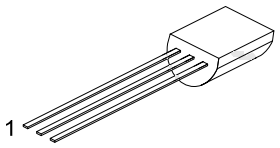
MCR101

SCR

SENSITIVE GATE SILICON CONTROLLED RECTIFIERS REVERSE BLOCKING THYRISTORS



TO-92

■ DESCRIPTION

PNPN devices designed for high volume, line-powered consumer applications such as relay and lamp drivers, small motor controls, gate drivers for larger thrusters, and sensing and detection circuits. Supplied in an inexpensive plastic TO-92 package which is readily adaptable for use in automatic insertion equipment.

■ FEATURES

*Sensitive Gate Allows Triggering by Micro Controllers and other Logic Circuits
*Blocking Voltage to 600V
*On-State Current Rating of 0.8A RMS at 80°C
*High Surge Current Capability – 10A
*Minimum and Maximum Values of IGT, VGT and IH Specified for Ease of Design
*Immunity to dV/dt – 20V/μsec Minimum at 110°C
*Glass-Passivated Surface for Reliability and Uniformity

■ ORDERING INFORMATION

Ordering Number			Package	Pin Assignment			Packing
Normal	Lead Free Plating	Halogen Free		1	2	3	
MCR101-x-xx-T92-B	MCR101L-x-xx-T92-B	MCR101G-x-xx-T92-B	TO-92	G	A	K	Tape Box
MCR101-x-xx-T92-K	MCR101L-x-xx-T92-K	MCR101G-x-xx-T92-K	TO-92	G	A	K	Bulk

Note: Pin Assignment: G: Gate A: Anode K: Cathode

MCR101L-x-xx-T92-B

(1)Packing Type	(1) B: Tape Reel, K: Bulk
(2)Package Type	(2) T92: TO-92
(3)Rank	(3) xx: refer to Classification of I_{GT}
(4)Peak Voltage	(4) 4: 200V, 6: 400V, 8: 600V
(5)Lead Plating	(5) L: Lead Free Plating, Blank: Pb/Sn G: Halogen Free

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNIT
Peak Repetitive Off-State Voltage(note) (T_J=-40 to 110°C, Sine Wave, 50 to 60Hz; Gate Open)	MCR101-4	V_{DRM},V_{RRM}	200	V
	MCR101-6		400	
	MCR101-8		600	
On-Sate RMS Current (Tc=80°C) 180° Condition Angles		$I_{T(RMS)}$	0.8	A
Peak Non-Repetitive Surge Current (1/2 cycle, Sine Wave, 60Hz, T_J=25°C)		I_{TSM}	10	A
Circuit Fusing Considerations (t=8.3 ms)		I^2t	0.415	A^2s
Forward Peak Gate Power (T_A=25°C, Pulse Width ≤1.0μs)		P_{GM}	0.1	W
Forward Average Gate Power (T_A=25°C, t=8.3ms)		$P_{G(AV)}$	0.1	W
Peak Gate Current – Forward (T_A=25°C, Pulse Width≤1.0μs)		I_{GM}	1	A
Peak Gate Voltage – Reverse (T_A=25°C, Pulse Width≤1.0μs)		V_{GRM}	5	V
Operating Junction Temperature @ Rated V_{RRM} and V_{DRM}		T_J	-40 ~ +110	°C
Storage Temperature		T_{STG}	-40 ~ +150	°C

Note: 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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	200	°C/W
Junction to Case	θ_{JC}	75	°C/W

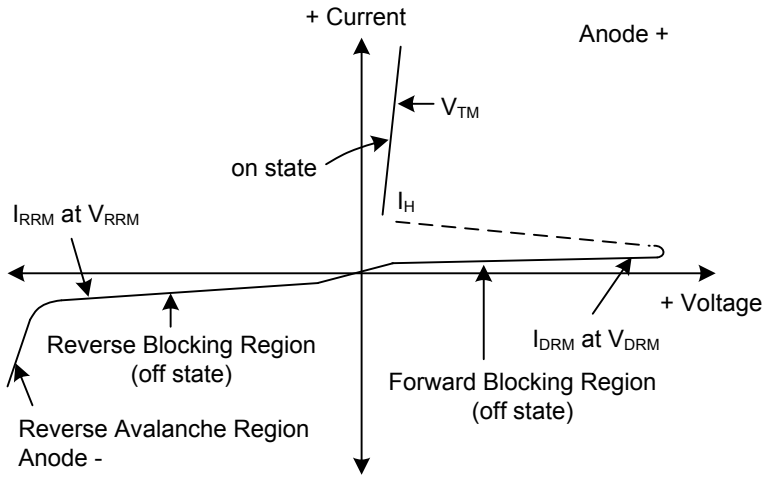
■ ELECTRICAL CHARACTERISTICS (T_J =25°C, unless otherwise stated)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Peak Forward or Reverse Blocking Current	Tc=25°C	I_{DRM}, I_{RRM}	V_D=Rated V_{DRM} and V_{RRM}; R_{GK}=1kΩ			10	μA
	Tc=125°C					100	
ON CHARACTERISTICS							
Peak Forward On-State Voltage (Note1)		V_{TM}	I_{TM}=1A Peak @ T_A=25°C			1.7	V
Gate Trigger Current (Continuous dc)(note2)		I_{GT}	V_{AK}=7Vdc, R_L=100Ω, T_C=25°C		40	200	μA
Holding Current (note 3)	Tc=25 °C	I_H	V_{AK}=7Vdc, initiating current=20mA		0.5	5	mA
	Tc=-40 °C					10	
Latch Current	Tc=25°C	I_L	V_{AK}=7V, Ig=200μA		0.6	10	mA
	Tc=-40 °C					15	
Gate Trigger Current (continuous dc) (Note 2)	Tc=25 °C	V_{GT}	V_{AK}=7Vdc, R_L=100Ω		0.62	0.8	V
	Tc=-40 °C					1.2	
DYNAMIC CHARACTERISTICS							
Critical Rate of Rise of Off-State Voltage		dV/dt	V_D=Rated V_{DRM}, Exponential Waveform, R_{GK}=1000Ω, T_J=110°C	20	35		V/μs
Critical Rate of Rise of On-State Current		di/dt	I_{PK}=20A, Pw=10μsec diG/dt=1A/μsec, Igt=20mA			50	A/μs

Notes: 1. Indicates Pulse Test Width≤1.0ms, duty cycle ≤1%
2. R_{GK}=1000Ω included in measurement.
3. Does not include R_{GK} in measurement.

■ VOLTAGE CURRENT CHARACTERISTIC OF SCR

SYMBOL	PARAMETER
V_{DRM}	Peak Repetitive Off Stat Forward Voltage
I_{DRM}	Peak Forward Blocking Current
V_{RRM}	Peak Repetitive Off State Reverse Voltage
I_{RRM}	Peak Reverse Blocking Current
V_{TM}	Peak On State Voltage
I_H	Holding Current



■ CLASSIFICATION OF I_{GT}

RANK	B	C	AA	AB	AC	AD
RANGE	48~105μA	95~200μA	8~16μA	14~21μA	19~25μA	23~52μA

■ TYPICAL CHARACTERISTICS

Figure 1. Typical Gate Trigger Current versus Junction Temperature

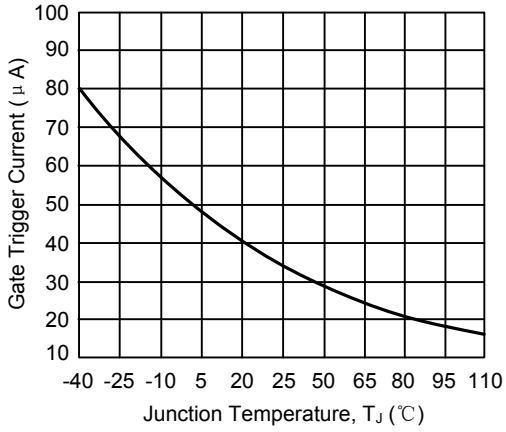


Figure 2. Typical Gate Trigger Voltage versus Junction Temperature

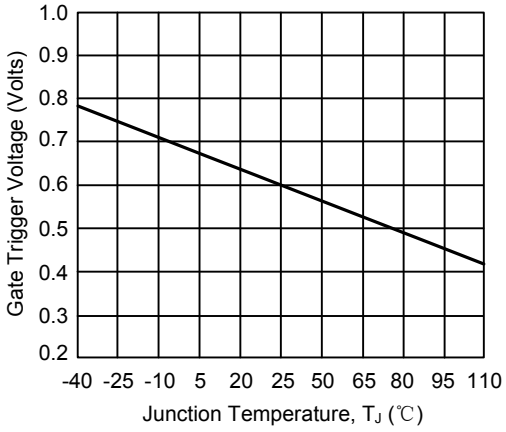


Figure 3. Typical Holding Current versus Junction Temperature

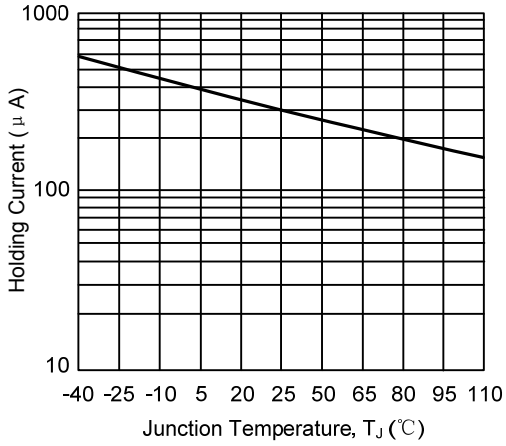


Figure 4. Typical Latching Current versus Junction Temperature

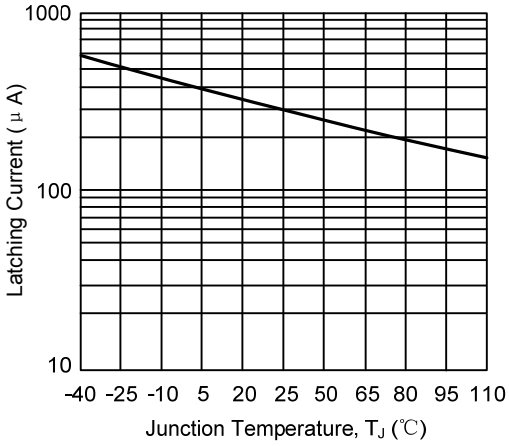


Figure 5. Typical RMS Current Derating

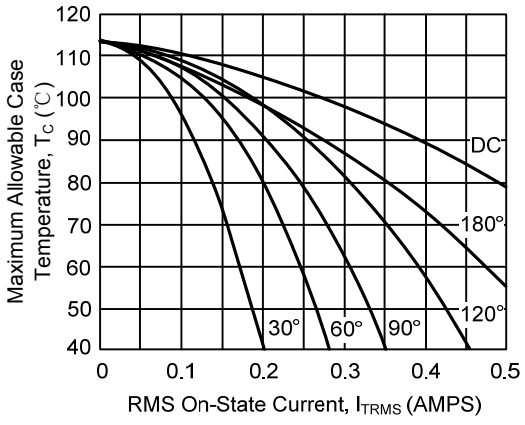


Figure 6. Typical On-State Characterstics