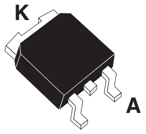
STPS8L30-Y

Automotive low drop power Schottky rectifier

Datasheet — production data



DPAK
STPS8L30BY-TR

Features

- Low cost device with low drop forward voltage for less power dissipation and reduced heatsink.
- Optimized conduction/reverse losses trade-off which leads to the highest yield in the application.
- High power surface mount miniature package.
- AEC-Q101 qualified.

Description

Single Schottky rectifier is suited to switched mode power supplies and high frequency DC to DC converters.

Packaged in DPAK, this device is especially intended for use as a rectifier at the SMPS or DC/DC units polarity protection in automotive applications.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	8 A
V_{RRM}	30 V
T_j	150 °C
$V_{F\ (MAX)}$	0.40 V

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		30	V
$I_{F(RMS)}$	Forward rms current		7	A
$I_{F(AV)}$	Average forward current, δ = 0.5	T_c = 135 °C	8	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	75	A
I_{RRM}	Peak repetitive reverse current	t_p = 2 µs, F = 1kHz square	1	A
I_{RSM}	Non repetitive peak reverse current	t_p = 100 µs square	2	A
T_{stg}	Storage temperature range		-65 to +150	°C
T_j	Operating junction temperature(1)		-40 to +150	°C
dV/dt	Critical rate of rise of reverse voltage		10000	V/µs

1. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ condition to avoid thermal runaway for a diode on its own heatsink

Table 3. Thermal parameters

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case	2.5	°C/W

Table 4. Static electrical characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$	-	-	1	mA
		T_j = 100 °C		-	15	40	
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 8 A	-	-	0.49	V
		T_j = 125 °C		-	0.35	0.40	
		T_j = 25 °C	I_F = 16 A	-	-	0.63	
		T_j = 125 °C		-	0.448	0.57	

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:
$P = 0.23 \times I_{F(AV)} + 0.021 \times I_F{}^2{}_{(RMS)}$

Figure 1. Average forward power dissipation vs. average forward current

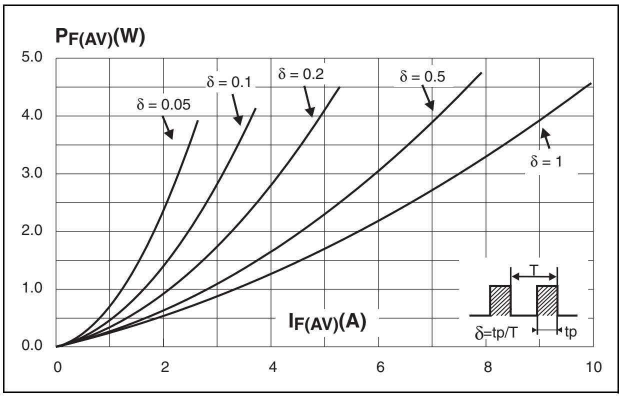


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

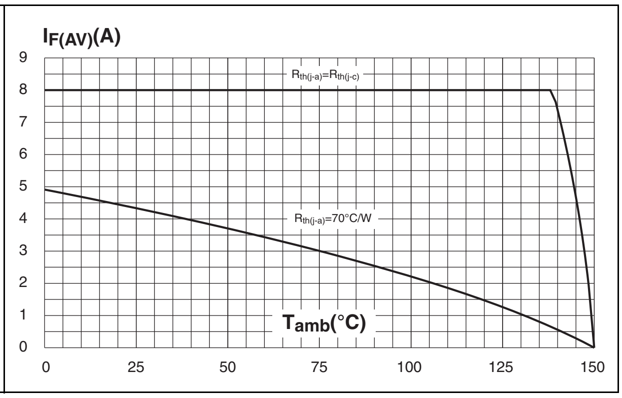


Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values)

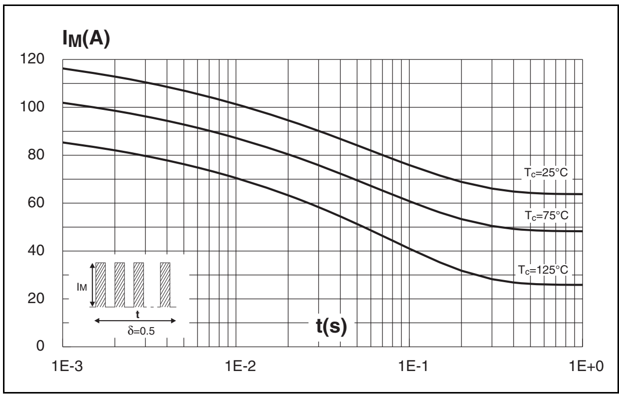


Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration

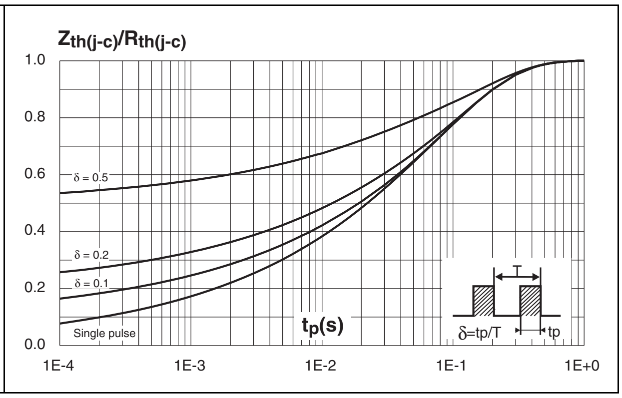


Figure 5. Reverse leakage current vs. reverse voltage applied (typical values)

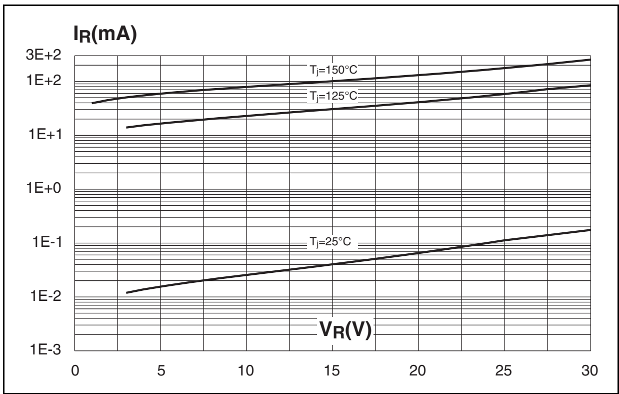


Figure 6. Junction capacitance vs. reverse voltage applied (typical values)

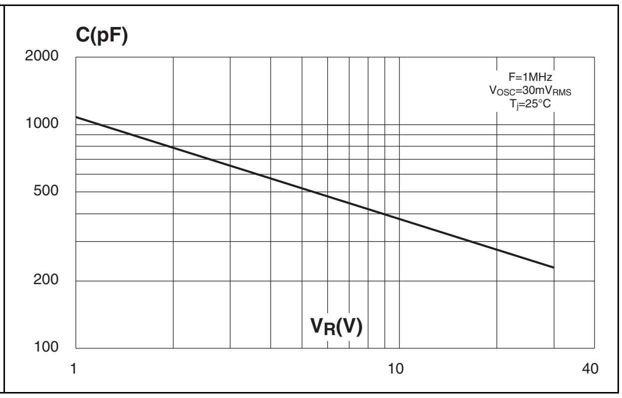


Figure 7. Forward voltage drop vs. forward current

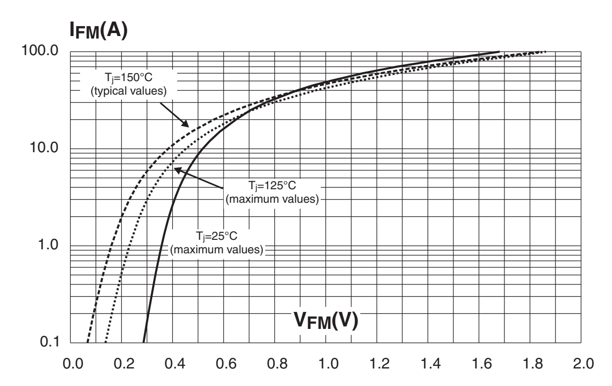
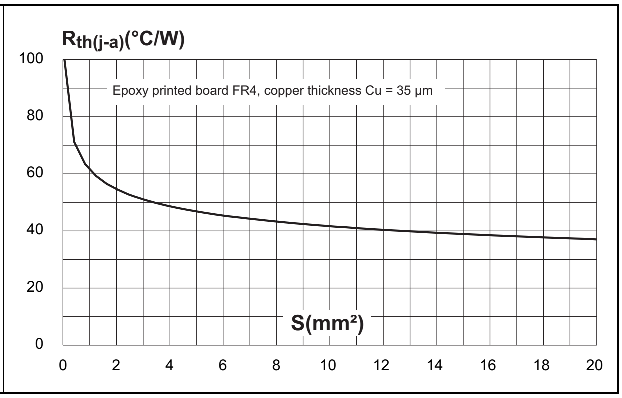


Figure 8. Thermal resistance junction to ambient versus copper surface under tab



2 Package information

- Epoxy meets UL94,V0
- Lead-free packages

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.

Figure 9. DPAK dimension definitions

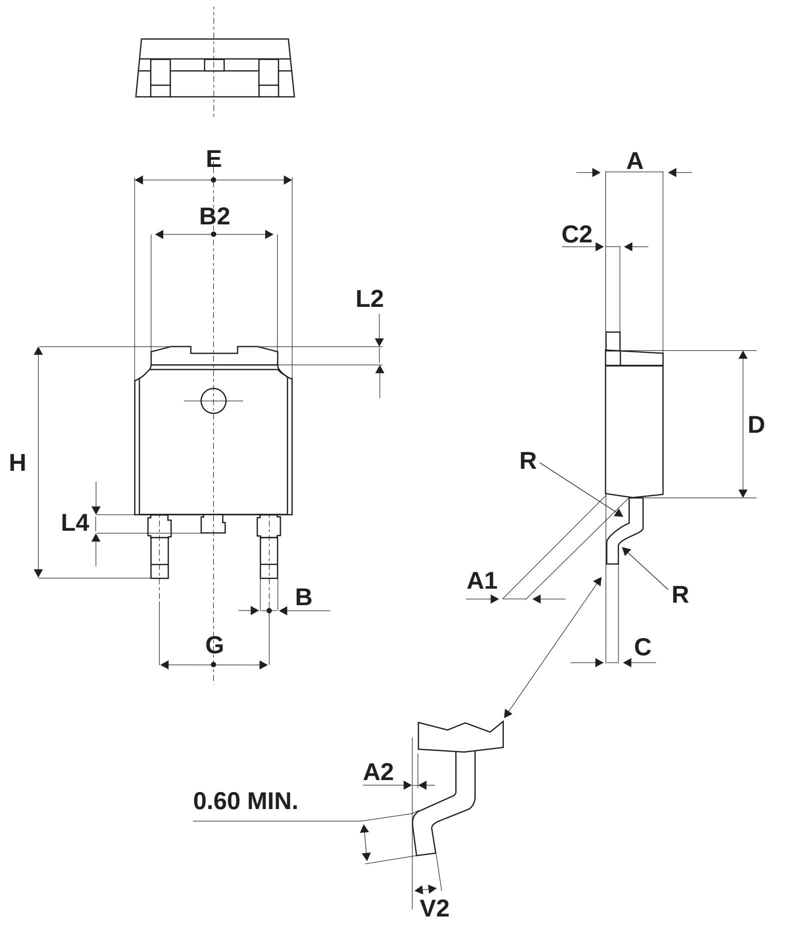
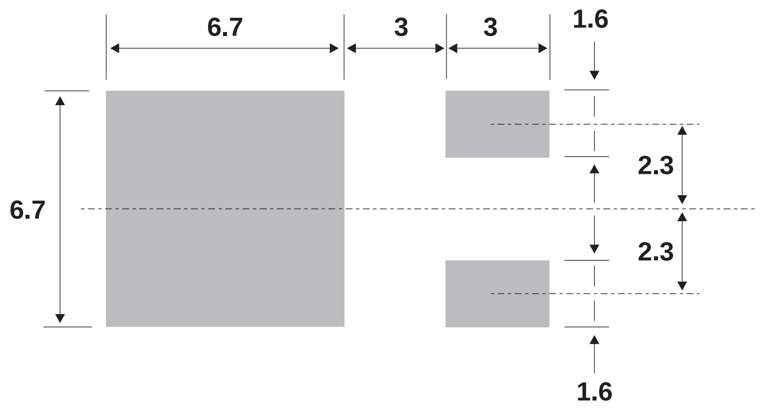


Table 5. DPAK dimension values

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	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 10. Footprint dimensions in mm (inches)



3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS8L30BY-TR	LS30Y	DPAK	0.3 g	2500	Tape and reel

4 Revision history

Table 7. Revision history

Date	Revision	Changes
11-Jul-2013	1	First issue