

## HIGH POWER NPN SILICON TRANSISTORS

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

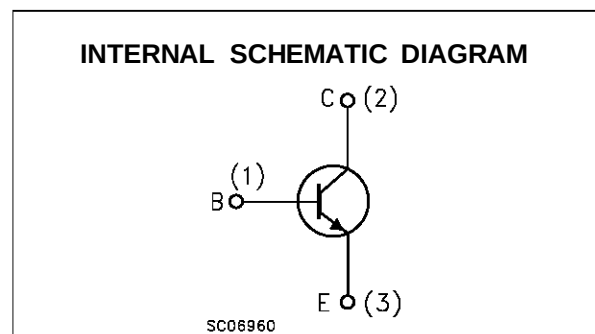
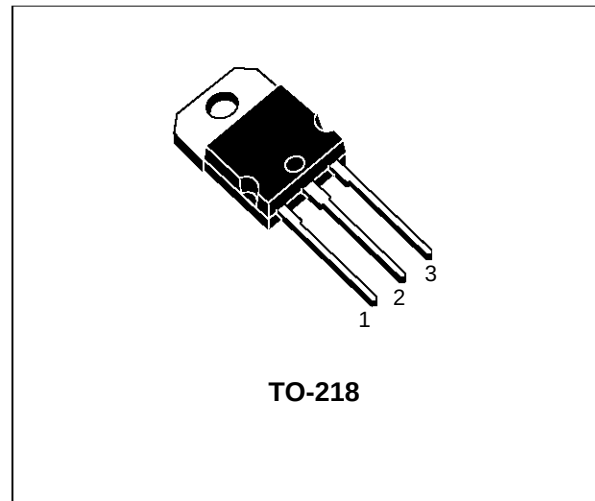
### APPLICATION

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

### DESCRIPTION

The BUW48 and BUW49 are Multiepitaxial planar NPN transistor in TO-218 plastic package.

It's 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 | Unit       |
| $V_{CEV}$ | Collector-emitter Voltage ( $V_{BE} = -1.5V$ )     | 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                             | 45         | 40    | A          |
| $I_B$     | Base Current                                       | 8          | 6     | A          |
| $I_{BM}$  | Base Peak Current                                  | 12         | 10    | A          |
| $P_{tot}$ | Total Power Dissipation at $T_{case} < 25^\circ C$ | 150        |       | W          |
| $T_{stg}$ | Storage Temperature                                | -65 to 175 |       | $^\circ C$ |
| $T_j$     | Max Operating Junction Temperature                 | 175        |       | $^\circ C$ |

**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>CE</sub> = V <sub>CEX</sub> V <sub>BE</sub> = -1.5V<br>V <sub>CE</sub> = V <sub>CEX</sub> V <sub>BE</sub> = -1.5V 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>C</sub> = 0.2A L = 25 mH for <b>BUW48</b><br>for <b>BUW49</b>                                                                                                                                                                               | 60<br>80 |      |                          | V<br>V           |
| V <sub>EB0</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>BUW49</b><br>I <sub>C</sub> = 15A I <sub>B</sub> = 1.5A for <b>BUW48</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              |

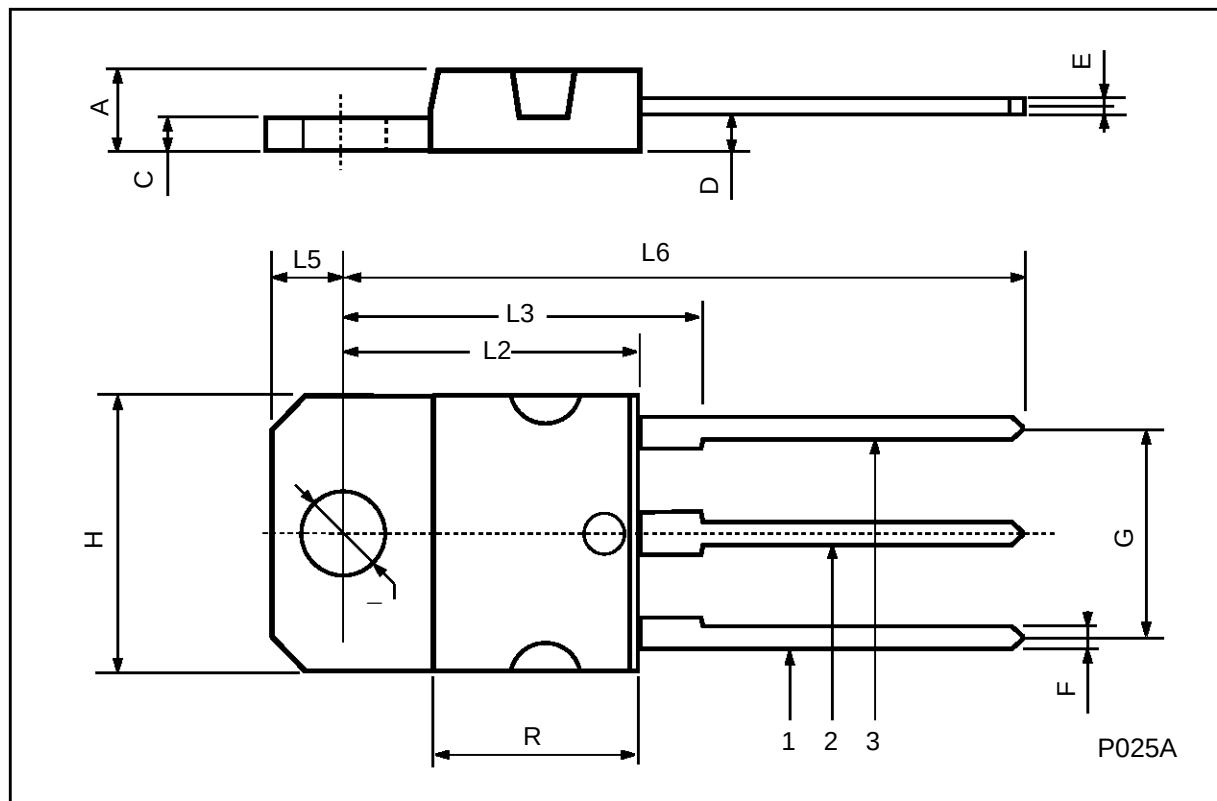
**RESISTIVE LOAD**

| 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 |      |                    | 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 |      |                    | 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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