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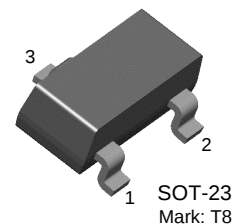
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## BSR16

BSR16

### PNP General Purpose Amplifier

- This device designed for use as general purpose amplifier and switches requiring collector currents to 500mA.
- Sourced from Process 63.
- See BCW68G for Characteristics.



1. Base 2. Emitter 3. Collector

### PNP Epitaxial Silicon Transistor

#### Absolute Maximum Ratings\* $T_a=25^{\circ}\text{C}$ unless otherwise noted

| Symbol        | Parameter                                        | Value      | Units              |
|---------------|--------------------------------------------------|------------|--------------------|
| $V_{CEO}$     | Collector-Emitter Voltage                        | -60        | V                  |
| $V_{CBO}$     | Collector-Base Voltage                           | -60        | V                  |
| $V_{EBO}$     | Emitter-Base Voltage                             | -5.0       | V                  |
| $I_C$         | Collector Current - Continuous                   | -800       | mA                 |
| $T_J, T_{ST}$ | Operating and Storage Junction Temperature Range | -55 ~ +150 | $^{\circ}\text{C}$ |

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

#### NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

**Electrical Characteristics**  $T_A=25^\circ\text{C}$  unless otherwise noted

| Symbol                              | Parameter                            | Test Condition                                                                                                                                                                                                                         | Min.                          | Typ. | Max.         | Units               |
|-------------------------------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------|--------------|---------------------|
| <b>Off Characteristics</b>          |                                      |                                                                                                                                                                                                                                        |                               |      |              |                     |
| $BV_{(BR)CEO}$                      | Collector-Emitter Breakdown Voltage  | $I_C = -10\text{mA}, I_B = 0$                                                                                                                                                                                                          | -60                           |      |              | V                   |
| $BV_{(BR)CBO}$                      | Collector-Base Breakdown Voltage     | $I_C = -100\mu\text{A}, I_E = 0$                                                                                                                                                                                                       | -60                           |      |              | V                   |
| $BV_{(BR)EBO}$                      | Emitter-Base Breakdown Voltage       | $I_E = -10\mu\text{A}, I_C = 0$                                                                                                                                                                                                        | -5.0                          |      |              | V                   |
| $I_{CBO}$                           | Collector Cut-off Current            | $V_{CB} = -50\text{V}$<br>$V_{CB} = -50\text{V}, T_A = 150^\circ\text{C}$                                                                                                                                                              |                               |      | -10<br>-10   | nA<br>$\mu\text{A}$ |
| $I_{CEX}$                           | Collector Cut-off Current            | $V_{CE} = -30\text{V}, V_{EB} = -0.5\text{V}$                                                                                                                                                                                          |                               |      | -50          | nA                  |
| $I_{BEX}$                           | Reverse Base Current                 | $V_{CE} = -30\text{V}, V_{EB} = -3.0\text{V}$                                                                                                                                                                                          |                               |      | -50          | nA                  |
| <b>On Characteristics</b>           |                                      |                                                                                                                                                                                                                                        |                               |      |              |                     |
| $h_{FE}$                            | DC Current Gain                      | $I_C = -0.1\text{mA}, V_{CE} = -10\text{V}$<br>$I_C = -1.0\text{mA}, V_{CE} = -10\text{V}$<br>$I_C = -10\text{mA}, V_{CE} = -10\text{V}$<br>$I_C = -150\text{mA}, V_{CE} = -10\text{V}$<br>$I_C = -500\text{mA}, V_{CE} = -10\text{V}$ | 75<br>100<br>100<br>100<br>50 | 300  |              |                     |
| $V_{CE(sat)}$                       | Collector-Emitter Saturation Voltage | $I_C = -150\text{mA}, I_B = -15\text{mA}$<br>$I_C = -500\text{mA}, I_B = -50\text{mA}$                                                                                                                                                 |                               |      | -0.4<br>-1.6 | V<br>V              |
| $V_{BE(sat)}$                       | Base-Emitter Saturation Voltage      | $I_C = -150\text{mA}, I_B = -15\text{mA}$<br>$I_C = -500\text{mA}, I_B = -50\text{mA}$                                                                                                                                                 |                               |      | -1.3<br>-2.6 | V<br>V              |
| <b>Small Signal Characteristics</b> |                                      |                                                                                                                                                                                                                                        |                               |      |              |                     |
| $f_T$                               | Current Gain Bandwidth Product       | $I_C = -50\text{mA}, V_{CE} = -20\text{V},$<br>$f = 100\text{MHz}, T_A = 25^\circ\text{C}$                                                                                                                                             | 200                           |      |              | MHz                 |
| $C_{cb}$                            | Output Capacitance                   | $V_{CB} = -10\text{V}, I_E = 0, f = 1.0\text{MHz}$                                                                                                                                                                                     |                               |      | 8.0          | pF                  |
| $C_{eb}$                            | Emitter-Base Capacitance             | $V_{CB} = -2.0\text{V}, I_E = 0, f = 1.0\text{MHz}$                                                                                                                                                                                    |                               |      | 30           | pF                  |
| <b>Switching Characteristics</b>    |                                      |                                                                                                                                                                                                                                        |                               |      |              |                     |
| $t_{on}$                            | Turn-On Time                         | $V_{CC} = -30\text{V}, I_C = -150\text{mA},$<br>$I_{B1} = -15\text{mA}$                                                                                                                                                                |                               |      | 45           | ns                  |
| $t_d$                               | Delay Time                           |                                                                                                                                                                                                                                        |                               |      | 10           | ns                  |
| $t_r$                               | Rise Time                            |                                                                                                                                                                                                                                        |                               |      | 40           | ns                  |
| $t_{off}$                           | Turn-Off Time                        | $V_{CC} = -30\text{V}, I_C = -150\text{mA},$<br>$I_{B1} = I_{B2} = -15\text{mA}$                                                                                                                                                       |                               |      | 100          | ns                  |
| $t_s$                               | Storage Time                         |                                                                                                                                                                                                                                        |                               |      | 80           | ns                  |
| $t_f$                               | Fall Time                            |                                                                                                                                                                                                                                        |                               |      | 30           | ns                  |

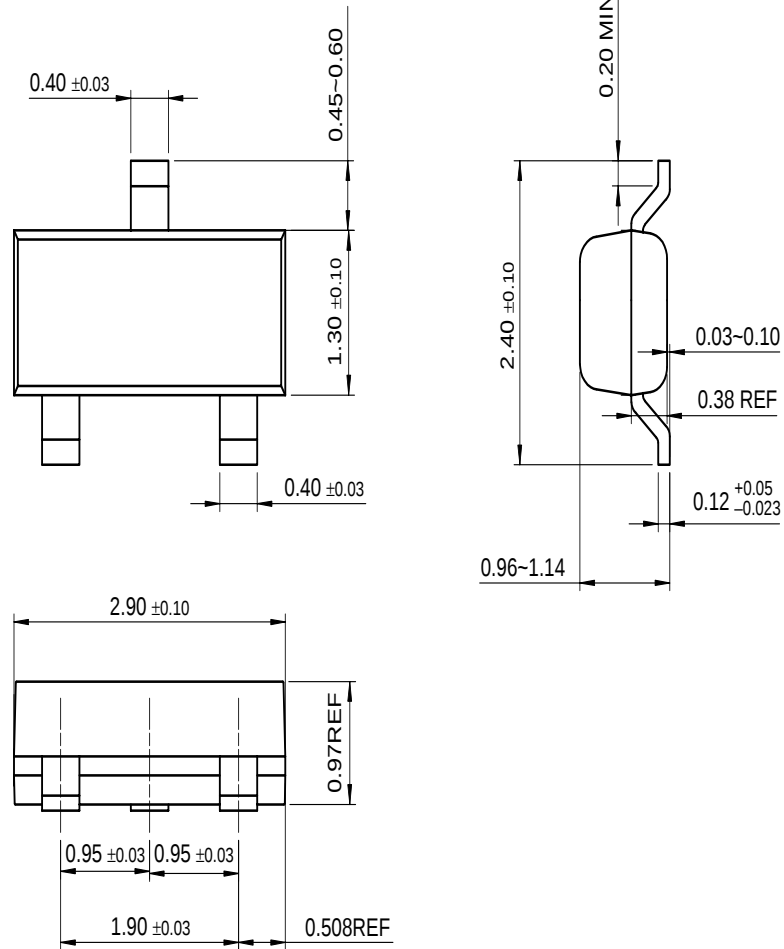
**Thermal Characteristics**  $T_A=25^\circ\text{C}$  unless otherwise noted

| Symbol          | Parameter                               | Max. | Units                |
|-----------------|-----------------------------------------|------|----------------------|
| $P_D$           | Total Device Dissipation                | 350  | mW                   |
|                 | Derate above $25^\circ\text{C}$         | 2.8  | mW/ $^\circ\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 357  | $^\circ\text{C/W}$   |

\* Device mounted on FR-4 PCB 40mm  $\times$  40mm  $\times$  1.5mm

## Package Dimensions

## SOT-23



Dimensions in Millimeters

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| CoolFET™             | GlobalOptoisolator™ | PACMAN™             | Stealth™        |      |
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