

STPS3L40

Power Schottky rectifier

Main product characteristics

I _{F(AV)}	3 A
V _{RRM}	40 V
T _j (max)	150° C
V _F (max)	0.44 V

Features and Benefits

- Negligible switching losses
- Low thermal resistance
- Low forward voltage drop
- Avalanche capability specified

Description

Schottky rectifier suited for switched mode power supplies and high frequency DC to DC converters. Packaged in SMC, and low profile SMB, this device is intended for use in DC/DC chargers.

A K C
SMC STPS3L40S
K A
SMB flat STPS3L40UF

Order codes

Part Number	Marking
STPS3L40S	S3L4
STPS3L40UF	FS3L4

Table 1. Absolute Ratings (limiting values)

Symbol		Value	Unit		
V _{RRM}	Repetitive peak reverse v	erse voltage			V
	SMC		$T_L = 120^\circ C \delta = 0.5$	2	۸
^I F(AV)	I _{F(AV)} Average forward current	SMB flat	$T_L = 130^\circ C \ \delta = 0.5$	3	A
I _{FSM}	Surge non repetitive forward current		t _p = 10 ms sinusoidal	75	А
P _{ARM}	Repetitive peak avalanche power $t_p = 1 \ \mu s$ $Tj = 25^{\circ} C$		1300	W	
T _{stg}	Storage temperature rang	-65 to + 175	°C		
Тj	Operating junction temperature ⁽¹⁾			150	°C

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

Characteristics 1

Table 2.	Thermal	resistance

Symbol	Parameter	Parameter		
D lunction to la	lunction to load	SMC	18	°C/W
R _{th(j-I)} Junction to lead		SMB flat	10	0/10

Table 3. Static electrical characteristics

Symbol	Parameter	Test Con	Тур.	Max.	Unit	
I _B ⁽¹⁾			V _ V		100	μA
'R`´	IR ⁽¹⁾ Reverse leakage current	$T_j = 125^\circ C$	$V_{R} = V_{RRM}$	16	40	mA
) (1) Energy lands and and	$T_j = 25^\circ C$	I _F = 3 A		0.5	
V _F ⁽¹⁾		$T_j = 125^\circ C$		0.40	0.44	V
V _F ⁽¹⁾ Forward voltage drop	$T_j = 25^\circ C$	1 - 6 4		0.62	v	
		T _j = 125° C	I _F = 6 A	0.52	0.58	

1. Pulse test: tp = 380 μ s, δ < 2%

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

Figure 1. Average forward power dissipation Figure 2. versus average forward current

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

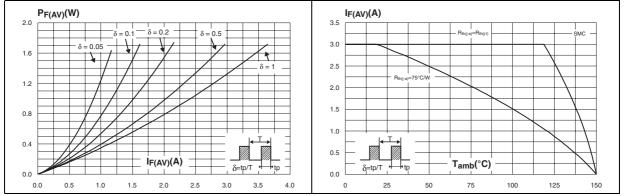
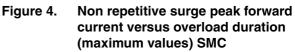
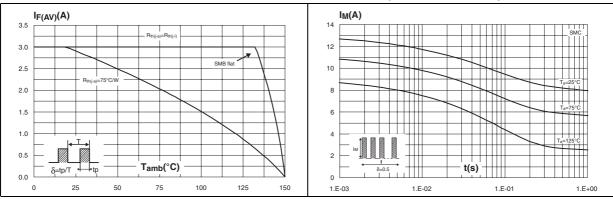




Figure 3. Average forward current versus ambient temperature (δ = 0.5) SMB flat





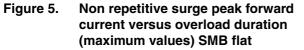


Figure 6. Normalized avalanche power derating versus pulse duration

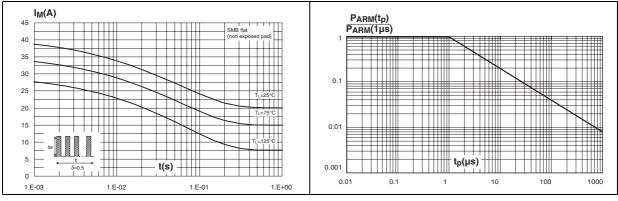
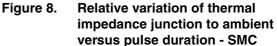


Figure 7. Normalized avalanche power derating versus junction temperature



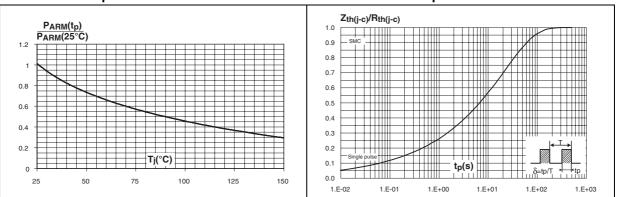
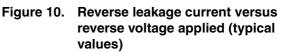


Figure 9. Relative variation of thermal impedance junction to lead versus pulse duration - SMB flat



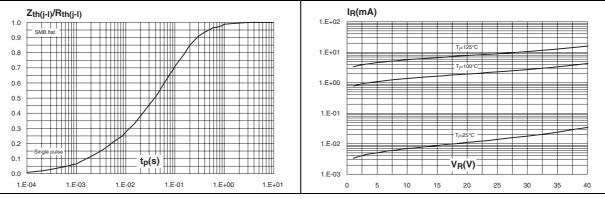


Figure 11. Junction capacitance versus reverse voltage applied (typical values)

Figure 12. Forward voltage drop versus forward current

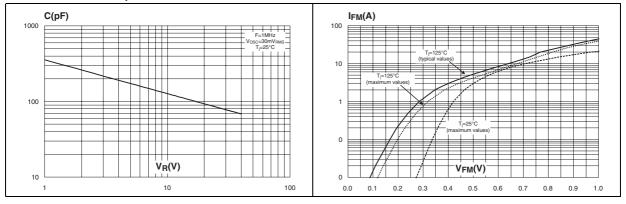
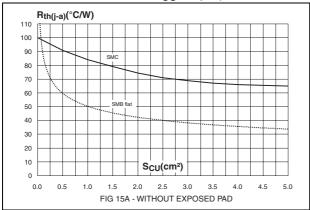


Figure 13. Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed board FR4, e_{CU}=35µm)





2 Package Information

• Epoxy meets UL94,V0

Table 4.SMC package mechanical data

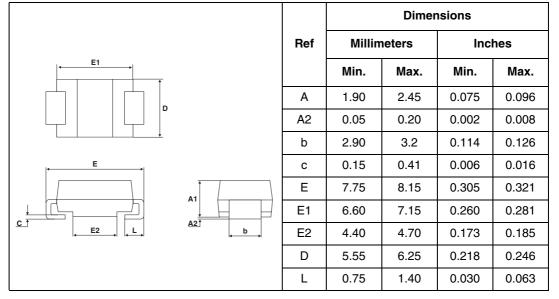
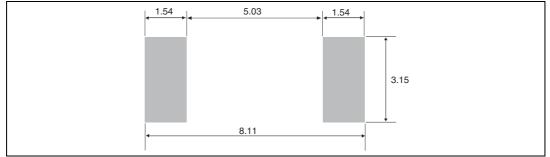


Figure 14. SMC footprint (dimensions in mm)



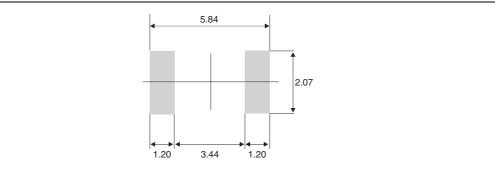


	Dimensions						
	Ref.	Мі	illimete	ers		Inches	
		Min.	Тур.	Max.	Min.	Тур.	Max.
	Α	0.90		1.10	0.035		0.043
	b ⁽¹⁾	1.95		2.20	0.077		0.087
	c ⁽¹⁾	0.15		0.40	0.006		0.016
E E1	D	3.30		3.95	0.130		0.156
↓	E	5.10		5.60	0.200		0.220
	E1	4.05		4.60	0.189		0.181
b	L	0.75		1.50	0.029		0.059
	L1		0.40			0.016	
	L2		0.60			0.024	

Table 5.SMB Flat dimensions

1. Applies to plated leads

Figure 15. SMB Flat footprint (dimensions in mm)



In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.



3 Ordering information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STPS3L40S	S3L4	SMC	0.24 g	2500	Tape and reel
STPS3L40UF	FS3L4	SMB flat	0.50 g	5000	Tape and reel

4 Revision history

Date	Revision	Description of Changes
Jul-2003	2A	Last update.
08-Feb-2007	3	Reformatted to current standard. Added ECOPACK statement. Added SMB flat package.



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