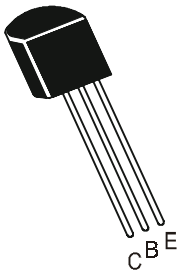
# NPN SILICON PLANAR EPITAXIAL TRANSISTORS

**CIL 187**

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




## Intended For Low Voltage , High Current Output Pair Application

## Complementary CIL 188

**ABSOLUTE MAXIMUM RATINGS ( Ta=25ºC unless specified otherwise)**

| DESCRIPTION | SYMBOL | VALUE | UNIT |
|---|---|---|---|
| Collector Emitter Voltage ($V_{BE}$ =0) | $V_{CES}$ | 25 | V |
| Collector Emitter Voltage ( Open Base) | $V_{CEO}$ | 15 | V |
| Emitter Base Voltage ( Open Collector) | $V_{EBO}$ | 5 | V |
| Collector Current | $I_C$ | 700 | mA |
| CollectorCurent ( Peak Value ) | $I_{CM}$ | 1 | A |
| Base Current | $I_B$ | 100 | mA |
| Base Current (Peak Value) | $I_{BM}$ | 200 | mA |
| Total Power Dissipation @ Ta=25ºC | $P_{TA}$ | 625 | mW |
| Operating And Storage Junction Temperature Range | $T_j$, $T_{stg}$ | -55 to +150 | ºC |

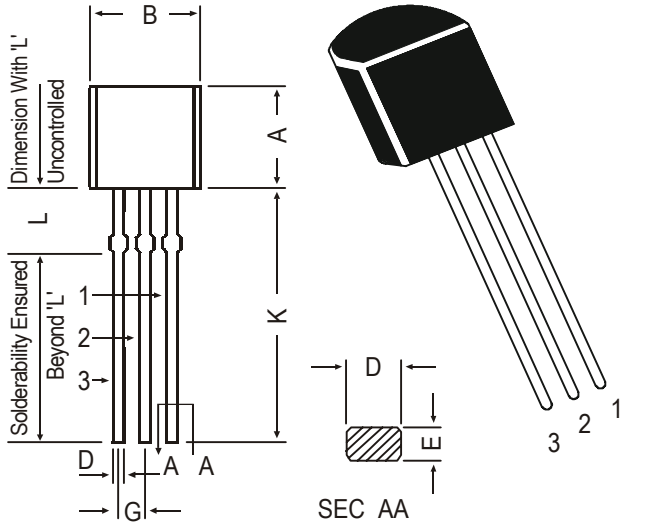
**ELECTRICAL CHARACTERISTICS ( Ta=25ºC unless specified otherwise)**

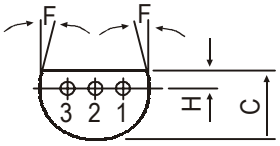
| DESCRIPTION | SYMBOL | TEST CONDITION | VALUE MIN | VALUE TYP | VALUE MAX | UNIT |
|---|---|---|---|---|---|---|
| Collector Cut off Current | $I_{CBO}$ | $V_{CB}$=25V, $I_E$ = 0 | | | 10 | µA |
| | | $V_{CB}$=25V, $I_E$ = 0 $T_j$= 150ºC | | | 1 | mA |
| Emitter Cut off Current | $I_{EBO}$ | $V_{EB}$=5V, $I_C$ = 0 | | | 10 | µA |
| Base Cut on Voltage | $V_{BE\ (on)}$ | $I_C$ =1A, $V_{CE}$ =1V | | | 1 | V |
| Collector Emitter Saturation Voltage | $V_{CE(sat)}$ | $I_C$=1A,$I_B$=100mA | | | 0.5 | V |
| DC Current Gain | $h_{FE}$ | $V_{CE}$=10V,$I_C$=5mA | 50 | | | |
| | | $V_{CE}$=1V,$I_C$=300mA | 100 | | 300 | |
| | | $V_{CE}$=1V,$I_C$=1A | 40 | | | |

**DYNAMIC CHARACTERISTICS**

| | | | | | |
|---|---|---|---|---|---|
| Transition Frequency | $f_T$ | $I_C$=10mA, $V_{CE}$=2V | | 270 | MHz |
| Collector Capacitance | $C_c$ | | | | |
| CIL187 | | $I_E$=0, $V_{CB}$=5V, | | 10 | pF |
| CIL188 | | f=1MHz | | 30 | pF |

# TO-92 Plastic Package



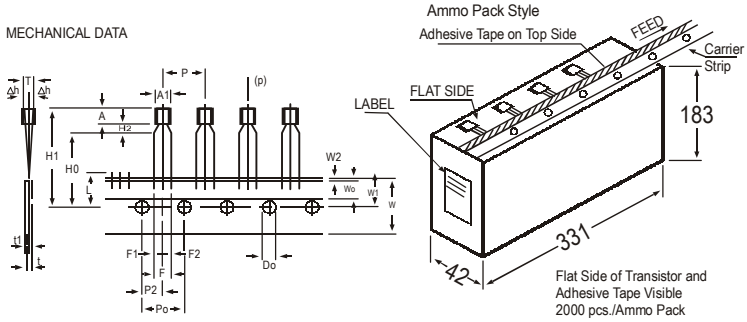




PIN CONFIGURATION
1. EMITTER
2. BASE
3. COLLECTOR

| 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 on Tape and Ammo Pack




**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" | 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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