

SILICON PLANAR EPITAXIAL TRANSISTORS

P-N-P silicon transistors

Marking

BCW61A = BA

BCW61B = BB

BCW61C = BC

BCW61D = BD

PACKAGE OUTLINE DETAILS

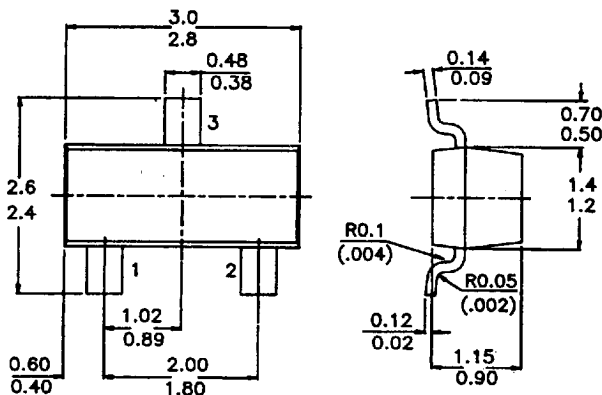
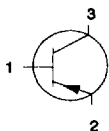
ALL DIMENSIONS IN mm

Pin configuration

1 = BASE

2 = EMITTER

3 = COLLECTOR



ABSOLUTE MAXIMUM RATINGS

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

$-V_{CES}$ max. 32 V

Collector-emitter voltage (open base)

$-V_{CEO}$ max. 32 V

Collector current (d.c.)

$-I_C$ max. 200 mA

Total power dissipation

P_{tot} max. 250 mW

Junction temperature

T_j max. 150 °C

Transition frequency at f : 100 MHz

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

f_T typ. 180 MHz

Noise figure at $f = 1$ kHz

$-V_{CE} = 5$ V; $-I_C = 200$ μ A

F typ. 2 dB

2383394 0000757 404

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	$^\circ\text{C}$
Junction temperature	T_j	max.	150 $^\circ\text{C}$

THERMAL RESISTANCE

From junction to ambient	$R_{th\ j-a}$	=	500 K/W
--------------------------	---------------	---	---------

CHARACTERISTICS

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

Collector-emitter cut-off current

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

$V_{EB} = 0; -V_{CE} = 32\text{ V}; T_{amb} = 150^\circ\text{C}$	$-I_{CES}$	<	20 μA
--	------------	---	------------------

Emitter-base cut-off current

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

Saturation voltages

$-I_C = 10\text{ mA}; -I_B = 0,25\text{ mA}$	$-V_{CEsat}$	0,06 to 0,25 V
--	--------------	----------------

$-V_{BEsat}$	0,6 to 0,85 V
--------------	---------------

$-I_C = 50\text{ mA}; -I_B = 1,25\text{ mA}$	$-V_{CEsat}$	0,12 to 0,55 V
--	--------------	----------------

$-V_{BEsat}$	0,68 to 1,05 V
--------------	----------------

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

$-V_{CE} = 5\text{ V}; -I_C = 10\text{ mA}$	f_T	typ.	180 MHz
---	-------	------	---------

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

$-V_{CB} = 10\text{ V}; I_E = 0$	C_c	typ.	4,5 pF
----------------------------------	-------	------	--------

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

$-V_{EB} = 0,5\text{ V}; I_C = I_E = 0$	C_e	typ.	11 pF
---	-------	------	-------

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

$-V_{CE} = 5\text{ V}; -I_C = 200\text{ }\mu\text{A}; B = 200\text{ Hz}$	F	<	6 dB
--	-----	---	------

D.C. current gain

$-V_{CE} = 5\text{ V}; -I_C = 10\text{ }\mu\text{A}$	h_{FE}	>	20	30	40	100
--	----------	---	----	----	----	-----

$-V_{CE} = 5\text{ V}; -I_C = 2\text{ mA}$	h_{FE}	>	120	180	250	380
--	----------	---	-----	-----	-----	-----

	h_{FE}	<	220	310	460	630
--	----------	---	-----	-----	-----	-----

$-V_{CE} = 1\text{ V}; -I_C = 50\text{ mA}$	h_{FE}	>	60	80	100	110
---	----------	---	----	----	-----	-----

Input impedance

$-V_{CE} = 5\text{ V}; -I_C = 2\text{ mA}; f = 1\text{ kHz}$	h_{ie}	typ	2,7	3,6	4,5	7,5 k Ω
--	----------	-----	-----	-----	-----	----------------

BCW61A 61B 61C 61D

2383394 0000758 340

			A	B	C	D	
Reverse voltage transfer ratio							
$-V_{CE} = 5 \text{ V}; -I_C = 2 \text{ mA}; f = 1 \text{ kHz}$	h_{re}	typ.	1,5	2	2	3	10^{-4}
Small-signal current gain							
$-V_{CE} = 5 \text{ V}; -I_C = 2 \text{ mA}; f = 1 \text{ kHz}$	h_{fe}	min.	125	175	250	350	
		max.	250	350	500	700	
Output admittance							
$-V_{CE} = 5 \text{ V}; -I_C = 2 \text{ mA}; f = 1 \text{ kHz}$	h_{oe}	typ.	18	24	30	50	μS
Base-emitter voltage							
$-V_{CE} = 5 \text{ V}; -I_C = 2 \text{ mA}$	V_{BE}		0,6 to 0,75				V
		typ.	0,65				V
$-V_{CE} = 5 \text{ V}; -I_C = 10 \mu\text{A}$	V_{BE}	typ.	0,55				V
$-V_{CE} = 1 \text{ V}; -I_C = 50 \text{ mA}$	V_{BE}	typ.	0,72				V