



# BAT54, A, C, S

## SMALL SIGNAL SCHOTTKY DIODE

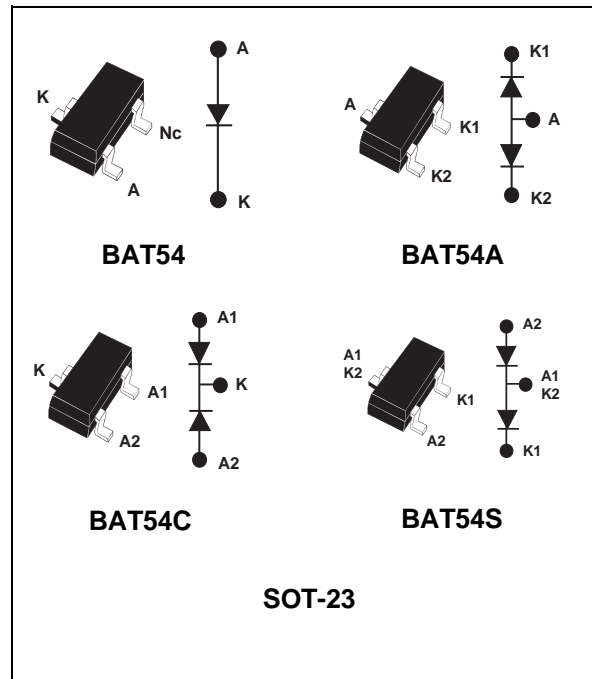
### FEATURES AND BENEFITS

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

### DESCRIPTION

Schottky barrier diodes encapsulated in a SOT-23 small SMD packages.

Double diodes with different pinning are available.



### ABSOLUTE RATINGS (limiting values)

| Symbol    | Parameter                                    |                        | Value        | Unit       |
|-----------|--|------------------------|--------------|------------|
| $V_{RRM}$ | Repetitive peak reverse voltage              |                        | 30           | V          |
| $I_F$     | Continuous forward current                   |                        | 0.3          | A          |
| $I_{FSM}$ | Surge non repetitive forward current         | $t_p=10ms$ sinusoidal  | 1            | A          |
| $P_{tot}$ | Power dissipation (note 1)                   | $T_{amb} = 25^\circ C$ | 250          | mW         |
| $T_{stg}$ | Maximum storage temperature range            |                        | - 65 to +150 | $^\circ C$ |
| $T_j$     | Maximum operating junction temperature *     |                        | 150          | $^\circ C$ |
| $T_L$     | Maximum temperature for soldering during 10s |                        | 260          | $^\circ C$ |

**Note 1:** for double diodes,  $P_{tot}$  is the total dissipation of both diodes.

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

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### THERMAL RESISTANCE

| Symbol        | Parameter               | Value | Unit |
|---------------|-------------------------|-------|------|
| $R_{th(j-a)}$ | Junction to ambient (*) | 500   | °C/W |

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

### STATIC ELECTRICAL CHARACTERISTICS (per diode)

| Symbol     | Parameters              | Tests conditions          | Min.                  | Typ. | Max. | Unit |               |
|------------|-------------------------|---------------------------|-----------------------|------|------|------|---------------|
| $V_F^*$    | Forward voltage drop    | $T_j = 25^\circ\text{C}$  | $I_F = 0.1\text{ mA}$ |      |      | 240  | mV            |
|            |                         |                           | $I_F = 1\text{ mA}$   |      |      | 320  |               |
|            |                         |                           | $I_F = 10\text{ mA}$  |      |      | 400  |               |
|            |                         |                           | $I_F = 30\text{ mA}$  |      |      | 500  |               |
|            |                         |                           | $I_F = 100\text{ mA}$ |      |      | 900  |               |
| $I_R^{**}$ | Reverse leakage current | $T_j = 25^\circ\text{C}$  | $V_R = 30\text{ V}$   |      |      | 1    | $\mu\text{A}$ |
|            |                         | $T_j = 100^\circ\text{C}$ |                       |      |      | 100  |               |

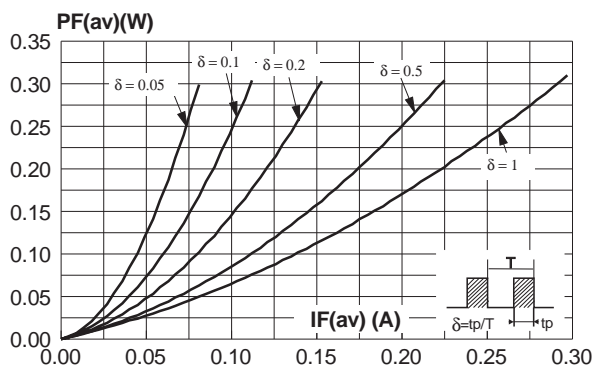
Pulse test : \*  $t_p = 380\ \mu\text{s}$ ,  $\delta < 2\%$

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

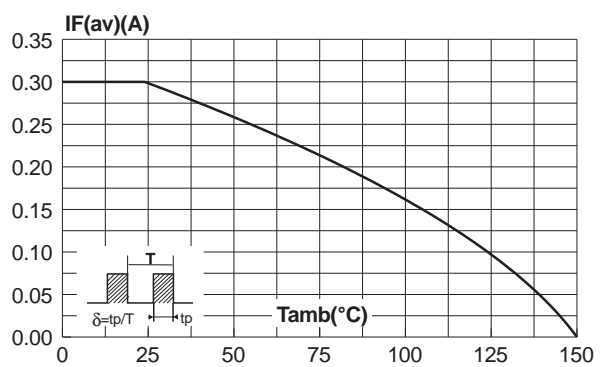
### DYNAMIC CHARACTERISTICS ( $T_j = 25^\circ\text{C}$ )

| Symbol   | Parameters            | Tests conditions   | Min. | Typ. | Max. | Unit |
|----------|-----------------------|--|------|------|------|------|
| C        | Junction capacitance  | $T_j = 25^\circ\text{C}$ $V_R = 1\text{ V}$ $F = 1\text{ MHz}$   |      |      | 10   | pF   |
| $t_{rr}$ | Reverse recovery time | $I_F = 10\text{ mA}$ $I_R = 10\text{ mA}$ $T_j = 25^\circ\text{C}$<br>$I_{rr} = 1\text{ mA}$ $R_L = 100\ \Omega$ |      |      | 5    | ns   |

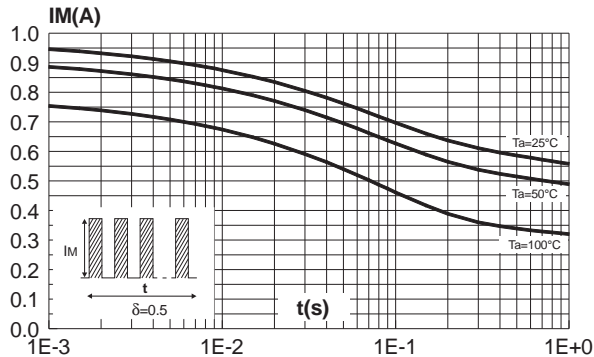
**Fig.1** : Average forward power dissipation versus average forward current.



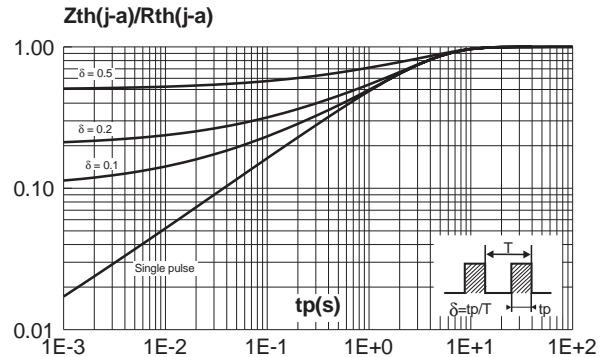
**Fig.2** : Average forward current versus ambient temperature ( $\delta = 1$ ).



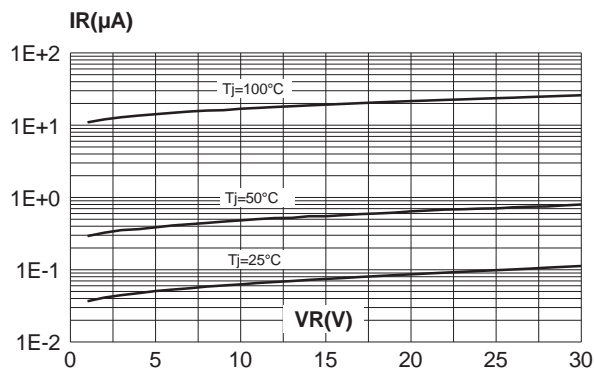
**Fig.3** : Non repetitive surge peak forward current versus overload duration (maximum values).



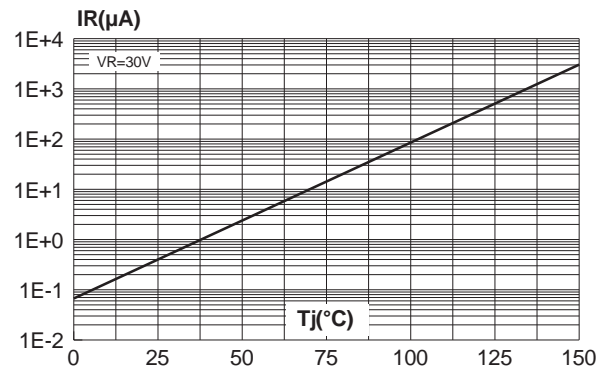
**Fig.4** : Relative variation of thermal impedance junction to ambient versus pulse duration (alumine substrate 10mm x 8mm x 0.5mm).



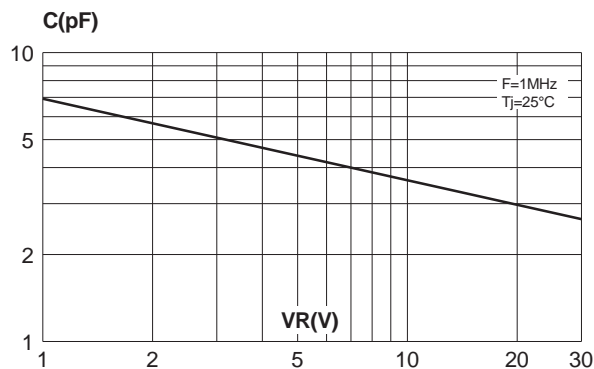
**Fig.5** : Reverse leakage current versus reverse voltage applied (typical values).



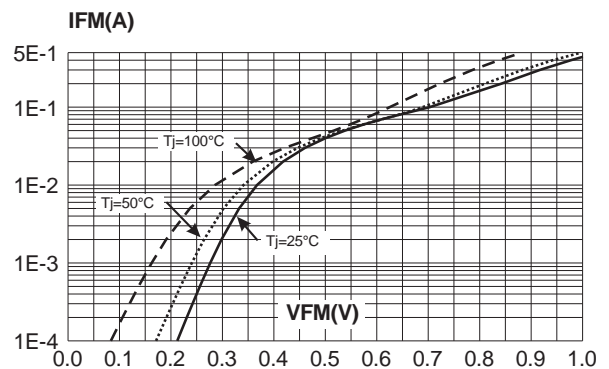
**Fig.6** : Reverse leakage current versus junction temperature.



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

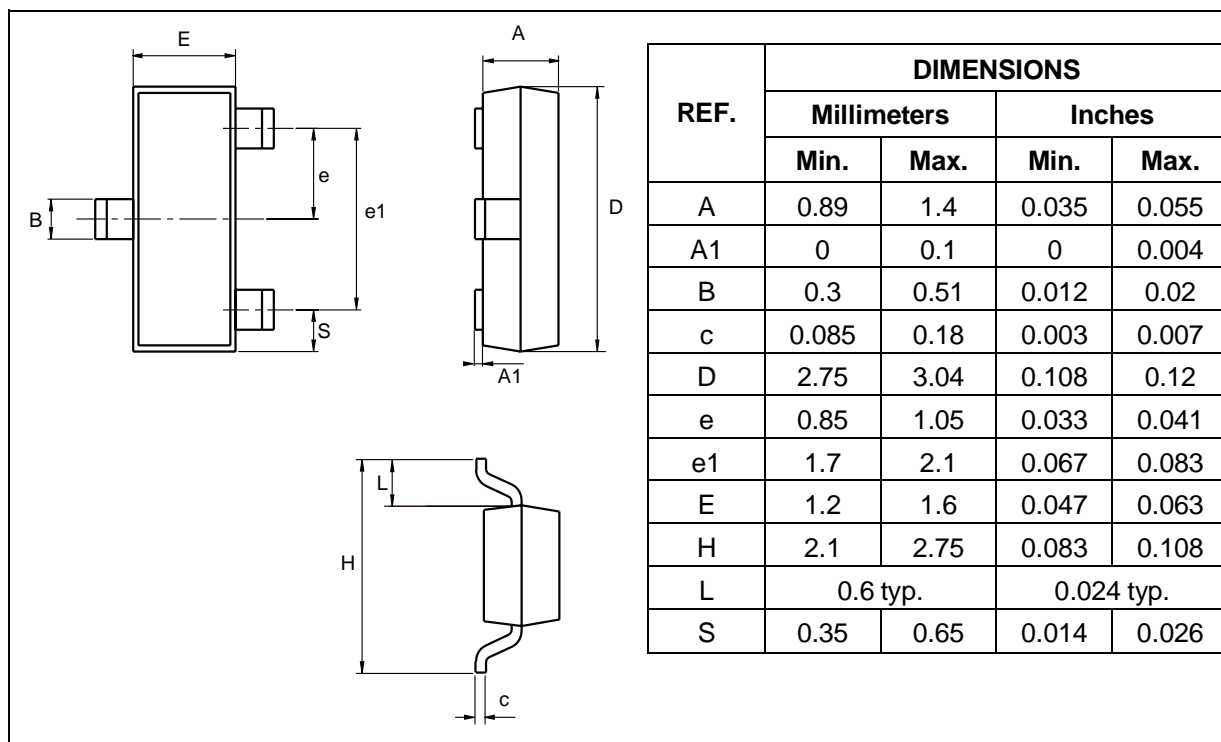


**Fig.8** : Forward voltage drop versus forward current (typical values).



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### PACKAGE MECHANICAL DATA SOT-23



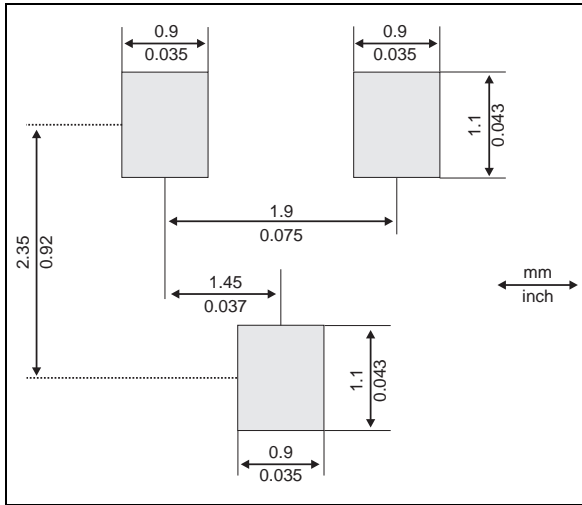
| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|---------|---------|--------|----------|---------------|
| BAT54FILM     | D86     | SOT-23  | 0.01g  | 3000     | Tape & reel   |
| BAT54AFILM    | D84     | SOT-23  | 0.01g  | 3000     | Tape & reel   |
| BAT54CFILM    | D87     | SOT-23  | 0.01g  | 3000     | Tape & reel   |
| BAT54SFILM    | D88     | SOT-23  | 0.01g  | 3000     | Tape & reel   |

■ Epoxy meets UL94,V0

**FOOTPRINT DIMENSIONS**

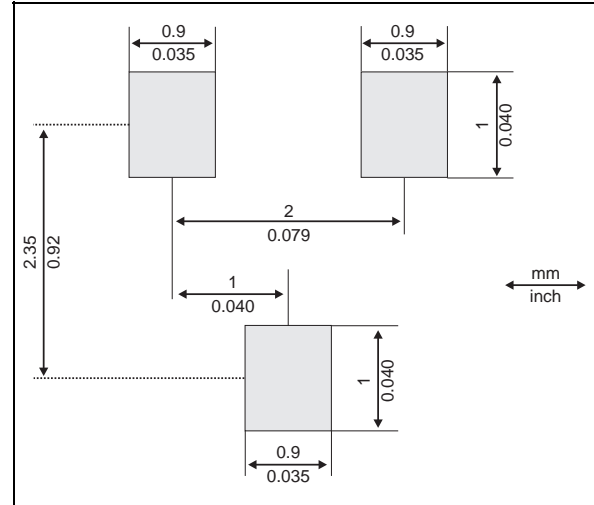
COMPATIBLE SOT-23 / SC-59

(in millimeters and inches)



**OPTIMIZED SOT-23 FOOTPRINT DIMENSIONS**

(in millimeters and inches)



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