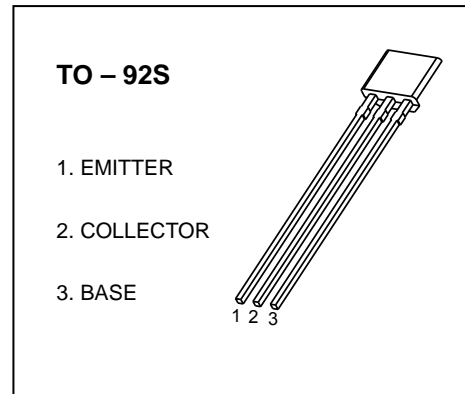


TO-92S Plastic-Encapsulate Transistors

2SA1309A TRANSISTOR (PNP)

FEATURES

- High Forward Current Transfer Ratio h_{FE} .
- Allowing Supply with the Radial Taping.
- Optimum for High-density Mounting.
- Complementary to 2SC3311A



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

| Symbol | Parameter | Value | Unit |
|-----------------|---|----------|-----------------------------|
| V_{CBO} | Collector-Base Voltage | -60 | V |
| V_{CEO} | Collector-Emitter Voltage | -50 | V |
| V_{EBO} | Emitter-Base Voltage | -7 | V |
| I_C | Collector Current | -100 | mA |
| P_C | Collector Power Dissipation | 300 | mW |
| $R_{\theta JA}$ | Thermal Resistance From Junction To Ambient | 417 | $^{\circ}\text{C}/\text{W}$ |
| T_j | Junction Temperature | 150 | $^{\circ}\text{C}$ |
| T_{stg} | Storage Temperature | -55~+150 | $^{\circ}\text{C}$ |

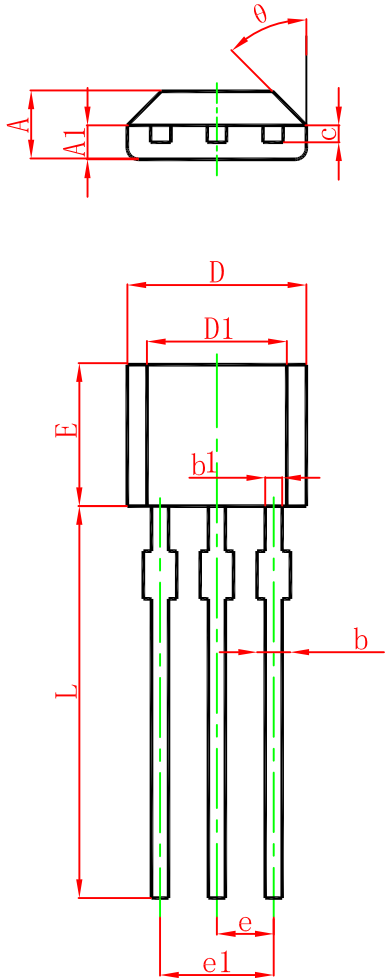
ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$ unless otherwise specified)

| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|--------------------------------------|---------------|--|-----|-----|------|---------------|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | $I_C = -0.01\text{mA}, I_E = 0$ | -60 | | | V |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | $I_C = -2\text{mA}, I_B = 0$ | -50 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E = -0.01\text{mA}, I_C = 0$ | -7 | | | V |
| Collector cut-off current | I_{CBO} | $V_{CB} = -10\text{V}, I_E = 0$ | | | -100 | nA |
| Collector cut-off current | I_{CEO} | $V_{CE} = -10\text{V}, I_B = 0$ | | | -1 | μA |
| Emitter cut-off current | I_{EBO} | $V_{EB} = -6\text{V}, I_C = 0$ | | | -100 | nA |
| DC current gain | h_{FE} | $V_{CE} = -10\text{V}, I_C = -2\text{mA}$ | 160 | | 460 | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C = -50\text{mA}, I_B = -5\text{mA}$ | | | -0.3 | V |
| Collector output capacitance | C_{ob} | $V_{CB} = -10\text{V}, I_E = 0, f = 1\text{MHz}$ | | 3.5 | | pF |
| Transition frequency | f_T | $V_{CE} = -10\text{V}, I_C = -1\text{mA}, f = 200\text{MHz}$ | | 80 | | MHz |

CLASSIFICATION OF h_{FE}

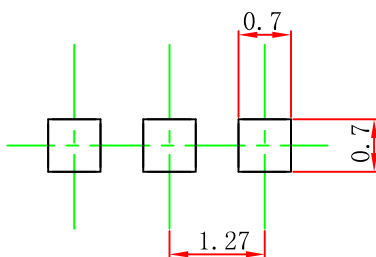
| RANK | Q | R | S |
|-------|---------|---------|---------|
| RANGE | 160-260 | 210-340 | 290-460 |

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



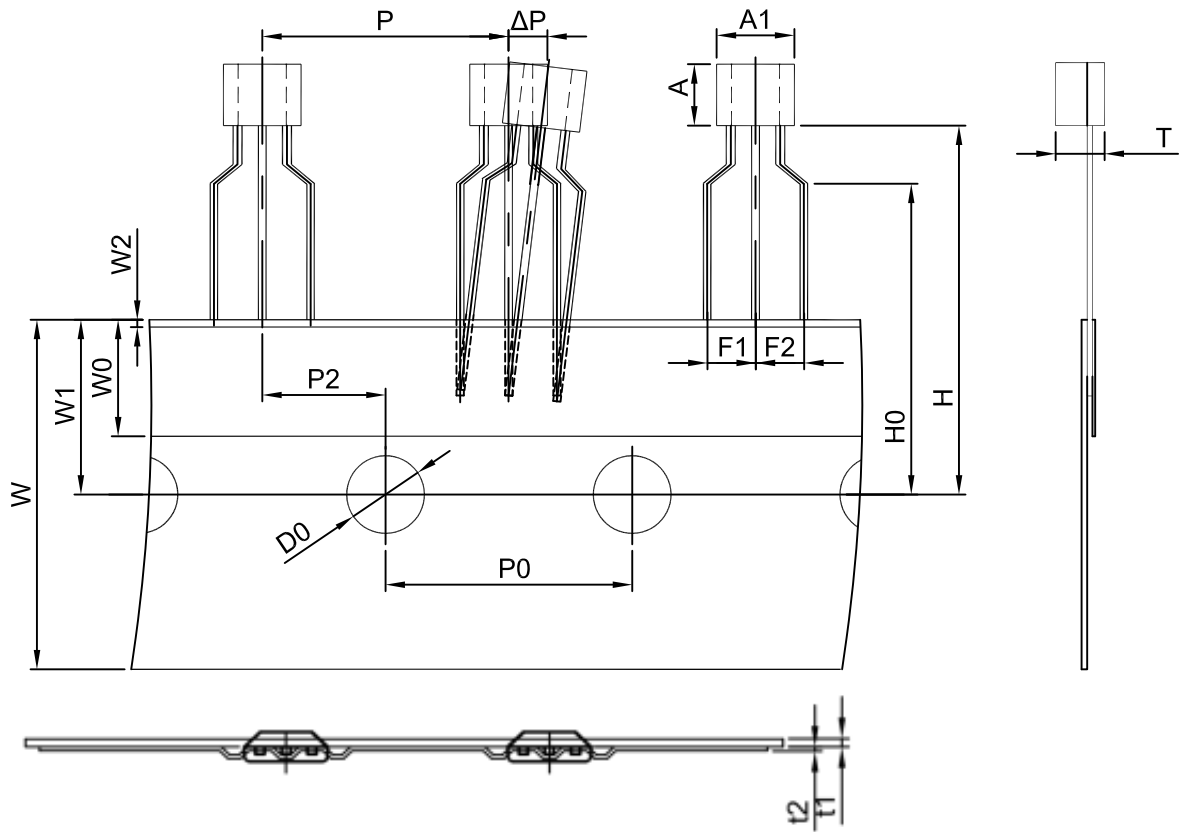
Note:

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

NOTICE

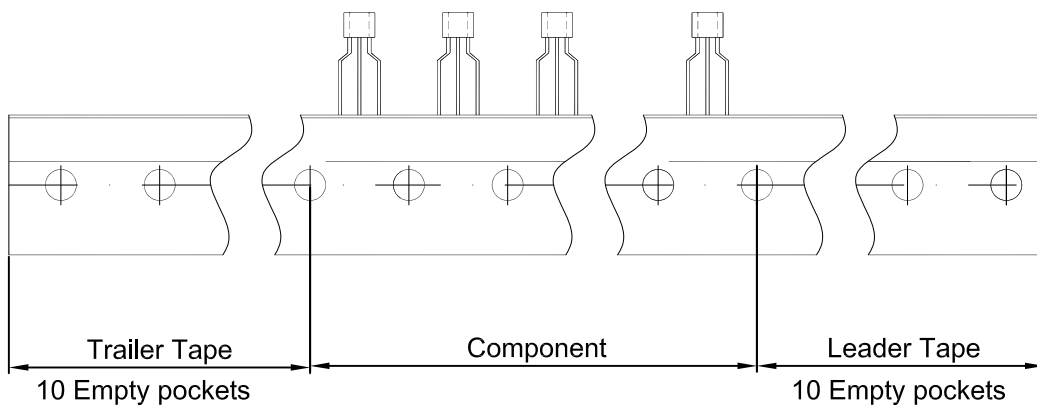
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TO-92S PACKAGE TAPEING DIMENSION



Dimensions 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 |