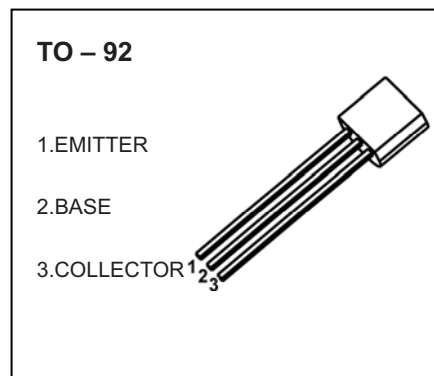


## TO-92 Plastic-Encapsulate Transistors

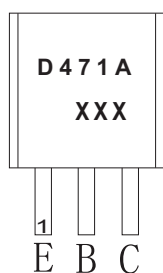
### KSD471A TRANSISTOR (NPN)

#### FEATURES

- Complement To KSB564A
- Low  $V_{CE(sat)}$

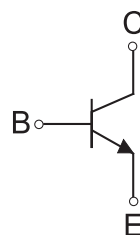


#### MARKING



D471A=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 |
|-------------|---------|----------------|---------------|
| KSD471A     | TO-92   | Bulk           | 1000pcs/Bag   |
| KSD471A-TA  | TO-92   | Tape           | 2000pcs/Box   |

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

| Symbol          | Parameter                                        | Value    | Unit                        |
|-----------------|--------------------------------------------------|----------|-----------------------------|
| $V_{CBO}$       | Collector-Base Voltage                           | 40       | V                           |
| $V_{CEO}$       | Collector-Emitter Voltage                        | 30       | V                           |
| $V_{EBO}$       | Emitter-Base Voltage                             | 5        | V                           |
| $I_C$           | Collector Current -Continuous                    | 1        | A                           |
| $P_D$           | Collector Power Dissipation                      | 800      | mW                          |
| $R_{\theta JA}$ | Thermal Resistance from Junction to Ambient      | 150      | $^\circ\text{C} / \text{W}$ |
| $T_J, T_{stg}$  | Operation Junction and Storage Temperature Range | -55~+150 | $^\circ\text{C}$            |

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## ELECTRICAL CHARACTERISTICS

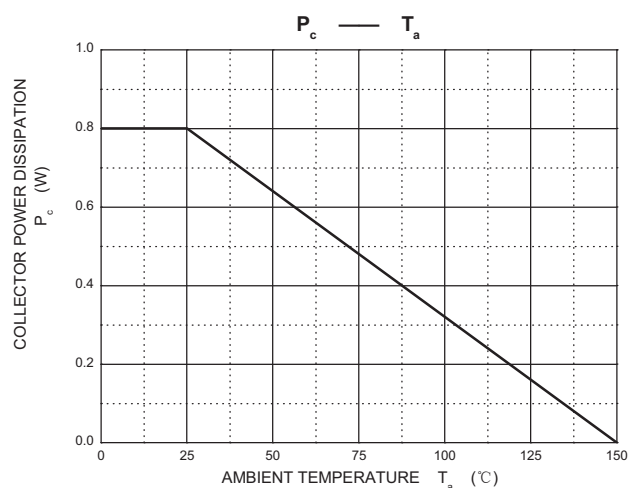
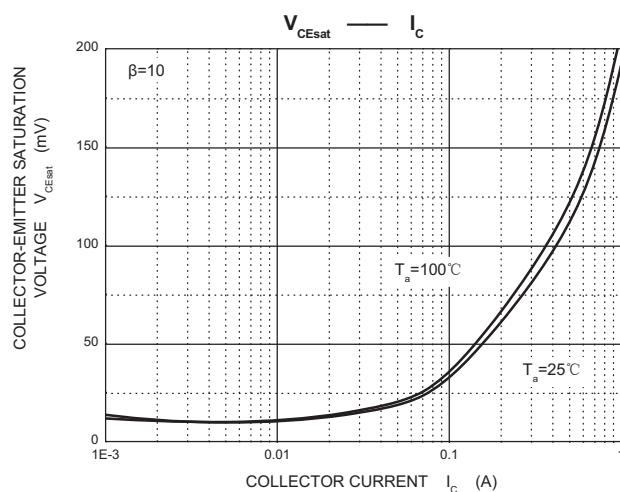
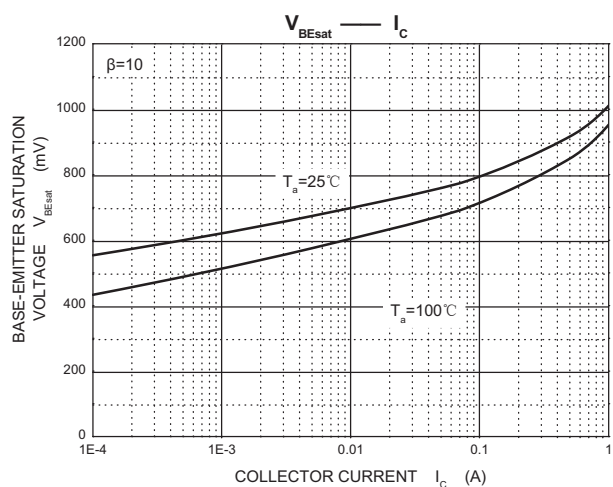
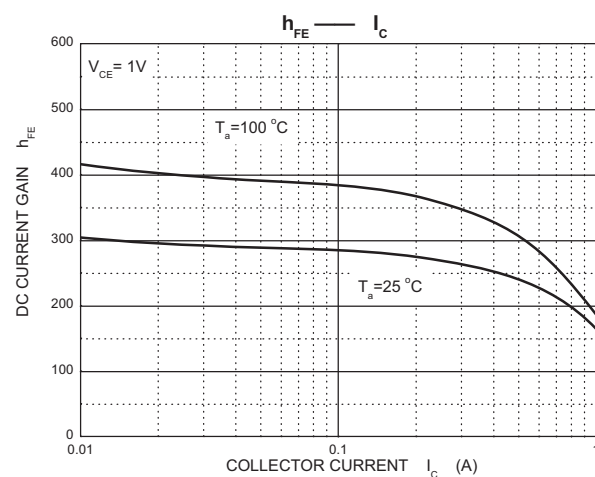
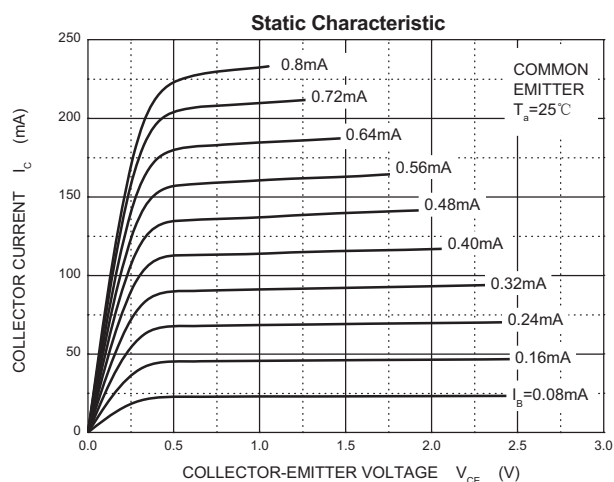
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$T_a=25^{\circ}\text{C}$  unless otherwise specified

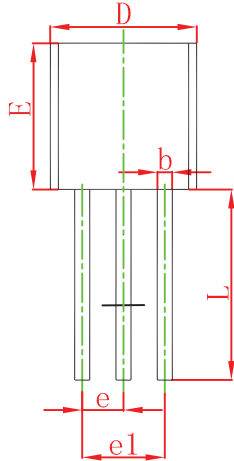
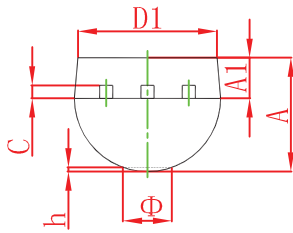
| Parameter                            | Symbol        | Test conditions                          | Min | Typ | Max | Unit          |
|--------------------------------------|---------------|------------------------------------------|-----|-----|-----|---------------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C=0.1\text{mA}, I_E=0$                | 40  |     |     | 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            | $I_{CBO}$     | $V_{CB}=30\text{V}, I_E=0$               |     |     | 0.1 | $\mu\text{A}$ |
| DC current gain                      | $h_{FE}$      | $V_{CE}=1\text{V}, I_C=100\text{mA}$     | 70  |     | 400 |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=1\text{A}, I_B=0.1\text{A}$         |     |     | 0.5 | V             |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ | $I_C=1\text{A}, I_B=0.1\text{A}$         |     |     | 1.2 | V             |
| Collector output capacitance         | $C_{ob}$      | $V_{CB}=6\text{V}, I_E=0, f=1\text{MHz}$ |     | 16  |     | pF            |
| Transition frequency                 | $f_T$         | $V_{CE}=6\text{V}, I_C=10\text{mA}$      |     | 130 |     | MHz           |

### CLASSIFICATION OF $h_{FE}$

| RANK  | O      | Y       | G       |
|-------|--------|---------|---------|
| RANGE | 70-140 | 120-240 | 200-400 |

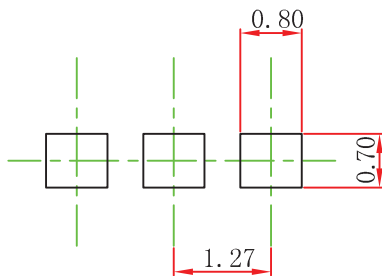


## TO-92 Package Outline Dimensions



| 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 |
| Φ      |                           | 1.600  |                      | 0.063 |
| h      | 0.000                     | 0.380  | 0.000                | 0.015 |

## TO-92 Suggested Pad Layout



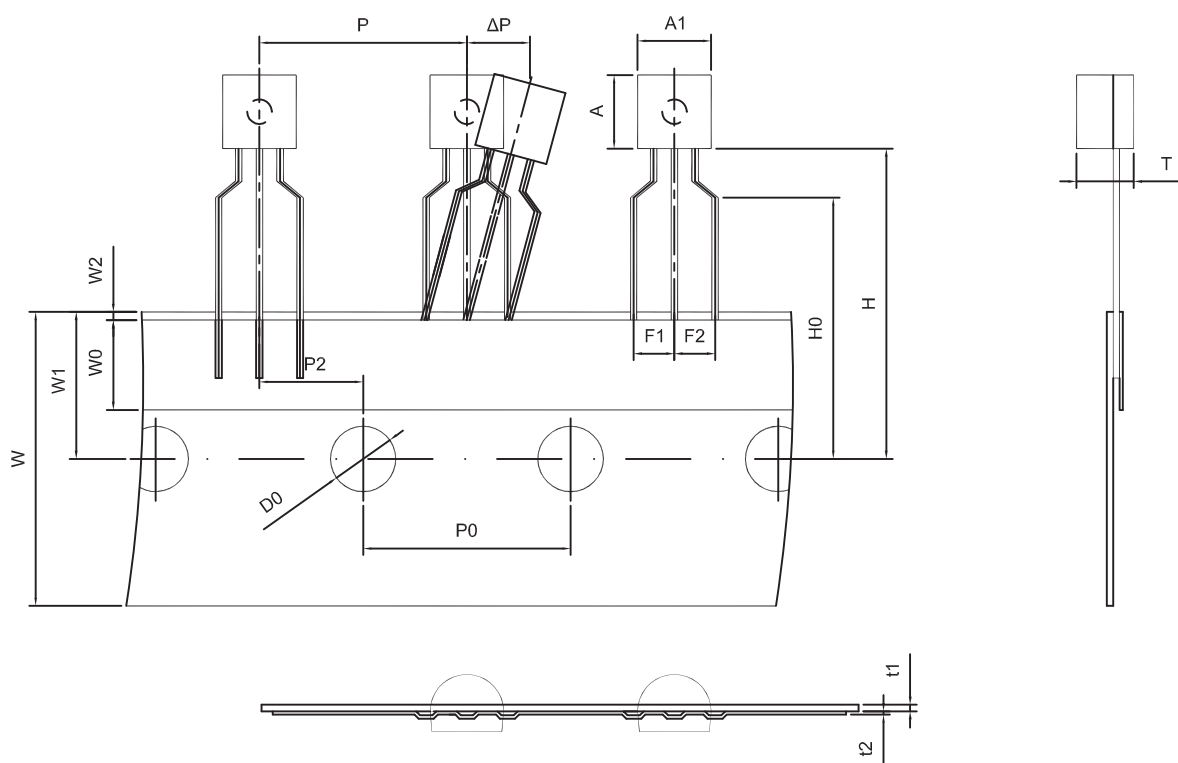
Note:

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

### NOTICE

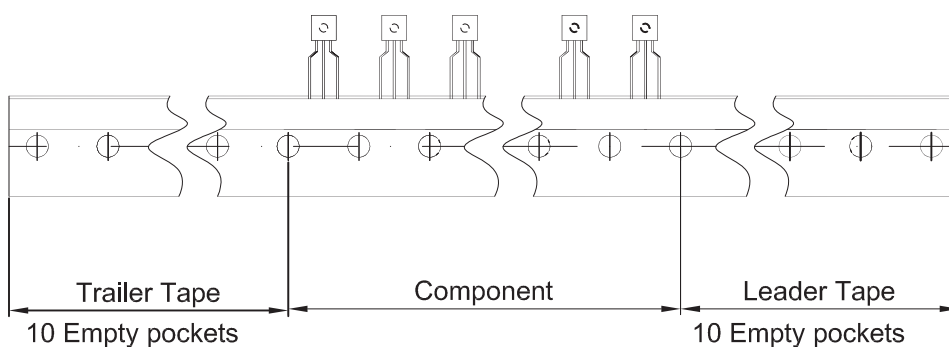
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# TO-92 PACKAGE TAPING DIMENSION



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  | ΔP   |
| 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     |