

## Automotive power Schottky rectifier

Datasheet – production data

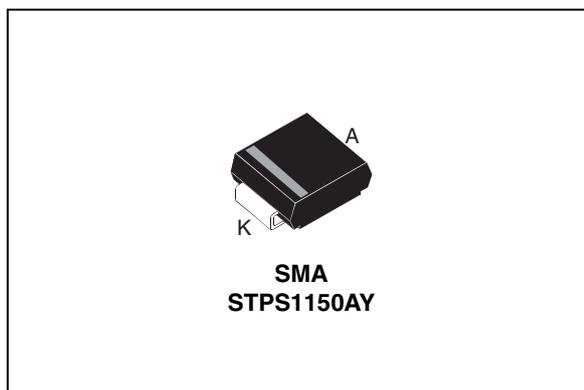
### Features

- AEC-Q101 qualified
- Negligible switching losses
- Low forward voltage drop for higher efficiency and extended battery life
- Low thermal resistance
- Surface mount miniature package
- Avalanche capability specified
- ECOPACK<sup>®</sup>2 compliant component

### Description

These 150 V power Schottky rectifiers are suited for switch mode power supplies on up to 24 V rails and high frequency converters.

Packaged in SMA, 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	Values
$I_{F(AV)}$	1 A
$V_{RRM}$	150 V
$T_j(\text{max})$	175 °C
$V_F(\text{max})$	0.67 V

# 1 Characteristics

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

Symbol	Parameter	Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage	150	V
$I_{F(RMS)}$	Forward rms current	15	A
$I_{F(AV)}$	Average forward current	$T_L = 150\text{ °C } \delta = 0.5$	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms sinusoidal}$	A
$P_{ARM}$	Repetitive peak avalanche power	$t_p = 1\mu\text{s } T_j = 25\text{ °C}$	W
$T_{stg}$	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 runaway for a diode on its own heatsink

**Table 3. Thermal resistance**

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

**Table 4. Static electrical characteristics**

Symbol	Parameter	Tests conditions	Min.	Typ.	Max.	Unit	
$I_R$ <sup>(1)</sup>	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$		0.2	1.0	μA
		$T_j = 125\text{ °C}$			0.2	1.0	mA
$V_F$ <sup>(2)</sup>	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 1\text{ A}$		0.78	0.82	V
		$T_j = 125\text{ °C}$			0.62	0.67	
		$T_j = 25\text{ °C}$	$I_F = 2\text{ A}$		0.85	0.89	
		$T_j = 125\text{ °C}$			0.69	0.75	

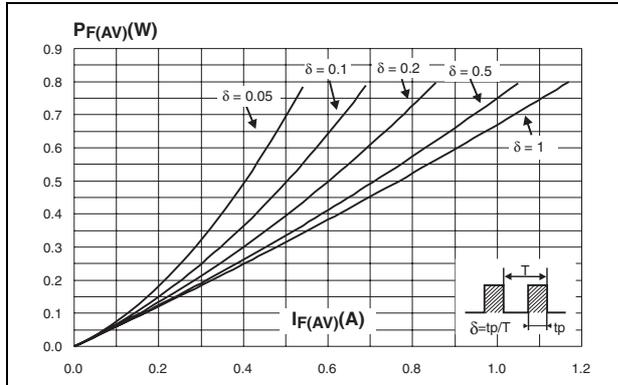
1.  $t_p = 5\text{ ms}, \delta < 2\%$

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

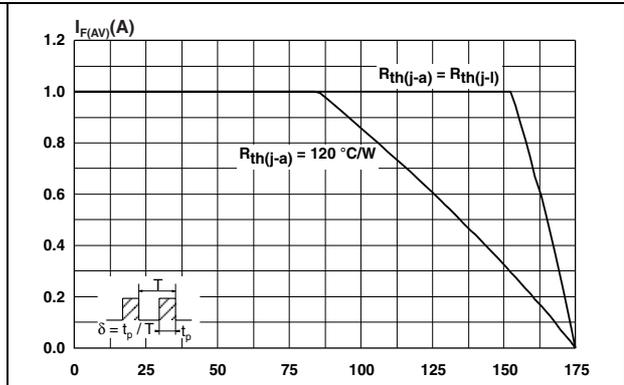
To evaluate the conduction losses use the following equation:

$$P = 0.59 \times I_{F(AV)} + 0.08 I_{F(RMS)}^2$$

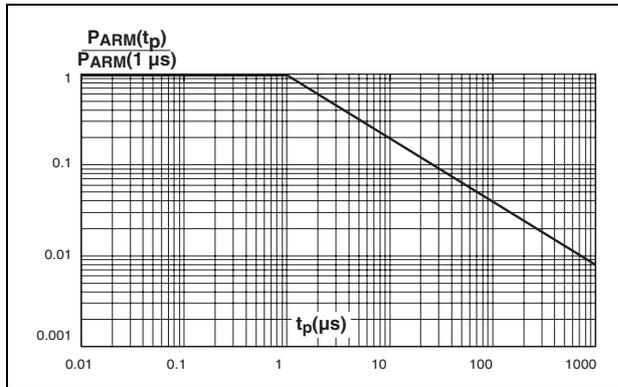
**Figure 1. Average forward power dissipation versus average forward current**



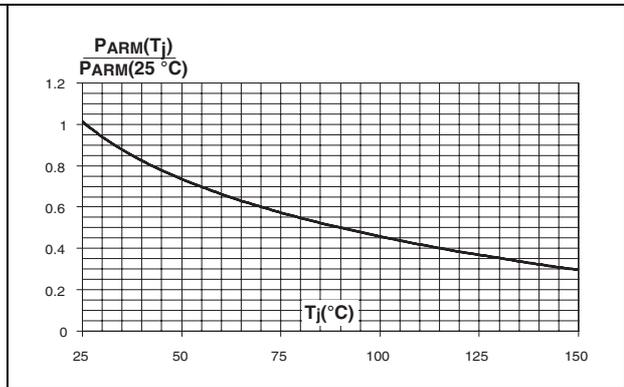
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ )**



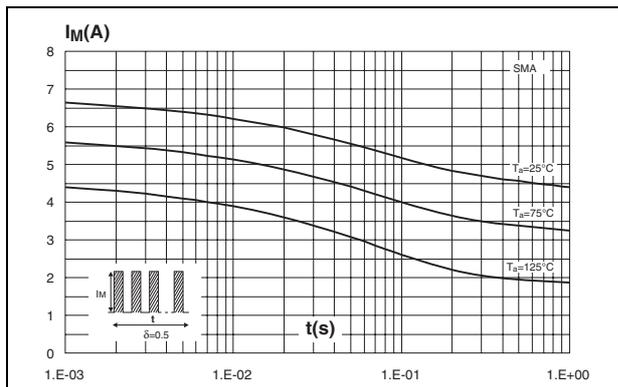
**Figure 3. Normalized avalanche power derating versus pulse duration**



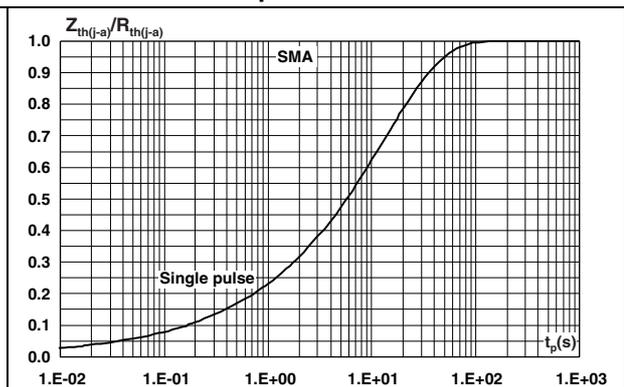
**Figure 4. Normalized avalanche power derating versus junction temperature**



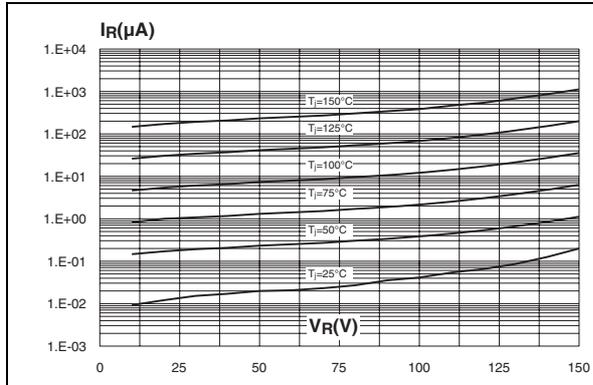
**Figure 5. Non repetitive surge peak forward current versus overload duration - maximum values**



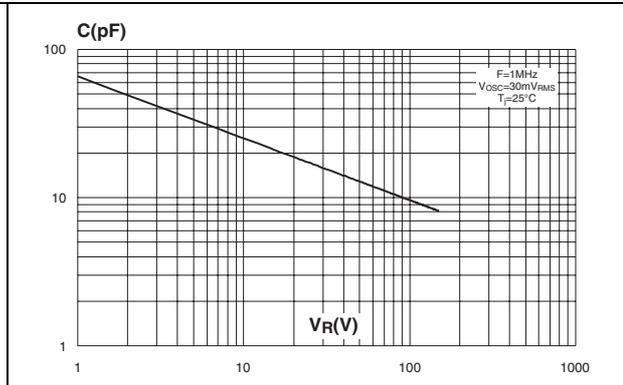
**Figure 6. Relative variation of thermal impedance junction to ambient versus pulse duration**



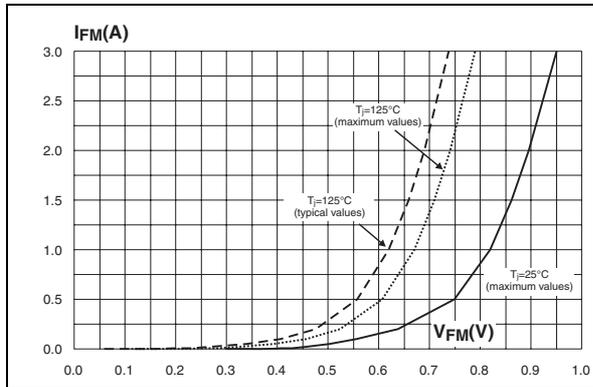
**Figure 7. Reverse leakage current versus reverse voltage applied (typical values)**



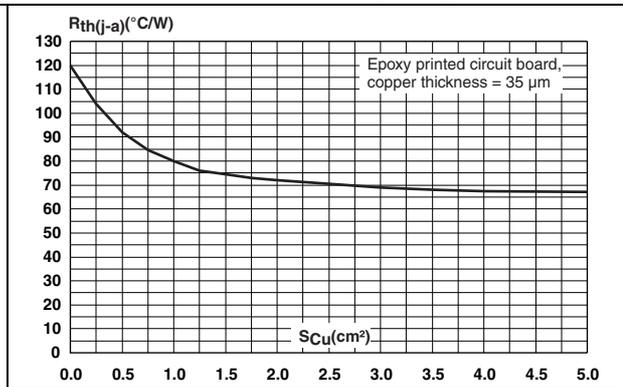
**Figure 8. Junction capacitance versus reverse voltage applied (typical values)**



**Figure 9. Forward voltage drop versus forward current (all packages)**



**Figure 10. Thermal resistance junction to ambient versus copper surface under each lead (SMA)**



## 2 Package information

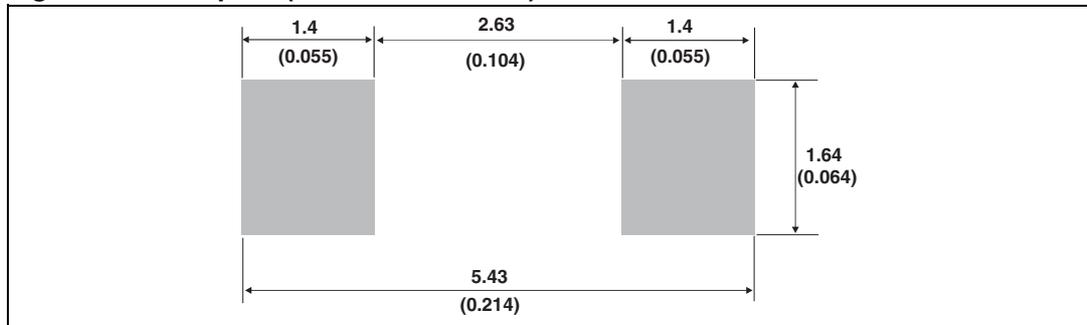
- Band shows cathode.
- Epoxy meets UL94, V0

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

**Table 5. SMA dimensions**

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.094
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.40	0.006	0.016
D	2.25	2.90	0.089	0.114
E	4.80	5.35	0.189	0.211
E1	3.95	4.60	0.156	0.181
L	0.75	1.50	0.030	0.059

**Figure 11. Footprint (dimensions in mm)**



### 3 Ordering information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS1150AY	1150Y	SMA	0.068 g	5000	Tape and reel

### 4 Revision history

Table 7. Document revision history

Date	Revision	Changes
02-Nov-2011	1	Initial release.
02-May-2012	2	Updated <a href="#">Table 3</a> .

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