

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

| | |
|-------------|--------|
| $I_{F(AV)}$ | 7.5 A |
| V_{RRM} | 45 V |
| $T_j(max)$ | 175 °C |
| $V_F(max)$ | 0.57 V |

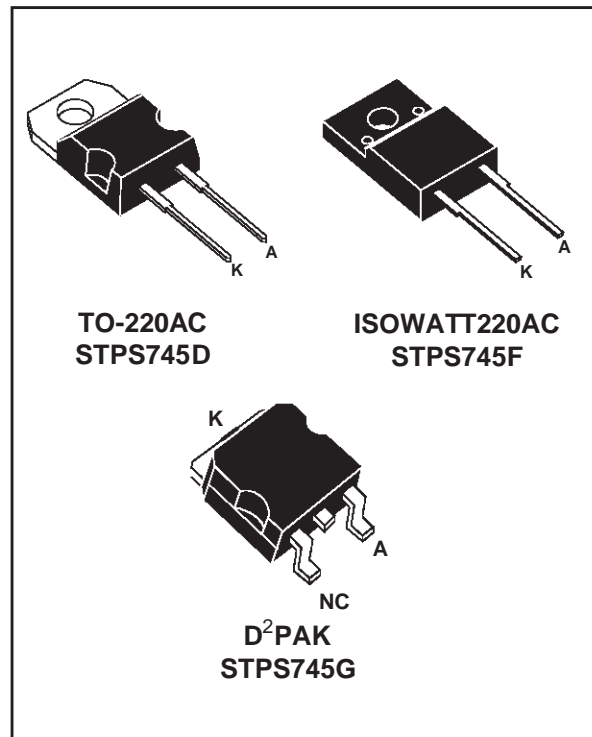
FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREMELY FAST SWITCHING
- INSULATED PACKAGE: ISOWATT220AC
Insulating voltage = 2000V DC
Capacitance = 12pF

DESCRIPTION

Single Schottky rectifier suited for Switch Mode Power Supply and high frequency DC to DC converters.

Packaged either in TO-220AC, ISOWATT220AC or D²PAK, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit | |
|--------------|---|--------------------------------------|---------------------------|------------------|---|
| V_{RRM} | Repetitive peak reverse voltage | | 45 | V | |
| $I_{F(RMS)}$ | RMS forward current | | 20 | A | |
| $I_{F(AV)}$ | Average forward current $\delta = 0.5$ | TO-220AC/ D ² PAK | $T_c = 160^\circ\text{C}$ | 7.5 | A |
| | | ISOWATT220AC | $T_c = 145^\circ\text{C}$ | | |
| I_{FSM} | Surge non repetitive forward current | tp = 10 ms sinusoidal | | 150 | A |
| I_{RRM} | Repetitive peak reverse current | tp = 2 μs square F = 1kHz | | 1 | A |
| I_{RSM} | Non repetitive peak reverse current | tp = 100 μs square | | 2 | A |
| 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 | |

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

STPS745D/F/G

THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|---------------|------------------|-------------------------------|-------|------|
| $R_{th(j-c)}$ | Junction to case | TO-220AC / D ² PAK | 3.0 | °C/W |
| | | ISOWATT220AC | 5.5 | |

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests Conditions | | Min. | Typ. | Max. | Unit |
|---------|-------------------------|---------------------------|----------------------|------|------|------|---------------|
| I_R^* | Reverse leakage current | $T_j = 25^\circ\text{C}$ | $V_R = V_{RRM}$ | | | 100 | μA |
| | | $T_j = 125^\circ\text{C}$ | | | 5 | 15 | mA |
| V_F^* | Forward voltage drop | $T_j = 125^\circ\text{C}$ | $I_F = 7.5\text{ A}$ | | 0.5 | 0.57 | V |
| | | $T_j = 25^\circ\text{C}$ | $I_F = 15\text{ A}$ | | | 0.84 | |
| | | $T_j = 125^\circ\text{C}$ | $I_F = 15\text{ A}$ | | 0.65 | 0.72 | |

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

To evaluate the conduction losses use the following equation :

$$P = 0.42 \times I_{F(AV)} + 0.020 I_{F(RMS)}^2$$

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

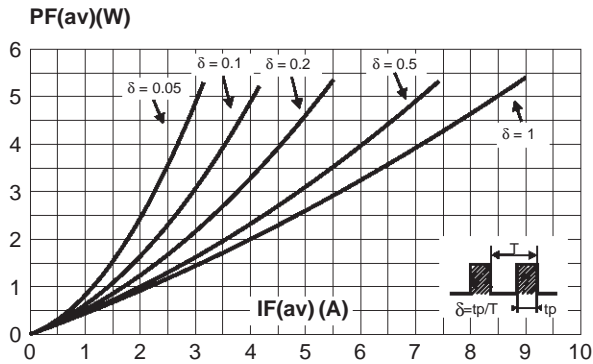


Fig. 2: Average current versus ambient temperature ($\delta = 0.5$).

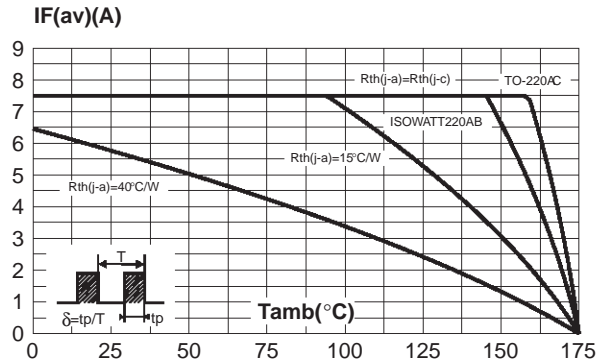


Fig. 3-1: Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220AC and D²PAK).

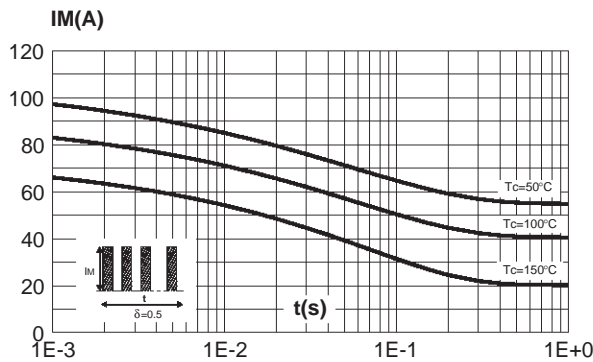


Fig. 3-2: Non repetitive surge peak forward current versus overload duration (maximum values) (ISOWATT220AC).

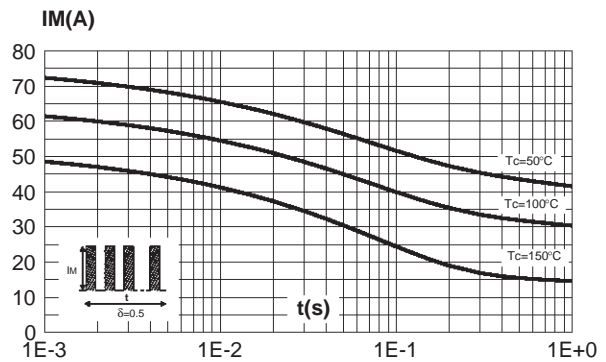


Fig. 4-1: Relative variation of thermal transient impedance junction to case versus pulse duration (TO-220AC and D²PAK).

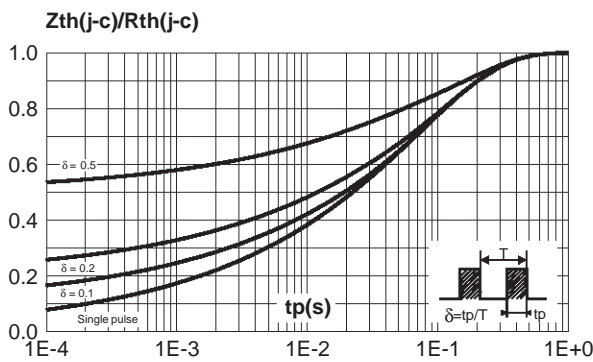


Fig. 4-2: Relative variation of thermal transient impedance junction to case versus pulse duration (ISOWATT220AC).

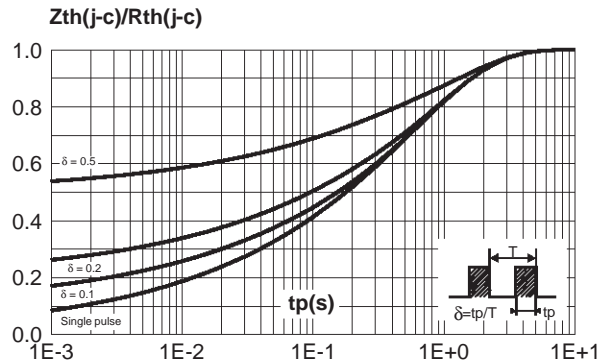


Fig. 5: Reverse leakage current versus reverse voltage applied (typical values).

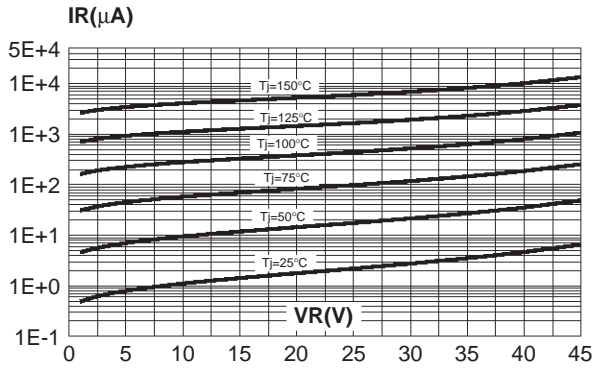


Fig. 6: Junction capacitance versus reverse voltage applied (typical values).

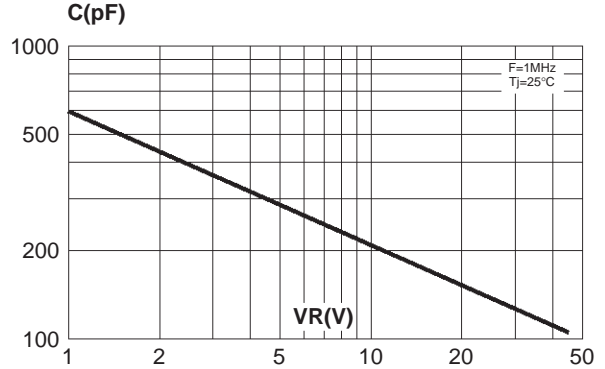


Fig. 7: Forward voltage drop versus forward current (maximum values).

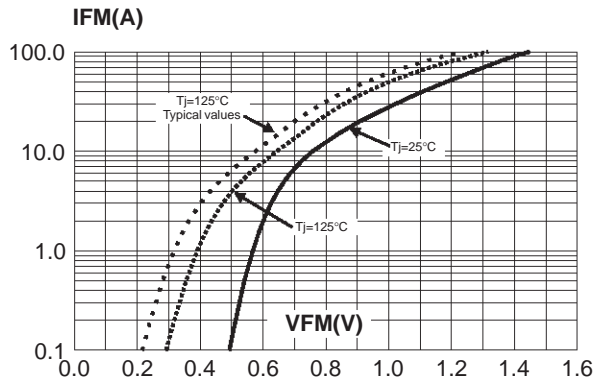
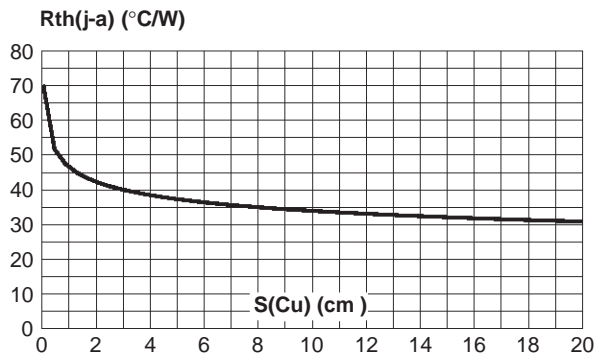
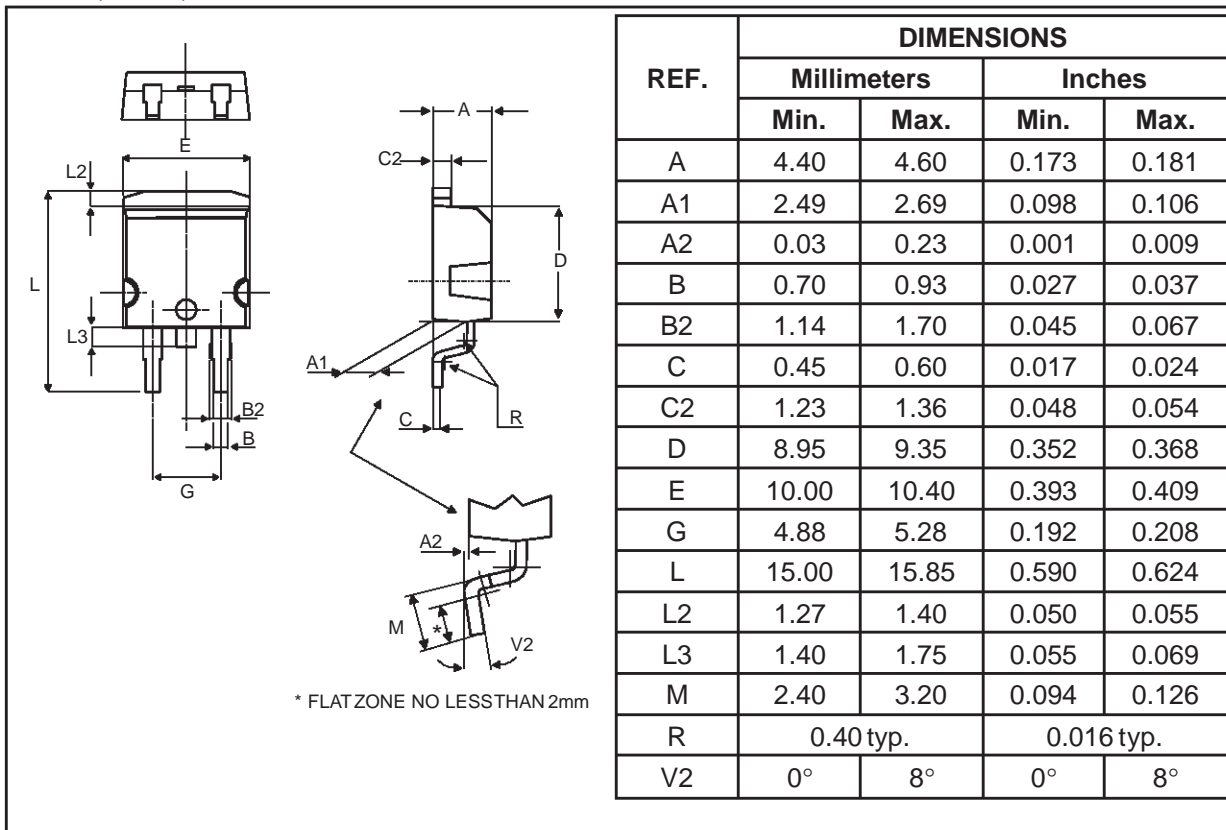


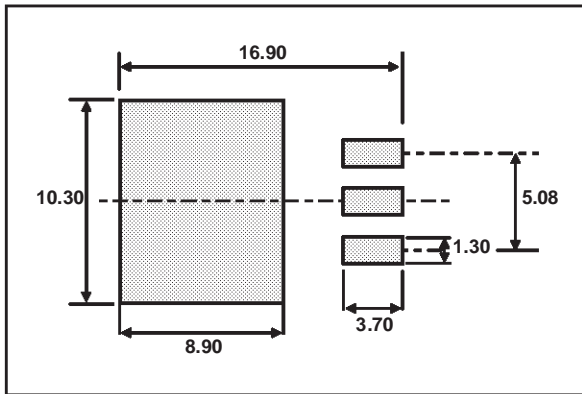
Fig. 8: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board, copper thickness: $35\mu m$).



PACKAGE MECHANICAL DATA
D²PAK (Plastic)

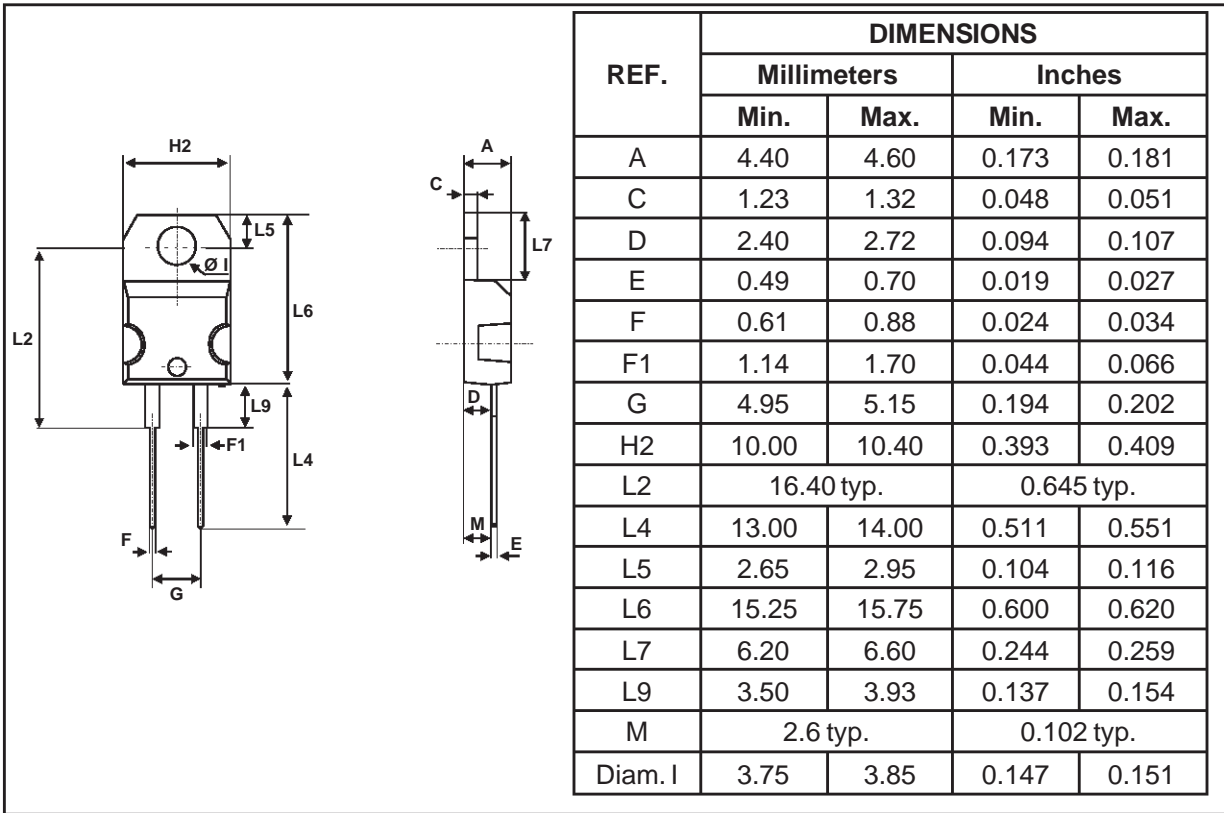


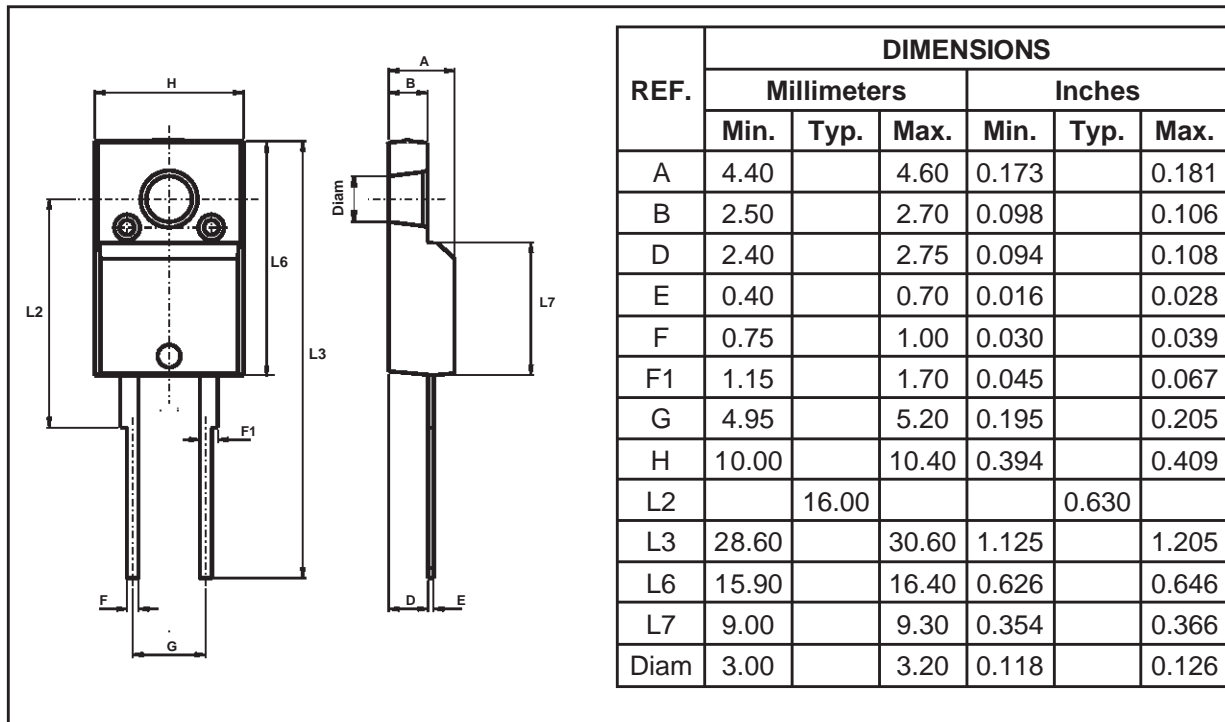
FOOTPRINT DIMENSIONS (in millimeters)



STPS745D/F/G

PACKAGE MECHANICAL DATA
TO-220AC



PACKAGE MECHANICAL DATA
 ISOWATT220AC


| Type | Marking | Package | Weight | Base qty | Delivery mode |
|-------------|----------|--------------------|---------|----------|---------------|
| STPS745D | STPS745D | TO-220AC | 1.86 g. | 50 | Tube |
| STPS745F | STPS745F | ISOWATT220AC | 2 g. | 50 | Tube |
| STPS745G | STPS745G | D ² PAK | 1.48 g. | 50 | Tube |
| STPS745G-TR | STPS745G | D ² PAK | 1.48 g. | 1000 | Tape & reel |

- Cooling method: by conduction (C)
- Recommended torque value: 0.55 N.m
- Maximum torque value: 0.7 N.m.
- Epoxy meets UL94,V0

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