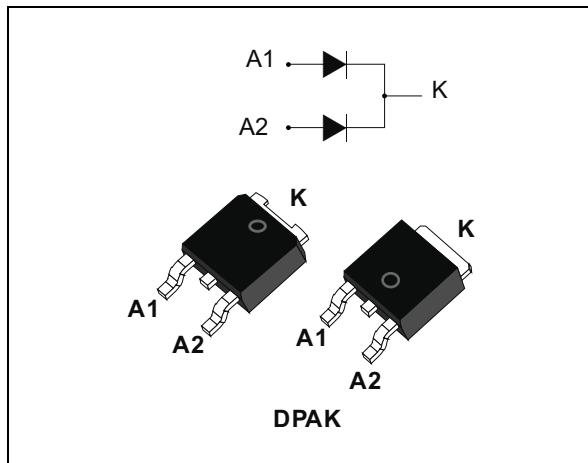




# STTH802C

High efficiency ultrafast diode

Datasheet - production data



## Features

- Suited for SMPS
- Low losses
- Low forward and reverse recovery time
- High surge current capability
- High junction temperature
- ECOPACK®2 compliant component for DPAK on demand

## Description

Dual center tap rectifier suited for switched mode power supply and high frequency DC to DC converters.

Packaged in DPAK, this device is intended for use in low voltage, high frequency inverters, freewheeling and polarity protection applications.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	2 X 4 A
$V_{RRM}$	200 V
$T_j$ (max)	175 °C
$V_F$ (typ.)	0.81 V
$t_{rr}$ (typ.)	13 ns

# 1 Characteristics

**Table 2. Absolute ratings (limiting values at  $T_j = 25^\circ\text{C}$  per diode, unless otherwise specified)**

Symbol	Parameter			Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage			200	V
$I_{F(\text{RMS})}$	Forward rms current			10	A
$I_{F(\text{AV})}$	Average forward current, $\delta = 0.5$ , square wave	$T_c = 155^\circ\text{C}$	Per diode	4	A
		$T_c = 150^\circ\text{C}$	Per device	8	
$I_{FSM}$	Surge non repetitive forward current		$t_p = 10 \text{ ms sinusoidal}$	50	A
$T_{\text{stg}}$	Storage temperature range			-65 to +175	$^\circ\text{C}$
$T_j$	Maximum operating junction temperature			175	$^\circ\text{C}$

**Table 3. Thermal resistances**

Symbol	Parameter	Max. value	Unit
$R_{\text{th(j-c)}}$	Junction to case	Per diode	$^\circ\text{C/W}$
		Total	
$R_{\text{th(c)}}$	Coupling	1.0	

When the diodes 1 and 2 are used simultaneously:

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

**Table 4. Static electrical characteristics (per diode)**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$	-		4	$\mu\text{A}$
		$T_j = 125^\circ\text{C}$		-	2	40	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 4 \text{ A}$	-		1.10	$\text{V}$
		$T_j = 125^\circ\text{C}$		-	0.81	0.95	
		$T_j = 25^\circ\text{C}$	$I_F = 8 \text{ A}$	-		1.25	
		$T_j = 125^\circ\text{C}$		-	0.95	1.10	

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

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

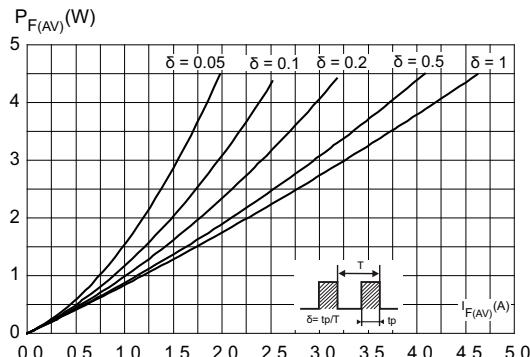
To evaluate the conduction losses, use the following equation:

$$P = 0.80 \times I_{F(\text{AV})} + 0.037 \times I_{F(\text{RMS})}^2$$

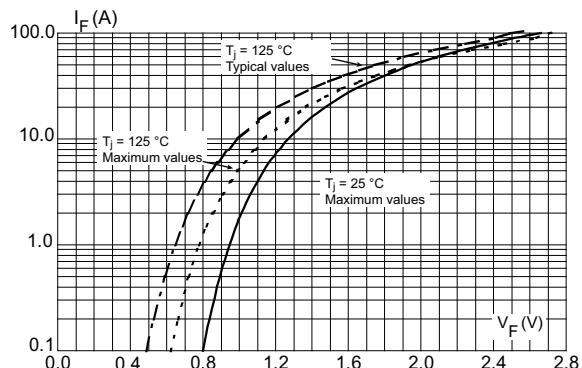
**Table 5. Dynamic characteristics (per diode)**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit	
$t_{rr}$	Reverse recovery time	$T_j = 25 \text{ }^\circ\text{C}$	$I_F = 0.5 \text{ A}$ $I_{RR} = 0.25 \text{ A}$ $I_R = 1 \text{ A}$	-	13	20	ns
$t_{fr}$	Forward recovery time		$I_F = 4 \text{ A}$ $dI_F/dt = 100 \text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$	-	50		ns
$V_{FP}$	Forward recovery voltage		$I_F = 4 \text{ A}$ $dI_F/dt = 100 \text{ A}/\mu\text{s}$	-	2.4		V

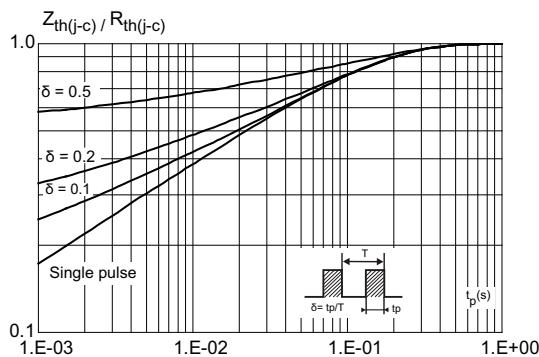
**Figure 1. Average forward power dissipation versus average forward current (per diode)**



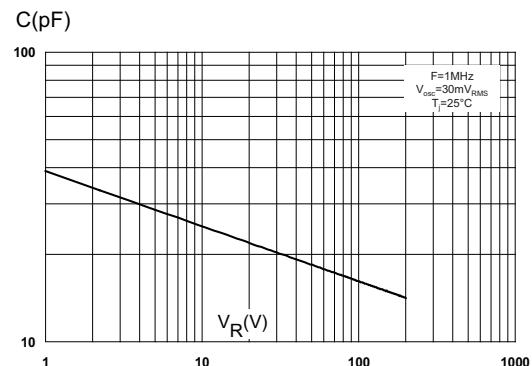
**Figure 2. Forward voltage drop versus forward current (per diode)**



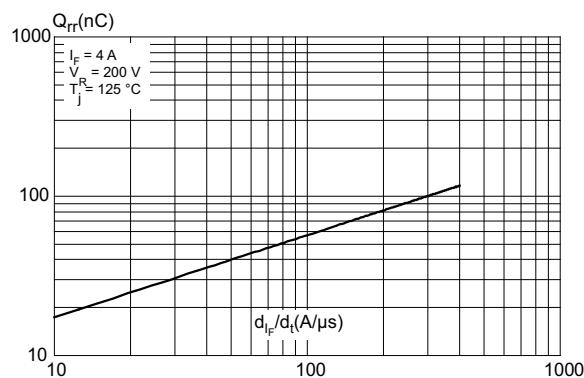
**Figure 3. Relative variation of thermal impedance, junction to case, versus pulse duration**



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



**Figure 5. Reverse recovery charges versus  $dI_F/dt$  (typical values, per diode)**



**Figure 6. Peak reverse recovery current versus  $dI_F/dt$  (typical values, per diode)**

