



# STTH16L06C

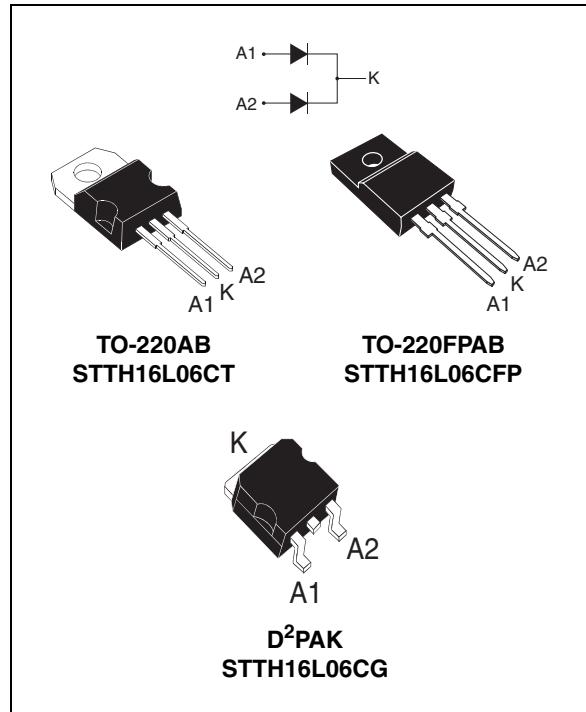
## Turbo 2 ultrafast high voltage rectifier

### Features

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

### Description

The STTH16L06, which is using ST Turbo 2 600 V technology, is specially suited for use in switching power supplies, and industrial applications, as rectification and discontinuous mode PFC boost diode.



**Table 1. Device summary**

$I_{F(AV)}$	Up to $2 \times 10$ A
$V_{RRM}$	600 V
$T_j$	175 °C
$V_F$ (typ)	1.05 V
$t_{rr}$ (max)	35 ns

# 1 Characteristics

**Table 2. Absolute ratings (limiting values)**

Symbol	Parameter				Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage				600	V
$I_{F(RMS)}$	Forward rms current				30	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AB / D <sup>2</sup> PAK	$T_c = 140^\circ\text{C}$	Per diode	8	A
			$T_c = 135^\circ\text{C}$	Per device	16	
			$T_c = 130^\circ\text{C}$	Per diode	10	
			$T_c = 120^\circ\text{C}$	Per device	20	
	TO-220FPAB	$T_c = 110^\circ\text{C}$	Per diode	8	A	
		$T_c = 80^\circ\text{C}$	Per device	16		
$I_{FSM}$	Surge non repetitive forward current		$t_p = 10 \text{ ms sinusoidal}$	120	A	
$T_{stg}$	Storage temperature range				-65 to + 175	°C
$T_j$	Maximum operating junction temperature				175	°C

**Table 3. Thermal resistance**

Symbol	Parameter			Maximum	Unit
$R_{th(j-c)}$	Junction to case	TO-220AB / D <sup>2</sup> PAK	Per diode	2.5	°C/W
		TO-220FPAB	Per diode	5	
		TO-220AB / D <sup>2</sup> PAK	Total	1.6	
		TO-220FPAB	Total	3.8	
$R_{th(c)}$	Coupling	TO-220AB / D <sup>2</sup> PAK		0.7	°C/W
		TO-220FPAB		2.5	

When the 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 4. Static electrical characteristics**

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			8	µA
		$T_j = 150^\circ\text{C}$			25	240	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ\text{C}$	$I_F = 8 \text{ A}$			1.8	V
		$T_j = 150^\circ\text{C}$			1.05	1.35	
		$T_j = 25^\circ\text{C}$	$I_F = 16 \text{ A}$			2.08	
		$T_j = 150^\circ\text{C}$			1.28	1.64	

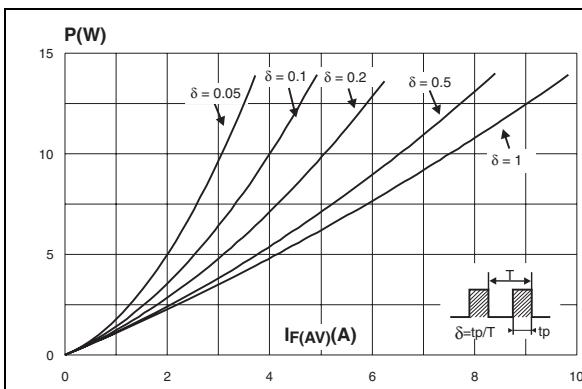
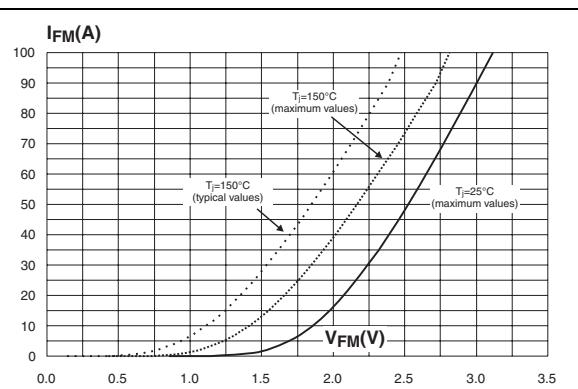
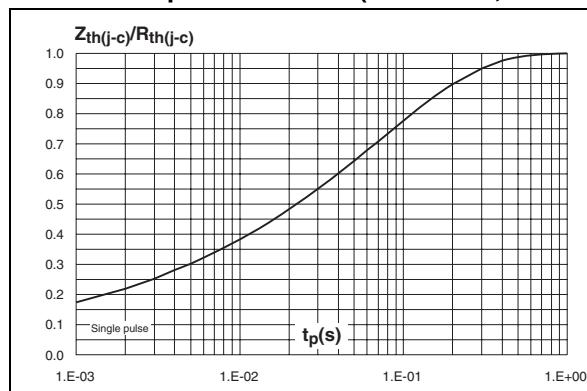
1. Pulse test:  $t_p = 5 \text{ ms}$ ,  $\delta < 2 \%$
2. Pulse test:  $t_p = 380 \mu\text{s}$ ,  $\delta < 2 \%$

To evaluate the maximum conduction losses use the following equation:

$$P = 1.06 \times I_{F(AV)} + 0.036 I_F^2 (\text{RMS})$$

**Table 5. Dynamic electrical characteristics**

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
$t_{rr}$	Reverse recovery time	$T_j = 25^\circ\text{C}$	$I_F = 0.5 \text{ A}, I_{rr} = 0.25 \text{ A}, I_R = 1 \text{ A}$			35	ns
			$I_F = 1 \text{ A}, dI_F/dt = 50 \text{ A}/\mu\text{s}, V_R = 30 \text{ V}$		40	55	
$I_{RM}$	Reverse recovery current	$T_j = 125^\circ\text{C}$	$I_F = 8 \text{ A}, dI_F/dt = 100 \text{ A}/\mu\text{s}, V_R = 400 \text{ V}$		4.5	6.5	A
$t_{fr}$	Forward recovery time	$T_j = 25^\circ\text{C}$	$I_F = 8 \text{ A}, dI_F/dt = 100 \text{ A}/\mu\text{s}$			200	ns
$V_{FP}$	Forward recovery voltage		$V_{FR} = 1.1 \times V_{Fmax}$		3.5		V

**Figure 1. Conduction losses versus average current****Figure 2. Forward voltage drop versus forward current****Figure 3. Relative variation of thermal impedance junction to case versus pulse duration (TO-220AB, D<sup>2</sup>PAK)****Figure 4. Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAB)**