

## 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 —  $I_{TSM} = 350$  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 or Stud Package
- Glass Passivated Junctions for Maximum Reliability

### MCR3835 Series MCR3935 Series

SCRs  
35 AMPERES RMS  
50 thru 800 VOLTS



CASE 174-04  
(TO-203)  
STYLE 1  
MCR3835 Series



CASE 175-03  
STYLE 1  
MCR3935 Series

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Forward and Reverse Blocking Voltage Note 1 MCR3835-2 -8 -10 MCR3935-2 -3 -4 -6 -8 -10	$V_{DRM}$ $V_{RRM}$	50 600 800 50 100 200 400 600 800	Volts
Peak Non-Repetitive Reverse Blocking Voltage ( $t \leq 5$ ms) MCR3835-2 -8 -10 MCR3935-2 -3 -4 -6 -8 -10	$V_{RSM}$	35 700 900 75 150 300 500 700 900	Volts
Forward Current RMS	$I_{T(RMS)}$	35	Amps
Peak Surge Current (One Cycle, 60 Hz, $T_J = -40$ to $+125^\circ\text{C}$ )	$I_{TSM}$	350	Amps
Circuit Fusing ( $T_J = -40$ to $+100^\circ\text{C}$ , $t = 1$ to 8.3 ms)	$I^2t$	510	$\text{A}^2\text{s}$
Peak Gate Power	$P_{GFM}$	5	Watts
Average Gate Power	$P_{GF(AV)}$	0.5	Watt
Peak Forward Gate Current	$I_{GFM}$	2	Amps
Peak Gate Voltage — Forward Reverse	$V_{GFM}$ $V_{GRM}$	10 10	Volt
Operating Junction Temperature Range	$T_J$	-40 to +125	$^\circ\text{C}$

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.

MOTOROLA THYRISTOR DEVICE DATA

3-268

## MCR3835 Series • MCR3935 Series

## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Storage Temperature Range	$T_{stg}$	-40 to +150	°C
Stud Torque	—	30	in. lb.

## THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case MCR3835	$R_{\theta JC}$	1.2	°C/W
MCR3935		1.3	

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Forward or Reverse Blocking Current (Rated $V_{DRM}$ or $V_{RRM}$ , gate open) $T_J = 25^\circ\text{C}$ $T_J = 100^\circ\text{C}$	$I_{DRM}, I_{RRM}$	— —	— 1	10 5	$\mu\text{A}$ mA
Forward "On" Voltage ( $I_{TM} = 35\text{ A Peak}$ )	$V_{TM}$	—	1.2	1.5	Volts
Gate Trigger Current (Continuous dc) ( $V_D = 7\text{ V}, R_L = 100\ \Omega$ )	$I_{GT}$	—	10	40	mA
Gate Trigger Voltage (Continuous dc) ( $V_D = 7\text{ V}, R_L = 100\ \Omega$ ) ( $V_D = \text{Rated } V_{DRM}, R_L = 100\ \Omega, T_J = 100^\circ\text{C}$ )	$V_{GT}$ $V_{GD}$	— 0.2	0.7 —	1.5 —	Volts
Holding Current ( $V_D = 7\text{ V}$ , gate open)	$I_H$	—	10	50	mA
Turn-On Time ( $t_d + t_r$ ) ( $I_{TM} = 35\text{ A dc}, I_{GT} = 40\text{ mA dc}$ )	$t_{on}$	—	1	—	$\mu\text{s}$
Turn-Off Time ( $I_{TM} = 10\text{ A}, I_R = 10\text{ A}$ ) ( $I_{TM} = 10\text{ A}, I_R = 10\text{ A}, T_J = 100^\circ\text{C}$ )	$t_q$	— —	20 30	— —	$\mu\text{s}$
Forward Voltage Application Rate ( $V_D = \text{Rated } V_{DRM}, T_J = 100^\circ\text{C}$ )	$dv/dt$	—	50	—	$\text{V}/\mu\text{s}$

FIGURE 1 — CURRENT DERATING

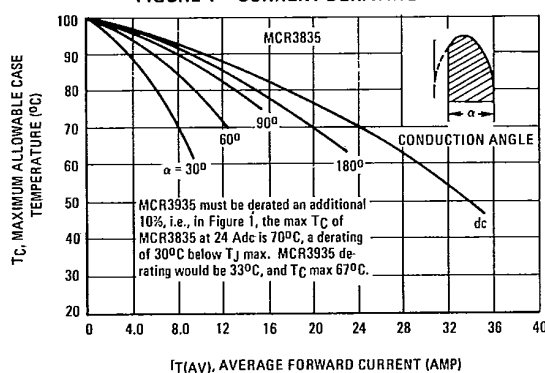
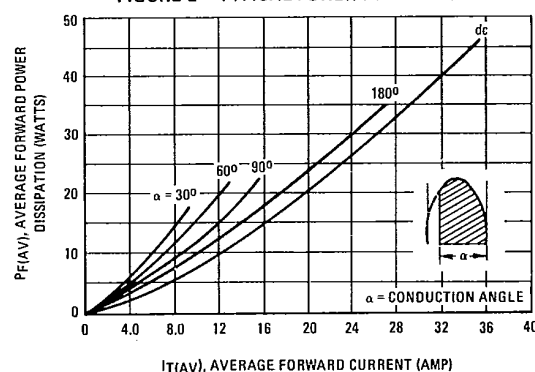


FIGURE 2 — TYPICAL POWER DISSIPATION



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FIGURE 3 – TYPICAL GATE TRIGGER CURRENT

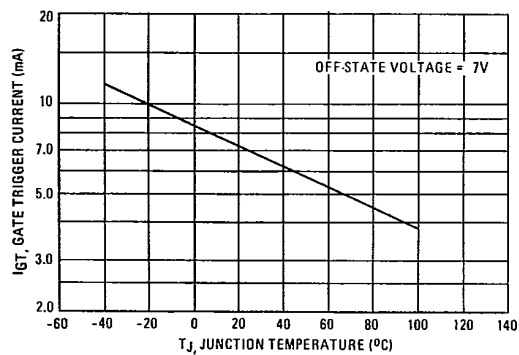


FIGURE 4 – TYPICAL GATE TRIGGER VOLTAGE

