

# NPN General-Purpose Amplifier

## KSP2222A

### Features

- Collector–Emitter Voltage:  $V_{CEO} = 40\text{ V}$
- Available as PN2222A
- These are Pb–Free Devices

### ABSOLUTE MAXIMUM RATINGS

( $T_A = 25^\circ\text{C}$  unless otherwise noted.)

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector–Base Voltage	75	V
$V_{CEO}$	Collector–Emitter Voltage	40	V
$V_{EBO}$	Emitter–Base Voltage	6.0	V
$I_C$	Collector Current	600	mA
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	–55 to 150	$^\circ\text{C}$

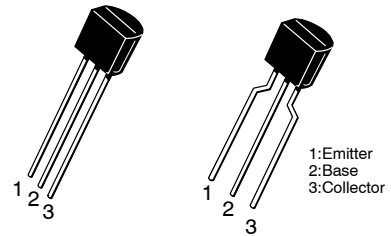
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS (Note 1)

( $T_A = 25^\circ\text{C}$  unless otherwise noted.)

Symbol	Parameter	Value	Unit
$P_D$	Power Dissipation by $R_{\theta JA}$	625	mW
	Derate Above $25^\circ\text{C}$	5	MW/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction–to–Case	83.3	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction–to–Ambient	200	$^\circ\text{C}/\text{W}$

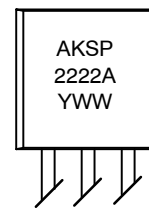
1. PCB size: FR–4, 76 mm x 114 mm x 1.57 mm (3.0 inch x 4.5 inch x 0.062 inch) with minimum land pattern size.



TO–92–3  
CASE 135AN

TO–92 LF  
CASE 135AR

### MARKING DIAGRAM



- A = Assembly Code
- KSP2222A = Specific Device Code
- Y = Year
- WW = Work Week

### ORDERING INFORMATION

Device	Package	Shipping
KSP2222ABU	TO–92 3 (Pb–Free)	10,000 Units / Bulk Bag
KSP2222ATA	TO–92 3 LF (Pb–Free)	2,000 / Fan–Fold

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, [BRD8011/D](#).

# KSP2222A

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted.)

Symbol	Parameter	Conditions	Min	Max	Unit
BV <sub>CBO</sub>	Collector–Base Breakdown Voltage	I <sub>C</sub> = 10 μA, I <sub>E</sub> = 0	75	–	V
BV <sub>CEO</sub>	Collector–Emitter Breakdown Voltage	I <sub>C</sub> = 10 mA, I <sub>B</sub> = 0	40	–	V
BV <sub>EBO</sub>	Emitter–Base Breakdown Voltage	I <sub>E</sub> = 10 μA, I <sub>C</sub> = 0	6.0	–	V
I <sub>CBO</sub>	Collector Cut–Off Current	V <sub>CB</sub> = 60 V, I <sub>E</sub> = 0	–	0.01	μA
I <sub>EBO</sub>	Emitter Cut–Off Current	V <sub>EB</sub> = 3.0 V, I <sub>C</sub> = 0	–	10	nA
h <sub>FE</sub>	DC Current Gain	V <sub>CE</sub> = 10 V, I <sub>C</sub> = 0.1 mA	35	–	
		V <sub>CE</sub> = 10 V, I <sub>C</sub> = 1 mA	50	–	
		V <sub>CE</sub> = 10 V, I <sub>C</sub> = 10 mA	75	–	
		V <sub>CE</sub> = 10 V, I <sub>C</sub> = 150 mA (Note 2)	100	300	
		V <sub>CE</sub> = 10 V, I <sub>C</sub> = 500 mA (Note 2)	40	–	
V <sub>CE(sat)</sub>	Collector–Emitter Saturation Voltage (Note 2)	I <sub>C</sub> = 150 mA, I <sub>B</sub> = 15 mA	–	0.3	V
		I <sub>C</sub> = 500 mA, I <sub>B</sub> = 50 mA	–	1.0	
V <sub>BE(on)</sub>	Base–Emitter On Saturation Voltage (Note 2)	I <sub>C</sub> = 150 mA, I <sub>B</sub> = 15 mA	0.6	1.2	V
		I <sub>C</sub> = 500 mA, I <sub>B</sub> = 50 mA	–	2.0	
f <sub>T</sub>	Current Gain Bandwidth Product	I <sub>C</sub> = 20 mA, V <sub>CE</sub> = 20 V, f = 100 MHz	300	–	MHz
C <sub>ob</sub>	Output Capacitance	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1.0 MHz	–	8	pF
t <sub>ON</sub>	Turn–On Time	V <sub>CC</sub> = 30 V, I <sub>C</sub> = 150 mA, I <sub>B1</sub> = 15 mA, V <sub>BE(off)</sub> = 0.5 V	–	35	ns
t <sub>OFF</sub>	Turn–Off Time	V <sub>CC</sub> = 30 V, I <sub>C</sub> = 150 mA, I <sub>B1</sub> = I <sub>B2</sub> = 15 mA	–	285	ns
NF	Noise Figure	I <sub>C</sub> = 100 μA, V <sub>CE</sub> = 10 V, R <sub>S</sub> = 1 kΩ, f = 1.0 kHz	–	4	dB

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.

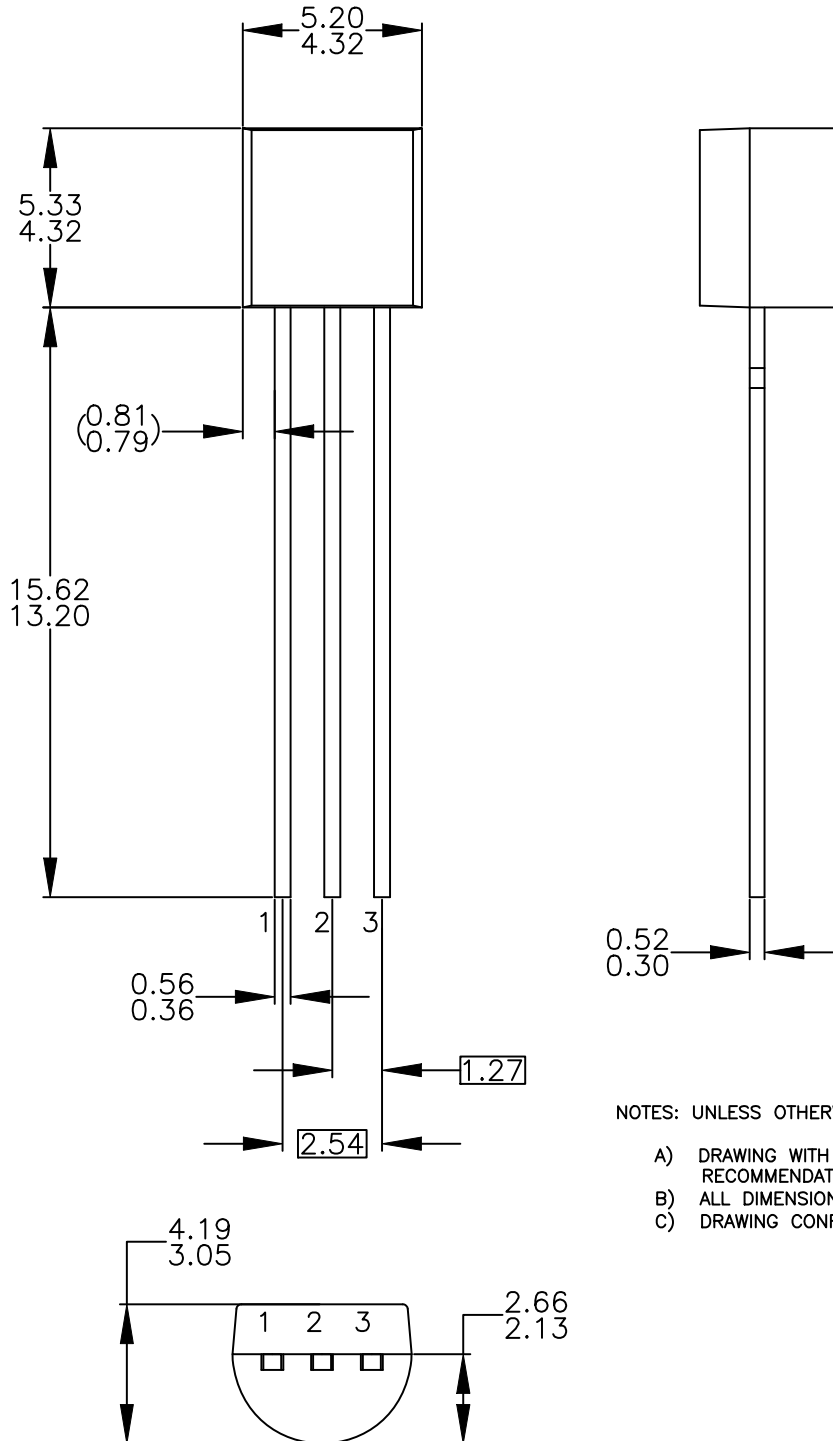
2. Pulse Test: PW ≤ 300 μs, Duty Cycle ≤ 2%.

**MECHANICAL CASE OUTLINE**  
**PACKAGE DIMENSIONS**



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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