

## Features

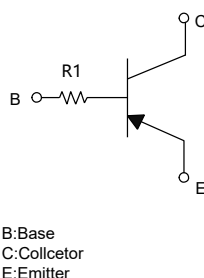
- Built-In Bias Resistors Enable the Configuration of an Inverter Circuit Without Connecting External Input Resistors
- The Bias Resistors Consist of Thin-Film Resistors With Complete Isolation to Allow Negative Biasing of the Input. They Also Have the Advantage of Almost Completely Eliminating Parasitic Effects
- Only the On/Off Conditions Need to Be Set For Operation, Making Device Design Easy
- 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

| Parameter                    | Symbol    | Value    | Unit |
|------------------------------|-----------|----------|------|
| Collector-Emitter Voltage    | $V_{CEO}$ | -50      | V    |
| Collector-Base Voltage       | $V_{CBO}$ | -50      | V    |
| Emitter-Base Voltage         | $V_{EBO}$ | -5       | mA   |
| Collector Current-Continuous | $I_C$     | -100     | mA   |
| Collector Dissipation        | $P_C$     | 200      | mW   |
| Junction Temperature         | $T_J$     | -55 ~150 | °C   |
| Storage Temperature Range    | $T_{STG}$ | -55 ~150 | °C   |

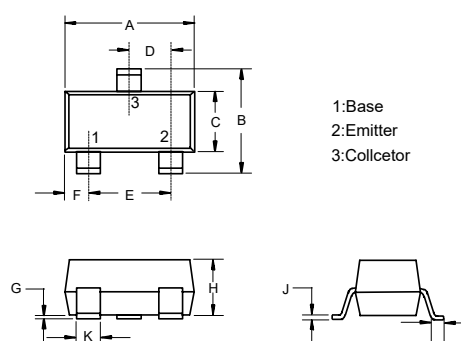
## Device Marking: 94

### Internal Structure



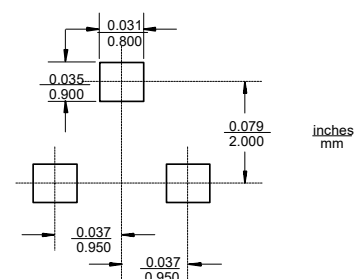
## PNP Digital Transistor

### SOT-23



| DIM | INCHES |       | MM   |      | NOTE |
|-----|--------|-------|------|------|------|
|     | MIN    | MAX   | MIN  | MAX  |      |
| A   | 0.110  | 0.120 | 2.80 | 3.04 |      |
| B   | 0.083  | 0.104 | 2.10 | 2.64 |      |
| C   | 0.047  | 0.055 | 1.20 | 1.40 |      |
| D   | 0.034  | 0.041 | 0.85 | 1.05 |      |
| E   | 0.067  | 0.083 | 1.70 | 2.10 |      |
| F   | 0.018  | 0.024 | 0.45 | 0.60 |      |
| G   | 0.0004 | 0.006 | 0.01 | 0.15 |      |
| H   | 0.035  | 0.043 | 0.90 | 1.10 |      |
| J   | 0.003  | 0.007 | 0.08 | 0.18 |      |
| K   | 0.012  | 0.020 | 0.30 | 0.51 |      |
| L   | 0.007  | 0.020 | 0.20 | 0.50 |      |

### Suggested Solder Pad Layout



## Electrical Characteristics @ 25° C Unless Otherwise Specified

| Parameter                            | Symbol        | Min | Typ | Max  | Units      | Conditions                               |
|--------------------------------------|---------------|-----|-----|------|------------|------------------------------------------|
| Collector-Base Breakdown Voltage     | $V_{(BR)CBO}$ | -50 | --- | ---  | V          | $I_C = -50\mu A, I_E = 0$                |
| Collector-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | -50 | --- | ---  | V          | $I_C = -1mA, I_B = 0$                    |
| Emitter-Base Breakdown Voltage       | $V_{(BR)EBO}$ | -5  | --- | ---  | V          | $I_E = -50\mu A, I_C = 0$                |
| Collector Cut-off Current            | $I_{CBO}$     | --- | --- | -0.5 | $\mu A$    | $V_{CB} = -50V, I_E = 0$                 |
| Emitter Cut-off Current              | $I_{EBO}$     | --- | --- | -0.5 | $\mu A$    | $V_{EB} = -4V, I_C = 0$                  |
| DC Current Gain                      | $h_{FE}$      | 100 | 250 | 600  | ---        | $I_C = -1mA, V_{CE} = -5V$               |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | --- | --- | -0.3 | V          | $I_C = -10mA, I_B = -1mA$                |
| Input Resistance                     | $R_1$         | 7   | 10  | 13   | K $\Omega$ |                                          |
| Transition Frequency                 | $f_T$         | --- | 250 | ---  | MHz        | $V_{CE} = -10.0V, I_E = 5mA, f = 100MHz$ |

## Curve Characteristics

Fig. 1 - Static Characteristics

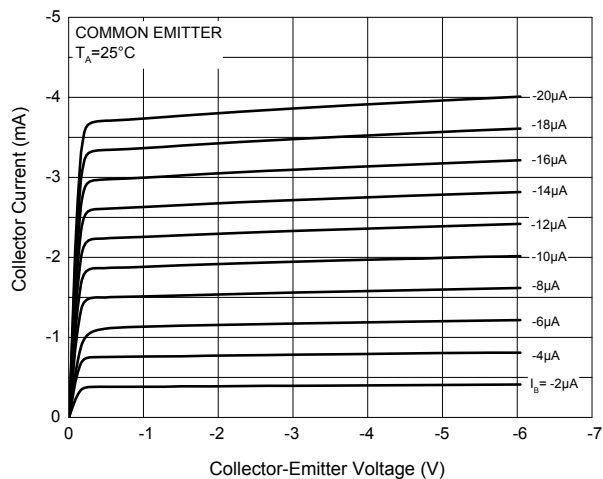


Fig. 2 - DC Current Gain Characteristics

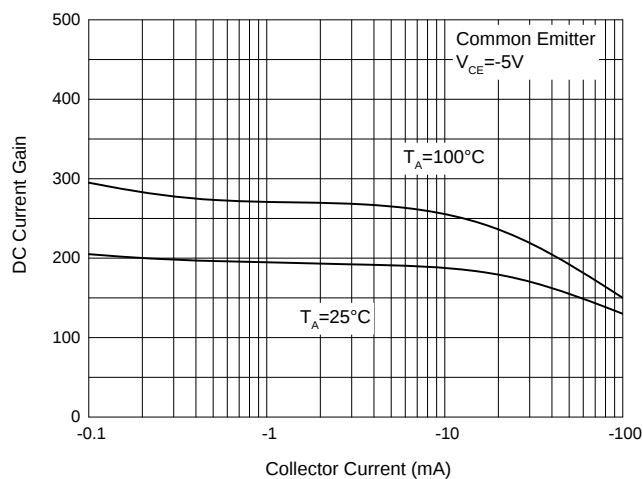


Fig. 3 - Collector-Emitter Saturation Voltage Characteristics

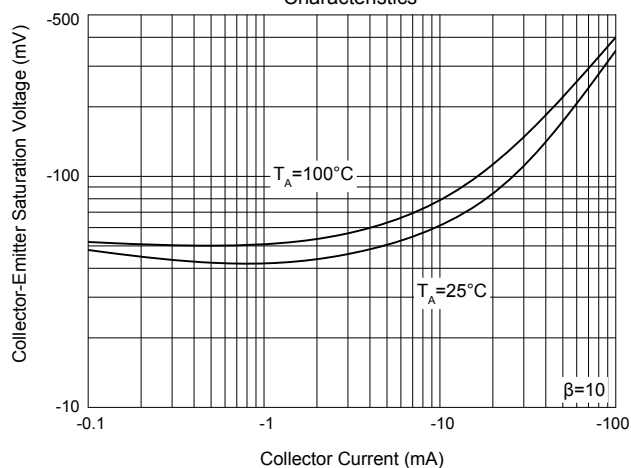


Fig. 4 - Base-Emitter Saturation Voltage Characteristics

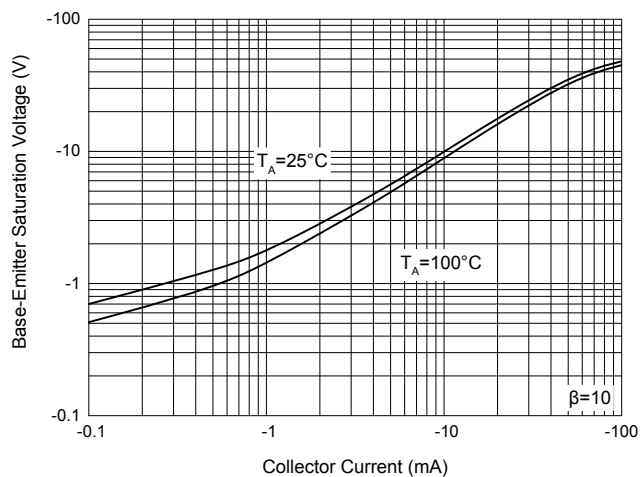
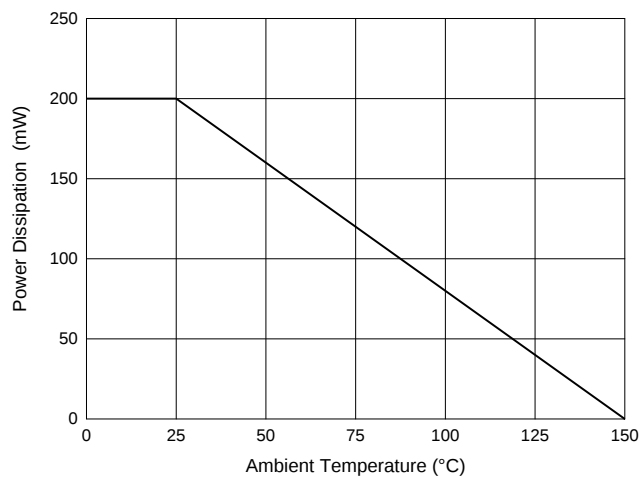


Fig. 5 - Power Derating Curve



## Ordering Information

| Device         | Packing              |
|----------------|----------------------|
| Part Number-TP | Tape&Reel:3Kpcs/Reel |

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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