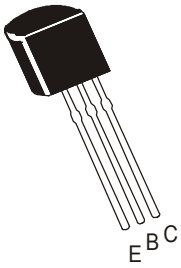
# PNP SILICON PLANAR EPITAXIAL TRANSISTORS

**PN200**
**PN200A**

**TO-92**
**Plastic Package**




## COMPLEMENTARY PN100, PN100A

### ABSOLUTE MAXIMUM RATINGS ($T_a$=25ºC unless specified otherwise)

| DESCRIPTION | SYMBOL | VALUE | UNITS |
|---|---|---|---|
| Collector Emitter Voltage | $V_{CEO}$ | 35 | V |
| Collector Base Voltage | $V_{CBO}$ | 60 | V |
| Emitter Base Voltage | $V_{EBO}$ | 5 | V |
| Collector Current Continuous | $I_C$ | 500 | mA |
| Power Dissipation @ $T_a$=25ºC | $P_D$ | 625 | mW |
| Operating And Storage Junction Temperature Range | $T_j$, $T_{stg}$ | -55 to +150 | ºC |

### THERMAL RESISTANCE

| | | | |
|---|---|---|---|
| Junction to Ambient in free air | $R_{th(j-a)}$ | 200 | ºC/W |

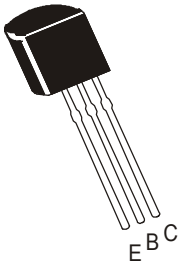
### ELECTRICAL CHARACTERISTICS ($T_a$=25ºC unless otherwise specified)

| DESCRIPTION | SYMBOL | TEST CONDITION | VALUE | | | UNITS |
|---|---|---|---|---|---|---|
| | | | MIN | | MAX | |
| Collector Emitter Breakdown Voltage | $BV_{CEO}$* | $I_C$=1mA,$I_B$=0 | 35 | | | V |
| Collector Base Breakdown Voltage | $BV_{CBO}$ | $I_C$=100µA,$I_E$=0 | 60 | | | V |
| Emitter Base Breakdown Voltage | $BV_{EBO}$ | $I_E$=100µA, $I_C$=0 | 5 | | | V |
| Base Cut off Current | $I_{CBO}$ | $V_{CB}$=35V, $I_E$ = 0 | | | 500 | nA |
| Collector Emitter Saturation Voltage | $V_{CE(sat)}$* | $I_C$=150mA, $I_B$=15mA | | | 0.4 | V |
| PN100, A | | $I_C$=500mA, $I_B$=50mA | | | 1.0 | V |
| PN200, A | | | | | 2.0 | V |
| | | | | | | |
| Base Emitter Saturation Voltage | $V_{BE(sat)}$* | $I_C$=150mA, $I_B$=15mA | | | 0.95 | V |
| PN100, A | | $I_C$=500mA, $I_B$=50mA | | | 1.2 | V |
| PN200, A | | | | | 1.3 | V |

***Pulse Condition: = Width ≤ 300µs, Duty Cycle ≤ 2%.**

## PNP SILICON PLANAR EPITAXIAL TRANSISTORS

**PN200**
**PN200A**




**TO-92**
**Plastic Package**

## COMPLEMENTARY PN100, PN100A

**ELECTRICAL CHARACTERISTICS ($T_a$=25ºC unless otherwise specified)**

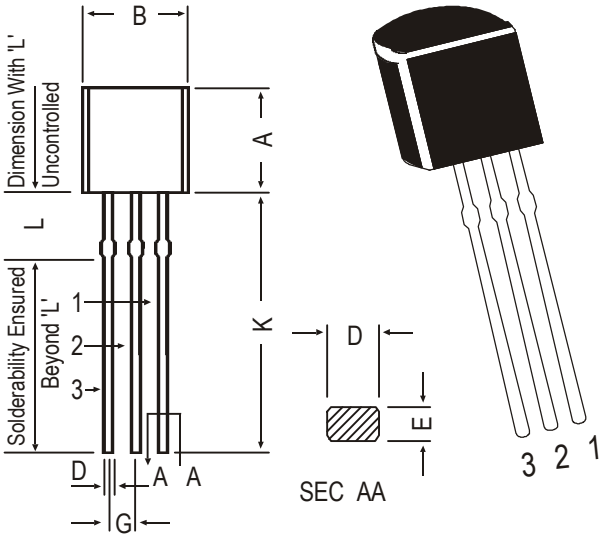
| DESCRIPTION | SYMBOL | TEST CONDITION | PN100 | PN100A | PN200 | PN200A |
|---|---|---|---|---|---|---|
| **DC Current Gain** | $h_{FE}$* | $I_C$=1mA, $V_{CE}$=1V | >40 | >40 | >40 | >40 |
| | | $I_C$=10mA, $V_{CE}$=1V | 100-450 | 300-600 | 100-450 | 300-600 |
| | | $I_C$=150mA, $V_{CE}$=1V* | >100 | >100 | | |
| | | $I_C$=150mA, $V_{CE}$=2V* | | | >100 | >100 |

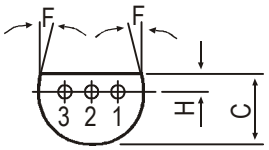
**DYNAMIC CHARACTERISTICS**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Transition Frequency** | $f_T$ | $I_C$=20mA, $V_{CE}$=10V | | | | |
| | | f=100MHz | | | | |
| **PN100, A** | | | >200 | | | MHz |
| **PN200, A** | | | >150 | | | MHz |

***Pulse Condition: = Width ≤ 300µs, Duty Cycle ≤ 2%.**

# TO-92 Plastic Package



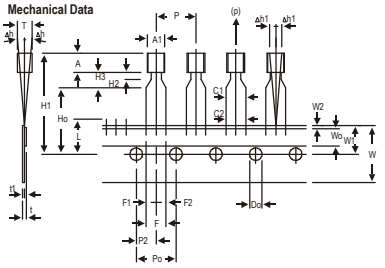



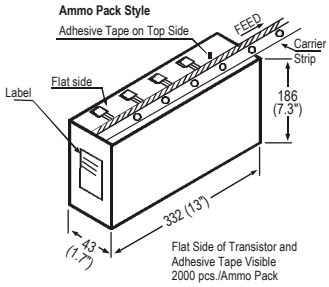

PIN CONFIGURATION
1. COLLECTOR
2. BASE
3. EMITTER

| DIM | MIN. | MAX. |
|---|---|---|
| A | 4.32 | 5.33 |
| B | 4.45 | 5.20 |
| C | 3.18 | 4.19 |
| D | 0.41 | 0.55 |
| E | 0.35 | 0.50 |
| F | 5 DEG | |
| G | 1.14 | 1.40 |
| H | 1.14 | 1.53 |
| K | 12.70 | — |
| L | 1.982 | 2.082 |

All diminsions in mm.

## TO-92 Transistors in Tape and Ammo Pack




**All dimensions in mm**

| ITEM | SYMBOL | SPECIFICATION | | | | REMARKS |
|---|---|---|---|---|---|---|
| | | MIN. | NOM. | MAX. | TOL . | |
| BODY WIDTH | A1 | 4.0 | | 4.8 | | |
| BODY HEIGHT | A | 4.8 | | 5.2 | | |
| BODY THICKNESS | T | 3.9 | | 4.2 | | |
| PITCH OF COMPONENT | P | | 12.7 | | ± 1.0 | |
| FEED HOLE PITCH | Po | | 12.7 | | ± 0.3 | CUMULATIVE PITCH ERROR 1.0 mm/20 PITCH |
| FEED HOLE CENTRE TO COMPONENT CENTRE | P2 | | 6.35 | | ± 0.4 | TO BE MEASURED AT BOTTOM OF CLINCH |
| DISTANCE BETWEEN OUTER LEADS | F | | 5.08 | | + 0.6 - 0.2 | |
| COMPONENT ALIGNMENT SIDE VIEW | Δh | | 0 | 1.0 | | AT TOP OF BODY |
| COMPONENT ALIGNMENT FRONT VIEW | Δh1 | | 0 | 1.3 | | AT TOP OF BODY |
| TAPE WIDTH | W | | 18 | | ± 0.5 | |
| HOLD-DOWN TAPE WIDTH | Wo | | 6 | | ± 0.2 | |
| HOLE POSITION | W1 | | 9 | | + 0.7 - 0.5 | |
| HOLD-DOWN TAPE POSITION | W2 | | 0.5 | | ± 0.2 | |
| LEAD WIRE CLINCH HEIGHT | Ho | | 16 | | ± 0.5 | |
| COMPONENT HEIGHT | H1 | | | 23.25 | | |
| LENGTH OF SNIPPED LEADS | L | | | 11.0 | | |
| FEED HOLE DIAMETER | Do | | 4 | | ± 0.2 | |
| TOTAL TAPE THICKNESS | t | | | 1.2 | | t1 0.3-0.6 |
| LEAD - TO - LEAD DISTANCE | F1, F2 | | 2.54 | | + 0.4 - 0.1 | |
| STAND OFF | H2 | 0.45 | | 1.45 | | |
| CLINCH HEIGHT | H3 | | | 3.0 | | |
| LEAD PARALLELISM | \| C1 - C2 \| | | | 0.22 | | |
| PULL - OUT FORCE | (P) | 6N | | | | |

**NOTES**
1. Maximum alignment deviation between leads will not to be greater than 0.2mm.
2. Maximum non-cumulative variation between tape feed holes shall not exceed 1 mm in 20 pitches.
3. Holddown tape will not exceed beyond the edge(s) of carrier tape and there shall be no exposure of adhesive.
4. There will be no more than three (3) consecutive missing components in a tape.
5. A tape trailer, having at least three feed holes are provided after the last component in a tape.
6. Splices should not interfere with the sprocket feed holes.

## Packing Detail

| PACKAGE | STANDARD PACK | | INNER CARTON BOX | | OUTER CARTON BOX | | |
|---|---|---|---|---|---|---|---|
| | **Details** | **Net Weight/Qty** | **Size** | **Qty** | **Size** | **Qty** | **Gr Wt** |
| **TO-92 Bulk** | **1K/polybag** | **200 gm/1K pcs** | **3" x 7.5" x 7.5"** | **5K** | **17" x 15" x 13.5"** | **80K** | **23 kgs** |
| **TO-92 T&A** | **2K/ammo box** | **645 gm/2K pcs** | **12.5" x 8" x 1.8"** | **2K** | **17" x 15" x 13.5"** | **32K** | **12.5 kgs** |

## Disclaimer

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