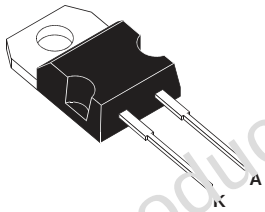
# STPS1645D

## POWER SCHOTTKY RECTIFIER

### MAIN PRODUCT CHARACTERISTICS

| | |
|---|---|
| $I_{F(AV)}$ | 16 A |
| $V_{RRM}$ | 45 V |
| Tj (max) | 175 °C |
| $V_F$ (max) | 0.57 V |




TO-220AC

### FEATURES AND BENEFITS

- Very small conduction losses
- Negligible switching losses
- Extremely fast switching

### DESCRIPTION

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

Packaged in TO-220AC, 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 | | 30 | A |
| $I_{F(AV)}$ | Average forward current $\delta = 0.5$ | Tc = 155°C | 16 | A |
| $I_{FSM}$ | Surge non repetitive forward current | tp = 10 ms Sinusoidal | 220 | 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 | 3 | A |
| Tstg | Storage temperature range | | - 65 to + 175 | °C |
| Tj | 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

## THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{th\ (j-c)}$ | Junction to case | 1.6 | °C/W |

## STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| $I_R$ * | Reverse leakage current | Tj = 25°C | $V_R = V_{RRM}$ | | | 200 | ∝A |
| | | Tj = 125°C | | | 11 | 40 | mA |
| $V_F$ * | Forward voltage drop | Tj = 125°C | $I_F$ = 16 A | | 0.5 | 0.57 | V |

Pulse test : * tp = 380 ∝s, δ < 2%

To evaluate the conduction losses use the following equation :
$P = 0.42 \times I_{F(AV)} + 0.01\ I_F{}^2{}_{(RMS)}$

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

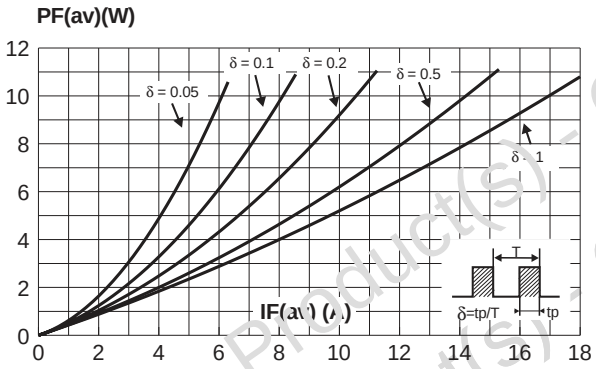



**Fig. 2:** Average current versus ambient temperature (δ : 0.5).

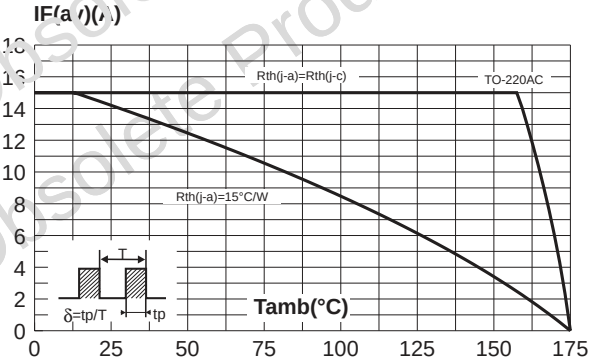



**Fig. 3:** Non repetitive surge peak forward current versus overload duration (maximum values).

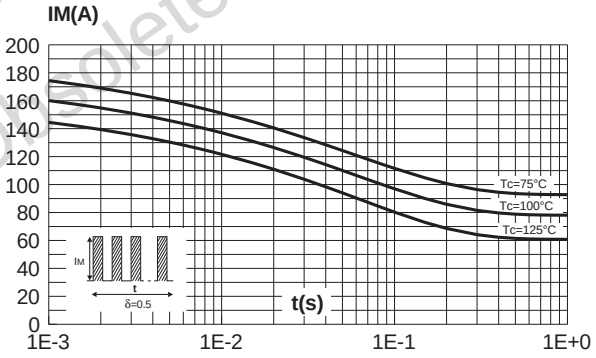



**Fig. 4:** Relative variation of thermal transient impedance junction to case versus pulse duration.

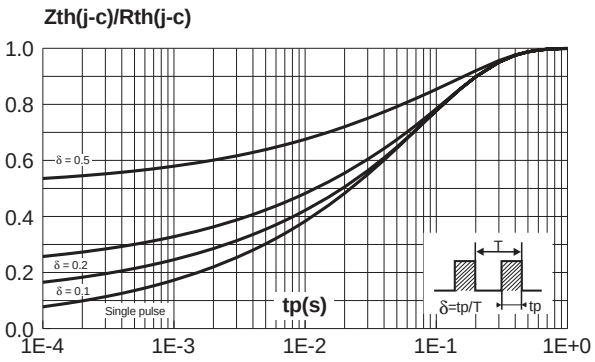


**Fig. 5:** Reverse leakage current versus reverse voltage applied (typical values).

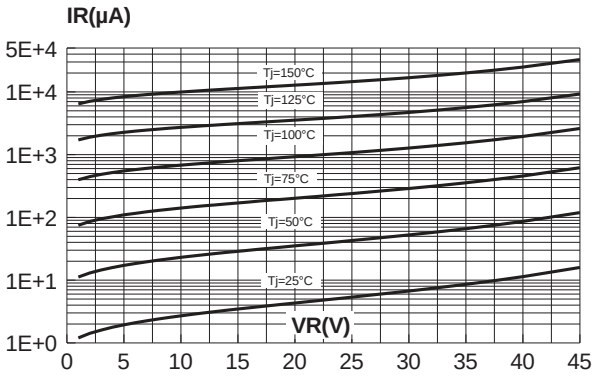



**Fig. 6:** Junction capacitance versus reverse voltage applied (typical values).

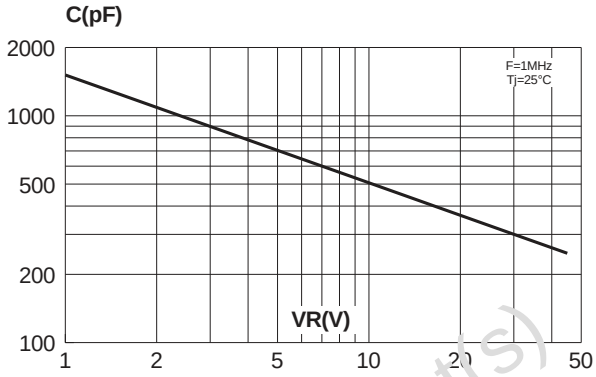
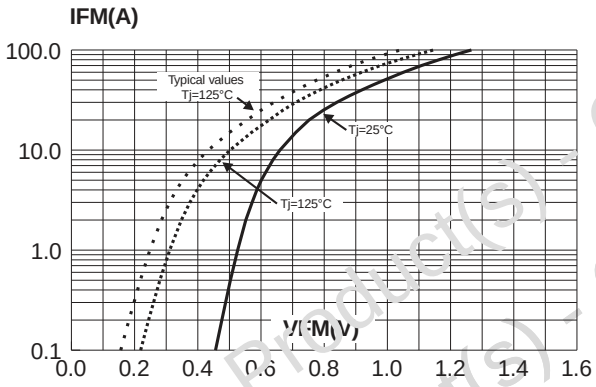
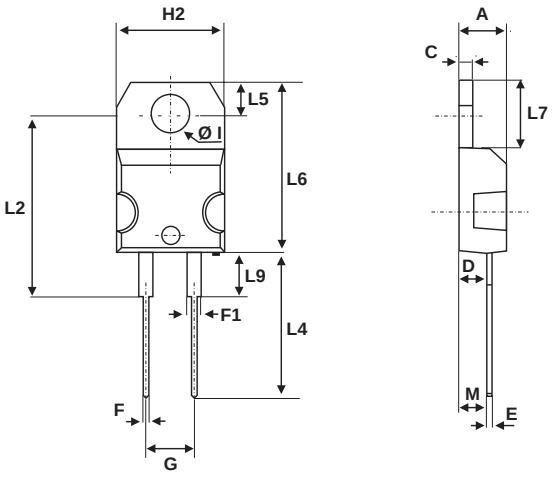



**Fig. 7:** Forward voltage drop versus forward current (maximum values).



## PACKAGE MECHANICAL DATA

TO-220AC




| REF. | DIMENSIONS | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.40 | 4.60 | 0.173 | 0.181 |
| C | 1.23 | 1.32 | 0.048 | 0.051 |
| D | 2.40 | 2.72 | 0.094 | 0.107 |
| E | 0.49 | 0.70 | 0.019 | 0.027 |
| F | 0.61 | 0.88 | 0.024 | 0.034 |
| F1 | 1.14 | 1.70 | 0.044 | 0.066 |
| G | 4.95 | 5.15 | 0.194 | 0.202 |
| H2 | 10.00 | 10.40 | 0.393 | 0.409 |
| L2 | 16.40 typ. | | 0.645 typ. | |
| L4 | 13.00 | 14.00 | 0.511 | 0.551 |
| L5 | 2.65 | 2.95 | 0.104 | 0.116 |
| L6 | 15.25 | 15.75 | 0.600 | 0.620 |
| L7 | 6.20 | 6.60 | 0.244 | 0.259 |
| L9 | 3.50 | 3.93 | 0.137 | 0.154 |
| M | 2.6 typ. | | 0.102 typ. | |
| Diam. I | 3.75 | 3.85 | 0.147 | 0.151 |

| Type | Marking | Package | Weight | Base qty | Delivery mode |
|---|---|---|---|---|---|
| STPS1645D | STPS1645D | TO-220AC | 1.86 g | 50 | Tube |

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