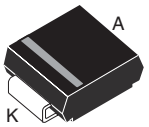
STPS3L40-Y

Automotive power Schottky rectifier

Features

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



SMC
STPS3L40SY

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 application.

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	3 A
V_{RRM}	40 V
T_j (max)	150 °C
V_F(max)	0.44 V

1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		40	V
$I_{F(AV)}$	Average forward current	T_L = 120 °C δ = 0.5	3	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	75	A
P_{ARM}	Repetitive peak avalanche power	t_p = 1 µs Tj = 25 °C	1300	W
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Operating junction temperature range(1)		-40 to +150	°C

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

Table 3. Thermal resistance

Symbol	Parameter	Value	Unit
$R_{th(j-l)}$	Junction to lead	18	°C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$		100	µA
		T_j = 125 °C		16	40	mA
V_F(1)	Forward voltage drop	T_j = 25 °C	I_F = 3 A		0.5	V
		T_j = 125 °C		0.40	0.44	
		T_j = 25 °C	I_F = 6 A		0.62	
		T_j = 125 °C		0.52	0.58	

1. Pulse test: tp = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation:
$P = 0.30 \times I_{F(AV)} + 0.047\ I_F{}^2{}_{(RMS)}$

Figure 1. Average forward power dissipation versus average forward current

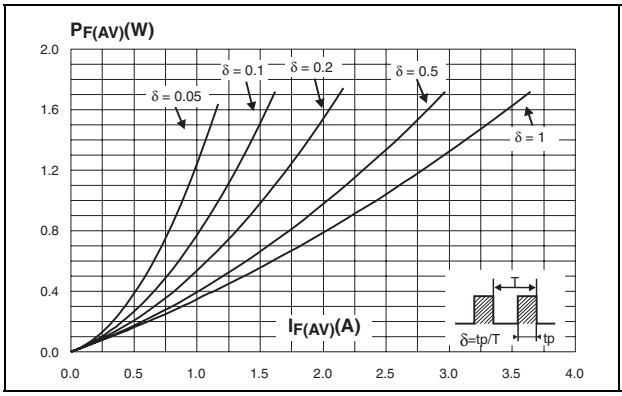


Figure 2. Average forward current versus ambient temperature (δ = 0.5) - SMC

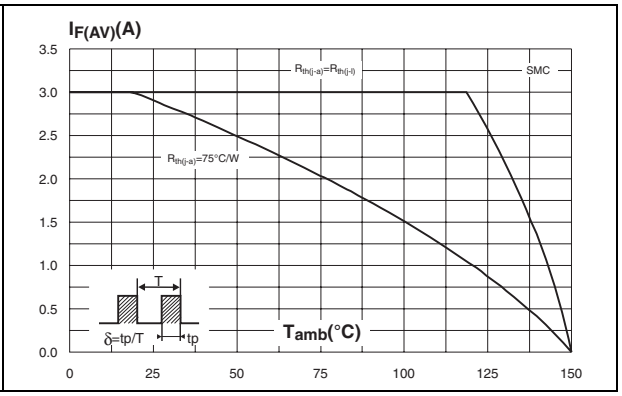


Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values)

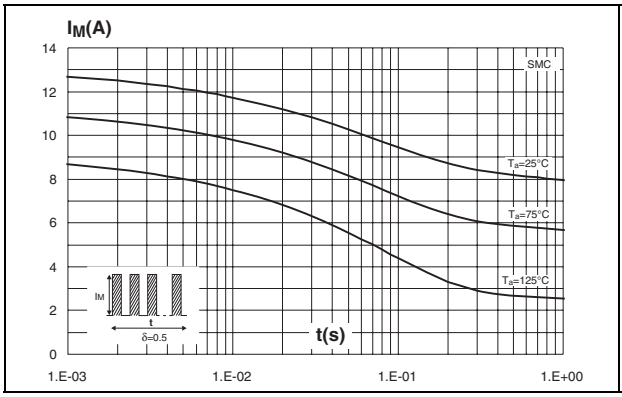


Figure 4. Normalized avalanche power derating versus pulse duration

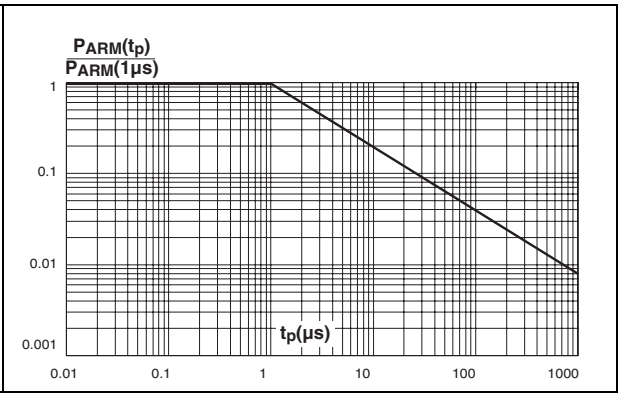


Figure 5. Normalized avalanche power derating versus junction temperature

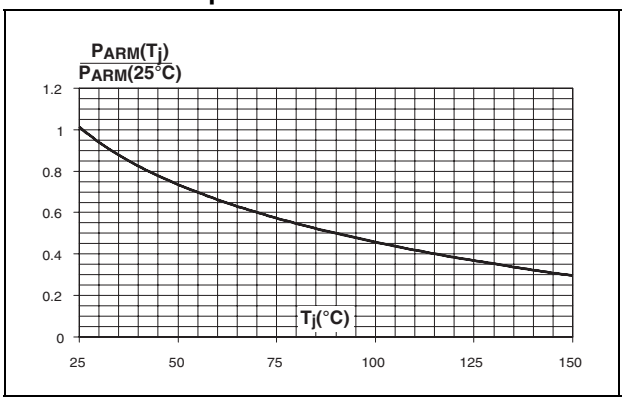


Figure 6. Relative variation of thermal impedance junction to ambient versus pulse duration

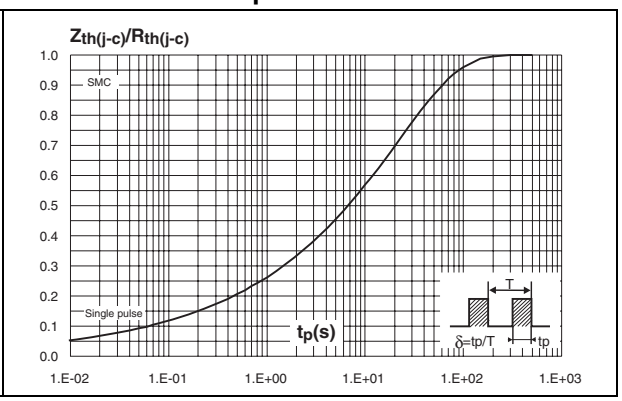


Figure 7. Reverse leakage current versus reverse voltage applied (typical values)

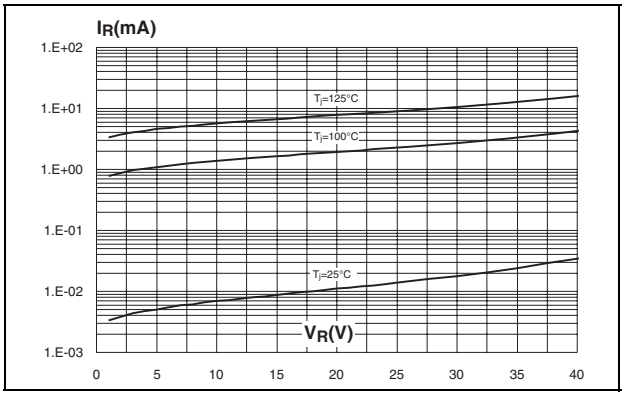


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

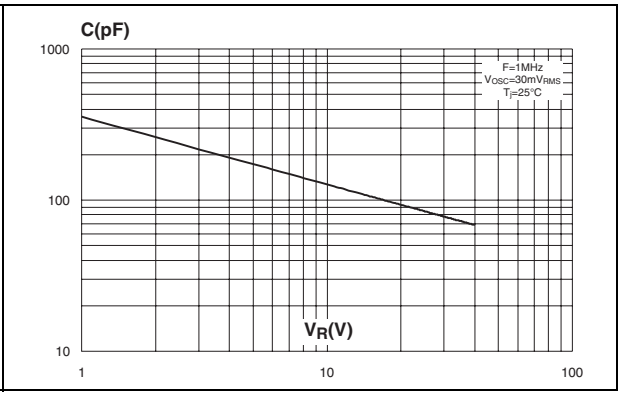


Figure 9. Forward voltage drop versus forward current

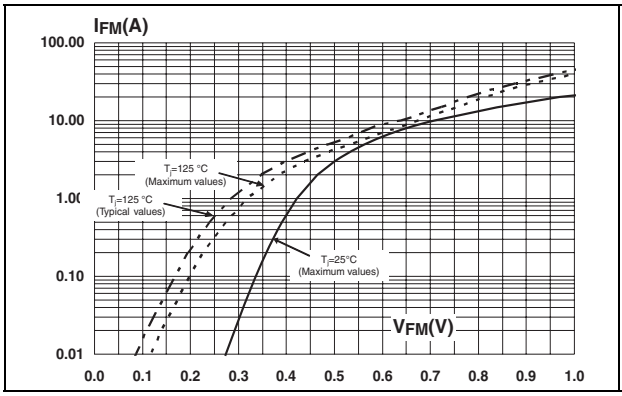
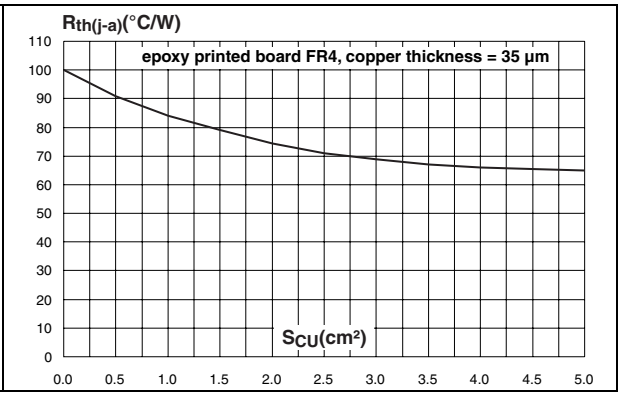


Figure 10. Thermal resistance junction to ambient versus copper surface under each lead

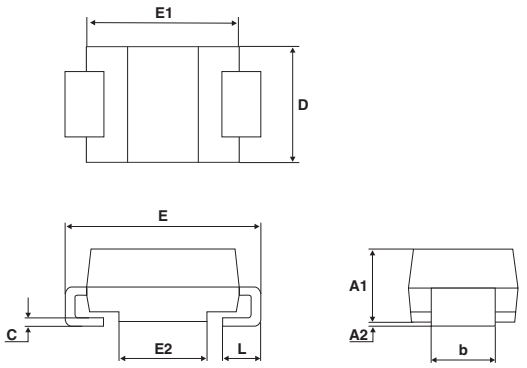


2 Package information

- Epoxy meets UL94,V0
- Lead-free packages

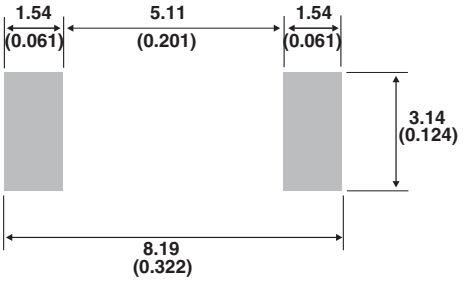
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Table 5. SMC package 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	2.90	3.2	0.114	0.126
c	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	1.40	0.030	0.063

Figure 11. SMC footprint dimensions in mm (inches)



3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS3L40SY	S3L4Y	SMC	0.24 g	2500	Tape and reel

4 Revision history

Table 7. Document revision history

Date	Revision	Changes
10-Mar-2011	1	First issue.

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