

## POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

|                            |                 |
|----------------------------|-----------------|
| <b>I<sub>F(AV)</sub></b>   | <b>2 x 40 A</b> |
| <b>V<sub>RRM</sub></b>     | <b>60 V</b>     |
| <b>T<sub>j (max)</sub></b> | <b>150 °C</b>   |
| <b>V<sub>F (max)</sub></b> | <b>0.56 V</b>   |

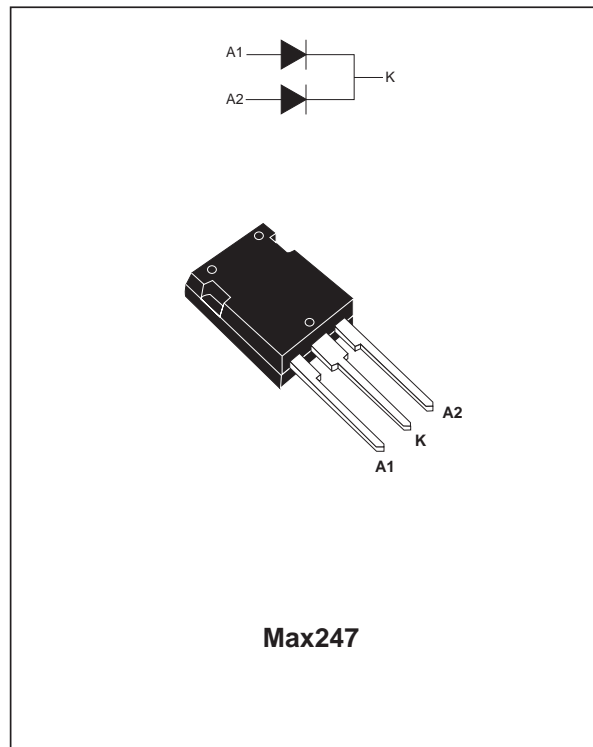
### FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- LOW FORWARD VOLTAGE DROP
- LOW THERMAL RESISTANCE
- AVALANCHE CAPABILITY SPECIFIED

### DESCRIPTION

Dual center tap Schottky rectifier suited for CAD computers and servers.

Packaged in Max247, STPS80L60CY is intended for use in low voltage, high frequency switching power supplies, free wheeling and polarity protection applications.



### ABSOLUTE RATINGS (limiting values, per diode)

| Symbol              | Parameter                                |                                 | Value         | Unit |   |
|---------------------|--|---------------------------------|---------------|------|---|
| V <sub>RRM</sub>    | Repetitive peak reverse voltage          |                                 | 60            | V    |   |
| I <sub>F(RMS)</sub> | RMS forward current                      |                                 | 56            | A    |   |
| I <sub>F(AV)</sub>  | Average forward current                  | T <sub>c</sub> = 130°C          | Per diode     | 40   | A |
|                     |  | δ = 0.5                         | Per device    | 80   |   |
| I <sub>FSM</sub>    | Surge non repetitive forward current     | tp = 10 ms sinusoidal           | 400           | A    |   |
| I <sub>RRM</sub>    | Repetitive peak reverse current          | tp = 2 μs square F = 1kHz       | 2             | A    |   |
| P <sub>ARM</sub>    | Repetitive peak avalanche power          | tp = 1 μs T <sub>j</sub> = 25°C | 20000         | W    |   |
| T <sub>stg</sub>    | Storage temperature range                |                                 | - 55 to + 150 | °C   |   |
| T <sub>j</sub>      | Maximum operating junction temperature * |                                 | 150           | °C   |   |
| dV/dt               | Critical rate of rise of reverse voltage |                                 | 10000         | V/μs |   |

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

# STPS80L60CY

## THERMAL RESISTANCES

| Symbol        | Parameter        |           | Value | Unit                        |
|---------------|------------------|-----------|-------|-----------------------------|
| $R_{th(j-c)}$ | Junction to case | Per diode | 0.70  | $^{\circ}\text{C}/\text{W}$ |
|               |                  | Total     | 0.50  |                             |
| $R_{th(c)}$   |                  | Coupling  | 0.3   |                             |

When the diodes 1 and 2 are used simultaneously :  
 $\Delta T_j(\text{diode } 1) = P(\text{diode } 1) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode } 2) \times R_{th(c)}$

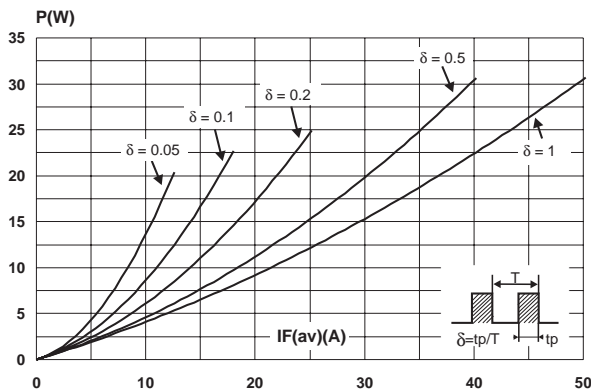
## STATIC ELECTRICAL CHARACTERISTICS (per diode)

| Symbol  | Parameter               | Tests conditions            |                     | Min. | Typ. | Max. | Unit |
|---------|-------------------------|-----------------------------|---------------------|------|------|------|------|
| $I_R^*$ | Reverse leakage current | $T_j = 25^{\circ}\text{C}$  | $V_R = V_{RRM}$     |      |      | 1.8  | mA   |
|         |                         | $T_j = 125^{\circ}\text{C}$ |                     |      | 0.4  | 0.9  |      |
| $V_F^*$ | Forward voltage drop    | $T_j = 25^{\circ}\text{C}$  | $I_F = 40\text{ A}$ |      |      | 0.57 | V    |
|         |                         | $T_j = 125^{\circ}\text{C}$ |                     |      | 0.50 | 0.56 |      |
|         |                         | $T_j = 25^{\circ}\text{C}$  | $I_F = 80\text{ A}$ |      |      | 0.78 |      |
|         |                         | $T_j = 125^{\circ}\text{C}$ |                     |      | 0.69 | 0.77 |      |

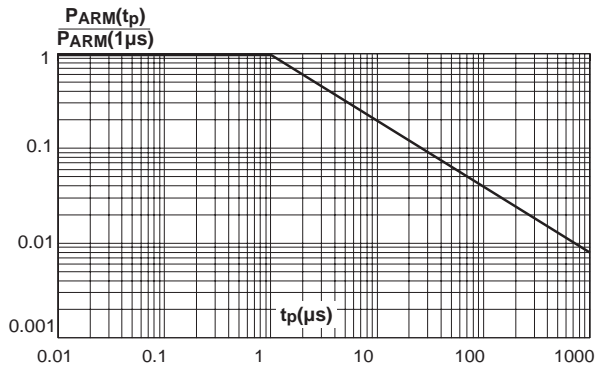
Pulse test : \*  $t_p = 380\ \mu\text{s}$ ,  $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation :  
 $P = 0.36 \times I_{F(AV)} + 0.005 \times I_{F(RMS)}^2$

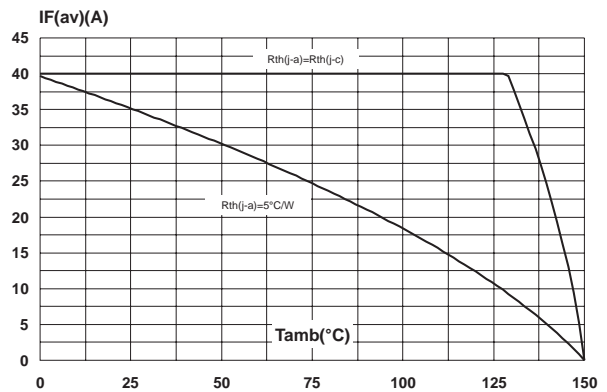
**Fig. 1:** Conduction losses versus average current.



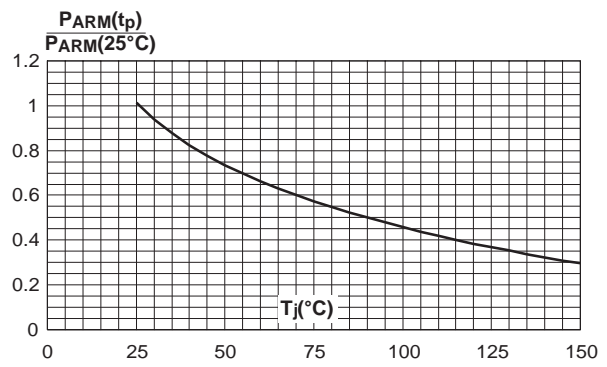
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



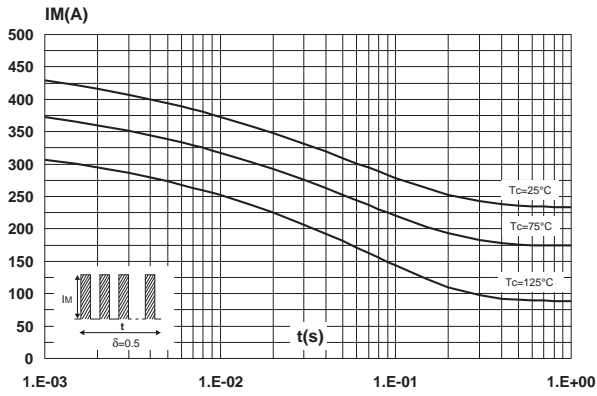
**Fig. 2:** Average forward current versus ambient temperature ( $\delta = 0.5$ ).



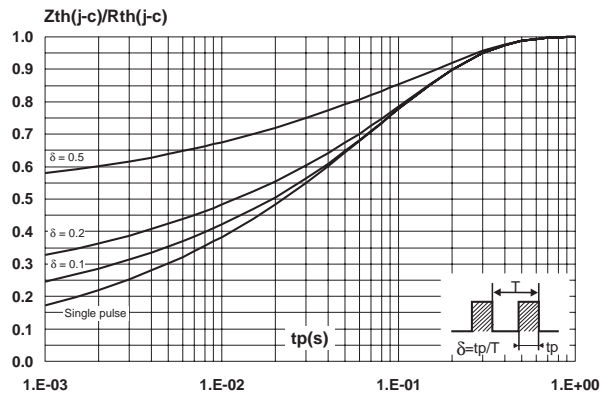
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



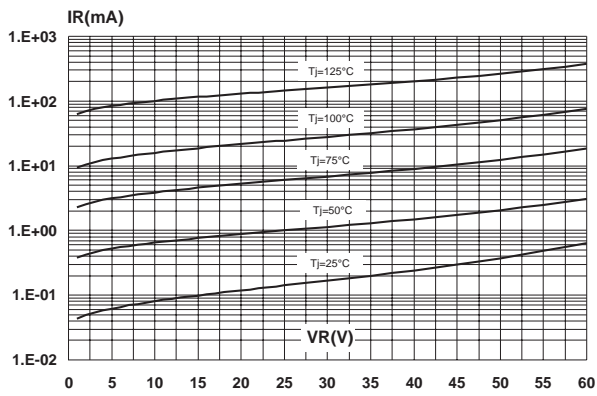
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values).



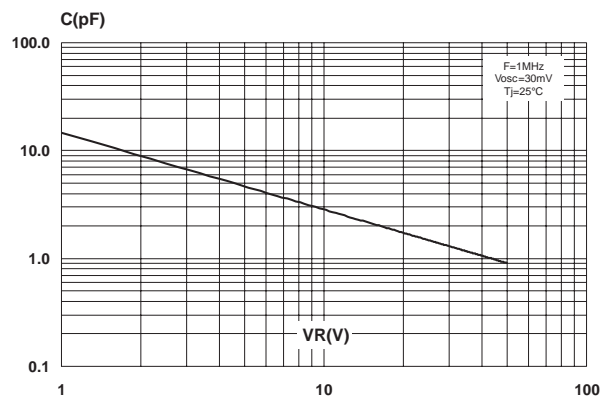
**Fig. 6:** Relative variation of thermal impedance junction to case versus pulse duration.



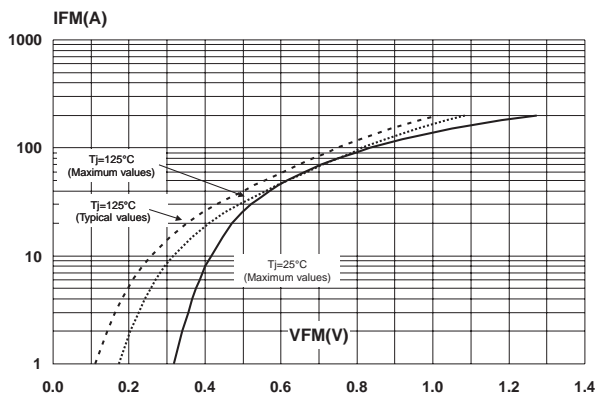
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values).



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



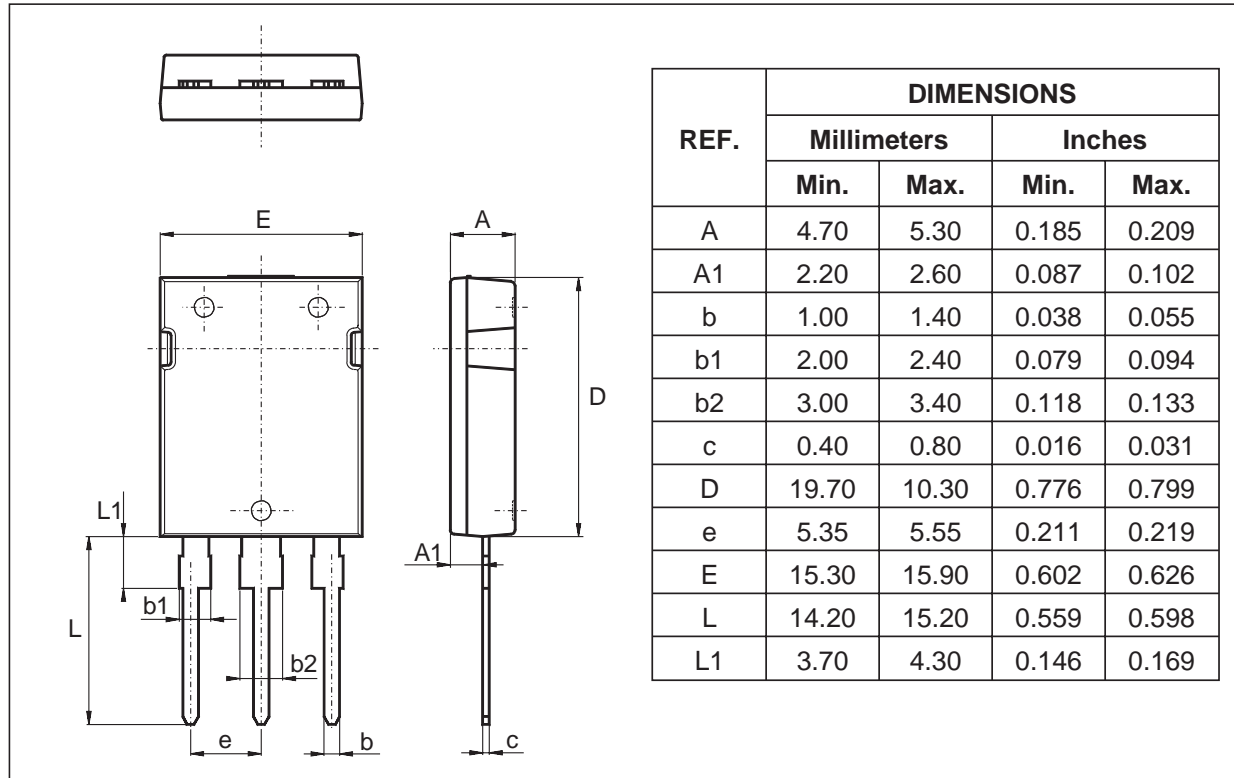
**Fig. 9:** Forward voltage drop versus forward current.



# STPS80L60CY

## PACKAGE MECHANICAL DATA

Max247



| Ordering type | Marking     | Package | Weight | Base qty | Delivery mode |
|---------------|-------------|---------|--------|----------|---------------|
| STPS80L60CY   | STPS80L60CY | Max247  | 4.4g   | 30       | Tube          |

- EPOXY MEETS UL94,V0

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