

STPS3150-Y

Automotive power Schottky rectifier

Features

- AEC-Q101 qualified
- Negligible switching losses
- Low forward voltage drop for higher efficiency and extented battery life
- Low thermal resistance
- ECOPACK®2 compliant component

Description

Packaged in SMB, this device is intended for use in automotive applications where low drop forward voltage is required to reduce power dissipation.

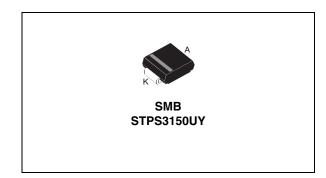


Table 1. Device summary

Symbol	Value
I _{F(AV)}	3 A
V_{RRM}	150 V
T _j (max)	175 °C
V _F (max)	0.67 V

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1 Characteristics

Table 2. Absolute ratings (limiting values)

Symbol	Parameter			Unit
V_{RRM}	Repetitive peak reverse voltage	150	V	
I _{F(AV)}	Average forward current $T_L = 130 ^{\circ}\text{C} \delta = 0$	0.5	3	Α
I _{FSM}	Surge non repetitive forward current $t_p = 10 \text{ ms sinuson}$	idal	80	Α
T _{stg}	Storage temperature range	-65 to +175	°C	
T _j	Operating junction temperature range ⁽¹⁾			°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	20	°C/W

Table 4. Static electrical characteristics

Symbol	Parameter	Tests conditions		Min.	Тур	Max.	Unit
ı_ (1)	Reverse leakage current	T _j = 25 °C	V V		0.4	2.0	μΑ
'R`		T _j = 125 °C	$V_R = V_{RRM}$		0.6	2.0	mA
		$T_j = 25 ^{\circ}\text{C}$ $T_j = 125 ^{\circ}\text{C}$ $I_F = 3 ^{\circ}\text{A}$		0.78	0.82		
V _F ⁽²⁾	Forward voltage drop		1F = 3 A		0.63	0.67	V
VF`'	v _F · / Forward voltage drop	T _j = 25 °C	I - 6 A		0.85	0.89	V
		T _j = 125 °C	I _F = 6 A		0.70	0.75	

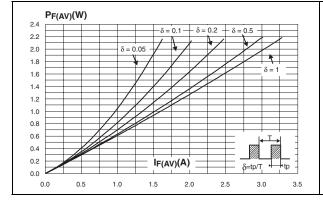
^{1.} $t_p = 5 \text{ ms}, \delta < 2\%$

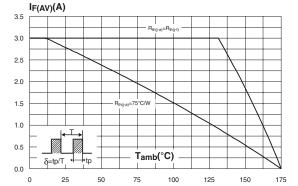
To evaluate the conduction losses use the following equation:

$$P = 0.59 \text{ x } I_{F(AV)} + 0.023 I_{F^2(RMS)}$$

Figure 1. Average forward power dissipation versus average forward current

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



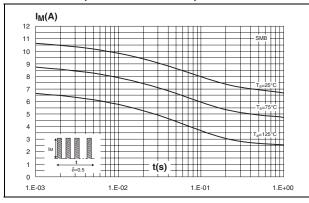


^{2.} $t_p = 380 \ \mu s, \ \delta < 2\%$

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

Figure 4. Normalized avalanche power derating versus pulse duration



PARM(tp)
PARM(1 μs)

0.1

0.01

tp(μs)

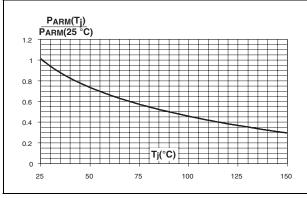
0.01

0.01

1 1 10 100 1000

Figure 5. Normalized avalanche power derating versus junction temperature

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



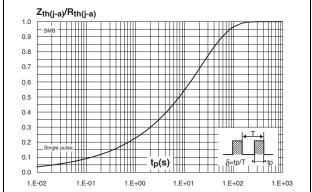
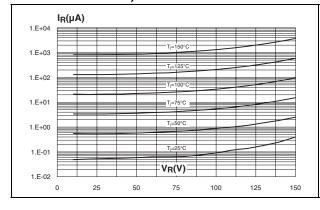
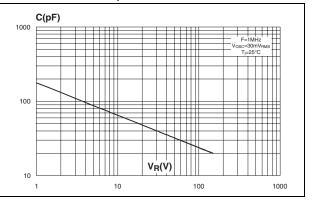


Figure 7. Reverse leakage current versus reverse voltage applied (typical values)

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

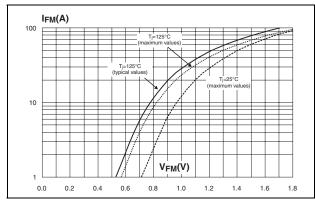




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Figure 9. Forward voltage drop versus forward current

Figure 10. Forward voltage drop versus forward current



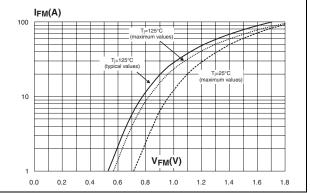
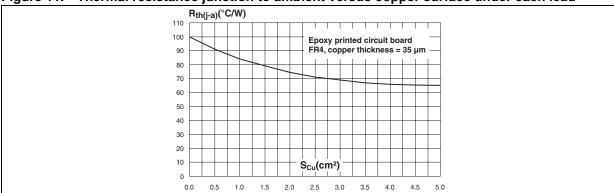


Figure 11. Thermal resistance junction to ambient versus copper surface under each lead

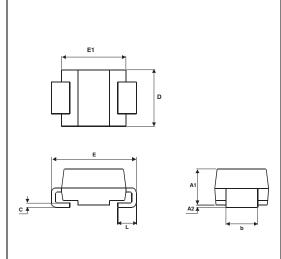


2 Package information

- Epoxy meets UL94, V0
- Lead-free package

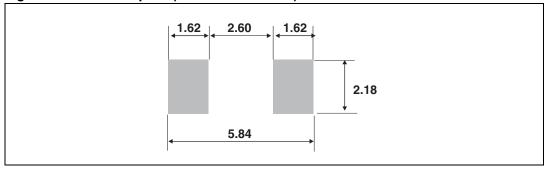
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Table 5. SMB dimensions



	Dimensions					
Ref.	Millimeters		Inc	hes		
	Min.	Max.	Min.	Max.		
A1	1.90	2.45	0.075	0.096		
A2	0.05	0.20	0.002	0.008		
b	1.95	2.20	0.077	0.087		
С	0.15	0.40	0.006	0.016		
Е	5.10	5.60	0.201	0.220		
E1	4.05	4.60	0.159	0.181		
D	3.30	3.95	0.130	0.156		
L	0.75	1.50	0.030	0.059		

Figure 12. SMB footprint (dimensions in mm)



Ordering information STPS3150-Y

3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS3150UY	G315Y	SMB	0.107 g	2500	Tape and reel

4 Revision history

Table 7. Document revision history

Date	Revision	Description of Changes
03-Nov-2011	1	Initial release.

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