

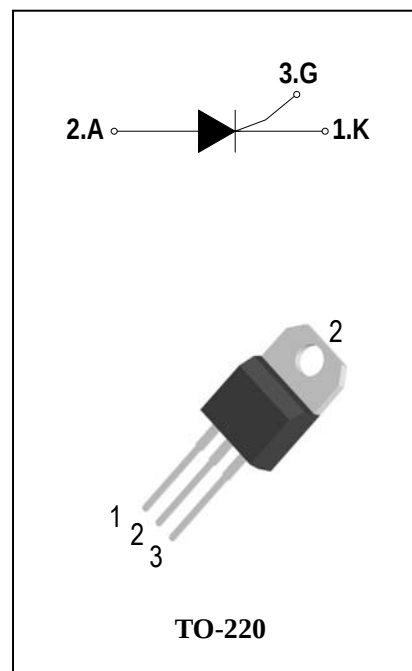
## SCRs

### General Description

The 40A SCR series of silicon controlled rectifiers, with high ability to withstand the shock loading of large current, provide high dv/dt rate with strong resistance to electromagnetic interference. They are especially recommended for use on solid state relay, motorcycle, power charger, T-tools etc.

### Features

- ◆ Repetitive Peak Off-State Voltage : 1000V and 1200V
- ◆ R.M.S On-State Current (  $I_{T(RMS)}$  ) = 40 A )
- ◆ These are Pb-Free Devices



### Absolute Maximum Ratings

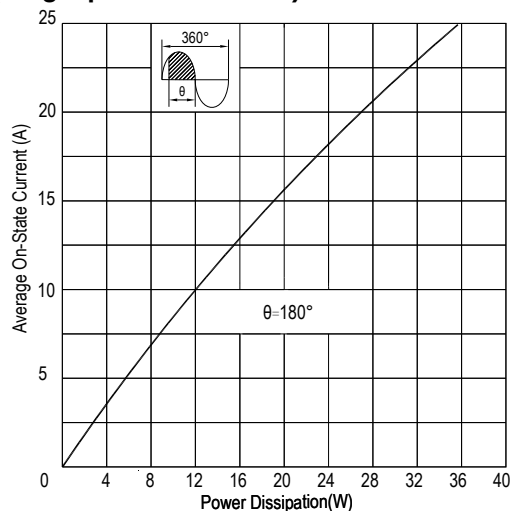
| Symbol       | Items                                  | Conditions                                                                                      |           | Ratings    | Unit                 |
|--------------|----------------------------------------|-------------------------------------------------------------------------------------------------|-----------|------------|----------------------|
| $V_{DRM}$    | Repetitive Peak Off-State Voltage      | $T_j = 25^\circ\text{C}$                                                                        | ADS40A100 | 1000       | V                    |
| $V_{RRM}$    | Repetitive peak reverse voltage        |                                                                                                 | ADS40A120 | 1200       | V                    |
| $I_{T(AV)}$  | Average On-State Current               | Half Sine Wave , $T_c = 90^\circ\text{C}$                                                       |           | 25         | A                    |
| $I_{T(RMS)}$ | R.M.S On-State Current                 | Half Sine Wave , $T_c = 90^\circ\text{C}$                                                       |           | 40         | A                    |
| $I_{TSM}$    | Surge On-State Current                 | 1/2 Cycle, Sine Wave Non-Repetitive,<br>$t_p = 10\text{ms}(50\text{Hz}) T_j = 25^\circ\text{C}$ |           | 460        | A                    |
| $I^2t$       | $I^2t$ for Fusing                      | $T_j = 25^\circ\text{C}, t_p = 10\text{ms}$                                                     |           | 1060       | $\text{A}^2\text{S}$ |
| $P_{GM}$     | Forward Peak Gate Power Dissipation    | $T_j = 125^\circ\text{C}$ , Pulse Width $\leq 20\mu\text{s}$                                    |           | 5          | W                    |
| $P_{G(AV)}$  | Forward Average Gate Power Dissipation | $T_j = 25^\circ\text{C}$ , $t_p = 10\text{ms}$                                                  |           | 1          | W                    |
| $I_{GM}$     | Peak Gate Current                      | $T_j = 125^\circ\text{C}$ , Pulse Width $\leq 20\mu\text{s}$                                    |           | 4          | A                    |
| $T_j$        | Operating Junction Temperature         |                                                                                                 |           | - 40 ~ 125 | $^\circ\text{C}$     |
| $T_{STG}$    | Storage Temperature                    |                                                                                                 |           | - 40 ~ 150 | $^\circ\text{C}$     |



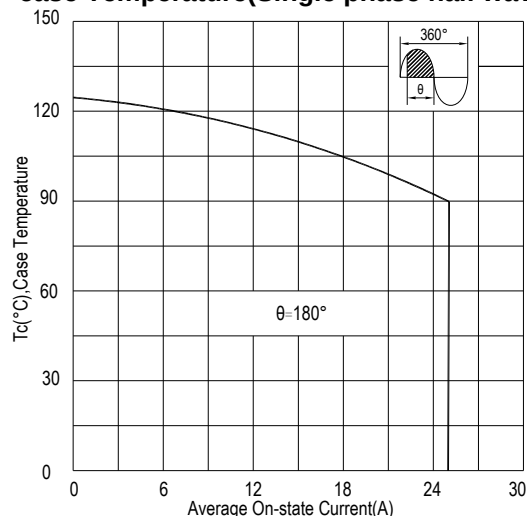
**Electrical Characteristics** (  $T_j = 25^\circ\text{C}$  unless otherwise specified )

| Symbol                               | Items                                         | Conditions                                                                      |      | ADS40A100/120 |       | Unit               |
|--------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------|------|---------------|-------|--------------------|
|                                      |                                               |                                                                                 |      | S             | Blank |                    |
| $I_{\text{DRM}}$<br>$I_{\text{RRM}}$ | Peak Forward Reverse<br>Blocking Current      | $V_{\text{DRM}} = V_{\text{RRM}}$<br>$T_j = 25^\circ\text{C}$                   | Max. | 10            |       | $\mu\text{A}$      |
|                                      |                                               | $V_{\text{DRM}} = V_{\text{RRM}}$<br>$T_j = 125^\circ\text{C}$                  |      | 4             |       | mA                 |
| $V_{\text{TM}}$                      | Peak On-State Voltage                         | $I_{\text{TM}} = 80\text{A}$ , $t_p = 380\ \mu\text{s}$                         | Max. | 1.6           |       | V                  |
| $V_{\text{GD}}$                      | Non-Trigger Gate Voltage                      | $V_D = V_{\text{DRM}}$ $R_L = 3.3\ \text{k}\Omega$<br>$T_j = 125^\circ\text{C}$ | Min. | 0.2           |       | V                  |
| $V_{\text{GT}}$                      | Gate Trigger Voltage                          | $V_D = 12\text{V}$ , $R_L = 33\Omega$                                           | Max. | 1.3           |       | V                  |
| $I_{\text{GT}}$                      | Gate Trigger Current                          |                                                                                 | Max. | 15            | 30    | mA                 |
| $I_{\text{H}}$                       | Holding Current                               | $I_T = 0.5\text{A}$                                                             | Max. | 30            | 40    | mA                 |
| $I_{\text{L}}$                       | Latching Current                              | $I_G = 1.2\ I_{\text{GT}}$                                                      | Max. | 50            | 50    | mA                 |
| $dV/dt$                              | Critical Rate of Rise of<br>Off-State Voltage | $V_D = 2/3V_{\text{DRM}}$ gate open<br>$T_j = 125^\circ\text{C}$                | Min. | 1000          | 1500  | V/ $\mu\text{s}$   |
| $R_{\text{th(j-c)}}$                 | Junction to case (AC)                         |                                                                                 | Max. | 0.8           |       | $^\circ\text{C/W}$ |
| $R_{\text{th(j-a)}}$                 | Junction to ambient                           |                                                                                 | Max. | 60            |       | $^\circ\text{C/W}$ |

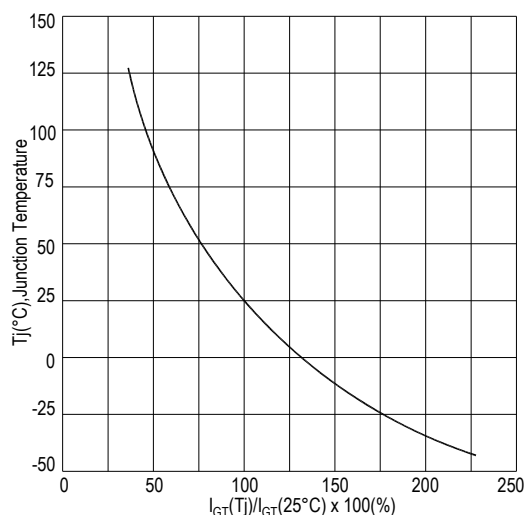
**FIG.1: Maximum average power dissipation  
(Single phase half wave)**



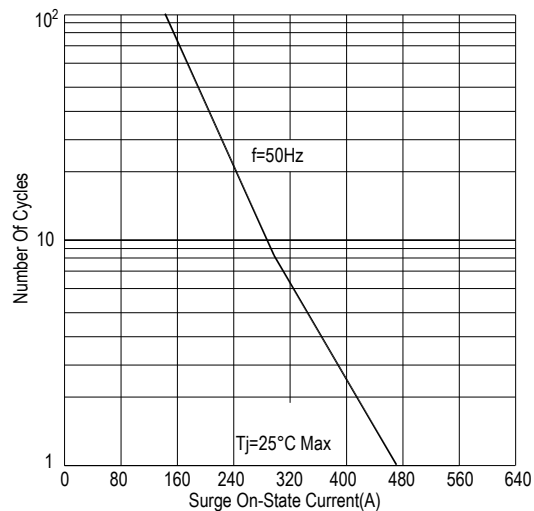
**FIG.2: Average on-state current VS Allowable case Temperature (Single phase half wave)**



**FIG.3: Gate trigger current VS Junction temperature**



**FIG.4: Rated surge on-state current (Non-Repetitive)**



**FIG.5: On-state characteristics(Max)**

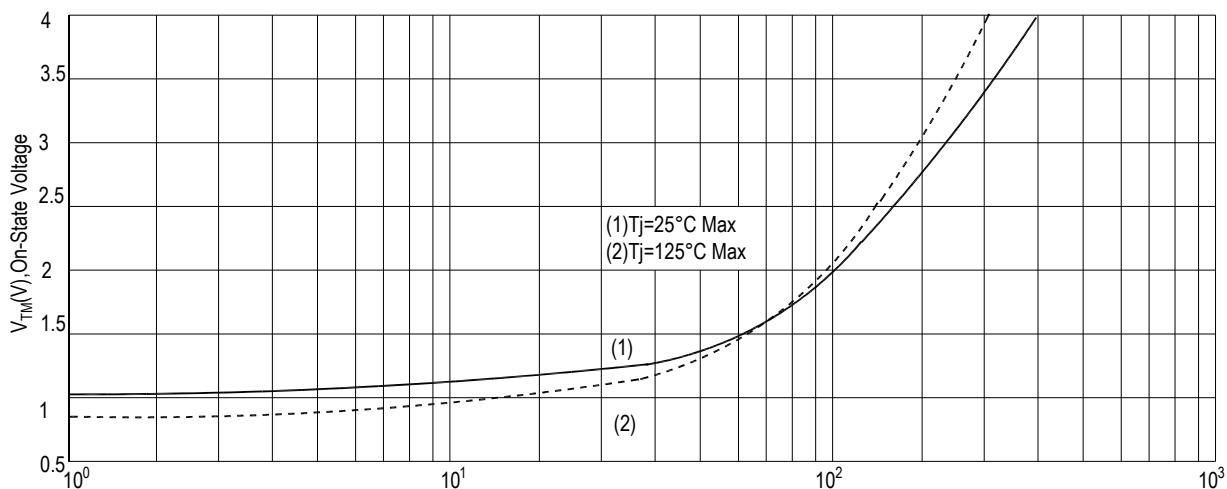


FIG.6:Holding current and Latching current VS Junction temperature

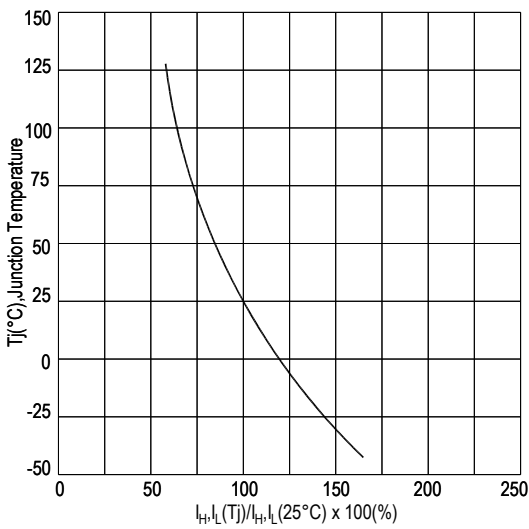
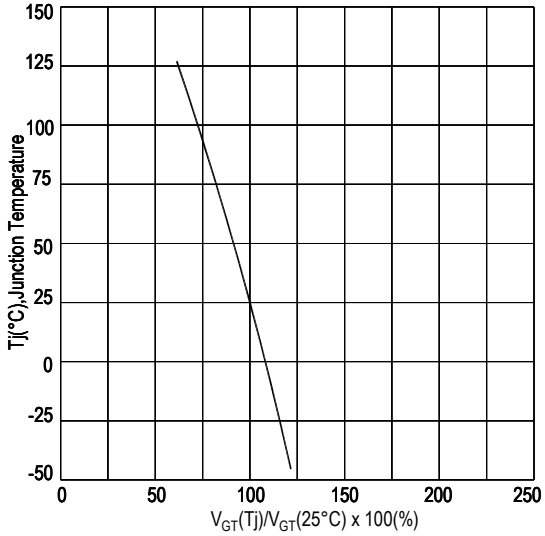
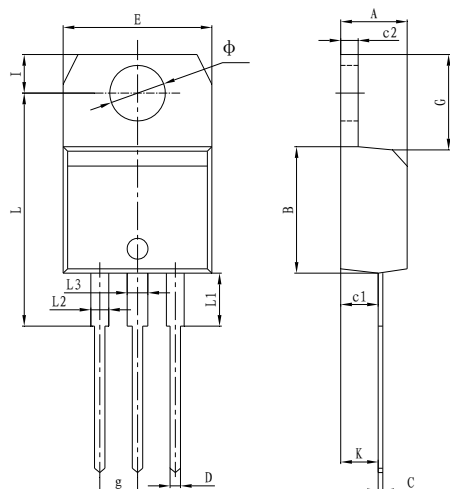


FIG.7: Gate trigger voltage VS Junction temperature



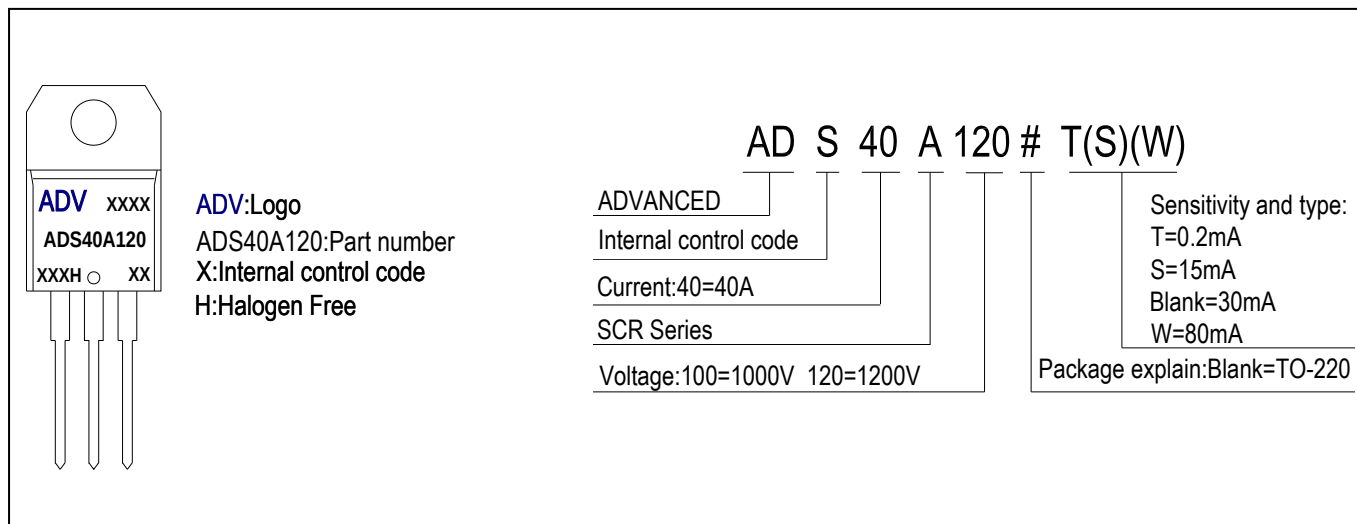
### PACKAGE MECHANICAL DATA

#### 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



#### Ordering information

| Part number | Package | Marking    | Packing | Quantity |
|-------------|---------|------------|---------|----------|
| ADS40A100#  | TO-220  | ADS40A100# | Tube    | 50pcs    |
| ADS40A120#  | TO-220  | ADS40A120# | Tube    | 50pcs    |

Note: # = Gate Trigger Current Sensitivity and type

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