

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

| | |
|------------|-------|
| $I_F(AV)$ | 1 A |
| V_{RRM} | 40 V |
| $V_F(max)$ | 0.5 V |

FEATURES AND BENEFITS

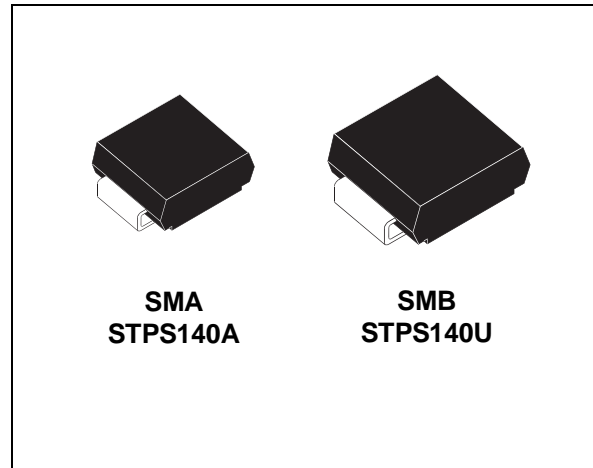
- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- LOW FORWARD VOLTAGE DROP
- SURFACE MOUNTED DEVICE

DESCRIPTION

Single chip Schottky rectifier suited for Switch-mode Power Supplies and high frequency DC to DC converters.

Packaged in SMA and SMB(*), this device is intended for surface mounting and used in low voltage, high frequency inverters, free wheeling and polarity protection applications.

(*) in accordance with DO214AA and DO21AC JEDEC



ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | | Value | Unit |
|------------|--|--|---------------------|---------------|------------|
| V_{RRM} | Repetitive peak reverse voltage | | | 40 | V |
| $I_F(RMS)$ | RMS forward current | | | 7 | A |
| $I_F(AV)$ | Average forward current $\delta = 0.5$ | SMA | $T_L = 130^\circ C$ | 1 | A |
| | | SMB | $T_L = 135^\circ C$ | | |
| I_{FSM} | Surge non repetitive forward current | $t_p = 10\text{ ms}$ Sinusoidal | | 60 | A |
| I_{RRM} | Repetitive peak reverse current | $t_p = 2\text{ }\mu s$ $F = 1\text{ kHz}$ | | 1 | A |
| I_{RSM} | Non repetitive peak reverse current | $t_p = 100\text{ }\mu s$ square | | 1 | A |
| T_{stg} | Storage temperature range | | | - 65 to + 150 | $^\circ C$ |
| T_j | Maximum junction temperature | | | 150 | |
| dV/dt | Critical rate of rise of reverse voltage | | | 10000 | V/ μs |

THERMAL RESISTANCES

| Symbol | Parameter | | Value | Unit |
|---------------|------------------|-----|-------|----------------------|
| $R_{th(j-l)}$ | Junction to lead | SMA | 30 | $^{\circ}\text{C/W}$ |
| | | SMB | 25 | |

STATIC ELECTRICAL CHARACTERISTICS

| Symbol | Tests Conditions | Tests Conditions | Min. | Typ. | Max. | Unit |
|------------|-------------------------|-----------------------------|--------------------|------|------|---------------|
| I_R^* | Reverse leakage current | $T_j = 25^{\circ}\text{C}$ | $V_R = 40\text{V}$ | | 12 | μA |
| | | $T_j = 100^{\circ}\text{C}$ | | 0.25 | 2 | mA |
| V_F^{**} | Forward voltage drop | $T_j = 25^{\circ}\text{C}$ | $I_F = 1\text{A}$ | | 0.55 | V |
| | | $T_j = 125^{\circ}\text{C}$ | $I_F = 1\text{A}$ | 0.43 | 0.5 | |
| | | $T_j = 25^{\circ}\text{C}$ | $I_F = 2\text{A}$ | | 0.65 | |
| | | $T_j = 125^{\circ}\text{C}$ | $I_F = 2\text{A}$ | 0.53 | 0.6 | |

Pulse test : * $t_p = 5\text{ms}$, $\delta < 2\%$
 ** $t_p = 380\mu\text{s}$, $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation :
 $P = 0.4 \times I_{F(AV)} + 0.10 \times I_F^2(RMS)$

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

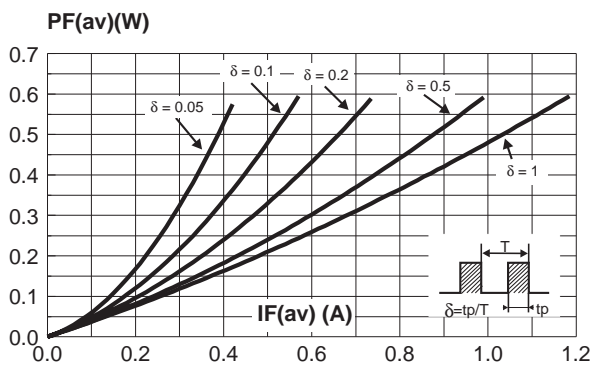


Fig. 2: Average forward current versus ambient temperature ($\delta=0.5$).

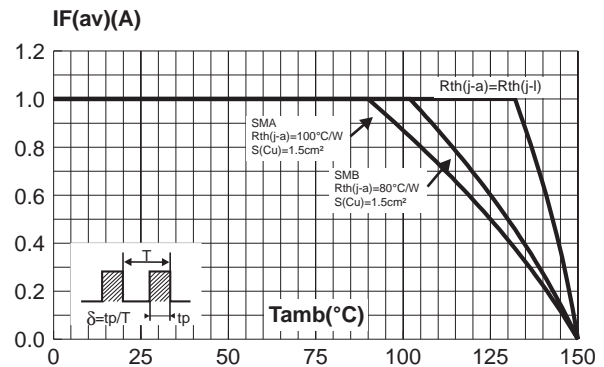


Fig. 3-1: Non repetitivesurge peak forward current versus overload duration (maximum values) (SMB).

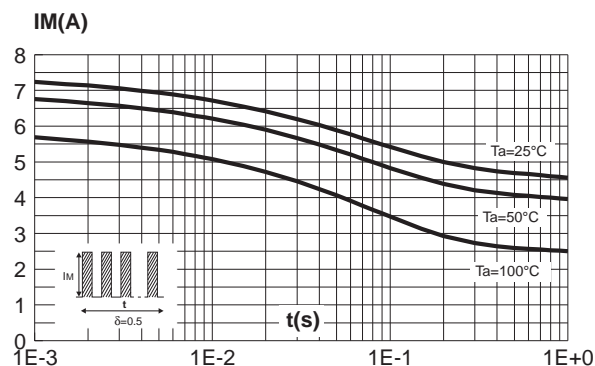


Fig. 3-2: Non repetitivesurge peak forward current versus overload duration (maximum values) (SMA).

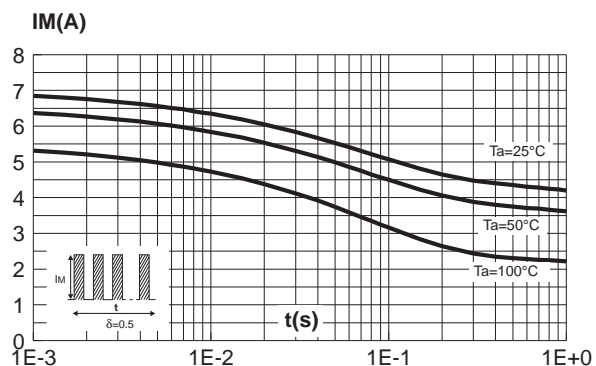


Fig. 4-1: Relative variation of thermal impedance junction to ambient versus pulse duration (SMB).

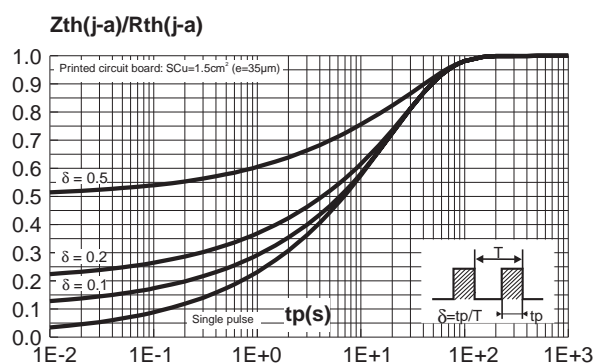


Fig. 4-2: Relative variation of thermal impedance junction to ambient versus pulse duration (SMA).

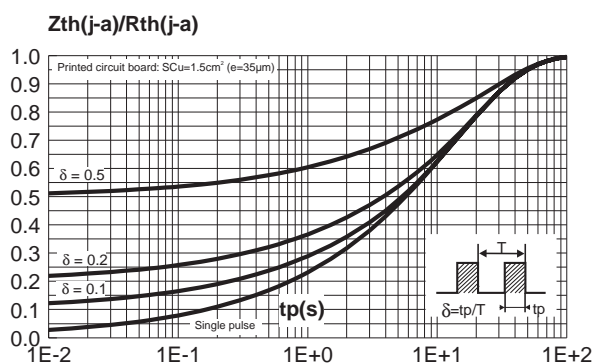


Fig. 5: Reverse leakage current versus reverse voltage applied (typical values).

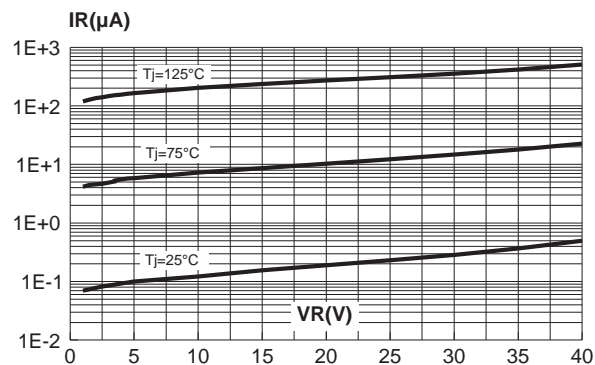


Fig. 6: Junction capacitance versus reverse voltage applied (typical values)

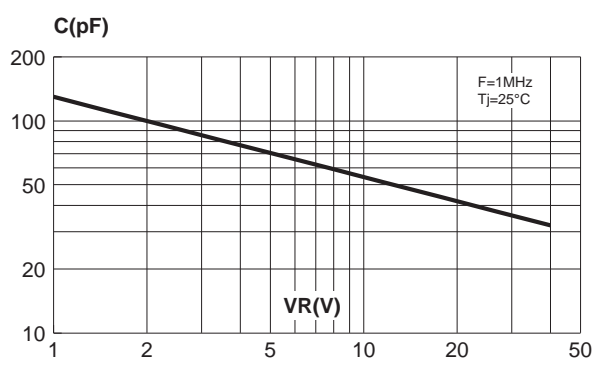


Fig. 7: Forward voltage drop versus forward current (maximum values).

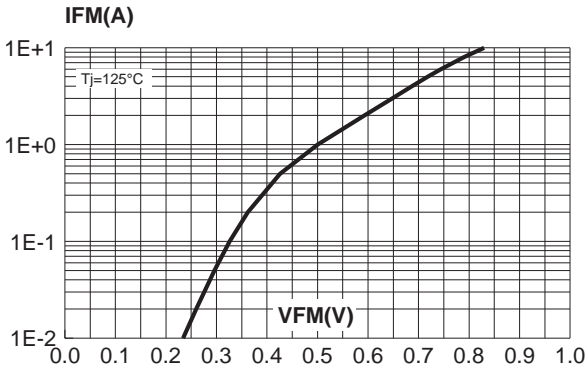


Fig. 8-1: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board, copper thickness: 35μm)(SMB).

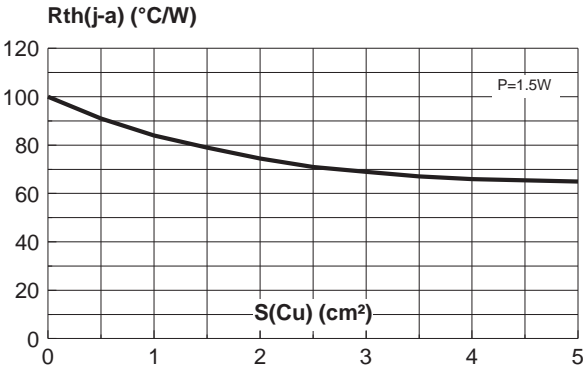
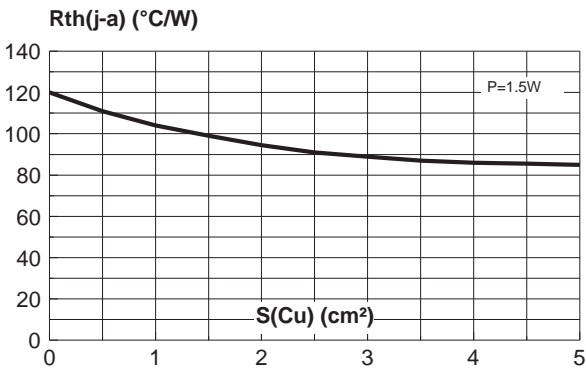


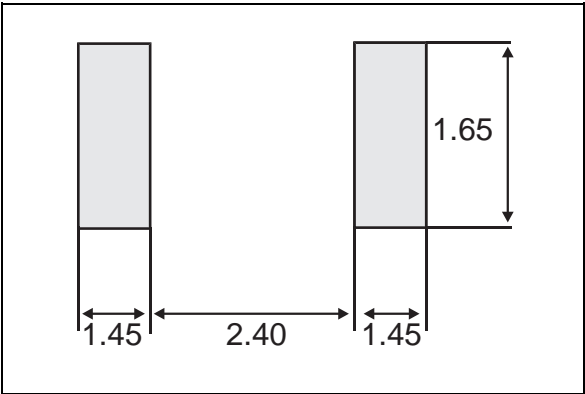
Fig. 8-2: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board, copper thickness: 35μm)(SMA).



PACKAGE MECHANICAL DATA
SMA

| REF. | DIMENSIONS | | | |
|------|-------------|------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A1 | 1.90 | 2.70 | 0.075 | 0.106 |
| A2 | 0.05 | 0.20 | 0.002 | 0.008 |
| b | 1.25 | 1.65 | 0.049 | 0.065 |
| c | 0.15 | 0.41 | 0.006 | 0.016 |
| E | 4.80 | 5.60 | 0.189 | 0.220 |
| E1 | 3.95 | 4.60 | 0.156 | 0.181 |
| D | 2.25 | 2.95 | 0.089 | 0.116 |
| L | 0.75 | 1.60 | 0.030 | 0.063 |

FOOT PRINT (in millimeters)



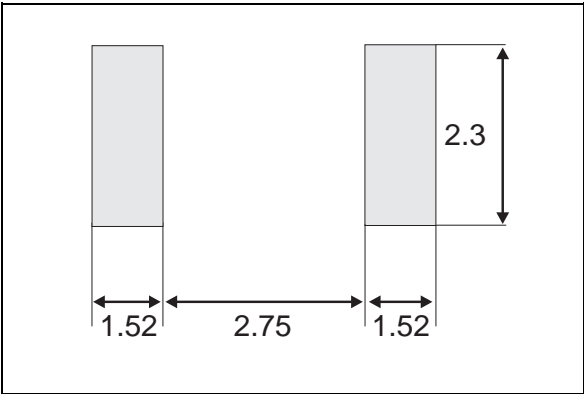
■ Marking: S140

PACKAGE MECHANICAL DATA
SMB Plastic

| | | | | |
|------|-------------|------|--------|-------|
| 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 | 1.95 | 2.20 | 0.077 | 0.087 |
| c | 0.15 | 0.41 | 0.006 | 0.016 |
| E | 5.10 | 5.60 | 0.201 | 0.220 |
| E1 | 4.05 | 4.60 | 0.159 | 0.181 |
| D | 3.30 | 3.95 | 0.130 | 0.156 |
| L | 0.75 | 1.60 | 0.030 | 0.063 |

FOOT PRINT (in millimeters)

■ Marking: G14



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