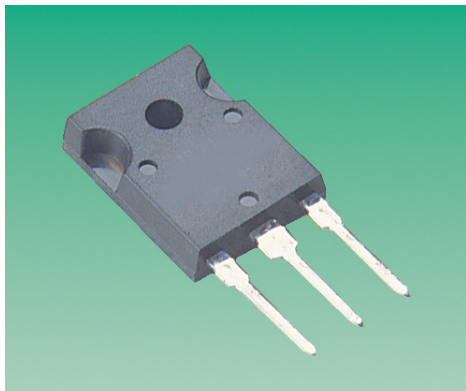


# BUW12A

## 8A Power Transistors



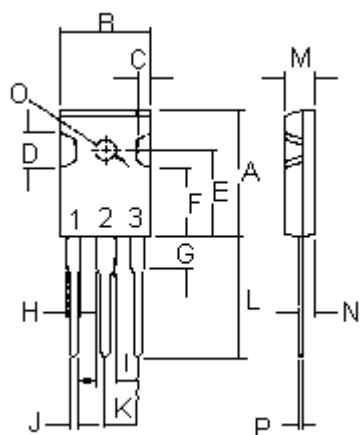
### High Voltage Switching



### Features:

High Voltage Power Transistor is a fast switching high voltage transistor, more specially intended for operating in industrial.

- Collector-Emitter Sustaining Voltage -  
 $V_{CE(sus)} = 450V$  (Minimum) - BUW12A.
- Low Collector-Emitter Saturation Voltage -  
 $V_{CE(sat)} = 1.5V$  (Maximum) at  $I_C = 6.0A$ ,  $I_B = 1.2A$ .



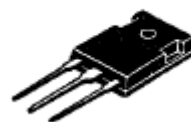
- Pin 1. Base  
2. Collector  
3. Emitter

| Dimensions | Minimum | Maximum |
|------------|---------|---------|
| A          | 20.63   | 22.38   |
| B          | 15.38   | 16.20   |
| C          | 1.90    | 2.70    |
| D          | 5.10    | 6.10    |
| E          | 14.81   | 15.22   |
| F          | 11.72   | 12.84   |
| G          | 4.20    | 4.50    |
| H          | 1.82    | 2.46    |
| I          | 2.92    | 3.23    |
| J          | 0.89    | 1.53    |
| K          | 5.26    | 5.66    |
| L          | 18.50   | 21.50   |
| M          | 4.68    | 5.36    |
| N          | 2.40    | 2.80    |
| O          | 3.25    | 3.65    |
| P          | 0.55    | 0.70    |

Dimensions : Millimetres

**NPN**  
**BUW12A**

8 Ampere  
Power  
Transistors  
450 Volts  
125 Watts



**TO-247(3P)**

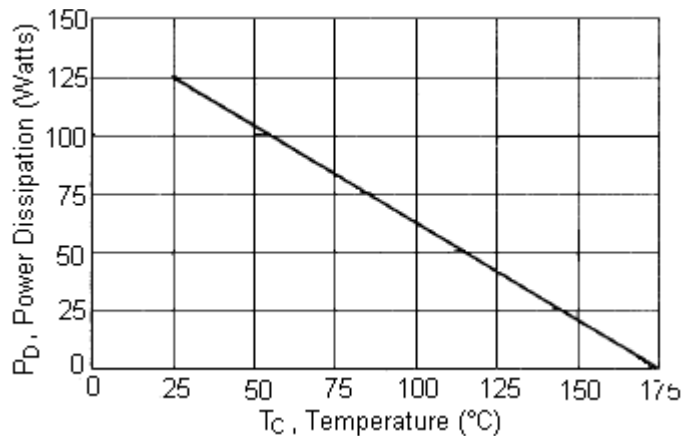
### Maximum Ratings

| Characteristic   | Symbol         | BUW12A       | Unit                           |
|--|----------------|--------------|--------------------------------|
| Collector-Emitter Voltage  | $V_{CEO}$      | 450          | V                              |
| Collector-Emitter Voltage ( $V_{BE} = 0$ )   | $V_{CES}$      | 1000         |                                |
| Emitter-Base Voltage   | $V_{EBO}$      | 9.0          |                                |
| Collector Current-Continuous<br>-Peak  | $I_C$          | 8.0<br>20    | A                              |
| Base Current-Continuous  | $I_B$          | 4.0          |                                |
| Total Power Dissipation at $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 125<br>0.833 | W<br>$\text{W}/^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range                                       | $T_J, T_{STG}$ | -65 to +175  | $^\circ\text{C}$               |

### Thermal Characteristics

| Characteristic                      | Symbol          | Maximum | Unit                      |
|-------------------------------------|-----------------|---------|---------------------------|
| Thermal Resistance Junction to Case | $R_{\theta jc}$ | 1.2     | $^\circ\text{C}/\text{W}$ |

Figure - 1 Power Derating

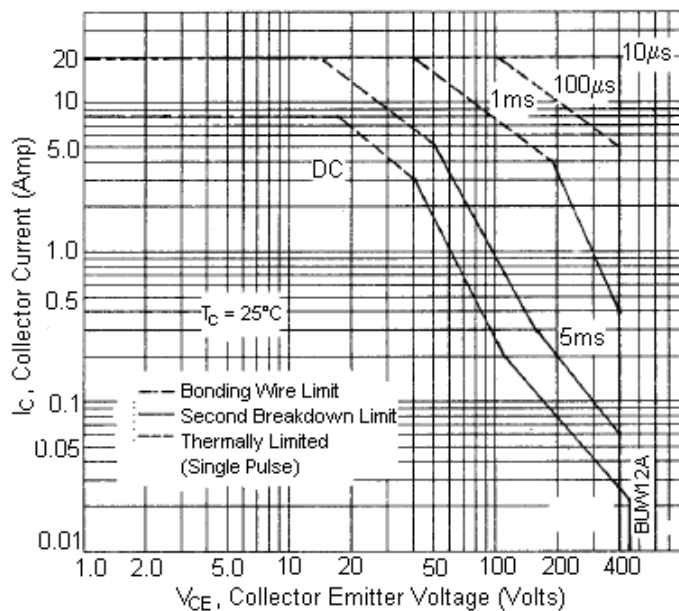


### Electrical Characteristics ( $T_C = 25^\circ\text{C}$ unless otherwise noted)

| Characteristic   | Symbol  | Minimum         | Maximum | Unit |               |
|--|---|-----------------|---------|------|---------------|
| <b>OFF Characteristics</b>   |   |                 |         |      |               |
| Collector-Emitter Sustaining Voltage (1)<br>( $I_C = 100\text{mA}$ , $I_B = 0$ , $L = 25\text{mH}$ )<br>BUW12A | $V_{\text{CEO(sus)}}$   | 450             | -       | V    |               |
| Collector Cut off Current<br>( $V_{\text{CE}} = 1000\text{V}$ , $V_{\text{BE}} = 0$ )<br>BUW12A                | $I_{\text{CES}}$  | -               | 1.0     | mA   |               |
| Emitter Cut off Current<br>( $V_{\text{EB}} = 9.0\text{V}$ , $I_C = 0$ )                                       | $I_{\text{EBO}}$  | -               | 10      |      |               |
| <b>ON Characteristics (1)</b>  |   |                 |         |      |               |
| Collector-Emitter Saturation Voltage<br>( $I_C = 6.0\text{A}$ , $I_B = 1.2\text{A}$ )                          | $V_{\text{CE(sat)}}$  | -               | 1.5     | V    |               |
| Base-Emitter Saturation Voltage<br>( $I_C = 6.0\text{A}$ , $I_B = 1.2\text{A}$ )                               | $V_{\text{BE(sat)}}$  | -               |         |      |               |
| <b>Switching Characteristics</b>   |   |                 |         |      |               |
| Turn On Time   | $V_{\text{CC}} = 240\text{V}$ , $I_C = 6.0\text{A}$<br>$I_{\text{B1}} = 1.2\text{A}$ , $I_{\text{B2}} = -1.2\text{A}$ | $t_{\text{on}}$ | -       | 1.0  | $\mu\text{s}$ |
| Storage Time   |   | $t_{\text{s}}$  | -       | 4.0  |               |
| Fall Time  |   | $t_{\text{f}}$  | -       | 0.8  |               |

(1) Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

Active-Region Safe Operating Area



There are two limitations on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate  $I_C$ - $V_{CE}$  limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than the curves indicate.

The data of SOA curve is based on  $T_{J(PK)} = 175^\circ\text{C}$ ;  $T_C$  is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(PK)} \leq 175^\circ\text{C}$ . At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

### Specifications

| $I_{C(av)}$<br>maximum<br>(A) | $V_{CE0}$<br>maximum<br>(V) | $V_{CES}$<br>maximum<br>(V) | $V_{CE(Sat)}$<br>(V)<br>at $I_C = 6A$ | $P_{tot}$<br>at $25^\circ\text{C}$<br>(W) | Package | Type | Part Number |
|-------------------------------|-----------------------------|-----------------------------|---------------------------------------|---|---------|------|-------------|
| 8                             | 450                         | 1000                        | 1.5                                   | 125                                       | TO-3P   | NPN  | BUW12A      |

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