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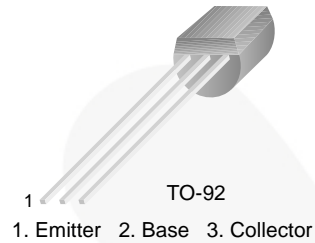


November 2014

# KSC945 NPN Epitaxial Silicon Transistor

## Features

- Audio Frequency Amplifier and High-Frequency OSC.
- Complimentary to KSA733
- Collector-Base Voltage:  $V_{CBO} = 60\text{ V}$
- High Current Gain Bandwidth Product:  $f_T = 300\text{ MHz}$  (Typical)
- Suffix “-C” means Center Collector (1. Emitter 2. Collector 3. Base)



## Ordering Information

Part Number	Top Mark	Package	Packing Method
KSC945YBU	C945	TO-92 3L	Bulk
KSC945YTA	C945	TO-92 3L	Ammo
KSC945GTA	C945	TO-92 3L	Ammo
KSC945CYTA	C945	TO-92 3L	Ammo
KSC945CGBU	C945	TO-92 3L	Bulk
KSC945CGTA	C945	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	60	V
$V_{CEO}$	Collector-Emitter Voltage	50	V
$V_{EBO}$	Emitter-Base Voltage	5	V
$I_C$	Collector Current	150	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	250	mW
	Derate Above $25^\circ\text{C}$	2.0	mW/ $^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	500	$^\circ\text{C}/\text{W}$

**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	$I_C = 100 \mu\text{A}$ , $I_E = 0$	60			V
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 10 \text{ mA}$ , $I_B = 0$	50			V
$BV_{EBO}$	Emitter-Base Breakdown Voltage	$I_E = 10 \mu\text{A}$ , $I_C = 0$	5			V
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = 40 \text{ V}$ , $I_E = 0$			0.1	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = 3 \text{ V}$ , $I_C = 0$			0.1	$\mu\text{A}$
$h_{FE}$	DC Current Gain	$V_{CE} = 6 \text{ V}$ , $I_C = 1.0 \text{ mA}$	40		700	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 100 \text{ mA}$ , $I_B = 10 \text{ mA}$		0.15	0.30	V
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 6 \text{ V}$ , $I_C = 10 \text{ mA}$		300		MHz
$C_{ob}$	Output Capacitance	$V_{CB} = 6 \text{ V}$ , $I_E = 0$ , $f = 1 \text{ MHz}$		2.5		pF
NF	Noise Figure	$V_{CE} = 6 \text{ V}$ , $I_C = 0.5 \text{ mA}$ , $f = 1 \text{ kHz}$ , $R_S = 500 \Omega$		4.0		dB

 **$h_{FE}$  Classification**

Classification	R	O	Y	G	L
$h_{FE}$	40 ~ 80	70 ~ 140	120 ~ 240	200 ~ 400	350 ~ 700

## Typical Performance Characteristics

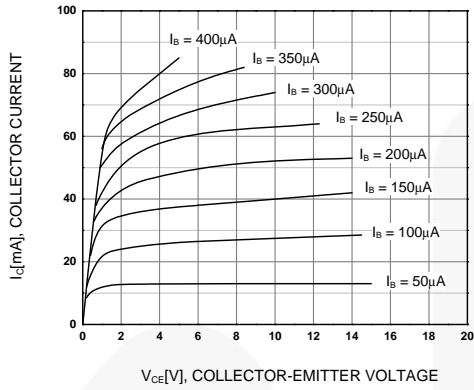


Figure 1. Static Characteristic

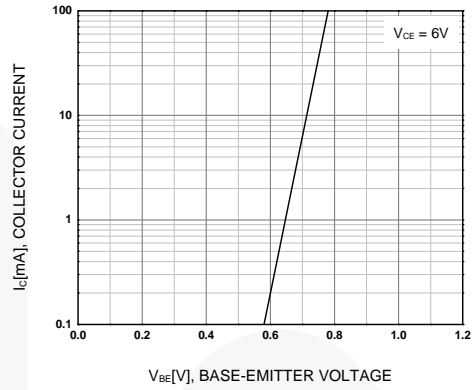


Figure 2. Transfer Characteristic

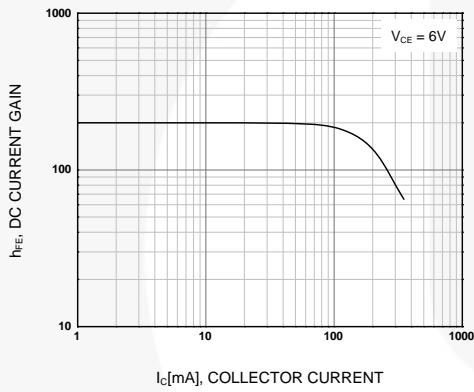


Figure 3. DC Current Gain

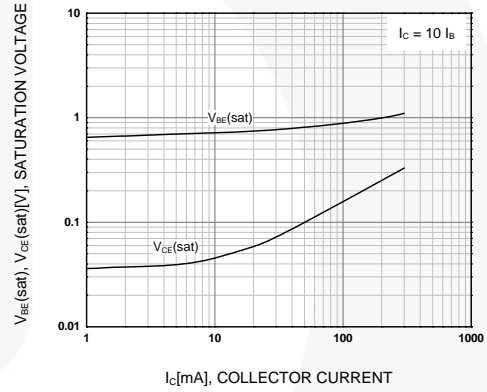


Figure 4. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

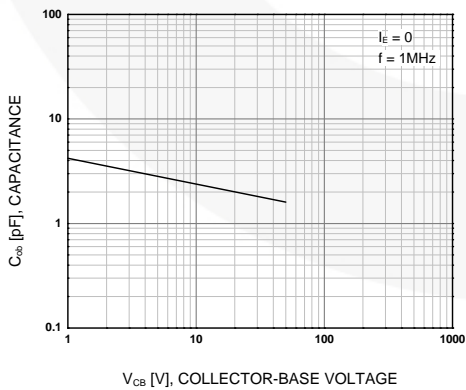


Figure 5. Output Capacitance

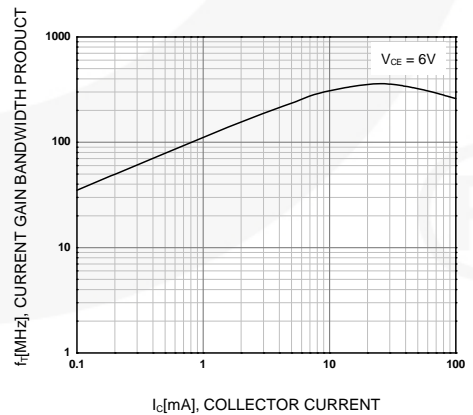
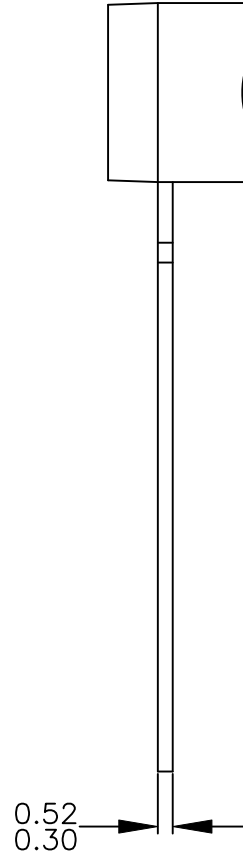
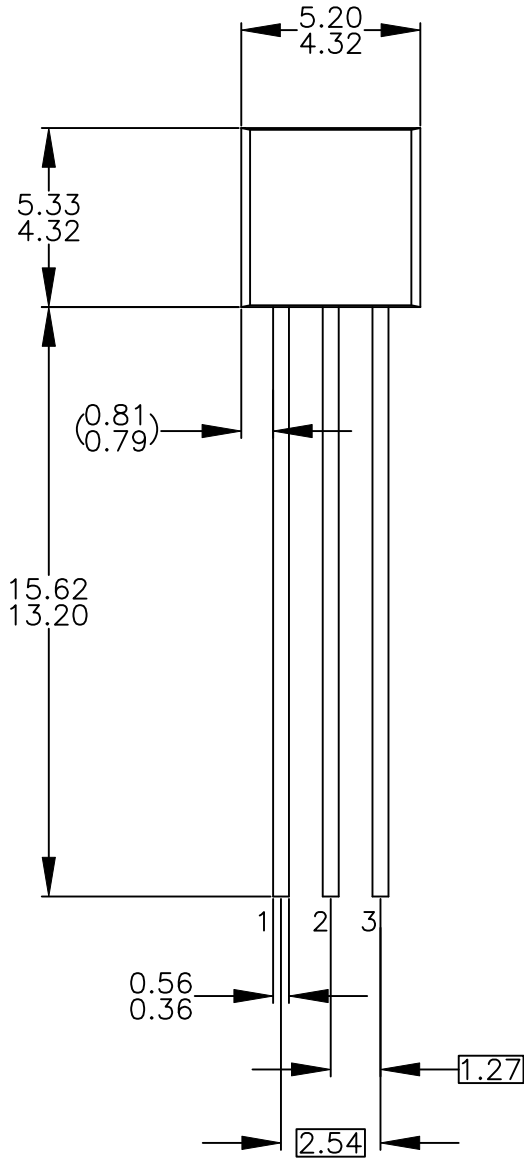


Figure 6. Current Gain Bandwidth Product



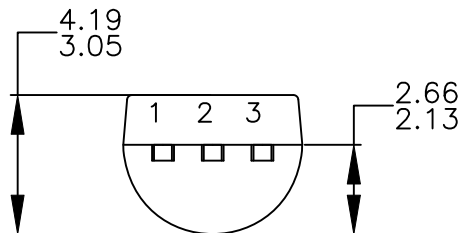
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