



# STPS2L40U

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

|             |        |
|-------------|--------|
| $I_{F(AV)}$ | 2 A    |
| $V_{RRM}$   | 40 V   |
| $T_j$ (max) | 150 °C |
| $V_F$ (max) | 0.34 V |

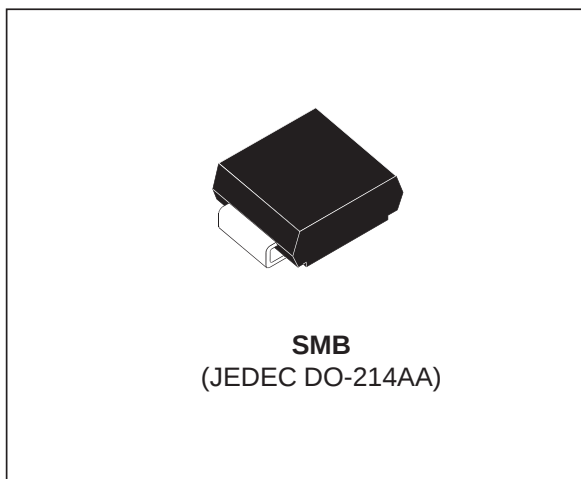
### FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- LOW FORWARD VOLTAGE DROP
- SURFACE MOUNT MINIATURE PACKAGE

### DESCRIPTION

Single chip Schottky rectifiers suited to Switched Mode Power Supplies and high frequency DC to DC converters.

Packaged in SMB, this device is especially intended for surface mounting and used in low voltage, high frequency inverters, free wheeling and polarity protection applications.



### ABSOLUTE RATINGS (limiting values)

| Symbol       | Parameter                                |                                                | Value         | Unit             |
|--------------|------------------------------------------|------------------------------------------------|---------------|------------------|
| $V_{RRM}$    | Repetitive peak reverse voltage          |                                                | 40            | V                |
| $I_{F(RMS)}$ | RMS forward current                      |                                                | 8             | A                |
| $I_{F(AV)}$  | Average forward current                  | $T_L = 130^{\circ}\text{C} \quad \delta = 0.5$ | 2             | A                |
| $I_{FSM}$    | Surge non repetitive forward current     | $t_p = 10 \text{ ms Sinusoidal}$               | 75            | A                |
| $T_{stg}$    | Storage temperature range                |                                                | - 65 to + 150 | °C               |
| $T_j$        | Maximum operating junction temperature * |                                                | 150           | °C               |
| $dV/dt$      | Critical rate of rise of reverse voltage |                                                | 10000         | V/ $\mu\text{s}$ |

\* :  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$  thermal runaway condition for a diode on its own heatsink

## STPS2L40U

### THERMAL RESISTANCES

| Symbol        | Parameter        |     | Value | Unit                 |
|---------------|------------------|-----|-------|----------------------|
| $R_{th(j-l)}$ | Junction to lead | SMB | 20    | $^{\circ}\text{C/W}$ |

### STATIC ELECTRICAL CHARACTERISTICS

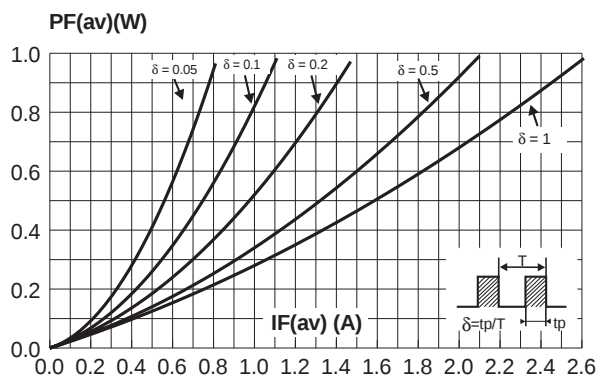
| Symbol  | Tests Conditions        | Tests Conditions            | Min.                | Typ. | Max. | Unit          |
|---------|-------------------------|-----------------------------|---------------------|------|------|---------------|
| $I_R^*$ | Reverse leakage current | $T_j = 25^{\circ}\text{C}$  | $V_R = 40\text{ V}$ |      | 220  | $\mu\text{A}$ |
|         |                         | $T_j = 100^{\circ}\text{C}$ |                     |      | 20   | $\text{mA}$   |
|         |                         | $T_j = 125^{\circ}\text{C}$ |                     | 38   | 80   | $\text{mA}$   |
| $V_F^*$ | Forward voltage drop    | $T_j = 25^{\circ}\text{C}$  | $I_F = 1\text{ A}$  |      | 0.39 | $\text{V}$    |
|         |                         | $T_j = 125^{\circ}\text{C}$ |                     | 0.25 | 0.28 |               |
|         |                         | $T_j = 25^{\circ}\text{C}$  | $I_F = 2\text{ A}$  |      | 0.43 | $\text{V}$    |
|         |                         | $T_j = 125^{\circ}\text{C}$ |                     | 0.31 | 0.34 |               |
|         |                         | $T_j = 25^{\circ}\text{C}$  | $I_F = 4\text{ A}$  |      | 0.5  | $\text{V}$    |
|         |                         | $T_j = 125^{\circ}\text{C}$ |                     | 0.39 | 0.45 |               |

Pulse test : \*  $t_p = 380\mu\text{s}$ ,  $\delta < 2\%$

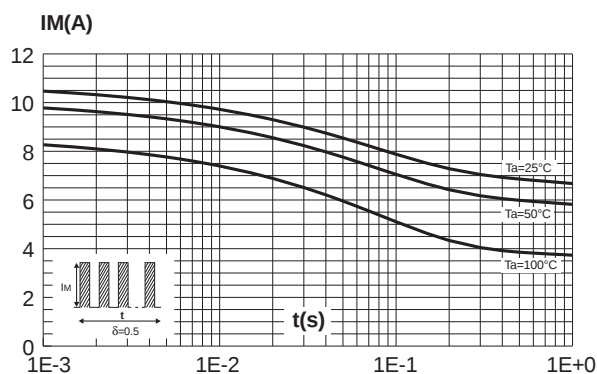
To evaluate the maximum conduction losses use the following equation :

$$P = 0.22 \times I_{F(AV)} + 0.06 I_{F(RMS)}^2$$

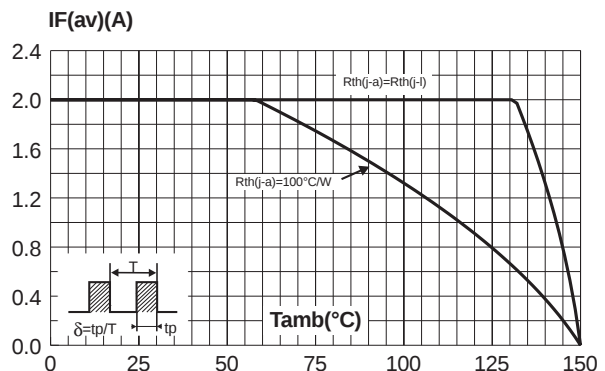
**Fig. 1:** Average forward power dissipation versus average forward current.



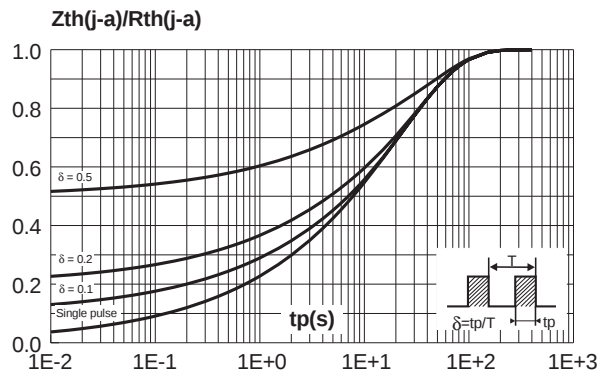
**Fig. 3:** Non repetitive surge peak forward current versus overload duration (maximum values)



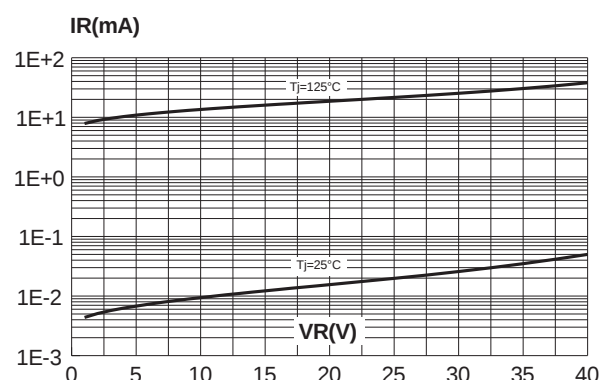
**Fig. 2:** Average forward current versus ambient temperature ( $\delta=0.5$ ).



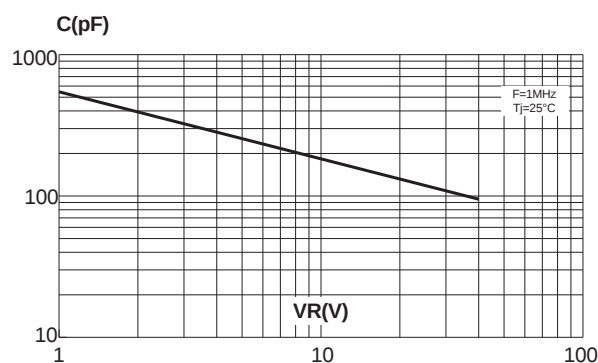
**Fig. 4:** Relative variation of thermal impedance junction to ambient versus pulse duration.



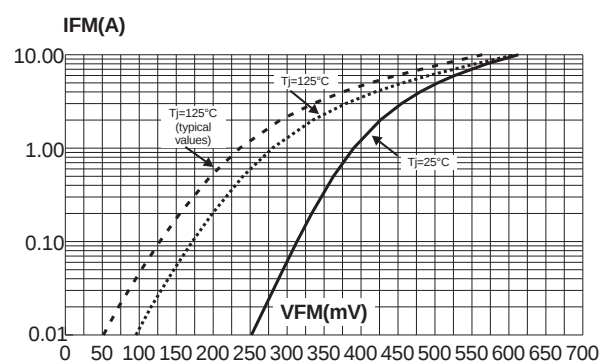
**Fig. 5:** Reverse leakage current versus reverse voltage applied (typical values).



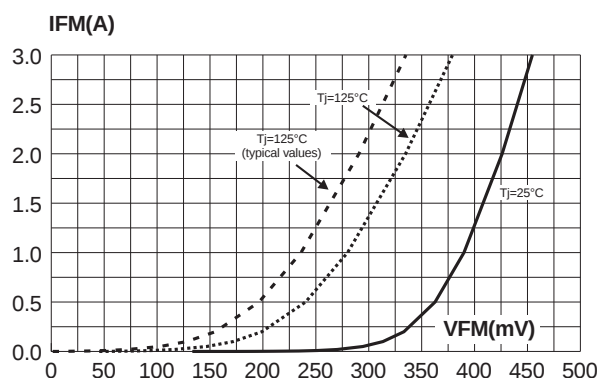
**Fig. 6:** Junction capacitance versus reverse voltage applied (typical values).



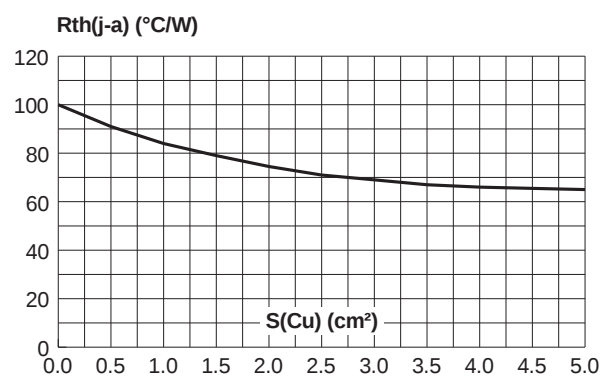
**Fig. 7-1:** Forward voltage drop versus forward current (maximum values, high level).



**Fig. 7-2:** Forward voltage drop versus forward current (maximum values, low level).



**Fig. 8:** Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness  $s(\text{Cu}) = 35\mu\text{m}$ )

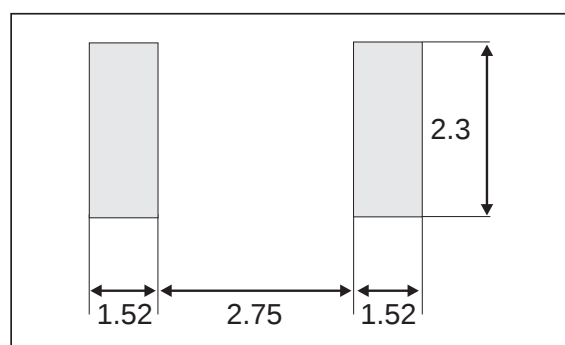


## PACKAGE MECHANICAL DATA

## SMB

| REF. | DIMENSIONS  |      |        |       |
|------|-------------|------|--------|-------|
|      | Millimeters |      | Inches |       |
|      | Min.        | Max. | Min.   | Max.  |
| A1   | 1.90        | 2.45 | 0.075  | 0.096 |
| A2   | 0.05        | 0.20 | 0.002  | 0.008 |
| b    | 1.95        | 2.20 | 0.077  | 0.087 |
| c    | 0.15        | 0.41 | 0.006  | 0.016 |
| E    | 5.10        | 5.60 | 0.201  | 0.220 |
| E1   | 4.05        | 4.60 | 0.159  | 0.181 |
| D    | 3.30        | 3.95 | 0.130  | 0.156 |
| L    | 0.75        | 1.60 | 0.030  | 0.063 |

## FOOT PRINT DIMENSIONS (in millimeters)



| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|---------|---------|--------|----------|---------------|
| STPS2L40U     | GD4     | SMB     | 0.107g | 2500     | Tape & reel   |

- Band indicates cathode
- Epoxy meets UL94,V0

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