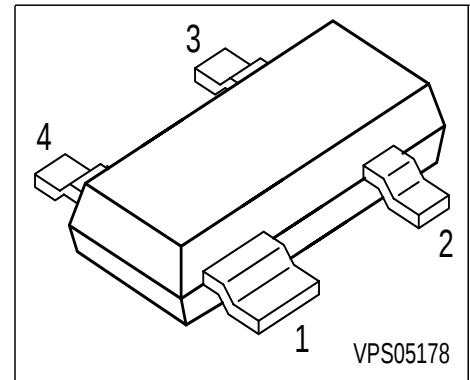
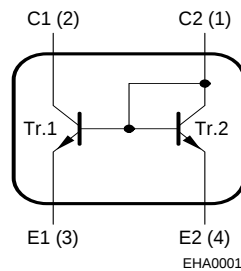


NPN Silicon Double Transistor

- To be used as a current mirror
- Good thermal coupling and V_{BE} matching
- High current gain
- Low collector-emitter saturation voltage



Type	Marking	Pin Configuration				Package
BCV61A	1Js	1 = C2	2 = C1	3 = E1	4 = E2	SOT143
BCV61B	1Ks	1 = C2	2 = C1	3 = E1	4 = E2	SOT143
BCV61C	1Ls	1 = C2	2 = C1	3 = E1	4 = E2	SOT143

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage (transistor T1)	V_{CEO}	30	V
Collector-base voltage (open emitter) (transistor T1)	V_{CBO}	30	
Emitter-base voltage	V_{EBS}	6	
DC collector current	I_C	100	mA
Peak collector current	I_{CM}	200	
Base peak current (transistor T1)	I_{BM}	200	
Total power dissipation, $T_S = 99\text{ °C}$	P_{tot}	300	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Junction - soldering point ¹⁾	R_{thJS}	≤170	K/W
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¹⁾For calculation of R_{thJA} please refer to Application Note Thermal Resistance

Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics of T1					
Collector-emitter breakdown voltage $I_C = 10\text{ mA}, I_B = 0$	$V_{(BR)CEO}$	30	-	-	V
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}, I_B = 0$	$V_{(BR)CBO}$	30	-	-	
Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}, I_C = 0$	$V_{(BR)EBO}$	6	-	-	
Collector cutoff current $V_{CB} = 30\text{ V}, I_E = 0$	I_{CBO}	-	-	15	nA
Collector cutoff current $V_{CB} = 30\text{ V}, I_E = 0, T_A = 150\text{ }^{\circ}\text{C}$	I_{CBO}	-	-	5	μA
DC current gain 1) $I_C = 0.1\text{ mA}, V_{CE} = 5\text{ V}$	h_{FE}	100	-	-	-
DC current gain 1) $I_C = 2\text{ mA}, V_{CE} = 5\text{ V}$	h_{FE}				
BCV61A		110	180	220	
BCV61B		200	290	450	
BCV61C	420	520	800		
Collector-emitter saturation voltage1) $I_C = 10\text{ mA}, I_B = 0.5\text{ mA}$ $I_C = 100\text{ mA}, I_B = 5\text{ mA}$	V_{CEsat}	- -	90 200	250 600	mV
Base-emitter saturation voltage 1) $I_C = 10\text{ mA}, I_B = 0.5\text{ mA}$ $I_C = 100\text{ mA}, I_B = 5\text{ mA}$	V_{BEsat}	- -	700 900	- -	
Base-emitter voltage 1) $I_C = 2\text{ mA}, V_{CE} = 5\text{ V}$ $I_C = 10\text{ mA}, V_{CE} = 5\text{ V}$	$V_{BE(ON)}$	580 -	660 -	700 770	

1) Pulse test: $t \leq 300\mu\text{s}$, $D = 2\%$

Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified.

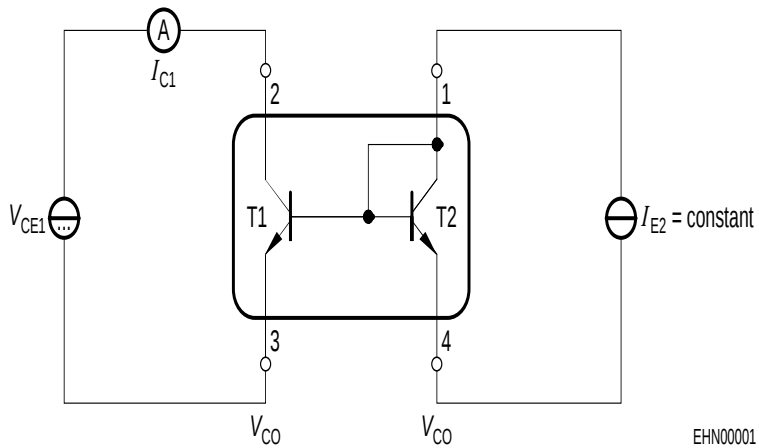
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Base-emitter forward voltage $I_E = 10 \mu A$ $I_E = 250 \text{ mA}$	V_{BES}	0.4 -	- -	- 1.8	V
Matching of transistor T1 and transistor T2 at $I_{E2} = 0.5\text{mA}$ and $V_{CE1} = 5V$ $T_A = 25 \text{ }^{\circ}\text{C}$ $T_A = 150 \text{ }^{\circ}\text{C}$	I_{C1} / I_{C2}	- 0.7 0.7	- - -	- 1.3 1.3	-
Thermal coupling of transistor T1 and transistor T2 ¹⁾ T1: $V_{CE} = 5V$ Maximum current of thermal stability of I_{C1}	I_{E2}	-	5	-	mA

AC characteristics for transistor T1

Transition frequency $I_C = 10 \text{ mA}$, $V_{\text{CE}} = 5 \text{ V}$, $f = 100 \text{ MHz}$	f_T	-	250	-	MHz
Collector-base capacitance $V_{\text{CB}} = 10 \text{ V}$, $f = 1 \text{ MHz}$	C_{cb}	-	3	-	pF
Emitter-base capacitance $V_{\text{EB}} = 0.5 \text{ V}$, $f = 1 \text{ MHz}$	C_{eb}	-	8	-	
Noise figure $I_C = 200 \mu\text{A}$, $V_{\text{CE}} = 5 \text{ V}$, $R_S = 2 \text{ k}\Omega$, $f = 1 \text{ kHz}$, $\Delta f = 200 \text{ Hz}$	F	-	2	-	dB
Short-circuit input impedance $I_C = 1 \text{ mA}$, $V_{\text{CE}} = 10 \text{ V}$, $f = 1 \text{ kHz}$	h_{11e}	-	4.5	-	k Ω
Open-circuit reverse voltage transf.ratio $I_C = 1 \text{ mA}$, $V_{\text{CE}} = 10 \text{ V}$, $f = 1 \text{ kHz}$	h_{12e}	-	2	-	10^{-4}
Short-circuit forward current transf.ratio $I_C = 1 \text{ mA}$, $V_{\text{CE}} = 10 \text{ V}$, $f = 1 \text{ kHz}$	h_{21e}	100	-	900	-
Open-circuit output admittance $I_C = 1 \text{ mA}$, $V_{\text{CE}} = 10 \text{ V}$, $f = 1 \text{ kHz}$	h_{22e}	-	30	-	μS

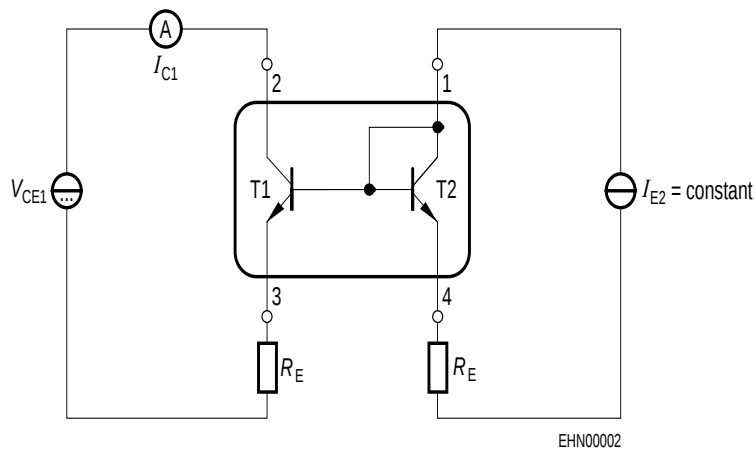
1) Witout emitter resistor. Device mounted on alumina 15mm x 16.5mm x 0.7mm

Test circuit for current matching



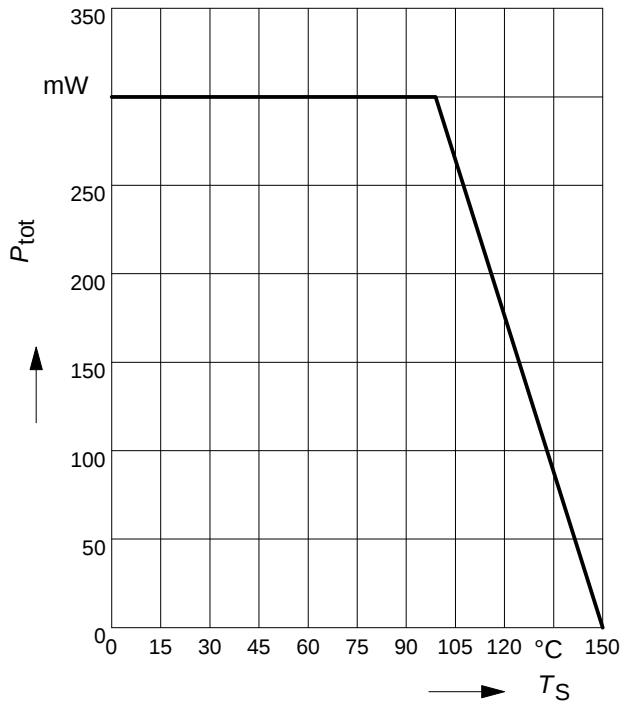
Note: Voltage drop at contacts: $V_{CO} < 2/3 V_T = 16\text{mV}$

Characteristic for determination of V_{CE1} at specified R_E range with I_{E2} as parameter under condition of $I_{C1}/I_{E2} = 1.3$



Note: BCV61 with emitter resistors

Total power dissipation $P_{\text{tot}} = f(T_S)$



Permissible pulse load

$$P_{\text{totmax}} / P_{\text{totDC}} = f(t_p)$$

