

## TO-92L Plastic-Encapsulate Transistors

### KSA928A TRANSISTOR(PNP)

#### FEATURE

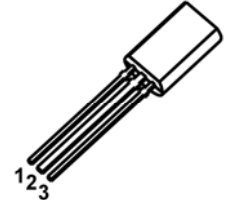
- Audio Power Amplifier
- Complement to Application

#### TO-92L

1.EMITTER

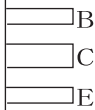
2.COLLECTOR

3.BASE



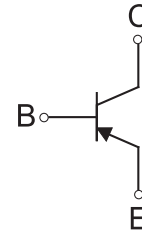
#### MARKING

**A928A**  
• **XXX**



A928A=Device code  
Solid dot = Green molding compound device,  
if none, the normal device  
XXX=Code

#### Equivalent Circuit



#### ORDERING INFORMATION

| Part Number | Package | Packing Method | Pack Quantity |
|-------------|---------|----------------|---------------|
| KSA928A     | TO-92L  | Bulk           | 500pcs/Bag    |
| KSA928A-TA  | TO-92L  | Tape           | 2000pcs/Box   |

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

| Symbol           | Parameter                     | Value       | Unit |
|------------------|-------------------------------|-------------|------|
| V <sub>CBO</sub> | Collector-Base Voltage        | -30         | V    |
| V <sub>CEO</sub> | Collector-Emitter Voltage     | -30         | V    |
| V <sub>EBO</sub> | Emitter-Base Voltage          | -5          | V    |
| I <sub>C</sub>   | Collector Current -Continuous | -2          | A    |
| P <sub>C</sub>   | Collector Power Dissipation   | 1           | W    |
| T <sub>J</sub>   | Junction Temperature          | 150         | °C   |
| T <sub>stg</sub> | Storage Temperature           | -55 to +150 | °C   |

## ELECTRICAL CHARACTERISTICS

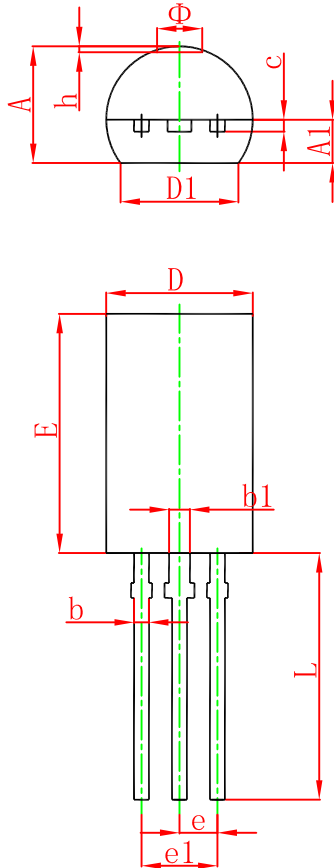
$T_a=25^\circ\text{C}$  unless otherwise specified

| Parameter                            | Symbol                      | Test conditions                                         | Min | Type | Max  | Unit           |
|--------------------------------------|-----------------------------|---------------------------------------------------------|-----|------|------|----------------|
| Collector-base breakdown voltage     | $V(\text{BR})_{\text{CBO}}$ | $I_C = -100\mu\text{A}, I_E = 0$                        | -30 |      |      | V              |
| Collector-emitter breakdown voltage  | $V(\text{BR})_{\text{CEO}}$ | $I_C = -10\text{ mA}, I_B = 0$                          | -30 |      |      | V              |
| Emitter-base breakdown voltage       | $V(\text{BR})_{\text{EBO}}$ | $I_E = -1\text{mA}, I_C = 0$                            | -5  |      |      | V              |
| Collector cut-off current            | $I_{\text{CBO}}$            | $V_{\text{CB}} = -30\text{V}, I_E = 0$                  |     |      | -0.1 | $\mu\text{ A}$ |
| Emitter cut-off current              | $I_{\text{EBO}}$            | $V_{\text{EB}} = -5\text{V}, I_C = 0$                   |     |      | -0.1 | $\mu\text{ A}$ |
| DC current gain                      | $h_{\text{FE}}$             | $V_{\text{CE}} = -2\text{V}, I_C = -500\text{mA}$       | 100 |      | 320  |                |
| Collector-emitter saturation voltage | $V_{\text{CE(sat)}}$        | $I_C = -1.5\text{ A}, I_B = -0.03\text{A}$              |     |      | -2   | V              |
| Base-emitter voltage                 | $V_{\text{BE}}$             | $I_C = -500\text{ mA}, V_{\text{CE}} = -2\text{V}$      |     |      | -1   | V              |
| Transition frequency                 | $f_{\text{T}}$              | $V_{\text{CE}} = -2\text{ V}, I_C = -500\text{mA}$      |     | 120  |      | MHz            |
| Collector output capacitance         | $C_{\text{ob}}$             | $V_{\text{CB}} = -10\text{V}, I_E = 0, f = 1\text{MHz}$ |     | 48   |      | pF             |

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

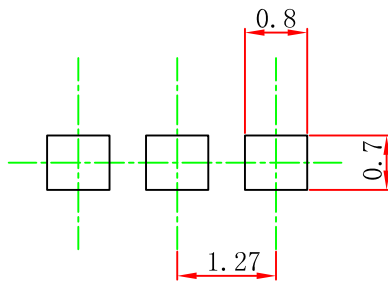
|       |         |         |
|-------|---------|---------|
| Rank  | O       | Y       |
| Range | 100-200 | 160-320 |

## 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



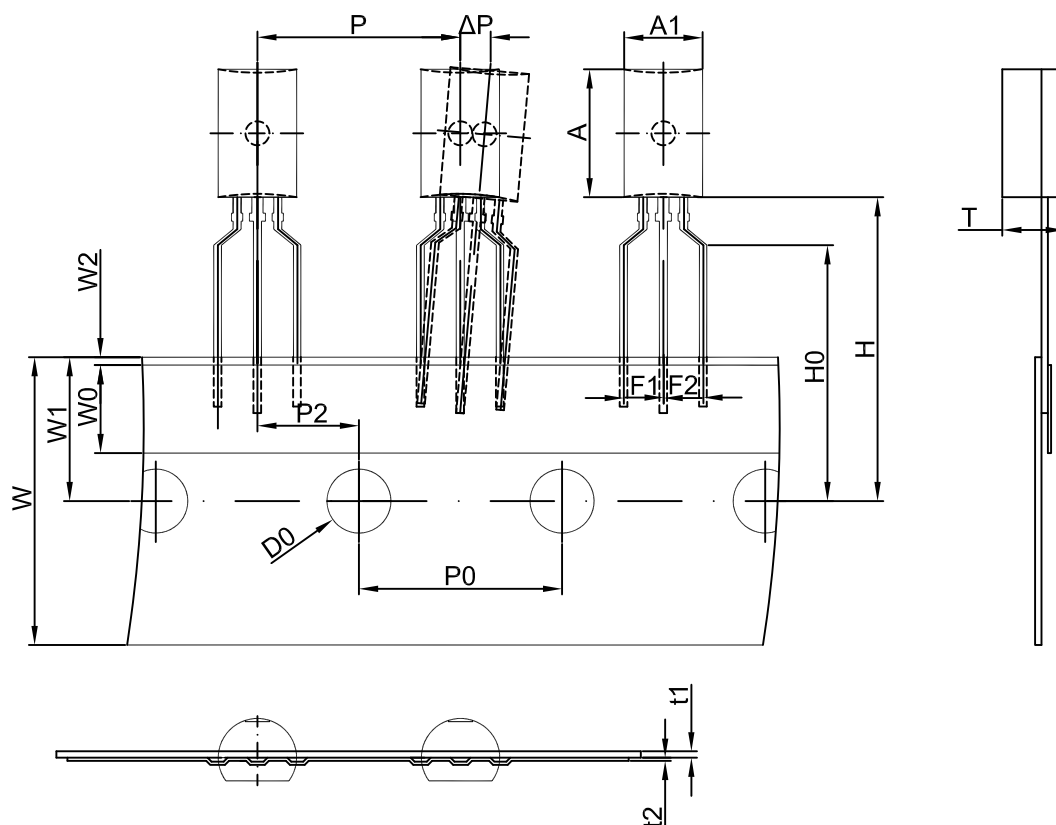
Note:

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

### NOTICE

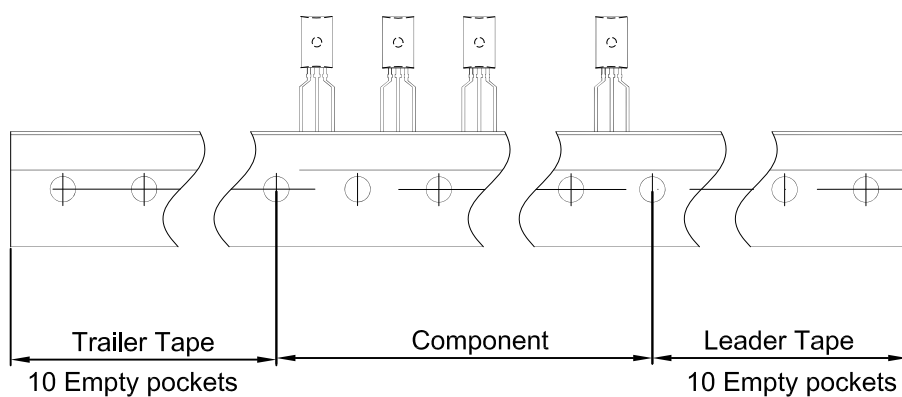
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## TO-92L PACKAGE TAPEING DIMENSION



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     |