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Kind regards,

Team Nexperia
1. **Product profile**

1.1 **General description**

PNP Resistor-Equipped Transistor (RET) in a leadless ultra small DFN1006B-3 (SOT883B) Surface-Mounted Device (SMD) plastic package.

NPN complement: PDTC115TMB.

1.2 **Features and benefits**

- 100 mA output current capability
- Reduces component count
- Built-in bias resistors
- Reduces pick and place costs
- Simplifies circuit design
- AEC-Q101 qualified
- Leadless ultra small SMD plastic package
- Low package height of 0.37 mm

1.3 **Applications**

- Low-current peripheral driver
- Control of IC inputs
- Replaces general-purpose transistors in digital applications
- 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&lt;sub&gt;CEO&lt;/sub&gt;</td>
<td>collector-emitter voltage</td>
<td>open base</td>
<td>-</td>
<td>-</td>
<td>-50</td>
<td>V</td>
</tr>
<tr>
<td>I&lt;sub&gt;O&lt;/sub&gt;</td>
<td>output current</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-100</td>
<td>mA</td>
</tr>
<tr>
<td>R1</td>
<td>bias resistor 1 (input)</td>
<td>T&lt;sub&gt;amb&lt;/sub&gt; = 25 °C</td>
<td>70</td>
<td>100</td>
<td>130</td>
<td>kΩ</td>
</tr>
</tbody>
</table>
2. Pinning information

Table 2. Pinning information

<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>I</td>
<td>input (base)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>G</td>
<td>GND (emitter)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>O</td>
<td>output (collector)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Ordering information

Table 3. 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>PDTA115TMB</td>
<td>DFN1006B-3</td>
<td>Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.37 mm</td>
<td>SOT883B</td>
<td></td>
</tr>
</tbody>
</table>

4. Marking

Table 4. Marking codes

<table>
<thead>
<tr>
<th>Type number</th>
<th>Marking code</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDTA115TMB</td>
<td>0010 0001</td>
</tr>
</tbody>
</table>

Fig 1. DFN1006B-3 (SOT883B) binary marking code description
5. Limiting values

Table 5. 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>-150</td>
<td>-50</td>
<td>V</td>
</tr>
<tr>
<td>V_{CEO}</td>
<td>collector-emitter voltage</td>
<td>open base</td>
<td>-150</td>
<td>-50</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_{O}</td>
<td>output current</td>
<td></td>
<td>-</td>
<td>-100</td>
<td>mA</td>
</tr>
<tr>
<td>I_{CM}</td>
<td>peak collector current</td>
<td>pulsed; t_p ≤ 1 ms</td>
<td>-100</td>
<td>-100</td>
<td>mA</td>
</tr>
<tr>
<td>P_{tot}</td>
<td>total power dissipation</td>
<td>T_amb ≤ 25 °C</td>
<td>-</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>-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>
</tr>
</tbody>
</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>R_{th(j-a)}</td>
<td>thermal resistance from junction to ambient</td>
<td>in free air</td>
<td>[1]</td>
<td>-</td>
<td>500</td>
<td>kW</td>
</tr>
</tbody>
</table>

FR4 PCB, standard footprint

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

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>$I_{CBO}$</td>
<td>collector-base cut-off current</td>
<td>$V_{CB} = -50 V; I_E = 0 A; T_{amb} = 25 ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>-100</td>
<td>nA</td>
</tr>
<tr>
<td>$I_{CEO}$</td>
<td>collector-emitter cut-off current</td>
<td>$V_{CE} = -30 V; I_B = 0 A; T_{amb} = 25 ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>-1</td>
<td>µA</td>
</tr>
<tr>
<td>$I_{EBO}$</td>
<td>emitter-base cut-off current</td>
<td>$V_{EB} = -5 V; I_C = 0 A; T_{amb} = 25 ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>-100</td>
<td>nA</td>
</tr>
<tr>
<td>$h_{FE}$</td>
<td>DC current gain</td>
<td>$V_{CE} = -5 V; I_C = -1 mA; T_{amb} = 25 ^\circ C$</td>
<td>100</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>$V_{CE_{sat}}$</td>
<td>collector-emitter saturation voltage</td>
<td>$I_C = -5 mA; I_B = -0.25 mA; T_{amb} = 25 ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>-150</td>
<td>mV</td>
</tr>
<tr>
<td>$R1$</td>
<td>bias resistor 1 (input)</td>
<td>$T_{amb} = 25 ^\circ C$</td>
<td>70</td>
<td>100</td>
<td>130</td>
<td>kΩ</td>
</tr>
<tr>
<td>$C_C$</td>
<td>collector capacitance</td>
<td>$V_{CB} = -10 V; I_E = 0 A; I_G = 0 A; f = 1 MHz; T_{amb} = 25 ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>pF</td>
</tr>
<tr>
<td>$f_T$</td>
<td>transition frequency</td>
<td>$V_{CE} = -5 V; I_C = -10 mA; f = 100 MHz; T_{amb} = 25 ^\circ C$</td>
<td>-</td>
<td>180</td>
<td>-</td>
<td>MHz</td>
</tr>
</tbody>
</table>

**PNP resistor-equipped transistor; R1 = 100 kΩ, R2 = open**

### Fig 4. DC current gain as a function of collector current; typical values

- \( V_{CE} = -5 \) V
- (1) \( T_{amb} = 100 \) °C
- (2) \( T_{amb} = 25 \) °C
- (3) \( T_{amb} = -40 \) °C

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

- \( I_{C}/I_{B} = 20 \)
- (1) \( T_{amb} = 100 \) °C
- (2) \( T_{amb} = 25 \) °C
- (3) \( T_{amb} = -40 \) °C

### Fig 6. Collector capacitance as a function of collector-base voltage; typical values of built-in transistor

- \( f = 1 \) MHz; \( T_{amb} = 25 \) °C

### Fig 7. Transition frequency as a function of collector current; typical values of built-in transistor

- \( V_{CE} = -5 \) V; \( T_{amb} = 25 \) °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

Fig 8. DFN1006B-3 (SOT883B)
10. Soldering

**Footprint information for reflow soldering**

Fig 9. Reflow soldering footprint for SOT883B (DFN1006B-3)
11. Revision history

Table 8. 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>
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<tbody>
<tr>
<td>PDTA115TMB v.1</td>
<td>20120702</td>
<td>Product data sheet</td>
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<td>-</td>
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12. Legal information

12.1 Data sheet status

<table>
<thead>
<tr>
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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>

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[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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NXP Semiconductors PDTA115TMB

PNP resistor-equipped transistor; R1 = 100 kΩ, R2 = open

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