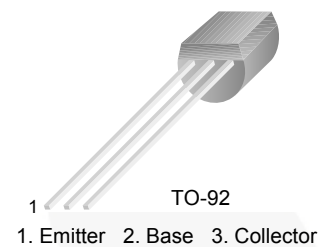


KSP44/45

NPN Epitaxial Silicon Transistor

Features

- High-Voltage Transistor
- Collector-Emitter Voltage: V_{CEO} = KSP44: 400V
KSP45: 350V
- Collector Power Dissipation: $P_C(\text{max})$ = 625mW



Ordering Information

| Part Number | Top Mark | Package | Packing Method |
|-------------|----------|----------|----------------|
| KSP44BU | KSP44 | TO-92 3L | Bulk |
| KSP44TA | KSP44 | TO-92 3L | Ammo |
| KSP44TF | KSP44 | TO-92 3L | Tape and Reel |
| KSP45TA | KSP45 | TO-92 3L | Ammo |

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.

| Symbol | Parameter | Value | Unit | |
|-----------|---------------------------|------------|------------------|---|
| V_{CBO} | Collector-Base Voltage | : KSP44 | 500 | V |
| | | : KSP45 | 400 | V |
| V_{CEO} | Collector-Emitter Voltage | : KSP44 | 400 | V |
| | | : KSP45 | 350 | V |
| V_{EBO} | Emitter-Base Voltage | 6 | V | |
| I_C | Collector Current | 300 | mA | |
| T_J | Junction Temperature | 150 | $^\circ\text{C}$ | |
| T_{STG} | Storage Temperature | -55 to 150 | $^\circ\text{C}$ | |

Thermal Characteristics

| Symbol | Parameter | Value | Unit |
|-----------------|--|-------|--------------------|
| P_C | Collector Power Dissipation ($T_A = 25^\circ\text{C}$) | 625 | mW |
| P_C | Collector Power Dissipation ($T_C = 25^\circ\text{C}$) | 1.5 | W |
| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 83.3 | $^\circ\text{C/W}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 200 | $^\circ\text{C/W}$ |

Electrical Characteristics

Values are at $T_a = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Conditions | Min. | Max. | Unit |
|----------------------|---|--|----------------------|--------------------|--------------------------------|
| BV_{CBO} | Collector-Base Breakdown Voltage : KSP44 : KSP45 | $I_C = 100\mu\text{A}, I_B = 0$ | 500 400 | | V V |
| BV_{CEO} | Collector -Emitter Breakdown Voltage ⁽¹⁾ : KSP44 : KSP45 | $I_C = 1\text{mA}, I_B = 0$ | 400 350 | | V V |
| BV_{EBO} | Emitter-Base Breakdown Voltage | $I_E = 100\mu\text{A}, I_C = 0$ | 6 | | V |
| I_{CBO} | Collector Cut-off Current : KSP44 : KSP45 | $V_{CB} = 400\text{V}, I_E = 0$ $V_{CB} = 320\text{V}, I_E = 0$ | | 0.1 0.1 | μA μA |
| I_{CES} | Collector Cut-off Current : KSP44 : KSP45 | $V_{CE} = 400\text{V}, I_B = 0$ $V_{CE} = 320\text{V}, I_B = 0$ | | 0.5 0.5 | μA μA |
| I_{EBO} | Emitter Cut-off Current | $V_{EB} = 4\text{V}, I_C = 0$ | | 0.1 | μA |
| h_{FE} | DC Current Gain ⁽¹⁾ | $V_{CE} = 10\text{V}, I_C = 1\text{mA}$ $V_{CE} = 10\text{V}, I_C = 10\text{mA}$ $V_{CE} = 10\text{V}, I_C = 50\text{mA}$ $V_{CE} = 10\text{V}, I_C = 100\text{mA}$ | 40 50 45 40 | 200 | |
| $V_{CE}(\text{sat})$ | Collector-Emitter Saturation Voltage ⁽¹⁾ | $I_C = 1\text{mA}, I_B = 0.1\text{mA}$ $I_C = 10\text{mA}, I_B = 1\text{mA}$ $I_C = 50\text{mA}, I_B = 5\text{mA}$ | | 0.4 0.5 0.75 | V V V |
| $V_{BE}(\text{sat})$ | Base-Emitter Saturation Voltage ⁽¹⁾ | $I_C = 10\text{mA}, I_B = 1\text{mA}$ | | 0.75 | V |
| C_{ob} | Output Capacitance | $V_{CB} = 20\text{V}, I_E = 0,$ $f = 1\text{MHz}$ | | 7 | pF |

Note:

1. Pulse Test: $PW \leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

Typical Performance Characteristics

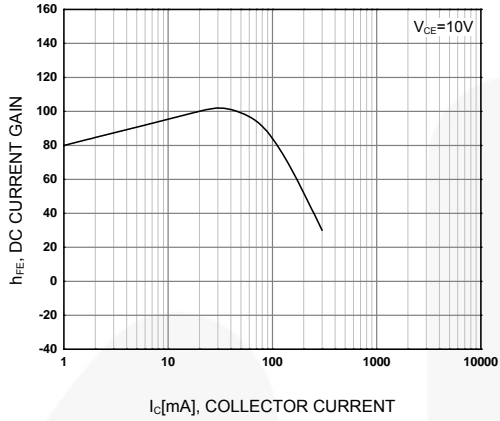


Figure 1. DC Current Gain

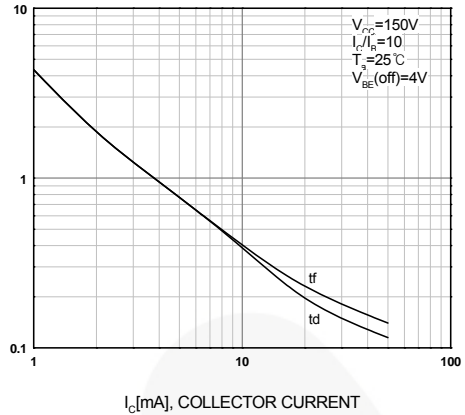


Figure 2. Turn-On Switching Times

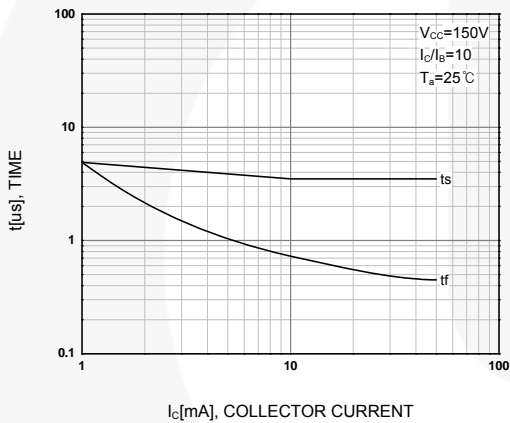


Figure 3. Turn-Off Switching Times

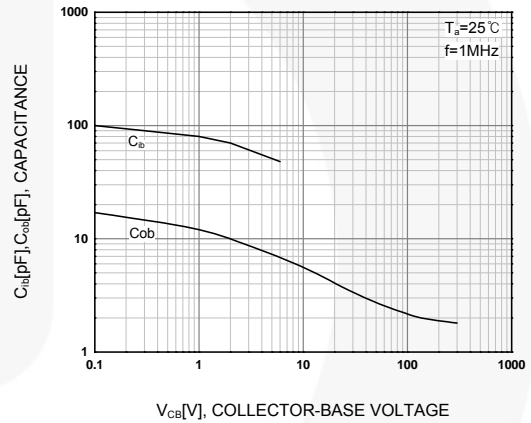


Figure 4. Capacitance

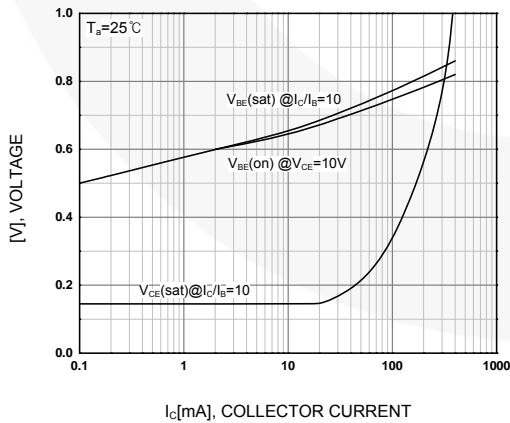


Figure 5. On Voltage

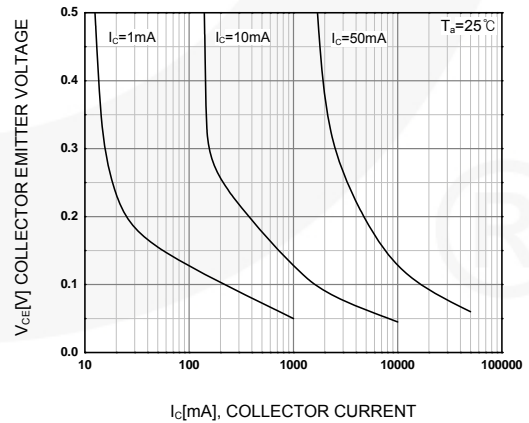


Figure 6. Collector Saturation Region

Typical Performance Characteristics (Continued)

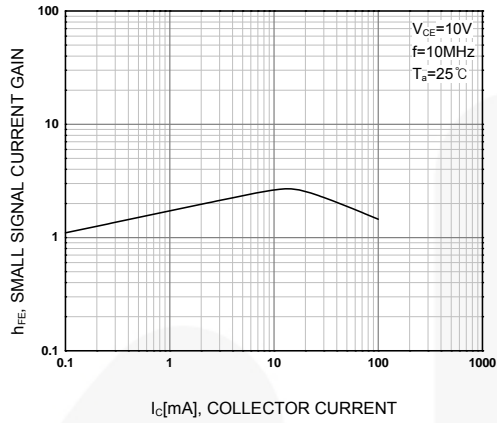


Figure 7. High-Frequency Current Gain

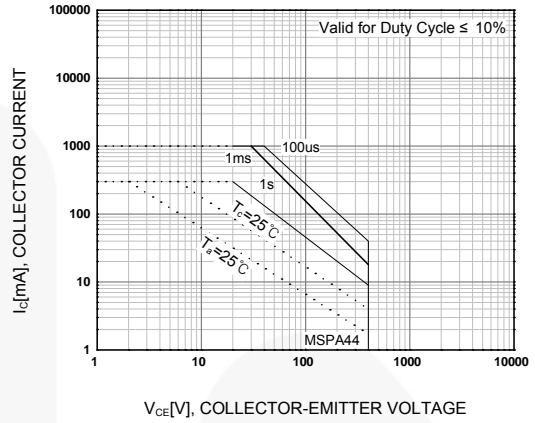
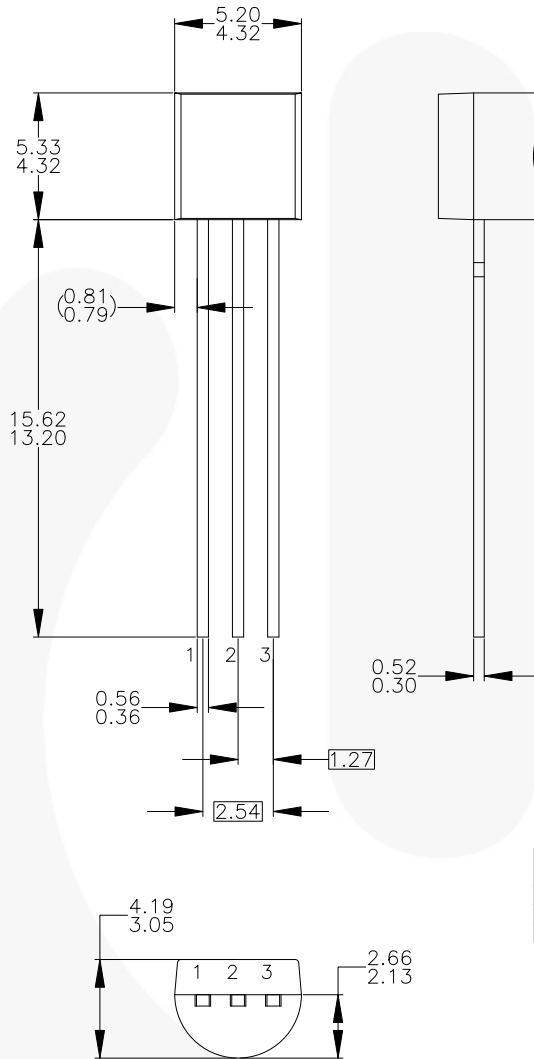


Figure 8. Safe Operating Area



Physical Dimensions

TO-92



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-1994.
- D) TO-92 (92,94,96,97,98) PIN CONFIGURATION:

| PIN | 92 | | | 94 | | | 96 | | | 97 | | | 98 | | |
|-----|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|
| | P | F | M | P | F | M | B | F | M | P | F | M | P | F | M |
| 1 | E | S | S | E | S | S | B | D | G | C | G | D | C | G | D |
| 2 | B | D | G | C | G | D | E | S | S | B | D | G | E | S | S |
| 3 | C | G | D | B | D | G | C | G | D | E | S | S | B | D | G |

LEGEND:

- P - BIPOLAR
- F - JFET
- M - DMOS
- E - EMITTER
- B - BASE
- C - COLLECTOR
- D - DRAIN
- S - SOURCE
- G - GATE

- E) FOR PACKAGE 92, 94, 96, 97 AND 98: PIN CONFIGURATION DRAIN "D" AND SOURCE "S" ARE INTERCHANGEABLE AT JFET "F" OPTION.
- F) DRAWING FILENAME: MKT-ZA03DREV3.

Figure 9. 3-Lead, TO-92, Molded, Standard Straight Lead, Bulk Type

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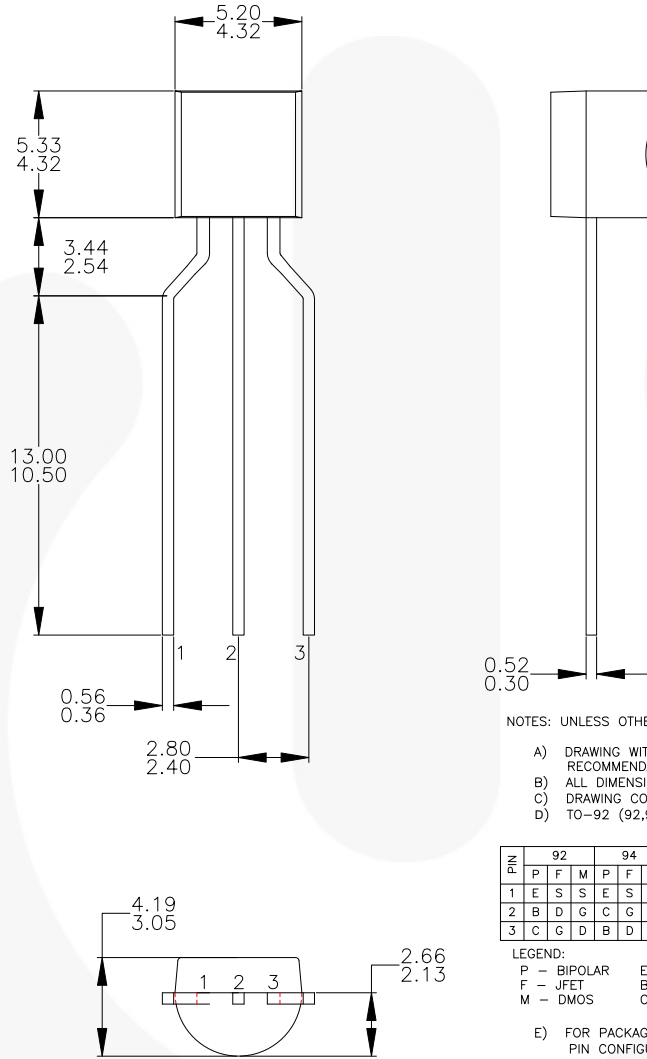
<http://www.fairchildsemi.com/packaging/>

For current tape and reel specifications, visit Fairchild Semiconductor's online packaging area:

http://www.fairchildsemi.com/products/discrete/pdf/to92pdd_tr.pdf

Physical Dimensions (Continued)

TO-92



- 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-1994.
 - D) TO-92 (92,94,96,97,98) PIN CONFIGURATION:

| PIN | 92 | | | 94 | | | 96 | | | 97 | | | 98 | | |
|-----|----|---|---|----|---|---|----|---|---|----|---|---|----|---|---|
| | P | F | M | P | F | M | B | F | M | P | F | M | P | F | M |
| 1 | E | S | S | E | S | S | B | D | G | C | G | D | C | G | D |
| 2 | B | D | G | C | G | D | E | S | S | B | D | G | E | S | S |
| 3 | C | G | D | B | D | G | C | G | D | E | S | S | B | D | G |

- LEGEND:
- P - BIPOLAR
 - F - JFET
 - M - DMOS
 - E - EMITTER
 - B - BASE
 - C - COLLECTOR
 - D - DRAIN
 - S - SOURCE
 - G - GATE
- E) FOR PACKAGE 92, 94, 96, 97 AND 98: PIN CONFIGURATION DRAIN "D" AND SOURCE "S" ARE INTERCHANGEABLE AT JFET "F" OPTION.
- F) DRAWING FILENAME: MKT-ZA03FREV2.

Figure 10. 3-Lead, TO-92, Molded, 0.2 In Line Spacing Lead Form, Ammo, Tape and Reel Type

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Rev. 162



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