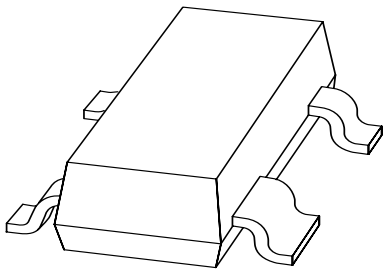
DATA SHEET



BCV61
NPN general purpose double transistor

Product specification
Supersedes data of 1997 Jun 16

1999 Apr 08

Philips
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NPN general purpose double transistor BCV61

FEATURES

- Low current (max. 100 mA)
- Low voltage (max. 30 V)
- Matched pairs.

APPLICATIONS

- For use in applications where the working point must be independent of temperature
- Current mirrors.

DESCRIPTION

NPN double transistor in a SOT143B plastic package.
PNP complement: BCV62.

MARKING

TYPE NUMBER	MARKING CODE	TYPE NUMBER	MARKING CODE
BCV61	1Mp	BCV61B	1Kp
BCV61A	1Jp	BCV61C	1Lp

PINNING

PIN	DESCRIPTION
1	collector TR2; base TR1 and TR2
2	collector TR1
3	emitter TR1
4	emitter TR2

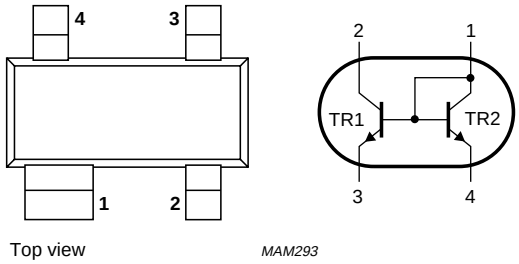


Fig.1 Simplified outline (SOT143B) and symbol.

LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage TR1	open emitter	–	30	V
V_{CEO}	collector-emitter voltage TR1	open base	–	30	V
V_{EBS}	emitter-base voltage	V_{CE} = 0	–	6	V
I_C	collector current (DC)		–	100	mA
I_{CM}	peak collector current		–	200	mA
I_{BM}	peak base current TR1		–	200	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C; note 1	–	250	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Note

1. Transistor mounted on an FR4 printed-circuit board.

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j\text{-}a}$	thermal resistance from junction to ambient	note 1	500	K/W

Note

1. Transistor mounted on an FR4 printed-circuit board.

CHARACTERISTICS

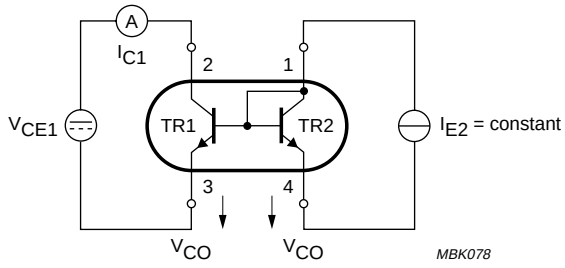
T_j = 25 °C unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Transistor TR1						
I_{CBO}	collector cut-off current	I_E = 0; V_{CB} = 30 V	–	–	15	nA
		I_E = 0; V_{CB} = 30 V; T_j = 150 °C	–	–	5	μA
I_{EBO}	emitter cut-off current	I_C = 0; V_{EB} = 5 V	–	–	100	nA
h_{FE}	DC current gain	I_C = 100 μA; V_{CE} = 5 V	100	–	–	
		I_C = 2 mA; V_{CE} = 5 V	110	–	800	
V_{CEsat}	collector-emitter saturation voltage	I_C = 10 mA; I_B = 0.5 mA	–	90	250	mV
		I_C = 100 mA; I_B = 5 mA	–	200	600	mV
V_{BEsat}	base-emitter saturation voltage	I_C = 10 mA; I_B = 0.5 mA; note 1	–	700	–	mV
		I_C = 100 mA; I_B = 5 mA; note 1	–	900	–	mV
V_{BE}	base-emitter voltage	I_C = 2 mA; V_{CE} = 5 V; note 2	580	660	700	mV
		I_C = 10 mA; V_{CE} = 5 V; note 2	–	–	770	mV
C_c	collector capacitance	$I_E = i_e$ = 0; V_{CB} = 10 V; f = 1 MHz	–	2.5	–	pF
f_T	transition frequency	I_C = 10 mA; V_{CE} = 5 V; f = 100 MHz	100	–	–	MHz
F	noise figure	I_C = 200 μA; V_{CE} = 5 V; R_S = 2 kΩ; f = 1 kHz; B = 200 Hz	–	–	10	dB
Transistor TR2						
V_{EBS}	base-emitter forward voltage	V_{CB} = 0; I_E = –250 mA	–	–	–1.8	V
		V_{CB} = 0; I_E = –10 μA	–400	–	–	mV
h_{FE}	DC current gain	I_C = 2 mA; V_{CE} = 5 V				
	BCV61A		110	–	220	
	BCV61B		200	–	450	
	BCV61C		420	–	800	

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Transistors TR1 and TR2						
$\frac{I_{C1}}{I_{E2}}$	current matching of transistors TR1 and TR2	I_{E2} = –0.5 mA; V_{CE1} = 5 V; $T_{amb} \leq 25$ °C	0.7	–	1.3	
		I_{E2} = –0.5 mA; V_{CE1} = 5 V; $T_{amb} \leq 150$ °C	0.7	–	1.3	
I_{E2}	emitter current for thermal stability of I_{C1}	V_{CE1} = 5 V; note 3; (see Fig.2)	–	–	–5	mA

Notes

1. Decreasing 1.7 mV/°C with increasing temperature.
2. Decreasing 2 mV/°C with increasing temperature.
3. Device, without emitter resistors, mounted on an FR4 printed-circuit board.



V_{CE1} = 5 V; device, without emitter resistors, mounted on an FR4 printed-circuit board.

Voltage drop at contacts: $V_{CO} < \frac{2}{3}U_T \triangleq 16$ mV

Fig.2 Test circuit current matching.

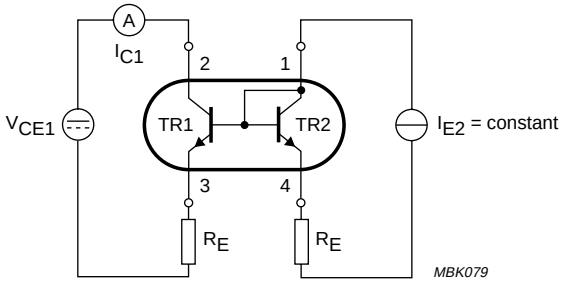
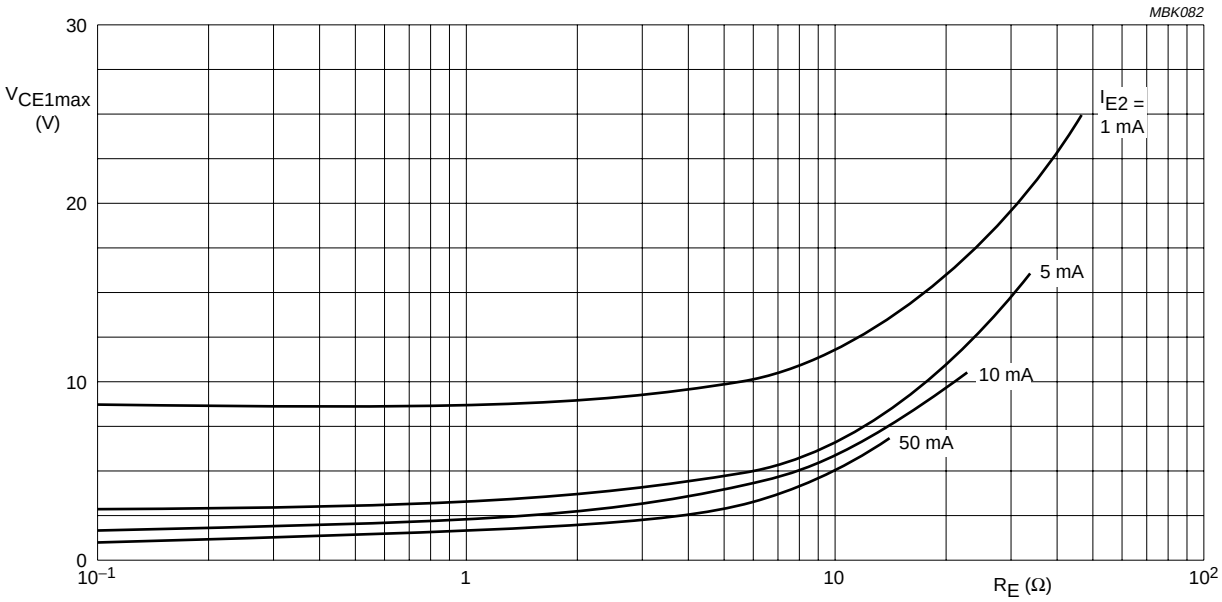


Fig.3 BCV61 with emitter resistors.

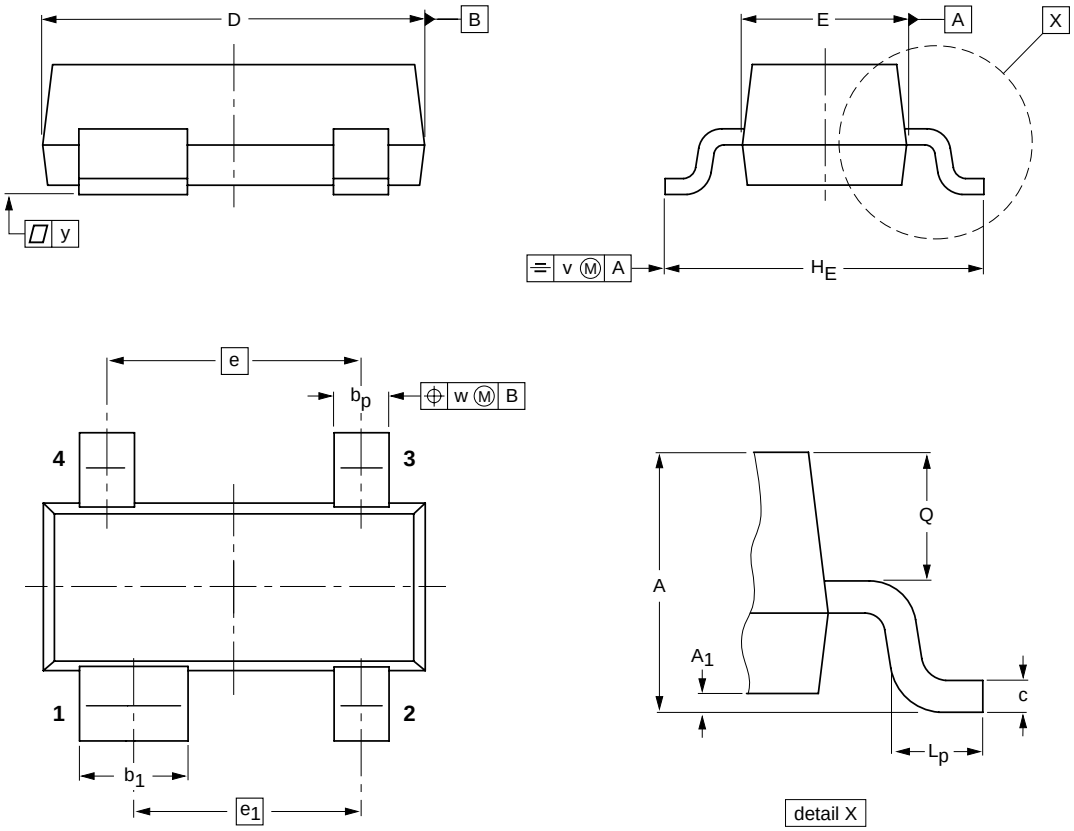


$\frac{I_{C1}}{I_{E2}}$ = 1.3 (see Fig.3).

Fig.4 Maximum collector-emitter voltage as a function of emitter resistance.

PACKAGE OUTLINE

Plastic surface mounted package; 4 leads **SOT143B**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	b_1	c	D	E	e	e_1	H_E	L_p	Q	v	w	y
mm	1.1 0.9	0.1	0.48 0.38	0.88 0.78	0.15 0.09	3.0 2.8	1.4 1.2	1.9	1.7	2.5 2.1	0.45 0.15	0.55 0.45	0.2	0.1	0.1

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT143B						97-02-28

DEFINITIONS

Data Sheet Status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

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