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KSP94
PNP Epitaxial Silicon Transistor

Features
• High Voltage Transistor
• High Collector-Emitter Voltage: \( V_{CEO} = -400 \text{ V} \)
• Low Collector-Emitter Saturation Voltage
• Complement to KSP44

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Top Mark</th>
<th>Package</th>
<th>Packing Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>KSP94BU</td>
<td>KSP94</td>
<td>TO-92 3L</td>
<td>Bulk</td>
</tr>
<tr>
<td>KSP94TA</td>
<td>KSP94</td>
<td>TO-92 3L</td>
<td>Ammo</td>
</tr>
</tbody>
</table>

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at \( T_A = 25^\circ\text{C} \) unless otherwise noted.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>( V_{CBO} )</td>
<td>Collector-Base Voltage</td>
<td>-400</td>
<td>V</td>
</tr>
<tr>
<td>( V_{CEO} )</td>
<td>Collector-Emitter Voltage</td>
<td>-400</td>
<td>V</td>
</tr>
<tr>
<td>( V_{EBO} )</td>
<td>Emitter-Base Voltage</td>
<td>-6</td>
<td>V</td>
</tr>
<tr>
<td>( I_C )</td>
<td>Collector Current</td>
<td>-300</td>
<td>mA</td>
</tr>
<tr>
<td>( T_J )</td>
<td>Junction Temperature</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>( T_{STG} )</td>
<td>Storage Temperature</td>
<td>-55 to +150</td>
<td>°C</td>
</tr>
</tbody>
</table>
**Thermal Characteristics**

Values are at $T_A = 25^\circ C$ unless otherwise noted.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_D$</td>
<td>Total Device Dissipation</td>
<td>625</td>
<td>mW</td>
</tr>
<tr>
<td></td>
<td>Derate Above 25°C</td>
<td>5.0</td>
<td>mW/°C</td>
</tr>
<tr>
<td>$R_{\text{JA}}$</td>
<td>Thermal Resistance, Junction-to-Ambient</td>
<td>200</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

**Note:**

1. PCB size: FR-4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.

**Electrical Characteristics**

Values are at $T_A = 25^\circ C$ unless otherwise noted.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$B_{\text{V}_{\text{CBO}}}$</td>
<td>Collector-Base Breakdown Voltage</td>
<td>$I_C = -100 \mu A, I_E = 0$</td>
<td>-400</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>$B_{\text{V}_{\text{CEO}}}$</td>
<td>Collector-Emitter Breakdown Voltage</td>
<td>$I_C = -1 mA, I_B = 0$</td>
<td>-400</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>$B_{\text{V}_{\text{EBO}}}$</td>
<td>Emitter-Base Breakdown Voltage</td>
<td>$I_E = -10 \mu A, I_C = 0$</td>
<td>-6</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>$I_{\text{CBO}}$</td>
<td>Collector Cut-Off Current</td>
<td>$V_{CB} = -300 \text{ V}, I_E = 0$</td>
<td></td>
<td>-100</td>
<td></td>
<td>nA</td>
</tr>
<tr>
<td>$I_{\text{CES}}$</td>
<td>Collector Cut-Off Current</td>
<td>$V_{CE} = -400 \text{ V}, V_{BE} = 0$</td>
<td></td>
<td>-1</td>
<td></td>
<td>µA</td>
</tr>
<tr>
<td>$I_{\text{EBO}}$</td>
<td>Emitter Cut-Off Current</td>
<td>$V_{EB} = -4 \text{ V}, I_C = 0$</td>
<td></td>
<td>-100</td>
<td></td>
<td>nA</td>
</tr>
<tr>
<td>$h_{\text{FE}}$</td>
<td>DC Current Gain</td>
<td>$V_{CE} = -10 \text{ V}, I_C = -1 mA$</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CE} = -10 \text{ V}, I_C = -10 mA$</td>
<td>50</td>
<td></td>
<td>300</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CE} = -10 \text{ V}, I_C = -50 mA$</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CE} = -10 \text{ V}, I_C = -100 mA$</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_{\text{CE}(\text{sat})}$</td>
<td>Collector-Emitter Saturation Voltage</td>
<td>$I_C = -10 mA, I_B = -1 mA$</td>
<td></td>
<td></td>
<td>-500</td>
<td>mV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_C = -50 mA, I_B = -5 mA$</td>
<td></td>
<td></td>
<td>-750</td>
<td>mV</td>
</tr>
<tr>
<td>$V_{\text{BE}(\text{sat})}$</td>
<td>Base-Emitter Saturation Voltage</td>
<td>$I_C = -10 mA, I_B = -1 mA$</td>
<td></td>
<td></td>
<td>-750</td>
<td>mV</td>
</tr>
<tr>
<td>$C_{\text{ob}}$</td>
<td>Output Capacitance</td>
<td>$V_{CB} = -20 \text{ V}, I_E = 0, f = 1 \text{ MHz}$</td>
<td>7</td>
<td></td>
<td></td>
<td>pF</td>
</tr>
</tbody>
</table>
Typical Performance Characteristics

Figure 1. DC Current Gain

Figure 2. Base-Emitter Saturation Voltage

Figure 3. Collector-Emitter Saturation Voltage

Figure 4. Collector Output Capacitance
Figure 5. 3-Lead, TO-92, JEDEC TO-92 Compliant Straight Lead Configuration, Bulk Type
Physical Dimensions (Continued)

Figure 6. 3-Lead, TO-92, Molded, 0.2 In Line Spacing Lead Form, Ammo Type

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B. ALL DIMENSIONS ARE IN MILLIMETERS.
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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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