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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: PDTC124TMB.

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>VCEO</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>-100</td>
<td>mA</td>
<td></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>15.4</td>
<td>22</td>
<td>28.6</td>
<td>kΩ</td>
</tr>
</tbody>
</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>1</td>
<td>1 2 3</td>
</tr>
<tr>
<td>2</td>
<td>G</td>
<td>GND (emitter)</td>
<td>2</td>
<td>1 2 3</td>
</tr>
<tr>
<td>3</td>
<td>O</td>
<td>output (collector)</td>
<td>3</td>
<td>1 2 3</td>
</tr>
</tbody>
</table>

DFN1006B-3 (SOT883B)

3. Ordering information

<table>
<thead>
<tr>
<th>Type number</th>
<th>Package</th>
<th>Description</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDTA124TMB</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>
</tr>
</tbody>
</table>

4. Marking

<table>
<thead>
<tr>
<th>Type number</th>
<th>Marking code</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDTA124TMB</td>
<td>0010 0110</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>-</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>-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>-</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>


FR4 PCB, standard footprint

Fig 2. Power derating curve for DFN1006B-3 (SOT883B)

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>K/W</td>
</tr>
</tbody>
</table>

PNP resistor-equipped transistor; R1 = 22 kΩ, R2 = open

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} = -5 V; I_{E} = 0 A; Tamb = 25 °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; Tamb = 25 °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; Tamb = 25 °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; Tamb = 25 °C</td>
<td>100</td>
<td>-</td>
<td>-</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; Tamb = 25 °C</td>
<td>-</td>
<td>-</td>
<td>-150</td>
<td>mV</td>
</tr>
<tr>
<td>R1</td>
<td>bias resistor 1 (input)</td>
<td>Tamb = 25 °C</td>
<td>15.4</td>
<td>22</td>
<td>28.6</td>
<td>kΩ</td>
</tr>
<tr>
<td>C_{C}</td>
<td>collector capacitance</td>
<td>V_{CB} = -10 V; I_{E} = 0 A; I_{P} = 0 A; f = 1 MHz; Tamb = 25 °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; Tamb = 25 °C</td>
<td>[1]</td>
<td>180</td>
<td>-</td>
<td>MHz</td>
</tr>
</tbody>
</table>


Fig 3. Transient thermal impedance from junction to ambient as a function of pulse duration; typical values
V_{CE} = -5 \text{ V}
1. T_{amb} = 100 \text{ °C}
2. T_{amb} = 25 \text{ °C}
3. T_{amb} = -40 \text{ °C}

\text{Fig 4. DC current gain as a function of collector current; typical values}

i_C/i_B = 20
1. T_{amb} = 100 \text{ °C}
2. T_{amb} = 25 \text{ °C}
3. T_{amb} = -40 \text{ °C}

\text{Fig 5. Collector-emitter saturation voltage as a function of collector current; typical values}

f = 1 \text{ MHz; } T_{amb} = 25 \text{ °C}

\text{Fig 6. Collector capacitance as a function of collector-base voltage; typical values of built-in transistor}

V_{CE} = -5 \text{ V; } T_{amb} = 25 \text{ °C}

\text{Fig 7. Transition frequency as a function of collector current; typical values of built-in transistor}
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>PDTA124TMB v.1</td>
<td>20120629</td>
<td>Product data sheet</td>
<td>-</td>
<td>-</td>
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</table>
12. Legal information

12.1 Data sheet status

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