# STPS2030CT/CG/CR

## LOW DROP POWER SCHOTTKY RECTIFIER

### MAJOR PRODUCTS CHARACTERISTICS

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

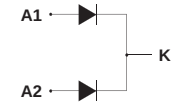
### FEATURES AND BENEFITS

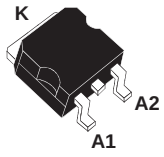
- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- LOW FORWARD VOLTAGE DROP FOR HIGHER EFFICIENCY
- LOW THERMAL RESISTANCE
- AVALANCHE CAPABILITY SPECIFIED

### DESCRIPTION

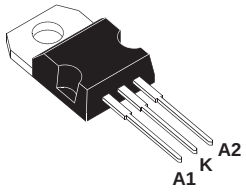
Dual Schottky rectifier suited for switch Mode Power Supply and high frequency DC to DC converters.

Packaged in TO-220AB, $D^2PAK$ and $I^2PAK$, this device is intended for use in low voltage high frequency inverters, free wheeling and polarity protection applications.

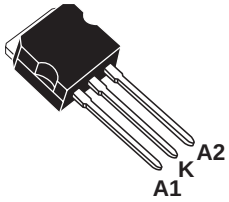



$D^2PAK$
**STPS2030CG**




TO-220AB
**STPS2030CT**




$I^2PAK$
**STPS2030CR**

### 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 | Tc = 140°C<br>δ = 0.5 | Per diode<br>Per device | 10<br>20 | A |
| $I_{FSM}$ | Surge non repetitive forward current | tp = 10 ms Sinusoidal | | 180 | A |
| $I_{RRM}$ | Peak repetitive reverse current | tp=2 µs square F=1kHz | | 1 | A |
| $I_{RSM}$ | Non repetitive peak reverse current | tp = 100 µs square | | 2 | A |
| $P_{ARM}$ | Repetitive peak avalanche power | tp = 1µs Tj = 25°C | | 3000 | W |
| $T_{stg}$ | Storage temperature range | | | - 65 to + 150 | °C |
| Tj | Maximum operating junction temperature * | | | 150 | °C |
| dV/dt | Critical rate of rise of reverse voltage (rated $V_R$, Tj = 25°C) | | | 10000 | V/µs |

* : $\frac{dPtot}{dTj} < \frac{1}{Rth(j-a)}$ 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 - $D^2PAK$ - $I^2PAK$ | Per diode<br>Total | 2.2<br>1.3 | °C/W |
| $R_{th(c)}$ | | Coupling | 0.3 | °C/W |

## STATIC ELECTRICAL CHARACTERISTICS (per diode)

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

Pulse test : * tp = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation :
$P = 0.28 \times I_{F(AV)} + 0.012\ I_F^2{}_{(RMS)}$

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

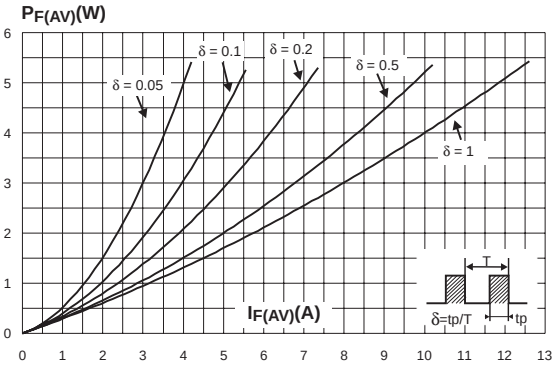



**Fig. 2:** Average forward current versus ambient temperature(δ = 0.5).

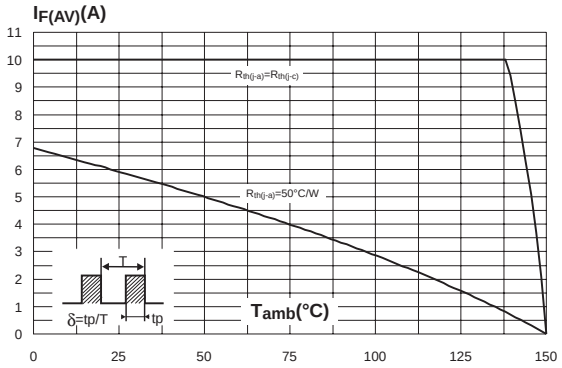



**Fig. 3:** Normalized avalanche power derating versus pulse duration.

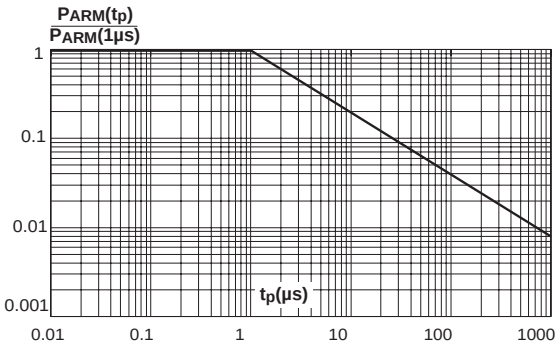



**Fig. 4:** Normalized avalanche power derating versus junction temperature.

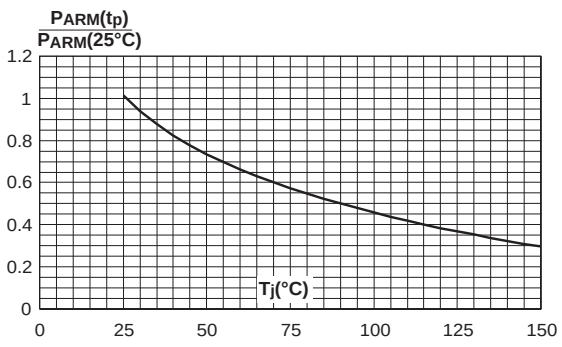


**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values).

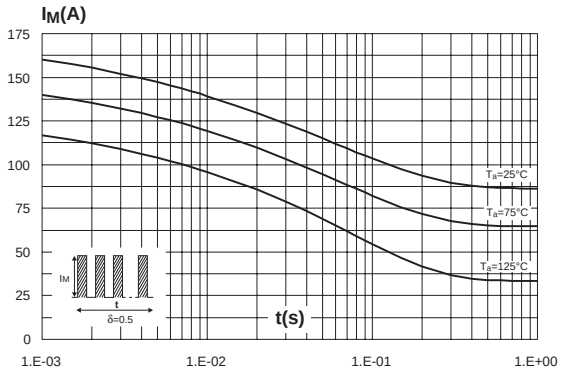



**Fig. 6:** Relative variation of thermal impedance junction to case versus pulse duration.

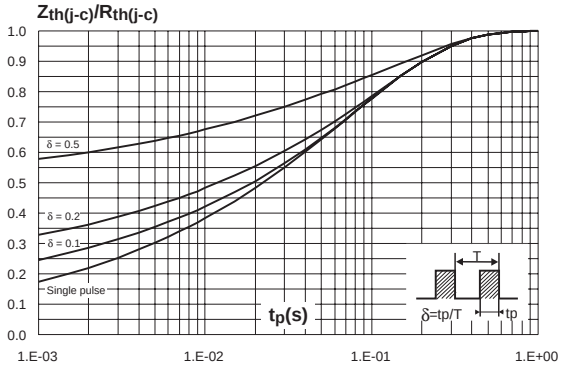



**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values).

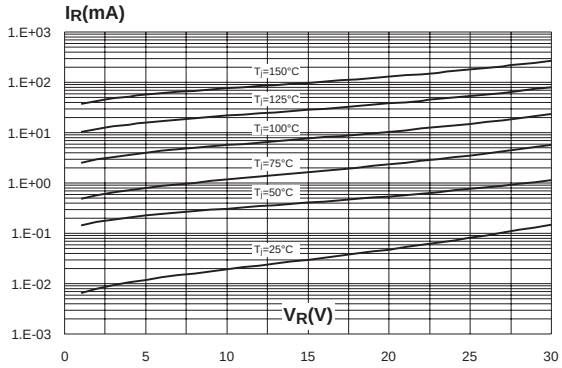



**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values).

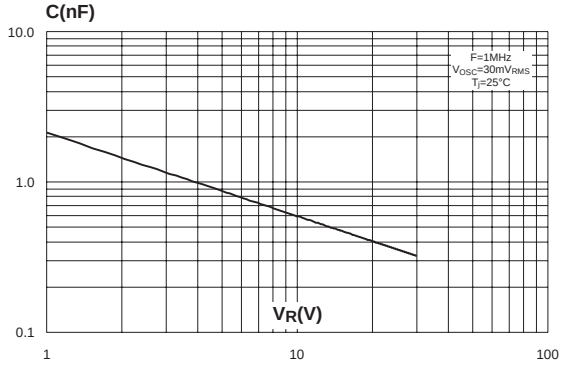



**Fig. 9:** Forward voltage drop versus forward current.

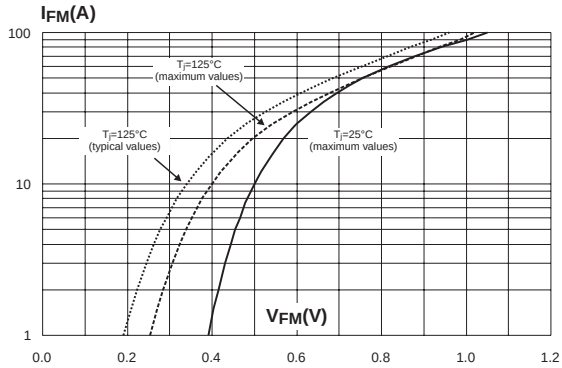
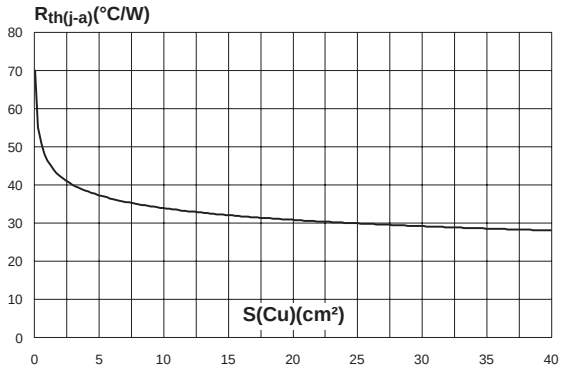
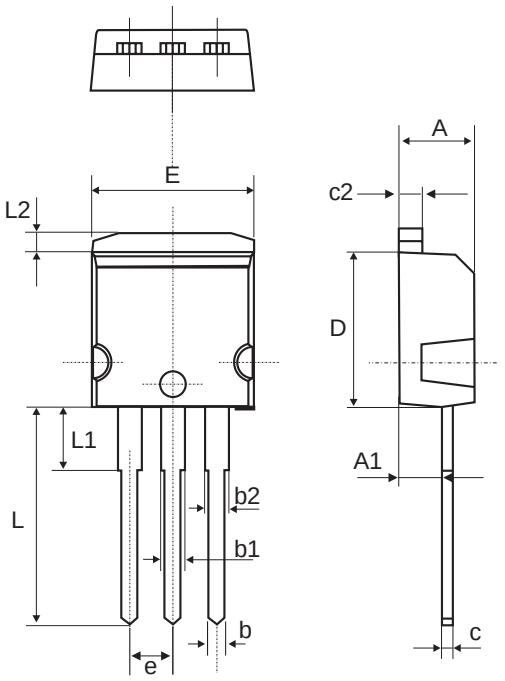



**Fig. 10:** Thermal resistance junction to ambient versus copper surface under tab (epoxy printed board FR4, Cu = 35µm).



## PACKAGE MECHANICAL DATA

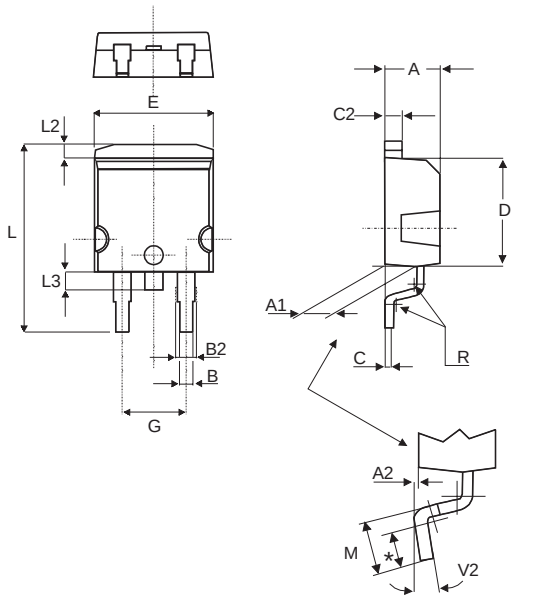
I²PAK




| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.40 | 4.60 | 0.173 | 0.181 |
| A1 | 2.49 | 2.69 | 0.098 | 0.106 |
| b | 0.70 | 0.93 | 0.028 | 0.037 |
| b1 | 1.14 | 1.17 | 0.044 | 0.046 |
| b2 | 1.14 | 1.17 | 0.044 | 0.046 |
| c | 0.45 | 0.60 | 0.018 | 0.024 |
| c2 | 1.23 | 1.36 | 0.048 | 0.054 |
| D | 8.95 | 9.35 | 0.352 | 0.368 |
| e | 2.40 | 2.70 | 0.094 | 0.106 |
| E | 10.0 | 10.4 | 0.394 | 0.409 |
| L | 13.1 | 13.6 | 0.516 | 0.535 |
| L1 | 3.48 | 3.78 | 0.137 | 0.149 |
| L2 | 1.27 | 1.40 | 0.050 | 0.055 |

## PACKAGE MECHANICAL DATA

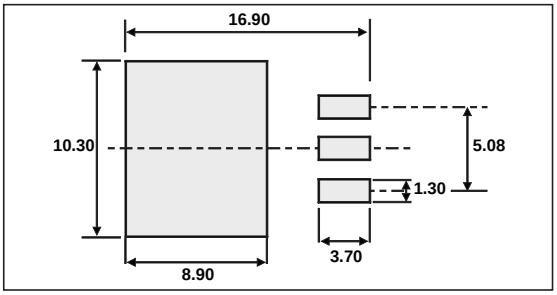
D²PAK




* FLAT ZONE NO LESS THAN 2mm

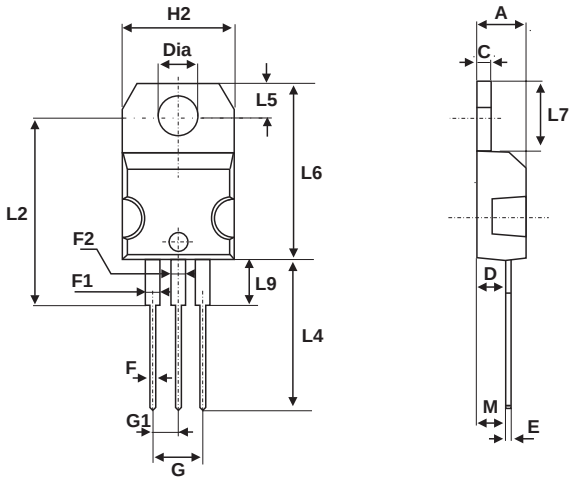
| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.40 | 4.60 | 0.173 | 0.181 |
| A1 | 2.49 | 2.69 | 0.098 | 0.106 |
| A2 | 0.03 | 0.23 | 0.001 | 0.009 |
| B | 0.70 | 0.93 | 0.027 | 0.037 |
| B2 | 1.14 | 1.70 | 0.045 | 0.067 |
| C | 0.45 | 0.60 | 0.017 | 0.024 |
| C2 | 1.23 | 1.36 | 0.048 | 0.054 |
| D | 8.95 | 9.35 | 0.352 | 0.368 |
| E | 10.00 | 10.40 | 0.393 | 0.409 |
| G | 4.88 | 5.28 | 0.192 | 0.208 |
| L | 15.00 | 15.85 | 0.590 | 0.624 |
| L2 | 1.27 | 1.40 | 0.050 | 0.055 |
| L3 | 1.40 | 1.75 | 0.055 | 0.069 |
| M | 2.40 | 3.20 | 0.094 | 0.126 |
| R | 0.40 typ. | | 0.016 typ. | |
| V2 | 0° | 8° | 0° | 8° |

## FOOTPRINT



## 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

| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| STPS2030CT | STPS2030CT | TO-220AB | 2.2 g | 50 | Tube |
| STPS2030CG | STPS2030CG | D²PAK | 1.48 g | 50 | Tube |
| STPS2030CG-TR | STPS2030CG | D²PAK | 1.48 g | 1000 | Tape & reel |
| STPS2030CR | STPS2030CR | I²PAK | 1.49 g | 50 | Tube |

- EPOXY MEETS UL94,V0