

## HIGH EFFICIENCY ULTRAFAST DIODE

### MAIN PRODUCT CHARACTERISTICS

<b>I<sub>F(AV)</sub></b>	<b>2 x 30 A</b>
<b>V<sub>RRM</sub></b>	<b>200 V</b>
<b>T<sub>j</sub> (max)</b>	<b>175 °C</b>
<b>V<sub>F</sub> (typ)</b>	<b>0.75 V</b>
<b>t<sub>rr</sub> (typ)</b>	<b>22 ns</b>

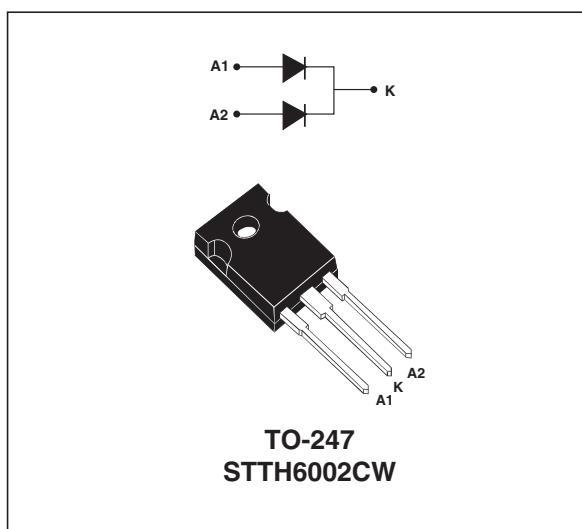
### FEATURES AND BENEFITS

- Suited for SMPS
- Low losses
- Low forward and reverse recovery times
- High surge current capability
- High junction temperature
- Low leakage current

### DESCRIPTION

Dual center tap rectifier suited for Switch Mode Power Supplies and High frequency DC to DC converters.

Packaged in TO-247, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



### ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter		Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage		200	V
I <sub>F(RMS)</sub>	RMS forward current		50	A
I <sub>F(AV)</sub>	Average forward current $\delta = 0.5$	T <sub>c</sub> = 140°C Per diode	30	A
		T <sub>c</sub> = 125°C Per device	60	
I <sub>FSM</sub>	Surge non repetitive forward current	tp = 10 ms Sinusoidal	330	A
T <sub>stg</sub>	Storage temperature range		- 65 + 175	°C
T <sub>j</sub>	Maximum operating junction temperature		175	°C

## STTH6002C

### THERMAL PARAMETERS

Symbol	Parameter		Maximum	Unit
R <sub>th(j-c)</sub>	Junction to case	Per diode	1.2	°C/W
		Per device	0.8	
R <sub>th(j-c)</sub>	Coupling		0.4	°C/W

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j (\text{diode1}) = P(\text{diode1}) \times R_{th(j-c)} (\text{per diode}) + P(\text{diode2}) \times R_{th(c)}$$

### STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> *	Reverse leakage current	T <sub>j</sub> = 25°C	V <sub>R</sub> = V <sub>RRM</sub>			30	μA
		T <sub>j</sub> = 125°C			30	300	
V <sub>F</sub> **	Forward voltage drop	T <sub>j</sub> = 25°C	I <sub>F</sub> = 30 A			1.05	V
		T <sub>j</sub> = 25°C	I <sub>F</sub> = 60 A			1.18	
		T <sub>j</sub> = 150°C	I <sub>F</sub> = 30 A		0.75	0.84	
		T <sub>j</sub> = 150°C	I <sub>F</sub> = 60 A			0.99	

Pulse test: \* tp = 5ms, δ < 2%

\*\* tp = 380μs, δ < 2%

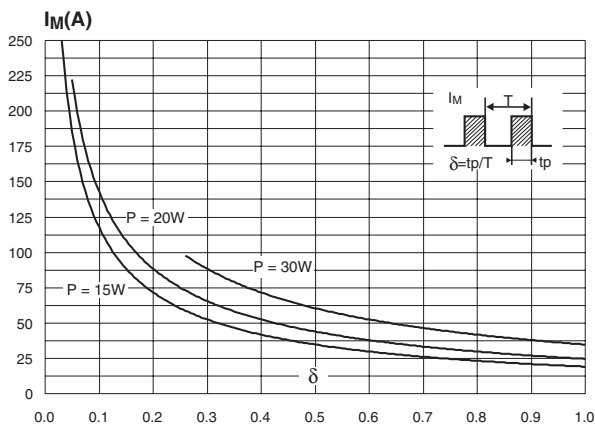
To evaluate the maximum conduction losses use the following equation :

$$P = 0.69 \times I_{F(AV)} + 0.005 I_{F(RMS)}^2$$

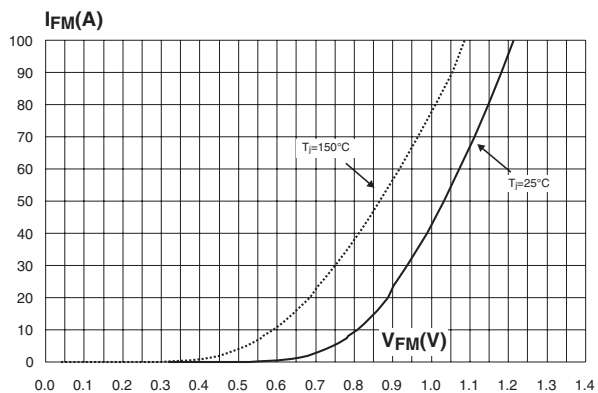
### DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
t <sub>rr</sub>	Reverse recovery time	T <sub>j</sub> = 25°C	I <sub>F</sub> = 1 A V <sub>R</sub> = 30V dI <sub>F</sub> /dt = 200 A/μs		22	27	ns
I <sub>RM</sub>	Reverse recovery current	T <sub>j</sub> = 125°C	I <sub>F</sub> = 30 A V <sub>R</sub> = 160V dI <sub>F</sub> /dt = 200 A/μs		6.3	8.2	A
t <sub>fr</sub>	Forward recovery time	T <sub>j</sub> = 25°C	I <sub>F</sub> = 30 A dI <sub>F</sub> /dt = 200 A/μs V <sub>FR</sub> = 1.1 x V <sub>Fmax</sub>			220	ns
V <sub>FP</sub>	Forward recovery voltage	T <sub>j</sub> = 25°C	I <sub>F</sub> = 30 A dI <sub>F</sub> /dt = 200 A/μs		2.5		V

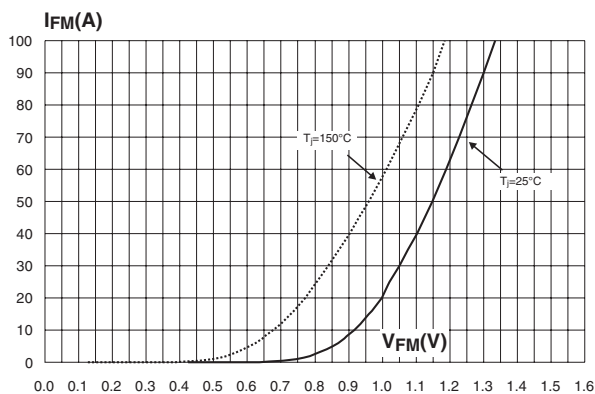
**Fig. 1:** Peak current versus duty cycle (per diode).



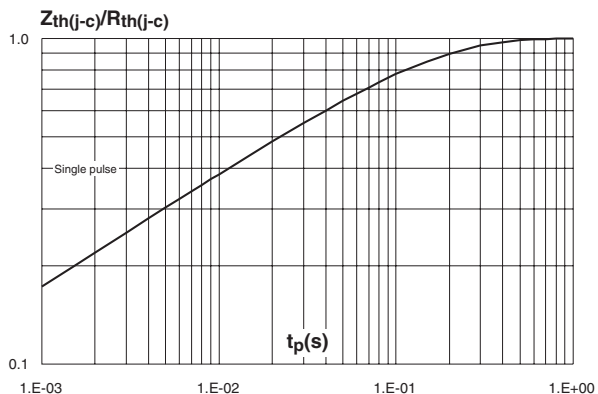
**Fig. 2-1:** Forward voltage drop versus forward current (typical values, per diode).



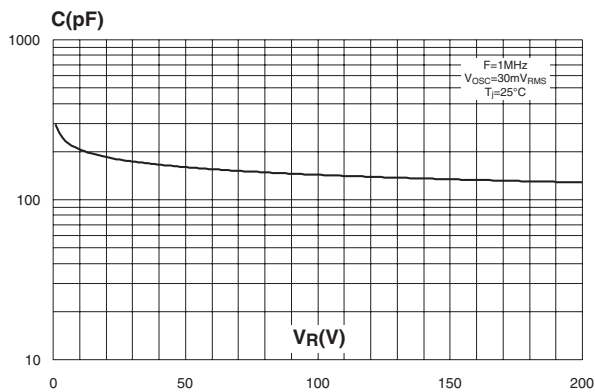
**Fig. 2-2:** Forward voltage drop versus forward current (maximum values, per diode).



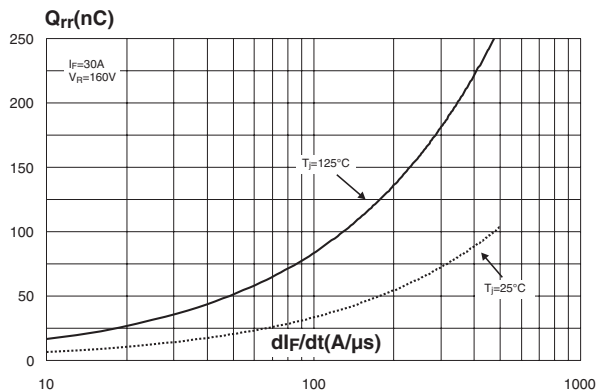
**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse duration.



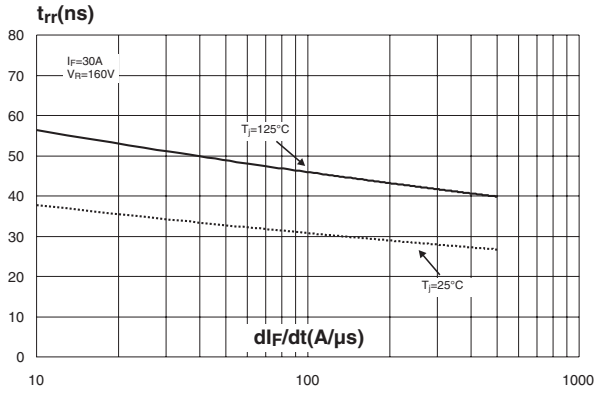
**Fig. 4:** Junction capacitance versus reverse voltage applied (typical values, per diode).



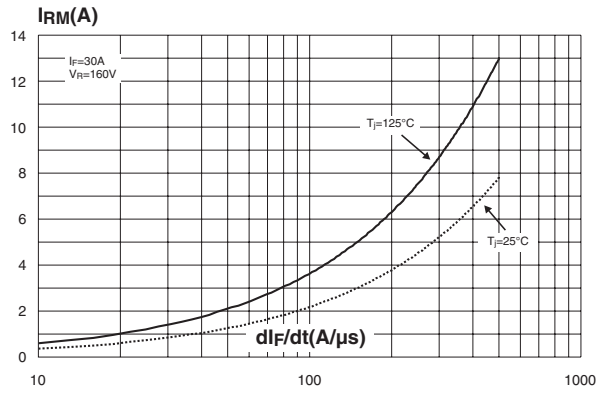
**Fig. 5:** Reverse recovery charges versus  $di_F/dt$  (typical values, per diode).



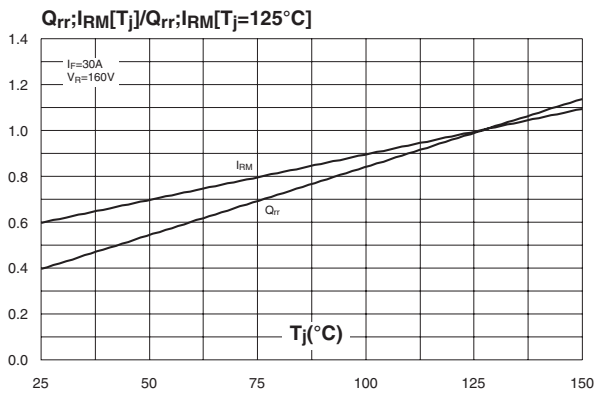
**Fig. 6:** Reverse recovery time versus  $di_F/dt$  (typical values, per diode).

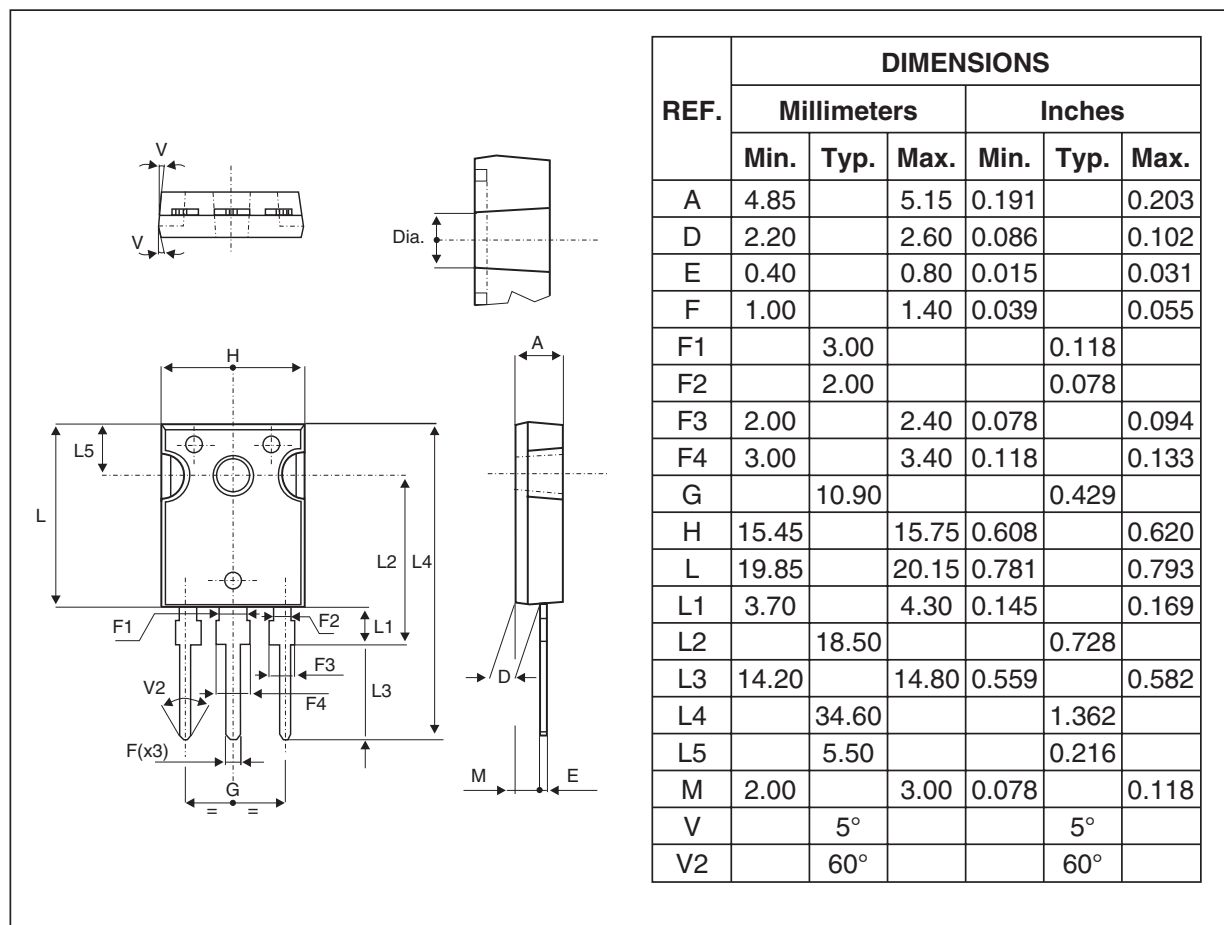


**Fig. 7:** Peak reverse recovery current versus  $di_F/dt$  (typical values, per diode).



**Fig. 8:** Dynamic parameters versus junction temperature.



**PACKAGE MECHANICAL DATA**  
 TO-247


Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH6002CW	STTH6002CW	TO-247	4.46 g	30	Tube

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