

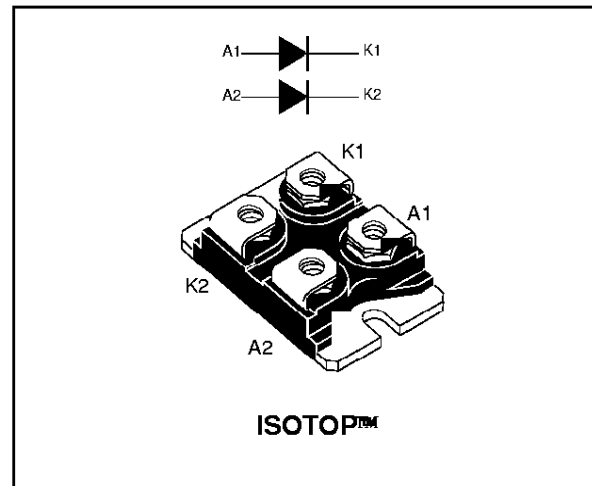


# STTH12003TV

## HIGH FREQUENCY SECONDARY RECTIFIER

### MAJOR PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 60 A
$V_{RRM}$	300 V
$T_j(\text{max})$	175 °C
$V_F(\text{max})$	1 V
$t_{rr}(\text{max})$	70 ns



### FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND REVERSE VOLTAGE PERFORMANCE
- ULTRAFAST, SOFT AND NOISE-FREE RECOVERY FOR LOW SIDE EFFECTS
- ISOLATED PACKAGE:  
2500 V<sub>RMS</sub> (UL APPROVAL PENDING DEVICE)  
Capacitance < 45 pF
- LOW INDUCTANCE AND LOW CAPACITANCE ALLOW SIMPLER LAYOUT

### DESCRIPTION

Dual rectifiers suited for Switch Mode Power Supply and high frequency DC to DC converters.

Packaged in ISOTOP, this device is intended for use in low voltage, high frequency inverters, free wheeling operation, welding equipments and telecom power supplies.

### ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter		Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage		300	V
$I_{F(RMS)}$	RMS forward current		150	A
$I_{F(AV)}$	Average forward current	$T_c = 85^\circ\text{C}$ $\delta = 0.5$	Per diode 120	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10 \text{ ms}$ sinusoidal	600	A
$I_{RSM}$	Non repetitive peak reverse current	$t_p = 100 \mu\text{s}$ square	6	A
$T_{stg}$	Storage temperature range		- 55 to + 150	°C
$T_j$	Maximum operating junction temperature		150	°C

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## STTH12003TV

### THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	0.8	°C/W
$R_{th(c)}$		Total	0.45	
	Coupling	0.1		

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	Tests conditions		Min.	Typ.	Max.	Unit
$I_R^*$	Reverse leakage current	$V_R = 300 \text{ V}$	$T_j = 25^\circ\text{C}$			120	$\mu\text{A}$
			$T_j = 125^\circ\text{C}$		0.12	1.2	mA
$V_F^{**}$	Forward voltage drop	$I_F = 60 \text{ A}$	$T_j = 25^\circ\text{C}$			1.25	V
			$T_j = 125^\circ\text{C}$		0.85	1	

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

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

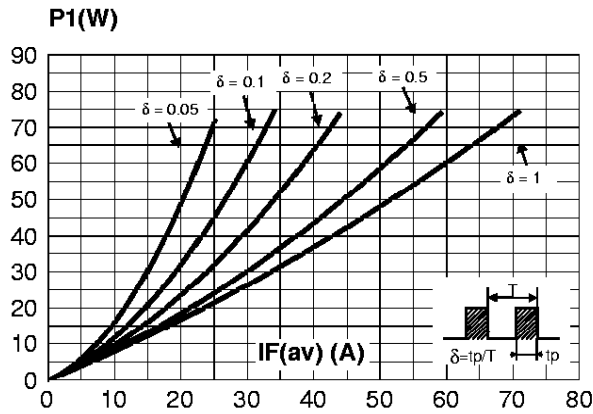
To evaluate the maximum conduction losses use the following equation:

$$P = 0.75 \times I_{F(AV)} + 0.042 \times I_{F(RMS)}^2$$

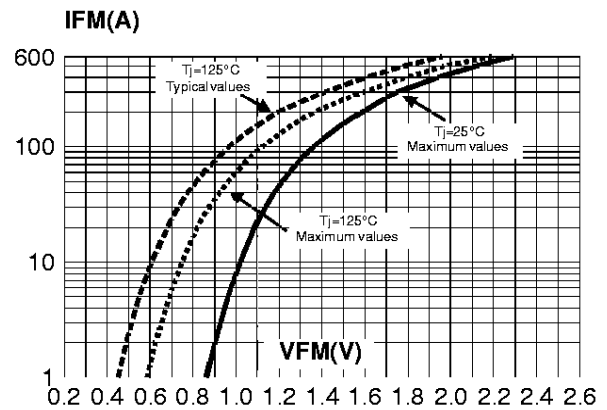
### RECOVERY CHARACTERISTICS

Symbol	Tests conditions			Min.	Typ.	Max.	Unit
$t_{rr}$	$I_F = 0.5 \text{ A}$	$I_{rr} = 0.25 \text{ A}$	$I_R = 1 \text{ A}$	$T_j = 25^\circ\text{C}$		55	ns
	$I_F = 1 \text{ A}$	$di_F/dt = -50 \text{ A}/\mu\text{s}$	$V_R = 30 \text{ V}$		$T_j = 25^\circ\text{C}$		
$t_{fr}$	$I_F = 60 \text{ A}$	$di_F/dt = 200 \text{ A}/\mu\text{s}$		$T_j = 25^\circ\text{C}$		600	ns
$V_{FP}$	$V_{FR} = 1.1 \times V_F \text{ max.}$			$T_j = 25^\circ\text{C}$		5	V
$S_{factor}$	$V_{CC} = 200 \text{ V}$	$I_F = 60 \text{ A}$		$T_j = 125^\circ\text{C}$	0.3		-
$I_{RM}$	$di_F/dt = 200 \text{ A}/\mu\text{s}$						

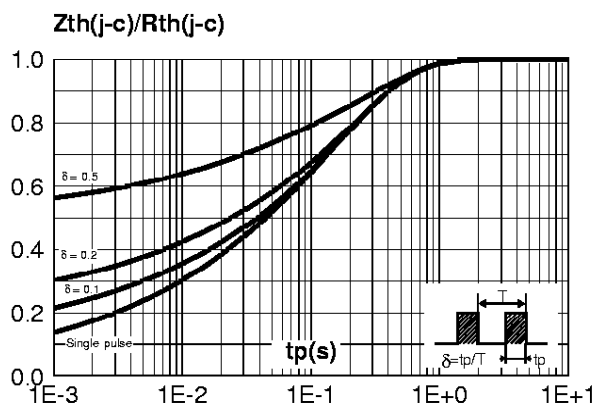
**Fig. 1:** Conduction losses versus average current (per diode).



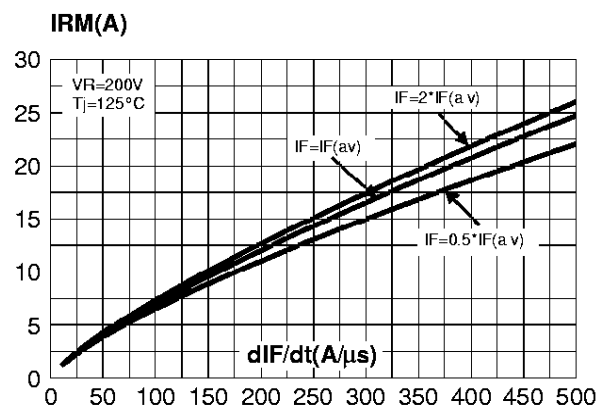
**Fig. 2:** Forward voltage drop versus forward current (per diode).



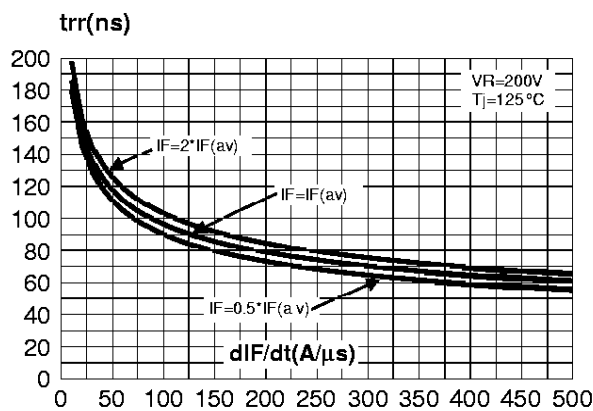
**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration.



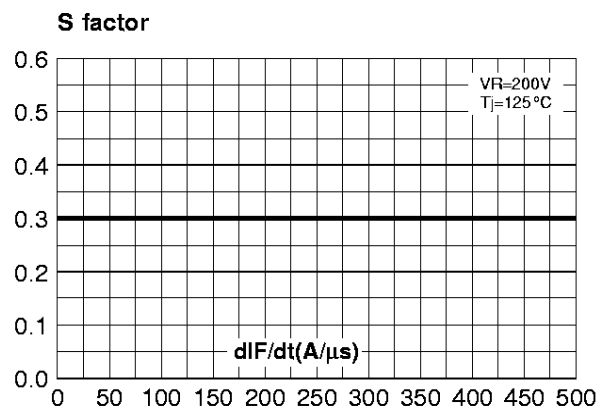
**Fig. 4:** Peak reverse recovery current versus dI/dt (90% confidence, per diode).



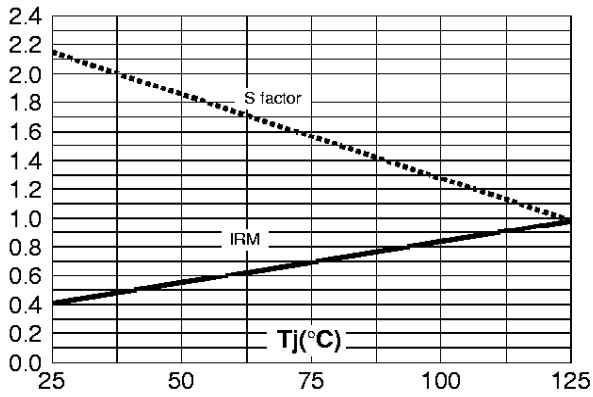
**Fig. 5:** Reverse recovery time versus dI/dt (90% confidence, per diode).



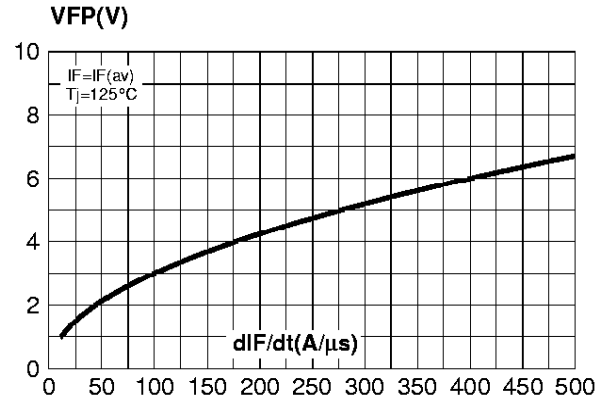
**Fig. 6:** Softness factor (tb/ta) versus dI/dt (typical values, per diode).



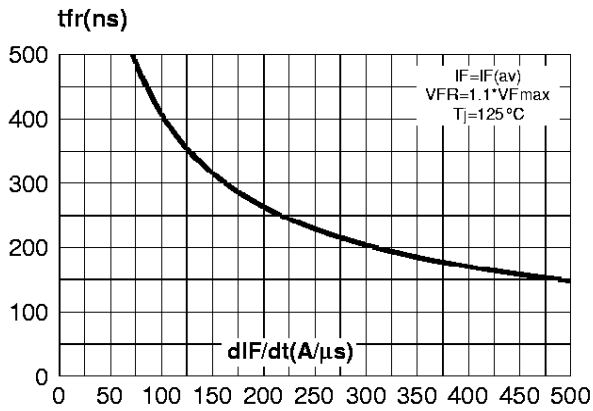
**Fig. 7:** Relative variation of dynamic parameters versus junction temperature (reference:  $T_j = 125^\circ\text{C}$ ).



**Fig. 8:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence, per diode).



**Fig. 9:** Forward recovery time versus  $dI_F/dt$  (90% confidence, per diode).



**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

- Cooling method: by conduction (C)
- Recommended torque value : 1.3 N.m.
- Maximum torque value: 1.5 N.m.

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH12003TV1	STTH12003TV	ISOTOP	27g without screws	10 with screws	Tube

- Epoxy meets UL 94,V0

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