1. **Product profile**

1.1 **General description**

PNP general-purpose transistors in a leadless ultra small SOT883B Surface-Mounted Device (SMD) plastic package.

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>JEITA</th>
<th>JEDEC</th>
<th>NPN complement</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC857AMB</td>
<td>SOT883B</td>
<td>-</td>
<td>-</td>
<td>BC847AMB</td>
</tr>
<tr>
<td>BC857BMB</td>
<td>SOT883B</td>
<td>-</td>
<td>-</td>
<td>BC847BMB</td>
</tr>
<tr>
<td>BC857CMB</td>
<td>SOT883B</td>
<td>-</td>
<td>-</td>
<td>BC847CMB</td>
</tr>
</tbody>
</table>

1.2 **Features and benefits**

- Leadless ultra small SMD plastic package
- Low package height of 0.37 mm
- Power dissipation comparable to SOT23
- AEC-Q101 qualified

1.3 **Applications**

- General-purpose switching and amplification
- Mobile applications

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>
</tr>
</thead>
<tbody>
<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>( I_C )</td>
<td>collector current</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-100</td>
<td>mA</td>
</tr>
<tr>
<td>( h_{FE} )</td>
<td>DC current gain</td>
<td>( V_{CE} = -5 ) V; ( I_C = -2 ) mA</td>
<td>125</td>
<td>-</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BC857AMB</td>
<td></td>
<td>220</td>
<td>-</td>
<td>475</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BC857CMB</td>
<td></td>
<td>420</td>
<td>-</td>
<td>800</td>
<td></td>
</tr>
</tbody>
</table>
Nexperia

BC857xMB series
45 V, 100 mA PNP general-purpose transistors

2. Pinning information

Table 3. Pinning

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>Simplified outline</th>
<th>Graphic symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>base</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>emitter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>collector</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Ordering information

Table 4. Ordering information

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>Name</th>
<th>Description</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC857xMB series</td>
<td>SOT883B</td>
<td>leadless ultra small plastic package; 3 solder lands; body 1.0 × 0.6 × 0.37 mm</td>
<td>SOT883B</td>
<td></td>
</tr>
</tbody>
</table>

4. Marking

Table 5. Marking codes

<table>
<thead>
<tr>
<th>Type number</th>
<th>Marking code[1]</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC857AMB</td>
<td>0100 0100</td>
</tr>
<tr>
<td>BC857BMB</td>
<td>0100 0101</td>
</tr>
<tr>
<td>BC857CMB</td>
<td>0100 0110</td>
</tr>
</tbody>
</table>

[1] For SOT883B binary marking code description, see Figure 1.

4.1 Binary marking code description

Fig 1. SOT883B binary marking code description
5. Limiting values

Table 6. Limiting values
In accordance with the Absolute Maximum Rating System (IEC 60134).

<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>-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>$V_{EBO}$</td>
<td>emitter-base voltage</td>
<td>open collector</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>$I_{BM}$</td>
<td>peak base current</td>
<td>single pulse; $t_p \leq 1$ ms</td>
<td>-</td>
<td>-100</td>
<td>mA</td>
</tr>
<tr>
<td>$P_{tot}$</td>
<td>total power dissipation</td>
<td>$T_{amb} \leq 25$ °C</td>
<td>1</td>
<td>250</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>-55</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>
</tr>
</tbody>
</table>

[2] Reflow soldering is the only recommended soldering method.
6. Thermal characteristics

Table 7. 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>$R_{th(j-a)}$</td>
<td>thermal resistance from junction to ambient</td>
<td>in free air</td>
<td></td>
<td></td>
<td>500</td>
<td>K/W</td>
</tr>
</tbody>
</table>


[2] Reflow soldering is the only recommended soldering method.

Fig 2. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values
7. Characteristics

Table 8. 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>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 °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} = −2 mA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BC857AMB</td>
<td></td>
<td>125</td>
<td>-</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BC857BMB</td>
<td></td>
<td>220</td>
<td>-</td>
<td>475</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BC857CMB</td>
<td></td>
<td>420</td>
<td>-</td>
<td>800</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>-</td>
<td>−200</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>−400</td>
<td>mV</td>
</tr>
<tr>
<td>V_{BE}</td>
<td>base-emitter voltage</td>
<td>I_{C} = −2 mA; V_{CE} = −5 V</td>
<td>−600</td>
<td>-</td>
<td>−750</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I_{C} = −10 mA; V_{CE} = −5 V</td>
<td>-</td>
<td>-</td>
<td>−820</td>
<td>mV</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>-</td>
<td>-</td>
<td>MHz</td>
</tr>
<tr>
<td>C_{C}</td>
<td>collector capacitance</td>
<td>V_{CB} = −10 V; I_{E} = I_{B} = 0 A; f = 1 MHz</td>
<td>-</td>
<td>-</td>
<td>2.5</td>
<td>pF</td>
</tr>
<tr>
<td>NF</td>
<td>noise figure</td>
<td>I_{C} = −200 µA; V_{CE} = −5 V; R_{S} = 2 kΩ; f = 1 kHz; B = 200 Hz</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td>dB</td>
</tr>
</tbody>
</table>

[1] Pulse test: t_{p} ≤ 300 µs; δ ≤ 0.02.


**BC857xMB series**

45 V, 100 mA PNP general-purpose transistors

---

**Fig 3.** BC857AMB: DC current gain as a function of collector current; typical values

- $V_{CE} = -5\, \text{V}$
  - (1) $T_{amb} = 150\, ^\circ\text{C}$
  - (2) $T_{amb} = 25\, ^\circ\text{C}$
  - (3) $T_{amb} = -55\, ^\circ\text{C}$

**Fig 4.** BC857AMB: Base-emitter voltage as a function of collector current; typical values

- $V_{CE} = -5\, \text{V}$
  - (1) $T_{amb} = -55\, ^\circ\text{C}$
  - (2) $T_{amb} = 25\, ^\circ\text{C}$
  - (3) $T_{amb} = 150\, ^\circ\text{C}$

---

**Fig 5.** BC857AMB: Collector-emitter saturation voltage as a function of collector current; typical values

- $I_C/I_B = 20$
  - (1) $T_{amb} = 150\, ^\circ\text{C}$
  - (2) $T_{amb} = 25\, ^\circ\text{C}$
  - (3) $T_{amb} = -55\, ^\circ\text{C}$

**Fig 6.** BC857AMB: Base-emitter saturation voltage as a function of collector current; typical values

- $I_C/I_B = 20$
  - (1) $T_{amb} = -55\, ^\circ\text{C}$
  - (2) $T_{amb} = 25\, ^\circ\text{C}$
  - (3) $T_{amb} = 150\, ^\circ\text{C}$
BC857xMB series
45 V, 100 mA PNP general-purpose transistors

Fig 7. BC857BMB: DC current gain as a function of collector current; typical values

Fig 8. BC857BMB: Base-emitter voltage as a function of collector current; typical values

Fig 9. BC857BMB: Collector-emitter saturation voltage as a function of collector current; typical values

Fig 10. BC857BMB: Base-emitter saturation voltage as a function of collector current; typical values
**BC857xMB series**

45 V, 100 mA PNP general-purpose transistors

---

**Fig 11. BC857CMB: DC current gain as a function of collector current; typical values**

- $h_{FE} = -5 \text{ V}$
  - (1) $T_{\text{amb}} = 150 ^\circ \text{C}$
  - (2) $T_{\text{amb}} = 25 ^\circ \text{C}$
  - (3) $T_{\text{amb}} = -55 ^\circ \text{C}$

**Fig 12. BC857CMB: Base-emitter voltage as a function of collector current; typical values**

- $V_{CE} = -5 \text{ V}$
  - (1) $T_{\text{amb}} = -55 ^\circ \text{C}$
  - (2) $T_{\text{amb}} = 25 ^\circ \text{C}$
  - (3) $T_{\text{amb}} = 150 ^\circ \text{C}$

**Fig 13. BC857CMB: Collector-emitter saturation voltage as a function of collector current; typical values**

- $I_C/I_B = 20$
  - (1) $T_{\text{amb}} = 150 ^\circ \text{C}$
  - (2) $T_{\text{amb}} = 25 ^\circ \text{C}$
  - (3) $T_{\text{amb}} = -55 ^\circ \text{C}$

**Fig 14. BC857CMB: Base-emitter saturation voltage as a function of collector current; typical values**

- $I_C/I_B = 20$
  - (1) $T_{\text{amb}} = -55 ^\circ \text{C}$
  - (2) $T_{\text{amb}} = 25 ^\circ \text{C}$
  - (3) $T_{\text{amb}} = 150 ^\circ \text{C}$
8. Test information

8.1 Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - Stress test qualification for discrete semiconductors, and is suitable for use in automotive applications.

9. Package outline

![Package outline SOT883B](image)

10. Packing information

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>Description</th>
<th>Packing quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC857xMB series</td>
<td>SOT883B</td>
<td>2 mm pitch, 8 mm tape and reel</td>
<td>-315</td>
</tr>
</tbody>
</table>

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

Reflow soldering is the only recommended soldering method.

Fig 16. Reflow soldering footprint SOT883B
12. Revision history

Table 10. Revision history

<table>
<thead>
<tr>
<th>Document ID</th>
<th>Release date</th>
<th>Data sheet status</th>
<th>Change notice</th>
<th>Supersedes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC857XMB_SER v.1</td>
<td>20120221</td>
<td>Product data sheet</td>
<td>-</td>
<td>-</td>
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</tbody>
</table>
13. Legal information

13.1 Data sheet status

<table>
<thead>
<tr>
<th>Document status</th>
<th>Product status</th>
<th>Definition</th>
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</thead>
<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.nexperia.com.

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BC857xMB series
45 V, 100 mA PNP general-purpose transistors

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14. Contact information

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