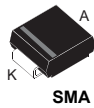
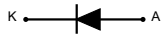


## Automotive power Schottky rectifier



### Features

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

### Description

This 150 V power Schottky rectifier is ideal for switch mode power supplies on up to 24 V rails and high frequency converters.

Packaged in SMA, the **STPS1150-Y** is intended for use in ECU (Engine Control Unit) and fly-back converters in automotive applications where low drop forward voltage is required to reduce power dissipation.

Product status	
STPS1150-Y	
Product summary	
Symbol	Values
$I_{F(AV)}$	1 A
$V_{RRM}$	150 V
$T_j(max)$	175 °C
$V_{F(max)}$	0.67 V

# 1 Characteristics

**Table 1. Absolute ratings (limiting values, at 25 °C unless otherwise specified)**

Symbol	Parameter		Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage, T <sub>j</sub> = -40 °C to +175 °C		150	V
I <sub>F(RMS)</sub>	Forward rms current		15	A
I <sub>F(AV)</sub>	Average forward current	T <sub>L</sub> = 150 °C, δ = 0.5 square wave	1	A
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms sinusoidal	50	A
P <sub>ARM</sub>	Repetitive peak avalanche power	t <sub>p</sub> = 10 μs, T <sub>j</sub> = 125 °C	108	W
T <sub>stg</sub>	Storage temperature range		-65 to +175	°C
T <sub>j</sub>	Operating junction temperature range <sup>(1)</sup>		-40 to +175	°C

1.  $(dP_{tot}/dT_j) < (1/R_{th(j-a)})$  condition to avoid thermal runaway for a diode on its own heatsink.

**Table 2. Thermal resistance parameters**

Symbol	Parameter	Max. value	Unit
R <sub>th(j-l)</sub>	Junction to lead	30	°C/W

**Table 3. Static electrical characteristics**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> <sup>(1)</sup>	Reverse leakage current	T <sub>j</sub> = 25 °C	V <sub>R</sub> = V <sub>RRM</sub>	-	0.2	1.0	μA
		T <sub>j</sub> = 125 °C		-	0.2	1.0	mA
V <sub>F</sub> <sup>(2)</sup>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 1 A	-	0.78	0.82	V
		T <sub>j</sub> = 125 °C		-	0.62	0.67	
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 2 A	-	0.85	0.89	
		T <sub>j</sub> = 125 °C		-	0.69	0.75	

1. t<sub>p</sub> = 5 ms, δ < 2%

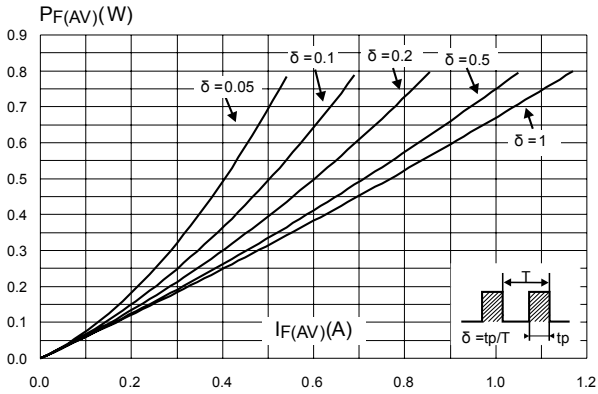
2. t<sub>p</sub> = 380 μs, δ < 2%

To evaluate the conduction losses, use the following equation:

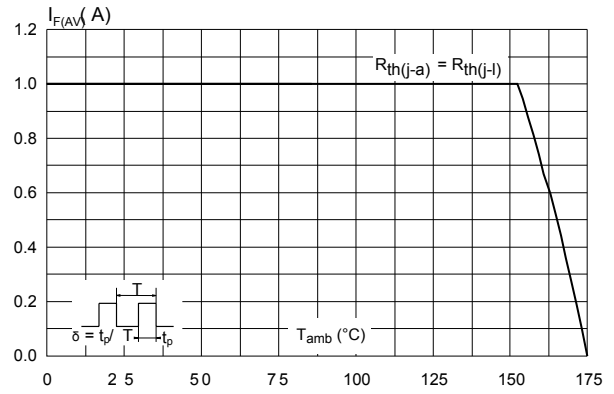
$$P = 0.59 \times I_{F(AV)} + 0.08 \times I_{F(RMS)}^2$$

### 1.1 Characteristics (curves)

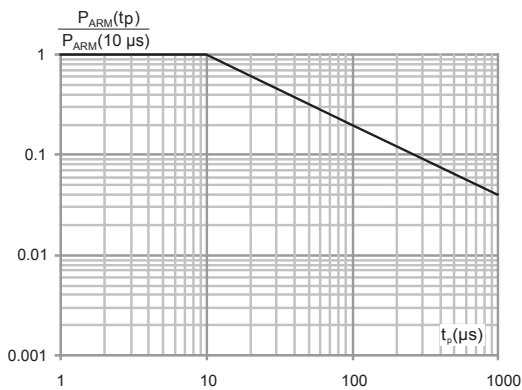
**Figure 1. Average forward power dissipation versus average forward current**



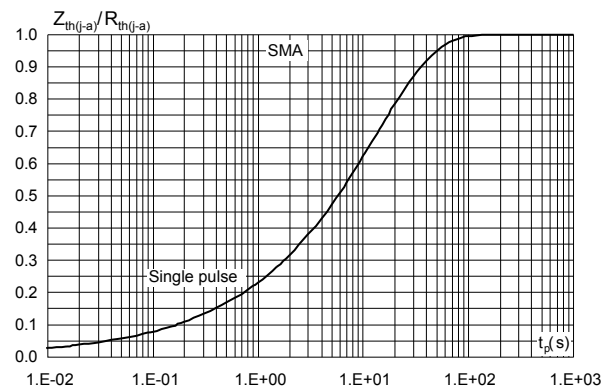
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ )**



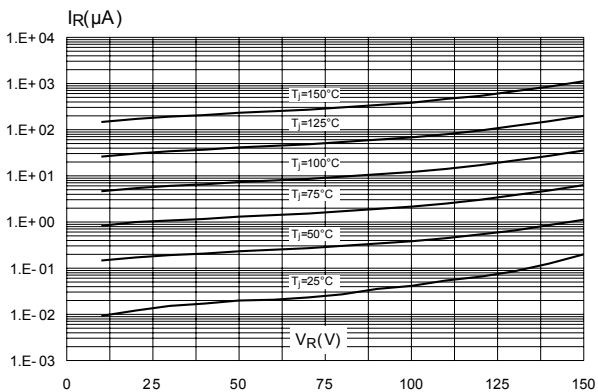
**Figure 3. Normalized avalanche power derating versus pulse duration ( $T_j = 125$  °C)**



**Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration**



**Figure 5. Reverse leakage current versus reverse voltage applied (typical values)**



**Figure 6. Junction capacitance versus reverse voltage applied (typical values)**

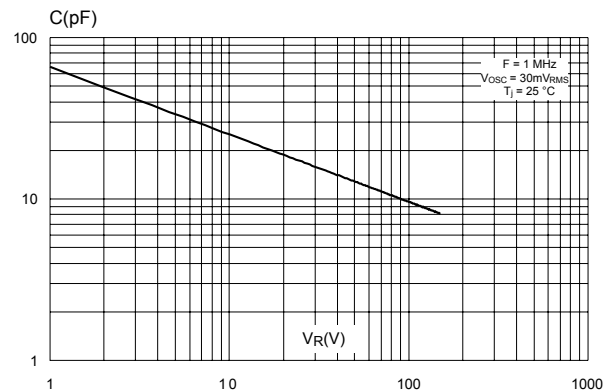


Figure 7. Forward voltage drop versus forward current

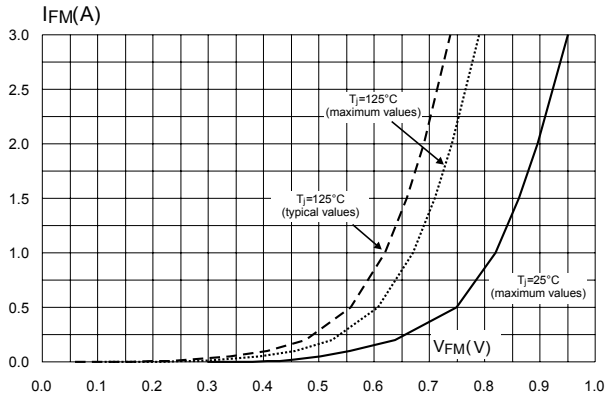
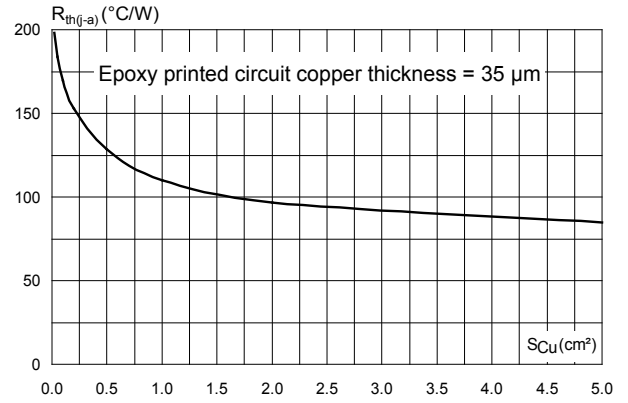


Figure 8. Thermal resistance junction to ambient versus copper surface under each lead (SMA)



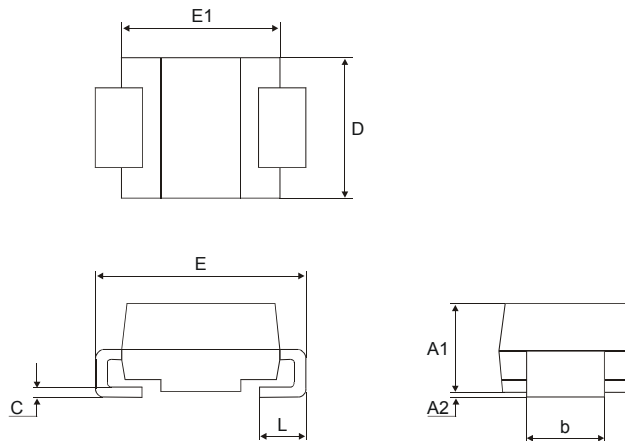
## 2 Package information

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](http://www.st.com). ECOPACK® is an ST trademark.

### 2.1 SMA package information

- Band shows cathode
- Epoxy meets UL94, V0

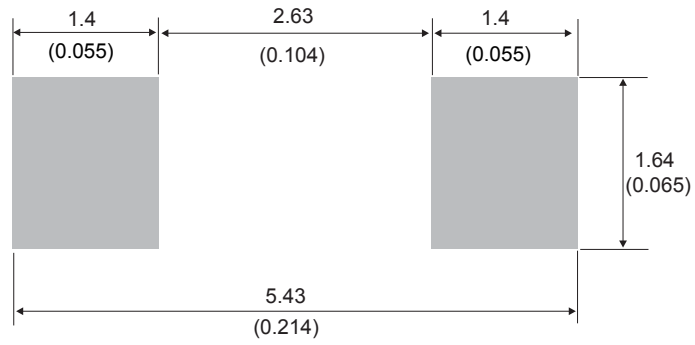
**Figure 9. SMA package outline**



**Table 4. SMA package mechanical data**

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.097
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 10. SMA recommended footprint in mm (inches)



### 3 Ordering Information

**Table 5. Ordering information**

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

## Revision history

**Table 6. Document revision history**

Date	Version	Changes
02-Nov-2011	1	Initial release.
02-May-2012	2	Updated Table 3.
16-Apr-2018	3	Updated <a href="#">Figure 3</a> . Normalized avalanche power derating versus pulse duration ( $T_j = 125\text{ °C}$ ), <a href="#">Table 2</a> . Thermal resistance parameters and <a href="#">Table 1</a> . Absolute ratings (limiting values, at $25\text{ °C}$ unless otherwise specified). Removed <a href="#">figure 4</a> and <a href="#">figure 5</a> .



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