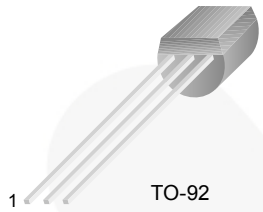
October 2014

KSP44 / KSP45
NPN Epitaxial Silicon Transistor

Features

- High-Voltage Transistor
- Collector-Emitter Voltage: V_{CEO} = KSP44: 400 V
  KSP45: 350 V



TO-92

1. Emitter 2. Base 3. Collector

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°C unless otherwise noted.

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

Thermal Characteristics[1]

Values are at T_A = 25°C unless otherwise noted.

Symbol	Parameter		Value	Unit
P_D	Power Dissipation	T_A = 25°C	625	mW
		T_C = 25°C	1.5	W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case		83.3	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		200	°C/W

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°C unless otherwise noted.

Symbol	Parameter		Conditions	Min.	Max.	Unit
BV_{CBO}	Collector-Base Breakdown Voltage	KSP44	I_C = 100 μA, I_E = 0	500		V
		KSP45		400		
BV_{CEO}	Collector-Emitter Breakdown Voltage[2]	KSP44	I_C = 1 mA, I_B = 0	400		V
		KSP45		350		
BV_{EBO}	Emitter-Base Breakdown Voltage		I_E = 100 μA, I_C = 0	6		V
I_{CBO}	Collector Cut-Off Current	KSP44	V_{CB} = 400 V, I_E = 0		0.1	μA
		KSP45	V_{CB} = 320 V, I_E = 0		0.1	
I_{CES}	Collector Cut-Off Current	KSP44	V_{CE} = 400 V, I_B = 0		0.5	μA
		KSP45	V_{CE} = 320 V, I_B = 0		0.5	
I_{EBO}	Emitter Cut-Off Current		V_{EB} = 4 V, I_C = 0		0.1	μA
h_{FE}	DC Current Gain[2]		V_{CE} = 10 V, I_C = 1 mA	40		
			V_{CE} = 10 V, I_C = 10 mA	50	200	
			V_{CE} = 10 V, I_C = 50 mA	45		
			V_{CE} = 10 V, I_C = 100 mA	40		
V_{CE}(sat)	Collector-Emitter Saturation Voltage[2]		I_C = 1 mA, I_B = 0.1 mA		0.40	V
			I_C = 10 mA, I_B = 1 mA		0.50	
			I_C = 50 mA, I_B = 5 mA		0.75	
V_{BE}(sat)	Base-Emitter Saturation Voltage[2]		I_C = 10 mA, I_B = 1 mA		0.75	V
C_{ob}	Output Capacitance		V_{CB} = 20 V, I_E = 0, f = 1 MHz		7	pF

Note:

2. Pulse test: pulse width ≤ 300 μs, duty cycle ≤ 2%.

Typical Performance Characteristics

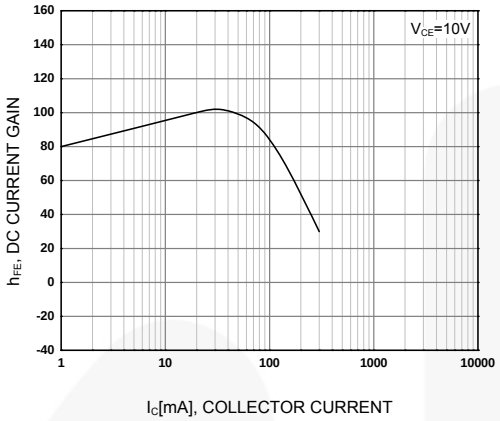


Figure 1. DC Current Gain

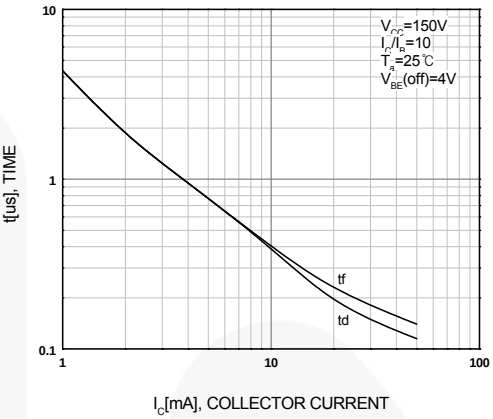


Figure 2. Turn-On Switching Times

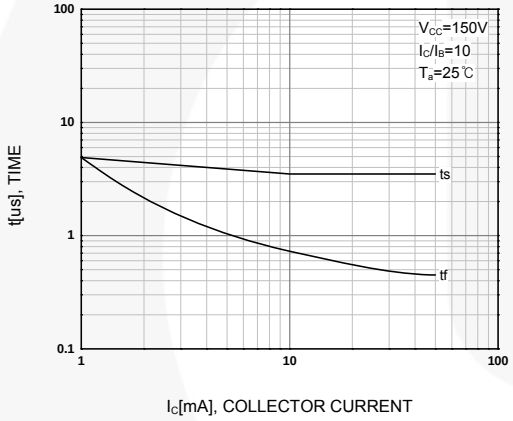


Figure 3. Turn-Off Switching Times

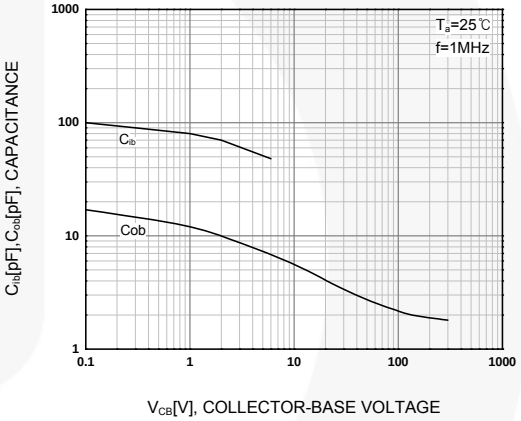


Figure 4. Capacitance

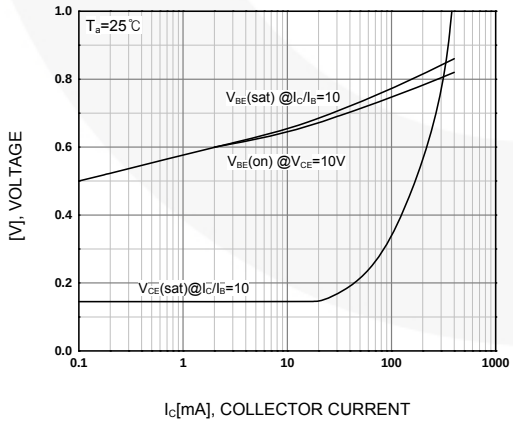


Figure 5. On Voltage

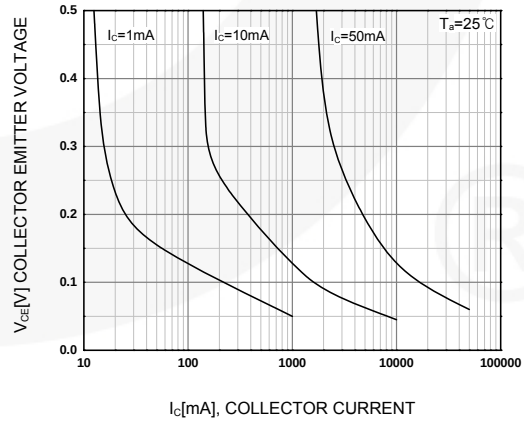


Figure 6. Collector Saturation Region

Typical Performance Characteristics (Continued)

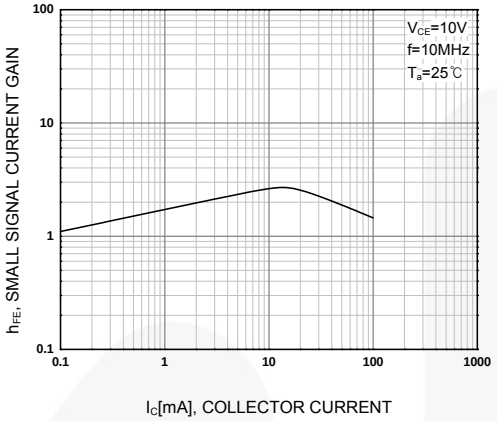


Figure 7. High-Frequency Current Gain

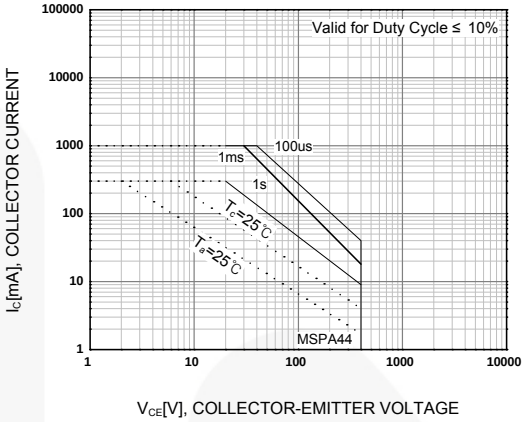
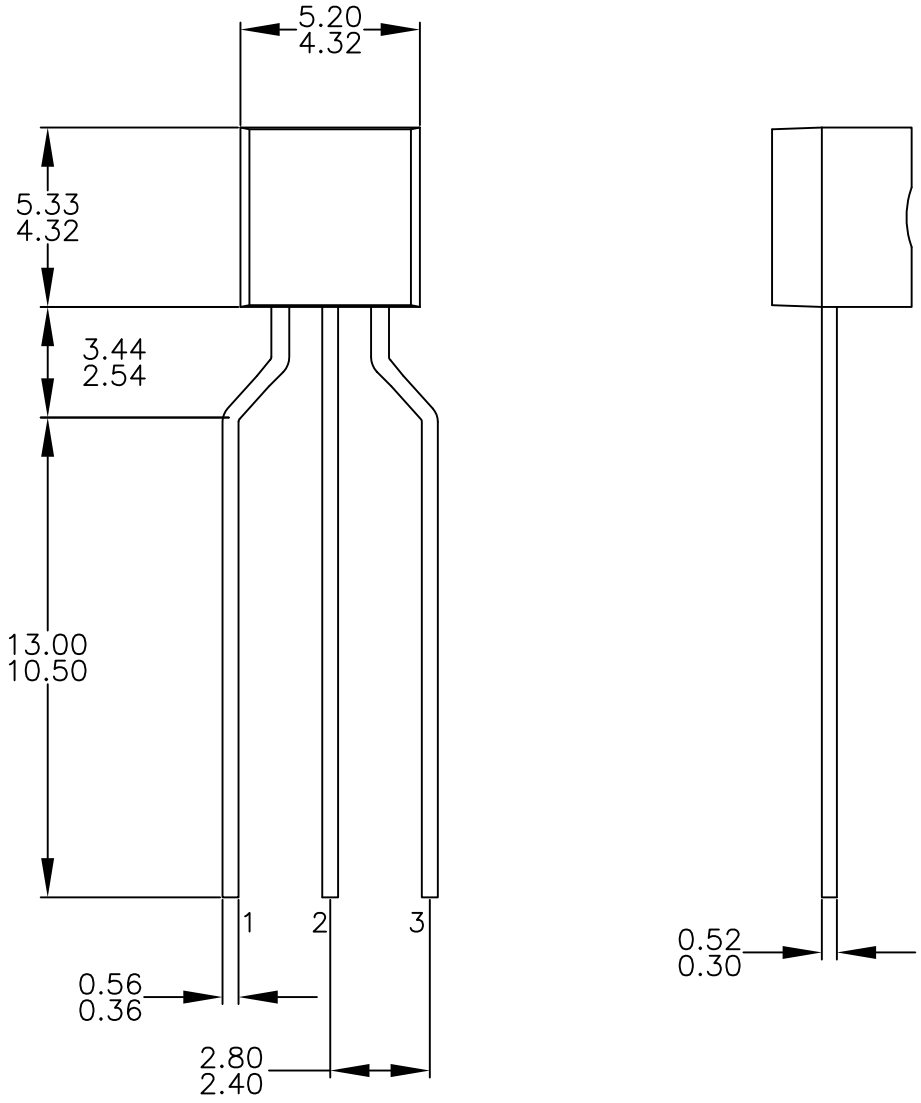
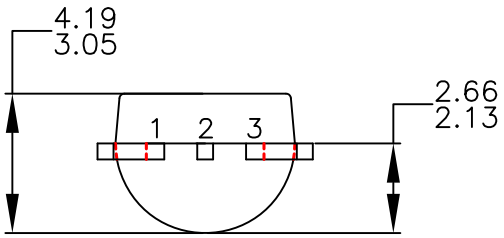


Figure 8. Safe Operating Area





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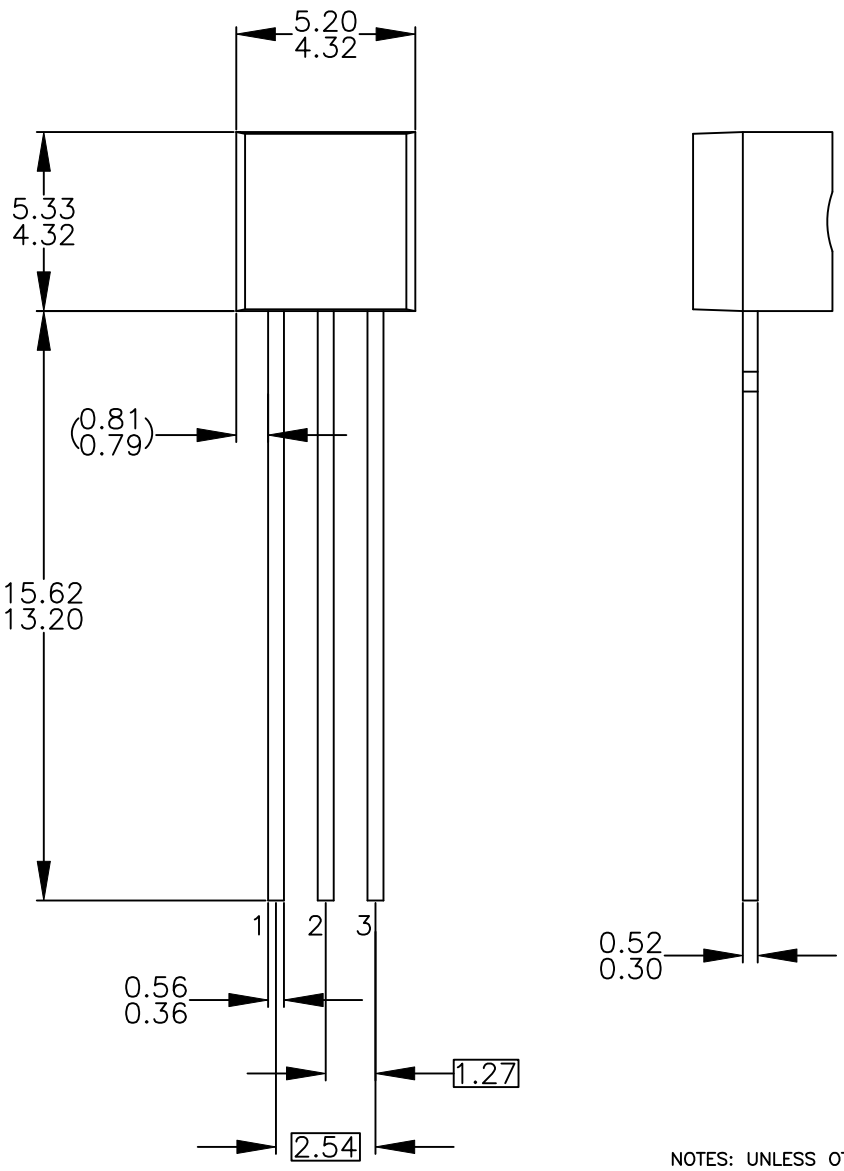

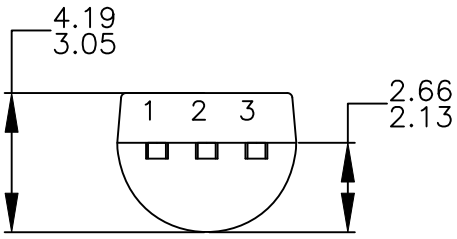

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