

KSP44TF Datasheet

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DiGi Electronics Part Number	KSP44TF-DG
Manufacturer	onsemi
Manufacturer Product Number	KSP44TF
Description	TRANS NPN 400V 0.3A TO92-3
Detailed Description	Bipolar (BJT) Transistor NPN 400 V 300 mA 625 mW Through Hole TO-92-3



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Purchase and inquiry

Manufacturer Product Number:

KSP44TF

Series:

-

Transistor Type:

NPN

Voltage - Collector Emitter Breakdown (Max):

400 V

Current - Collector Cutoff (Max):

500nA

Power - Max:

625 mW

Operating Temperature:

150°C (TJ)

Package / Case:

TO-226-3, TO-92-3 (TO-226AA) Formed Leads

Base Product Number:

KSP44

Manufacturer:

onsemi

Product Status:

Active

Current - Collector (Ic) (Max):

300 mA

Vce Saturation (Max) @ Ib, Ic:

750mV @ 5mA, 50mA

DC Current Gain (hFE) (Min) @ Ic, Vce:

50 @ 10mA, 10V

Frequency - Transition:

-

Mounting Type:

Through Hole

Supplier Device Package:

TO-92-3

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.21.0095

Moisture Sensitivity Level (MSL):

Not Applicable

ECCN:

EAR99

NPN Epitaxial Silicon Transistor

KSP44, KSP45

Features

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

ABSOLUTE MAXIMUM RATINGS

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_{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	$^\circ\text{C}$
T_{STG}	Storage Temperature		-55 to 150	$^\circ\text{C}$

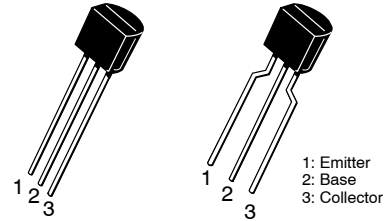
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS (Note 1)

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

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

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.



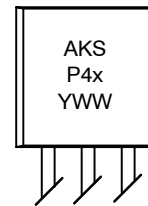
STRAIGHT LEAD
BULK PACK

TO-92-3
CASE 135AN

BENT LEAD
TAPE & REEL
AMMO PACK

TO-92 LF
CASE 135AR

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.

KSP44, KSP45**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 $T_A = 25^\circ\text{C}$ 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		
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		
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	
C _{ob}	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 $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.

KSP44, KSP45

TYPICAL PERFORMANCE CHARACTERISTICS

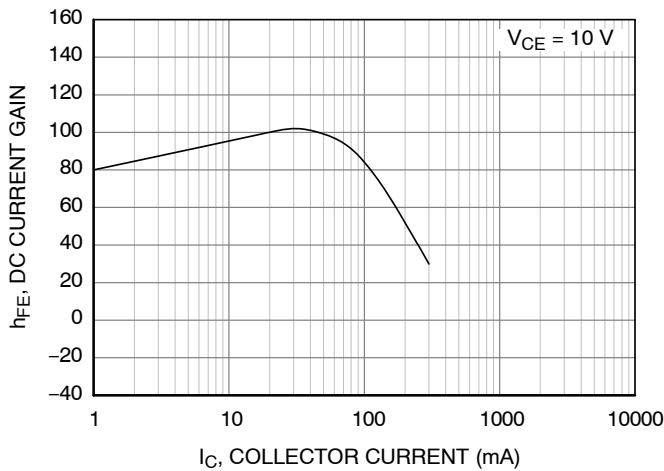


Figure 1. DC Current Gain

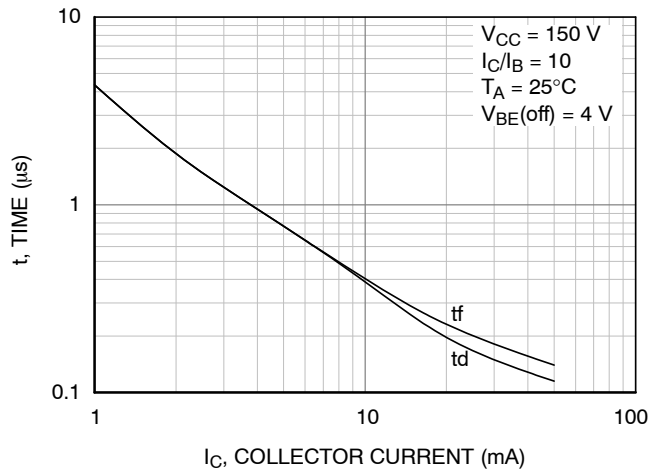


Figure 2. Turn-On Switching Times

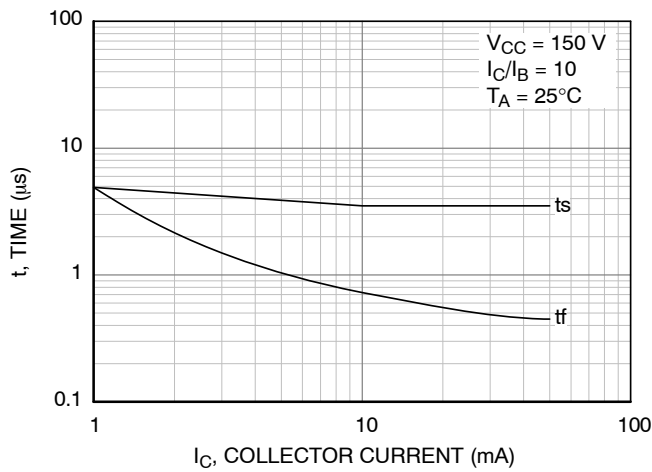


Figure 3. Turn-Off Switching Times

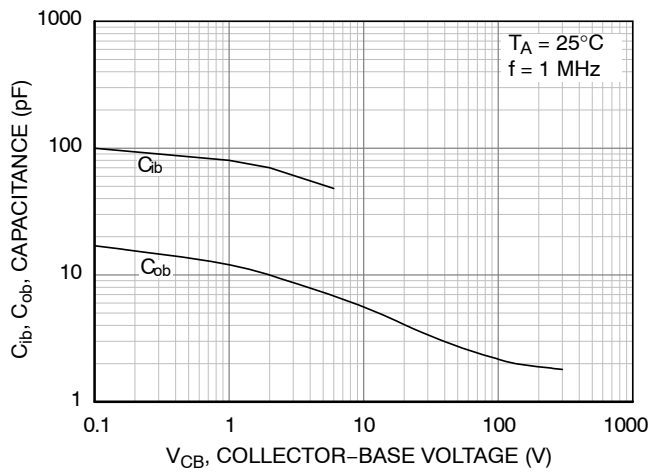


Figure 4. Capacitance

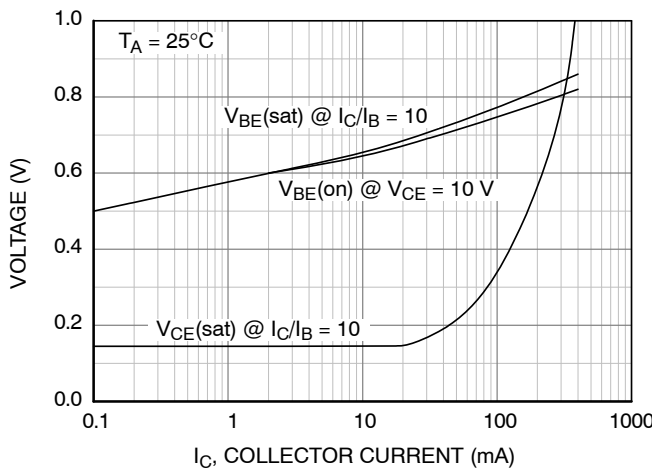


Figure 5. On Voltage

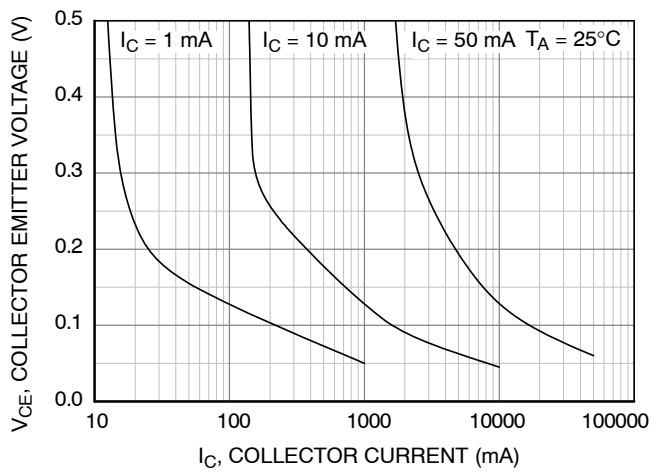


Figure 6. Collector Saturation Region

KSP44, KSP45

TYPICAL PERFORMANCE CHARACTERISTICS (continued)

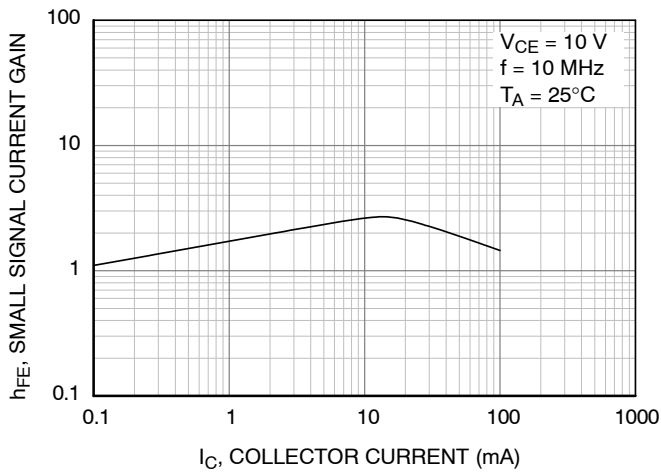


Figure 7. High-Frequency Current Gain

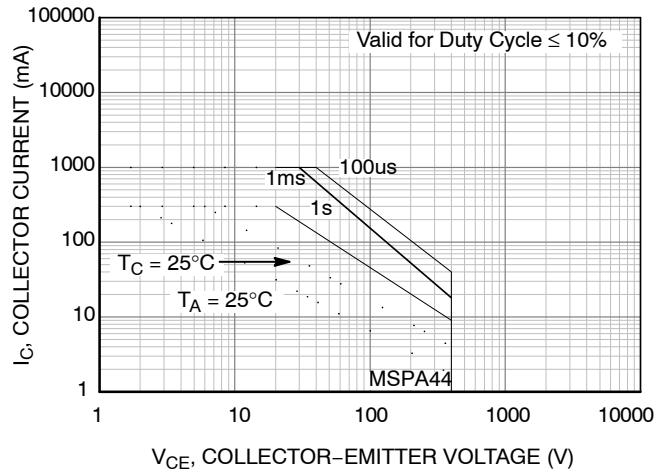
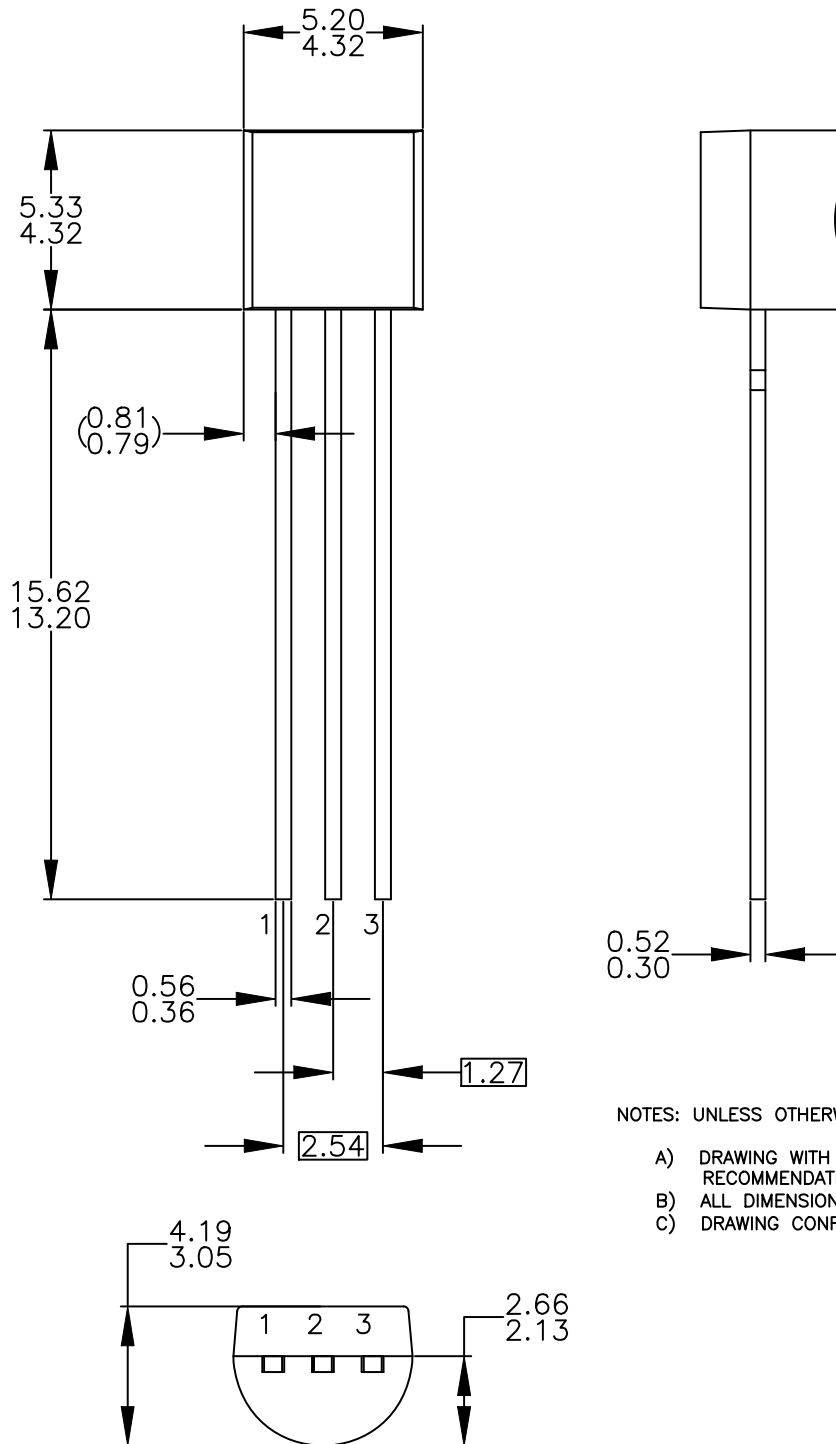


Figure 8. Safe Operating Area

TO-92 3 4.825x4.76
CASE 135AN
ISSUE O

DATE 31 JUL 2016



NOTES: UNLESS OTHERWISE SPECIFIED

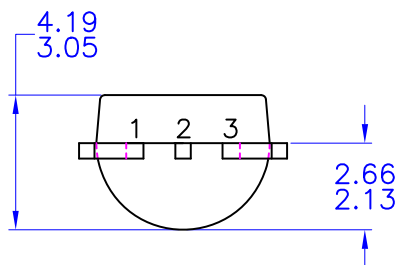
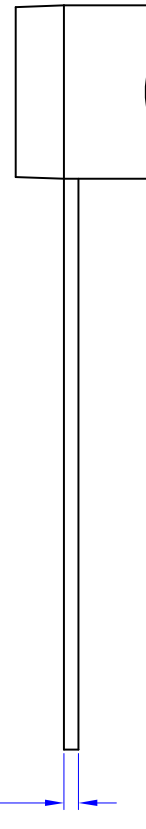
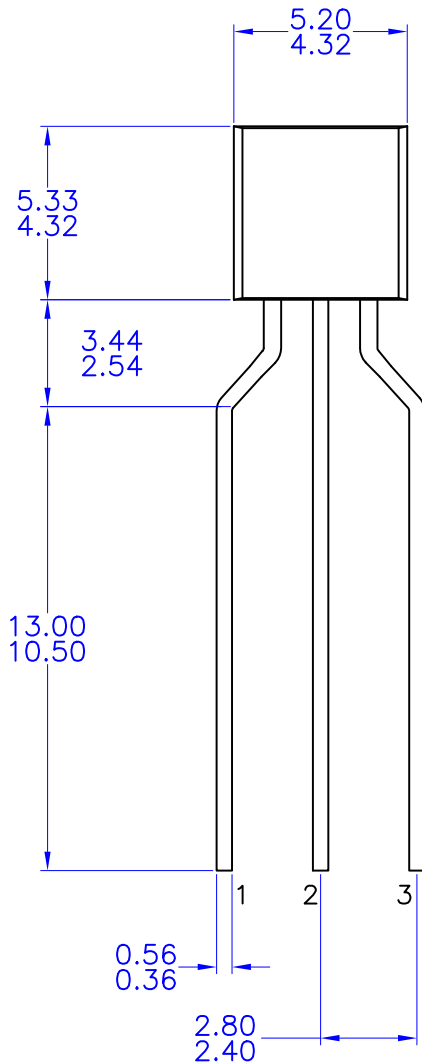
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