

MCR100-8(LS)

**SENSITIVE GATE
SILICON CONTROLLED RECTIFIERS
REVERSE BLOCKING THYRISTORS**

SCRs 0.25 AMPERES RMS 600 VOLTS

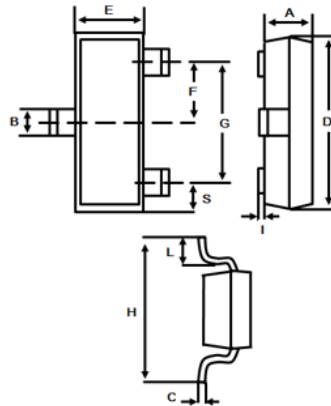
FEATURES

- Sensitive gate allows triggering by microcontrollers and other logic circuits.
- Blocking voltage to 600 volts.
- On-state current rating of 0.25 amperes RMS at +80°C.
- High surge current capability – 9 Amperes.
- Minimum and maximum values of I_{GT} , V_{GT} and I_H specified for ease of design.
- Immunity to dv/dt – 20V/ μ s minimum at $T_J = +110^\circ\text{C}$
- Glass-passivated surface for reliability and uniformity.
- Autoclave test meets JESD22-A102-C, condition B.
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

MECHANICAL DATA

- Package: SOT-23
- Package Material: molding plastic. Pb-Free package
- Moisture Sensitivity: Level 3 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ③
- Weight : 0.007 ounces, 0.2 grams (Approximate)

SOT-23



SOT-23		
DIM.	MIN.	MAX.
A	0.89	1.20
B	0.30	0.51
C	0.085	0.18
D	2.75	3.04
E	1.20	1.60
F	0.85	1.05
G	1.70	2.10
H	2.10	2.75
I	0.0	0.1
L	0.60 TYP.	
S	0.35	0.65

All dimensions in millimeter

PIN ASSIGNMENT	
1	Gate
2	Cathode
3	Anode

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS ($T_J = +25^\circ\text{C}$, unless otherwise noticed.)

ABSOLUTE RATINGS

CHARACTERISTICS	SYMBOL	VALUE	UNIT
Peak repetitive off-state voltage (Note 4) $T_J = -40^\circ\text{C}$ to $+110^\circ\text{C}$, sine wave, 50 to 60 Hz, gate open	V_{DRM} V_{RRM}	600	V
On-state RMS current ($T_C = +80^\circ\text{C}$) 180°c conduction angles	$I_{T(RMS)}$	0.25	A
Peak non-repetitive surge current 1/2 cycle sine wave 60Hz @ $T_J = +25^\circ\text{C}$	I_{TSM}	9	A
Circuit fusing consideration @ $t = 8.3\text{ms}$	I^2t	0.336	A^2s
Forward peak gate power, pulse width $\leq 1.0\mu\text{s}$ @ $T_a = +25^\circ\text{C}$	P_{GM}	0.1	W
Forward average gate power, $t \leq 8.3\text{ms}$ @ $T_a = +25^\circ\text{C}$	$P_{G(AV)}$	0.1	W
Forward peak gate current, Pulse width $\leq 1.0\mu\text{s}$ @ $T_a = +25^\circ\text{C}$	I_{GM}	1	A
Reverse peak gate voltage, Pulse width $\leq 1.0\text{ms}$ @ $T_a = +25^\circ\text{C}$	V_{GRM}	5	V
Operating Junction Temperature Range	T_J	-40 to +110	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-40 to +150	$^\circ\text{C}$

- Notes:**
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. V_{DRM} and V_{RRM} for all types can be applied on a continuous basis. Ratings apply for zero or negative gate voltage; 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	VALUE	UNIT
Thermal resistance – junction to case	RthJC	50	°C/W
Maximum lead temperature for soldering purposes 1/16" from case for 10 seconds	T _L	260	°C

ELECTRICAL CHARACTERISTICS (T_J = +25°C, unless otherwise noted.)

OFF CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Peak repetitive forward or reverse blocking current (V _D = R _{ated} V _{DRM} and V _{RRM} ; R _{GK} = 1K ohms)	I _{DRM} I _{RRM}	-- --	-- --	10 100	μA

ON CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Peak forward on-state voltage (I _{TM} = ±0.3A peak, pulse width ≤ 1.0ms, duty cycle ≤ 1%)	V _{TM}	--	--	1.5	V
Gate trigger current (V _D = 7.0Vdc, R _L = 100 Ohms)	I _{GT}	--	--	50	μA
Holding current (V _D = 7.0Vdc, R _L = 100 Ohms)	I _H	--	--	5 10	mA
Gated trigger voltage(V _D = 7.0Vdc, R _L = 100 Ohms)	V _{GT}	--	--	0.8 1.2	V
Latch current (V _D = 7.0Vdc, R _L = 100 Ohms)	I _L	--	--	10 15	mA

DYNAMIC CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Critical rate of rise of off-state voltage (V _D = rated V _{DRM} , exponential waveform, R _{GK} = 1k Ohms, T _J = 110°C)	dv/dt	20	--	--	V/μs
Critical rate of rise of on-state current (I _{PK} = 50A, P _W = 10usec, f = 60Hz)	di/dt	--	--	50	A/μs

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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

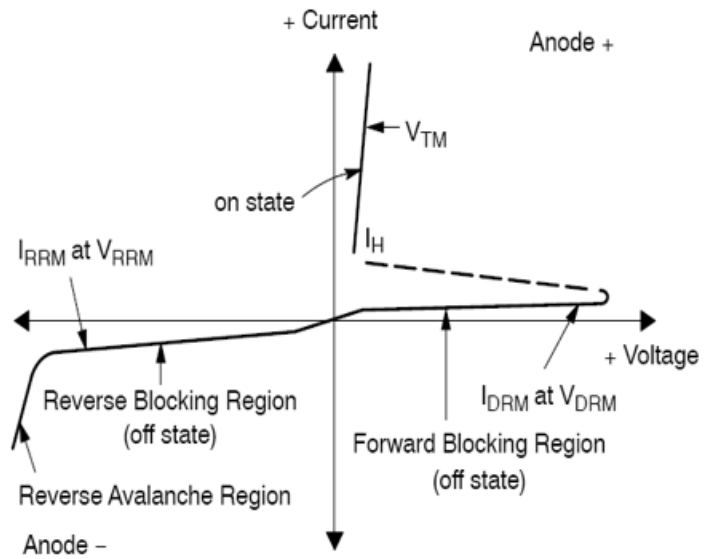


FIG.1 On-State Characteristics

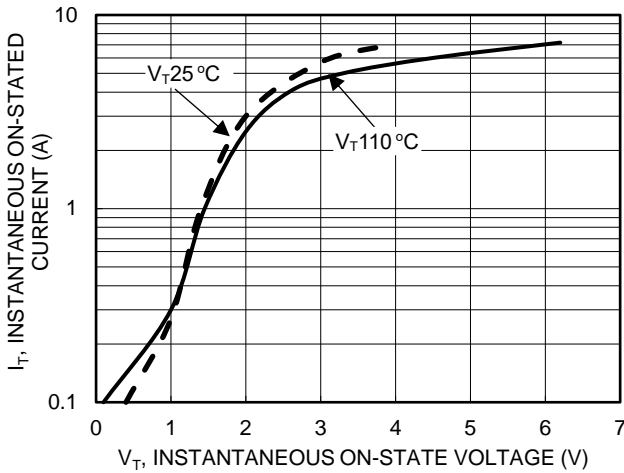
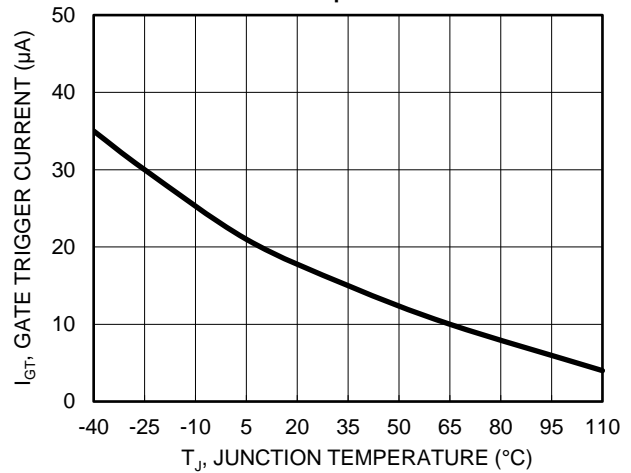


FIG.2 Typical Gate Trigger Current vs Junction Temperature



RATING AND CHARACTERISTIC CURVES

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FIG.3 Typical Gate Trigger Voltage vs Junction Temperature

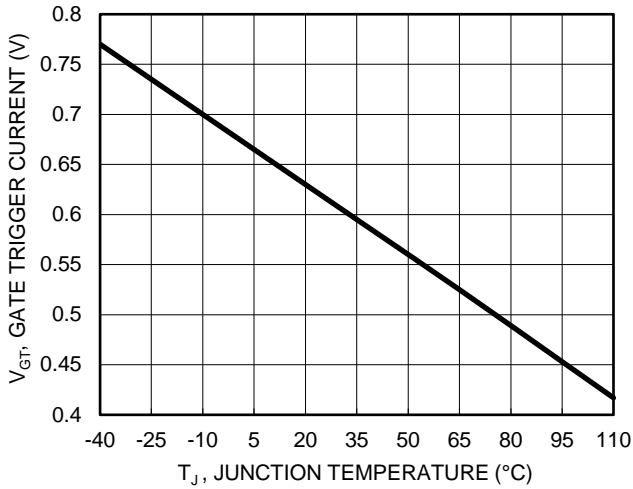


FIG.4 Typical Holding Current vs Junction Temperature

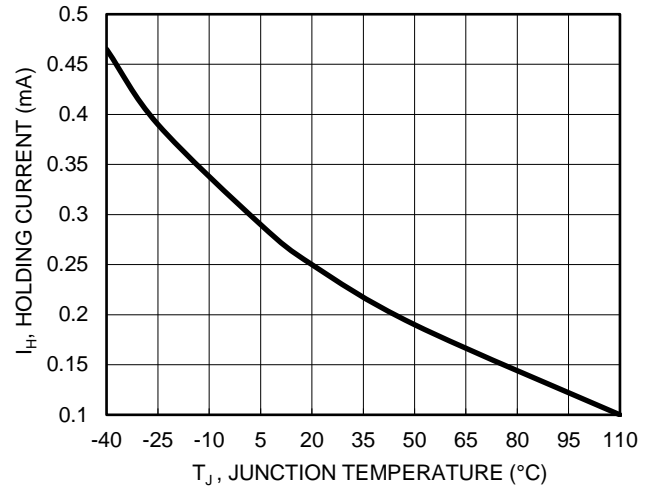


FIG.5 Typical Latch Current vs Junction Temperature

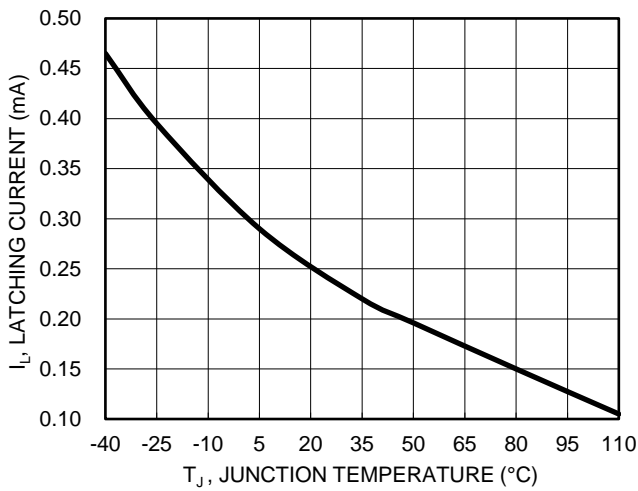
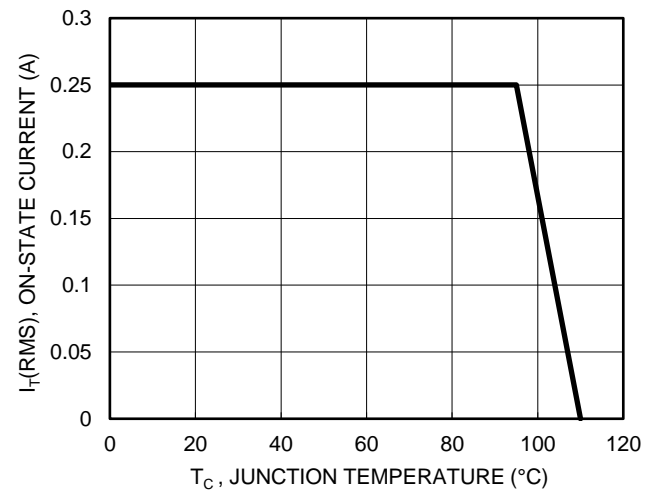


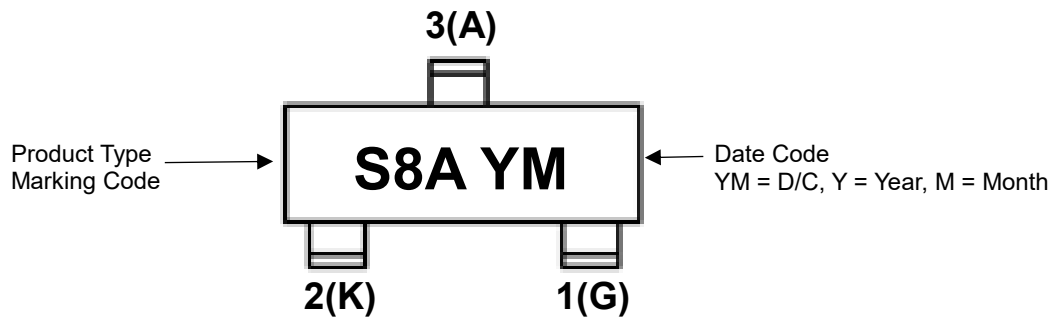
FIG.6 On-Stage Current Rating Curve



Ordering Information:

Part Number	Package	Packing	
		Qty.	Carrier
MCR100-8	SOT-23	3000	T&R

Marking Information:



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