



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 |

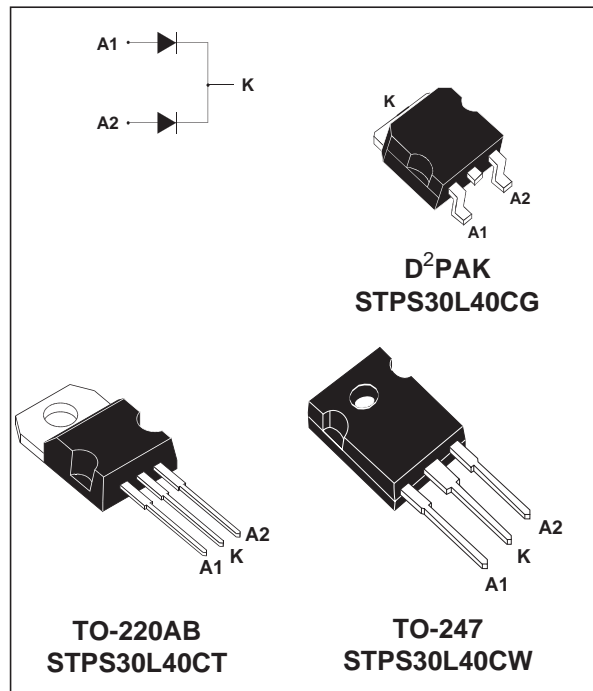
FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- LOW FORWARD VOLTAGE DROP
- LOW THERMAL RESISTANCE
- AVALANCHE 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 D²PAK 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_{RRM} | Repetitive peak reverse voltage | | 40 | V |
| $I_{F(RMS)}$ | RMS forward current | | 30 | A |
| $I_{F(AV)}$ | Average forward current | $T_c = 135^\circ\text{C}$ $\delta = 0.5$ | Per diode 15 Per device 30 | A |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10$ ms Sinusoidal | 220 | A |
| I_{RRM} | Repetitive peak reverse current | $t_p = 2$ μs square $F=1\text{kHz}$ | 1 | A |
| I_{RSM} | Non repetitive peak reverse current | $t_p = 100$ μs square | 3 | A |
| P_{ARM} | Repetitive peak avalanche power | $t_p = 1$ μs $T_j = 25^\circ\text{C}$ | 6000 | W |
| 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/ μs |

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

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THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|---------------|------------------|-----------|-------|------|
| $R_{th(j-c)}$ | Junction to case | Per diode | 1.60 | °C/W |
| | | Total | 0.85 | |
| $R_{th(c)}$ | | 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 | μA |
| | | $T_j = 100^\circ\text{C}$ | | | 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 : * $t_p = 380\ \mu\text{s}$, $\delta < 2\%$

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).

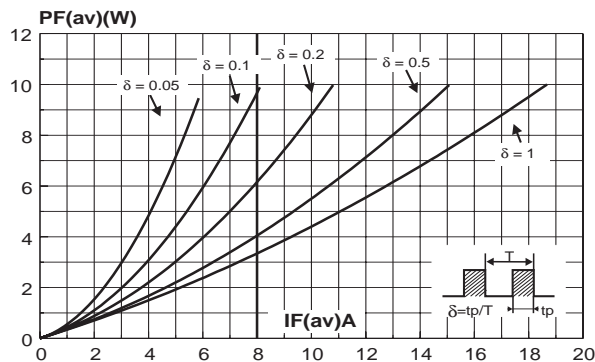


Fig. 2: Average current versus ambient temperature ($\delta=0.5$) (per diode).

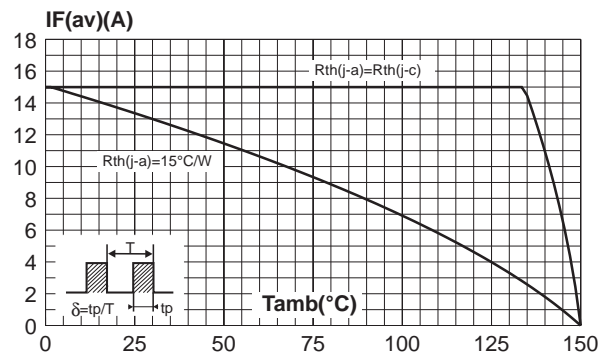


Fig. 3: Normalized avalanche power derating versus pulse duration.

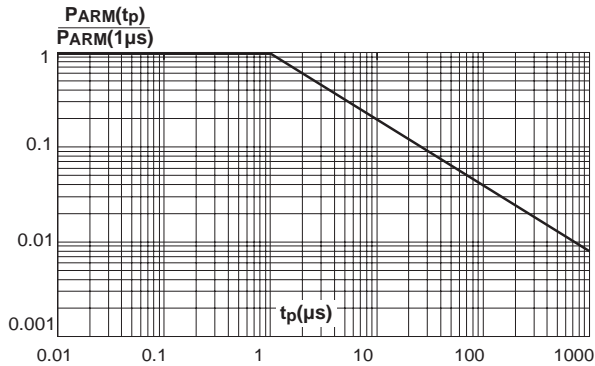


Fig. 4: Normalized avalanche power derating versus junction temperature.

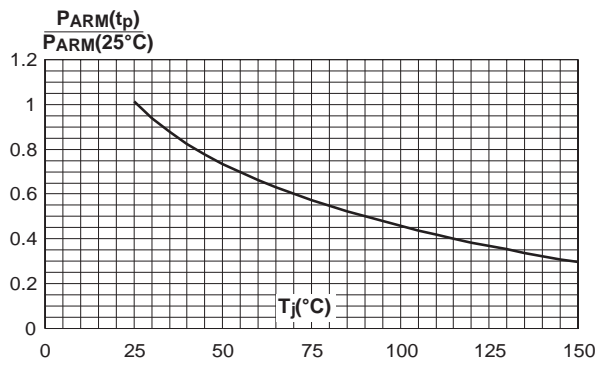


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values) (per diode).

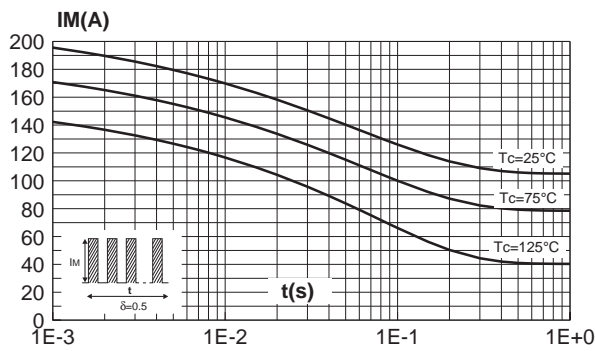


Fig. 6: Relative variation of thermal transient impedance junction to case versus pulse duration.

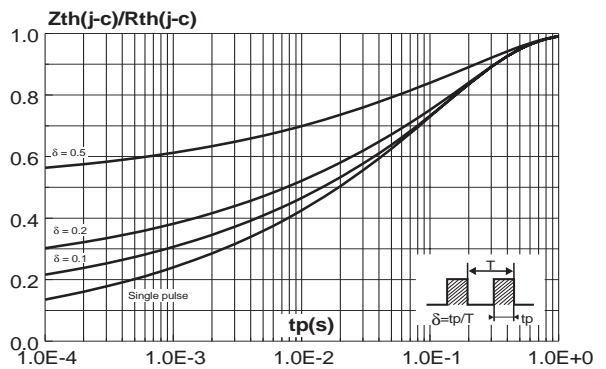


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values) (per diode).

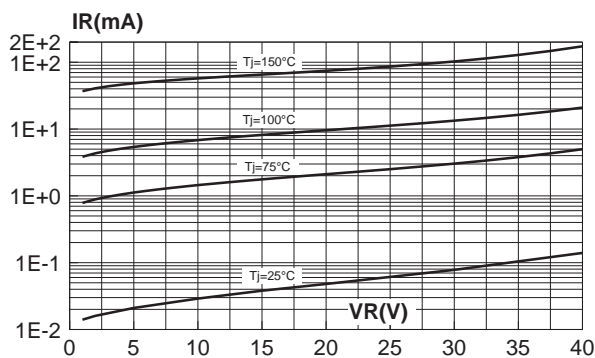


Fig. 8: Junction capacitance versus reverse voltage applied (typical values) (per diode).

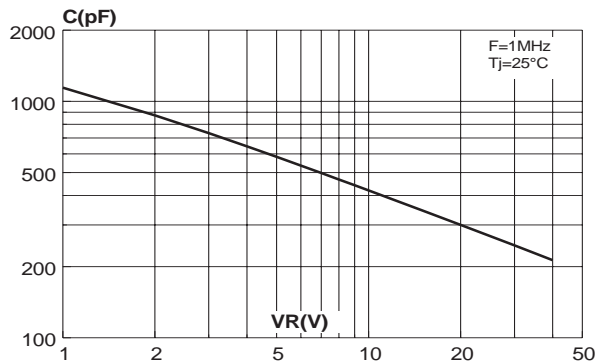


Fig. 9: Forward voltage drop versus forward current (maximum values) (per diode).

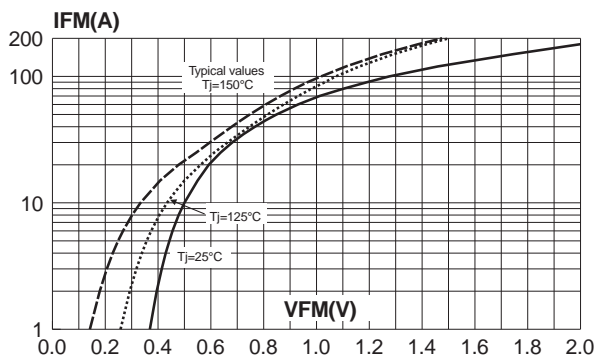
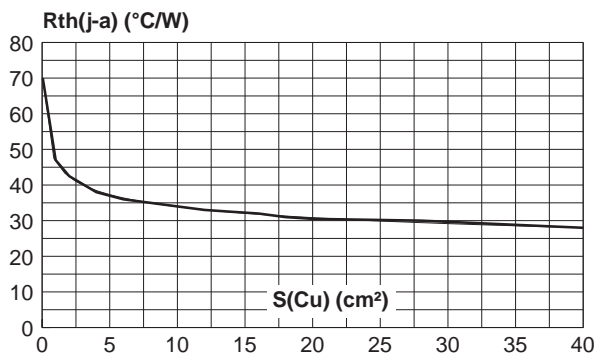


Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm) (STPS30L40CG only).

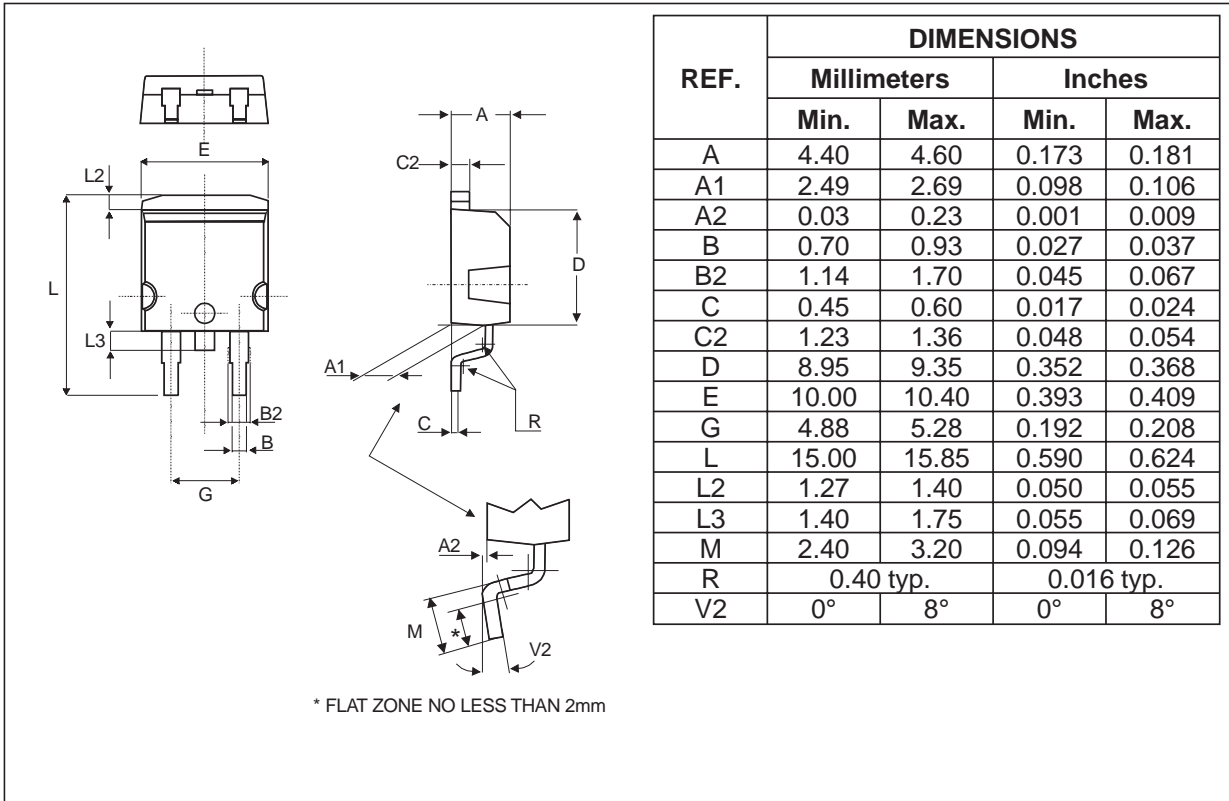


PACKAGE MECHANICAL DATA
TO-220AB

| REF. | DIMENSIONS | | | |
|-------|-------------|-------|------------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.40 | 4.60 | 0.173 | 0.181 |
| C | 1.23 | 1.32 | 0.048 | 0.051 |
| D | 2.40 | 2.72 | 0.094 | 0.107 |
| E | 0.49 | 0.70 | 0.019 | 0.027 |
| F | 0.61 | 0.88 | 0.024 | 0.034 |
| F1 | 1.14 | 1.70 | 0.044 | 0.066 |
| F2 | 1.14 | 1.70 | 0.044 | 0.066 |
| G | 4.95 | 5.15 | 0.194 | 0.202 |
| G1 | 2.40 | 2.70 | 0.094 | 0.106 |
| H2 | 10 | 10.40 | 0.393 | 0.409 |
| L2 | 16.4 typ. | | 0.645 typ. | |
| L4 | 13 | 14 | 0.511 | 0.551 |
| L5 | 2.65 | 2.95 | 0.104 | 0.116 |
| L6 | 15.25 | 15.75 | 0.600 | 0.620 |
| L7 | 6.20 | 6.60 | 0.244 | 0.259 |
| L9 | 3.50 | 3.93 | 0.137 | 0.154 |
| M | 2.6 typ. | | 0.102 typ. | |
| Diam. | 3.75 | 3.85 | 0.147 | 0.151 |

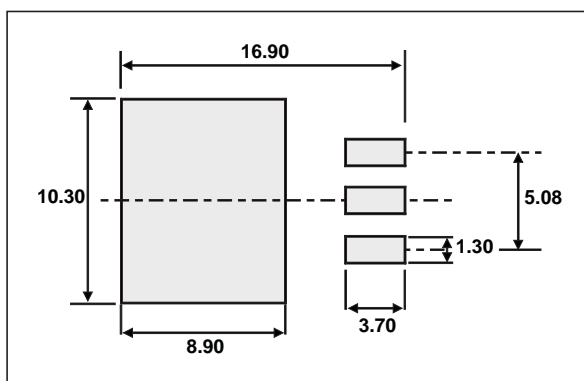
- COOLING METHOD : C
- RECOMMENDED TORQUE VALUE : 0.55 M.N
- MAXIMUM TORQUE VALUE : 0.70 M.N

PACKAGE MECHANICAL DATA
D²PAK



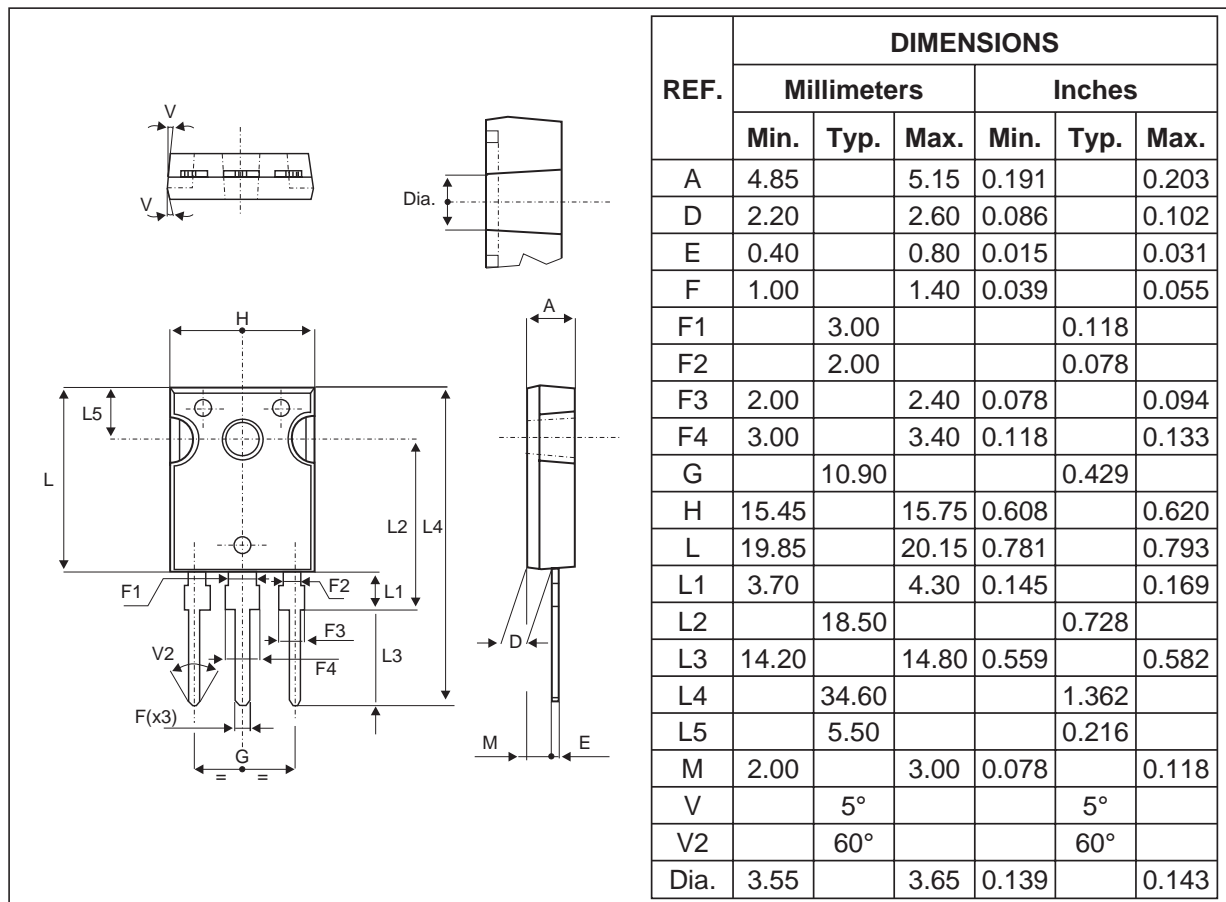
• COOLING METHOD : BY CONDUCTION
(METHOD C)

FOOT PRINT (in millimeters)
D²PAK



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 ² PAK | 1.8g | 50 | Tube |
| STPS30L40CG-TR | STPS30L40CG | D ² PAK | 1.8g | 500 | Tape & reel |
| STPS30L40CW | STPS30L40CW | TO-247 | 4.4g | 30 | Tube |

- EPOXY MEETS UL94,V0

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