



BU208A BU508A/BU508AFI

HIGH VOLTAGE FAST-SWITCHING NPN POWER TRANSISTORS

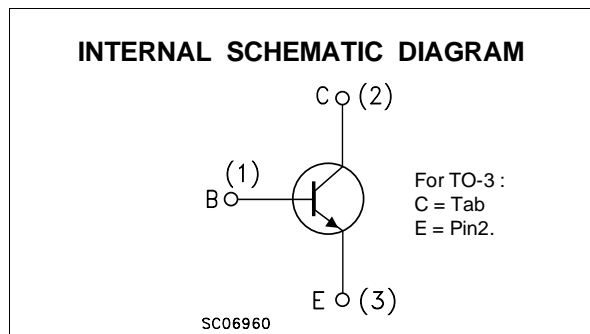
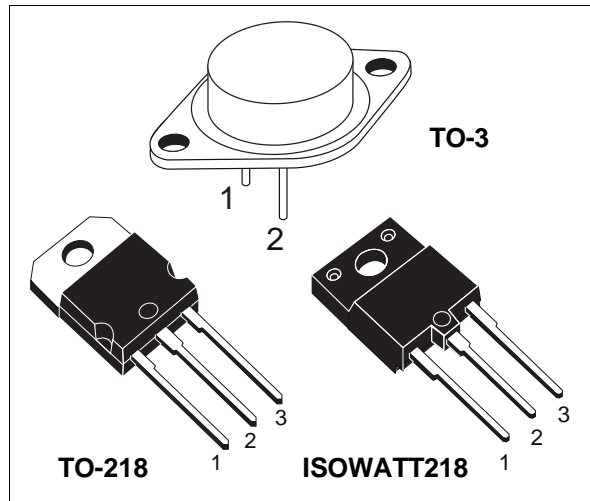
- STMicroelectronics PREFERRED SALESTYPES
- HIGH VOLTAGE CAPABILITY (> 1500 V)
- FULLY INSULATED PACKAGE (U.L. COMPLIANT) FOR EASY MOUNTING

APPLICATIONS:

- HORIZONTAL DEFLECTION FOR COLOUR TV

DESCRIPTION

The BU208A, BU508A and BU508AFI are manufactured using Multi-epitaxial Mesa technology for cost-effective high performance and use a Hollow Emitter structure to enhance switching speeds.



ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Value | | | Unit |
|------------|--|---------------|-----------------|-------------------|------|
| V_{CES} | Collector-Emitter Voltage ($V_{BE} = 0$) | 1500 | | | V |
| V_{CEO} | Collector-Emitter Voltage ($I_B = 0$) | 700 | | | V |
| V_{EBO} | Emitter-Base Voltage ($I_C = 0$) | 10 | | | V |
| I_C | Collector Current | 8 | | | A |
| I_{CM} | Collector Peak Current ($t_p < 5$ ms) | 15 | | | A |
| | | BU208A | BU508A | BU508AFI | |
| | | TO - 3 | TO - 218 | ISOWATT218 | |
| P_{tot} | Total Dissipation at $T_c = 25$ °C | 150 | 125 | 50 | W |
| V_{isol} | Insulation Withstand Voltage (RMS) from All Three Leads to External Heatsink | | | 2500 | V |
| T_{stg} | Storage Temperature | -65 to 175 | -65 to 150 | -65 to 150 | °C |
| T_j | Max. Operating Junction Temperature | 175 | 150 | 150 | °C |

BU208A / BU508A / BU508AFI

THERMAL DATA

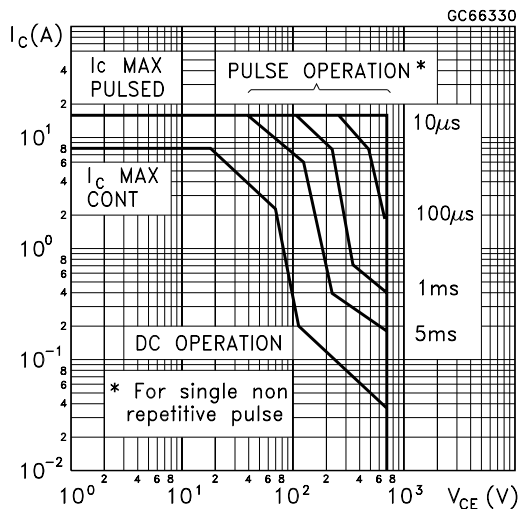
| | | | TO-3 | TO-218 | ISOWATT218 | |
|----------------|----------------------------------|-----|------|--------|------------|------|
| $R_{thj-case}$ | Thermal Resistance Junction-case | Max | 1 | 1 | 2.5 | °C/W |

ELECTRICAL CHARACTERISTICS ($T_{case} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

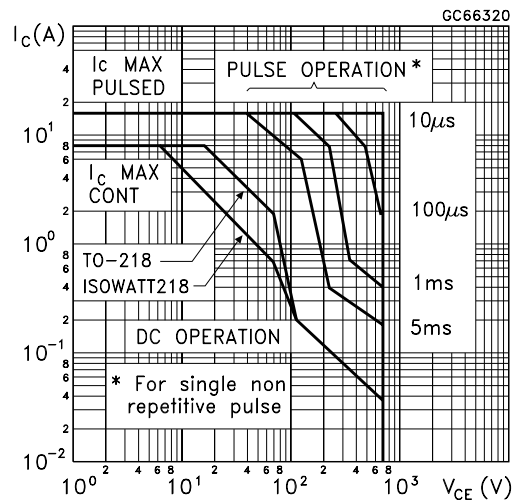
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Unit |
|-----------------|--|---|------|----------|--------|---------------------|
| I_{CES} | Collector Cut-off Current ($V_{BE} = 0$) | $V_{CE} = 1500\text{ V}$ $V_{CE} = 1500\text{ V}$ $T_C = 125\text{ }^{\circ}\text{C}$ | | | 1 2 | mA mA |
| I_{EBO} | Emitter Cut-off Current ($I_C = 0$) | $V_{EB} = 5\text{ V}$ | | | 100 | μA |
| $V_{CEO(sus)*}$ | Collector-Emitter Sustaining Voltage ($I_B = 0$) | $I_C = 100\text{ mA}$ | 700 | | | V |
| V_{EBO} | Emitter Base Voltage ($I_C = 0$) | $I_E = 10\text{ mA}$ | 10 | | | V |
| $V_{CE(sat)*}$ | Collector-Emitter Saturation Voltage | $I_C = 4.5\text{ A}$ $I_B = 2\text{ A}$ | | | 1 | V |
| $V_{BE(sat)*}$ | Base-Emitter Saturation Voltage | $I_C = 4.5\text{ A}$ $I_B = 2\text{ A}$ | | | 1.3 | V |
| t_s t_f | INDUCTIVE LOAD Storage Time Fall Time | $I_C = 4.5\text{ A}$ $h_{FE} = 2.5$ $V_{CC} = 140\text{ V}$ $L_C = 0.9\text{ mH}$ $L_B = 3\text{ }\mu\text{H}$ | | 7 550 | | μs ns |
| f_T | Transition Frequency | $I_C = 0.1\text{ A}$ $V_{CE} = 5\text{ V}$ $f = 5\text{ MHz}$ | | 7 | | MHz |

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

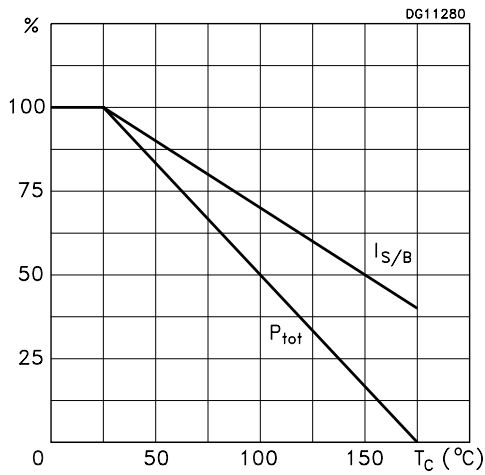
Safe Operating Area (TO-3)



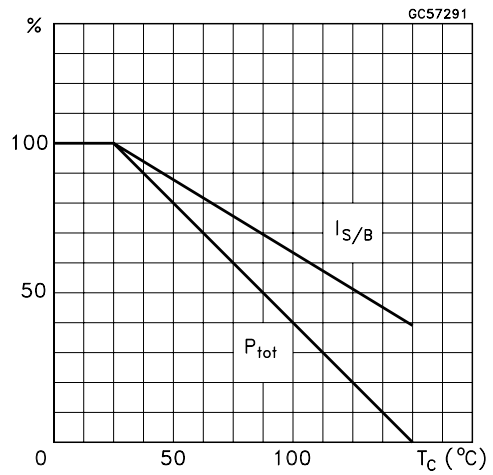
Safe Operating Areas (TO-218/ISOWATT218)



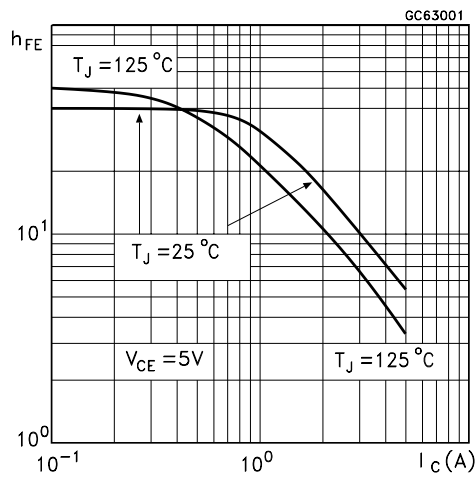
Derating Curves (TO-3)



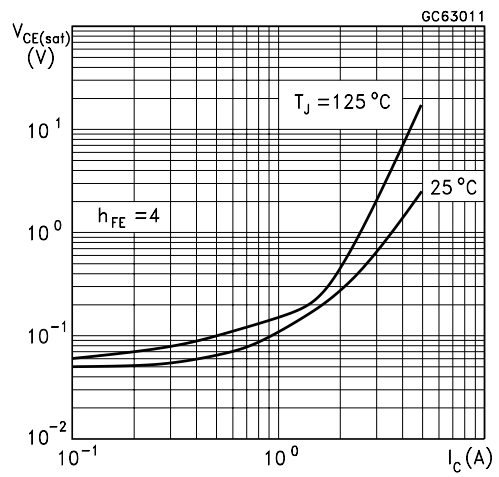
Derating Curves (TO-218/ISOWATT218)



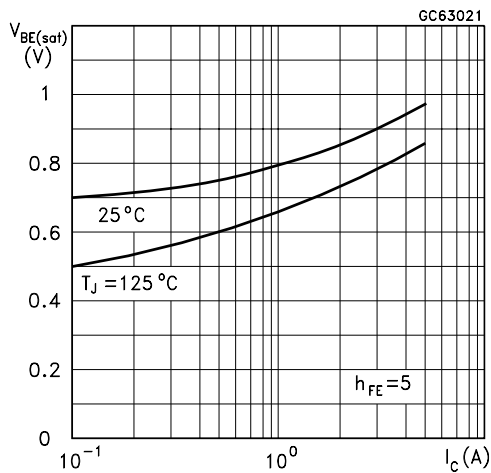
DC Current Gain



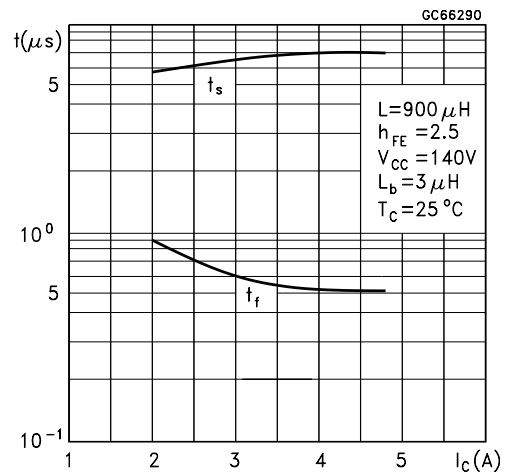
Collector Emitter Saturation Voltage



Base Emitter Saturation Voltage



Switching Time Inductive Load



Switching Time Inductive Load

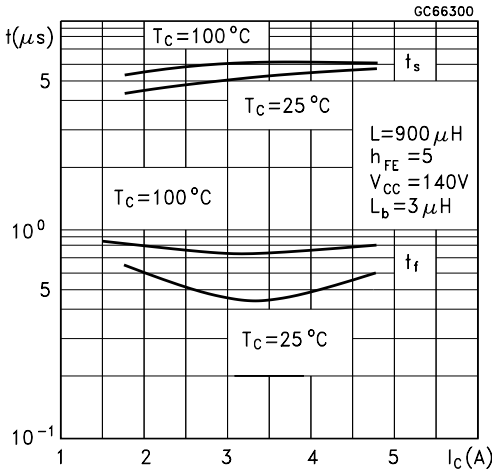
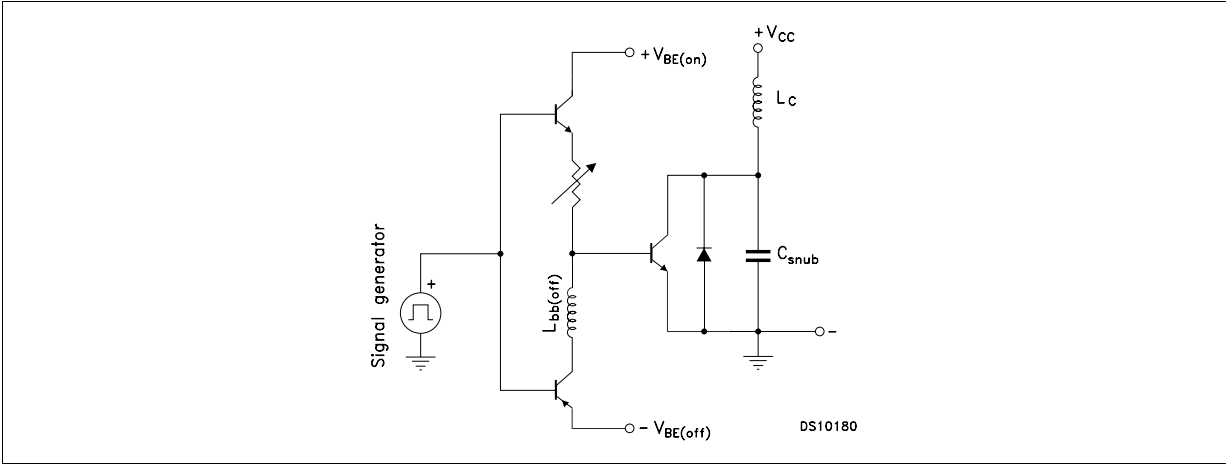
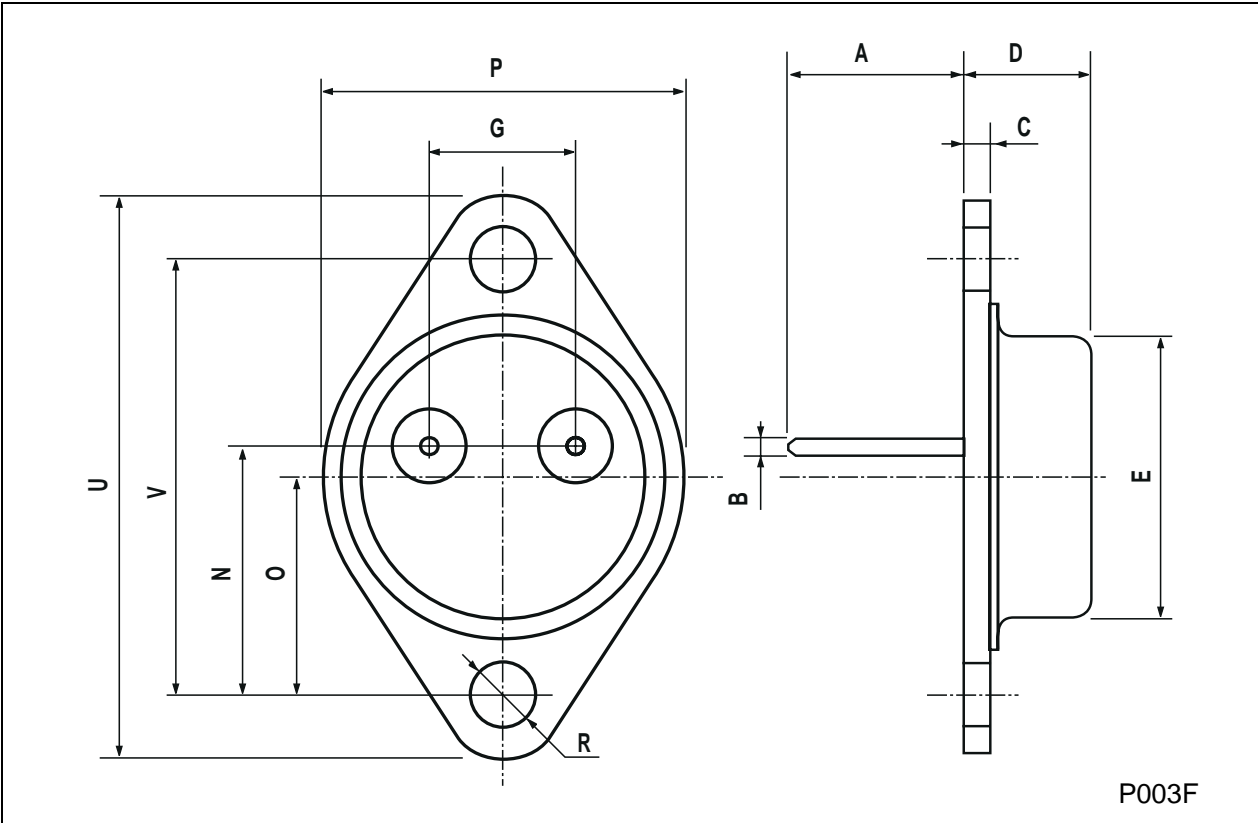


Figure 1: Inductive Load Switching Test Circuit.



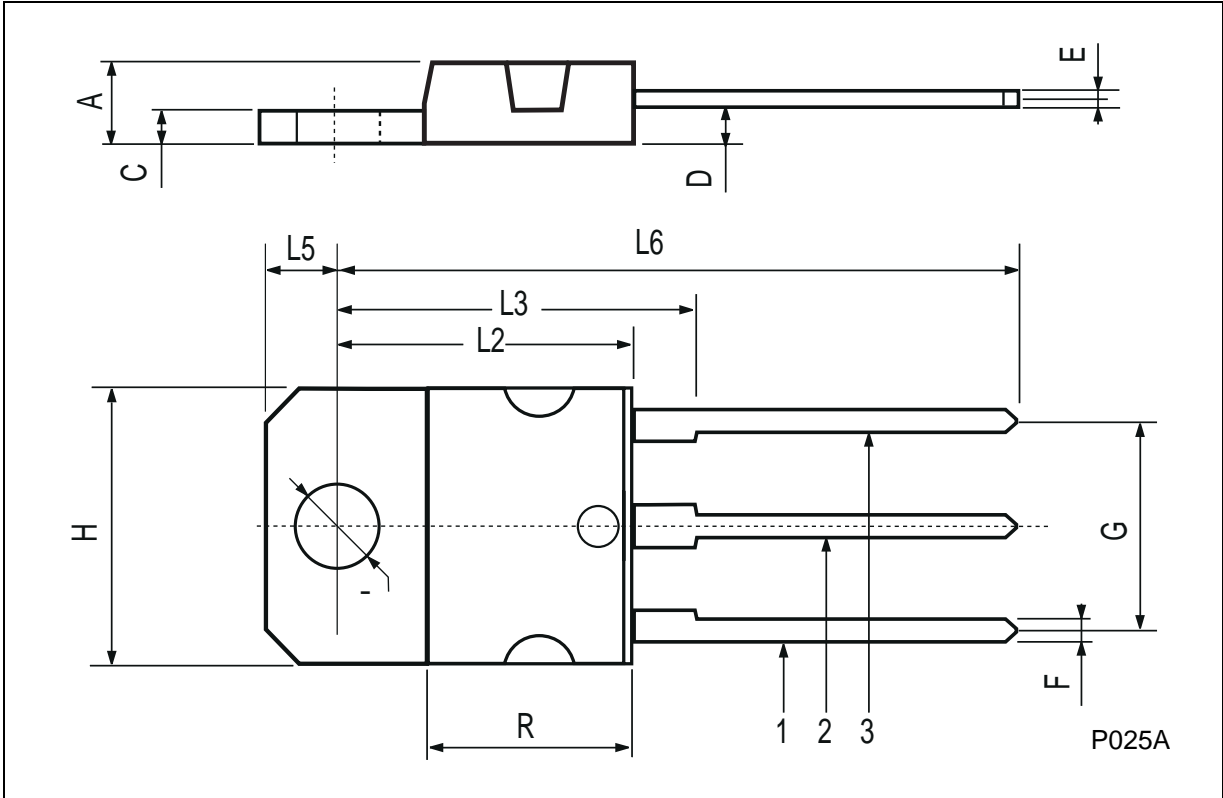
TO-3 MECHANICAL DATA

| 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 |



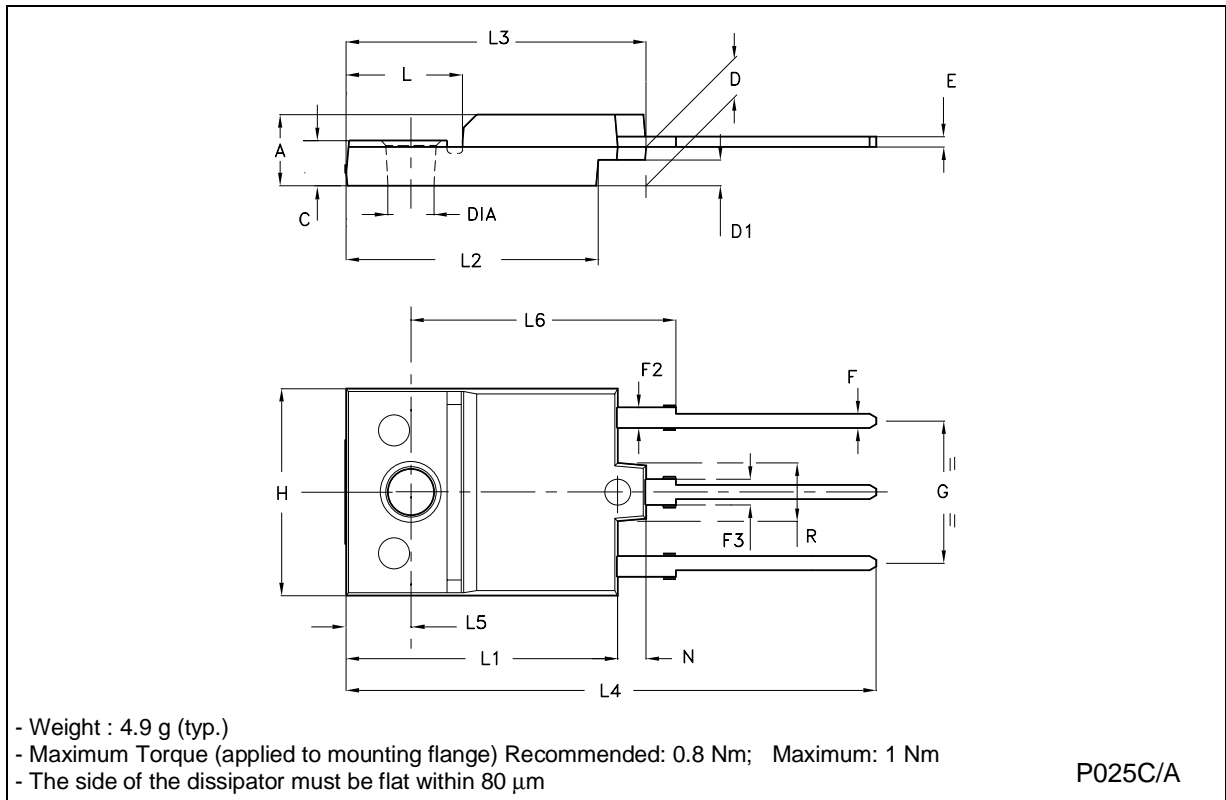
TO-218 (SOT-93) MECHANICAL DATA

| 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 | 0.211 | | 0.222 |
| C | 3.30 | | 3.80 | 0.130 | | 0.150 |
| D | 2.90 | | 3.10 | 0.114 | | 0.122 |
| D1 | 1.88 | | 2.08 | 0.074 | | 0.082 |
| E | 0.75 | | 0.95 | 0.030 | | 0.037 |
| F | 1.05 | | 1.25 | 0.041 | | 0.049 |
| F2 | 1.50 | | 1.70 | 0.059 | | 0.067 |
| F3 | 1.90 | | 2.10 | 0.075 | | 0.083 |
| G | 10.80 | | 11.20 | 0.425 | | 0.441 |
| H | 15.80 | | 16.20 | 0.622 | | 0.638 |
| L | | 9 | | | 0.354 | |
| L1 | 20.80 | | 21.20 | 0.819 | | 0.835 |
| L2 | 19.10 | | 19.90 | 0.752 | | 0.783 |
| L3 | 22.80 | | 23.60 | 0.898 | | 0.929 |
| L4 | 40.50 | | 42.50 | 1.594 | | 1.673 |
| L5 | 4.85 | | 5.25 | 0.191 | | 0.207 |
| L6 | 20.25 | | 20.75 | 0.797 | | 0.817 |
| N | 2.1 | | 2.3 | 0.083 | | 0.091 |
| R | | 4.6 | | | 0.181 | |
| DIA | 3.5 | | 3.7 | 0.138 | | 0.146 |



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