

# 8050-HAF

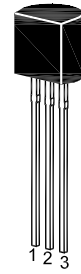
## NPN Silicon Epitaxial Planar Transistor

### Features

- The transistor is subdivided into four groups, B, C, D and E, according to its DC current gain.
- Halogen and Antimony Free(HAF), RoHS compliant

### Applications

- For switching and amplifier. Especially suitable
- For AF-driver stages and low power output stages.



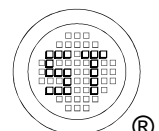
1. Emitter 2. Base 3. Collector  
TO-92 Plastic Package

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

| 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         | $I_C$     | 800           | mA               |
| Base Current              | $I_B$     | 100           | mA               |
| Power Dissipation         | $P_{tot}$ | 625           | mW               |
| Junction Temperature      | $T_j$     | 150           | $^\circ\text{C}$ |
| Storage Temperature Range | $T_{stg}$ | - 55 to + 150 | $^\circ\text{C}$ |

### Thermal Characteristics

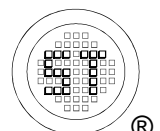
| Parameter                                   | Symbol          | Max. | Unit               |
|---|-----------------|------|--------------------|
| Thermal Resistance from Junction to Ambient | $R_{\theta JA}$ | 200  | $^\circ\text{C/W}$ |



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## Characteristics at $T_a = 25^\circ\text{C}$

| Parameter   | Symbol               | Min.     | Typ. | Max. | Unit |   |
|---|----------------------|----------|------|------|------|---|
| DC Current Gain<br>at $V_{CE} = 1\text{ V}$ , $I_C = 100\text{ mA}$<br><br>at $V_{CE} = 1\text{ V}$ , $I_C = 350\text{ mA}$ | Current Gain Group B | $h_{FE}$ | 70   | -    | 120  | - |
|   | C                    | $h_{FE}$ | 120  | -    | 200  | - |
|   | D                    | $h_{FE}$ | 160  | -    | 300  | - |
|   | E                    | $h_{FE}$ | 300  | -    | 380  | - |
|   |                      | $h_{FE}$ | 60   | -    | -    | - |
|   |                      | $h_{FE}$ | 60   | -    | -    | - |
| Collector Base Cutoff Current<br>at $V_{CB} = 35\text{ V}$  | $I_{CBO}$            | -        | -    | 100  | nA   |   |
| Collector Base Breakdown Voltage<br>at $I_C = 10\text{ }\mu\text{A}$  | $V_{(BR)CBO}$        | 40       | -    | -    | V    |   |
| Collector Emitter Breakdown Voltage<br>at $I_C = 2\text{ mA}$   | $V_{(BR)CEO}$        | 25       | -    | -    | V    |   |
| Emitter Base Breakdown Voltage<br>at $I_E = 100\text{ }\mu\text{A}$   | $V_{(BR)EBO}$        | 6        | -    | -    | V    |   |
| Collector Emitter Saturation Voltage<br>at $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$                                     | $V_{CE(sat)}$        | -        | -    | 0.5  | V    |   |
| Base Emitter Saturation Voltage<br>at $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$  | $V_{BE(sat)}$        | -        | -    | 1.2  | V    |   |
| Gain Bandwidth Product<br>at $V_{CE} = 5\text{ V}$ , $I_C = 10\text{ mA}$ , $f = 50\text{ MHz}$                             | $f_T$                | -        | 100  | -    | MHz  |   |
| Collector Base Capacitance<br>at $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$  | $C_{ob}$             | -        | 4    | -    | pF   |   |



## Electrical Characteristics Curves

Fig. 1 Output Characteristics Curve

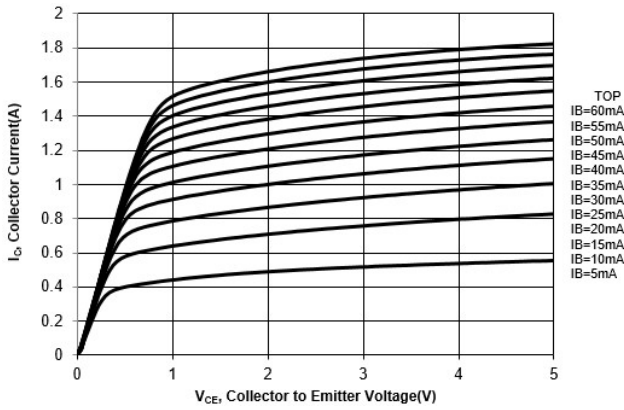


Fig. 2 Collector Current vs. Base to Emitter Voltage

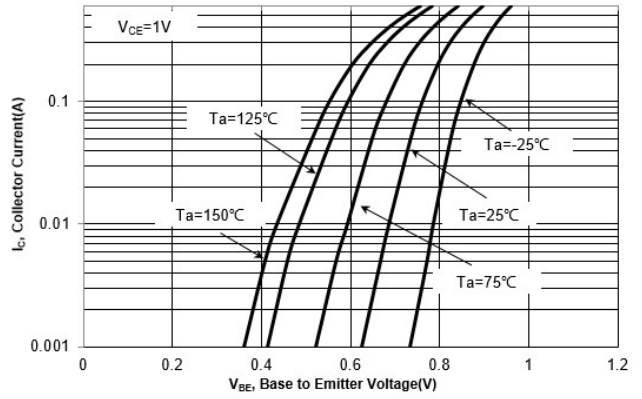


Fig. 3 DC Current Gain vs. Collector Current

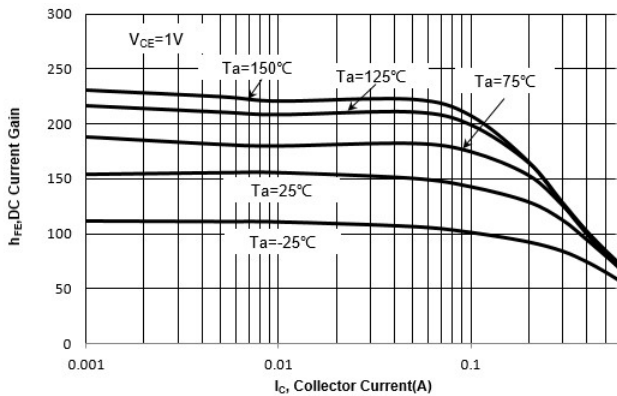
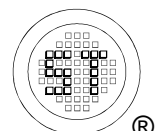
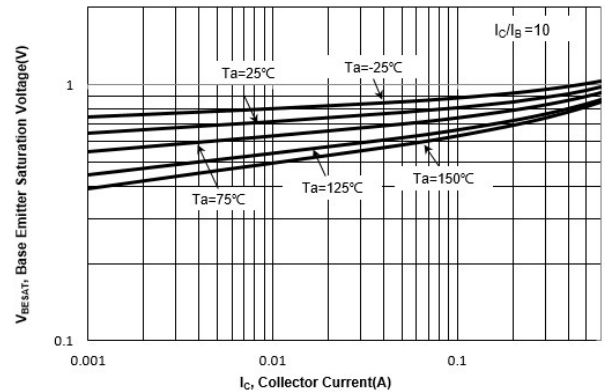


Fig. 4  $V_{BESAT}$  vs. Collector Current



## Electrical Characteristics Curves

Fig. 5  $V_{CESAT}$  vs. Collector Current

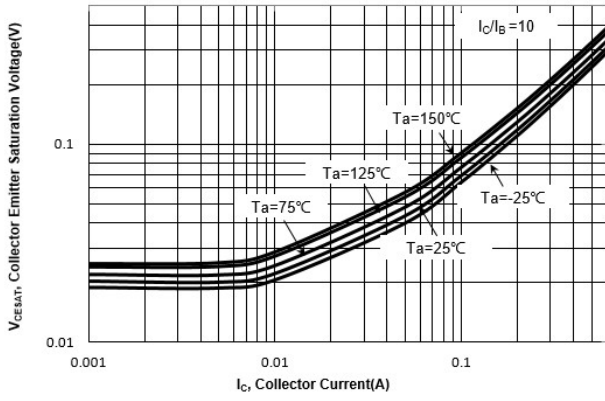


Fig. 6 Output Capacitance

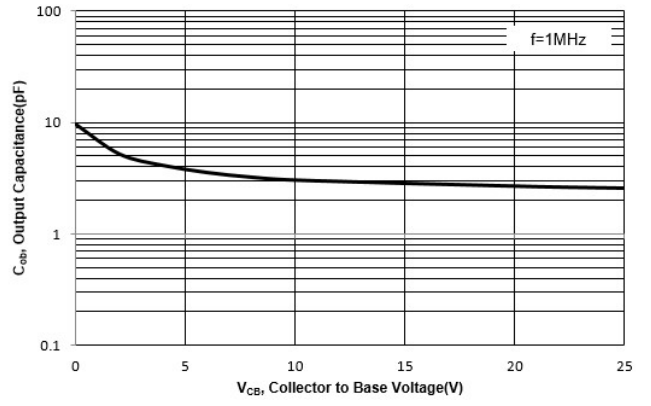
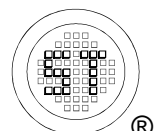
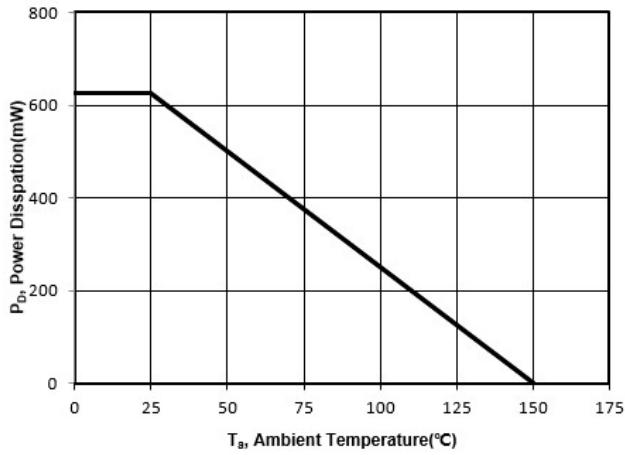
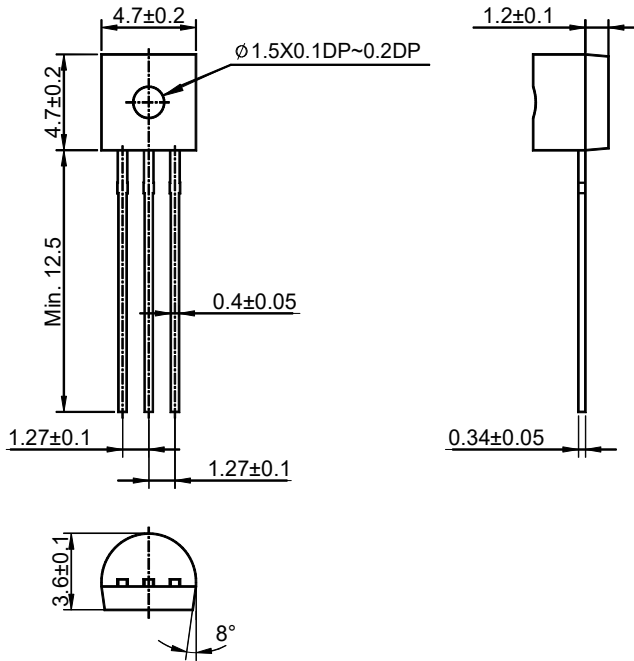


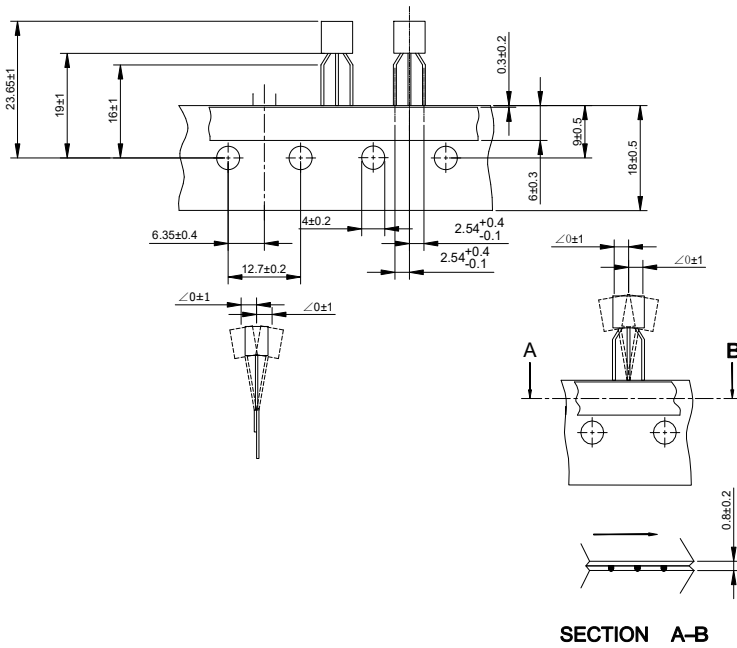
Fig. 7 Power Derating Curve



TO-92 Package Outline (Dimensions in millimeters)



TO-92 Ammo-Pack Outline (Dimensions in millimeters)



SECTION A-B

Packing information

| Package | Bulk Packing |             |                | Ammo-Packing |                |
|---------|--------------|-------------|----------------|--------------|----------------|
|         | Per Bag Qty  | Per Box Qty | Per Carton Qty | Per Box Qty  | Per Carton Qty |
| TO-92   | 1,000        | 5,000       | 50,000         | 4,000        | 20,000         |

