

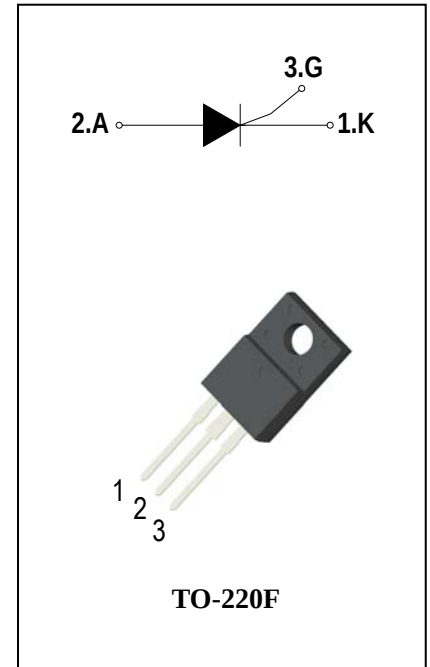
## SCRs

### 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 (  $I_{T(RMS)} = 40\text{ A}$  )
- ◆ These are Pb-Free Devices



### Absolute Maximum Ratings

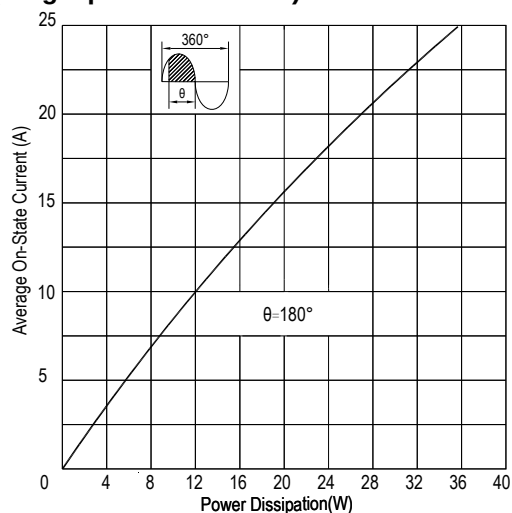
| Symbol       | Items                                  | Conditions                                                                                      |            | Ratings    | Unit                 |
|--------------|----------------------------------------|-------------------------------------------------------------------------------------------------|------------|------------|----------------------|
| $V_{DRM}$    | Repetitive Peak Off-State Voltage      | $T_j = 25^\circ\text{C}$                                                                        | ADS40A100F | 1000       | V                    |
| $V_{RRM}$    | Repetitive peak reverse voltage        |                                                                                                 | ADS40A120F | 1200       | V                    |
| $I_{T(AV)}$  | Average On-State Current               | Half Sine Wave , $T_c = 85^\circ\text{C}$                                                       |            | 25         | A                    |
| $I_{T(RMS)}$ | R.M.S On-State Current                 | Half Sine Wave , $T_c = 85^\circ\text{C}$                                                       |            | 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 | $^\circ\text{C}$     |



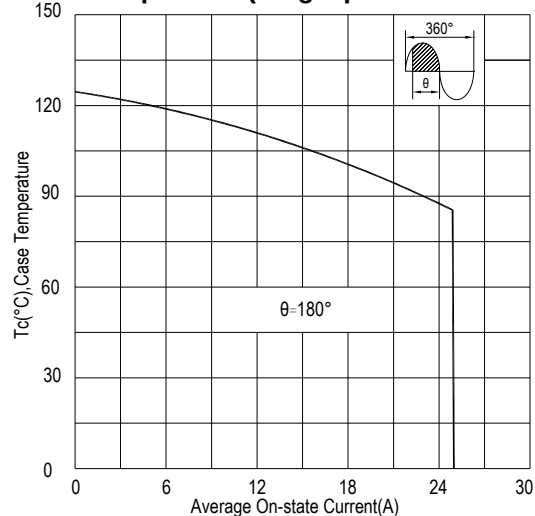
**Electrical Characteristics** (  $T_j = 25^\circ\text{C}$  unless otherwise specified )

| Symbol                               | Items                                         | Conditions                                                                      |      | ADS40A100F/120F |       | 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. | 1.0             |       | $^\circ\text{C/W}$ |
| $R_{\text{th(j-a)}}$                 | Junction to ambient                           |                                                                                 | Max. | 60              |       | $^\circ\text{C/W}$ |

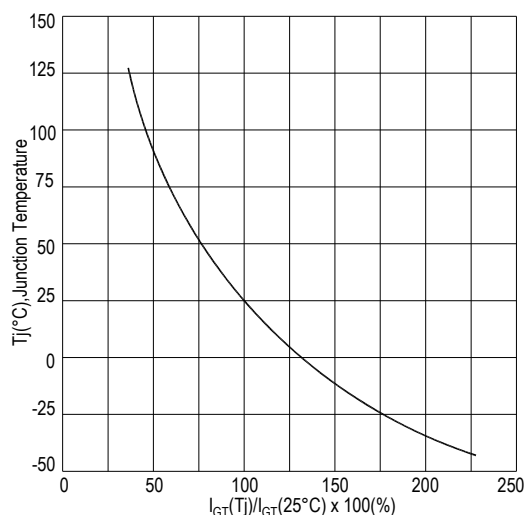
**FIG.1: Maximum average power dissipation  
(Single phase half wave)**



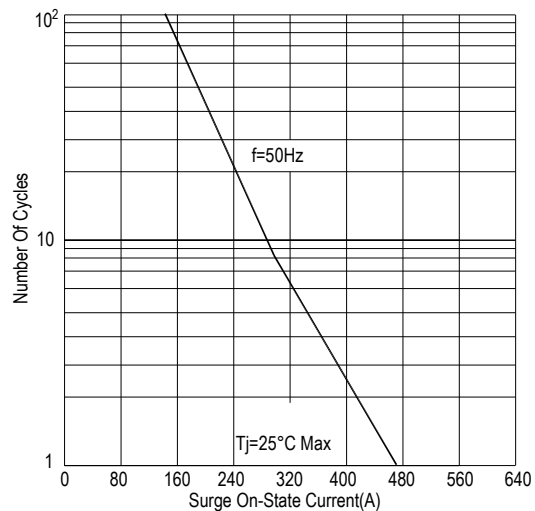
**FIG.2: Average on-state current VS Allowable case Temperature (Single phase half wave)**



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



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



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

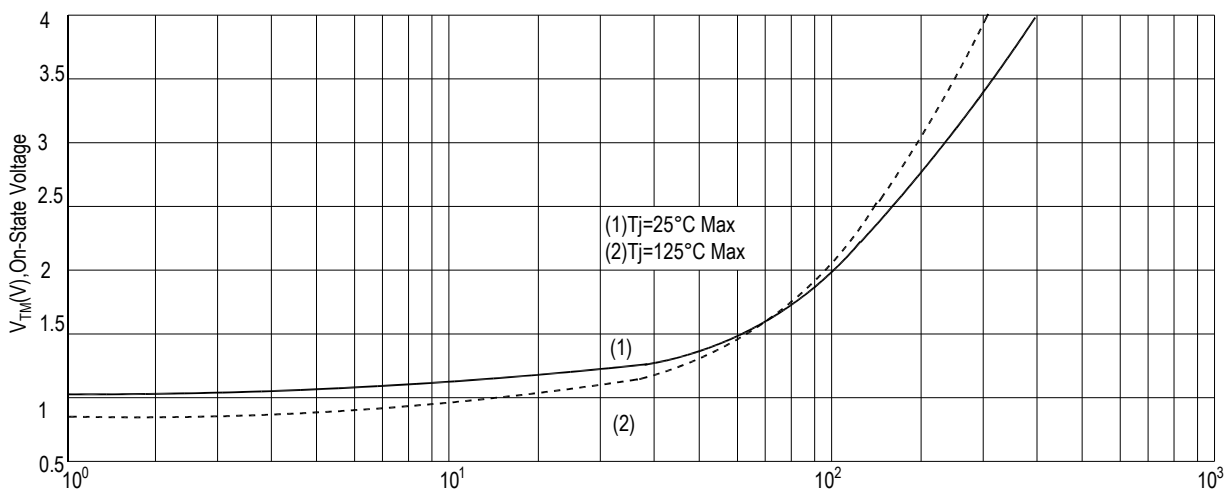


FIG.6:Holding current and Latching current VS Junction temperature

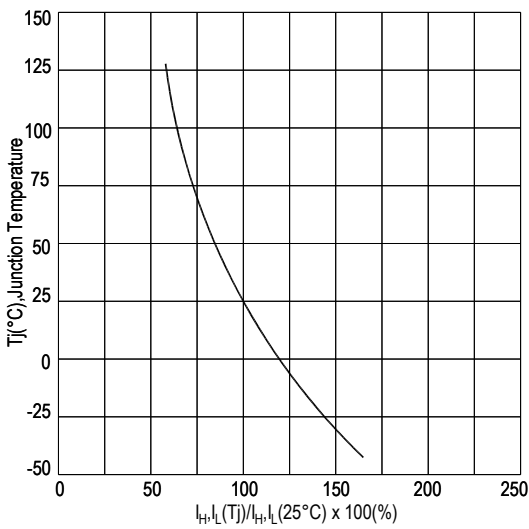
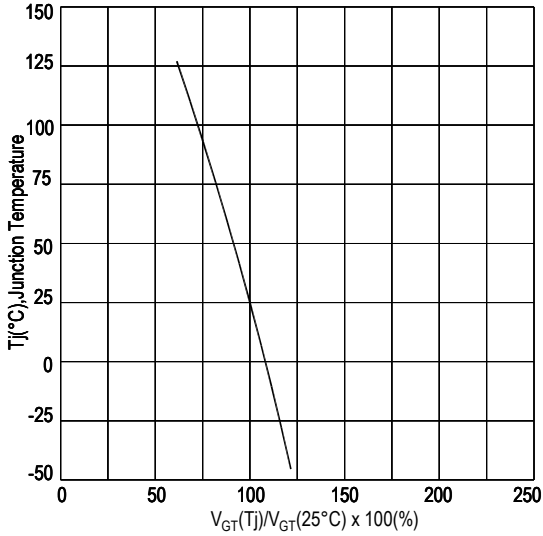
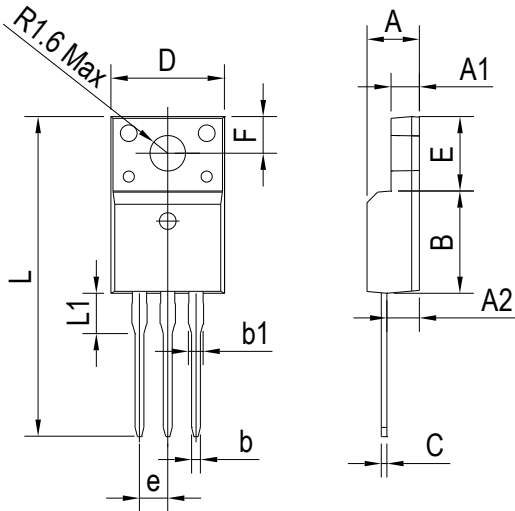


FIG.7: Gate trigger voltage VS Junction temperature



### PACKAGE MECHANICAL DATA

#### TO-220F Package Dimension



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min                       | Max    | Min                  | Max   |
| A      | 4.300                     | 4.800  | 0.169                | 0.189 |
| A1     | 2.400                     | 2.700  | 0.094                | 0.106 |
| A2     | 2.500                     | 3.000  | 0.098                | 0.118 |
| B      | 8.800                     | 9.300  | 0.346                | 0.367 |
| b      | 0.600                     | 0.950  | 0.023                | 0.037 |
| b1     | 1.100                     | 1.700  | 0.043                | 0.067 |
| C      | 0.500                     | 0.750  | 0.020                | 0.030 |
| D      | 9.700                     | 10.360 | 0.382                | 0.408 |
| E      | 6.400                     | 6.800  | 0.252                | 0.268 |
| e      | 2.540 TYP                 |        | 0.100 TYP            |       |
| F      | 3.300 REF                 |        | 0.130 REF            |       |
| L      | 28.000                    | 30.000 | 1.102                | 1.181 |
| L1     | 2.900                     | 3.630  | 0.114                | 0.143 |

#### Making Diagram

**ADV**:Logo  
**ADS40A120F**:Part number  
**XXXH**:Internal control code  
**XX**:Halogen Free

**AD S 40 A 120 F T(S)(W)**

|                                                                                                                         |                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| <p>ADVANCED</p> <p>Internal control code</p> <p>Current:40=40A</p> <p>SCR Series</p> <p>Voltage:100=1000V 120=1200V</p> | <p>Sensitivity and type:<br/>T=0.2mA<br/>S=15mA<br/>Blank=30mA<br/>W=80mA</p> <p>Package explain:F=TO-220F</p> |
|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|

#### Ordering information

| Part number | Package | Marking     | Packing | Quantity |
|-------------|---------|-------------|---------|----------|
| ADS40A100F# | TO-220F | ADS40A100F# | Tube    | 50pcs    |
| ADS40A120F# | TO-220F | ADS40A120F# | Tube    | 50pcs    |

Note:# = Gate Trigger Current Sensitivity and type

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