

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[®]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.

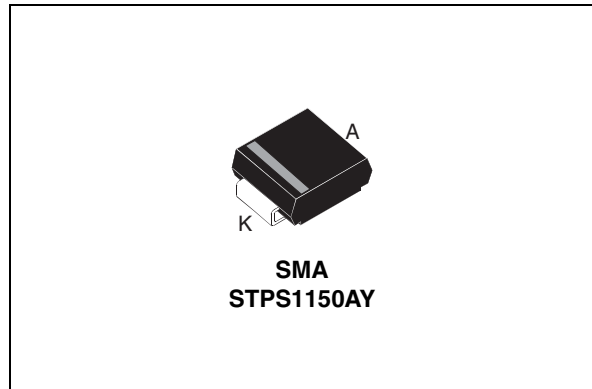


Table 1. Device summary

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	$T_L = 150\text{ °C} \quad \delta = 0.5$	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms sinusoidal}$	A
P_{ARM}	Repetitive peak avalanche power	$t_p = 1\mu\text{s} \quad T_j = 25\text{ °C}$	W
T_{stg}	Storage temperature range	-65 to +175	°C
T_j	Operating junction temperature range ⁽¹⁾	-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	
$I_R^{(1)}$	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
$V_F^{(2)}$	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

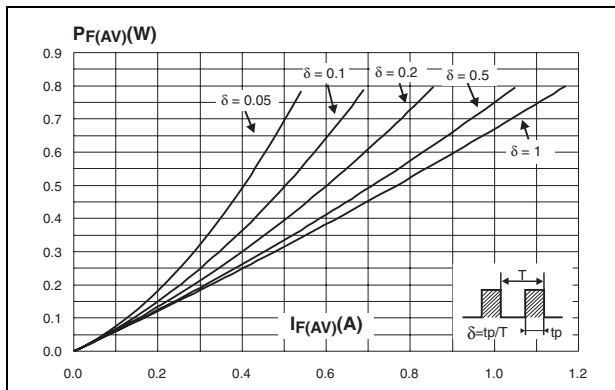


Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$)

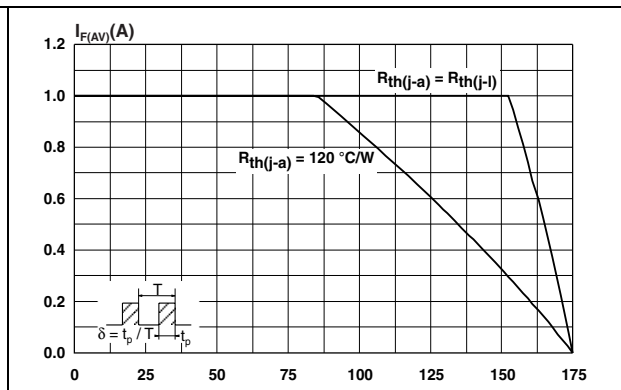


Figure 3. Normalized avalanche power derating versus pulse duration

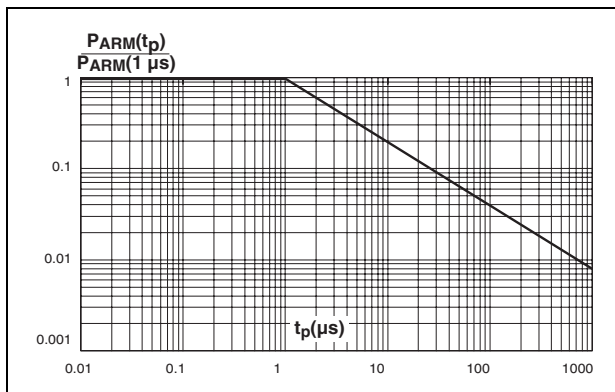


Figure 4. Normalized avalanche power derating versus junction temperature

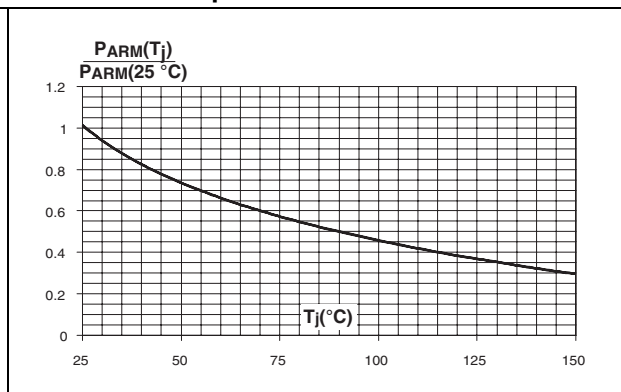


Figure 5. Non repetitive surge peak forward current versus overload duration - maximum values

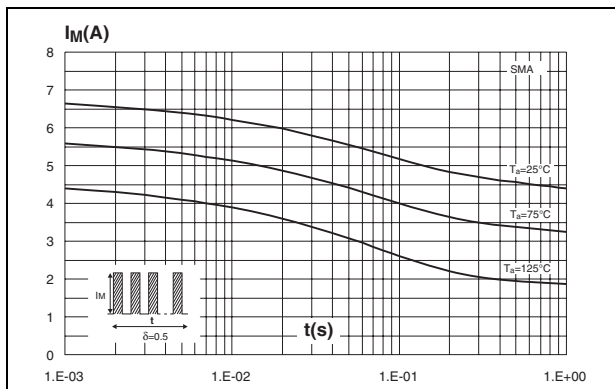


Figure 6. Relative variation of thermal impedance junction to ambient versus pulse duration

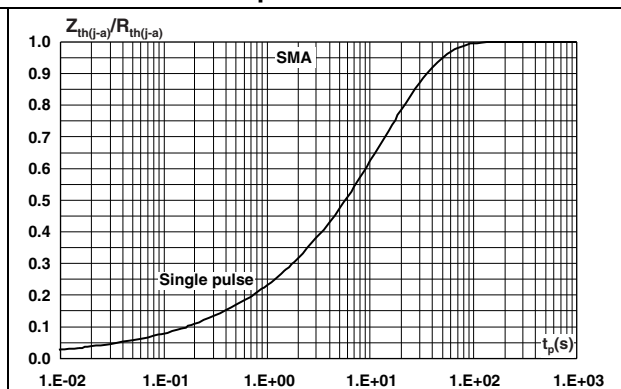


Figure 7. Reverse leakage current versus reverse voltage applied (typical values)

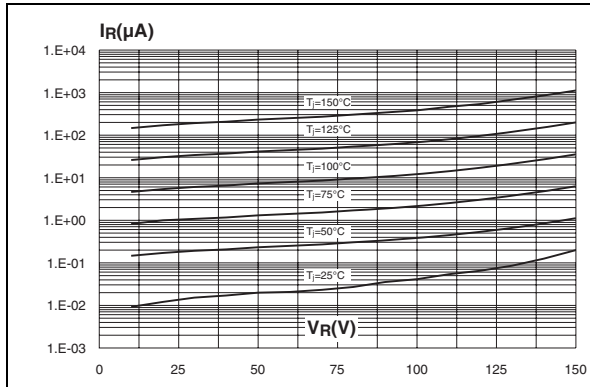


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

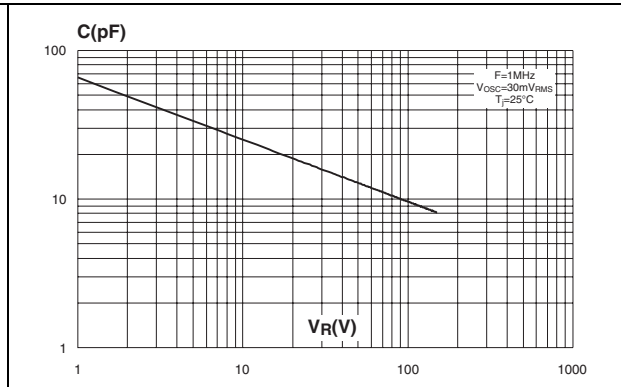


Figure 9. Forward voltage drop versus forward current (all packages)

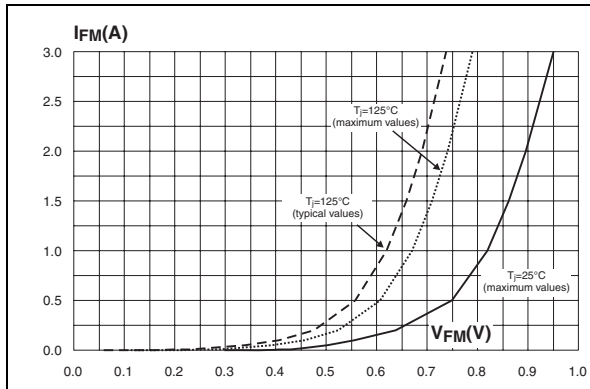
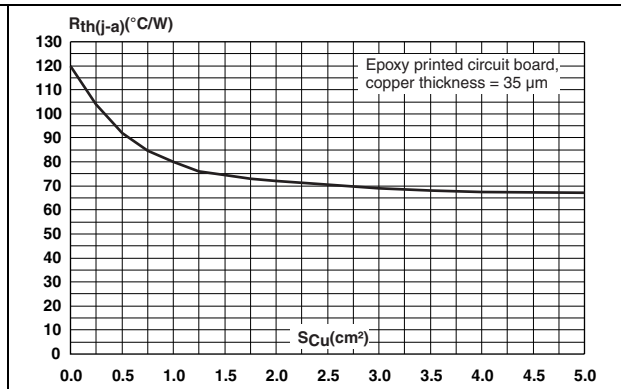


Figure 10. Thermal resistance junction to ambient versus copper surface under each lead (SMA)



2 Package information

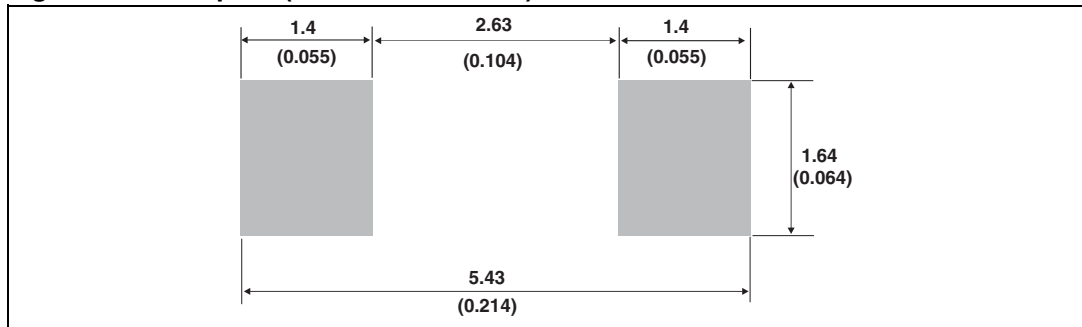
- Band shows cathode.
- Epoxy meets UL94, V0

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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 Table 3 .

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