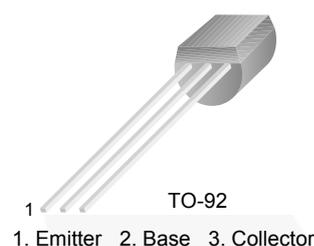


# KSP44/45

## 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 <sup>(1)</sup> : 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	$\mu\text{A}$ $\mu\text{A}$
$I_{CES}$	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	$\mu\text{A}$ $\mu\text{A}$
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = 4\text{V}, I_C = 0$		0.1	$\mu\text{A}$
$h_{FE}$	DC Current Gain <sup>(1)</sup>	$V_{CE} = 10\text{V}, I_C = 1\text{mA}$ $V_{CE} = 10\text{V}, I_C = 10\text{mA}$ $V_{CE} = 10\text{V}, I_C = 50\text{mA}$ $V_{CE} = 10\text{V}, I_C = 100\text{mA}$	40 50 45 40	200	
$V_{CE}(\text{sat})$	Collector-Emitter Saturation Voltage <sup>(1)</sup>	$I_C = 1\text{mA}, I_B = 0.1\text{mA}$ $I_C = 10\text{mA}, I_B = 1\text{mA}$ $I_C = 50\text{mA}, I_B = 5\text{mA}$		0.4 0.5 0.75	V V V
$V_{BE}(\text{sat})$	Base-Emitter Saturation Voltage <sup>(1)</sup>	$I_C = 10\text{mA}, I_B = 1\text{mA}$		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

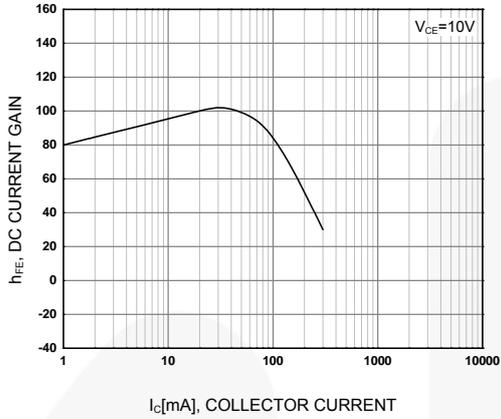


Figure 1. DC Current Gain

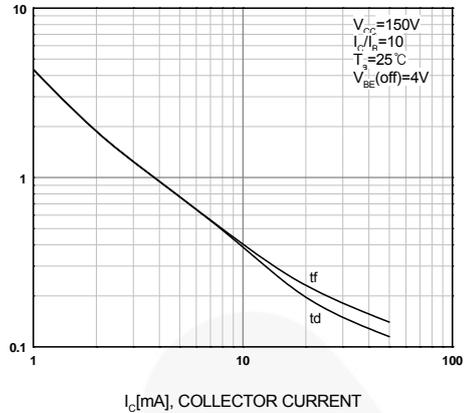


Figure 2. Turn-On Switching Times

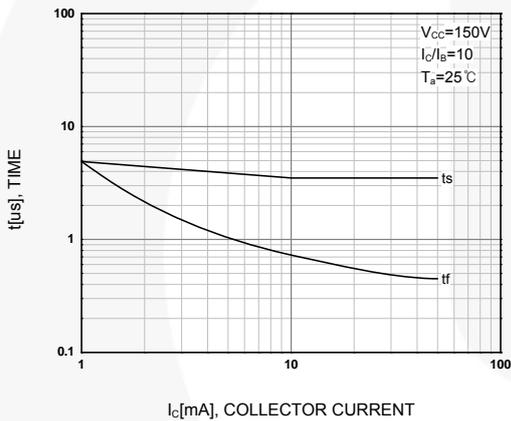


Figure 3. Turn-Off Switching Times

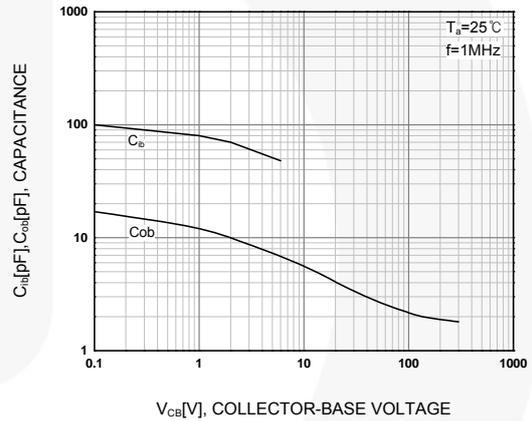


Figure 4. Capacitance

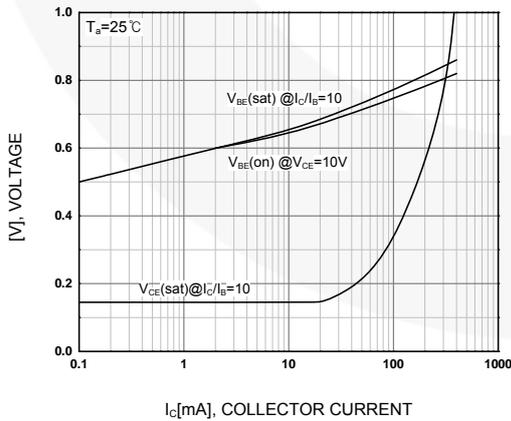


Figure 5. On Voltage

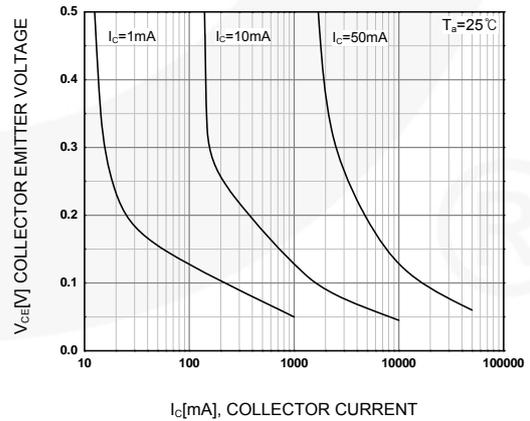


Figure 6. Collector Saturation Region

Typical Performance Characteristics (Continued)

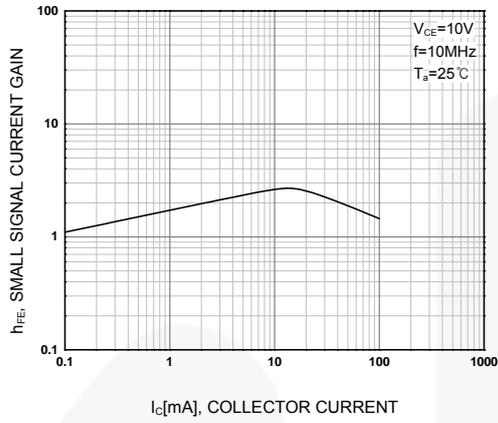


Figure 7. High-Frequency Current Gain

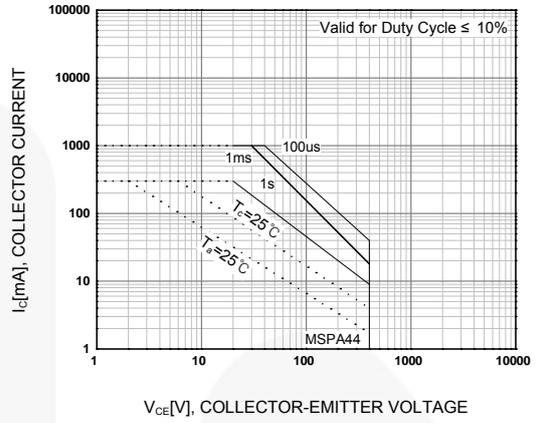
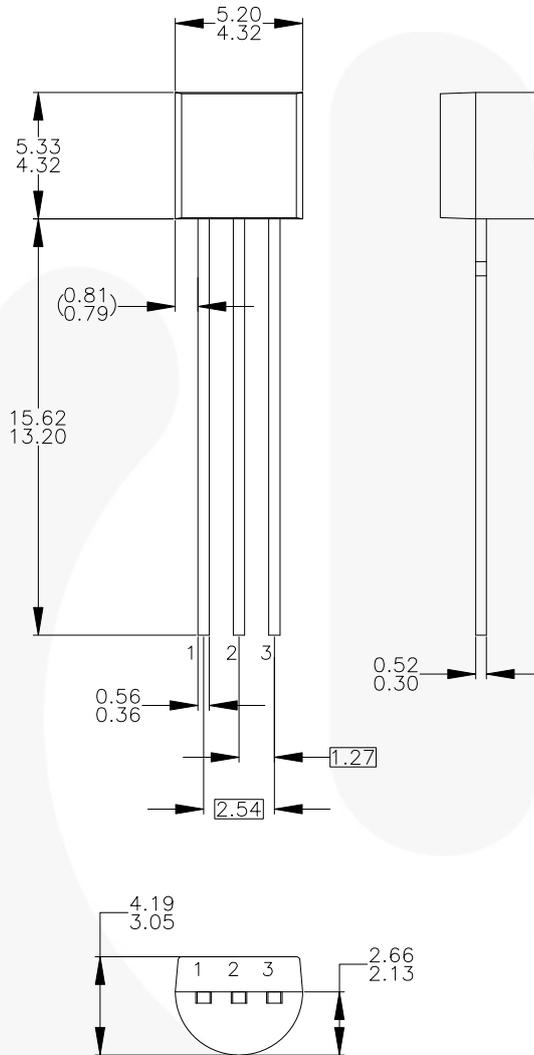


Figure 8. Safe Operating Area

## 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      E - EMITTER      D - DRAIN  
 F - JFET          B - BASE          S - SOURCE  
 M - DMOS        C - COLLECTOR    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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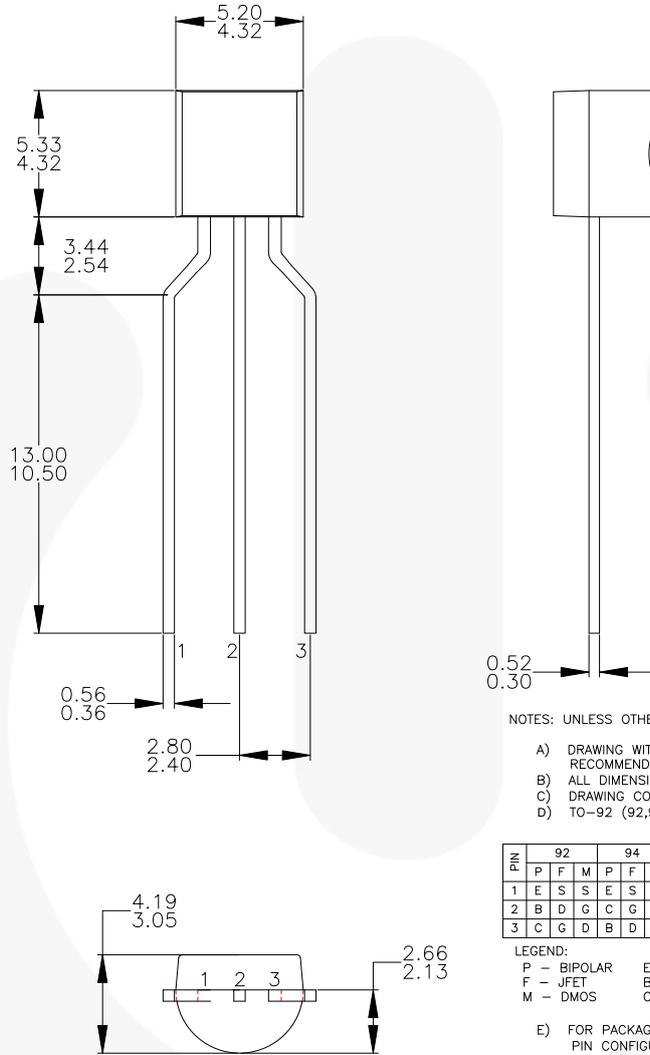
<http://www.fairchildsemi.com/packaging/>

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

[http://www.fairchildsemi.com/products/discrete/pdf/to92pdd\\_tr.pdf](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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For current tape and reel specifications, visit Fairchild Semiconductor's online packaging area:  
[http://www.fairchildsemi.com/products/discrete/pdf/to92pdd\\_tr.pdf](http://www.fairchildsemi.com/products/discrete/pdf/to92pdd_tr.pdf)



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