

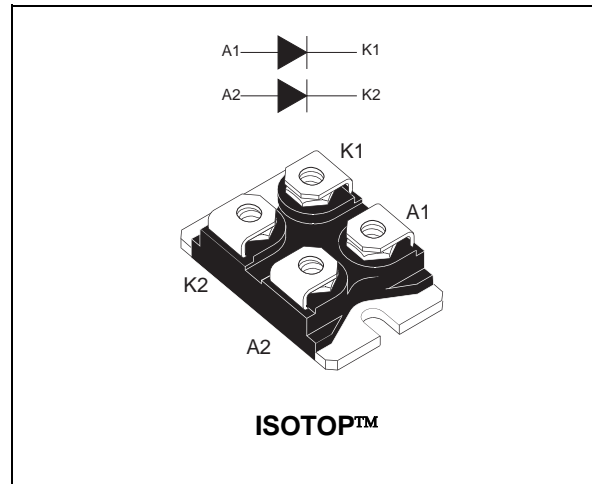
## HIGH FREQUENCY SECONDARY RECTIFIER

### MAJOR PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	<b>2 x 80 A</b>
$V_{RRM}$	<b>300 V</b>
$T_j$ (max)	<b>150 °C</b>
$V_F$ (max)	<b>0.95 V</b>
$t_{rr}$ (max)	<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  $V_{RMS}$   
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
$V_{RRM}$	Repetitive peak reverse voltage		300	V
$I_{F(RMS)}$	RMS forward current		180	A
$I_{F(AV)}$	Average forward current	$T_c = 80^\circ\text{C}$ $\delta = 0.5$	Per diode 80 Perdevice 160	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10 \text{ ms}$ sinusoidal	800	A
$I_{RSM}$	Non repetitive peak reverse current	$t_p = 100 \mu\text{s}$ square	5	A
$T_{stg}$	Storage temperature range		- 55 to + 150	°C
$T_j$	Maximum operating junction temperature		150	°C

## STTH16003TV

### THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
R <sub>th(j-c)</sub>	Junction to case	Per diode	0.7	°C/W
		Total	0.4	
R <sub>th(c)</sub>		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 : \* t<sub>p</sub> = 5 ms, δ < 2 %

\*\* t<sub>p</sub> = 380 μs, δ < 2%

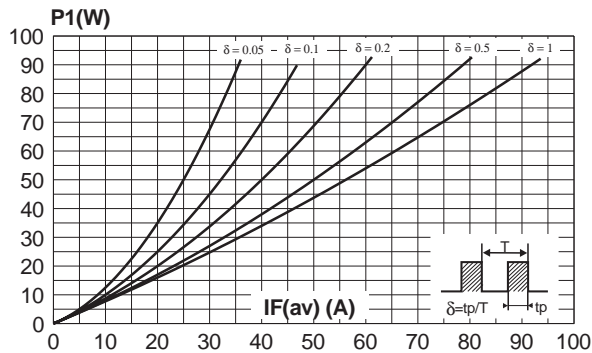
To evaluate the maximum conduction losses use the following equation:

$$P = 0.75 \times I_{F(AV)} + 0.0025 \times I_{F(RMS)}^2$$

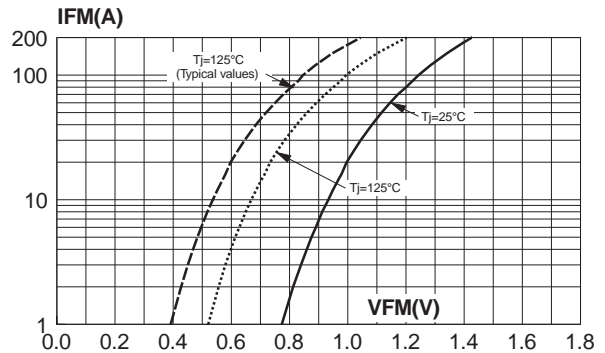
### RECOVERY CHARACTERISTICS

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	V <sub>R</sub> = 30 V			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>FP</sub>	V <sub>FR</sub> = 1.1 x V <sub>F</sub> max.					5	V
S <sub>factor</sub>	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

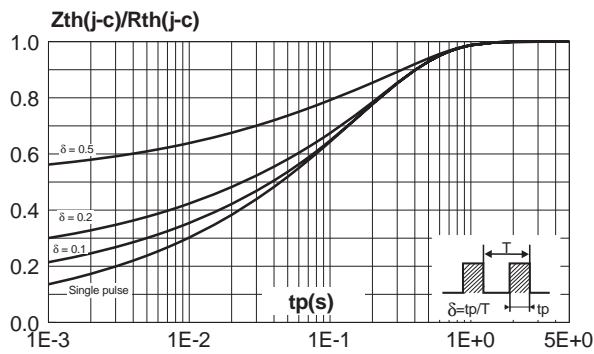
**Fig. 1:** Conduction losses versus average current (per diode).



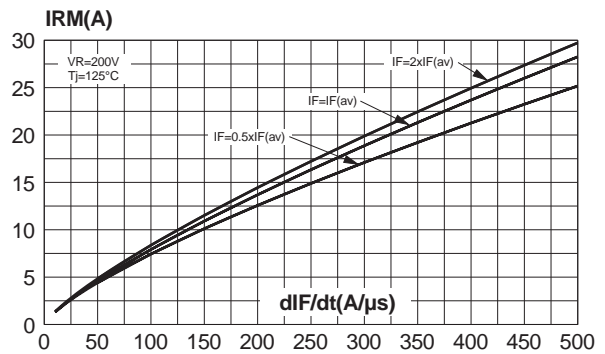
**Fig. 2:** Forward voltage drop versus forward current (Maximum values, per diode).



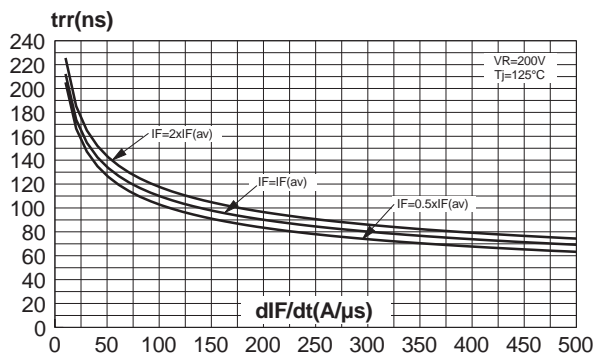
**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration.



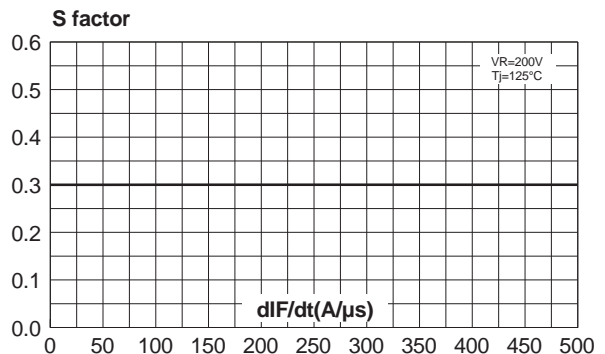
**Fig. 4:** Peak reverse recovery current versus dIF/dt (90% confidence, per diode).



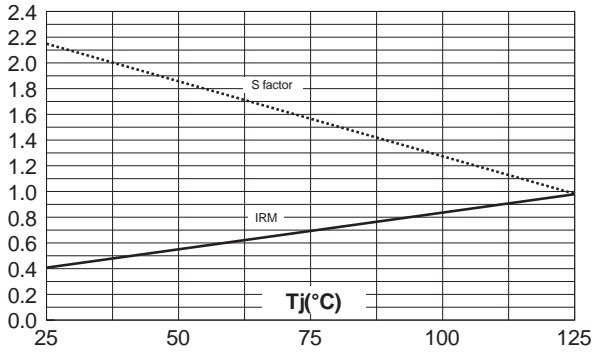
**Fig. 5:** Reverse recovery time versus dIF/dt (90% confidence, per diode).



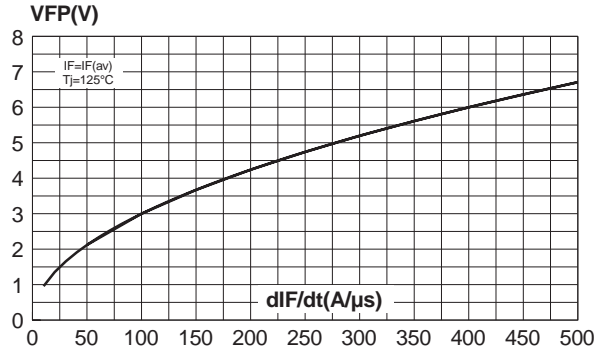
**Fig. 6:** Softness factor (tb/ta) versus dIF/dt (typical values, per diode).



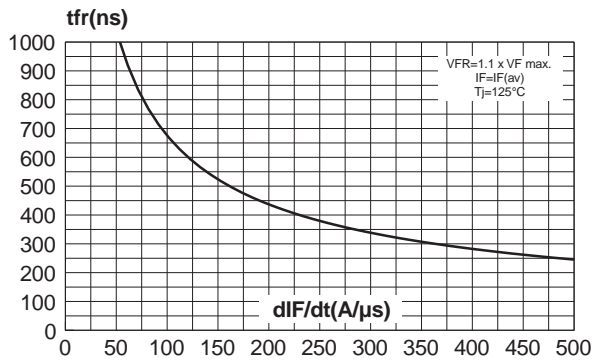
**Fig. 7:** Relative variation of dynamic parameters versus junction temperature (Reference:  $T_j=125^\circ\text{C}$ ).

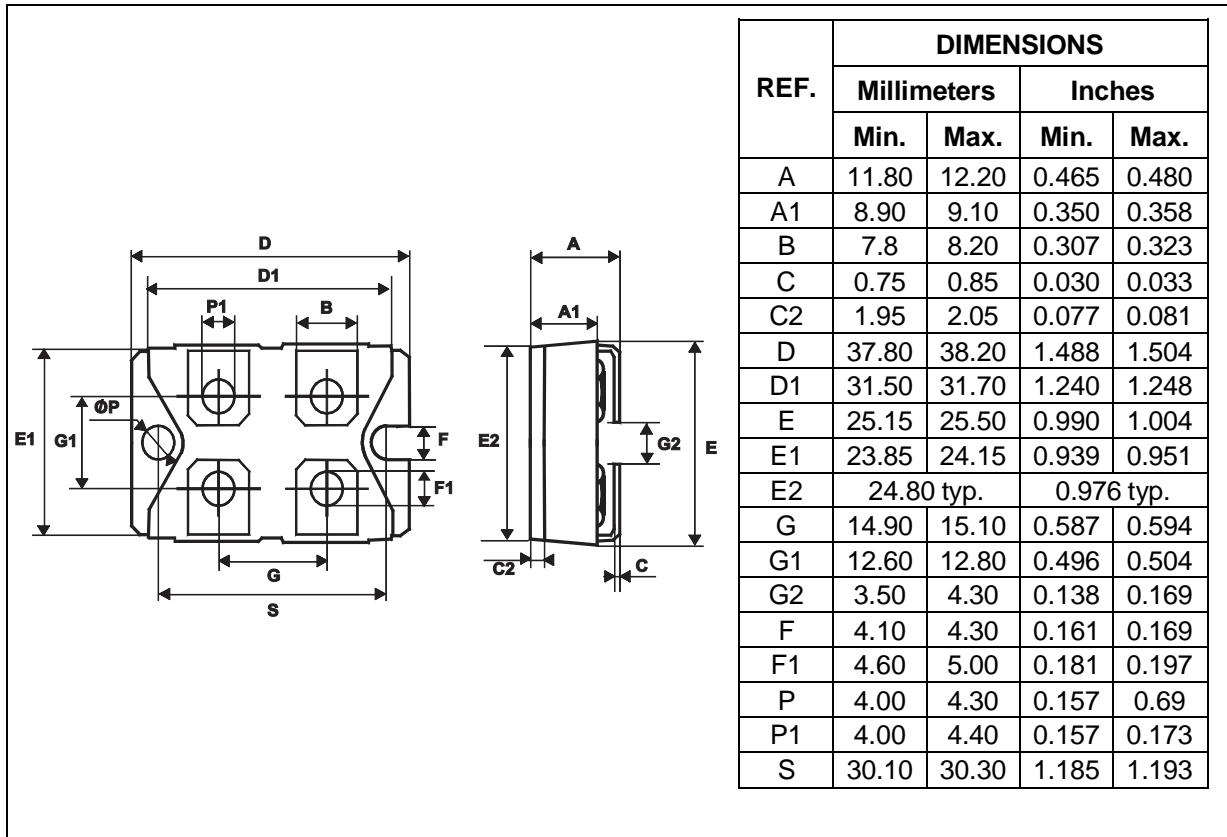


**Fig. 8:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence, per diode).



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



**PACKAGE MECHANICAL DATA**  
 ISOTOP


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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