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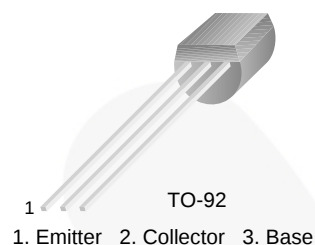
May 2016

# KSC1815

## NPN Epitaxial Silicon Transistor

### Features

- Audio Frequency Amplifier and High-Frequency OSC
- Complement to KSA1015
- Collector-Base Voltage:  $V_{CBO} = 50\text{ V}$



### Ordering Information

| Part Number | Top Mark | Package  | Packing Method |
|-------------|----------|----------|----------------|
| KSC1815YTA  | YC&3     | 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               |
| $I_B$     | Base Current              | 50         | mA               |
| $T_J$     | Junction Temperature      | 150        | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | $^\circ\text{C}$ |

KSC1815 — NPN Epitaxial Silicon Transistor

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

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

| Symbol          | Parameter                               | Max. | Unit                 |
|-----------------|-----------------------------------------|------|----------------------|
| $P_D$           | Total Device Dissipation                | 400  | mW                   |
|                 | Derate Above $25^\circ\text{C}$         | 3.2  | mW/ $^\circ\text{C}$ |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 312  | $^\circ\text{C/W}$   |

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

| Symbol        | Parameter                            | Conditions                                                                                       | Min. | Typ. | Max. | Unit          |
|---------------|--------------------------------------|--------------------------------------------------------------------------------------------------|------|------|------|---------------|
| $BV_{CBO}$    | Collector-Base Voltage               | $I_C = 1\text{ mA}$ , $I_E = 0$                                                                  | 60   |      |      | V             |
| $BV_{CEO}$    | Collector-Emitter Voltage            | $I_C = 10\text{ mA}$ , $I_B = 0$                                                                 | 50   |      |      | V             |
| $BV_{EBO}$    | Emitter-Base Voltage                 | $I_E = 10\text{ }\mu\text{A}$ , $I_C = 0$                                                        | 5    |      |      | V             |
| $I_{CBO}$     | Collector Cut-Off Current            | $V_{CB} = 60\text{ V}$ , $I_E = 0$                                                               |      |      | 0.1  | $\mu\text{A}$ |
| $I_{EBO}$     | Emitter Cut-Off Current              | $V_{EB} = 5\text{ V}$ , $I_C = 0$                                                                |      |      | 0.1  | $\mu\text{A}$ |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 100\text{ mA}$ , $I_B = 10\text{ mA}$                                                     |      | 0.10 | 0.25 | V             |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage      | $I_C = 100\text{ mA}$ , $I_B = 10\text{ mA}$                                                     |      |      | 1.0  | V             |
| $h_{FE1}$     | DC Current Gain                      | $V_{CE} = 6\text{ V}$ , $I_C = 2\text{ mA}$                                                      | 70   |      | 700  |               |
| $h_{FE2}$     | DC Current Gain                      | $V_{CE} = 6\text{ V}$ , $I_C = 150\text{ mA}$                                                    | 25   |      |      |               |
| $f_T$         | Current Gain Bandwidth Product       | $V_{CE} = 10\text{ V}$ , $I_C = 1\text{ mA}$                                                     | 80   |      |      | MHz           |
| $C_{ob}$      | Output Capacitance                   | $V_{CB} = 10\text{ V}$ , $I_E = 0$ ,<br>$f = 1\text{ MHz}$                                       |      | 2.0  | 3.0  | pF            |
| $N_F$         | Noise Figure                         | $V_{CE} = 6\text{ V}$ , $I_C = 0.1\text{ mA}$ ,<br>$R_S = 10\text{ k}\Omega$ , $f = 1\text{ Hz}$ |      | 1.0  | 10.0 | dB            |

 **$h_{FE}$  Classification**

| Classification | O        | Y         | GR        | L         |
|----------------|----------|-----------|-----------|-----------|
| $h_{FE1}$      | 70 ~ 140 | 120 ~ 240 | 200 ~ 400 | 350 ~ 700 |

## Typical Performance Characteristics

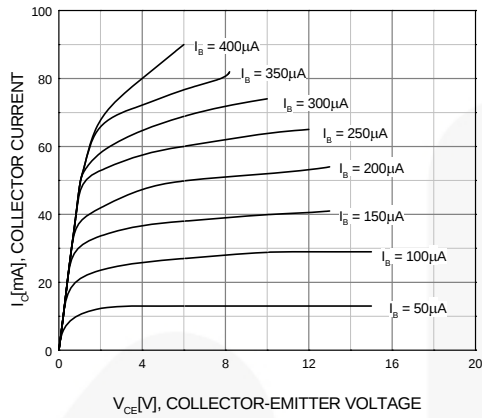


Figure 1. Static Characteristic

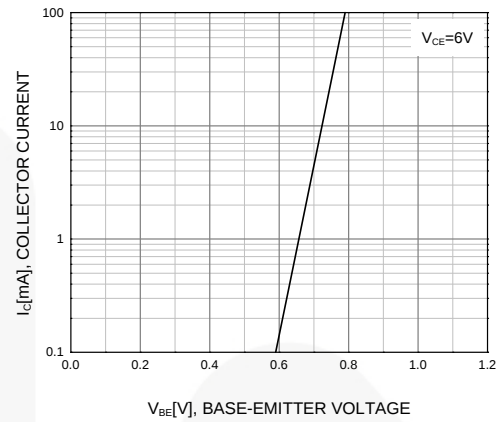


Figure 2. Transfer Characteristic

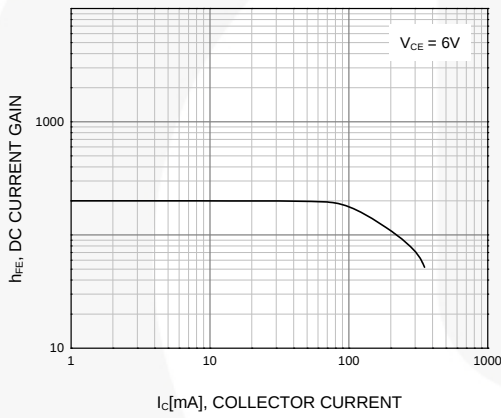


Figure 3. DC Current Gain

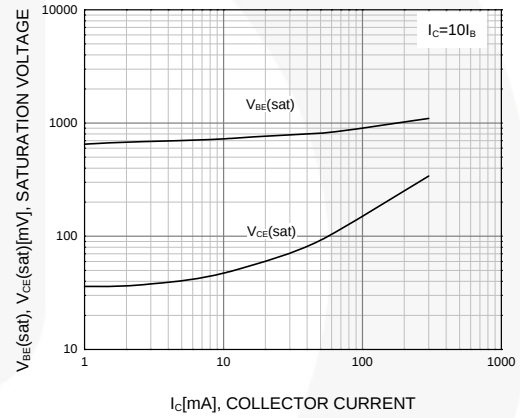


Figure 4. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

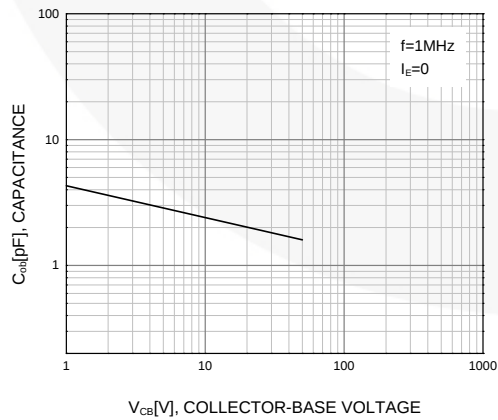


Figure 5. Output Capacitance

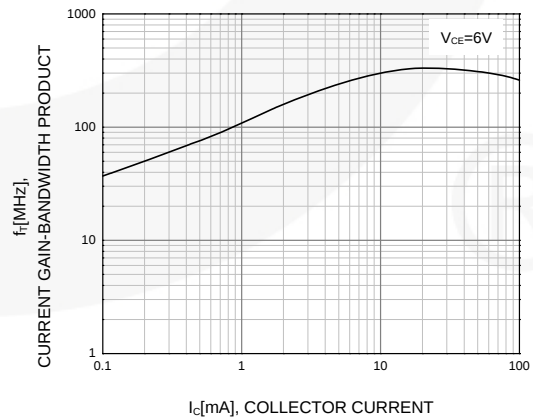
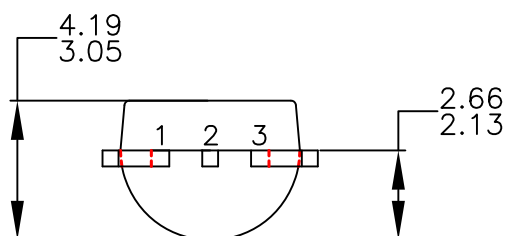
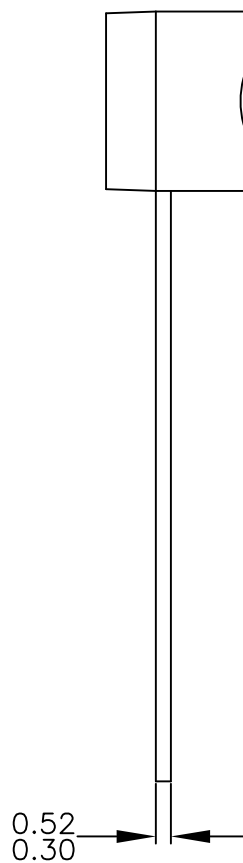
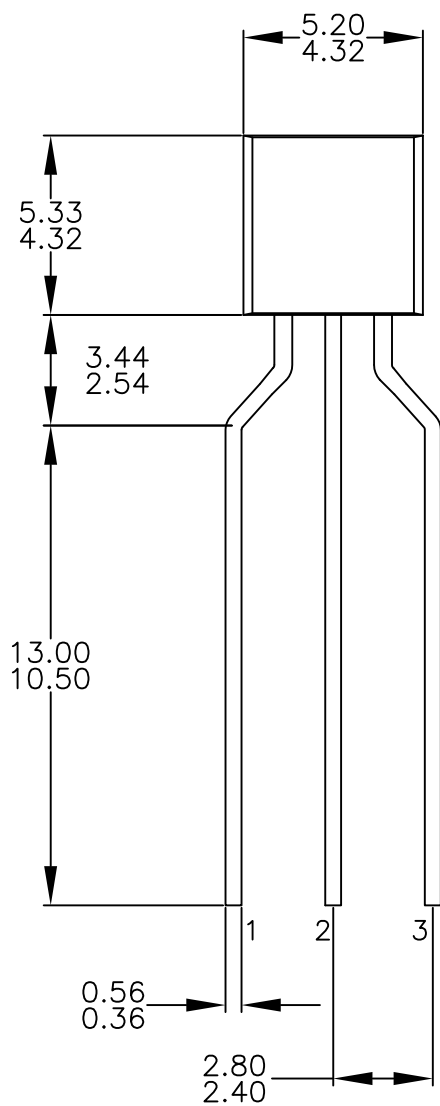


Figure 6. Current Gain Bandwidth Product



NOTES: UNLESS OTHERWISE SPECIFIED

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