



New Product

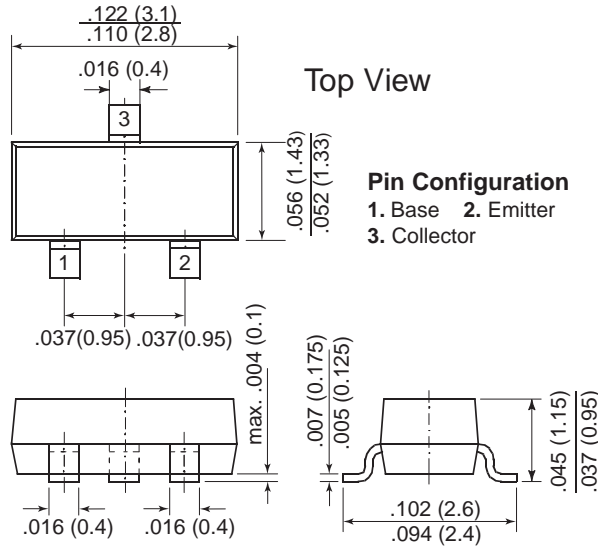
BCW61 Series

Vishay Semiconductors
formerly General Semiconductor



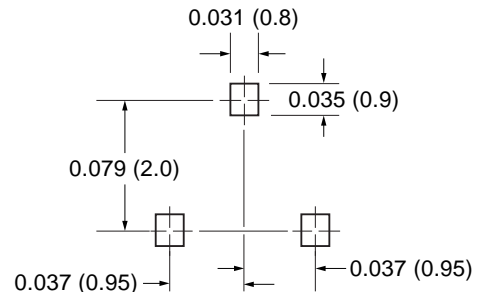
Small Signal Transistors (PNP)

TO-236AB (SOT-23)



Dimensions in inches and (millimeters)

Mounting Pad Layout



Mechanical Data

Case: SOT-23 Plastic Package

Weight: approx. 0.008g

Marking BCW61A = BA

Code: BCW61B = BB

BCW61C = BC

BCW61D = BD

Packaging Codes/Options:

E8/10K per 13" reel (8mm tape), 30K/box

E9/3K per 7" reel (8mm tape), 30K/box

Features

- PNP Silicon Epitaxial Planar Transistors
- Suited for low level, low noise, low frequency applications in hybrid circuits.
- Low Current, Low Voltage.
- As complementary types, BCW60 Series NPN transistors are recommended.

Maximum Ratings & Thermal Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage ($V_{BE} = 0$)	$-V_{CES}$	32	V
Collector-Emitter Voltage	$-V_{CEO}$	32	V
Emitter-Base Voltage	$-V_{EBO}$	5.0	V
Collector Current (DC)	$-I_C$	100	mA
Peak Collector Current	$-I_{CM}$	200	mA
Base Current (DC)	$-I_B$	50	mA
Power Dissipation	P_{tot}	250	mW
Maximum Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{STG}	-65 to +150	°C
Thermal Resistance, Junction to Ambient Air	$R_{\theta JA}$	500 ⁽¹⁾	°C/W

Note:

(1) Mounted on FR-4 printed-circuit board.

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Electrical Characteristics

Ratings at 25°C ambient temperature unless otherwise specified.

	Symbol	Min.	TYP.	Max.	Unit
DC Current Gain					
at $-V_{CE} = 5\text{ V}$, $-I_C = 10\ \mu\text{A}$	BCW61A	hFE	–	–	–
at $-V_{CE} = 5\text{ V}$, $-I_C = 10\ \mu\text{A}$	BCW61B	hFE	30	–	–
at $-V_{CE} = 5\text{ V}$, $-I_C = 10\ \mu\text{A}$	BCW61C	hFE	40	–	–
at $-V_{CE} = 5\text{ V}$, $-I_C = 10\ \mu\text{A}$	BCW61D	hFE	100	–	–
at $-V_{CE} = 5\text{ V}$, $-I_C = 2\text{ mA}$	BCW61A	hFE	120	–	220
at $-V_{CE} = 5\text{ V}$, $-I_C = 2\text{ mA}$	BCW61B	hFE	180	–	310
at $-V_{CE} = 5\text{ V}$, $-I_C = 2\text{ mA}$	BCW61C	hFE	250	–	460
at $-V_{CE} = 5\text{ V}$, $-I_C = 2\text{ mA}$	BCW61D	hFE	380	–	630
at $-V_{CE} = 1\text{ V}$, $-I_C = 50\text{ mA}$	BCW61A	hFE	60	–	–
at $-V_{CE} = 1\text{ V}$, $-I_C = 50\text{ mA}$	BCW61B	hFE	80	–	–
at $-V_{CE} = 1\text{ V}$, $-I_C = 50\text{ mA}$	BCW61C	hFE	100	–	–
at $-V_{CE} = 1\text{ V}$, $-I_C = 50\text{ mA}$	BCW61D	hFE	110	–	–
Collector-Emitter Saturation Voltage					
at $-I_C = 10\text{ mA}$, $-I_B = 0.25\text{ mA}$	$-V_{CEsat}$	60	–	250	mV
at $-I_C = 50\text{ mA}$, $-I_B = 1.25\text{ mA}$	$-V_{CEsat}$	120	–	550	mV
Base-Emitter Saturation Voltage					
at $-I_C = 10\text{ mA}$, $-I_B = 0.25\text{ mA}$	$-V_{BEsat}$	600	–	850	mV
at $-I_C = 50\text{ mA}$, $-I_B = 1.25\text{ mA}$	$-V_{BEsat}$	680	–	1050	mV
Base-Emitter Voltage					
at $-V_{CE} = 5\text{ V}$, $-I_C = 2\text{ mA}$	$-V_{BE}$	600	650	750	mV
at $-V_{CE} = 5\text{ V}$, $-I_C = 10\ \mu\text{A}$	$-V_{BE}$	–	550	–	mV
at $-V_{CE} = 1\text{ V}$, $-I_C = 50\text{ mA}$	$-V_{BE}$	–	720	–	mV
Collector-Emitter Cut-off Current					
at $-V_{CE} = 32\text{ V}$, $V_{EB}=0$	$-I_{CES}$	–	–	20	nA
at $-V_{CE} = 32\text{ V}$, $V_{EB}=0$, $T_A = 150^\circ\text{C}$	$-I_{CES}$	–	–	20	μA
Emitter-Base Cut-off Current					
at $-V_{EB} = 4\text{ V}$, $I_C=0$	$-I_{EBO}$	–	–	20	nA
Gain-Bandwidth Product					
at $-V_{CE} = 5\text{ V}$, $-I_C = 10\text{ mA}$, $f = 100\text{ MHz}$	fT	100	–	–	MHz
Collector-Base Capacitance					
at $-V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$, $I_E=0$	C _{CB0}	–	4.5	–	pF
Emitter-Base Capacitance					
at $-V_{EB} = 0.5\text{ V}$, $f = 1\text{ MHz}$, $I_C=0$	C _{EBO}	–	11	–	pF
Noise Figure					
at $-V_{CE} = 5\text{ V}$, $-I_C = 200\ \mu\text{A}$, $R_S = 2\text{ k}\Omega$, $f = 100\text{ kHz}$, $B = 200\text{ Hz}$	F	–	2	6	dB
Small Signal Current Gain					
at $-V_{CE} = 5\text{ V}$, $-I_C = 2\text{ mA}$, $f = 1.0\text{ kHz}$	BCW60A	h _{fe}	–	200	
	BCW60B	h _{fe}	–	260	
	BCW60C	h _{fe}	–	330	
	BCW60D	h _{fe}	–	520	
Turn-on Time at $R_L = 990\ \Omega$ (see fig. 1)					
$-V_{CC} = 10\text{ V}$, $-I_C = 10\text{ mA}$, $-I_{B(on)} = I_{B(off)} = 1\text{ mA}$	t _{on}	–	85	150	ns
Turn-off Time at $R_L = 990\ \Omega$ (see fig. 1)					
$-V_{CC} = 10\text{ V}$, $-I_C = 10\text{ mA}$, $-I_{B(on)} = I_{B(off)} = 1\text{ mA}$	t _{off}	–	480	800	ns

Fig. 1 - Switching Waveforms
