

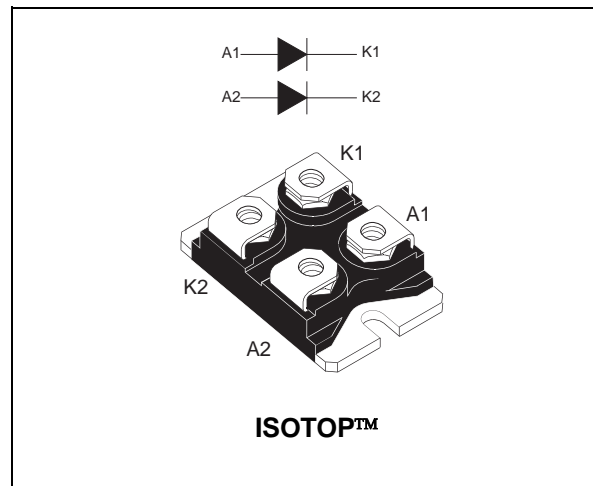
## HIGH FREQUENCY SECONDARY RECTIFIER

### MAJOR PRODUCTS CHARACTERISTICS

<b>I<sub>F(AV)</sub></b>	<b>2 x 100 A</b>
<b>V<sub>RRM</sub></b>	<b>300 V</b>
<b>T<sub>j</sub> (max)</b>	<b>150 °C</b>
<b>V<sub>F</sub> (max)</b>	<b>0.95 V</b>
<b>t<sub>rr</sub> (max)</b>	<b>90 ns</b>

### FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND REVERSE VOLTAGE PERFORMANCE
- ULTRAFAST, SOFT AND NOISE-FREE RECOVERY
- ISOLATED PACKAGE:  
2500 V<sub>RMS</sub> (UL APPROVAL PENDING DEVICE)
- 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 equipment and telecom power supplies.

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

Symbol	Parameter		Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage		300	V
I <sub>F(RMS)</sub>	RMS forward current		180	A
I <sub>F(AV)</sub>	Average forward current	T <sub>c</sub> = 85°C δ = 0.5	Per diode 100 Perdevice 200	A
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms sinusoidal	1000	A
I <sub>RSM</sub>	Non Repetitive peak reverse current	t <sub>p</sub> = 100 μs square	13	A
T <sub>stg</sub>	Storage temperature range		- 55 to + 150	°C
T <sub>j</sub>	Maximum operating junction temperature		150	°C

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## STTH20003TV

### THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	0.55	$^{\circ}\text{C/W}$
		Total	0.35	
$R_{th(c)}$		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	$V_R = 300 \text{ V}$	$T_j = 25^{\circ}\text{C}$			200	$\mu\text{A}$
			$T_j = 125^{\circ}\text{C}$		0.2	2	mA
$V_F^{**}$	Forward voltage drop	$I_F = 100 \text{ A}$	$T_j = 25^{\circ}\text{C}$			1.20	V
			$T_j = 125^{\circ}\text{C}$		0.8	0.95	

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

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

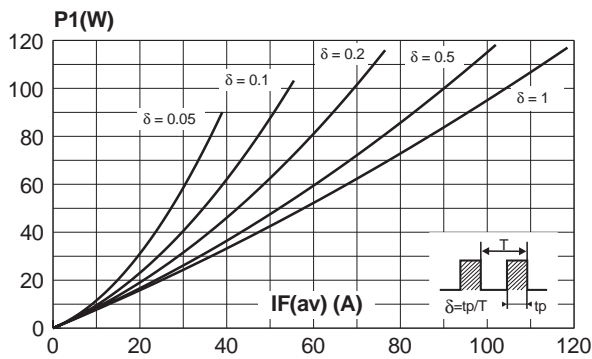
To evaluate the maximum conduction losses use the following equation:

$$P = 0.75 \times I_{F(AV)} + 0.0020 \times I_{F(RMS)}^2$$

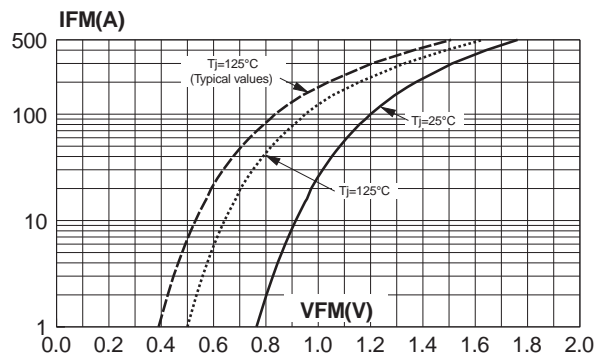
### RECOVERY CHARACTERISTICS

Symbol	Tests Conditions			Min.	Typ.	Max.	Unit
trr	$I_F = 0.5 \text{ A}$	$I_{rr} = 0.25 \text{ A}$	$I_R = 1 \text{ A}$	$T_j = 25^{\circ}\text{C}$		55	ns
	$I_F = 1 \text{ A}$	$di_F/dt = -50 \text{ A}/\mu\text{s}$	$V_R = 30 \text{ V}$			90	
tfr	$I_F = 100 \text{ A}$	$di_F/dt = 200 \text{ A}/\mu\text{s}$	$T_j = 25^{\circ}\text{C}$			1400	ns
$V_{FP}$	$V_{FR} = 1.1 \times V_F \text{ max.}$					5	V
$S_{factor}$	$V_{CC} = 200 \text{ V}$	$I_F = 100 \text{ A}$	$T_j = 125^{\circ}\text{C}$		0.3		-
$I_{RM}$	$di_F/dt = 200 \text{ A}/\mu\text{s}$					18	A

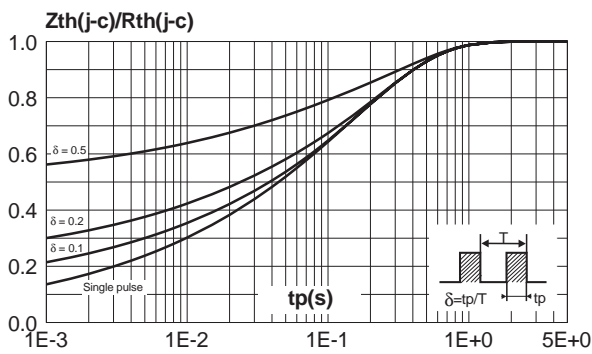
**Fig. 1:** Conduction losses versus average current (per diode).



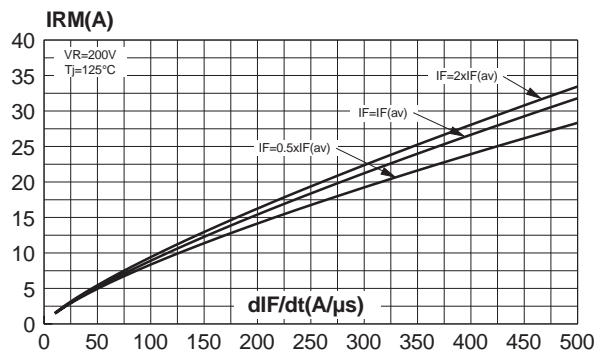
**Fig. 2:** Forward voltage drop versus forward current (Maximum values, per diode).



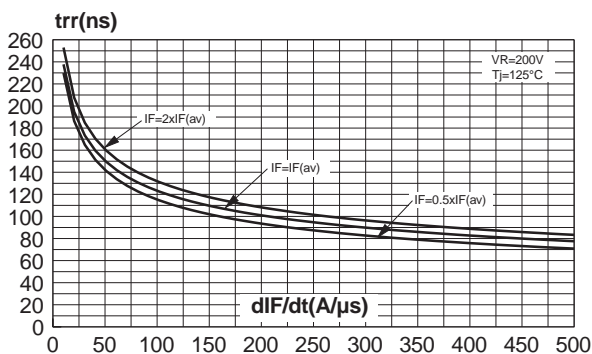
**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration.



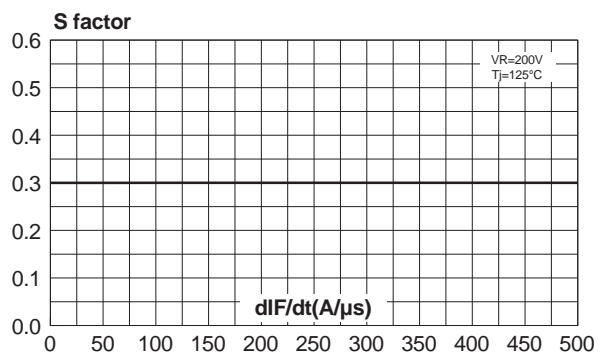
**Fig. 4:** Peak reverse recovery current versus dIF/dt (90% confidence, per diode).



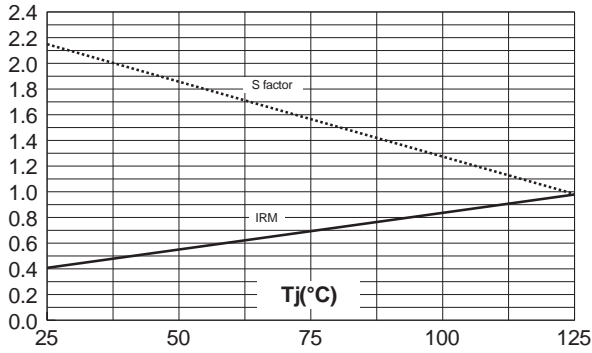
**Fig. 5:** Reverse recovery time versus dIF/dt (90% confidence, per diode).



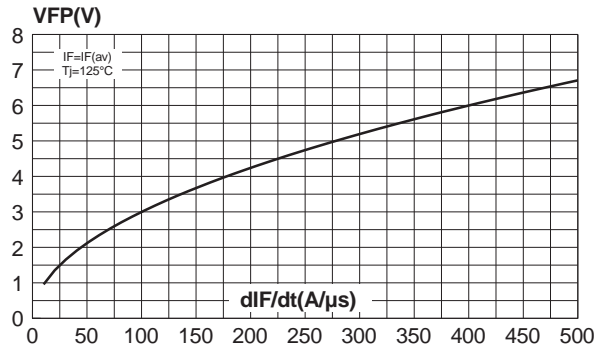
**Fig. 6:** Softness factor (tb/ta) versus dIF/dt (typical values, per diode).



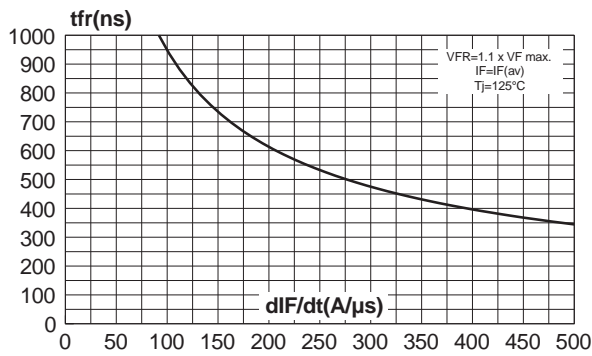
**Fig. 7:** Relative variation of dynamic parameters versus junction temperature (Reference:  $T_j=125^\circ\text{C}$ ).



**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
STTH20003TV	STTH20003TV	ISOTOP	27g. without screws	10 with screws	Tube

- Epoxy meets UL 94,V0

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