

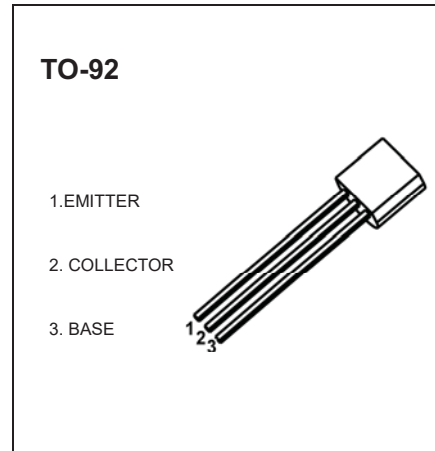


**TO-92 Plastic-Encapsulate Transistors**

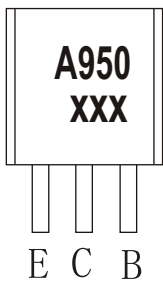
**2SA950** TRANSISTOR (PNP)

**FEATURES**

- 1W Output Applications
- Complementary to 2SC2120

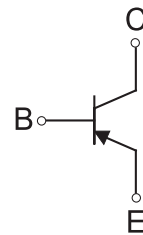


**MARKING**



A950=Device code  
 XXX=Code  
 GXX=Green molding compound device  
 CXX=Normal molding compound device

**Equivalent Circuit**



**ORDERING INFORMATION**

| Part Number | Package | Packing Method | Pack Quantity |
|-------------|---------|----------------|---------------|
| 2SA950      | TO-92   | Bulk           | 1000pcs/Bag   |
| 2SA950-TA   | "O-92   | "ape           | 2000pcs/Box   |

**MAXIMUM RATINGS (T<sub>a</sub>=25°C unless otherwise noted)**

| Symbol                            | Parameter  | Value    | Unit  |
|-----------------------------------|--|----------|-------|
| V <sub>CB0</sub>                  | Collector-Base Voltage                           | -35      | V     |
| V <sub>CE0</sub>                  | Collector-Emitter Voltage                        | -30      | V     |
| V <sub>EB0</sub>                  | Emitter-Base Voltage                             | -5       | V     |
| I <sub>c</sub>                    | Collector Current -Continuous                    | -0.8     | A     |
| P <sub>D</sub>                    | Collector Power Dissipation                      | 600      | mW    |
| R <sub>KJA</sub>                  | Thermal Resistance from Junction to Ambient      | 208      | °C /W |
| T <sub>J</sub> , T <sub>stg</sub> | Operation Junction and Storage Temperature Range | -55~+150 | °C    |

## ELECTRICAL CHARACTERISTICS

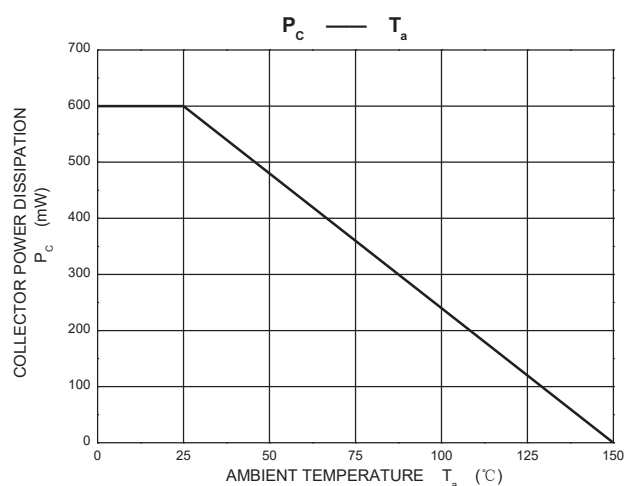
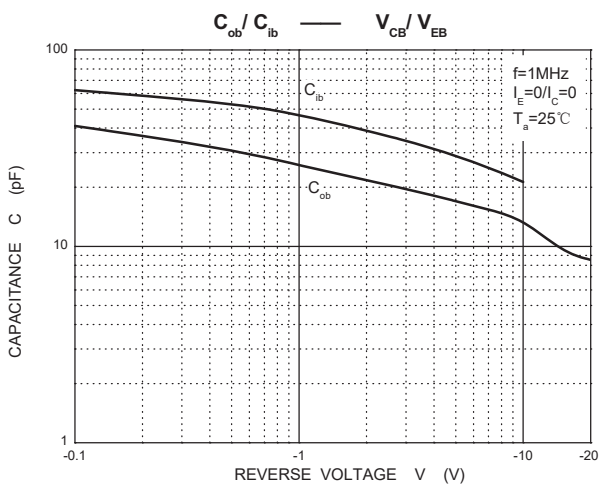
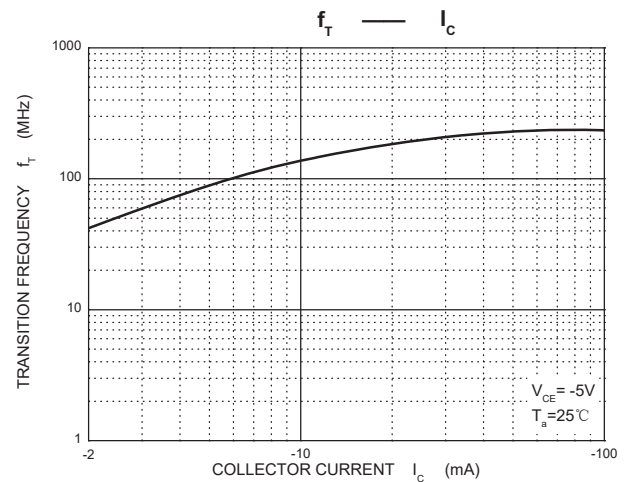
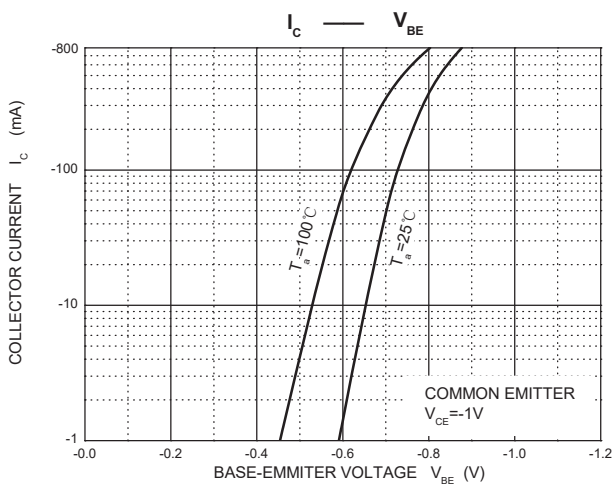
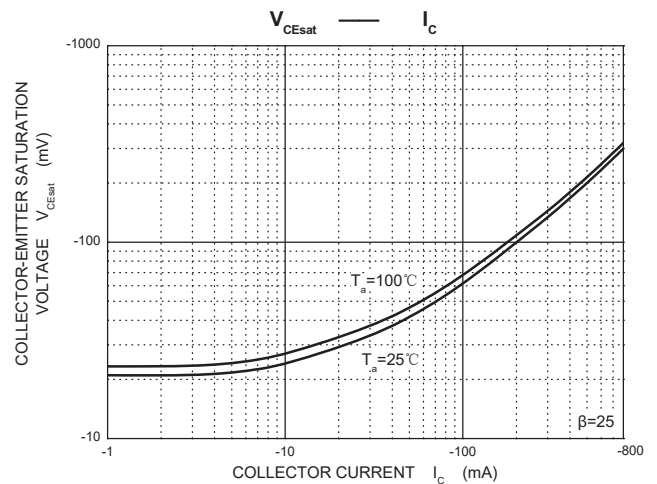
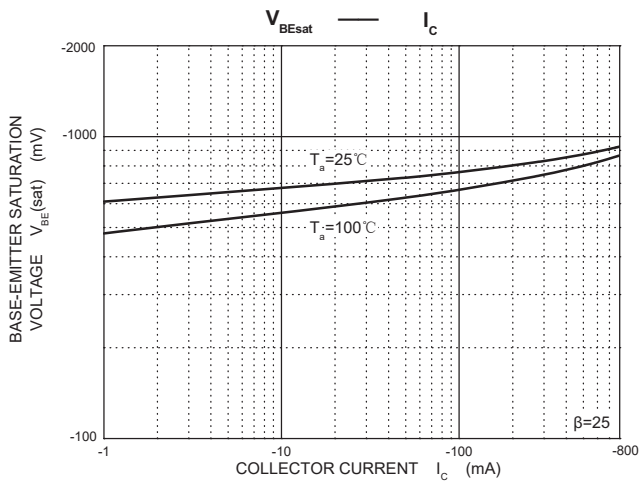
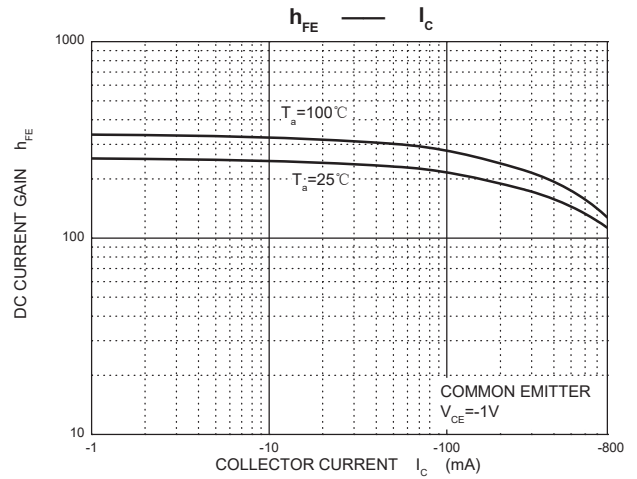
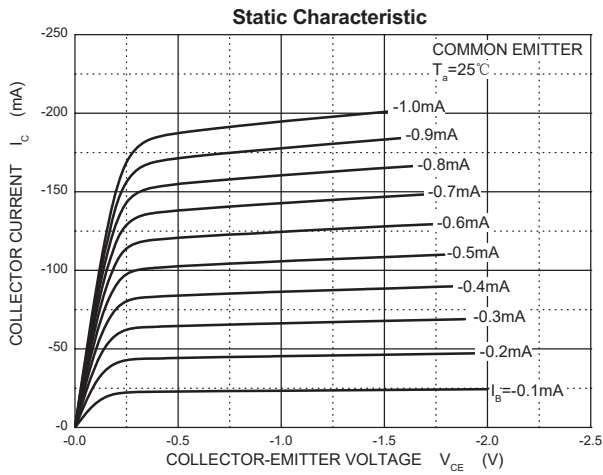
$T_a=25^\circ\text{C}$  unless otherwise specified

| Parameter                            | Symbol        | Test conditions   | M&+  | T0! | Max  | U+&'          |
|--------------------------------------|---------------|---|------|-----|------|---------------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C = -0.1\text{mA}$ , $I_E = 0$                       | -35  |     |      | V             |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | $I_C = -10\text{mA}$ , $I_B = 0$                        | -30  |     |      | V             |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | $I_E = -0.1\text{mA}$ , $I_C = 0$                       | -5   |     |      | V             |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB} = -35\text{V}$ , $I_E = 0$                      |      |     | -0.1 | $\mu\text{A}$ |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB} = -5\text{V}$ , $I_C = 0$                       |      |     | -0.1 | $\mu\text{A}$ |
| DC current gain                      | $h_{FE(1)}$   | $V_{CE} = -1\text{V}$ , $I_C = -100\text{mA}$           | 100  |     | 320  |               |
|                                      | $h_{FE(2)}$   | $V_{CE} = -1\text{V}$ , $I_C = -700\text{mA}$           | 35   |     |      |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -500\text{mA}$ , $I_B = -20\text{mA}$            |      |     | -0.7 | V             |
| Emitter-base voltage                 | $V_{BE}$      | $V_{CE} = -1\text{V}$ , $I_C = -10\text{mA}$            | -0.5 |     | -0.8 | V             |
| Collector Output Capacitance         | $C_{ob}$      | $V_{CB} = -10\text{V}$ , $I_E = 0$<br>$f = 1\text{MHz}$ |      | 19  |      | pF            |
| Transition frequency                 | $f_T$         | $V_{CE} = -5\text{V}$ , $I_C = -10\text{mA}$            |      | 120 |      | MHz           |

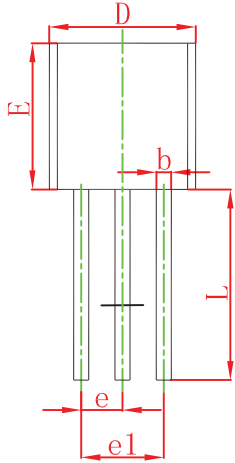
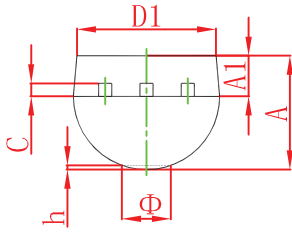
### CLASSIFICATION OF $h_{FE(1)}$

|       |         |         |
|-------|---------|---------|
| Rank  | O       | Y       |
| Range | 100-200 | 160-320 |

# Typical Characteristics

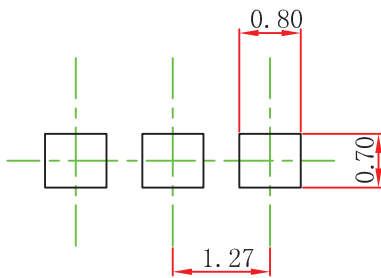


## TO-92 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min                       | Max    | Min                  | Max   |
| A      | 3.300                     | 3.700  | 0.130                | 0.146 |
| A1     | 1.100                     | 1.400  | 0.043                | 0.055 |
| b      | 0.380                     | 0.550  | 0.015                | 0.022 |
| c      | 0.360                     | 0.510  | 0.014                | 0.020 |
| D      | 4.300                     | 4.700  | 0.169                | 0.185 |
| D1     | 3.430                     |        | 0.135                |       |
| E      | 4.300                     | 4.700  | 0.169                | 0.185 |
| e      | 1.270 TYP                 |        | 0.050 TYP            |       |
| e1     | 2.440                     | 2.640  | 0.096                | 0.104 |
| L      | 14.100                    | 14.500 | 0.555                | 0.571 |
| v      |                           | 1.600  |                      | 0.063 |
| h      | 0.000                     | 0.380  | 0.000                | 0.015 |

## TO-92 Suggested Pad Layout



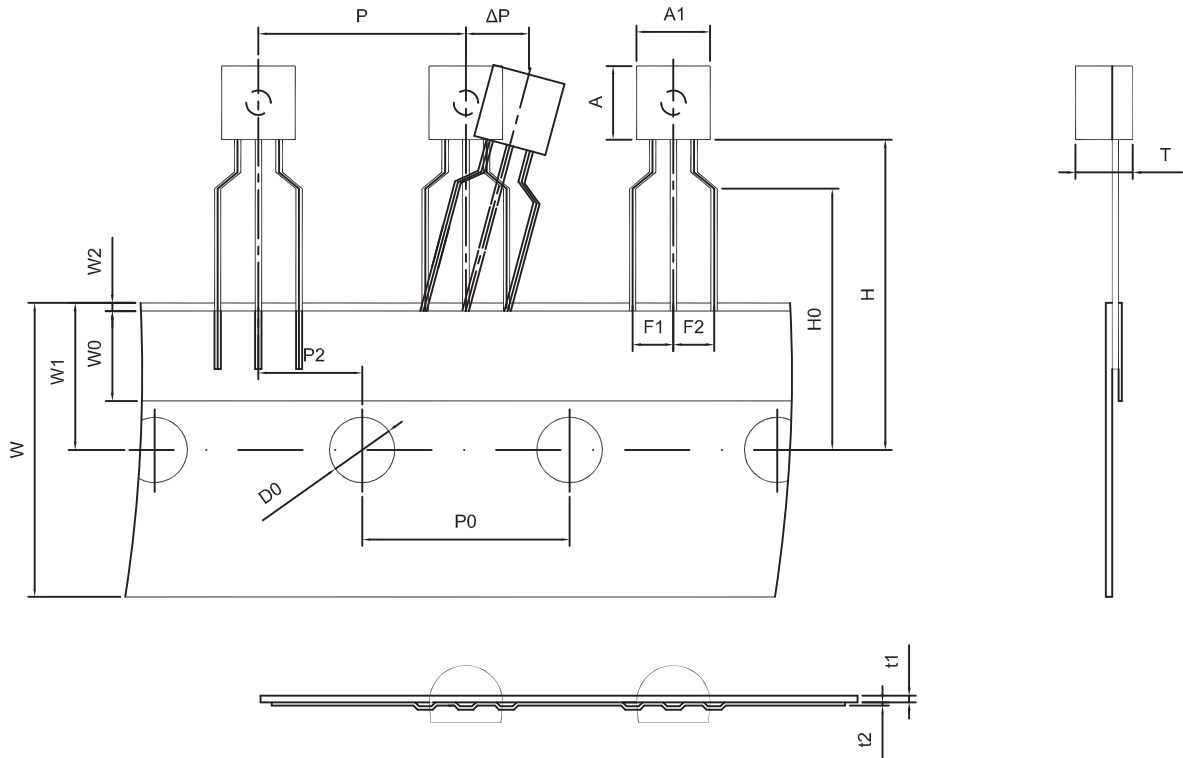
### Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

### NOTICE

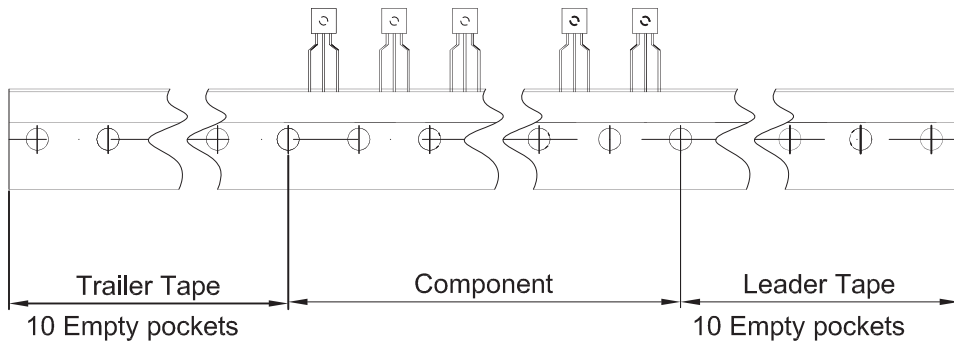
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# TO-92 Tape and Reel



Dimiensions are in millimeter

| A1  | A   | T        | P    | P0   | P2   | F1  | F2  | W          |
|-----|-----|----------|------|------|------|-----|-----|------------|
| 4.5 | 4.5 | 3.5      | 12.7 | 12.7 | 6.35 | 2.5 | 2.5 | 18.0       |
| W0  | W1  | W2       | H    | H0   | D0   | t1  | t2  | $\Delta P$ |
| 6.0 | 9.0 | 1.0 MAX. | 19.0 | 16.0 | 4.0  | 0.4 | 0.2 | 0          |



| Package | Box      | Box Size(mm) | Carton     | Carton Size(mm) |
|---------|----------|--------------|------------|-----------------|
| TO-92   | 2000 pcs | 333×162×43   | 20,000 pcs | 350×340×250     |