

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

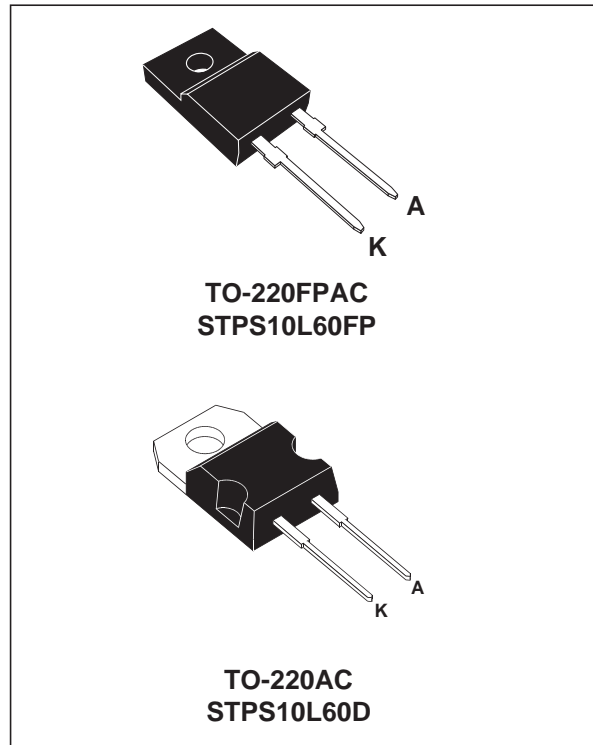
| | |
|-------------------|--------|
| $I_{F(AV)}$ | 10 A |
| V_{RRM} | 60 V |
| $T_j(\text{max})$ | 150°C |
| $V_F(\text{max})$ | 0.56 V |

FEATURES AND BENEFITS

- LOW FORWARD VOLTAGE DROP
- NEGLIGIBLE SWITCHING LOSSES
- LOW THERMAL RESISTANCE
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Schottky rectifier suited for Switched Mode Power Supplies and high frequency DC to DC converters. Packaged in TO-220AC, TO-220FPAC this device is intended for use in DC/DC chargers.



ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|--------------|--|--|---------------|------------------|
| V_{RRM} | Repetitive peak reverse voltage | | 60 | V |
| $I_{F(RMS)}$ | RMS forward current | | 30 | A |
| $I_{F(AV)}$ | Average forward current | TO-220AC | 10 | A |
| | | TO-220FPAC | | |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10 \text{ ms}$ Sinusoidal | 220 | A |
| I_{RRM} | Repetitive peak reverse current | $t_p = 2 \mu\text{s}$ square $F=1\text{kHz}$ | 1 | A |
| P_{ARM} | Repetitive peak avalanche power | $t_p = 1 \mu\text{s} \quad T_j = 25^\circ\text{C}$ | 5800 | W |
| T_{stg} | Storage temperature range | | - 65 to + 175 | °C |
| T_j | Maximum operating junction temperature * | | 150 | °C |
| dV/dt | Critical rate of rise of reverse voltage | | 10000 | V/ μs |

* : $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

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THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---------------|------------------|------------|------|
| $R_{th(j-c)}$ | Junction to case | TO-220AC | 1.6 |
| | | TO-220FPAC | 4 |

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests conditions | Min. | Typ. | Max. | Unit |
|---------|-------------------------|---------------------------|---------------------|------|------|---------------|
| I_R^* | Reverse leakage current | $T_j = 25^\circ\text{C}$ | $V_R = V_{RRM}$ | | 350 | μA |
| | | $T_j = 125^\circ\text{C}$ | | 65 | 95 | mA |
| V_F^* | Forward voltage drop | $T_j = 25^\circ\text{C}$ | $I_F = 10\text{ A}$ | | 0.6 | V |
| | | $T_j = 125^\circ\text{C}$ | $I_F = 10\text{ A}$ | 0.48 | 0.56 | |
| | | $T_j = 25^\circ\text{C}$ | $I_F = 20\text{ A}$ | | 0.74 | |
| | | $T_j = 125^\circ\text{C}$ | $I_F = 20\text{ A}$ | 0.62 | 0.7 | |

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

To evaluate the conduction losses use the following equation :

$$P = 0.42 \times I_{F(AV)} + 0.014 I_{F(RMS)}^2$$

Fig. 1: Average forward power dissipation versus average forward current.

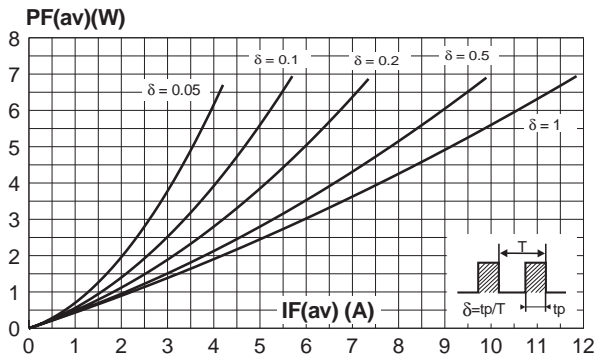


Fig. 3: Normalized avalanche power derating versus pulse duration.

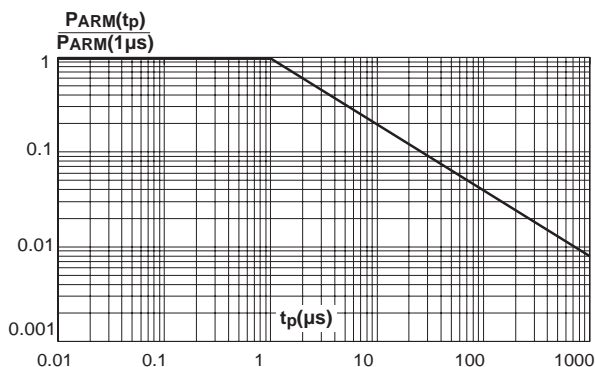


Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$).

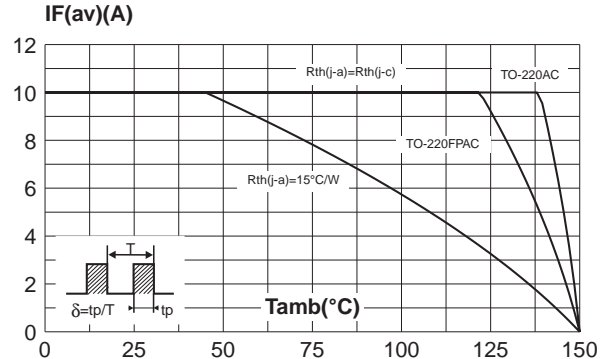


Fig. 4: Normalized avalanche power derating versus junction temperature.

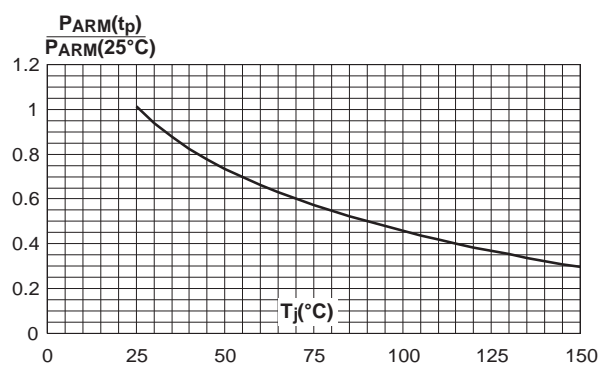


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220AC).

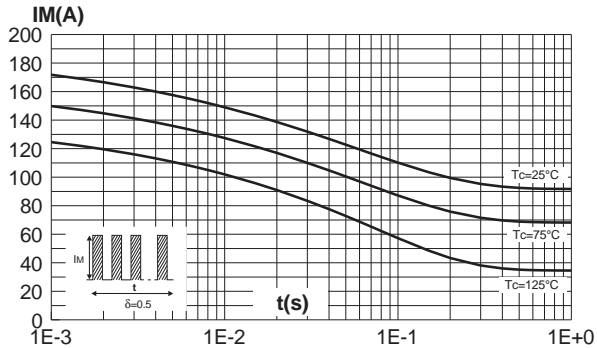


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220FPAC).

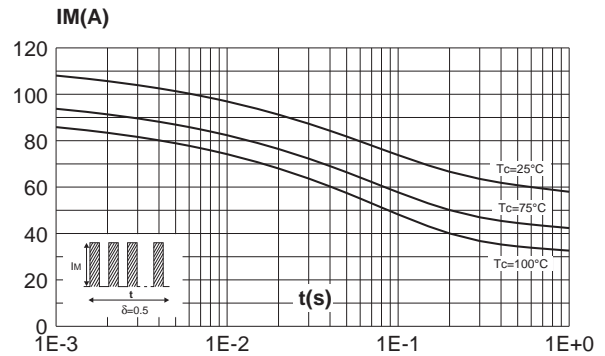


Fig. 6-1: Relative variation of thermal impedance junction to lead versus pulse duration (TO-220AC).

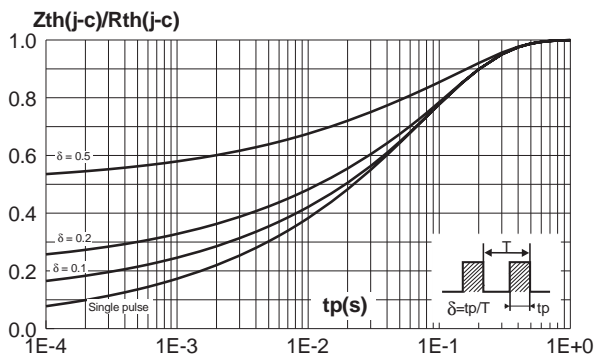


Fig. 6-2: Relative variation of thermal impedance junction to lead versus pulse duration (TO-220FPAC).

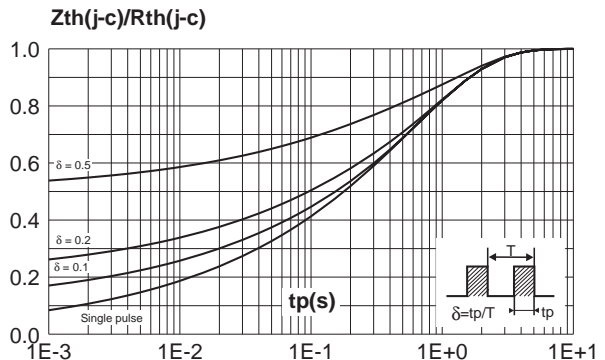


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

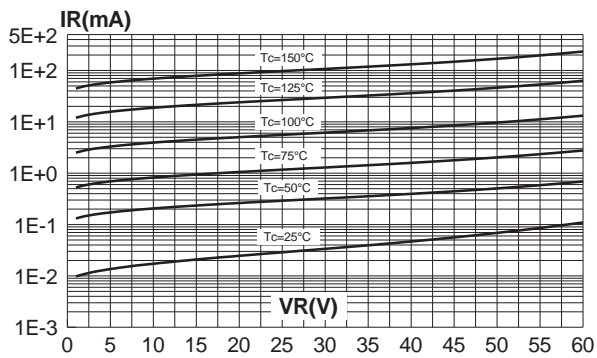
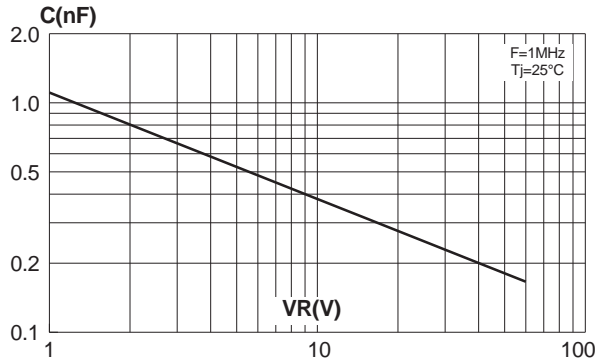
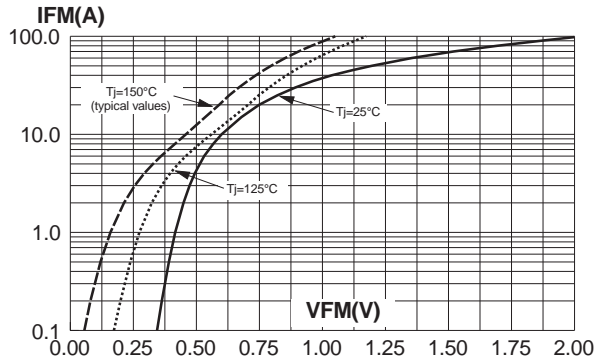


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

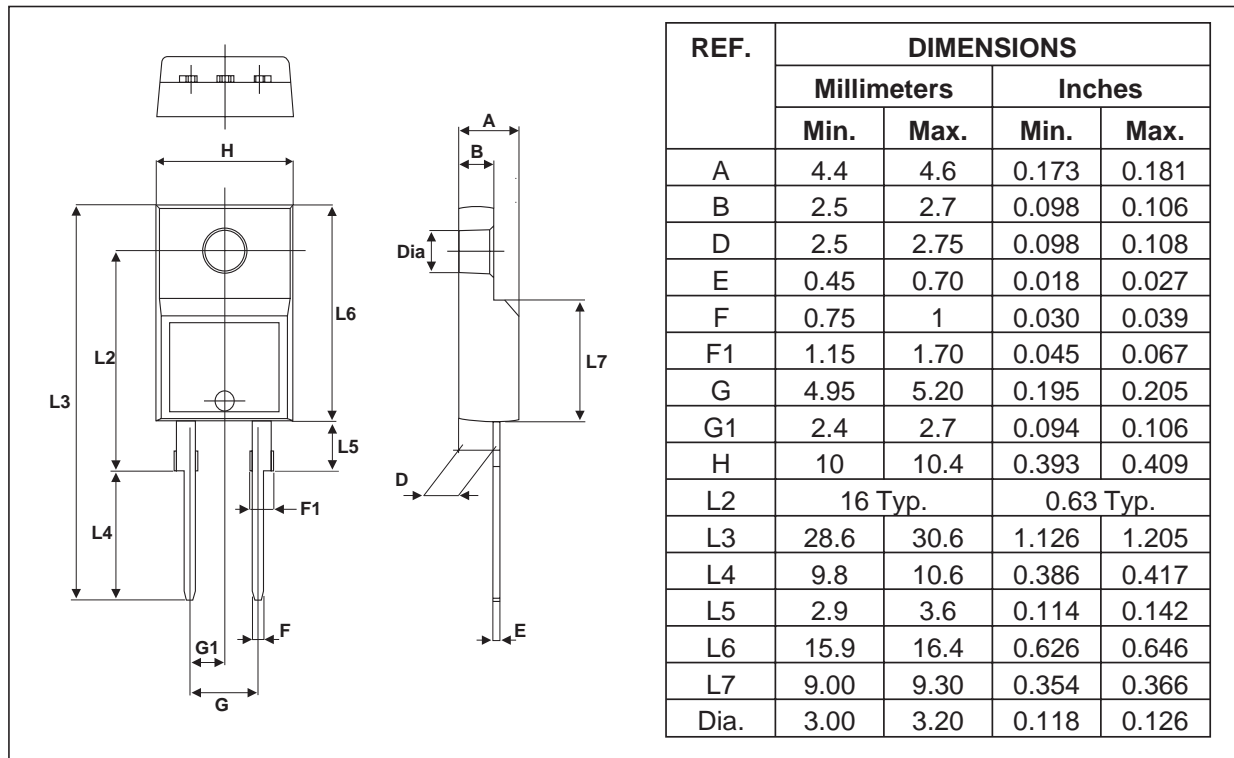


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Fig. 9: Forward voltage drop versus forward current (low level, maximum values).

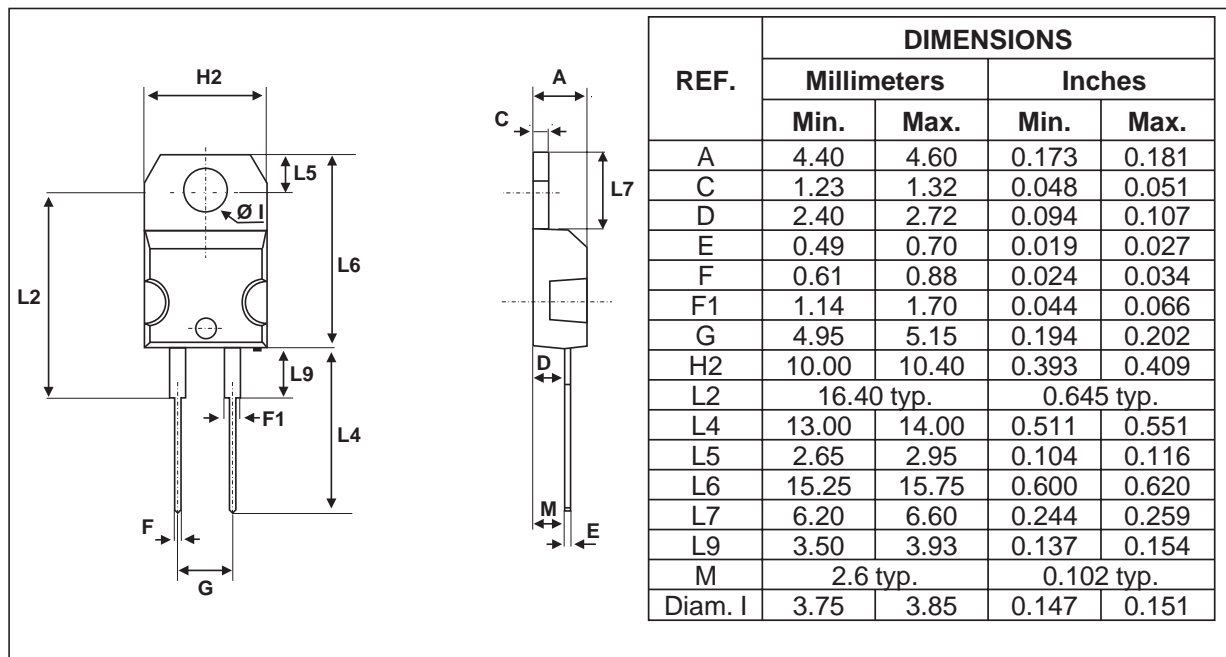


PACKAGE MECHANICAL DATA TO-220FPAC



STPS10L60D/FP

PACKAGE MECHANICAL DATA TO-220AC



- COOLING METHOD : C
- RECOMMENDED TORQUE VALUE : 0.8M.N
- MAXIMUM TORQUE VALUE : 1.0M.N

| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|-------------|------------|--------|----------|---------------|
| STPS10L60D | STPS10L60D | TO-220AC | 1.86g | 50 | Tube |
| STPS10L60FP | STPS10L60FP | TO-220FPAC | 1.9g | 50 | Tube |

- EPOXY MEETS UL94,V0

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