

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAIN PRODUCTS CHARACTERISTICS

|             |          |
|-------------|----------|
| $I_{F(AV)}$ | 2 x 15 A |
| $V_{RRM}$   | 40 V     |
| $T_j$ (max) | 150 °C   |
| $V_F$ (max) | 0.50 V   |

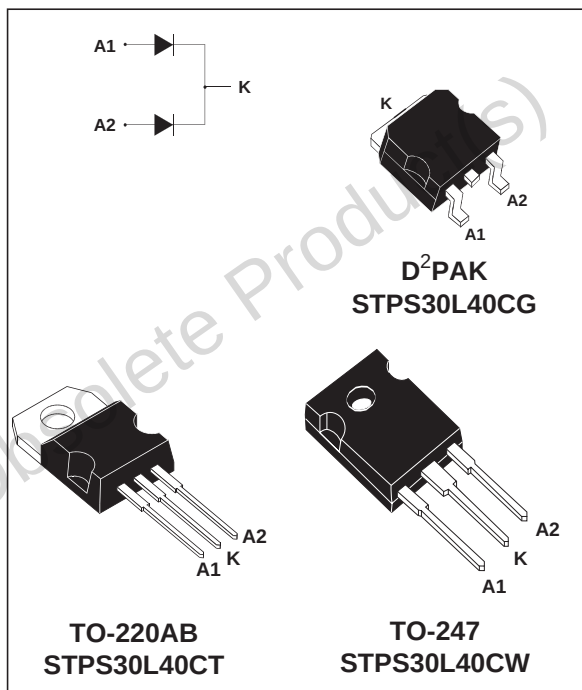
### FEATURES AND BENEFITS

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

### DESCRIPTION

Dual center tap schottky rectifiers suited for Switched Mode Power Supplies and high frequency DC to DC converters.

Packaged in TO-247, TO-220AB and D<sup>2</sup>PAK these devices are intended for use in low voltage, high frequency inverters, free-wheeling and polarity protection applications.



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

| Symbol              | Parameter                                |                                            |                         | Value         | Unit |
|---------------------|------------------------------------------|--------------------------------------------|-------------------------|---------------|------|
| V <sub>RRM</sub>    | Repetitive peak reverse voltage          |                                            |                         | 40            | V    |
| I <sub>F(RMS)</sub> | RMS forward current                      |                                            |                         | 30            | A    |
| I <sub>F(AV)</sub>  | Average forward current                  | T <sub>c</sub> = 135°C<br>δ = 0.5          | Per diode<br>Per device | 15<br>30      | A    |
| I <sub>FSM</sub>    | Surge non repetitive forward current     | t <sub>p</sub> = 10 ms Sinusoidal          |                         | 220           | A    |
| I <sub>RRM</sub>    | Repetitive peak reverse current          | t <sub>p</sub> = 2 μs square F=1kHz        |                         | 1             | A    |
| I <sub>RSM</sub>    | Non repetitive peak reverse current      | t <sub>p</sub> = 100 μs square             |                         | 3             | A    |
| P <sub>ARM</sub>    | Repetitive peak avalanche power          | t <sub>p</sub> = 1μs T <sub>j</sub> = 25°C |                         | 6000          | W    |
| T <sub>stg</sub>    | Storage temperature range                |                                            |                         | - 65 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

## STPS30L40CG/CT/CW

### THERMAL RESISTANCES

| Symbol        | Parameter        |                    | Value        | Unit |
|---------------|------------------|--------------------|--------------|------|
| $R_{th(j-c)}$ | Junction to case | Per diode<br>Total | 1.60<br>0.85 | °C/W |
| $R_{th(c)}$   |                  | Coupling           | 0.10         | °C/W |

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)

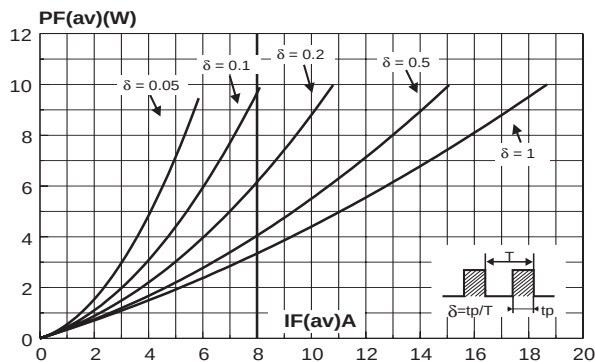
| Symbol  | Parameter               | Tests Conditions          |                     | Min. | Typ. | Max. | Unit          |
|---------|-------------------------|---------------------------|---------------------|------|------|------|---------------|
| $I_R^*$ | Reverse leakage current | $T_j = 25^\circ\text{C}$  | $V_R = V_{RRM}$     |      |      | 360  | $\mu\text{A}$ |
|         |                         | $T_j = 100^\circ\text{C}$ |                     |      | 20   | 50   | mA            |
| $V_F^*$ | Forward voltage drop    | $T_j = 25^\circ\text{C}$  | $I_F = 15\text{ A}$ |      |      | 0.55 | V             |
|         |                         | $T_j = 125^\circ\text{C}$ | $I_F = 15\text{ A}$ |      | 0.42 | 0.50 |               |
|         |                         | $T_j = 25^\circ\text{C}$  | $I_F = 30\text{ A}$ |      |      | 0.74 |               |
|         |                         | $T_j = 125^\circ\text{C}$ | $I_F = 30\text{ A}$ |      | 0.59 | 0.67 |               |

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

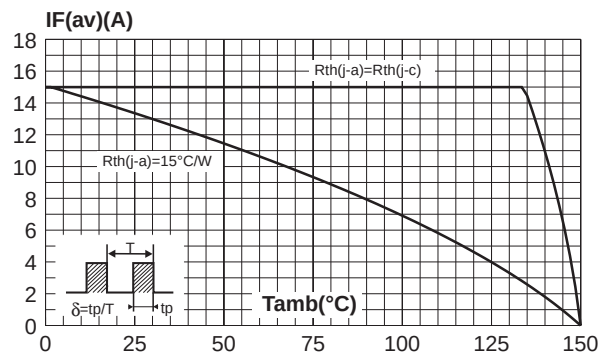
To evaluate the conduction losses use the following equation :

$$P = 0.330 \times I_{F(AV)} + 0.011 I_{F(RMS)}^2$$

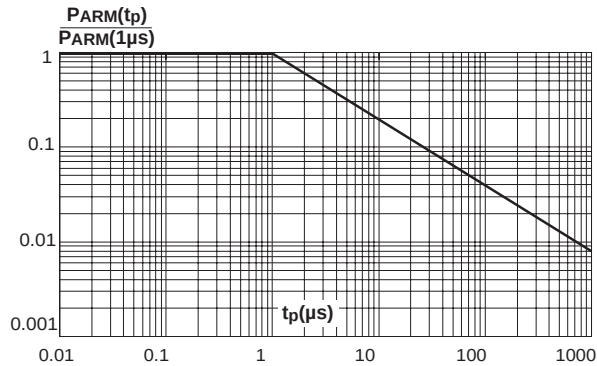
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



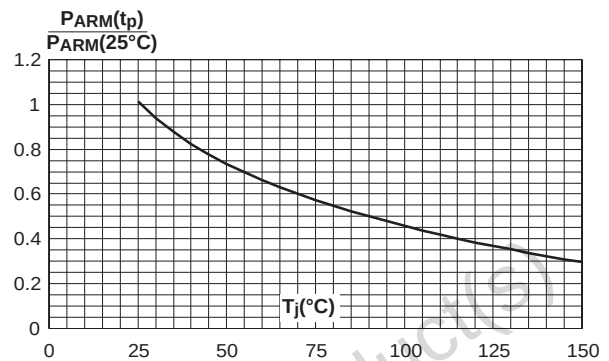
**Fig. 2:** Average current versus ambient temperature ( $\delta=0.5$ ) (per diode).



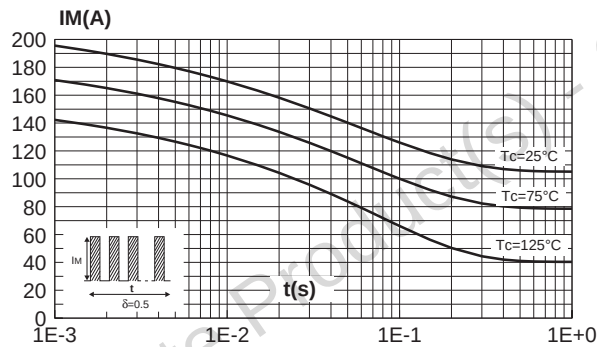
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



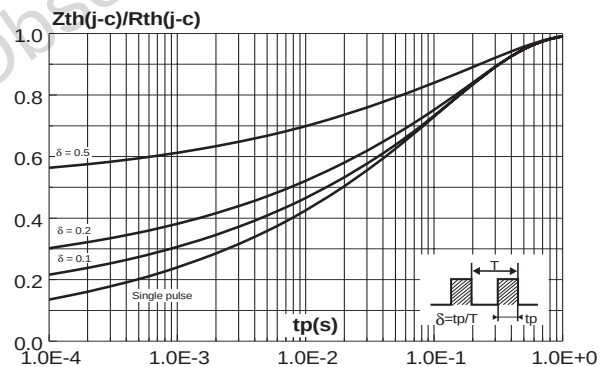
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



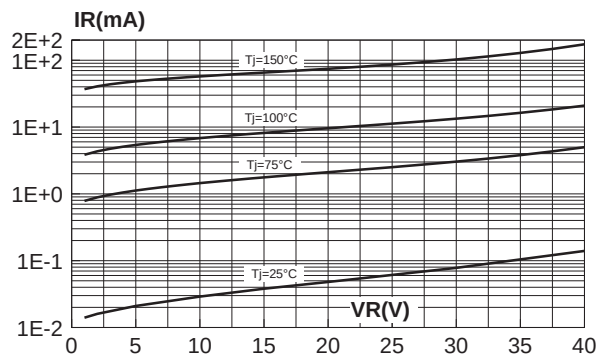
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values) (per diode).



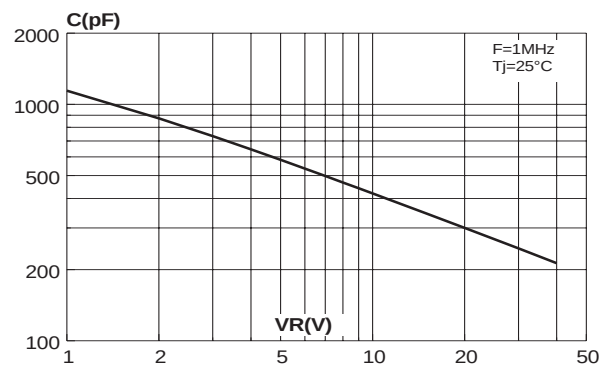
**Fig. 6:** Relative variation of thermal transient impedance junction to case versus pulse duration.



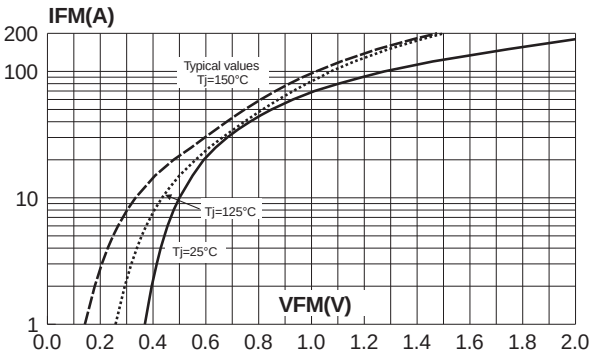
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values) (per diode).



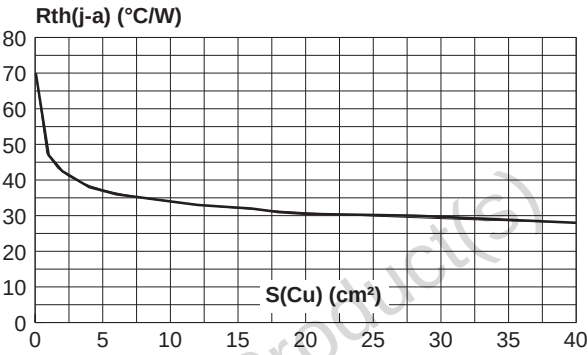
**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values) (per diode).



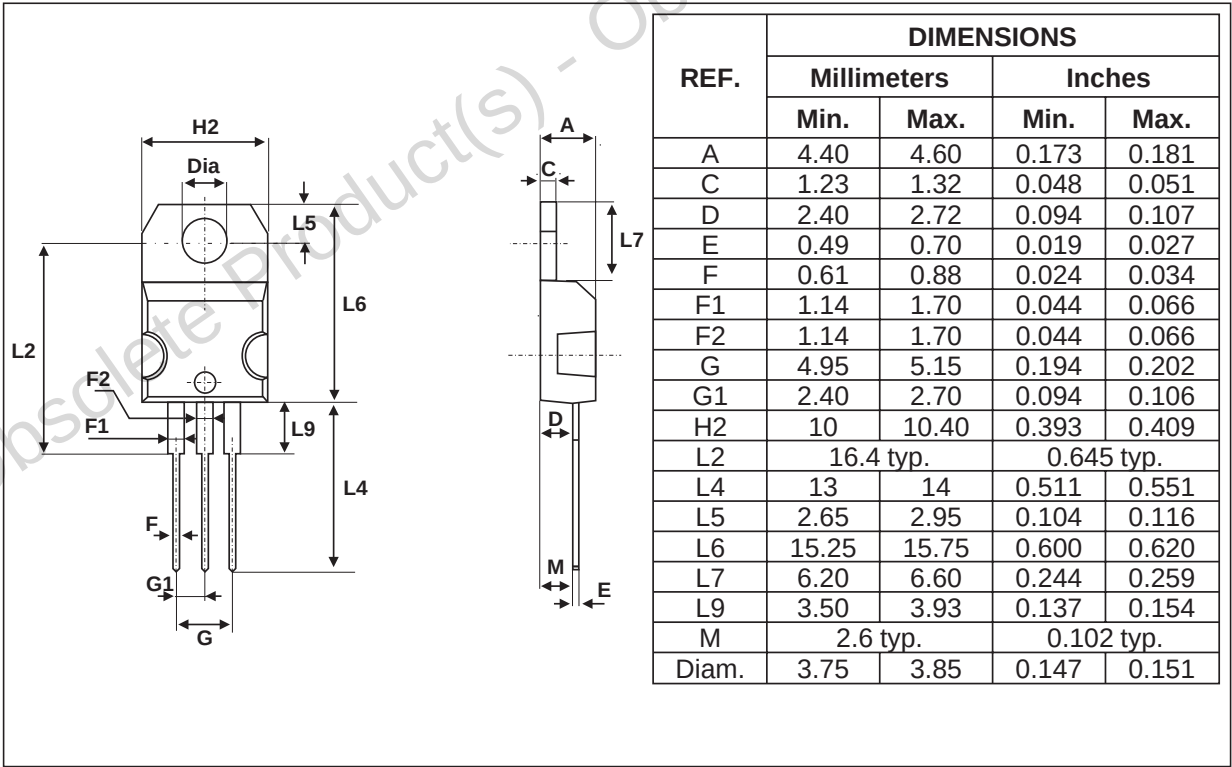
**Fig. 9:** Forward voltage drop versus forward current (maximum values) (per diode).



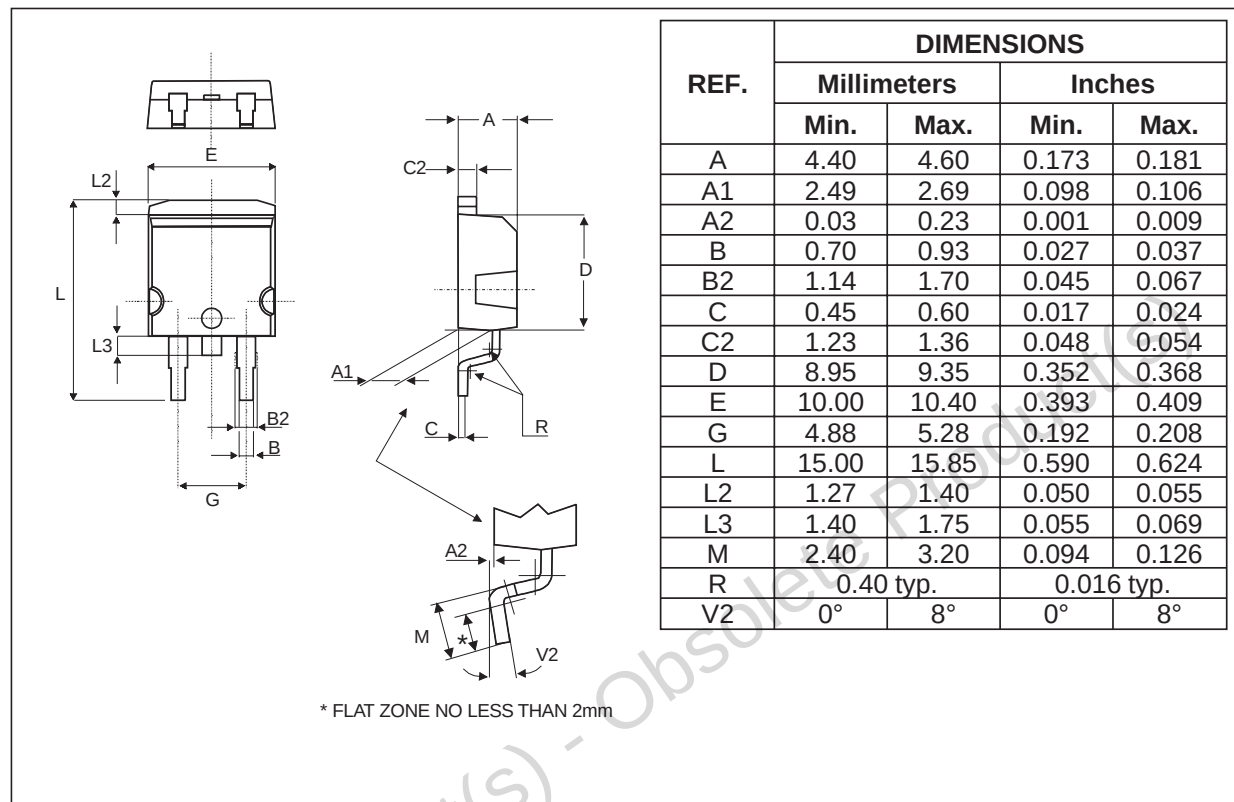
**Fig. 10:** Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35μm) (STPS30L40CG only).



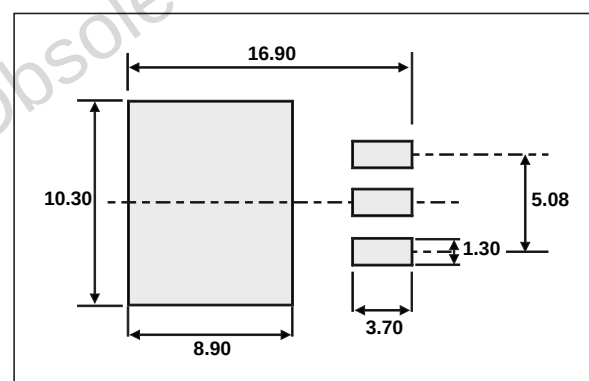
**PACKAGE MECHANICAL DATA**  
TO-220AB



- COOLING METHOD : C
- RECOMMENDED TORQUE VALUE : 0.55 M.N
- MAXIMUM TORQUE VALUE : 0.70 M.N

**PACKAGE MECHANICAL DATA**  
**D<sup>2</sup>PAK**


- COOLING METHOD : BY CONDUCTION  
(METHOD C)

**FOOT PRINT (in millimeters)**
**D<sup>2</sup>PAK**


**STPS30L40CG/CT/CW****PACKAGE MECHANICAL DATA**

TO-247

| REF. | DIMENSIONS  |       |       |        |       |       |
|------|-------------|-------|-------|--------|-------|-------|
|      | Millimeters |       |       | Inches |       |       |
|      | Min.        | Typ.  | Max.  | Min.   | Typ.  | Max.  |
| A    | 4.85        |       | 5.15  | 0.191  |       | 0.203 |
| D    | 2.20        |       | 2.60  | 0.086  |       | 0.102 |
| E    | 0.40        |       | 0.80  | 0.015  |       | 0.031 |
| F    | 1.00        |       | 1.40  | 0.039  |       | 0.055 |
| F1   |             | 3.00  |       |        | 0.118 |       |
| F2   |             | 2.00  |       |        | 0.078 |       |
| F3   | 2.00        |       | 2.40  | 0.078  |       | 0.094 |
| F4   | 3.00        |       | 3.40  | 0.118  |       | 0.133 |
| G    |             | 10.90 |       |        | 0.429 |       |
| H    | 15.45       |       | 15.75 | 0.608  |       | 0.620 |
| L    | 19.85       |       | 20.15 | 0.781  |       | 0.793 |
| L1   | 3.70        |       | 4.30  | 0.145  |       | 0.169 |
| L2   |             | 18.50 |       |        | 0.728 |       |
| L3   | 14.20       |       | 14.80 | 0.559  |       | 0.582 |
| L4   |             | 34.60 |       |        | 1.362 |       |
| L5   |             | 5.50  |       |        | 0.216 |       |
| M    | 2.00        |       | 3.00  | 0.078  |       | 0.118 |
| V    |             | 5°    |       |        | 5°    |       |
| V2   |             | 60°   |       |        | 60°   |       |
| Dia. | 3.55        |       | 3.65  | 0.139  |       | 0.143 |

- COOLING METHOD : C
- RECOMMENDED TORQUE VALUE : 0.8M.N
- MAXIMUM TORQUE VALUE : 1.0M.N

| Ordering type  | Marking     | Package            | Weight | Base qty | Delivery mode |
|----------------|-------------|--------------------|--------|----------|---------------|
| STPS30L40CT    | STPS30L40CT | TO-220AB           | 2g     | 50       | Tube          |
| STPS30L40CG    | STPS30L40CG | D <sup>2</sup> PAK | 1.8g   | 50       | Tube          |
| STPS30L40CG-TR | STPS30L40CG | D <sup>2</sup> PAK | 1.8g   | 500      | Tape & reel   |
| STPS30L40CW    | STPS30L40CW | TO-247             | 4.4g   | 30       | Tube          |

- EPOXY MEETS UL94,V0

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