

# NPN Epitaxial Silicon Transistor

## KSC1845

### Features

- Audio Frequency Low-Noise Amplifier
- Complement to KSA992
- This is a Pb-Free Device

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

Symbol	Parameter	Value	Unit
$V_{CB0}$	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)

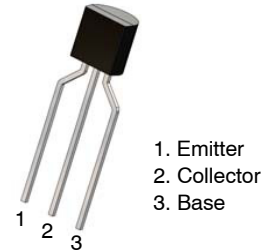
Symbol	Parameter	Value	Unit
$P_D$	Power Dissipation	500	mW
	Derate Above $25^\circ\text{C}$	4	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	250	$^\circ\text{C}/\text{W}$

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.



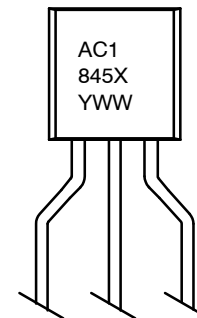
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**TO-92 3 4.83x4.76  
LEADFORMED  
CASE 135AR**

### MARKING DIAGRAM



A = Assembly Code  
C1845 = Device Code  
X = P / F / E / U  
YWW = Date Code

### ORDERING INFORMATION

Device	Package	Shipping
KSC1845FTA	TO-92 3L (Pb-Free)	2000 / Fan-Fold

# KSC1845

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$BV_{CBO}$	Collector-Base Breakdown Voltage	$I_C = 100 \mu\text{A}, I_A = 0$	120	-	-	V
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 1 \text{ mA}, I_B = 0$	120	-	-	V
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E = 100 \mu\text{A}, I_C = 0$	5	-	-	V
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = 120 \text{ V}, I_E = 0$	-	-	50	nA
$I_{EBO}$	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	580	-	
$h_{FE2}$		$V_{CE} = 6 \text{ V}, I_C = 1 \text{ mA}$	200	600	1200	
$V_{BE(on)}$	Base-Emitter On Voltage	$V_{CE} = 6 \text{ V}, I_C = 1 \text{ mA}$	0.55	0.59	0.65	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 10 \text{ mA}, I_B = 1 \text{ mA}$	-	0.07	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	$V_{CB} = 30 \text{ V}, I_E = 0, f = 1 \text{ MHz}$	-	1.6	2.5	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	E	U
$h_{FE2}$	200~400	300~600	400~800	600~1200

TYPICAL PERFORMANCE CHARACTERISTICS

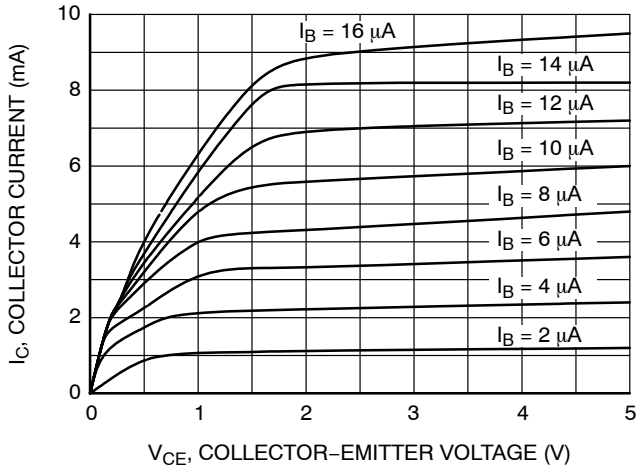


Figure 1. Static Characteristic

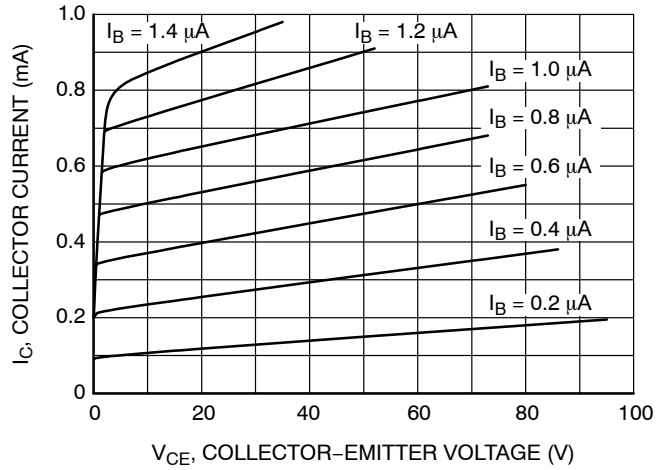


Figure 2. Static Characteristic

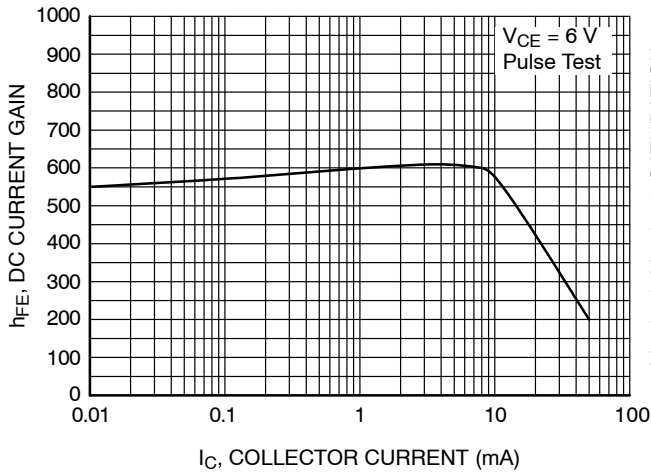


Figure 3. DC Current Gain

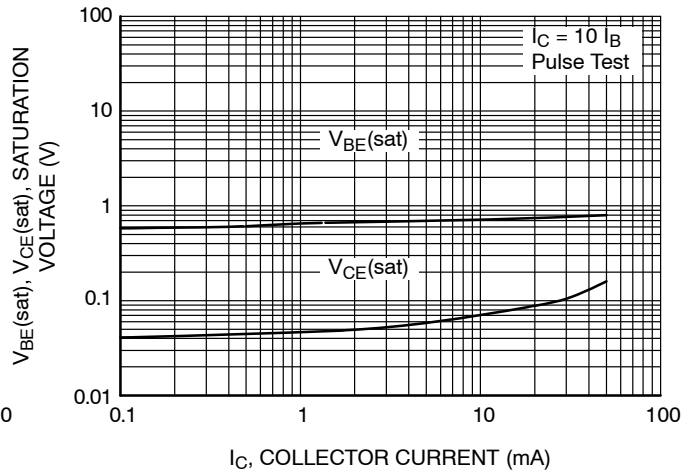


Figure 4. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

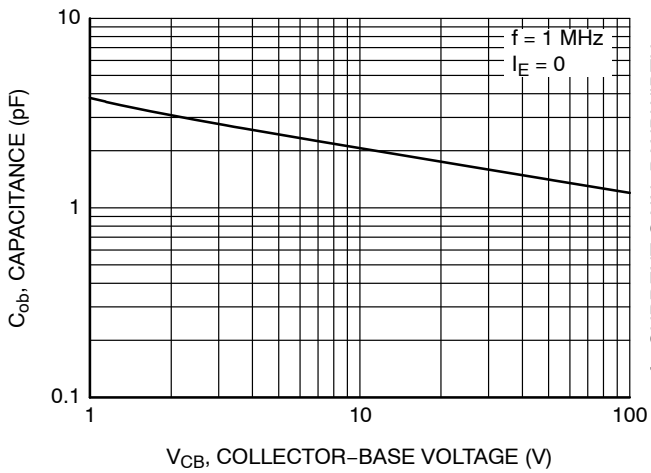


Figure 5. Collector Output Capacitance

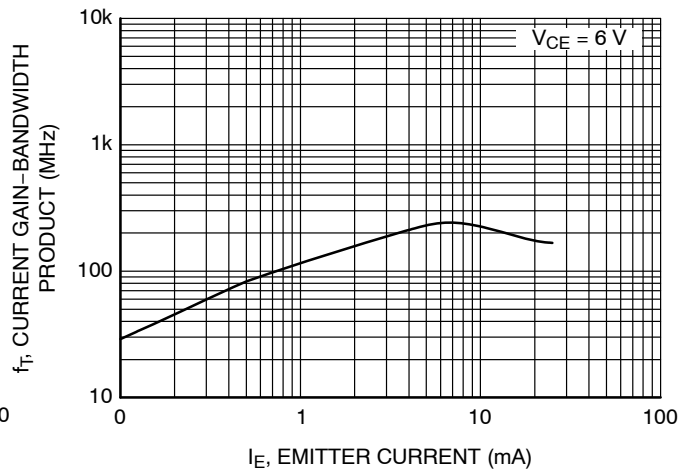


Figure 6. Current Gain Bandwidth Product

TYPICAL PERFORMANCE CHARACTERISTICS (Continued)

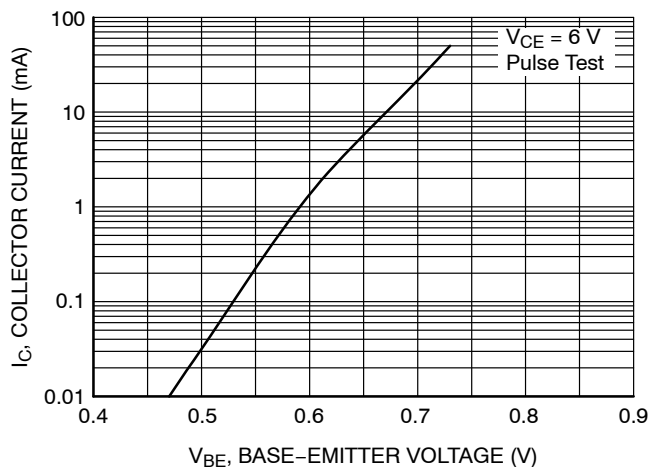


Figure 7. Collector Current vs. Base-Emitter Voltage

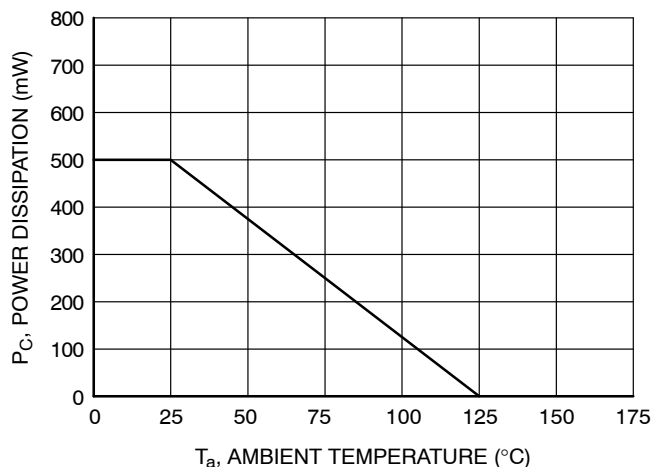
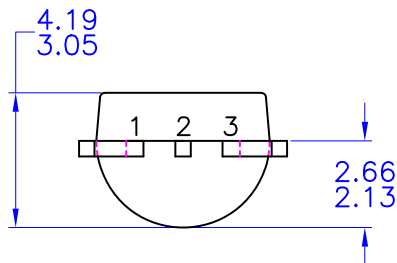
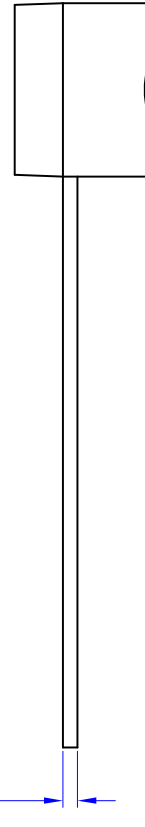
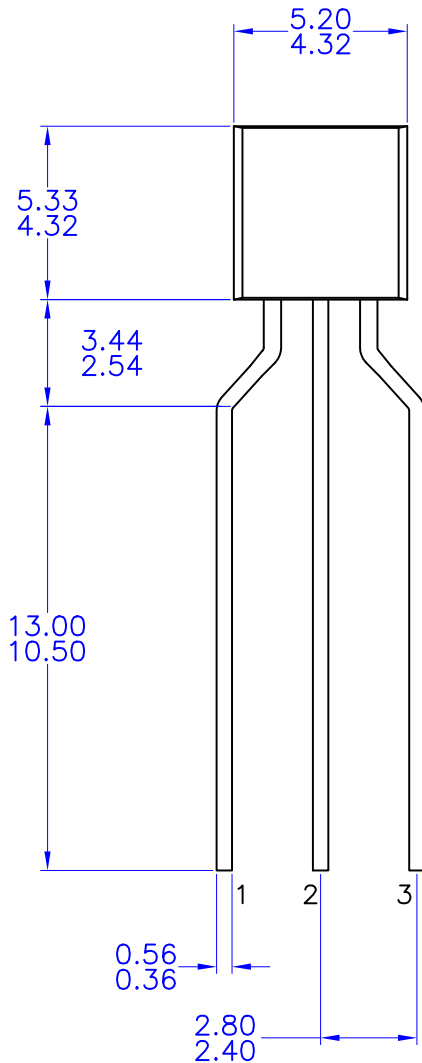


Figure 8. Power Derating

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


DATE 30 SEP 2016



NOTES: UNLESS OTHERWISE SPECIFIED

- A) DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DRAWING CONFORMS TO ASME Y14.5M-1994

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