Transistor

2SA683, 2SA684
Silicon PNP epitaxial planer type

For low-frequency power amplification and driver amplification
Complementary to 2SC1383 and 2SC1384

■ Features
- Complementary pair with 2SC1383 and 2SC1384.
- Allowing supply with the radial taping.

■ Absolute Maximum Ratings (Ta=25˚C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Ratings</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector to base voltage</td>
<td>V_CBO</td>
<td>−30 V</td>
<td></td>
</tr>
<tr>
<td>Collector to emitter voltage</td>
<td>V_CEO</td>
<td>−50 V</td>
<td></td>
</tr>
<tr>
<td>Emitter to base voltage</td>
<td>V_EBO</td>
<td>−5 V</td>
<td></td>
</tr>
<tr>
<td>Peak collector current</td>
<td>I_CP</td>
<td>−1.5 A</td>
<td></td>
</tr>
<tr>
<td>Collector current</td>
<td>I_C</td>
<td>−1 A</td>
<td></td>
</tr>
<tr>
<td>Collector power dissipation</td>
<td>P_C</td>
<td>1 W</td>
<td></td>
</tr>
<tr>
<td>Junction temperature</td>
<td>T_j</td>
<td>150 °C</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>T_stg</td>
<td>−55 ~ +150 °C</td>
<td></td>
</tr>
</tbody>
</table>

■ Electrical Characteristics (Ta=25˚C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Conditions</th>
<th>min</th>
<th>typ</th>
<th>max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector cutoff current</td>
<td>I_CBO</td>
<td>V_CB = −20V, I_E = 0</td>
<td>−0.1 μA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collector to base voltage</td>
<td>V_CBO</td>
<td>I_C = −10μA, I_E = 0</td>
<td>−30 V</td>
<td>−60 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collector to emitter voltage</td>
<td>V_CEO</td>
<td>I_C = −2mA, I_B = 0</td>
<td>−25 V</td>
<td>−50 V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emitter to base voltage</td>
<td>V_EBO</td>
<td>I_E = −10μA, I_C = 0</td>
<td>−5 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forward current transfer ratio</td>
<td>h_FE1</td>
<td>V_CE = −10V, I_C = −500mA</td>
<td>85</td>
<td>340</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collector to emitter saturation voltage</td>
<td>V_CE(sat)</td>
<td>I_C = −500mA, I_B = −50mA</td>
<td>−0.2</td>
<td>−0.4</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Base to emitter saturation voltage</td>
<td>V_BE(sat)</td>
<td>I_C = −500mA, I_B = −50mA</td>
<td>−0.85</td>
<td>−1.2</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Transition frequency</td>
<td>f_T</td>
<td>V_CB = −10V, I_E = 50mA, f = 200MHz</td>
<td>200</td>
<td></td>
<td></td>
<td>MHz</td>
</tr>
<tr>
<td>Collector output capacitance</td>
<td>C_{ob}</td>
<td>V_CB = −10V, I_E = 0, f = 1MHz</td>
<td>20</td>
<td>30</td>
<td></td>
<td>pF</td>
</tr>
</tbody>
</table>

*h_FE1 Rank classification

<table>
<thead>
<tr>
<th>Rank</th>
<th>Q</th>
<th>R</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>h_FE1</td>
<td>85 ~ 170</td>
<td>120 ~ 240</td>
<td>170 ~ 340</td>
</tr>
</tbody>
</table>
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**Graphs and Charts**

1. **Collector power dissipation** $P_C - Ta$ vs. Ambient temperature $Ta$ (°C)
2. **Collector current** $I_C$ vs. Collector power dissipation $P_C$ (W)
3. **Collector current** $I_C$ vs. Collector to emitter voltage $V_{CE}$ (V)
4. **Collector current** $I_C$ vs. Base current $I_B$ (mA)
5. **Collector current** $I_C$ vs. Collector to emitter saturation voltage $V_{CE(sat)}$ (V)
6. **Transition frequency** $f_T$ vs. Collector current $I_C$ (A)
7. **Collector output capacitance** $C_{ob}$ vs. Collector to base voltage $V_{CB}$ (V)
8. **Collector to emitter voltage** $V_{CER}$ vs. Base to emitter resistance $R_{BE}$ (kΩ)

**Typical Characteristics**

- $V_{CE} = -10V$
- $Ta = 25°C$
- $IC / I_B = 10$
- $f = 1MHz$
- $I_E = 0$
- $I_B = 10mA$

**Key Parameters**

- $V_{CE(sat)}$
- $V_{BE(sat)}$
- $h_{FE}$
- $f_T$
- $C_{ob}$
- $V_{CER}$
- $R_{BE}$

**Data Tables**

- Ambient temperature $Ta$ in °C
- Collector power dissipation $P_C$ in W
- Collector current $I_C$ in A
- Collector to emitter voltage $V_{CE}$ in V
- Base current $I_B$ in mA
- Collector to emitter saturation voltage $V_{CE(sat)}$ in V
- Forward current transfer ratio $h_{FE}$
- Transition frequency $f_T$ in MHz
- Collector output capacitance $C_{ob}$ in pF
- Collector to emitter voltage $V_{CER}$ in V
- Base to emitter resistance $R_{BE}$ in kΩ
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Collector to emitter voltage $V_{CE}$ (V)

Collector current $I_C$ (A)

Ambient temperature $T_a$ (°C)

Current $I_{CEO}$ vs. $T_a$

Area of safe operation (ASO)

Single pulse

$T_a=25°C$

t=10ms

$t=1s$

$ICP$

$IC$

Collector to emitter voltage $V_{CE}$ (V)