Discrete & Integration™
SEMICONDUCTOR

MCR100-6

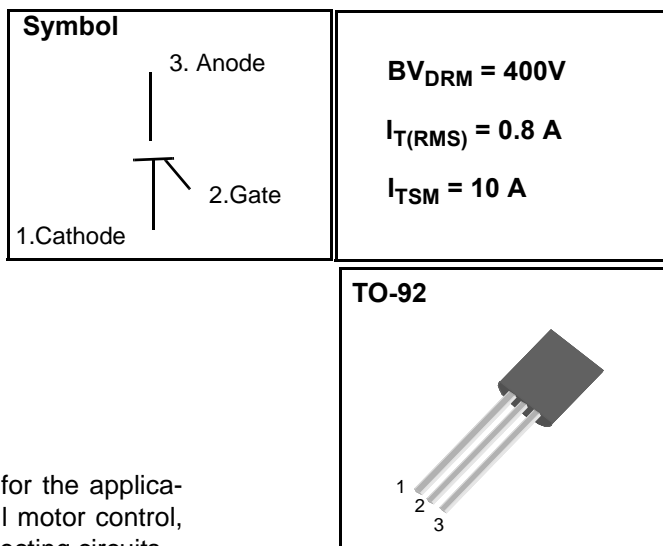## Sensitive Gate Silicon Controlled - Rectifiers

Features

Repetitive Peak Off-State Voltage : 400V
R.M.S On-State Current ($I_{T(RMS)}$= 0.8 A)
Low On-State Voltage (1.2V(Typ.)@ I_{TM})
Pb - Free Packages are available

General Description

Sensitive-gate triggering thyristor is suitable for the application where gate current limited such as small motor control, gate driver for large thyristor, sensing and detecting circuits.

Symbol

3. Anode

2.Gate

1.Cathode

BV_{DRM} = 400V

$I_{T(RMS)}$ = 0.8 A

I_{TSM} = 10 A

TO-92

1
2
3

Absolute Maximum Ratings (T_J = 25°C unless otherwise specified)

Symbol	Parameter	Condition	Ratings	Units
V_{DRM}	Repetitive Peak Off-State Voltage	sine wave,50 to 60Hz,gate open	400	V
$I_{T(AV)}$	Average On-State Current	half sine wave : T_C = 74 °C	0.5	A
$I_{T(RMS)}$	R.M.S On-State Current	180° Conduction Angle	0.8	A
I_{TSM}	Surge On-State Current	1/2 Cycle, 60Hz, sine wave non-repetitive , t = 8.3ms	10	A
I^2t	I^2t for Fusing	t = 8.3ms	0.415	A^2s
P_{GM}	Forward Peak Gate Power Dissipation	T_A = 25 °C, pulse width 1.0	2	W
$P_{G(AV)}$	Forward Average Gate Power Dissipation	T_A = 25 °C, t = 8.3ms	0.1	W
I_{FGM}	Forward Peak Gate Current	T_A = 25 °C, pulse width 1.0	1	A
V_{RGM}	Reverse Peak Gate Voltage	T_A = 25 °C, pulse width 1.0	5.0	V
T_J	Operating Junction Temperature		- 40 ~ 125	°C
T_{STG}	Storage Temperature		- 40 ~ 125	°C

MCR100-6

Electrical Characteristics (T_C = 25 °C unless otherwise noted)

Symbol	Items	Conditions	Ratings			Unit
			Min.	Typ.	Max.	
I_{DRM}	Repetitive Peak Off-State Current	$V_{AK} = V_{DRM}$ or V_{RRM} ; $R_{GK} = 1000$ T_C = 25 °C T_C = 125 °C			10 200	
V_{TM}	Peak On-State Voltage (1)	(I_{TM} = 1 A, Peak)		1.2	1.7	V
I_{GT}	Gate Trigger Current (2)	V_{AK} = 6 V, R_L=100 T_C = 25 °C T_C = - 40 °C			200 500	
V_{GT}	Gate Trigger Voltage (2)	V_D = 7 V, R_L=100 T_C = 25 °C T_C = - 40 °C			0.8 1.2	V
V_{GD}	Non-Trigger Gate Voltage (1)	V_{AK} = 12 V, R_L=100 T_C = 125 °C	0.2			V
dv/dt	Critical Rate of Rise Off-State Voltage	V_D = Rated V_{DRM} , Exponential wave-form , R_{GK} = 1000 T_J = 125 °C	20	35		V/
di/dt	Critical Rate of Rise Off-State Voltage	I_{PK} = 20A ; P_W = 10 ; diG/dt = 1A/ Igt = 20mA			50	A/
I_H	Holding Current	V_{AK} = 12 V, Gate Open Initiating Curent = 20mA T_C = 25 °C T_C = - 40 °C		2	5.0 10	mA
$R_{th(j-c)}$	Thermal Impedance	Junction to case			60	°C/W
$R_{th(j-a)}$	Thermal Impedance	Junction to Ambient			150	°C/W

Notes :

1. Pulse Width   1.0 ms , Duty cycle   1%

2. Does not include R_{GK} in measurement.

MCR100-6

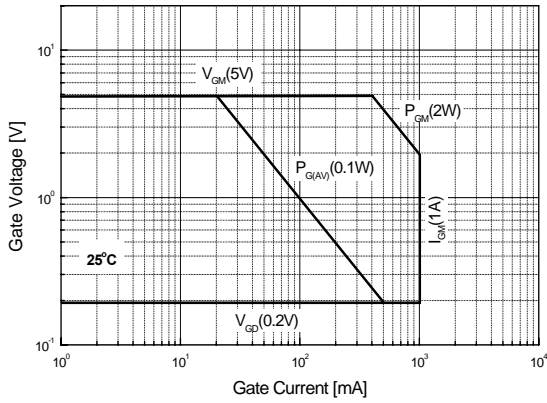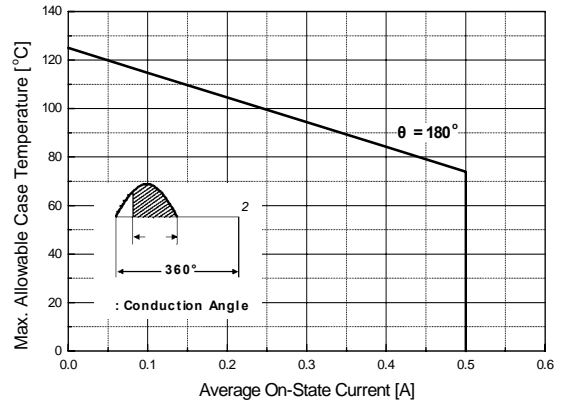**Fig 1. Gate Characteristics**

Fig 2. Maximum Case Temperature
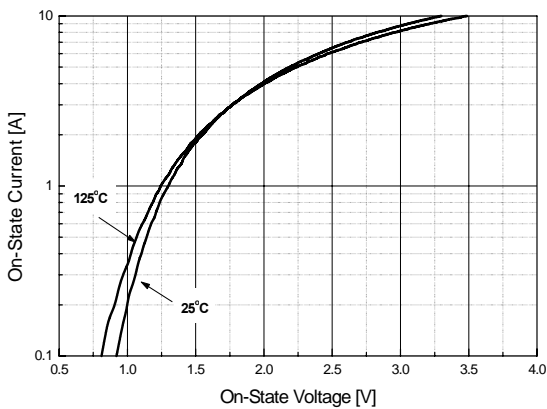

Fig 3. Typical Forward Voltage
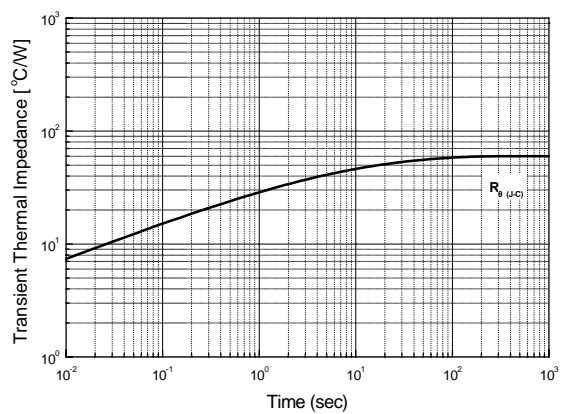

Fig 4. Thermal Response

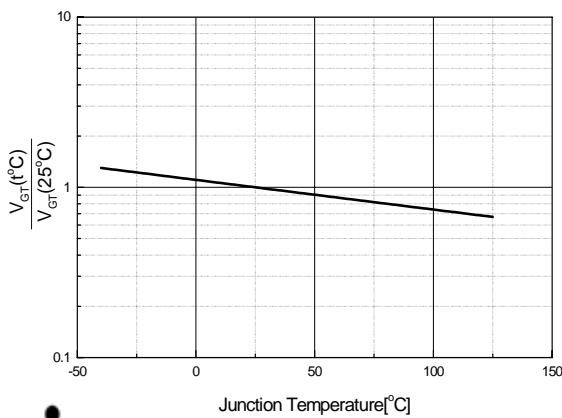**Fig 5. Typical Gate Trigger Voltage vs. Junction Temperature**

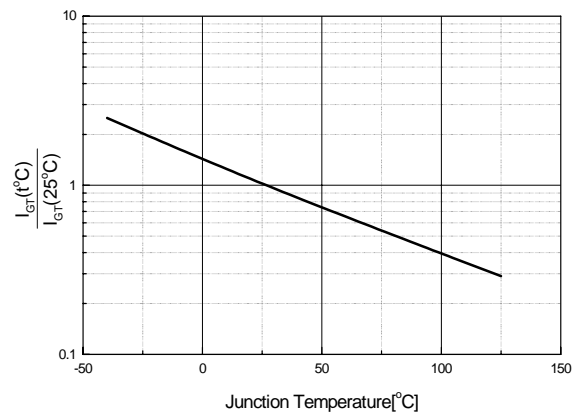**Fig 6. Typical Gate Trigger Current vs. Junction Temperature**
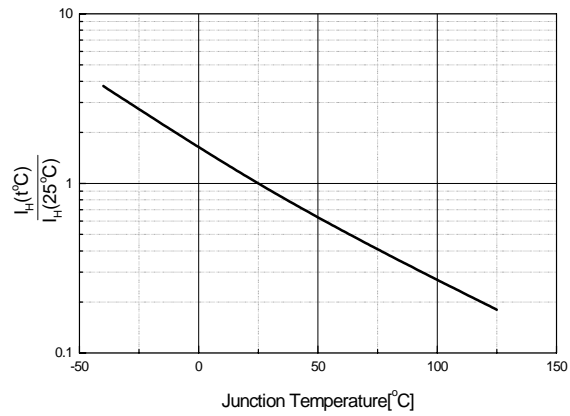
MCR100-6

Fig 7. Typical Holding Current

Fig 8. Power Dissipation

MCR100-6

TO-92 Package Dimension

Dim.	mm			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A		4.2			0.165	
B			3.7			0.146
C	4.43		4.83	0.174		0.190
D	14.07		14.87	0.554		0.585
E			0.4			0.016
F	4.43		4.83	0.174		0.190
G			0.45			0.017
H		2.54			0.100	
I		2.54			0.100	
J	0.33		0.48	0.013		0.019

1. Cathode
2. Gate
3. Anode