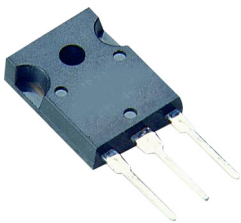


RoHS  
Compliant

## Description

Switchmode Series NPN Power Transistors is designed for use in high-voltage, high-speed, power switching regulators, converters, inverters, motor control system application



## Features

- Collector-Emitter Sustaining Voltage-  
 $V_{CEO(SUS)} = 400\text{ V (Min)}$
- Collector-Emitter Saturation Voltage -  
 $V_{CE(sat)} = 1.5\text{ V (Max.) @ } I_c = 10\text{ A}$
- Switching Time- $t_r = 0.8\text{ us (Max.) @ } I_c = 10\text{ A}$

## Maximum Ratings

| Parameter   | Symbol            | Value       | Unit                   |
|---|-------------------|-------------|------------------------|
| Collector-Emitter Voltage   | $V_{CEO}$         | 400         | V                      |
| Collector-Emitter Voltage ( $V_{Be} = -2.5\text{V}$ )                                 | $V_{CEX}$         | 850         |                        |
| Emitter-Base Voltage  | $V_{EBO}$         | 7           |                        |
| Collector Current - Continuous<br>-Peak   | $I_c$<br>$I_{CM}$ | 15<br>30    | A                      |
| Base Current  | $I_B$             | 4           |                        |
| Total Power Dissipation @ $T_c = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$             | 150<br>1    | W<br>$W^\circ\text{C}$ |
| Operating and Storage Junction<br>Temperature Range                                   | $T_J, T_{STG}$    | -65 to +175 | $^\circ\text{C}$       |

## Thermal Characteristics

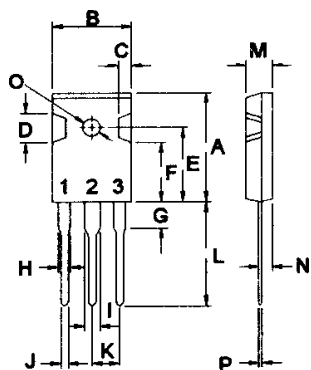
| Parameter                           | Symbol          | Value | Unit               |
|-------------------------------------|-----------------|-------|--------------------|
| Thermal Resistance Junction to Case | $R_{\theta jc}$ | 1     | $^\circ\text{C/W}$ |

## Electrical Characteristics ( $T_C = 25^\circ\text{C}$ unless otherwise specified)

| Parameter  | Symbol  | Min.       | Max.     | Unit |    |
|--|---|------------|----------|------|----|
| <b>Off Characteristics</b>   |   |            |          |      |    |
| Collector-Emitter Sustaining Voltage (1)<br>( $I_C = 200\text{mA}, I_B = 0, L = 25\text{mH}$ )   | $V_{CEO(SUS)}$  | 400<br>450 | -        | V    |    |
| Collector Cut-off Current<br>$V_{CE} = V_{CEX}, V_{BE} = -2.5\text{V}$<br>$V_{CE} = V_{CEX}, V_{BE} = -2.5\text{V}, T_C = 125^\circ\text{C}$ | $I_{CEX}$   |            | 0.2<br>2 | mA   |    |
| Collector Cut-off Current<br>$V_{CE} = V_{CEX}, R_{BE} < 10\Omega$<br>$V_{CE} = V_{CEX}, R_{BE} < 10\Omega, T_C = 125^\circ\text{C}$         | $I_{CER}$   |            | 0.5<br>4 |      |    |
| Emitter Cut-off Current<br>$V_{EB} = 5\text{V}, I_C = 0$   | $I_{EBO}$   |            | 1        |      |    |
| <b>On Characteristics (1)</b>  |   |            |          |      |    |
| Collector-Emitter Saturation Voltage<br>( $I_C = 10\text{A}, I_B = 2\text{A}$ )<br>( $I_C = 15\text{A}, I_B = 3\text{A}$ )                   | $V_{CE(SAT)}$   |            | 1.5<br>5 | V    |    |
| Base-Emitter Saturation Voltage<br>( $I_C = 10\text{A}, I_B = 2\text{A}$ )   | $V_{BE(SAT)}$   | -          | 1.6      |      |    |
| <b>Switching Characteristics</b>   |   |            |          |      |    |
| Turn On Time   | $I_C = 10\text{A}, I_{B1} = 2\text{A}, I_{B2} = -2.0\text{A}$<br>$V_{CC} = 150\text{V}$ | $t_{on}$   |          | 1    | us |
| Storage Time   |   | $t_s$      |          | 3    |    |
| Fall Time  |   | $t_f$      |          | 0.8  |    |

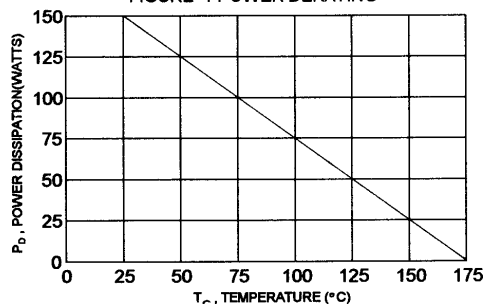
(1) Pulse Test: Pulse width = 300, us, Duty Cycle  $\leq 2\%$

## Dimensions



PIN 1. Base  
2. Collector  
3. Emitter

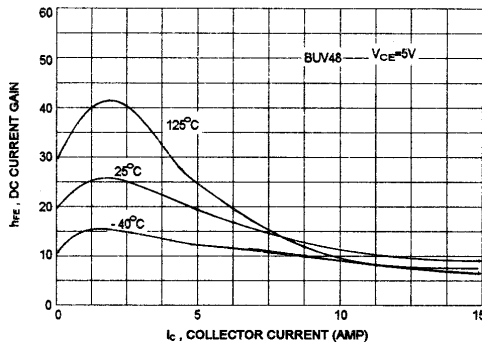
FIGURE -1 POWER DERATING



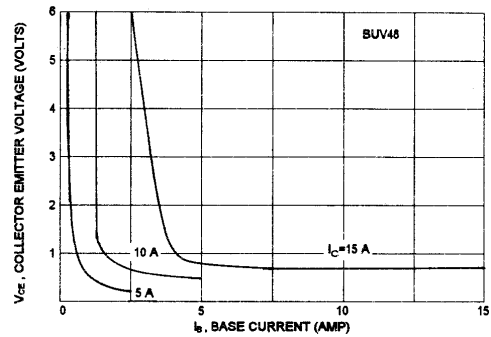
| Dim | Min.  | Max.  |
|-----|-------|-------|
| A   | 20.63 | 22.38 |
| B   | 15.38 | 16.2  |
| C   | 1.9   | 2.7   |
| D   | 5.1   | 6.1   |
| E   | 14.81 | 15.22 |
| F   | 11.72 | 12.84 |
| G   | 4.2   | 4.5   |
| H   | 1.82  | 2.46  |
| I   | 2.92  | 3.23  |
| J   | 0.89  | 1.53  |
| K   | 5.26  | 5.66  |
| L   | 18.5  | 21.5  |
| M   | 4.68  | 5.36  |
| N   | 2.4   | 2.8   |
| O   | 3.25  | 3.65  |
| P   | 0.55  | 0.7   |

Dimensions : Millimetres

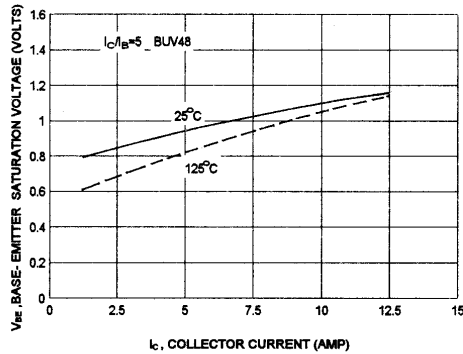
DC CURRENT GAIN



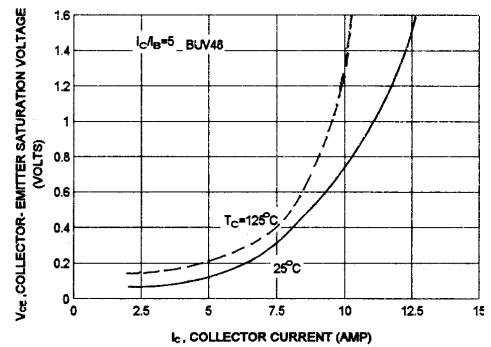
COLLECTOR SATURATION REGION



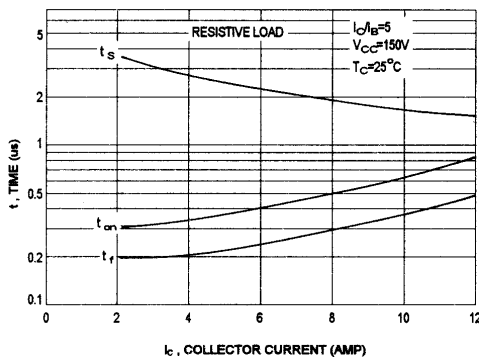
BASE-EMITTER SATURATION VOLTAGE



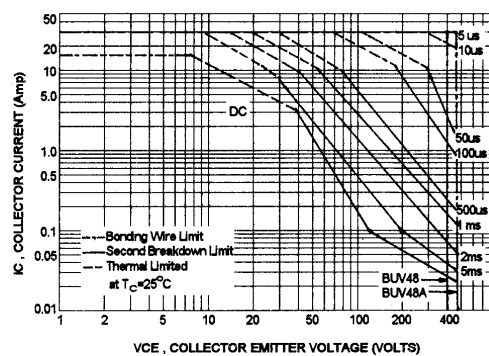
COLLECTOR-EMITTER SATURATION VOLTAGE



SWITCHING TIME



ACTIVE-REGION SAFE OPERATING AREA



## Part Number Table

| Description                              | Part Number |
|--|-------------|
| Transistor, NPN, 15A, 400V, 150W, TO-247 | MP008586    |

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