

## TO-92L Plastic-Encapsulate Transistors

### KSA708 TRANSISTOR (PNP)

#### FEATURES

- Low Collector-Emitter Saturation Voltage
- Low Frequency Amplifier&Medium Speed Switching

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

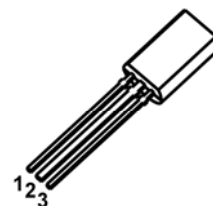
| Symbol          | Parameter                                   | Value    | Unit                 |
|-----------------|---------------------------------------------|----------|----------------------|
| $V_{CBO}$       | Collector-Base Voltage                      | -80      | V                    |
| $V_{CEO}$       | Collector-Emitter Voltage                   | -60      | V                    |
| $V_{EBO}$       | Emitter-Base Voltage                        | -8       | V                    |
| $I_C$           | Collector Current                           | -0.7     | A                    |
| $P_C$           | Collector Power Dissipation                 | 800      | mW                   |
| $R_{\theta JA}$ | Thermal Resistance From Junction To Ambient | 156      | $^{\circ}\text{C/W}$ |
| $T_j$           | Junction Temperature                        | 150      | $^{\circ}\text{C}$   |
| $T_{stg}$       | Storage Temperature                         | -55~+150 | $^{\circ}\text{C}$   |

#### TO - 92L

1. EMITTER

2. BASE

3. COLLECTOR



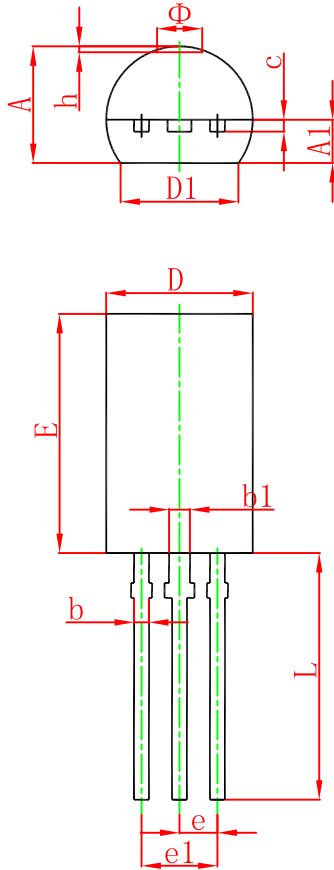
#### ELECTRICAL CHARACTERISTICS ( $T_a=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter                            | Symbol        | Test conditions                                  | Min | Typ | Max  | Unit          |
|--------------------------------------|---------------|--------------------------------------------------|-----|-----|------|---------------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C = -100\mu\text{A}, I_E = 0$                 | -80 |     |      | V             |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | $I_C = -10\text{mA}, I_B = 0$                    | -60 |     |      | V             |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | $I_E = -100\mu\text{A}, I_C = 0$                 | -8  |     |      | V             |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB} = -60\text{V}, I_E = 0$                  |     |     | -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                      | $h_{FE}$      | $V_{CE} = -2\text{V}, I_C = -50\text{mA}$        | 40  |     | 240  |               |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -500\text{mA}, I_B = -50\text{mA}$        |     |     | -0.7 | V             |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ | $I_C = -500\text{mA}, I_B = -50\text{mA}$        |     |     | -1.1 | V             |
| Collector output capacitance         | $C_{ob}$      | $V_{CB} = -10\text{V}, I_E = 0, f = 1\text{MHz}$ |     | 13  |      | pF            |
| Transition frequency                 | $f_T$         | $V_{CE} = -10\text{V}, I_C = -50\text{mA}$       |     | 50  |      | MHz           |

#### CLASSIFICATION OF $h_{FE}$

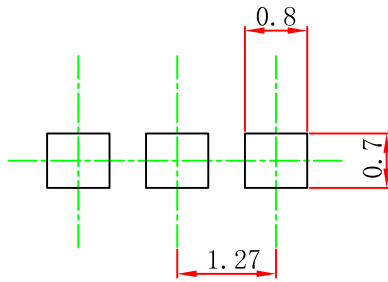
| RANK  | R     | O      | Y       |
|-------|-------|--------|---------|
| RANGE | 40-80 | 70-140 | 120-240 |

## TO-92L Package Outline Dimensions



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 3.750                     | 4.050  | 0.148                | 0.159 |
| A1     | 1.280                     | 1.580  | 0.050                | 0.062 |
| b      | 0.380                     | 0.550  | 0.015                | 0.022 |
| b1     | 0.620                     | 0.780  | 0.024                | 0.031 |
| c      | 0.350                     | 0.450  | 0.014                | 0.018 |
| D      | 4.750                     | 5.050  | 0.187                | 0.199 |
| D1     | 4.000                     |        | 0.157                |       |
| E      | 7.850                     | 8.150  | 0.309                | 0.321 |
| e      | 1.270 TYP.                |        | 0.050 TYP.           |       |
| e1     | 2.440                     | 2.640  | 0.096                | 0.104 |
| L      | 13.800                    | 14.200 | 0.543                | 0.559 |
| $\Phi$ |                           | 1.600  |                      | 0.063 |
| h      | 0.000                     | 0.300  | 0.000                | 0.012 |

## TO-92L Suggested Pad Layout



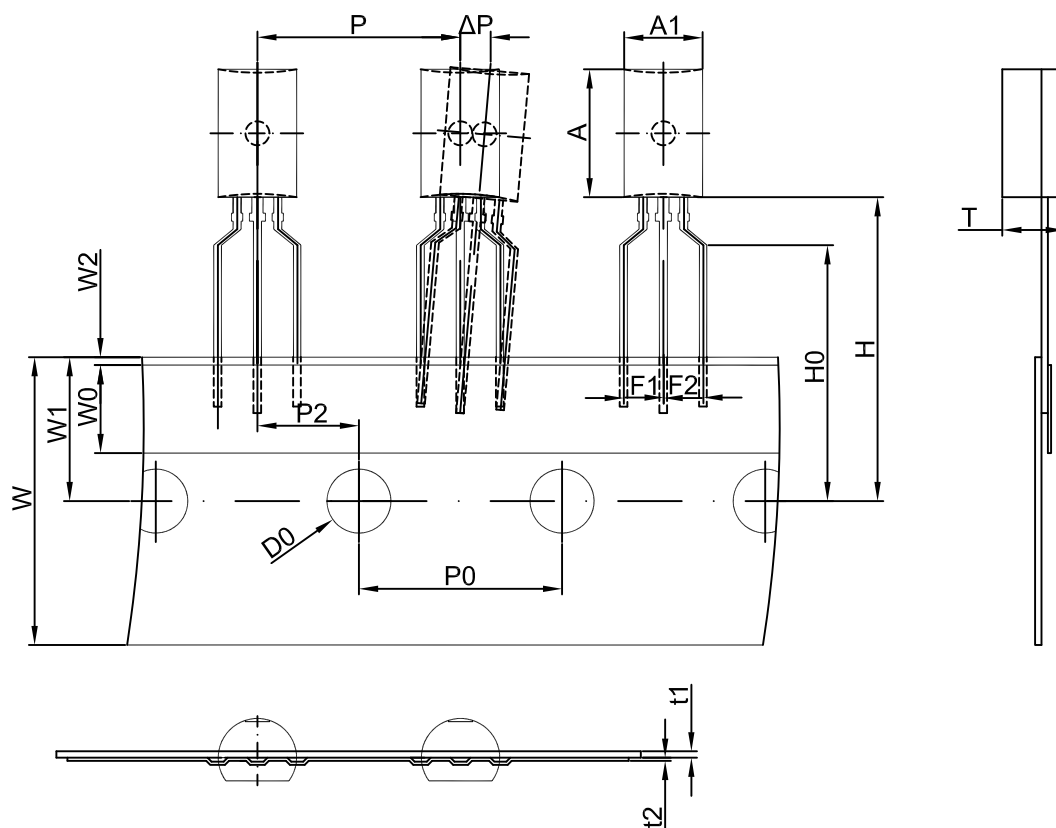
Note:

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

### NOTICE

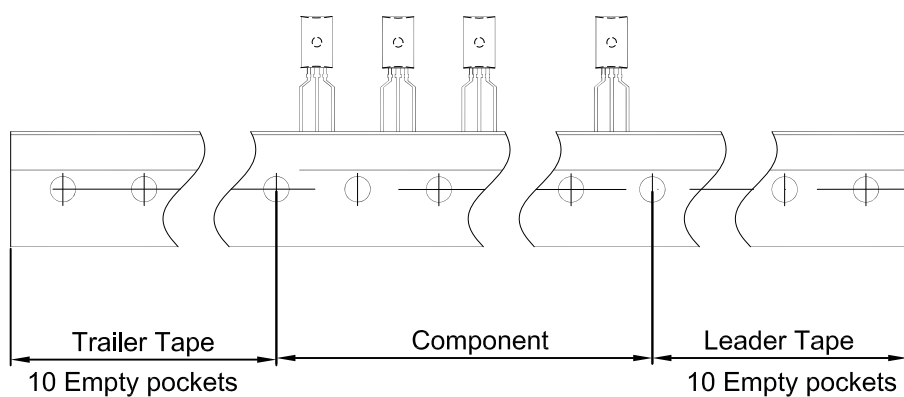
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## TO-92L PACKAGE TAPEING DIMENSION



Dimensions are in millimeter

| A1  | A   | T   | P    | P0   | P2   | F1  | F2  | W    |
|-----|-----|-----|------|------|------|-----|-----|------|
| 4.9 | 8.0 | 3.9 | 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-92L  | 2000 pcs | 333×203×42   | 20,000 pcs | 493×400×264     |