

# PNP Epitaxial Silicon Transistor



## KSA992

### Features

- Audio Frequency Low-Noise Amplifier
- Complement to KSC1845
- These are Pb-Free Devices

### MAXIMUM RATINGS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.)

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage	-120	V
$V_{CEO}$	Collector-Emitter Voltage	-120	V
$V_{EBO}$	Emitter-Base Voltage	-5	V
$I_C$	Collector Current	-50	mA
$I_B$	Base Current	-10	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.

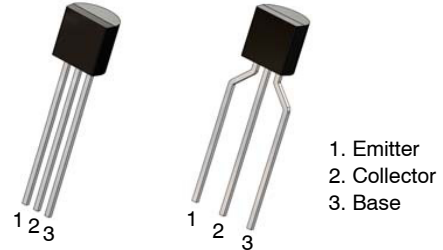
### THERMAL CHARACTERISTICS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.) (Note 1)

Symbol	Parameter	Value	Unit
$P_D$	Power Dissipation	500	mW
	Derate Above $25^\circ\text{C}$	4	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	250	$^\circ\text{C}/\text{W}$

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.

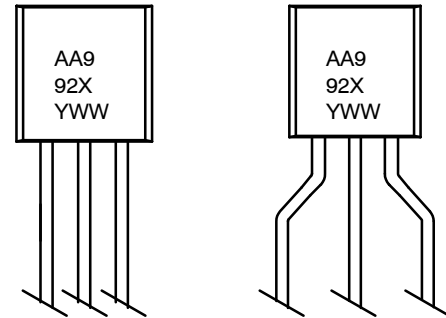
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TO-92 3 4.825x4.76 CASE 135AN  
TO-92 3 4.83x4.76 LEADFORMED CASE 135AR

### MARKING DIAGRAM



A = Assembly Code  
A992 = Device Code  
X = F / FA / FB  
YWW = Date Code

### ORDERING INFORMATION

See detailed ordering and shipping information on page 4 of this data sheet.

# KSA992

## ELECTRICAL CHARACTERISTICS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = -120\text{ V}, I_E = 0$	-	-	-50	nA
$I_{CEO}$	Collector Cut-Off Current	$V_{CE} = -100\text{ V}, I_B = 0$	-	-	-1	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = -5\text{ V}, I_C = 0$	-	-	-50	nA
$h_{FE1}$	DC Current Gain	$V_{CE} = -6\text{ V}, I_C = -0.1\text{ mA}$	150	500	-	
$h_{FE2}$		$V_{CE} = -6\text{ V}, I_C = -1\text{ mA}$	200	500	800	
$V_{BE(on)}$	Base-Emitter On Voltage	$V_{CE} = -6\text{ V}, I_C = -1\text{ mA}$	-0.55	-0.61	-0.65	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = -10\text{ mA}, I_B = -1\text{ mA}$	-	-0.09	-0.30	V
$f_T$	Current Gain Bandwidth Product	$V_{CE} = -6\text{ V}, I_C = -1\text{ mA}$	50	100	-	MHz
$C_{ob}$	Output Capacitance	$V_{CB} = -30\text{ V}, I_E = 0, f = 1\text{ MHz}$	-	2	3	pF
NF	Noise Figure	$V_{CE} = -5\text{ V}, I_C = -1.0\text{ mA},$ $R_S = 100\text{ k}\Omega, f = 1\text{ kHz}$	-	7	-	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.

## $h_{FE}$ CLASSIFICATION

Classification	P	F	FA	FB	E
$h_{FE2}$	200~400	300~600	300~470	430~600	400~800

TYPICAL PERFORMANCE CHARACTERISTICS

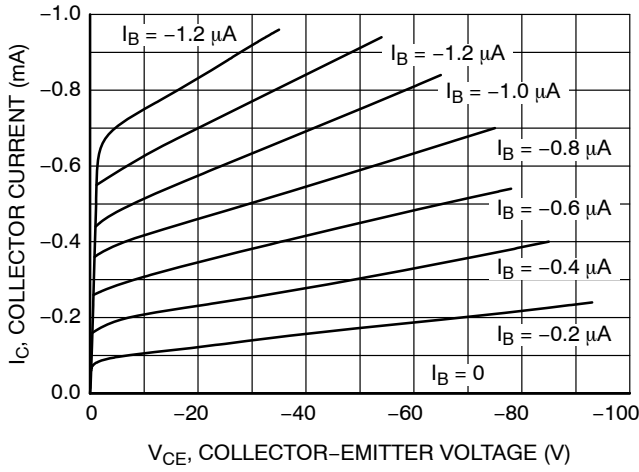


Figure 1. Static Characteristic

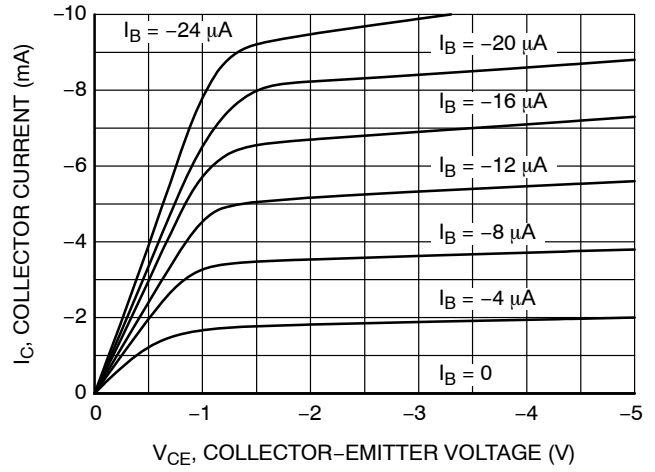


Figure 2. Static Characteristic

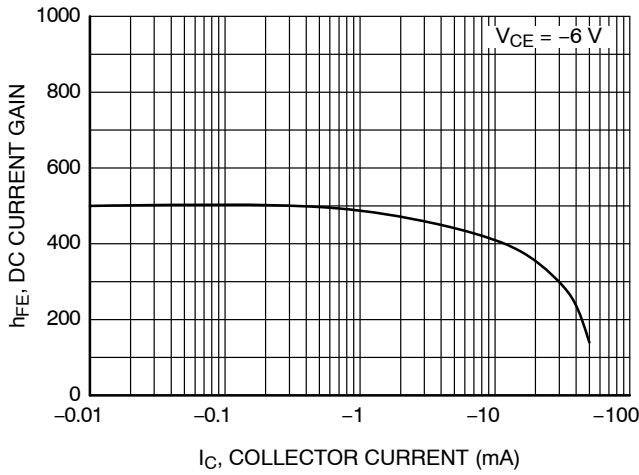


Figure 3. DC Current Gain

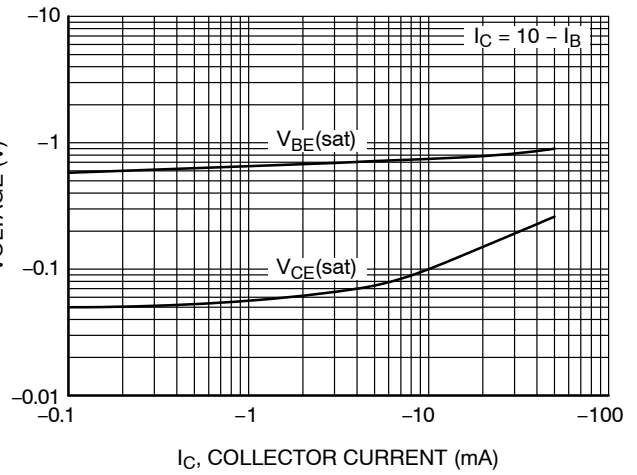


Figure 4. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

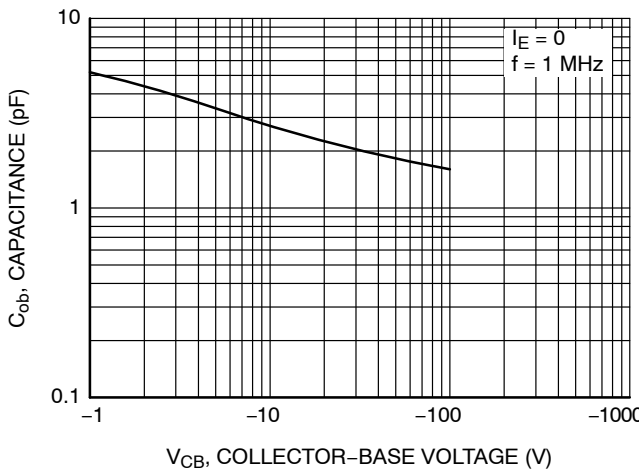


Figure 5. Collector Output Capacitance

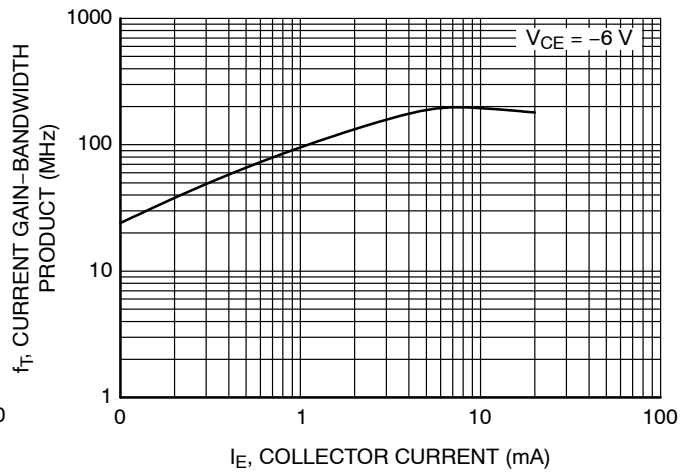
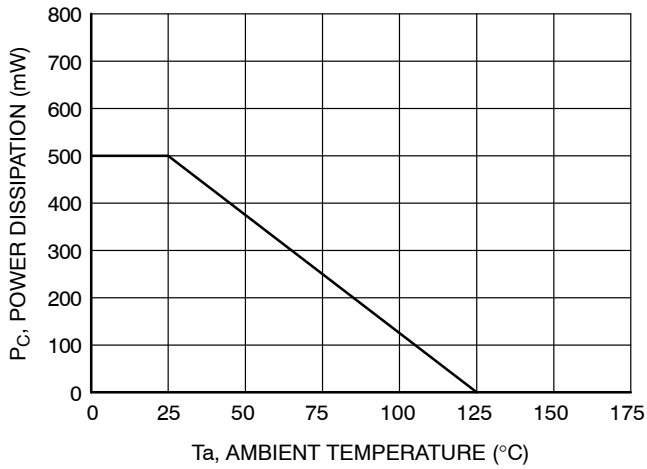


Figure 6. Current Gain Bandwidth Product

# KSA992

## TYPICAL PERFORMANCE CHARACTERISTICS (Continued)



**Figure 7. Power Derating**

### ORDERING INFORMATION

Part Number	Top Mark	Package	Shipping <sup>†</sup>
KSA992FBU	A992	TO-92 3L (Pb-Free)	10000 Units / Bulk
KSA992FTA	A992	TO-92 3L (Pb-Free)	2000 / Tape & Ammo
KSA992FATA	A992	TO-92 3L (Pb-Free)	2000 / Tape & Ammo
KSA992FBTA	A992	TO-92 3L (Pb-Free)	2000 / Tape & Ammo

<sup>†</sup>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.

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

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

DATE 31 JUL 2016



NOTES: UNLESS OTHERWISE SPECIFIED

- A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
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**TO-92 3 4.83x4.76 LEADFORMED**  
**CASE 135AR**  
**ISSUE O**

DATE 30 SEP 2016



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