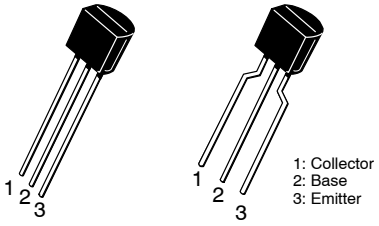
NPN Epitaxial Silicon Transistor

KSP44, KSP45



STRAIGHT LEAD
BULK PACK

TO−92−3
CASE 135AN

BENT LEAD
TAPE & REEL
AMMO PACK

TO−92 LF
CASE 135AR

Features

- High−Voltage Transistor
- Collector−Emitter Voltage:
  - KSP44: V_{CEO} = 400 V
  - KSP45: V_{CEO} = 350 V
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

ABSOLUTE MAXIMUM RATINGS

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

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

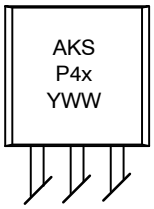
THERMAL CHARACTERISTICS (Note 1)

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

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.

MARKING DIAGRAM



A = Assembly Code
KSP4x = Device Code (x = 4 or 5)
Y = Year
WW = Work Week

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

ORDERING INFORMATION

Part Number	Top Mark	Package	Shipping†
KSP44BU	KSP44	TO−92−3 (Pb−Free), case 135AN	10,000 units / Bulk Bag
KSP44TA	KSP44	TO−92−3 (Pb−Free), case 135AR	2,000 units / Fan−Fold
KSP44TF	KSP44	TO−92−3 (Pb−Free), case 135AR	2,000 units / Tape & Reel
KSP45TA	KSP45	TO−92−3 (Pb−Free), case 135AR	2,000 units / Fan−Fold

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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 (Note 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_E = 0		0.5	μA
		KSP45	V_{CE} = 320 V, I_E = 0		0.5	
I_{EBO}	Emitter Cut−Off Current		V_{EB} = 4 V, I_C = 0		0.1	μA
h_{FE}	DC Current Gain (Note 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 (Note 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 (Note 2)		I_C = 10 mA, I_B = 1 mA		0.75	V
Cob	Output Capacitance		V_{CB} = 20 V, I_E = 0, f = 1 MHz		7	pF

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

TYPICAL PERFORMANCE CHARACTERISTICS

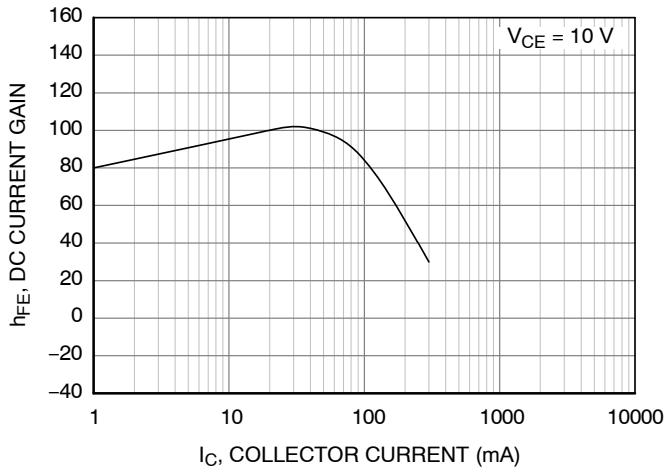


Figure 1. DC Current Gain

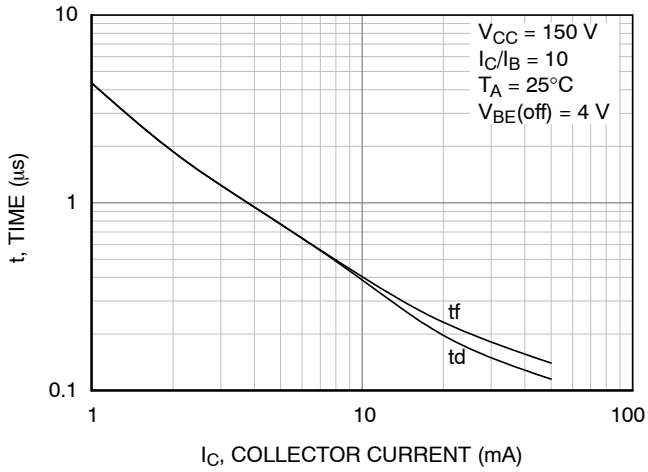


Figure 2. Turn−On Switching Times

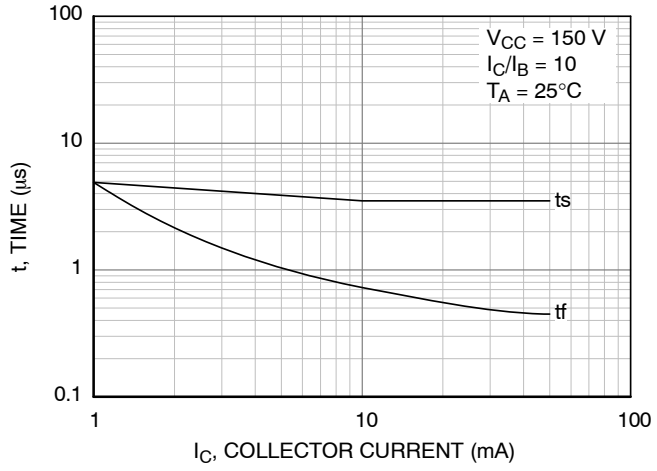


Figure 3. Turn−Off Switching Times

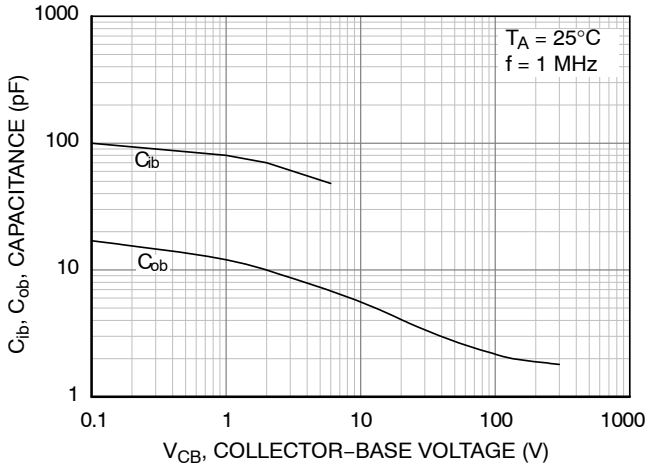


Figure 4. Capacitance

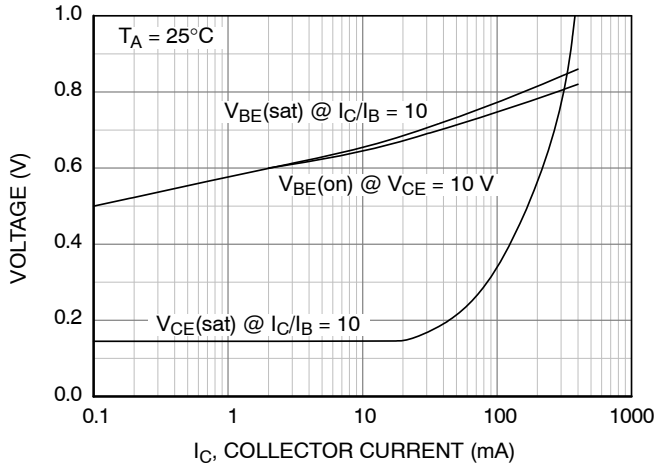


Figure 5. On Voltage

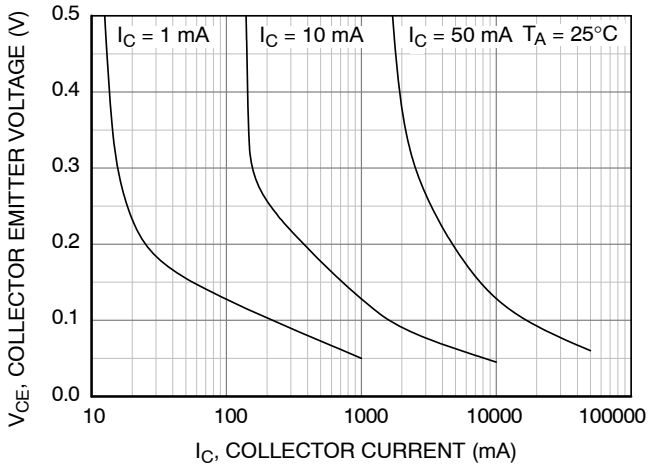


Figure 6. Collector Saturation Region

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

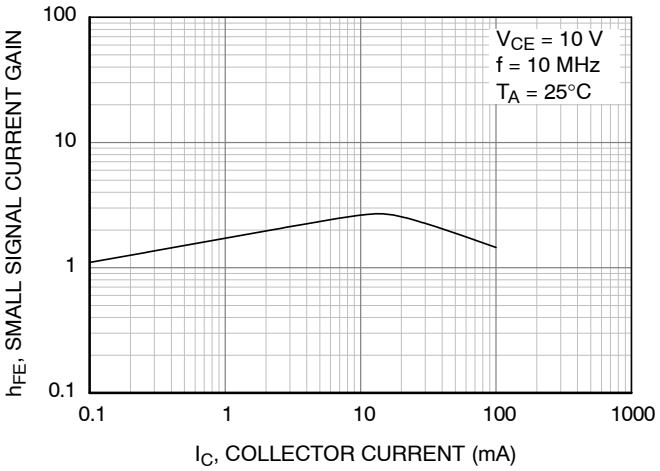


Figure 7. High−Frequency Current Gain

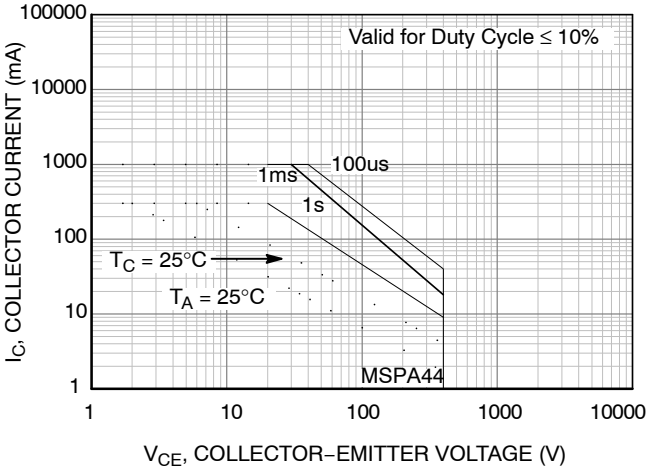
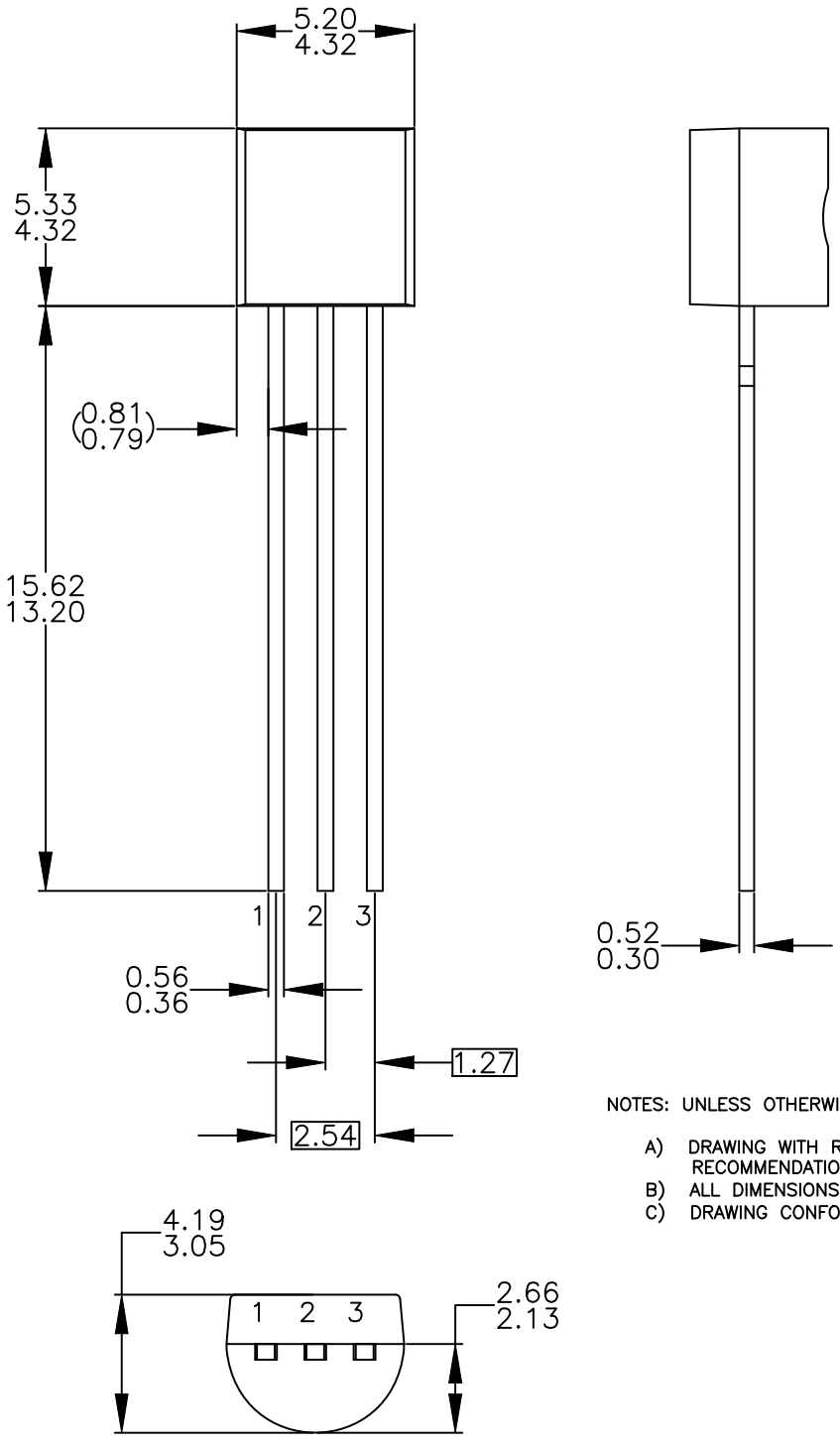


Figure 8. Safe Operating Area

TO−92 3 4.825x4.76
CASE 135AN
ISSUE O

DATE 31 JUL 2016



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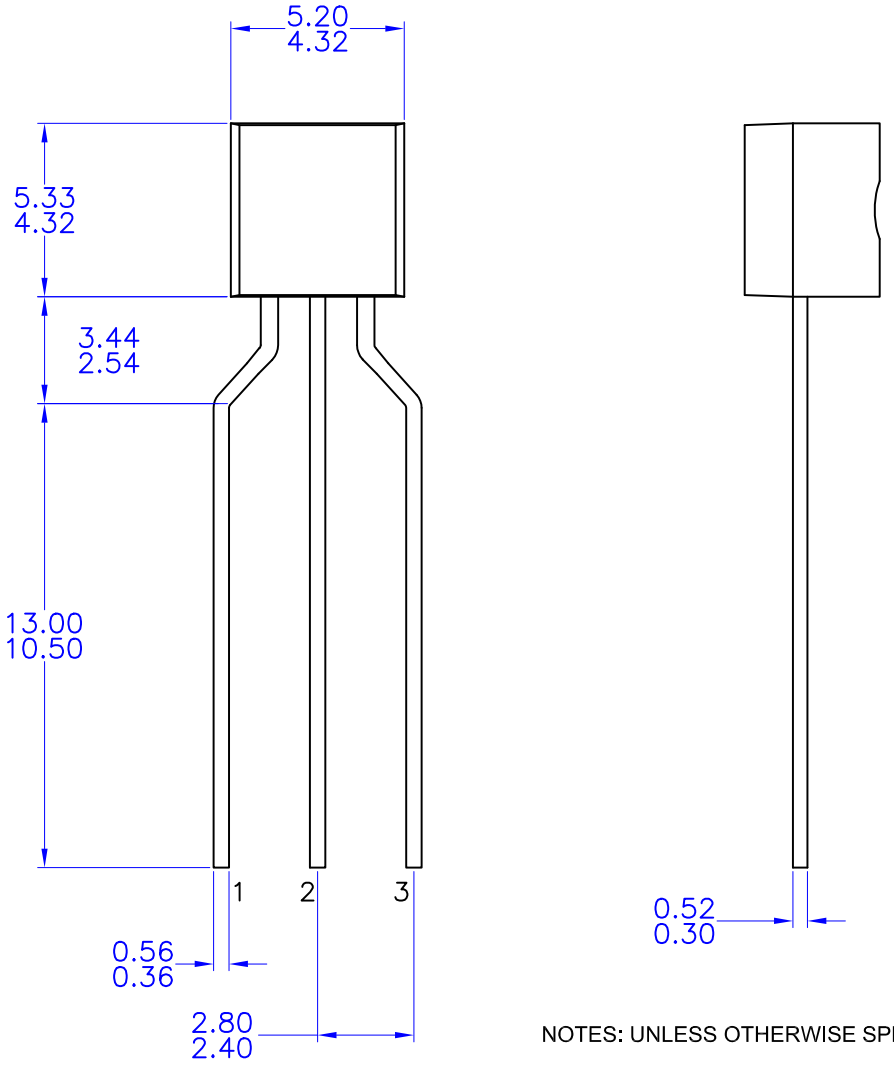
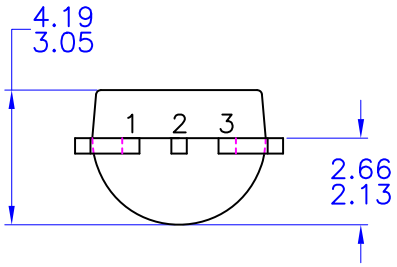
TO−92 3 4.83x4.76 LEADFORMED
CASE 135AR
ISSUE O

DATE 30 SEP 2016





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