BCV63; BCV63B
NPN general purpose double transistors

Product specification
Supersedes data of 1997 Mar 10

1999 May 21
Philips Semiconductors

NPN general purpose double transistors BCV63; BCV63B

FEATURES
• Low current (max. 100 mA)
• Low voltage (max. 30 and 6 V).

APPLICATIONS
• General purpose switching and amplification
• For use in Schmitt-trigger applications.

DESCRIPTION
NPN double transistor in a SOT143B plastic package.
PNP complement: BCV64B.

MARKING

<table>
<thead>
<tr>
<th>TYPE NUMBER</th>
<th>MARKING CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCV63</td>
<td>D95</td>
</tr>
<tr>
<td>BCV63B</td>
<td>D96</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>PARAMETER</th>
<th>CONDITIONS</th>
<th>MIN.</th>
<th>MAX.</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{CBO}$</td>
<td>collector-base voltage</td>
<td>open emitter</td>
<td>–</td>
<td>30</td>
<td>V</td>
</tr>
<tr>
<td>TR1</td>
<td></td>
<td></td>
<td>–</td>
<td>6</td>
<td>V</td>
</tr>
<tr>
<td>TR2</td>
<td></td>
<td></td>
<td>–</td>
<td>6</td>
<td>V</td>
</tr>
<tr>
<td>$V_{CEO}$</td>
<td>collector-emitter voltage</td>
<td>open base</td>
<td>–</td>
<td>30</td>
<td>V</td>
</tr>
<tr>
<td>TR1</td>
<td></td>
<td></td>
<td>–</td>
<td>6</td>
<td>V</td>
</tr>
<tr>
<td>TR2</td>
<td></td>
<td></td>
<td>–</td>
<td>6</td>
<td>V</td>
</tr>
<tr>
<td>$V_{EBO}$</td>
<td>emitter-base voltage</td>
<td>open collector</td>
<td>–</td>
<td>6</td>
<td>V</td>
</tr>
<tr>
<td>$I_C$</td>
<td>collector current (DC)</td>
<td></td>
<td>–</td>
<td>100</td>
<td>mA</td>
</tr>
<tr>
<td>$I_{CM}$</td>
<td>peak collector current</td>
<td></td>
<td>–</td>
<td>200</td>
<td>mA</td>
</tr>
<tr>
<td>$I_B$</td>
<td>base current (DC)</td>
<td></td>
<td>–</td>
<td>100</td>
<td>mA</td>
</tr>
<tr>
<td>$P_{tot}$</td>
<td>total power dissipation</td>
<td>$T_{amb} \leq 25 \degree C$; note 1</td>
<td>–</td>
<td>250</td>
<td>mW</td>
</tr>
<tr>
<td>$T_{stg}$</td>
<td>storage temperature</td>
<td></td>
<td>–65</td>
<td>+150</td>
<td>°C</td>
</tr>
<tr>
<td>$T_J$</td>
<td>junction temperature</td>
<td></td>
<td>–</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>$T_{amb}$</td>
<td>operating ambient temperature</td>
<td></td>
<td>–65</td>
<td>+150</td>
<td>°C</td>
</tr>
</tbody>
</table>

Note
1. Transistor mounted on a printed-circuit board.
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BCV63; BCV63B

THERMAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>PARAMETER</th>
<th>CONDITIONS</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_{th,j-a}$</td>
<td>thermal resistance from junction to ambient</td>
<td>note 1</td>
<td>500</td>
<td>K/W</td>
</tr>
</tbody>
</table>

Note
1. Transistor mounted on a printed-circuit board.

CHARACTERISTICS

$T_{amb} = 25 \degree C$ unless otherwise specified.

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>PARAMETER</th>
<th>CONDITIONS</th>
<th>MIN.</th>
<th>TYP.</th>
<th>MAX.</th>
<th>UNIT</th>
</tr>
</thead>
</table>

**ICBO**

Collector cut-off current

$I_E = 0; V_{CB} = 30 \text{ V}$

$I_E = 0; V_{CB} = 30 \text{ V}; T_J = 150 \degree C$

---

**hFE**

DC current gain

BCV63 TR1

$I_C = 2 \text{ mA}; V_{CE} = 5 \text{ V}$

---

110

800

BCV63 TR2

$I_C = 2 \text{ mA}; V_{CE} = 700 \text{ mV}; note 1$

---

110

800

BCV63B TR1

$I_C = 2 \text{ mA}; V_{CE} = 5 \text{ V}$

---

200

450

BCV63B TR2

$I_C = 2 \text{ mA}; V_{CE} = 700 \text{ mV}; note 1$

---

200

450

**VCEsat**

Collector-emitter saturation voltage

$I_C = 10 \text{ mA}; I_B = 0.5 \text{ mA}$

---

75

300

$mV$

**VBEsat**

Base-emitter saturation voltage

$I_C = 10 \text{ mA}; I_B = 5 \text{ mA}$

---

TR1

250

650

$mV$

**VBE**

Base-emitter voltage

$I_C = 10 \text{ mA}; V_{CE} = 5 \text{ V}; note 3$

---

TR1

600

650

750

$mV$

TR1

TR2

---

600

650

820

$mV$

---

700

---

$mV$

**Cc**

Collector capacitance

$I_E = I_B = 0; V_{CB} = 10 \text{ V}; f = 1 \text{ MHz}$

---

TR1

4

---

$pF$

**fT**

Transition frequency

$I_C = 10 \text{ mA}; V_{CE} = 5 \text{ V}; f = 100 \text{ MHz}$

---

TR1

100

---

$MHz$

Notes
1. Group selection will be done on TR1. Due to matched dies, $h_{FE}$ values for TR2 are the same as for TR1.
2. $V_{BE_{sat}}$ decreases by approximately 1.7 mV/K with increasing temperature.
3. $V_{BE}$ decreases by approximately 2 mV/K with increasing temperature.
APPLICATION INFORMATION

Fig.2 Schmitt-trigger application.
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PACKAGING OUTLINE

Plastic surface mounted package; 4 leads

SOT143B

DIMENSIONS (mm are the original dimensions)

<table>
<thead>
<tr>
<th>UNIT</th>
<th>A1</th>
<th>b1</th>
<th>c</th>
<th>D</th>
<th>e</th>
<th>e1</th>
<th>HE</th>
<th>LP</th>
<th>Q</th>
<th>V</th>
<th>W</th>
<th>Y</th>
</tr>
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<tbody>
<tr>
<td>mm</td>
<td>1.1</td>
<td>0.1</td>
<td>0.38</td>
<td>0.15</td>
<td>2.8</td>
<td>1.9</td>
<td>1.7</td>
<td>2.5</td>
<td>0.45</td>
<td>0.2</td>
<td>0.1</td>
<td>0.1</td>
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OUTLINE VERSION  REFERENCES  EUROPEAN PROJECTION  ISSUE DATE

SOT143B  IEC  JEDEC  EIAJ  97-02-28
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DEFINITIONS

Data Sheet Status

<table>
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<tr>
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<tbody>
<tr>
<td>Objective specification</td>
<td>This data sheet contains target or goal specifications for product development.</td>
</tr>
<tr>
<td>Preliminary specification</td>
<td>This data sheet contains preliminary data; supplementary data may be published later.</td>
</tr>
<tr>
<td>Product specification</td>
<td>This data sheet contains final product specifications.</td>
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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.

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.
<table>
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**NOTES**