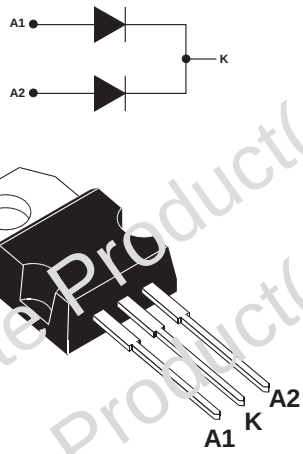
# STPR2420CT

## ULTRA-FAST RECOVERY RECTIFIER DIODES

### MAIN PRODUCTS CHARACTERISTICS

| | |
|---|---|
| $I_{F(AV)}$ | 2 x 12 A |
| $V_{RRM}$ | 200 V |
| Tj (max) | 150°C |
| $V_F$ (max) | 0.99 V |
| trr (max) | 30 ns |




**TO-220AB**

### FEATURES

- SUITED FOR SMPS
- LOW LOSSES
- LOW FORWARD AND REVERSE RECOVERY TIME
- HIGH SURGE CURRENT CAPABILITY
- HIGH AVALANCHE ENERGY CAPABILITY

Low cost dual center tap rectifier suited for Switch Mode Power Supply and high frequency DC to DC converters.

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



| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $V_{RRM}$ | Repetitive peak reverse voltage | | | 200 | V |
| $I_{F(RMS)}$ | RMS forward current | | | 30 | A |
| $I_{F(AV)}$ | Average forward current $\delta = 0.5$ | Tc = 115°C | Per diode | 12 | A |
| | | | Per device | 24 | |
| $I_{FSM}$ | Surge non repetitive forward current | | Tp = 10 ms Sinusoidal | 120 | A |
| $T_{stg}$ | Storage temperature range | | | - 65 to + 150 | °C |
| Tj | Maximum operating junction temperature | | | + 150 | |

## THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|---|---|---|---|---|
| $R_{th(j-c)}$ | Junction to case | Per diode<br>Total | 2.5<br>1.4 | °C/W |
| $R_{th(c)}$ | | Coupling | 0.23 | |

When the diodes 1 and 2 are used simultaneously :
$\Delta$ Tj(diode 1) = P(diode 1) x Rth(j-c) (Per diode) + P(diode 2) x Rth(c)

## STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameters | Test conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$ * | Reverse leakage current | Tj = 25°C | $V_R = V_{RRM}$ | | | 50 | µA |
| | | Tj = 100°C | | | | 0.8 | mA |
| $V_F$ ** | Forward voltage drop | Tj = 125°C | $I_F$ = 12 A | | | 0.99 | V |
| | | Tj = 125°C | $I_F$ = 24 A | | | 1.20 | |
| | | Tj = 25°C | $I_F$ = 24 A | | | 1.25 | |

Pulse test : * tp = 5 ms, $\delta$ < 2 %
** tp = 380 µs, $\delta$ < 2 %

To evaluate the conduction losses use the following equation :
$P = 0.78 \times I_{F(AV)} + 0.0175 \times I_{F^2(RMS)}$

## RECOVERY CHARACTERISTICS

| Symbol | Test conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| trr | $T_j$ = 25°C | $I_F$ = 0.5A Irr = 0.25A $I_R$ = 1A | | | 30 | ns |
| tfr | $T_j$ = 25°C | $I_F$ = 1A tr = 10 ns $V_{FR} = 1.1 \times V_F$ | | 20 | | |
| $V_{FP}$ | $T_j$ = 25°C | $I_F$ = 1A tr = 10 ns | | 3 | | V |

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

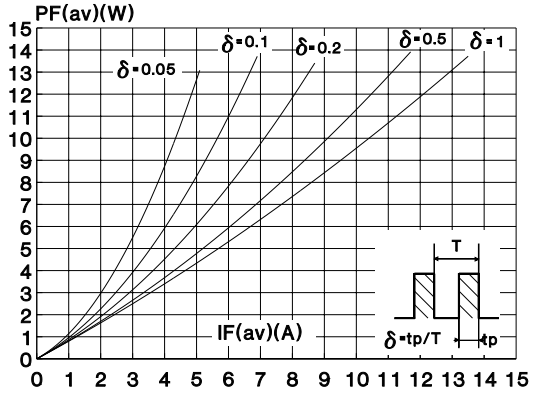



**Fig. 2:** Peak current versus form factor (per diode).

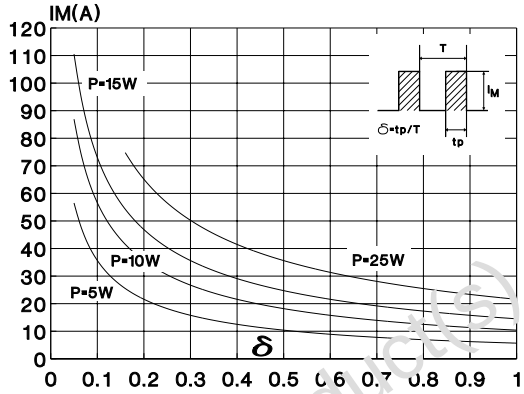



**Fig. 3:** Average current versus ambient temperature.

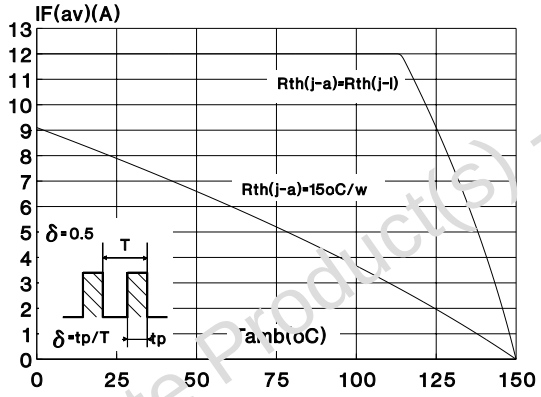



**Fig. 4:** Non repetitive surge peak forward current versus overload duration (maximum values).

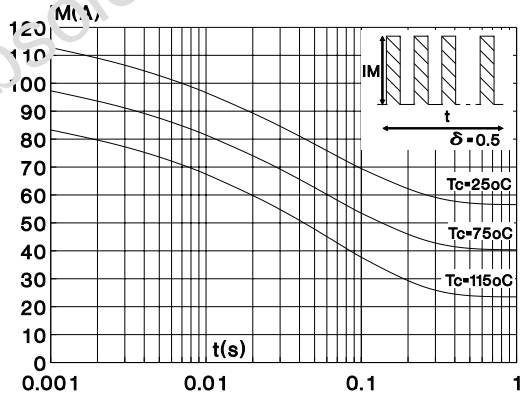



**Fig. 5:** Relative variation of thermal transient impedance junction to case versus pulse duration.

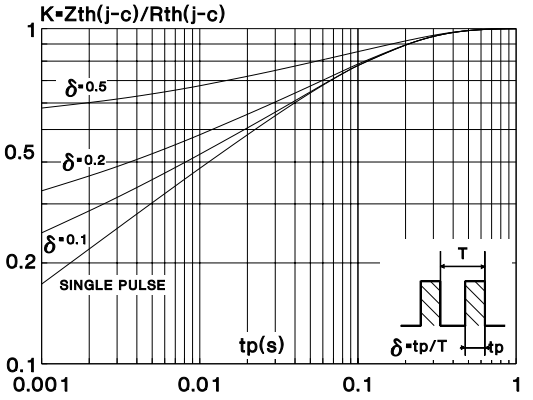



**Fig. 6:** Forward voltage drop versus forward current.

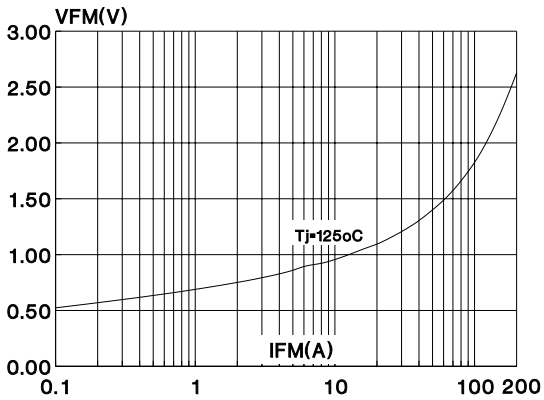


**Fig. 7:** Junction capacitance versus reverse voltage applied (typical values, per diode).

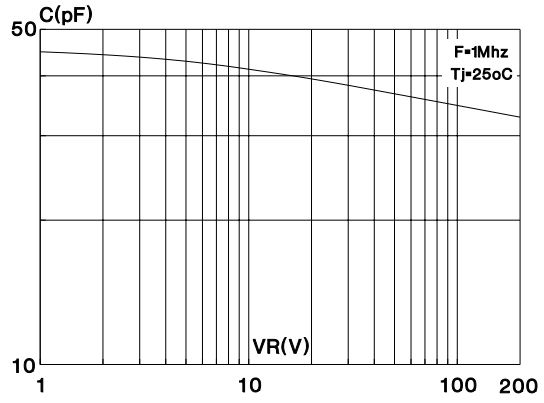



**Fig. 8:** Recovery charge versus $dI_F/dt$ (per diode).

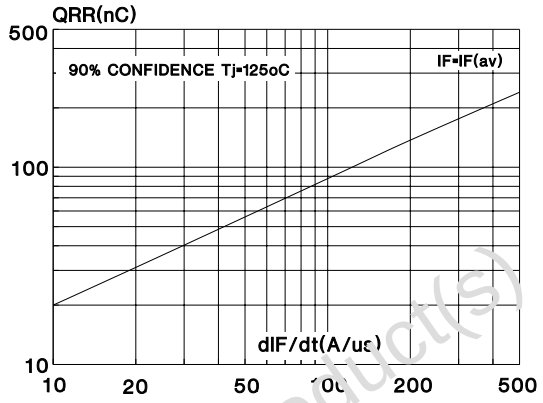



**Fig. 9:** Peak reverse current versus $dI_F/dt$ (per diode).

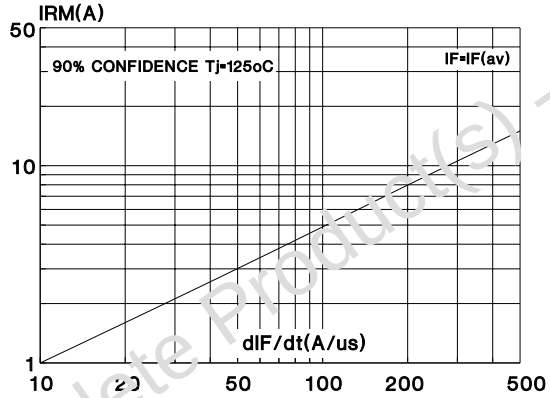
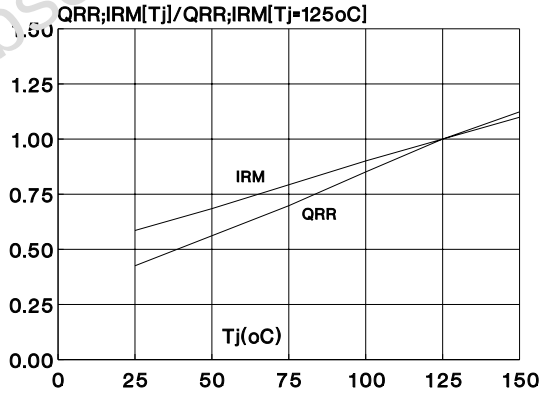
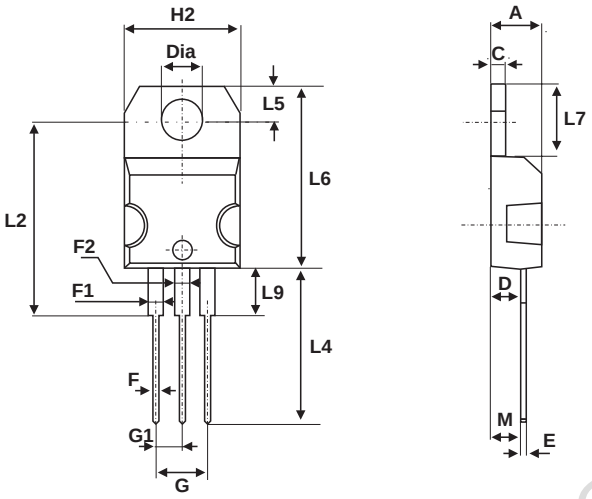



**Fig. 10:** Dynamic parameters versus junction temperature (per diode).



## 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 |