

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 ( $T_J = -40$ to $+125^\circ\text{C}$ ) C228A, C228A3, C229A C228B, C228B3, C229B C228D, C228D3, C229D C228M, C228M3, C229M	$V_{DRM}$ and $V_{RRM}$	100 200 400 600	Volts
Non-Repetitive Reverse Voltage ( $T_J = -40$ to $+125^\circ\text{C}$ ) C228A, C228A3, C229A C228B, C228B3, C229B C228D, C228D3, C229D C228M, C228M3, C229M	$V_{RSM}$	150 300 500 720	Volts
Forward Current RMS	$I_{T(RMS)}$	35	Amps
Peak Surge Current (One Cycle, 60 Hz, $T_C = -40$ to $+125^\circ\text{C}$ )	$I_{TSM}$	300	Amps
Circuit Fusing Considerations ( $T_C = -40$ 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**

**C228 • C228( )3 • C229 Series**

**THERMAL CHARACTERISTICS**

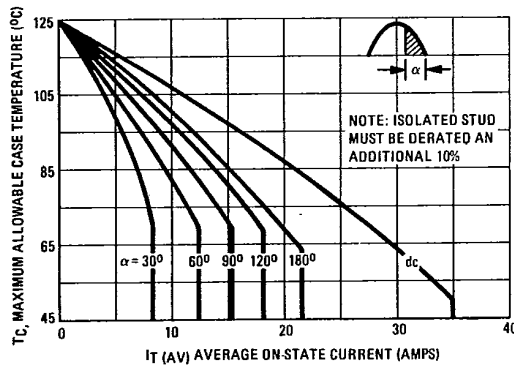
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case C228 and C229 Series C228( )3 Series	$R_{\theta JC}$	1.7 1.85	$^{\circ}C/W$

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

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

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



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

