To learn more about ON Semiconductor, please visit our website at www.onsemi.com

Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor’s system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.
KSP42 / KSP43
NPN Epitaxial Silicon Transistor

Features
- Collector-Emitter Voltage: $V_{CEO} = KSP42: 300\,V$
  $KSP43: 200\,V$
- Collector Dissipation: $P_C (\text{max.}) = 625\,\text{mW}$

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>KSP42BU</td>
<td>KSP42</td>
<td>TO-92 3L</td>
<td>Bulk</td>
</tr>
<tr>
<td>KSP42TA</td>
<td>KSP42</td>
<td>TO-92 3L</td>
<td>Ammo</td>
</tr>
<tr>
<td>KSP43BU</td>
<td>KSP43</td>
<td>TO-92 3L</td>
<td>Bulk</td>
</tr>
<tr>
<td>KSP43TA</td>
<td>KSP43</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>KSP42 300</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KSP43 200</td>
<td></td>
</tr>
<tr>
<td>$V_{CEO}$</td>
<td>Collector-Emitter Voltage</td>
<td>KSP42 300</td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>KSP43 200</td>
<td></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>500</td>
<td>mA</td>
</tr>
<tr>
<td>$P_C$</td>
<td>Collector Power Dissipation</td>
<td>625</td>
<td>mW</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>
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</table>
### 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>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>$B_{VCBO}$</td>
<td>Collector-Base Breakdown Voltage</td>
<td>$I_C = 100 \mu A, I_E = 0$</td>
<td>300</td>
<td></td>
<td>V</td>
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<tr>
<td></td>
<td></td>
<td>$I_C = 100 \mu A, I_E = 0$</td>
<td>200</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>$B_{VCEO}$</td>
<td>Collector-Emitter Breakdown Voltage$^{(1)}$</td>
<td>$I_C = 1 mA, I_E = 0$</td>
<td>300</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_C = 1 mA, I_E = 0$</td>
<td>200</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>$B_{VEBO}$</td>
<td>Emitter-Base Breakdown Voltage</td>
<td>$I_E = 100 \mu A, I_C = 0$</td>
<td>6</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>$I_{CBO}$</td>
<td>Collector Cut-Off Current</td>
<td>$V_{CB} = 200 V, I_E = 0$</td>
<td>100</td>
<td></td>
<td>nA</td>
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<td></td>
<td></td>
<td>$V_{CB} = 160 V, I_E = 0$</td>
<td>100</td>
<td></td>
<td>nA</td>
</tr>
<tr>
<td>$I_{EBO}$</td>
<td>Emitter Cut-Off Current</td>
<td>$V_{EB} = 6 V, I_C = 0$</td>
<td>100</td>
<td></td>
<td>nA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{EB} = 4 V, I_C = 0$</td>
<td>100</td>
<td></td>
<td>nA</td>
</tr>
<tr>
<td>$h_{FE}$</td>
<td>DC Current Gain$^{(1)}$</td>
<td>$V_{CE} = 10 V, I_C = 1 mA$</td>
<td>25</td>
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<tr>
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<td>$V_{CE} = 10 V, I_C = 10 mA$</td>
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<td></td>
<td></td>
<td>$V_{CE} = 10 V, I_C = 30 mA$</td>
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<tr>
<td>$V_{CE(sat)}$</td>
<td>Collector-Emitter Saturation Voltage$^{(1)}$</td>
<td>$I_C = 20 mA, I_E = 2 mA$</td>
<td>0.5</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>$V_{BE(sat)}$</td>
<td>Base-Emitter Saturation Voltage$^{(1)}$</td>
<td>$I_C = 20 mA, I_E = 2 mA$</td>
<td>0.9</td>
<td></td>
<td>V</td>
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<tr>
<td>$C_{ob}$</td>
<td>Output Capacitance</td>
<td>$V_{CB} = 20 V, I_E = 0$, $f = 1 MHz$</td>
<td>3</td>
<td></td>
<td>pF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_{CB} = 20 V, I_E = 0$, $f = 100 MHz$</td>
<td>4</td>
<td></td>
<td>pF</td>
</tr>
<tr>
<td>$f_T$</td>
<td>Current Gain Bandwidth Product</td>
<td>$V_{CE} = 20 V, I_C = 10 mA$, $f = 100 MHz$</td>
<td>50</td>
<td></td>
<td>MHz</td>
</tr>
</tbody>
</table>

**Note:**

1. Pulse test: pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$.
Typical Performance Characteristics

Figure 1. DC Current Gain

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

Figure 3. Collector-Base Capacitance

Figure 4. Current Gain Bandwidth Product
Physical Dimensions

Figure 5. 3-Lead, TO-92, JEDEC TO-92 Compliant Straight Lead Configuration, Bulk Type

NOTES: UNLESS OTHERWISE SPECIFIED
A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DRAWING CONFORMS TO ASME Y14.5M-2009.
D) DRAWING FILENAME: MKT-ZA030REV.A.

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Physical Dimensions (Continued)

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

NOTES: UNLESS OTHERWISE SPECIFIED
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B. ALL DIMENSIONS ARE IN MILLIMETERS.
C. DRAWING CONFORMS TO ASME Y14.5M-2009.
D. DRAWING FILENAME: MRT-2AD3PREV3.
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<th>Datasheet Identification</th>
<th>Product Status</th>
<th>Definition</th>
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<td>Advance Information</td>
<td>Formative / In Design</td>
<td>Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.</td>
</tr>
<tr>
<td>Preliminary</td>
<td>First Production</td>
<td>Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.</td>
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Rev. 176