

**SOT-23 Formed SMD Package**

**BCW60A BCW60B  
BCW60C BCW60D**

**SILICON PLANAR EPITAXIAL TRANSISTORS**

*N-P-N silicon transistors*

**Marking**

BCW60A = AA

BCW60B = AB

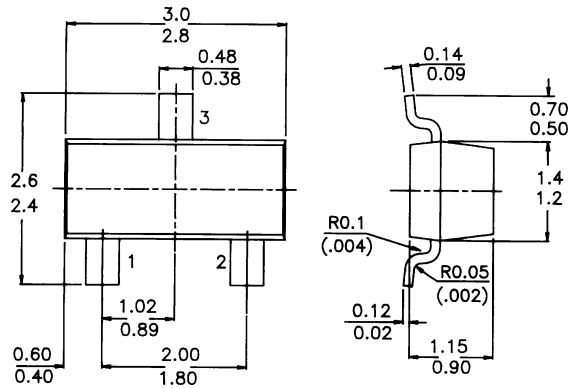
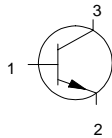
BCW60C = AC

BCW60D = AD

**PACKAGE OUTLINE DETAILS  
ALL DIMENSIONS IN mm**

**Pin configuration**

- 1 = BASE
- 2 = EMITTER
- 3 = COLLECTOR



**ABSOLUTE MAXIMUM RATINGS**

Collector-emitter voltage ( $V_{BE} = 0$ )

Collector-emitter voltage (open base)

Collector current (d.c.)

Total power dissipation

Junction temperature

Transition frequency at  $f = 100$  MHz

$V_{CE} = 5$  V;  $I_C = 10$  mA

Noise figure at  $f = 1$  kHz

$V_{CE} = 5$  V;  $I_C = 200$  mA;  $B = 200$  Hz

$V_{CES}$  max. 32 V

$V_{CE0}$  max. 32 V

$I_C$  max. 200 mA

$P_{tot}$  max. 250 mW

$T_j$  max. 150 °C

$f_T$  typ. 250 MHz

$F$  typ. 2 dB

**BCW60A BCW60B  
BCW60C BCW60D**

**RATINGS** (at  $T_A = 25^\circ\text{C}$  unless otherwise specified)

Limiting values

Collector-emitter voltage ( $V_{BE} = 0$ )	$V_{CES}$	max.	32 V
Collector-emitter voltage (open base)	$V_{CE0}$	max.	32 V
Emitter-base voltage (open collector)	$V_{EB0}$	max.	5 V
Collector current (d.c.)	$I_C$	max.	200 mA
Base current	$I_B$	max.	50 mA
Total power dissipation up to $T_{amb}: 25^\circ\text{C}$	$P_{tot}$	max.	250 mW
Storage temperature	$T_{stg}$		-55 to +150 °C
Junction temperature	$T_j$	max.	150 °C

**THERMAL RESISTANCE**

From junction to ambient\*

$$R_{th\ j-a} = 500\ \text{KW}$$

**CHARACTERISTICS**

$T_{amb} = 25^\circ\text{C}$  unless otherwise specified

Collector-emitter cut-off current

$$V_{BE} = 0; V_{CE} = 32\ \text{V} \quad I_{CES} < 20\ \text{nA}$$

$$V_{BE} = 0; V_{CE} = 32\ \text{V}; T_{amb} = 150^\circ\text{C} \quad I_{CES} < 20\ \text{mA}$$

Emitter-base cut-off current

$$I_C = 0; V_{EB} = 4\ \text{V} \quad I_{EB0} < 20\ \text{nA}$$

Saturation voltages

$$\text{at } I_C = 10\ \text{mA}; I_B = 0,25\ \text{mA} \quad V_{CEsat} \ 0,05\ \text{to}\ 0,35\ \text{V}$$

$$V_{BEsat} \ 0,6\ \text{to}\ 0,85\ \text{V}$$

$$\text{at } I_C = 50\ \text{mA}; I_B = 1,25\ \text{mA} \quad V_{CEsat} \ 0,1\ \text{to}\ 0,55\ \text{V}$$

$$V_{BEsat} \ 0,7\ \text{to}\ 1,05\ \text{V}$$

Transition frequency at  $f = 100\ \text{MHz}$  .

$$I_C = 10\ \text{mA}; V_{CE} = 5\ \text{V} \quad f_T > 125\ \text{MHz}$$

Collector capacitance at  $f = 1\ \text{MHz}$

$$I_E = I_e = 0; V_{CB} = 10\ \text{V} \quad C_C \ \text{typ.} \ 2,5\ \text{pF}$$

Emitter capacitance at  $f = 1\ \text{MHz}$

$$I_C = I_c = 0; V_{EB} = 0,5\ \text{V} \quad C_e \ \text{typ.} \ 8\ \text{pF}$$

Noise figure at  $R_S = 2\ \text{k}\Omega$

$$I_C = 200\ \text{mA}; V_{CE} = 5\ \text{V}; f: 1\ \text{kHz}; B = 200\ \text{Hz} \quad F \ \text{typ.} \ 2\ \text{dB}$$

$$F < 6\ \text{dB}$$

**BCW60A 60B 60C 60D**

D.C. current gain

$$V_{CE} = 5\ \text{V}; I_C = 10\ \text{mA} \quad h_{FE} > \begin{array}{|c|c|c|c|} \hline - & 20 & 40 & 100 \\ \hline \end{array}$$

$$V_{CE} = 5\ \text{V}; I_C: 2\ \text{mA} \quad h_{FE} > \begin{array}{|c|c|c|c|} \hline 120 & 180 & 250 & 380 \\ < & 220 & 310 & 460 & 630 \\ \hline \end{array}$$

$$V_{CE} = 1\ \text{V}; I_C: 50\ \text{mA} \quad h_{FE} > \begin{array}{|c|c|c|c|} \hline 50 & 70 & 90 & 100 \\ \hline \end{array}$$

Input impedance

$$V_{CE} = 5\ \text{V}; I_C = 2\ \text{mA}, f = 1\ \text{kHz} \quad h_{ie} \ \text{typ.} \ \begin{array}{|c|c|c|c|} \hline 2,7 & 3,6 & 4,5 & 7,5\ \text{k}\Omega \\ \hline \end{array}$$

**BCW60A BCW60B  
BCW60C BCW60D**

				A	B	C	D
<i>Reverse voltage transfer ratio</i>							
$V_{CE} = 5\text{ V}; I_C = 2\text{ mA}; f = 1\text{ kHz}$	$h_{re}$	typ.		1,5	2	2	3 $10^4$
<i>Small-signal current gain</i>							
$V_{CE} = 5\text{ V}; I_C = 2\text{ mA}; f = 1\text{ kHz}$	$h_{fe}$	min.		125	175	250	350
		max.		250	350	500	700
<i>Output admittance</i>							
$V_{CE} = 5\text{ V}; I_C = 2\text{ mA}; f = 1\text{ kHz}$	$h_{oe}$	typ.		18	24	30	50 $\text{mS}$
<i>Base-emitter voltage</i>							
$V_{CE} = 5\text{ V}; I_C = 2\text{ mA}$	$V_{BE}$				0,55 to 0,75		V
		typ.			0,65		V
$V_{CE} = 5\text{ V}; I_C = 10\text{ mA}$	$V_{BE}$	typ.			0,52		V
$V_{CE} = 1\text{ V}; I_C = 50\text{ mA}$	$V_{BE}$	typ.			0,78		V

**Disclaimer**

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