

## SMALL SIGNAL SCHOTTKY DIODE

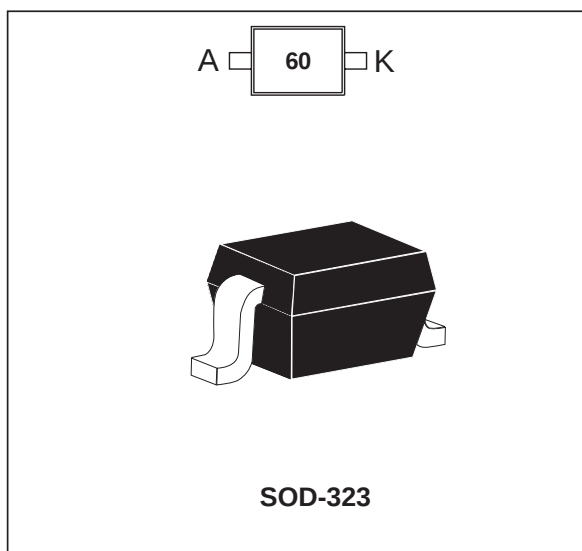
### FEATURES AND BENEFITS

- 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    | $\mu\text{A}$ |
|            |                         | $T_j = 25^\circ\text{C}$ | $V_R = 8\text{ V}$    |      | 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  |               |

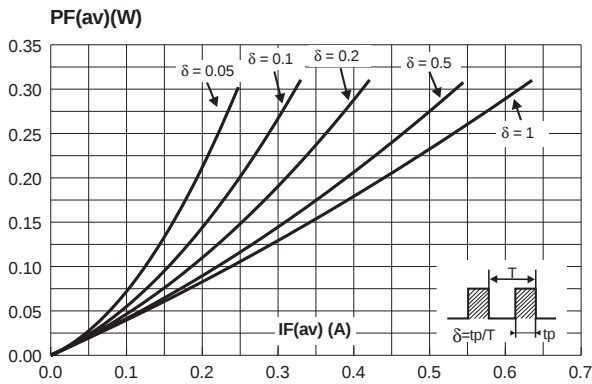
Pulse test: \*  $t_p = 380\mu\text{s}$ ,  $\delta < 2\%$

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

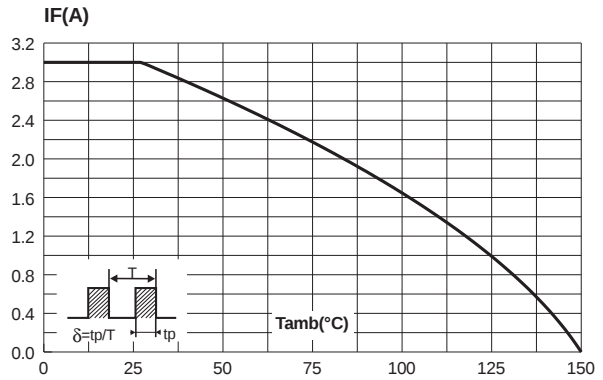
To evaluate the conduction losses the following equation:

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

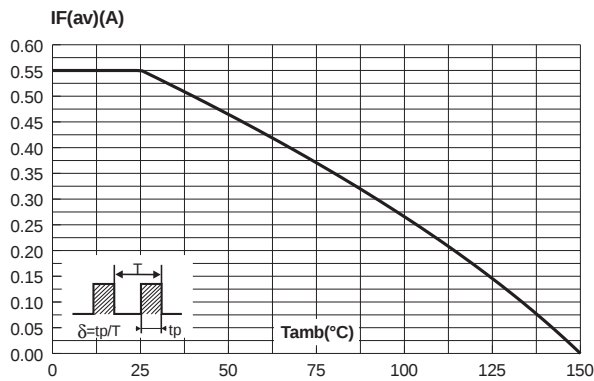
**Fig. 1:** Average forward power dissipation versus average forward current.



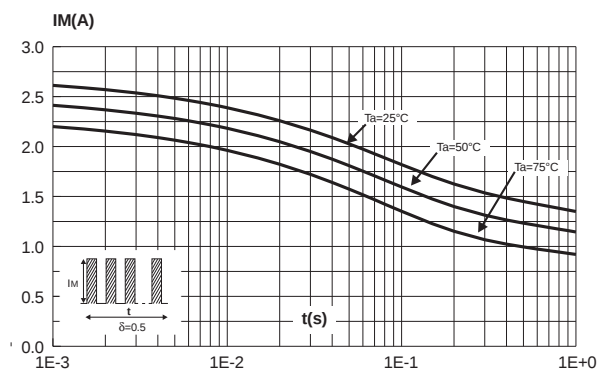
**Fig. 2-1:** Peak forward current versus ambient temperature ( $\delta = 0.11$ ).



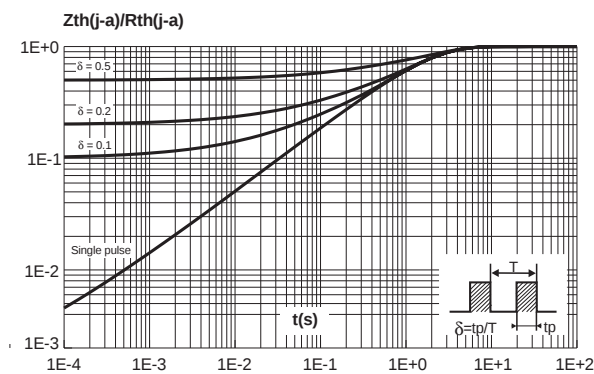
**Fig. 2-2:** Average forward current versus ambient temperature ( $\delta = 0.5$ ).



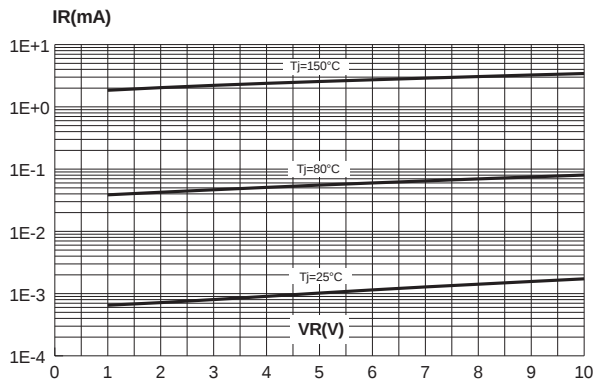
**Fig. 3:** Non repetitive surge peak forward current versus overload duration (maximum values).



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

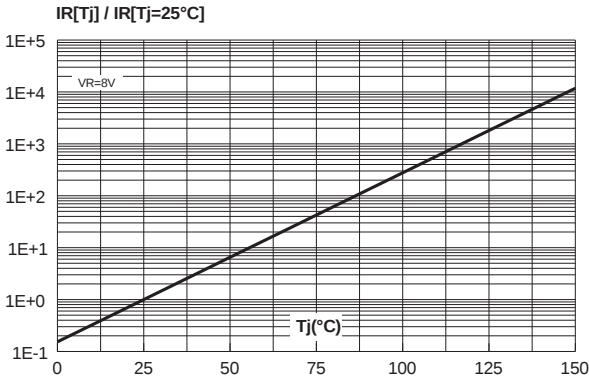


**Fig. 5:** Reverse leakage current versus reverse voltage applied (typical values).

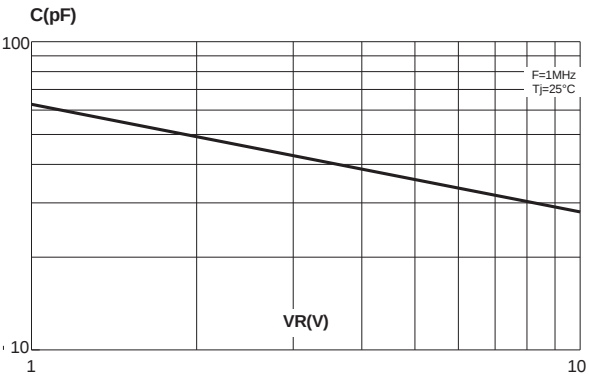


# BAT60J

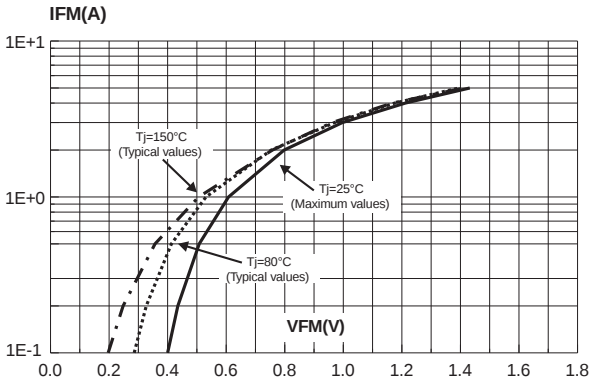
**Fig. 6:** Reverse leakage current versus junction temperature (typical values).



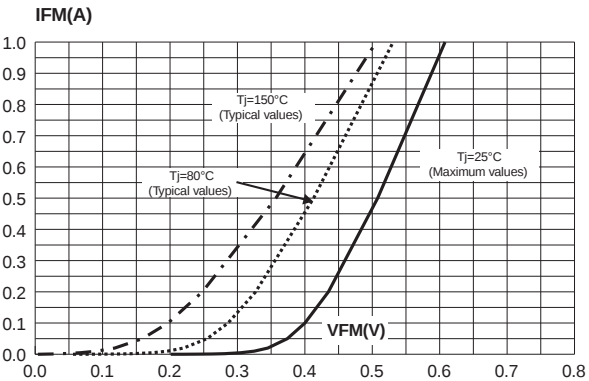
**Fig. 7:** Junction capacitance versus reverse voltage applied (typical values).



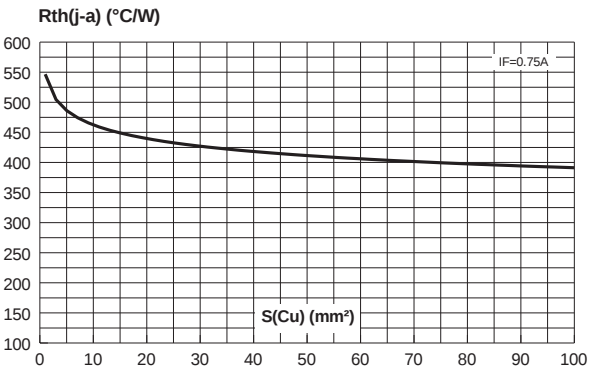
**Fig. 8-1:** Forward voltage drop versus forward current (High level).



**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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