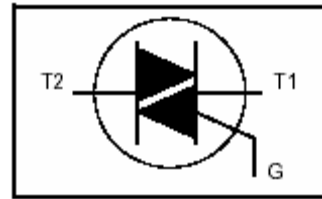


## BT138 Series

### TRIACS

#### FEATURE

Glass passivated triacs in a plastic TO220 package. They are intended for use in applications requiring high bidirectional transient and blocking voltage capability and high thermal cycling performance. Typical applications include motor control, industrial and domestic lighting, heating and static switching. Compliance to RoHS.



#### ABSOLUTE MAXIMUM RATINGS

| Symbol       | Ratings                              | Value       |           |           | Unit |
|--------------|--------------------------------------|-------------|-----------|-----------|------|
|              |                                      | BT138-500   | BT138-600 | BT138-800 |      |
| $V_{DRM}$    | Repetitive peak off-state voltage    | 500         | 600       | 800       | V    |
| $V_{RRM}$    | Repetitive peak reverse voltage      | 500         | 600       | 800       |      |
| $I_{T(RMS)}$ | RMS on-state current                 | 12          |           |           | A    |
| $I_{TSM}$    | Non-repetitive peak on-state current | 95          |           |           | A    |
| $P_{GM}$     | Peak gate power                      | 5           |           |           | W    |
| $PG_{(AV)}$  | Average gate power                   | 0.5         |           |           | W    |
| $T_{stg}$    | Storage temperature range            | -45 to +150 |           |           | °C   |
| $T_j$        | Operating junction temperature       | 110         |           |           | °C   |

#### THERMAL CHARACTERISTICS

| Symbol            | Ratings                                      | Value      | Unit |
|-------------------|--|------------|------|
| $R_{\theta j-mb}$ | Thermal resistance junction to mounting base | $\leq 1.5$ | °C/W |
| $R_{\theta JA}$   | Thermal resistance junction to ambient       | $\leq 60$  |      |

## BT138 Series

### ELECTRICAL CHARACTERISTICS

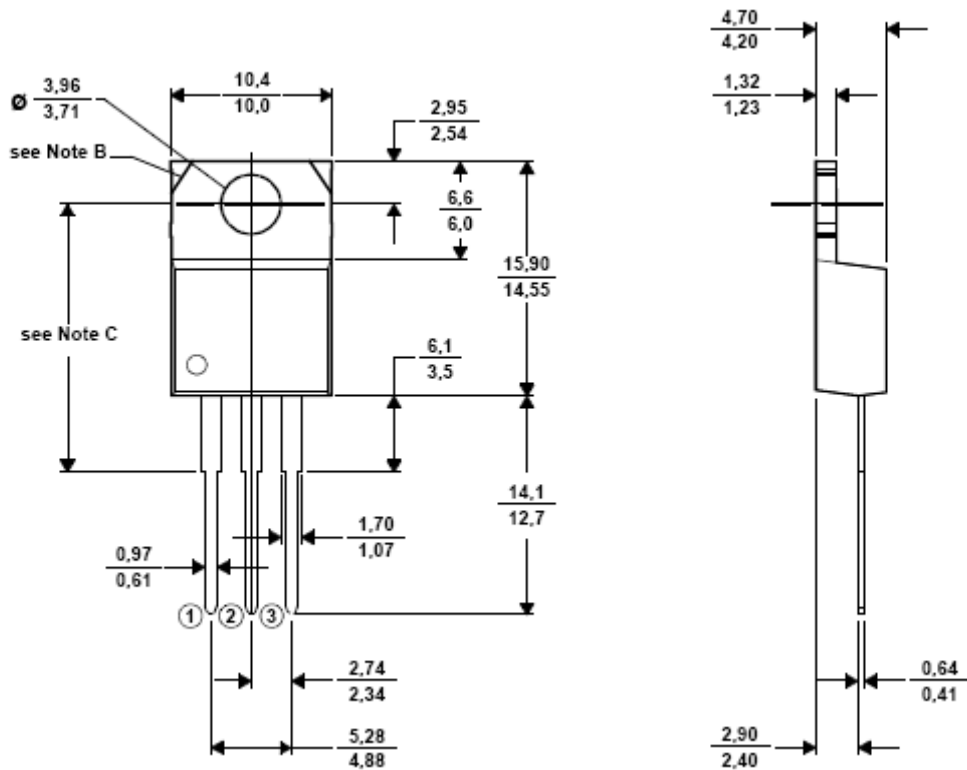
TC=25°C unless otherwise noted

| Symbol        | Ratings   | Test Condition(s)  | Min       | Typ | Max | Unit             |    |
|---------------|---|--|-----------|-----|-----|------------------|----|
| $V_{DRM}$     | Repetitive peak off-state voltage                   | $I_D = 0.1 \text{ mA}$   | BT137-500 | 500 | -   | -                | V  |
|               |   |  | BT137-600 | 600 | -   | -                |    |
|               |   |  | BT137-800 | 800 | -   | -                |    |
| $V_{RRM}$     | Repetitive peak reverse voltage                     | $I_D = 0.5 \text{ mA}$   | BT137-500 | 500 | -   | -                | V  |
|               |   |  | BT137-600 | 600 | -   | -                |    |
|               |   |  | BT137-800 | 800 | -   | -                |    |
| $I_{GT}$      | Gate trigger current                                | $V_D = 12 \text{ V}$<br>$R_L = 100 \Omega$   | T2+ G+    | -   | -   | 30               | mA |
|               |   |  | T2+ G-    | -   | -   | 30               |    |
|               |   |  | T2- G-    | -   | -   | 30               |    |
|               |   |  | T2- G+    | -   | -   | 100              |    |
| $V_{GT}$      | Gate trigger voltage                                | $V_D = 12 \text{ V}$<br>$R_L = 100 \Omega$   | T2+ G+    | -   | -   | 1.5              | V  |
|               |   |  | T2+ G-    | -   | -   | 1.5              |    |
|               |   |  | T2- G-    | -   | -   | 1.5              |    |
|               |   |  | T2- G+    | -   | -   | 1.8              |    |
| $I_L$         | Latching current                                    | $V_D = 12 \text{ V}$<br>$I_{GT} = 100 \text{ mA}$  | T2+ G+    | -   | -   | 60               | mA |
|               |   |  | T2+ G-    | -   | -   | 90               |    |
|               |   |  | T2- G-    | -   | -   | 60               |    |
|               |   |  | T2- G+    | -   | -   | 90               |    |
| $I_H$         | Holding current                                     | $I_T = 200 \text{ mA}, I_{GT} = 50 \text{ mA}$   | -         | -   | 50  | mA               |    |
| $I_D$         | Off-state leakage current                           | $V_D = V_{DRM \text{ max}}$<br>$T_j = 125^\circ\text{C}$   | -         | -   | 0.5 | mA               |    |
| $V_T$         | On-state voltage                                    | $I_T = 15 \text{ A}$   | -         | -   | 1.7 | V                |    |
| $dV_D/dt$     | Critical rate of rise of off-state voltage          | $V_{DM} = 67\% V_{DRM \text{ max}}$<br>$T_j = 125^\circ\text{C}$<br>Exponential waveform;<br>gate open circuit             | 100       | 250 | -   | V/ $\mu\text{s}$ |    |
| $dV_{COM}/dt$ | Critical rate of rise of change commutating current | $V_D = 400 \text{ V}; T_j = 95^\circ\text{C}$<br>$di_{com}/dt = 5.4 \text{ A/ms}; I_T = 12 \text{ A}$<br>gate open circuit | -         | 20  | -   | V/ $\mu\text{s}$ |    |
| $t_{gt}$      | Gate controlled turn-on time                        | $I_{TM} = 16 \text{ A}; V_D = V_{DRM \text{ max}}$<br>$I_G = 0.1 \text{ A}; di_G/dt = 5 \text{ A}/\mu\text{s}$             | -         | 2   | -   | $\mu\text{s}$    |    |

## BT138 Series

### MECHANICAL DATA CASE TO-220

TO220



|         |                 |
|---------|-----------------|
| Pin 1 : | Main Terminal 1 |
| Pin 2 : | Main Terminal 2 |
| Pin 3 : | Gate            |
| Case :  | Main Terminal 2 |

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