

HIGH EFFICIENCY ULTRAFAST DIODE

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 30 A
V_{RRM}	200 V
T_j (max)	175 °C
V_F (typ)	0.75 V
t_{rr} (typ)	22 ns

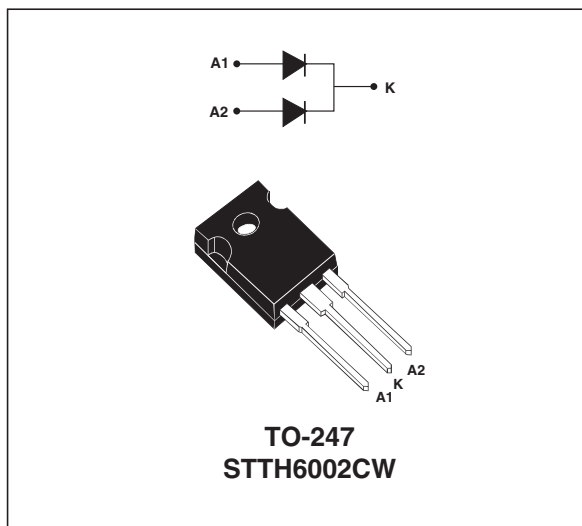
FEATURES AND BENEFITS

- 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 _{RRM}	Repetitive peak reverse voltage			200	V
I _{F(RMS)}	RMS forward current			50	A
I _{F(AV)}	Average forward current δ =0.5	T _c = 140°C	Per diode	30	A
		T _c = 125°C	Per device	60	
I _{FSM}	Surge non repetitive forward current	tp = 10 ms Sinusoidal		330	A
T _{stg}	Storage temperature range			- 65 + 175	°C
T _j	Maximum operating junction temperature			175	°C

STTH6002C

THERMAL PARAMETERS

Symbol	Parameter		Maximum	Unit
$R_{th(j-c)}$	Junction to case	Per diode	1.2	$^{\circ}\text{C/W}$
		Per device	0.8	
$R_{th(j-c)}$	Coupling		0.4	$^{\circ}\text{C/W}$

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_R^*	Reverse leakage current	$T_j = 25^{\circ}\text{C}$	$V_R = V_{RRM}$			30	μA
		$T_j = 125^{\circ}\text{C}$			30	300	
V_F^{**}	Forward voltage drop	$T_j = 25^{\circ}\text{C}$	$I_F = 30\text{ A}$			1.05	V
		$T_j = 25^{\circ}\text{C}$	$I_F = 60\text{ A}$			1.18	
		$T_j = 150^{\circ}\text{C}$	$I_F = 30\text{ A}$		0.75	0.84	
		$T_j = 150^{\circ}\text{C}$	$I_F = 60\text{ A}$			0.99	

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

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

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_{rr}	Reverse recovery time	$T_j = 25^{\circ}\text{C}$	$I_F = 1\text{ A}$ $V_R = 30\text{V}$ $di_F/dt = 200\text{ A}/\mu\text{s}$		22	27	ns
I_{RM}	Reverse recovery current	$T_j = 125^{\circ}\text{C}$	$I_F = 30\text{ A}$ $V_R = 160\text{V}$ $di_F/dt = 200\text{ A}/\mu\text{s}$		6.3	8.2	A
t_{fr}	Forward recovery time	$T_j = 25^{\circ}\text{C}$	$I_F = 30\text{ A}$ $di_F/dt = 200\text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$			220	ns
V_{FP}	Forward recovery voltage	$T_j = 25^{\circ}\text{C}$	$I_F = 30\text{ A}$ $di_F/dt = 200\text{ A}/\mu\text{s}$		2.5		V

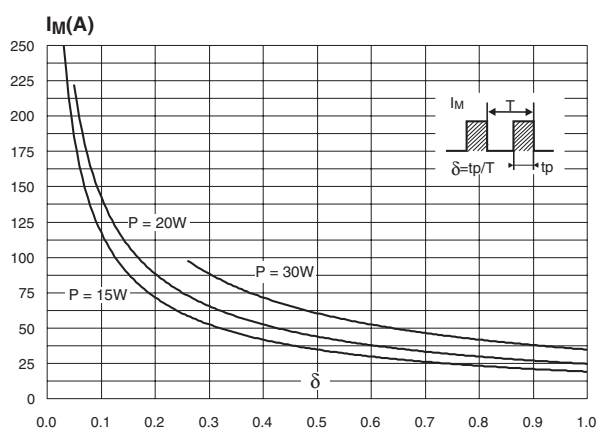
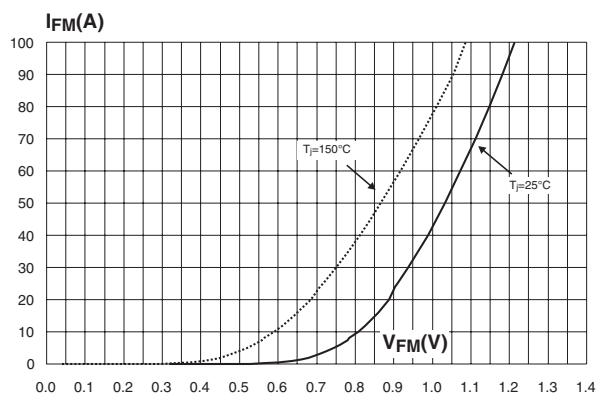
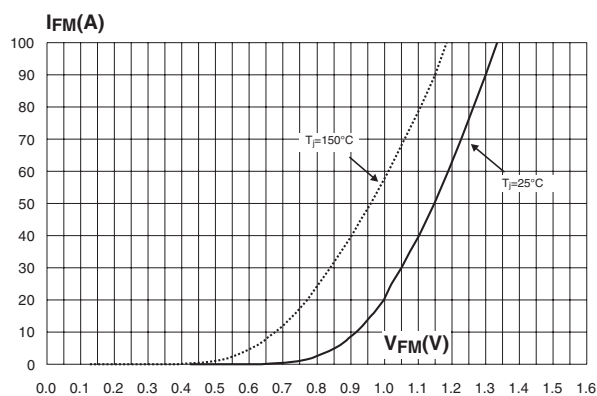
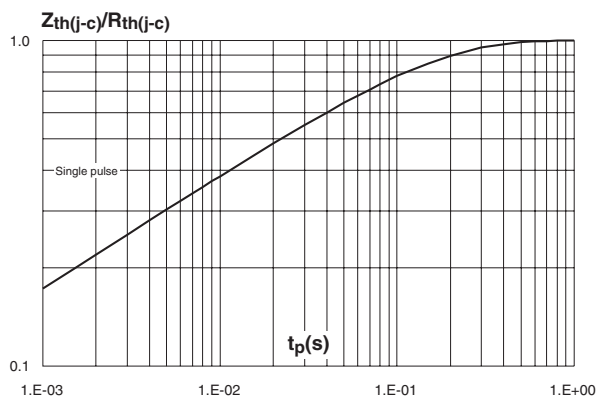
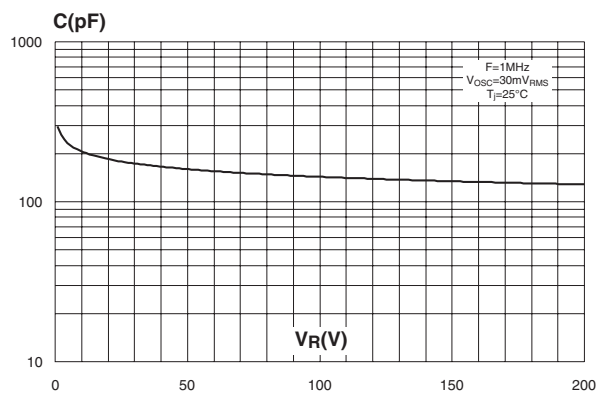
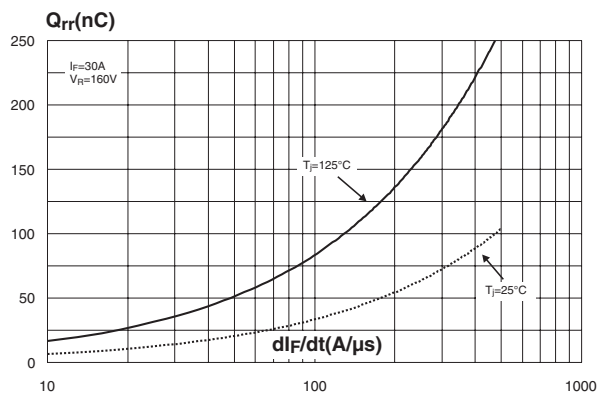
Fig. 1: Peak current versus duty cycle (per diode).**Fig. 2-1:** Forward voltage drop versus forward current (typical values, per diode).**Fig. 2-2:** Forward voltage drop versus forward current (maximum values, per diode).**Fig. 3:** Relative variation of thermal impedance junction to case versus pulse 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 dl_F/dt (typical values, per diode).

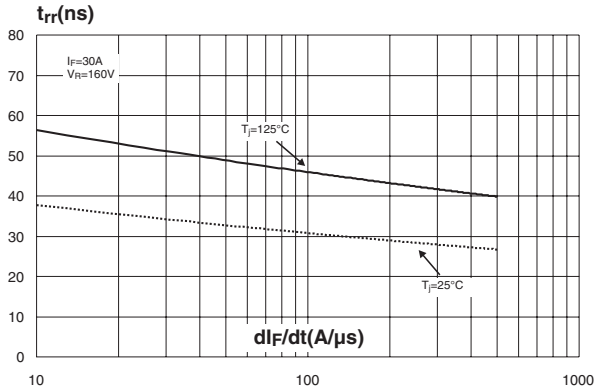


Fig. 7: Peak reverse recovery current versus dl_F/dt (typical values, per diode).

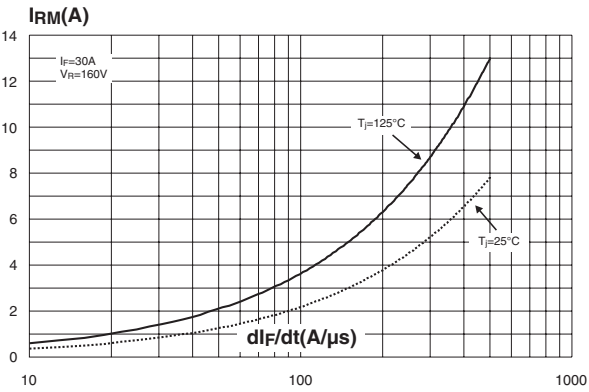
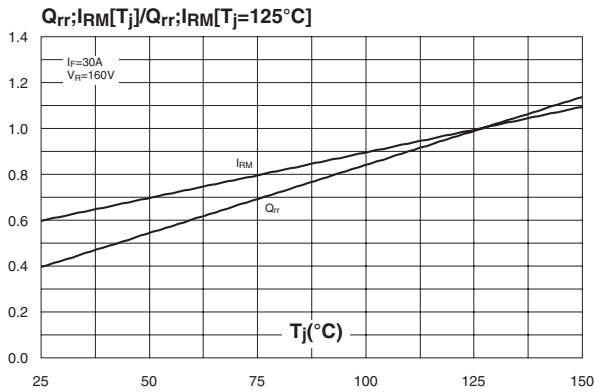
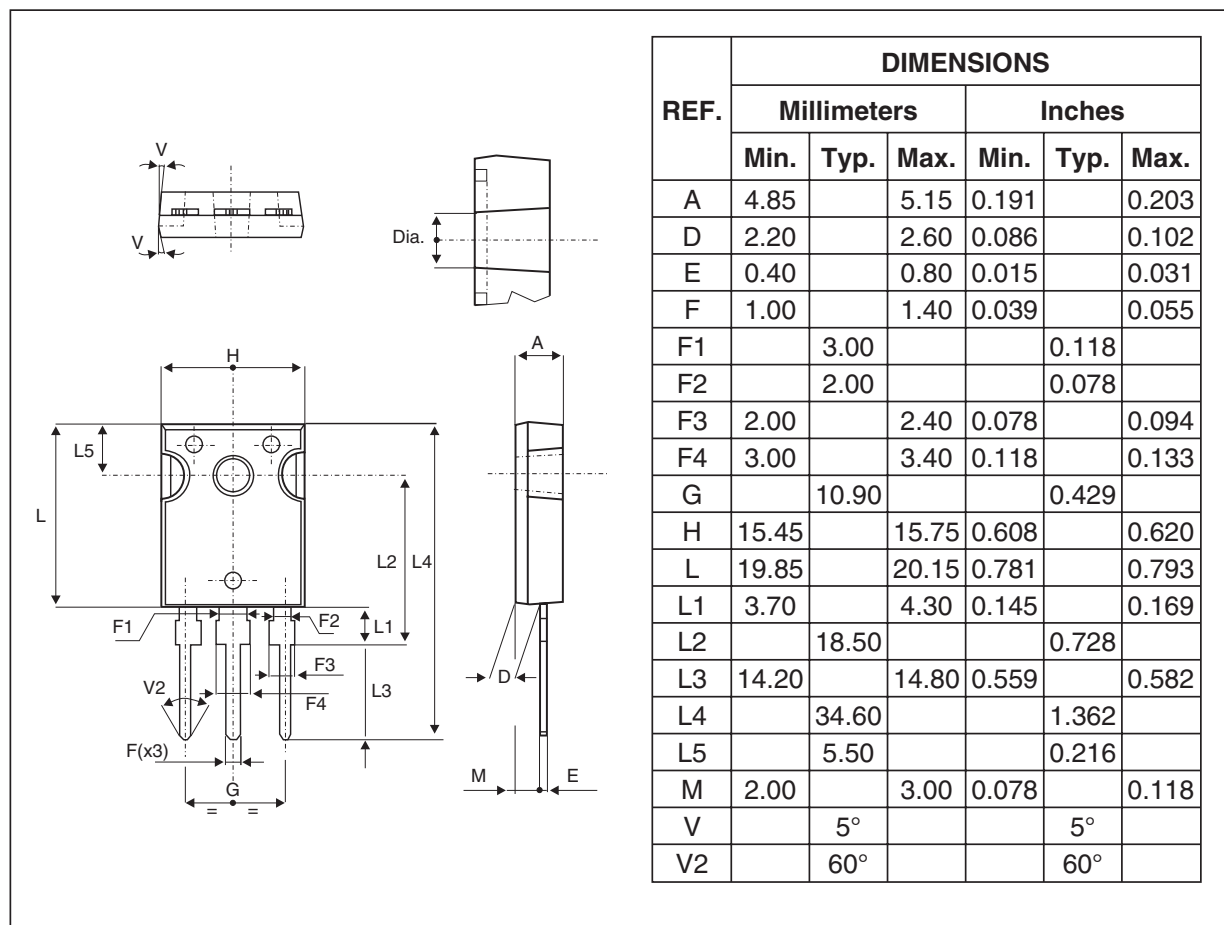


Fig. 8: Dynamic parameters versus junction temperature.



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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