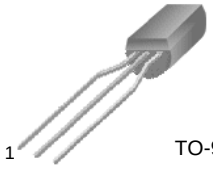
November 2014

# KSC2331
# NPN Epitaxial Silicon Transistor

## Features

- Low-Frequency Amplifier and Medium Speed Switching
- Complement to KSA931
- High Collector-Base Voltage: $V_{CBO}$ = 80 V
- Collector Current: $I_C$ = 700 mA




TO-92L

1. Emitter 2. Collector 3. Base

## Ordering Information

| Part Number | Top Mark | Package | Packing Method |
|---|---|---|---|
| KSC2331YTA | C2331 Y- | 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°C unless otherwise noted.

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 80 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 60 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 8 | V |
| $I_C$ | Collector Current | 700 | mA |
| $T_J$ | Junction Temperature | 150 | °C |
| $T_{STG}$ | Storage Temperature | -55 to +150 | °C |

## Thermal Characteristics[1]

Values are at $T_A$ = 25°C unless otherwise noted.

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $P_D$ | Power Dissipation | 1 | W |
| | Derate Above 25°C | 8.0 | mW/°C |
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient | 125 | °C/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°C unless otherwise noted.

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $BV_{CBO}$ | Collector-Base Breakdown Voltage | $I_C$ = 100 μA, $I_E$ = 0 | 80 | | | V |
| $BV_{CEO}$ | Collector-Emitter Breakdown Voltage | $I_C$ = 10 mA, $I_B$ = 0 | 60 | | | V |
| $BV_{EBO}$ | Emitter-Base Breakdown Voltage | $I_E$ = 10 μA, $I_C$ = 0 | 8 | | | V |
| $I_{CBO}$ | Collector Cut-Off Current | $V_{CB}$ = 60 V, $I_E$ = 0 | | | 0.1 | μA |
| $I_{EBO}$ | Emitter Cut-Off Current | $V_{EB}$ = 5 V, $I_C$ = 0 | | | 0.1 | μA |
| $h_{FE}$ | DC Current Gain | $V_{CE}$ = 2 V, $I_C$ = 50 mA | 40 | | 240 | |
| $V_{CE}$(sat) | Collector-Emitter Saturation Voltage | $I_C$ = 500 mA, $I_B$ = 50 mA | | 0.2 | 0.7 | V |
| $V_{BE}$(sat) | Base-Emitter Saturation Voltage | $I_C$ = 500 mA, $I_B$ = 50 mA | | 0.86 | 1.20 | V |
| $f_T$ | Current Gain Bandwidth Product | $V_{CE}$ = 10V, $I_C$ = 50 mA | 30 | 50 | | MHz |
| $C_{ob}$ | Output Capacitance | $V_{CB}$ = 10 V, $I_E$ = 0, f = 1 MHz | | 8 | | pF |

## $h_{FE}$ Classification

| Classification | R | O | Y |
|---|---|---|---|
| $h_{FE}$ | 40 ~ 80 | 70 ~ 140 | 120 ~ 240 |

## Typical Performance Characteristics

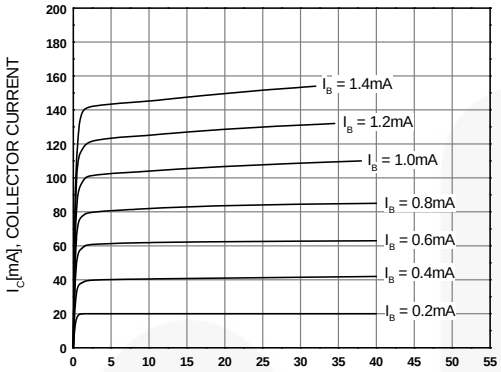



**Figure 1. Static Characteristic**

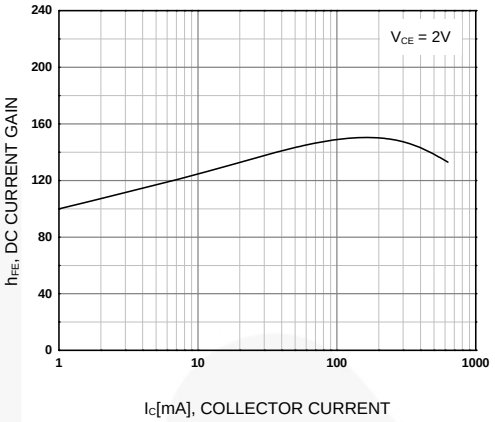



**Figure 2. DC Current Gain**

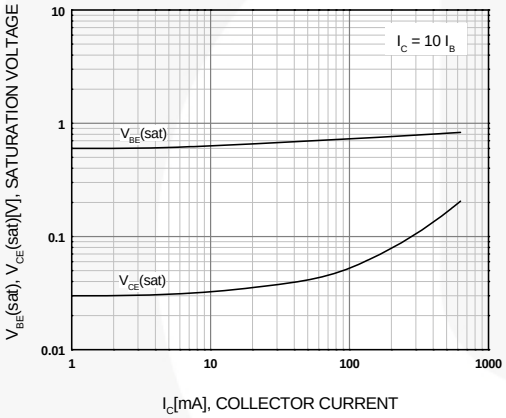



**Figure 3. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage**

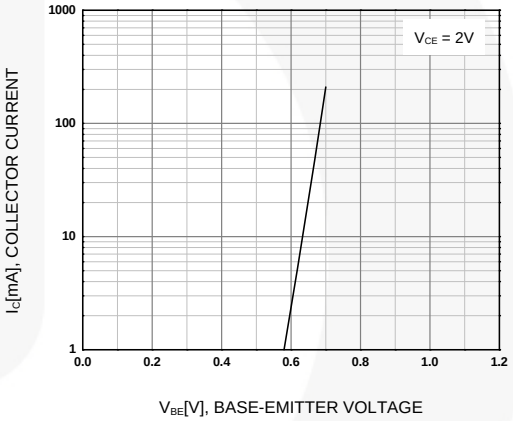



**Figure 4. Base-Emitter On Voltage**

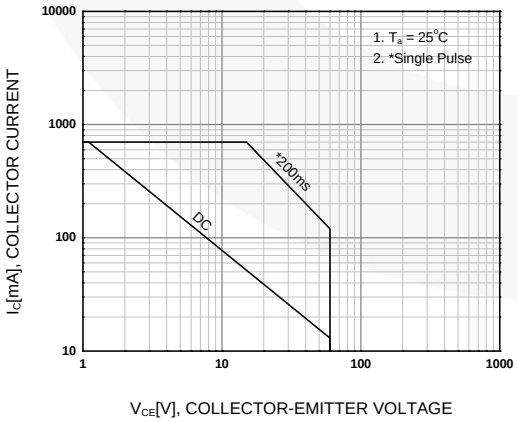



**Figure 5. Safe Operating Area**

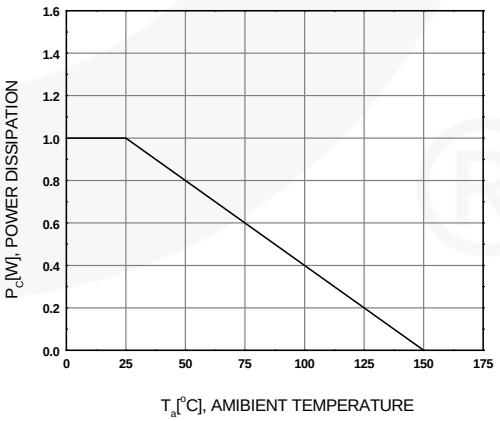
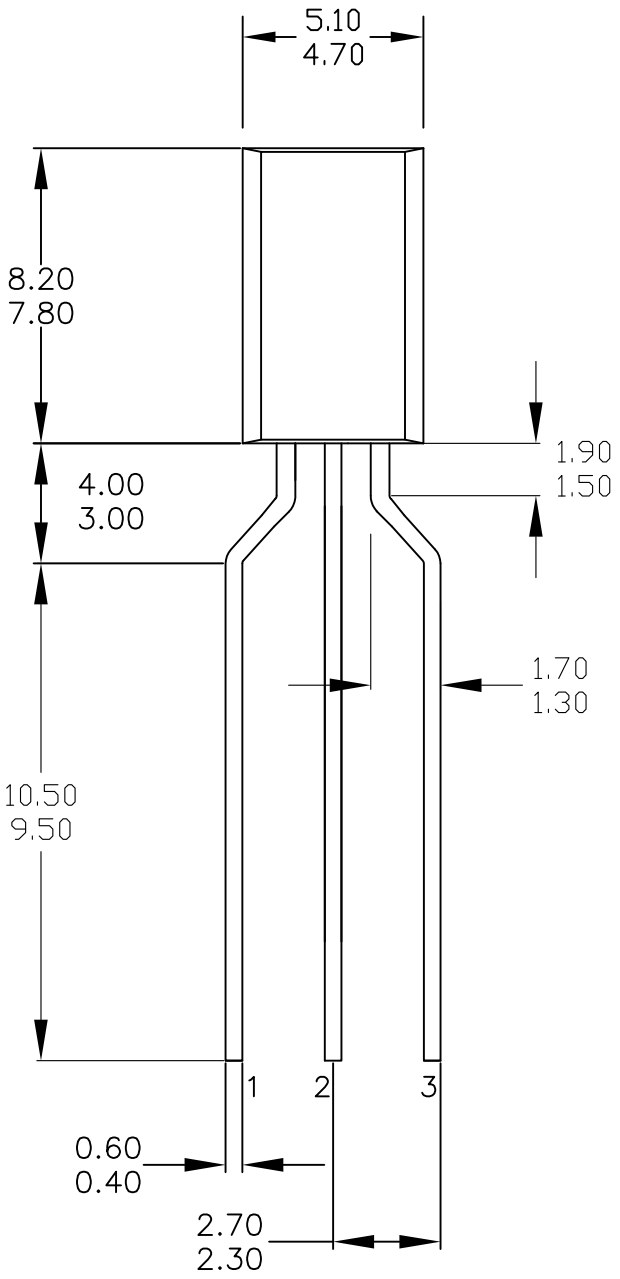
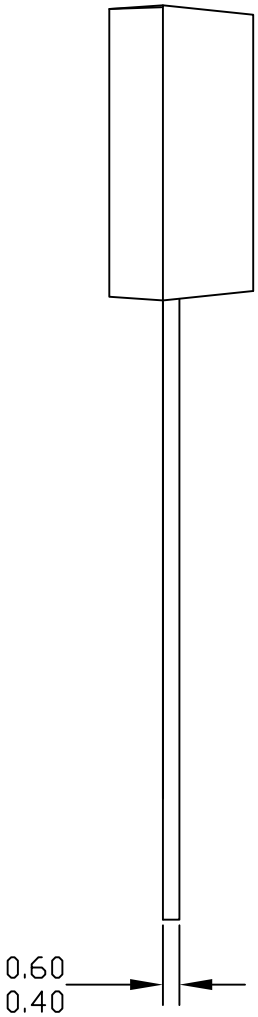
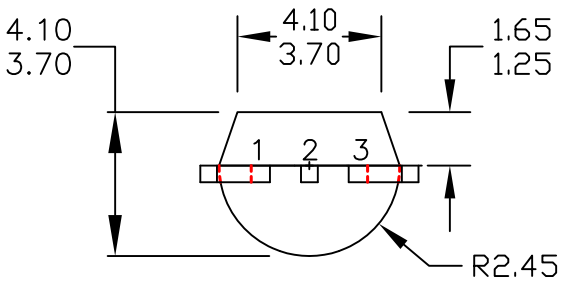



**Figure 6. Power Derating**

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