Silicon Controlled Rectifiers
Reverse Blocking Triode Thyristors

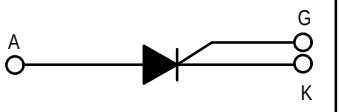
MCR703A thru MCR708A*

***Motorola preferred devices**

SCRs
4.0 AMPERES RMS
100 thru 600 VOLTS

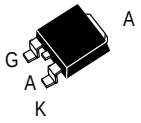
. . . PNPN devices designed for high volume, low cost consumer applications such as temperature, light and speed control; process and remote control; and warning systems where reliability of operation is critical.

- 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

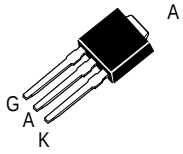


ORDERING INFORMATION

- To Obtain “DPAK” in Surface Mount Leadform (Case 369A):
  Shipped in 16 mm Tape and Reel — Add “T4” Suffix to Device Number, i.e., MCR706AT4
- To Obtain “DPAK” in Straight Lead Version:
  Shipped in Sleeves — Add ‘1’ Suffix to Device Number, i.e., MCR706A1



CASE 369A
STYLE 5



CASE 369
STYLE 5

MAXIMUM RATINGS (T_J = 25°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°C)	MCR703A MCR704A MCR706A MCR708A	V_{DRM} or V_{RRM}	 100 200 400 600	Volts
Peak Non-repetitive Reverse Blocking Voltage (1/2 Sine Wave, R_{GK} = 1000 Ohms, T_C = –40 to +110°C)	MCR703A MCR704A MCR706A MCR708A	V_{RSM}	 150 250 450 650	Volts
Average On-State Current	(T_C = –40 to +90°C) (T_C = +100°C)	$I_{T(AV)}$	2.6 1.6	Amps
Surge On-State Current	(1/2 Sine Wave, 60 Hz, T_C = +90°C) (1/2 Sine Wave, 1.5 ms T_C = +90°C)	I_{TSM}	25 35	Amps
Circuit Fusing (t = 8.3 ms)		I^2t	2.6	A^2s
Peak Gate Power (Pulse Width = 10 μs, T_C = 90°C)		P_{GM}	0.5	Watt
Average Gate Power (t = 8.3 ms, T_C = 90°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	°C
Storage Temperature Range		T_{stg}	–40 to +150	°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.

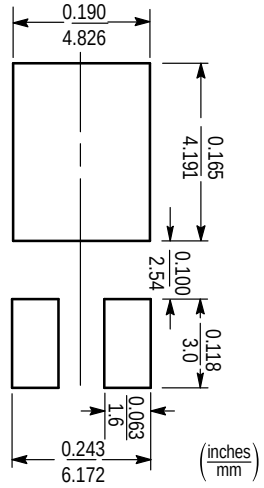


Figure 1. Minimum Pad Sizes for Surface Mounting

REV 2

THERMAL CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS (T_C = 25°C and R_{GK} = 1000 ohms unless otherwise noted.)

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

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

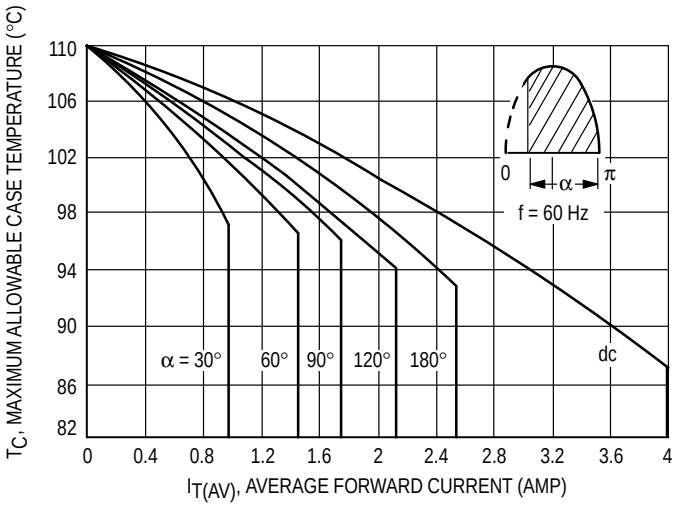


Figure 2. Maximum Case Temperature

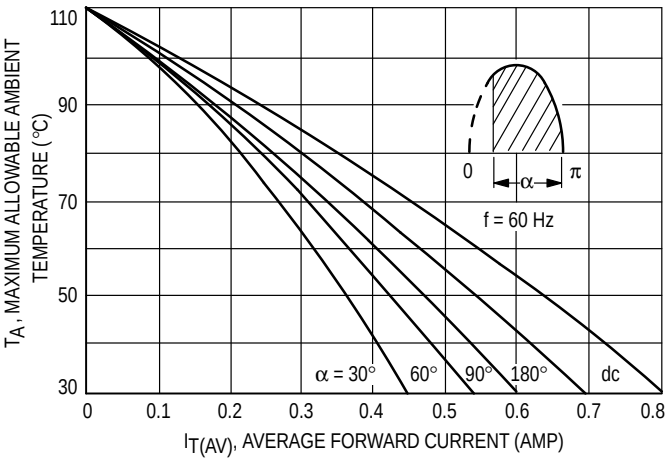
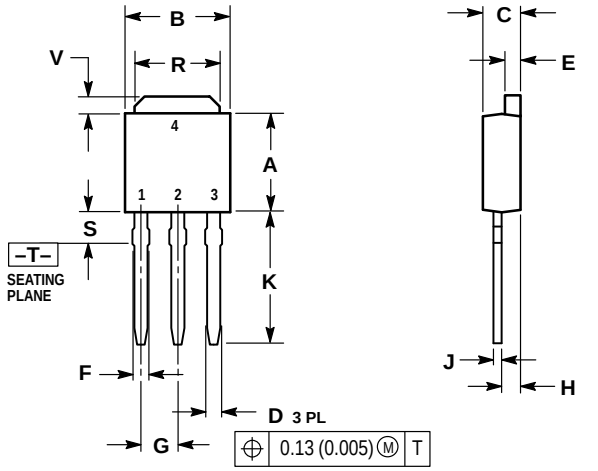


Figure 3. Maximum Ambient Temperature

PACKAGE DIMENSIONS



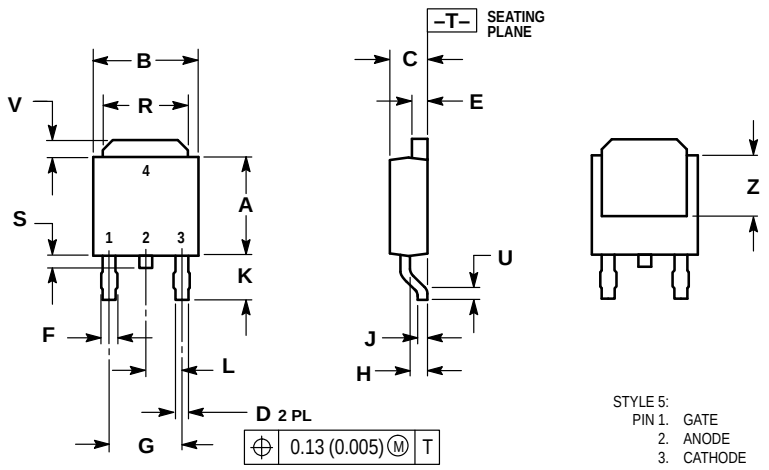
STYLE 5:
PIN 1. GATE
2. ANODE
3. CATHODE
4. ANODE

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

	INCHES		MILLIMETERS	
DIM	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

PACKAGE DIMENSIONS



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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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