PUMT1
Dual PNP transistor

Preliminary specification
File under Discrete Semiconductors, SC04

1995 Dec 07
Dual PNP transistor

**FEATURES**
- Two transistors in one SC70 package
- Reduces number of components and board space
- No mutual interference between the transistors.

**APPLICATIONS**
- General purpose switching
- Small signal amplification.

**DESCRIPTION**
Two PNP transistors in a plastic six lead SC70-6 (S-mini) package.

**PINNING**

<table>
<thead>
<tr>
<th>PIN</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>emitter TR1</td>
</tr>
<tr>
<td>2</td>
<td>base TR1</td>
</tr>
<tr>
<td>3</td>
<td>collector TR2</td>
</tr>
<tr>
<td>4</td>
<td>emitter TR2</td>
</tr>
<tr>
<td>5</td>
<td>base TR2</td>
</tr>
<tr>
<td>6</td>
<td>collector TR1</td>
</tr>
</tbody>
</table>

**QUICK REFERENCE DATA**

<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></td>
<td></td>
<td>Per transistor</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>–40</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 (DC)</td>
<td>I_C = –1 mA; V_{CE} = –6 V</td>
<td>–100</td>
<td>–</td>
<td>mA</td>
</tr>
<tr>
<td>f_T</td>
<td>transition frequency</td>
<td>I_C = –2 mA; V_{CE} = –12 V; f = 100 MHz; T_{amb} = 25 °C</td>
<td>100</td>
<td>–</td>
<td>MHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Per package</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P_{tot}</td>
<td>total power dissipation</td>
<td>up to T_{amb} = 25 °C</td>
<td>–</td>
<td>300</td>
<td>mW</td>
</tr>
</tbody>
</table>

Marking code: FF.

Fig. 1 Simplified outline (SC70-6), pin configuration and symbol.
LIMITING VALUES
In accordance with the Absolute Maximum Rating System (IEC 134).

<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>−40</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 (DC)</td>
<td></td>
<td>−</td>
<td>−100</td>
<td>mA</td>
</tr>
<tr>
<td>P_{tot}</td>
<td>total power dissipation</td>
<td></td>
<td>−</td>
<td>200</td>
<td>mW</td>
</tr>
<tr>
<td>T_{amb}</td>
<td>operating 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>
<tr>
<td>T_j</td>
<td>junction temperature</td>
<td></td>
<td>−</td>
<td>150</td>
<td>°C</td>
</tr>
</tbody>
</table>

Per package:

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>PARAMETER</th>
<th>CONDITIONS</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_{tot}</td>
<td>total power dissipation</td>
<td>up to T_{amb} = 25 °C; note 1</td>
<td>−</td>
<td>300</td>
</tr>
</tbody>
</table>

THERMAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>PARAMETER</th>
<th>CONDITIONS</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>R_{thj-a}</td>
<td>thermal resistance from junction to ambient</td>
<td>in free air; note 1</td>
<td>416</td>
<td>K/W</td>
</tr>
</tbody>
</table>

Note to the ‘Limiting values’ and ‘ Thermal characteristics’

1. In accordance with standard mounting conditions SC70, six lead version.

ELECTRICAL CHARACTERISTICS

T_{amb} = 25 °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_{(BR)CBO}</td>
<td>collector-base breakdown voltage</td>
<td>open emitter; I_C = −50 μA; I_E = 0</td>
<td>−50</td>
<td>−</td>
<td>V</td>
</tr>
<tr>
<td>V_{(BR)CEO}</td>
<td>collector-emitter breakdown voltage</td>
<td>open base; I_C = −1 mA; I_B = 0</td>
<td>−40</td>
<td>−</td>
<td>V</td>
</tr>
<tr>
<td>V_{(BR)EBO}</td>
<td>emitter-base breakdown voltage</td>
<td>open collector; I_E = −50 μA; I_C = 0</td>
<td>−5</td>
<td>−</td>
<td>V</td>
</tr>
<tr>
<td>V_{CESat}</td>
<td>collector-emitter saturation voltage</td>
<td>I_C = −50 mA; I_B = −5 mA; note 1</td>
<td>−</td>
<td>−200</td>
<td>mV</td>
</tr>
<tr>
<td>I_{CBO}</td>
<td>collector-base cut-off current</td>
<td>V_CB = −30 V; I_E = 0</td>
<td>−</td>
<td>−100</td>
<td>nA</td>
</tr>
<tr>
<td>I_{EBO}</td>
<td>emitter-base cut-off current</td>
<td>V_{EB} = −4 V; I_C = 0</td>
<td>−</td>
<td>−10</td>
<td>μA</td>
</tr>
<tr>
<td>h_{FE}</td>
<td>DC current gain</td>
<td>I_C = −1 mA; V_CE = −6 V</td>
<td>120</td>
<td>−</td>
<td></td>
</tr>
<tr>
<td>f_T</td>
<td>transition frequency</td>
<td>I_C = −2 mA; V_CE = −12 V; f = 100 MHz</td>
<td>100</td>
<td>−</td>
<td>MHz</td>
</tr>
<tr>
<td>C_c</td>
<td>collector capacitance</td>
<td>I_E = i_e = 0; V_CB = −12 V; f = 1 MHz</td>
<td>2.2</td>
<td>−</td>
<td>pF</td>
</tr>
</tbody>
</table>

Note to the ‘Electrical characteristics’

1. Pulse test: t_p ≤ 300 μs; δ ≤ 0.02.
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PACKAGE OUTLINE

DEFINITIONS

<table>
<thead>
<tr>
<th>Data sheet status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective specification</td>
<td>This data sheet contains target or goal specifications for product development.</td>
</tr>
<tr>
<td>Preliminary specification</td>
<td>This data sheet contains preliminary data; supplementary data may be published later.</td>
</tr>
<tr>
<td>Product specification</td>
<td>This data sheet contains final product specifications.</td>
</tr>
</tbody>
</table>

Limiting values

Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

Application information

Where application information is given, it is advisory and does not form part of the specification.

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.
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PUMT1

NOTES
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PUMT1

NOTES