

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

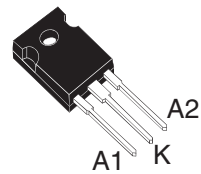
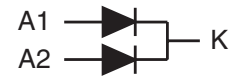
Features and benefits

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

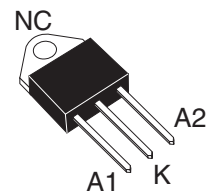
Description

Dual center tab rectifier suited for switch mode power supplies and high frequency DC to DC converters.

Packaged in TO-247 and TOP3I, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection



TO-247
STTH6002CW



TOP3I
STTH6002CPI

Order codes

Part Number	Marking
STTH6002CW	STTH6002C
STTH6002CPI	STTH6002C

1 Characteristics

Table 1. Absolute ratings (limiting values at $T_j = 25^\circ \text{C}$, unless otherwise specified)

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	TO-247	Per diode T _C = 140° C	30	A
			Per device T _C = 125° C	60	
		TOP3I	Per diode T _C = 120° C	30	
			Per device T _C = 105° C	60	
I _{FSM}	Surge non repetitive forward current	t _p = 10 ms Sinusoidal		330	A
T _{stg}	Storage temperature range			-65 to +175	° C
T _j	Maximum operating junction temperature			175	° C

Table 2. Thermal parameters

Symbol	Parameter			Value	Unit
$R_{th(j-c)}$	Junction to case	TO-247	Per diode	1.2	$^\circ \text{C/W}$
			Total	0.8	
		TOP3I	Per diode	1.8	
			Total	1.20	
$R_{th(c)}$	Coupling	TO-247		0.4	
		TOP3I		0.6	

When the two diodes 1 and 2 are used simultaneously:

$$\Delta T_j(\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)} (\text{Per diode}) + P(\text{diode 2}) \times R_{th(c)}$$

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Typ	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ \text{C}$	$V_R = V_{RRM}$		30	μA
		$T_j = 125^\circ \text{C}$		30	300	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ \text{C}$	$I_F = 30 \text{ A}$		1.05	V
			$I_F = 60 \text{ A}$		1.18	
		$T_j = 150^\circ \text{C}$	$I_F = 30 \text{ A}$	0.75	0.84	
			$I_F = 60 \text{ A}$	0.9	0.99	

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

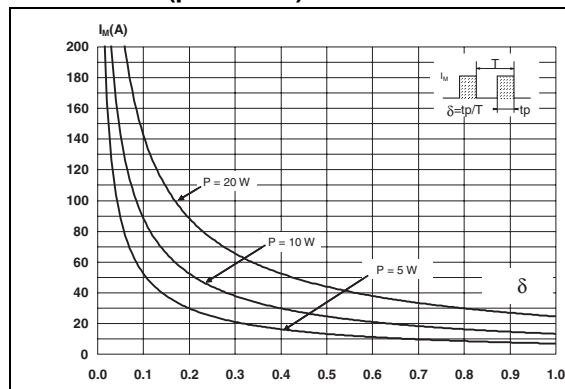
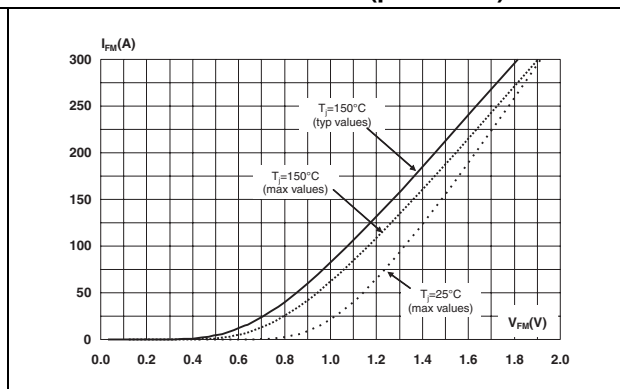
2. Pulse test: $t_p = 380 \mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation:

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

Table 4. Dynamic characteristics

Symbol	Parameter	Test conditions	Typ	Max.	Unit
t_{rr}	Reverse recovery time	$I_F = 1 \text{ A}$, $dI_F/dt = 200 \text{ A}/\mu\text{s}$, $V_R = 30 \text{ V}$, $T_j = 25^\circ \text{C}$	22	27	ns
I_{RM}	Reverse recovery current	$I_F = 30 \text{ A}$, $dI_F/dt = 200 \text{ A}/\mu\text{s}$, $V_R = 160 \text{ V}$, $T_j = 125^\circ \text{C}$	7.6	9.5	A
t_{fr}	Forward recovery time	$I_F = 30 \text{ A}$, $dI_F/dt = 200 \text{ A}/\mu\text{s}$, $V_{FR} = 1.1 \times V_{Fmax}$, $T_j = 25^\circ \text{C}$		220	ns
V_{FP}	Forward recovery voltage	$I_F = 30 \text{ A}$, $dI_F/dt = 200 \text{ A}/\mu\text{s}$, $T_j = 25^\circ \text{C}$	2.5		V

Figure 1. Peak current versus duty cycle (per diode)**Figure 2. Forward voltage drop versus forward current (per diode)**

4 **Ordering information**

Part Number	Marking	Package	Weight	Base qty	Delivery mode
STTH6002CW	STTH6002C	TO-247	4.46 g	30	Tube
STTH6002CPI	STTH6002C	TOP3I	4.7 g	30	Tube