



BUX48/48A BUV48A/V48AFI

HIGH POWER NPN SILICON TRANSISTORS

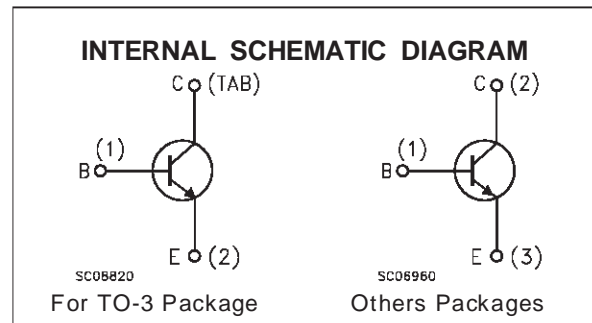
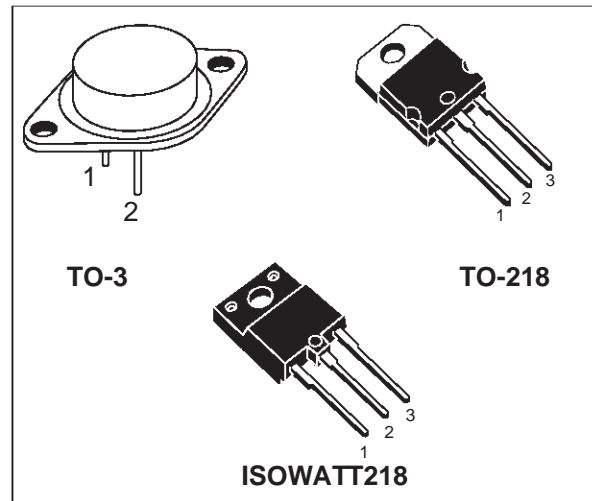
- STMicroelectronics PREFERRED SALESTYPES
- NPN TRANSISTOR
- HIGH VOLTAGE CAPABILITY
- HIGH CURRENT CAPABILITY
- FAST SWITCHING SPEED

APPLICATIONS

- SWITCH MODE POWER SUPPLIES
- FLYBACK AND FORWARD SINGLE TRANSISTOR LOW POWER CONVERTERS

DESCRIPTION

The BUX48/A, BUV48A and BUV48AFI are silicon multiepitaxial mesa NPN transistors mounted respectively in TO-3 metal case, TO-218 plastic package and ISOWATT218 fully isolated package. They are particularly intended for switching and industrial applications from single and three-phase mains.



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | | | Unit |
|------------------|---|-------------|------------------------------|-------------------|------|
| | | BUX48 | BUX48A BUV48A BUV48AFI | | |
| V _{CER} | Collector-Emitter Voltage (R _{BE} = 10Ω) | 850 | 1000 | | V |
| V _{CES} | Collector-Emitter Voltage (V _{BE} = 0) | 850 | 1000 | | V |
| V _{CEO} | Collector-Emitter Voltage (I _B = 0) | 400 | 450 | | V |
| V _{EBO} | Emitter-Base Voltage (I _C = 0) | 7 | | | V |
| I _C | Collector Current | 15 | | | A |
| I _{CM} | Collector Peak Current | 30 | | | A |
| I _{CP} | Collector Peak Current non repetitive (t _p < 20μS) | 55 | | | A |
| I _B | Base Current | 4 | | | A |
| I _{BM} | Base Peak Current | 20 | | | A |
| | | TO-3 | TO-218 | ISOWATT218 | |
| P _{tot} | Total Dissipation at T _c = 25 °C | 175 | 125 | 55 | W |
| T _{stg} | Storage Temperature | -65 to 200 | -65 to 150 | -65 to 150 | °C |
| T _j | Max. Operating Junction Temperature | 200 | 150 | 150 | °C |

BUX48/BUX48A/BUV48A/BUV48AFI

THERMAL DATA

| | | TO-3 | TO-218 | ISOWATT218 | |
|-----------------------|--------------------------------------|------|--------|------------|------|
| R _{thj-case} | Thermal Resistance Junction-case Max | 1 | 1 | 2.2 | °C/W |

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-----------------------|---|--|------------|------|-----------------------------|-----------------------|
| I _{CES} | Collector Cut-off Current (V _{BE} = 0) | V _{CE} = rated V _{CE} V _{CE} = rated V _{CES} , T _c = 125 °C | | | 200 2 | μA mA |
| I _{CER} | Collector Cut-off Current (R _{BE} = 10 Ω) | V _{CE} = rated V _{CER} V _{CE} = rated V _{CER} , T _c = 125 °C | | | 500 4 | μA mA |
| I _{EBO} | Emitter Cut-off Current (I _C = 0) | V _{EB} = 5 V | | | 1 | mA |
| V _{CEO(SUS)} | Collector-Emitter Sustaining Voltage (I _B = 0) | I _C = 200 mA L = 25mH for BUX48/X48A/V48A/V48AFI | 400 450 | | | V V |
| V _{EBO} | Emitter-Base Voltage (I _C = 0) | I _E = 50 mA | 7 | | 30 | V |
| V _{CE(sat)*} | Collector-Emitter Saturation Voltage | for BUX48 I _C = 10 A I _B = 2 A I _C = 15 A I _B = 4 A I _C = 15 A I _B = 3 A for BUX48A/V48A/V48AFI I _C = 8 A I _B = 1.6 A I _C = 12 A I _B = 2.4 A | | | 1.5 3.5 5 1.5 5 | V V V V V |
| V _{BE(sat)*} | Base-Emitter Saturation Voltage | for BUX48 I _C = 10 A I _B = 2 A for BUX48A/V48A/V48AFI I _C = 8 A I _B = 1.6 A | | | 1.6 1.6 | V V |

* Pulsed: Pulse duration = 300 μs, duty cycle ≤ 2 %

RESISTIVE SWITCHING TIMES

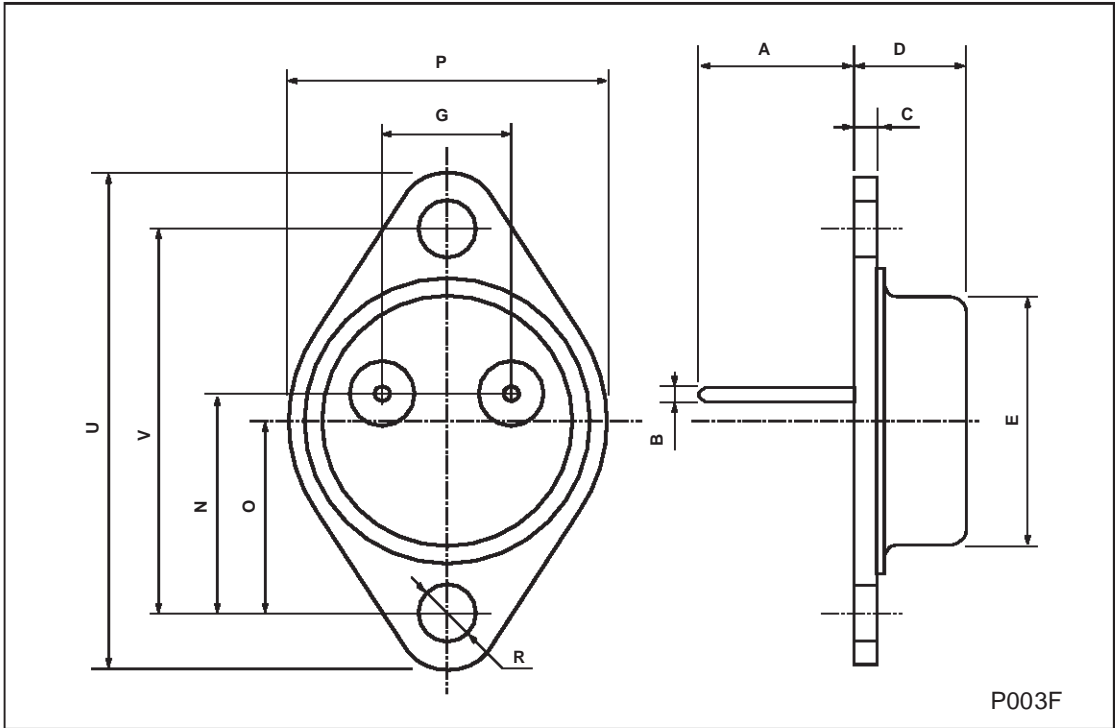
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-----------------|--------------|--|------|------|------------|----------|
| t _{on} | Turn-on Time | for BUX48 V _{CC} = 150 V I _C = 10 A I _{B1} = 2 A for BUX48A/V48A/V48AFI V _{CC} = 150 V I _C = 8 A I _{B1} = 1.6 A | | | 1 1 | μs μs |
| t _s | Storage Time | for BUX48 V _{CC} = 150 V I _C = 10 A I _{B1} = - I _{B2} = 2 A for BUX48A/V48A/V48AFI V _{CC} = 150 V I _C = 8 A I _{B1} = - I _{B2} = 1.6 A | | | 3 3 | μs μs |
| t _f | Fall Time | for BUX48 V _{CC} = 150 V I _C = 10 A I _{B1} = - I _{B2} = 2 A for BUX48A/V48A/V48AFI V _{CC} = 150 V I _C = 8 A I _{B1} = - I _{B2} = 1.6 A | | | 0.8 0.8 | μs μs |

INDUCTIVE SWITCHING TIMES

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|--------|--------------|--|------|------|------|--------------------------------|
| t_s | Storage Time | for BUX48 $V_{CC} = 300\text{ V}$ $I_C = 10\text{ A}$ $L_B = 3\text{ }\mu\text{H}$ $V_{BE} = -5\text{ V}$ $I_{B1} = 2\text{ A}$ same, $T_{case} = 125\text{ }^\circ\text{C}$ for BUX48A/V48A/V48AFI $V_{CC} = 300\text{ V}$ $I_C = 8\text{ A}$ $L_B = 3\text{ }\mu\text{H}$ $V_{BE} = -5\text{ V}$ $I_{B1} = 1.6\text{ A}$ same, $T_{case} = 125\text{ }^\circ\text{C}$ | | 2.7 | 5 | μs μs |
| t_s | Fall Time | for BUX48 $V_{CC} = 300\text{ V}$ $I_C = 10\text{ A}$ $L_B = 3\text{ }\mu\text{H}$ $V_{BE} = -5\text{ V}$ $I_{B1} = 2\text{ A}$ same, $T_{case} = 125\text{ }^\circ\text{C}$ for BUX48A/V48A/V48AFI $V_{CC} = 300\text{ V}$ $I_C = 8\text{ A}$ $L_B = 3\text{ }\mu\text{H}$ $V_{BE} = -5\text{ V}$ $I_{B1} = 1.6\text{ A}$ same, $T_{case} = 125\text{ }^\circ\text{C}$ | | 0.16 | 0.4 | μs μs |
| | | | | 0.13 | 0.4 | μs μs |

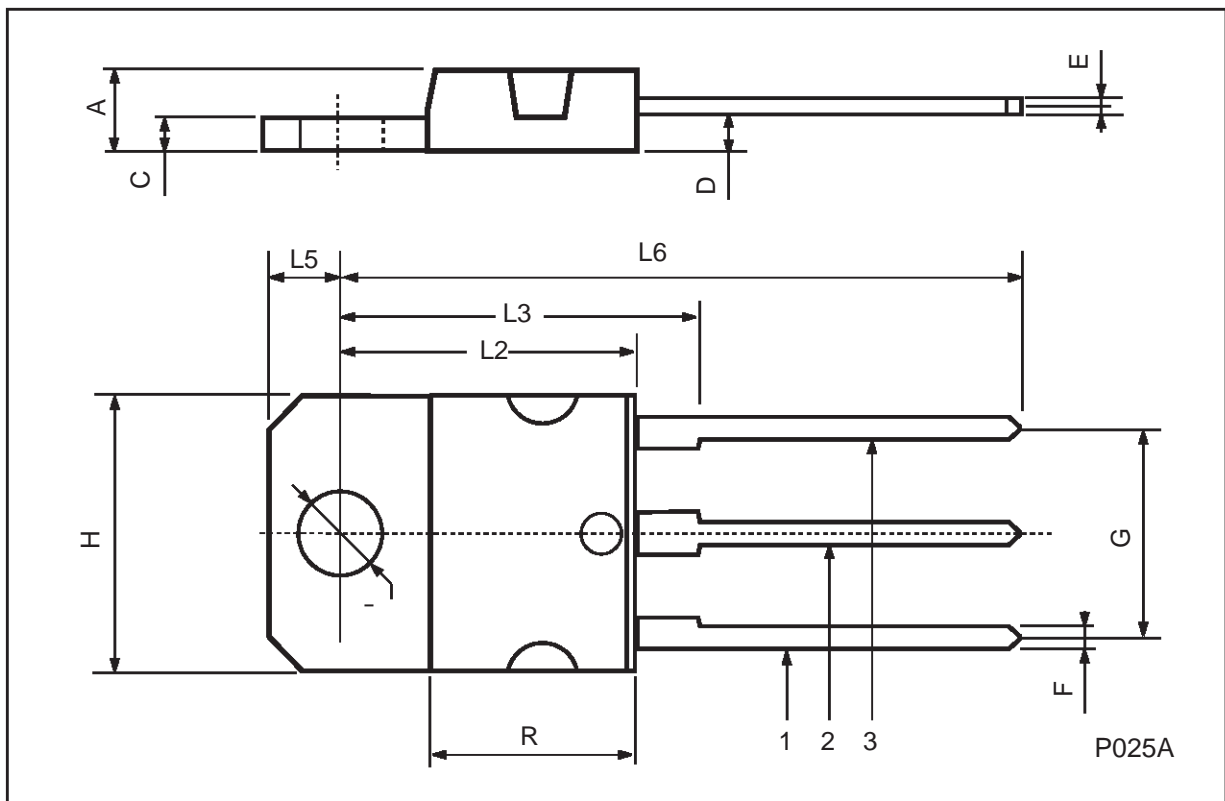
TO-3 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|-------|------|-------|-------|------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 11.00 | | 13.10 | 0.433 | | 0.516 |
| B | 0.97 | | 1.15 | 0.038 | | 0.045 |
| C | 1.50 | | 1.65 | 0.059 | | 0.065 |
| D | 8.32 | | 8.92 | 0.327 | | 0.351 |
| E | 19.00 | | 20.00 | 0.748 | | 0.787 |
| G | 10.70 | | 11.10 | 0.421 | | 0.437 |
| N | 16.50 | | 17.20 | 0.649 | | 0.677 |
| P | 25.00 | | 26.00 | 0.984 | | 1.023 |
| R | 4.00 | | 4.09 | 0.157 | | 0.161 |
| U | 38.50 | | 39.30 | 1.515 | | 1.547 |
| V | 30.00 | | 30.30 | 1.187 | | 1.193 |



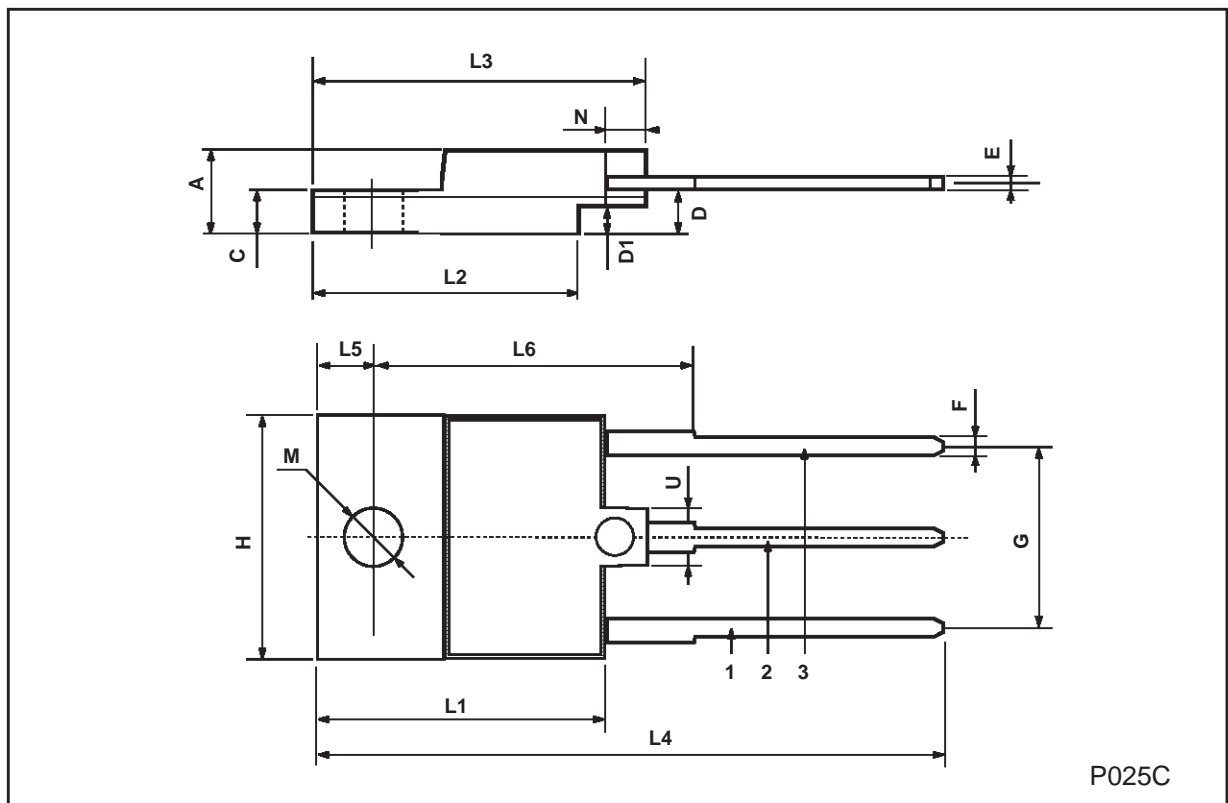
TO-218 (SOT-93) MECHANICAL DATA

| 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 |



ISOWATT218 MECHANICAL DATA

| DIM. | mm | | | inch | | |
|------|-------|------|-------|-------|-------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A | 5.35 | | 5.65 | 0.210 | | 0.222 |
| C | 3.3 | | 3.8 | 0.130 | | 0.149 |
| D | 2.9 | | 3.1 | 0.114 | | 0.122 |
| D1 | 1.88 | | 2.08 | 0.074 | | 0.081 |
| E | 0.75 | | 1 | 0.029 | | 0.039 |
| F | 1.05 | | 1.25 | 0.041 | | 0.049 |
| G | 10.8 | | 11.2 | 0.425 | | 0.441 |
| H | 15.8 | | 16.2 | 0.622 | | 0.637 |
| L1 | 20.8 | | 21.2 | 0.818 | | 0.834 |
| L2 | 19.1 | | 19.9 | 0.752 | | 0.783 |
| L3 | 22.8 | | 23.6 | 0.897 | | 0.929 |
| L4 | 40.5 | | 42.5 | 1.594 | | 1.673 |
| L5 | 4.85 | | 5.25 | 0.190 | | 0.206 |
| L6 | 20.25 | | 20.75 | 0.797 | | 0.817 |
| M | 3.5 | | 3.7 | 0.137 | | 0.145 |
| N | 2.1 | | 2.3 | 0.082 | | 0.090 |
| U | | 4.6 | | | 0.181 | |



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