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# STTH6003TV/CW

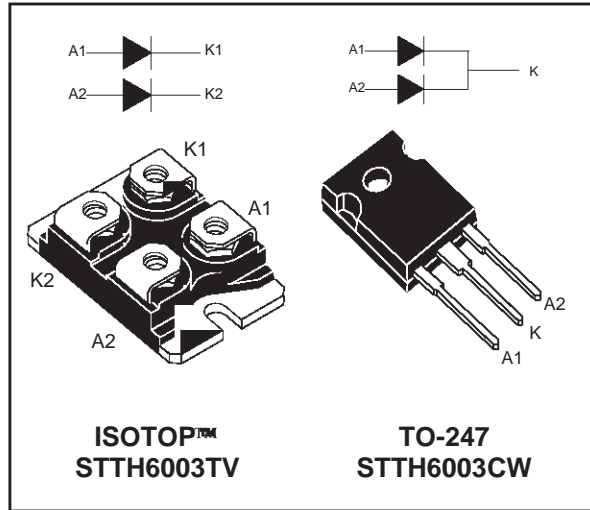
## HIGH FREQUENCY SECONDARY RECTIFIER

### MAJOR PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 30 A
$V_{RRM}$	300 V
$V_F(max)$	1 V
$t_{rr}(max)$	55 ns

### 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	
$V_{RRM}$	Repetitive peak reverse voltage			300	V	
$I_{F(RMS)}$	RMS forward current		ISOTOP	100	A	
$I_{F(RMS)}$	RMS forward current		TO-247	60	A	
$I_{F(AV)}$	Average forward current	ISOTOP	$T_c = 95^\circ\text{C}$ $\delta = 0.5$	Per diode Per device	30 60	A
		TO-247	$T_c = 135^\circ\text{C}$ $\delta = 0.5$	Per diode Per device	30 60	A
$I_{FSM}$	Surge non repetitive forward current.	ISOTOP	$t_p = 10$ ms sinusoidal		400	A
		TO-247	$t_p = 10$ ms sinusoidal		300	A
$I_{RSM}$	Non repetitive peak reverse current		$t_p = 100$ $\mu\text{s}$ square	4	A	
$T_{stg}$	Storage temperature range			ISOTOP	- 55 to + 150	$^\circ\text{C}$
				TO-247	- 65 to + 175	$^\circ\text{C}$
$T_j$	Maximum operating junction temperature			ISOTOP	150	$^\circ\text{C}$
				TO-247	175	$^\circ\text{C}$

**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%

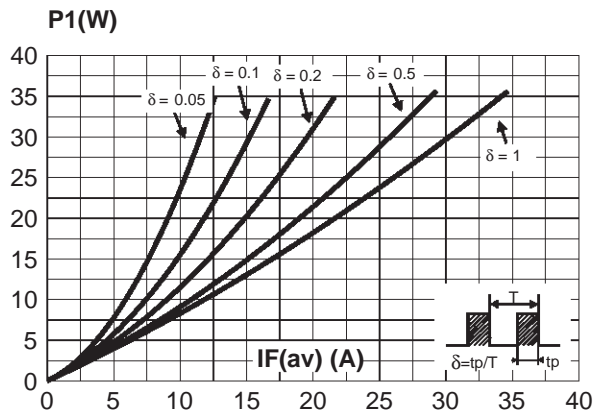
To evaluate the maximum conduction losses use the following equation:

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

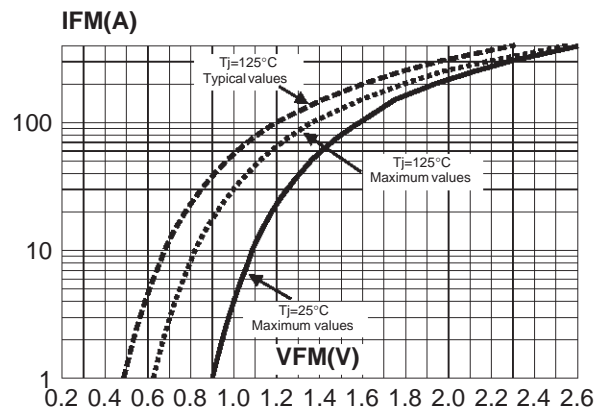
**RECOVERY CHARACTERISTICS**

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

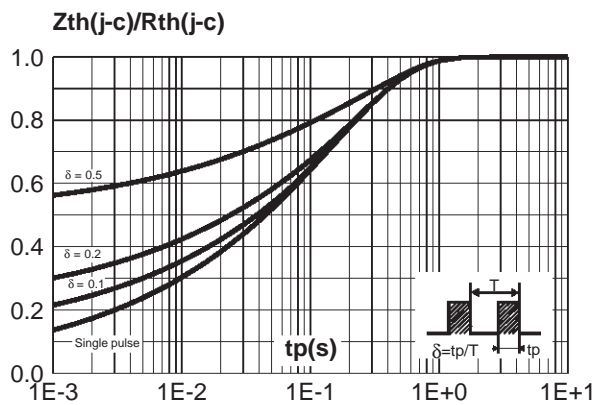
**Fig. 1:** Conduction losses versus average current (per diode).



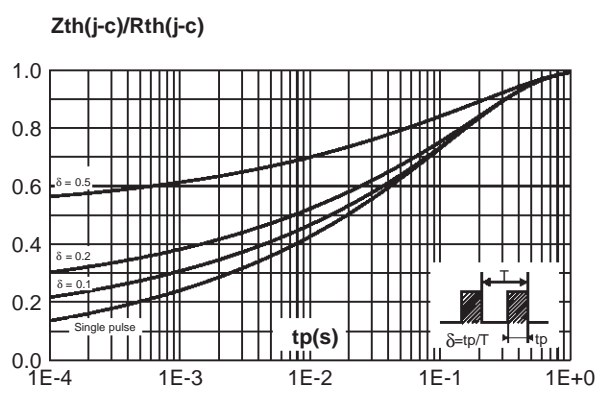
**Fig. 2:** Forward voltage drop versus forward current (maximum values, per diode).



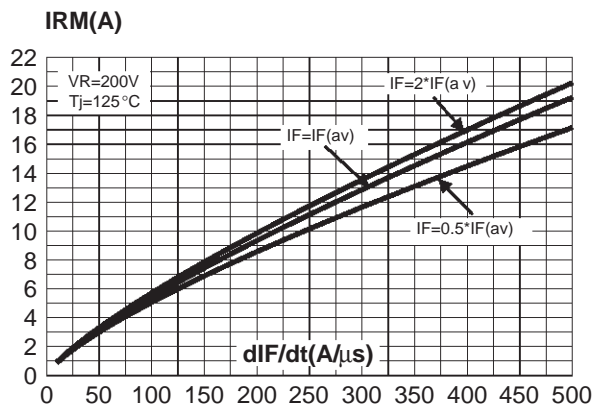
**Fig. 3a:** Relative variation of thermal impedance junction to case versus pulse duration (ISOTOP).



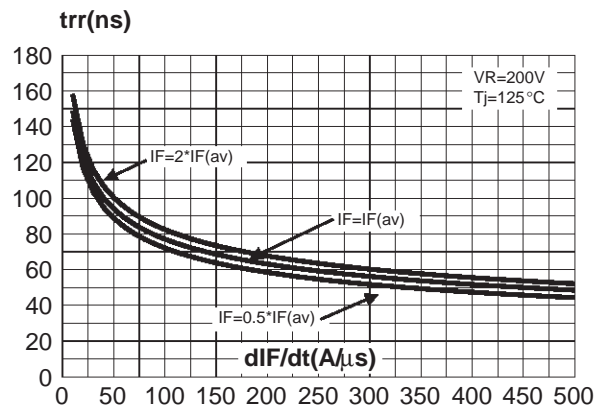
**Fig. 3b:** Relative variation of thermal impedance junction to case versus pulse duration (TO-247).



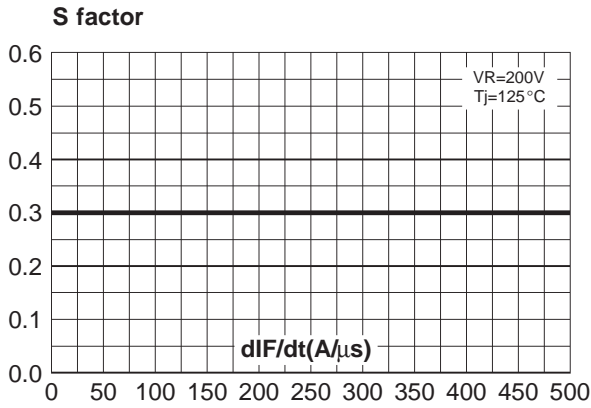
**Fig. 4:** Peak reverse recovery current versus dIF/dt (90% confidence, per diode).



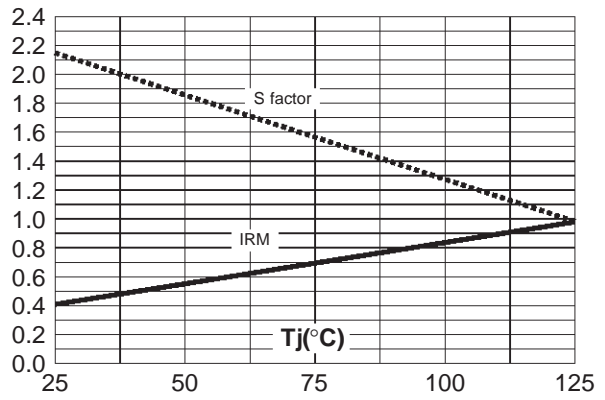
**Fig. 5:** Reverse recovery time versus dIF/dt (90% confidence, per diode).



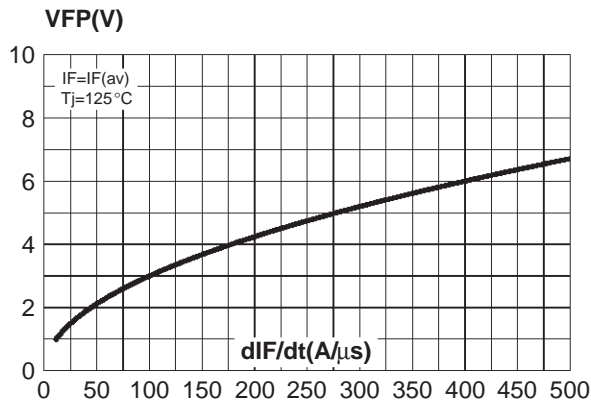
**Fig. 6:** Softness factor ( $t_b/t_a$ ) versus  $dI_F/dt$  (typical values, per diode).



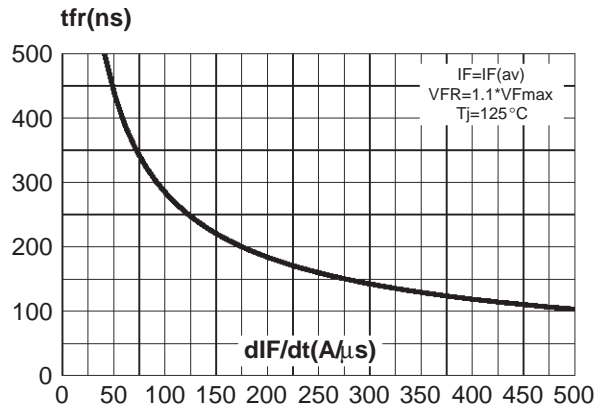
**Fig. 7:** Relative variation of dynamic parameters versus junction temperature (reference: T<sub>j</sub> = 125°C).



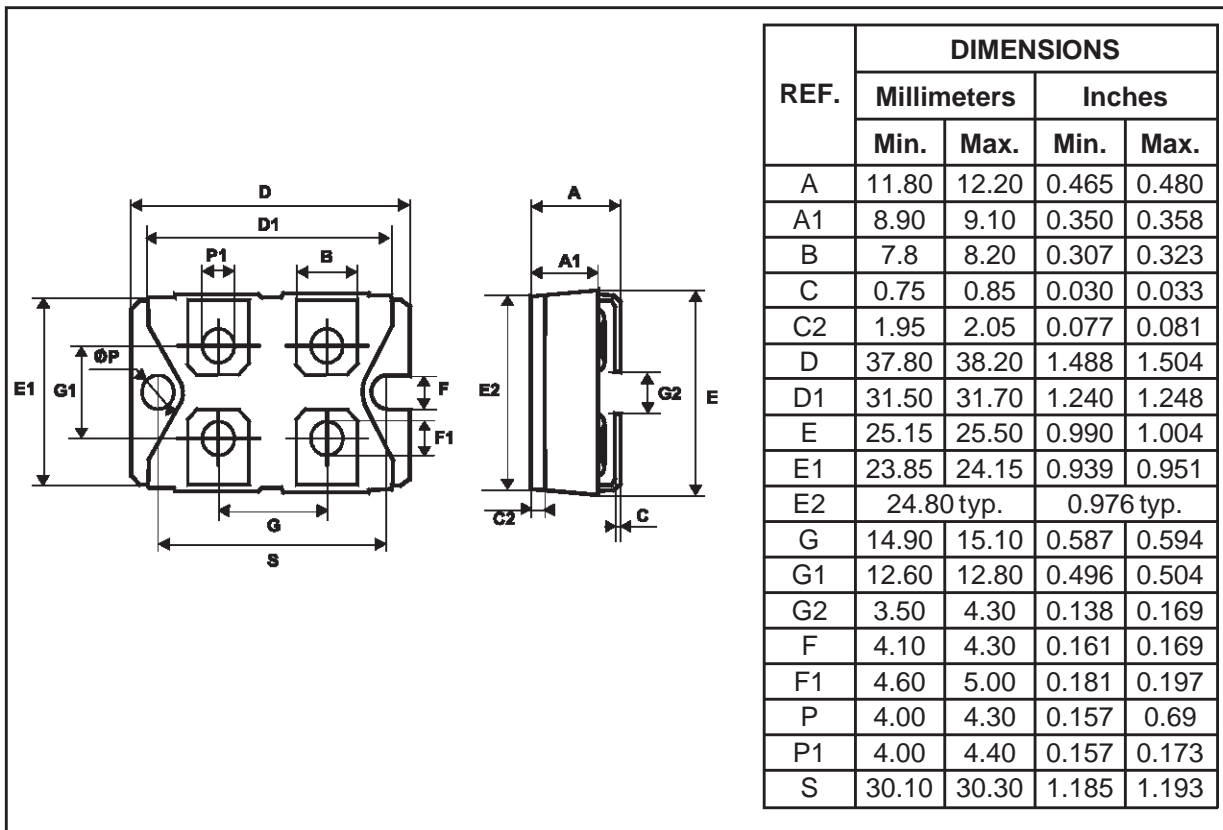
**Fig. 8:** Transient peak forward voltage versus  $dI_F/dt$  (90% confidence, per diode).



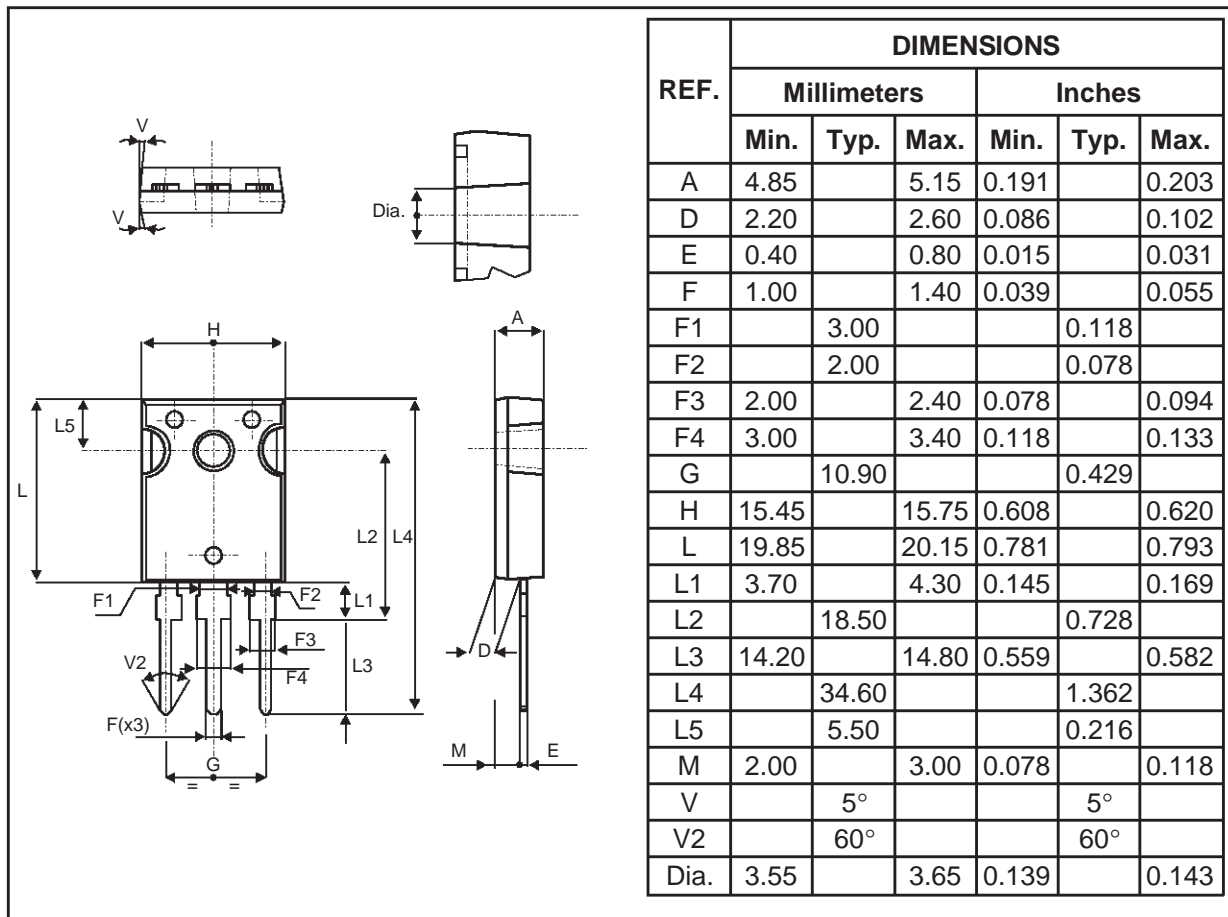
**Fig. 9:** Forward recovery time versus  $dI_F/dt$  (90% confidence, per diode).



PACKAGE MECHANICAL DATA  
ISOTOP



**PACKAGE MECHANICAL DATA**  
TO-247



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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