# STPS140Z-Y

## Automotive power Schottky rectifier

**Datasheet - production data**

**SOD123**

## Features

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching
- ECOPACK®2 compliant component
- AEC-Q101 qualified

## Description

This single Schottky rectifier is suited for switch mode power supplies and high frequency DC to DC converters.

Packaged in SOD-123, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection for automotive applications.

**Table 1. Device summary**

| Symbol | Value |
|---|---|
| $I_{F(AV)}$ | 1 A |
| $V_{RRM}$ | 40 V |
| $T_j$ (max) | 150 °C |
| $V_{F\ (max)}$ | 0.51 V |

# 1 Characteristics

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

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | | 40 | V |
| $I_F$ | Continuous forward current | $T_{amb}$ = 60 °C | 1 | A |
| $I_{FSM}$ | Surge non repetitive forward current | $t_p$ = 10 ms sinusoidal | 5.5 | A |
| $I_{RRM}$ | Repetitive peak reverse current | $t_p$ = 2 µs F = 1 kHz square | 0.5 | A |
| $I_{RSM}$ | Non repetitive peak reverse current | $t_p$ = 100 µs square | 1 | A |
| $T_{stg}$ | Storage temperature range | | - 65 to + 150 | °C |
| $T_j$ | Operating junction temperature (1) | | - 40 to + 150 | °C |
| dV/dt | Critical rate of rise of reverse voltage | | 10000 | V/µs |

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

**Table 3. Thermal resistance**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{th(j-a)}$ | Junction to ambient(1) | 500 | °C/W |

1. Mounted on epoxy board.

**Table 4. Static electrical characteristics**

| Symbol | Parameter | Test conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$(1) | Reverse leakage current | $T_j$ = 25 °C | $V_R$ = 5 V | | | 10 | µA |
| | | $T_j$ = 25 °C | $V_R$ = 40 V | | | 40 | |
| | | $T_j$ = 100 °C | | | 1.5 | 5 | mA |
| $V_F$(2) | Forward voltage drop | $T_j$ = 25 °C | $I_F$ = 1 A | | | 0.55 | V |
| | | $T_j$ = 100 °C | | | 0.45 | 0.51 | |

1. Pulse test: $t_p$ = 5 ms, δ < 2%
2. Pulse test: $t_p$ = 380 ms, δ < 2%

To evaluate the maximum conduction losses use the following equation:
$P = 0.2 \times I_{F(AV)} + 0.3 \times I_F{}^2{}_{(RMS)}$ at $T_j$ = 150 °C

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

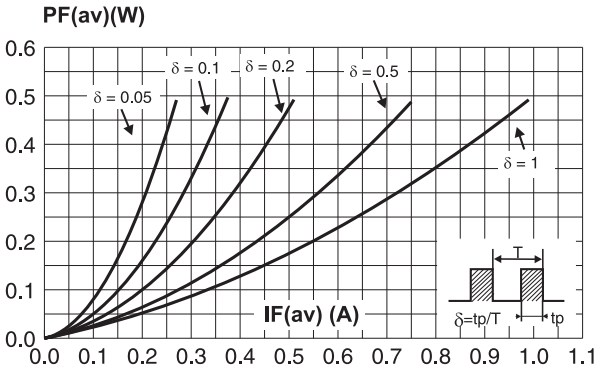



**Figure 2. Average forward current versus ambient temperature (δ = 1)**

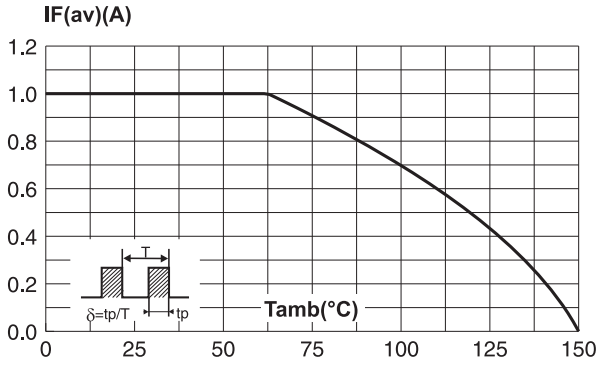



**Figure 3. Non repetitive surge peak forward current versus overload duration (maximum values)**

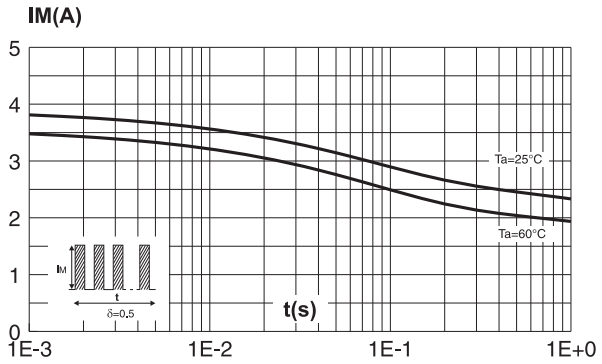



**Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration**

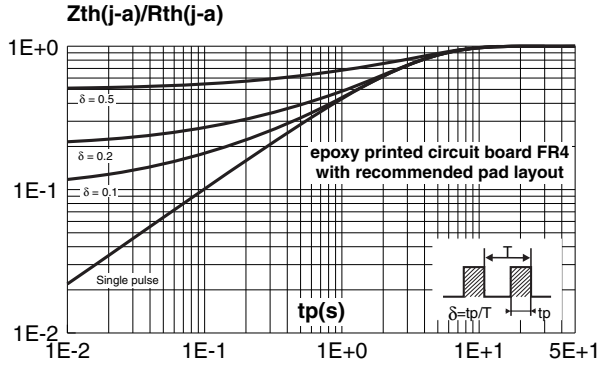


**Figure 5. Reverse leakage current versus reverse voltage applied (typical value)**

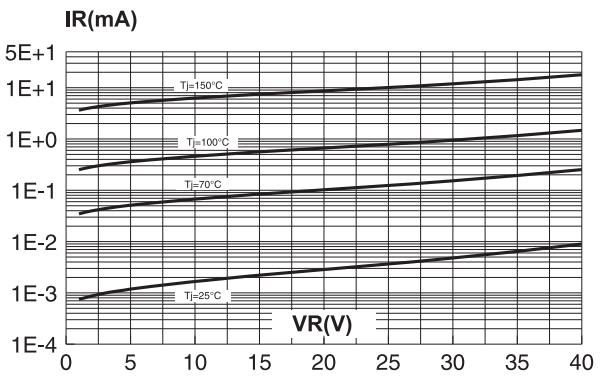



**Figure 6. Reverse leakage current versus junction temperature (typical value)**

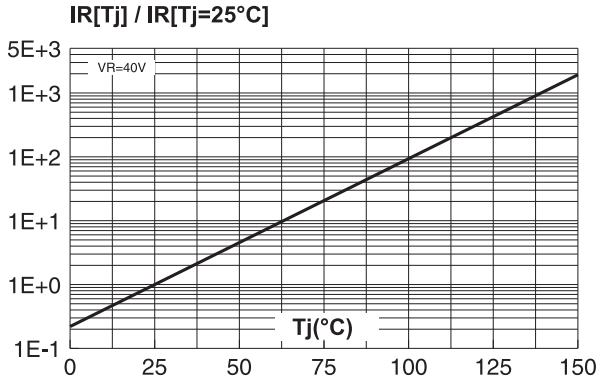



**Figure 7. Junction capacitance versus reverse voltage applied (typical value)**

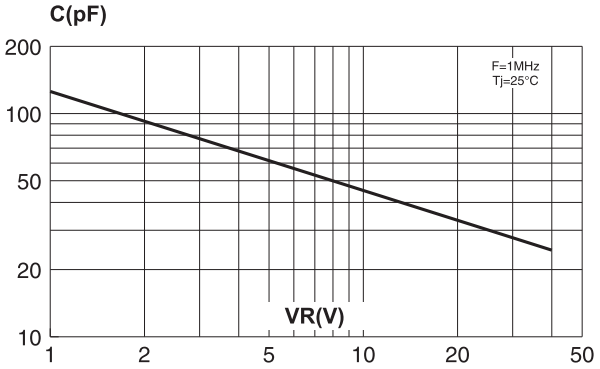



**Figure 8. Forward voltage drop versus forward current (high level, maximum values)**

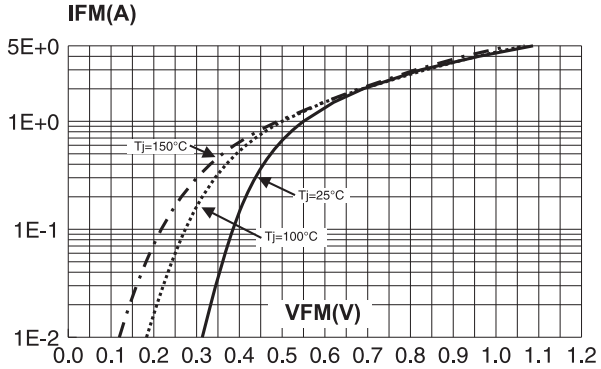
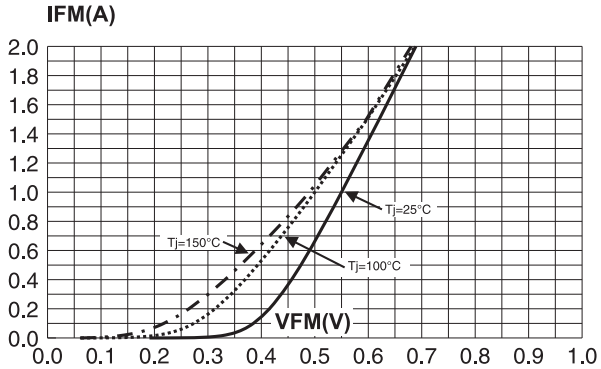



**Figure 9. Forward voltage drop versus forward current (low level, maximum values)**



# 2 Package Information

- Epoxy meets UL94,V0
- Lead-free packages

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.

## 2.1 SOD-123 package information

**Figure 10. SOD123 package outline**

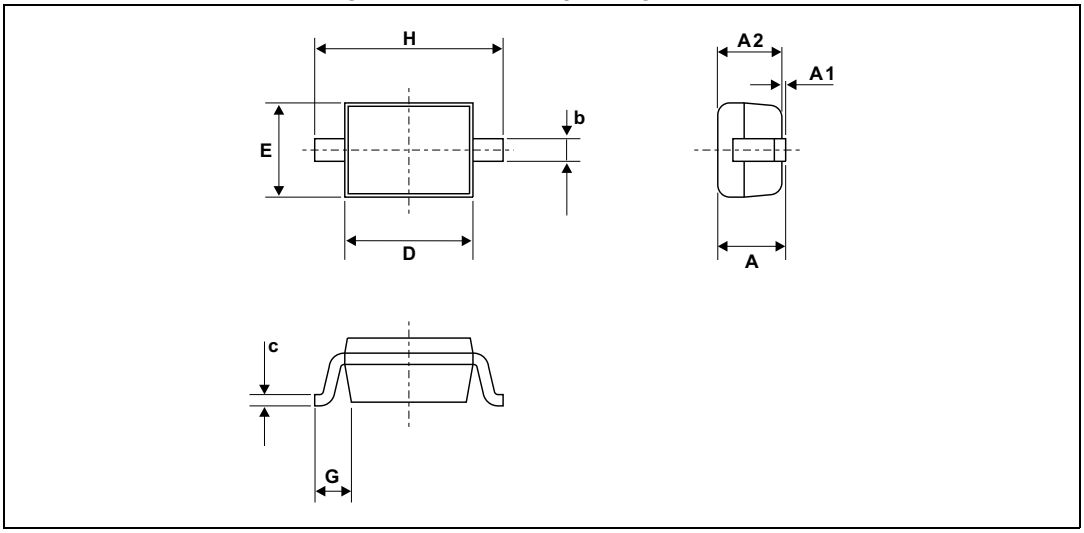
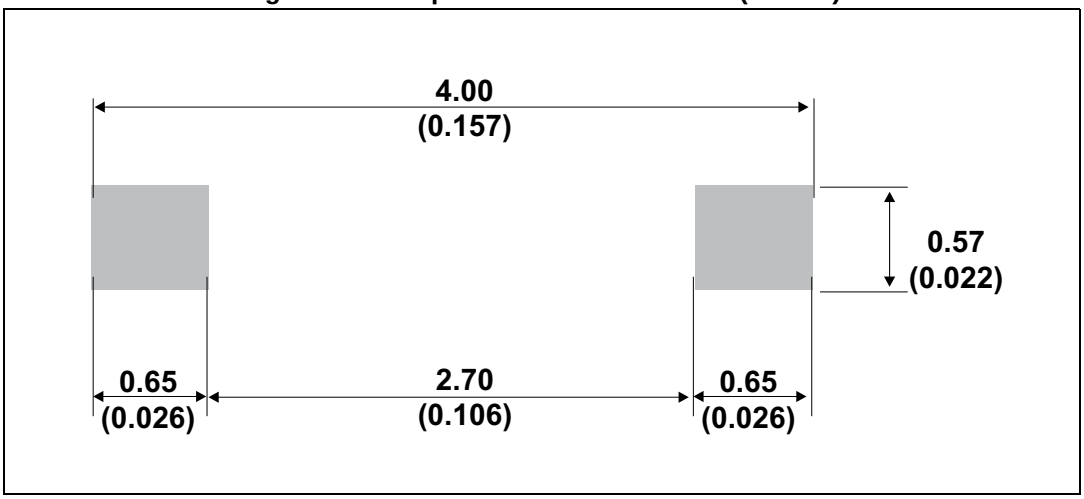



**Table 5. SOD123 package mechanical data**

| Ref. | Dimensions | | | | | |
|---|---|---|---|---|---|---|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 1.45 | | | 0.057 |
| A1 | 0 | | 0.1 | 0 | | 0.004 |
| A2 | 0.85 | | 1.35 | 0.033 | | 0.053 |
| b | | 0.55 | | | 0.022 | |
| c | | 0.15 | | | 0.039 | |
| D | 2.55 | | 2.85 | 0.1 | | 0.112 |
| E | 1.4 | | 1.7 | 0.055 | | 0.067 |
| G | 0.25 | | | 0.01 | | |
| H | 3.55 | | 3.75 | 0.14 | | 0.148 |

Figure 11. Footprint dimensions in mm (inches)



# 3 Ordering information

**Table 6. Ordering information**

| Order code | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| STPS140ZY | Z1Y | SOD-123 | 0.01 g | 3000 | Tape and reel |

# 4 Revision history

**Table 7. Document revision history**

| Date | Revision | Changes |
|---|---|---|
| 24-Oct-2012 | 1 | First issue. |
| 07-Jul-2015 | 2 | Updated *Table 4* and reformatted to current standard. |

Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

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- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

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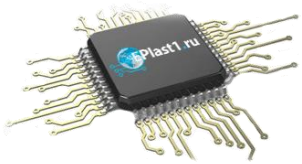
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.

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