

Silicon Controlled Rectifiers Reverse Blocking Triode Thyristors

... PNP devices designed for high volume, low cost consumer applications such as temperature, light and speed control; process and remote control; and warning systems where reliability of operation is critical.

- Small Size
- Passivated Die Surface for Reliability and Uniformity
- Low Level Triggering and Holding Characteristics
- Recommend Electrical Replacement for C106
- Available in Two Package Styles:
 - Surface Mount Leadforms — Case 369A
 - Miniature Plastic Package — Straight Leads — Case 369

ORDERING INFORMATION

- To Obtain "DPAK" in Surface Mount Leadform (Case 369A):
 - Shipped in Sleeves — No Suffix, i.e., MCR706A
 - Shipped in 16 mm Tape and Reel — Add "RL" Suffix to Device Number, i.e., MCR706ARL
- To Obtain "DPAK" in Straight Lead Version:
 - Shipped in Sleeves — Add '1' Suffix to Device Number, i.e., MCR706A1

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted.)

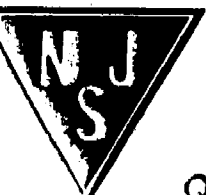
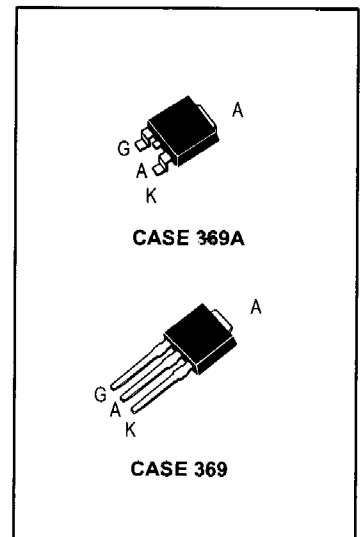
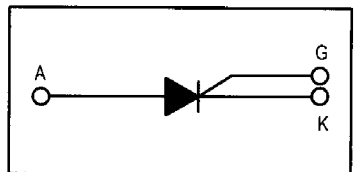
Characteristic	Symbol	Value	Unit
Peak Repetitive Forward and Reverse Blocking Voltage (1) (1/2 Sine Wave) ($R_{GK} = 1000$ Ohms, $T_C = -40$ to $+110^\circ\text{C}$)	V_{DRM} or V_{RRM}	MCR703A1, MCR703A MCR704A1, MCR704A MCR706A1, MCR706A MCR708A1, MCR708A	Volts
Peak Non-repetitive Reverse Blocking Voltage (1/2 Sine Wave, $R_{GK} = 1000$ Ohms, $T_C = -40$ to $+110^\circ\text{C}$)	V_{RSM}	MCR703A1, MCR703A MCR704A1, MCR704A MCR706A1, MCR706A MCR708A1, MCR708A	Volts
Average On-State Current ($T_C = -40$ to $+90^\circ\text{C}$) ($T_C = +100^\circ\text{C}$)	$I_{T(AV)}$	2.6 1.6	Amps
Surge On-State Current (1/2 Sine Wave, 60 Hz, $T_C = +90^\circ\text{C}$) (1/2 Sine Wave, 1.5 ms $T_C = +90^\circ\text{C}$)	I_{TSM}	25 35	Amps
Circuit Fusing ($t = 8.3$ ms)	I^2t	2.6	A^2s
Peak Gate Power (Pulse Width = $10 \mu\text{s}$, $T_C = 90^\circ\text{C}$)	P_{GM}	0.5	Watt
Average Gate Power ($t = 8.3$ ms, $T_C = 90^\circ\text{C}$)	$P_{G(AV)}$	0.1	Watt
Peak Forward Gate Current	I_{GM}	0.2	Amp
Peak Reverse Gate Voltage	V_{RGM}	6	Volts
Operating Junction Temperature Range	T_J	-40 to +110	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-40 to +150	$^\circ\text{C}$

1. V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; however, positive gate voltage shall not be applied concurrent with negative potential on the anode. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

**MCR703A
thru
MCR708A***

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



MCR703A thru MCR708A

THERMAL CHARACTERISTICS

Characteristic	Symbol	Min	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	—	8.33	$^{\circ}C/W$
Thermal Resistance, Junction to Ambient (Case 369A-04) ⁽¹⁾	$R_{\theta JA}$	—	80	$^{\circ}C/W$
Thermal Resistance, Junction to Ambient (Case 369-03) ⁽²⁾	$R_{\theta JA}$	—	85	$^{\circ}C/W$

ELECTRICAL CHARACTERISTICS ($T_C = 25^{\circ}C$ and $R_{GK} = 1000$ ohms unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Forward or Reverse Blocking Current ($V_{AK} = \text{Rated } V_{DRM}$ or V_{RRM}) $T_C = 25^{\circ}C$ $T_C = 110^{\circ}C$	I_{DRM}, I_{RRM}	— —	—	10 200	μA
Peak Forward "On" Voltage ($I_{TM} = 8.2$ A Peak, Pulse Width = 1 to 2 ms, 2% Duty Cycle)	V_{TM}	—	—	2.2	Volts
Gate Trigger Current (Continuous dc) ⁽³⁾ ($V_{AK} = 12$ Vdc, $R_L = 24$ Ohms) ($V_{AK} = 12$ Vdc, $R_L = 24$ Ohms, $T_C = -40^{\circ}C$)	I_{GT}	— —	25 —	75 300	μA
Gate Trigger Voltage (Continuous dc) (Source Voltage = 12 V, $R_S = 50$ Ohms) ($V_{AK} = 12$ Vdc, $R_L = 24$ Ohms, $T_C = -40^{\circ}C$)	V_{GT}	—	—	1	Volts
Gate Non-Trigger Voltage ($V_{AK} = \text{Rated } V_{DRM}$, $R_L = 100$ Ohms, $T_C = 110^{\circ}C$)	V_{GD}	0.2	—	—	Volts
Holding Current ($V_{AK} = 12$ Vdc, $I_{GT} = 2$ mA) $T_C = 25^{\circ}C$ (Initiating On-State Current = 200 mA) $T_C = -40^{\circ}C$	I_H	— —	—	5 10	mA
Total Turn-On Time (Source Voltage = 12 V, $R_S = 6$ k Ohms) ($I_{TM} = 8.2$ A, $I_{GT} = 2$ mA, Rated V_{DRM}) (Rise Time = 20 ns, Pulse Width = 10 μs)	t_{gt}	—	2	—	μs
Forward Voltage Application Rate ($V_D = \text{Rated } V_{DRM}$, Exponential Waveform, $T_C = 110^{\circ}C$)	dv/dt	—	10	—	V/ μs

- Case 369A-04 when surface mounted on minimum pad sizes recommended.
- Case 369-03 standing in free air.
- R_{GK} current not included in measurement.

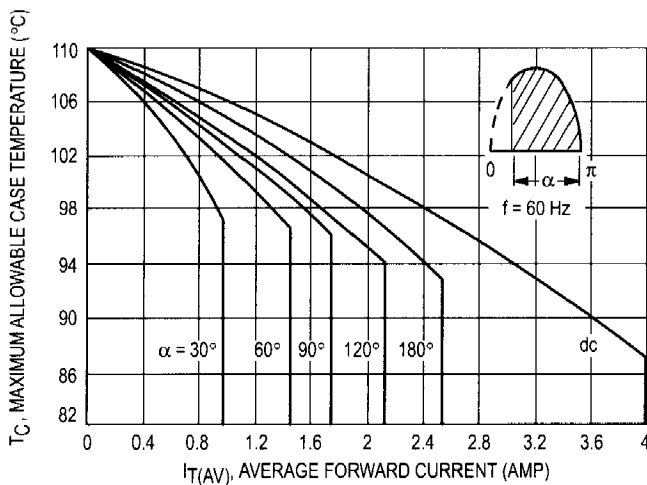


Figure 2. Maximum Case Temperature

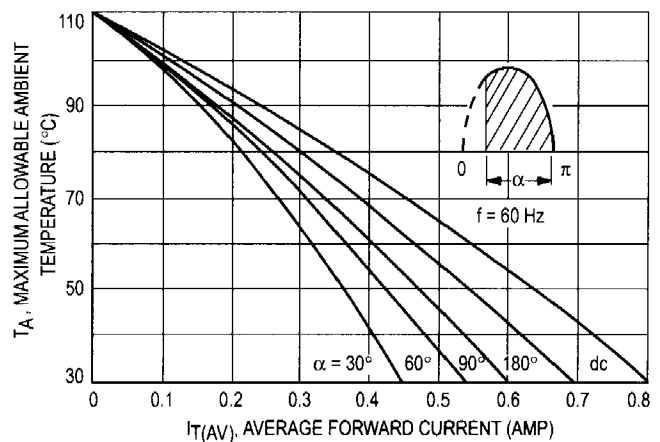


Figure 3. Maximum Ambient Temperature