

Main product characteristics

| | |
|-------------|---------|
| $I_{F(AV)}$ | 30 A |
| V_{RRM} | 100 V |
| T_j (max) | 150° C |
| V_F (typ) | 0.385 V |

Features and Benefits

- Avalanche rated
- Low V_F
- Good trade off between leakage current and forward voltage drop
- High frequency operation
- Avalanche capability specified

Description

Single Schottky rectifier, suited for high frequency switch mode power supply.

Packaged in TO-220AB, this device is intended to be used in notebook and game station adaptors, providing in these applications a good efficiency at both low and high load.

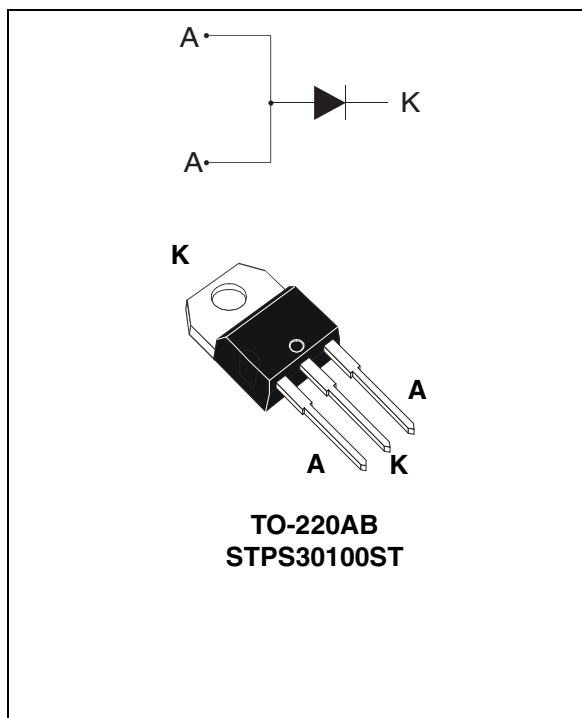


Table 1. Absolute Ratings (limiting values)

| Symbol | Parameter | Value | Unit |
|--------------|---|--|------|
| V_{RRM} | Repetitive peak reverse voltage | 100 | V |
| $I_{F(RMS)}$ | RMS forward current | 60 | A |
| $I_{F(AV)}$ | Average forward current $\delta = 0.5$ | $T_c = 125^\circ \text{C}$ 30 | A |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10 \text{ ms sinusoidal}$ 300 | A |
| P_{ARM} | Repetitive peak avalanche power | $t_p = 1 \mu\text{s}$ $T_j = 25^\circ \text{C}$ 26400 | W |
| T_{stg} | Storage temperature range | -65 to + 175 | °C |
| T_j | Maximum operating junction temperature ⁽¹⁾ | 150 | °C |

1. $\frac{dP_{Tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ condition to avoid thermal runaway for a diode on its own heatsink

1 Characteristics

Table 2. Thermal resistance

| Symbol | Parameter | Value | Unit |
|---------------|------------------|-------|------|
| $R_{th(j-c)}$ | Junction to case | 1 | °C/W |

Table 3. Static electrical characteristics (per diode)

| Symbol | Parameter | Test Conditions | | Min. | Typ. | Max. | Unit |
|-------------|-------------------------|----------------------------|----------------------|------|-------|-------|---------------|
| $I_R^{(1)}$ | Reverse leakage current | $T_j = 25^\circ \text{C}$ | $V_R = V_{RRM}$ | | | 175 | μA |
| | | $T_j = 125^\circ \text{C}$ | | | 20 | 50 | mA |
| | | $T_j = 25^\circ \text{C}$ | $V_R = 70 \text{ V}$ | | | 60 | μA |
| | | $T_j = 125^\circ \text{C}$ | | | 10 | 20 | mA |
| $V_F^{(2)}$ | Forward voltage drop | $T_j = 25^\circ \text{C}$ | $I_F = 5 \text{ A}$ | | 0.475 | | V |
| | | $T_j = 125^\circ \text{C}$ | | | 0.385 | | |
| | | $T_j = 25^\circ \text{C}$ | $I_F = 10 \text{ A}$ | | 0.555 | | |
| | | $T_j = 125^\circ \text{C}$ | | | 0.475 | | |
| | | $T_j = 25^\circ \text{C}$ | $I_F = 15 \text{ A}$ | | 0.620 | 0.660 | |
| | | $T_j = 125^\circ \text{C}$ | | | 0.525 | 0.565 | |
| | | $T_j = 25^\circ \text{C}$ | $I_F = 30 \text{ A}$ | | 0.740 | 0.800 | |
| | | $T_j = 125^\circ \text{C}$ | | | 0.605 | 0.655 | |

1. Pulse test: $t_p = 5 \text{ ms}$, $\delta < 2\%$

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

To evaluate the conduction losses use the following equation:

$$P = 0.475 \times I_{F(AV)} + 0.006 \times I_F^2_{(RMS)}$$

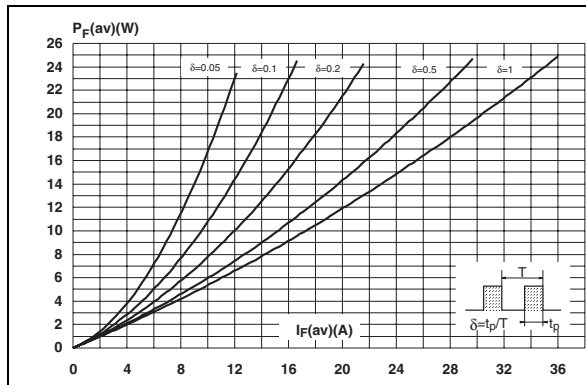
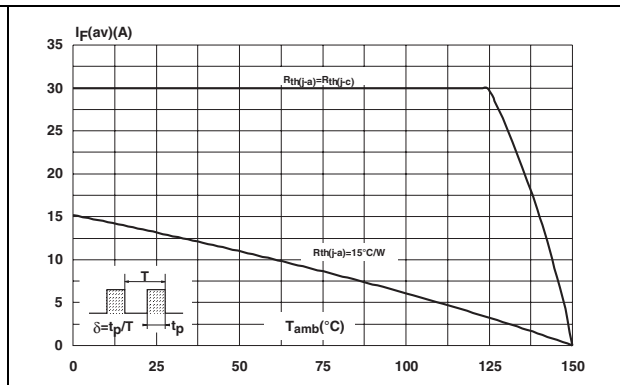
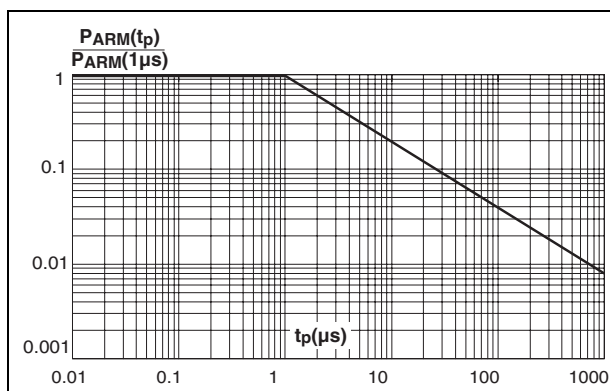
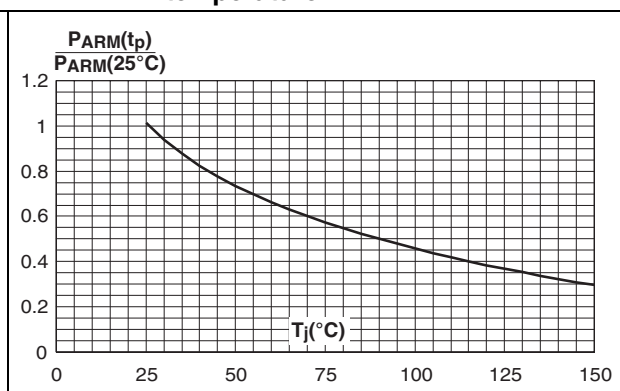
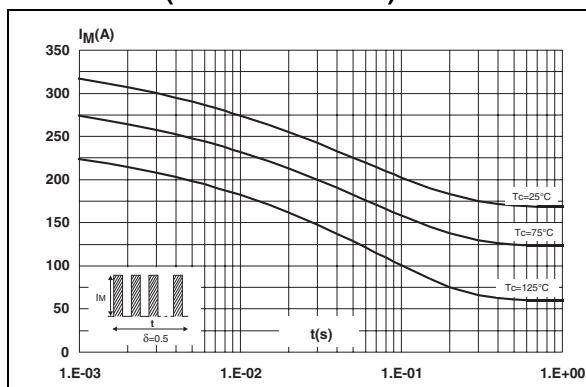
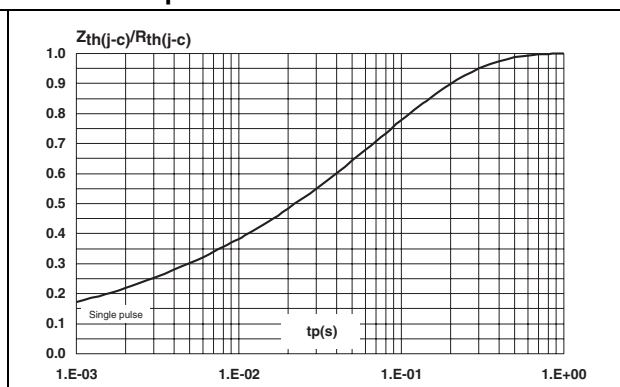
Figure 1. Conduction losses versus average current**Figure 2. Average forward current versus ambient temperature ($\delta = 0.5$)****Figure 3. Normalized avalanche power derating versus pulse duration****Figure 4. Normalized avalanche power derating versus junction temperature****Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)****Figure 6. Relative variation of thermal impedance junction to case versus pulse duration**

Figure 7. Reverse leakage current versus reverse voltage applied (typical values)

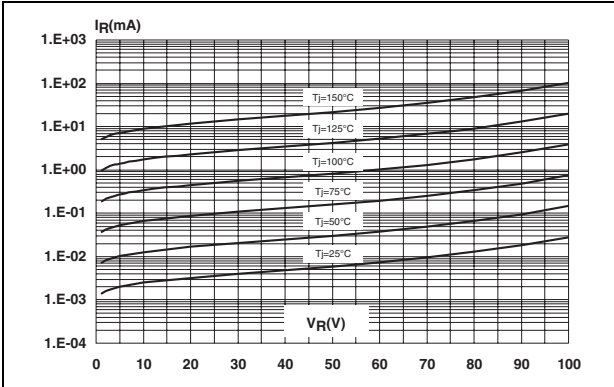


Figure 8. Junction capacitance versus reverse voltage applied (typical values)

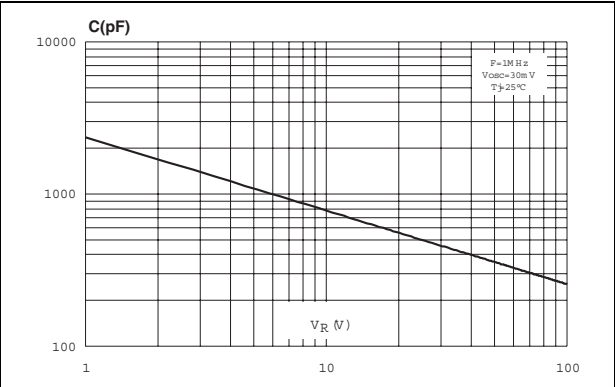


Figure 9. Forward voltage drop versus forward current (high level)

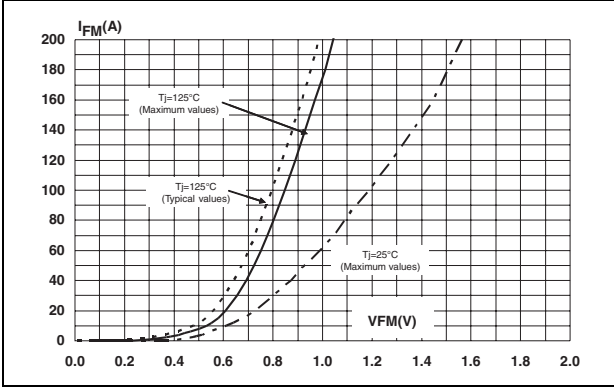
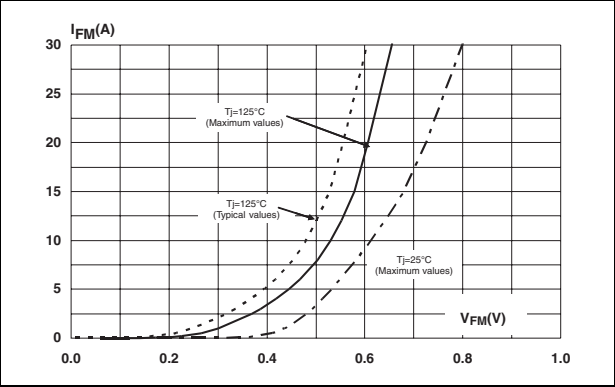


Figure 10. Forward voltage drop versus forward current (low level)



2 Package Information

Epoxy meets UL94,V0

Table 4. TO-220AB dimensions

| Ref. | Dimensions | | | | | |
|------|-------------|-------|-------|--------|-------|-------|
| | Millimeters | | | Inches | | |
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | 15.20 | | 15.90 | 0.598 | | 0.625 |
| a1 | | 3.75 | | | 0.147 | |
| a2 | 13.00 | | 14.00 | 0.511 | | 0.551 |
| B | 10.00 | | 10.40 | 0.393 | | 0.409 |
| b1 | 0.61 | | 0.88 | 0.024 | | 0.034 |
| b2 | 1.23 | | 1.32 | 0.048 | | 0.051 |
| C | 4.40 | | 4.60 | 0.173 | | 0.181 |
| c1 | 0.49 | | 0.70 | 0.019 | | 0.027 |
| c2 | 2.40 | | 2.72 | 0.094 | | 0.107 |
| e | 2.40 | | 2.70 | 0.094 | | 0.106 |
| F | 6.20 | | 6.60 | 0.244 | | 0.259 |
| ØI | 3.75 | | 3.85 | 0.147 | | 0.151 |
| I4 | 15.80 | 16.40 | 16.80 | 0.622 | 0.646 | 0.661 |
| L | 2.65 | | 2.95 | 0.104 | | 0.116 |
| I2 | 1.14 | | 1.70 | 0.044 | | 0.066 |
| I3 | 1.14 | | 1.70 | 0.044 | | 0.066 |
| M | | 2.60 | | | 0.102 | |

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.

3 Ordering Information

| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|-------------|----------|--------|----------|---------------|
| STPS30100ST | STPS30100ST | TO-220AB | 2.23 g | 50 | Tube |

4 Revision History

| Date | Revision | Changes |
|-------------|----------|-------------|
| 24-Oct-2006 | 1 | First issue |

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