

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

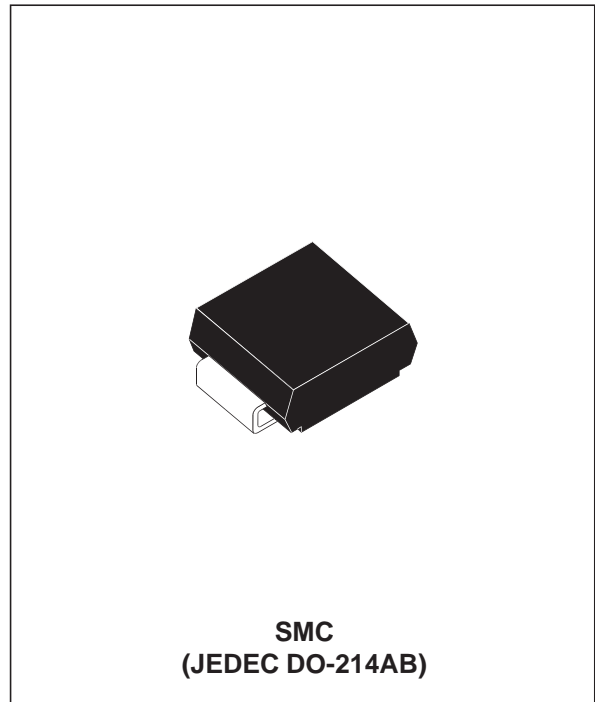
| | |
|-------------------|--------|
| $I_{F(AV)}$ | 3 A |
| V_{RRM} | 60 V |
| $T_j(\text{max})$ | 150°C |
| $V_F(\text{max})$ | 0.65 V |

FEATURES AND BENEFITS

- 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 SMC, 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 | 10 | A |
| $I_{F(AV)}$ | Average forward current | $T_c = 100^\circ\text{C} \quad \delta = 0.5$ | A |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10 \text{ ms}$ Sinusoidal | A |
| I_{RRM} | Repetitive peak reverse current | $t_p = 2 \mu\text{s}$ square $F=1\text{kHz}$ | A |
| P_{ARM} | Repetitive peak avalanche power | $t_p = 1 \mu\text{s} \quad T_j = 25^\circ\text{C}$ | 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

STPS3L60S

THERMAL RESISTANCES

| Symbol | Parameter | Value | Unit |
|---------------|-------------------|-------|----------------------|
| $R_{th(j-l)}$ | Junction to leads | 20 | $^{\circ}\text{C/W}$ |

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Tests conditions | Min. | Typ. | Max. | Unit | |
|---------|-------------------------|-----------------------------|--------------------|------|------|---------------|-------------|
| I_R^* | Reverse leakage current | $T_j = 25^{\circ}\text{C}$ | $V_R = V_{RRM}$ | | 55 | μA | |
| | | $T_j = 125^{\circ}\text{C}$ | | | 10 | 15 | mA |
| V_F^* | Forward voltage drop | $T_j = 25^{\circ}\text{C}$ | $I_F = 3\text{ A}$ | | | 0.7 | V |
| | | $T_j = 125^{\circ}\text{C}$ | $I_F = 3\text{ A}$ | | 0.56 | 0.65 | |
| | | $T_j = 25^{\circ}\text{C}$ | $I_F = 6\text{ A}$ | | | 0.94 | |
| | | $T_j = 125^{\circ}\text{C}$ | $I_F = 6\text{ A}$ | | 0.67 | 0.76 | |

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

To evaluate the conduction losses use the following equation :

$$P = 0.54 \times I_{F(AV)} + 0.037 I_{F(RMS)}^2$$

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

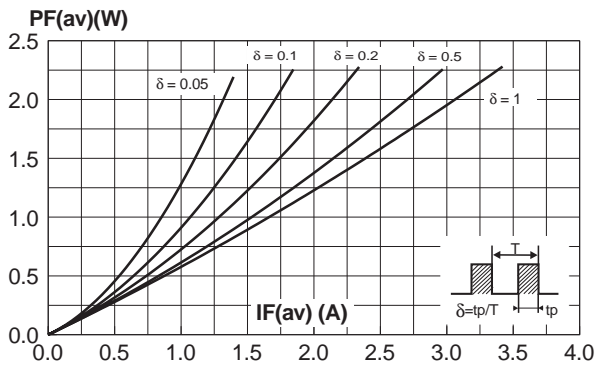


Fig. 2: Average forward current versus ambient temperature ($\delta = 0.5$).

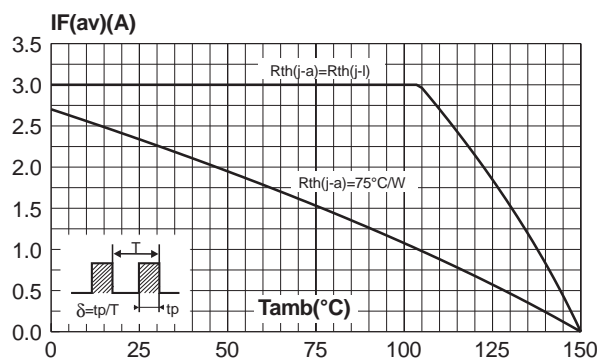


Fig. 3: Normalized avalanche power derating versus pulse duration.

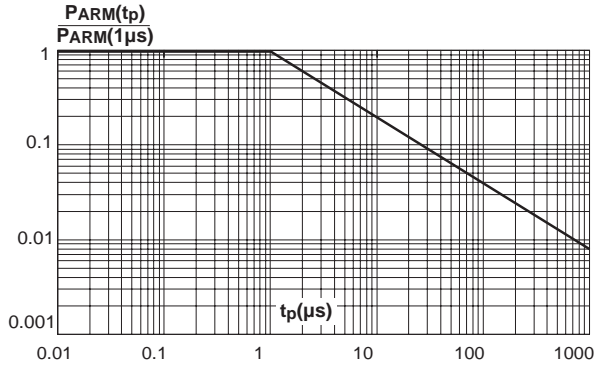


Fig. 4: Normalized avalanche power derating versus junction temperature.

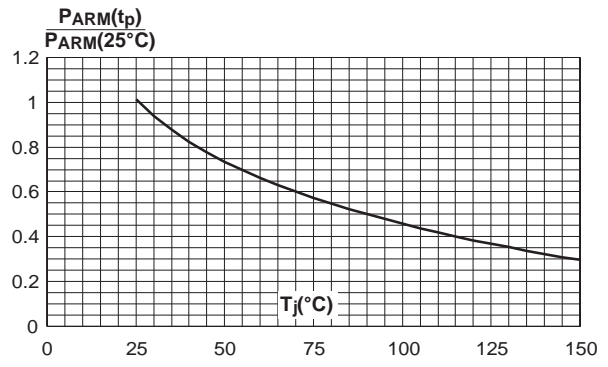


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values).

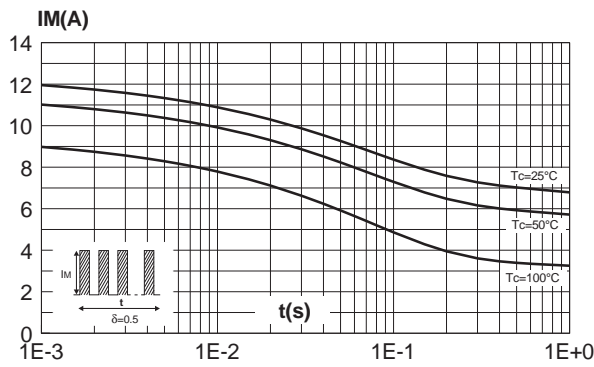


Fig. 6: Relative variation of thermal impedance junction to lead versus pulse duration.

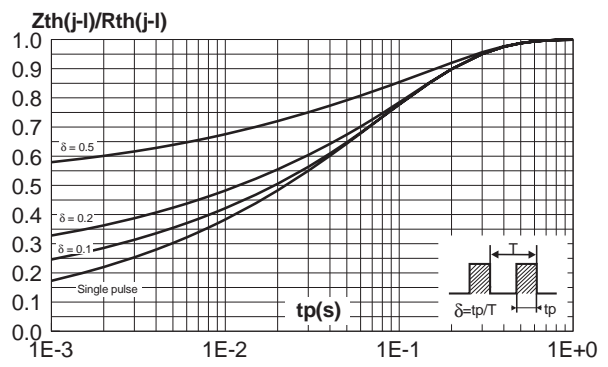


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values).

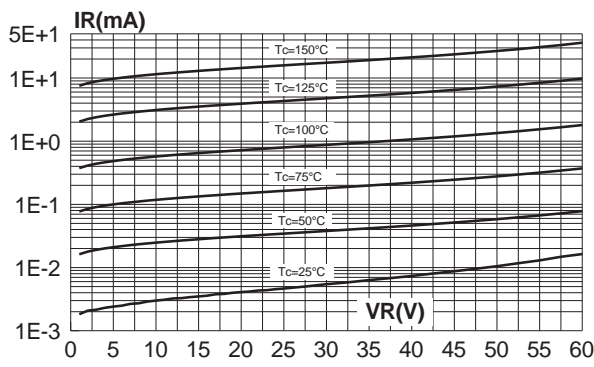


Fig. 8: Junction capacitance versus reverse voltage applied (typical values).

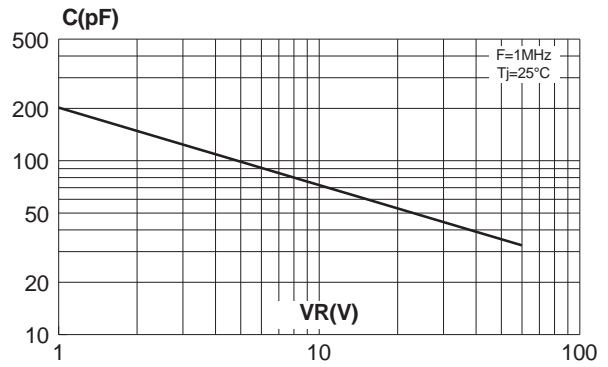


Fig. 9-1: Forward voltage drop versus forward current (low level, maximum values).

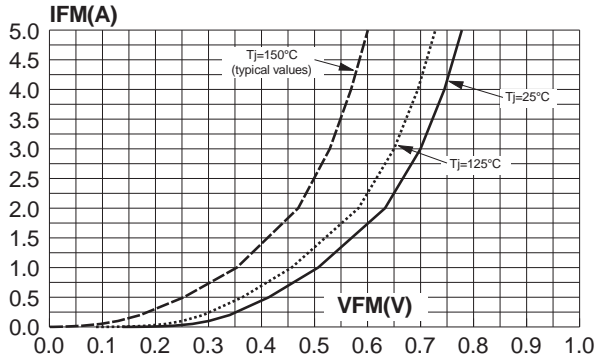


Fig. 9-2: Forward voltage drop versus forward current (high level, maximum values).

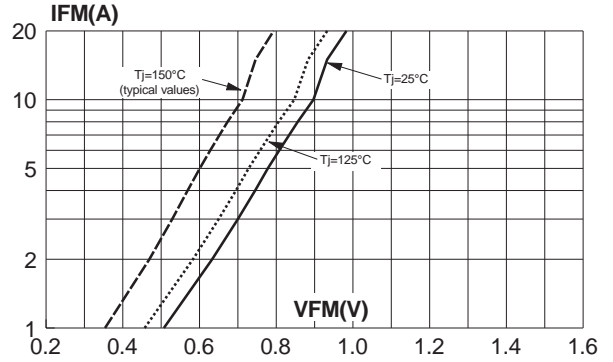
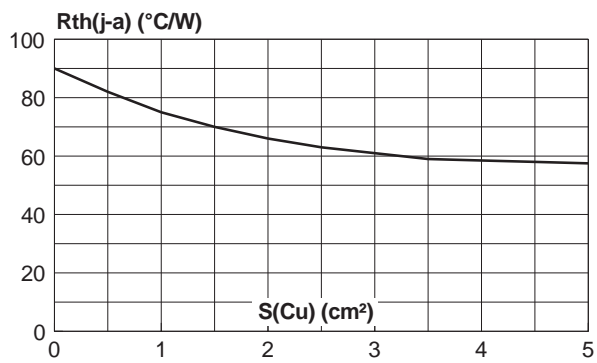


Fig. 10: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness: 35µm)

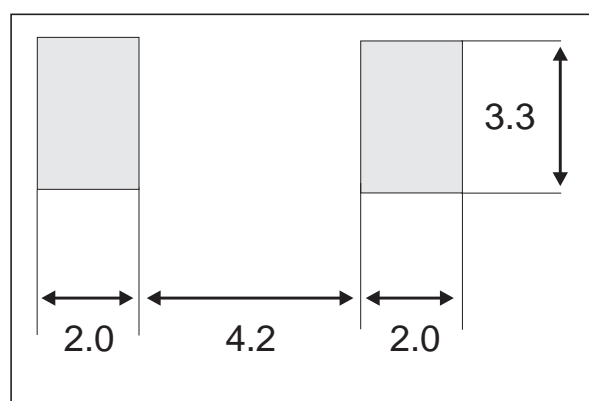


PACKAGE MECHANICAL DATA

SMC

| REF. | DIMENSIONS | | | |
|------|-------------|------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A1 | 1.90 | 2.45 | 0.075 | 0.096 |
| A2 | 0.05 | 0.20 | 0.002 | 0.008 |
| b | 2.90 | 3.2 | 0.114 | 0.126 |
| c | 0.15 | 0.41 | 0.006 | 0.016 |
| E | 7.75 | 8.15 | 0.305 | 0.321 |
| E1 | 6.60 | 7.15 | 0.260 | 0.281 |
| E2 | 4.40 | 4.70 | 0.173 | 0.185 |
| D | 5.55 | 6.25 | 0.218 | 0.246 |
| L | 0.75 | 1.60 | 0.030 | 0.063 |

FOOT PRINT (in millimeters)



| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|---------|---------|--------|----------|---------------|
| STPS3L60S | S36 | SMC | 0.24g | 2500 | Tape and reel |

- EPOXY MEETS UL94,V0

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