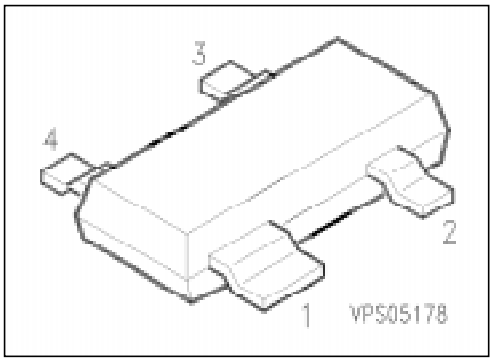
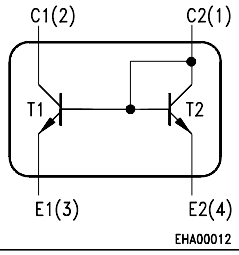
SIEMENS

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, $T_S \leq 99$ °C[2)]	P_{tot}	300	mW
Junction temperature	T_j	150	°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 ˚C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC characteristics for transistor T1					
Collector-emitter breakdown voltage I_C = 10 mA, I_B = 0	$V_{(BR)CE0}$	30	–	–	V
Collector-base breakdown voltage I_C = 10 µA, I_B = 0	$V_{(BR)CB0}$	30	–	–	
Emitter-base breakdown voltage I_E = 10 µA, I_C = 0	$V_{(BR)EBS}$	6	–	–	
Collector-base cutoff current V_{CB} = 30 V, I_E = 0 V_{CB} = 30 V, I_E = 0, T_A = 150 ˚C	I_{CB0}	 – –	 – –	 15 5	 nA µA
DC current gain[1)] I_C = 0.1 mA, V_{CE} = 5 V I_C = 2 mA, V_{CE} = 5 V BCV 61 A BCV 61 B BCV 61 C	h_{FE}	 100 110 200 420	 – 180 290 520	 220 450 800	–
Collector-emitter saturation voltage[1)] I_C = 10 mA, I_B = 0.5 mA I_C = 100 mA, I_B = 5 mA	V_{CEsat}	 – –	 90 200	 250 600	mV
Base-emitter saturation voltage[1)] I_C = 10 mA, I_C = 0.5 mA I_C = 100 mA, I_C = 5 mA	V_{BEsat}	 – –	 700 900	 – –	
Base-emitter voltage I_C = 2 mA, V_{CE} = 5 V I_C = 10 mA, V_{CE} = 5 V	V_{BE}	 580 –	 660 –	 700 770	

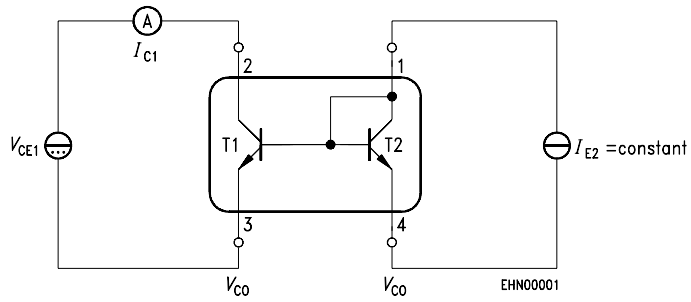
1) Pulse test conditions: $t \leq 300$ µs, D = 2 %.

Electrical Characteristics
at T_A = 25 °C, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC characteristics for transistor T2					
Base-emitter forward voltage I_E = 10 µA I_E = 250 mA	V_{BES}	 0.4 –	 – –	 – 1.8	V
Matching of transistor T1 and transistor T2 at I_{E2} = 0.5 mA and V_{CE1} = 5 V T_A = 25 °C T_A = 150 °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 V Maximum current for thermal stability of I_{C1}	I_{E2}	–	5	–	mA
AC characteristics for transistor T1					
Transition frequency I_C = 10 mA, V_{CE} = 5 V, f = 100 MHz	f_T	–	250	–	MHz
Collector-base capacitance V_{CB} = 10 V, I_C = i_C = 0, f = 1 MHz	C_{cb}	–	3	–	pF
Input capacitance V_{EB} = 0.5 V, I_C = i_C = 0, f = 1 MHz	C_{ibo}	–	8	–	
Noise figure I_C = 200 µA, V_{CE} = 5 V, R_S = 2 kΩ f = 1 kHz, B = 200 Hz	F	–	2	–	dB
Input impedance I_C = 1 mA, V_{CE} = 10 V, f = 1 kHz	h_{11e}	–	4.5	–	kΩ
Open-circuit reverse voltage transfer ratio I_C = 1 mA, V_{CE} = 10 V, f = 1 kHz	h_{12e}	–	2	–	10^{-4}
Short-circuit forward current transfer ratio I_C = 1 mA, V_{CE} = 10 V, f = 1 kHz	h_{21e}	100	–	900	–
Open-circuit output admittance I_C = 1 mA, V_{CE} = 10 V, f = 1 kHz	h_{22e}	–	30	–	µS

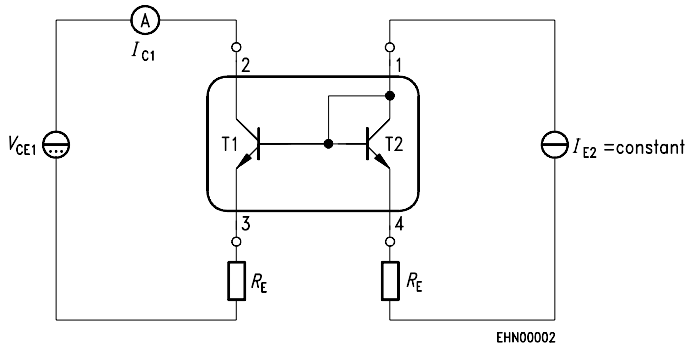
[1] Without emitter resistor. Device mounted on alumina 15 mm × 16.5 mm × 0.7 mm.

Test circuit for current matching



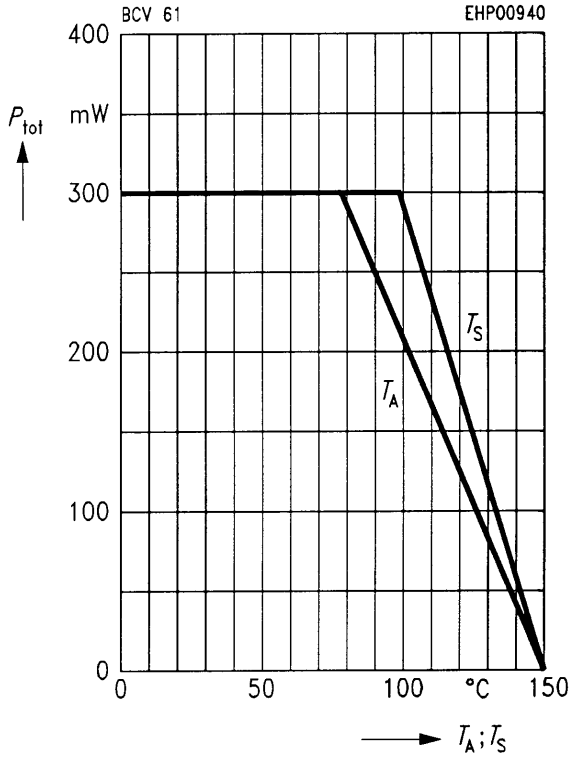
Note: Voltage drop at contacts: $V_{CO} < \frac{2}{3} V_T$ = 16 mV

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 $P_{tot\,max}/P_{tot\,DC} = f(t_p)$