

## 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   |

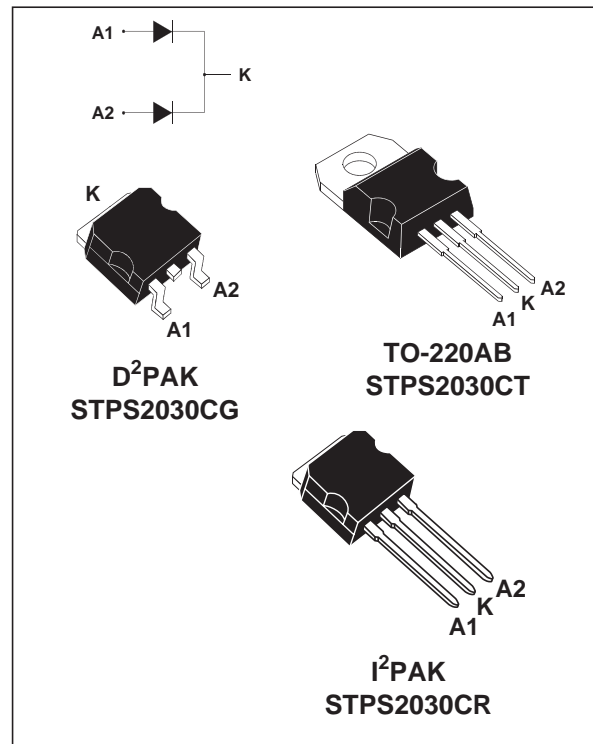
### FEATURES AND BENEFITS

- 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, D<sup>2</sup>PAK and I<sup>2</sup>PAK, 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  | $T_c = 140^\circ\text{C}$<br>$\delta = 0.5$    | Per diode<br>20<br>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/ $\mu\text{s}$ |

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

**THERMAL RESISTANCES**

| Symbol        | Parameter   |           | Value | Unit |
|---------------|---|-----------|-------|------|
| $R_{th(j-c)}$ | Junction to case TO-220AB - D <sup>2</sup> PAK - I <sup>2</sup> PAK | Per diode | 2.2   | °C/W |
|               |   | Total     | 1.3   |      |
| $R_{th(c)}$   |   | Coupling  | 0.3   | °C/W |

**STATIC ELECTRICAL CHARACTERISTICS (per diode)**

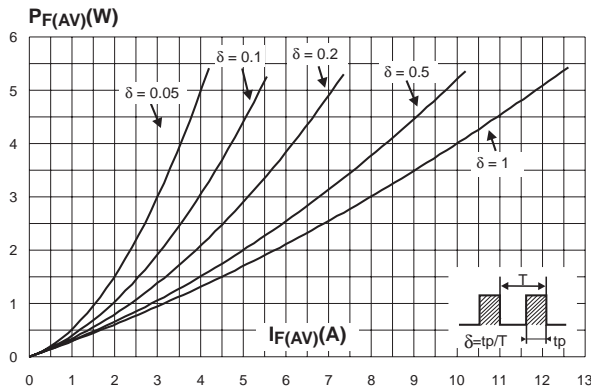
| Symbol  | Parameter               | Tests Conditions          |                     | Min. | Typ. | Max. | Unit |
|---------|-------------------------|---------------------------|---------------------|------|------|------|------|
| $I_R^*$ | Reverse leakage current | $T_j = 25^\circ\text{C}$  | $V_R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

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

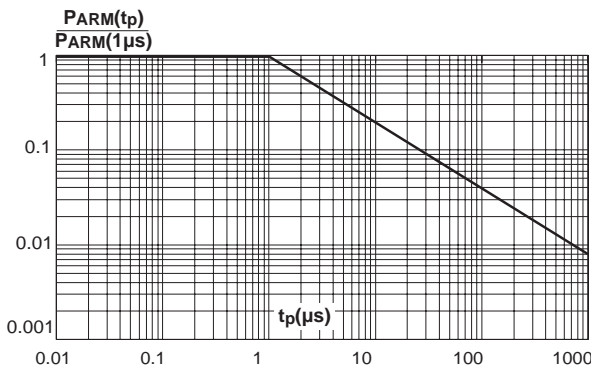
To evaluate the conduction losses use the following equation :

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

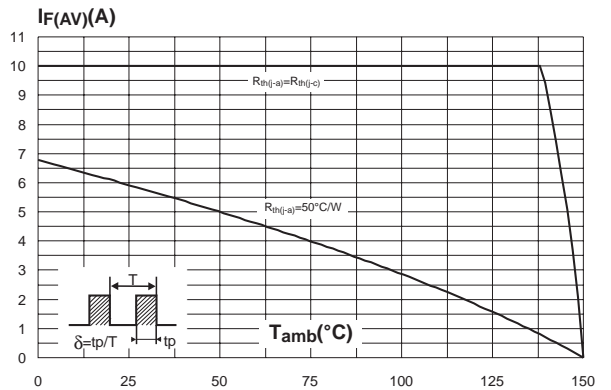
**Fig. 1:** Conduction losses versus average current.



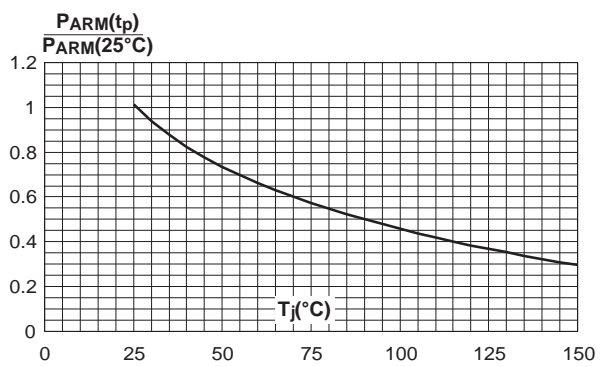
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



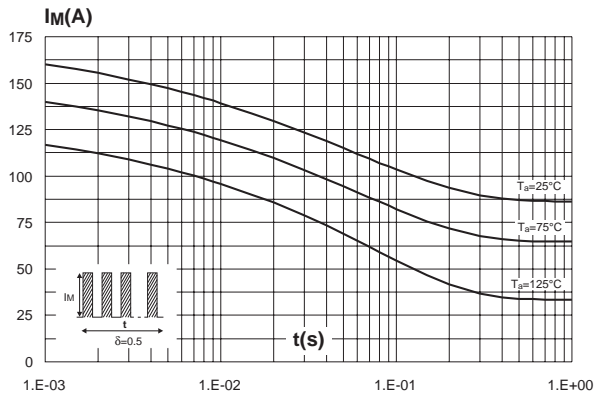
**Fig. 2:** Average forward current versus ambient temperature ( $\delta = 0.5$ ).



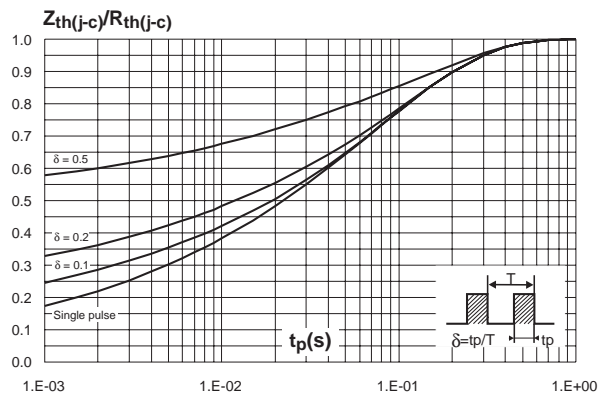
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



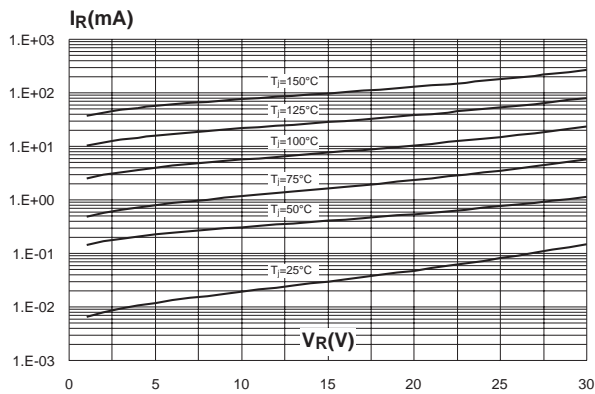
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values).



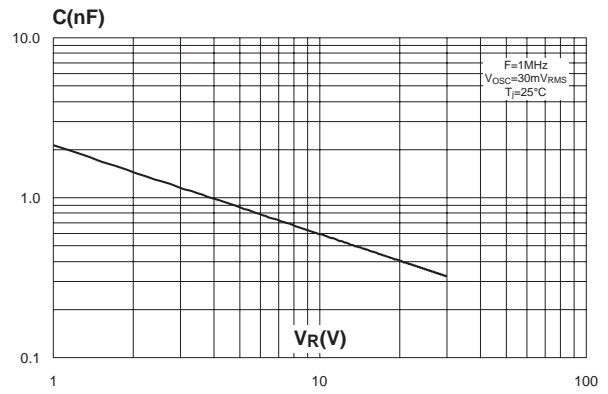
**Fig. 6:** Relative variation of thermal impedance junction to case versus pulse duration.



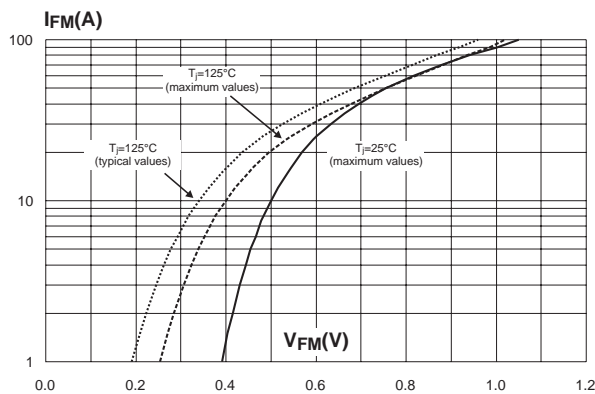
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values).



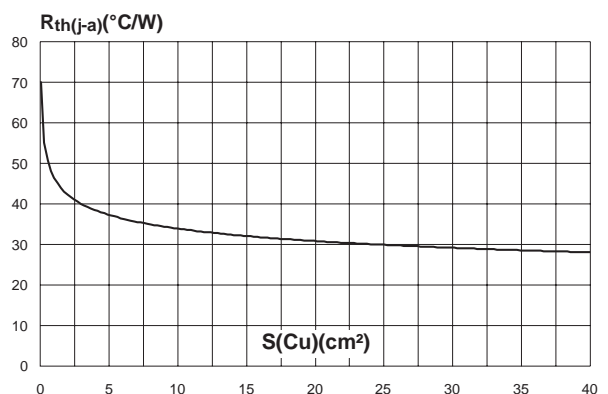
**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values).



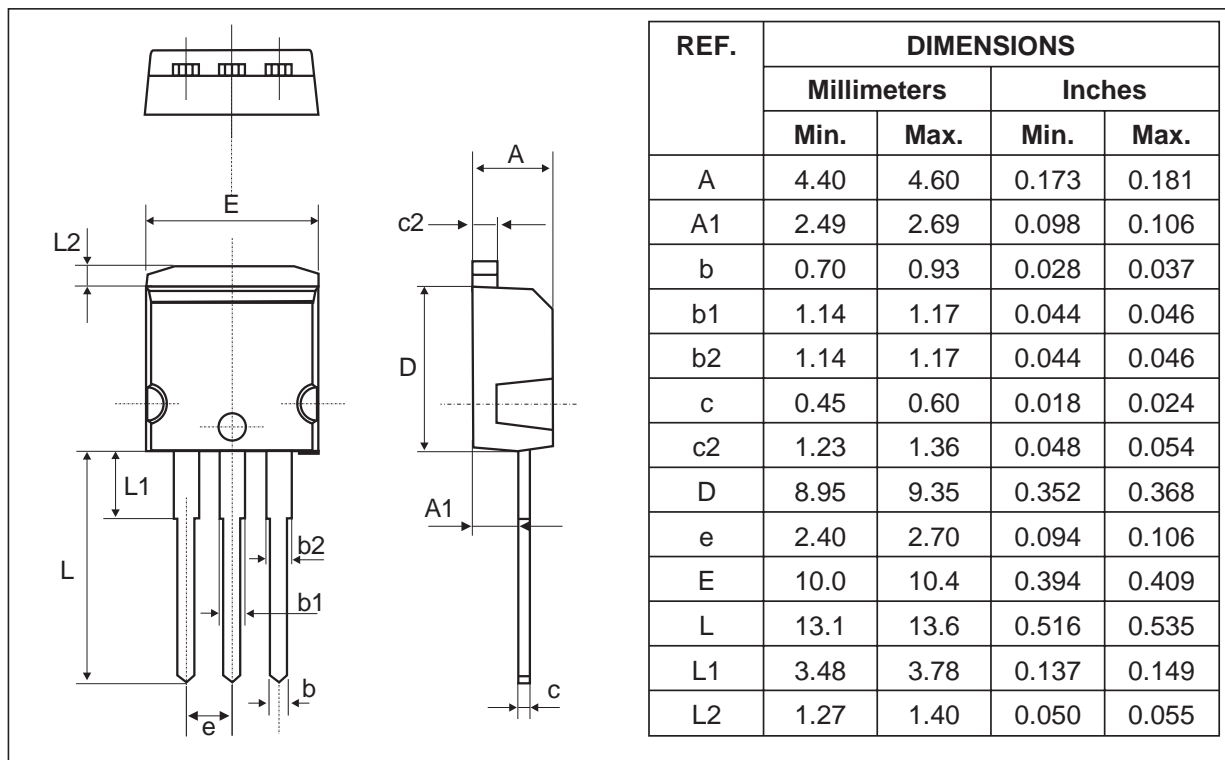
**Fig. 9:** Forward voltage drop versus forward current.



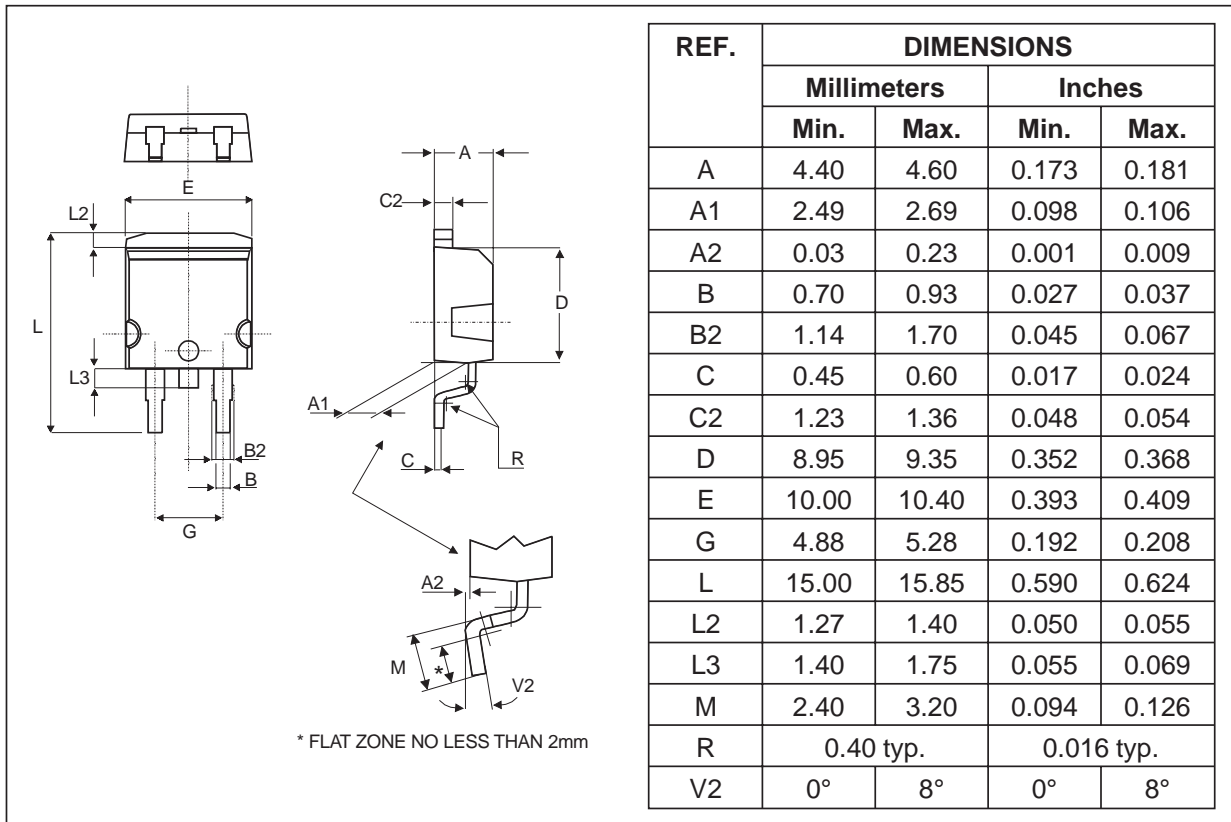
**Fig. 10:** Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35μm).



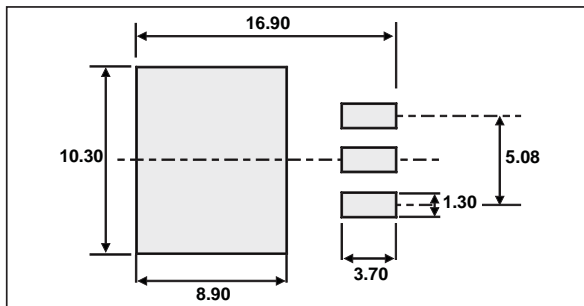
PACKAGE MECHANICAL DATA  
I<sup>2</sup>PAK



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

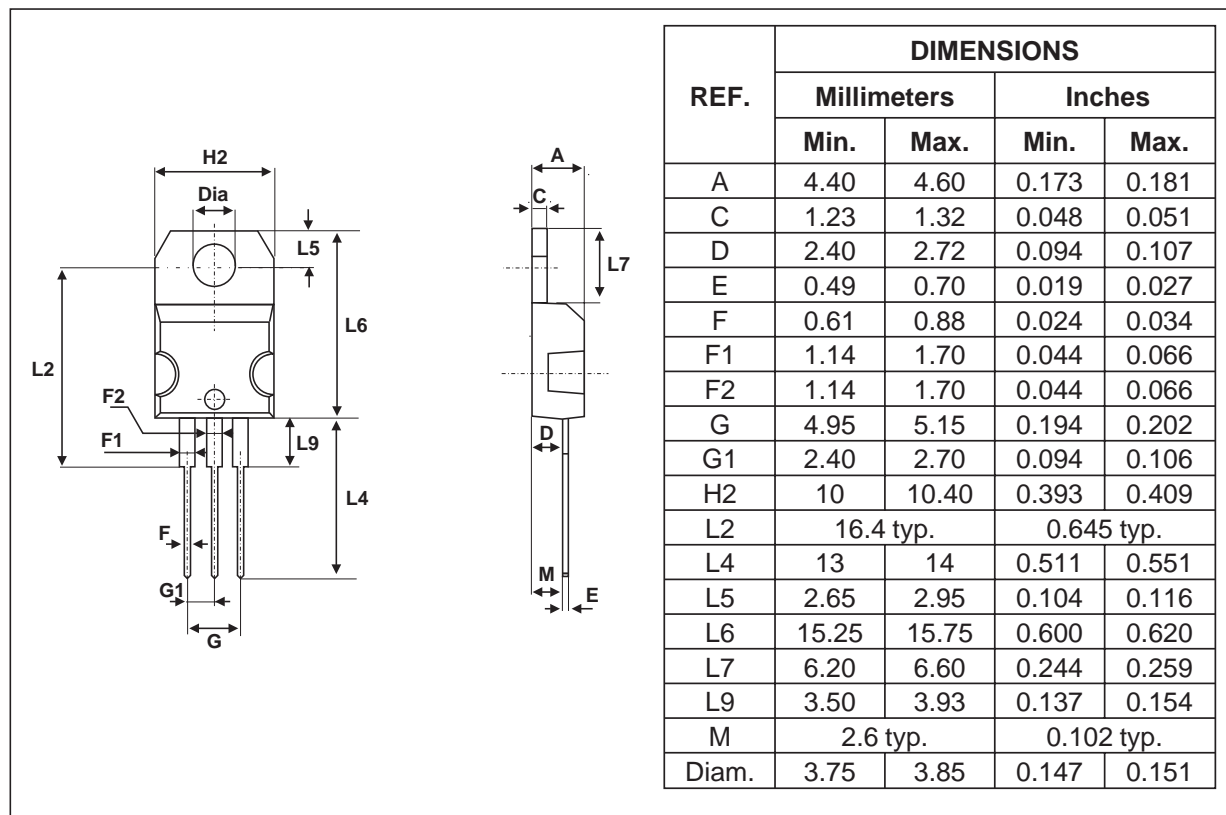


**FOOTPRINT**



# STPS2030CT/CG/CR

## 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 <sup>2</sup> PAK | 1.48 g | 50       | Tube          |
| STPS2030CG-TR | STPS2030CG | D <sup>2</sup> PAK | 1.48 g | 1000     | Tape & reel   |
| STPS2030CR    | STPS2030CR | I <sup>2</sup> PAK | 1.49 g | 50       | Tube          |

- EPOXY MEETS UL94,V0

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