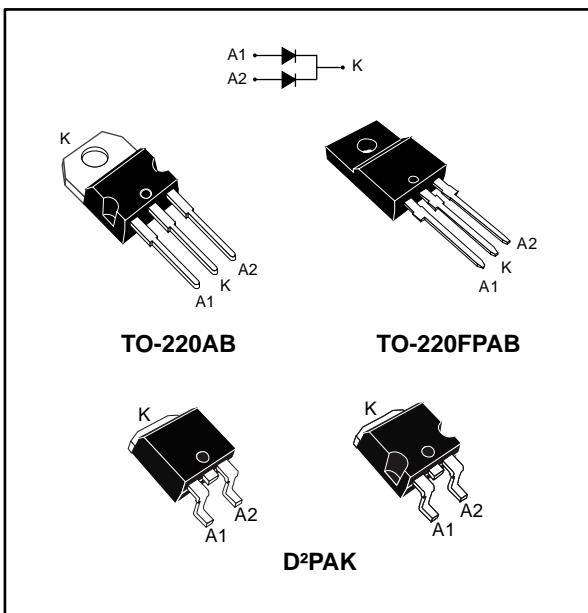




STTH1602C

High efficiency ultrafast diode

Datasheet - production data



Description

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

Packaged either in TO-220AB, TO-220FPAB and D²PAK, this device is especially intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.

Table 1: Device summary

Symbol	Value
$I_{F(AV)}$	Up to 2 x 10 A
V_{RRM}	200 V
T_j (max.)	175 °C
V_F (typ.)	0.78 V
t_{rr} (typ.)	21 ns

Features

- Suited for SMPS
- Low losses
- Low forward and reverse recovery time
- Low leakage current
- High junction temperature
- Insulated package: TO-220FPAB
 - insulating voltage: 2000 V_{RMS} sine
- ECOPACK®2 compliant component for D²PAK on demand

1 Characteristics

Table 2: Absolute ratings (limiting values, per diode, at 25 °C, unless otherwise specified)

Symbol	Parameter				Value	Unit	
V _{RRM}	Repetitive peak reverse voltage				200	V	
I _{F(RMS)}	Forward rms current				30	A	
I _{F(AV)}	Average forward current $\delta = 0.5$, square wave	TO-220AB / D ² PAK	T _C = 150 °C	Per diode	8	A	
			T _C = 140 °C	Per device	16		
			T _C = 140 °C	Per diode	10		
			T _C = 130 °C	Per device	20		
	TO-220FPAB	T _C = 130 °C	Per diode	8			
			Per device	16			
		T _C = 110 °C	Per diode	10			
			Per device	20			
I _{FSM}	Surge non repetitive forward current			t _p = 10 ms sinusoidal	80	A	
T _{stg}	Storage temperature range				-65 to +175	°C	
T _j	Maximum operating junction temperature				175	°C	

Table 3: Thermal parameter

Symbol	Parameter				Value	Unit
R _{th(j-c)}	Junction to case	TO-220AB / D ² PAK	Per diode	3.0	°C/W	
			Per device	1.9		
		TO-220FPAB	Per diode	5.5		
			Per device	4.5		
R _{th(c)}	Coupling	TO-220AB / D ² PAK			0.8	°C/W
		TO-220FPAB			3.5	

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	$T_j = 25^\circ C$	$V_R = V_{RRM}$	-		6	μA
		$T_j = 125^\circ C$		-	4	60	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ C$	$I_F = 8 A$	-		1.10	V
		$T_j = 150^\circ C$		-	0.78	0.89	
		$T_j = 25^\circ C$	$I_F = 16 A$	-		1.25	
		$T_j = 150^\circ C$		-		1.05	

Notes:(1)Pulse test: $t_p = 5 \text{ ms}$, $\delta < 2\%$ (2)Pulse test: $t_p = 380 \text{ } \mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation:

$$P = 0.73 \times I_{F(AV)} + 0.020 \times I_F^2(\text{RMS})$$

Table 5: Dynamic electrical characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	$T_j = 25^\circ C$	$I_F = 1 A$, $V_R = 30 V$, $dI_F/dt = 100 A/\mu s$	-	21	26	ns
I_{RM}	Reverse recovery current	$T_j = 125^\circ C$	$I_F = 8 A$, $V_R = 160 V$, $dI_F/dt = 200 A/\mu s$	-	6.8	8.8	A
t_{fr}	Forward recovery time	$T_j = 25^\circ C$	$I_F = 8 A$, $dI_F/dt = 100 A/\mu s$ $V_{FR} = 1.1 \times V_{Fmax}$	-		160	ns
V_{FP}	Forward recovery voltage		$I_F = 8 A$, $dI_F/dt = 100 A/\mu s$	-	2.4		V

1.1 Characteristics (curves)

Figure 1: Peak current versus duty cycle (per diode)

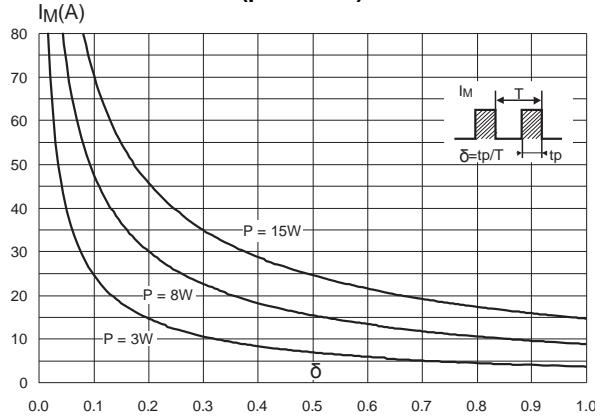


Figure 2: Forward voltage drop versus forward current (typical values, per diode)

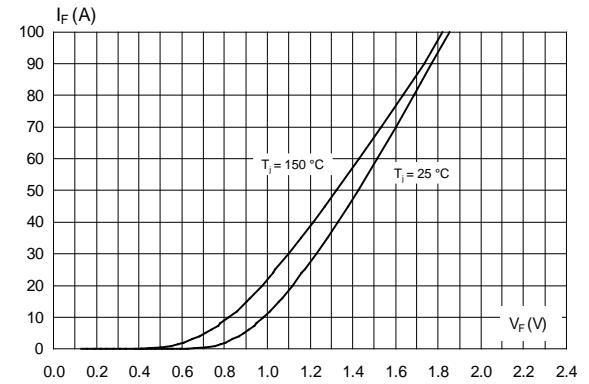


Figure 3: Forward voltage drop versus forward current (maximum values, per diode)

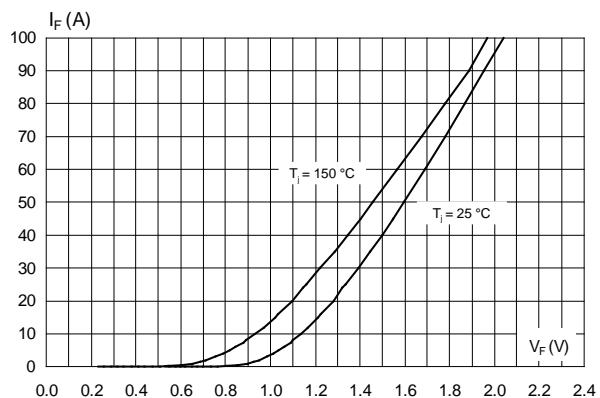


Figure 4: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AB, D²PAK)

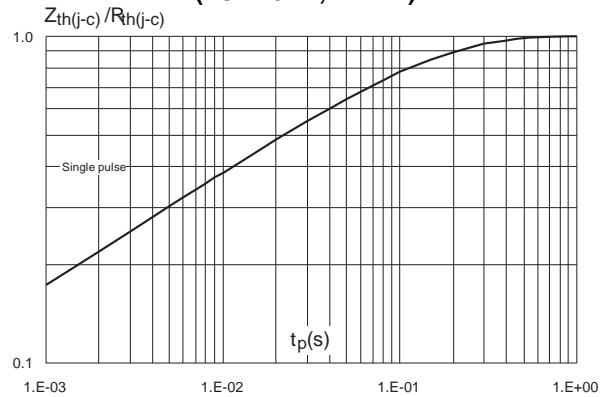


Figure 5: Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAB)

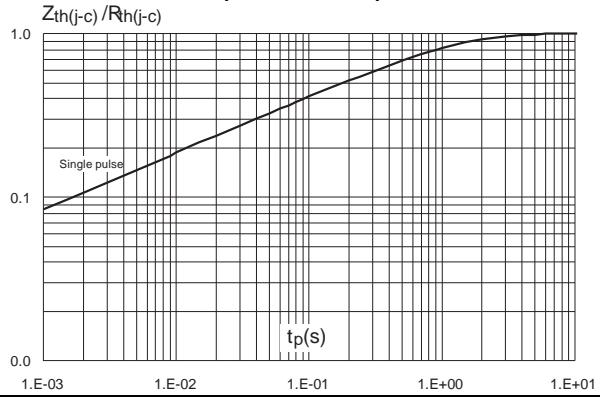
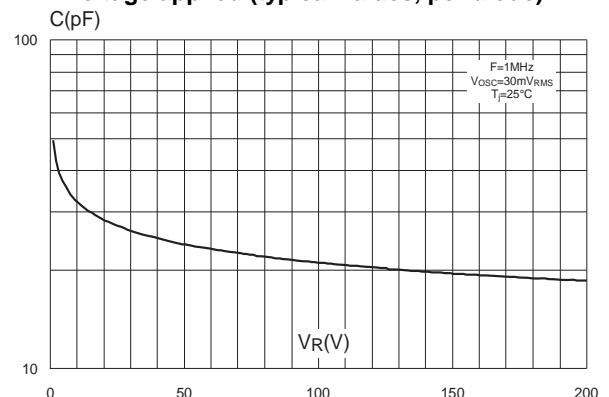


Figure 6: Junction capacitance versus reverse voltage applied (typical values, per diode)



3 Ordering information

Table 9: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STTH1602CG-TR	STTH1602CG	D ² PAK	1.38 g	1000	Tape and reel
STTH1602CT	STTH1602CT	TO-220AB	1.90 g	50	Tube
STTH1602CFP	STTH1602CFP	TO-220FPAB	1.70 g	50	Tube