

## Silicon Controlled Rectifiers Reverse Blocking Triode Thyristors

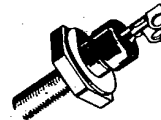
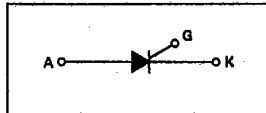
... fast switching, high-voltage Silicon Controlled Rectifiers especially designed for pulse modulator applications in radar and other similar equipment.

- High-Voltage:  $V_{DRM} = 300$  to 800 Volts
- Turn-On Times: in Nanosecond Range
- Repetitive Pulse Current to 100 Amps
- Stable Switching Characteristics Over an Operating Temperature Range From  $-65$  to  $+105^{\circ}\text{C}$
- Pulse Repetition Rates as High as 10,000 pps

**MCR649AP1-10**  
(See 2N2574)

**MCR729-5**  
thru  
**MCR729-10**

SCRs  
5 AMPERES RMS  
300 thru 800 VOLTS



CASE 63-03  
(TO-64)  
STYLE 1

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MAXIMUM RATINGS ( $T_J = 105^{\circ}\text{C}$  unless otherwise noted.)

Characteristic	Symbol	Value	Unit
Peak Repetitive Forward Blocking Voltage, Note 1	$V_{DRM}$	300	Volts
MCR729-5		400	
-6		500	
-7		600	
-8		700	
-9		800	
-10			
Peak Repetitive Reverse Blocking Voltage, Note 1	$V_{RRM}$	50	Volts
Forward Current RMS	$I_T(\text{RMS})$	5	Amps
Average Forward Power	$P_{F(\text{AV})}$	5	Watts
Peak Repetitive On-State Control ( $PW = 10 \mu\text{s}$ )	$I_{TRM}$	100	Amps
Peak Forward Gate Power	$P_{GF(\text{M})}$	20	Watts
Average Forward Gate Power	$P_{GF(\text{AV})}$	1	Watt
Peak Forward Gate Current	$I_{GF(\text{M})}$	5	Amps
Peak Forward Gate Voltage	$V_{GF(\text{M})}$	10	Volts
Peak Reverse Gate Voltage	$V_{GR(\text{M})}$	10	Volts
Operating Junction Temperature Range	$T_J$	$-65$ to $+105$	$^{\circ}\text{C}$
Storage Temperature Range	$T_{\text{stg}}$	$-65$ to $+150$	$^{\circ}\text{C}$
Stud Torque		15	in. lb.

Note 1. Ratings apply for zero or negative gate voltages. Devices shall not have a positive bias to the gate concurrently with a negative potential on the anode. Devices should not be tested with a constant current source for forward and reverse blocking voltages such that the applied voltage exceeds the ratings.

**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) $T_C = 105^\circ\text{C}$	$I_{DRM}$ , $I_{RRM}$	—	0.2	2	mA
Gate Trigger Current (Continuous dc) ( $V_D = 7\text{ Vdc}$ , $R_L = 100\text{ ohms}$ )	$I_{GT}$	—	10	50	mAdc
Gate Trigger Voltage (Continuous dc) ( $V_D = 7\text{ Vdc}$ , $R_L = 100\text{ ohms}$ )	$V_{GT}$	—	0.8	1.5	Volts
Holding Current ( $V_D = 7\text{ Vdc}$ , gate open)	$I_H$	3	15	—	mA
Forward On Voltage ( $I_{TM} = 5\text{ A}$ , $PW \leq 1\text{ ms}$ , Duty Cycle $\leq 1\%$ )	$V_{TM}$	—	—	2.6	Volts
Dynamic Forward On Voltage ( $0.5\ \mu\text{s}$ after 50% pt, $I_G = 200\text{ mA}$ , $V_D = \text{Rated } V_{DRM}$ , $I_F(\text{pulse}) = 30\text{ Amps}$ )	$V_{TM}$	—	15	25	Volts
Turn-On Time ( $t_d + t_r$ ) ( $I_G = 200\text{ mA}$ , $V_D = \text{Rated } V_{DRM}$ ) ( $I_{TM} = 30\text{ Amps peak}$ ) ( $I_{TM} = 100\text{ Amps peak}$ )	$t_{on}$	— —	200 400	— —	ns
Turn-On Time Variation ( $T_C = +25^\circ\text{C}$ to $+105^\circ\text{C}$ and $-65^\circ\text{C}$ to $+25^\circ\text{C}$ , $I_{TM} = 30\text{ A}$ )	$t_{on}$	—	$\pm 500$	—	ns
Pulse Turn-Off Time ( $I_F(\text{pulse}) = 30\text{ Amps}$ , $I_{\text{reverse}} = 0$ ) (Inductive charging circuit)	$t_{rec}$	—	15	—	$\mu\text{s}$
Forward Voltage Application Rate (Linear Rate of Rise) ( $V_D = \text{Rated } V_{DRM}$ , gate open, $T_C = 105^\circ\text{C}$ )	$dv/dt$	50	—	—	$\text{V}/\mu\text{s}$
Thermal Resistance (Junction to Case)	$\theta_{JC}$	—	—	4	$^\circ\text{C}/\text{W}$