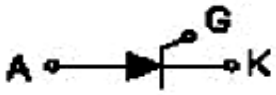
0.8 Amp. SENSITIVE GATE SCR

REVERSE BLOCKING THYRISTOR

MCR100

TO-92 Leaded
Plastic Package
RoHS compliant



TO-92

APPLICATION:

PNPN Device Designed for High Volume, Line-Powered Consumer Applications such as Relay and Lamp Drivers, Small Motor Controls, Gate Drivers for Larger Thyristors and Sensing and Detection Circuits

ABSOLUTE MAXIMUM RATINGS (Ta = 25 ℃ Unless otherwise specified)

PARAMETER		SYMBOL	VALUE	UNIT
Peak Repetitive Off State Voltage (Tj= - 40 to 110ºC, Sine Wave, 50 to 60Hz; Gate Open)	**MCR100-3**	*V_{DRM} *V_{RRM}	100	V
	MCR100-4		200	V
	MCR100-6		400	V
	MCR100-8		600	V
On State RMS Current (T_C=80ºC) 180º Pulse Width <1ms)		$I_{T(RMS)}$	0.8	A
Peak Non Repetitive Surge Current ($1/_2$ Cycle, Sine Wave, 60Hz, T_J=25ºC)		I_{TSM}	10	A
Circuit Fusing Consideration (t=8.3ms)		I^2t	0.415	A^2s
Forward Peak Gate Power (T_a=25ºC, Pulse Width ≤1ms)		P_{GM}	0.1	W
Forward Average Gate Power (T_a=25ºC, t=8.3ms)		$P_{G\ (AV)}$	0.1	W
Forward Peak Gate Current (T_a=25ºC, Pulse Width ≤1ms)		I_{GM}	1.0	A
Reverse Peak Gate Voltage (T_a=25ºC, Pulse Width ≤1ms)		V_{GRM}	5.0	V
Operating Junction Temperature Range @ Rate V_{RRM} and V_{DRM}		T_j	-40 to +110	°C
Storage Temperature Range		T_{stg}	-40 to +150	°C

*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 voltage shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded

ELECTRICAL CHARACTERISTICS at (Ta = 25 ℃ Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	VALUE			UNIT
			MIN	TYP	MAX	
OFF CHARACTERISTICS						
Peak Repetitive Forward or Reverse Blocking Current	$^{**}I_{DRM}$, $^{**}I_{RRM}$	V_D=Rated V_{DRM} and V_{RRM}; R_{GK}=1KΩ	--	--	--	
		T_C=25ºC	--	--	10	µA
		T_C=110ºC	--	--	100	µA
ON CHARACTERISTICS						
Peak Forward On State Voltage (note1)	V_{TM}	I_{TM}=1A peak @ T_a=25ºC	--	--	1.7	V
Gate Trigger Current (Continuous DC)	$^{***}I_{GT}$	V_{AK}=7V, R_L=100Ω, Tc=25ºC	--	--	0.2	mA
Holding Current	$^{**}I_H$	V_{AK}=7V, initiating Current 20mA	--	--	--	
		T_C=25ºC	--	--	5.0	mA
		T_C= -40ºC	--	--	10	mA
Latching Current	I_L	V_{AK}=7V, I_G=200µA	--	--		
		T_C=25ºC	--	--	10	mA
		T_C= -40ºC	--	--	15	mA
Gate Trigger Voltage (Continuous DC)	$^{***}V_{GT}$	V_{AK}=7V, R_L=100Ω	--	--	--	
		T_C=25ºC	--	--	--	V
		T_C= -40ºC	--	--	1.2	V
DYNAMIC CHARACTERISTICS						
Critical Rate of Rise of off State Voltage	dv /dt	V_D=Rated V_{DRM}, exponential waveform, R_{GK}=1000Ω, T_j=110ºC	20	--	--	V/µs
Critical Rate of Rise of on State Current	di/dt	I_{PK}=20A, Pw=10µs, dig/dt=1A/µs, Igt=20mA	--	--	50	A/µs

Note 1 Pulse Test: Pulse Width ≤1ms, Duty Cycle ≤1%

$^{**}R_{GK}$=1000Ω include in measurement

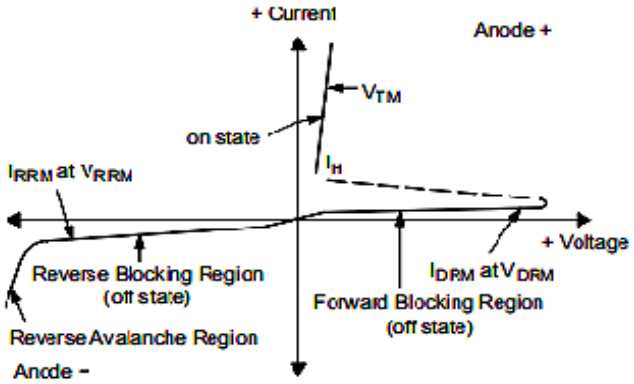
***Does not include R_{GK} in measurement

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Case	$R_{th\ (j-c)}$	75	°C/W
Junction to Ambient in free air	$R_{th\ (j-a)}$	200	°C/W
Lead Solder Temperature (1/16" from case, 10secs max)	T_L	260	°C

Voltage Current Characteristic of SCR

Symbol	Parameter
V_{DRM}	Peak Repetitive Off State 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



TYPICAL CHARACTERISTICS CURVES

Fig 1: Typical Gate Trigger Current versus Junction Temperature

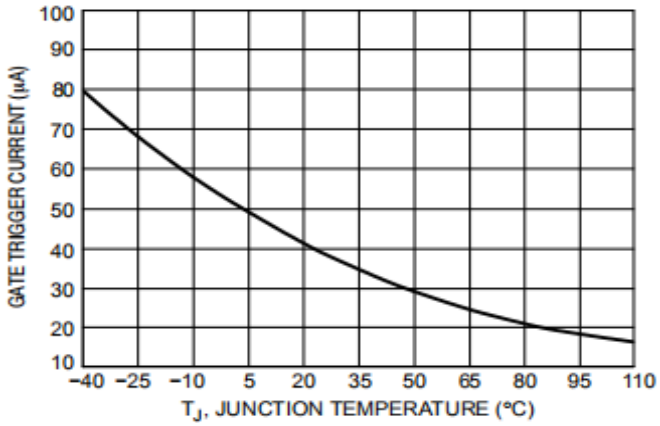


Fig 2:Typical Gate Trigger Voltage versus Junction Temperature

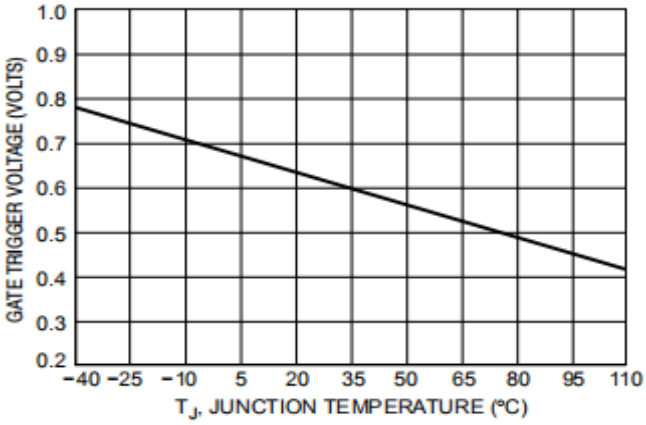


Fig 3: Typical Holding Current versus Junction Temperature

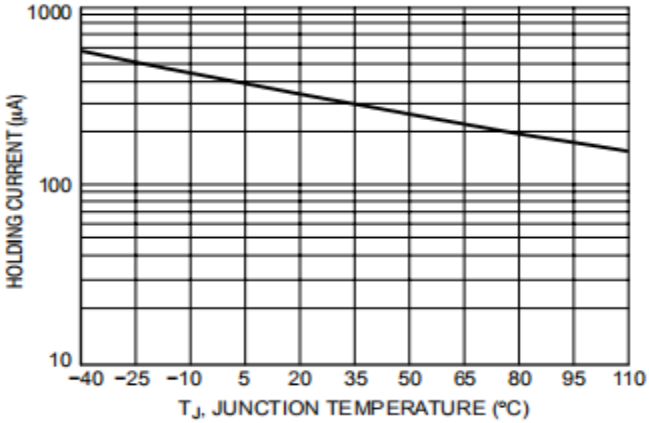


Fig 4: Typical Latching Current versus Junction Temperature

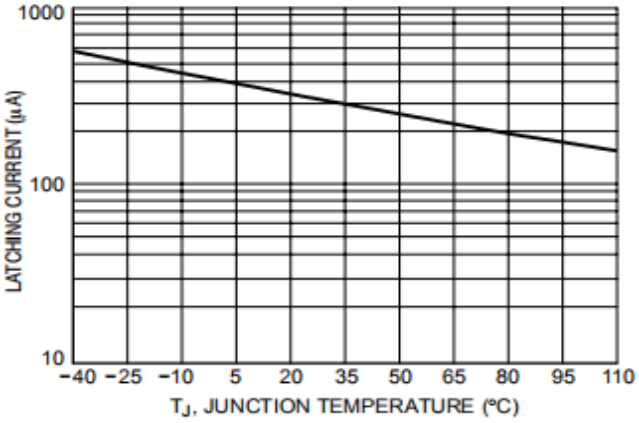


Fig 5: Typical RMS Current Derating

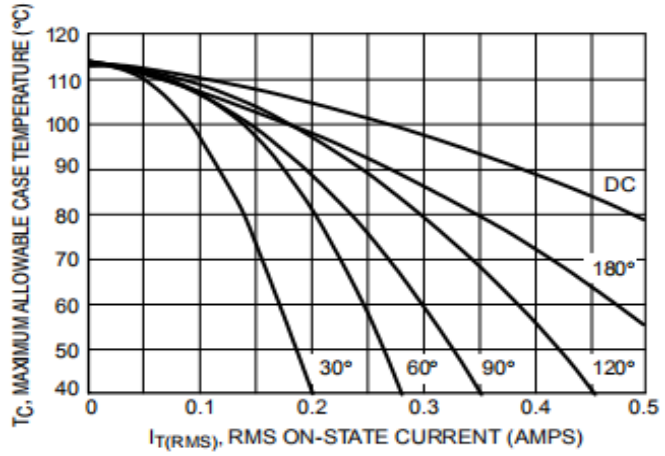
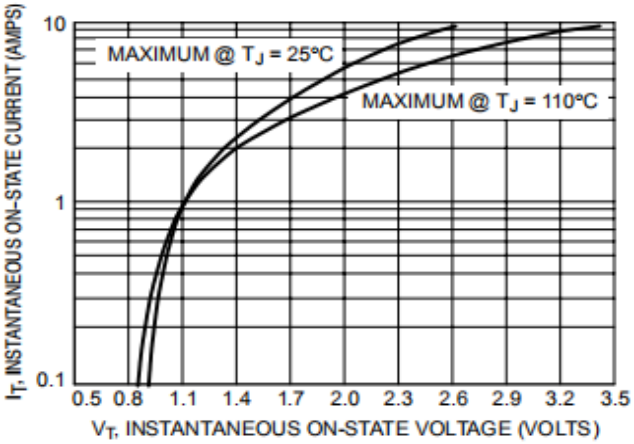


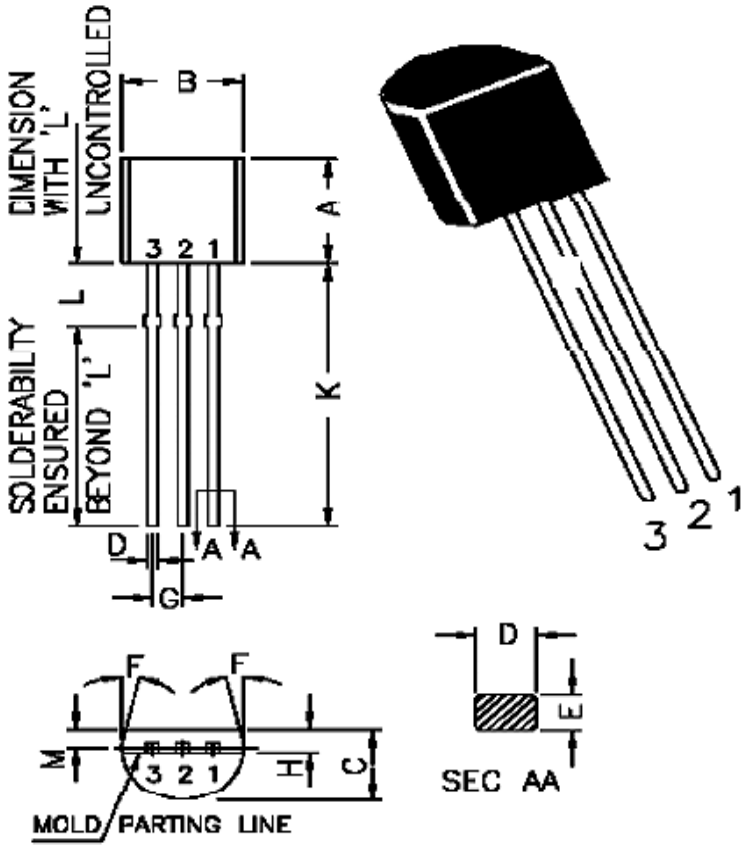
Fig 6: Typical On−State Characteristics



MCR100
Rev01 28092020E

PACKAGE DETAILS

TO-92 Plastic Package



DIM	MIN	MAX
A	4,32	5,33
B	4,45	5,20
C	3,18	4,19
D	0,41	0,55
E	0,35	0,50
F	5 DEG	
G	1,14	1,40
H	1,20	1,40
K	12,70	--
L	1,982	2,082
M	1,03	1,20

PIN CONFIGURATION

1. ANODE
2. GATE
3. CATHODE

Recommended Product Storage Environment for Discrete Semiconductor Devices

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature 5 °C to 30 °C
- Humidity between 40 to 70 %RH
- Air should be clean.
- Avoid harmful gas or dust.
- Avoid outdoor exposure or storage in areas subject to rain or water spraying .
- Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
- Avoid rapid change of temperature.
- Avoid condensation.
- Mechanical stress such as vibration and impact shall be avoided.
- The product shall not be placed directly on the floor.
- The product shall be stored on a plane area. They should not be turned upside down. They should not be placed against the wall.

Shelf Life of CDIL Products

The shelf life of products is the period from product manufacture to shipment to customers. The product can be unconditionally shipped within this period. The period is defined as 2 years.
If products are stored longer than the shelf life of 2 years the products shall be subjected to quality check as per CDIL quality procedure.
The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

Floor Life of CDIL Products and MSL Level

When the products are opened from the original packing, the floor life will start.
For this, the following JEDEC table may be referred:

JEDEC MSL Level		
Level	**Time**	**Condition**
1	Unlimited	≤30 °C / 85% RH
2	1 Year	≤30 °C / 60% RH
2a	4 Weeks	≤30 °C / 60% RH
3	168 Hours	≤30 °C / 60% RH
4	72 Hours	≤30 °C / 60% RH
5	48 Hours	≤30 °C / 60% RH
5a	24 Hours	≤30 °C / 60% RH
6	Time on Label(TOL)	≤30 °C / 60% RH

Customer Notes

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).
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