



STTH10LCD06C

Turbo 2 ultrafast - high voltage rectifier for SMPS

Features

- Ultrafast switching
- Low reverse current
- Low thermal resistance
- Reduces conduction and switching losses

Description

The STTH10LCD06C uses ST Turbo2 technology. This device is specially suited for switching power supplies working with interleaved PFCs.

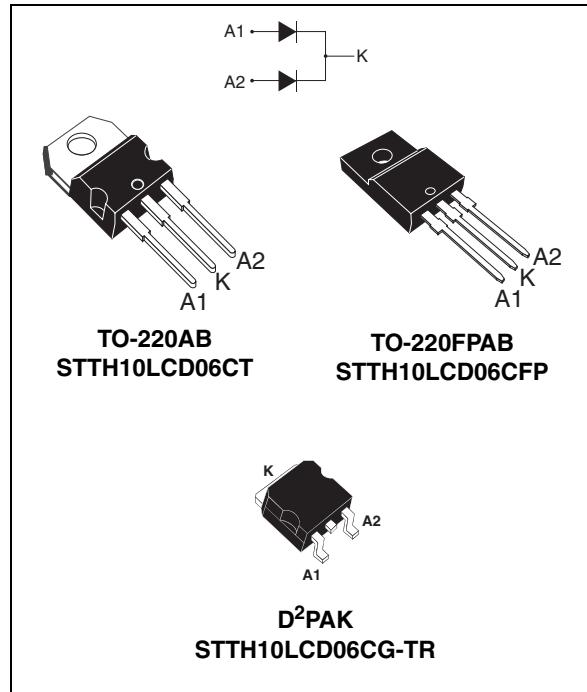


Table 1. Device summary

$I_{F(AV)}$	2 x 5A
V_{RRM}	600 V
T_j	175 °C
V_F (typ)	1.25 V
t_{rr} (max)	25 ns

1 Characteristics

Table 2. Absolute ratings⁽¹⁾

Symbol	Parameter				Value	Unit		
V_{RRM}	Repetitive peak reverse voltage				600	V		
$I_{F(RMS)}$	Forward current rms				20	A		
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	$T_c = 130 \text{ }^\circ\text{C}$	TO-220AB, D ² PAK	Per diode	5	A		
				Per device	10	A		
	$T_c = 100 \text{ }^\circ\text{C}$	TO-220FPAB	Per diode	5	A			
			Per device	10	A			
I_{FSM}	Surge non repetitive forward current	$t_p = 10 \text{ ms sinusoidal}$		60	A			
T_{sig}	Storage temperature range				-65 to + 175	$^\circ\text{C}$		
T_j	Maximum operating junction temperature ⁽²⁾				175	$^\circ\text{C}$		

1. Limiting values per diode at 25 $^\circ\text{C}$, unless otherwise specified
2. $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ condition to avoid thermal runaway for a diode on its own heatsink

Table 3. Thermal resistance

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case(per diode)		TO-220AB, D ² PAK	4.5
	TO-220FPAB		7.5	

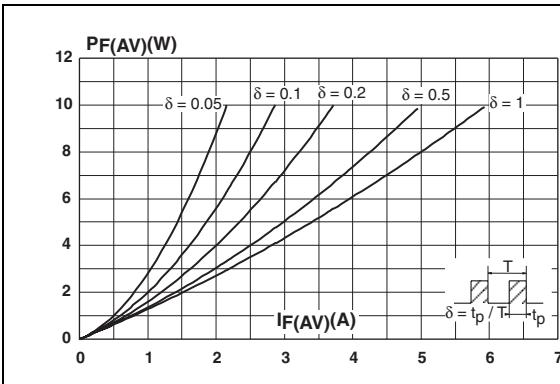
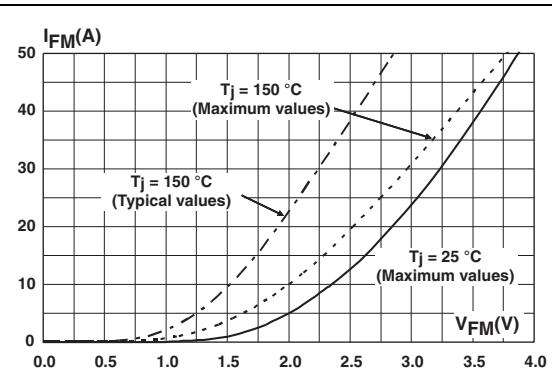
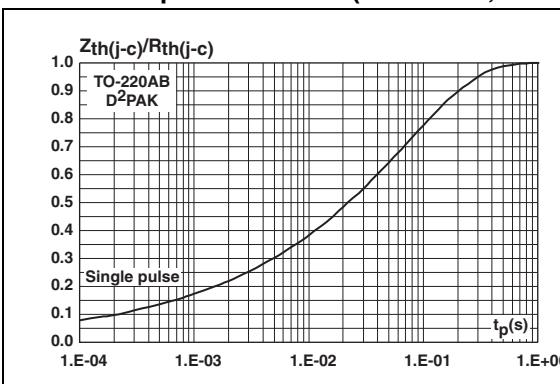
Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25 \text{ }^\circ\text{C}$	$V_R = V_{RRM}$			1	μA
		$T_j = 150 \text{ }^\circ\text{C}$			5	50	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25 \text{ }^\circ\text{C}$	$I_F = 5 \text{ A}$			2	V
		$T_j = 150 \text{ }^\circ\text{C}$			1.25	1.6	
		$T_j = 25 \text{ }^\circ\text{C}$	$I_F = 10 \text{ A}$			2.35	
		$T_j = 150 \text{ }^\circ\text{C}$			1.55	2	

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:
 $P = 1.2 \times I_{F(AV)} + 0.08 \times I_{F(RMS)}^2$

Table 5. Dynamic electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	$I_F = 0.5 \text{ A}, I_{rr} = 0.25 \text{ A}, I_R = 1 \text{ A}, T_j = 25^\circ\text{C}$			25	ns
		$I_F = 1 \text{ A}, dI_F/dt = -50 \text{ A}/\mu\text{s}, V_R = 30 \text{ V}, T_j = 25^\circ\text{C}$		35	50	
I_{RM}	Reverse recovery current	$I_F = 5 \text{ A}, dI_F/dt = -50 \text{ A}/\mu\text{s}, V_R = 400 \text{ V}, T_j = 125^\circ\text{C}$		1.8	2.5	A
t_{fr}	Forward recovery time	$I_F = 5 \text{ A}, dI_F/dt = 100 \text{ A}/\mu\text{s}, V_{FR} = 1.1 \times V_{Fmax}, T_j = 25^\circ\text{C}$			100	ns
V_{FP}	Forward recovery voltage	$I_F = 5 \text{ A}, dI_F/dt = 100 \text{ A}/\mu\text{s}, V_{FR} = 1.1 \times V_{Fmax}, T_j = 25^\circ\text{C}$		5		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 (TO-220AB, D²PAK)****Figure 4. Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAB)**