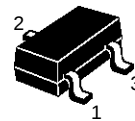


## SMALL SIGNAL PNP TRANSISTORS

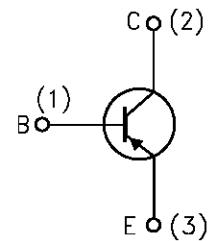
| Type  | Marking |
|-------|---------|
| BCW69 | H1      |
| BCW70 | H2      |

- SILICON EPITAXIAL PLANAR PNP TRANSISTORS
- MINIATURE PLASTIC PACKAGE FOR APPLICATION IN SURFACE MOUNTING CIRCUITS
- LOW LEVEL AUDIO AMPLIFICATION AND SWITCHING



**SOT-23**

### INTERNAL SCHEMATIC DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter                                     | Value      | Unit             |
|-----------|-----------------------------------------------|------------|------------------|
| $V_{CES}$ | Collector-Emitter Voltage ( $V_{BE} = 0$ )    | -50        | V                |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )       | -45        | V                |
| $V_{CBO}$ | Collector-Base Voltage ( $I_E = 0$ )          | -50        | V                |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )            | -5         | V                |
| $I_C$     | Collector Current                             | -0.1       | A                |
| $I_{CM}$  | Collector Peak Current                        | -0.2       | A                |
| $P_{tot}$ | Total Dissipation at $T_c = 25^\circ\text{C}$ | 300        | mW               |
| $T_{stg}$ | Storage Temperature                           | -65 to 150 | $^\circ\text{C}$ |
| $T_j$     | Max. Operating Junction Temperature           | 150        | $^\circ\text{C}$ |

## BCW69/BCW70

### THERMAL DATA

|               |                                     |     |     |                      |
|---------------|-------------------------------------|-----|-----|----------------------|
| $R_{thj-amb}$ | Thermal Resistance Junction-Ambient | Max | 420 | $^{\circ}\text{C/W}$ |
|---------------|-------------------------------------|-----|-----|----------------------|

• Mounted on a ceramic substrate area = 10 x 8 x 0.6 mm

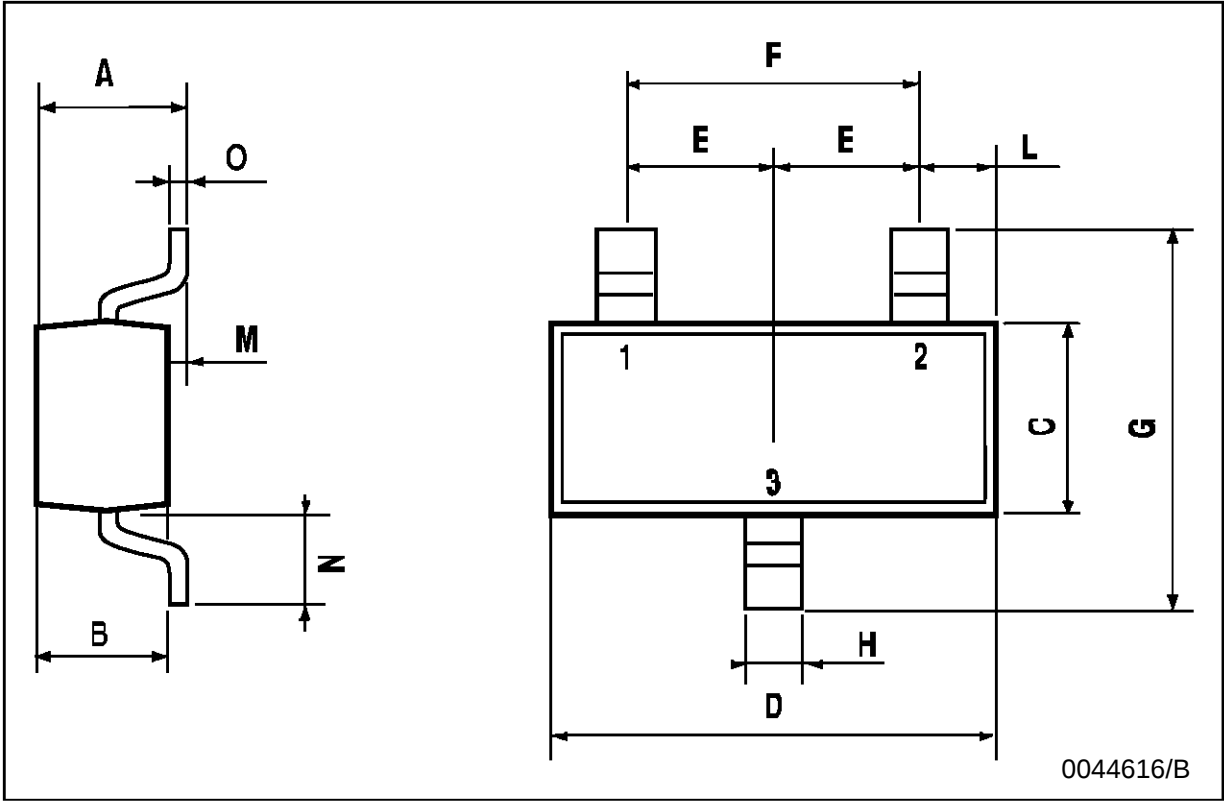
### ELECTRICAL CHARACTERISTICS ( $T_{case} = 25^{\circ}\text{C}$ unless otherwise specified)

| Symbol          | Parameter                                            | Test Conditions                                                                                                                                                                                                                                      | Min.           | Typ.           | Max.           | Unit                |
|-----------------|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|---------------------|
| $I_{CBO}$       | Collector Cut-off Current ( $I_E = 0$ )              | $V_{CB} = -20\text{ V}$<br>$V_{CB} = -20\text{ V}$ $T_j = 100^{\circ}\text{C}$                                                                                                                                                                       |                |                | -100<br>-10    | nA<br>$\mu\text{A}$ |
| $V_{(BR)CES}^*$ | Collector-Emitter Breakdown Voltage ( $V_{BE} = 0$ ) | $I_C = -10\text{ }\mu\text{A}$                                                                                                                                                                                                                       | -50            |                |                | V                   |
| $V_{(BR)CEO}^*$ | Collector-Emitter Breakdown Voltage ( $I_B = 0$ )    | $I_C = -2\text{ mA}$                                                                                                                                                                                                                                 | -45            |                |                | V                   |
| $V_{(BR)CBO}^*$ | Collector-Base Breakdown Voltage ( $I_E = 0$ )       | $I_C = -10\text{ }\mu\text{A}$                                                                                                                                                                                                                       | -50            |                |                | V                   |
| $V_{(BR)EBO}$   | Emitter-Base Breakdown Voltage ( $I_C = 0$ )         | $I_E = -10\text{ }\mu\text{A}$                                                                                                                                                                                                                       | -5             |                |                | V                   |
| $V_{CE(sat)}^*$ | Collector-Emitter Saturation Voltage                 | $I_C = -10\text{ mA}$ $I_B = -0.5\text{ mA}$<br>$I_C = -50\text{ mA}$ $I_B = -2.5\text{ mA}$                                                                                                                                                         |                | -0.18          | -0.3           | V<br>V              |
| $V_{BE(sat)}^*$ | Collector-Base Saturation Voltage                    | $I_C = -10\text{ mA}$ $I_B = -0.5\text{ mA}$<br>$I_C = -50\text{ mA}$ $I_B = -2.5\text{ mA}$                                                                                                                                                         |                | -0.72<br>-0.81 |                | V<br>V              |
| $V_{BE(on)}^*$  | Base-Emitter On Voltage                              | $I_C = -2\text{ mA}$ $V_{CE} = -5\text{ V}$                                                                                                                                                                                                          | -0.6           |                | -0.75          | V                   |
| $h_{FE}^*$      | DC Current Gain                                      | for <b>BCW69</b><br>$I_C = -10\text{ }\mu\text{A}$ $V_{CE} = -5\text{ V}$<br>$I_C = -2\text{ mA}$ $V_{CE} = -5\text{ V}$<br>for <b>BCW70</b><br>$I_C = -10\text{ }\mu\text{A}$ $V_{CE} = -5\text{ V}$<br>$I_C = -2\text{ mA}$ $V_{CE} = -5\text{ V}$ | 120<br><br>215 | 90<br><br>150  | 260<br><br>500 |                     |
| $f_T$           | Transition Frequency                                 | $I_C = -10\text{ mA}$ $V_{CE} = -5\text{ V}$ $f = 100\text{ MHz}$                                                                                                                                                                                    |                | 150            |                | MHz                 |
| $C_{CB}$        | Collector Base Capacitance                           | $I_E = 0$ $V_{CB} = -10\text{ V}$ $f = 1\text{ MHz}$                                                                                                                                                                                                 |                |                | 7              | dB                  |
| NF              | Noise Figure                                         | $I_C = -0.2\text{ mA}$ $V_{CE} = -5\text{ V}$ $f = 1\text{ KHz}$<br>$\Delta f = 200\text{ Hz}$ $R_g = 2\text{ K}\Omega$                                                                                                                              |                |                | 10             | dB                  |

\* Pulsed: Pulse duration = 300  $\mu\text{s}$ , duty cycle  $\leq 2\%$

SOT-23 MECHANICAL DATA

| DIM. | mm   |      |      | mils  |      |      |
|------|------|------|------|-------|------|------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP. | MAX. |
| A    | 0.85 |      | 1.1  | 33.4  |      | 43.3 |
| B    | 0.65 |      | 0.95 | 25.6  |      | 37.4 |
| C    | 1.20 |      | 1.4  | 47.2  |      | 55.1 |
| D    | 2.80 |      | 3    | 110.2 |      | 118  |
| E    | 0.95 |      | 1.05 | 37.4  |      | 41.3 |
| F    | 1.9  |      | 2.05 | 74.8  |      | 80.7 |
| G    | 2.1  |      | 2.5  | 82.6  |      | 98.4 |
| H    | 0.38 |      | 0.48 | 14.9  |      | 18.8 |
| L    | 0.3  |      | 0.6  | 11.8  |      | 23.6 |
| M    | 0    |      | 0.1  | 0     |      | 3.9  |
| N    | 0.3  |      | 0.65 | 11.8  |      | 25.6 |
| O    | 0.09 |      | 0.17 | 3.5   |      | 6.7  |



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