

T-25-17

## Silicon Controlled Rectifier Reverse Blocking Triode Thyristor

... designed for industrial and consumer applications such as power supplies, battery chargers, temperature, motor, light and welder controls.

- Economical for a Wide Range of Uses
- High Surge Current —  $I_{TSM} = 300$  Amps
- Low Forward "On" Voltage — 1.2 V (Typ) @  $I_{TM} = 35$  Amps
- Practical Level Triggering and Holding Characteristics — 10 mA (Typ) @  $T_C = 25^\circ\text{C}$
- Rugged Construction in Either Pressfit, Stud, or Isolated Stud Packages
- Glass Passivated Junctions for Maximum Reliability

**C228**  
**C228( )3**  
**C229**  
**Series**

**SCRs**  
**35 AMPERES RMS**  
**100 thru 600 VOLTS**



### MAXIMUM RATINGS

| Rating                                                                                                                                                                               | Symbol                        | Value                    | Unit                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------|----------------------|
| Repetitive Peak Off-State Voltage, Note 1<br>( $T_J = -40$ to $+125^\circ\text{C}$ )<br>C228A, C228A3, C229A<br>C228B, C228B3, C229B<br>C228D, C228D3, C229D<br>C228M, C228M3, C229M | $V_{DRM}$<br>and<br>$V_{RRM}$ | 100<br>200<br>400<br>600 | Volts                |
| Non-Repetitive Reverse Voltage<br>( $T_J = -40$ to $+125^\circ\text{C}$ )<br>C228A, C228A3, C229A<br>C228B, C228B3, C229B<br>C228D, C228D3, C229D<br>C228M, C228M3, C229M            | $V_{RSM}$                     | 150<br>300<br>500<br>720 | Volts                |
| Forward Current RMS                                                                                                                                                                  | $I_T(\text{RMS})$             | 35                       | Amps                 |
| Peak Surge Current<br>(One Cycle, 60 Hz, $T_C = -40$ to $+125^\circ\text{C}$ )                                                                                                       | $I_{TSM}$                     | 300                      | Amps                 |
| Circuit Fusing Considerations<br>( $T_C = -40$ to $+125^\circ\text{C}$ , $t = 1$ to 8.3 ms)                                                                                          | $I^2t$                        | 370                      | $\text{A}^2\text{s}$ |
| Peak Gate Power                                                                                                                                                                      | $P_{GM}$                      | 5                        | Watts                |
| Average Gate Power                                                                                                                                                                   | $P_{G(AV)}$                   | 0.5                      | Watt                 |
| Peak Forward Gate Current                                                                                                                                                            | $I_{GM}$                      | 2                        | Amps                 |
| Operating Junction Temperature Range                                                                                                                                                 | $T_J$                         | $-40$ to $+125$          | $^\circ\text{C}$     |
| Storage Temperature Range                                                                                                                                                            | $T_{stg}$                     | $-40$ to $+150$          | $^\circ\text{C}$     |
| Stud Torque                                                                                                                                                                          | —                             | 30                       | in. lb.              |

Note 1.  $V_{DRM}$  and  $V_{RRM}$  for all types can be applied on a continuous dc basis without incurring damage. Ratings apply for zero or negative gate voltage. Devices shall not have a positive bias applied to the gate concurrently with a negative potential on the anode.



**CASE 310-02**  
**STYLE 1**  
**C229 Series**



**CASE 263-04**  
**STYLE 1**  
**C228 Series**



**CASE 311-02**  
**STYLE 1**  
**C228( )3 Series**

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C228 • C228( )3 • C229 Series

THERMAL CHARACTERISTICS

| Characteristic                                                                  | Symbol          | Max         | Unit                 |
|---------------------------------------------------------------------------------|-----------------|-------------|----------------------|
| Thermal Resistance, Junction to Case<br>C228 and C229 Series<br>C228( )3 Series | $R_{\theta JC}$ | 1.7<br>1.85 | $^{\circ}\text{C/W}$ |

ELECTRICAL CHARACTERISTICS ( $T_C = 25^{\circ}\text{C}$  unless otherwise noted.)

| Characteristic                                                                                                                                                                                                 | Symbol             | Min    | Typ      | Max       | Unit                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------|----------|-----------|------------------------------|
| Peak Forward or Reverse Blocking Current<br>(Rated $V_{DRM}$ or $V_{RRM}$ , gate open)<br>$T_C = 25^{\circ}\text{C}$<br>$T_C = 125^{\circ}\text{C}$                                                            | $I_{DRM}, I_{RRM}$ | —<br>— | —<br>—   | 10<br>3   | $\mu\text{A}$<br>$\text{mA}$ |
| Forward "On" Voltage<br>( $I_{TM} = 100 \text{ A Peak}$ )                                                                                                                                                      | $V_{TM}$           | —      | —        | 1.9       | Volts                        |
| Gate Trigger Current (Continuous dc)<br>( $V_D = 12 \text{ Vdc}$ , $R_L = 80 \text{ Ohms}$ , $T_C = 25^{\circ}\text{C}$ )<br>( $V_D = 6 \text{ Vdc}$ , $R_L = 50 \text{ Ohms}$ , $T_C = -40^{\circ}\text{C}$ ) | $I_{GT}$           | —<br>— | —<br>—   | 40<br>80  | $\text{mA}$                  |
| Gate Trigger Voltage (Continuous dc)<br>( $V_D = 12 \text{ Vdc}$ , $R_L = 80 \text{ Ohms}$ , $T_C = 25^{\circ}\text{C}$ )<br>( $V_D = 6 \text{ Vdc}$ , $R_L = 80 \text{ Ohms}$ , $T_C = -40^{\circ}\text{C}$ ) | $V_{GT}$           | —<br>— | —<br>—   | 2.5<br>3  | Volts                        |
| Gate Trigger Voltage<br>(Rated $V_{DRM}$ , $R_L = 1000 \text{ Ohms}$ , $T_C = +125^{\circ}\text{C}$ )                                                                                                          | $V_{GT}$           | 0.2    | —        | —         | Volts                        |
| Holding Current<br>(Anode Voltage = 24 V, gate open)<br>$T_C = 25^{\circ}\text{C}$<br>$T_C = -40^{\circ}\text{C}$                                                                                              | $I_H$              | —<br>— | —<br>—   | 75<br>150 | $\text{mA}$                  |
| Turn-On Time ( $t_d + t_r$ )<br>( $I_{TM} = 35 \text{ Adc}$ , $I_{GT} = 40 \text{ mAdc}$ )                                                                                                                     | $t_{on}$           | —      | 1        | —         | $\mu\text{s}$                |
| Turn-Off Time<br>( $I_{TM} = 10 \text{ A}$ , $I_R = 10 \text{ A}$ )<br>( $I_{TM} = 10 \text{ A}$ , $I_R = 10 \text{ A}$ , $T_C = 100^{\circ}\text{C}$ )                                                        | $t_{off}$          | —<br>— | 20<br>35 | —<br>—    | $\mu\text{s}$                |
| Forward Voltage Application Rate<br>( $T_C = 100^{\circ}\text{C}$ )                                                                                                                                            | $dv/dt$            | —      | 50       | —         | $\text{V}/\mu\text{s}$       |

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FIGURE 1 — CURRENT DERATING  
(HALF-WAVE RECTIFIED SINE WAVE)

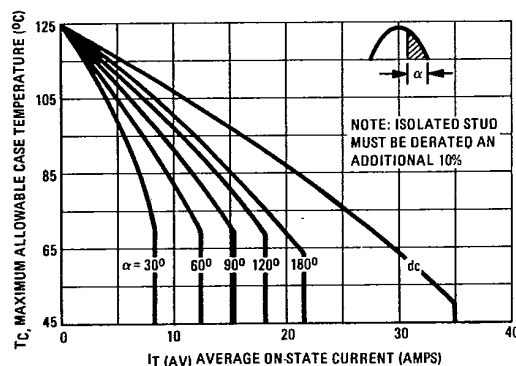


FIGURE 2 — CURRENT DERATING  
(FULL-WAVE RECTIFIED SINE WAVE)

