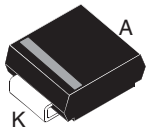
# STPS1150-Y

## 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
- Surface mount miniature package
- Avalanche capability specified
- ECOPACK®2 compliant component




**SMA**
**STPS1150AY**

## 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**

| | |
|---|---|
| $I_{F(AV)}$ | 1 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 |
| $I_{F(RMS)}$ | Forward rms current | | 15 | A |
| $I_{F(AV)}$ | Average forward current | $T_L$ = 150 °C $\delta$ = 0.5 | 1 | A |
| $I_{FSM}$ | Surge non repetitive forward current | $t_p$ = 10 ms sinusoidal | 50 | A |
| $P_{ARM}$ | Repetitive peak avalanche power | $t_p$ = 1µs $T_j$ = 25 °C | 1500 | W |
| $T_{stg}$ | Storage temperature range | | -65 to +175 | °C |
| $T_j$ | Operating junction temperature range(1) | | -40 to +175 | °C |

1. $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ condition to avoid runaway for a diode on its own heatsink

**Table 3. Thermal resistance**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{th(j-l)}$ | Junction to lead | 30 | |

**Table 4. Static electrical characteristics**

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

1. $t_p$ = 5 ms, $\delta$ < 2%
2. $t_p$ = 380 µs, $\delta$ < 2%

To evaluate the conduction losses use the following equation:
$P = 0.59 \times I_{F(AV)} + 0.08\ I_{F^2(RMS)}$

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

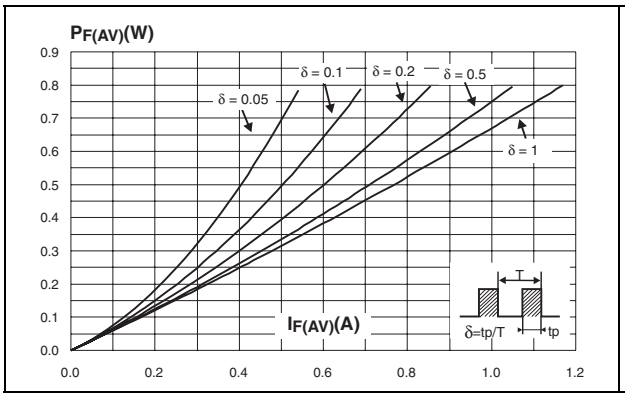



**Figure 2. Average forward current versus ambient temperature (δ = 0.5)**

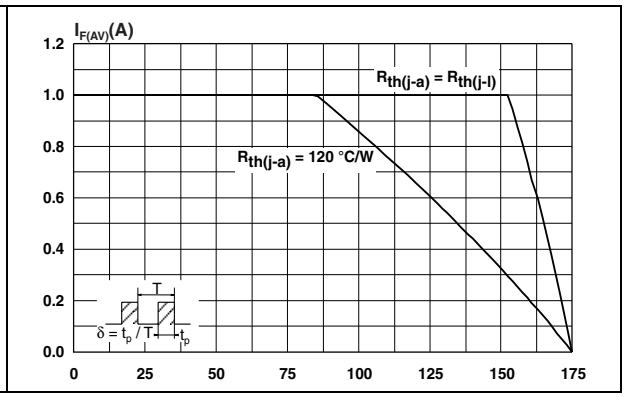



**Figure 3. Normalized avalanche power derating versus pulse duration**

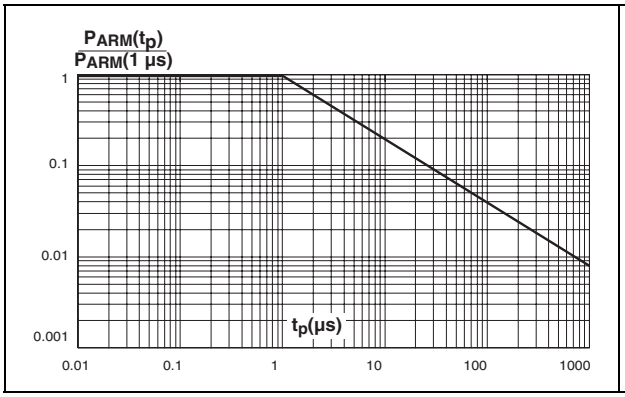



**Figure 4. Normalized avalanche power derating versus junction temperature**

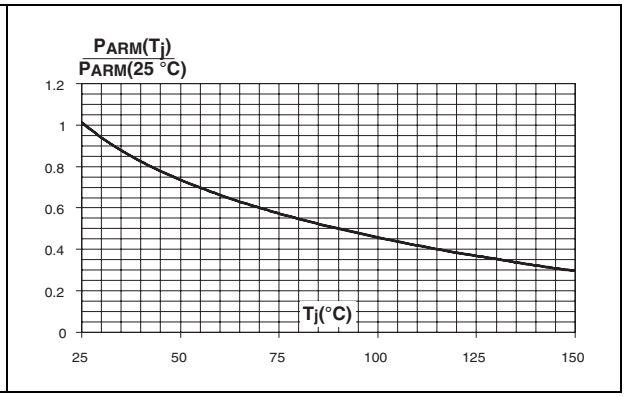



**Figure 5. Non repetitive surge peak forward current versus overload duration - maximum values**

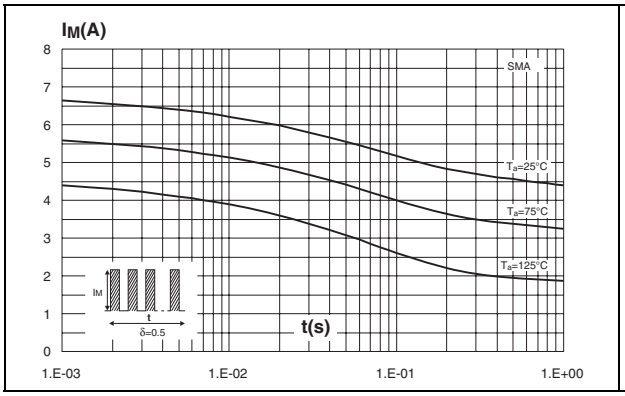



**Figure 6. Relative variation of thermal impedance junction to ambient versus pulse duration**

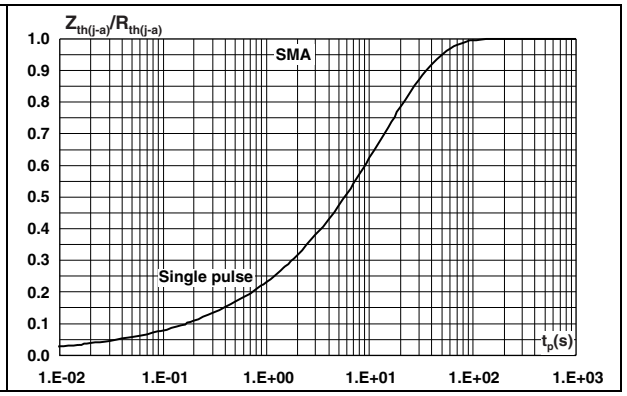


**Figure 7. Reverse leakage current versus reverse voltage applied (typical values)**

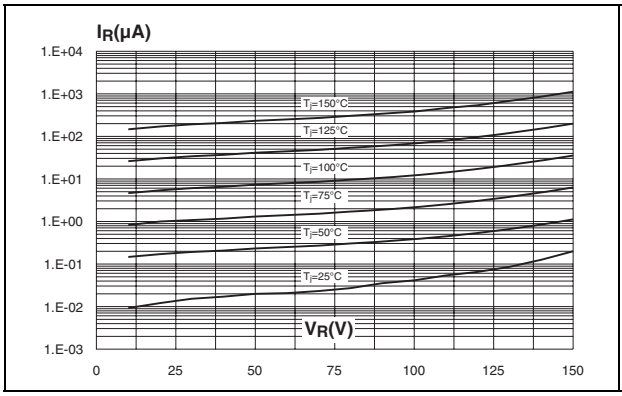



**Figure 8. Junction capacitance versus reverse voltage applied (typical values)**

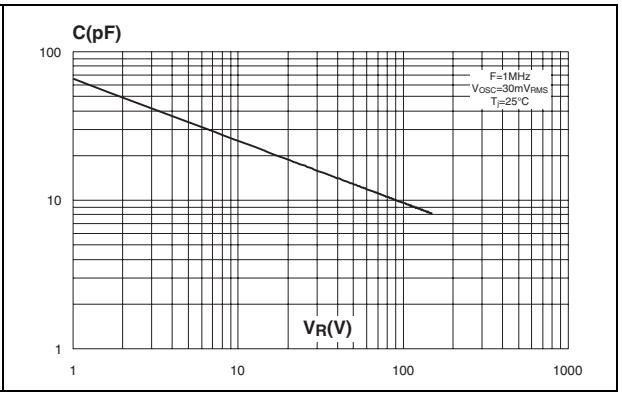



**Figure 9. Forward voltage drop versus forward current (all packages)**

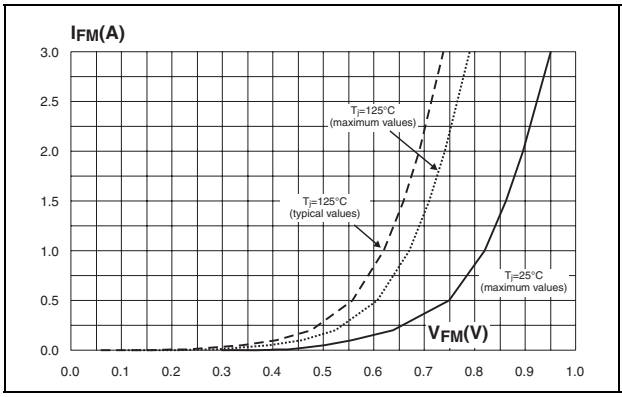
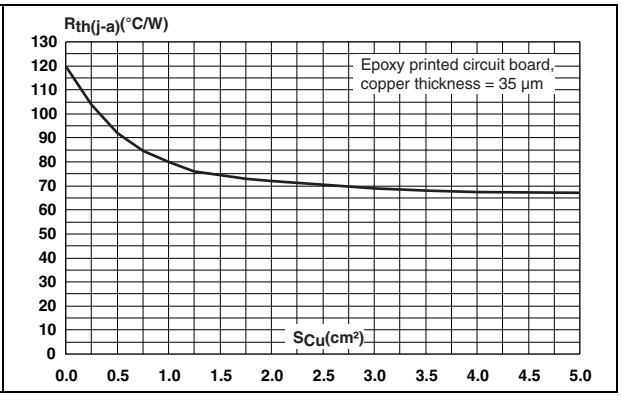



**Figure 10. Thermal resistance junction to ambient versus copper surface under each lead (SMA)**

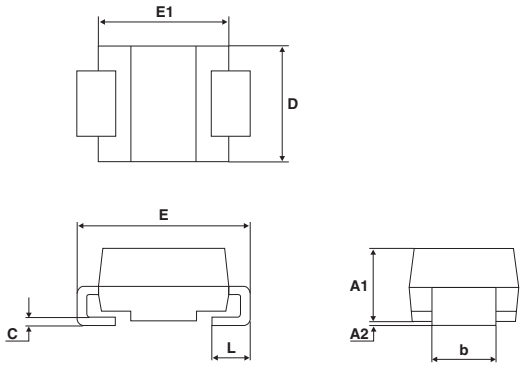


# 2 Package information

- Band shows cathode.
- Epoxy meets UL94, V0

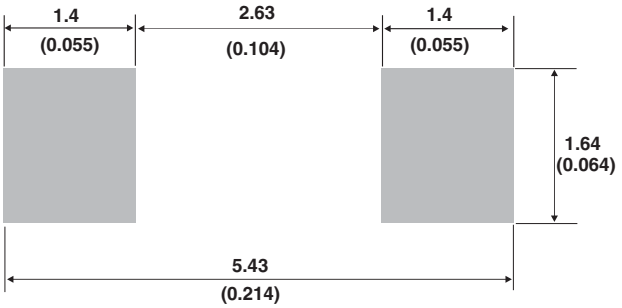
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK® is an ST trademark.

**Table 5. 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. |

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