TIP29/TIP29A/TIP29B/TIP29C
NPN Epitaxial Silicon Transistor

Features
- Complementary to TIP30/TIP30A/TIP30B/TIP30C

Absolute Maximum Ratings \( T_C = 25^\circ C \) unless otherwise noted

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_{CBO} )</td>
<td>Collector-Base Voltage</td>
<td>TIP29: 40 V, 60 V, 80 V, 100 V</td>
<td></td>
</tr>
<tr>
<td>( V_{CEO} )</td>
<td>Collector-Emitter Voltage</td>
<td>TIP29: 40 V, 60 V, 80 V, 100 V</td>
<td></td>
</tr>
<tr>
<td>( V_{EBO} )</td>
<td>Emitter-Base Voltage</td>
<td>5 V</td>
<td></td>
</tr>
<tr>
<td>( I_C )</td>
<td>Collector Current (DC)</td>
<td>1 A</td>
<td></td>
</tr>
<tr>
<td>( I_{CP} )</td>
<td>Collector Current (Pulse)</td>
<td>3 A</td>
<td></td>
</tr>
<tr>
<td>( I_B )</td>
<td>Base Current</td>
<td>0.4 A</td>
<td></td>
</tr>
<tr>
<td>( P_C )</td>
<td>Collector Dissipation ( (T_C=25^\circ C) )</td>
<td>30 W</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collector Dissipation ( (T_A=25^\circ C) )</td>
<td>2 W</td>
<td></td>
</tr>
<tr>
<td>( T_J )</td>
<td>Junction Temperature</td>
<td>150 ( ^\circ C )</td>
<td></td>
</tr>
<tr>
<td>( T_{STG} )</td>
<td>Storage Temperature</td>
<td>-65 – 150 ( ^\circ C )</td>
<td></td>
</tr>
</tbody>
</table>
### Electrical Characteristics

$T_C=25^\circ C$ unless otherwise noted

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Test Condition</th>
<th>Min.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{CEO(sus)}$</td>
<td>*Collector-Emitter Sustaining Voltage</td>
<td>$I_C = 30,mA, , I_B = 0$</td>
<td>40</td>
<td>60</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>: TIP29</td>
<td></td>
<td></td>
<td>80</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>: TIP29A</td>
<td></td>
<td></td>
<td>100</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>: TIP29B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>: TIP29C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{CEO}$</td>
<td>Collector Cut-off Current</td>
<td>$V_{CE} = 30,V, , I_B = 0$</td>
<td>0.3</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>: TIP29/29A</td>
<td>$V_{CE} = 60,V, , I_B = 0$</td>
<td>0.3</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>: TIP29B/29C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{CES}$</td>
<td>Collector Cut-off Current</td>
<td>$V_{CE} = 40,V, , V_{EB} = 0$</td>
<td>200</td>
<td>μA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>: TIP29</td>
<td>$V_{CE} = 60,V, , V_{EB} = 0$</td>
<td>200</td>
<td>μA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>: TIP29A</td>
<td>$V_{CE} = 80,V, , V_{EB} = 0$</td>
<td>200</td>
<td>μA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>: TIP29B</td>
<td>$V_{CE} = 100,V, , V_{EB} = 0$</td>
<td>200</td>
<td>μA</td>
<td></td>
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<tr>
<td>$I_{EBO}$</td>
<td>Emitter Cut-off Current</td>
<td>$V_{EB} = 5,V, , I_C = 0$</td>
<td>1.0</td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>$h_{FE}$</td>
<td>*DC Current Gain</td>
<td>$V_{CE} = 4,V, , I_C = 0.2,A$</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CE} = 4,V, , I_C = 1,A$</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_{CE(sat)}$</td>
<td>*Collector-Emitter Saturation Voltage</td>
<td>$I_C = 1,A, , I_B = 125,mA$</td>
<td>0.7</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>$V_{BE(sat)}$</td>
<td>*Base-Emitter Saturation Voltage</td>
<td>$V_{CE} = 4,V, , I_C = 1,A$</td>
<td>1.3</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>$f_T$</td>
<td>Current Gain Bandwidth Product</td>
<td>$V_{CE} = 10,V, , I_C = 200,mA$</td>
<td>3.0</td>
<td>MHz</td>
<td></td>
</tr>
</tbody>
</table>

* Pulse Test: PW $\leq 300\,ms$, Duty Cycle $\leq 2\%$
Typical Characteristics

Figure 1. DC current Gain

Figure 2. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

Figure 3. Safe Operating Area

Figure 4. Power Derating
Mechanical Dimensions

TO220

NOTES: UNLESS OTHERWISE SPECIFIED
A) REFERENCE JEDEC, TO-220, ISSUE K, VARIATION AB, DATED APRIL, 2002.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONING AND TOLERANCING PER ANSI Y14.5M-1973
D) LOCATION OF THE PIN HOLE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
E) DOES NOT COMPLY JEDEC STANDARD VALUE.
F) "A1" DIMENSIONS REPRESENT LIKE BELOW:
   SINGLE GAUGE = 0.51 - 0.61
   DUAL GAUGE = 1.14 - 1.40
G) DRAWING FILE NAME: TO220B03REV6
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