



# STPS0540Z / STPS0560Z

## SCHOTTKY RECTIFIER

PRELIMINARY DATASHEET

### MAIN PRODUCT CHARACTERISTICS

|            |               |
|------------|---------------|
| $I_F(AV)$  | 0.5 A         |
| $V_{RRM}$  | 40 / 60 V     |
| $V_F(max)$ | 0.40 / 0.50 V |

### FEATURES AND BENEFITS

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

### DESCRIPTION

Single Schottky rectifier suited for switch mode power supplies and high frequency DC to DC converters.

Packades in SOD-123, these device are intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications. Due to the small size of the package these devices fit GSM and PCMCIA requirements.



SOD-123

### ABSOLUTE RATINGS (limiting values)

| Symbol              | Parameter                                    |                        |                        | Value         |       | Unit |
|---------------------|----------------------------------------------|------------------------|------------------------|---------------|-------|------|
|                     |                                              |                        |                        | STPS          |       |      |
|                     |                                              |                        |                        | 0540Z         | 0560Z |      |
| V <sub>RRM</sub>    | Repetitive peak reverse voltage              |                        |                        | 40            | 60    | V    |
| I <sub>F(RMS)</sub> | RMS forward current                          |                        |                        | 2             |       | A    |
| I <sub>F(AV)</sub>  | Average forward current<br>δ=0.5             | STPS0540Z<br>STPS0560Z | Ta = 60°C<br>Ta = 40°C | 0.5           |       | A    |
| I <sub>FSM</sub>    | Surge non repetitive forward current         |                        | tp=10ms<br>sinusoidal  | 5.5           |       | A    |
| dV/dt               | Critical rate of rise of reverse voltage     |                        |                        | 10000         |       | V/μs |
| T <sub>stg</sub>    | Storage temperature range                    |                        |                        | - 65 to + 150 |       | °C   |
| T <sub>j</sub>      | Maximum operating junction temperature *     |                        |                        | 150           |       | °C   |
| TL                  | Maximum temperature for soldering during 10s |                        |                        | 260           |       | °C   |

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

## STPS0540Z / STPS0560Z

### THERMAL RESISTANCE

| Symbol        | Parameter               | Value | Unit |
|---------------|-------------------------|-------|------|
| $R_{th(j-a)}$ | Junction to ambient (*) | 340   | °C/W |

(\*) Mounted on epoxy board with recommended Pad Layout.

### STATIC ELECTRICAL CHARACTERISTICS

| Symbol            | Parameter               | Tests conditions      |                                   | Value     |      |           |      | Unit |
|-------------------|-------------------------|-----------------------|-----------------------------------|-----------|------|-----------|------|------|
|                   |                         |                       |                                   | STPS0540Z |      | STPS0560Z |      |      |
|                   |                         |                       |                                   | typ.      | max. | typ.      | max. |      |
| I <sub>R</sub> *  | Reverse leakage current | T <sub>j</sub> =25°C  | V <sub>R</sub> = V <sub>RRM</sub> |           | 40   |           | 50   | μA   |
|                   |                         | T =100°C              |                                   | 1.5       | 5    | 1         | 4    | mA   |
| V <sub>F</sub> ** | Forward voltage drop    | T <sub>j</sub> =25°C  | I <sub>F</sub> = 0.5 A            |           | 0.50 |           | 0.53 | V    |
|                   |                         | T <sub>j</sub> =100°C |                                   | 0.35      | 0.40 | 0.44      | 0.50 |      |
|                   |                         | T <sub>j</sub> =25°C  | I <sub>F</sub> = 1 A              |           | 0.55 |           | 0.66 |      |
|                   |                         | T <sub>j</sub> =100°C |                                   | 0.45      | 0.51 | 0.58      | 0.65 |      |

Pulse test : \*  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

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

To evaluate the maximum conduction losses use the following equation :

$$\text{STPS0540Z: } P = 0.29 \times I_{F(AV)} + 0.22 \times I_F^2(RMS)$$

$$\text{STPS0560Z: } P = 0.35 \times I_{F(AV)} + 0.3 \times I_F^2(RMS)$$

**PACKAGE MECHANICAL DATA**  
 SOD-123

| 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 |

**MARKING**

| Type      | Marking | Package | Weight | Base qty | Delivery mode |
|-----------|---------|---------|--------|----------|---------------|
| STPS0540Z | Z54     | SOD-123 | 0.01g. | 3000     | Tape & reel   |
| STPS0560Z | Z56     | SOD-123 | 0.01g. | 3000     | Tape & Reel   |

Epoxy meets UL94, V0.

Band indicates cathode.

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