

Automotive Turbo 2 ultrafast high voltage rectifier

Features

- Ultrafast switching
- Low reverse recovery current
- Low thermal resistance
- Reduces switching losses
- AEC-Q101 qualified

Description

The STTH8R06, which uses ST Turbo 2 600 V technology, is specially suited as a boost diode in continuous mode power factor correction and hard switching conditions. This device is also intended for use as a free wheeling diode in power supplies and other power switching applications.

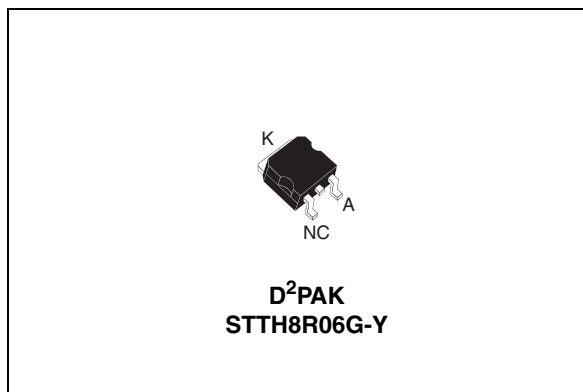


Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	8 A
V_{RRM}	600 V
T_j	175 °C
V_F (typ)	1.5 V
t_{rr} (max)	45 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		40	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	$T_c = 135\text{ }^{\circ}\text{C}$	8	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms sinusoidal}$	90	A
T_{stg}	Storage temperature range		-65 to + 175	$^{\circ}\text{C}$
T_j	Operating junction temperature range		-40 to + 175	$^{\circ}\text{C}$

Table 3. Thermal resistance

Symbol	Parameter	Value (max)	Unit
$R_{th(j-c)}$	Junction to case	1.9	$^{\circ}\text{C/W}$

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R	Reverse leakage current	$T_j = 25\text{ }^{\circ}\text{C}$	$V_R = V_{RRM}$			30	μA
		$T_j = 125\text{ }^{\circ}\text{C}$			35	400	
V_F	Forward voltage drop	$T_j = 25\text{ }^{\circ}\text{C}$	$I_F = 8\text{ A}$			3.2	V
		$T_j = 125\text{ }^{\circ}\text{C}$			1.5	1.95	

To evaluate the conduction losses use the following equation:

$$P = 1.35 \times I_{F(AV)} + 0.075 I_{F(RMS)}^2$$

Table 5. Dynamic characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	$T_j = 25\text{ }^{\circ}\text{C}$	$I_F = 0.5\text{ A},$ $I_{rr} = 0.25\text{ A}, I_R = 1\text{ A}$			25	ns
			$I_F = 1\text{ A},$ $dI_F/dt = -50\text{ A}/\mu\text{s},$ $V_R = 30\text{ V}$			45	
I_{RM}	Reverse recovery current	$T_j = 125\text{ }^{\circ}\text{C}$	$I_F = 8\text{ A}, V_R = 400\text{ V},$ $dI_F/dt = -200\text{ A}/\mu\text{s}$		5.5	7.2	A
S factor	Softness factor				0.4		
Qrr	Reverse recovery charges				150		nC
t_{fr}	Forward recovery time	$T_j = 25\text{ }^{\circ}\text{C}$	$I_F = 8\text{ A},$ $dI_F/dt = 64\text{ A}/\mu\text{s}$ $V_{FR} = 2.5\text{ V}$			200	ns
V_{FP}	Forward recovery voltage					5	V

Figure 1. Average forward power dissipation versus average forward current

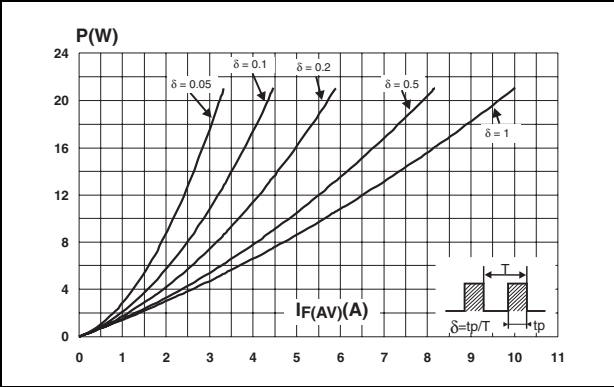


Figure 2. Forward voltage drop versus forward current

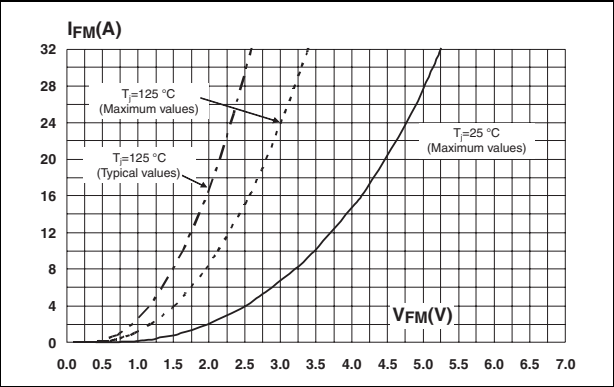


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration

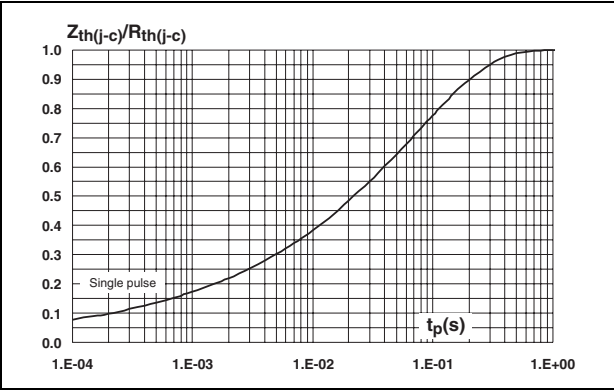


Figure 4. Peak reverse recovery current versus dIF/dt (typical values)

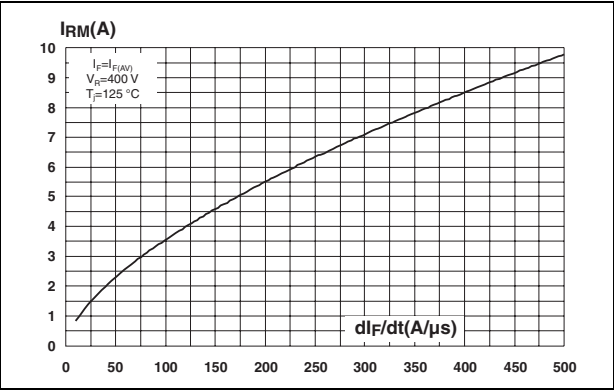


Figure 5. Reverse recovery time versus di_F/dt (typical values)

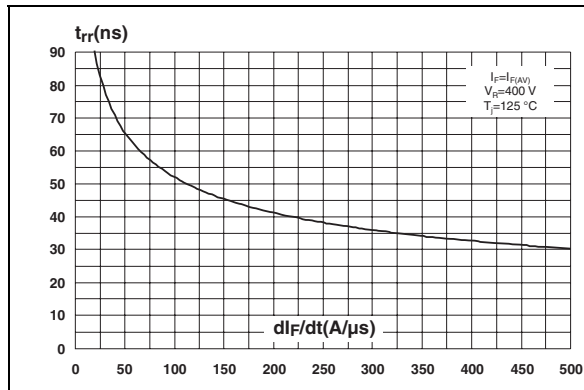


Figure 6. Reverse recovery charges versus di_F/dt (typical values)

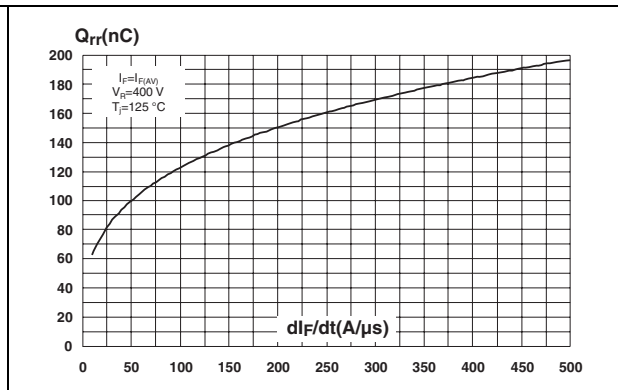


Figure 7. Reverse recovery softness factor versus di_F/dt (typical values)

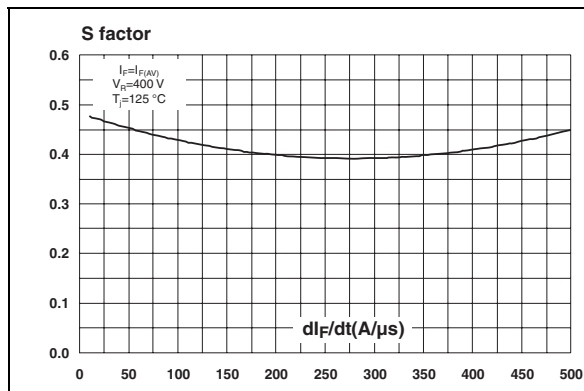


Figure 8. Relative variations of dynamic parameters versus junction temperature

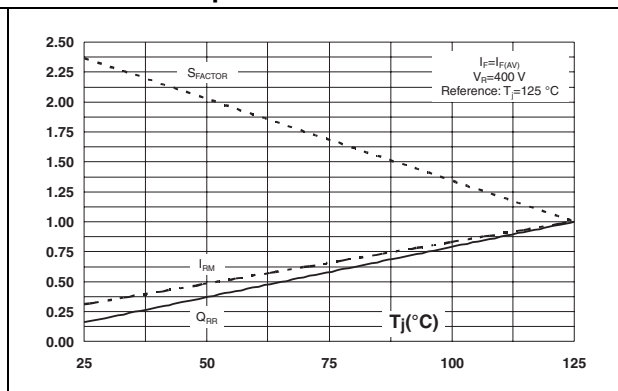


Figure 9. Transient peak forward voltage versus dl_F/dt (typical values)

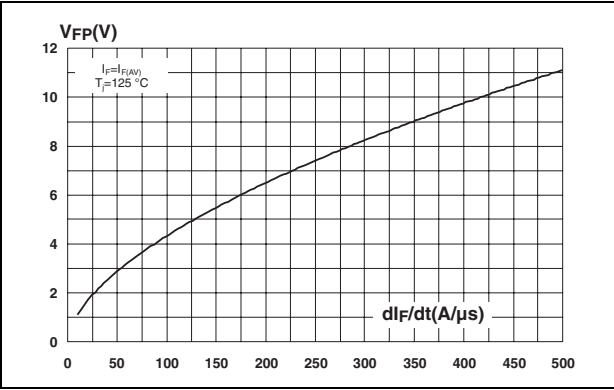


Figure 10. Forward recovery time versus dl_F/dt (typical values)

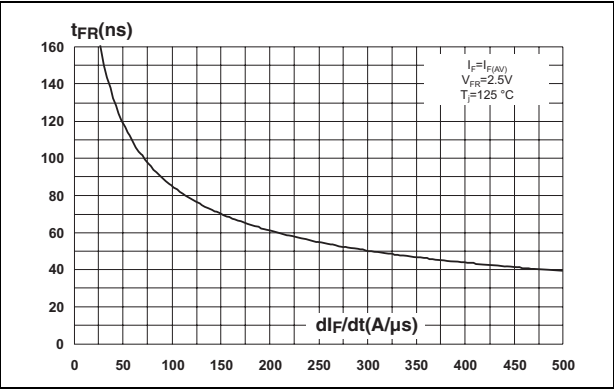


Figure 11. Junction capacitance versus reverse voltage applied (typical values)

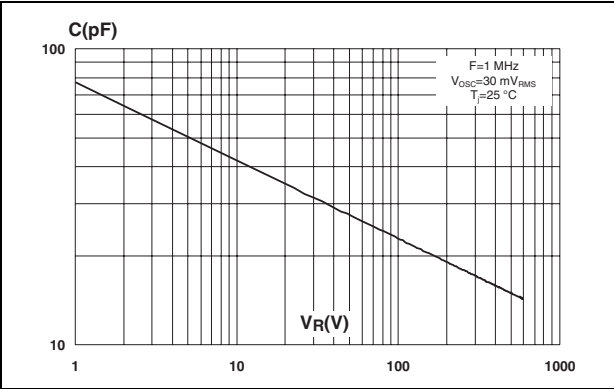
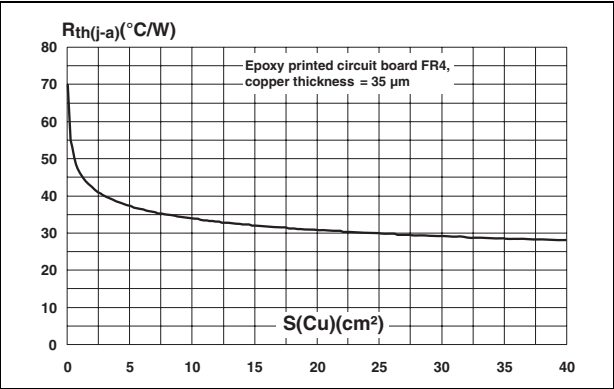


Figure 12. Thermal resistance junction to ambient versus copper surface under tab



- Epoxy meets UL94, V0
- Lead-free package

Table 6. D²PAK dimensions

* FLAT ZONE NO LESS THAN 2mm

Technical drawing of a stepped block. The front view is a rectangle with a width of 16.90 and a height of 10.30. The top surface is divided into two sections: a larger section on the left with a width of 8.90 and a smaller section on the right with a width of 3.70. The side view shows the block's profile with a total height of 5.08. The top surface of the side view is divided into three sections: a top section with a height of 1.30, a middle section with a height of 1.30, and a bottom section with a height of 1.30. The side view is shown with dashed lines indicating the hidden edges of the block.

3 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STTH8R06GY-TR	STTH8R06GY	D ² PAK	1.48 g	1000	Tape and reel

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
03-Nov-2011	1	Initial release.

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