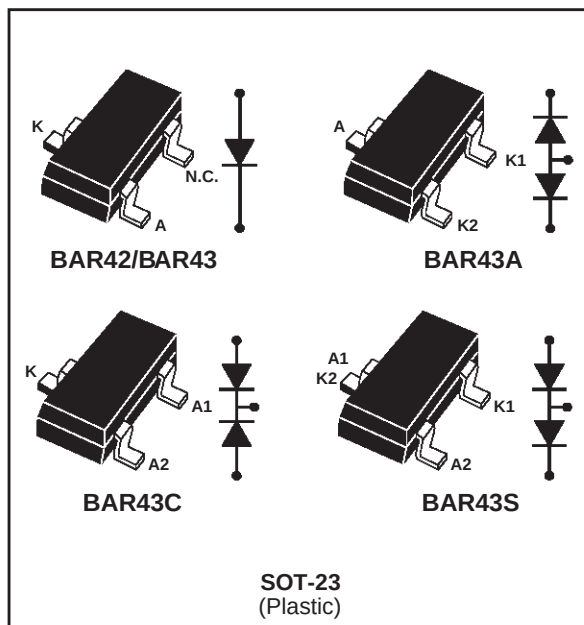


## SMALL SIGNAL SCHOTTKY DIODES

### DESCRIPTION

General purpose metal to silicon diodes featuring very low turn-on voltage and fast switching.



### ABSOLUTE RATINGS (limiting values)

| Symbol           | Parameter                                    |                         | Value        | Unit |
|------------------|----------------------------------------------|-------------------------|--------------|------|
| V <sub>RRM</sub> | Repetitive peak reverse voltage              |                         | 30           | V    |
| I <sub>F</sub>   | Continuous forward current                   |                         | 100          | mA   |
| I <sub>FSM</sub> | Surge non repetitive forward current         | tp=10ms sinusoidal      | 750          | mA   |
| P <sub>tot</sub> | Power dissipation (note 1)                   | T <sub>amb</sub> = 25°C | 250          | mW   |
| T <sub>stg</sub> | Maximum storage temperature range            |                         | - 65 to +150 | °C   |
| T <sub>j</sub>   | Maximum operating junction temperature *     |                         | 150          | °C   |
| T <sub>L</sub>   | Maximum temperature for soldering during 10s |                         | 260          | °C   |

**Note 1:** for double diodes, P<sub>tot</sub> is the total power 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

### THERMAL RESISTANCE

| Symbol               | Test conditions    | Value | Unit |
|----------------------|--------------------|-------|------|
| R <sub>th(j-a)</sub> | Junction-ambient * | 500   | °C/W |

\* Mounted on epoxy board with recommended pad layout.

## BAR 42/BAR 43, A, C, S

### ELECTRICAL CHARACTERISTICS

#### STATIC CHARACTERISTICS

| Symbol     | Test Conditions           |                        |                       | Min. | Typ. | Max. | Unit          |
|------------|---------------------------|------------------------|-----------------------|------|------|------|---------------|
| $V_{BR}$   | $T_j = 25^\circ\text{C}$  | $I_R = 100\mu\text{A}$ |                       | 30   |      |      | V             |
| $V_F^*$    | $T_j = 25^\circ\text{C}$  | BAR 42                 | $I_F = 10\text{ mA}$  |      | 0.35 | 0.4  | V             |
|            |                           |                        | $I_F = 50\text{ mA}$  |      | 0.5  | 0.65 |               |
|            |                           | BAR 43                 | $I_F = 2\text{ mA}$   | 0.26 |      | 0.33 |               |
|            |                           |                        | $I_F = 15\text{ mA}$  |      |      | 0.45 |               |
|            |                           | All                    | $I_F = 100\text{ mA}$ |      |      | 1    |               |
| $I_R^{**}$ | $T_j = 25^\circ\text{C}$  | $V_R = 25\text{V}$     |                       |      |      | 500  | nA            |
|            | $T_j = 100^\circ\text{C}$ |                        |                       |      |      | 100  | $\mu\text{A}$ |

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

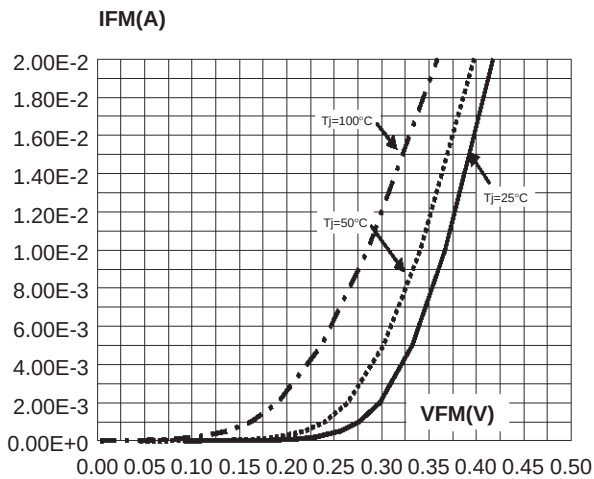
\*\*  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

#### DYNAMIC CHARACTERISTICS

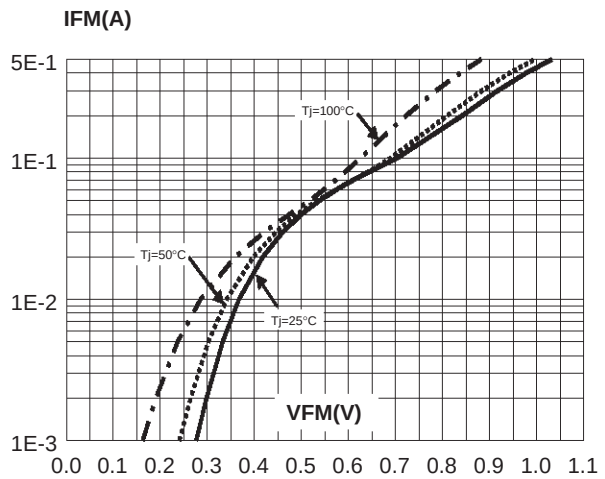
| Symbol   | Test Conditions                                   |                                                |                                     | Min. | Typ. | Max. | Unit |
|----------|---------------------------------------------------|------------------------------------------------|-------------------------------------|------|------|------|------|
| C        | $T_j = 25^\circ\text{C}$                          | $V_R = 1\text{V}$                              | $F = 1\text{MHz}$                   |      | 7    |      | pF   |
| $t_{rr}$ | $T_j = 25^\circ\text{C}$<br>$I_{rr} = 1\text{mA}$ | $I_F = 10\text{ mA}$<br>$R_L = 100\ \Omega$    | $I_R = 10\text{ mA}$                |      |      | 5    | ns   |
| $\eta^*$ | $T_j = 25^\circ\text{C}$<br>$F = 45\text{MHz}$    | $R_L = 50\text{ K}\Omega$<br>$V_i = 2\text{V}$ | $C_L = 300\text{ pF}$<br>for BAR 43 | 80   |      |      | %    |

\* Detection efficiency.

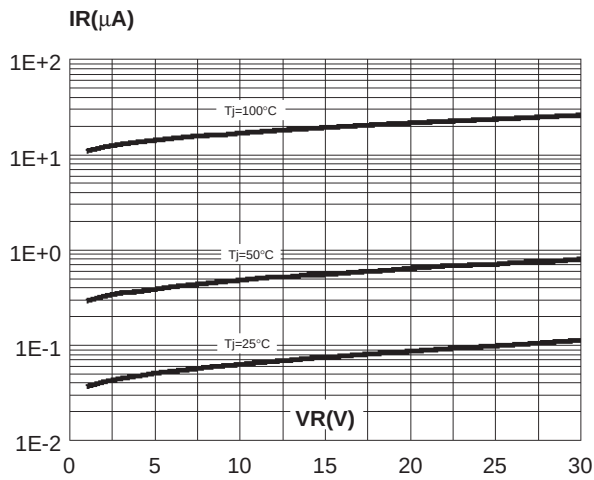
**Fig. 1-1:** Forward voltage drop versus forward current (typical values, low level).



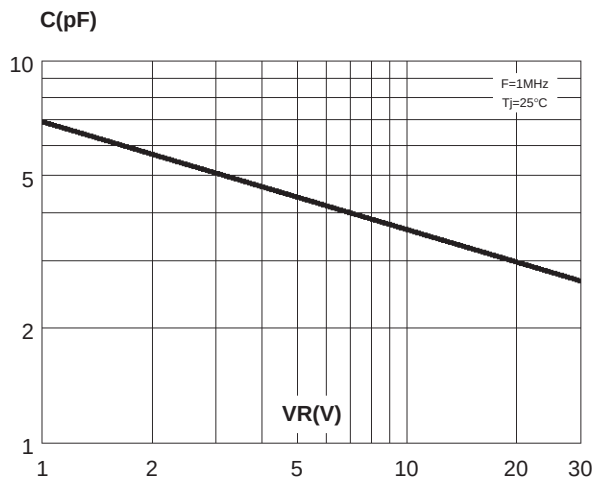
**Fig. 1-2:** Forward voltage drop versus forward current (typical values, high level).



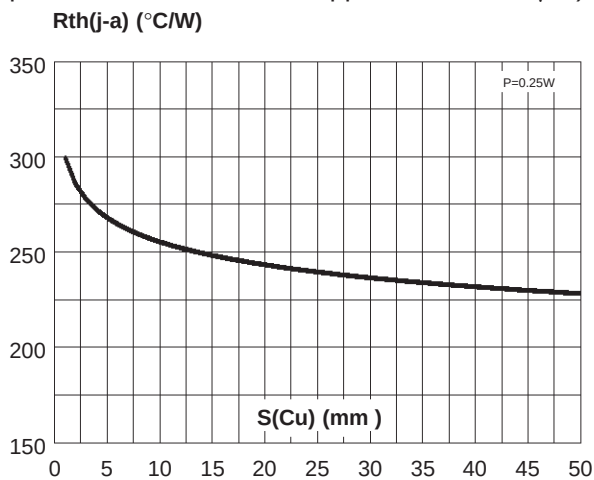
**Fig. 2:** Reverse leakage current versus reverse voltage applied (typical values).



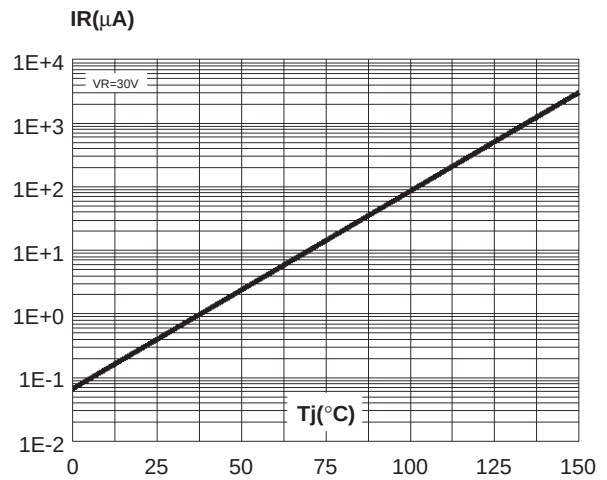
**Fig. 4:** Junction capacitance versus reverse voltage applied (typical values).



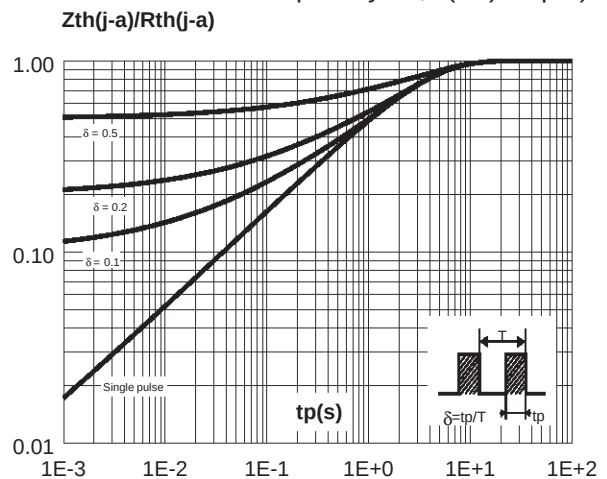
**Fig. 6:** Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, copper thickness:  $35\mu m$ ).



**Fig. 3:** Reverse leakage current versus junction temperature.



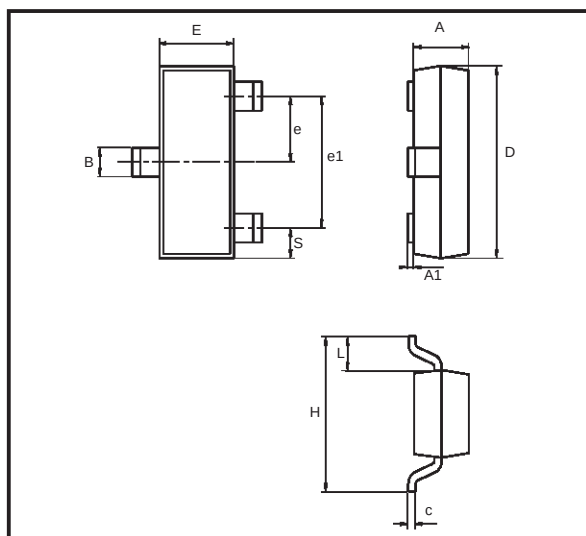
**Fig. 5:** Relative variation of thermal impedance junction to ambient versus pulse duration (epoxy FR4 with recommended pad layout,  $e(Cu) = 35\mu m$ ).



## BAR 42/BAR 43, A, C, S

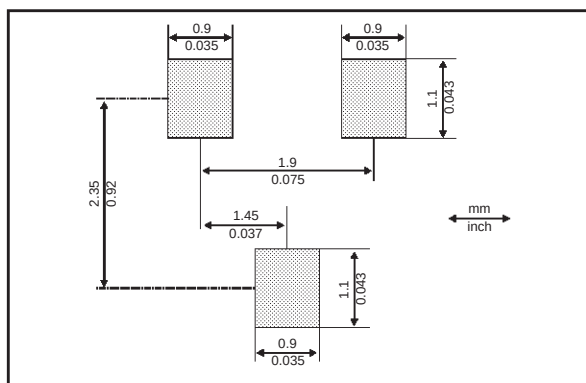
### PACKAGE MECHANICAL DATA

SOT 23 (Plastic)



| REF. | DIMENSIONS  |      |            |       |
|------|-------------|------|------------|-------|
|      | Millimeters |      | Inches     |       |
|      | Min.        | Max. | Min.       | Max.  |
| A    | 0.89        | 1.4  | 0.035      | 0.055 |
| A1   | 0           | 0.1  | 0          | 0.004 |
| B    | 0.3         | 0.51 | 0.012      | 0.02  |
| c    | 0.085       | 0.18 | 0.003      | 0.007 |
| D    | 2.75        | 3.04 | 0.108      | 0.12  |
| e    | 0.85        | 1.05 | 0.033      | 0.041 |
| e1   | 1.7         | 2.1  | 0.067      | 0.083 |
| E    | 1.2         | 1.6  | 0.047      | 0.063 |
| H    | 2.1         | 2.75 | 0.083      | 0.108 |
| L    | 0.6 typ.    |      | 0.024 typ. |       |
| S    | 0.35        | 0.65 | 0.014      | 0.026 |

### FOOT PRINT DIMENSIONS



| Ordering type | Marking | Package | Weight | Base qty | Delivery mode |
|---------------|---------|---------|--------|----------|---------------|
| BAR42         | D94     | SOT-23  | 0.01g  | 3000     | Tape & reel   |
| BAR43         | D95     | SOT-23  | 0.01g  | 3000     | Tape & reel   |
| BAR43S        | DB1     | SOT-23  | 0.01g  | 3000     | Tape & reel   |
| BAR43C        | DB2     | SOT-23  | 0.01g  | 3000     | Tape & reel   |
| BAR43S        | DA5     | SOT-23  | 0.01g  | 3000     | Tape & reel   |

Epoxy meets UL94,V0

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