

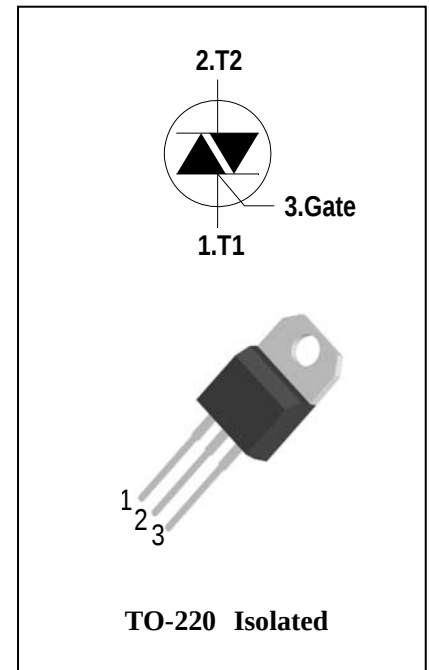
### 3 Quadrants Triacs

#### General Description

High current density due to mesa technology .the AIT25C 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, High power motor controls e.g. washing machines and vacuum cleaners, Rectifier-fed DC inductive loads e.g. DC motors and solenoids , motor speed controllers.

#### Features

- ◆ Repetitive Peak Off-State Voltage: 600V and 800V
- ◆ R.M.S On-State Current (  $I_{T(RMS)} = 25A$  )
- ◆ High Commutation  $dv/dt$
- ◆ These Devices are Pb-Free and are RoHS Compliant
- ◆ Isolated heatsink mounted , Isolation Voltage (  $V_{ISO} = 2500V AC$  )



#### Absolute Maximum Ratings

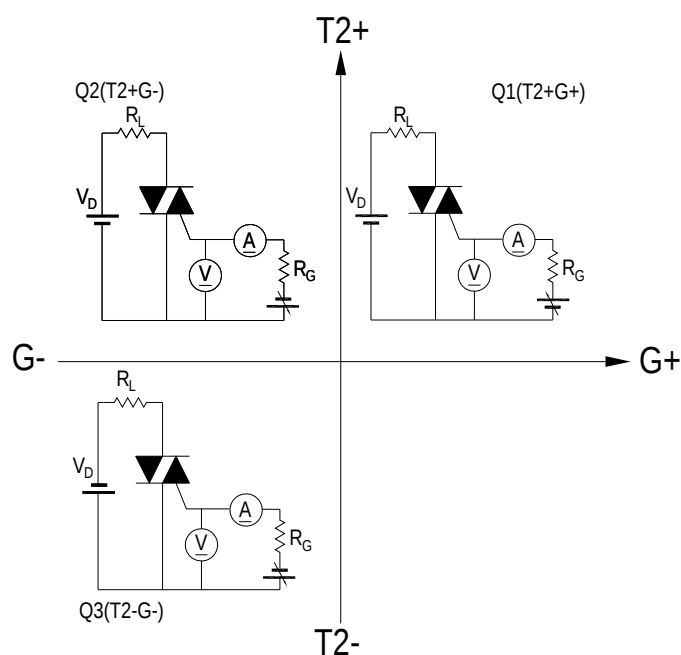
| Symbol                 | Items                                                          | Conditions                                                                                     |          | Ratings    | Unit        |
|------------------------|----------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------|------------|-------------|
| $V_{DRM}$<br>$V_{RRM}$ | Repetitive Peak Off-State Voltage                              | $T_j = 25^{\circ}C$                                                                            | AIT25C60 | 600        | V           |
|                        |                                                                |                                                                                                | AIT25C80 | 800        | V           |
| $I_{T(RMS)}$           | R.M.S On-State Current                                         | $T_C = 75^{\circ}C$                                                                            |          | 25         | A           |
| $I_{TSM}$              | Surge On-State Current                                         | $t_p=20ms(50Hz)/t_p=16.7ms(60Hz)$                                                              |          | 250/260    | A           |
| $I^2t$                 | $I^2t$ for fusing                                              | $t_p=10ms$                                                                                     |          | 335        | $A^2s$      |
| $di/dt$                | Critical rate of rise of on-state current                      | $F = 120\text{ Hz}$ $T_j = 125^{\circ}C$<br>$I_G = 2 \times I_{GT}$ , $t_r \leq 100\text{ ns}$ |          | 55         | $A/\mu s$   |
| $I_{GM}$               | Peak Gate Current                                              | $t_p = 20\text{ }\mu s$ $T_j = 125^{\circ}C$                                                   |          | 4          | A           |
| $P_{G(AV)}$            | Average Gate Power Dissipation( $T_j=125^{\circ}C$ )           |                                                                                                |          | 1          | W           |
| $P_{GM}$               | Peak Gate Power Dissipation( $t_p=20\mu s, T_j=125^{\circ}C$ ) |                                                                                                |          | 10         | W           |
| $T_j$                  | Operating Junction Temperature                                 |                                                                                                |          | - 40 ~ 125 | $^{\circ}C$ |
| $T_{STG}$              | Storage Temperature                                            |                                                                                                |          | - 40 ~ 150 | $^{\circ}C$ |



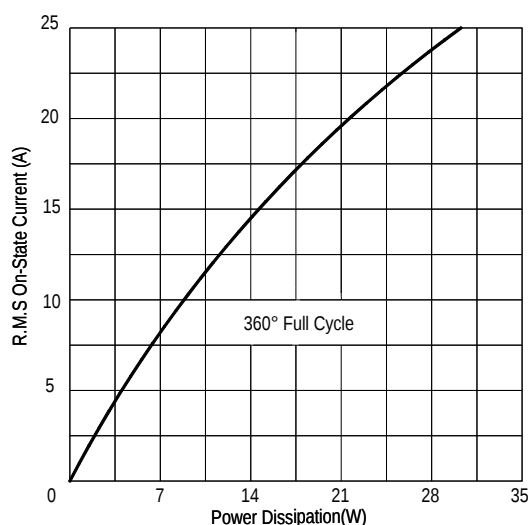
### Electrical Characteristics( $T_j = 25^\circ\text{C}$ unless otherwise specified )

| Symbol               | Items                                          | Conditions                                                                                                 |      | AIT25C60/80 |       |      | Unit                      |
|----------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------|------|-------------|-------|------|---------------------------|
|                      |                                                |                                                                                                            |      | S           | Blank | B    |                           |
| $I_{\text{DRM}}$     | Peak Forward Reverse Blocking Current          | $V_{\text{DRM}} = V_{\text{RRM}}, T_j = 25^\circ\text{C}$                                                  | Max. | 5           |       |      | $\mu\text{A}$             |
| $I_{\text{RRM}}$     |                                                | $V_{\text{DRM}} = V_{\text{RRM}}, T_j = 125^\circ\text{C}$                                                 |      | 3           |       |      | $\text{mA}$               |
| $V_{\text{TM}}$      | Peak On-State Voltage                          | $I_{\text{TM}} = 35\text{A}, t_p = 380 \mu\text{s}$                                                        | Max. | 1.5         |       |      | V                         |
| $V_{\text{GD}}$      | Q1-Q2-Q3                                       | Non-Trigger Gate Voltage<br>$V_D = V_{\text{DRM}}, R_L = 3.3 \text{ k}\Omega$<br>$T_j = 125^\circ\text{C}$ | Min. | 0.2         |       |      | V                         |
| $V_{\text{GT}}$      | Q1-Q2-Q3                                       | Gate Trigger Voltage<br>$V_D = 12\text{V}, R_L = 33\Omega$                                                 | Max. | 1.3         |       |      | V                         |
| $I_{\text{GT}}$      | Q1-Q2-Q3                                       | Gate Trigger Current                                                                                       | Max. | 10          | 35    | 50   | $\text{mA}$               |
| $I_{\text{H}}$       | Q1-Q2-Q3                                       | Holding Current<br>$I_T = 0.1\text{A}$                                                                     | Max. | 20          | 50    | 75   | $\text{mA}$               |
| $I_{\text{L}}$       | Q1-Q3                                          | Latching Current<br>$I_G = 1.2 I_{\text{GT}}$                                                              | Max. | 20          | 80    | 90   | $\text{mA}$               |
|                      | Q2                                             |                                                                                                            |      | 35          | 90    | 110  |                           |
| $dV/dt$              | Critical Rate of Rise of Off-State Voltage     | $V_D = 2/3 V_{\text{DRM}}$ gate open<br>$T_j = 125^\circ\text{C}$                                          | Min. | 500         | 1000  | 1500 | $\text{V}/\mu\text{s}$    |
| $(dV/dt)_c$          | Critical Rate of Change of Commutating Voltage | $(dI/dt)_c = -12\text{A/ms}$<br>$T_j = 125^\circ\text{C}$                                                  | Min. | 1           | 15    | 20   | $\text{V}/\mu\text{s}$    |
| $R_{\text{th(j-c)}}$ | Junction to case (AC)                          |                                                                                                            | Max. | 1.7         |       |      | $^\circ\text{C}/\text{W}$ |
| $R_{\text{th(j-a)}}$ | Junction to ambient                            |                                                                                                            | Max. | 60          |       |      | $^\circ\text{C}/\text{W}$ |

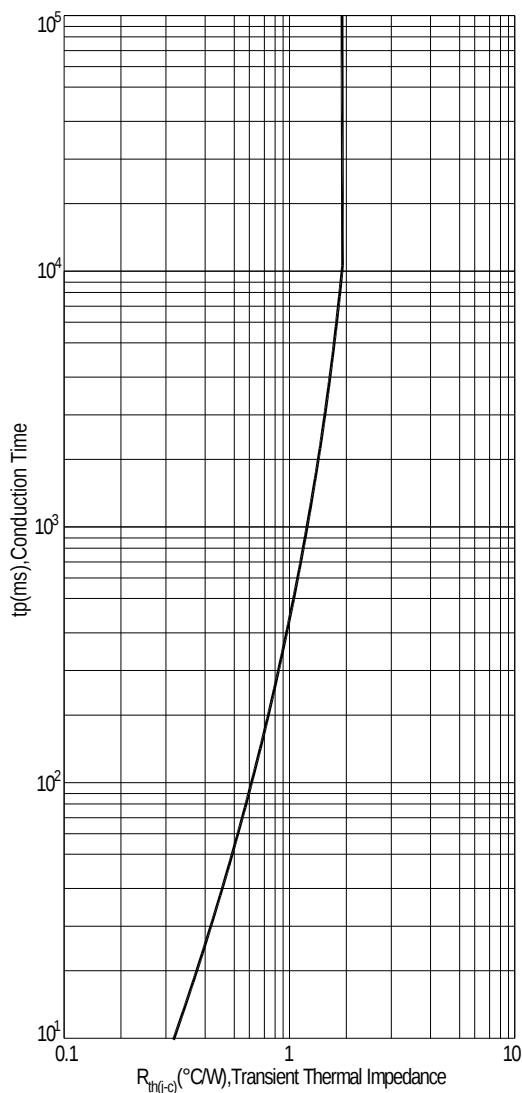
FIG.1: Triac quadrant are defined and the gate trigger test circuit



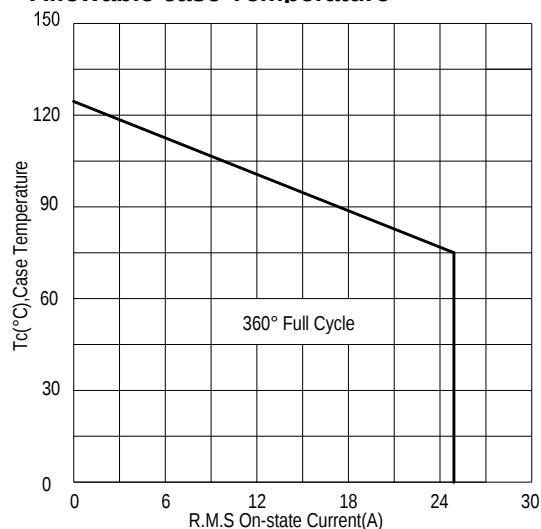
**FIG.2: Maximum on-state power dissipation**



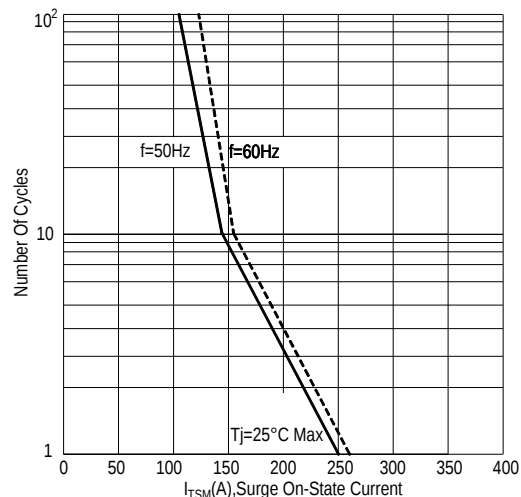
**FIG.4: Maximum transient thermal impedance**



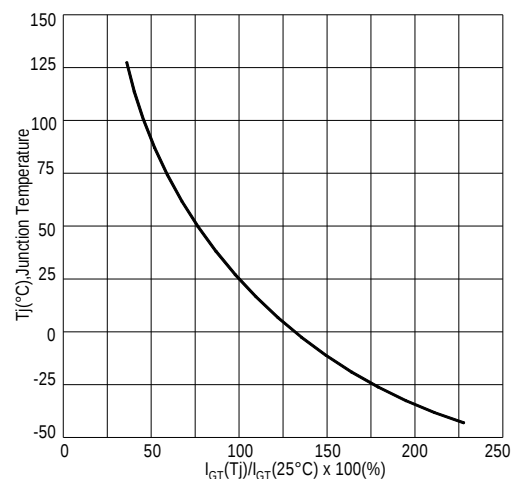
**FIG.3: Typical RMS on-state current VS Allowable case Temperature**



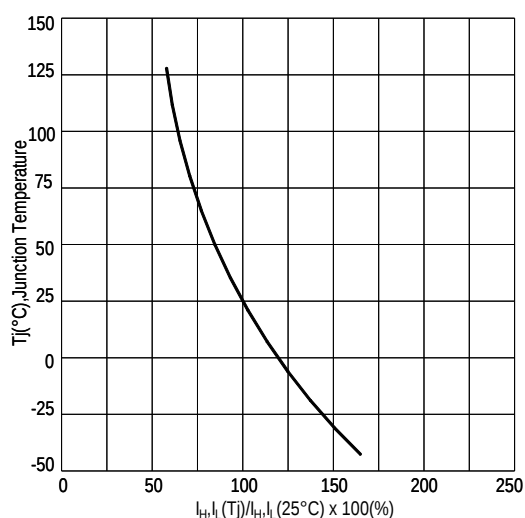
**FIG.5: Rated surge on-state current ( Non-Repetitive)**



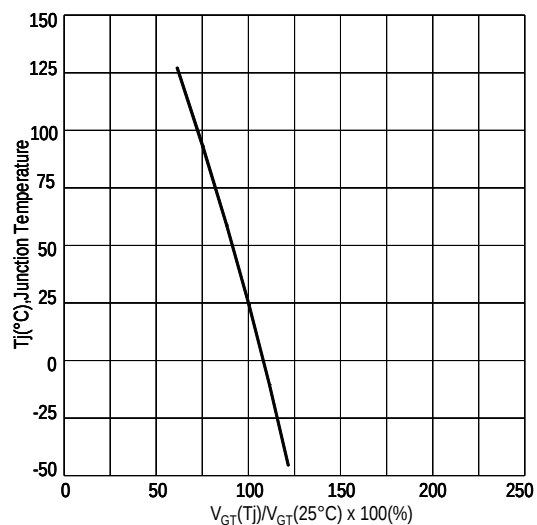
**FIG.6: Gate trigger current VS Junction temperature**



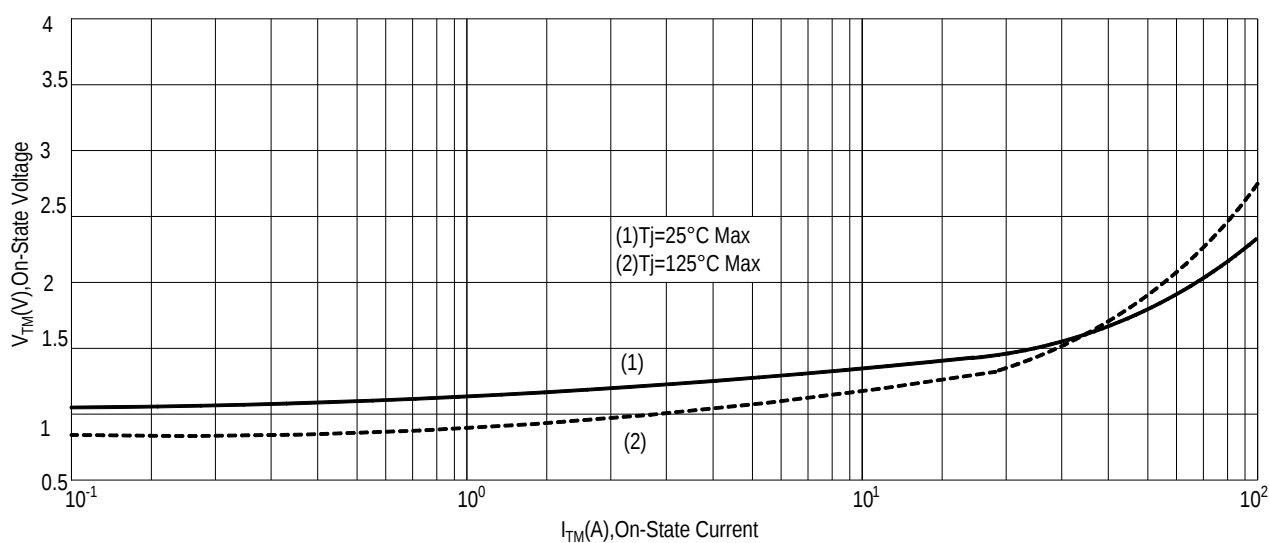
**FIG.7:Holding current and Latching current VS Junction temperature**



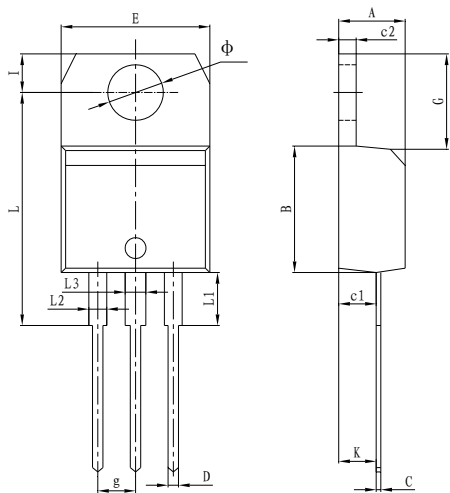
**FIG.8: Gate trigger voltage VS Junction temperature**



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



PACKAGE MECHANICAL DATA  
TO-220(isolated) 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 |
| Φ      | 3.60                         | 3.90  | 0.141                   | 0.153 |
| K      | 2.60TYP                      |       | 0.102TYP                |       |

Making Diagram

ADV:Logo  
AIT25C60B:Part number  
X:Internal control code  
H:Halogen Free

A I T 25 C 60 # S(B)

ADVANCED  
isolated  
Internal control code  
Current:25=25A  
Quadrant:C=3Q

Sensitivity and type:  
S=10mA  
Blank=35mA  
B=50mA  
Package explain:Blank=TO-220  
Voltage:60=600V 80=800V

Ordering information

| Part number | Package         | Marking   | Packing | Quantity |
|-------------|-----------------|-----------|---------|----------|
| AIT25C60#   | TO-220 isolated | AIT25C60# | Tube    | 50pcs    |
| AIT25C80#   | TO-220 isolated | AIT25C80# | Tube    | 50pcs    |

Note:# = Gate Trigger Current Sensitivity and type

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