



# STPS30L40CG/CT/CW

## 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   |

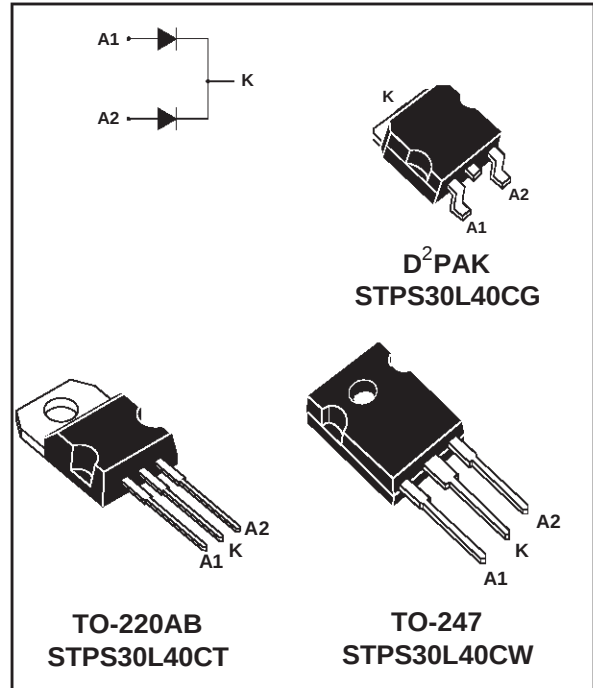
### FEATURES AND BENEFITS

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

### 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     | tp = 10 ms Sinusoidal             |                         | 220           | A    |
| I <sub>RRM</sub>    | Repetitive peak reverse current          | tp=2 μs square F=1kHz             |                         | 1             | A    |
| I <sub>RSM</sub>    | Non repetitive peak reverse current      | tp = 100 μs square                |                         | 3             | A    |
| 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

## THERMAL RESISTANCES

| Symbol        | Parameter        |           | Value | Unit                 |
|---------------|------------------|-----------|-------|----------------------|
| $R_{th(j-c)}$ | Junction to case | Per diode | 1.60  | $^{\circ}\text{C/W}$ |
|               |                  | Total     | 0.85  |                      |
| $R_{th(c)}$   |                  | Coupling  | 0.10  | $^{\circ}\text{C/W}$ |

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)

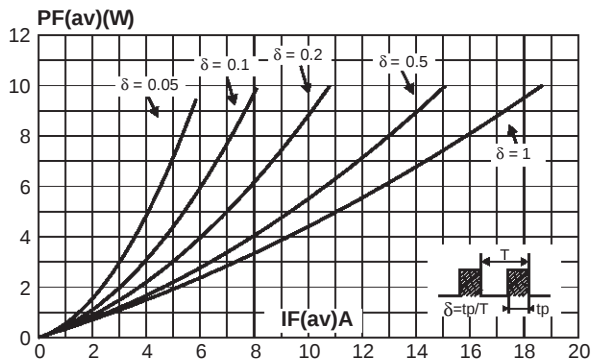
| Symbol  | Parameter               | Tests Conditions            |                     | Min. | Typ. | Max. | Unit          |
|---------|-------------------------|-----------------------------|---------------------|------|------|------|---------------|
| $I_R^*$ | Reverse leakage current | $T_j = 25^{\circ}\text{C}$  | $V_R = V_{RRM}$     |      |      | 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 : \*  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

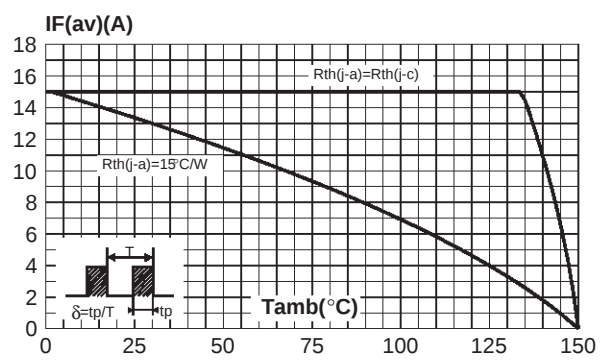
To evaluate the conduction losses use the following equation :

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

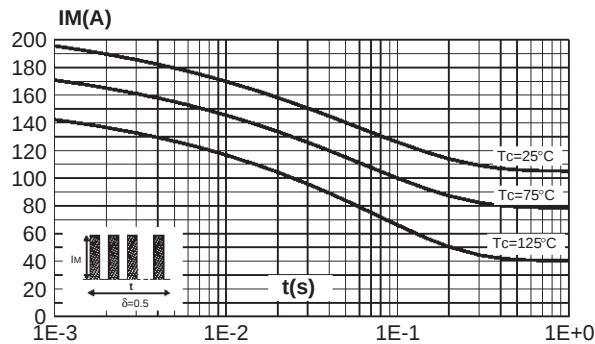
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



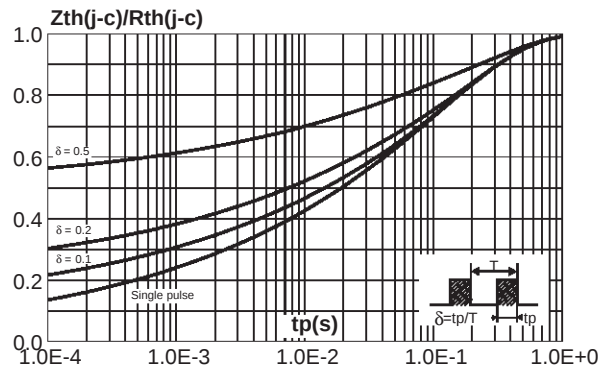
**Fig. 2:** Average current versus ambient temperature ( $\delta=0.5$ ) (per diode).



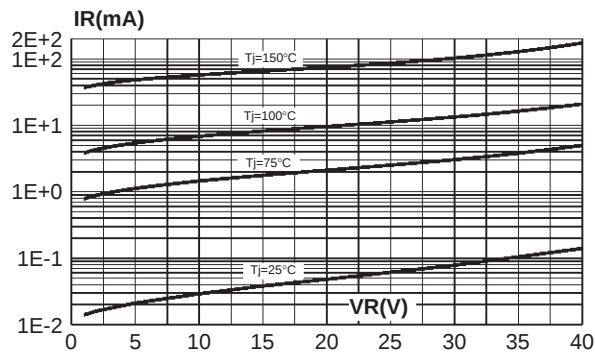
**Fig. 3:** Non repetitive surge peak forward current versus overload duration (maximum values) (per diode).



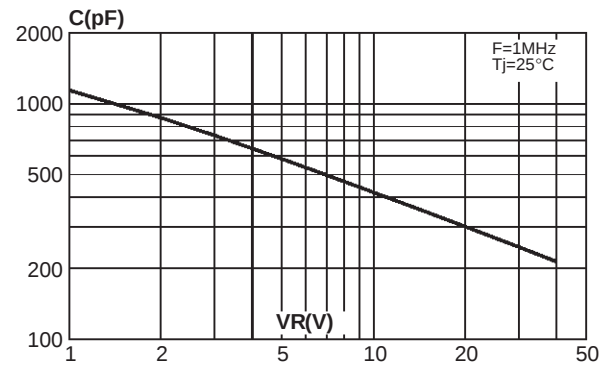
**Fig. 4:** Relative variation of thermal transient impedance junction to case versus pulse duration.



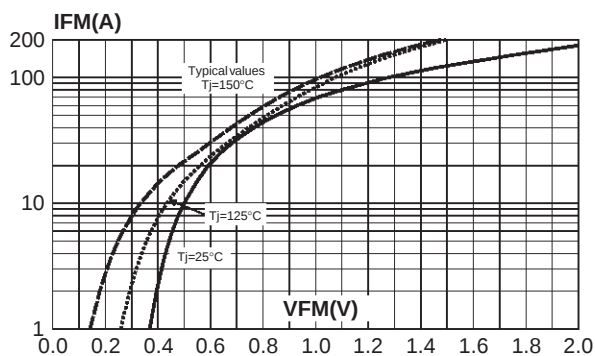
**Fig. 5:** Reverse leakage current versus reverse voltage applied (typical values) (per diode).



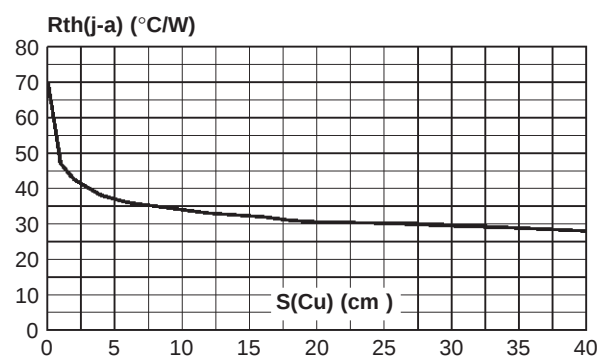
**Fig. 6:** Junction capacitance versus reverse voltage applied (typical values) (per diode).



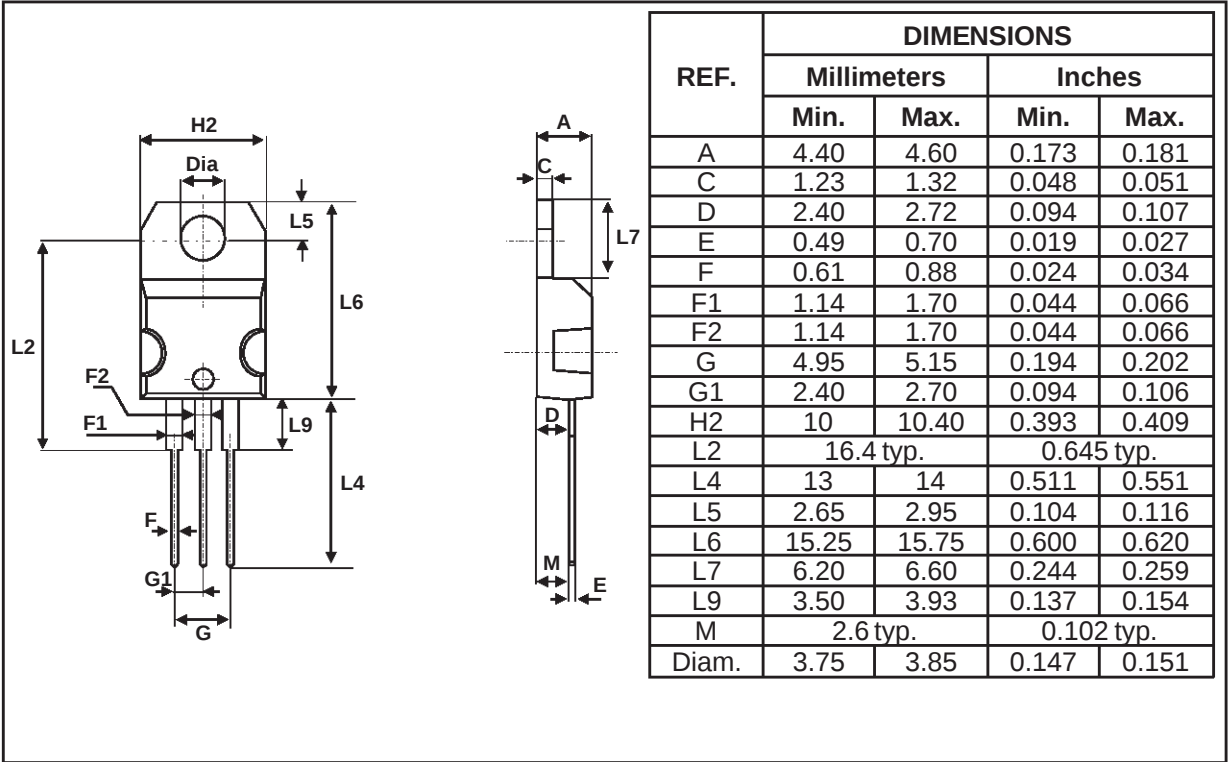
**Fig. 7:** Forward voltage drop versus forward current (maximum values) (per diode).



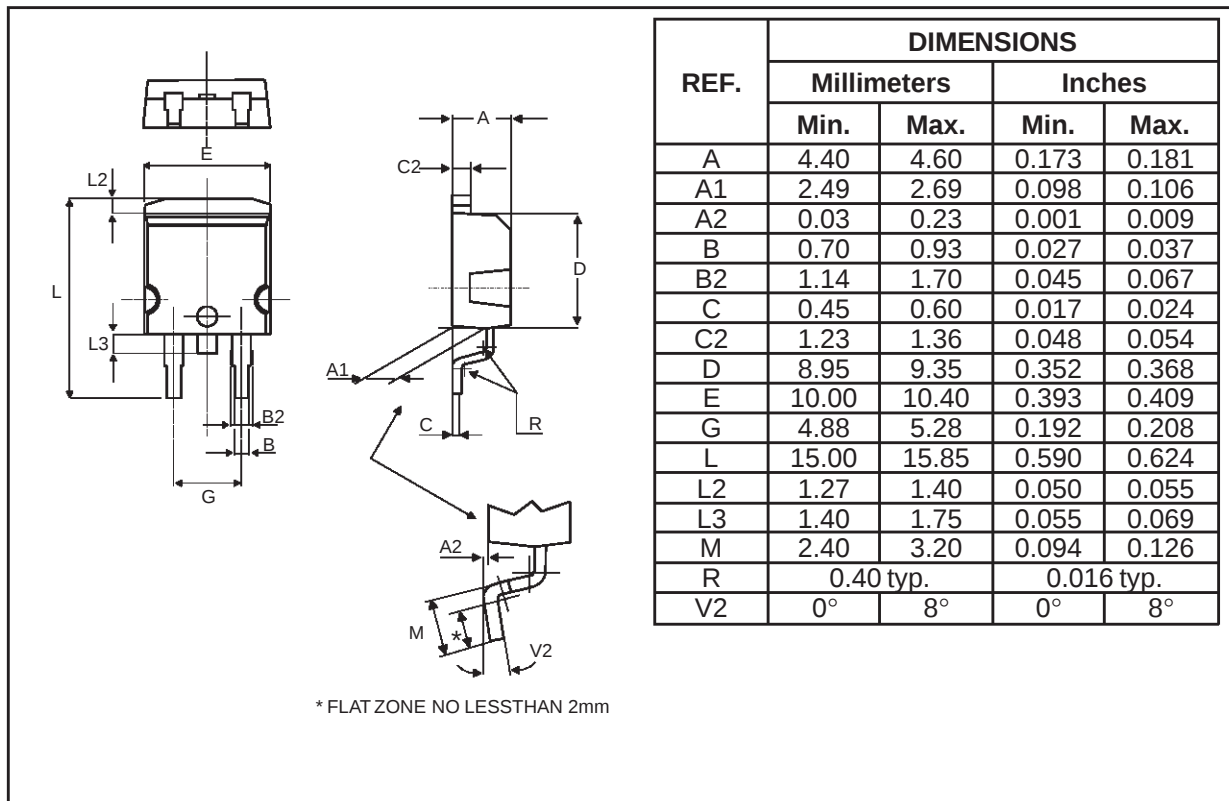
**Fig. 8:** Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35 $\mu\text{m}$ ) (STPS30L40CG only).



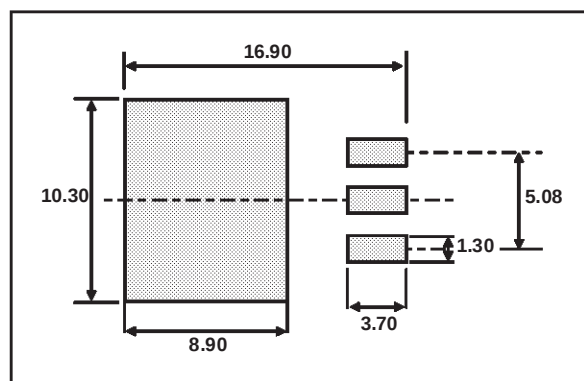
PACKAGE MECHANICAL DATA  
TO-220AB



- Cooling method : C
- Recommended torque value : 0.55 m.N
- Maximum torque value : 0.70 m.N

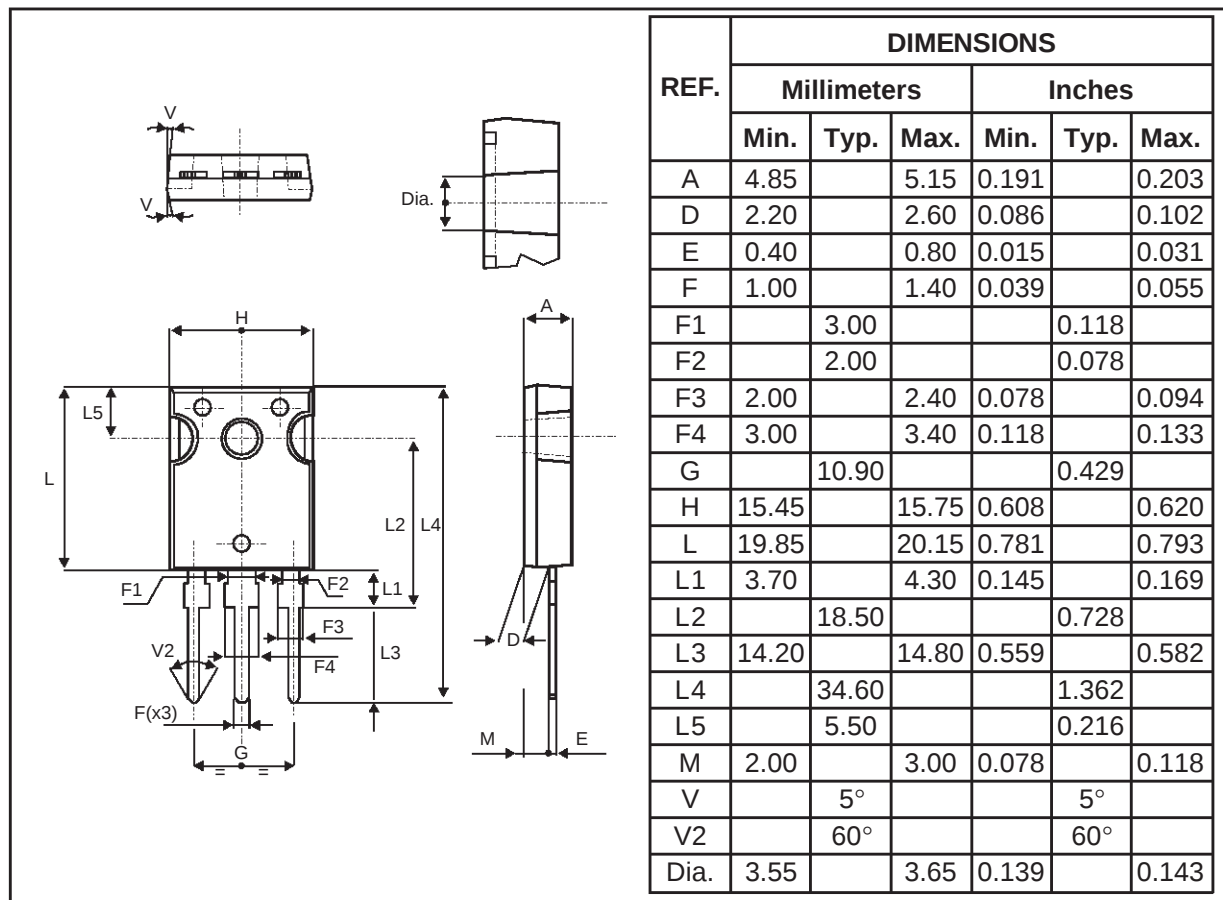
**PACKAGE MECHANICAL DATA**  
**D<sup>2</sup>PAK**


■ Cooling method : by conduction (method C)

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


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

TO-247



- 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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