



STPS30L40CG/CT/CW

LOW DROP POWER SCHOTTKY RECTIFIER

MAIN PRODUCTS CHARACTERISTICS

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

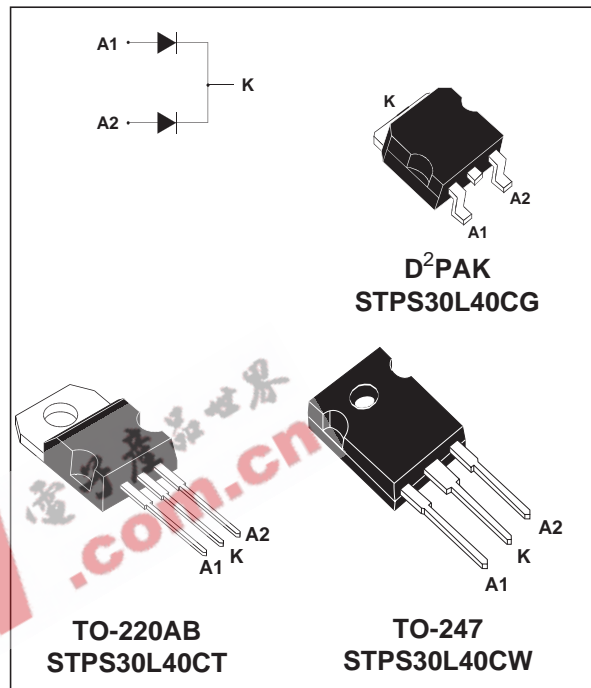
FEATURES AND BENEFITS

- 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 | $t_p = 10 \text{ ms}$ Sinusoidal | 220 | A |
| I_{RRM} | Repetitive peak reverse current | $t_p = 2 \mu\text{s}$ square $F=1\text{kHz}$ | 1 | A |
| I_{RSM} | Non repetitive peak reverse current | $t_p = 100 \mu\text{s}$ square | 3 | A |
| P_{ARM} | Repetitive peak avalanche power | $t_p = 1 \mu\text{s}$ $T_j = 25^\circ\text{C}$ | 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

STPS30L40CG/CT/CW

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 | 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 :

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

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

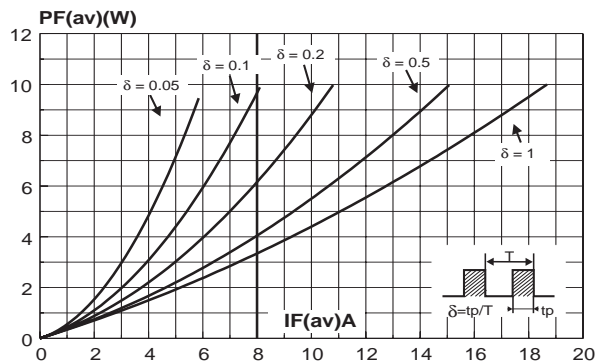


Fig. 2: Average current versus ambient temperature ($\delta=0.5$) (per diode).

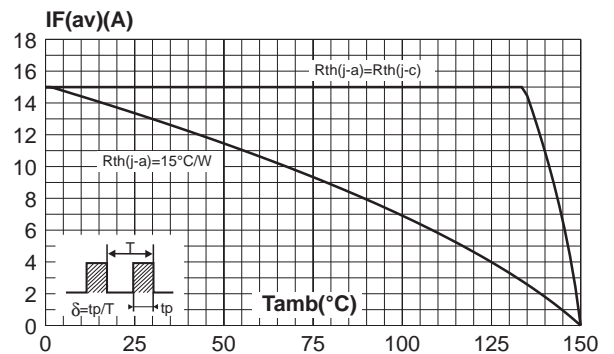


Fig. 3: Normalized avalanche power derating versus pulse duration.

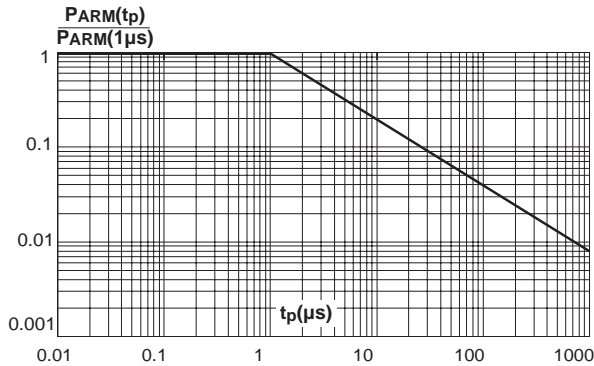


Fig. 4: Normalized avalanche power derating versus junction temperature.

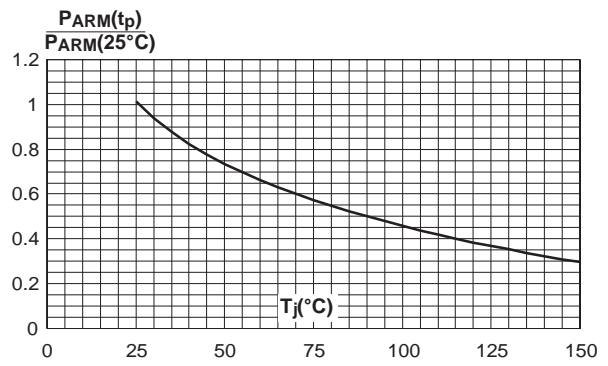


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values) (per diode).

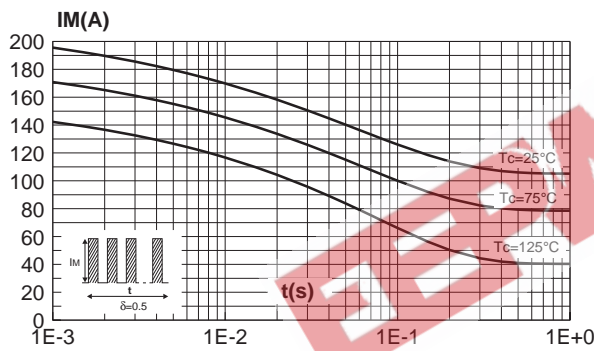


Fig. 6: Relative variation of thermal transient impedance junction to case versus pulse duration.

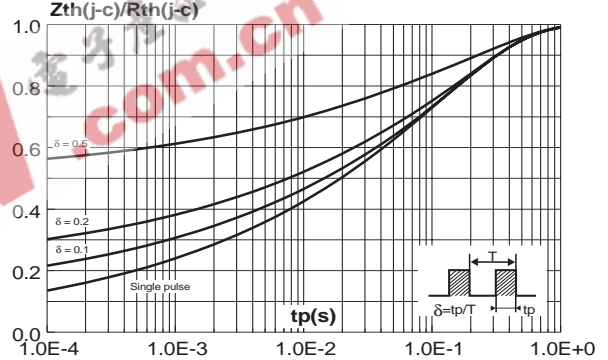


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values) (per diode).

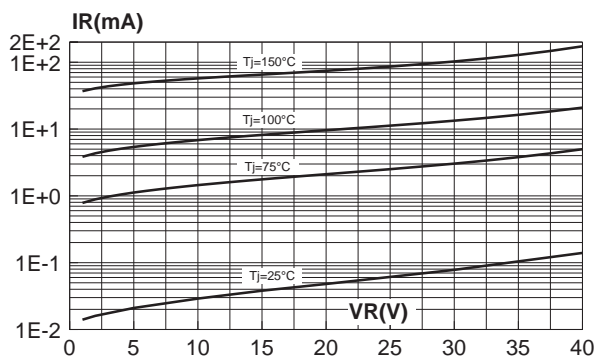


Fig. 8: Junction capacitance versus reverse voltage applied (typical values) (per diode).

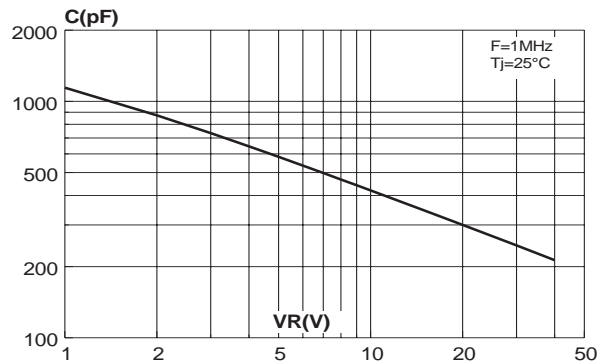


Fig. 9: Forward voltage drop versus forward current (maximum values) (per diode).

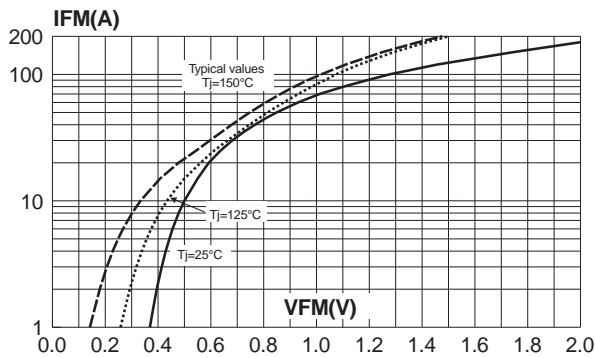
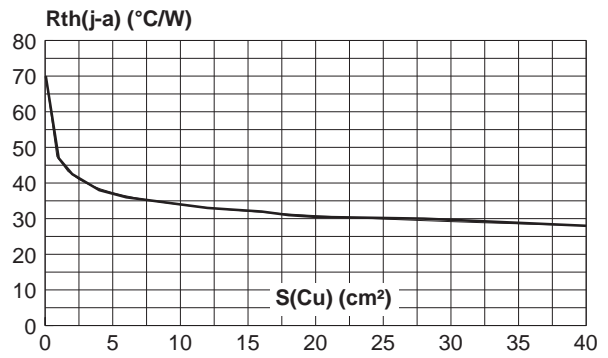
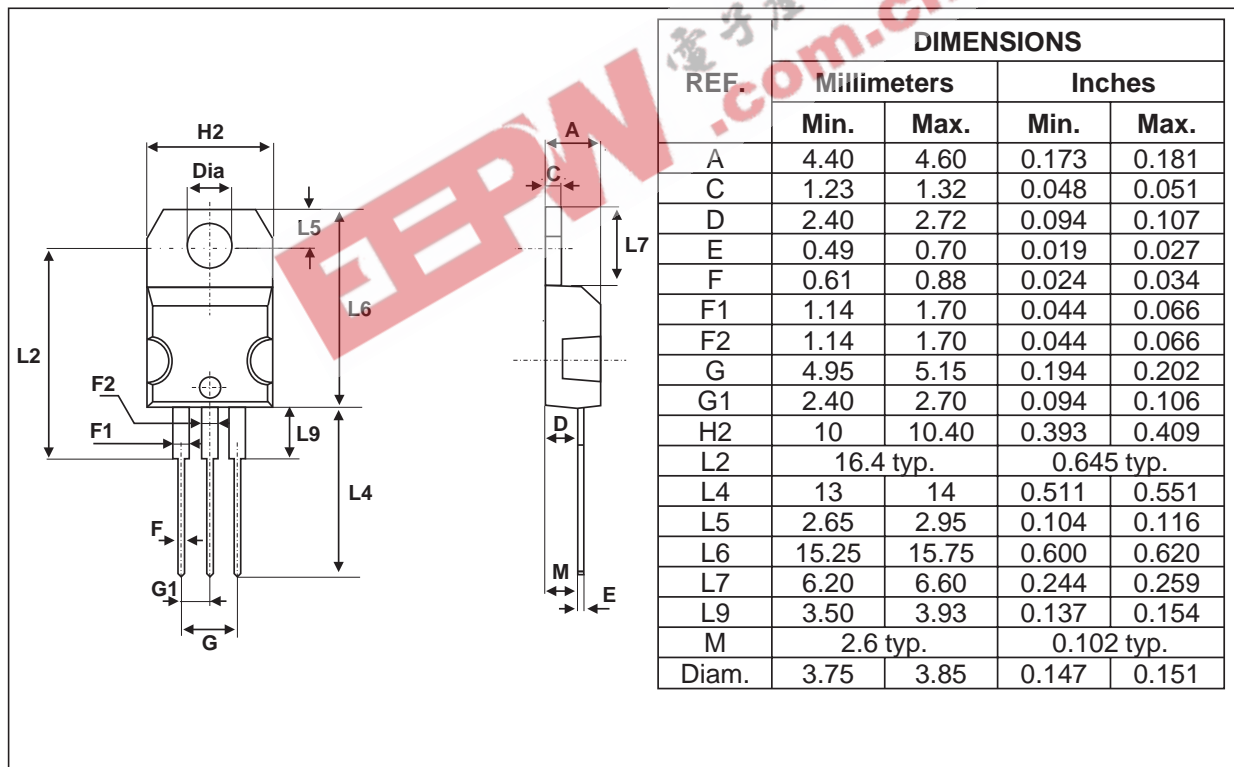


Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm) (STPS30L40CG only).

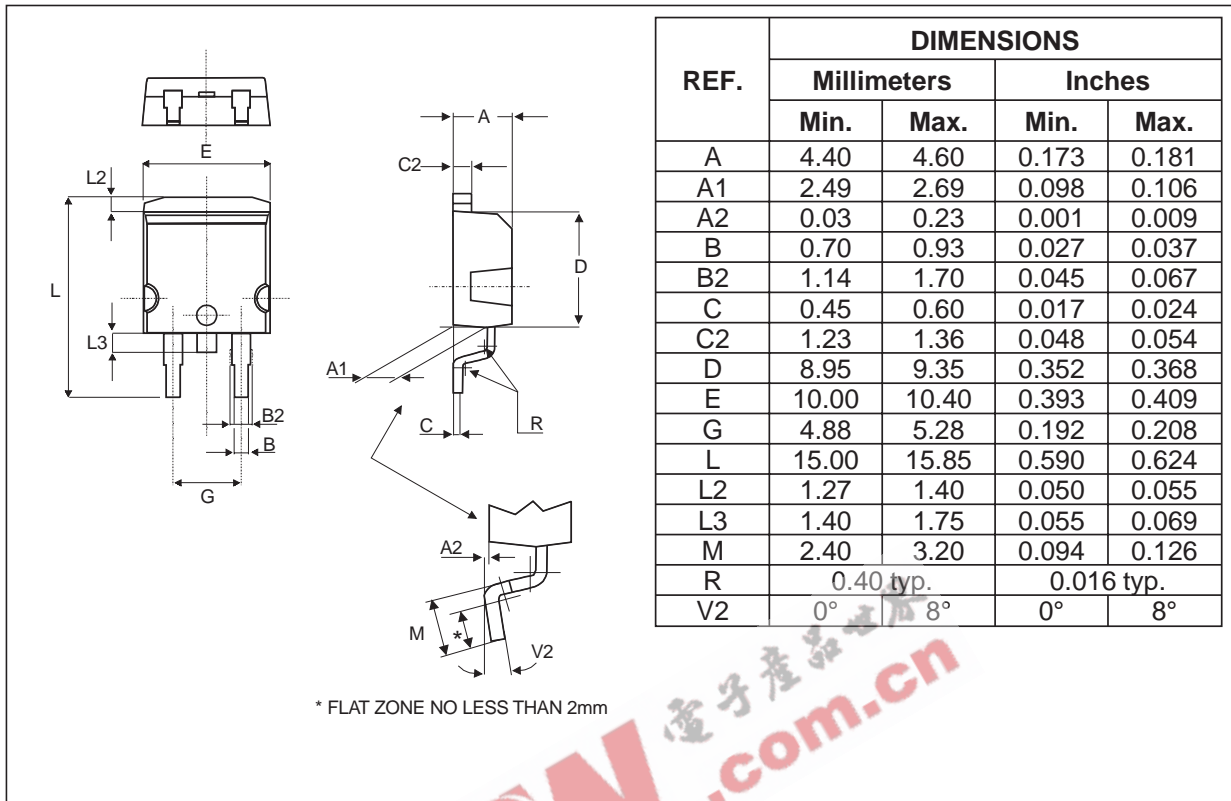


PACKAGE MECHANICAL DATA
TO-220AB



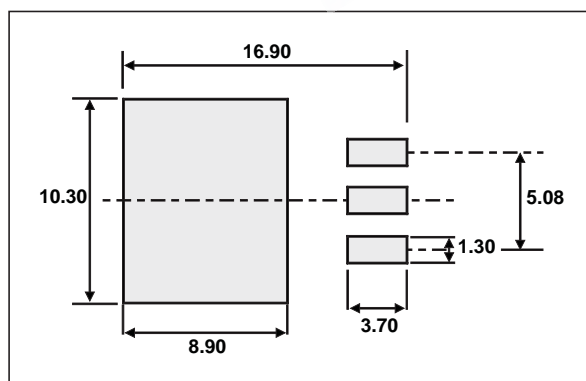
- COOLING METHOD : C
- RECOMMENDED TORQUE VALUE : 0.55 M.N
- MAXIMUM TORQUE VALUE : 0.70 M.N

PACKAGE MECHANICAL DATA
D²PAK



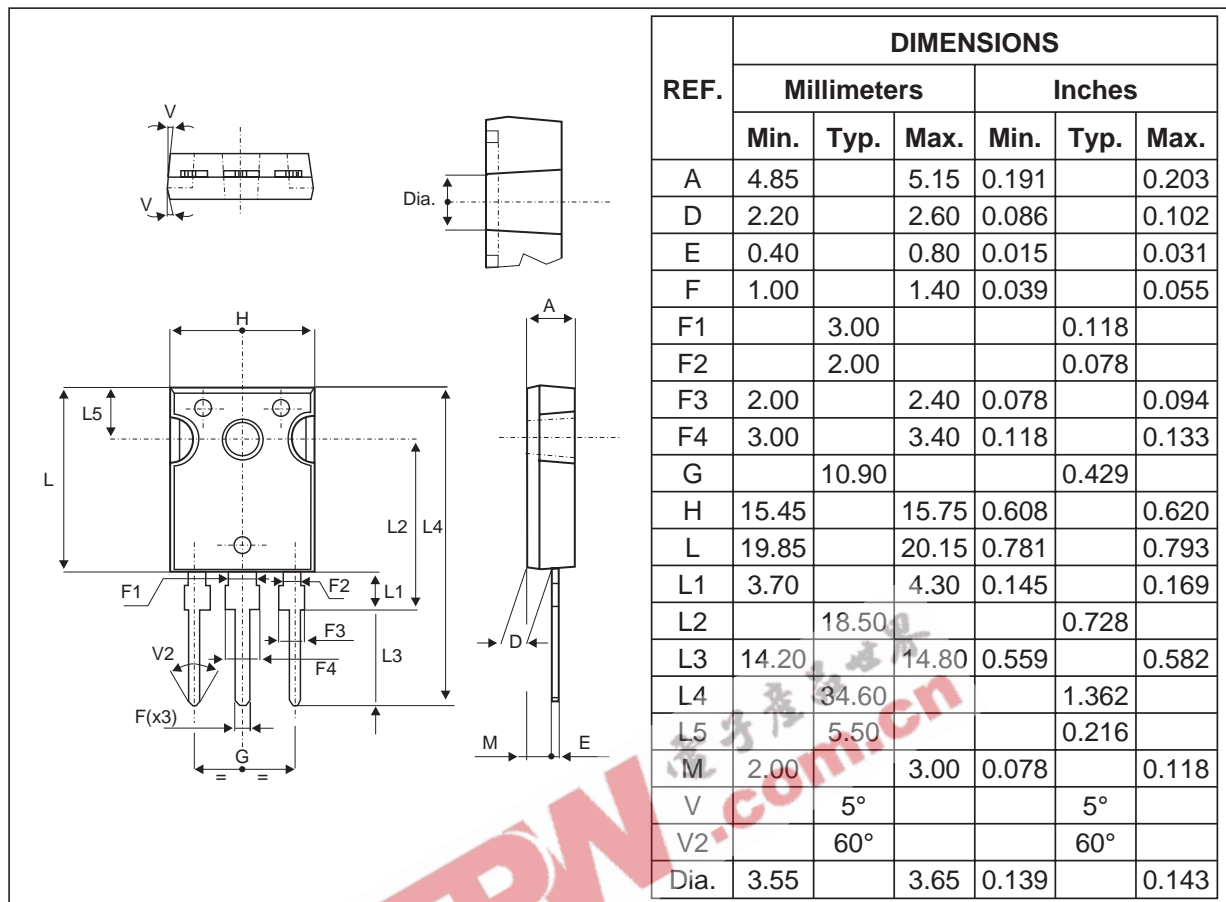
• COOLING METHOD : BY CONDUCTION (METHOD C)

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

Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is a registered trademark of STMicroelectronics
 © 2003 STMicroelectronics - Printed in Italy - All rights reserved.
 STMicroelectronics GROUP OF COMPANIES
 Australia - Brazil - Canada - China - Finland - France - Germany
 Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore
 Spain - Sweden - Switzerland - United Kingdom - United States.

<http://www.st.com>

