



## 8050S

## NPN SILICON TRANSISTOR

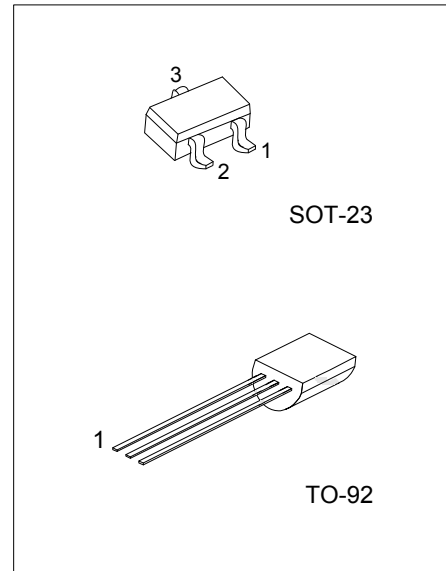
### LOW VOLTAGE HIGH CURRENT SMALL SIGNAL NPN TRANSISTOR

#### DESCRIPTION

The UTC **8050S** is a low voltage high current small signal NPN transistor, designed for Class B push-pull audio amplifier and general purpose applications.

#### FEATURES

- \*Collector current up to 700mA
- \*Collector-Emitter voltage up to 20V
- \*Complementary to UTC 8550S

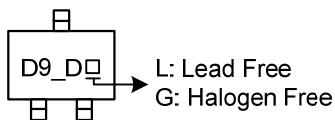


#### ORDERING INFORMATION

| Ordering Number |                | Package | Pin Assignment |   |   | Packing   |
|-----------------|----------------|---------|----------------|---|---|-----------|
| Lead Free       | Halogen-Free   |         | 1              | 2 | 3 |           |
| 8050SL-x-AE3-R  | 8050SG-x-AE3-R | SOT-23  | E              | B | C | Tape Reel |
| 8050SL-x-T92-B  | 8050SG-x-T92-B | TO-92   | E              | C | B | Tape Box  |
| 8050SL-x-T92-K  | 8050SG-x-T92-K | TO-92   | E              | C | B | Bulk      |
| 8050SL-x-T92-R  | 8050SG-x-T92-R | TO-92   | E              | C | B | Tape Reel |

|   |  |
|---|--|
| <p>8050SL-x-AE3-R</p> <p>(1)Packing Type<br/>(2)Package Type<br/>(3)Rank<br/>(4)Lead Free</p> | <p>(1) B: Tape Box, K: Bulk, R: Tape Reel<br/>(2) AE3: SOT-23, T92: TO-92<br/>(3) x: refer to Classification of <math>h_{FE2}</math><br/>(4) G: Halogen Free, L: Lead Free</p> |
|---|--|

#### MARKING (For SOT-23 Package)



■ ABSOLUTE MAXIMUM RATING (  $T_A=25^{\circ}\text{C}$ , unless otherwise specified )

| PARAMETER   |        | SYMBOL    | RATINGS    | UNIT               |
|---|--------|-----------|------------|--------------------|
| Collector-Base Voltage                            |        | $V_{CBO}$ | 30         | V                  |
| Collector-Emitter Voltage                         |        | $V_{CEO}$ | 20         | V                  |
| Emitter-Base Voltage                              |        | $V_{EBO}$ | 5          | V                  |
| Collector Current                                 |        | $I_C$     | 700        | mA                 |
| Collector Dissipation( $T_A=25^{\circ}\text{C}$ ) | SOT-23 | $P_C$     | 350        | mW                 |
|   | TO-92  |           | 1          | W                  |
| Junction Temperature                              |        | $T_J$     | +150       | $^{\circ}\text{C}$ |
| Storage Temperature                               |        | $T_{STG}$ | -40 ~ +150 | $^{\circ}\text{C}$ |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

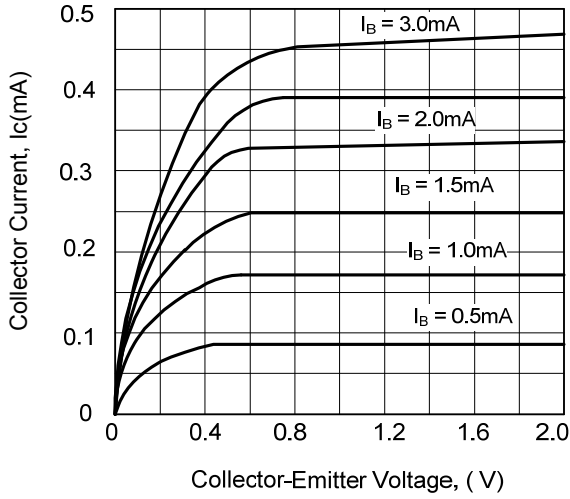
| PARAMETER                            | SYMBOL        | TEST CONDITIONS                                 | MIN | TYP | MAX | UNIT          |
|--------------------------------------|---------------|---|-----|-----|-----|---------------|
| Collector-Base Breakdown Voltage     | $BV_{CBO}$    | $I_C = 100\mu\text{A}, I_E = 0$                 | 30  |     |     | V             |
| Collector-Emitter Breakdown Voltage  | $BV_{CEO}$    | $I_C = 1\text{mA}, I_B = 0$                     | 20  |     |     | V             |
| Emitter-Base Breakdown Voltage       | $BV_{EBO}$    | $I_E = 100\mu\text{A}, I_C = 0$                 | 5   |     |     | V             |
| Collector Cut-Off Current            | $I_{CBO}$     | $V_{CB} = 30\text{V}, I_E = 0$                  |     |     | 1   | $\mu\text{A}$ |
| Emitter Cut-Off Current              | $I_{EBO}$     | $V_{EB} = 5\text{V}, I_C = 0$                   |     |     | 100 | nA            |
| DC Current Gain(note)                | $h_{FE1}$     | $V_{CE} = 1\text{V}, I_C = 1\text{mA}$          | 100 |     | 400 |               |
|                                      | $h_{FE2}$     | $V_{CE} = 1\text{V}, I_C = 150\text{mA}$        | 120 |     |     |               |
|                                      | $h_{FE3}$     | $V_{CE} = 1\text{V}, I_C = 500\text{mA}$        | 40  |     |     |               |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | $I_C = 500\text{mA}, I_B = 50\text{mA}$         |     |     | 0.5 | V             |
| Base-Emitter Saturation Voltage      | $V_{BE(SAT)}$ | $I_C = 500\text{mA}, I_B = 50\text{mA}$         |     |     | 1.2 | V             |
| Base-Emitter Saturation Voltage      | $V_{BE(SAT)}$ | $V_{CE} = 1\text{V}, I_C = 10\text{mA}$         |     |     | 1.0 | V             |
| Current Gain Bandwidth Product       | $f_T$         | $V_{CE} = 10\text{V}, I_C = 50\text{mA}$        | 100 |     |     | MHz           |
| Output Capacitance                   | Cob           | $V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$ |     | 9.0 |     | pF            |

■ CLASSIFICATION OF  $h_{FE2}$

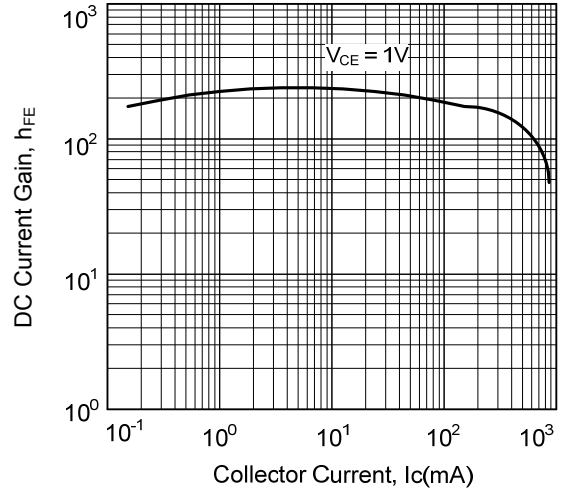
| RANK  | C       | D       | E       |
|-------|---------|---------|---------|
| RANGE | 120-200 | 160-300 | 280-400 |

■ TYPICAL CHARACTERISTICS

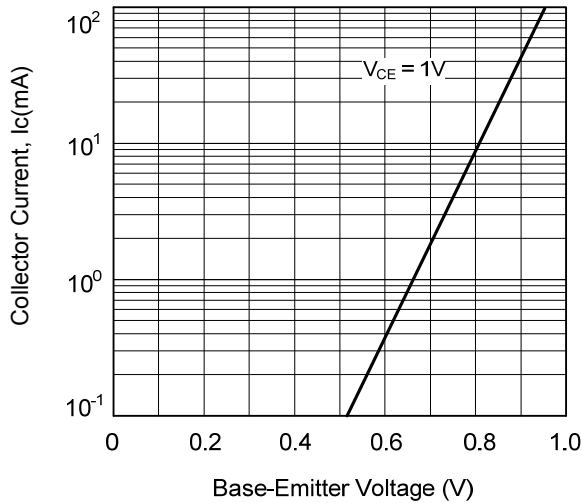
Static Characteristics



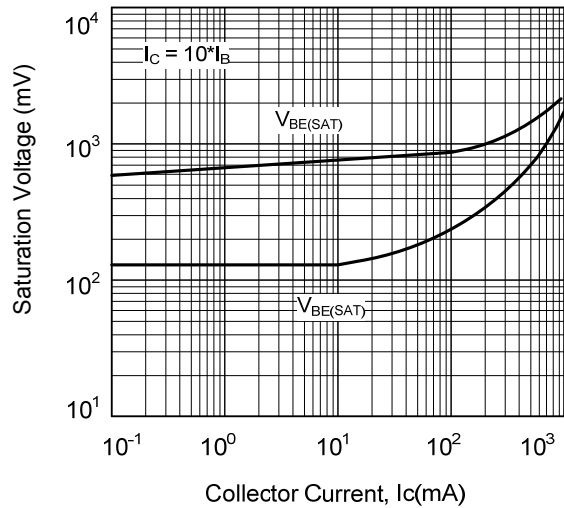
DC Current Gain



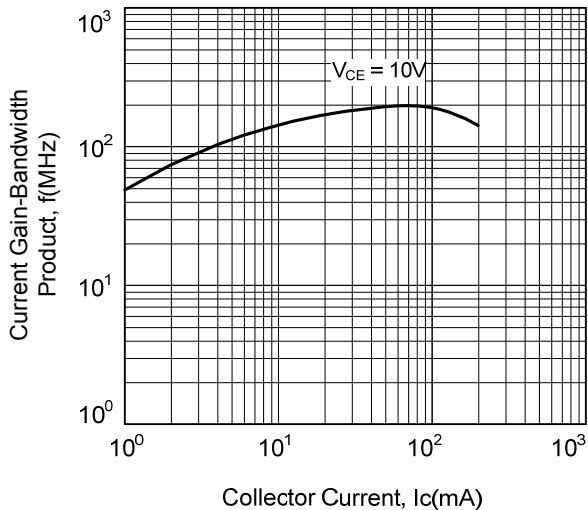
Base-Emitter on Voltage



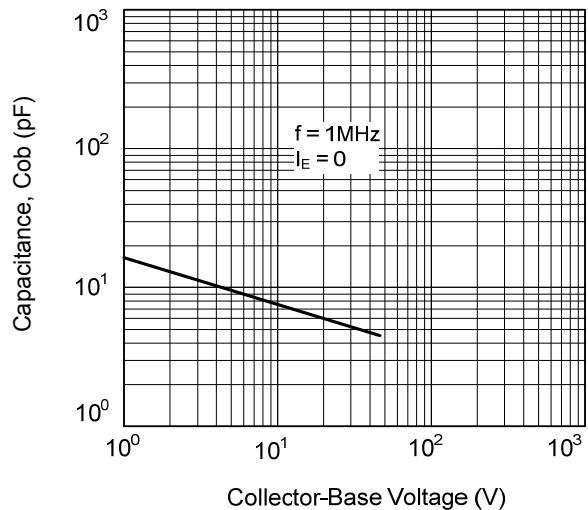
Saturation Voltage



Current Gain-Bandwidth Product



Collector Output Capacitance



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