



# STPS20170CT

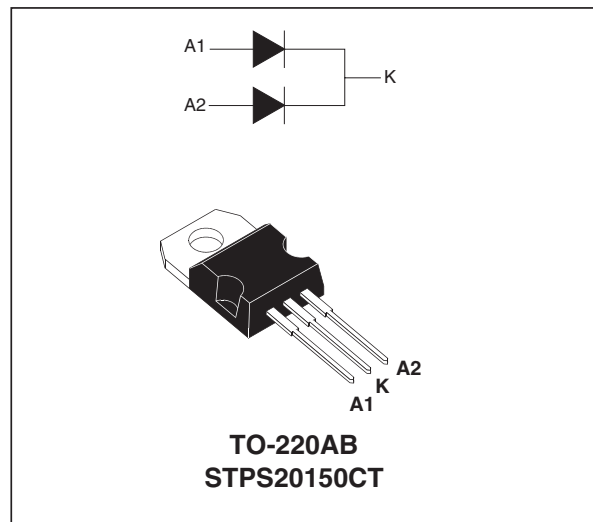
## HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

|             |          |
|-------------|----------|
| $I_{F(AV)}$ | 2 x 10 A |
| $V_{RRM}$   | 170 V    |
| $T_j$       | 175°C    |
| $V_F(max)$  | 0.75 V   |

### FEATURES AND BENEFITS

- HIGH JUNCTION TEMPERATURE CAPABILITY
- GOOD TRADE OFF BETWEEN LEAKAGE CURRENT AND FORWARD VOLTAGE DROP
- LOW LEAKAGE CURRENT
- AVALANCHE CAPABILITY SPECIFIED



### DESCRIPTION

Dual center tap schottky rectifier designed for high frequency Switched Mode Power Supplies.

### ABSOLUTE RATINGS (limiting values, per diode)

| Symbol       | Parameter                                | Value  | Unit             |
|--------------|--|--|------------------|
| $V_{RRM}$    | Repetitive peak reverse voltage          | 170  | V                |
| $I_{F(RMS)}$ | RMS forward current                      | 30   | A                |
| $I_{F(AV)}$  | Average forward current $\delta = 0.5$   | $T_c = 155^\circ\text{C}$<br>Per diode: 10<br>Per device: 20 | A                |
| $I_{FSM}$    | Surge non repetitive forward current     | $t_p = 10\text{ ms}$ sinusoidal                              | A                |
| $P_{ARM}$    | Repetitive peak avalanche power          | $t_p = 1\mu\text{s}$ $T_j = 25^\circ\text{C}$                | W                |
| $T_{stg}$    | Storage temperature range                | - 65 to + 175  | °C               |
| $T_j$        | Maximum operating junction temperature*  | 175  | °C               |
| dV/dt        | Critical rate of rise of reverse voltage | 10000  | V/ $\mu\text{s}$ |

\* Thermal runaway condition for a diode on its own heatsink  $\delta P_{tot}/\delta T_j < 1/(R_{th(j-a)})$

## THERMAL RESISTANCES

| Symbol        | Parameter        |           | Value | Unit |
|---------------|------------------|-----------|-------|------|
| $R_{th(j-c)}$ | Junction to case | Per diode | 2.2   | °C/W |
|               |                  | Total     | 1.3   |      |
| $R_{th(c)}$   |                  | Coupling  | 0.3   |      |

When the diodes 1 and 2 are used simultaneously :  
 $\Delta T_j(\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode 2}) \times R_{th(c)}$

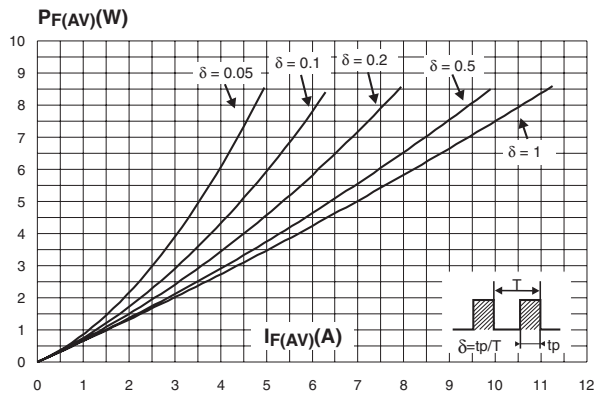
## STATIC ELECTRICAL CHARACTERISTICS (per diode)

| Symbol     | Parameter               | Tests conditions          |                     | Min. | Typ. | Max. | Unit          |
|------------|-------------------------|---------------------------|---------------------|------|------|------|---------------|
| $I_R^*$    | Reverse leakage current | $T_j = 25^\circ\text{C}$  | $V_R = V_{RRM}$     |      |      | 15   | $\mu\text{A}$ |
|            |                         | $T_j = 125^\circ\text{C}$ |                     |      |      | 15   | mA            |
| $V_F^{**}$ | Forward voltage drop    | $T_j = 25^\circ\text{C}$  | $I_F = 10\text{ A}$ |      |      | 0.90 | V             |
|            |                         | $T_j = 125^\circ\text{C}$ | $I_F = 10\text{ A}$ |      | 0.69 | 0.75 |               |
|            |                         | $T_j = 25^\circ\text{C}$  | $I_F = 20\text{ A}$ |      |      | 0.99 |               |
|            |                         | $T_j = 125^\circ\text{C}$ | $I_F = 20\text{ A}$ |      | 0.79 | 0.86 |               |

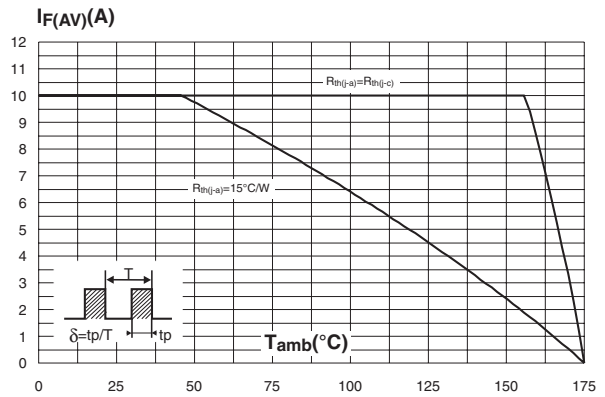
Pulse test : \*  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$   
 \*\*  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

To evaluate the conduction losses use the following equation:  
 $P = 0.64 \times I_{F(AV)} + 0.011 I_{F(RMS)}^2$

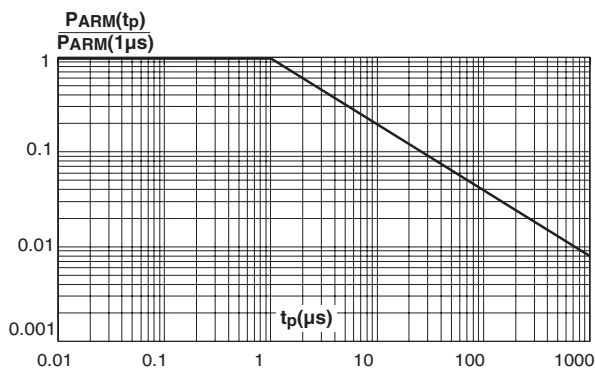
**Fig. 1:** Average forward power dissipation versus average forward current (per diode).



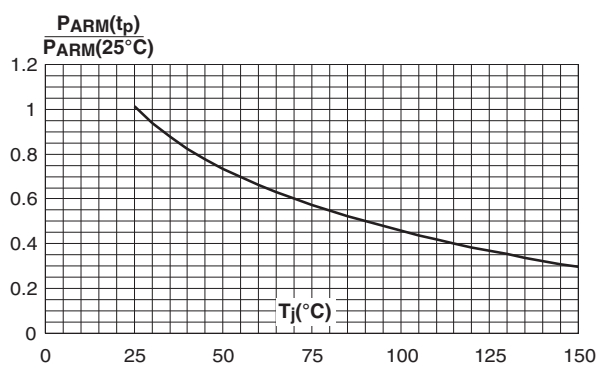
**Fig. 2:** Average forward current versus ambient temperature ( $\delta = 0.5$ , per diode).



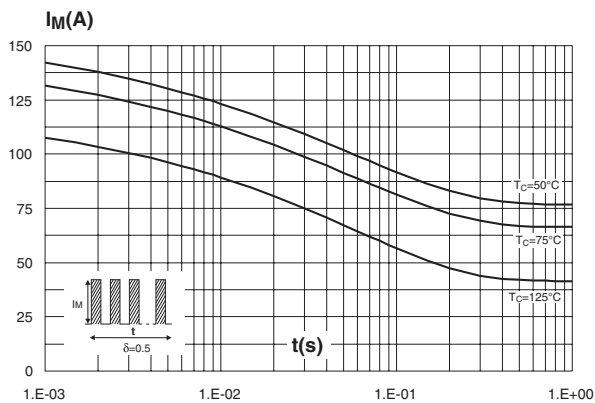
**Fig. 3:** Normalized avalanche power derating versus pulse duration.



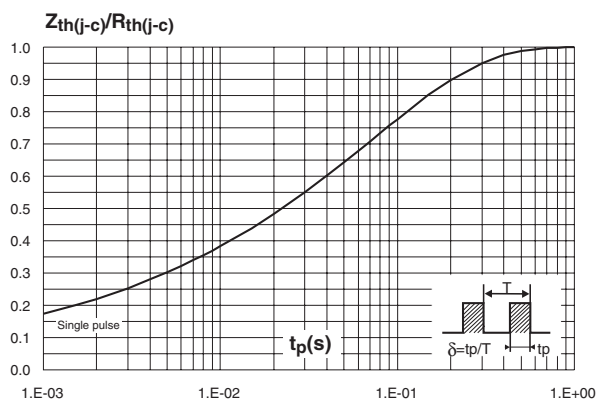
**Fig. 4:** Normalized avalanche power derating versus junction temperature.



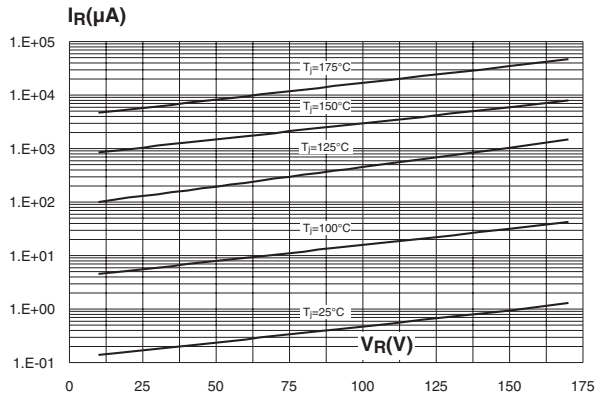
**Fig. 5:** Non repetitive surge peak forward current versus overload duration (maximum values, per diode).



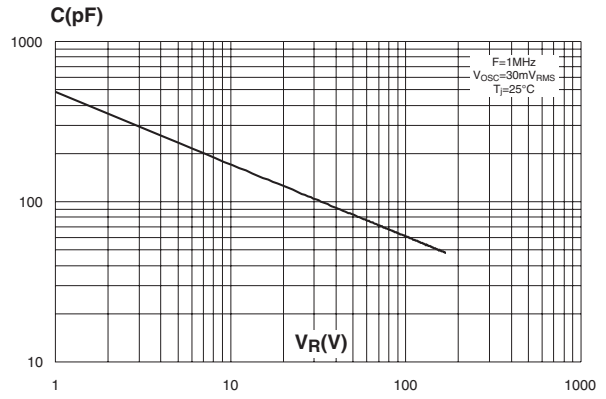
**Fig. 6:** Relative variation of thermal impedance junction to case versus pulse duration.



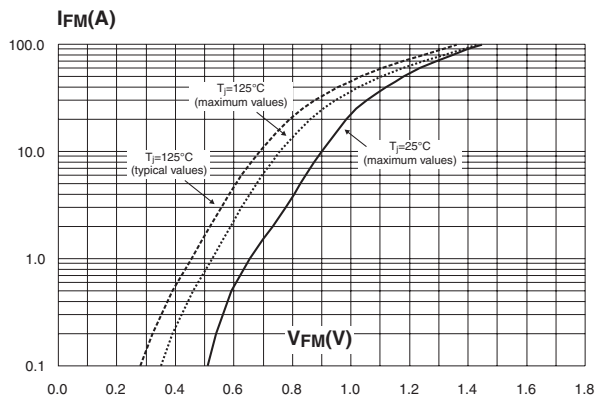
**Fig. 7:** Reverse leakage current versus reverse voltage applied (typical values, per diode).

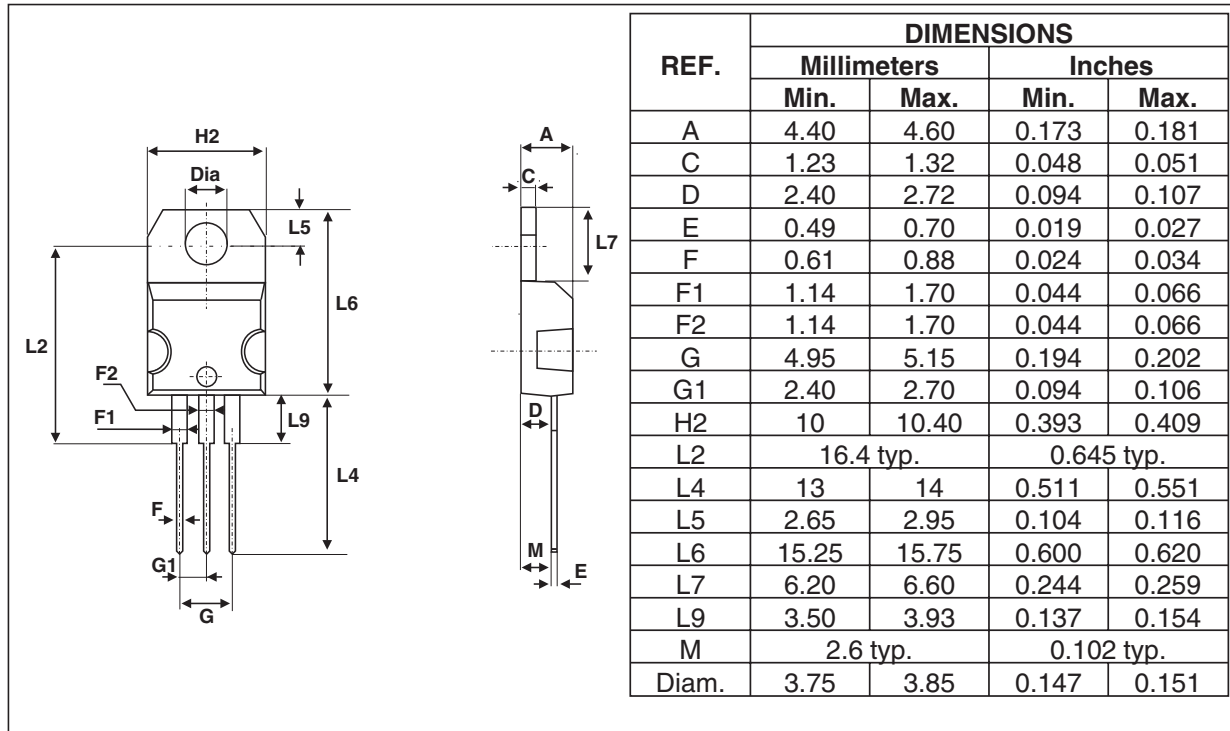


**Fig. 8:** Junction capacitance versus reverse voltage applied (typical values, per diode).



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



**PACKAGE MECHANICAL DATA**  
 TO-220AB

**OTHER INFORMATION**

| Ordering type | Marking     | Package  | Weight | Base qty | Delivery mode |
|---------------|-------------|----------|--------|----------|---------------|
| STPS20170CT   | STPS20170CT | TO-220AB | 2.20 g | 50       | Tube          |

**EPOXY MEETS UL94, V0**

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