STTH802-Y

Automotive ultrafast recovery diode

Datasheet – production data

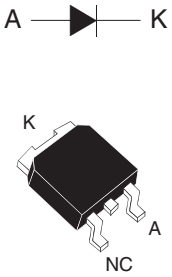
Features

- 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.



DPAK
STTH802BY-TR

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

1 Characteristics

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

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		200	V
$I_{F(RMS)}$	Forward rms current		16	A
$I_{F(AV)}$	Average forward current, δ = 0.5	T_c = 145 °C	8	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	100	A
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Operating junction temperature range		-40 to + 175	°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.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$			6	µA
		T_j = 125 °C			6	60	
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 8 A		0.95	1.05	V
		T_j = 150 °C			0.8	0.90	

1. Pulse test: t_p = 5 ms, δ < 2%
2. Pulse test: t_p = 380 µs, 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.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	I_F = 1 A, dI_F/dt = -50 A/µs, V_R = 30 V, T_j = 25 °C		25	30	ns
		I_F = 1 A, dI_F/dt = -100 A/µs, V_R = 30 V, T_j = 25 °C		17	22	
I_{RM}	Reverse recovery current	I_F = 8 A, dI_F/dt = -200 A/µs, V_R = 160 V, T_j = 125 °C		5.5	7	A
t_{fr}	Forward recovery time	I_F = 8 A, dI_F/dt = 50 A/µs V_{FR} = 1.1 x V_{Fmax}, T_j = 25 °C		150		ns
V_{FP}	Forward recovery voltage	I_F = 8 A, dI_F/dt = 50 A/µs, T_j = 25 °C		1.5		V

Figure 1. Peak current versus duty cycle

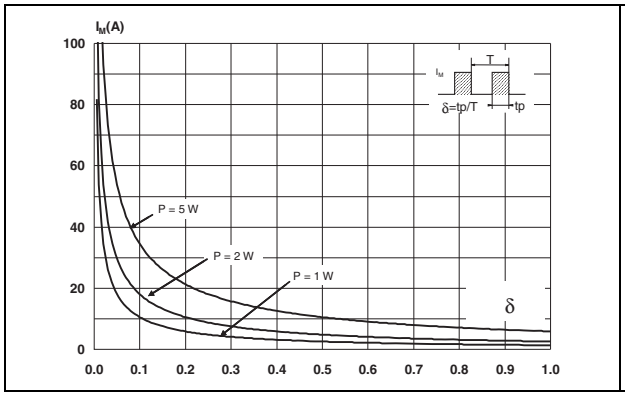


Figure 2. Forward voltage drop versus forward current (typical values)

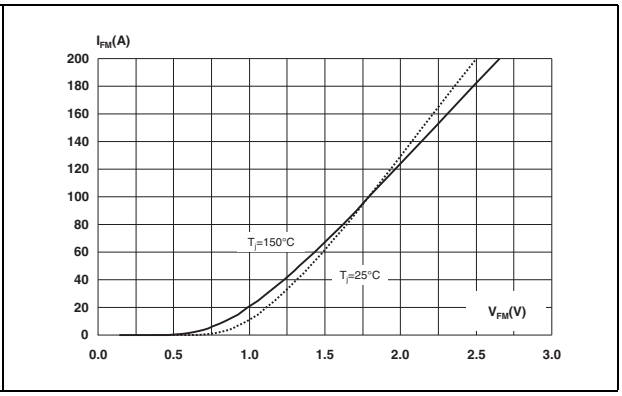


Figure 3. Forward voltage drop versus forward current (maximum values)

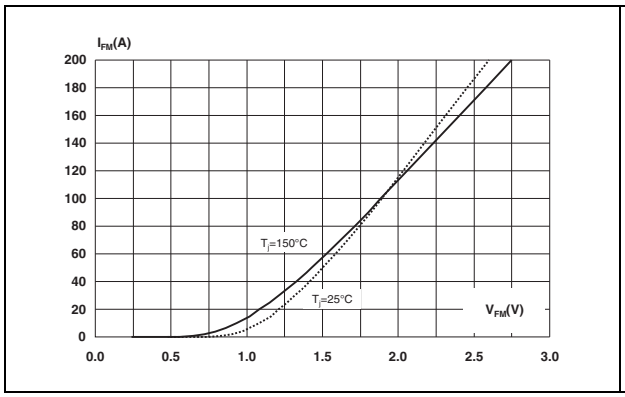


Figure 4. Relative variation of thermal impedance, junction to case, versus pulse duration

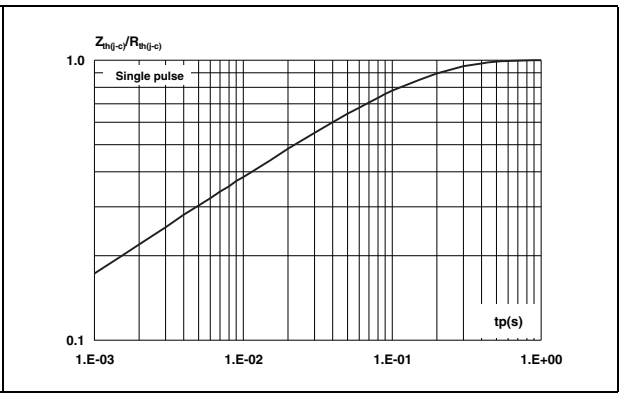


Figure 5. Junction capacitanceversus reverse applied voltage (typical values)

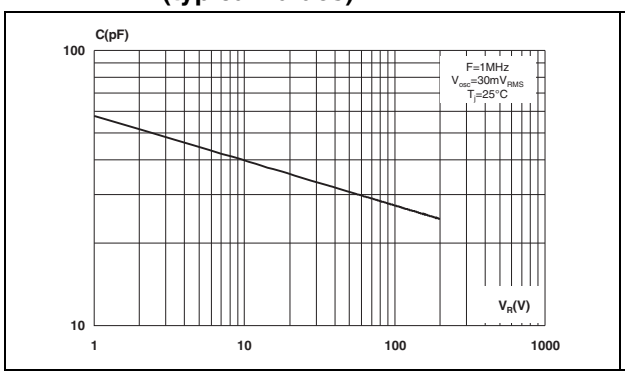


Figure 6. Reverse recovery charges versus dI_F/dt (typical values)

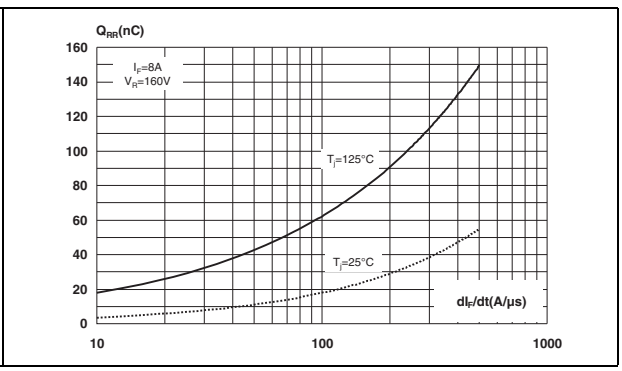


Figure 7. Reverse recovery time versus dI_F/dt (typical values)

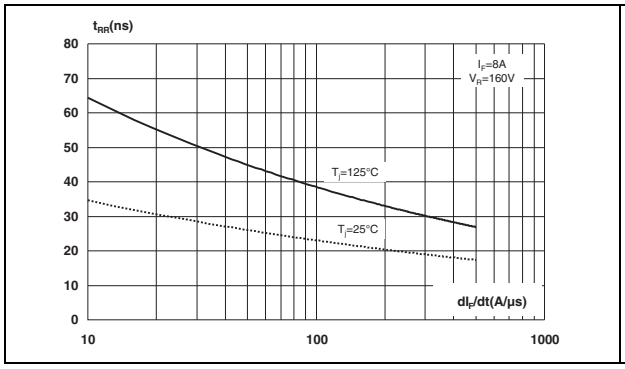


Figure 8. Peak reverse recovery current versus dI_F/dt (typical values)

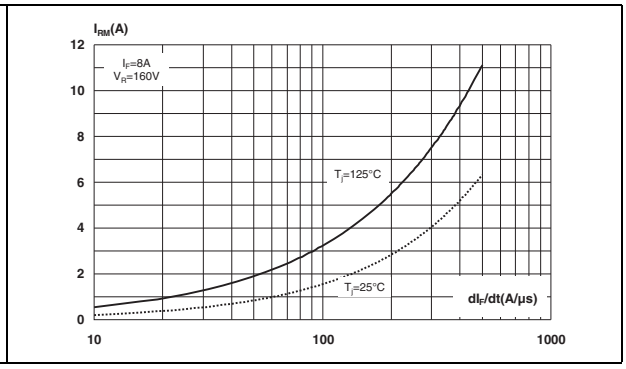


Figure 9. Dynamic parameters versus junction temperature

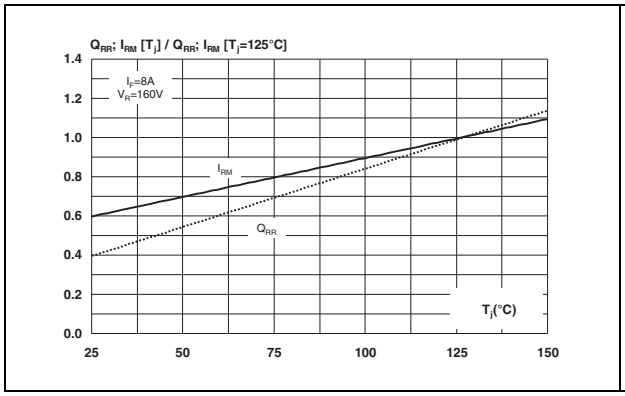
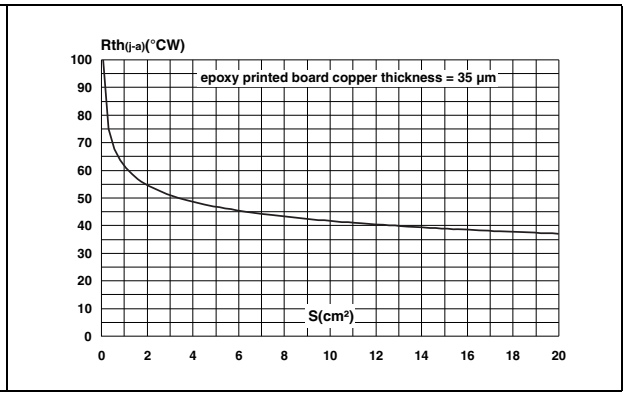


Figure 10. Thermal resistance, junction to ambient, versus copper surface under tab

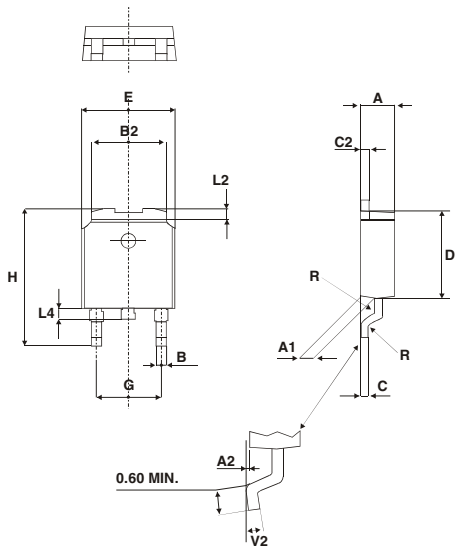


2 Package information

- Epoxy meets UL94, V0
- Lead-free package

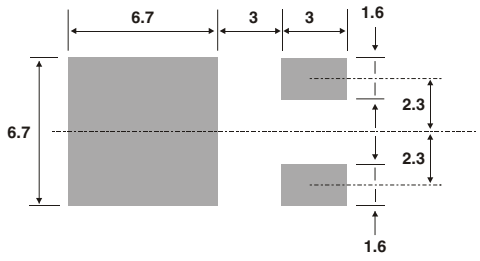
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK® is an ST trademark.

Table 6. DPAK dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	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
B	0.64	0.90	0.025	0.035
B2	5.20	5.40	0.204	0.212
C	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
E	6.40	6.60	0.251	0.259
G	4.40	4.60	0.173	0.181
H	9.35	10.10	0.368	0.397
L2	0.80 typ.		0.031 typ.	
L4	0.60	1.00	0.023	0.039
V2	0°	8°	0°	8°

Figure 11. Footprint (dimensions in mm)



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 *Table 2*.

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