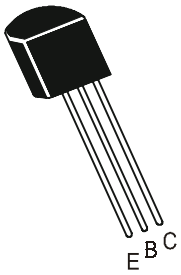
# NPN SILICON EPITAXIAL TRANSISTOR

**CD9581**
**TO-92**
**CBE**




## General Purpose Transistor.

**ABSOLUTE MAXIMUM RATINGS(Ta=25deg C )**

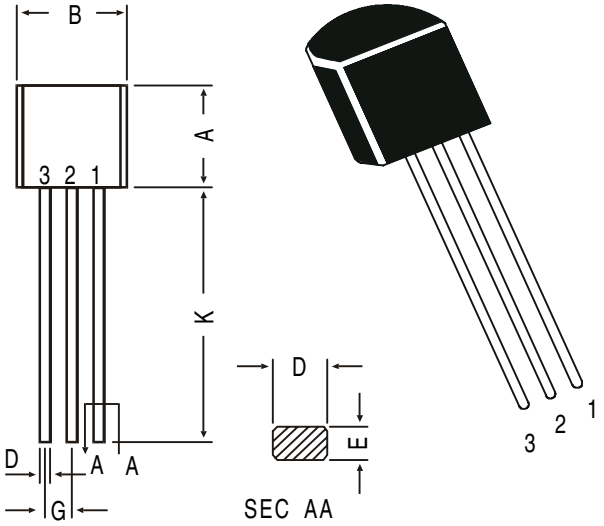
| DESCRIPTION | SYMBOL | VALUE | UNIT |
|---|---|---|---|
| **Collector -Base Voltage** | VCBO | 60 | V |
| **Collector -Emitter Voltage** | VCEO | 40 | V |
| **Emitter Base Voltage** | VEBO | 7.0 | V |
| **Collector Current** | IC | 100 | mA |
| **Power Dissipation** | PD | 500 | mW |
| **Operating & Storage Junction Temperature Range** | TJ, Tstg | -65 to +125 | deg C |
| **Lead Temperature for Soldering 1/16" From Body, For 10 Seconds** | TL | 280 | deg C |
| **THERMAL RESISTANCE** | | | |
| **Junction to Ambient** | Rth(j-a) | 200 | deg C/W |

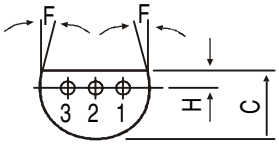
**ELECTRICAL CHARACTERISTICS (Ta=25 +- 3 deg C Unless Otherwise Specified)**

| DESCRIPTION | SYMBOL | TEST CONDITION | MIN | MAX | UNIT |
|---|---|---|---|---|---|
| **Collector -Base Voltage** | VCBO | IC=10uA, IE=0 | 60 | - | V |
| **Collector -Emitter Voltage** | VCEO* | IC=1mA, IB=0 | 40 | - | V |
| **Emitter- Base Voltage** | VEBO | IE=100uA, IC=0 | 7.0 | - | V |
| **Collector Cut-off Current** | ICBO | VCB=40V, IE=0 | - | 50 | nA |
| | ICEO | VCE=35V, IB=0 | - | 1.0 | uA |
| **Emitter Cut -off Current** | IEBO | VEB=7V, IC=0 | - | 200 | nA |
| **Forward Current Transfer Ratio** | hFE | IC=10mA,VCE=10V | 150 | 300 | |
| | | IC=100uA,VCE=10V | 50 | - | |
| **Collector Emitter (Sat) Voltage** | VCE(Sat) * | IC=50mA,IB=10mA | - | 0.22 | V |
| **DYNAMIC CHARACTERISTICS** | | | | | |
| **Cut off frequency** | ft | VCE=5V, IC=10mA | 100 | 350 | MHz |
| **Noise Figure** | NF | VCE=5V, IC=12uA f=1kHz, Rs=k ohm | - | 12 | dB |
| **Fead Back Capacitance** | Cre | VCB=10V, f=1MHz | - | 4.0 | pF |
| **Forward Current Transfer Ratio(A.C)** | hfe | IC=0.5mA, VCE=5V, f=50 kHz | 100 | - | |

***Pulse test 300us Duty Cycle=2%**

# TO-92 Plastic Package



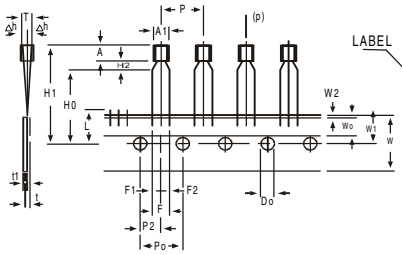

PIN CONFIGURATION
1. BASE
2. COLLECTOR
3. EMITTER

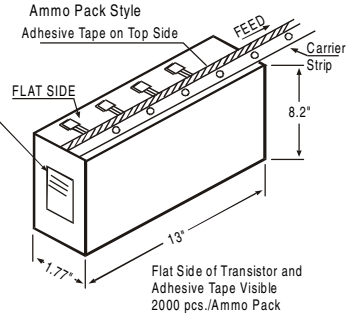
All diminsions in mm.

| 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 | — |

## TO-92 Transistors on Tape and Ammo Pack

MECHANICAL DATA




**All dimensions in mm unless specified otherwise**

| ITEM | SYMBOL | SPECIFICATION MIN. | NOM. | MAX. | TOL . | REMARKS |
|---|---|---|---|---|---|---|
| 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 | |
| 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 | △h | | 0 | 1 | | 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 DISTANCEF1, | F2 | | 2.54 | | +0.4 -0.1 | |
| CLINCH HEIGHT | H2 | | | 3 | | |
| PULL - OUT FORCE | (P) | 6N | | | | |

**NOTES**
1. MAXIMUM ALIGNMENT DEVIATION BETWEEN LEADS NOT TO BE GREATER THAN 0.2 mm.
2. MAXIMUM NON-CUMULATIVE VARIATION BETWEEN TAPE FEED HOLES SHALL NOT EXCEED 1 mm IN 20 PITCHES.
3. HOLDDOWN TAPE NOT TO EXCEED BEYOND THE EDGE(S) OF CARRIER TAPE AND THERE SHALL BE NO EXPOSURE OF ADHESIVE.
4. NO MORE THAN 3 CONSECUTIVE MISSING COMPONENTS ARE PERMITTED.
5. A TAPE TRAILER, HAVING AT LEAST THREE FEED HOLES ARE REQUIRED AFTER THE LAST COMPONENT.
6. SPLICES SHALL 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" | 5.0K | 17" x 15" x 13.5" | 80.0K | 23 kgs |
| TO-92 T&A | 2K/ammo box | 645 gm/2K pcs | 12.5" x 8" x 1.8" | 2.0K | 17" x 15" x 13.5" | 32.0K | 12.5 kgs |

## Customer Notes

## Disclaimer

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