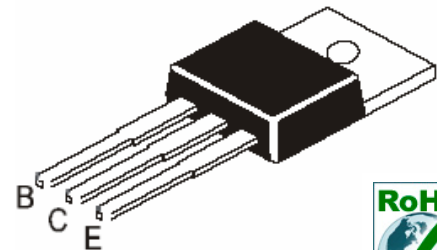


## NPN High Voltage Power Transistors

### Features

- Application for High Voltage and Switching Circuit
- RoHS Compliant



TO-220



### Maximum Ratings *(T<sub>Ambient</sub>=25°C unless noted otherwise)*

| Symbol                               | Description                    | Value      | Unit   | Conditions             |              |
|--------------------------------------|--------------------------------|------------|--------|------------------------|--------------|
| <b>V<sub>CB0</sub></b>               | Collector-Base Voltage:        | TIP47      | 350    | V                      | Open Emitter |
|                                      |                                | TIP48      | 400    |                        |              |
|                                      |                                | TIP49      | 450    |                        |              |
|                                      |                                | TIP50      | 500    |                        |              |
| <b>V<sub>CEO</sub></b>               | Collector-Emitter Voltage:     | TIP47      | 250    | V                      | Open Base    |
|                                      |                                | TIP48      | 300    |                        |              |
|                                      |                                | TIP49      | 350    |                        |              |
|                                      |                                | TIP50      | 400    |                        |              |
| <b>V<sub>EBO</sub></b>               | Emitter-Base Voltage           | 5          | V      | Open Collector         |              |
| <b>I<sub>C</sub></b>                 | Collector Current (Continuous) | 1          | A      |                        |              |
| <b>I<sub>CP</sub></b>                | Collector Current (Peak)       | 2          | A      |                        |              |
| <b>I<sub>B</sub></b>                 | Base Current                   | 0.6        | A      |                        |              |
| <b>P<sub>D</sub></b>                 | Collector Power Dissipation    | 40         | W      | T <sub>C</sub> = 25 °C |              |
|                                      |                                | 0.32       | mW/° C | Derate above 25 °C     |              |
| <b>T<sub>J</sub>,T<sub>STG</sub></b> | Operating Junction and Storage | -55 to 150 | ° C    |                        |              |

### Thermal Characteristics

| Symbol                     | Description                                 | Value | Unit  |
|----------------------------|---|-------|-------|
| <b>R<sub>th(j-a)</sub></b> | Thermal Resistance from Junction to Ambient | 62.5  | ° C/W |
| <b>R<sub>th(j-c)</sub></b> | Thermal Resistance from Junction to Case    | 3.125 | ° C/W |

# NPN High Voltage Power Transistors

## TIP47/48/49/50

### Electrical Characteristics ( $T_{Ambient}=25^{\circ}C$ unless noted otherwise)

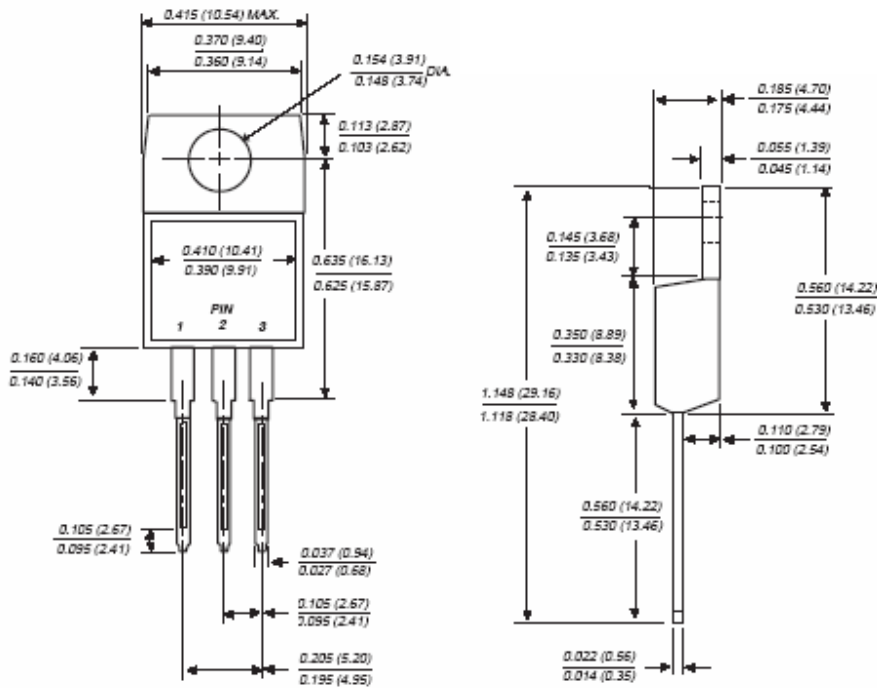
| Symbol  | Description   | Min.                     | Max.             | Unit | Conditions   |
|---|---|--------------------------|------------------|------|--|
| <b>V<sub>CEO</sub> (sus)</b>                                      | Collector- Emitter Sustaining Voltage<br>TIP47<br>TIP48<br>TIP49<br>TIP50 | 250<br>300<br>350<br>400 | --               | V    | $I_C = 30mA; I_B = 0$  |
| <b>I<sub>CEO</sub></b>  | Collector Cut-Off Current<br>TIP47<br>TIP48<br>TIP49<br>TIP50             | --                       | 1<br>1<br>1<br>1 | mA   | $V_{CE} = 150V, I_B = 0$<br>$V_{CE} = 200V, I_B = 0$<br>$V_{CE} = 250V, I_B = 0$<br>$V_{CE} = 300V, I_B = 0$             |
| <b>I<sub>CES</sub></b>  | Collector Cut-Off Current<br>TIP47<br>TIP48<br>TIP49<br>TIP50             | --                       | 1<br>1<br>1<br>1 | mA   | $V_{CE} = 350V, V_{BE} = 0$<br>$V_{CE} = 400V, V_{BE} = 0$<br>$V_{CE} = 450V, V_{BE} = 0$<br>$V_{CE} = 500V, V_{BE} = 0$ |
| <b>I<sub>EBO</sub></b>  | Emitter Cut-Off Current   | --                       | 1                | mA   | $V_{EB} = 5V, I_C = 0$   |
| <b>h<sub>FE</sub></b>   | * DC Current Gain   | 30<br>10                 | 150              |      | $V_{CE} = 10V, I_C = 0.3A$<br>$V_{CE} = 10V, I_C = 1A$   |
| <b>V<sub>CE(sat)</sub></b>  | * Collector-Emitter Saturation Voltage                                    | --                       | 1                | V    | $I_C = 1A; I_B = 0.2A$   |
| <b>V<sub>BE(on)</sub></b>   | * Base-Emitter On Voltage   | --                       | 1.5              | V    | $V_{CE} = 10V, I_C = 1A$   |
| <b>f<sub>T</sub></b>  | Current Gain Bandwidth Product  | 10                       | --               | MHz  | $V_{CE} = 10V, I_C = 0.2A, f=2MHz$   |
| <b>t<sub>ON</sub></b>   | Turn ON Time  | --                       | 0.5              | μs   | $V_{CC} = 400V,$<br>$5 I_{B1} = -2.5 I_{B2} = I_C = 6A$<br>$R_L = 66.7\Omega$  |
| <b>t<sub>STG</sub></b>  | Storage Time  | --                       | 3                | μs   |  |
| <b>t<sub>F</sub></b>  | Fall Time   | --                       | 0.3              | μs   |  |
| * Pulse Test: Pulse Width $\leq 300\mu s$ , duty Cycle $\leq 2\%$ |   |                          |                  |      |  |

# NPN High Voltage Power Transistors

## TIP47/48/49/50

### Package Dimensions

#### TO-220



#### Pin Configuration

1. Base
2. Collector
3. Emitter

# NPN High Voltage Power Transistors

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TIP47/48/49/50

## How to contact us:

### US HEADQUARTERS

28040 WEST HARRISON PARKWAY, VALENCIA, CA 91355-4162

Tel: (800) TAITRON (800) 824-8766 (661) 257-6060

Fax: (800) TAITFAX (800) 824-8329 (661) 257-6415

Email: [taitron@taitroncomponents.com](mailto:taitron@taitroncomponents.com)

Http://[www.taitroncomponents.com](http://www.taitroncomponents.com)

### TAITRON COMPONENTS MEXICO, S.A .DE C.V.

BOULEVARD CENTRAL 5000 INTERIOR 5 PARQUE INDUSTRIAL ATITALAQUIA, HIDALGO C.P.

42970 MEXICO

Tel: +52-55-5560-1519

Fax: +52-55-5560-2190

### TAITRON COMPONENTS INCORPORATED REPRESENTAÇÕES DO BRASIL LTDA

RUA DOMINGOS DE MORAIS, 2777, 2.ANDAR, SALA 24 SAÚDE - SÃO PAULO-SP 04035-001 BRAZIL

Tel: +55-11-5574-7949

Fax: +55-11-5572-0052

### TAITRON COMPONENTS INCORPORATED, SHANGHAI REPRESENTATIVE OFFICE

METROBANK PLAZA, 1160 WEST YAN' AN ROAD, SUITE 1503, SHANGHAI, 200052, CHINA

Tel: +86-21-5424-9942

Fax: +86-21-5424-9931