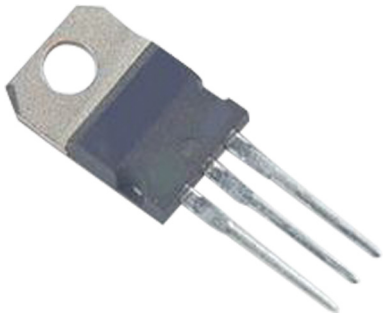
# Power Transistor



## Description:

Switch mode Series NPN Power Transistors are designed for use in high-voltage, highspeed, power switching regulators, converters, inverters, motor control system application.

## Features:

- Collector-Emitter Sustaining Voltage - $V_{CEO(sus)}$ = 400V (Min.)
- Collector-Emitter Saturation Voltage - $V_{CE(sat)}$ = 1V (Max.) at $I_C$ = 1A, $I_B$ = 0.2A
- Switching Time- $t_f$ = 0.6µs (Max.) at $I_C$ = 1A

## Maximum Ratings

| Characteristic | Symbol | BU406 | Unit |
|---|---|---|---|
| Collector-Emitter Voltage | $V_{CEO}$ | 400 | V |
| Collector-Emitter Voltage ($V_{BE}$ = 0) | $V_{CES}$ | 800 | |
| Emitter-Base Voltage | $V_{EBO}$ | 10 | |
| Collector Current-Continuous<br>-Peak | $I_C$<br>$I_{CM}$ | 2<br>3 | A |
| Base Current | $I_B$ | 0.75 | |
| Total Power Dissipation at $T_C$ = 25°C<br>Derate above 25°C | $P_D$ | 40<br>0.32 | W<br>W/°C |
| Operating and Storage Junction Temperature Range | $T_J$, $T_{STG}$ | -65 to +150 | °C |

## Thermal Characteristics

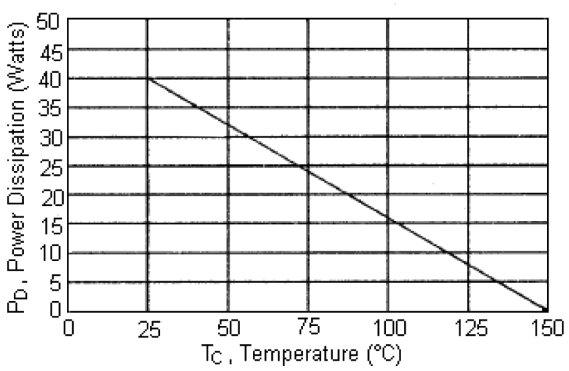
| Characteristic | Symbol | Max. | Unit |
|---|---|---|---|
| Thermal Resistance Junction to Case | $R_{\theta jc}$ | 3.125 | °C/W |

## Electrical Characteristics ($T_C$ = 25°C unless otherwise noted)

| Characteristic | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| **OFF Characteristics** | | | | |
| Collector-Emitter Sustaining Voltage<br>$I_C$ = 0.2A, $I_B$ = 0, L = 25mH | $V_{CEO(sus)}$ | 400 | - | V |
| Collector Cut off Current<br>$V_{CE}$ = $V_{CES}$, $V_{BE}$ = 0<br>$V_{CE}$ = $V_{CES}$, $V_{BE}$ = 0, $T_C$ = 125°C | $I_{CES}$ | - | 0.2<br>1.5 | mA |
| Emitter Cut off Current<br>$V_{EB}$ = 5V, $I_C$ = 0 | $I_{EBO}$ | - | 1 | |
| **ON Characteristics (1)** | | | | |
| DC Current Gain<br>$I_C$ = 100mA, $V_{CE}$ = 5V | $h_{FE}$ | 30 (Typ.) | - | - |
| Collector-Emitter Saturation Voltage<br>$I_C$ = 0.3A, $I_B$ = 30mA<br>$I_C$ = 1A, $I_B$ = 0.2A | $V_{CE\ (sat)}$ | - | 0.8<br>1 | V |
| Base-Emitter Saturation Voltage<br>$I_C$ = 1A, $I_B$ = 0.2A | $V_{BE(sat)}$ | - | 1.1 | |
| **Dynamic Characteristics** | | | | |
| Current Gain-Bandwidth Product<br>$I_C$ = 0.2A, $V_{CE}$ = 10V, f = 1MHz | $f_T$ | 20 (Typ.) | - | MHz |
| **Switching Characteristics** | | | | |
| Turn On Time | $V_{CC}$ = 250V, $I_C$ = 1A<br>$I_{B1}$ = 0.2A, $I_{B2}$ = -0.4A | $t_{on}$ | - | 0.5 | µs |
| Storage Time | | $t_s$ | - | 3.5 | |
| Fall Time | | $t_f$ | - | 0.6 | |

(1) Pulse Test: Pulse Width = 300µs, Duty Cycle ≤2%

**Figure - 1 Power Derating**



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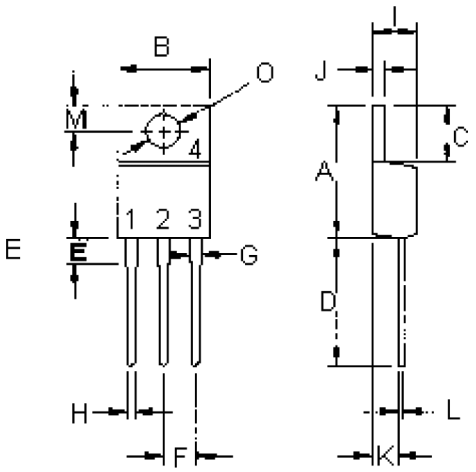


| Dimensions | Min. | Max. |
|---|---|---|
| A | 14.68 | 15.31 |
| B | 9.78 | 10.42 |
| C | 5.01 | 6.52 |
| D | 13.06 | 14.62 |
| E | 3.57 | 4.07 |
| F | 2.42 | 3.66 |
| G | 1.12 | 1.36 |
| H | 0.72 | 0.96 |
| I | 4.22 | 4.98 |
| J | 1.14 | 1.38 |
| K | 2.2 | 2.97 |
| L | 0.33 | 0.55 |
| M | 2.48 | 2.98 |
| O | 3.7 | 3.9 |

Dimensions : Millimetres

**Pin Configuration:**
1. Base
2. Collector
3. Emitter
4. Collector(Case)

## Part Number Table

| Description | Part Number |
|---|---|
| Transistor, NPN, TO-220 | BUX84 |