STPS3L60-Y

Automotive power Schottky rectifier

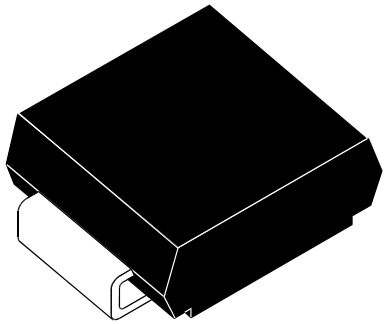
Features

- Negligible switching losses
- Low thermal resistance
- Avalanche capability specified
- AEC Q101 qualified
- ECOPACK®2 compliant component

Description

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

Packaged in SMC this device is intended for use in DC/DC chargers for automotive applications.



STPS3L60SY
SMC
(JEDEC DO-214AB)

Table 1. Device summary

$I_{F(AV)}$	3 A
V_{RRM}	60 V
$T_{j\ (max)}$	150 °C
$V_{F\ (max)}$	0.65 V

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		60	V
$I_{F(RMS)}$	Forward rms current		10	A
$I_{F(AV)}$	Average forward current	T_C = 100 °C δ = 0.5	3	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms Sinusoidal	75	A
I_{RRM}	Repetitive peak reverse current	t_p = 2 µs square F=1 kHz	1	A
P_{ARM}	Repetitive peak avalanche power	t_p = 1 µs T_j = 25 °C	1600	W
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Operating junction temperature range(1)		-40 to +150	°C
dV/dt	Critical rate of rise 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 resistances

Symbol	Parameter	Value	Unit
$R_{th\ (j-l)}$	Junction to leads	20	° C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I_R (1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$			55	µA
		T_j = 125 °C			10	15	mA
V_F (1)	Forward voltage drop	T_j = 25 °C	I_F = 3 A			0.7	V
		T_j = 125 °C	I_F = 3 A		0.56	0.65	
		T_j = 25 °C	I_F = 6 A			0.94	
		T_j = 125 °C	I_F = 6 A		0.67	0.76	

1. Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:
$P = 0.54 \times I_{F(AV)} + 0.037 \times I_{F}^{2}{}_{(RMS)}$

Figure 1. Average forward power dissipation versus average forward current

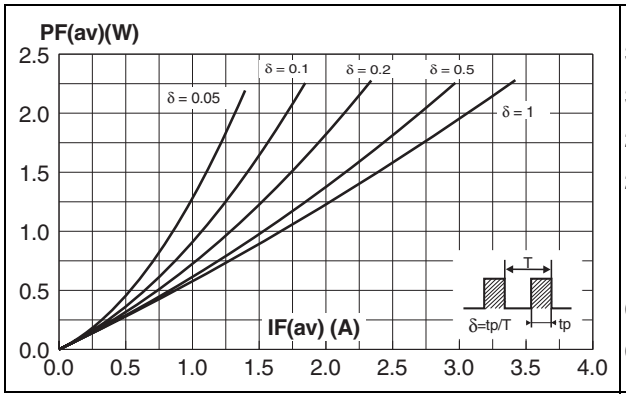


Figure 2. Average forward current versus ambient temperature (δ = 0.5)

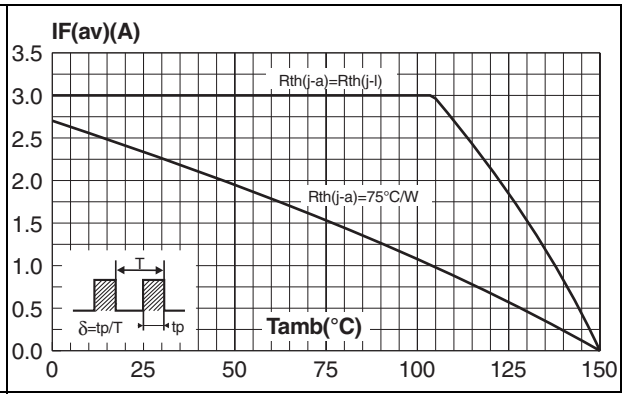


Figure 3. Normalized avalanche power derating versus pulse duration

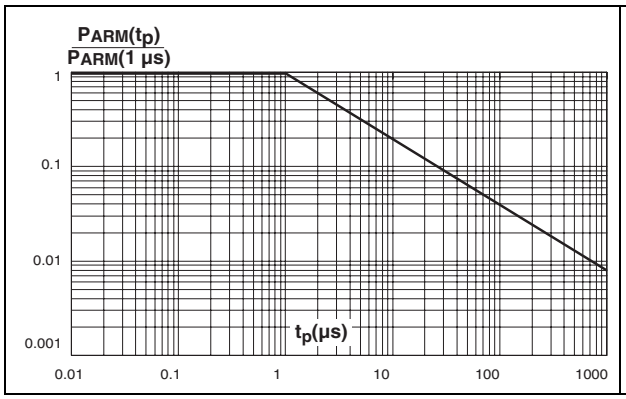


Figure 4. Normalized avalanche power derating versus junction temperature

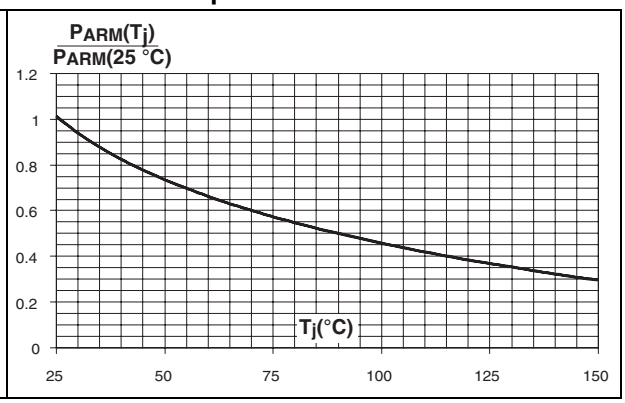


Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)

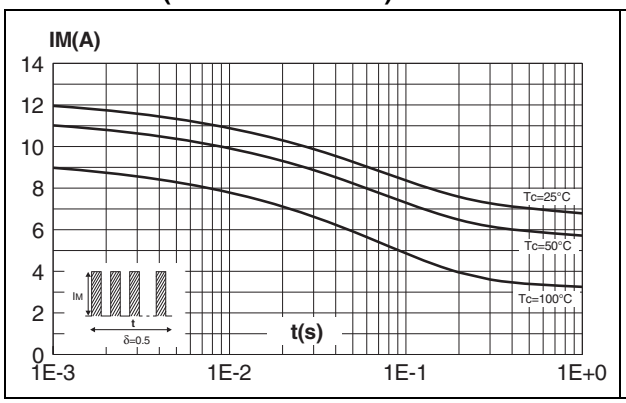


Figure 6. Relative variation of thermal impedance junction to lead versus pulse duration

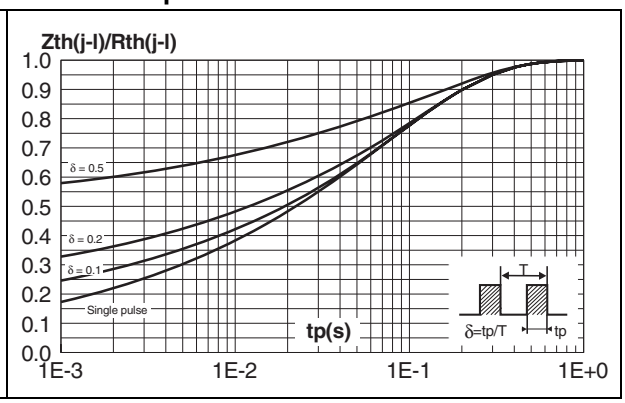


Figure 7. Reverse leakage current versus reverse voltage applied (typical values)

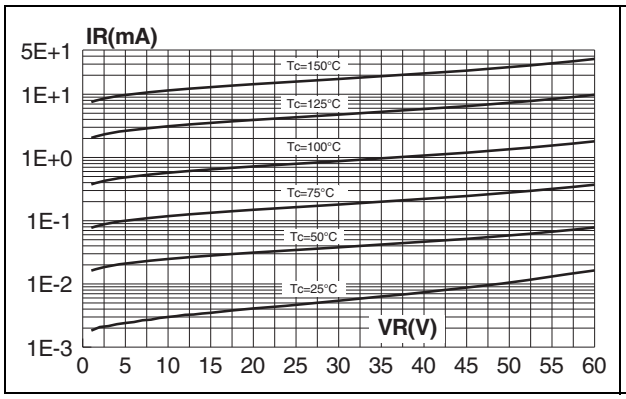


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

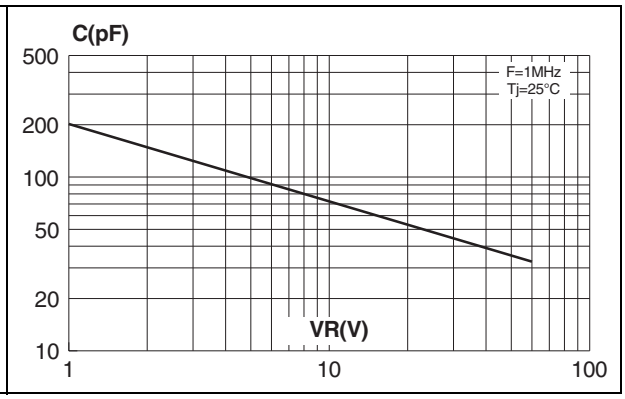


Figure 9. Forward voltage drop versus forward current (low level, maximum values)

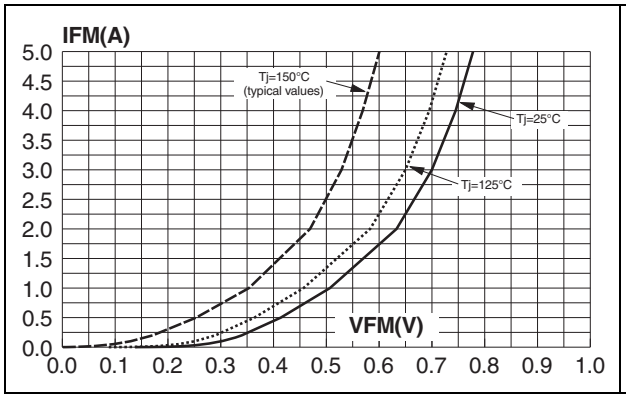


Figure 10. Forward voltage drop versus forward current (high level, maximum values)

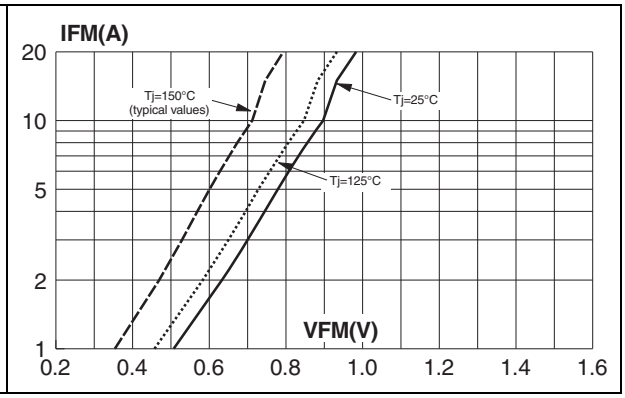
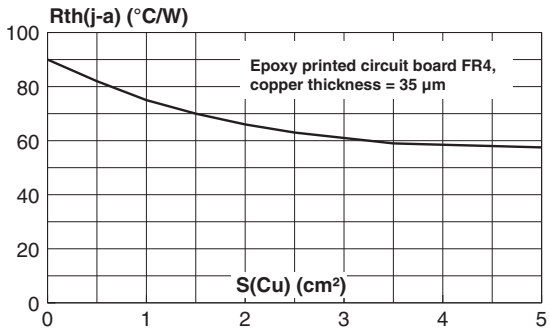


Figure 11. Thermal resistance junction to ambient versus copper surface under each lead

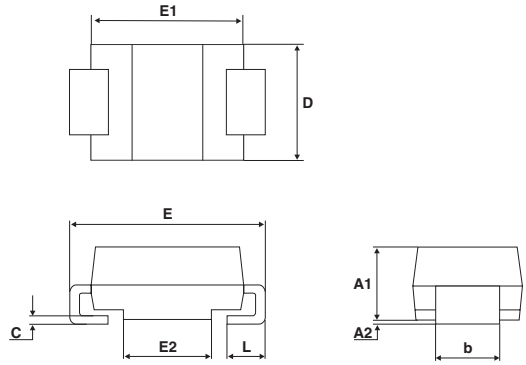


2 Package information

- 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.

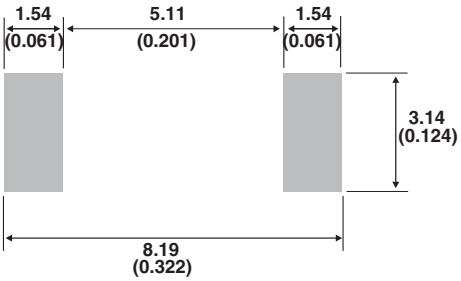
Table 5. SMC Dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b(1)	2.90	3.20	0.114	0.126
c(1)	0.15	0.40	0.006	0.016
D	5.55	6.25	0.218	0.246
E	7.75	8.15	0.305	0.321
E1	6.60	7.15	0.260	0.281
E2	4.40	4.70	0.173	0.185
L	0.75	1.50	0.030	0.059

1. Dimensions b and c apply to plated leads

Figure 12. Footprint, dimensions in mm (inches)



3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS3L60SY	S36Y	SMC	0.24 g	2500	Tape and reel

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
15-Sep-2011	1	Initial release.

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