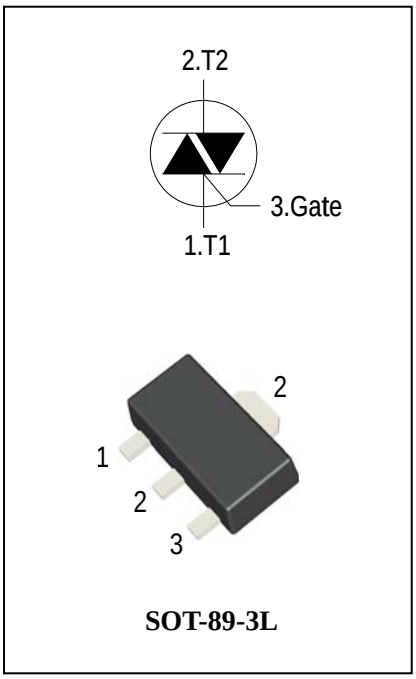
# *4 Quadrants Triacs*

## General Description

This device is suitable for low power AC switching application, phase control application such as fan speed and temperature modulation control , lighting control and static switching relay also designed for use in MPU interface, TTLlogic.




## Features

- Repetitive Peak Off-State Voltage: 600Vand800V
- R.M.S On-State Current ( $I_{T(RMS)}$= 0.8 A )
- These Devices are Pb-Free and are RoHS Compliant

## Absolute Maximum Ratings ( $T_j$ = 25°C unless otherwise specified )

| Symbol | Items | Conditions | | Ratings | Unit |
|---|---|---|---|---|---|
| $V_{DRM}$ | Repetitive Peak Off-State Voltage | Tj = 25°C | ADS1D60A | 600 | V |
| $V_{RRM}$ | | | ADS1D80A | 800 | V |
| $I_{T(RMS)}$ | R.M.S On-State Current | $T_C$ = 70°C | | 0.8 | A |
| $I_{TSM}$ | Surge On-State Current | tp =20ms(50Hz)/tp=16.7ms(60Hz) | | 8/8.3 | A |
| $I^2t$ | $I^2t$ for fusing | tp=10ms | | 0.32 | $A^2s$ |
| dI/dt | Critical rate of rise of on-state current | F = 120 Hz Tj = 110°C<br>$I_G$ = 2 x $I_{GT}$ , tr ≤ 100 ns | | 20 | A/μs |
| $I_{GM}$ | Peak Gate Current | tp = 20 μs Tj = 110°C | | 1 | A |
| $P_{G(AV)}$ | Average Gate Power Dissipation(tp=10ms,Tj=80°C) | | | 0.1 | W |
| $P_{GM}$ | Peak Gate Power Dissipation(tp=10ms,Tj=80°C) | | | 1 | W |
| $T_j$ | Operating Junction Temperature | | | - 40 ~ 110 | °C |
| $T_{STG}$ | Storage Temperature | | | - 40 ~ 150 | °C |

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## Electrical Characteristics ( $T_j$ = 25°C unless otherwise specified )

| Symbol | Items | | Conditions | | ADS1D60A/80A | Unit |
|---|---|---|---|---|---|---|
| $I_{DRM}$ | Peak Forward Reverse Blocking Current | | $V_{DRM}$ = $V_{RRM}$, Tj = 25°C | Max. | 5 | uA |
| $I_{RRM}$ | | | $V_{DRM}$ = $V_{RRM}$, Tj = 110°C | | 0.1 | mA |
| $V_{TM}$ | Peak On-State Voltage | | $I_{TM}$ = 1.1A, $t_p$ = 380 μs | Max. | 1.5 | V |
| $V_{GD}$ | Q1-Q2-Q3-Q4 | Non－Trigger Gate Voltage | $V_D$ = $V_{DRM}$ $R_L$ = 3.3 kΩ Tj = 110°C | Min. | 0.2 | V |
| $V_{GT}$ | Q1-Q2-Q3-Q4 | GateTrigger Voltage | $V_D$ = 12V ， $R_L$ = 33Ω | Max. | 1.5 | V |
| $I_{GT}$ | Q1-Q2-Q3 | GateTrigger Current | | Max. | 5 | mA |
| | Q4 | | | | 7 | |
| $I_H$ | Q1-Q2-Q3-Q4 | Holding Current | $I_T$ = 0.2A | Max. | 5 | mA |
| $I_L$ | Q1-Q3-Q4 | Latching Current | $I_G$ = 1.2 $I_{GT}$ | Max. | 10 | mA |
| | Q2 | | | | 20 | |
| dV/dt | Critical Rate of Rise of Off-State Voltage | | $V_D$ = 2/3$V_{DRM}$ gate open Tj = 110°C | Min. | 25 | V/μs |
| (dV/dt)c | Critical Rate of Change of Commutating Voltage | | (dI/dt)c=-0.3A/ms Tj = 110°C | Min. | 0.5 | V/μs |
| $R_{th(j-c)}$ | Junction to case (AC) | | | Max. | 50 | °C/W |
| $R_{th(j-a)}$ | Junction to ambient(Copper surface under tab:S=5cm$^2$) | | | Max. | 100 | °C/W |

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

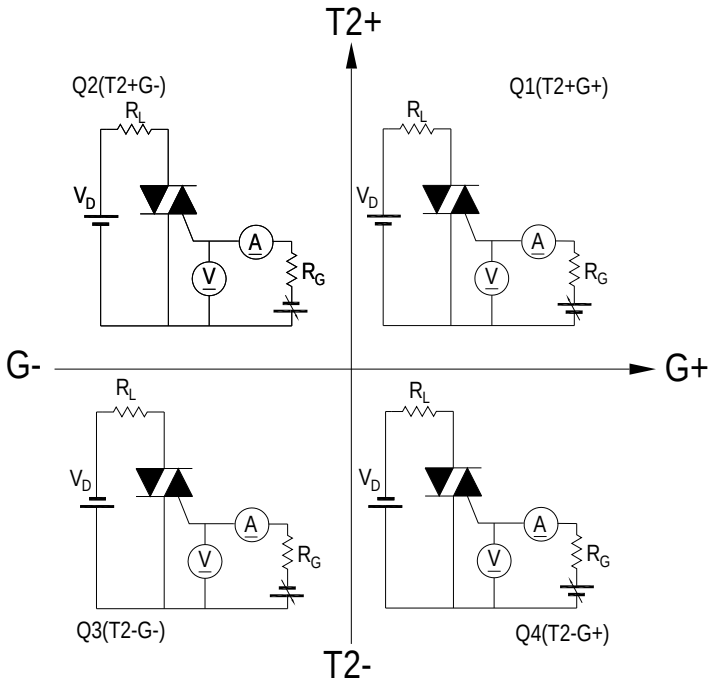


**FIG.2: Maximum on-state power dissipation**

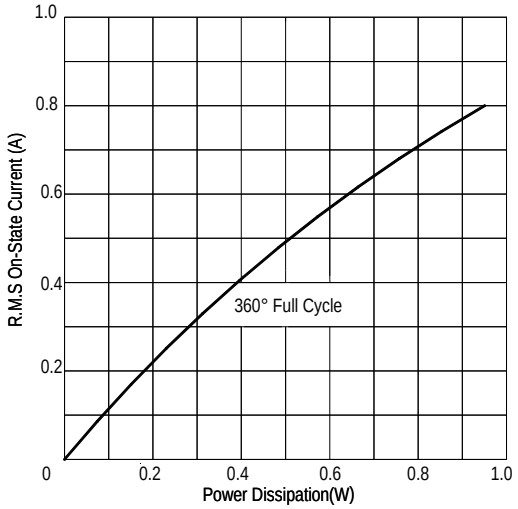



**FIG.3: Typical RMS on-state current VS Allowable case Temperature**

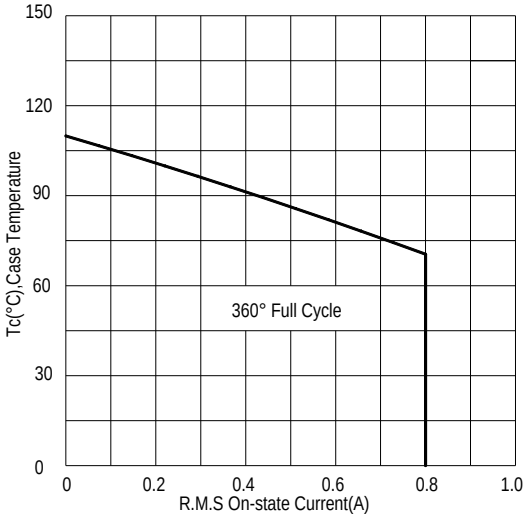



**FIG.4: Gate trigger current VS Junction temperature**

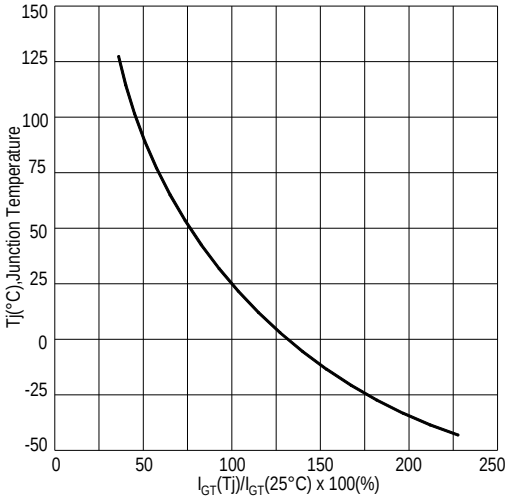



**FIG.5: Rated surge on-state current ( Non-Repetitive)**

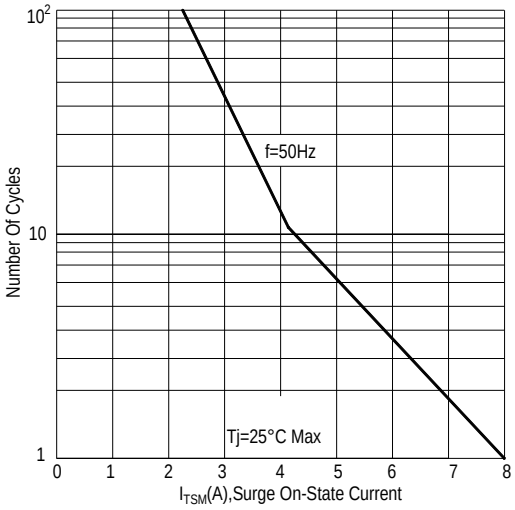



**FIG.6: On-state characteristics(Max)**

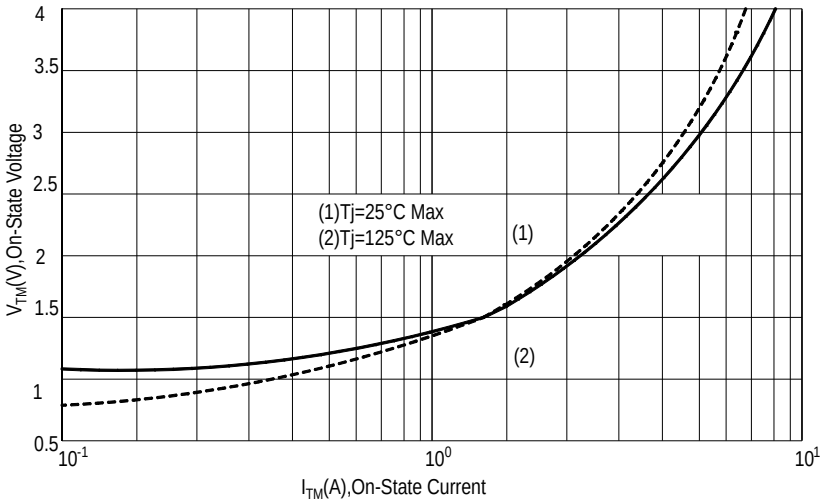


**FIG.7:Holding current and Latching current VS Junction temperature**

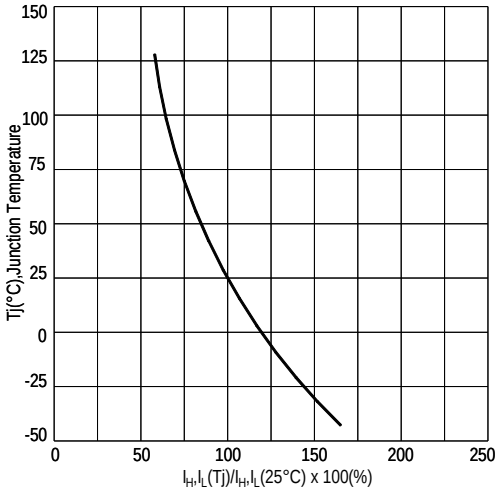
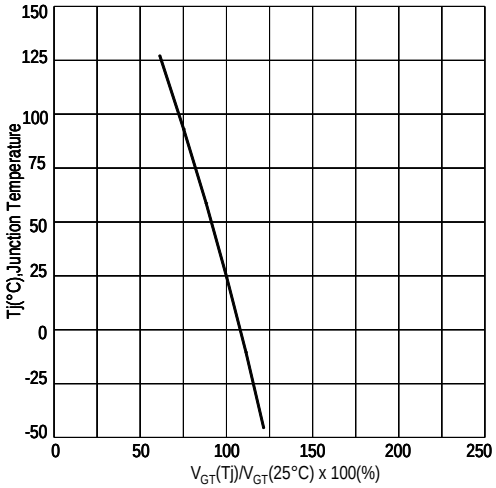
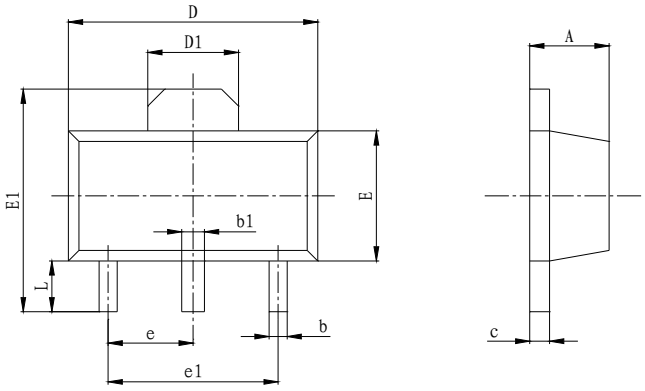



**FIG.8: Gate trigger voltage VS Junction temperature**



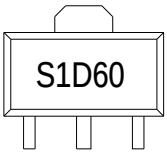
**PACKAGE MECHANICAL DATA**

**SOT-89-3L Package Dimension**




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.400 | 1.600 | 0.055 | 0.063 |
| b | 0.320 | 0.520 | 0.013 | 0.197 |
| b1 | 0.400 | 0.580 | 0.016 | 0.023 |
| c | 0.350 | 0.440 | 0.014 | 0.017 |
| D | 4.400 | 4.600 | 0.173 | 0.181 |
| D1 | 1.550 REF | | 0.061 REF | |
| E | 2.300 | 2.600 | 0.091 | 0.102 |
| E1 | 3.940 | 4.250 | 0.155 | 0.167 |
| e | 1.500 TYP | | 0.060TYP | |
| e1 | 3.000 TYP | | 0.118TYP | |
| L | 0.900 | 1.200 | 0.035 | 0.047 |

**Making Diagram**




S1D60:Part number
(ADS1D60A)

AD S 1 D 60 A

ADVANCED

Internal control code

Current:1=0.8A

Quadrant:D=4Q

Voltage:60=600V 80=800V

Package explain:A=SOT-89-3L

**Ordering information**

| Part number | Package | Marking | Packing | Quantity |
|---|---|---|---|---|
| ADS1D60A | SOT-89 | S1D60 | Embossed tape | 1000pcs |
| ADS1D80A | SOT-89 | S1D80 | Embossed tape | 1000pcs |

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