



# STTH6003TV/CW

## HIGH FREQUENCY SECONDARY RECTIFIER

### MAJOR PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 30 A
$V_{RRM}$	300 V
$T_j$ (max)	175 °C
$V_F$ (max)	1 V
$t_{rr}$ (max)	55 ns

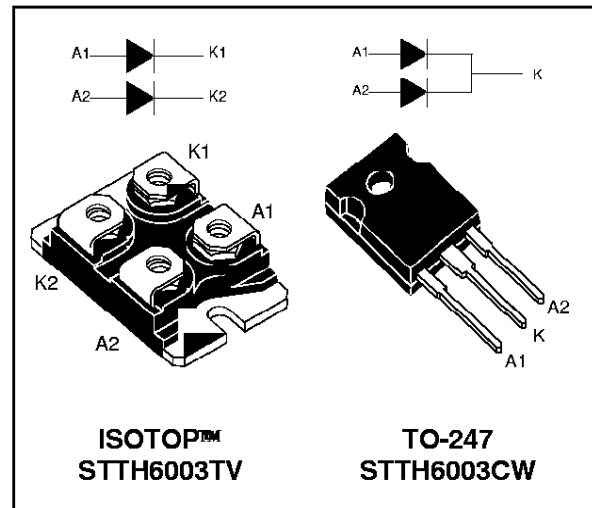
### FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND VOLTAGE PERFORMANCE
- ULTRAFAST, SOFT AND NOISE-FREE RECOVERY FOR LOW SIDE EFFECTS
- ISOLATED PACKAGE: 2500 V<sub>RMS</sub> (UL APPROVAL PENDING DEVICES)
- 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 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	°C	
		TO-247		- 65 to + 175	°C	
$T_j$	Maximum operating junction temperature	ISOTOP		150	°C	
		TO-247		175	°C	

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### THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case	ISOTOP	Per diode Total	1.4 0.75	$^{\circ}\text{C}/\text{W}$
		TO-247	Per diode Total	1 0.55	
$R_{th(c)}$			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	$V_R = 300\text{ V}$	$T_j = 25^{\circ}\text{C}$			60	$\mu\text{A}$
			$T_j = 125^{\circ}\text{C}$		60	600	
$V_F^{**}$	Forward voltage drop	$I_F = 30\text{ A}$	$T_j = 25^{\circ}\text{C}$			1.25	V
			$T_j = 125^{\circ}\text{C}$		0.85	1	

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

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

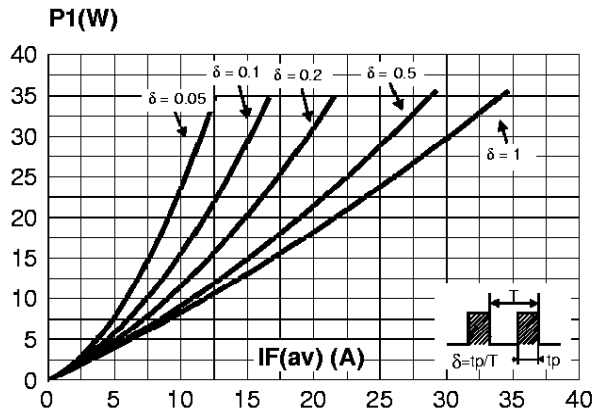
To evaluate the maximum conduction losses use the following equation:

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

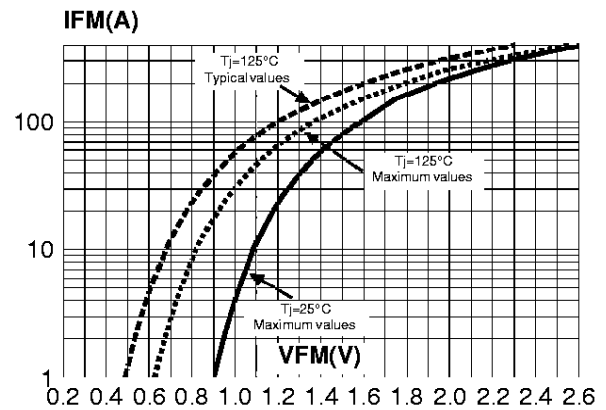
### RECOVERY CHARACTERISTICS

Symbol	Tests conditions			Min.	Typ.	Max.	Unit
trr	$I_F = 0.5\text{ A}$	$I_{rr} = 0.25\text{ A}$	$I_R = 1\text{ A}$	$T_j = 25^{\circ}\text{C}$		40	ns
	$I_F = 1\text{ A}$	$dI_F/dt = -50\text{ A}/\mu\text{s}$	$V_R = 30\text{ V}$			55	
tfr	$I_F = 30\text{ A}$	$dI_F/dt = 200\text{ A}/\mu\text{s}$		$T_j = 25^{\circ}\text{C}$		350	ns
$V_{FP}$	$V_{FR} = 1.1 \times V_F \text{ max.}$					5	V
$S_{factor}$	$V_{CC} = 200\text{ V}$	$I_F = 30\text{ A}$		$T_j = 125^{\circ}\text{C}$	0.3		-
$I_{RM}$	$dI_F/dt = 200\text{ A}/\mu\text{s}$						11

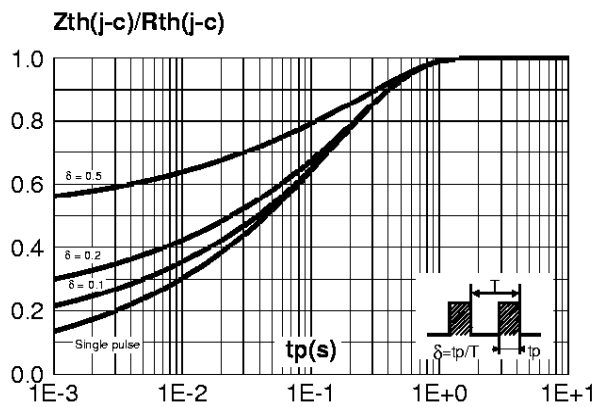
**Fig. 1:** Conduction losses versus average current (per diode).



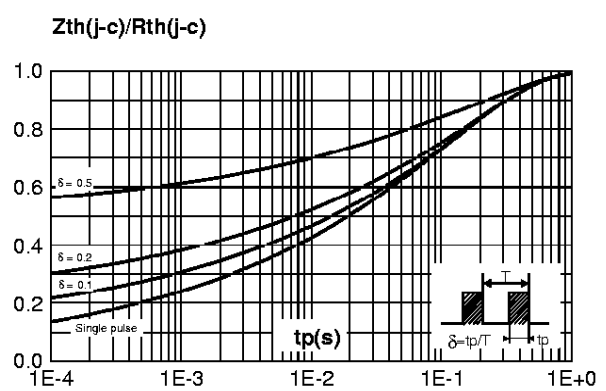
**Fig. 2:** Forward voltage drop versus forward current (maximum values, per diode).



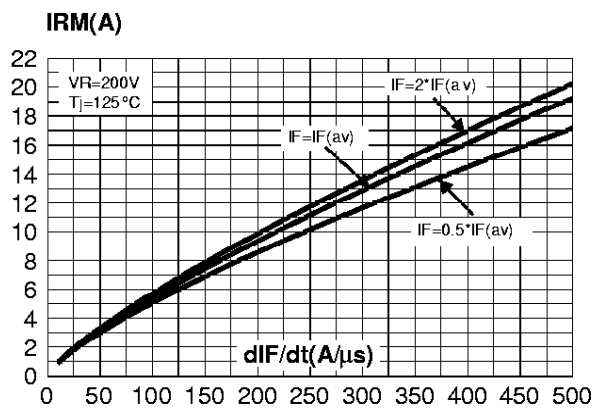
**Fig. 3a:** Relative variation of thermal impedance junction to case versus pulse duration (ISOTOP).



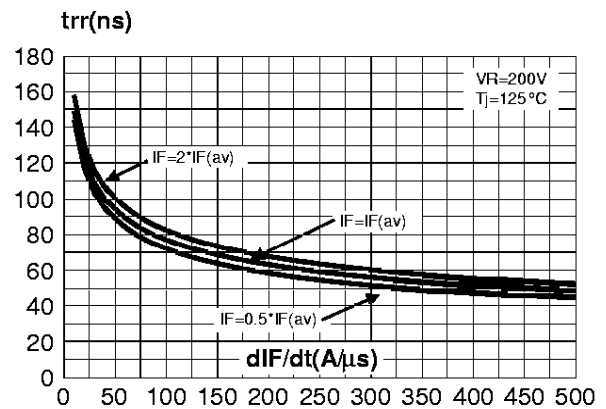
**Fig. 3b:** Relative variation of thermal impedance junction to case versus pulse duration (TO-247).



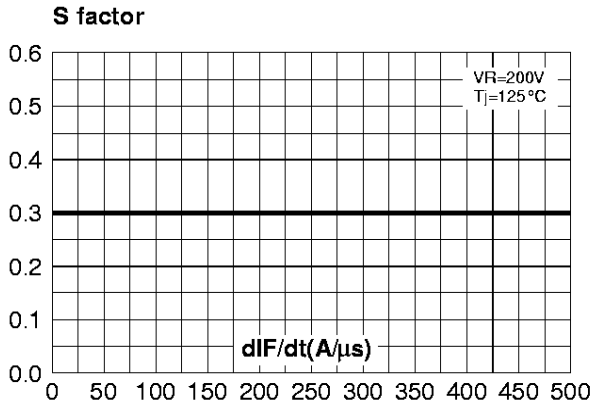
**Fig. 4:** Peak reverse recovery current versus dIF/dt (90% confidence, per diode).



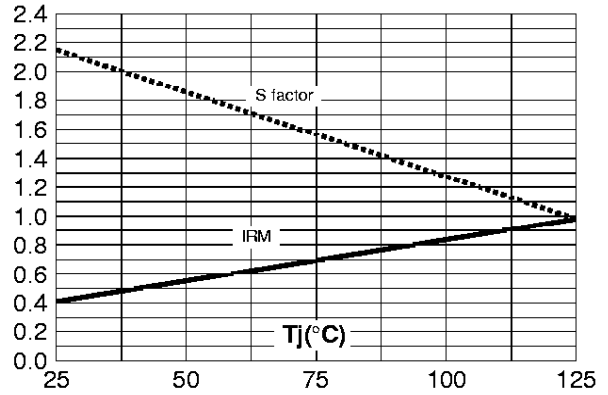
**Fig. 5:** Reverse recovery time versus dIF/dt (90% confidence, per diode).



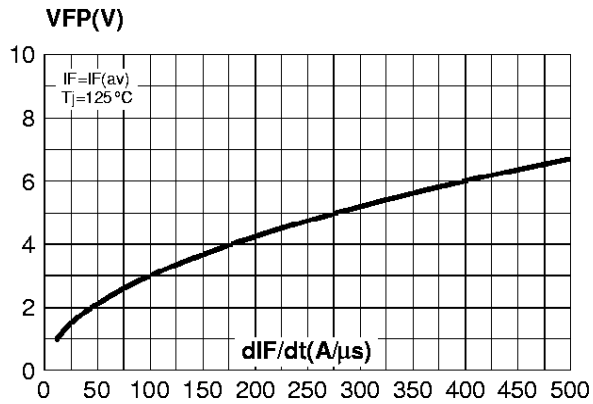
**Fig. 6:** Softness factor (tb/ta) versus dIF/dt (typical values, per diode).



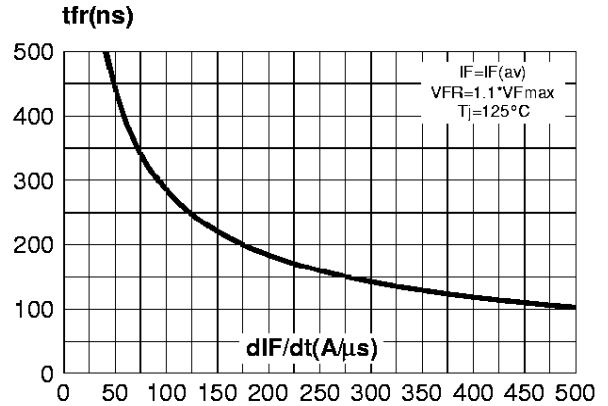
**Fig. 7:** Relative variation of dynamic parameters versus junction temperature (reference: Tj = 125°C).



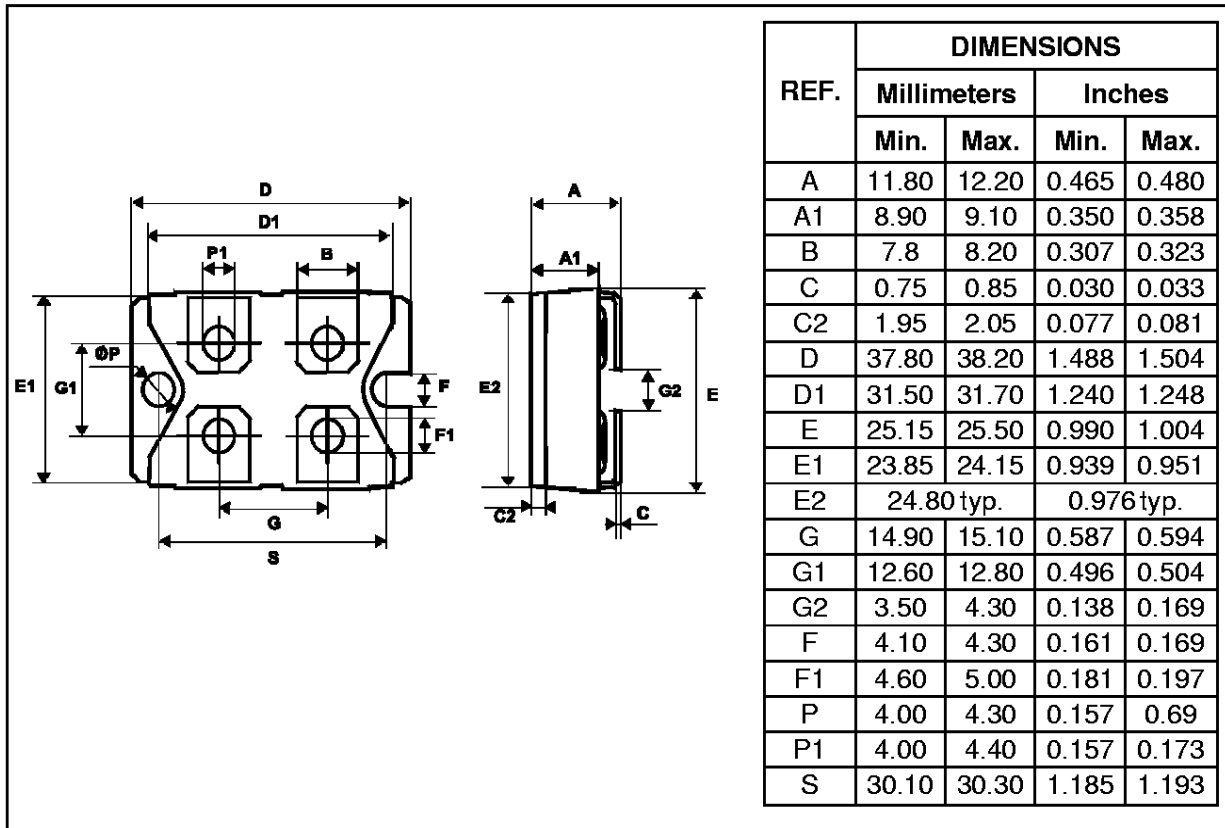
**Fig. 8:** Transient peak forward voltage versus dIF/dt (90% confidence, per diode).



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



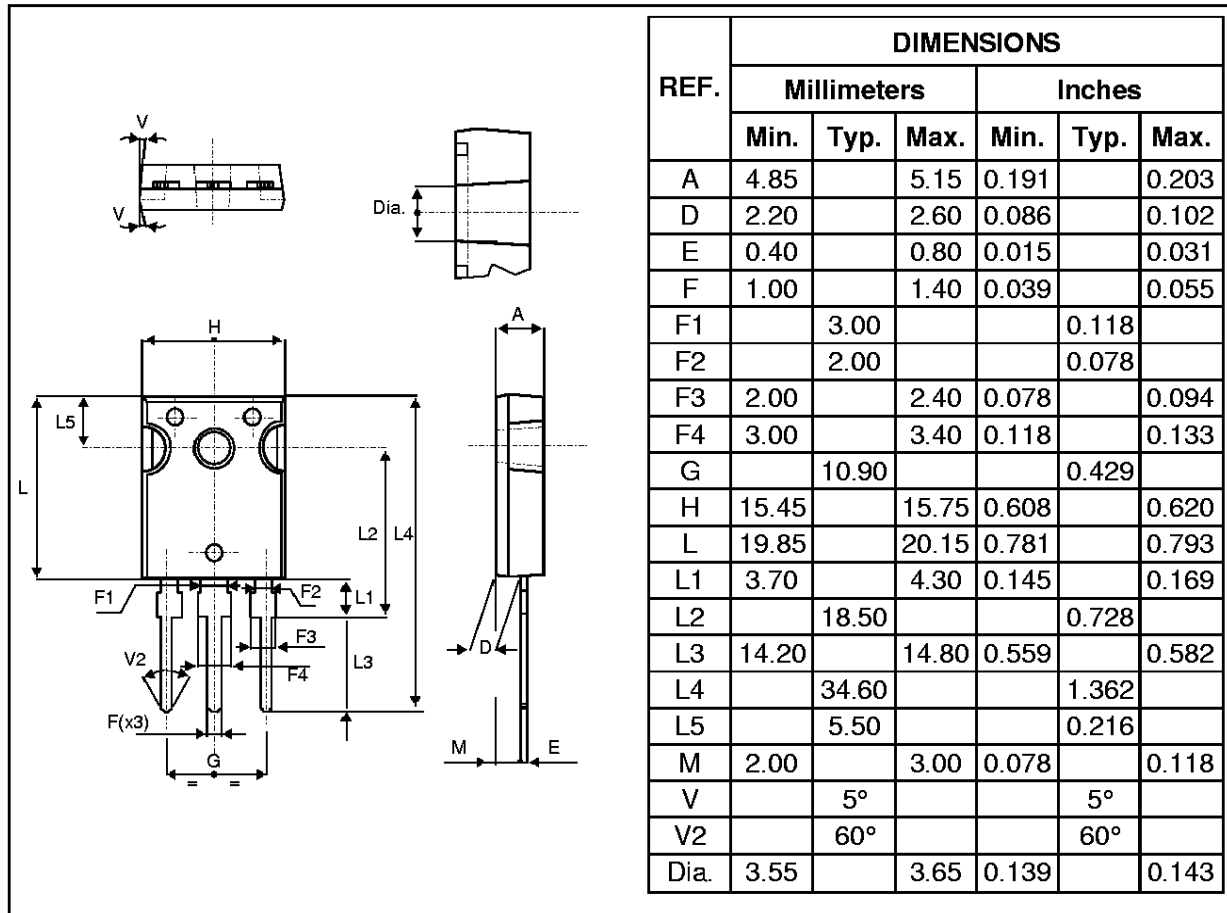
**PACKAGE MECHANICAL DATA**  
ISOTOP



- Cooling method: by conduction (C)
- Recommended torque value : 1.3 N.m.
- Maximum torque value : 1.5 N.m.

# STTH6003TV/CW

## PACKAGE MECHANICAL DATA TO-247



- Cooling method : by conduction (C)
- Recommended torque value : 0.8m.N
- Maximum torque value : 1.0m.N

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	50	Tube

- Epoxy meets UL 94, V0

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