# STPS140Z

## POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

| | |
|---|---|
| $I_F$ | 1 A |
| $V_{RRM}$ | 40 V |
| $V_F$ (max) | 0.49 V |
| Tj (max) | 150°C |

**SOD-123**

### FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING

### DESCRIPTION

Single Schottky rectifier suited for Switchmode 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 applications. Due to the small size of the package this device fit GSM and PCMCIA requirements.

### 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 | tp = 10 ms Sinusoidal | 5.5 | A |
| $I_{RRM}$ | Repetitive peak reverse current | tp = 2 µs square F = 1kHz | 0.5 | A |
| $I_{RSM}$ | Non repetitive peak reverse current | tp = 100µs square | 1 | A |
| $T_{stg}$ | Storage temperature range | | - 65 to + 150 | °C |
| Tj | Maximum operating junction temperature * | | 150 | |
| $T_L$ | Maximum temperature for soldering during 10s | | 260 | °C |
| dV/dt | Critical rate of rise of reverse voltage | | 10000 | V/µs |

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



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## THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{th\ (j-a)}$ | Junction to ambient * | 175 | °C/W |

* with 50 $mm^2$ copper area (e=35µm)

## STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Tests Conditions | Tests Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$ * | Reverse leakage current | Tj = 25°C | $V_R$ = 5V | | | 10 | µA |
| | | Tj = 25°C | $V_R$ = 40V | | | 40 | µA |
| | | Tj = 100°C | | | 1.5 | 5 | mA |
| $V_F$ ** | Forward voltage drop | Tj = 25°C | $I_F$ = 1 A | | | 0.55 | V |
| | | Tj = 100°C | | | 0.45 | 0.51 | |

Pulse test : * tp = 5 ms, δ < 2 %
** tp = 380 µs, 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 Tj = 150°C

**Fig. 1:** Average forward power dissipation versus average forward current.

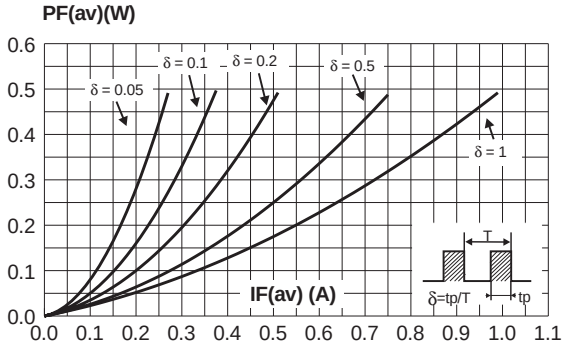


**Fig. 2:** Average forward current versus ambient temperature (δ=1).

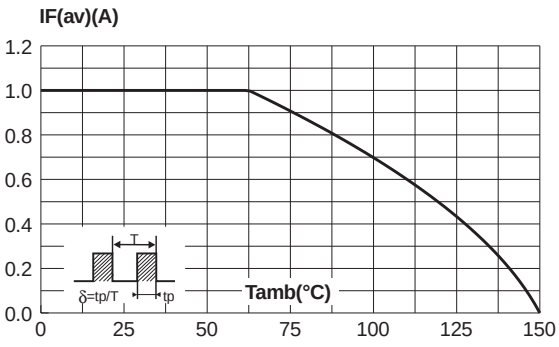




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**Fig. 3:** Non repetive surge peak forward current versus overload duration (maximum values).

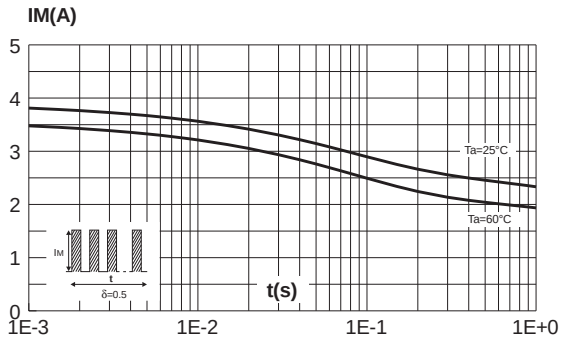


**Fig. 4:** Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy printed circuit board FR4 with recommended pad layout).

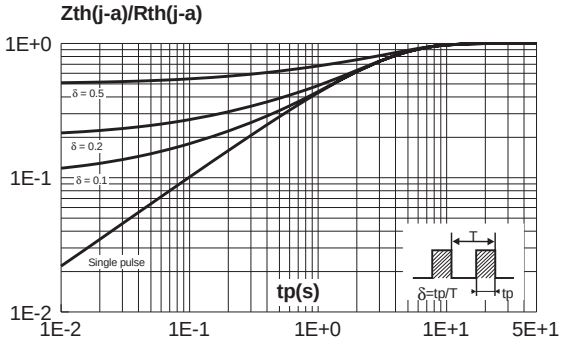


**Fig. 5:** Reverse leakage current versus reverse voltage applied (typical value).

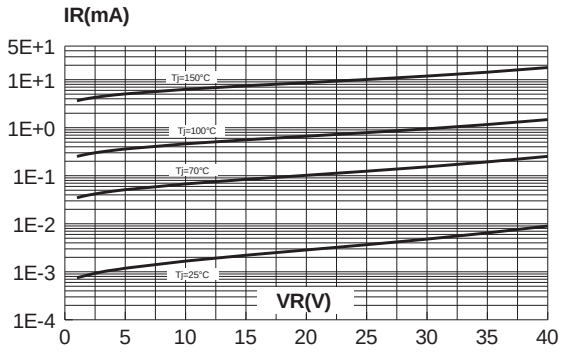


**Fig. 6:** Reverse leakage current versus junction temperature (typical value).

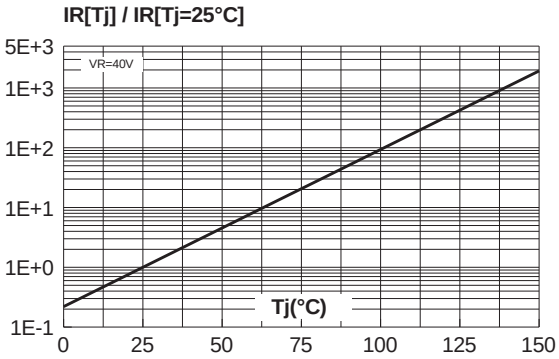


**Fig. 7:** Junction capacitance versus reverse voltage applied (typical value).

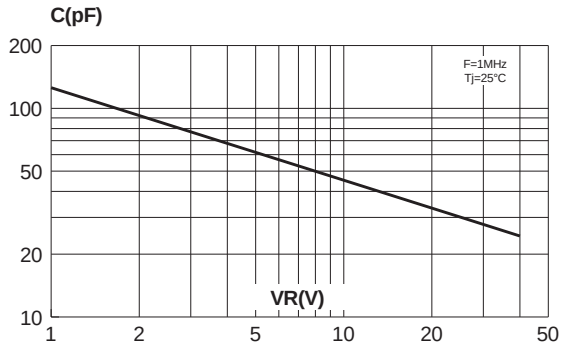


**Fig. 8-1:** Forward voltage drop versus forward current (high level, maximum values).

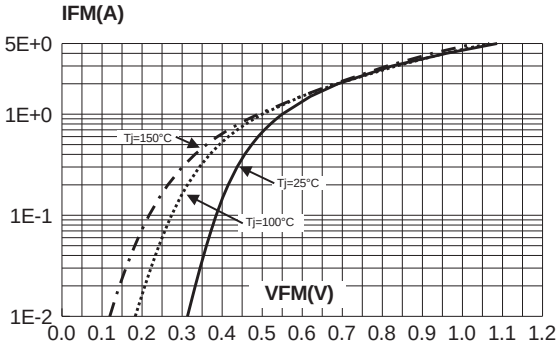




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**Fig. 8-2:** Forward voltage drop versus forward current (low level, maximum values).

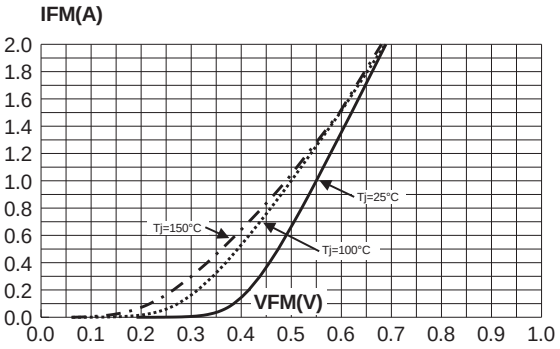
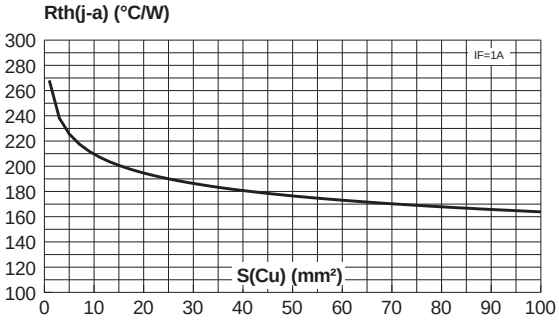



**Fig. 9:** Thermal resistance junction to ambient versus copper surface (epoxy printed circuit board FR4, copper thickness: 35µm).



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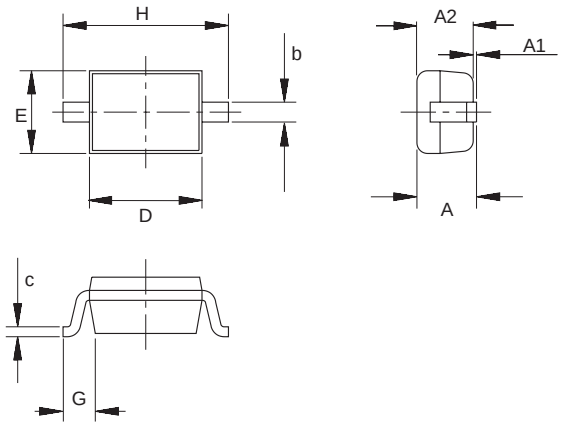
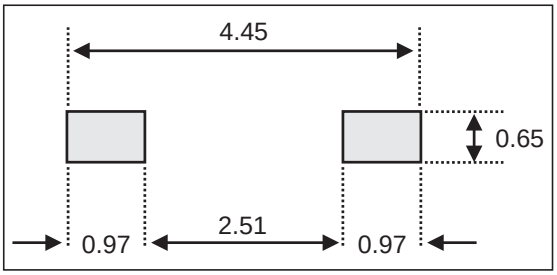
## PACKAGE MECHANICAL DATA

SOD-123 Plastic




| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | 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 Typ. | | 0.022 Typ. | |
| c | 0.15 Typ. | | 0.039 Typ. | |
| 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 | 3.95 | 0.14 | 0.156 |

**FOOTPRINT** (in millimeters)




## MARKING

| Type | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| STPS140Z | Z54 | SOD-123 | 0.01 g | 3000 | Tape & reel |

- Epoxy meets UL94, V0
- Band indicates cathode

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