

# NPN Epitaxial Silicon Transistor

## SS8050

### Features

- 2 W Output Amplifier of Portable Radios in Class B Push–Pull Operation
- Complementary to SS8550
- Collector Current:  $I_C = 1.5\text{ A}$
- These Devices are Pb–Free, Halogen Free/BFR Free and are RoHS Compliant

### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Parameter                 | Symbol    | Value      | Unit             |
|---------------------------|-----------|------------|------------------|
| Collector–Base Voltage    | $V_{CBO}$ | 40         | V                |
| Collector–Emitter Voltage | $V_{CEO}$ | 25         | V                |
| Emitter–Base Voltage      | $V_{EBO}$ | 6          | V                |
| Collector Current         | $I_C$     | 1.5        | A                |
| Junction Temperature      | $T_J$     | 150        | $^\circ\text{C}$ |
| Storage Temperature       | $T_{STG}$ | –65 to 150 | $^\circ\text{C}$ |

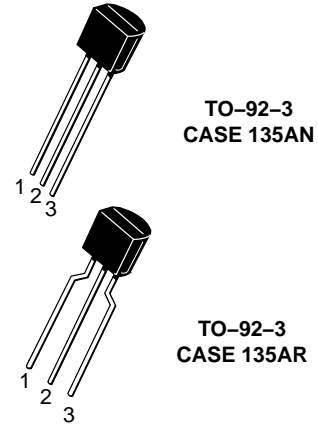
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### THERMAL CHARACTERISTICS (Note 1)

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

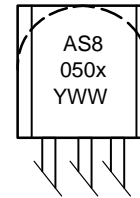
| Parameter                               | Symbol          | Value | Unit                      |
|---|-----------------|-------|---------------------------|
| Power Dissipation                       | $P_D$           | 1     | W                         |
| Derate Above $25^\circ\text{C}$         |                 | 8     | mW/ $^\circ\text{C}$      |
| Thermal Resistance, Junction–to–Ambient | $R_{\theta JA}$ | 125   | $^\circ\text{C}/\text{W}$ |

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.



1. Emitter
2. Base
3. Collector

### MARKING DIAGRAM



- $S8050x$  = Specific Device Code  
 Line 1: A = Assembly Location  
 Line 2: x = B, C or D  
 Line 3: Y = Year  
 WW = Work Week

### ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

# SS8050

## ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)

| Symbol               | Parameter                            | Conditions  | Min. | Typ. | Max. | Unit |
|----------------------|--------------------------------------|---|------|------|------|------|
| BV <sub>CBO</sub>    | Collector–Base Breakdown Voltage     | I <sub>C</sub> = 100 μA, I <sub>E</sub> = 0           | 40   |      |      | V    |
| BV <sub>CEO</sub>    | Collector–Emitter Breakdown Voltage  | I <sub>C</sub> = 2 mA, I <sub>B</sub> = 0             | 25   |      |      | V    |
| BV <sub>EBO</sub>    | Emitter–Base Breakdown Voltage       | I <sub>E</sub> = 100 μA, I <sub>C</sub> = 0           | 6    |      |      | V    |
| I <sub>CBO</sub>     | Collector Cut–Off Current            | V <sub>CB</sub> = 35 V, I <sub>E</sub> = 0            |      |      | 100  | nA   |
| I <sub>EBO</sub>     | Emitter Cut–Off Current              | V <sub>EB</sub> = 6 V, I <sub>C</sub> = 0             |      |      | 100  | nA   |
| h <sub>FE1</sub>     | DC Current Gain                      | V <sub>CE</sub> = 1 V, I <sub>C</sub> = 5 mA          | 45   |      |      |      |
| h <sub>FE2</sub>     |                                      | V <sub>CE</sub> = 1 V, I <sub>C</sub> = 100 mA        | 85   |      | 300  |      |
| h <sub>FE3</sub>     |                                      | V <sub>CE</sub> = 1 V, I <sub>C</sub> = 800 mA        | 40   |      |      |      |
| V <sub>CE(sat)</sub> | Collector–Emitter Saturation Voltage | I <sub>C</sub> = 800 mA, I <sub>B</sub> = 80 mA       |      |      | 0.5  | V    |
| V <sub>BE(sat)</sub> | Base–Emitter Saturation Voltage      | I <sub>C</sub> = 800 mA, I <sub>B</sub> = 80 mA       |      |      | 1.2  | V    |
| V <sub>BE(on)</sub>  | Base–Emitter On Voltage              | V <sub>CE</sub> = 1 V, I <sub>C</sub> = 10 mA         |      |      | 1    | V    |
| C <sub>ob</sub>      | Output Capacitance                   | V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1 MHz |      | 9.0  |      | pF   |
| f <sub>T</sub>       | Current Gain Bandwidth Product       | V <sub>CE</sub> = 10 V, I <sub>C</sub> = 50 mA        | 100  |      |      | MHz  |

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.

## h<sub>FE</sub> CLASSIFICATION

| Classification   | B        | C         | D         |
|------------------|----------|-----------|-----------|
| h <sub>FE2</sub> | 85 ~ 160 | 120 ~ 200 | 160 ~ 300 |

## ORDERING INFORMATION

| Part Number | Top Mark | Package                       | Shipping               |
|-------------|----------|-------------------------------|------------------------|
| SS8050BBU   | S8050B   | TO–92–3, case 135AN (Pb–Free) | 10,000 Units/ Bulk Box |
| SS8050CBU   | S8050C   | TO–92–3, case 135AN (Pb–Free) | 10,000 Units/ Bulk Box |
| SS8050CTA   | S8050C   | TO–92–3, case 135AR (Pb–Free) | 2,000 Units/ Fan–Fold  |
| SS8050DBU   | S8050D   | TO–92–3, case 135AN (Pb–Free) | 10,000 Units/ Bulk Box |
| SS8050DTA   | S8050D   | TO–92–3, case 135AR (Pb–Free) | 2,000 Units/ Fan–Fold  |

TYPICAL PERFORMANCE CHARACTERISTICS

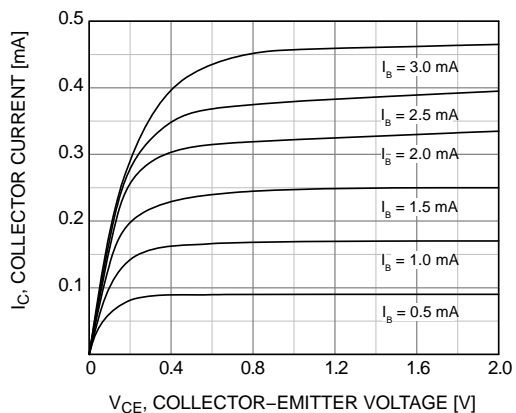


Figure 1. Static Characteristic

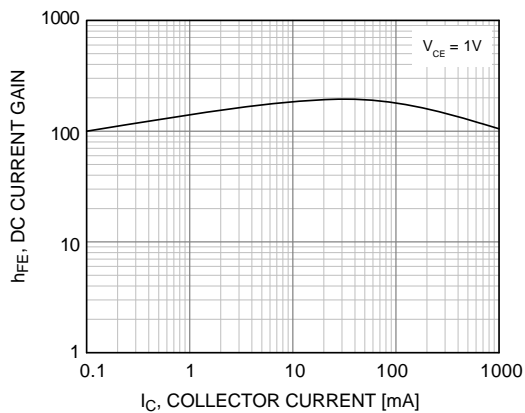


Figure 2. DC Current Gain

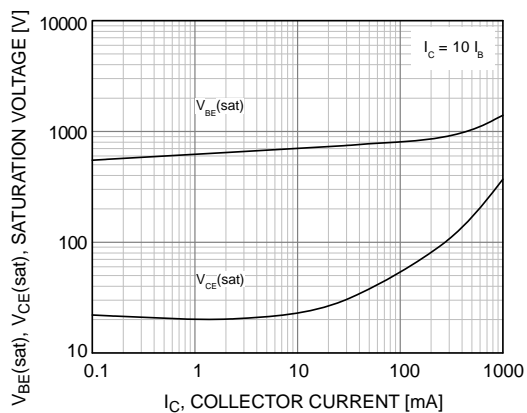


Figure 3. Base-Emitter Saturation Voltage and Collector-Emitter Saturation Voltage

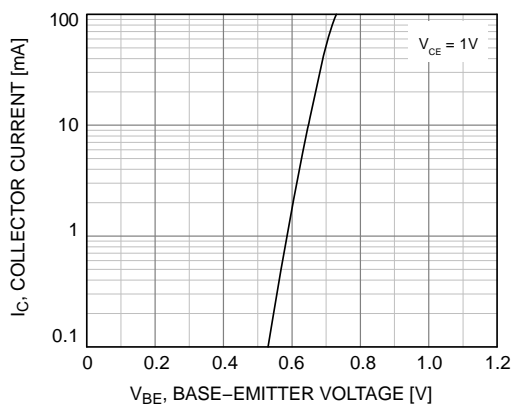


Figure 4. Base-Emitter On Voltage

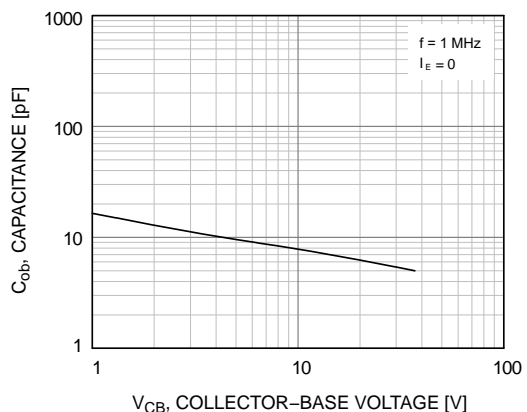


Figure 5. Collector Output Capacitance

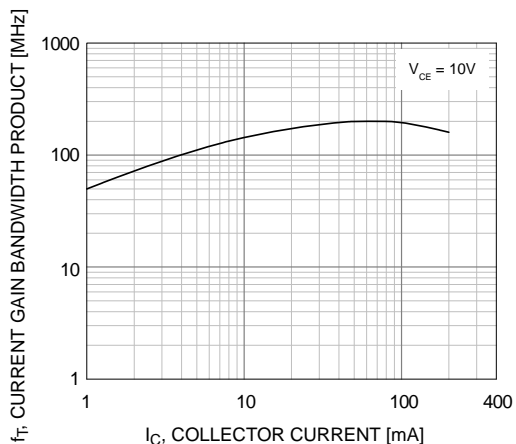
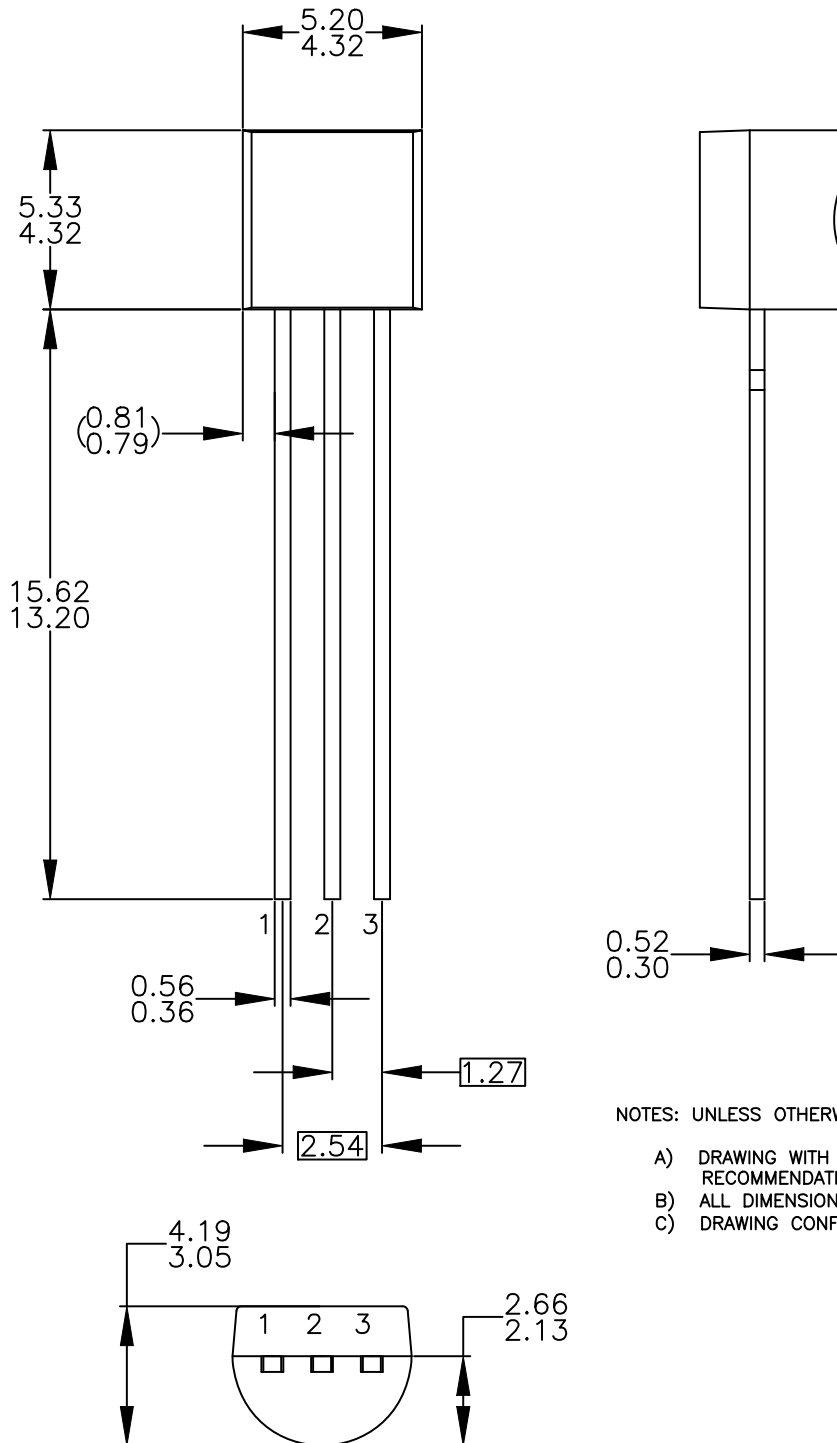


Figure 6. Current Gain Bandwidth Product

**MECHANICAL CASE OUTLINE**  
**PACKAGE DIMENSIONS**

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

DATE 31 JUL 2016



NOTES: UNLESS OTHERWISE SPECIFIED

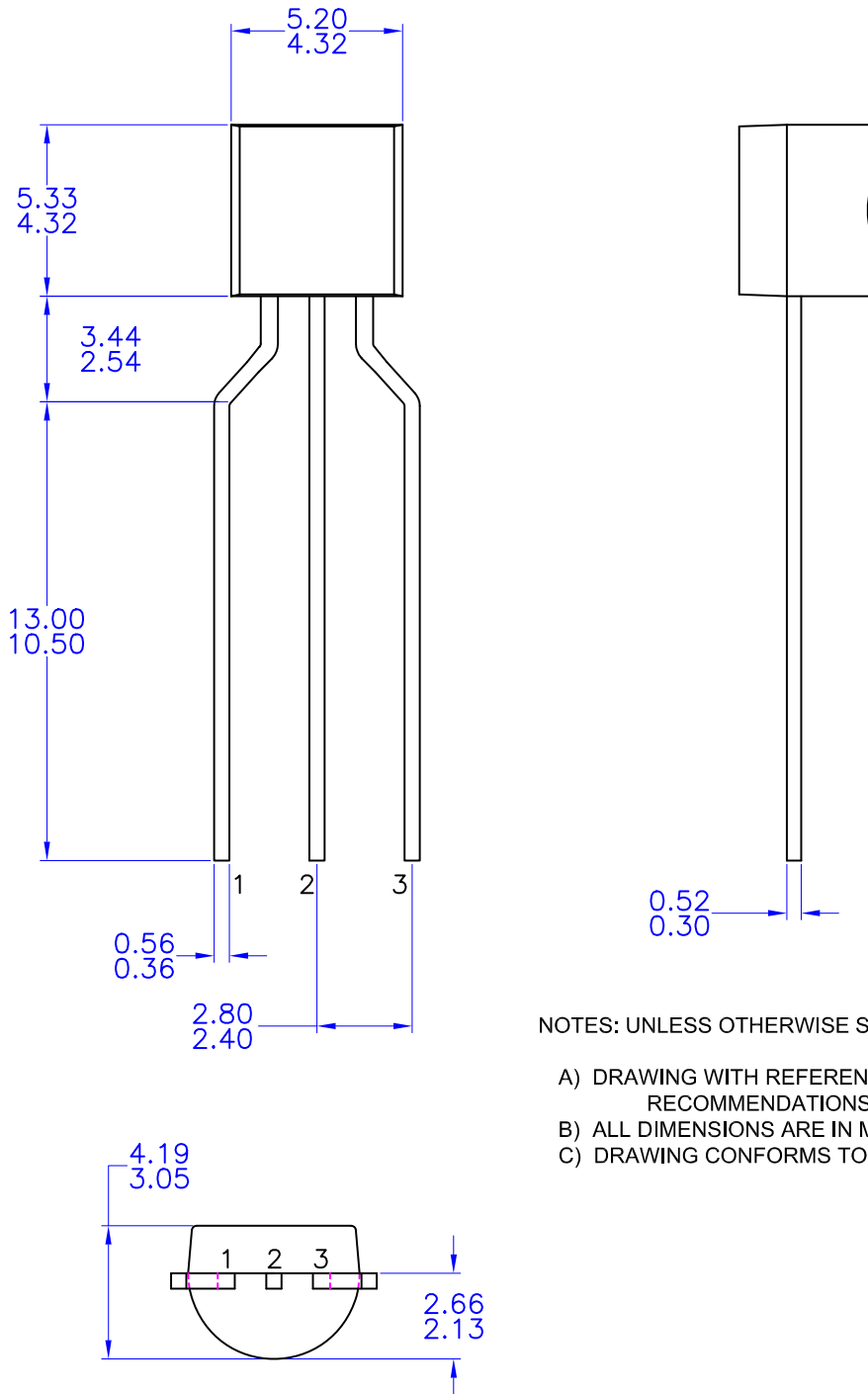
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- B) ALL DIMENSIONS ARE IN MILLIMETERS.
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**TO-92 3 4.83x4.76 LEADFORMED**  
**CASE 135AR**  
**ISSUE O**


DATE 30 SEP 2016



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