

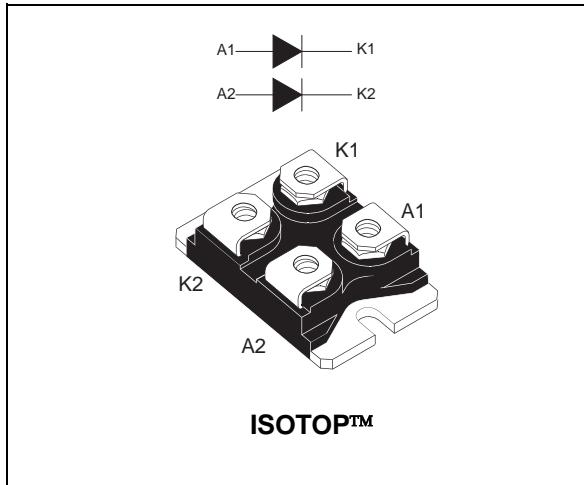
## HIGH FREQUENCY SECONDARY RECTIFIER

### MAJOR PRODUCTS CHARACTERISTICS

<b>I<sub>F(AV)</sub></b>	<b>2 x 80 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>trr (max)</b>	<b>80 ns</b>

### FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND VOLTAGE PERFORMANCE
- ULTRA-FAST, SOFT AND NOISE-FREE RECOVERY
- ISOLATED PACKAGE: ISOTOP  
Insulated voltage: 2500 V<sub>RMS</sub>  
Capacitance: < 45 pF
- LOW INDUCTANCE AND LOW CAPACITANCE ALLOW SIMPLIFIED 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> = 80°C δ = 0.5	Per diode Perdevice	80 160	A		
I <sub>FSM</sub>	Surge non repetitive forward current	tp = 10 ms sinusoidal		800	A		
I <sub>RSRM</sub>	Non repetitive peak reverse current	tp = 100 µs square		5	A		
T <sub>stg</sub>	Storage temperature range			- 55 to + 150	°C		
T <sub>j</sub>	Maximum operating junction temperature			150	°C		

# STTH16003TV

## THERMAL RESISTANCES

Symbol	Parameter	Value	Unit	
R <sub>th</sub> (j-c)	Junction to case	Per diode Total	°C/W	0.7 0.4
R <sub>th</sub> (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 <sub>R</sub> *	Reverse leakage current	V <sub>R</sub> = 300 V	T <sub>j</sub> = 25°C			200	μA
			T <sub>j</sub> = 125°C		0.2	2	mA
V <sub>F</sub> **	Forward voltage drop	I <sub>F</sub> = 80 A	T <sub>j</sub> = 25°C			1.2	V
			T <sub>j</sub> = 125°C		0.8	0.95	

Pulse test : \* tp = 5 ms, δ < 2 %

\*\* tp = 380 μs, δ < 2%

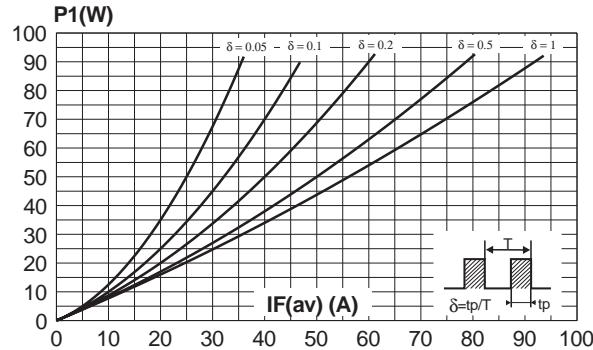
To evaluate the maximum conduction losses use the following equation:

$$P = 0.75 \times I_F(AV) + 0.0025 \times I_F^2(RMS)$$

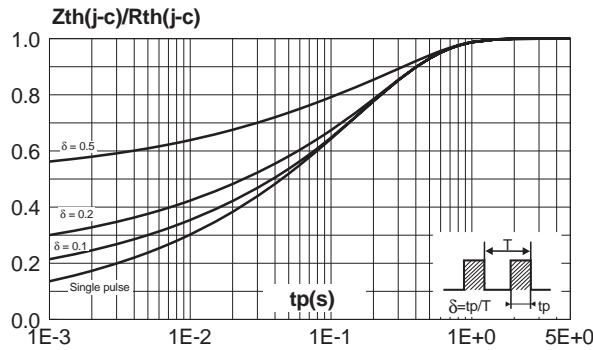
## RECOVERY CHARACTERISTICS

Symbol	Tests conditions			Min.	Typ.	Max.	Unit
trr	I <sub>F</sub> = 0.5 A	I <sub>rr</sub> = 0.25 A	I <sub>R</sub> = 1A	T <sub>j</sub> = 25°C		60	ns
	I <sub>F</sub> = 1 A	dI <sub>F</sub> /dt = - 50 A/μs				80	
tfr	I <sub>F</sub> = 80 A	dI <sub>F</sub> /dt = 200 A/μs		T <sub>j</sub> = 25°C		1000	ns
	V <sub>FR</sub> = 1.1 × V <sub>F</sub> max.					5	V
Sfactor	V <sub>cc</sub> = 200 V		I <sub>F</sub> = 80 A	T <sub>j</sub> = 125°C	0.3		-
I <sub>RM</sub>	dI <sub>F</sub> /dt = 200 A/μs					16	A

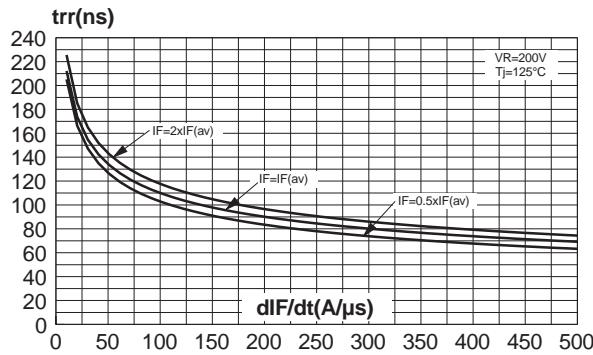
**Fig. 1:** Conduction losses versus average current (per diode).



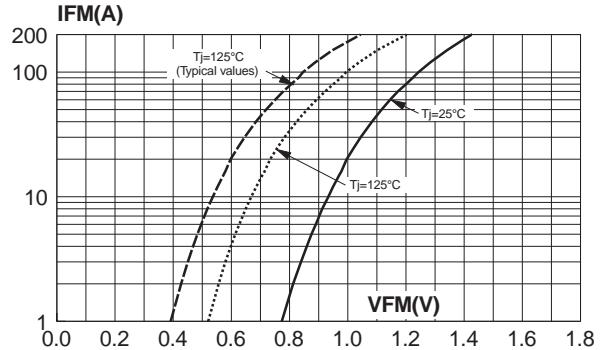
**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration.



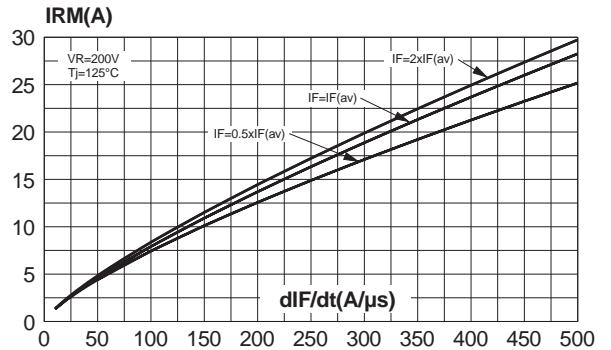
**Fig. 5:** Reverse recovery time versus  $dI_F/dt$  (90% confidence, per diode).



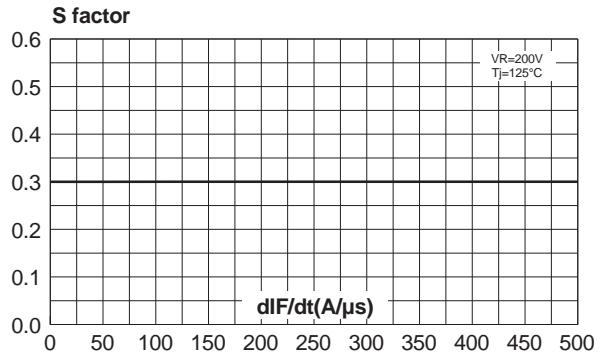
**Fig. 2:** Forward voltage drop versus forward current (Maximum values, per diode).



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

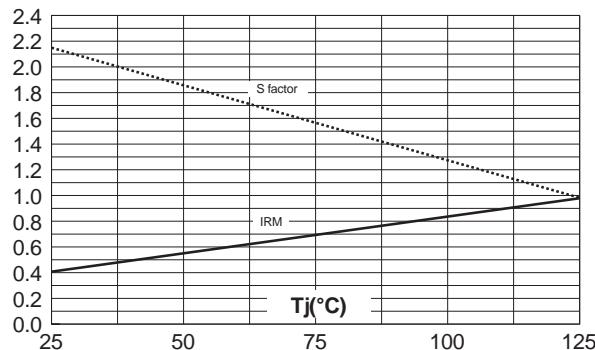


**Fig. 6:** Softness factor ( $tb/ta$ ) versus  $dI_F/dt$  (typical values, per diode).

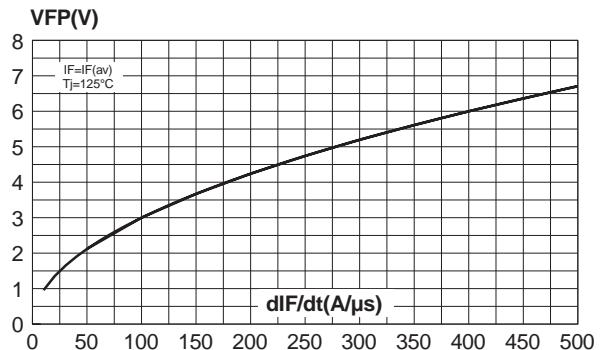


## STTH16003TV

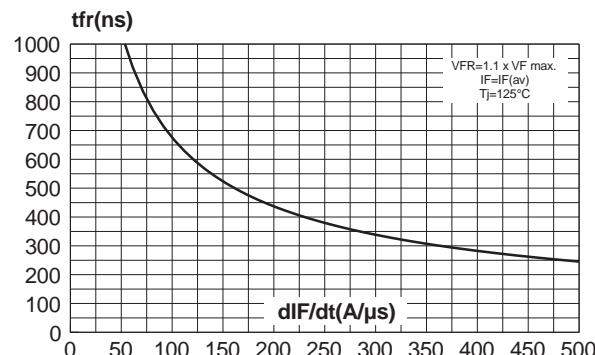
**Fig. 7:** Relative variation of dynamic parameters versus junction temperature (Reference:  $T_j=125^\circ\text{C}$ ).



**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

Type	Marking	Package	Weight	Base qty	Delivery mode
STTH16003TV1	STTH16003TV	ISOTOP	27 g. without screws	10 with screws	Tube

- Cooling method: by conduction (C)
- Recommended torque value: 1.3 N.m.
- Maximum torque value: 1.5 N.m.
- Epoxy meets UL 94, V0

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