



**BUW48**  
**BUW49**

## HIGH POWER NPN SILICON TRANSISTORS

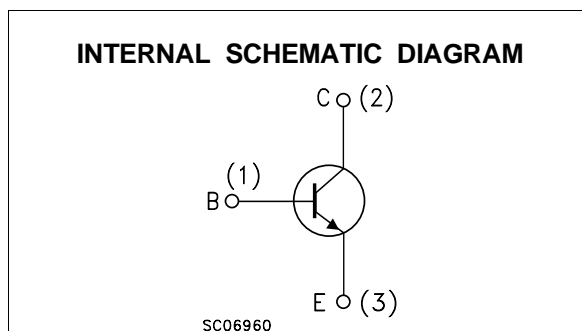
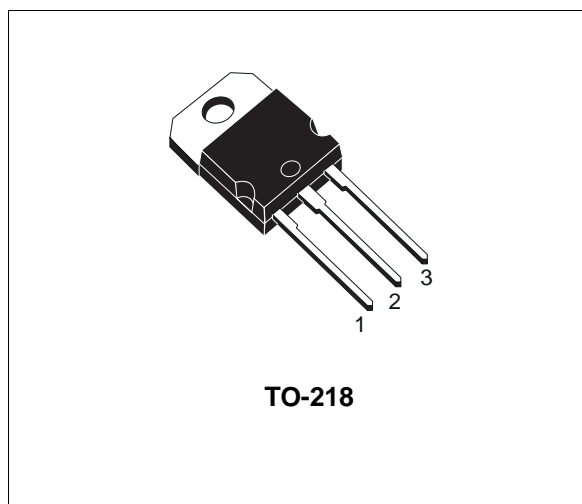
- STMicroelectronics PREFERRED SALESTYPES
- NPN TRANSISTOR
- HIGH CURRENT CAPABILITY
- FAST SWITCHING SPEED
- VERY LOW SATURATION VOLTAGE AND HIGH GAIN

### APPLICATION

- SWITCHING REGULATORS
- MOTOR CONTROL
- HIGH FREQUENCY AND EFFICIENCY CONVERTERS

### DESCRIPTION

The BUW48 and BUW49 are Multi-Epitaxial Planar NPN transistor in TO-218 plastic package. They are intended for use in high frequency and efficiency converters such as motor controllers and industrial equipment.



### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter  | Value      |       | Unit             |
|-----------|--|------------|-------|------------------|
|           |  | BUW48      | BUW49 |                  |
| $V_{CEV}$ | Collector-Emitter Voltage ( $V_{BE} = -1.5\text{ V}$ ) | 120        | 160   | V                |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )                | 60         | 80    | V                |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )                     | 7          |       | V                |
| $I_C$     | Collector Current                                      | 30         |       | A                |
| $I_{CM}$  | Collector Peak Current ( $t_p < 5\text{ ms}$ )         | 45         | 40    | A                |
| $I_B$     | Base Current   | 8          | 6     | A                |
| $I_{BM}$  | Base Peak Current ( $t_p < 5\text{ ms}$ )              | 12         | 10    | A                |
| $P_{tot}$ | Total Dissipation at $T_c = 25\text{ }^\circ\text{C}$  | 150        |       | W                |
| $T_{stg}$ | Storage Temperature                                    | -65 to 175 |       | $^\circ\text{C}$ |
| $T_j$     | Max. Operating Junction Temperature                    | 175        |       | $^\circ\text{C}$ |

## THERMAL DATA

|                       |                                  |     |   |      |
|-----------------------|----------------------------------|-----|---|------|
| R <sub>thj-case</sub> | Thermal Resistance Junction-case | Max | 1 | °C/W |
|-----------------------|----------------------------------|-----|---|------|

## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

| Symbol                 | Parameter   | Test Conditions  | Min.     | Typ. | Max.                     | Unit             |
|------------------------|---|--|----------|------|--------------------------|------------------|
| I <sub>CEX</sub>       | Collector Cut-off Current (V <sub>BE</sub> = -1.5V)       | V <sub>CE</sub> = V <sub>CEX</sub><br>V <sub>CE</sub> = V <sub>CEX</sub> T <sub>C</sub> = 125°C  |          |      | 1<br>3                   | mA<br>mA         |
| I <sub>EBO</sub>       | Emitter Cut-off Current (I <sub>C</sub> = 0)              | V <sub>EB</sub> = 5 V  |          |      | 1                        | mA               |
| V <sub>CEO(sus)*</sub> | Collector-Emitter Sustaining Voltage (I <sub>B</sub> = 0) | I <sub>C</sub> = 0.2A L = 25 mH for <b>BUW48</b><br>for <b>BUW49</b>   | 60<br>80 |      |                          | V<br>V           |
| V <sub>EBO</sub>       | Emitter-base Voltage (I <sub>C</sub> = 0)                 | I <sub>E</sub> = 50 mA   | 7        |      |                          | V                |
| V <sub>CE(sat)*</sub>  | Collector-Emitter Saturation Voltage                      | I <sub>C</sub> = 20A I <sub>B</sub> = 2A for <b>BUW48</b><br>I <sub>C</sub> = 40A I <sub>B</sub> = 4A for <b>BUW48</b><br>I <sub>C</sub> = 15A I <sub>B</sub> = 1.5A for <b>BUW49</b><br>I <sub>C</sub> = 30A I <sub>B</sub> = 3A for <b>BUW49</b> |          |      | 0.6<br>1.4<br>0.5<br>1.2 | V<br>V<br>V<br>V |
| V <sub>BE(sat)*</sub>  | Base-Emitter Saturation Voltage                           | I <sub>C</sub> = 40A I <sub>B</sub> = 4A for <b>BUW48</b><br>I <sub>C</sub> = 30A I <sub>B</sub> = 3A for <b>BUW49</b>   |          |      | 2.1<br>2                 | V<br>V           |
| f <sub>T</sub>         | Transition Frequency                                      | I <sub>C</sub> = 1A V <sub>CE</sub> = 15V f = 15 MHz   |          | 8    |                          | MHz              |

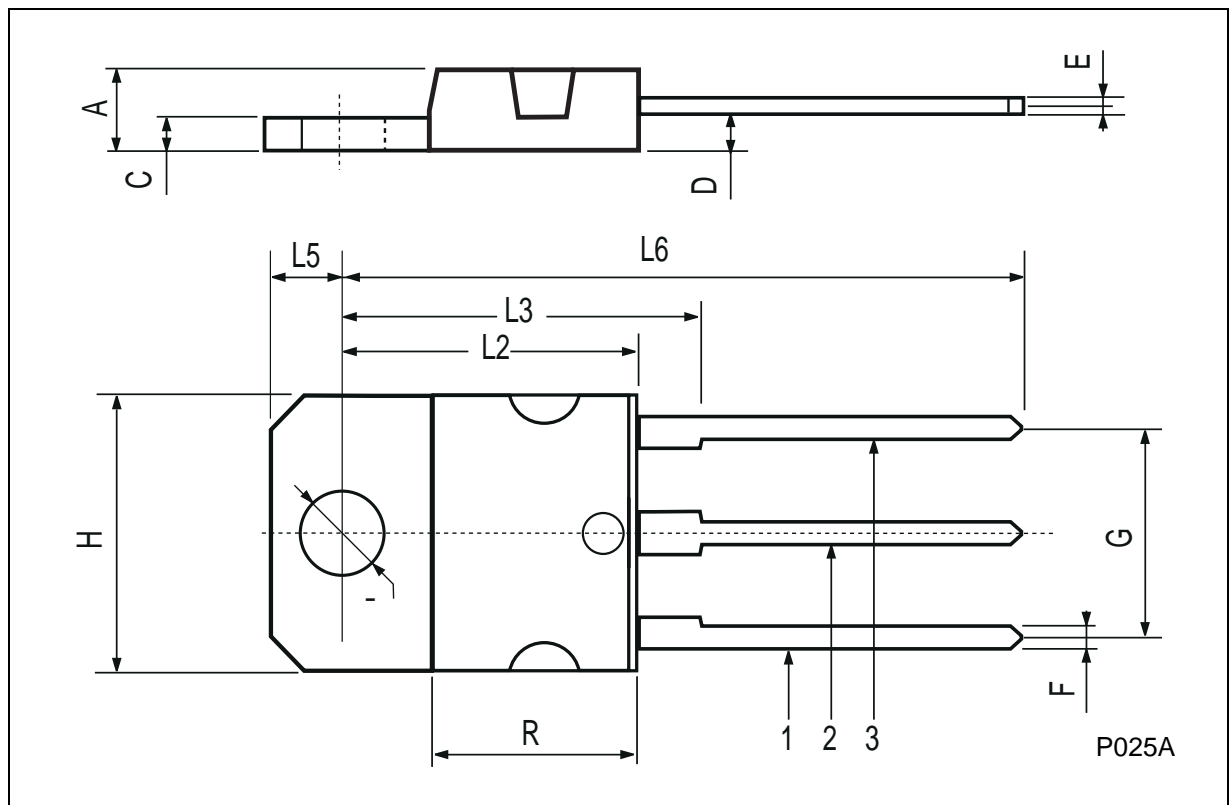
## RESISTIVE LOAD

| Symbol  | Parameter                                 | Test Conditions   | Min. | Typ.               | Max.               | Unit           |
|---|---|---|------|--------------------|--------------------|----------------|
| t <sub>on</sub><br>t <sub>s</sub><br>t <sub>f</sub> | Turn-on Time<br>Storage Time<br>Fall Time | for BUW48<br>V <sub>CC</sub> = 60V I <sub>C</sub> = 40A<br>I <sub>B1</sub> = -I <sub>B2</sub> = 4A                        |      | 1.2<br>0.6<br>0.17 | 1.5<br>1.1<br>0.25 | μs<br>μs<br>μs |
| t <sub>s</sub><br>t <sub>f</sub>                    | Storage Time<br>Fall Time                 | for BUW48<br>V <sub>CC</sub> = 60V I <sub>C</sub> = 40A<br>I <sub>B1</sub> = -I <sub>B2</sub> = 4A T <sub>C</sub> = 100°C |      |                    | 1.65<br>0.5        | μs<br>μs       |
| t <sub>on</sub><br>t <sub>s</sub><br>t <sub>f</sub> | Turn-on Time<br>Storage Time<br>Fall Time | for BUW49<br>V <sub>CC</sub> = 80V I <sub>C</sub> = 30A<br>I <sub>B1</sub> = -I <sub>B2</sub> = 4A                        |      | 0.8<br>0.6<br>0.15 | 1.2<br>1.1<br>0.25 | μs<br>μs<br>μs |
| t <sub>s</sub><br>t <sub>f</sub>                    | Storage Time<br>Fall Time                 | for BUW49<br>V <sub>CC</sub> = 80V I <sub>C</sub> = 30A<br>I <sub>B1</sub> = -I <sub>B2</sub> = 4A T <sub>C</sub> = 100°C |      |                    | 1.65<br>0.5        | μs<br>μs       |

\* Pulsed: Pulse duration = 300 μs, duty cycle < 1.5 %

**TO-218 (SOT-93) MECHANICAL DATA**

| DIM. | mm   |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 4.7  |      | 4.9  | 0.185 |       | 0.193 |
| C    | 1.17 |      | 1.37 | 0.046 |       | 0.054 |
| D    |      | 2.5  |      |       | 0.098 |       |
| E    | 0.5  |      | 0.78 | 0.019 |       | 0.030 |
| F    | 1.1  |      | 1.3  | 0.043 |       | 0.051 |
| G    | 10.8 |      | 11.1 | 0.425 |       | 0.437 |
| H    | 14.7 |      | 15.2 | 0.578 |       | 0.598 |
| L2   | -    |      | 16.2 | -     |       | 0.637 |
| L3   |      | 18   |      |       | 0.708 |       |
| L5   | 3.95 |      | 4.15 | 0.155 |       | 0.163 |
| L6   |      | 31   |      |       | 1.220 |       |
| R    | -    |      | 12.2 | -     |       | 0.480 |
| Ø    | 4    |      | 4.1  | 0.157 |       | 0.161 |



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