

## TO-92 Plastic-Encapsulate Transistors

### 2SC1318A TRANSISTOR (NPN)

#### FEATURES

- Collector Output Capacitance :

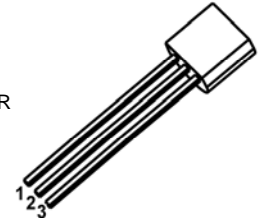
$C_{ob}=11$  pF (TYP), 20 pF (MAX)

MAXIMUM RATINGS ( $T_a=25$  °C unless otherwise note )

| Symbol    | Parameter                     | Value   | Unit |
|-----------|-------------------------------|---------|------|
| $V_{CBO}$ | Collector-Base Voltage        | 80      | V    |
| $V_{CEO}$ | Collector-Emitter Voltage     | 70      | V    |
| $V_{EBO}$ | Emitter-Base Voltage          | 5       | V    |
| $I_C$     | Collector Current -Continuous | 500     | mA   |
| $P_C$     | Collector Power Dissipation   | 750     | mW   |
| $T_j$     | Junction Temperature          | 150     | °C   |
| $T_{stg}$ | Storage Temperature           | -55-150 | °C   |

#### TO-92

1. EMITTER
2. COLLECTOR
3. BASE



#### ELECTRICAL CHARACTERISTICS ( $T_a=25$ °C unless otherwise specified)

| Parameter                            | Symbol        | Test conditions                  | MIN | TYP | MAX | UNIT    |
|--------------------------------------|---------------|----------------------------------|-----|-----|-----|---------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | $I_C=10\mu A, I_E=0$             | 80  |     |     | V       |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | $I_C=2mA, I_B=0$                 | 70  |     |     | V       |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | $I_E=10\mu A, I_C=0$             | 5   |     |     | V       |
| Collector cut-off current            | $I_{CBO}$     | $V_{CB}=20V, I_E=0$              |     |     | 0.1 | $\mu A$ |
| DC current gain                      | $h_{FE(1)}$   | $V_{CE}=10V, I_C=150mA$          | 85  |     | 340 |         |
|                                      | $h_{FE(2)}$   | $V_{CE}=10V, I_C=500mA$          | 40  |     |     |         |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C=300mA, I_B=30mA$            |     |     | 0.6 | V       |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ | $I_C=300mA, I_B=30mA$            |     |     | 1.5 | V       |
| Transition frequency                 | $f_T$         | $V_{CE}=10V, I_C=50mA, f=200MHz$ |     | 120 |     | MHz     |
| Collector output capacitance         | $C_{ob}$      | $V_{CB}=10V, I_E=0, f=1MHz$      |     | 11  | 20  | pF      |

#### CLASSIFICATION OF $h_{FE(1)}$

| Rank  | Q      | R       | S       |
|-------|--------|---------|---------|
| Range | 85-170 | 120-240 | 170-340 |

## 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 TAPEING 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     |