



# STTH20002TV

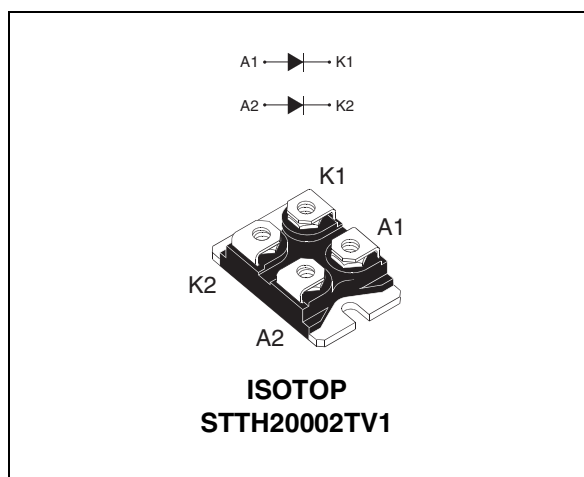
## TURBO 2 ULTRAFast HIGH VOLTAGE RECTIFIER

### 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<sub>RMS</sub>  
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 <sub>RRM</sub>	Repetitive peak reverse voltage			200	V
I <sub>F(RMS)</sub>	RMS forward voltage			170	A
I <sub>F(AV)</sub>	Average forward current δ = 0.5	T <sub>c</sub> = 95°C	Per diode	100	A
		T <sub>c</sub> = 80°C	Per diode	120	
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10ms sinusoidal		1000	A
T <sub>stg</sub>	Storage temperature range			-55 to + 150	°C
T <sub>j</sub>	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	$^{\circ}\text{C/W}$
		Total	0.31	
$R_{th(c)}$	Coupling		0.1	$^{\circ}\text{C/W}$

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	$\mu\text{A}$
		$T_j = 125^{\circ}\text{C}$			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	

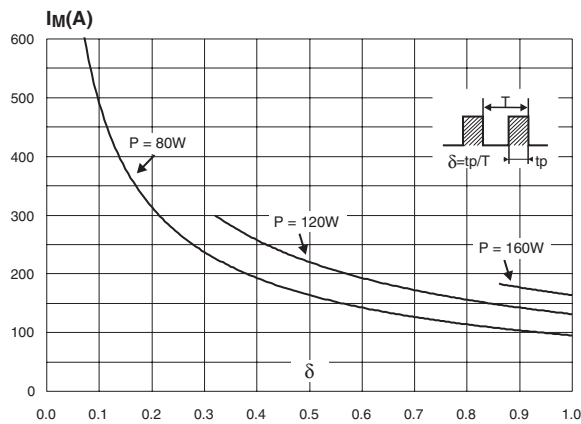
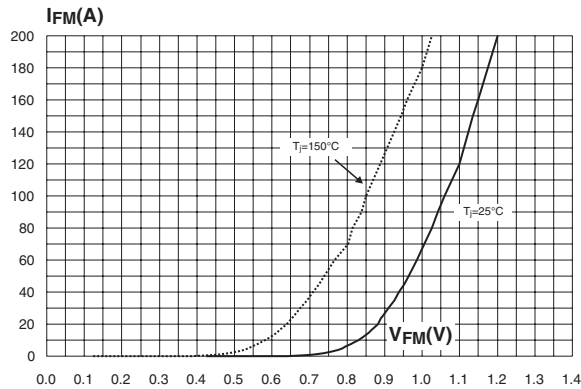
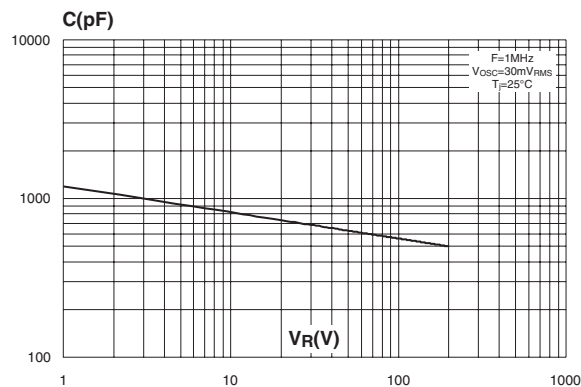
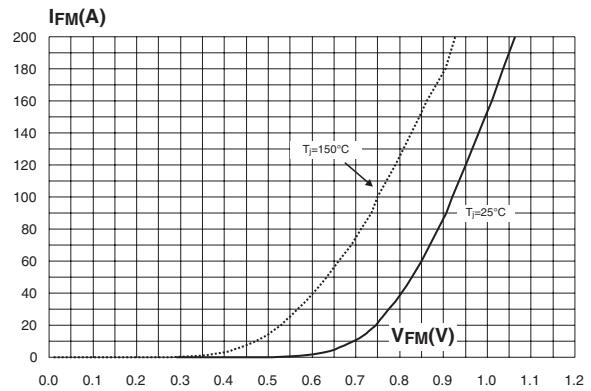
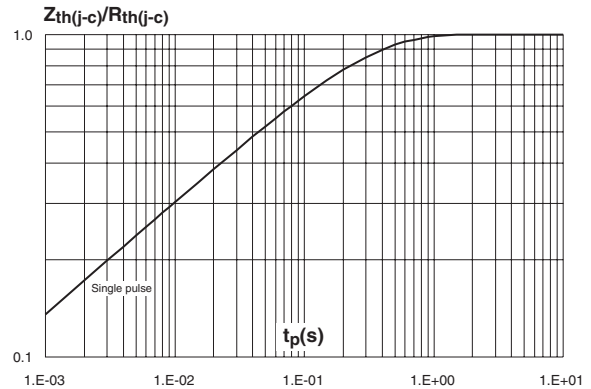
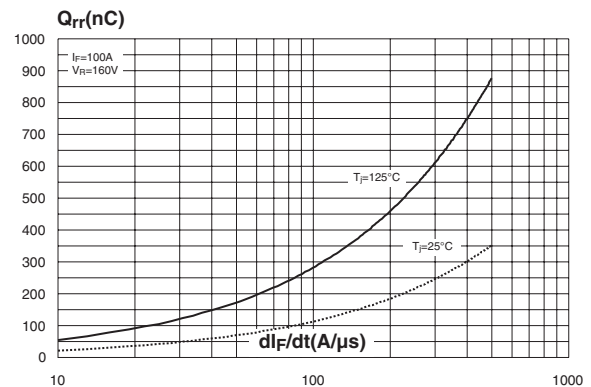
Pulse test: \*  $t_p = 5 \text{ ms}$ ,  $\delta < 2\%$

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

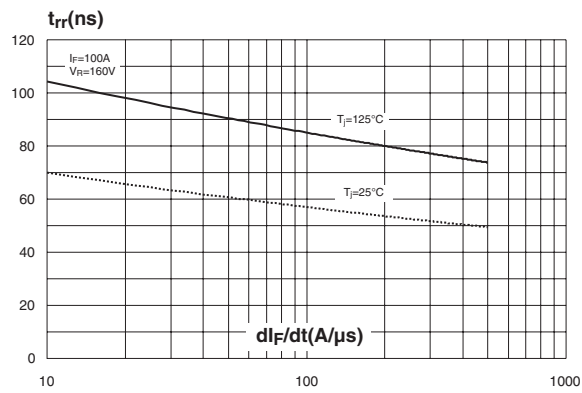
To evaluate the conduction losses use the following equation:  $P = 0.65 \times I_{F(AV)} + 0.002 I_F^2(\text{RMS})$

## DYNAMIC CHARACTERISTICS (per diode)

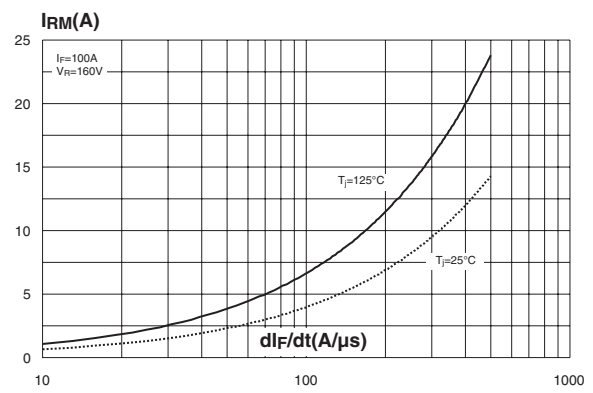
Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
$t_{rr}$	Reverse recovery time	$T_j = 25^{\circ}\text{C}$	$I_F = 1\text{A}$ $di_F/dt = 200 \text{ A}/\mu\text{s}$ $V_R = 30\text{V}$		41	50	ns
$I_{RM}$	Reverse recovery current	$T_j = 125^{\circ}\text{C}$	$I_F = 100\text{A}$ $V_R = 160\text{V}$ $di_F/dt = 200 \text{ A}/\mu\text{s}$		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  $di_F/dt$  (typical values, per diode).

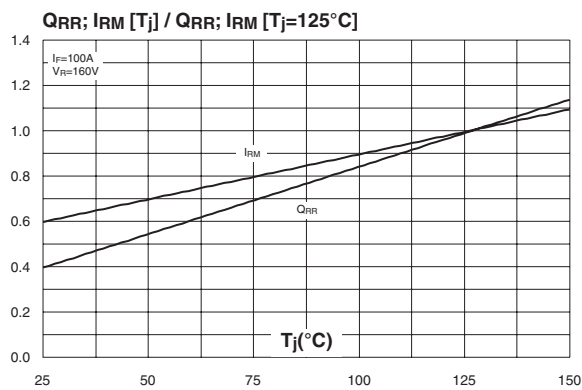
**Fig. 6:** Reverse recovery time versus  $di_F/dt$  (typical values, per diode).



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



**Fig. 8:** Dynamic parameters versus junction temperature.



# **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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