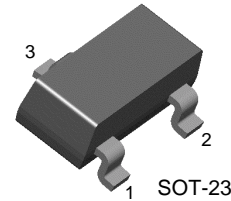


## BCW60A/B/C/D

### General Purpose Transistor



SOT-23  
1. Base 2. Emitter 3. Collector

### NPN Epitaxial Silicon Transistor

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

| Symbol    | Parameter                   | Value | Units            |
|-----------|-----------------------------|-------|------------------|
| $V_{CBO}$ | Collector-Base Voltage      | 32    | V                |
| $V_{CEO}$ | Collector-Emitter Voltage   | 32    | V                |
| $V_{EBO}$ | Emitter-Base Voltage        | 5     | V                |
| $I_C$     | Collector Current           | 100   | mA               |
| $P_C$     | Collector Power Dissipation | 350   | mW               |
| $T_{STG}$ | Storage Temperature         | 150   | $^\circ\text{C}$ |

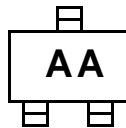
**Electrical Characteristics**  $T_a=25^\circ\text{C}$  unless otherwise noted

| Symbol        | Parameter                            | Test Condition  | Min.       | Max.         | Units  |
|---------------|--------------------------------------|---|------------|--------------|--------|
| $BV_{CEO}$    | Collector-Emitter Breakdown Voltage  | $I_C=2\text{mA}, I_B=0$   | 32         |              | V      |
| $BV_{EBO}$    | Emitter-Base Breakdown Voltage       | $I_E=1\mu\text{A}, I_C=0$   | 5          |              | V      |
| $I_{CES}$     | Collector Cut-off Current            | $V_{CE}=32\text{V}, V_{BE}=0$   |            | 20           | nA     |
| $I_{EBO}$     | Emitter Cut-off Current              | $V_{EB}=4\text{V}, I_C=0$   |            | 20           | nA     |
| $h_{FE}$      | DC Current Gain                      |   |            |              |        |
|               | : BCW60B                             | $V_{CE}=5\text{V}, I_C=10\mu\text{A}$   | 20         |              |        |
|               | : BCW60C                             |   | 40         |              |        |
|               | : BCW60D                             |   | 100        |              |        |
|               | : BCW60A                             | $V_{CE}=5\text{V}, I_C=2\text{mA}$  | 120        | 220          |        |
|               | : BCW60B                             |   | 180        | 310          |        |
|               | : BCW60C                             |   | 250        | 460          |        |
|               | : BCW60D                             |   | 380        | 630          |        |
|               | : BCW60A                             | $V_{CE}=1\text{V}, I_C=50\text{mA}$   | 60         |              |        |
|               | : BCW60B                             |   | 70         |              |        |
|               | : BCW60C                             |   | 90         |              |        |
|               | : BCW60D                             |   | 100        |              |        |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C=50\text{mA}, I_B=1.25\text{mA}$<br>$I_C=10\text{mA}, I_B=0.25\text{mA}$      |            | 0.55<br>0.35 | V<br>V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage      | $I_C=50\text{mA}, I_B=1.25\text{mA}$<br>$I_C=10\text{mA}, I_B=0.25\text{mA}$      | 0.7<br>0.6 | 1.05<br>0.85 | V<br>V |
| $V_{BE(on)}$  | Base-Emitter On Voltage              | $V_{CE}=5\text{V}, I_C=2\text{mA}$  | 0.55       | 0.75         | V      |
| $C_{ob}$      | Output Capacitance                   | $V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$   |            | 4.5          | pF     |
| $f_T$         | Current Gain Bandwidth Product       | $I_C=10\text{mA}, V_{CE}=5\text{V}, f=100\text{MHz}$                              | 125        |              | MHz    |
| NF            | Noise Figure                         | $I_C=0.2\text{mA}, V_{CE}=5\text{V}$<br>$R_G=2\text{K}\Omega, f=1\text{KHz}$      |            | 6            | dB     |
| $t_{ON}$      | Turn On Time                         | $I_C=10\text{mA}, I_{B1}=1\text{mA}$  |            | 150          | ns     |
| $t_{OFF}$     | Turn Off Time                        | $V_{BB}=3.6\text{V}, I_{B2}=1\text{mA}$<br>$R1=R2=5\text{K}\Omega, R_L=990\Omega$ |            | 800          | ns     |

**Marking Code**

| Type  | BCW60A | BCW60B | BCW60C | BCW60D |
|-------|--------|--------|--------|--------|
| Mark. | AA     | AB     | AC     | AD     |

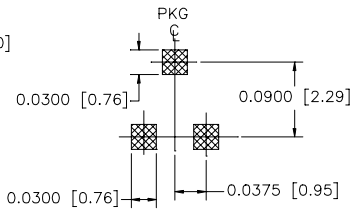
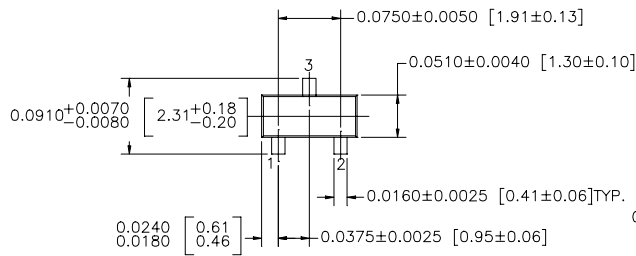
Marking



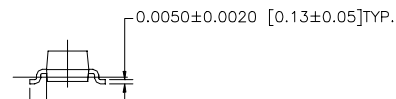
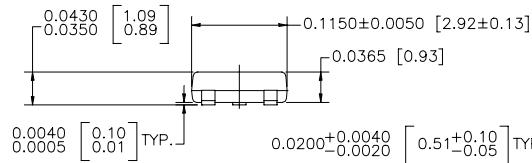
# Package Dimensions

BCW60A/B/C/D

## SOT-23



LAND PATTERN RECOMMENDATION



SOT 23, 3 LEADS LOW PROFILE

CONTROLLING DIMENSION IS INCH  
VALUES IN [ ] ARE MILLIMETERS

NOTE : UNLESS OTHERWISE SPECIFIED

1. STANDARD LEAD FINISH 150 MICROINCHES / 3.81 MICROMETERS  
MINIMUM TIN / LEAD (SOLDER) ON ALLOY 42
2. REFERENCE JEDEC REGISTRATION TO-236, VARIATION AB, ISSUE G, DATED JUL 1993

Dimensions in Millimeters

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| ActiveArray <sup>™</sup>                         | FACT Quiet series <sup>™</sup>  | ISOPLANAR <sup>™</sup>         | POP <sup>™</sup>                | Stealth <sup>™</sup>        |
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|--------------------------|------------------------|---|
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