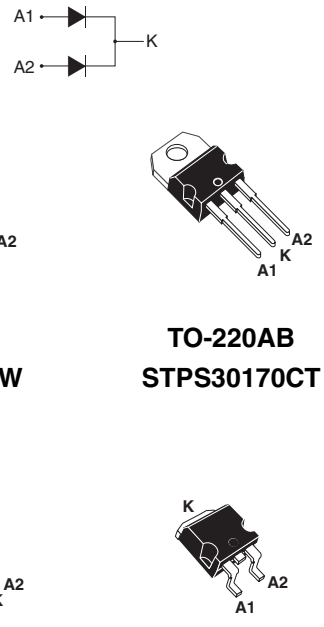
# STPS30170C

## HIGH VOLTAGE POWER SCHOTTKY RECTIFIER

**Table 1: Main Product Characteristics**

| | |
|---|---|
| $I_{F(AV)}$ | 2 x 15 A |
| $V_{RRM}$ | 170 V |
| $T_j$ | 175 °C |
| $V_F$(max) | 0.75 V |




**TO-247**
**STPS30170CW**

**TO-220AB**
**STPS30170CT**

**TO-220FPAB**
**STPS30170CFP**

**D$^2$PAK**
**STPS30170CG**

### FEATURES AND BENEFITS

- High junction temperature capability
- Low leakage current
- Good trade off between leakage current and forward voltage drop
- Insulated package: TO-220FPAB
  Insulating voltage: 2000 V DC
  Capacitance: 45 pF
- Avalanche specification

### DESCRIPTION

Dual center tab Schottky rectifier suited for High Frequency Switch Mode Power Supply.

**Table 2: Order Codes**

| Part Numbers | Marking |
|---|---|
| STPS30170CW | STPS30170CW |
| STPS30170CT | STPS30170CT |
| STPS30170CFP | STPS30170CFP |
| STPS30170CG | STPS30170CG |
| STPS30170CG-TR | STPS30170CG |

**Table 3: 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 $\delta = 0.5$ | TO-220FPAB | Tc = 120 °C | Per diode | 15 | A |
| | | TO-220AB / $D^2PAK$ | Tc = 155 °C | | | |
| | | TO-247 | | Per device | 30 | |
| $I_{FSM}$ | Surge non repetitive forward current | | tp = 10ms sinusoidal | | 220 | A |
| $P_{ARM}$ | Repetitive peak avalanche power | | tp = 1µs Tj = 25 °C | | 10500 | 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/µs |

* : $\frac{dPtot}{dTj} > \frac{1}{Rth(j-a)}$ thermal runaway condition for a diode on its own heatsink

**Table 4: Thermal Parameters**

| Symbol | Parameter | | | Value | Unit |
|---|---|---|---|---|---|
| $R_{th(j-c)}$ | Junction to case | TO-220FPAB | Per diode<br>Total | 4<br>3.3 | °C/W |
| | | TO-220AB / $D^2PAK$ | Per diode<br>Total | 1.6<br>0.85 | |
| | | TO-247 | Per diode<br>Total | 1.5<br>0.8 | |
| $R_{th(c)}$ | | TO-220FPAB | Coupling | 2.6 | °C/W |
| | | TO-220AB / $D^2PAK$ | Coupling | 0.3 | |
| | | TO-247 | Coupling | 0.3 | |

When the diodes 1 and 2 are used simultaneously:

$\Delta$ Tj(diode 1) = P(diode 1) x $R_{th(j-c)}$(Per diode) + P(diode 2) x $R_{th(c)}$

**Table 5: Static Electrical Characteristics** (per diode)

| Symbol | Parameter | Tests conditions | | Min. | Typ | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$ * | Reverse leakage current | $T_j$ = 25 °C | $V_R = V_{RRM}$ | | | 20 | µA |
| | | $T_j$ = 125 °C | | | 5 | 20 | mA |
| $V_F$ ** | Forward voltage drop | $T_j$ = 25 °C | $I_F$ = 15 A | | | 0.92 | V |
| | | $T_j$ = 125 °C | | | 0.69 | 0.75 | |
| | | $T_j$ = 25 °C | $I_F$ = 30 A | | | 1 | |
| | | $T_j$ = 125 °C | | | 0.80 | 0.86 | |

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

To evaluate the conduction losses use the following equation: P = 0.64 x $I_{F(AV)}$ + 0.0073 $I_F{}^2{}_{(RMS)}$

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

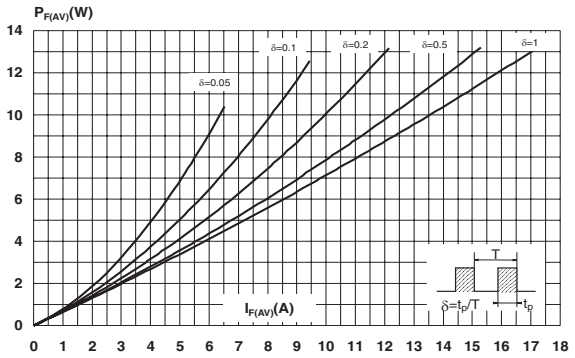



**Figure 2: Average forward current versus ambient temperature (δ = 0.5, per diode)**

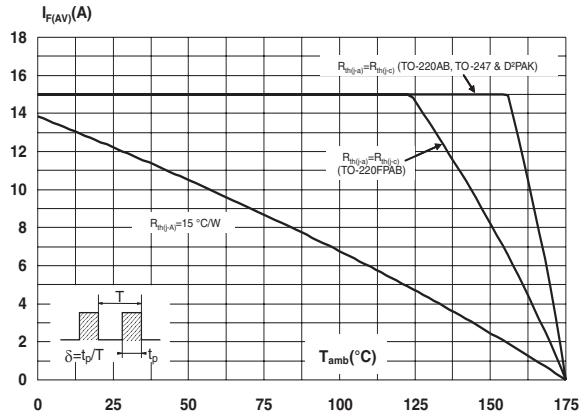



**Figure 3: Normalized avalanche power derating versus pulse duration**

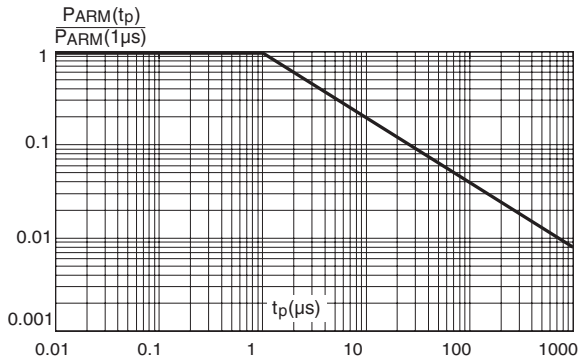



**Figure 4: Normalized avalanche power derating versus junction temperature**

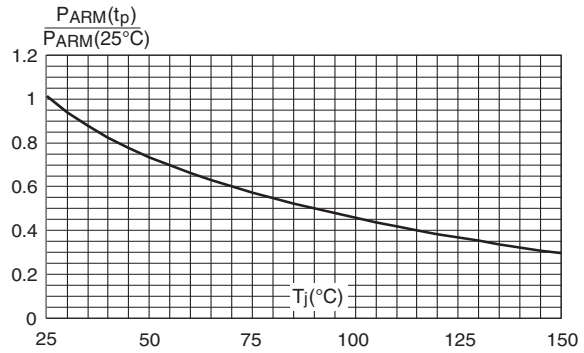



**Figure 5: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220AB, TO-247, D²PAK)**

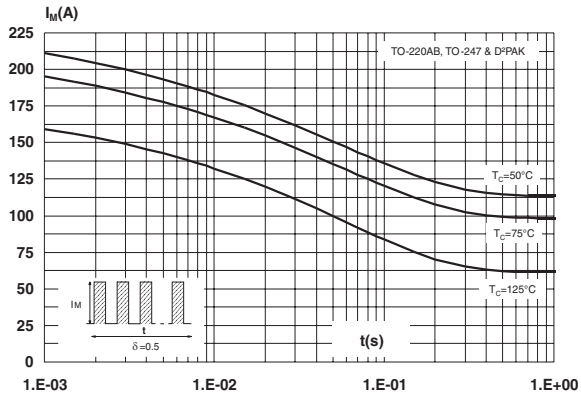
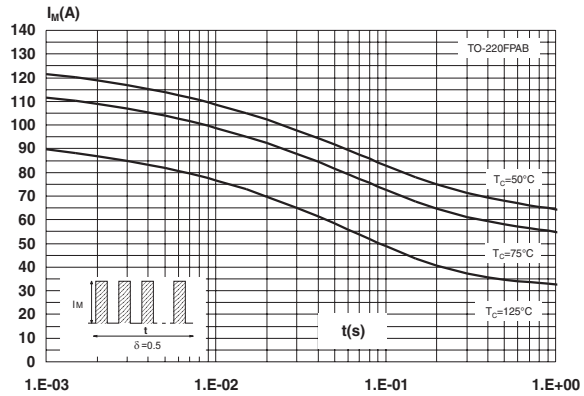



**Figure 6: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TO-220FPAB)**



In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com.

**Table 6: Ordering Information**

| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| STPS30170CW | STPS30170CW | TO-247 | 4.40 g | 30 | Tube |
| STPS30170CT | STPS30170CT | TO-220AB | 2 g | 50 | Tube |
| STPS30170CFP | STPS30170CFP | TO-220FPAB | 1.9 g | 50 | Tube |
| STPS30170CG | STPS30170CG | $D^2PAK$ | 1.48 g | 50 | Tube |
| STPS30170CG-TR | STPS30170CG | | | 1000 | Tape & reel |

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- TO-220 - Recommended torque value: 0.55 Nm, Maximum torque value: 0.7 Nm.
- TO-247 - Recommended torque value: 0.8 Nm, Maximum torque value: 1.0 Nm.