

## Sensitive Gate Silicon Controlled Rectifiers Reverse Blocking Thyristors

SCRs  
0.8 AMPERES RMS  
400 VOLTS

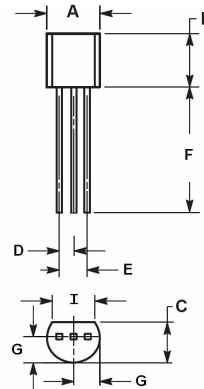
### FEATURES

- Sensitive Gate Allows Triggering by Microcontrollers and Other logic Circuits
- Blocking Voltage to 400 Volts
- On - State Current Rating of 0.8 Amperes RMS at 80°C
- High Surge Current Capability — 10 Amperes
- Minimum and Maximum Values of IGT, VGT and IH Specified for Ease of Design
- Immunity to  $dV/dt$  — 20 V/us Minimum at  $T_J=110^\circ\text{C}$
- Glass-Passivated Surface for Reliability and Uniformity
- Pb-Free Package

### MECHANICAL DATA

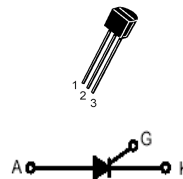
- Case: Molded plastic
- Weight: 0.007 ounces, 0.2 grams

### TO-92 (TO-226AA)



TO-92		
DIM.	MIN.	MAX.
A	4.45	4.70
B	4.32	5.33
C	3.18	4.19
D	1.15	1.39
E	2.42	2.66
F	12.7	----
G	2.04	2.66
I	3.43	----

All Dimensions in millimeter



PIN ASSIGNMENT	
1	Cathode
2	Gate
3	Anode

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

Rating	Symbol	Value	Unit
Peak Repetitive Off - State Voltage ( $T_J = -40$ to $110^\circ\text{C}$ , Sine Wave, 50 to 60 Hz; Gate Open)	V <sub>DRM</sub> V <sub>RRM</sub>	400	Volts
On-State RMS Current ( $T_c = 80^\circ\text{C}$ ) 180° Conduction Angles	I <sub>T(RMS)</sub>	0.8	Amps
Peak Non-Repetitive Surge Current (1/2 Cycle, Sine Wave, 60 Hz, $T_J = 25^\circ\text{C}$ )	I <sub>TSM</sub>	10	Amps
Circuit Fusing Consideration ( $t = 8.3$ ms)	$I^2 t$	0.415	A <sup>2</sup> s
Forward Peak Gate Power ( $T_a = 25^\circ\text{C}$ , Pulse Width $\leq 1.0$ us)	P <sub>GM</sub>	0.1	Watts
Forward Average Gate Power ( $T_a = 25^\circ\text{C}$ , $t = 8.3$ ms)	P <sub>G(AV)</sub>	0.1	Watts
Forward Peak Gate Current ( $T_a = 25^\circ\text{C}$ , Pulse Width $\leq 1.0$ us)	I <sub>GM</sub>	1	Amps
Reverse Peak Gate Voltage ( $T_a = 25^\circ\text{C}$ , Pulse Width $\leq 1.0$ ms)	V <sub>GRM</sub>	5	Volts
Operating Junction Temperature Range @ Rate V <sub>RRM</sub> and V <sub>DRM</sub>	T <sub>J</sub>	-40 to + 110	°C
Storage Temperature Range	T <sub>stg</sub>	-40 to + 150	°C

REV. 1, Oct-2010, KTXD24

**RATING AND CHARACTERISTIC CURVES**  
**MCR100-6**

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Value	Unit
Thermal Resistance – Junction to Case	RthjC	75	°C/W
Maximum Lead Temperature for Soldering Purposes 1/16" from Case for 10 Seconds	TL	260	°C

**ELECTRICAL CHARACTERISTICS (Tj= 25°C unless otherwise noticed)**

Characteristic	Symbol	Min	Typ	Max	Unit
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**OFF CHARACTERISTICS**

Peak Repetitive Forward or Reverse Blocking Current (VD=Rated VDRM and VRRM; RGK =1K Ohms)	TJ=25°C TJ=110°C	IDRM IRRM	---	---	10 100	uA
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**ON CHARACTERISTICS**

Peak Forward On-State Voltage (ITM= ± 1.6A Peak, Pulse Width ≤ 1.0ms, Duty Cycle ≤ 1%)		VTM	---	---	1.7	Volts
Gate Trigger Current(VD= 7.0 Vdc, RL=100 Ohms) (1)		IGT	---	---	50	uA
Holding Current(VD= 7.0 Vdc, Initiating Current = 20mA)	TJ= 25°C TJ= -40°C	IH	---	---	5 10	mA
Gate Trigger Voltage(VD= 7.0 Vdc, RL=100 Ohms) (1)	TJ= 25°C TJ= -40°C	VGT	---	---	0.8 1.2	Volts
Latch Current(VD= 7.0 Vdc, RL 100 Ohms)	TJ= 25°C TJ= -40°C	IL	---	---	10 15	mA

**DYNAMIC CHARACTERISTICS**

Critical Rate of Rise of Off-State Voltage (VD=Rated VDRM, Exponential Waveform, PGK=1K Ohms, TJ=110°C)		dv/dt	20	---	---	V/us
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(1) RGK current is not included in measurement

## RATING AND CHARACTERISTIC CURVES MCR100-6

### 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

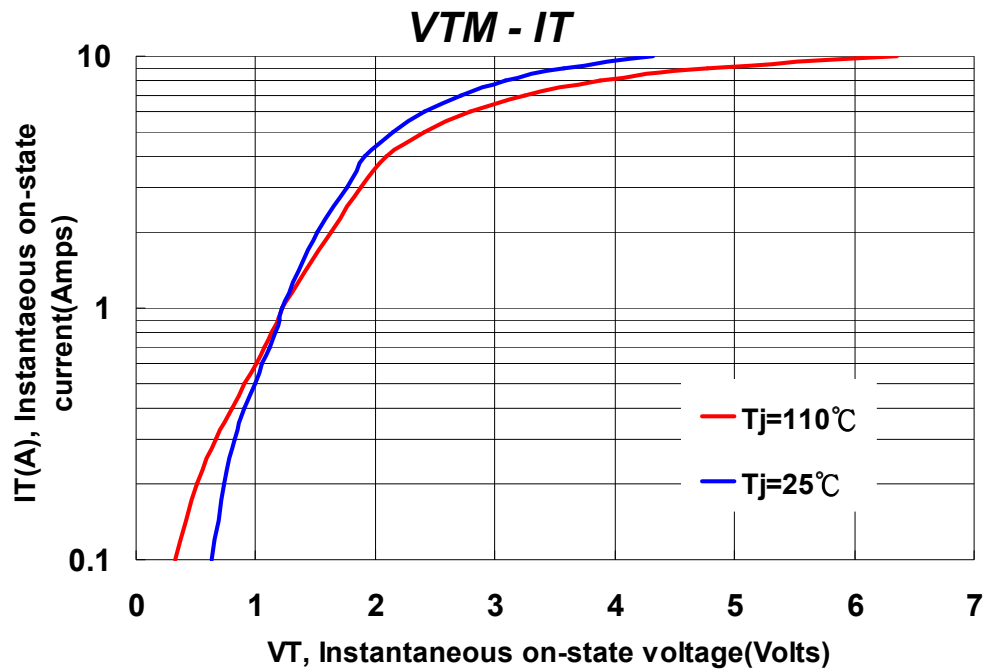
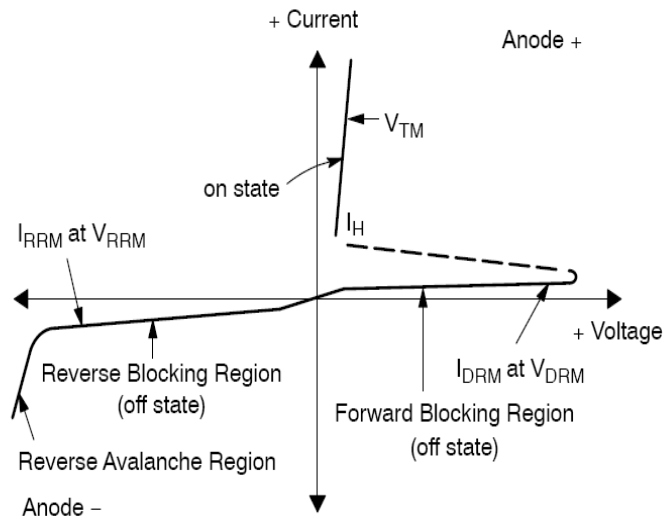


Figure 1. On-State Characteristics

## RATING AND CHARACTERISTIC CURVES MCR100-6

Typical gate trigger current V.S. junction temperature

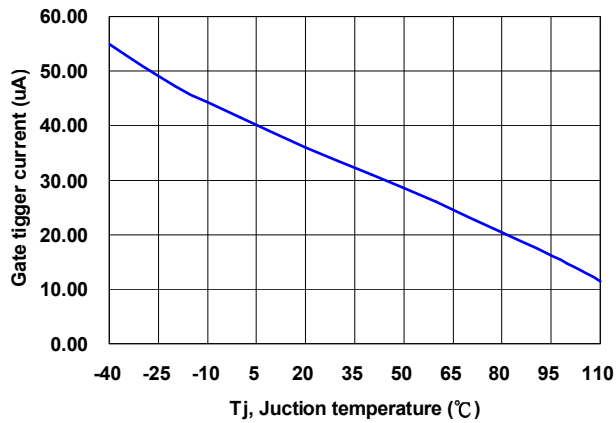


Figure 2. IGT(TJ) / IGT(25°C) versus TJ

Typical gate trigger voltage V.S. junction temperature

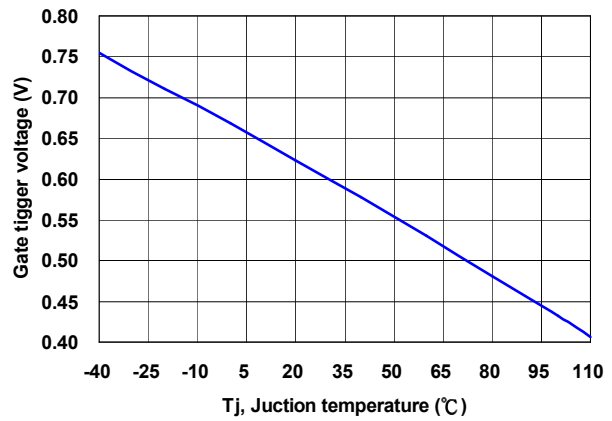


Figure 3. VGT(TJ) / VGT(25°C) versus TJ

Typical holding current V.S. junction temperature

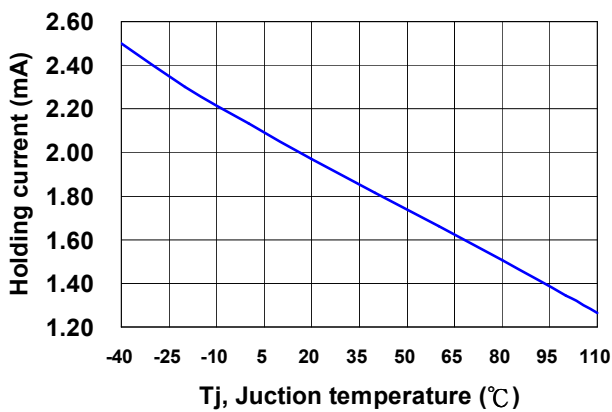


Figure 4. IH versus TJ

Typical latch current V.S. junction temperature

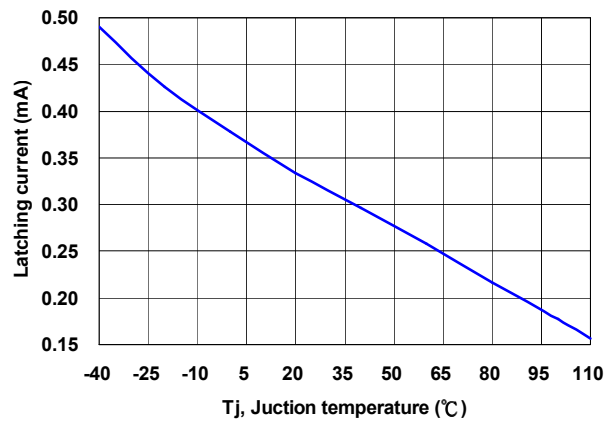


Figure 5. IL versus TJ

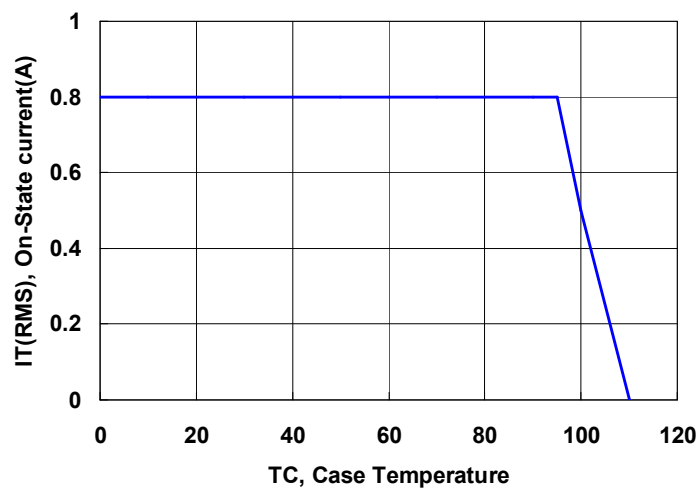


Figure 6. On-Stage Current Rating Curve

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