

# NPN Epitaxial Silicon Transistor

## KSC945

### 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)

### ABSOLUTE MAXIMUM RATINGS

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

| Symbol    | Parameter                 | Ratings    | 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 | $^\circ\text{C}$ |

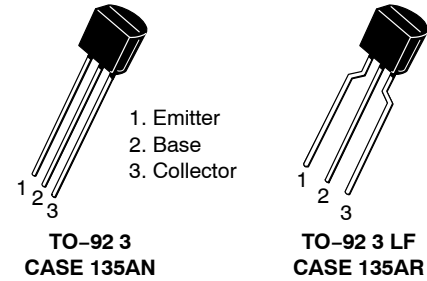
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS

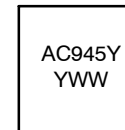
( $T_A = 25^\circ\text{C}$  unless otherwise noted.)

| Symbol          | Parameter                               | Value | Unit                       |
|-----------------|---|-------|----------------------------|
| $P_D$           | Power Dissipation                       | 250   | mW                         |
|                 | Derate Above $25^\circ\text{C}$         | 2.0   | $\text{mW}/^\circ\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 500   | $^\circ\text{C}/\text{W}$  |

2. 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.



### MARKING DIAGRAM



- A = Assembly Site
- C945Y = Specific Device Code
- Y = Year of Production
- WW = Work Week

### ORDERING INFORMATION

| Device     | Package              | Shipping            |
|------------|----------------------|---------------------|
| KSC945CYTA | TO-92 3 LF (Pb-Free) | 2,000 Units / FNFLD |
| KSC945YTA  | TO-92 3 LF (Pb-Free) | 2,000 Units / FNFLD |

### DISCONTINUED (Note 1)

|           |                   |                     |
|-----------|-------------------|---------------------|
| KSC945YBU | TO-92 3 (Pb-Free) | 10,000 Units / Bulk |
|-----------|-------------------|---------------------|

1. **DISCONTINUED:** This device is not recommended for new design. Please contact your **onsemi** representative for information. The most current information on this device may be available on [www.onsemi.com](http://www.onsemi.com).

# KSC945

## ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ 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                      | $V_{CE} = 6 \text{ V}, I_C = 1.0 \text{ mA}$                                      | 120 | -    | 240  |               |
| $V_{CE(sat)}$ | 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            |

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.

TYPICAL CHARACTERISTICS

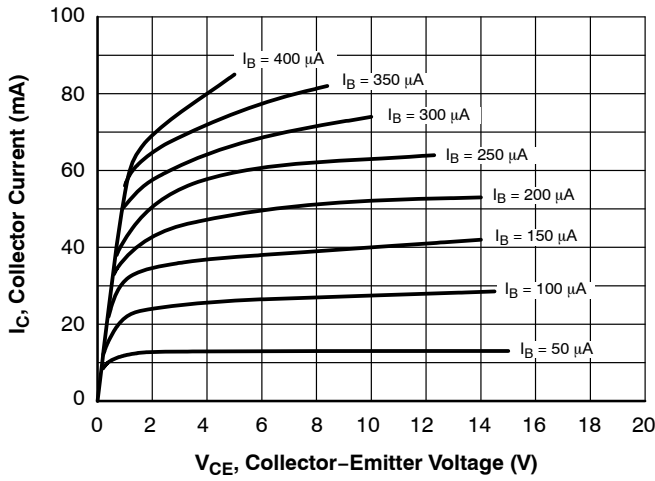


Figure 1. Static Characteristic

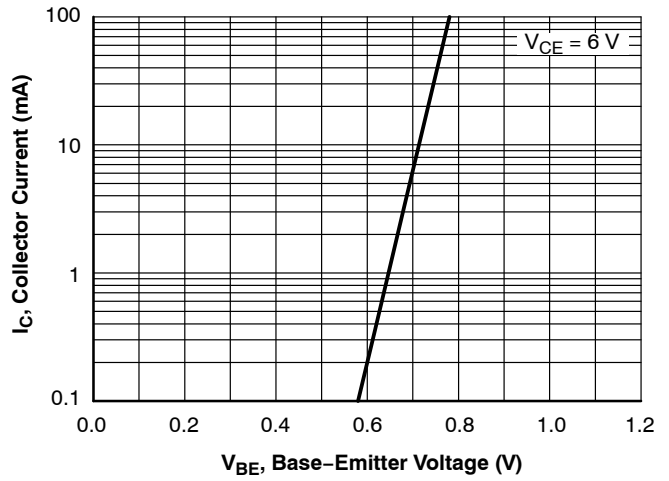


Figure 2. Transfer Characteristic

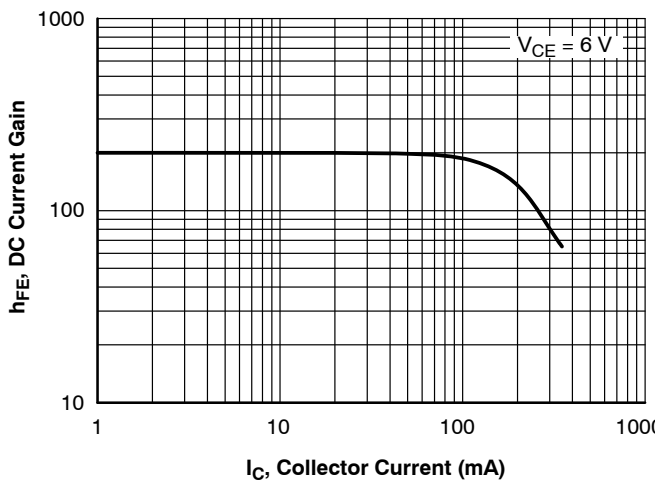


Figure 3. DC Current Gain

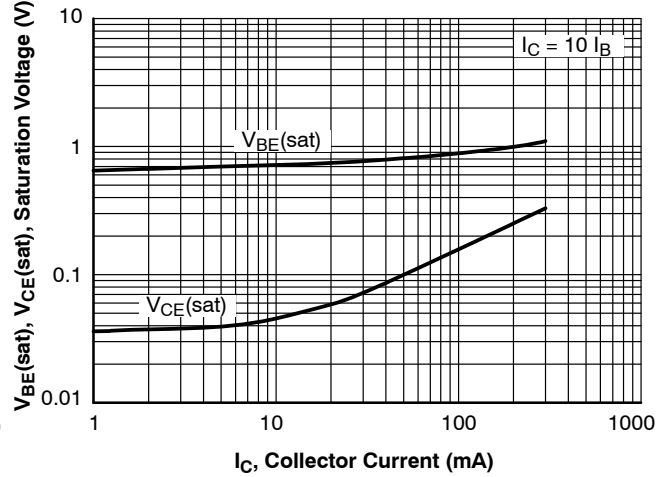


Figure 4. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

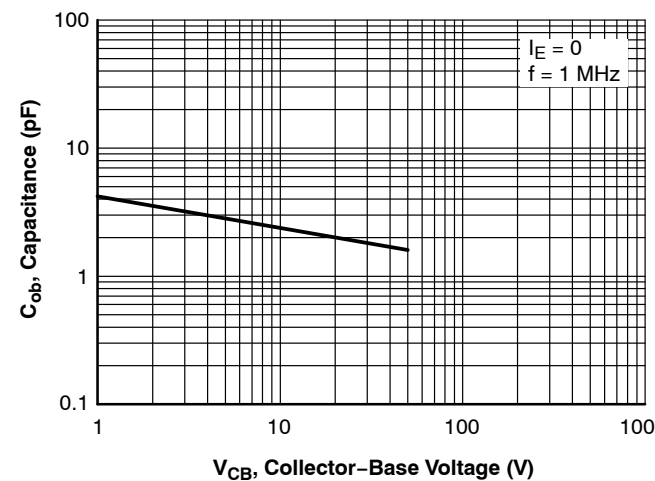


Figure 5. Output Capacitance

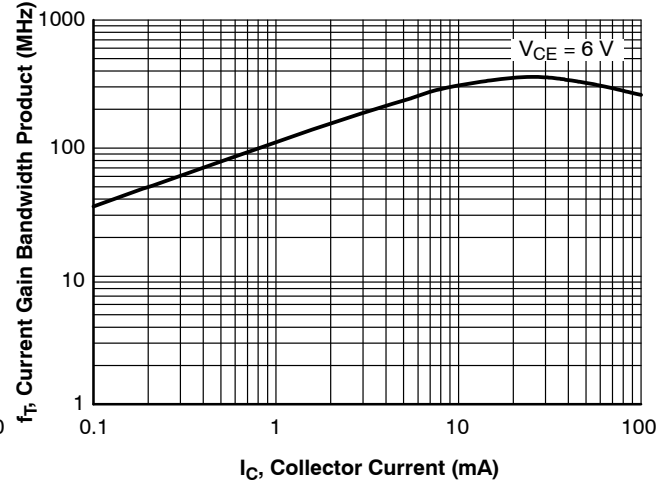
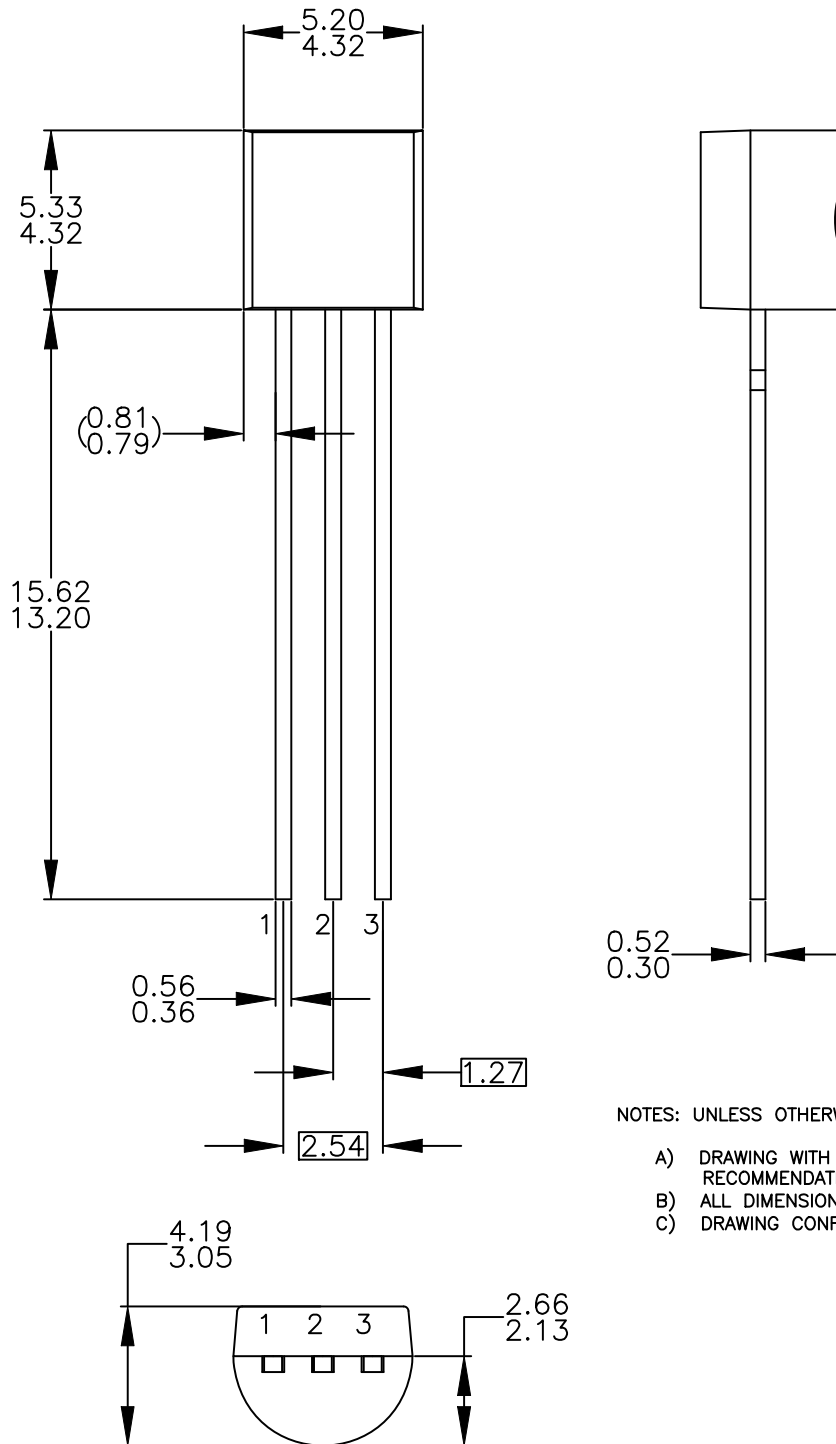


Figure 6. Current Gain Bandwidth Product

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

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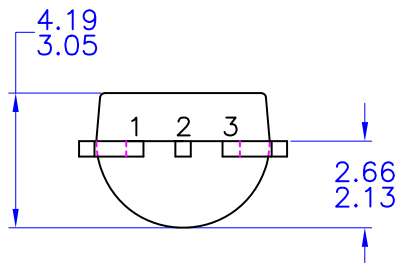
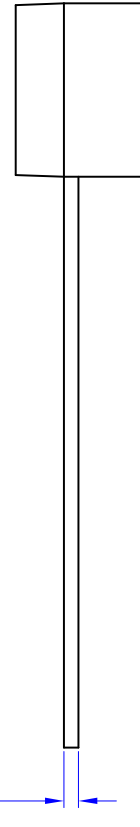
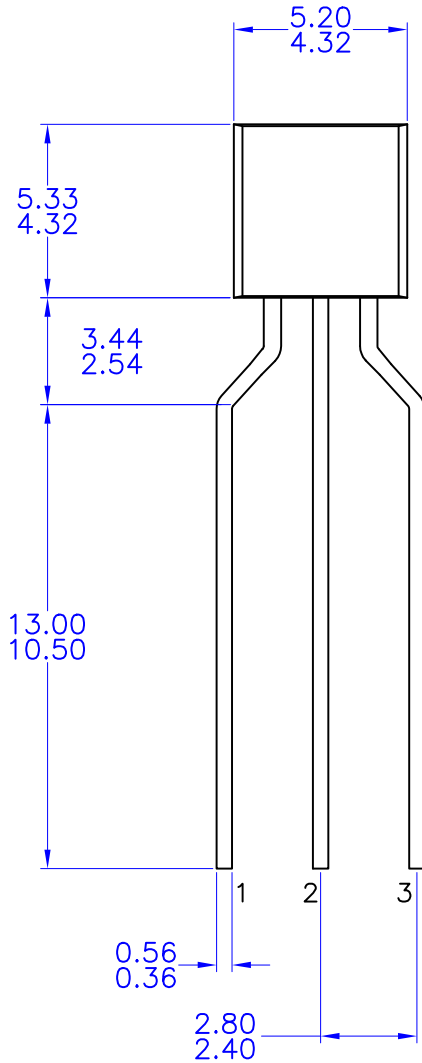
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