STTH8R06-Y

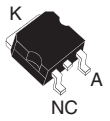
Automotive Turbo 2 ultrafast high voltage rectifier

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.



D^2PAK
STTH8R06G-Y

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 °C	8	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	90	A
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Operating junction temperature range		-40 to + 175	°C

Table 3. Thermal resistance

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

Table 4. Static electrical characteristics

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

To evaluate the conduction losses use the following equation:
$P = 1.35 \times I_{F(AV)} + 0.075\ I_F{}^2{}_{(RMS)}$

Table 5. Dynamic characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	T_j = 25 °C	I_F = 0.5 A, I_{rr} = 0.25 A, I_R =1 A			25	ns
			I_F = 1 A, dI_F/dt = -50 A/µs, V_R = 30 V			45	
I_{RM}	Reverse recovery current	T_j = 125 °C	I_F = 8 A, V_R = 400 V, dI_F/dt = -200 A/µs		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 °C	I_F = 8 A, dI_F/dt = 64 A/µs V_{FR} = 2.5 V			200	ns
V_{FP}	Forward recovery voltage					5	V

Figure 1. Average forward power dissipation versus average forward current

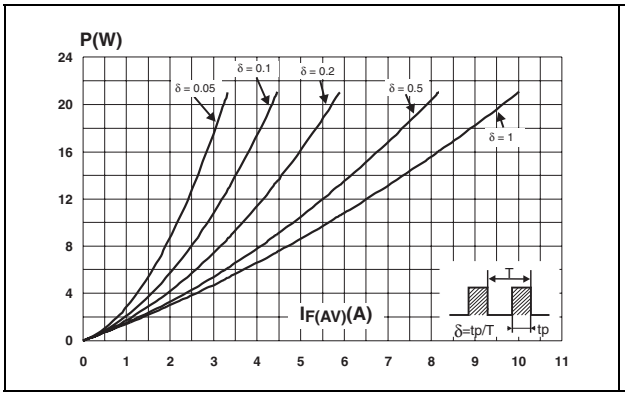


Figure 2. Forward voltage drop versus forward current

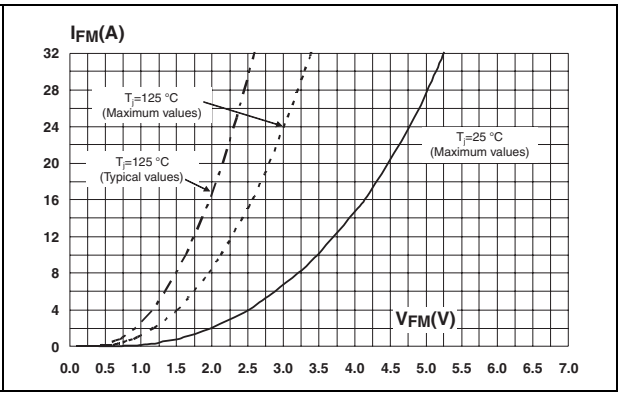


Figure 3. Relative variation of thermal impedance junction to case versus pulse duration

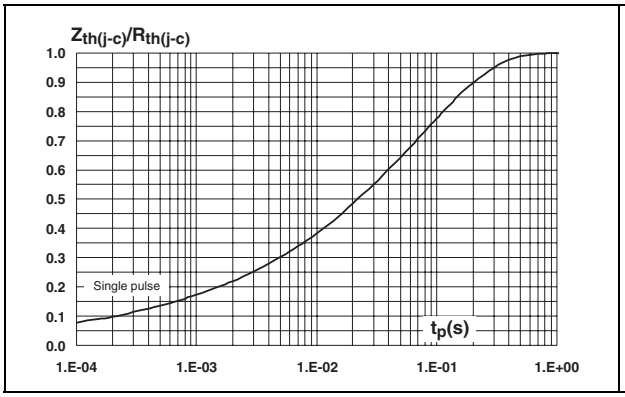


Figure 4. Peak reverse recovery current versus dI_F/dt (typical values)

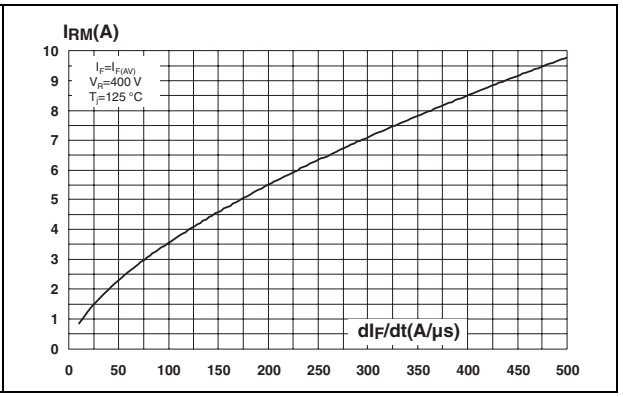


Figure 5. Reverse recovery time versus dI_F/dt (typical values)

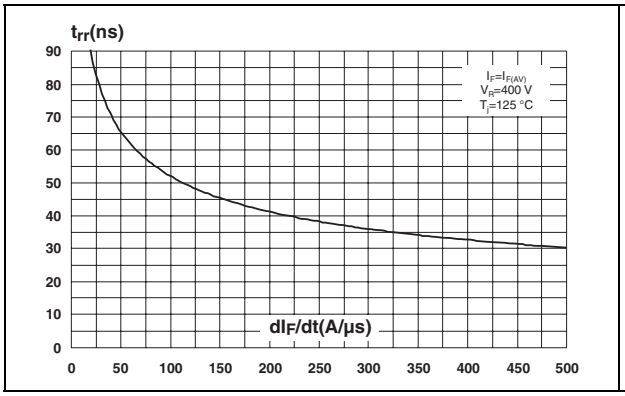


Figure 6. Reverse recovery charges versus dI_F/dt (typical values)

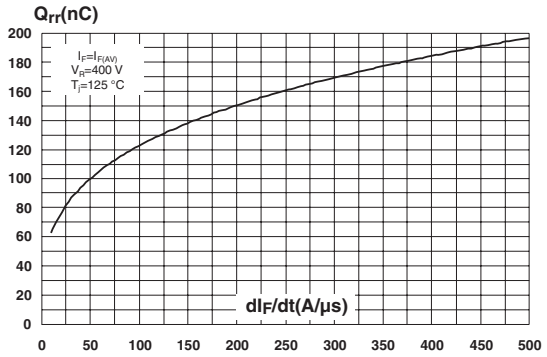


Figure 7. Reverse recovery softness factor versus dI_F/dt (typical values)

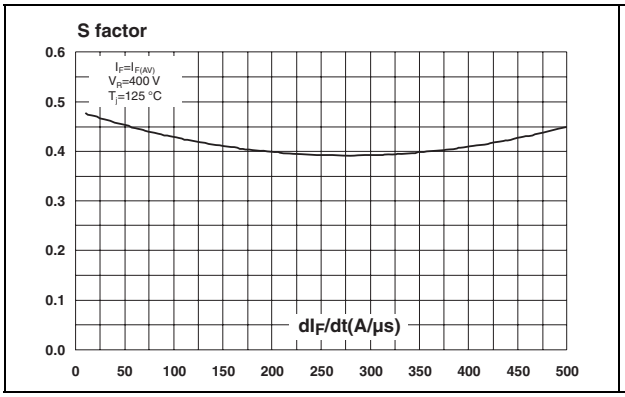


Figure 8. Relative variations of dynamic parameters versus junction temperature

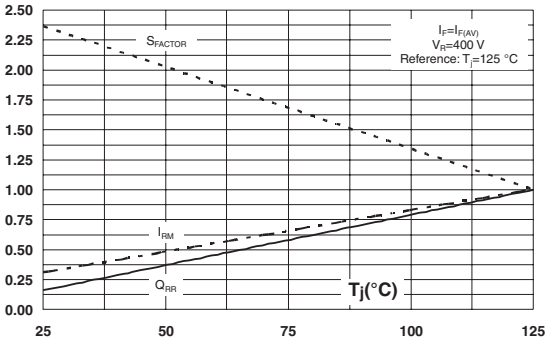


Figure 9. Transient peak forward voltage versus dI_F/dt (typical values)

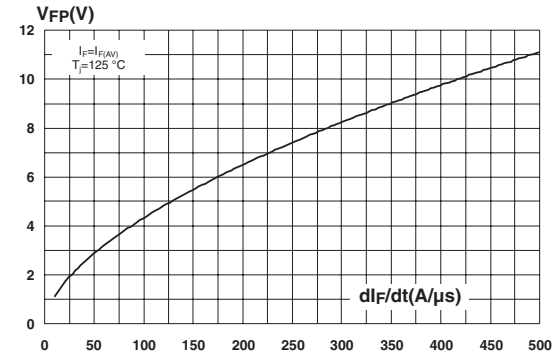


Figure 10. Forward recovery time versus dI_F/dt (typical values)

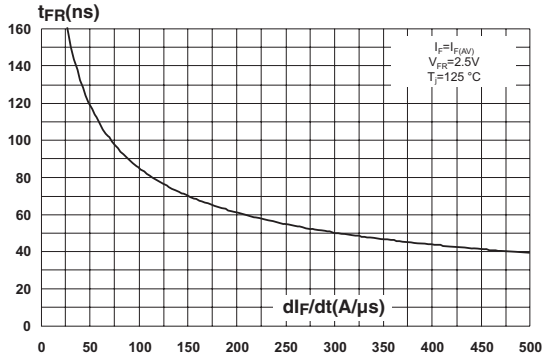


Figure 11. Junction capacitance versus reverse voltage applied (typical values)

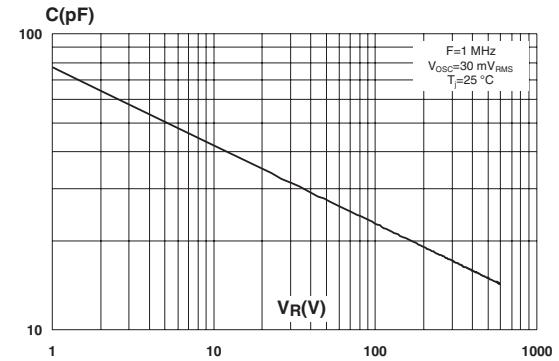
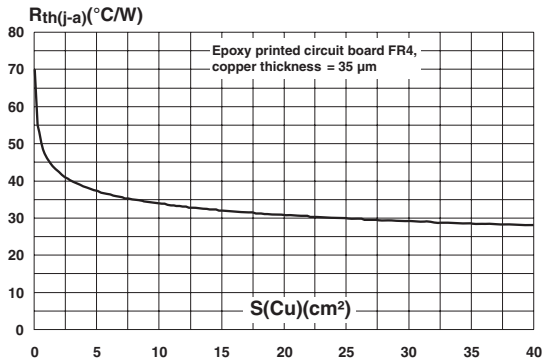


Figure 12. Thermal resistance junction to ambient versus copper surface under tab

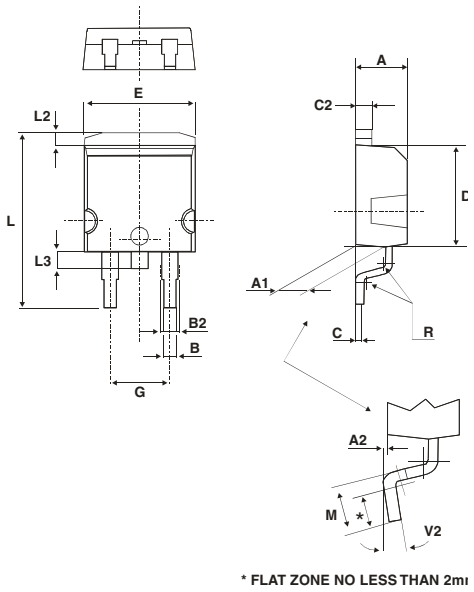


2 Package information

- Epoxy meets UL94, V0
- Lead-free package

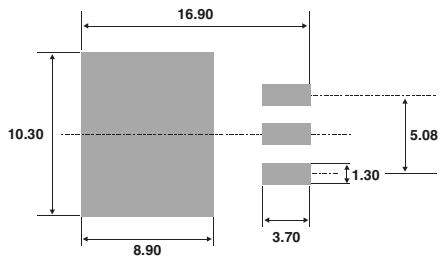
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Table 6. D²PAK dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°

Figure 13. D²PAK footprint (dimensions in mm)



3 Ordering information

Table 7. Ordering information

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

4 Revision history

Table 8. Document revision history

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