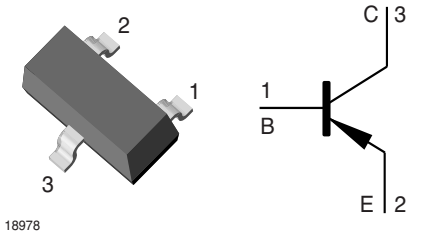
Small Signal Transistors (PNP)

Features

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



Mechanical Data

Case: SOT-23 Plastic case

Weight: approx. 8.8 mg

Marking:
BCW61A = BA
BCW61B = BB
BCW61C = BC
BCW61D = BD

Packaging Codes/Options:
GS18 / 10 k per 13" reel (8 mm tape), 10 k/box
GS08 / 3 k per 7" reel (8 mm tape), 15 k/box

Pinning:
1 = Base, 2 = Emitter, 3 = Collector

Absolute Maximum Ratings

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Collector-emitter voltage		$-V_{CEO}$	32	V
Collector-base voltage		$-V_{CBO}$	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	T_A = 25 °C	P_{tot}	250	mW

Maximum Thermal Resistance

Parameter	Test condition	Symbol	Value	Unit
Maximum junction temperature		T_j	150	°C
Storage temperature range		T_S	- 65 to + 150	°C
Thermal resistance junction to ambient air		$R_{\theta JA}$	500[1)]	°C/W

[1)] Mounted an FR-4 printed-circuit board.

Electrical DC Characteristics

Parameter	Test condition	Part	Symbol	Min	Typ	Max	Unit
DC current gain	- V_{CE} = 5 V, - I_C = 10 µA	BCW61A	h_{FE}				
		BCW61B	h_{FE}	30			
		BCW61C	h_{FE}	40			
		BCW61D	h_{FE}	100			
	- V_{CE} = 5 V, - I_C = 2 mA	BCW61A	h_{FE}	120		220	
		BCW61B	h_{FE}	180		310	
		BCW61C	h_{FE}	250		460	
		BCW61D	h_{FE}	380		630	
	- V_{CE} = 1 V, - I_C = 50 mA	BCW61B	h_{FE}	60			
		BCW61B	h_{FE}	80			
		BCW61C	h_{FE}	100			
		BCW61D	h_{FE}	110			
Collector - emitter saturation voltage	- I_C = 10 mA, - I_B = 0.25 mA		V_{CEsat}	60		250	mV
	- I_C = 50 mA, - I_B = 1.25 mA		V_{CEsat}	120		550	mV
Base - emitter saturation voltage	- I_C = 10 mA, - I_B = 0.25 mA		V_{BEsat}	600		850	mV
	- I_C = 50 mA, - I_B = 1.25 mA		V_{BEsat}	680		1050	mV
Base - emitter voltage	- V_{CE} = 5 V, - I_C = 2 mA		V_{BE}	600	650	750	mV
	- V_{CE} = 5 V, - I_C = 10 µA		V_{BE}		520		mV
	- V_{CE} = 1 V, - I_C = 50 mA		V_{BE}		780		mV
Collector-emitter cut-off current	- V_{CE} = 32 V, V_{EB} = 0 V		I_{CES}			20	nA
	- V_{CE} = 32 V, V_{EB} = 0 V, T_A = 150 °C		I_{CES}			20	µA
Emitter-base cut-off current	- V_{EB} = 4 V, I_C = 0		I_{EBO}			20	nA

Electrical AC Characteristics

Parameter	Test condition	Part	Symbol	Min	Typ	Max	Unit
Gain - bandwidth product	- V_{CE} = 5 V, - I_C = 10 mA, f = 100 MHz		f_T	100			MHz
Collector - base capacitance	- V_{CB} = 10 V, f = 1 MHz, I_E = 0		C_{CBO}		4.5		pF
Emitter - base capacitance	- V_{EB} = 0.5 V, f = 1 MHz, I_C = 0		C_{EBO}		11		pF
Noise figure	- V_{CE} = 5 V, - I_C = 200 µA, R_S = 2 kΩ, f = 1 kHz, B = 200 Hz		F		2	6	dB
Small signal current gain	- V_{CE} = 5 V, - I_C = 2 mA, f = 1.0 kHz	BCW61A	h_{fe}		200		
		BCW61B	h_{fe}		260		
		BCW61C	h_{fe}		330		
		BCW61D	h_{fe}		520		
Turn - on time	R_L = 990 Ω (see fig.1) - V_{CC} = 10 V, - I_C = 10 mA, - $I_{B(on)}$ = $I_{B(off)}$ = 1 mA		t_{on}		85	150	ns
Turn - off time	R_L = 990 Ω (see fig.1) - V_{CC} = 10 V, - I_C = 10 mA, - $I_{B(on)}$ = $I_{B(off)}$ = 1 mA		t_{off}		480	800	ns

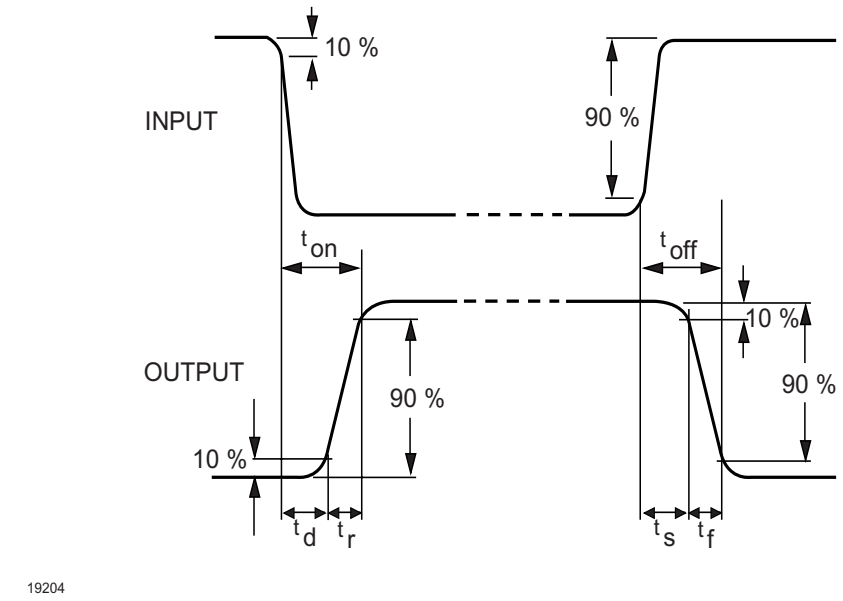
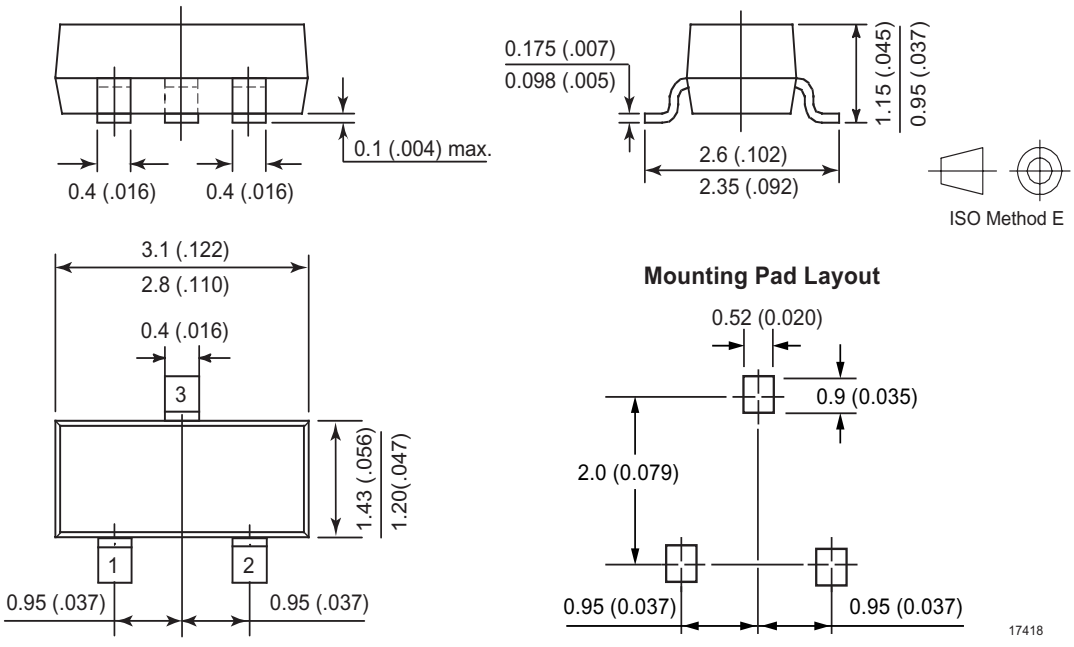


Figure 1. Switching Waveform

Package Dimensions in mm (Inches)



Ozone Depleting Substances Policy Statement

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operatingsystems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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