STTH802-Y



Automotive ultrafast recovery diode

Datasheet - production data

Features

- Very low conduction losses
- Negligible switching losses
- Low forward and reverse recovery time
- High junction temperature
- AEC-Q101 qualified

Description

The STTH802-Y uses ST's new 200 V planar Pt doping technology, and is specially suited for switching mode base drive and transistor circuits.

Packaged in DPAK, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection for automotive application.

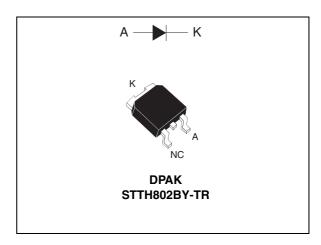


Table 1. Device summary

I _{F(AV)}	8 A
V _{RRM}	200 V
T _{j (max)}	175 °C
V _F (typ)	0.8 V
t _{rr} (typ)	17 ns

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1 Characteristics

Table 2. Absolute ratings (limiting values at $T_i = 25$ °C, unless otherwise specified)

Symbol	Parameter	Value	Unit	
V _{RRM}	Repetitive peak reverse voltage	200	V	
I _{F(RMS)}	Forward rms current	16	Α	
I _{F(AV)}	Average forward current, $\delta = 0.5$ $T_c = 145 ^{\circ}C$		8	Α
I _{FSM}	Surge non repetitive forward current $t_p = 10 \text{ ms sinusoidal}$		100	Α
T _{stg}	Storage temperature range			°C
Tj	Operating junction temperature range			°C

Table 3. Thermal parameters

Symbol	Parameter	Value	Unit
R _{th(j-c)}	Junction to case	3.2	°C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
I _B ⁽¹⁾	Reverse leakage current	T _j = 25 °C	V - V			6	^
'R`	neverse leakage current	$T_j = 125 ^{\circ}\text{C}$ $V_R = V_{RRM}$	R = VRRM	6	60	μΑ	
V (2)	$V_F^{(2)}$ Forward voltage drop $ T_j = 25 ^{\circ}C $ $T_j = 150 ^{\circ}C $ $I_F = 8 A$	I _ Q A		0.95	1.05	V	
v _F , ,		T _j = 150 °C	I IF = O A		0.8	0.90	V

^{1.} Pulse test: t_p = 5 ms, δ < 2%

To evaluate the conduction losses use the following equation:

$$P = 0.73 \times I_{F(AV)} + 0.021 I_{F}^{2}_{(RMS)}$$

Table 5. Dynamic characteristics

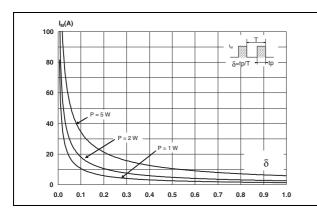
Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
	$I_F = 1 \text{ A, } dI_F/dt = -50 \text{ A/}\mu\text{s,}$ $V_R = 30 \text{ V, } T_j = 25 \text{ °C}$		25	30	ns	
t _{rr}	Reverse recovery time	$I_F = 1 \text{ A, } dI_F/dt = -100 \text{ A/}\mu\text{s,}$ $V_R = 30 \text{ V, } T_j = 25 \text{ °C}$		17	22	
I _{RM}	Reverse recovery current	$I_F = 8 \text{ A}, dI_F/dt = -200 \text{ A/}\mu\text{s}, \ V_R = 160 \text{ V}, T_j = 125 ^{\circ}\text{C}$		5.5	7	Α
t _{fr}	Forward recovery time	$I_F = 8 \text{ A}, dI_F/dt = 50 \text{ A/}\mu\text{s}$ $V_{FR} = 1.1 \text{ x } V_{Fmax}, T_j = 25 \text{ °C}$		150		ns
V _{FP}	Forward recovery voltage	$I_F = 8$ A, $dI_F/dt = 50$ A/ μ s, $T_j = 25$ °C		1.5		V

^{2.} Pulse test: t_p = 380 μ s, δ < 2%

STTH802-Y Characteristics

Figure 1. Peak current versus duty cycle

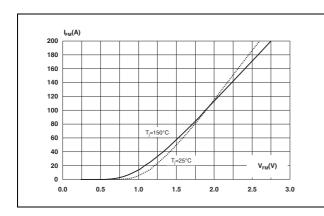
Figure 2. Forward voltage drop versus forward current (typical values)



1_{FM}(A)
200
180
160
140
120
100
80
60
40
20
0
0.0 0.5 1.0 1.5 2.0 2.5 3.0

Figure 3. Forward voltage drop versus forward current (maximum values)

Figure 4. Relative variation of thermal impedance, junction to case, versus pulse duration



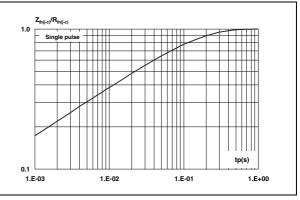
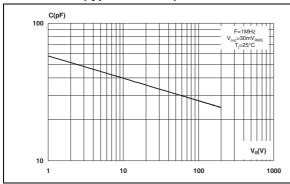
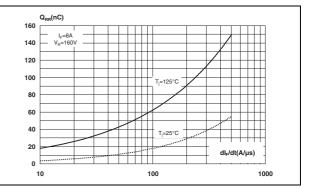


Figure 5. Junction capacitanceversus reverse applied voltage (typical values)

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





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Figure 7. Reverse recovery time versus dl_F/dt Figure 8. Peak reverse recovery current (typical values)

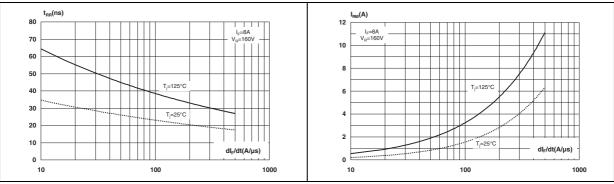
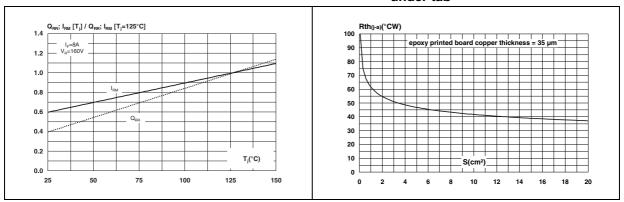


Figure 9. Dynamic parameters versus junction temperature

Figure 10. Thermal resistance, junction to ambient, versus copper surface under tab



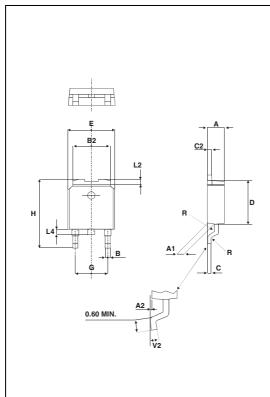
STTH802-Y Package information

2 Package information

- Epoxy meets UL94, V0
- Lead-free package

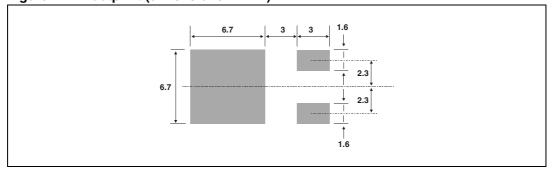
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK[®] packages, depending on their level of environmental compliance. ECOPACK[®] specifications, grade definitions and product status are available at: www.st.com. ECOPACK[®] is an ST trademark.

Table 6. DPAK dimensions



		Dimensions			
Ref.	Millim	neters	Inc	nches	
	Min.	Max.	Min.	Max.	
Α	2.20	2.40	0.086	0.094	
A1	0.90	1.10	0.035	0.043	
A2	0.03	0.23	0.001	0.009	
В	0.64	0.90	0.025	0.035	
B2	5.20	5.40	0.204	0.212	
С	0.45	0.60	0.017	0.023	
C2	0.48	0.60	0.018	0.023	
D	6.00	6.20	0.236	0.244	
Е	6.40	6.60	0.251	0.259	
G	4.40	4.60	0.173	0.181	
Τ	9.35	10.10	0.368	0.397	
L2	0.80 typ.		0.03	1 typ.	
L4	0.60	1.00	0.023	0.039	
V2	0°	8°	0°	8°	

Figure 11. Footprint (dimensions in mm)



Ordering information STTH802-Y

3 Ordering information

 Table 7.
 Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STTH802BY-TR	STTH802Y	DPAK	0.3 g	2500	Tape and reel

4 Revision history

Table 8. Document revision history

Date	Revision	Changes
10-Mar-2011	1	First issue.
24-Oct-2012	2	Updated operating temperature range in <i>Table 2</i> .

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