TOSHIBA Transistor Silicon NPN Triple Diffused Type

TTC5200

Power Amplifier Applications

- High collector voltage: $V_{CEO} = 230$ V (min)
- Complementary to TTA1943
- Recommended for 100-W high-fidelity audio frequency amplifier output stage.

Absolute Maximum Ratings ($Ta = 25^\circ$C)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Symbol</th>
<th>Rating</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector-base voltage</td>
<td>$V_{CBO}$</td>
<td>230</td>
<td>V</td>
</tr>
<tr>
<td>Collector-emitter voltage</td>
<td>$V_{CEO}$</td>
<td>230</td>
<td>V</td>
</tr>
<tr>
<td>Emitter-base voltage</td>
<td>$V_{EBO}$</td>
<td>5</td>
<td>V</td>
</tr>
<tr>
<td>Collector current</td>
<td>$I_C$</td>
<td>15</td>
<td>A</td>
</tr>
<tr>
<td>Base current</td>
<td>$I_B$</td>
<td>1.5</td>
<td>A</td>
</tr>
<tr>
<td>Collector power dissipation (Tc=25°C)</td>
<td>$P_C$</td>
<td>150</td>
<td>W</td>
</tr>
<tr>
<td>Junction temperature</td>
<td>$T_J$</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>$T_{stg}$</td>
<td>55 to 150</td>
<td>°C</td>
</tr>
</tbody>
</table>

Note 1: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

Weight: 9.75 g (typ)
Electrical Characteristics (Ta = 25°C)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Symbol</th>
<th>Test Condition</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector cut-off current</td>
<td>I_CBO</td>
<td>V_CB = 230V, I_E = 0</td>
<td></td>
<td></td>
<td></td>
<td>μA</td>
</tr>
<tr>
<td>Emitter cut-off current</td>
<td>I_EBO</td>
<td>V_EB = 5V, I_C = 0</td>
<td></td>
<td></td>
<td></td>
<td>μA</td>
</tr>
<tr>
<td>Collector-emitter breakdown voltage</td>
<td>V (BR) CEO</td>
<td>I_C = 50 mA, I_B = 0</td>
<td></td>
<td></td>
<td>230</td>
<td>V</td>
</tr>
<tr>
<td>DC current gain</td>
<td>h_FE(1)</td>
<td>V_CE = 5V, I_C = 1 A</td>
<td>80</td>
<td></td>
<td>160</td>
<td></td>
</tr>
<tr>
<td></td>
<td>h_FE(2)</td>
<td>V_CE = 5V, I_C = 7 A</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collector-emitter saturation voltage</td>
<td>V_CE(sat)</td>
<td>I_C = 8 A, I_B = 0.8 A</td>
<td></td>
<td></td>
<td>3.0</td>
<td>V</td>
</tr>
<tr>
<td>Base-emitter voltage</td>
<td>V_BE</td>
<td>V_CE = 5V, I_C = 7 A</td>
<td></td>
<td></td>
<td>1.5</td>
<td>V</td>
</tr>
<tr>
<td>Transition frequency</td>
<td>f_T</td>
<td>V_CE = 5V, I_C = 1 A</td>
<td></td>
<td></td>
<td>30</td>
<td>MHz</td>
</tr>
<tr>
<td>Collector output capacitance</td>
<td>C_Ob</td>
<td>V_CB = 10 V, I_E = 0, f = 1 MHz</td>
<td></td>
<td>145</td>
<td></td>
<td>pF</td>
</tr>
</tbody>
</table>

Marking

Part No. (or abbreviation code)

Lot No.

Note 2: A line under a Lot No. identifies the indication of product Labels.

[[G]]/RoHS COMPATIBLE or [[G]]/RoHS [Pb]

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product.

Collector current $I_C$ (A) vs. Collector-emitter voltage $V_{CE}$ (V)

Collector-emitter saturation voltage
$V_{CE(sat)}$ (V)

Base-emitter voltage $V_{BE}$ (V)

Collector power dissipation $P_C$ (W)

Ambient temperature $T_a$ (°C)

Collector current $I_C$ (A) vs. DC current gain $h_{FE}$

Collector current $I_C$ (A) vs. Collector-emitter voltage $V_{CE}$ (V)

Collector current $I_C$ (A) vs. Collector-emitter saturation voltage $V_{CE(sat)}$ (V)

Collector current $I_C$ (A) vs. Base-emitter saturation voltage $V_{BE(sat)}$ (V)

Collector current $I_C$ (A) vs. Base-emitter voltage $V_{BE}$ (V)

Collector current $I_C$ (A) vs. Collector power dissipation $P_C$ (W)

Ambient temperature $T_a$ (°C)
Curves apply only to limited areas of thermal resistance.

Single nonrepetitive pulse

Tc=25°C Infinite heat sink

Ic MAX (Pulse)*

Ic MAX (continuous)

1ms*

10ms*

100ms*

VCBO MAX

Collector current Ic (A)

Collector-emitter voltage Vce (V)

Curves must be derated linearly with increase in temperature.

*Single nonrepetitive pulse

Tc = 25°C

DC operation

Tc=25°C
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