

SMALL SIGNAL SCHOTTKY DIODE

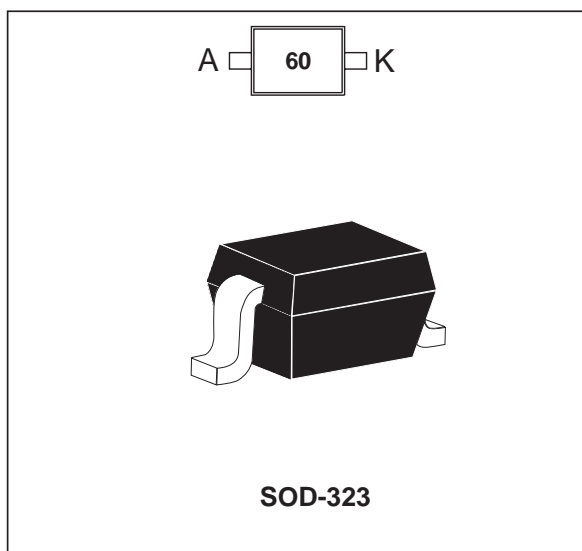
FEATURES AND BENEFITS

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

DESCRIPTION

Schottky barrier diode encapsulated in a SOD-323 small SMD package.

This device is intended for use in portable equipments. It is suited for DC to DC converters, step-up conversion and power management.



ABSOLUTE RATINGS (limiting values)

| Symbol | Parameter | | Value | Unit |
|-----------|--|------------------|--------------|------------|
| V_{RRM} | Repetitive peak reverse voltage | | 10 | V |
| I_F | Peak forward current | $\delta = 0.11$ | 3 | A |
| I_{FSM} | Surge non repetitive forward current | $t_p=10ms$ | 5 | A |
| P_{tot} | Power Dissipation | $T_a=25^\circ C$ | 310 | mW |
| T_{stg} | Storage temperature range | | - 65 to +150 | $^\circ C$ |
| T_j | Maximum operating junction temperature * | | 150 | $^\circ C$ |
| TL | Maximum temperature for soldering during 10s | | 260 | $^\circ C$ |

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

THERMAL RESISTANCE

| Symbol | Parameter | Value | Unit |
|---------------|-------------------------|-------|--------------|
| $R_{th(j-a)}$ | Junction to ambient (*) | 400 | $^\circ C/W$ |

(*) Mounted on epoxy board with recommended pad layout.

BAT60J**STATIC ELECTRICAL CHARACTERISTICS**

| Symbol | Tests Conditions | Tests conditions | | Min. | Typ. | Max. | Unit |
|----------|-------------------------|--------------------------|-----------------------|------|------|------|---------------|
| V_F * | Forward voltage drop | $T_j = 25^\circ\text{C}$ | $I_F = 10\text{ mA}$ | | 0.28 | 0.32 | V |
| | | | $I_F = 100\text{ mA}$ | | 0.35 | 0.40 | |
| | | | $I_F = 1\text{ A}$ | | 0.53 | 0.58 | |
| I_R ** | Reverse leakage current | $T_j = 25^\circ\text{C}$ | $V_R = 5\text{ V}$ | | 1 | 3 | μA |
| | | $T_j = 25^\circ\text{C}$ | $V_R = 8\text{ V}$ | | 1.3 | 4 | |
| | | $T_j = 25^\circ\text{C}$ | $V_R = 10\text{ V}$ | | 2 | 6 | |
| | | $T_j = 25^\circ\text{C}$ | $V_R = 12\text{ V}$ | | 2.5 | 7.5 | |
| | | $T_j = 80^\circ\text{C}$ | $V_R = 8\text{ V}$ | | 73 | 150 | |

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

** $t_p = 5\text{ms}$, $\delta < 2\%$

To evaluate the conduction losses the following equation:

$$P = 0.38 \times I_{F(AV)} + 0.17 I_{F(RMS)}^2$$

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

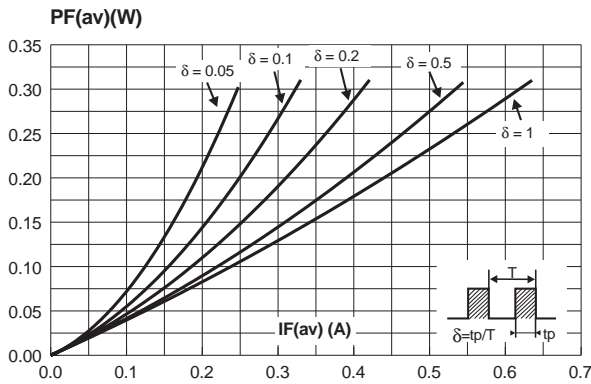


Fig. 2-1: Peak forward current versus ambient temperature ($\delta = 0.11$).

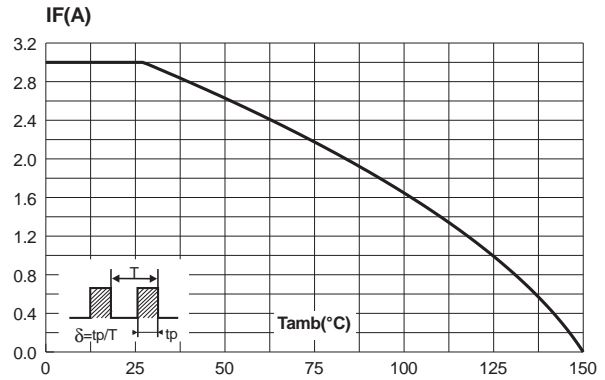


Fig. 2-2: Average forward current versus ambient temperature ($\delta = 0.5$).

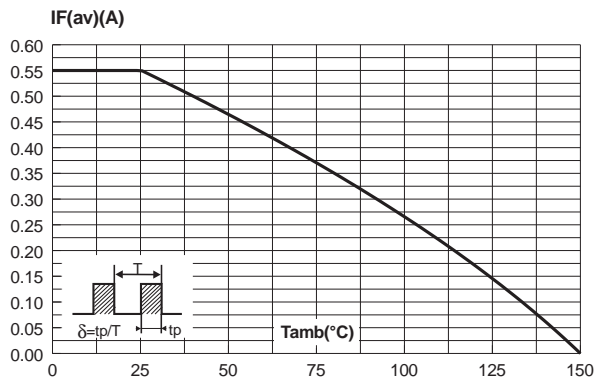


Fig. 3: Non repetitive surge peak forward current versus overload duration (maximum values).

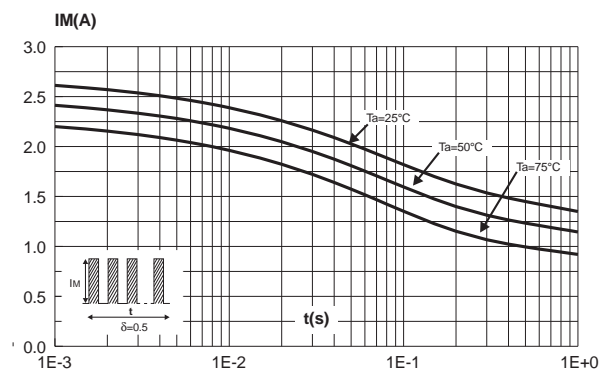


Fig. 4: Relative variation of thermal impedance junction to ambient versus pulse duration (Epoxy printed circuit board FR4 with recommended pad layout).

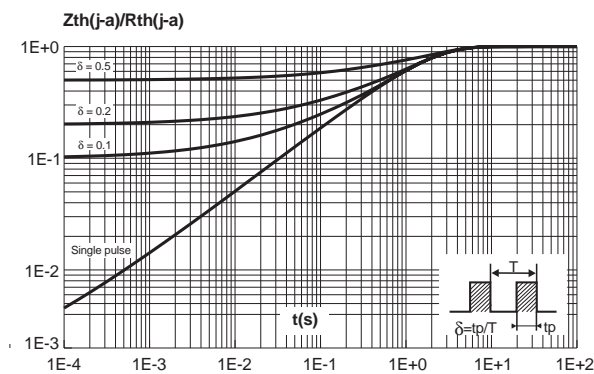
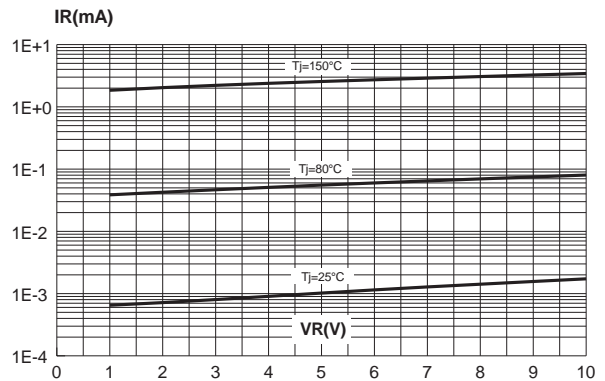


Fig. 5: Reverse leakage current versus reverse voltage applied (typical values).



BAT60J

Fig. 6: Reverse leakage current versus junction temperature (typical values).

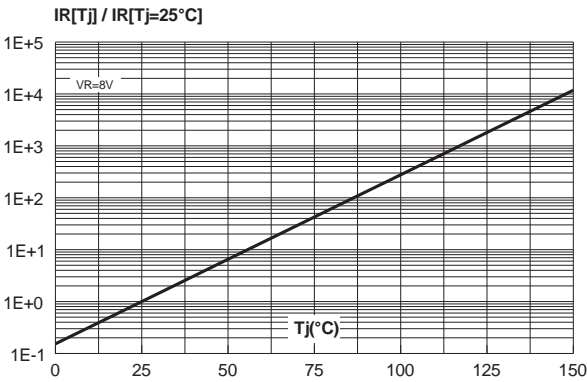


Fig. 7: Junction capacitance versus reverse voltage applied (typical values).

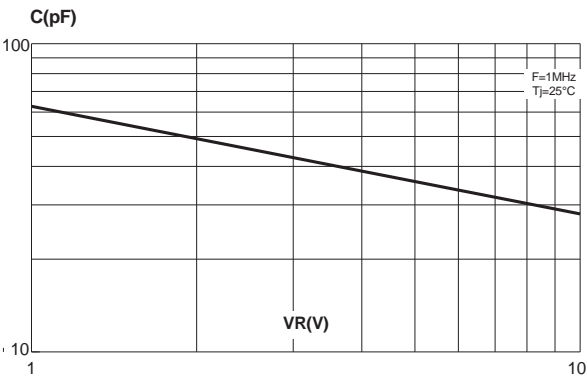


Fig. 8-1: Forward voltage drop versus forward current (High level).

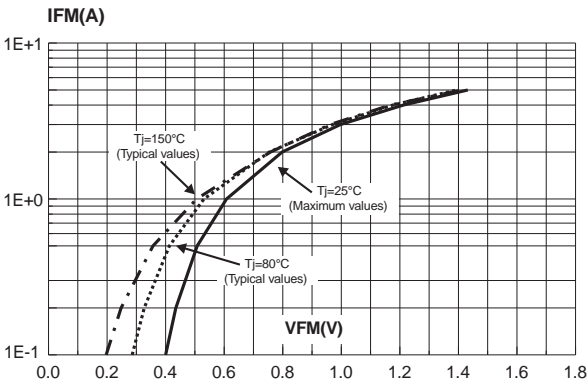


Fig. 8-2: Forward voltage drop versus forward current (Low level).

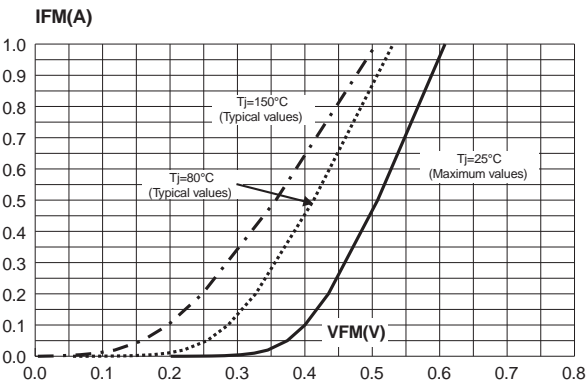
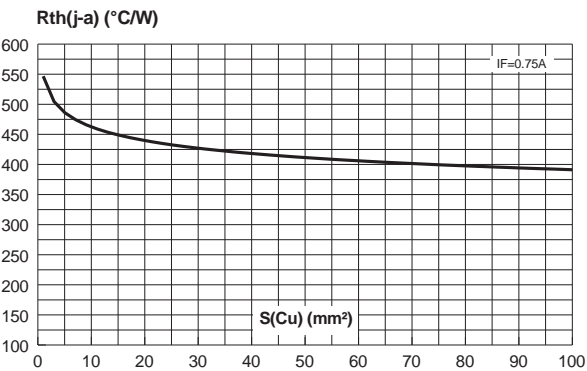


Fig. 9: Thermal resistance junction to ambient versus copper surface (epoxy printed circuit board FR4, copper thickness: 35μm).



PACKAGE MECHANICAL DATA
SOD-323

| REF. | DIMENSIONS | | | |
|------|-------------|------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | | 1.17 | | 0.046 |
| A1 | 0 | 0.1 | 0 | 0.004 |
| b | 0.25 | 0.44 | 0.01 | 0.017 |
| c | 0.1 | 0.25 | 0.004 | 0.01 |
| D | 1.52 | 1.8 | 0.06 | 0.071 |
| E | 1.11 | 1.45 | 0.044 | 0.057 |
| H | 2.3 | 2.7 | 0.09 | 0.106 |
| L | 0.1 | 0.46 | 0.004 | 0.02 |
| Q1 | 0.1 | 0.41 | 0.004 | 0.016 |

MARKING

| Type | Marking | Package | Weight | Base qty | Delivery mode |
|------------|---------|---------|----------|----------|---------------|
| BAT60JFILM | 60 | SOD-323 | 0.005 g. | 3000 | Tape & reel |

- Epoxy meets UL94V-0

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