

# BSW68A NPN switching transistor

## FEATURES

- High current (max. 1 A)
- High voltage (max. 150 V).

## APPLICATIONS

- General purpose switching and amplification
- Industrial applications.

## DESCRIPTION

NPN transistor in a TO-39 metal package.

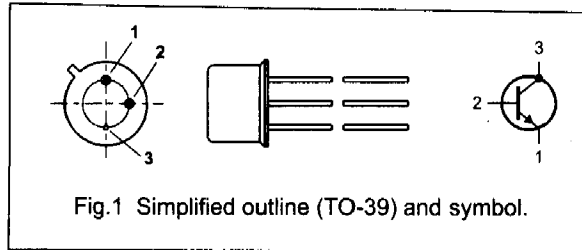


Fig. 1 Simplified outline (TO-39) and symbol.

## PINNING

| PIN | DESCRIPTION                  |
|-----|------------------------------|
| 1   | emitter                      |
| 2   | base                         |
| 3   | collector, connected to case |

| SYMBOL    | PARAMETER                           | CONDITIONS  | MIN. | MAX. | UNIT       |
|-----------|-------------------------------------|---|------|------|------------|
| $V_{CBO}$ | collector-base voltage<br>BSW68A    | open emitter  | -    | 150  | V          |
| $V_{CEO}$ | collector-emitter voltage<br>BSW68A | open base   | -    | 150  | V          |
| $V_{EBO}$ | emitter-base voltage                | open collector  | -    | 6    | V          |
| $I_C$     | collector current (DC)              |   | -    | 1    | A          |
| $I_{CM}$  | peak collector current              | $t_p \leq 20$ ms  | -    | 2    | A          |
| $I_{BM}$  | peak base current                   |   | -    | 200  | mA         |
| $P_{tot}$ | total power dissipation             | $T_{amb} \leq 25^\circ C$<br>$T_{case} \leq 25^\circ C$ | -    | 800  | mW         |
| $T_{stg}$ | storage temperature                 |   | -65  | +150 | $^\circ C$ |
| $T_j$     | junction temperature                |   | -    | 200  | $^\circ C$ |
| $T_{amb}$ | operating ambient temperature       |   | -65  | +150 | $^\circ C$ |

## THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                                   | CONDITIONS | VALUE | UNIT |
|---------------|---|------------|-------|------|
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | free air   | 220   | K/W  |
| $R_{th\ j-c}$ | thermal resistance from junction to case    |            | 35    | K/W  |

## CHARACTERISTICS

$T_j = 25^\circ C$  unless otherwise specified.

| SYMBOL  | PARAMETER                            | CONDITIONS                                     | MIN. | TYP. | MAX. | UNIT    |
|---|--------------------------------------|--|------|------|------|---------|
| $I_{CBO}$   | collector cut-off current<br>BSW68A  | $I_E = 0; V_{CB} = 75$ V                       | -    | -    | 100  | nA      |
|   |                                      | $I_E = 0; V_{CB} = 75$ V; $T_j = 150^\circ C$  | -    | -    | 50   | $\mu A$ |
|   |                                      | $I_E = 0; V_{CB} = 150$ V                      | -    | -    | 100  | $\mu A$ |
| $I_{EBO}$   | emitter cut-off current              | $I_C = 0; V_{EB} = 3$ V                        | -    | -    | 100  | nA      |
|   |                                      | $I_C = 0; V_{EB} = 6$ V                        | -    | -    | 100  | $\mu A$ |
| $h_{FE}$  | DC current gain                      | $V_{CE} = 5$ V<br>$I_C = 10$ mA                | 30   | -    | -    |         |
|   |                                      | $I_C = 100$ mA                                 | 40   | -    | -    |         |
|   |                                      | $I_C = 500$ mA                                 | 30   | -    | -    |         |
|   |                                      | $I_C = 1$ A                                    | 10   | -    | -    |         |
| $V_{CEsat}$   | collector-emitter saturation voltage | $I_C = 100$ mA; $I_B = 10$ mA                  | -    | -    | 150  | mV      |
|   |                                      | $I_C = 500$ mA; $I_B = 50$ mA                  | -    | -    | 400  | mV      |
|   |                                      | $I_C = 1$ A; $I_B = 150$ mA                    | -    | -    | 1    | V       |
| $V_{BEsat}$   | base-emitter saturation voltage      | $I_C = 100$ mA; $I_B = 10$ mA                  | -    | -    | 900  | mV      |
|   |                                      | $I_C = 500$ mA; $I_B = 50$ mA                  | -    | -    | 1.1  | V       |
|   |                                      | $I_C = 1$ A; $I_B = 150$ mA                    | -    | -    | 1.4  | V       |
| $C_c$   | collector capacitance                | $I_E = I_B = 0; V_{CB} = 10$ V; $f = 1$ MHz    | -    | -    | 20   | pF      |
| $C_e$   | emitter capacitance                  | $I_C = I_C = 0; V_{EB} = 0; f = 1$ MHz         | -    | -    | 300  | pF      |
| $f_T$   | transition frequency                 | $I_C = 100$ mA; $V_{CE} = 20$ V; $f = 100$ MHz | -    | 130  | -    | MHz     |
| <b>Switching times (between 10% and 90% levels)</b> |                                      |  |      |      |      |         |
| $t_{on}$  | turn-on time                         | $I_{Con} = 500$ mA; $I_{Bon} = 50$ mA;         | -    | 500  | -    | ns      |
| $t_{off}$   | turn-off time                        | $I_{Boff} = -50$ mA                            | -    | 900  | -    | ns      |

