STTH20LCD06C

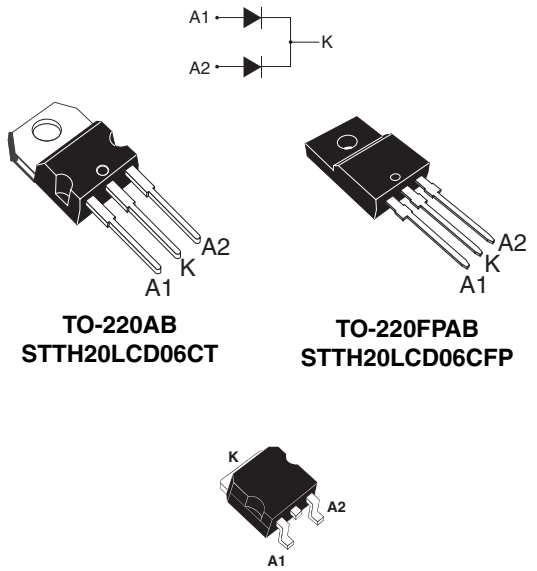
Turbo2 ultrafast - high voltage rectifier for SMPS

Features

- ultrafast switching
- low reverse current
- low thermal resistance
- reduces conduction and switching losses

Description

The STTH20LCD06C uses ST Turbo2 technology. This device is specially suited for switching power supplies working with interleaved PFCs.



TO-220AB
STTH20LCD06CT

TO-220FPAB
STTH20LCD06CFP

D²PAK
STTH20LCD06CG-TR

Table 1. Device summary

$I_{F(AV)}$	2 x 10 A
V_{RRM}	600 V
T_j	175 °C
V_F (typ)	1.25 V
t_{rr} (max)	50 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				30	A
$I_{F(AV)}$	Average forward current, $\delta = 0.5$	$T_c = 105$ °C	TO-220AB, D^2PAK	Per diode	10	A
				Per device	20	A
		$T_c = 60$ °C	TO-220FPAB	Per diode	10	A
				Per device	20	A
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(2)				175	°C

1. Limiting values per diode at 25 °C, unless otherwise specified
2. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ 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	TO-220AB, D^2PAK	3.5	°C/W
		TO-220FPAB	5.8	

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	$T_j = 25$ °C	$V_R = V_{RRM}$	-	-	1	µA
		$T_j = 150$ °C		-	10	100	
V_F(2)	Forward voltage drop	$T_j = 25$ °C	$I_F = 10$ A	-	-	2	V
		$T_j = 150$ °C		-	1.25	1.6	
		$T_j = 25$ °C	$I_F = 20$ A	-	-	2.35	
		$T_j = 150$ °C		-	1.55	2	

1. Pulse test: $t_p = 5$ ms, $\delta < 2$ %
2. Pulse test: $t_p = 380$ µs, $\delta < 2$ %

To evaluate the conduction losses use the following equation:
$P = 1.2 \times I_{F(AV)} + 0.04 \times I_F{}^2{}_{(RMS)}$

Table 5. Dynamic electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	I_F = 0.5 A, I_{rr} = 0.25 A, I_R = 1 A, T_j = 25 °C			25	ns
		I_F = 1 A, dI_F/dt = -50 A/µs, V_R = 30 V, T_j = 25 °C		35	50	
I_{RM}	Reverse recovery current	I_F = 10 A, dI_F/dt = -50 A/µs, V_R = 400 V, T_j = 125 °C		2	2.8	A
t_{fr}	Forward recovery time	I_F = 10 A, dI_F/dt = 100 A/µs V_{FR} = 1.1 x V_{Fmax}, T_j = 25 °C			230	ns
V_{FP}	Forward recovery voltage	I_F = 10 A, dI_F/dt = 100 A/µs V_{FR} = 1.1 x V_{Fmax}, T_j = 25 °C		4		V

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

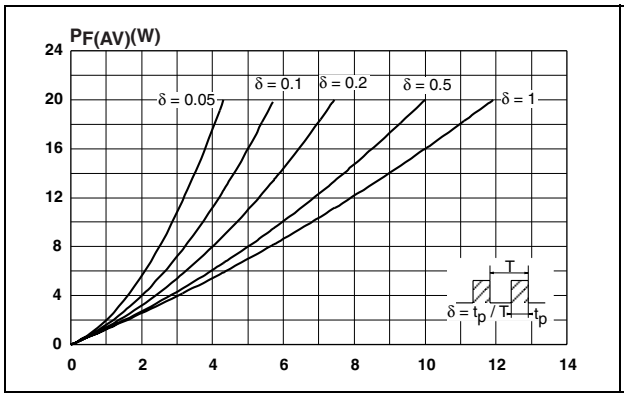


Figure 2. Forward voltage drop versus forward current (per diode)

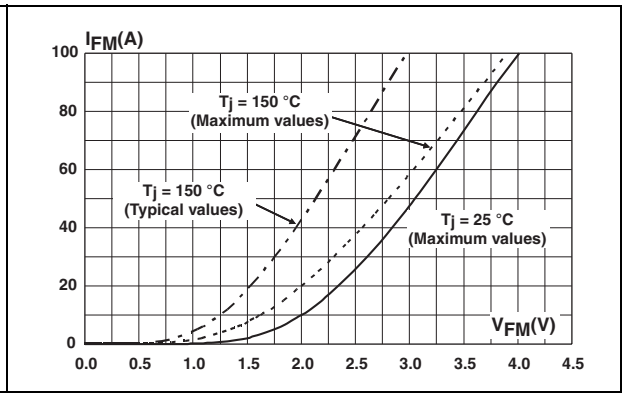


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration (TO-220AB, D²PAK)

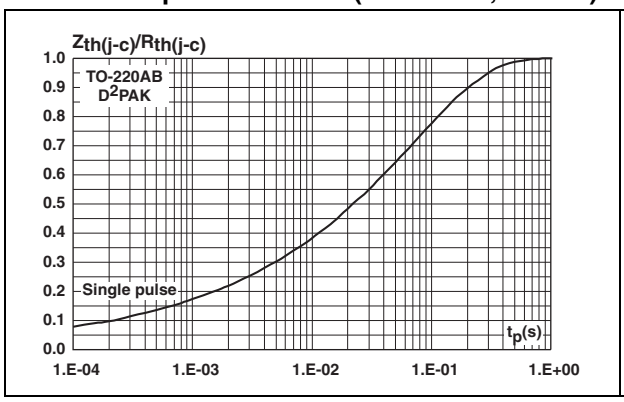


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAB)