



STTH20002TV

TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	Up to 2 x 120 A
V_{RRM}	200 V
T_j	150°C
V_F (typ)	0.75 V
t_{rr} (typ)	41 ns

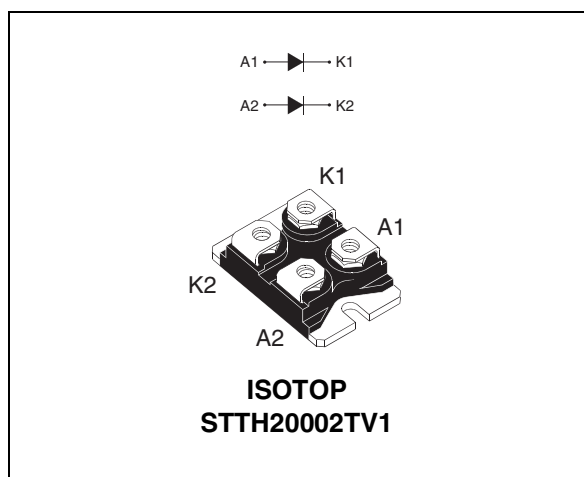
FEATURES AND BENEFITS

- Suited for SMPS
- Very Low Forward Losses
- Low recovery time
- High surge current capability
- Insulated:
Insulating voltage=2500V_{RMS}
Capacitance = 55pF

DESCRIPTION

Dual rectifier suited for welding equipment, high power industrial application.

Packaged in Isotop, this device is intended for use in the secondary rectification of the applications.



ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		200	V
$I_{F(RMS)}$	RMS forward current		170	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	$T_c = 95^\circ\text{C}$ Per diode	100	A
		$T_c = 80^\circ\text{C}$ Per diode	120	
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ms}$ sinusoidal	1000	A
T_{stg}	Storage temperature range		-55 to + 150	°C
T_j	Maximum operating junction temperature		150	°C

Order Codes

Part Number	Marking
STTH20002TV1	STTH20002TV1

THERMAL RESISTANCE

Symbol	Parameter	Maximum	Unit
$R_{th(j-c)}$	Junction to case	Per diode	0.52
		Total	0.31
$R_{th(c)}$	Coupling	0.1	$^{\circ}\text{C}/\text{W}$

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_{j(\text{diode } 1)} = P(\text{diode } 1) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode } 2) \times R_{th(c)}$$

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Test conditions	Min.	Typ	Max.	Unit
I_R^*	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = V_{RRM}$		100	μA
		$T_j = 125^{\circ}\text{C}$		80	800	
V_F^{**}	Forward voltage drop	$T_j = 25^{\circ}\text{C}$	$I_F = 100\text{A}$		1.05	V
			$I_F = 200\text{A}$		1.20	
		$T_j = 150^{\circ}\text{C}$	$I_F = 100\text{A}$	0.75	0.85	
			$I_F = 200\text{A}$		1.05	

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

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

To evaluate the conduction losses use the following equation: $P = 0.65 \times I_{F(AV)} + 0.002 I_F^2(\text{RMS})$

DYNAMIC CHARACTERISTICS (per diode)

Symbol	Parameter	Test conditions	Min.	Typ	Max.	Unit
t_{rr}	Reverse recovery time	$T_j = 25^{\circ}\text{C}$ $I_F = 1\text{A}$ $di_F/dt = 200 \text{ A}/\mu\text{s}$ $V_R = 30\text{V}$		41	50	ns
I_{RM}	Reverse recovery current	$T_j = 125^{\circ}\text{C}$ $I_F = 100\text{A}$ $V_R = 160\text{V}$ $di_F/dt = 200 \text{ A}/\mu\text{s}$		11.5	15	A
t_{fr}	Forward recovery time	$T_j = 25^{\circ}\text{C}$ $I_F = 100\text{A}$ $di_F/dt = 200 \text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$			800	ns
V_{FP}	Forward recovery voltage	$T_j = 25^{\circ}\text{C}$ $I_F = 100\text{A}$ $di_F/dt = 200 \text{ A}/\mu\text{s}$		2.5		V

Fig. 1: Peak current versus duty cycle (per diode).

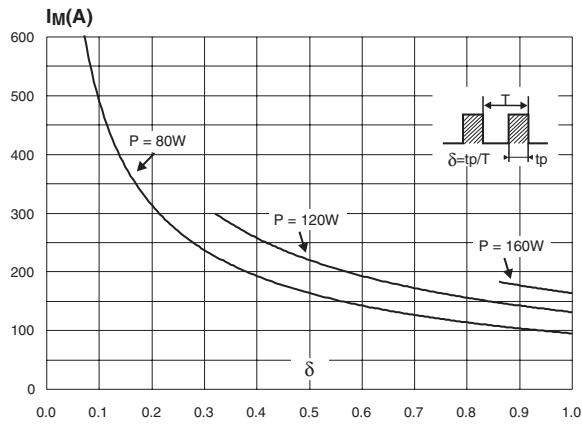


Fig. 2-2: Forward voltage drop versus forward current (maximum values, per diode).

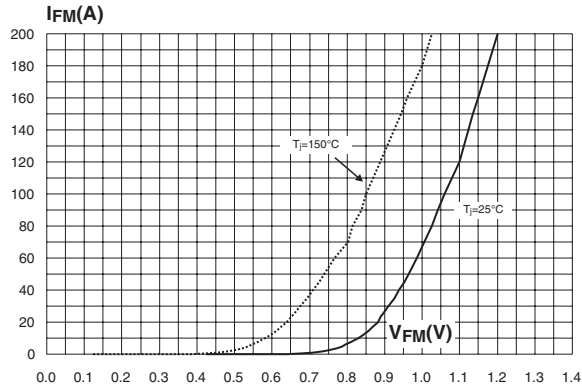


Fig. 4: Junction capacitance versus reverse voltage applied (typical values, per diode).

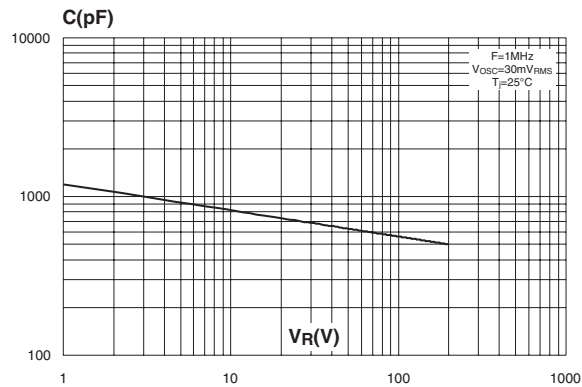


Fig. 2-1: Forward voltage drop versus forward current (typical values, per diode).

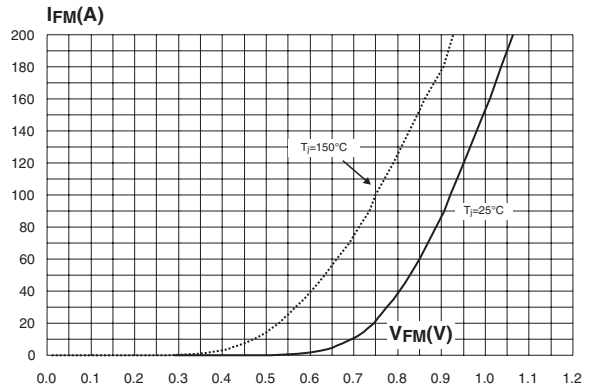


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

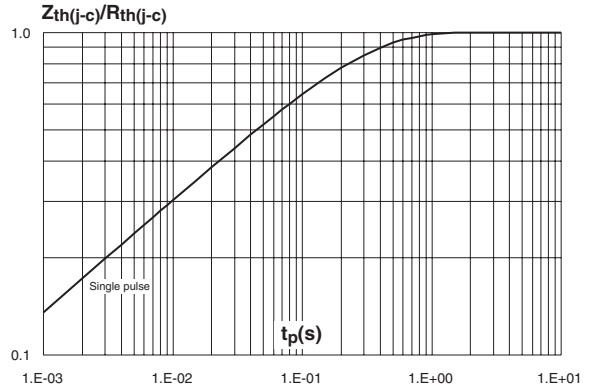


Fig. 5: Reverse recovery charges versus di/dt (typical values, per diode).

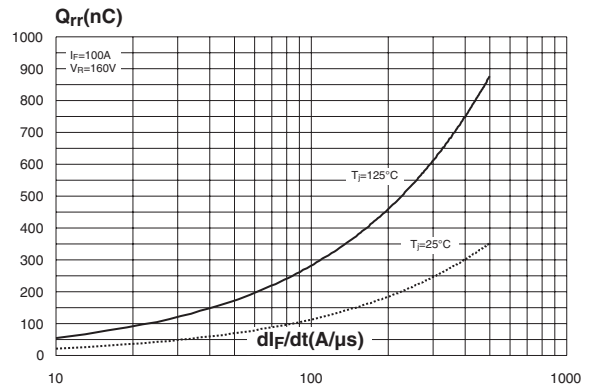


Fig. 6: Reverse recovery time versus di_F/dt (typical values, per diode).

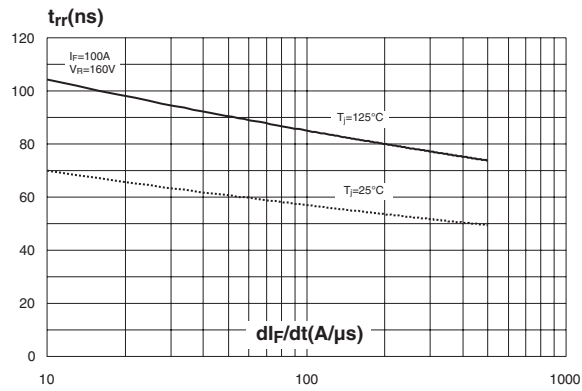


Fig. 7: Peak reverse recovery current versus di_F/dt (typical values, per diode).

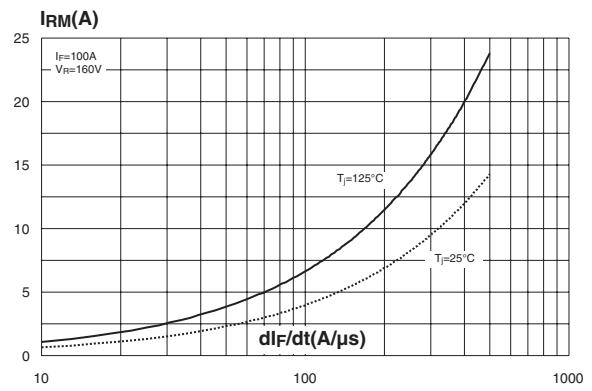
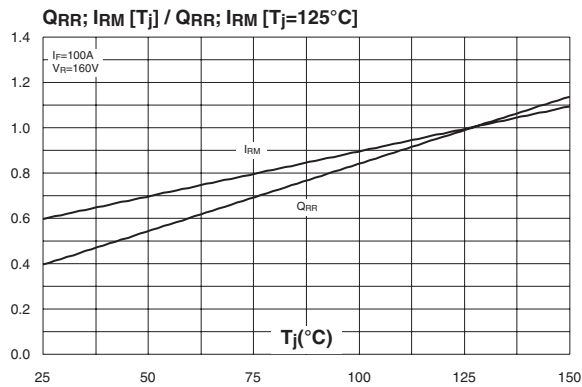


Fig. 8: Dynamic parameters versus junction temperature.



STTH20002TV

PACKAGE MECHANICAL DATA ISOTOP

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	11.80	12.20	0.465	0.480
A1	8.90	9.10	0.350	0.358
B	7.8	8.20	0.307	0.323
C	0.75	0.85	0.030	0.033
C2	1.95	2.05	0.077	0.081
D	37.80	38.20	1.488	1.504
D1	31.50	31.70	1.240	1.248
E	25.15	25.50	0.990	1.004
E1	23.85	24.15	0.939	0.951
E2	24.80 typ.		0.976 typ.	
G	14.90	15.10	0.587	0.594
G1	12.60	12.80	0.496	0.504
G2	3.50	4.30	0.138	0.169
F	4.10	4.30	0.161	0.169
F1	4.60	5.00	0.181	0.197
P	4.00	4.30	0.157	0.69
P1	4.00	4.40	0.157	0.173
S	30.10	30.30	1.185	1.193

ORDERING INFORMATION

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STTH20002TV1	STTH20002TV1	ISOTOP	27 g (without screws)	10 (with screws)	Tube

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)

REVISION HISTORY

Table 1: Revision history

Date	Revision	Description of Changes
26-May-2004	1	First issue
13-Jul-2004	2	Figure 6 legend corrected: "Forward" changed to "Reverse"

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