

# SCRs

## 1.6 Amp, Planar

AD100-AD104  
AD107-AD111  
AD114-AD118

### FEATURES

- Maximum Gate Trigger Current: 2, 20 or 200  $\mu$ A
- Tight Gate Trigger Voltage Range: .44 to .6V
- Voltage Ratings: to 400V
- Specified for  $dv/dt$  and Switching Time

### DESCRIPTION

This data sheet describes Microsemi's AD Series 1.6A SCRs designed for medium-current control and sensing applications. Units are available in a complete range of blocking voltages from 60 to 400 volts.

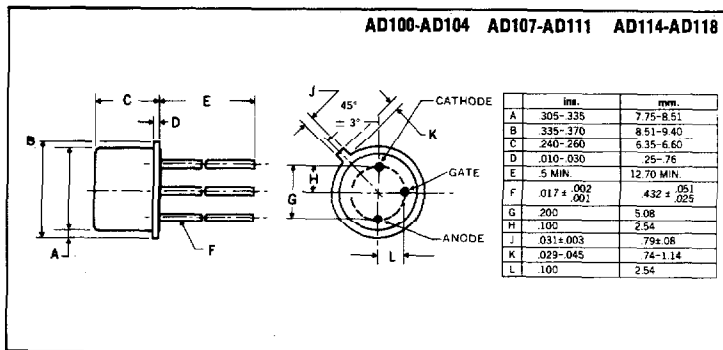
The AD100 series offers a maximum gate trigger current of 2.0 microamps making it the most sensitive device of its type. The AD107 series has a maximum  $I_{GT}$  of 20  $\mu$ A while this parameter is specified at 200  $\mu$ A for the AD114 series.

### ABSOLUTE MAXIMUM RATINGS

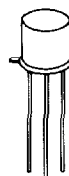
|                                                             | AD100<br>AD107<br>AD114 | AD101<br>AD108<br>AD115 | AD102<br>AD109<br>AD116 | AD103<br>AD110<br>AD117 | AD104<br>AD111<br>AD118 |
|-------------------------------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Repetitive Peak Off-State Voltage, $V_{DRM}$                | 60V                     | 100V                    | 200V                    | 300V                    | 400V                    |
| Repetitive Peak Reverse Voltage, $V_{RRM}$                  | 60V                     | 100V                    | 200V                    | 300V                    | 400V                    |
| Non-Repetitive Peak Reverse Voltage, $V_{RSM}$              | 80V                     | 150V                    | 300V                    | 400V                    | 500V                    |
| Non-Repetitive Peak Off-State Voltage, $V_{DSM}$            |                         |                         | 500V                    |                         |                         |
| D.C. On-State Current, $I_T$                                |                         |                         |                         |                         |                         |
| 75°C Ambient                                                |                         |                         | 450mA                   |                         |                         |
| 85°C Case                                                   |                         |                         | 1.6A                    |                         |                         |
| Repetitive Peak On-State Current, $I_{TRM}$                 |                         |                         | up to 30A               |                         |                         |
| Peak One Cycle Surge (Non-Rep.) On-State Current, $I_{TSM}$ |                         |                         | 15A                     |                         |                         |
| Peak Gate Current, $I_{GM}$                                 |                         |                         | 250mA                   |                         |                         |
| Average Gate Current, $I_{G(AV)}$                           |                         |                         | 25mA                    |                         |                         |
| Reverse Gate Voltage, $V_{GR}$                              |                         |                         | 6V                      |                         |                         |
| Operating and Storage Temperature Range                     |                         |                         | -65°C to +150°C         |                         |                         |

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### MECHANICAL SPECIFICATIONS



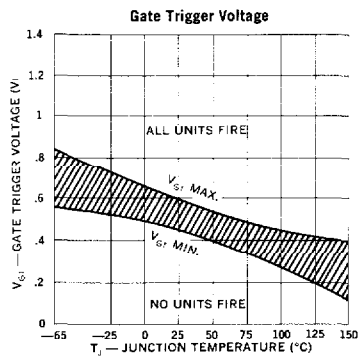
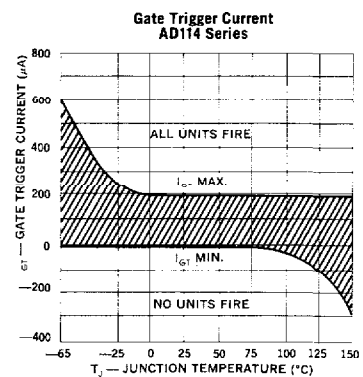
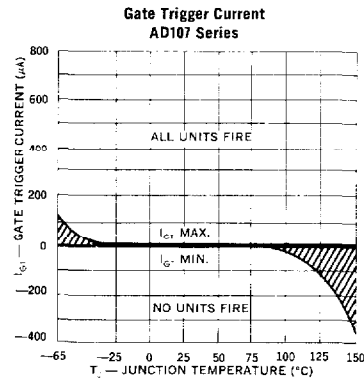
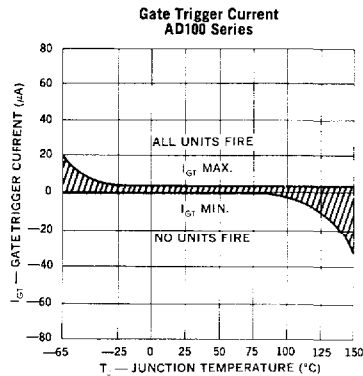
### TO-205AD (TO-39)

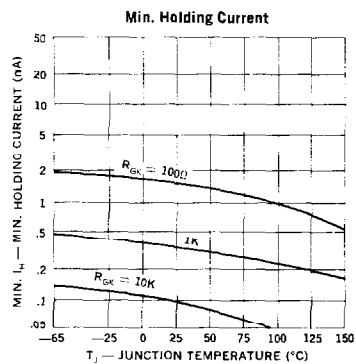
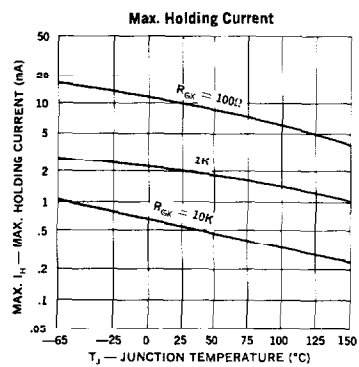


## ELECTRICAL SPECIFICATIONS (at 25°C unless noted)

| Parameter                              | Symbol                | Min. | Typical | Max. | Units      | Test Conditions                                                                                                                                                              |
|----------------------------------------|-----------------------|------|---------|------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SUBGROUP 1                             |                       |      |         |      |            |                                                                                                                                                                              |
| Visual & Mechanical                    | —                     | —    | —       | —    | —          |                                                                                                                                                                              |
| SUBGROUP 2 (25°C TESTS)                |                       |      |         |      |            |                                                                                                                                                                              |
| Off-State Current                      | $I_{DRM}$             | —    | .01     | 0.1  | $\mu A$    | $R_{GK} = 1K, V_{DRM} = \text{Rating}$<br>$R_{GK} = 1K, V_{RRM} = \text{Rating}$<br>$V_{GR} = 2V$<br>$R_{GS} = 10K, V_D = 5V$                                                |
| Reverse Current                        | $I_{RRM}$             | —    | .01     | 0.1  | $\mu A$    |                                                                                                                                                                              |
| Reverse Gate Current                   | $I_{GR}$              | —    | 0.1     | 0.2  | $\mu A$    |                                                                                                                                                                              |
| Gate Trigger Current                   | $I_{GT}$              | —    | —       | —    | —          |                                                                                                                                                                              |
| AD100-104                              | —                     | —    | 0.2     | 2.0  | $\mu A$    |                                                                                                                                                                              |
| AD107-111                              | —                     | —    | 2.0     | 20   | $\mu A$    | $R_{GS} = 100\Omega, V_D = 5V$<br>$I_T = 1.0 \text{ Amp (pulse)}$<br>$R_{GK} = 1K$                                                                                           |
| AD114-118                              | —                     | —    | 20      | 200  | $\mu A$    |                                                                                                                                                                              |
| Gate Trigger Voltage                   | $V_{GT}$              | 0.44 | 0.52    | 0.60 | V          |                                                                                                                                                                              |
| On-State Voltage                       | $V_T$                 | —    | 1.1     | 1.5  | V          |                                                                                                                                                                              |
| Holding Current                        | $I_H$                 | 0.3  | 0.5     | 2.0  | mA         |                                                                                                                                                                              |
| SUBGROUP 3 (25°C TESTS)                |                       |      |         |      |            |                                                                                                                                                                              |
| On-State Voltage-Critical Rate of Rise | $dv/dt$               | 50   | 100     | —    | V/ $\mu S$ | $R_{GK} = 1K, V_D = 30V$<br>$I_G = 10mA, I_T = 1A, V_D = 30V$<br>$I_G = 10mA, I_T = 1A, V_D = 30V$<br>$I_G = 10mA, I_T = 1A, V_D = 30V$<br>$I_T = 1A, I_R = 1A, R_{GK} = 1K$ |
| Gate Trigger-on Pulse Width            | $t_{pg} \text{ (on)}$ | —    | 0.5     | 2.0  | $\mu S$    |                                                                                                                                                                              |
| Delay Time                             | $t_d$                 | —    | 0.6     | —    | $\mu S$    |                                                                                                                                                                              |
| Rise Time                              | $t_r$                 | —    | 0.4     | —    | $\mu S$    |                                                                                                                                                                              |
| Circuit Commutated Turn-off Time       | $t_q$                 | —    | 20      | 50   | $\mu S$    |                                                                                                                                                                              |
| SUBGROUP 4 (125°C TESTS)               |                       |      |         |      |            |                                                                                                                                                                              |
| Off-State Current                      | $I_{DRM}$             | —    | 10      | 100  | $\mu A$    | $R_{GK} = 1K, V_{DRM} = \text{Rating}$<br>$R_{GK} = 1K, V_{RRM} = \text{Rating}$<br>$R_{GS} = 100\Omega, V_D = 5V$<br>$R_{GK} = 1K$                                          |
| Reverse Current                        | $I_{RRM}$             | —    | 30      | 100  | $\mu A$    |                                                                                                                                                                              |
| Gate Trigger Voltage                   | $V_{GT}$              | 0.15 | 0.2     | —    | V          |                                                                                                                                                                              |
| Holding Current                        | $I_H$                 | 0.2  | 0.4     | 1.5  | mA         |                                                                                                                                                                              |

Note: Blocking voltage ratings apply over the full operating temperature range, provided the gate is connected to the cathode through a resistor, 1000 ohms or smaller, or other adequate bias is used.





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