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September 2015

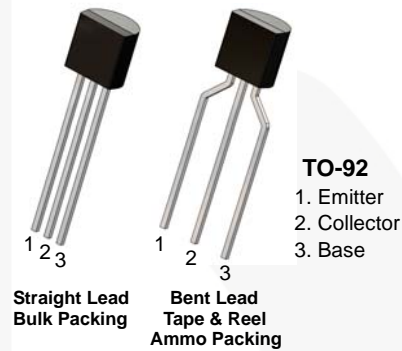


KSC1845 — NPN Epitaxial Silicon Transistor

# KSC1845 NPN Epitaxial Silicon Transistor

## Features

- Audio Frequency Low-Noise Amplifier
- Complement to KSA992



## Ordering Information

Part Number	Top Mark	Package	Packing Method
KSC1845FTA	C1845	TO-92 3L	Ammo

## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. 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	$^\circ\text{C}$

**Thermal Characteristics<sup>(1)</sup>**

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

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	$^\circ\text{C}/\text{W}$

**Note:**

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.

**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	$I_C = 100 \mu\text{A}$ , $I_E = 0$	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		
$h_{FE2}$	DC Current Gain	$V_{CE} = 6 \text{ V}$ , $I_C = 1 \text{ mA}$	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	110		MHz
$C_{ob}$	Output Capacitance	$V_{CB} = 30 \text{ V}$ , $I_E = 0$ , $f = 1 \text{ MHz}$		1.6	2.5	pF
NL	Noise Level	$V_{CE} = 5.0 \text{ V}$ , $I_C = 1.0 \text{ mA}$ , $R_G = 100\text{k}\Omega$ , $G_V = 80 \text{ dB}$ , $f = 10 \text{ Hz to } 1.0 \text{ kHz}$		25	40	mV

 **$h_{FE}$  Classification**

Classification	P	F	E	U
$h_{FE2}$	200 ~ 400	300 ~ 600	400 ~ 800	600 ~ 1200

## Typical Performance Characteristics

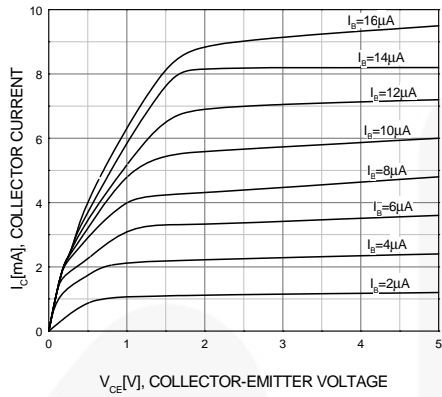


Figure 1. Static Characteristic

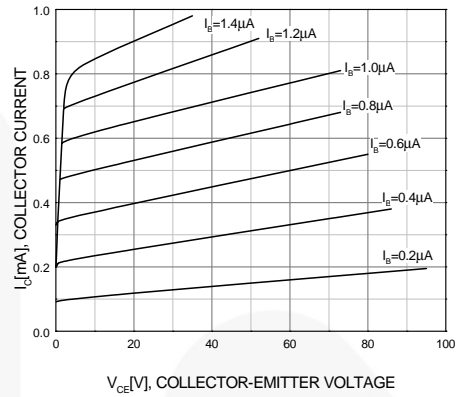


Figure 2. Static Characteristic

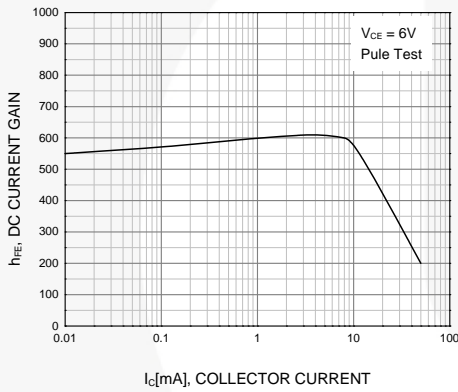


Figure 3. DC Current Gain

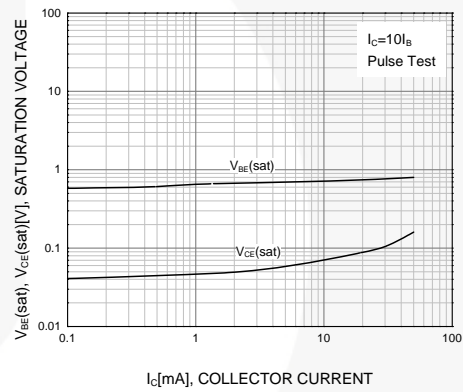


Figure 4. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

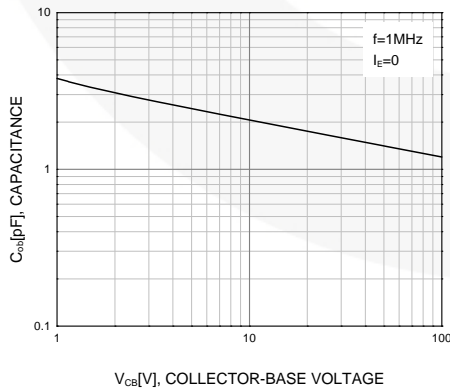


Figure 5. Collector Output Capacitance

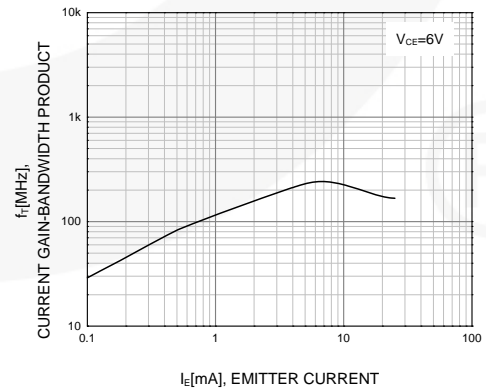


Figure 6. Current Gain Bandwidth Product

Typical Performance Characteristics (Continued)

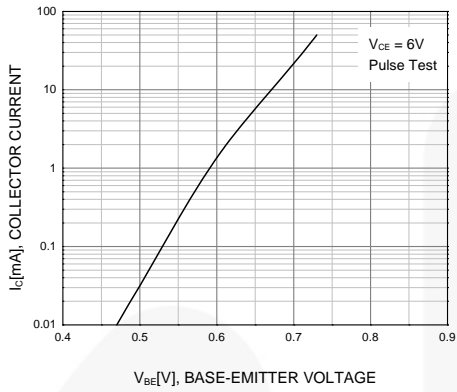


Figure 7. Collector Current vs. Base-Emitter Voltage

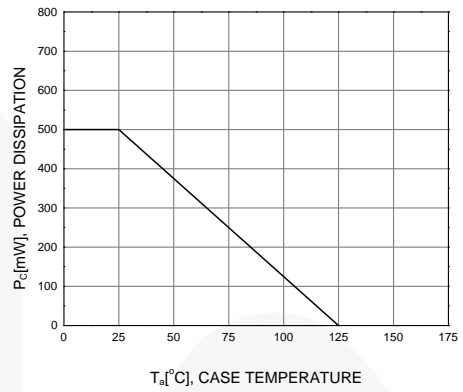


Figure 8. Power Derating



Physical Dimensions

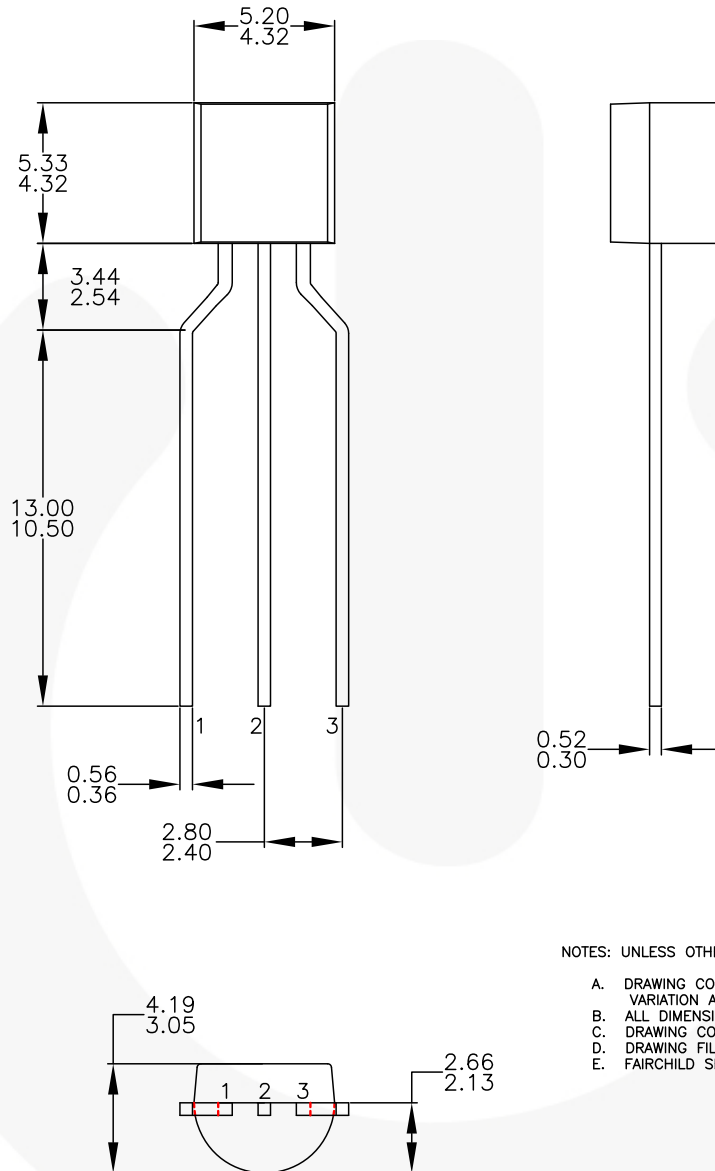



Figure 9. 3-Lead, TO-92, Molded, 0.2 In Line Spacing Lead Form, Ammo Type





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