



STPS2030CT/CG/CR

LOW DROP POWER SCHOTTKY RECTIFIER

MAJOR PRODUCTS CHARACTERISTICS

| | |
|-------------------|----------|
| $I_{F(AV)}$ | 2 x 10 A |
| V_{RRM} | 30 V |
| $T_j(\text{max})$ | 150°C |
| $V_F(\text{max})$ | 0.40 V |

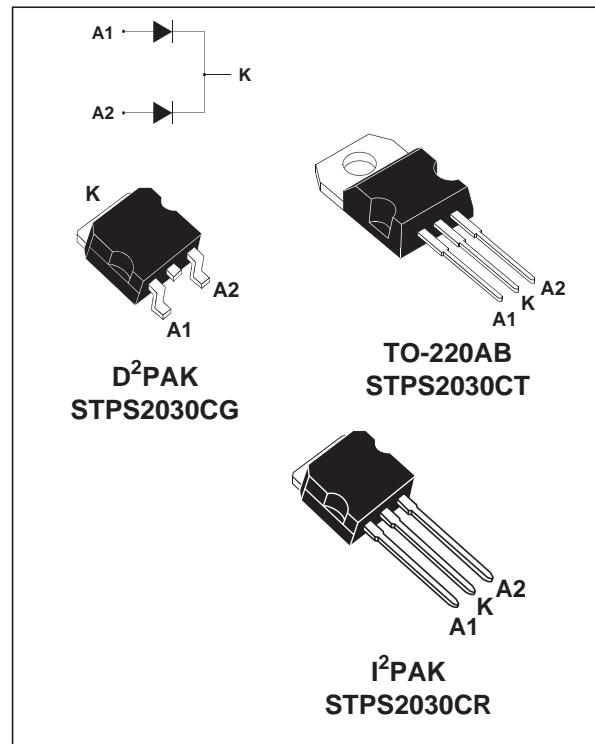
FEATURES AND BENEFITS

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

DESCRIPTION

Dual Schottky rectifier suited for switch Mode Power Supply and high frequency DC to DC converters.

Packaged in TO-220AB, D²PAK and I²PAK, this device is 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 | | 30 | V |
| $I_{F(RMS)}$ | RMS forward current | | 30 | A |
| $I_{F(AV)}$ | Average forward current | $T_c = 140^\circ\text{C}$ $\delta = 0.5$ | Per diode 20 Per device | A |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10 \text{ ms}$ Sinusoidal | 180 | A |
| I_{RRM} | Peak repetitive 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 | 2 | A |
| P_{ARM} | Repetitive peak avalanche power | $t_p = 1 \mu\text{s}$ $T_j = 25^\circ\text{C}$ | 3000 | 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 (rated V_R , $T_j = 25^\circ\text{C}$) | | 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 TO-220AB - D ² PAK - I ² PAK | Per diode | 2.2 |
| | | Total | 1.3 |
| $R_{th(c)}$ | Coupling | 0.3 | °C/W |

STATIC ELECTRICAL CHARACTERISTICS (per diode)

| Symbol | Parameter | Tests Conditions | Min. | Typ. | Max. | Unit | |
|---------|-------------------------|---------------------------|---------------------|---------------------|------|------|------|
| I_R^* | Reverse leakage current | $T_j = 25^\circ\text{C}$ | $V_R = V_{RRM}$ | 0.15 | 1.0 | mA | |
| | | $T_j = 125^\circ\text{C}$ | | 80 | 160 | | |
| V_F^* | Forward voltage drop | $T_j = 25^\circ\text{C}$ | $I_F = 10\text{ A}$ | 0.44 | 0.50 | V | |
| | | $T_j = 125^\circ\text{C}$ | | 0.34 | 0.40 | | |
| | | $T_j = 25^\circ\text{C}$ | | $I_F = 20\text{ A}$ | 0.50 | | 0.58 |
| | | $T_j = 125^\circ\text{C}$ | | | 0.44 | | 0.52 |

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

To evaluate the conduction losses use the following equation :

$$P = 0.28 \times I_{F(AV)} + 0.012 I_{F(RMS)}^2$$

Fig. 1: Conduction losses versus average current.

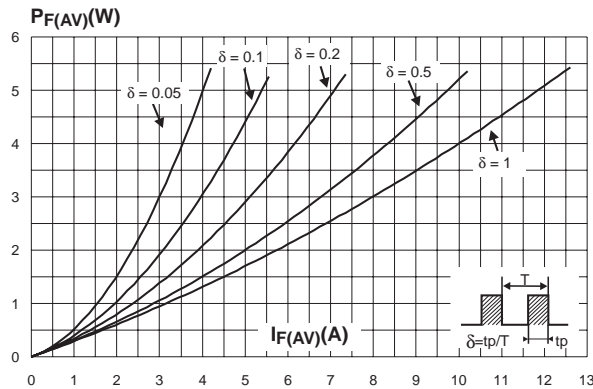


Fig. 3: Normalized avalanche power derating versus pulse duration.

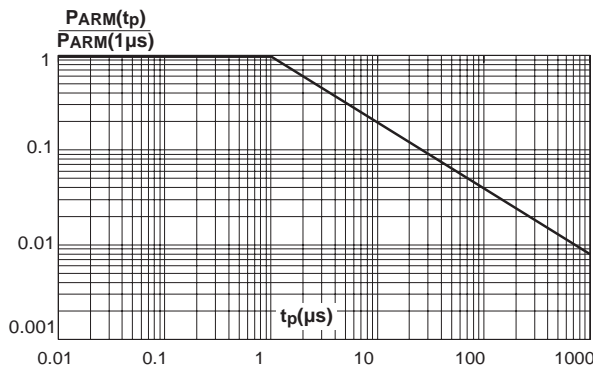


Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$).

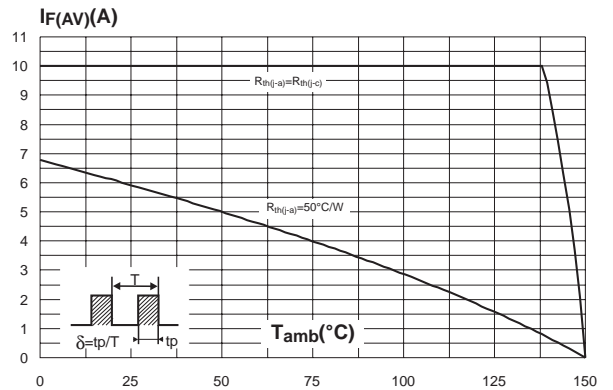


Fig. 4: Normalized avalanche power derating versus junction temperature.

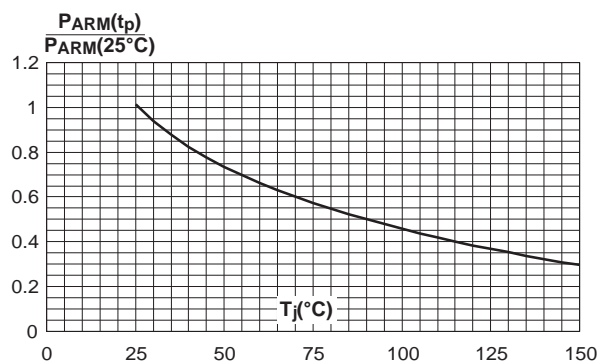


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values).

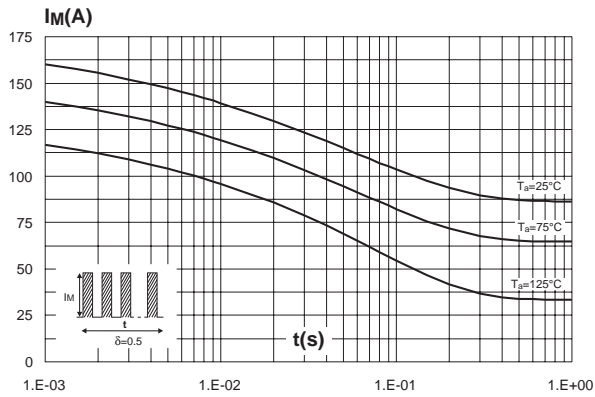


Fig. 6: Relative variation of thermal impedance junction to case versus pulse duration.

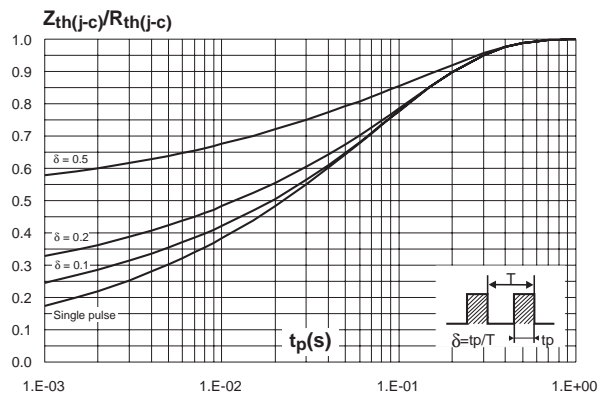


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

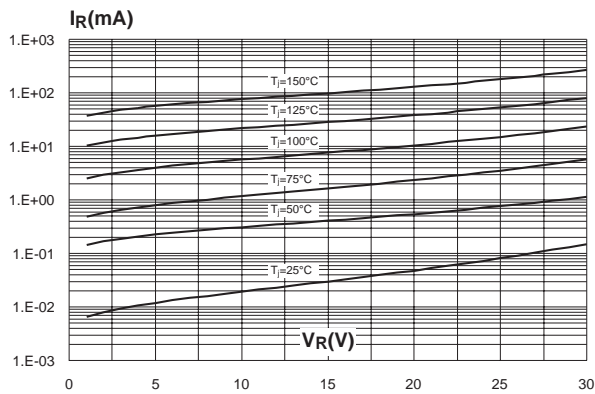


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

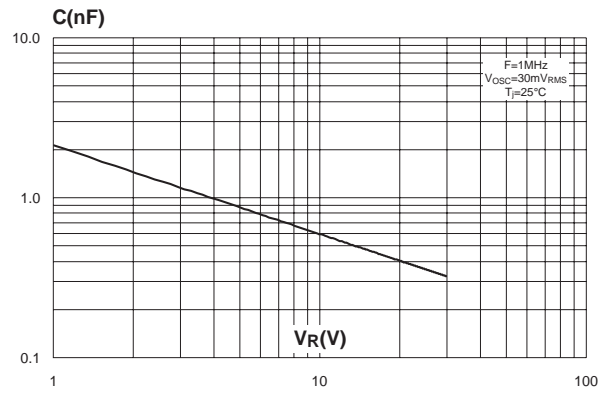


Fig. 9: Forward voltage drop versus forward current.

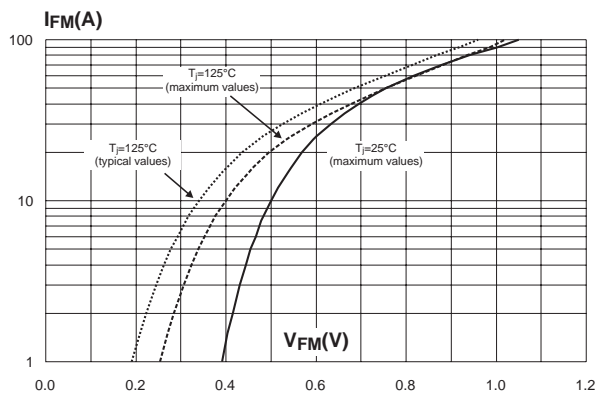
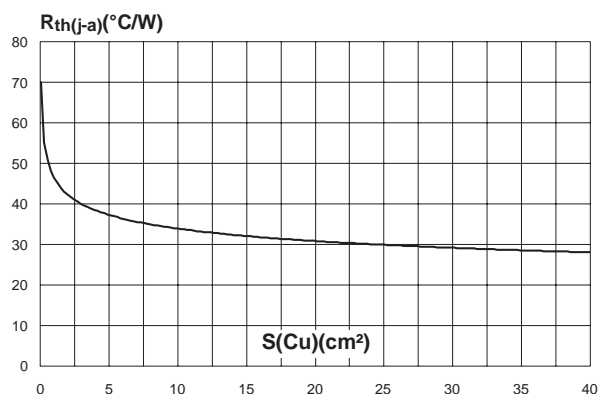
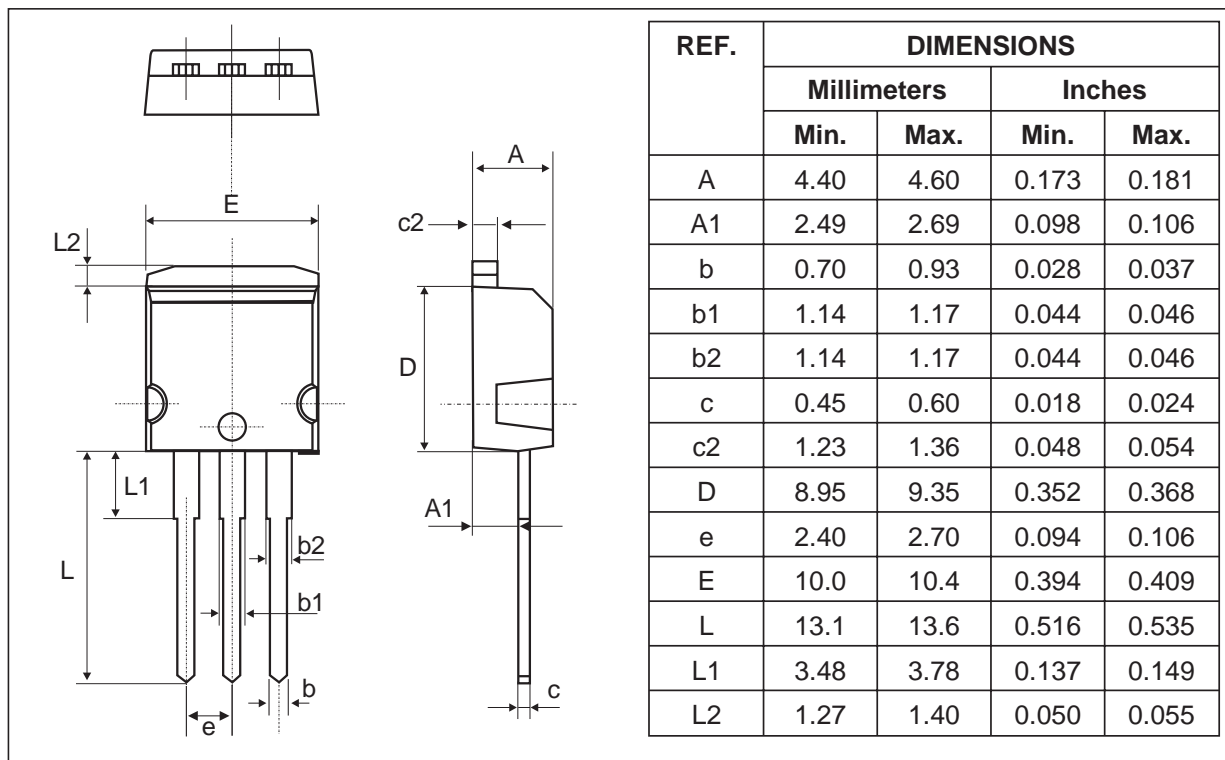


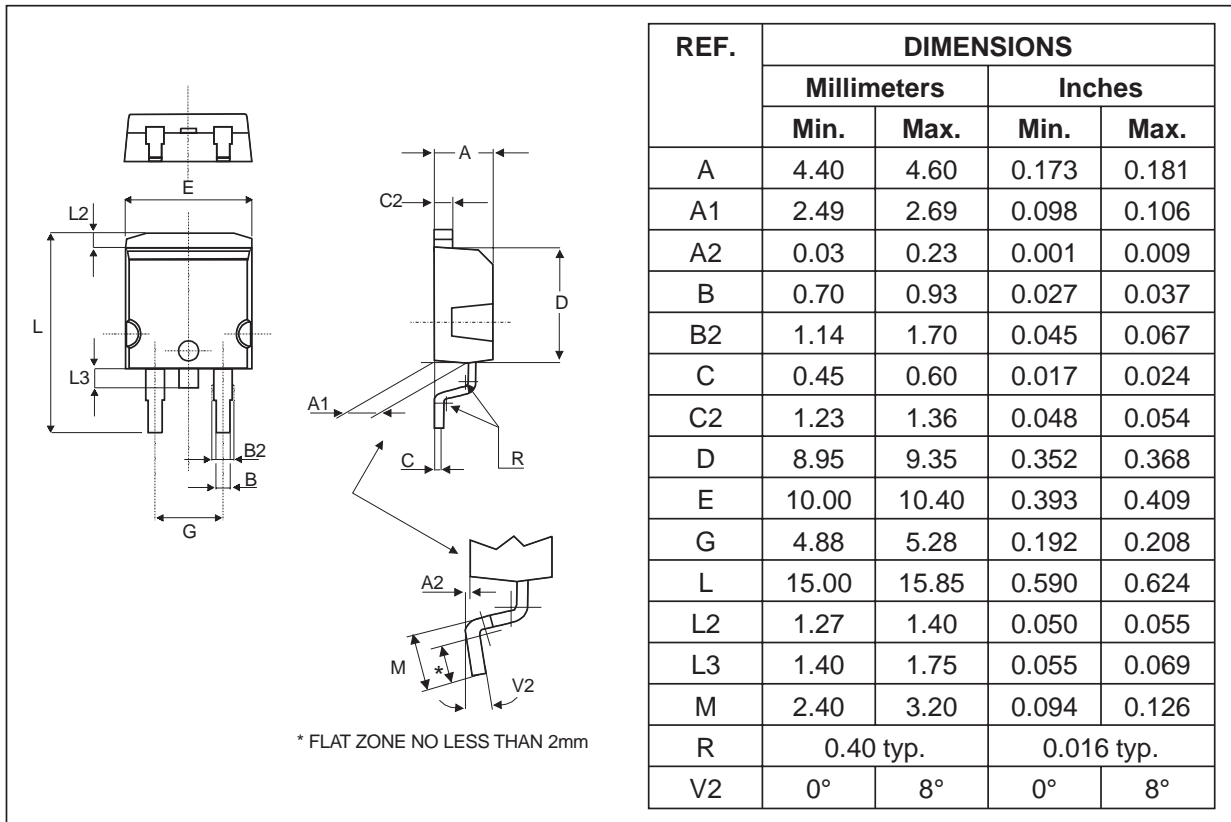
Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35µm).



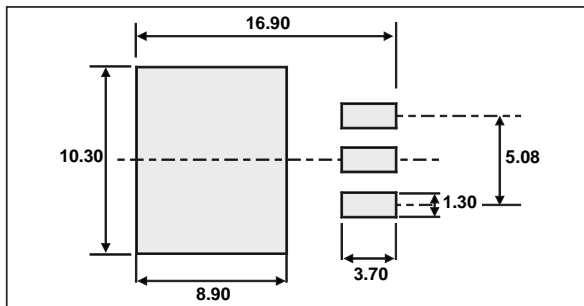
PACKAGE MECHANICAL DATA
I²PAK



PACKAGE MECHANICAL DATA
D²PAK

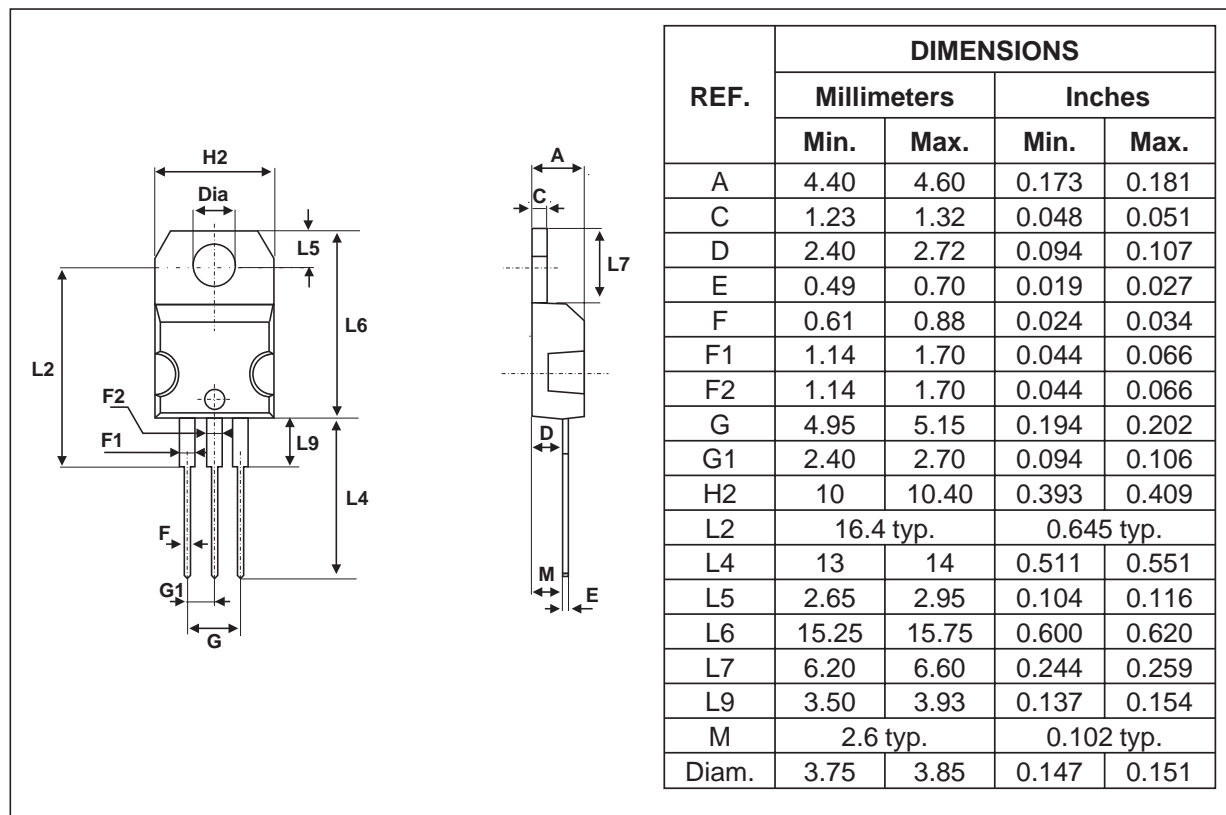


FOOTPRINT



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PACKAGE MECHANICAL DATA TO-220AB



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

| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|------------|--------------------|--------|----------|---------------|
| STPS2030CT | STPS2030CT | TO-220AB | 2.2 g | 50 | Tube |
| STPS2030CG | STPS2030CG | D ² PAK | 1.48 g | 50 | Tube |
| STPS2030CG-TR | STPS2030CG | D ² PAK | 1.48 g | 1000 | Tape & reel |
| STPS2030CR | STPS2030CR | I ² PAK | 1.49 g | 50 | Tube |

- EPOXY MEETS UL94,V0

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