



# STTH6003TV/CW

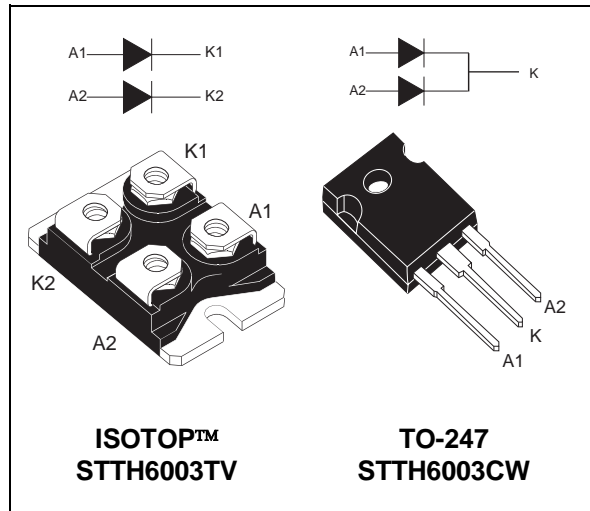
## HIGH FREQUENCY SECONDARY RECTIFIER

### MAJOR PRODUCT CHARACTERISTICS

<b>I<sub>F(AV)</sub></b>	<b>2 x 30 A</b>
<b>V<sub>RRM</sub></b>	<b>300 V</b>
<b>V<sub>F</sub> (max)</b>	<b>1 V</b>
<b>trr (max)</b>	<b>55 ns</b>

### FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND VOLTAGE PERFORMANCE
- ULTRA-FAST, SOFT AND NOISE-FREE RECOVERY
- INSULATED PACKAGE: ISOTOP  
Insulation 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 either in ISOTOP or in TO-247, 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 <sub>RRM</sub>	Repetitive peak reverse voltage			300	V	
I <sub>F(RMS)</sub>	RMS forward current		ISOTOP	100	A	
I <sub>F(RMS)</sub>	RMS forward current		TO-247	60	A	
I <sub>F(AV)</sub>	Average forward current	ISOTOP	T <sub>c</sub> = 95°C δ = 0.5	Per diode Per device	30 60	A
		TO-247	T <sub>c</sub> = 135°C δ = 0.5	Per diode Per device	30 60	A
I <sub>FSM</sub>	Surge non repetitive forward current.	ISOTOP	tp = 10 ms sinusoidal		400	A
		TO-247	tp = 10 ms sinusoidal		300	A
I <sub>RSM</sub>	Non repetitive peak reverse current	tp = 100 μs square		4	A	
T <sub>stg</sub>	Storage temperature range			ISOTOP	- 55 to + 150	°C
				TO-247	- 65 to + 175	°C
T <sub>j</sub>	Maximum operating junction temperature			ISOTOP	150	°C
				TO-247	175	°C

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### THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
R <sub>th(j-c)</sub>	Junction to case	ISOTOP	Per diode Total	1.4 0.75	°C/W
		TO-247	Per diode Total	1 0.55	
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			60	μA
			T <sub>j</sub> = 125°C		60	600	
V <sub>F</sub> **	Forward voltage drop	I <sub>F</sub> = 30 A	T <sub>j</sub> = 25°C			1.25	V
			T <sub>j</sub> = 125°C		0.85	1	

Pulse test : \* t<sub>p</sub> = 5 ms, δ < 2 %

\*\* t<sub>p</sub> = 380 μs, δ < 2%

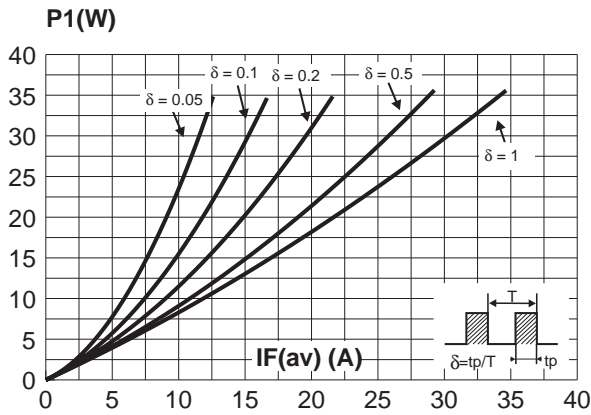
To evaluate the maximum conduction losses use the following equation:

$$P = 0.75 \times I_{F(AV)} + 0.008 \times I_{F(RMS)}^2$$

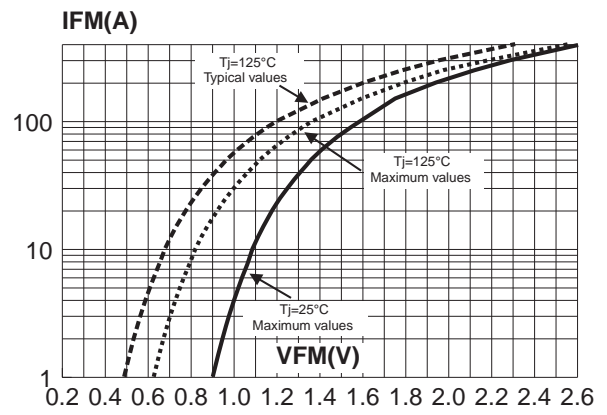
### RECOVERY CHARACTERISTICS

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> = 1 A	T <sub>j</sub> = 25°C		40	ns
	I <sub>F</sub> = 1 A	di <sub>F</sub> /dt = - 50 A/μs	V <sub>R</sub> = 30 V			55	
tfr	I <sub>F</sub> = 30 A	di <sub>F</sub> /dt = 200 A/μs		T <sub>j</sub> = 25°C		350	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> = 30 A		T <sub>j</sub> = 125°C		0.3	-
I <sub>RM</sub>	di <sub>F</sub> /dt = 200 A/μs						11

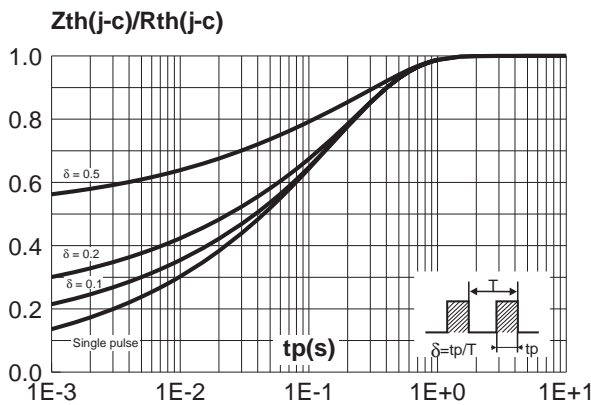
**Fig. 1:** Conduction losses versus average current (per diode).



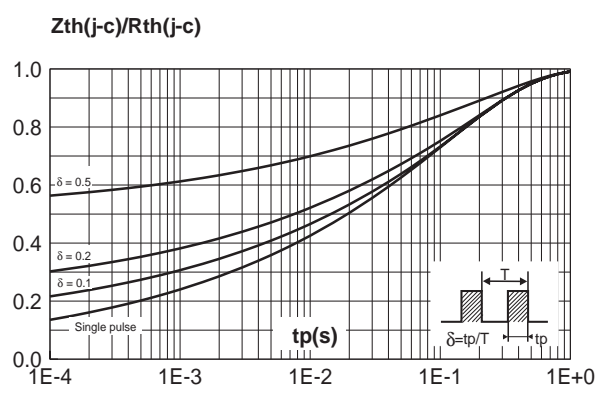
**Fig. 2:** Forward voltage drop versus forward current (maximum values, per diode).



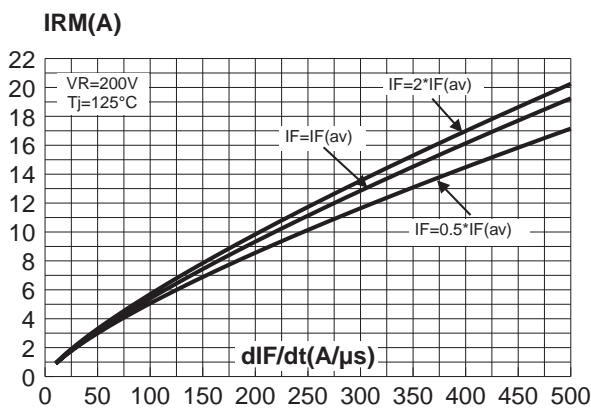
**Fig. 3a:** Relative variation of thermal impedance junction to case versus pulse duration (ISOTOP).



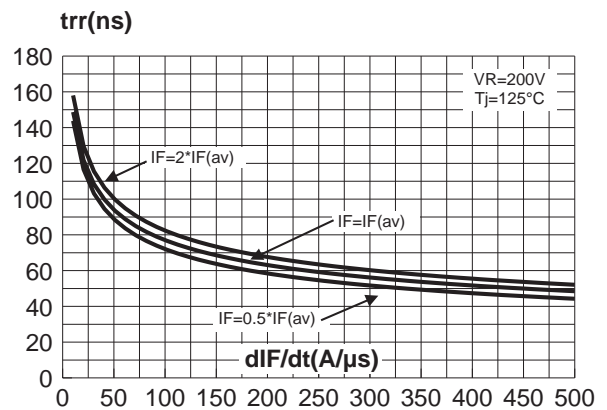
**Fig. 3b:** Relative variation of thermal impedance junction to case versus pulse duration (TO-247).



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

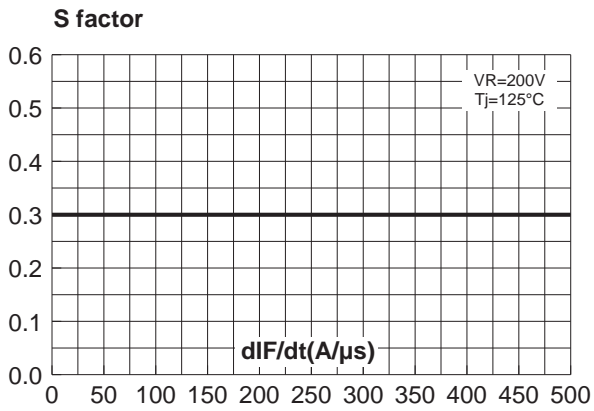


**Fig. 5:** Reverse recovery time versus  $dI_F/dt$  (90% confidence, per diode).

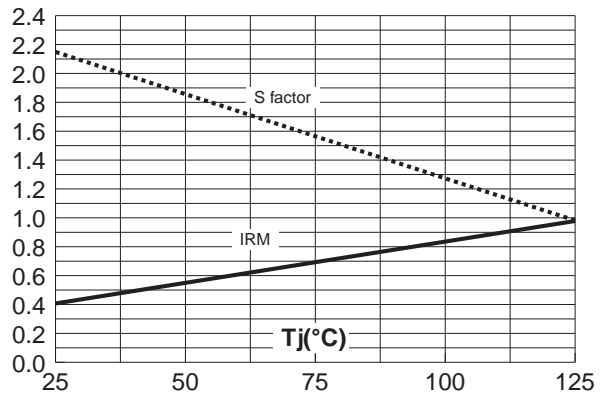


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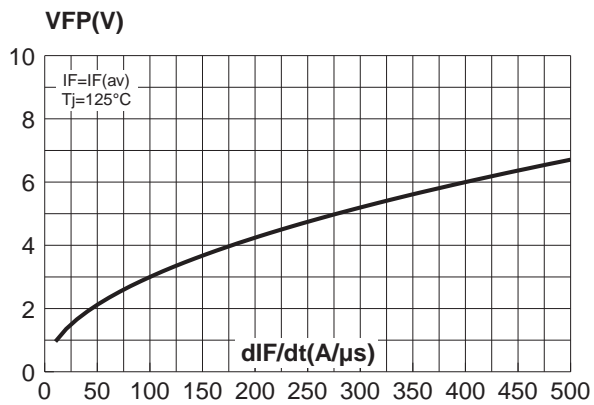
**Fig. 6:** Softness factor ( $t_b/t_a$ ) versus  $dI_F/dt$  (typical values, per diode).



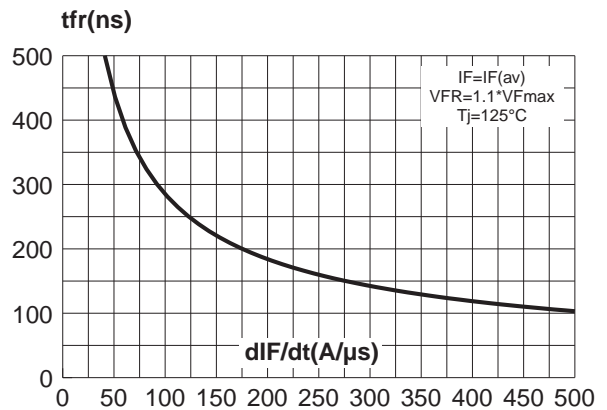
**Fig. 7:** Relative variation of dynamic parameters versus junction temperature (reference:  $T_j = 125^\circ\text{C}$ ).



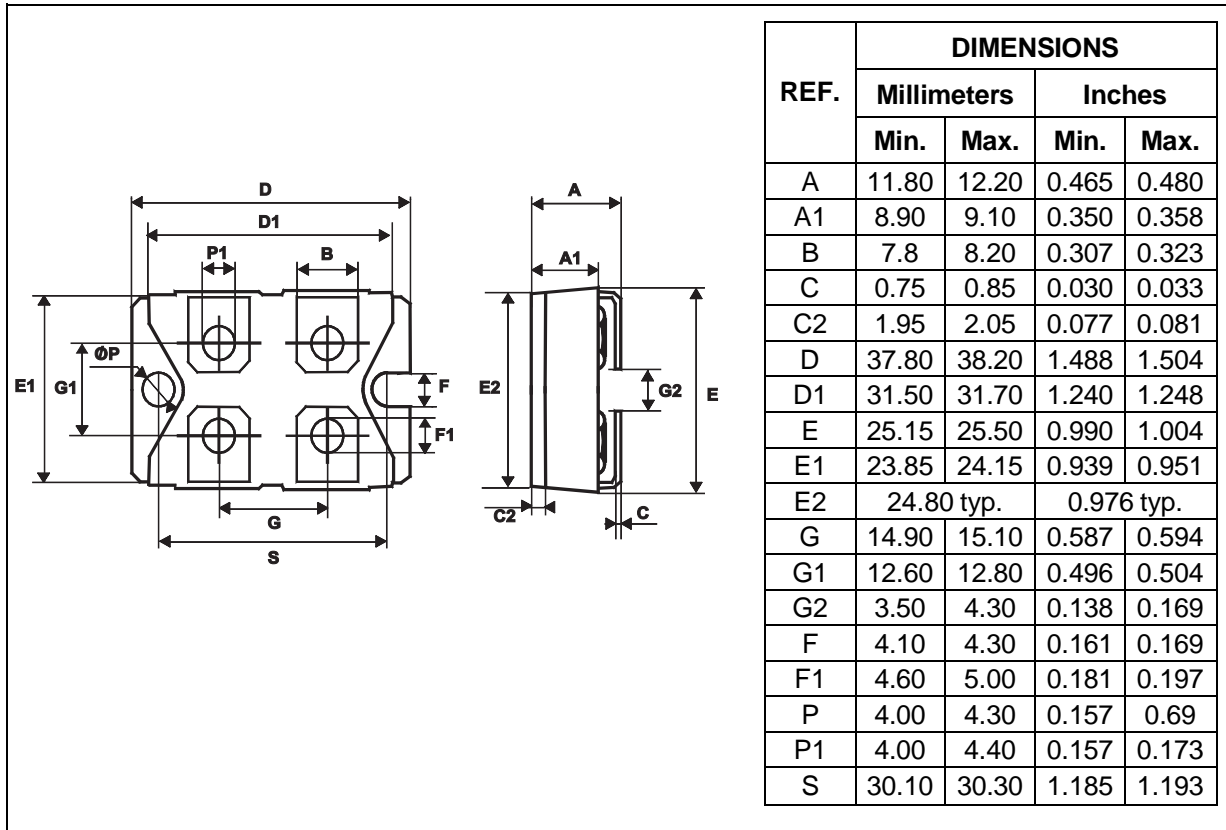
**Fig. 8:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence, per diode).



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



PACKAGE MECHANICAL DATA  
ISOTOP



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## PACKAGE MECHANICAL DATA TO-247

REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.85		5.15	0.191		0.203
D	2.20		2.60	0.086		0.102
E	0.40		0.80	0.015		0.031
F	1.00		1.40	0.039		0.055
F1		3.00			0.118	
F2		2.00			0.078	
F3	2.00		2.40	0.078		0.094
F4	3.00		3.40	0.118		0.133
G		10.90			0.429	
H	15.45		15.75	0.608		0.620
L	19.85		20.15	0.781		0.793
L1	3.70		4.30	0.145		0.169
L2		18.50			0.728	
L3	14.20		14.80	0.559		0.582
L4		34.60			1.362	
L5		5.50			0.216	
M	2.00		3.00	0.078		0.118
V		5°			5°	
V2		60°			60°	
Dia.	3.55		3.65	0.139		0.143

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH6006TV1	STTH6006TV	ISOTOP	27g without screws	10 with screws	Tube
STTH6006CW	STTH6006CW	TO-247	4.36g	30	Tube

- Cooling method: by conduction (C)
- Recommended torque value (ISOTOP): 1.3 N.m.
- Recommended torque value (TO-247°): 0.8 N.m.
- Maximum torque value (ISOTOP): 1.5 N.m.
- Maximum torque value (TO-247): 1.0 N.m.
- Epoxy meets UL 94, V0

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