# **GMCR100-6** SENSITIVE GATE SILICON CONTROLLED RECTIFIERS REVERSE BLOCKING THYRISTORS 0.8A, 400V

#### Description

The GMCR100-6 PNPN device is designed for high volume, line-powered applications such as relay and lamp drivers, small motor controls, gate drivers for larger thyristors, and sensing and detection circuits. Supplied in an inexpensive plastic TO-92 package which is readily adaptable for use in automatic insertion equipment.

### Features

- www.DataSheet4 Sensitive Gate Allows Triggering by Microcontrollers and Other Logic Circuits
  - 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 20 V/µsec Minimum at 110 $^\circ\!\mathbb{C}$
  - Glass-Passivated Surface for Reliability and Uniformity

#### **Package Dimensions**





DEE	Millimeter		DEE	Millimeter		
	Min.	Max.		Min.	Max.	
Α	4.45	4.7	D	4.44	4.7	
S1	1.02	-	E	3.30	3.81	
b	0.36	0.51	L	12.70	-	
b1	0.36	0.76	e1	1.150	1.390	
С	0.36	0.51	е	2.42	2.66	

#### Absolute Maximum Ratings (TJ=25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage(Note1) $(T_J=-40 \text{ to } 110^{\circ}C, \text{ Sine Wave, 50 to 60Hz; Gate open})$	Vdrm Vrrm	400	V
On-state RMS Current, (Tc=80°C) 180° Conduction Angles	IT(RMS)	0.8	А
Peak Non-Repetitive Surge Current (1/2 Cycle, Sine Wave, 60Hz, TJ= $25^{\circ}$ C)	Iтsм	10	A
Circuit Fusing Consideration (t=8.3ms)	l <sup>2</sup> t	0.415	A <sup>2</sup> s
Forward Peak Gate Power (Ta= $25^{\circ}$ C, Pulse Width $\leq 1.0\mu$ s)	Рдм	100	mW
Forward Average Gate Power (Ta=25°C, t=8.3ms)	PG(AV)	10	mW
Forward Peak Gate Current (Ta=25 $^{\circ}$ C, Pulse Width ≤ 1.0 $\mu$ s)	lgм	1.0	A
Reverse Peak Gate Voltage (Ta=25℃, Pulse Width ≤ 1.0µs)	Vgrm	5.0	V
Operating Junction Temperature Rang @ Rate VRRM and VDRM	TJ	-40 ~ +110	°C
Storage Temperature Rage	Tstg	-40 ~ +150	°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device function operation is not implied, damage may occur and reliability may be affected.

Note 1.VDRM and VRRM 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 Characteristics**

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-case Junction-to-Ambient	Rejc Reja	75 200	°C/W
Lead Solder Temperature (< 1/16" from case, 10 secs max)	T∟	260	°C

### Electrical Characteristics (Tc = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Тур	Max	Unit
Off Characteristics						•
Peak Repetitive Forward or Reverse Blocking Curren	t (Note2) Tc=25℃	Idrm, Irrm	-	-	10	μA
(VDRM=400V and VRRM=400V; RGK=1k $\Omega$ )	Tc=110℃				100	
On Characteristics						
Peak Forward On-State Voltage* (ITM=1A Peak @TA=	= <b>25</b> ℃)	Vтм	-	-	1.7	V
Gate Trigger Current (Continuous dc) (Note3) (Vaκ=7.0 Vdc, RL=100Ω)	Tc=25℃	Igt	-	50	100	μA
Holding Current (Note2) (Vak=7.0 Vdc, Initiating Current=20mA)	Tc=25℃ Tc=-40℃	Ін	-	0.5 -	5.0 10	mA
Latch Current (VAK=7.0 Vdc, Ig=200µA)	Tc=25℃ Tc=-40℃	ΙL	-	0.6 -	10 15	mA
Gate Trigger Voltage (Continuous dc) (Note3) (Vaκ=7.0 Vdc, RL=100Ω)	Tc=25℃ Tc=-40℃	Vgt	-	0.62	0.8 1.2	V
Dynamic Characteristics						
Critical Rate of Rise of Off-State Voltage (VD=400V, Exponential Waveform, RGK=1000Ω, TJ=1	<b>10</b> ℃)	dV/dt	20	35	-	V/µs
Critical Rate of Rise of Off-State Current (IPK=20AV, Pw=10µsec; diG/dt=1A/µsec, Igt=20mA)		di/dt	-	-	50	A/µs

e Test: Pulse Width ≤ 1.0ms, Duty Cycle ≤ 1%.

Note 2.RGK=1000 $\Omega$  included in measurement.

Note 3.Dose not include RGK in measurement.

## **Voltage Current Characteristic of SCR**

Symbol	Parameter
Vdrm	Peak Repetitive Off State Forward Voltage
Idrm	Peak Forward Blocking Current
VRRM	Peak Repetitive Off State Reverse Voltage
IRRM	Peak Reverse Blocking Current
Vтм	Peak On State Voltage
Ін	Holding Current



Characteristics Curve



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