MPSA06 / MMBTA06 / PZTA06  
NPN General Purpose Amplifier

Features
- This device is designed for general purpose amplifier applications at collector currents to 300mA.
- Sourced from Process 33.

Absolute Maximum Ratings * $T_a = 25°C$ unless otherwise noted

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Value</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{CEO}$</td>
<td>Collector-Emitter Voltage</td>
<td>80</td>
<td>V</td>
</tr>
<tr>
<td>$V_{CBO}$</td>
<td>Collector-Base Voltage</td>
<td>80</td>
<td>V</td>
</tr>
<tr>
<td>$V_{CEO}$</td>
<td>Emitter-Base Voltage</td>
<td>4.0</td>
<td>V</td>
</tr>
<tr>
<td>$I_C$</td>
<td>Collector Current - Continuous</td>
<td>500</td>
<td>mA</td>
</tr>
<tr>
<td>$T_J, T_{stg}$</td>
<td>Operating and Storage Junction Temperature Range</td>
<td>-55 to +150</td>
<td>°C</td>
</tr>
</tbody>
</table>

* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:
1) These ratings are based on a maximum junction temperature of 150 degrees C.
2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics $T_a = 25°C$ unless otherwise noted

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_D$</td>
<td>Total Device Dissipation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Derate above 25°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MPSA06</td>
<td>625</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td><strong>MMBTA06</strong></td>
<td>350</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td><strong>PZTA06</strong></td>
<td>1,000</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td>Derate above 25°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MPSA06</td>
<td>5.0</td>
<td>mW/°C</td>
</tr>
<tr>
<td></td>
<td><strong>MMBTA06</strong></td>
<td>2.8</td>
<td>mW/°C</td>
</tr>
<tr>
<td></td>
<td><strong>PZTA06</strong></td>
<td>8.0</td>
<td>mW/°C</td>
</tr>
</tbody>
</table>

| $R_{JUC}$ | Thermal Resistance, Junction to Case | 83.3 | °C/W |
| $R_{JUA}$ | Thermal Resistance, Junction to Ambient | 200 | °C/W |
| | MPSA06 | 357 | 125 | |
## Electrical Characteristics

**Tₐ = 25°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><strong>Off Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V(BR)CEO</td>
<td>Collector-Emitter Breakdown Voltage*</td>
<td>I_C = 1.0mA, I_B = 0</td>
<td>80</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>V(BR)EBO</td>
<td>Emitter-Base Breakdown Voltage</td>
<td>I_E = 100μA, I_C = 0</td>
<td>4.0</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>I_CEO</td>
<td>Collector-Cutoff Current</td>
<td>V_CE = 60V, I_B = 0</td>
<td>0.1</td>
<td>μA</td>
<td></td>
</tr>
<tr>
<td>I_CBO</td>
<td>Collector-Cutoff Current</td>
<td>V_CB = 80V, I_E = 0</td>
<td>0.1</td>
<td>μA</td>
<td></td>
</tr>
<tr>
<td><strong>On Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h FE</td>
<td>DC Current Gain</td>
<td>I_C = 10mA, V_CE = 1.0V</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V_CE(sat)</td>
<td>Collector-Emitter Saturation Voltage</td>
<td>I_C = 100mA, I_B = 10mA</td>
<td>0.25</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>V_BE(on)</td>
<td>Base-Emitter On Voltage</td>
<td>I_C = 100mA, V_CE = 1.0V</td>
<td>1.2</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td><strong>Small Signal Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f T</td>
<td>Current Gain - Bandwidth Product</td>
<td>I_C = 10mA, V_CE = 2.0V, f = 100MHz</td>
<td>100</td>
<td>MHz</td>
<td></td>
</tr>
</tbody>
</table>

* Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2.0%
Typical Performance Characteristics (continued)

Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base

![Figure 7. Collector-Emitter Breakdown Voltage with Resistance Between Emitter-Base](image)

Input and Output Capacitance vs Reverse Voltage

![Figure 8. Input and Output Capacitance vs Reverse Voltage](image)

Gain Bandwidth Product vs Collector Current

![Figure 9. Gain Bandwidth Product vs Collector Current](image)

Power Dissipation vs Ambient Temperature

![Figure 10. Power Dissipation vs Ambient Temperature](image)
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<th>Definition</th>
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<td>Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.</td>
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