Important notice

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Should be replaced with:
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If you have any questions related to the data sheet, please contact our nearest sales office via e-mail or telephone (details via salesaddresses@nexperia.com). Thank you for your cooperation and understanding.

Kind regards,

Team Nexperia
1. Product profile

1.1 General description

NPN/NPN equivalent: BCM61B

1.2 Features
- Current gain matching

1.3 Applications
- Current mirror
- Differential amplifier

1.4 Quick reference data

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Per transistor TR1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V_{CEO}</td>
<td>collector-emitter voltage</td>
<td>open base</td>
<td>-</td>
<td>-</td>
<td>-45</td>
<td>V</td>
</tr>
<tr>
<td>h_{FE}</td>
<td>DC current gain</td>
<td>V_{CE} = -5 V; I_C = -2 mA</td>
<td>200</td>
<td>290</td>
<td>450</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Per transistor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I_C</td>
<td>collector current</td>
<td>V_{CE1} = -5 V; I_E2 = 0.5 mA; T_{amb} ≤ 25 °C</td>
<td>1</td>
<td>1.1</td>
<td>1.2</td>
<td>mA</td>
</tr>
<tr>
<td>I_{C1}/I_{E2}</td>
<td>current matching</td>
<td></td>
<td>1</td>
<td>1.1</td>
<td>1.2</td>
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2. Pinning information

Table 2. Pinning

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<th>Pin</th>
<th>Description</th>
<th>Simplified outline</th>
<th>Symbol</th>
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<tr>
<td>1</td>
<td>collector TR2, base TR1 and TR2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>collector TR1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>emitter TR1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>emitter TR2</td>
<td></td>
<td></td>
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3. Ordering information

Table 3. Ordering information

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<thead>
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<th>Type number</th>
<th>Package</th>
<th>Name</th>
<th>Description</th>
<th>Version</th>
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</thead>
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<tr>
<td>BCM62B</td>
<td>-</td>
<td>plastic surface-mounted package; 4 leads</td>
<td>SOT143B</td>
<td></td>
</tr>
</tbody>
</table>

4. Marking

Table 4. Marking codes

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<th>Marking code [1]</th>
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<tr>
<td>BCM62B</td>
<td>*AD</td>
</tr>
</tbody>
</table>

[1] * = -: made in Hong Kong
     * = p: made in Hong Kong
     * = t: made in Malaysia
     * = W: made in China
5. Limiting values

Table 5. Limiting values
In accordance with the Absolute Maximum Rating System (IEC 60134).

<table>
<thead>
<tr>
<th>Symbol</th>
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<th>Conditions</th>
<th>Min</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Per transistor TR1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_{CBO}$</td>
<td>collector-base voltage</td>
<td>open emitter</td>
<td>-</td>
<td>-50</td>
<td>V</td>
</tr>
<tr>
<td>$V_{CEO}$</td>
<td>collector-emitter voltage</td>
<td>open base</td>
<td>-</td>
<td>-45</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>Per transistor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_{EBS}$</td>
<td>emitter-base voltage</td>
<td>$V_{CB} = 0$ V</td>
<td>-</td>
<td>-5</td>
<td>V</td>
</tr>
<tr>
<td>$I_C$</td>
<td>collector current</td>
<td></td>
<td>-</td>
<td>-100</td>
<td>mA</td>
</tr>
<tr>
<td>$I_{CM}$</td>
<td>peak collector current</td>
<td>single pulse; $t_p \leq 1$ ms</td>
<td>-</td>
<td>-200</td>
<td>mA</td>
</tr>
<tr>
<td>$P_{tot}$</td>
<td>total power dissipation</td>
<td>$T_{amb} \leq 25$ °C</td>
<td>[1]</td>
<td>220</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td>Per device</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$P_{tot}$</td>
<td>total power dissipation</td>
<td>$T_{amb} \leq 25$ °C</td>
<td>[1]</td>
<td>390</td>
<td>mW</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>ambient temperature</td>
<td></td>
<td>-65</td>
<td>+150</td>
<td>°C</td>
</tr>
<tr>
<td>$T_{stg}$</td>
<td>storage temperature</td>
<td></td>
<td>-65</td>
<td>+150</td>
<td>°C</td>
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</table>


6. Thermal characteristics

Table 6. Thermal characteristics

<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>
<tbody>
<tr>
<td></td>
<td>Per transistor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R_{th(j-a)}$</td>
<td>thermal resistance from junction to ambient</td>
<td>in free air</td>
<td>[1]</td>
<td>-</td>
<td>568</td>
<td>K/W</td>
</tr>
<tr>
<td></td>
<td>Per device</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R_{th(j-a)}$</td>
<td>thermal resistance from junction to ambient</td>
<td>in free air</td>
<td>[1]</td>
<td>-</td>
<td>321</td>
<td>K/W</td>
</tr>
</tbody>
</table>

# 7. Characteristics

Table 7. Characteristics

<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>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Per transistor TR1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{CBO}$</td>
<td>collector-base cut-off current</td>
<td>$V_{CB} = -30 , V$; $I_E = 0 , A$</td>
<td>-</td>
<td>-</td>
<td>-15</td>
<td>nA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CB} = -30 , V$; $I_E = 0 , A$; $T_J = 150 , ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>-5</td>
<td>µA</td>
</tr>
<tr>
<td>$I_{EBO}$</td>
<td>emitter-base cut-off current</td>
<td>$V_{EB} = -5 , V$; $I_C = 0 , A$</td>
<td>-</td>
<td>-</td>
<td>-100</td>
<td>nA</td>
</tr>
<tr>
<td>$h_{FE}$</td>
<td>DC current gain</td>
<td>$V_{CE} = -5 , V$; $I_C = -10 , \mu A$</td>
<td>-</td>
<td>250</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CE} = -5 , V$; $I_C = -100 , \mu A$</td>
<td>100</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CE} = -5 , V$; $I_C = -2 , mA$</td>
<td>200</td>
<td>290</td>
<td>450</td>
<td></td>
</tr>
<tr>
<td>$V_{Cesat}$</td>
<td>collector-emitter saturation voltage</td>
<td>$I_C = -10 , mA$; $I_B = 0.5 , mA$</td>
<td>-</td>
<td>-50</td>
<td>-200</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_C = -100 , mA$; $I_B = -5 , mA$</td>
<td>-</td>
<td>-200</td>
<td>-400</td>
<td>mV</td>
</tr>
<tr>
<td>$V_{Besat}$</td>
<td>base-emitter saturation voltage</td>
<td>$I_C = -10 , mA$; $I_B = 0.5 , mA$</td>
<td>[1]</td>
<td>-</td>
<td>-760</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_C = -100 , mA$; $I_B = -5 , mA$</td>
<td>[1]</td>
<td>-</td>
<td>-920</td>
<td>mV</td>
</tr>
<tr>
<td>$V_{BE}$</td>
<td>base-emitter voltage</td>
<td>$V_{CE} = -5 , V$; $I_C = -2 , mA$</td>
<td>[2]</td>
<td>-600</td>
<td>-650</td>
<td>-700</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CE} = -5 , V$; $I_C = -10 , mA$</td>
<td>[2]</td>
<td>-</td>
<td>-</td>
<td>-760</td>
</tr>
<tr>
<td>$C_c$</td>
<td>collector capacitance</td>
<td>$V_{CB} = -10 , V$; $I_E = I_a = 0 , A$; $f = 1 , MHz$</td>
<td>-</td>
<td>-</td>
<td>2.2</td>
<td>pF</td>
</tr>
<tr>
<td>$C_e$</td>
<td>emitter capacitance</td>
<td>$V_{EB} = -0.5 , V$; $I_C = I_e = 0 , A$; $f = 1 , MHz$</td>
<td>-</td>
<td>10</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td>$f_T$</td>
<td>transition frequency</td>
<td>$V_{CE} = -5 , V$; $I_C = -10 , mA$; $f = 100 , MHz$</td>
<td>100</td>
<td>175</td>
<td>-</td>
<td>MHz</td>
</tr>
<tr>
<td>NF</td>
<td>noise figure</td>
<td>$V_{CE} = -5 , V$; $I_C = 0.2 , mA$; $R_S = 2 , k\Omega$; $f = 100 , Hz$ to 15.7 kHz</td>
<td>-</td>
<td>1.6</td>
<td>-</td>
<td>dB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CE} = -5 , V$; $I_C = 0.2 , mA$; $R_S = 2 , k\Omega$; $f = 1 , kHz$; $B = 200 , Hz$</td>
<td>-</td>
<td>3.1</td>
<td>-</td>
<td>dB</td>
</tr>
</tbody>
</table>
Table 7. Characteristics ...continued
T_{\text{amb}} = 25 ^\circ \text{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>
<tbody>
<tr>
<td>V_{EBS}</td>
<td>emitter-base voltage</td>
<td>V_{CB} = 0 V; I_{E} = 250 mA</td>
<td>-</td>
<td>-</td>
<td>1.5</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>V_{CB} = 0 V; I_{E} = 10 \mu A</td>
<td>400</td>
<td>-</td>
<td>-</td>
<td>mV</td>
</tr>
</tbody>
</table>

Per device

<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>
<tbody>
<tr>
<td>I_{C1}/I_{E2}</td>
<td>current matching</td>
<td>V_{CE1} = -5 V; I_{E2} = 0.5 mA; T_{\text{amb}} \leq 25 ^\circ \text{C}</td>
<td>1</td>
<td>1.1</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>V_{CE1} = -5 V; I_{E2} = 0.5 mA; T_{\text{amb}} \leq 150 ^\circ \text{C}</td>
<td>1.02</td>
<td>-</td>
<td>1.22</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>V_{CE1} = -3 V; I_{E2} = 0.5 mA; T_{\text{amb}} \leq 25 ^\circ \text{C}</td>
<td>0.95</td>
<td>1.05</td>
<td>1.15</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>V_{CE1} = -1 V; I_{E2} = 0.5 mA; T_{\text{amb}} \leq 25 ^\circ \text{C}</td>
<td>0.9</td>
<td>1</td>
<td>1.1</td>
<td></td>
</tr>
</tbody>
</table>

[1] V_{\text{BEsat}} decreases by about 1.7 mV/K with increasing temperature.
[2] V_{\text{BE}} decreases by about 2 mV/K with increasing temperature.
Fig 1. Collector current as a function of collector-emitter voltage; typical values

Fig 2. DC current gain as a function of collector current; typical values

Fig 3. Base-emitter saturation voltage as a function of collector current; typical values

Fig 4. Collector-emitter saturation voltage as a function of collector current; typical values
Fig 5. Base-emitter voltage as a function of collector current; typical values

Fig 6. Transition frequency as a function of collector current; typical values

Fig 7. Collector capacitance as a function of collector-base voltage; typical values

Fig 8. Emitter capacitance as a function of emitter-base voltage; typical values
8. Test information

Fig 9. Current matching as a function of emitter current 2; typical values

Fig 10. Test circuit current matching
9. Package outline

Fig 11. Package outline SOT143B

10. Packing information

Table 8. Packing methods
The indicated -xxx are the last three digits of the 12NC ordering code.[1]

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>Description</th>
<th>Packing quantity</th>
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<tbody>
<tr>
<td>BCM62B</td>
<td>SOT143B</td>
<td>4 mm pitch, 8 mm tape and reel</td>
<td>3000 10000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-215 -235</td>
<td></td>
</tr>
</tbody>
</table>

[1] For further information and the availability of packing methods, see Section 14.
11. Soldering

Fig 12. Reflow soldering footprint SOT143B

Fig 13. Wave soldering footprint SOT143B
## 12. Revision history

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<th>Document ID</th>
<th>Release date</th>
<th>Data sheet status</th>
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<th>Supersedes</th>
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<tr>
<td>BCM62B_2</td>
<td>20090828</td>
<td>Product data sheet</td>
<td>-</td>
<td>BCM62B_1</td>
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</table>

**Modifications:**
- This data sheet was changed to reflect the new company name NXP Semiconductors, including new legal definitions and disclaimers. No changes were made to the technical content.
- Figure 13 “Wave soldering footprint SOT143B” updated

<table>
<thead>
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<th>Data sheet status</th>
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<th>Supersedes</th>
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<td>20060919</td>
<td>Product data sheet</td>
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13. Legal information

13.1 Data sheet status

<table>
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<tr>
<th>Document status</th>
<th>Product status</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Objective [short] data sheet</td>
<td>Development</td>
<td>This document contains data from the objective specification for product development.</td>
</tr>
<tr>
<td>Preliminary [short] data sheet</td>
<td>Qualification</td>
<td>This document contains data from the preliminary specification.</td>
</tr>
<tr>
<td>Product [short] data sheet</td>
<td>Production</td>
<td>This document contains the product specification.</td>
</tr>
</tbody>
</table>

[1] Please consult the most recently issued document before initiating or completing a design.
[2] The term 'short data sheet' is explained in section "Definitions".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL http://www.nxp.com.

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14. Contact information

For more information, please visit: http://www.nxp.com

For sales office addresses, please send an email to: salesaddresses@nxp.com
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