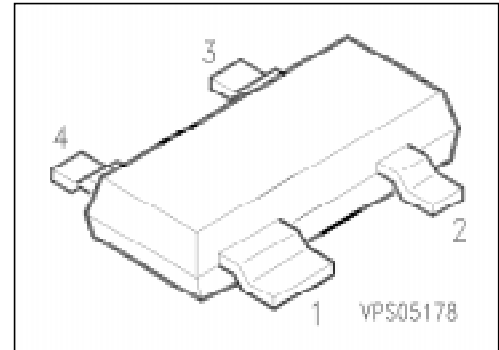


NPN Silicon Double Transistors

BCV 61

Preliminary Data

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



Type	Marking	Ordering Code (tape and reel)	Pin Configuration	Package ¹⁾
BCV 61 A BCV 61 B BCV 61 C	1Js 1Ks 1Ls	Q62702-C2155 Q62702-C2156 Q62702-C2157		SOT-143

Maximum Ratings

Parameter	Symbol	Values	Unit
Collector-emitter voltage (transistor T1)	V_{CE0}	30	V
Collector-base voltage (open emitter) (transistor T1)	V_{CB0}	30	
Emitter-base voltage	V_{EBS}	6	
Collector current	I_C	100	mA
Collector peak current	I_{CM}	200	
Base peak current (transistor T1)	I_{BM}	200	
Total power dissipation, $T_s \leq 99 \text{ }^\circ\text{C}^2)$	P_{tot}	300	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature range	T_{stg}	- 65 ... + 150	

Thermal Resistance

Junction - ambient ²⁾	$R_{th JA}$	≤ 240	K/W
Junction - soldering point	$R_{th JS}$	≤ 170	

¹⁾ For detailed information see chapter Package Outlines.

²⁾ Package mounted on epoxy pcb 40 mm × 40 mm × 1.5 mm/6 cm² Cu.

Electrical Characteristics

at $T_A = 25\text{ °C}$, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

DC characteristics for transistor T1

Collector-emitter breakdown voltage $I_C = 10\text{ mA}, I_B = 0$	$V_{(BR)CE0}$	30	–	–	V
Collector-base breakdown voltage $I_C = 10\text{ }\mu\text{A}, I_B = 0$	$V_{(BR)CB0}$	30	–	–	
Emitter-base breakdown voltage $I_E = 10\text{ }\mu\text{A}, I_C = 0$	$V_{(BR)EBS}$	6	–	–	
Collector-base cutoff current $V_{CB} = 30\text{ V}, I_E = 0$ $V_{CB} = 30\text{ V}, I_E = 0, T_A = 150\text{ °C}$	I_{CB0}	– –	– –	15 5	nA μA
DC current gain ¹⁾ $I_C = 0.1\text{ mA}, V_{CE} = 5\text{ V}$ $I_C = 2\text{ mA}, V_{CE} = 5\text{ V}$	h_{FE}	100 110 200 420	– 180 290 520	– 220 450 800	–
Collector-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_{CEsat}	– –	90 200	250 600	mV
Base-emitter saturation voltage ¹⁾ $I_C = 10\text{ mA}, I_C = 0.5\text{ mA}$ $I_C = 100\text{ mA}, I_C = 5\text{ mA}$	V_{BEsat}	– –	700 900	– –	
Base-emitter voltage $I_C = 2\text{ mA}, V_{CE} = 5\text{ V}$ $I_C = 10\text{ mA}, V_{CE} = 5\text{ V}$	V_{BE}	580 –	660 –	700 770	

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

Electrical Characteristics

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	

DC characteristics for transistor T2

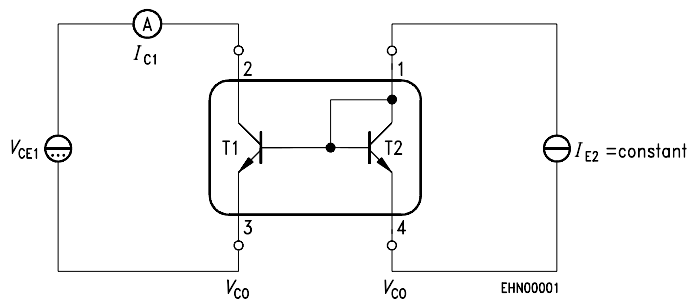
Base-emitter forward voltage $I_E = 10\text{ }\mu\text{A}$ $I_E = 250\text{ mA}$	V_{BES}	0.4 –	– –	– 1.8	V
Matching of transistor T1 and transistor T2 at $I_{E2} = 0.5\text{ mA}$ and $V_{CE1} = 5\text{ V}$ $T_A = 25\text{ }^\circ\text{C}$ $T_A = 150\text{ }^\circ\text{C}$	I_{C1} / I_{C2} I_{C1} / I_{C2}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

AC characteristics for transistor T1

Transition frequency $I_C = 10\text{ mA}$, $V_{CE} = 5\text{ V}$, $f = 100\text{ MHz}$	f_i	–	250	–	MHz
Collector-base capacitance $V_{CB} = 10\text{ V}$, $I_C = i_c = 0$, $f = 1\text{ MHz}$	C_{cb}	–	3	–	pF
Input capacitance $V_{EB} = 0.5\text{ V}$, $I_C = i_c = 0$, $f = 1\text{ MHz}$	C_{ibo}	–	8	–	
Noise figure $I_C = 200\text{ }\mu\text{A}$, $V_{CE} = 5\text{ V}$, $R_S = 2\text{ k}\Omega$ $f = 1\text{ kHz}$, $B = 200\text{ Hz}$	F	–	2	–	dB
Input impedance $I_C = 1\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ kHz}$	h_{11e}	–	4.5	–	k Ω
Open-circuit reverse voltage transfer ratio $I_C = 1\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ kHz}$	h_{12e}	–	2	–	10^{-4}
Short-circuit forward current transfer ratio $I_C = 1\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ kHz}$	h_{21e}	100	–	900	–
Open-circuit output admittance $I_C = 1\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1\text{ kHz}$	h_{22e}	–	30	–	μS

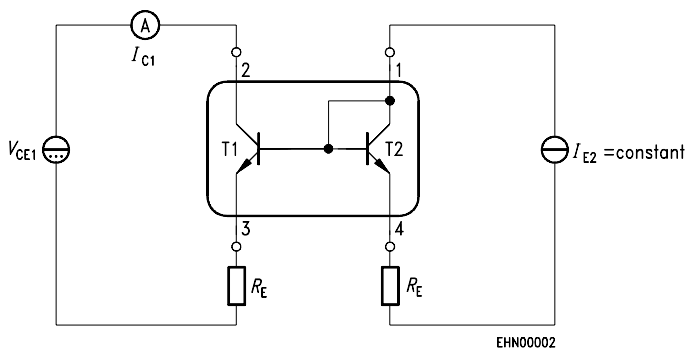
¹⁾ Without emitter resistor. Device mounted on alumina 15 mm × 16.5 mm × 0.7 mm.

Test circuit for current matching



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

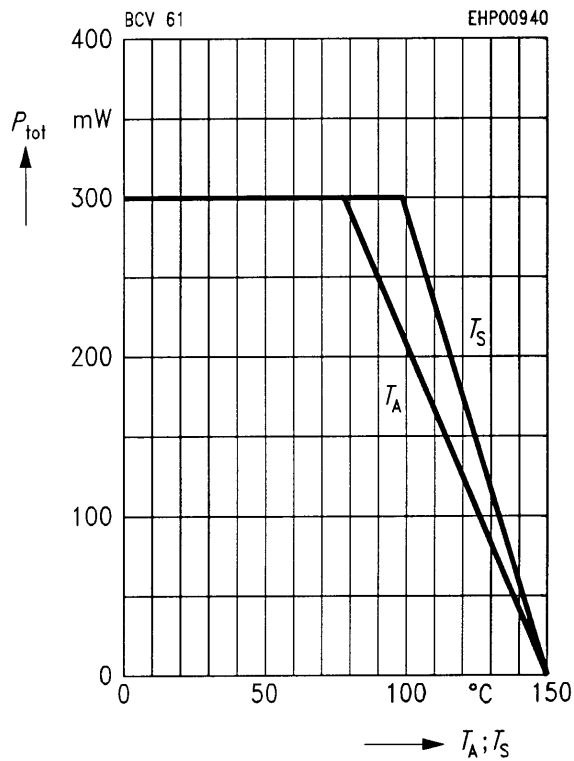
Characteristic for determination of V_{CE1} at specified R_E range with I_{E2} as parameter under condition of $I_{C1} / I_{E2} = 1.3$



Note: BCV 61 with emitter resistors

Total power dissipation $P_{tot} = f(T_A^*; T_S)$

* Package mounted on epoxy



Permissible pulse load $P_{tot max}/P_{tot DC} = f(t_p)$

