

Turbo 2 ultrafast high voltage rectifier

Main product characteristics

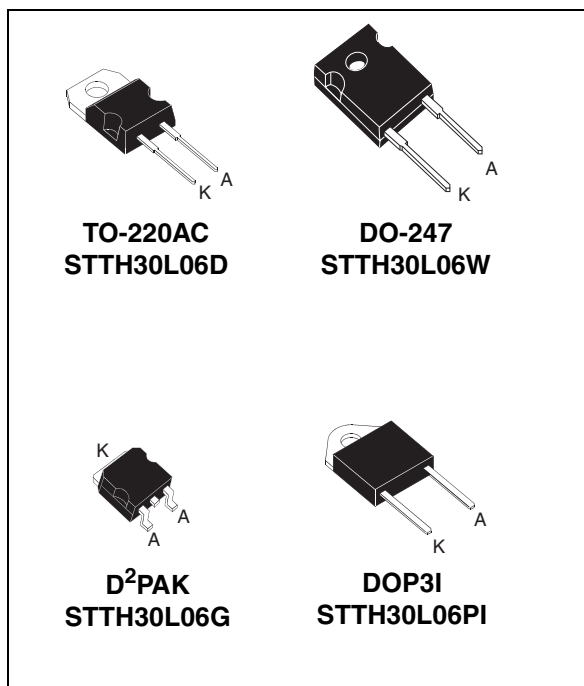
$I_{F(AV)}$	30 A
V_{RRM}	600 V
T_j	175°C
V_F (typ)	1.0 V
t_{rr} (max)	65 ns

Features and benefits

- Ultrafast switching
- Low reverse current
- Low thermal resistance
- Reduces switching & conduction losses
- Package insulation voltage
DOP3I: 2500 V_{RMS}

Description

The STTH30L06, which is using ST Turbo 2 600V technology, is specially suited for use in switching power supplies, and industrial applications, as rectification and discontinuous mode PFC boost diode.



Order codes

Part Number	Marking
STTH30L06D	STTH30L06D
STTH30L06G	STTH30L06G
STTH30L06G-TR	STTH30L06G
STTH30L06W	STTH30L06W
STTH30L06PI	STTH30L06PI

1 Characteristics

Table 1. Absolute ratings (limiting values)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			600	V
$I_{F(RMS)}$	RMS forward voltage			50	A
$I_{F(AV)}$	Average forward current	TO-220AC / TO-247 / D ² PAK	$T_c = 125^\circ \text{C}$ $\delta = 0.5$	30	A
		DOP3I	$T_c = 95^\circ \text{C}$ $\delta = 0.5$		
I_{FSM}	Surge non repetitive forward current		$t_p = 10 \text{ ms}$ sinusoidal	160	A
T_{stg}	Storage temperature range			-65 to + 175	$^\circ\text{C}$
T_j	Maximum operating junction temperature			175	$^\circ\text{C}$

Table 2. Thermal resistance

Symbol	Parameter		Value (max).	Unit
$R_{th(j-c)}$	Junction to case	TO-220AC / TO-247 / D ² PAK	1.1	$^\circ\text{C/W}$
		DOP3I	1.7	

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25^\circ \text{C}$	$V_R = V_{RRM}$			25	μA
		$T_j = 150^\circ \text{C}$			80	800	
$V_F^{(2)}$	Forward voltage drop	$T_j = 25^\circ \text{C}$	$I_F = 30 \text{ A}$			1.55	V
		$T_j = 150^\circ \text{C}$			1.0	1.25	

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: $P = 0.95 \times I_{F(AV)} + 0.010 I_{F(RMS)}^2$

Table 4. Dynamic Characteristics

Symbol	Parameter	Test conditions		Min	Typ	Max	Unit
t_{rr}	Reverse recovery time	$T_j = 25^\circ \text{C}$	$I_F = 0.5 \text{ A}$ $I_{rr} = 0.25 \text{ A}$ $I_R = 1 \text{ A}$			65	ns
			$I_F = 1 \text{ A}$ $dl_F/dt = 50 \text{ A}/\mu\text{s}$ $V_R = 30 \text{ V}$		65	90	
I_{RM}	Reverse recovery current	$T_j = 125^\circ \text{C}$	$I_F = 30 \text{ A}$ $V_R = 400 \text{ V}$ $dl_F/dt = 100 \text{ A}/\mu\text{s}$		11.5	16	A
t_{fr}	Forward recovery time	$T_j = 25^\circ \text{C}$	$I_F = 30 \text{ A}$ $dl_F/dt = 100 \text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$			500	ns
V_{FP}	Forward recovery voltage	$T_j = 25^\circ \text{C}$	$I_F = 30 \text{ A}$ $dl_F/dt = 100 \text{ A}/\mu\text{s}$ $V_{FR} = 1.1 \times V_{Fmax}$		2.5		V

Figure 1. Conduction losses versus average forward current

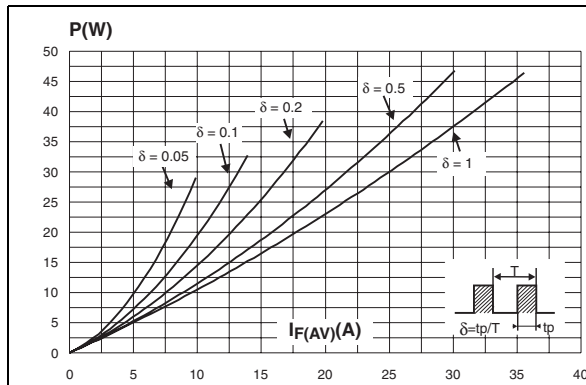


Figure 2. Forward voltage drop versus forward current

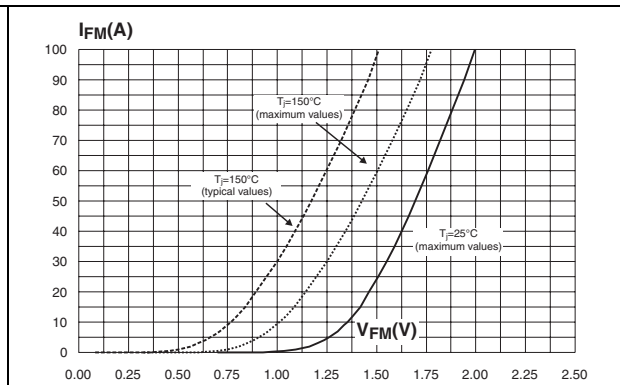


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration

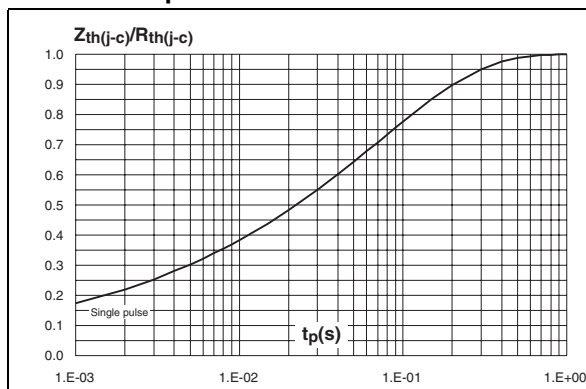


Figure 4. Peak reverse recovery current versus di_F/dt (typical values)

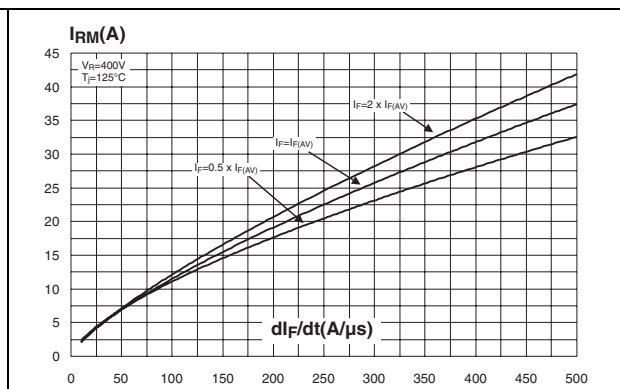


Figure 5. Reverse recovery time versus di_F/dt (typical values)

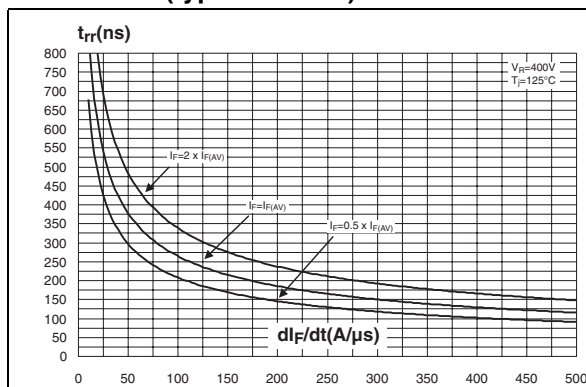
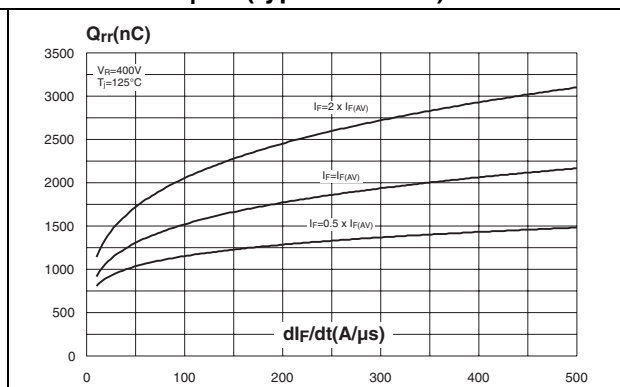


Figure 6. Reverse recovery charges versus di_F/dt (typical values)



3 Ordering information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STTH30L06D	STTH30L06D	TO-220AC	1.90 g	50	Tube
STTH30L06G	STTH30L06G	D ² PAK	1.48 g	50	Tube
STTH30L06G-TR	STTH30L06G	D ² PAK	1.48 g	1000	Tape & reel
STTH30L06W	STTH30L06W	DO-247	4.40 g	30	Tube
STTH30L06PI	STTH30L06PI	DOP3I	4.46 g	30	Tube