

## Features

- Low Collector Saturation Voltage
- Excellent Current to Gain Characteristics
- Halogen Free Available Upon Request By Adding Suffix "-HF"
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

## Maximum Ratings @ 25°C Unless Otherwise Specified

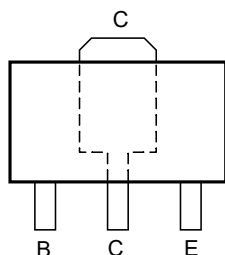
- Operating Junction Temperature Range: -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 250°C/W Junction to Ambient

| Parameter                   | Symbol    | Rating | Unit |
|-----------------------------|-----------|--------|------|
| Collector-Base Voltage      | $V_{CBO}$ | -30    | V    |
| Collector-Emitter Voltage   | $V_{CEO}$ | -20    | V    |
| Emitter-Base Voltage        | $V_{EBO}$ | -6.0   | V    |
| Collector Current           | $I_C$     | -5.0   | A    |
| Pulsed Collector Current    | $I_{CP}$  | -10    | A    |
| Collector Power Dissipation | $P_C$     | 500    | mW   |

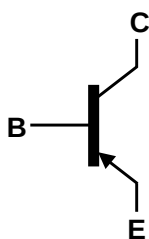
## Classification Of $h_{FE}$

| Rank    | P      | Q       | R       |
|---------|--------|---------|---------|
| Range   | 82-180 | 120-270 | 180-390 |
| Marking | BHP    | BHQ     | BHR     |

Pin Configuration - Top View

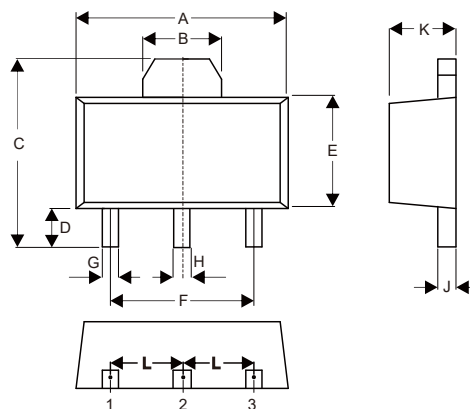


Internal Structure



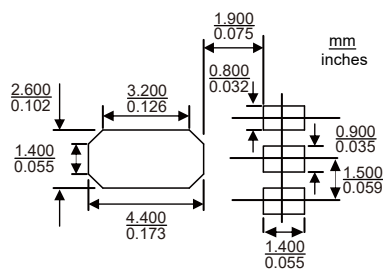
## PNP Silicon Epitaxial Transistors

### SOT-89



| DIMENSIONS |        |       |      |      |      |
|------------|--------|-------|------|------|------|
| DIM        | INCHES |       | MM   |      | NOTE |
|            | MIN    | MAX   | MIN  | MAX  |      |
| A          | 0.169  | 0.185 | 4.30 | 4.70 |      |
| B          | 0.061  |       | 1.55 |      | TYP. |
| C          | 0.154  | 0.171 | 3.91 | 4.35 |      |
| D          | 0.031  | 0.047 | 0.80 | 1.20 |      |
| E          | 0.089  | 0.104 | 2.25 | 2.65 |      |
| F          | 0.118  |       | 3.00 |      | TYP. |
| G          | 0.013  | 0.020 | 0.33 | 0.52 |      |
| H          | 0.015  | 0.021 | 0.38 | 0.53 |      |
| J          | 0.014  | 0.017 | 0.35 | 0.44 |      |
| K          | 0.055  | 0.063 | 1.40 | 1.60 |      |
| L          | 0.059  |       | 1.50 |      | TYP. |

### Suggested Solder Pad Layout



**Electrical Characteristics @ 25°C Unless Otherwise Specified**

| Parameter                            | Symbol        | Min | Typ | Max  | Units   | Conditions                             |
|--------------------------------------|---------------|-----|-----|------|---------|----------------------------------------|
| Collector-Base Breakdown Voltage     | $V_{(BR)CEO}$ | -30 |     |      | V       | $I_C = -50\mu A, I_E = 0$              |
| Collector-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | -20 |     |      | V       | $I_C = -1mA, I_B = 0$                  |
| Emitter-Base Breakdown Voltage       | $V_{(BR)EBO}$ | -6  |     |      | V       | $I_E = -50\mu A, I_C = 0$              |
| Collector-Base Cutoff Current        | $I_{CBO}$     |     |     | -0.5 | $\mu A$ | $V_{CB} = -20V, I_E = 0$               |
| Emitter-Base Cutoff Current          | $I_{EBO}$     |     |     | -0.5 | $\mu A$ | $V_{EB} = -5V, I_C = 0$                |
| DC Current Gain                      | $h_{FE}$      | 82  |     | 390  |         | $V_{CE} = -2V, I_C = -0.5A$            |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ |     |     | -1.0 | V       | $I_C = -4A, I_B = -0.1A$               |
| Transition Frequency                 | $f_T$         |     | 120 |      | MHz     | $V_{CE} = -6V, I_C = -50mA, f = 30MHz$ |
| Collector Output Capacitance         | $C_{ob}$      |     | 60  |      | pF      | $V_{CB} = -20V, I_E = 0, f = 1.0MHz$   |

## Curve Characteristics

Fig. 1 - Static Characteristics

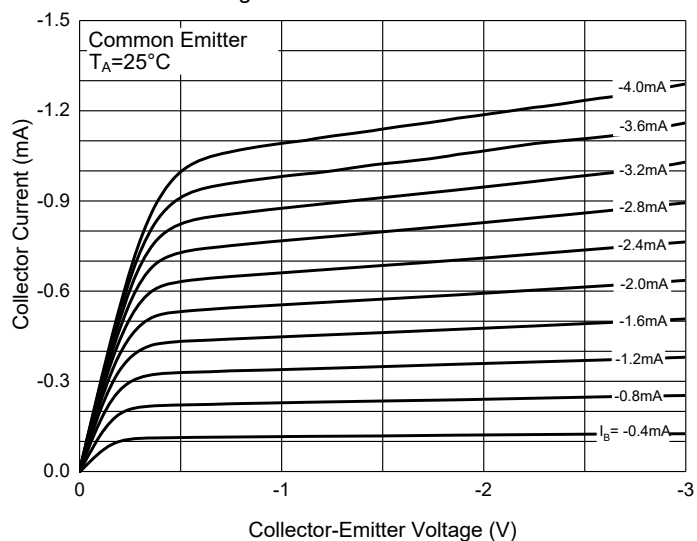


Fig. 2 - DC Current Gain Characteristics

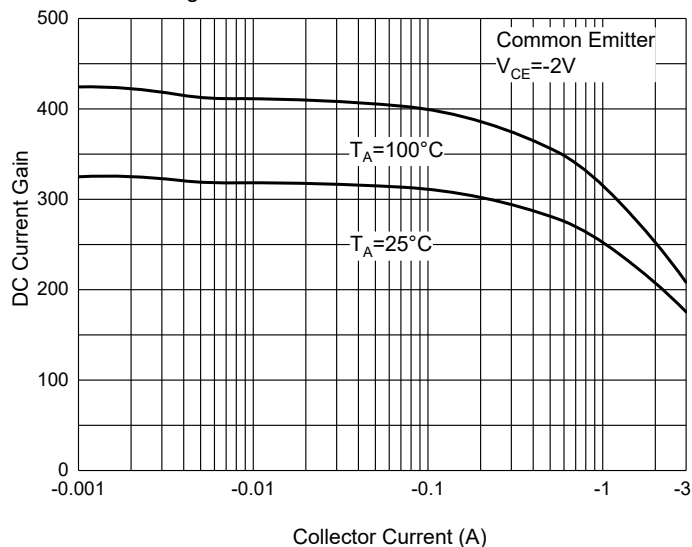


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

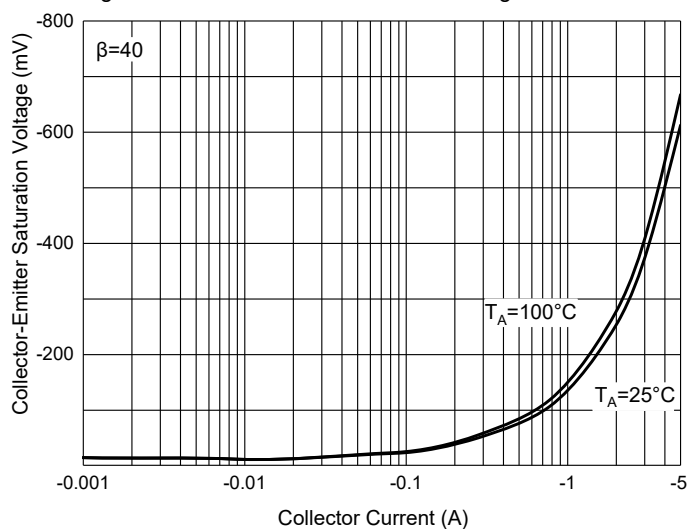


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

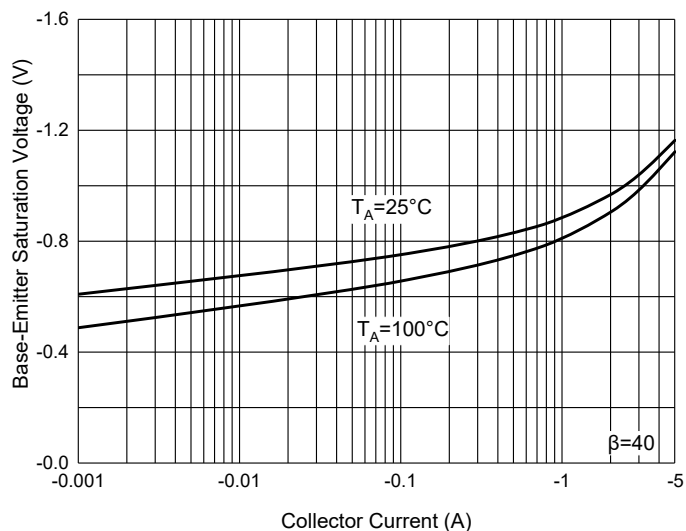


Fig. 5 - Base-Emitter Voltage Characteristics

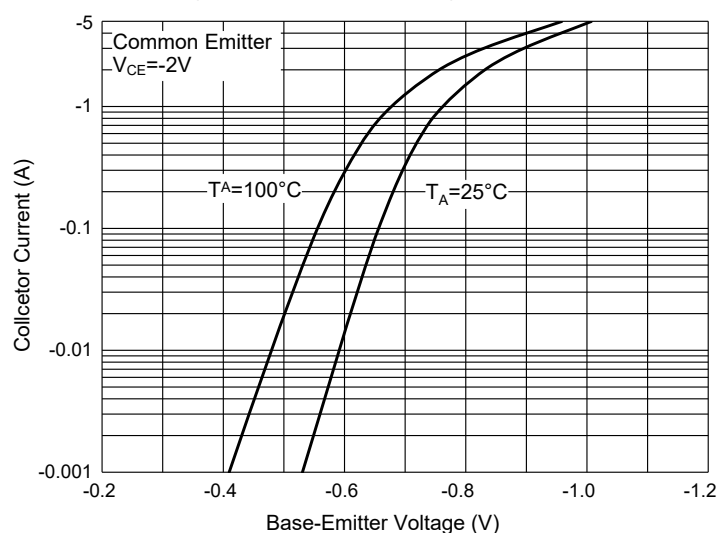
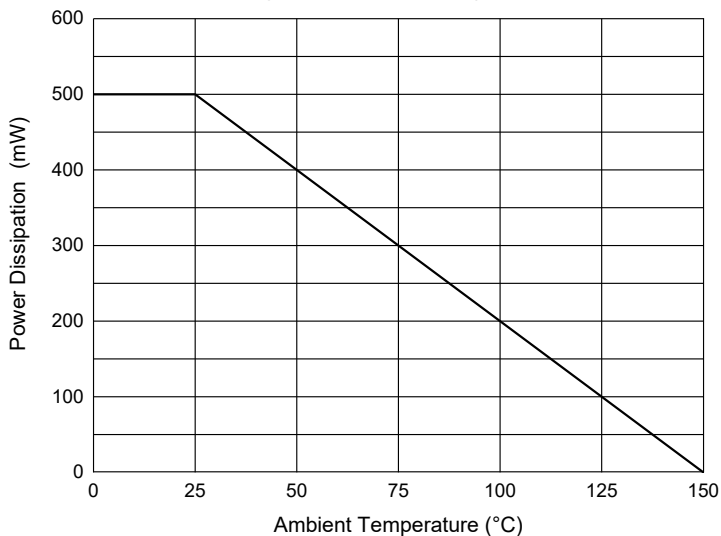


Fig. 6 - Power Derating Curve



## Ordering Information

| Device         | Packing              |
|----------------|----------------------|
| Part Number-TP | Tape&Reel:1Kpcs/Reel |

Note : Adding "-HF" Suffix For Halogen Free, eg. Part Number-TP-HF

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