# TSD965L

## Low Vce(sat) NPN Transistor

TO-92


Pin assignment:
1. Emitter
2. Collector
3. Base

**$BV_{CEO}$ = 10V**
**Ic = 5A**
**$V_{CE\ (SAT)}$, = 0.23V(typ.) @Ic / Ib = 3A / 60mA**

### Features

- Low $V_{CE\ (SAT)}$.
- High current capability
- High allowable power dissipation

### Structure

- Epitaxial planar type.

### Ordering Information

| Part No. | Packing | Package |
|---|---|---|
| TSD965LCT B0 | Bulk Pack | TO-92 |
| TSD965LCT A3 | Ammo Pack | |

### Absolute Maximum Rating (Ta = 25 °C unless otherwise noted)

| Parameter | | Symbol | Limit | Unit |
|---|---|---|---|---|
| Collector-Base Voltage | | $V_{CBO}$ | 15V | V |
| Collector-Emitter Voltage | | $V_{CEO}$ | 10V | V |
| Emitter-Base Voltage | | $V_{EBO}$ | 7 | V |
| Collector Current | DC | $I_C$ | 5 | A |
| | Pulse | | 9 (note 1) | |
| Collector Power Dissipation | | $P_D$ | 0.75 (note 2) | W |
| Operating Junction Temperature | | $T_J$ | +150 | °C |
| Operating Junction and Storage Temperature Range | | $T_{STG}$ | - 55 to +150 | °C |

Note: 1. Single pulse, Pw = 350uS, Duty <= 2%
2. When a device is mounted on a glass epoxy board, Measuring 35mm x 30mm x 1mm

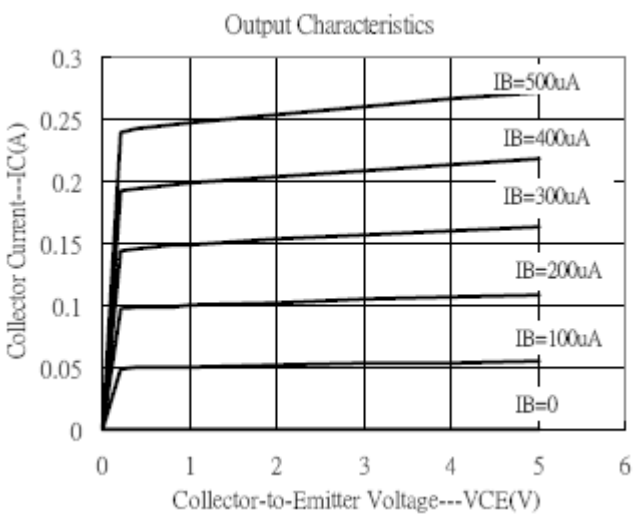
### Electrical Characteristics

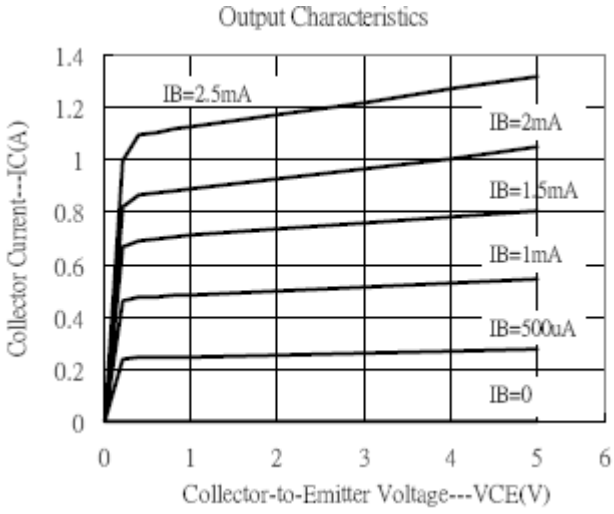
Ta = 25 °C unless otherwise noted

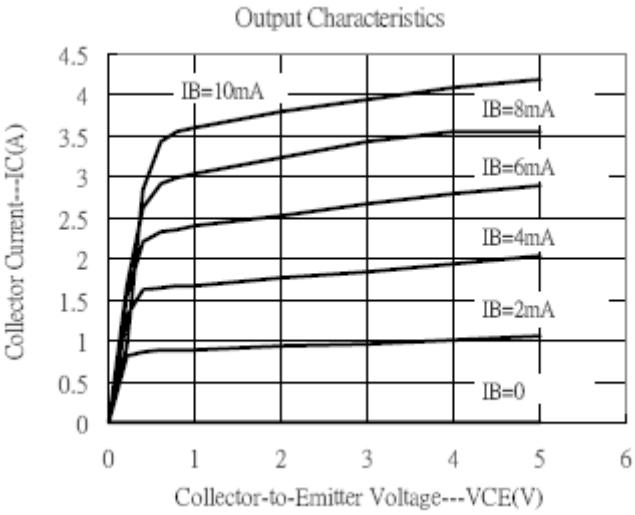
| Parameter | Conditions | Symbol | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Collector-Base Voltage | $I_C$ = 100uA, $I_E$ = 0 | $BV_{CBO}$ | 15 | -- | -- | V |
| Collector-Emitter Breakdown Voltage | $I_C$ = 1mA, $I_B$ = 0 | $BV_{CEO}$ | 10 | -- | -- | V |
| Emitter-Base Breakdown Voltage | $I_E$ = 10uA, $I_C$ = 0 | $BV_{EBO}$ | 7 | -- | -- | V |
| Collector Cutoff Current | $V_{CB}$ = 15V, $I_E$ = 0 | $I_{CBO}$ | -- | -- | 100 | nA |
| Emitter Cutoff Current | $V_{EB}$ = 5V, $I_C$ = 0 | $I_{EBO}$ | -- | -- | 100 | nA |
| Collector-Emitter Saturation Voltage | $I_C$ / $I_B$ = 1.5A / 30mA | $V_{CE(SAT)}$ | -- | -- | 0.18 | V |
| | $I_C$ / $I_B$ = 3.0A / 60mA | $V_{CE(SAT)}$ | -- | 0.23 | 0.35 | V |
| Base-Emitter Saturation Voltage | $I_C$ / $I_B$ = 1.5A / 30mA | $V_{CE(SAT)}$ | -- | 0.95 | 1.2 | V |
| DC Current Transfer Ratio | $V_{CE}$ = 2V, $I_C$ = 0.5A | $h_{FE}$ | 400 | -- | -- | |
| | $V_{CE}$ = 2V, $I_C$ = 2.0A | $h_{FE}$ | 390 | -- | 820 | |
| | $V_{CE}$ = 2V, $I_C$ = 5.0A | $h_{FE}$ | 185 | -- | -- | |
| Transition Frequency | $V_{CE}$ = 6V, $I_C$ = 50mA, f = 100MHz | $f_T$ | -- | 170 | -- | MHz |
| Output Capacitance | $V_{CB}$ = 10V, f=1MHz | Cob | -- | 25 | -- | pF |

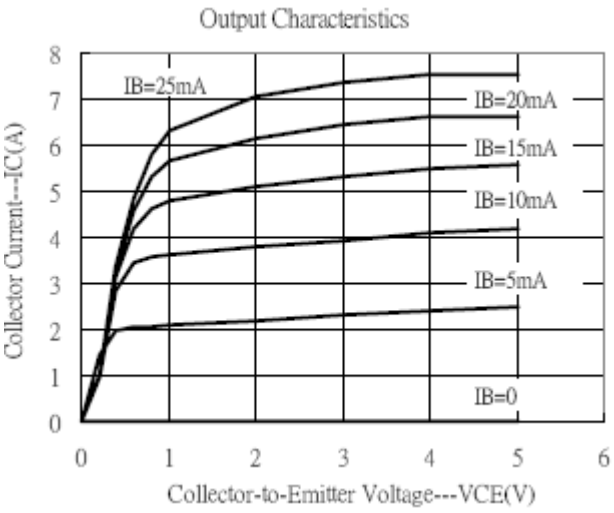
Note : pulse test: pulse width <=380uS, duty cycle <=2%

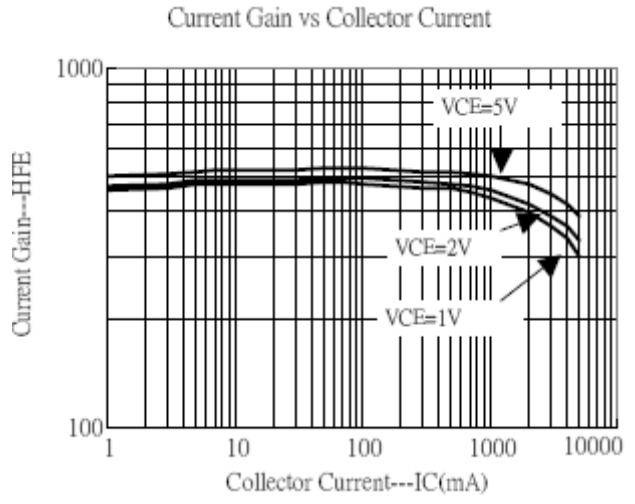
## Electrical Characteristics Curve

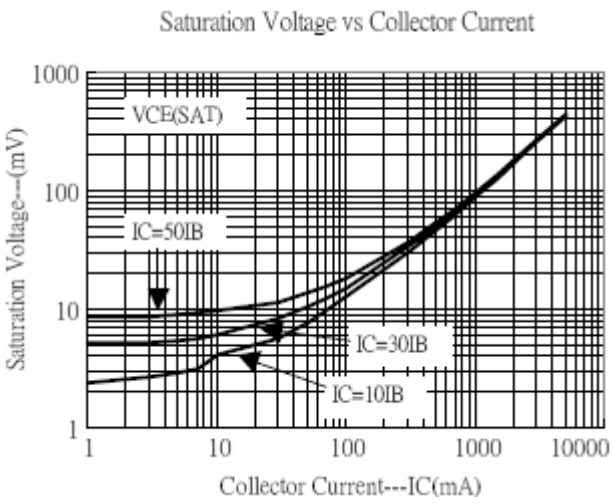


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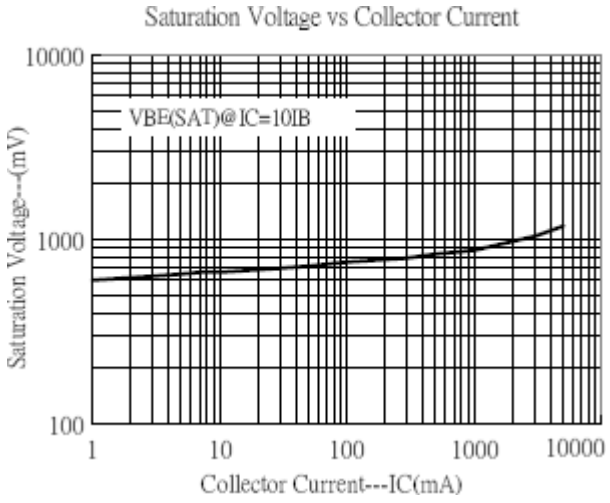
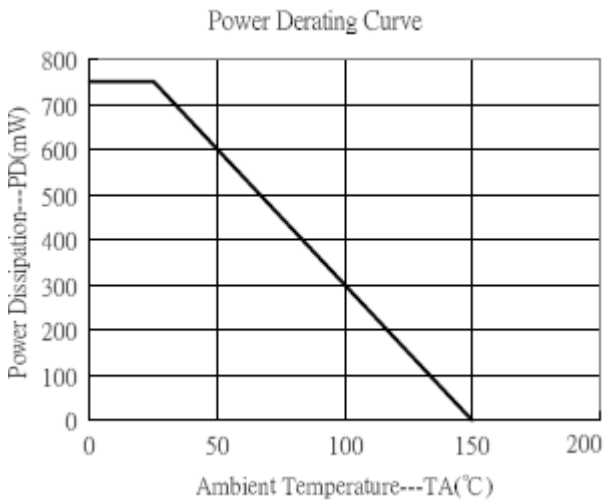
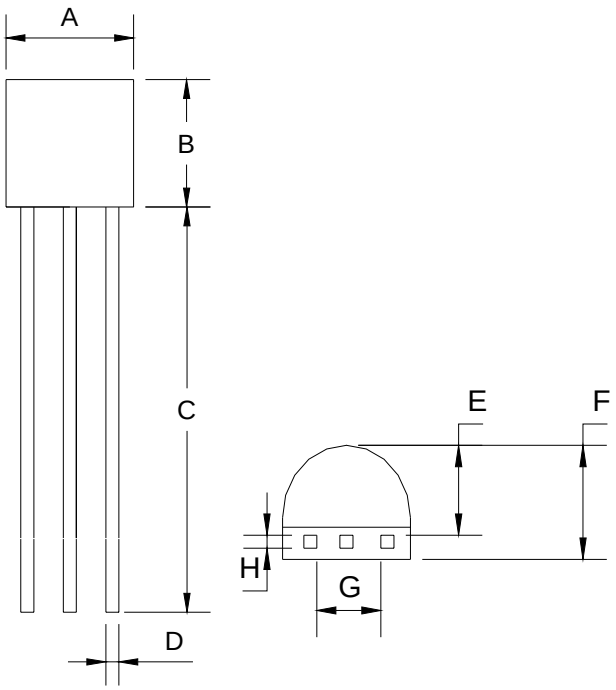


# TO-92 Mechanical Drawing




| TO-92 DIMENSION | | | | |
|---|---|---|---|---|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 4.30 | 4.70 | 0.169 | 0.185 |
| B | 4.30 | 4.70 | 0.169 | 0.185 |
| C | 14.30(typ) | | 0.563(typ) | |
| D | 0.43 | 0.49 | 0.017 | 0.019 |
| E | 2.19 | 2.81 | 0.086 | 0.111 |
| F | 3.30 | 3.70 | 0.130 | 0.146 |
| G | 2.42 | 2.66 | 0.095 | 0.105 |
| H | 0.37 | 0.43 | 0.015 | 0.017 |
| | | | | |