

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) ($R_{GK} = 1000\ \Omega$, $T_C = -40$ to $+110^\circ\text{C}$)	V_{DRM} or V_{RRM}	100 200 400 600	Volts
Peak Non-repetitive Reverse Blocking Voltage (1/2 Sine Wave, $R_{GK} = 1000\ \Omega$, $T_C = -40$ to $+110^\circ\text{C}$)	V_{RSM}	150 250 450 650	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 ($t = 8.3\ \text{ms}$)	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 ($t = 8.3\ \text{ms}$, $T_C = 90^\circ\text{C}$)	$P_{G(AV)}$	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.

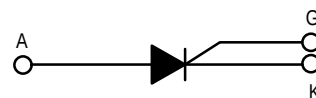
Preferred devices are Motorola recommended choices for future use and best overall value.

REV 1

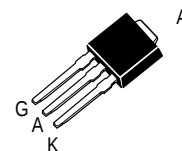
MCR703A thru MCR708A*

*Motorola preferred devices

SCRs
4.0 AMPERES RMS
100 thru 600 VOLTS



CASE 369A
STYLE 5



CASE 369
STYLE 5

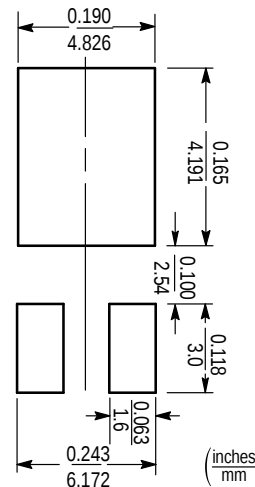


Figure 1. Minimum Pad
Sizes for
Surface Mounting



MOTOROLA

MCR703A thru MCR708A

THERMAL CHARACTERISTICS

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

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

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Forward or Reverse Blocking Current ($V_{AK} = \text{Rated } V_{DRM} \text{ or } V_{RRM}$) $T_C = 25^{\circ}\text{C}$ $T_C = 110^{\circ}\text{C}$	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, $T_C = -40^{\circ}\text{C}$)	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, $T_C = -40^{\circ}\text{C}$)	V_{GT}	—	—	1	Volts
Gate Non-Trigger Voltage ($V_{AK} = \text{Rated } V_{DRM}$, $R_L = 100$ Ohms, $T_C = 110^{\circ}\text{C}$)	V_{GD}	0.2	—	—	Volts
Holding Current ($V_{AK} = 12$ Vdc, $I_{GT} = 2$ mA) $T_C = 25^{\circ}\text{C}$ (Initiating On-State Current = 200 mA) $T_C = -40^{\circ}\text{C}$	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, $T_C = 110^{\circ}\text{C}$)	dv/dt	—	10	—	$\text{V}/\mu\text{s}$

- 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.

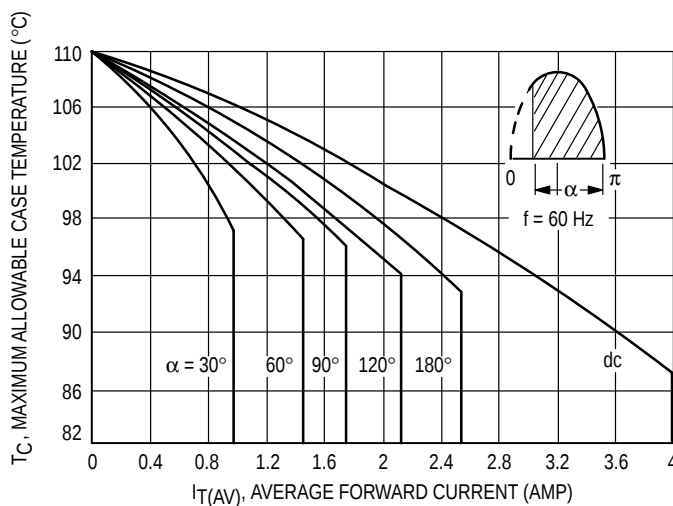


Figure 2. Maximum Case Temperature

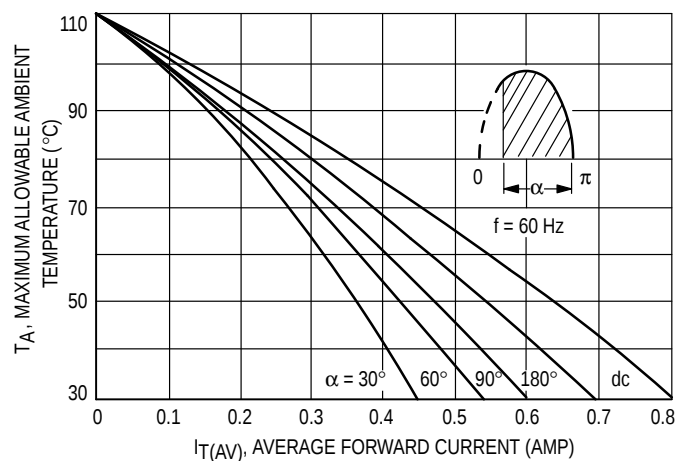
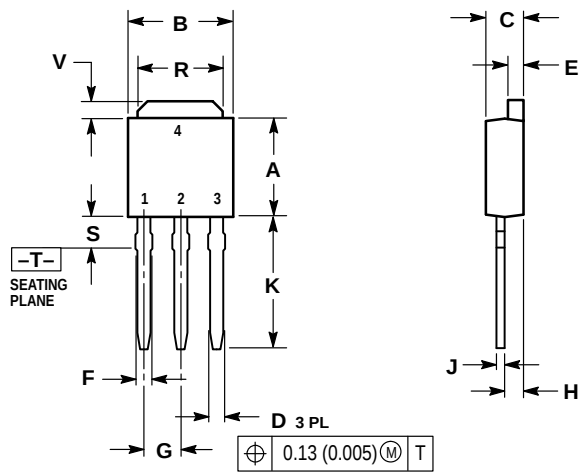


Figure 3. Maximum Ambient Temperature

PACKAGE DIMENSIONS



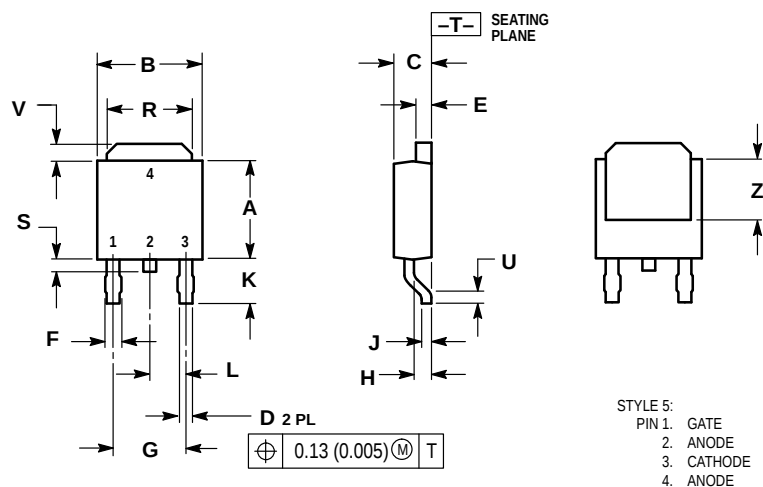
STYLE 5:
PIN 1. GATE
2. ANODE
3. CATHODE
4. ANODE

- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.235	0.250	5.97	6.35
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.033	0.040	0.84	1.01
F	0.037	0.047	0.94	1.19
G	0.090 BSC		2.29 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.350	0.380	8.89	9.65
R	0.175	0.215	4.45	5.46
S	0.050	0.090	1.27	2.28
V	0.030	0.050	0.77	1.27

CASE 369

MCR703A thru MCR708A



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	MIN	MAX	MIN	MAX
A	0.235	0.250	5.97	6.35
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.033	0.040	0.84	1.01
F	0.037	0.047	0.94	1.19
G	0.180 BSC		4.58 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.102	0.114	2.60	2.89
L	0.090 BSC		2.29 BSC	
R	0.175	0.215	4.45	5.46
S	0.020	0.050	0.51	1.27
U	0.020	—	0.51	—
V	0.030	0.050	0.77	1.27
Z	0.138	—	3.51	—

STYLE 5:
PIN 1. GATE
2. ANODE
3. CATHODE
4. ANODE

CASE 369A

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MCR703A/D

