

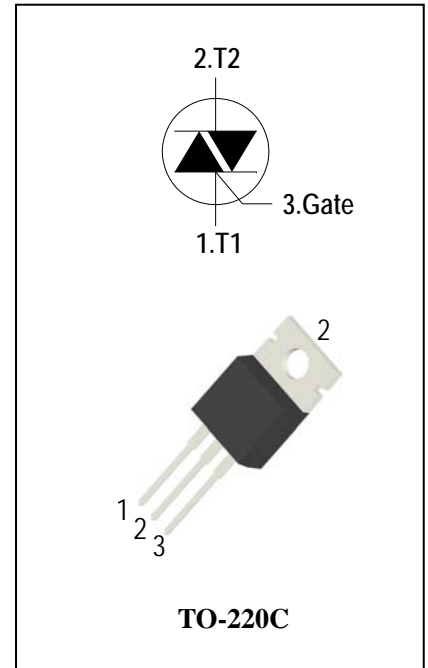
## 4Quadrants Triacs

### General Description

High current density due to mesa technology .the BT137 triac series is suitable for general purpose AC switching. They can be used as an ON/OFF function in applications such as static relays, heating regulation, Rectifier-fed DC inductive loads e.g.DC motors and solenoids , motor speed controllers.

### Features

- ◆ Repetitive Peak Off-State Voltage: 600Vand800V
- ◆ R.M.S On-State Current (  $I_{T(RMS)} = 8A$  )
- ◆ These Devices are Pb-Free and are RoHS Compliant



### Absolute Maximum Ratings

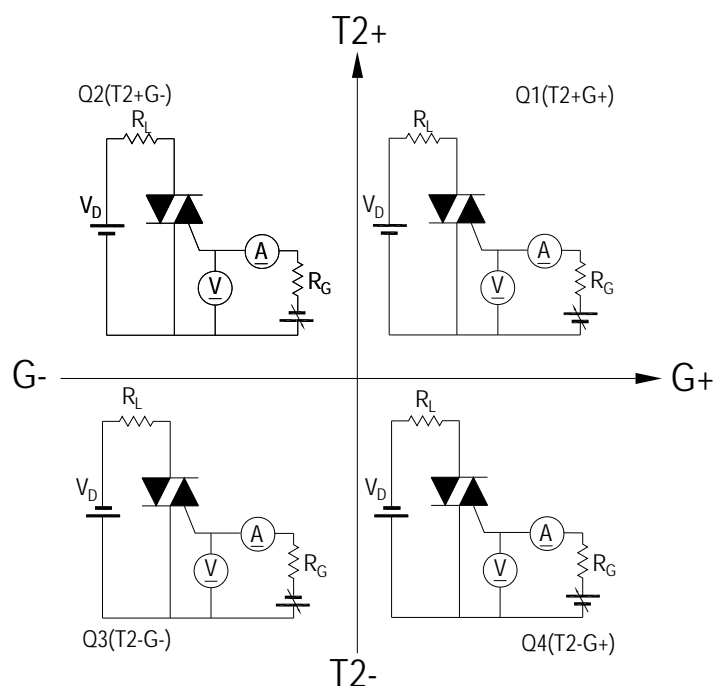
| Symbol                 | Items   | Conditions  |           | Ratings    | Unit       |
|------------------------|---|---|-----------|------------|------------|
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive Peak Off-State Voltage                             | $T_j = 25^\circ C$  | BT137-600 | 600        | V          |
|                        |   |   | BT137-800 | 800        | V          |
| $I_{T(RMS)}$           | R.M.S On-State Current  | $T_C = 110^\circ C$   |           | 8          | A          |
| $I_{TSM}$              | Surge On-State Current  | $t_p=20ms(50Hz)/t_p=16.7ms(60Hz)$   |           | 80/84      | A          |
| $I^2t$                 | $I^2t$ for fusing   | $t_p=10ms$  |           | 36         | $A^2s$     |
| dI/dt                  | Critical rate of rise of on-state current                     | F = 120 Hz $T_j = 125^\circ C$<br>$I_G = 2 \times I_{GT}$ , $t_r \leq 100$ ns | Q1-Q2-Q3  | 50         | A/ $\mu s$ |
|                        |   |   | Q4        | 10         |            |
| $I_{GM}$               | Peak Gate Current   | $t_p = 20 \mu s$ $T_j = 125^\circ C$  |           | 2          | A          |
| $P_{G(AV)}$            | Average Gate Power Dissipation( $T_j=125^\circ C$ )           |   |           | 0.5        | W          |
| $P_{GM}$               | Peak Gate Power Dissipation( $t_p=20\mu s, T_j=125^\circ C$ ) |   |           | 5          | W          |
| $T_j$                  | Operating Junction Temperature                                |   |           | - 40 ~ 125 | $^\circ C$ |
| $T_{STG}$              | Storage Temperature   |   |           | - 40 ~ 150 | $^\circ C$ |



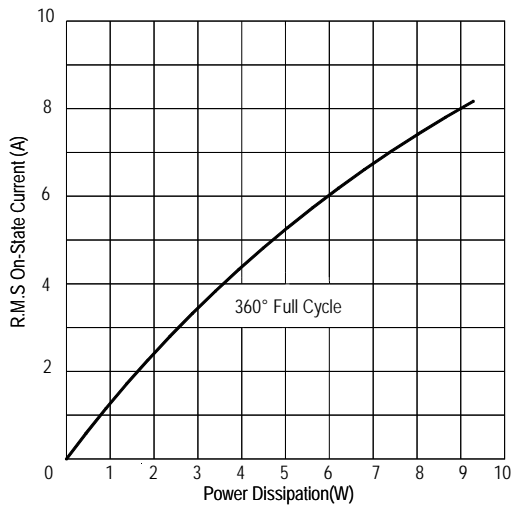
## Electrical Characteristics ( $T_J = 25^\circ\text{C}$ unless otherwise specified )

| Symbol                 | Items   | Conditions  |      | BT137-600/800 |          |          |           | Unit                |
|------------------------|---|---|------|---------------|----------|----------|-----------|---------------------|
|                        |   |   |      | D             | E        | F        | G         |                     |
| $I_{DRM}$<br>$I_{RRM}$ | Peak Forward Reverse Blocking<br>Current      | $V_{DRM} = V_{RRM}, T_J = 25^\circ\text{C}$<br>$V_{DRM} = V_{RRM}, T_J = 125^\circ\text{C}$ | Max. | 5<br>1        |          |          |           | $\mu\text{A}$<br>mA |
| $V_{TM}$               | Peak On-State Voltage                         | $I_{TM} = 11\text{A}, t_p = 380 \mu\text{s}$  | Max. | 1.55          |          |          |           | V                   |
| $V_{GD}$               | Q1-Q2-Q3-Q4<br>Non – Trigger Gate<br>Voltage  | $V_D = V_{DRM}, R_L = 3.3 \text{ k}\Omega$<br>$T_J = 125^\circ\text{C}$                     | Min. | 0.2           |          |          |           | V                   |
| $V_{GT}$               | Q1-Q2-Q3-Q4<br>Gate Trigger Voltage           | $V_D = 12\text{V}, R_L = 33\Omega$  | Max. | 1.3           |          |          |           | V                   |
| $I_{GT}$               | Q1-Q2-Q3<br>Q4<br>Gate Trigger Current        |   | Max. | 5<br>10       | 10<br>25 | 25<br>70 | 50<br>100 | mA                  |
| $I_H$                  | Q1-Q2-Q3-Q4<br>Holding Current                | $I_T = 0.1\text{A}$   | Max. | 10            | 25       | 30       | 60        | mA                  |
| $I_L$                  | Q1-Q3-Q4<br>Q2<br>Latching Current            | $I_G = 1.2 I_{GT}$  | Max. | 15<br>20      | 30<br>40 | 40<br>60 | 60<br>90  | mA                  |
| $dV/dt$                | Critical Rate of Rise of Off-State<br>Voltage | $V_D = 2/3V_{DRM}$ gate open<br>$T_J = 125^\circ\text{C}$                                   | Min. | 10            | 20       | 200      | 400       | V/ $\mu\text{s}$    |
| $(dV/dt)_c$            | Rate of Change of Commutating<br>Current,     | $(dI/dt)_c = -3.5\text{A/ms}$<br>$T_J = 125^\circ\text{C}$                                  | Min. | 1             | 2        | 5        | 10        | V/ $\mu\text{s}$    |
| $R_{th(j-c)}$          | Junction to case (AC)                         |   | Max. | 1.6           |          |          |           | $^\circ\text{C/W}$  |
| $R_{th(j-a)}$          | Junction to ambient                           |   | Max. | 60            |          |          |           | $^\circ\text{C/W}$  |

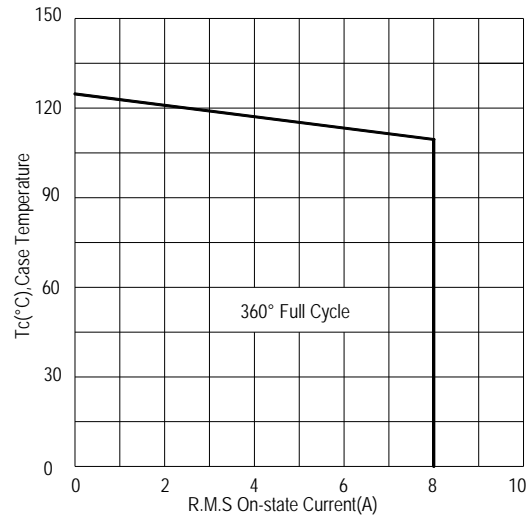
FIG.1: Triac quadrant are defined and the gate trigger test circuit



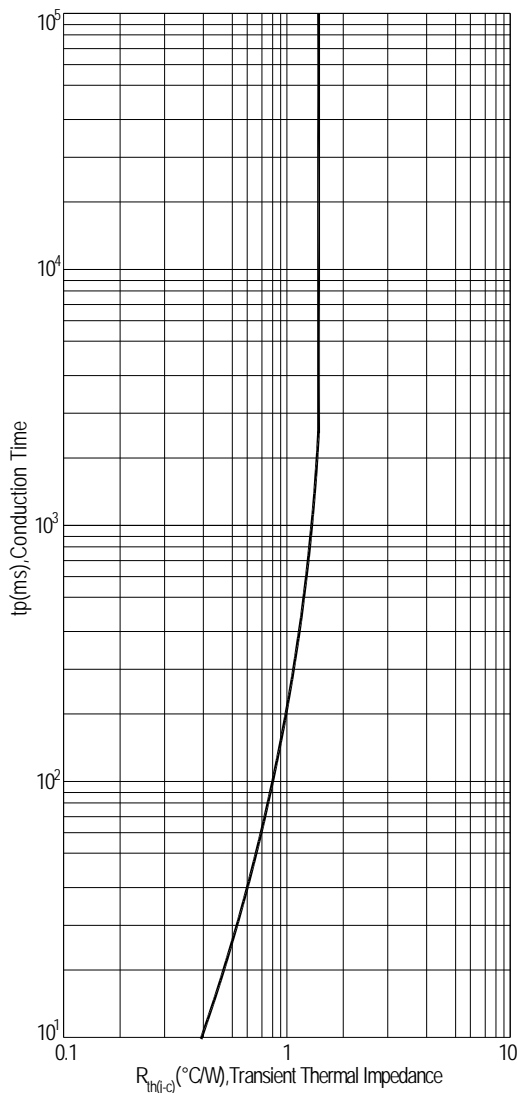
**FIG.2: Maximum on-state power dissipation**



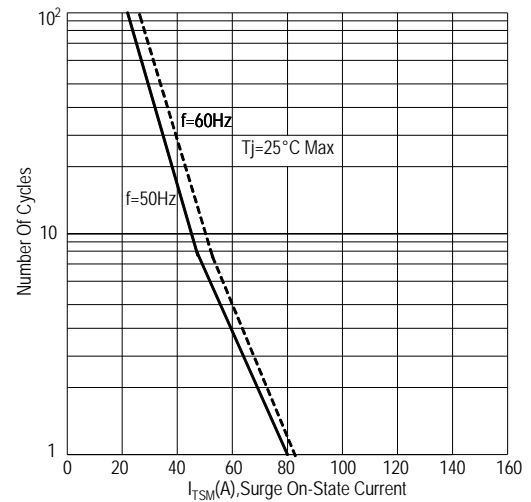
**FIG.3: Typical RMS on-state current VS Allowable case Temperature**



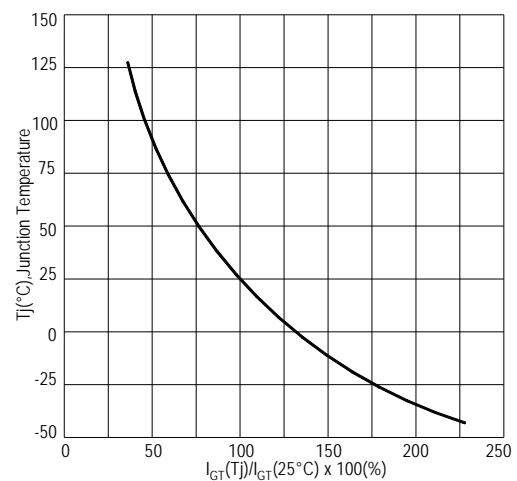
**FIG.4: Maximum transient thermal impedance**



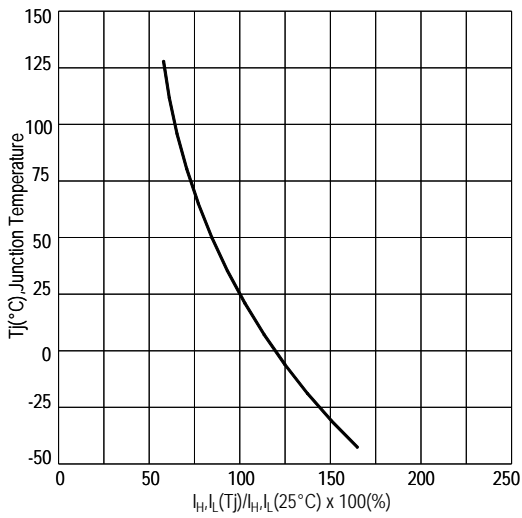
**FIG.5: Rated surge on-state current (Non-Repetitive)**



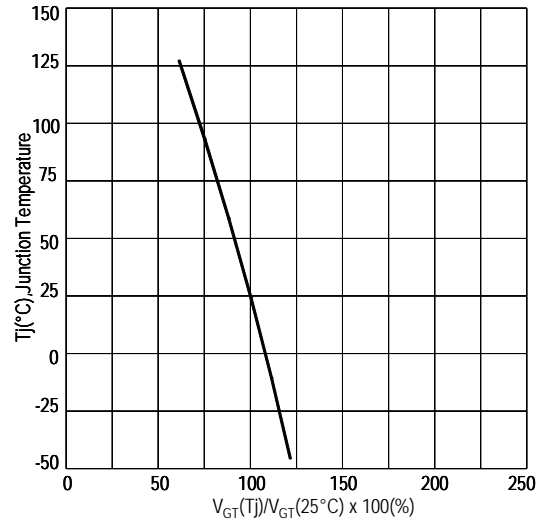
**FIG.6: Gate trigger current VS Junction temperature**



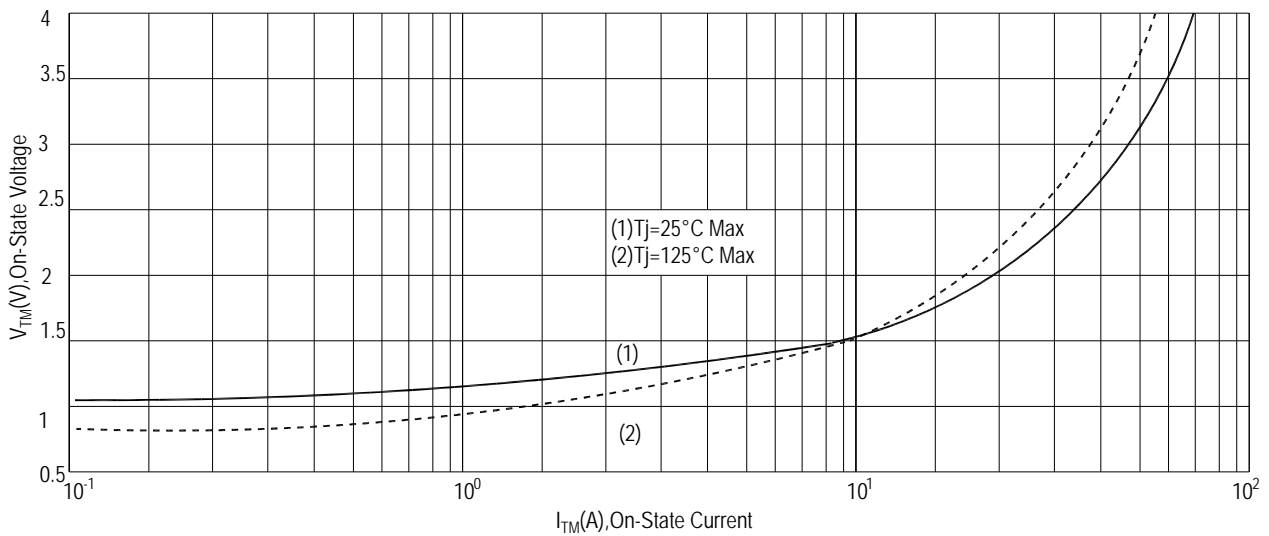
**FIG.7: Holding current and Latching current VS Junction temperature**



**FIG.8: Gate trigger voltage VS Junction temperature**

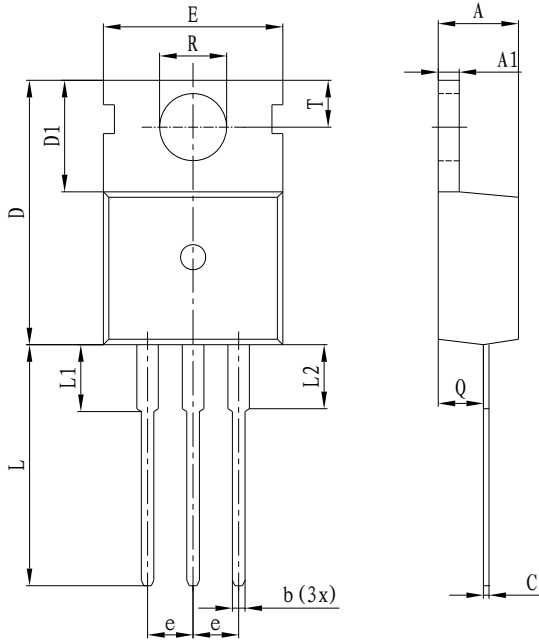


**FIG.9: On-state characteristics(Max)**



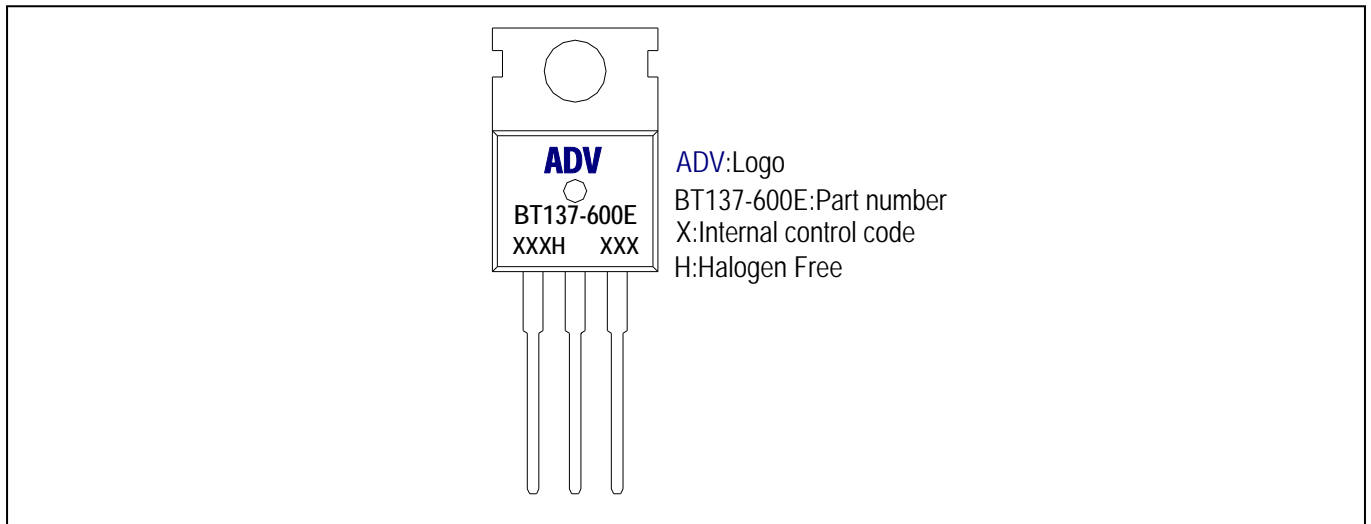
## PACKAGE MECHANICAL DATA

### TO-220C Package Dimension



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| e      | 2.54 TYP                  |       | 0.099TYP             |       |
| A      | 4.10                      | 4.70  | 0.161                | 0.185 |
| A1     | 1.25                      | 1.40  | 0.049                | 0.055 |
| b      | 0.60                      | 0.90  | 0.023                | 0.035 |
| C      | 0.40                      | 0.70  | 0.016                | 0.027 |
| D      | 15.20                     | 16.00 | 0.598                | 0.630 |
| D1     | 5.90                      | 6.60  | 0.232                | 0.259 |
| E      | 9.70                      | 10.30 | 0.382                | 0.405 |
| L      | 12.80                     | 15.00 | 0.504                | 0.590 |
| L1     | 2.79                      | 3.30  | 0.110                | 0.130 |
| R      | 3.50                      | 3.80  | 0.138                | 0.149 |
| T      | 2.70                      | 3.00  | 0.106                | 0.118 |
| Q      | 2.20                      | 2.60  | 0.086                | 0.102 |
| L2     |                           | 3.00  |                      | 0.118 |

### Making Diagram



### Ordering information

| Part number | Package | Marking    | Packing | Quantity |
|-------------|---------|------------|---------|----------|
| BT137-600#  | TO-220C | BT137-600# | Tube    | 50pcs    |
| BT137-800#  | TO-220C | BT137-800# | Tube    | 50pcs    |

Note:# = Gate Trigger Current Sensitivity and type

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