

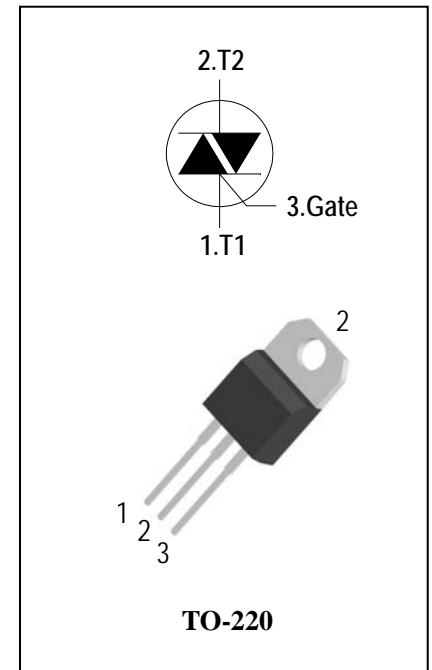
## 4Quadrants Triacs

### General Description

High current density due to mesa technology .the ADT4D 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 (  $I_{T(RMS)} = 4A$  )
- ◆ These Devices are Pb-Free and are RoHS Compliant



### Absolute Maximum Ratings

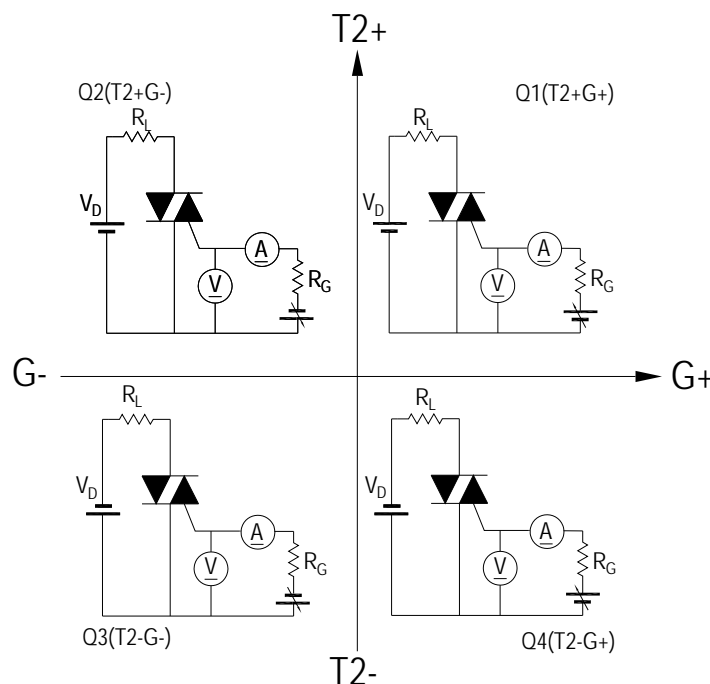
| Symbol                 | Items   | Conditions  |          | Ratings    | Unit       |
|------------------------|---|---|----------|------------|------------|
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive Peak Off-State Voltage                             | $T_j = 25^\circ C$  | ADT4D60  | 600        | V          |
|                        |   |   | ADT4D80  | 800        | V          |
| $I_{T(RMS)}$           | R.M.S On-State Current  | $T_C = 110^\circ C$   |          | 4          | A          |
| $I_{TSM}$              | Surge On-State Current  | $t_p=20ms(50Hz)/t_p=16.7ms(60Hz)$   |          | 30/32      | A          |
| $I^2t$                 | $I^2t$ for fusing   | $t_p=10ms$  |          | 5.1        | $A^2s$     |
| 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   | $t_p = 20 \mu s$ $T_j = 125^\circ C$  |          | 4          | A          |
| $P_{G(AV)}$            | Average Gate Power Dissipation( $T_j=125^\circ C$ )           |   |          | 1          | 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 | $^\circ C$ |



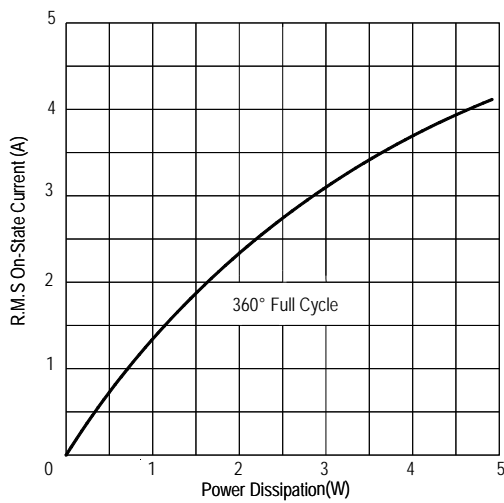
## Electrical Characteristics ( $T_j = 25^\circ\text{C}$ unless otherwise specified )

| Symbol        | Items                                      | Conditions  |      | ADT4D60/80 |    |       |     | Unit                      |
|---------------|--|---|------|------------|----|-------|-----|---------------------------|
|               |  |   |      | T          | S  | Blank | B   |                           |
| $I_{DRM}$     | Peak Forward Reverse Blocking Current      | $V_{DRM} = V_{RRM}, T_j = 25^\circ\text{C}$                             | Max. | 5          |    |       |     | $\mu\text{A}$             |
| $I_{RRM}$     |  | $V_{DRM} = V_{RRM}, T_j = 125^\circ\text{C}$                            |      | 1          |    |       |     | $\text{mA}$               |
| $V_{TM}$      | Peak On-State Voltage                      | $I_{TM} = 5.5\text{A}, t_p = 380 \mu\text{s}$                           | Max. | 1.6        |    |       |     | $\text{V}$                |
| $V_{GD}$      | Q1-Q2-Q3-Q4<br>Non – Trigger Gate Voltage  | $V_D = V_{DRM}, R_L = 3.3 \text{ k}\Omega$<br>$T_j = 125^\circ\text{C}$ | Min. | 0.2        |    |       |     | $\text{V}$                |
| $V_{GT}$      | Q1-Q2-Q3-Q4<br>Gate Trigger Voltage        | $V_D = 12\text{V}, R_L = 33\Omega$                                      | Max. | 1.3        |    |       |     | $\text{V}$                |
| $I_{GT}$      | Q1-Q2-Q3<br>Q4<br>Gate Trigger Current     |   | Max. | 5          | 10 | 35    | 50  | $\text{mA}$               |
| $I_H$         | Q1-Q2-Q3-Q4<br>Holding Current             | $I_T = 0.1\text{A}$   | Max. | 10         | 25 | 35    | 60  | $\text{mA}$               |
| $I_L$         | Q1-Q3-Q4<br>Q2<br>Latching Current         | $I_G = 1.2 I_{GT}$  | Max. | 15         | 30 | 40    | 60  | $\text{mA}$               |
| $dV/dt$       | Critical Rate of Rise of Off-State Voltage | $V_D = 2/3V_{DRM}$ gate open<br>$T_j = 125^\circ\text{C}$               | Min. | 5          | 10 | 50    | 200 | $\text{V}/\mu\text{s}$    |
| $(dV/dt)_c$   | Rate of Change of Commutating Current,     | $(dI/dt)_c = -1.8\text{A/ms}$<br>$T_j = 125^\circ\text{C}$              | Min. | 1          | 2  | 5     | 10  | $\text{V}/\mu\text{s}$    |
| $R_{th(j-c)}$ | Junction to case (AC)                      |   | Max. | 2.6        |    |       |     | $^\circ\text{C}/\text{W}$ |
| $R_{th(j-a)}$ | Junction to ambient                        |   | Max. | 60         |    |       |     | $^\circ\text{C}/\text{W}$ |

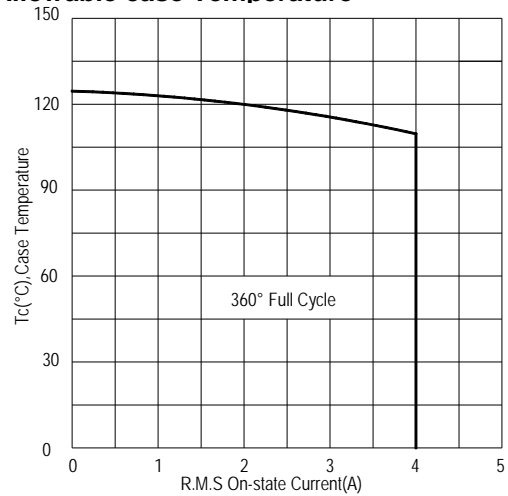
FIG.1: Triac quadrant are defined and the gate trigger test circuit



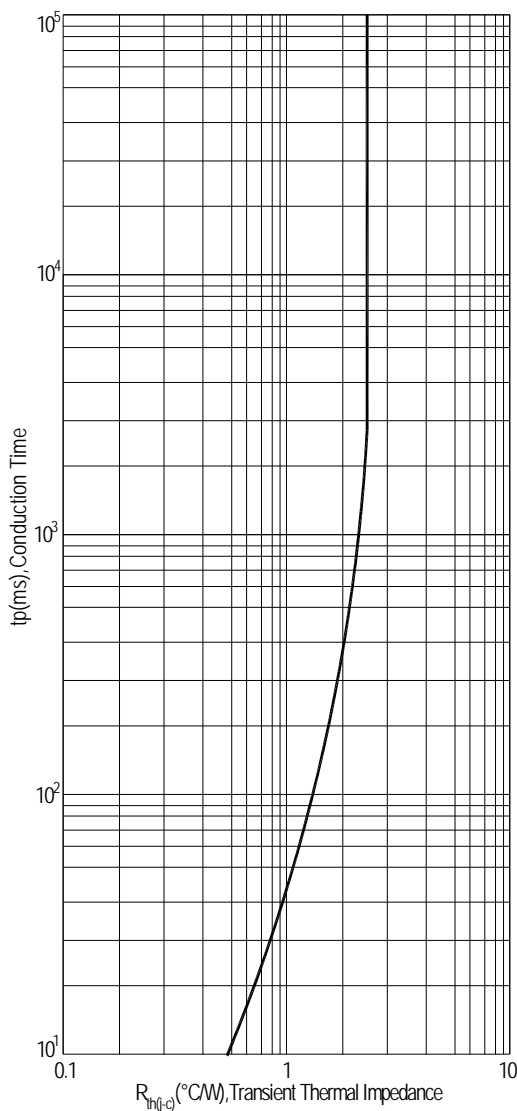
**FIG.2: Maximum on-state power dissipation**



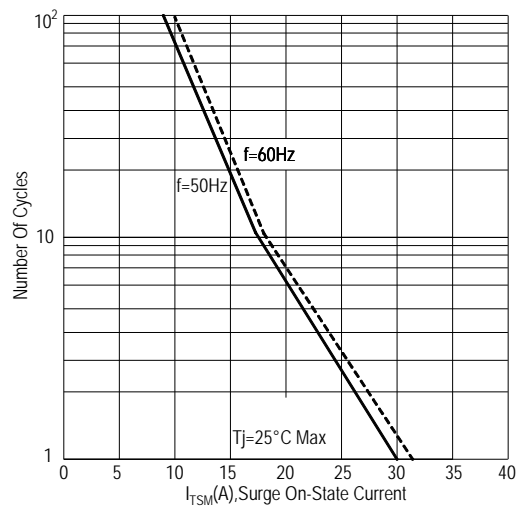
**FIG.3: Typical RMS on-state current VS Allowable case Temperature**



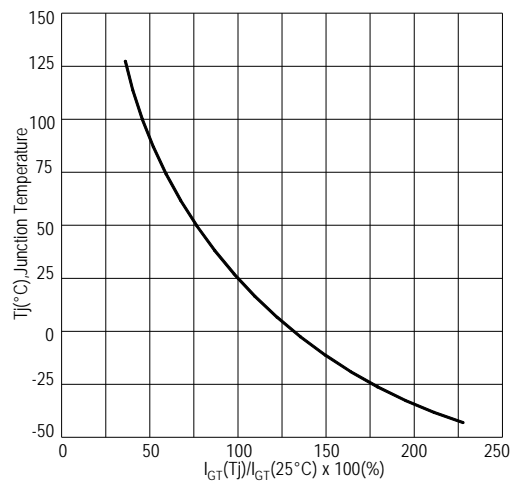
**FIG.4: Maximum transient thermal impedance**



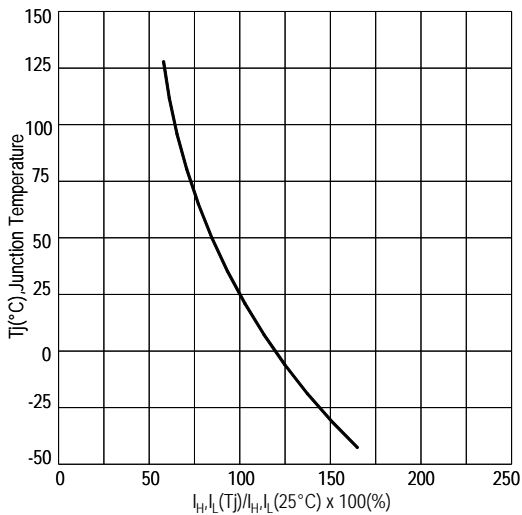
**FIG.5: Rated surge on-state current (Non-Repetitive)**



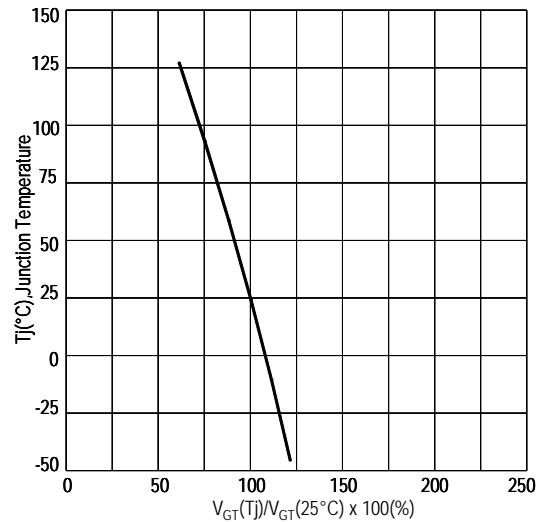
**FIG.6: Gate trigger current VS Junction temperature**



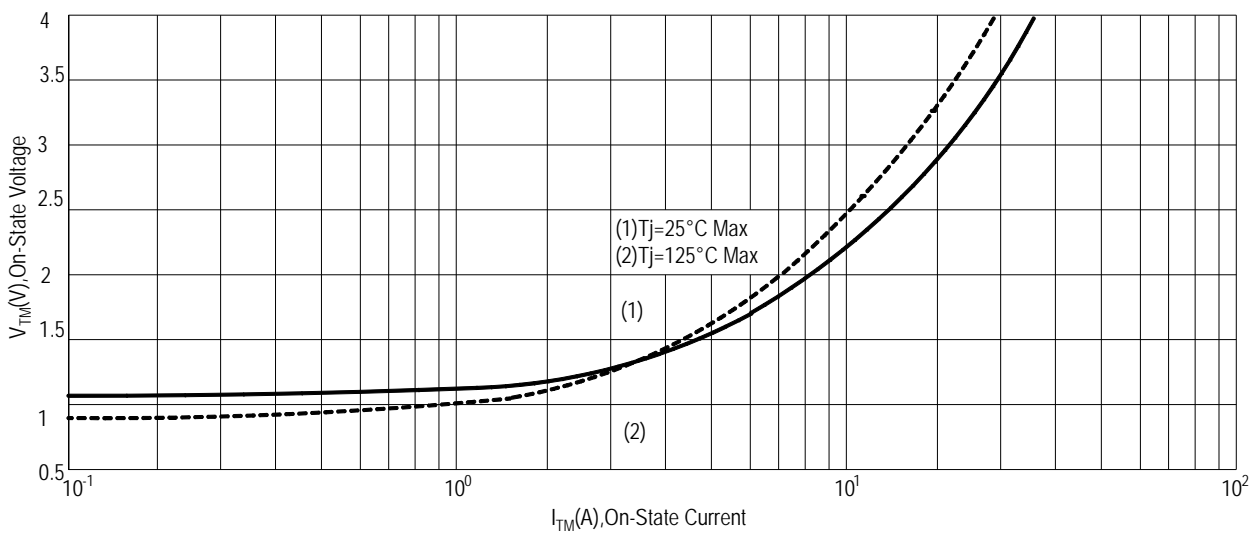
**FIG.7: Holding current and Latching current VS Junction temperature**



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

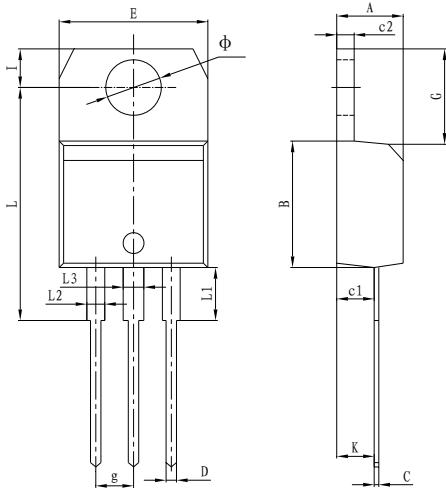


**FIG.9: On-state characteristics(Max)**



## PACKAGE MECHANICAL DATA

### TO-220 Package Dimension



| Symbol | Dimensions<br>In Millimeters |       | Dimensions<br>In Inches |       |
|--------|------------------------------|-------|-------------------------|-------|
|        | Min                          | Max   | Min                     | Max   |
| A      | 4.40                         | 4.60  | 0.173                   | 0.181 |
| B      | 9.00                         | 9.30  | 0.354                   | 0.366 |
| C      | 0.40                         | 0.60  | 0.015                   | 0.023 |
| c1     | 2.00                         | 2.60  | 0.078                   | 0.102 |
| c2     | 1.23                         | 1.32  | 0.048                   | 0.051 |
| D      | 0.70                         | 1.00  | 0.027                   | 0.039 |
| E      | 10.00                        | 10.40 | 0.393                   | 0.409 |
| g      | 2.40                         | 2.70  | 0.094                   | 0.106 |
| G      | 6.20                         | 6.80  | 0.244                   | 0.267 |
| I      | 2.65                         | 2.95  | 0.104                   | 0.116 |
| L      | 15.80                        | 16.80 | 0.622                   | 0.661 |
| L1     | 3.75                         |       | 0.147                   |       |
| L2     | 1.14                         | 1.70  | 0.044                   | 0.066 |
| L3     | 1.14                         | 1.70  | 0.044                   | 0.066 |
| phi    | 3.60                         | 3.90  | 0.141                   | 0.153 |
| K      | 2.60TYP                      |       | 0.102TYP                |       |

### Making Diagram

**ADV** Logo  
 ADT4D80S: Part number  
 X: Internal control code  
 H: Halogen Free

AD T 4 D 80 # T(S)(B)

|                                   |   |   |
|-----------------------------------|---|---|
| ADVANCED<br>Internal control code | Current: 4=4A<br>Quadrant: D=4Q<br>Voltage: 60=600V 80=800V | Sensitivity and type:<br>T=5mA<br>S=10mA<br>Blank=35mA<br>B=50mA<br>Package explain: Blank=TO-220 |
|-----------------------------------|---|---|

### Ordering information

| Part number | Package | Marking  | Packing | Quantity |
|-------------|---------|----------|---------|----------|
| ADT4D60#    | TO-220  | ADT4D60# | Tube    | 50pcs    |
| ADT4D80#    | TO-220  | ADT4D80# | Tube    | 50pcs    |

Note: # = Gate Trigger Current Sensitivity and type

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