTH1506TPI	TOP3I	4.46 g.	30	Tube

- Epoxy meets UL94,V0