1. Product profile

1.1. General description
PNP general-purpose transistors in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

Table 1. Product overview

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>NPN complement</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC807-16H</td>
<td>SOT23</td>
<td>BC817K-16H</td>
</tr>
<tr>
<td>BC807-25H</td>
<td>TO-236AB</td>
<td>BC817K-25H</td>
</tr>
<tr>
<td>BC807-40H</td>
<td></td>
<td>BC817K-40H</td>
</tr>
</tbody>
</table>

1.2. Features and benefits
- Three current gain selections
- High-temperature applications up to 175 °C
- AEC-Q101 qualified

1.3. Applications
- General-purpose switching and amplification

1.4. Quick reference data

Table 2. 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>-500</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>I_{CM}</td>
<td>peak collector current</td>
<td>single pulse; t_p ≤ 1 ms</td>
<td>-</td>
<td>-1</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>h_{FE}</td>
<td>DC current gain</td>
<td>V_{CE} = -1 V; I_C = -100 mA</td>
<td>[1] 100</td>
<td>-</td>
<td>250</td>
<td></td>
</tr>
</tbody>
</table>

[1] pulsed; t_p ≤ 300 μs; δ ≤ 0.02
2. Pinning information

Table 3. Pinning

<table>
<thead>
<tr>
<th>Pin</th>
<th>Symbol</th>
<th>Description</th>
<th>Simplified outline</th>
<th>Graphic symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>B</td>
<td>base</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>E</td>
<td>emitter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>C</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>Description</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC807-16H</td>
<td>TO-236AB</td>
<td>plastic, surface-mounted package; 3 leads</td>
<td>SOT23</td>
</tr>
<tr>
<td>BC807-25H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BC807-40H</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Marking

Table 5. Marking

<table>
<thead>
<tr>
<th>Type number</th>
<th>Marking code</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC807-16H</td>
<td>[1] 6S%</td>
</tr>
<tr>
<td>BC807-25H</td>
<td>[1] 6T%</td>
</tr>
<tr>
<td>BC807-40H</td>
<td>[1] 6U%</td>
</tr>
</tbody>
</table>

[1] % = placeholder for manufacturing site code
5. Limiting values

Table 6. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

\( T_{\text{amb}} = 25 \, ^\circ\text{C} \) unless otherwise specified.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>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>-7</td>
<td>V</td>
</tr>
<tr>
<td>( I_C )</td>
<td>collector current</td>
<td></td>
<td>-500</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>( I_{CM} )</td>
<td>peak collector current</td>
<td>single pulse; ( t_p \leq 1 , \text{ms} )</td>
<td>-</td>
<td>-1</td>
<td>A</td>
</tr>
<tr>
<td>( I_{BM} )</td>
<td>peak base current</td>
<td>single pulse; ( t_p \leq 1 , \text{ms} )</td>
<td>-</td>
<td>-200</td>
<td>mA</td>
</tr>
<tr>
<td>( P_{\text{tot}} )</td>
<td>total power dissipation</td>
<td>( T_{\text{amb}} \leq 25 , ^\circ\text{C} )</td>
<td>[1]</td>
<td>320</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[2]</td>
<td>440</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[3]</td>
<td>460</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[4]</td>
<td>540</td>
<td>mW</td>
</tr>
<tr>
<td>( T_j )</td>
<td>junction temperature</td>
<td></td>
<td>-</td>
<td>175</td>
<td>°C</td>
</tr>
<tr>
<td>( T_{\text{amb}} )</td>
<td>ambient temperature</td>
<td></td>
<td>-55</td>
<td>175</td>
<td>°C</td>
</tr>
<tr>
<td>( T_{\text{stg}} )</td>
<td>storage temperature</td>
<td></td>
<td>-65</td>
<td>175</td>
<td>°C</td>
</tr>
</tbody>
</table>

[1] Device mounted on an FR4 Printed-Circuit-Board (PCB); single-sided copper; tin-plated and standard footprint.
[2] Device mounted on an FR4 Printed-Circuit-Board (PCB); single-sided copper; tin-plated; mounting pad for collector 1 cm\(^2\).
[3] Device mounted on an FR4 Printed-Circuit-Board (PCB); 4-layer copper; tin-plated and standard footprint.
[4] Device mounted on an FR4 Printed-Circuit-Board (PCB); 4-layer copper; tin-plated; mounting pad for collector 1 cm\(^2\).

Fig. 1. Power derating curves

1. FR4 PCB; 4-layer copper, 1 cm\(^2\)
2. FR4 PCB; 4-layer copper, standard footprint
3. FR4 PCB; single-sided copper, 1 cm\(^2\)
4. FR4 PCB; single-sided copper, standard footprint
FR4 PCB; single-sided copper; standard footprint

$T_{\text{amb}} = 25 \, ^\circ\text{C}$

**Fig. 2.** Safe operating area; junction to ambient; continuous and peak collector currents as a function of collector-emitter voltage
6. Thermal characteristics

Table 7. Thermal characteristics

\( T_{\text{amb}} = 25 \, ^\circ\text{C} \) 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></td>
<td>thermal resistance from junction to ambient</td>
<td>in free air</td>
<td>-</td>
<td>-</td>
<td>470</td>
<td>K/W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[1]</td>
<td>-</td>
<td>-</td>
<td>340</td>
<td>K/W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[2]</td>
<td>-</td>
<td>-</td>
<td>325</td>
<td>K/W</td>
</tr>
<tr>
<td></td>
<td>thermal resistance from junction to solder point</td>
<td>FR4 PCB; single-sided copper; tin-plated and standard footprint</td>
<td>-</td>
<td>-</td>
<td>110</td>
<td>K/W</td>
</tr>
</tbody>
</table>

[1] Device mounted on an FR4 Printed-Circuit-Board (PCB); single-sided copper; tin-plated and standard footprint.
[2] Device mounted on an FR4 Printed-Circuit-Board (PCB); single-sided copper; tin-plated; mounting pad for collector 1 cm².
[3] Device mounted on an FR4 Printed-Circuit-Board (PCB); 4-layer copper; tin-plated and standard footprint.
[4] Device mounted on an FR4 Printed-Circuit-Board (PCB); 4-layer copper; tin-plated; mounting pad for collector 1 cm².

Fig. 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

FR4 PCB; single-sided copper; tin-plated and standard footprint

Fig. 4. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

FR4 PCB; single-sided copper; tin-plated; mounting pad for collector 1 cm²
FR4 PCB; 4-layer copper; tin-plated and standard footprint

Fig. 5. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values

FR4 PCB; 4-layer copper; tin-plated; mounting pad for collector 1 cm²

Fig. 6. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values
## 7. Characteristics

### Table 8. Characteristics

*\( T_{\text{amb}} = 25 \, ^\circ\text{C} \) 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_{(BR)CBO} )</td>
<td>collector-base breakdown voltage</td>
<td>( I_C = -100 , \mu\text{A}; , I_E = 0 , \text{mA} )</td>
<td>-50</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>( V_{(BR)CEO} )</td>
<td>collector-emitter breakdown voltage</td>
<td>( I_C = -10 , \text{mA}; , I_E = 0 , \text{mA} )</td>
<td>-45</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>( V_{(BR)EBO} )</td>
<td>emitter-base breakdown voltage</td>
<td>( I_E = -100 , \mu\text{A}; , I_C = 0 , \text{mA} )</td>
<td>-7</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>( I_{CBO} )</td>
<td>collector-base cut-off current</td>
<td>( V_{CB} = -25 , \text{V}; , I_E = 0 , \text{A} )</td>
<td>-</td>
<td>-</td>
<td>-100</td>
<td>nA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>( V_{CB} = -25 , \text{V}; , I_E = 0 , \text{A}; , T_j = 150 , ^\circ\text{C} )</td>
<td>-</td>
<td>-</td>
<td>-5</td>
<td>\mu A</td>
</tr>
<tr>
<td>( I_{EBO} )</td>
<td>emitter-base cut-off current</td>
<td>( V_{EB} = -5 , \text{V}; , I_C = 0 , \text{A} )</td>
<td>-</td>
<td>-</td>
<td>-100</td>
<td>nA</td>
</tr>
<tr>
<td><strong>h_FE</strong></td>
<td>DC current gain</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BC807-16H</td>
<td></td>
<td>( V_{CE} = -1 , \text{V}; , I_C = -100 , \text{mA} )</td>
<td>[1]</td>
<td>100</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>BC807-40H</td>
<td></td>
<td></td>
<td>[1]</td>
<td>250</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td><strong>V_{CEsat}</strong></td>
<td>collector-emitter saturation voltage</td>
<td>( I_C = -500 , \text{mA}; , I_B = -50 , \text{mA} )</td>
<td>[1]</td>
<td>40</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>V_{BEsat}</strong></td>
<td>base-emitter saturation voltage</td>
<td>( I_C = -500 , \text{mA}; , I_B = -50 , \text{mA} )</td>
<td>[1]</td>
<td>-</td>
<td>-700</td>
<td>mV</td>
</tr>
<tr>
<td><strong>V_{BE}</strong></td>
<td>base-emitter voltage</td>
<td>( V_{CE} = -1 , \text{V}; , I_C = -500 , \text{mA} )</td>
<td>[1]</td>
<td>-</td>
<td>-1.2</td>
<td>V</td>
</tr>
<tr>
<td><strong>f_T</strong></td>
<td>transition frequency</td>
<td>( V_{CE} = -5 , \text{V}; , I_C = -10 , \text{mA}; , f = 100 , \text{MHz} )</td>
<td></td>
<td>80</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>C_C</strong></td>
<td>collector capacitance</td>
<td>( V_{CB} = -10 , \text{V}; , I_E = I_B = 0 , \text{mA}; , f = 1 , \text{MHz} )</td>
<td></td>
<td>-</td>
<td>7</td>
<td>pF</td>
</tr>
<tr>
<td><strong>C_e</strong></td>
<td>emitter capacitance</td>
<td>( V_{EB} = -0.5 , \text{V}; , I_C = I_E = 0 , \text{mA}; , f = 1 , \text{MHz} )</td>
<td></td>
<td></td>
<td>50</td>
<td>pF</td>
</tr>
</tbody>
</table>

[1] pulsed; \( t_p \leq 300 \, \mu\text{s}; \, \delta \leq 0.02 \)
BC807-16H: DC current gain as a function of collector current; typical values

$V_{CE} = -1 \text{ V}$
1. $T_{\text{amb}} = 175 \degree \text{C}$
2. $T_{\text{amb}} = 150 \degree \text{C}$
3. $T_{\text{amb}} = 125 \degree \text{C}$
4. $T_{\text{amb}} = 100 \degree \text{C}$
5. $T_{\text{amb}} = 85 \degree \text{C}$
6. $T_{\text{amb}} = 25 \degree \text{C}$
7. $T_{\text{amb}} = -40 \degree \text{C}$
8. $T_{\text{amb}} = -55 \degree \text{C}$

Fig. 7. BC807-16H: DC current gain as a function of collector current; typical values

$T_{\text{amb}} = 25 \degree \text{C}$
1. $V_{CE} = -5 \text{ V}$
2. $V_{CE} = -2 \text{ V}$
3. $V_{CE} = -1 \text{ V}$

Fig. 8. BC807-16H: DC current gain as a function of collector current; typical values

$V_{CE} = -1 \text{ V}$
1. $T_{\text{amb}} = -55 \degree \text{C}$
2. $T_{\text{amb}} = -40 \degree \text{C}$
3. $T_{\text{amb}} = -25 \degree \text{C}$
4. $T_{\text{amb}} = -10 \degree \text{C}$
5. $T_{\text{amb}} = 0 \degree \text{C}$
6. $T_{\text{amb}} = 10 \degree \text{C}$
7. $T_{\text{amb}} = 25 \degree \text{C}$
8. $T_{\text{amb}} = 50 \degree \text{C}$

Fig. 9. BC807-16H: Base-emitter voltage as a function of collector current; typical values

$T_{\text{amb}} = 25 \degree \text{C}$
1. $V_{CE} = -1 \text{ V}$
2. $V_{CE} = -2 \text{ V}$
3. $V_{CE} = -5 \text{ V}$

Fig. 10. BC807-16H: Base-emitter voltage as a function of collector current; typical values
Nexperia

BC807H series

45 V, 500 mA PNP general-purpose transistors

Fig. 11. BC807-16H: Base-emitter saturation voltage as a function of collector current; typical values

Fig. 12. BC807-16H: Base-emitter saturation voltage as a function of collector current; typical values

Fig. 13. BC807-16H: Collector-emitter saturation voltage as a function of collector current; typical values

Fig. 14. BC807-16H: Collector-emitter saturation voltage as a function of collector current; typical values

IC / IB = 10
(1) T_{amb} = -55 °C
(2) T_{amb} = -40 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = 85 °C
(5) T_{amb} = 100 °C
(6) T_{amb} = 125 °C
(7) T_{amb} = 150 °C
(8) T_{amb} = 175 °C

T_{amb} = 25 °C
(1) IC / IB = 10
(2) IC / IB = 20
(3) IC / IB = 50
(4) IC / IB = 100

IC / IB = 10
(1) T_{amb} = 175 °C
(2) T_{amb} = 85 °C
(3) T_{amb} = 25 °C
(4) T_{amb} = 40 °C

(1) IC / IB = 100
(2) IC / IB = 50
(3) IC / IB = 20
(4) IC / IB = 10
**BC807H series**

45 V, 500 mA PNP general-purpose transistors

---

**Fig. 15.** BC807-16H: Collector current as a function of collector-emitter voltage; typical values

**Fig. 16.** BC807-16H: Collector capacitance as a function of collector-base voltage; typical values

**Fig. 17.** BC807-16H: Emitter capacitance as a function of emitter-base voltage; typical values

**Fig. 18.** BC807-16H: Transition frequency as a function of collector current; typical values

---

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**Fig. 19.** BC807-25H: DC current gain as a function of collector current; typical values

**Fig. 20.** BC807-25H: DC current gain as a function of collector current; typical values

**Fig. 21.** BC807-25H: Base-emitter voltage as a function of collector current; typical values

**Fig. 22.** BC807-25H: Base-emitter voltage as a function of collector current; typical values
Nexperia

BC807H series

45 V, 500 mA PNP general-purpose transistors

IC / IB = 10
(1) $T_{\text{amb}} = -55 ^\circ C$
(2) $T_{\text{amb}} = -40 ^\circ C$
(3) $T_{\text{amb}} = 25 ^\circ C$
(4) $T_{\text{amb}} = 85 ^\circ C$
(5) $T_{\text{amb}} = 100 ^\circ C$
(6) $T_{\text{amb}} = 125 ^\circ C$
(7) $T_{\text{amb}} = 150 ^\circ C$
(8) $T_{\text{amb}} = 175 ^\circ C$

$T_{\text{amb}} = 25 ^\circ C$
(1) IC / IB = 10
(2) IC / IB = 20
(3) IC / IB = 50
(4) IC / IB = 100

Fig. 23. BC807-25H: Base-emitter saturation voltage as a function of collector current; typical values

Fig. 24. BC807-25H: Collector-emitter saturation voltage as a function of collector current; typical values

IC / IB = 10
(1) $T_{\text{amb}} = 175 ^\circ C$
(2) $T_{\text{amb}} = 85 ^\circ C$
(3) $T_{\text{amb}} = 25 ^\circ C$
(4) $T_{\text{amb}} = 40 ^\circ C$

$T_{\text{amb}} = 25 ^\circ C$
(1) IC / IB = 100
(2) IC / IB = 50
(3) IC / IB = 20
(4) IC / IB = 10

Fig. 25. BC807-25H: Collector-emitter saturation voltage as a function of collector current; typical values

Fig. 26. BC807-25H: Collector-emitter saturation voltage as a function of collector current; typical values
**BC807H series**

**45 V, 500 mA PNP general-purpose transistors**

---

**Fig. 27.** BC807-25H: Collector current as a function of collector-emitter voltage; typical values

---

**Fig. 28.** BC807-25H: Collector capacitance as a function of collector-base voltage; typical values

---

**Fig. 29.** BC807-25H: Emitter capacitance as a function of emitter-base voltage; typical values

---

**Fig. 30.** BC807-25H: Transition frequency as a function of collector current; typical values

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BC807H series

45 V, 500 mA PNP general-purpose transistors

**Fig. 31.** BC807-40H: DC current gain as a function of collector current; typical values

V_{CE} = -1 V
1. T_{amb} = 175 °C
2. T_{amb} = 150 °C
3. T_{amb} = 125 °C
4. T_{amb} = 100 °C
5. T_{amb} = 85 °C
6. T_{amb} = 25 °C
7. T_{amb} = -40 °C
8. T_{amb} = -55 °C

**Fig. 32.** BC807-40H: DC current gain as a function of collector current; typical values

T_{amb} = 25 °C
1. V_{CE} = -5 V
2. V_{CE} = -2 V
3. V_{CE} = -1 V

**Fig. 33.** BC807-40H: Base-emitter voltage as a function of collector current; typical values

V_{CE} = -1 V
1. T_{amb} = -55 °C
2. T_{amb} = -40 °C
3. T_{amb} = 25 °C
4. T_{amb} = 85 °C
5. T_{amb} = 100 °C
6. T_{amb} = 125 °C
7. T_{amb} = 150 °C
8. T_{amb} = 175 °C

**Fig. 34.** BC807-40H: Base-emitter voltage as a function of collector current; typical values

T_{amb} = 25 °C
1. V_{CE} = -1 V
2. V_{CE} = -2 V
3. V_{CE} = -5 V
IC / IB = 10
(1) $T_{\text{amb}} = -55 \, ^\circ\text{C}$
(2) $T_{\text{amb}} = -40 \, ^\circ\text{C}$
(3) $T_{\text{amb}} = 25 \, ^\circ\text{C}$
(4) $T_{\text{amb}} = 85 \, ^\circ\text{C}$
(5) $T_{\text{amb}} = 100 \, ^\circ\text{C}$
(6) $T_{\text{amb}} = 125 \, ^\circ\text{C}$
(7) $T_{\text{amb}} = 150 \, ^\circ\text{C}$
(8) $T_{\text{amb}} = 175 \, ^\circ\text{C}$

$T_{\text{amb}} = 25 \, ^\circ\text{C}$
(1) IC / IB = 10
(2) IC / IB = 20
(3) IC / IB = 50
(4) IC / IB = 100
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

Table 9. Package outline

<table>
<thead>
<tr>
<th>Dimension (mm)</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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Fig. 43. Package outline TO-236AB (SOT23)
10. Soldering

Table 10. Soldering

Fig. 44. Reflow soldering footprint for TO-236AB (SOT23)

Fig. 45. Wave soldering footprint for TO-236AB (SOT23)
11. Revision history

Table 11. Revision history

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12. Legal information

Data sheet status

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BC807H series

45 V, 500 mA PNP general-purpose transistors

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