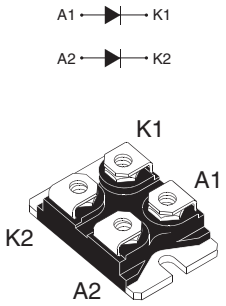
STTH20002TV

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



ISOTOP
STTH20002TV1

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 voltage			170	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	Tc = 95°C	Per diode	100	A
		Tc = 80°C	Per diode	120	
I_{FSM}	Surge non repetitive forward current	tp = 10ms 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	°C/W
		Total	0.31	
$R_{th(c)}$	Coupling		0.1	°C/W

When the diodes 1 and 2 are used simultaneously:
Δ Tj(diode 1) = P(diode 1) x $R_{th(j-c)}$(Per diode) + P(diode 2) x $R_{th(c)}$

STATIC ELECTRICAL CHARACTERISTICS (per diode)

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

Pulse test: * tp = 5 ms, δ < 2%
** tp = 380 µs, δ < 2%

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

DYNAMIC CHARACTERISTICS (per diode)

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
t_{rr}	Reverse recovery time	T_j = 25°C	I_F = 1A dI_F/dt = 200 A/µs V_R =30V		41	50	ns
I_{RM}	Reverse recovery current	T_j = 125°C	I_F = 100A V_R = 160V dI_F/dt = 200 A/µs		11.5	15	A
t_{fr}	Forward recovery time	T_j = 25°C	I_F = 100A dI_F/dt = 200 A/µs V_{FR} = 1.1 x V_{Fmax}			800	ns
V_{FP}	Forward recovery voltage	T_j = 25°C	I_F = 100A dI_F/dt = 200 A/µs		2.5		V

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

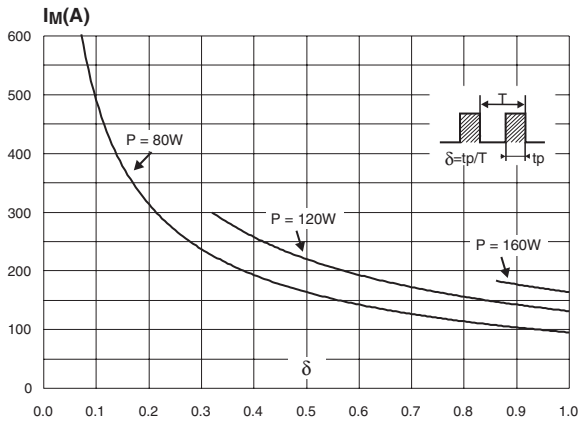


Fig. 2-1: Forward voltage drop versus forward current (typical values, per diode).

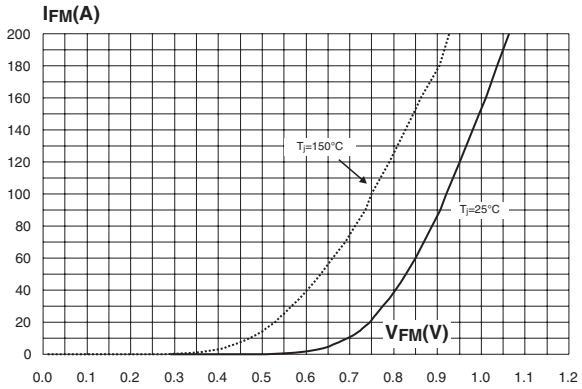


Fig. 2-2: Forward voltage drop versus forward current (maximum values, per diode).

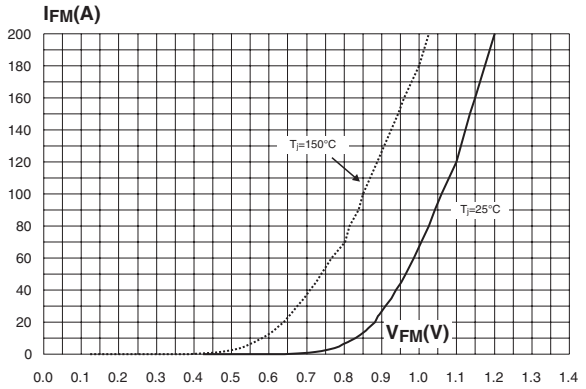


Fig. 3: Relative variation of thermal impedance junction to case versus pulse duration.

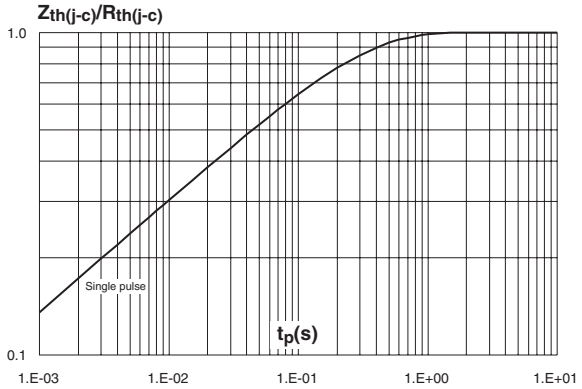


Fig. 4: Junction capacitance versus reverse voltage applied (typical values, per diode).

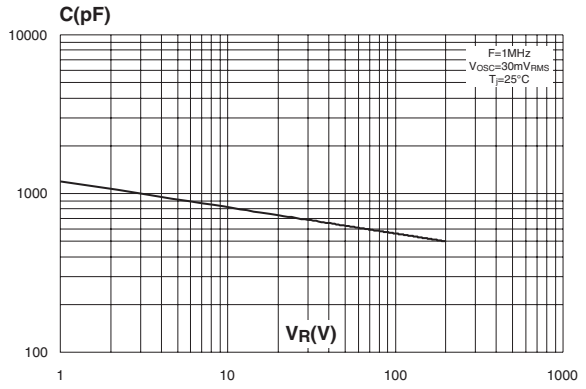


Fig. 5: Reverse recovery charges versus dI_F/dt (typical values, per diode).

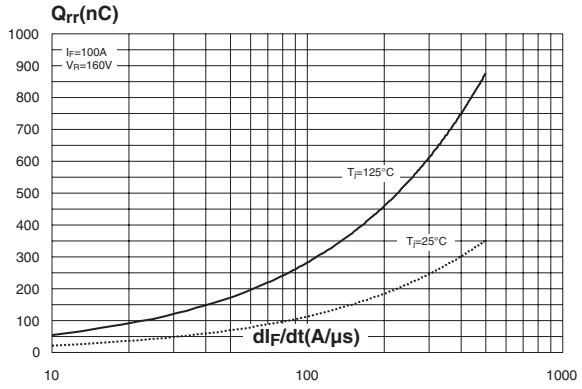


Fig. 6: Reserve recovery time versus dI_F/dt (typical values, per diode).

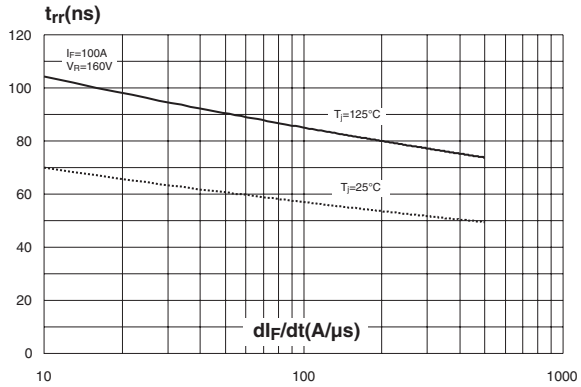


Fig. 7: Peak reverse recovery current versus dI_F/dt (typical values, per diode).

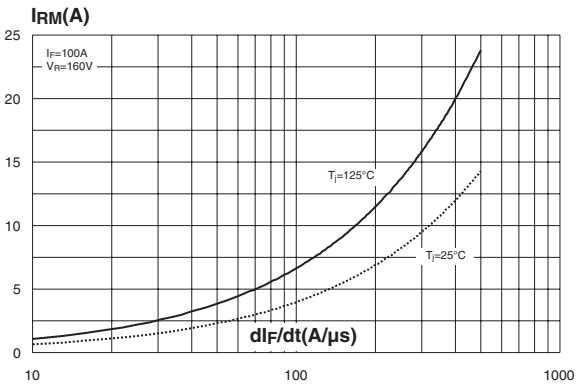
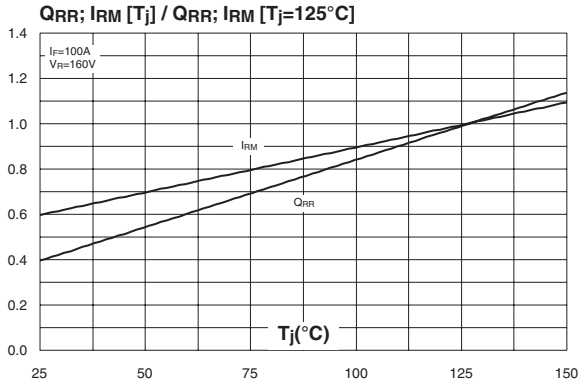
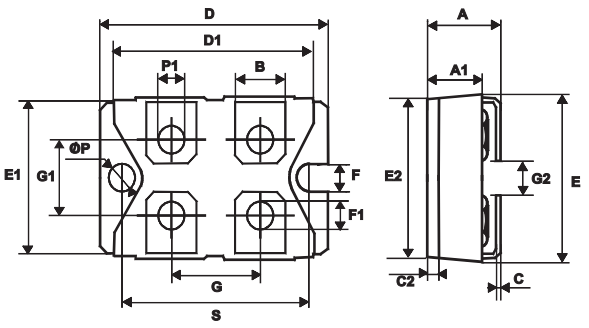


Fig. 8: Dynamic parameters versus junction temperature.



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”