

## Automotive power Schottky rectifier

### Features

- AEC-Q101 qualified
- Negligible switching losses
- Low forward voltage drop for higher efficiency and extended battery life
- Low thermal resistance
- ECOPACK<sup>®</sup>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

# 1 Characteristics

**Table 2. Absolute ratings (limiting values)**

Symbol	Parameter	Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage	150	V
$I_{F(AV)}$	Average forward current	$T_L = 130\text{ °C } \delta = 0.5$	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms sinusoidal}$	A
$T_{stg}$	Storage temperature range	-65 to +175	°C
$T_j$	Operating junction temperature range <sup>(1)</sup>	-40 to +175	°C

1.  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$  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

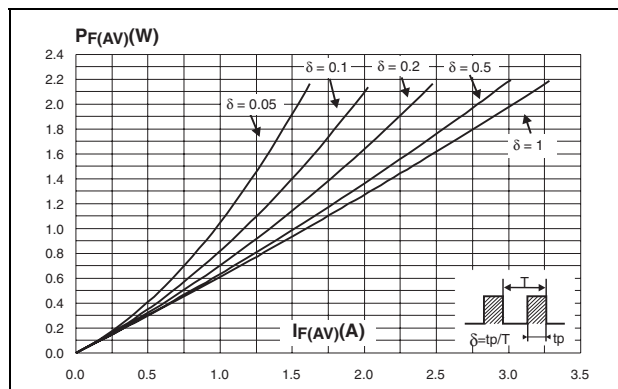
**Table 4. Static electrical characteristics**

Symbol	Parameter	Tests conditions	Min.	Typ	Max.	Unit
$I_R$ <sup>(1)</sup>	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	0.4	2.0	µA
		$T_j = 125\text{ °C}$		0.6	2.0	mA
$V_F$ <sup>(2)</sup>	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 3\text{ A}$	0.78	0.82	V
		$T_j = 125\text{ °C}$		0.63	0.67	
		$T_j = 25\text{ °C}$	$I_F = 6\text{ A}$	0.85	0.89	
		$T_j = 125\text{ °C}$		0.70	0.75	

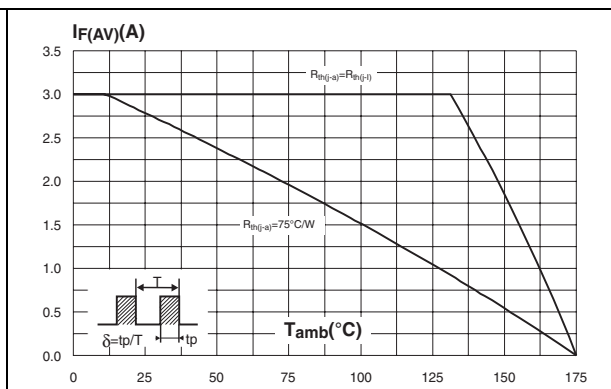
- 1.  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$
- 2.  $t_p = 380\text{ µs}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equation:  
 $P = 0.59 \times I_{F(AV)} + 0.023 I_F^2(RMS)$

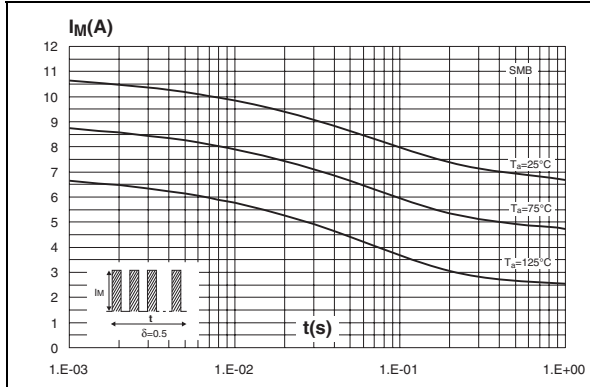
**Figure 1. Average forward power dissipation versus average forward current**



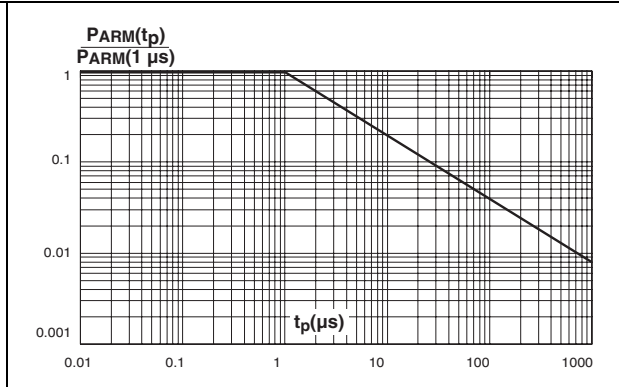
**Figure 2. Average forward current versus ambient temperature (delta = 0.5)**



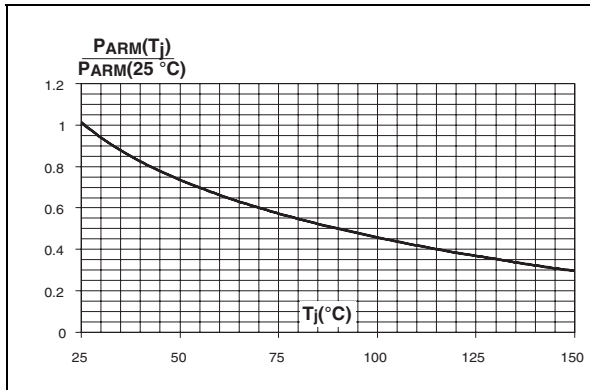
**Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values)**



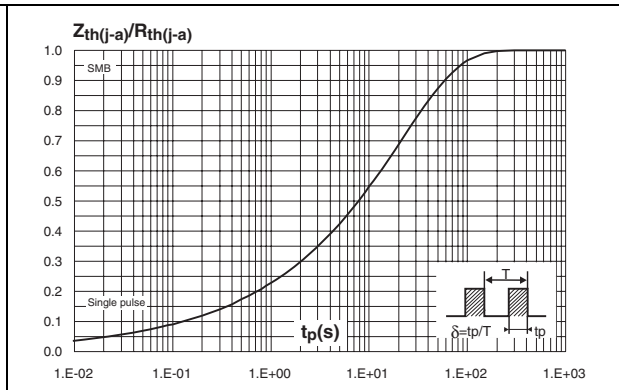
**Figure 4. Normalized avalanche power derating versus pulse duration**



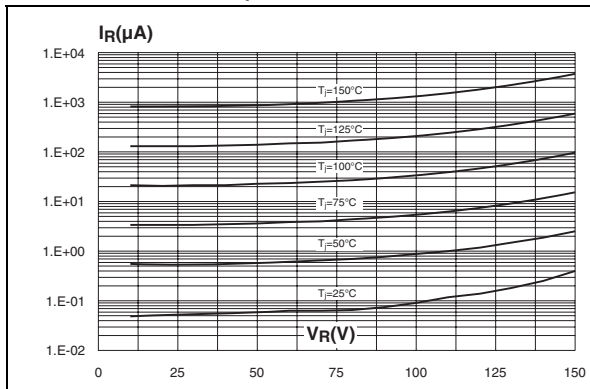
**Figure 5. Normalized avalanche power derating versus junction temperature**



**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)**

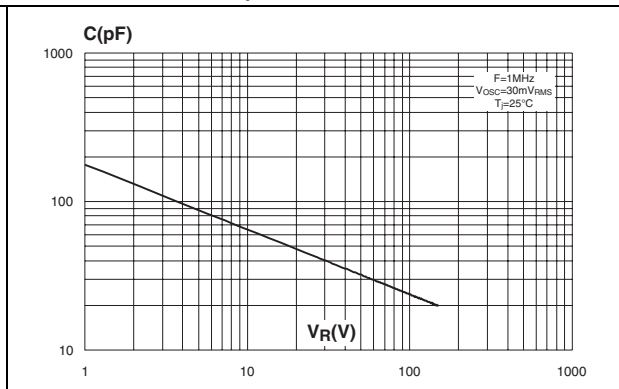


Figure 9. Forward voltage drop versus forward current

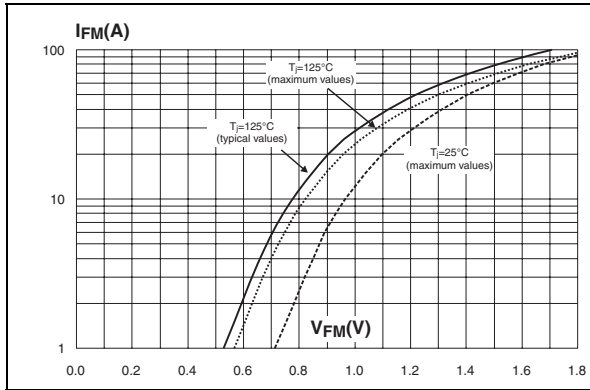


Figure 10. Forward voltage drop versus forward current

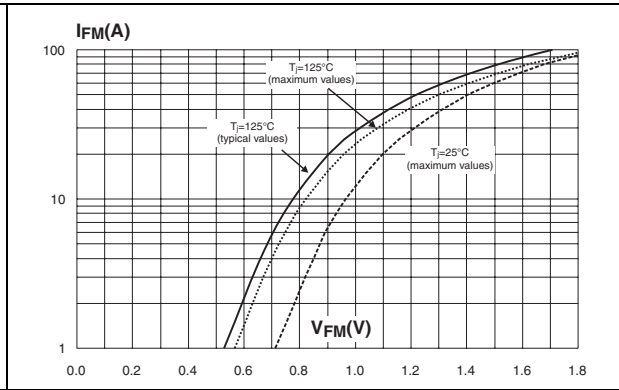
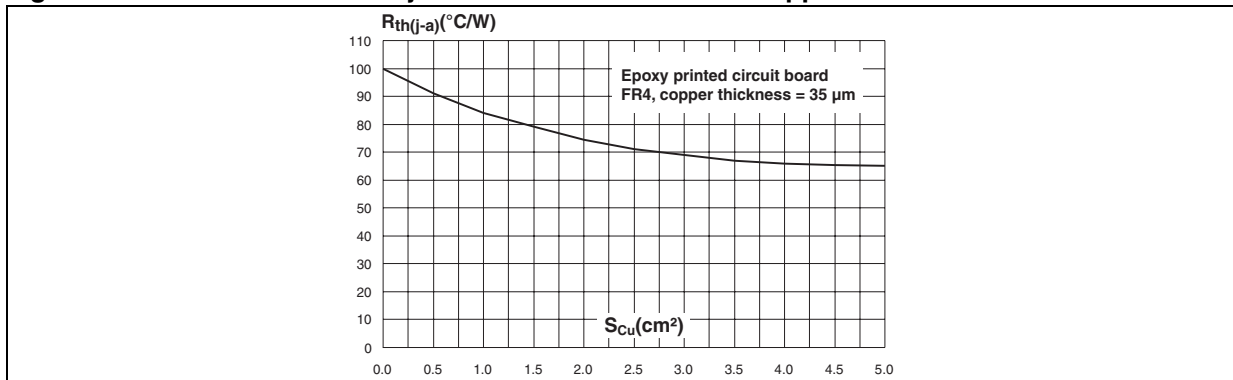


Figure 11. Thermal resistance junction to ambient versus copper surface under each lead



## 2 Package information

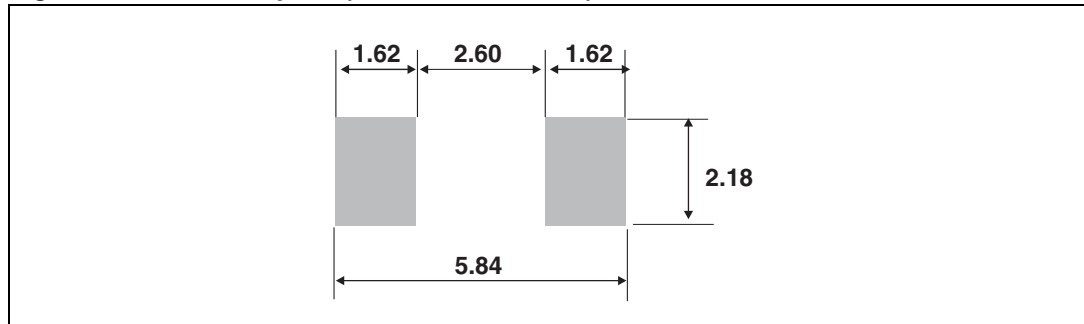
- Epoxy meets UL94, V0
- Lead-free package

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**Table 5. SMB 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	1.95	2.20	0.077	0.087
c	0.15	0.40	0.006	0.016
E	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)**



### 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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