



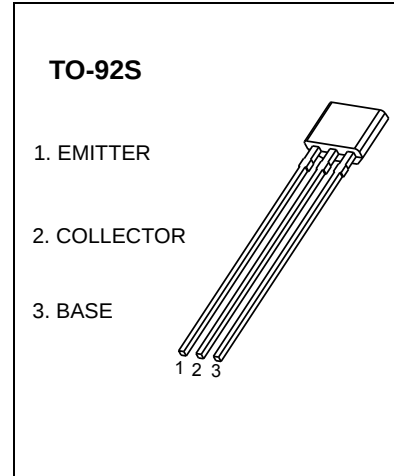
JIANGSU CHANGJING ELECTRONICS TECHNOLOGY CO., LTD

## TO-92S Plastic-Encapsulate Transistors

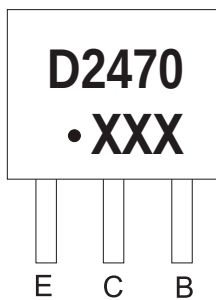
### 2SD2470 TRANSISTOR (NPN)

#### FEATURES

- Low Saturation Voltage

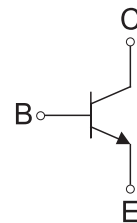


#### MARKING



D2470=Device code  
Solid dot= Greenmolding compound device,  
if none, the normal device  
XXX=Code

#### Equivalent Circuit



#### ORDERING INFORMATION

| Part Number | Package | Packing Method | Pack Quantity |
|-------------|---------|----------------|---------------|
| 2SD2470     | TO-92S  | Bulk           | 1000pcs/Bag   |
| 2SD2470-TA  | TO-92S  | Tape           | 3000pcs/Box   |

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

| Symbol         | Parameter                                        | Value    | Unit               |
|----------------|--------------------------------------------------|----------|--------------------|
| $V_{CBO}$      | Collector-Base Voltage                           | 15       | V                  |
| $V_{CEO}$      | Collector-Emitter Voltage                        | 10       | V                  |
| $V_{EBO}$      | Emitter-Base Voltage                             | 8        | V                  |
| $I_C$          | Collector Current –Continuous                    | 5        | A                  |
| $P_C$          | Collector Power Dissipation                      | 400      | mW                 |
| $T_J, T_{stg}$ | Operation Junction and Storage Temperature Range | -55~+150 | $^{\circ}\text{C}$ |

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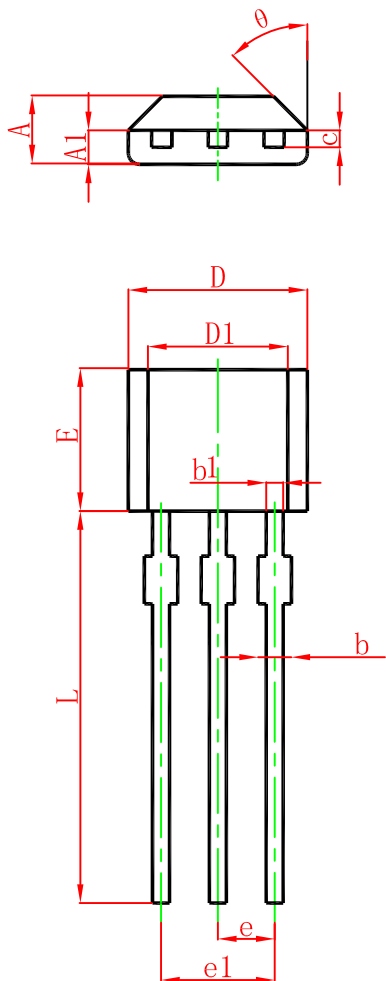
## ELECTRICAL CHARACTERISTICS

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

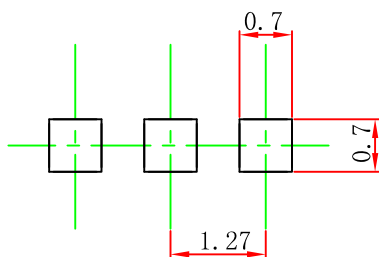
| Parameter                            | Symbol        | Test conditions                                            | Min | Typ | Max | Unit          |
|--------------------------------------|---------------|------------------------------------------------------------|-----|-----|-----|---------------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C=50\mu\text{A}$ , $I_E=0$                              | 15  |     |     | V             |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | $I_C=1\text{mA}$ , $I_B=0$                                 | 10  |     |     | V             |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | $I_E=50\mu\text{A}$ , $I_C=0$                              | 8   |     |     | V             |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB}=10\text{V}$ , $I_E=0$                              |     |     | 0.1 | $\mu\text{A}$ |
| Emitter cut-off current              | $I_{EBO}$     | $V_{EB}=8\text{V}$ , $I_C=0$                               |     |     | 0.5 | $\mu\text{A}$ |
| DC current gain                      | $h_{FE}$      | $V_{CE}=2\text{V}$ , $I_C=2\text{A}$                       | 270 |     | 820 |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=3\text{A}$ , $I_B=0.1\text{A}$                        |     |     | 0.5 | V             |
| Transition frequency                 | $f_T$         | $V_{CE}=6\text{V}$ , $I_C=50\text{mA}$ , $f=100\text{MHz}$ |     | 170 |     | MHz           |
| Collector output capacitance         | $C_{ob}$      | $V_{CB}=10\text{V}$ , $I_E=0$ , $f=1\text{MHz}$            |     | 30  |     | pF            |

## TO-92S Package Outline Dimensions



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 1.420                     | 1.620  | 0.056                | 0.064 |
| A1     | 0.660                     | 0.860  | 0.026                | 0.034 |
| b      | 0.330                     | 0.480  | 0.013                | 0.019 |
| b1     | 0.400                     | 0.510  | 0.016                | 0.020 |
| c      | 0.330                     | 0.510  | 0.013                | 0.020 |
| D      | 3.900                     | 4.100  | 0.154                | 0.161 |
| D1     | 2.280                     | 2.680  | 0.090                | 0.106 |
| E      | 3.050                     | 3.250  | 0.120                | 0.128 |
| e      | 1.270 TYP.                |        | 0.050 TYP.           |       |
| e1     | 2.440                     | 2.640  | 0.096                | 0.104 |
| L      | 15.100                    | 15.500 | 0.594                | 0.610 |
| θ      | 45° TYP.                  |        | 45° TYP.             |       |

## TO-92S Suggested Pad Layout



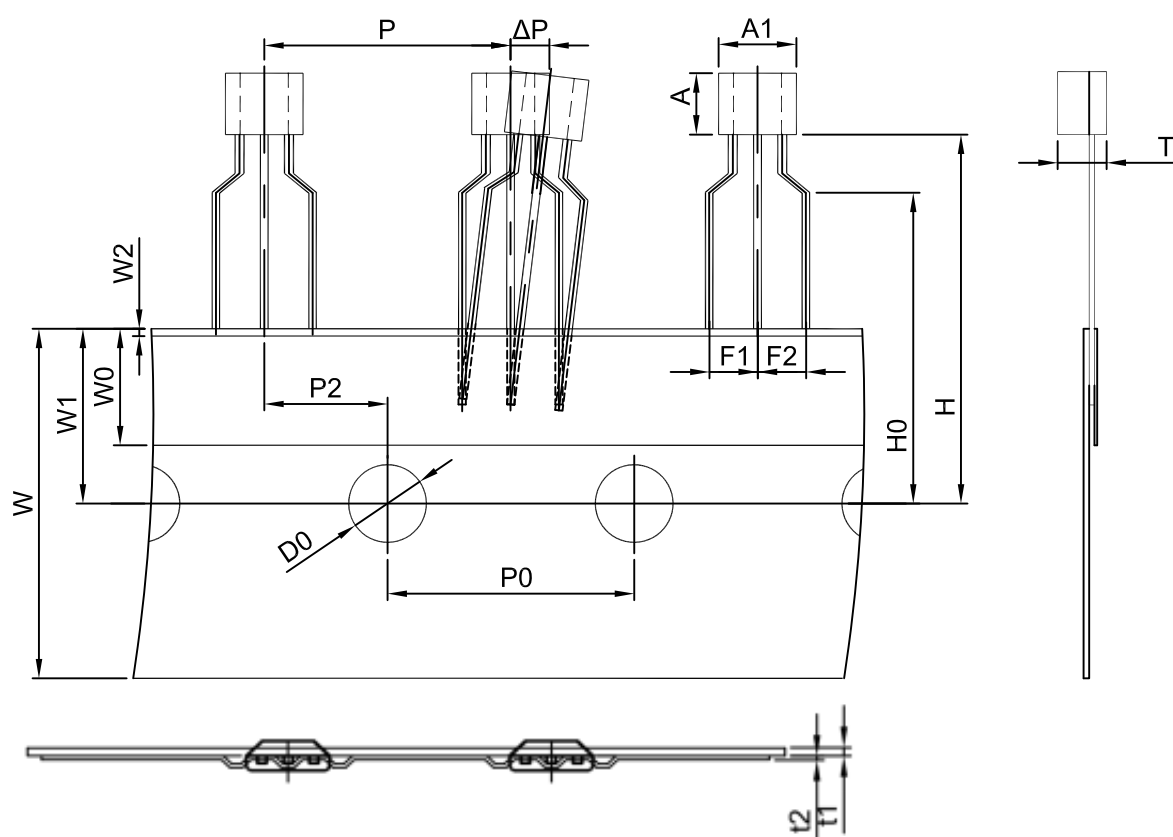
Note:

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

### NOTICE

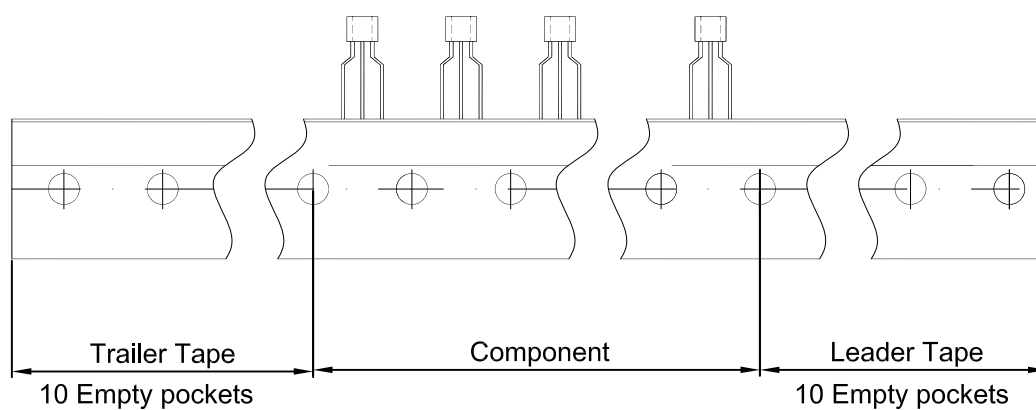
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## TO-92S PACKAGE TAPING DIMENSION



Dimiensions are in millimeter

| A1  | A    | T    | P    | P0   | P2   | F1  | F2  | W    |
|-----|------|------|------|------|------|-----|-----|------|
| 4.0 | 3.15 | 1.52 | 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  | 19.0 | 16.0 | 4.0  | 0.4 | 0.2 | 0    |



| Package | Box      | Box Size(mm) | Carton     | Carton Size(mm) |
|---------|----------|--------------|------------|-----------------|
| TO-92S  | 3000 pcs | 333×162×43   | 30,000 pcs | 350×340×250     |