



# Silicon Controlled Rectifier

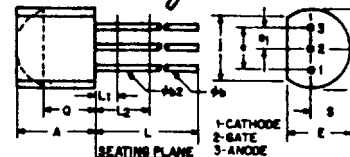
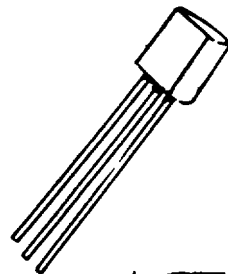
**C203**

0.8A RMS UP TO 400 VOLTS

362-839

**TYPICAL APPLICATIONS:**

- Sensors
  - Temperature
  - Pressure
  - Dryness
  - Proximity\*
  - Voltage
  - Current
- Amplifiers (gate)
- Timers
- Logic Circuits
- Controls
  - Small Motors
  - Small Lamps
  - Remote
- Switching
  - Solid-State Relay
  - Relay Driver
  - Counter
  - Low Power Inverter
- 120V AC Line Operation



| SYMBOL      | INCHES |      | MILLIMETERS |      | NOT |
|-------------|--------|------|-------------|------|-----|
|             | MIN    | MAX  | MIN         | MAX  |     |
| A           | 1.70   | 2.10 | 4.30        | 5.33 |     |
| $\phi_b$    | 0.16   | 0.21 | 4.07        | 5.33 | 1   |
| $\phi_{b2}$ | 0.16   | 0.18 | 4.07        | 4.62 | 3   |
| $\phi_D$    | 1.75   | 2.03 | 4.43        | 5.20 |     |
| E           | 1.25   | 1.63 | 3.18        | 4.19 |     |
| e           | 0.98   | 1.03 | 2.42        | 2.68 |     |
| $\phi_1$    | 0.45   | 0.53 | 1.15        | 1.39 |     |
| J           | 1.39   | -    | 3.43        | -    |     |
| L           | 50.0   | -    | 12.70       | -    | 1   |
| $L_1$       | -      | 0.50 | -           | 1.27 |     |
| $L_2$       | 2.50   | -    | 6.35        | -    |     |
| Q           | 1.18   | -    | 2.93        | -    |     |
| S           | 0.80   | 1.03 | 2.03        | 2.66 |     |

NOTES  
 1. THREE LEADS  
 2. CONTOUR OF THE PACKAGE BEYOND THIS ZONE UNCONTROLLED  
 3. (THREE LEADS)  $\phi_{b2}$  APPLIES BETWEEN  $L_1$  AND  $\phi_b$  APPLIES BETWEEN  $L_2$  AND 5 INCH (12.70) FROM SEATING PLANE. DIAMETER IS UNCONTROLLED IN  $L_1$  AND BEYOND 5 INCH (12.70) FROM SEATING PLANE

**FEATURES:**

- 200  $\mu$ A Gate Sensitivity
- 8-Amp Surge
- 30 through 200 Volt Selection
- Plastic TO-92 Package
- Low  $V_F$
- High dv/dt

**MAXIMUM ALLOWABLE RATINGS**

| TYPE   | REPETITIVE PEAK OFF-STATE VOLTAGE, $V_{DRM}^{(1)}$<br>$T_C = -65^\circ\text{C to } +125^\circ\text{C}$ | REPETITIVE PEAK REVERSE VOLTAGE, $V_{DRM}^{(2)}$<br>$T_C = -65^\circ\text{C to } +125^\circ\text{C}$ |
|--------|--|--|
| C203Y  | 30 Volts   | 30 Volts   |
| C203YY | 60 Volts   | 60 Volts   |
| C203A  | 100 Volts  | 100 Volts  |
| C203B  | 200 Volts  | 200 Volts  |
| C203C  | 300 Volts  | 300 Volts  |
| C203D  | 400 Volts  | 400 Volts  |

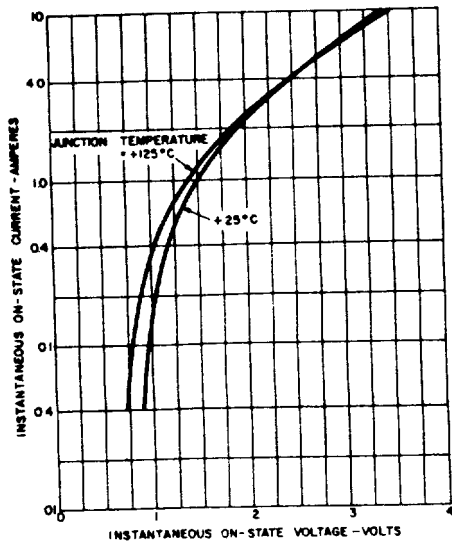
<sup>1</sup>  $R_{GK} = 1000$  ohms maximum.  
<sup>2</sup> Values apply for zero or negative gate voltage only.

|  |  |
|--|--|
| RMS On-State Current, $I_{T(RMS)}$ (all Conduction Angles) | 0.8 Amperes                                |
| Peak One Cycle Surge (non-rep) On-State Current, $I_{TSM}$ | 8.0 Amperes                                |
| Peak Gate Power Dissipation, $P_{GM}$                      | 1.0 Watts for 8.3 msec.                    |
| Average Gate Power Dissipation, $P_{G(AV)}$                | 0.01 Watts                                 |
| Peak Positive Gate Current, $I_{GM}$                       | 0.5 Amperes                                |
| Peak Negative Gate Voltage, $V_{GM}$                       | 8 Volts                                    |
| Storage Temperature, $T_{STG}$                             | $-65^\circ\text{C to } +150^\circ\text{C}$ |
| Operating Junction Temperature, $T_J$                      | $-65^\circ\text{C to } +125^\circ\text{C}$ |

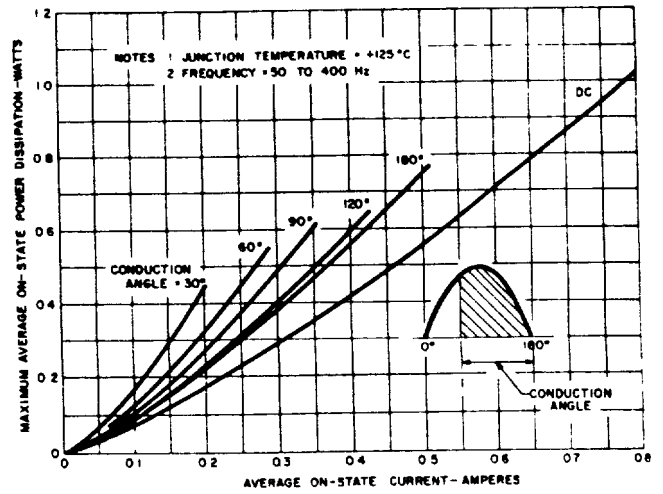
## CHARACTERISTICS

| TEST  | SYMBOL                       | MIN. | TYP. | MAX. | UNITS            | TEST CONDITIONS   |
|---|------------------------------|------|------|------|------------------|---|
| Peak Reverse and Off-State Current<br>(All Types) | $I_{RRM}$<br>OR<br>$I_{DRM}$ | —    | —    | 1.0  | $\mu A$          | $T_C = +25^\circ C$ , $R_{GK} = 1000$ ohms<br>$V_{RRM} = V_{DRM} = \text{Rated Value}$ .  |
|   |                              | —    | —    | 50   |                  | $T_C = +125^\circ C$ , $R_{GK} = 1000$ ohms<br>$V_{RRM} = V_{DRM} = \text{Rated Value}$ .   |
| DC Gate Trigger Current                           | $I_{GT}$                     | —    | —    | 200  | $\mu A_{dc}$     | $T_C = +25^\circ C$ , $V_D = 6V_{dc}$ ,<br>$R_L = 100$ ohms.  |
|   |                              | —    | —    | 500  |                  | $T_C = -65^\circ C$ , $V_D = 6V_{dc}$ ,<br>$R_L = 100$ ohms.  |
| DC Gate Trigger Voltage                           | $V_{GT}$                     | —    | —    | 0.8  | Vdc              | $T_C = +25^\circ C$ , $V_D = 6V_{dc}$ ,<br>$R_L = 100$ ohms.  |
|   |                              | —    | —    | 1.0  |                  | $T_C = -65^\circ C$ , $V_D = 6V_{dc}$ ,<br>$R_L = 100$ ohms.  |
|   |                              | 0.1  | —    | —    |                  | $T_C = +125^\circ C$ , Rated $V_{DRM}$ ,<br>$R_L = 1000$ ohms.  |
| Peak On-State Voltage                             | $V_{TM}$                     | —    | —    | 1.5  | V                | $T_C = +25^\circ C$ , $I_{TM} = 1.0A$ peak,<br>1 msec. wide pulse, Duty Cycle $\leq 2\%$  |
| Holding Current                                   | $I_H$                        | —    | —    | 5.0  | mA <sub>dc</sub> | Anode source voltage = 12Vdc,<br>$R_{GK} = 1000$ ohms. $T_C = +25^\circ C$ .  |
|   |                              | —    | —    | 10.0 |                  | $T_C = -65^\circ C$   |
| Critical Rate-of-Rise<br>of Off-State Voltage     | dv/dt                        | —    | 20   | —    | V/ $\mu sec$     | $T_C = +125^\circ C$ , Rated $V_{DRM}$ ,<br>$R_{GK} = 1000$ ohms.   |
| Circuit Commutated<br>Turn-Off Time               | $t_q$                        | —    | 15   | —    | $\mu sec$        | $T_C = +125^\circ C$ , rectangular current<br>waveform. Rate-of-rise of current<br><10A/ $\mu sec$ . Rate reversal of current<br><5A/ $\mu sec$ . $I_{TM} = 1A$ (50 $\mu sec$ . pulse).<br>Rep. Rate = 60 pps. $V_{RRM} = \text{Rated}$ ,<br>$V_{RX} = 15V$ Min., $V_{DRM} = \text{Rated}$ .<br>Rate-of-rise of reapplied off-state<br>voltage = 20V/ $\mu sec$ .; Gate Bias = 0<br>Volts, 100 Ohms (during turn-off<br>time interval). |
| Steady-State<br>Thermal Resistance                | $R_{\theta JC}$              | —    | —    | 125  | $^\circ C/W$     | Junction-to-case (flat side of case is<br>temperature reference point).   |
|   | $R_{\theta JA}$              | —    | —    | 230  |                  | Junction-to-ambient (free convection).  |

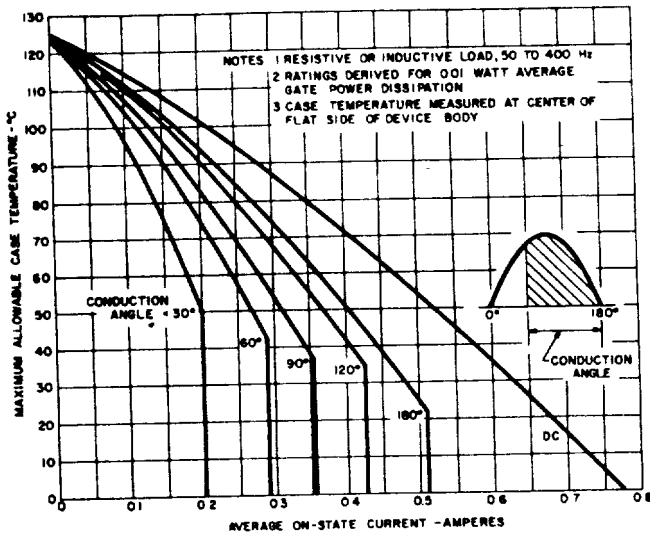
TYPICAL CHARACTERISTICS



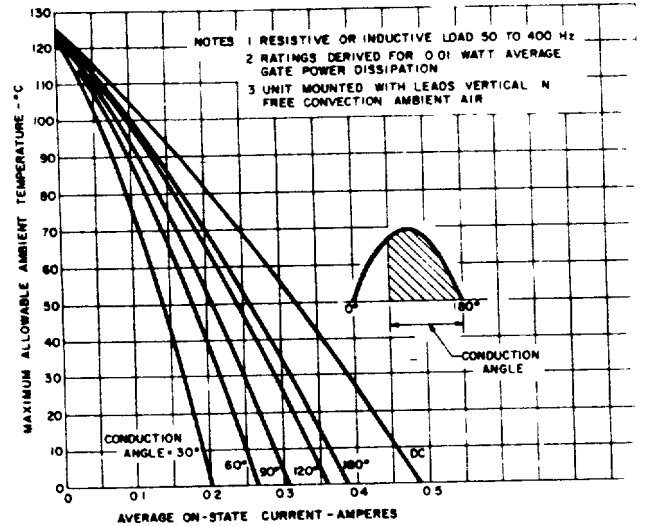
1. MAXIMUM ON-STATE CHARACTERISTICS



2. MAXIMUM ON-STATE POWER DISSIPATION FOR SINUSOIDAL CURRENT WAVEFORM

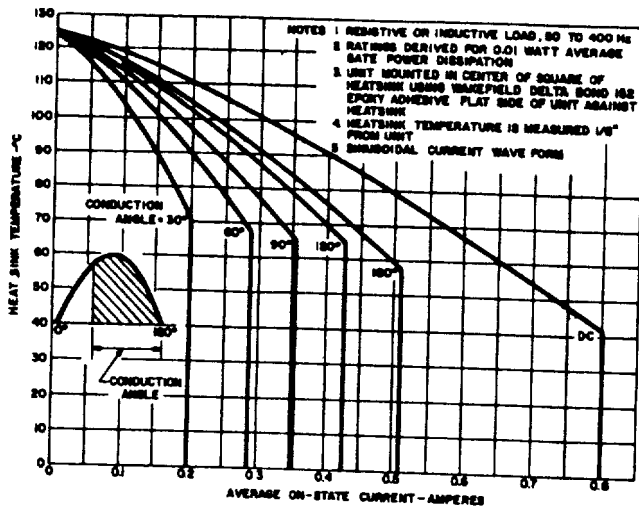


3. MAXIMUM ALLOWABLE CASE TEMPERATURE FOR SINUSOIDAL CURRENT WAVEFORM

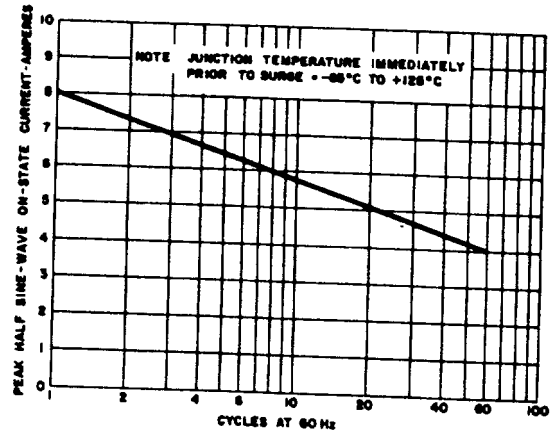


4. MAXIMUM ALLOWABLE AMBIENT TEMPERATURE FOR SINUSOIDAL CURRENT WAVEFORM

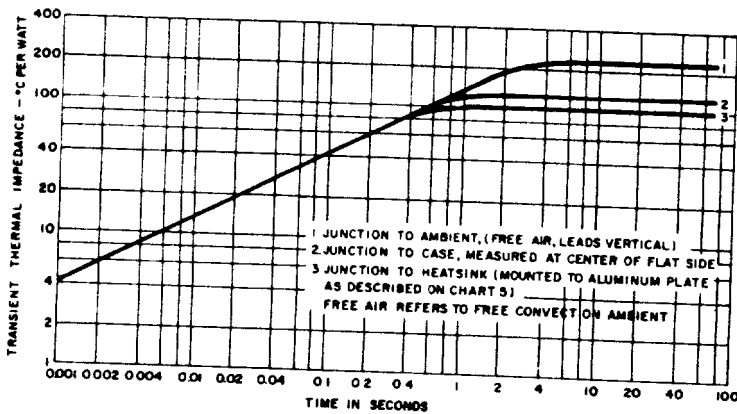
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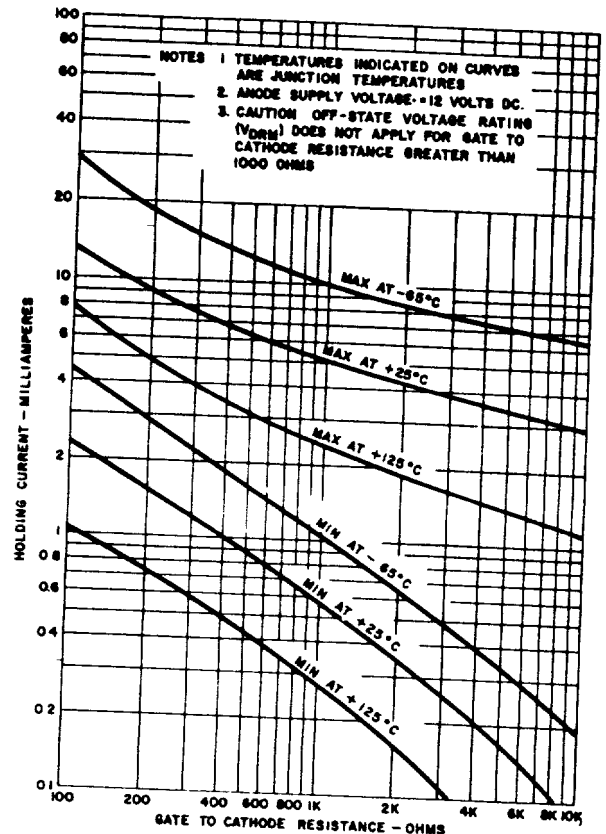
5. TYPICAL CURRENT CARRYING CAPABILITY FOR DEVICE MOUNTED ON 1" x 1" x 1/16" ALUMINUM HEATSINK



6. MAXIMUM ALLOWABLE SURGE (NON-REP) ON-STATE CURRENT



7. MAXIMUM TRANSIENT THERMAL IMPEDANCE



8. MAXIMUM AND MINIMUM HOLDING CURRENT VARIATION WITH GATE TO CATHODE RESISTANCE

\*Chart 5. For reference only, units are not available in this configuration.