

S1U50700A(LS)

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

SCRs 1 AMPERES RMS 700 VOLTS

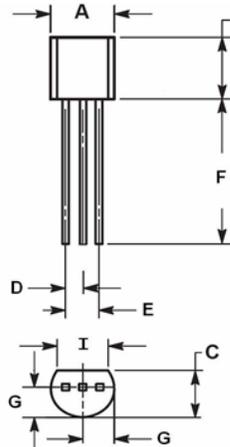
FEATURES

- Sensitive Gate Allows Triggering by Microcontrollers and Other Logic Circuits
- Blocking Voltage to 700 Volts
- On-State Current Rating of 0.8 Amperes RMS at $T_c=80^\circ\text{C}$
- 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/msec Minimum at 110°C
- Glass-Passivated Surface for Reliability and Uniformity
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

MECHANICAL DATA

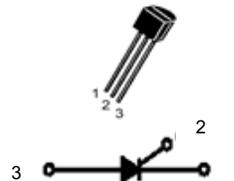
- Package: TO-92
- Package Material: Molded Plastic
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.21 grams (Approximate)

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 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) ($T_J = -40$ to 125°C , Sine Wave, 50 to 60Hz; Gate Open)	V_{DRM} V_{RRM}	700	V
On-State RMS Current ($T_c = 80^\circ\text{C}$) 180° Conduction Angles	$I_{T(RMS)}$	1.0	A
Peak Non-Repetitive Surge Current $T_A=25^\circ\text{C}$ (1/2 Cycle, Sine Wave, 60 Hz, $T_J = 25^\circ\text{C}$)	I_{TSM}	10	A
Circuit Fusing Consideration ($t = 8.3\text{ms}$)	I^2t	0.415	A^2s
Forward Peak Gate Power ($T_A = 25^\circ\text{C}$, Pulse Width ≤ 1.0 us)	P_{GM}	0.1	W
Forward Average Gate Power ($T_A = 25^\circ\text{C}$, $t = 8.3$ ms)	$P_{G(AV)}$	0.1	W
Forward Peak Gate Current ($T_A = 25^\circ\text{C}$, Pulse Width ≤ 1.0 us)	I_{GM}	1.0	A
Reverse Peak Gate Voltage ($T_A = 25^\circ\text{C}$, Pulse Width ≤ 1.0 ms)	V_{GRM}	5	V
Operating Junction Temperature Range @ Rate V_{RRM} and V_{DRM}	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 - Junction to Ambient	RthJC	75	°C/W
	RthJA	150	
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 (Note 5) (V _D = Rated V _{DRM} and V _{RRM} ; R _{GK} = 1k Ohms)	I _{DRM}	--	--	10	μA
	I _{RRM}	--	--	100	

ON CHARACTERISTICS	SYMBOL	MIN.	TYP.	MAX.	UNIT	
Peak Forward On-State Voltage @TA=25°C (I _{TM} =± 3.0A Peak, Pulse Width≤1.0 ms, Duty Cycle ≤1%)	V _{TM}	--	1.2	1.7	V	
Gate Trigger Current (V _{AK} = 7.0 Vdc; R _L = 100 Ohms)	I _{GT}	--	20	50	μA	
Holding Current (V _{AK} = 7 V, Gate Open, Initiating Current = 20 mA)	I _H	T _J = 25°C	--	0.5	5.0	mA
		T _J =-40°C	--	--	10	
Gate Trigger Voltage (V _D = 7 V; R _L =100 Ohms)	V _{GT}	T _J = 25°C	--	0.62	0.8	V
		T _J =-40°C	--	--	1.2	
Latch Current (V _{AK} =7.0 V, I _g = 200 uA)	I _L	T _J = 25°C	--	0.6	10	mA
		T _J =-40°C	--	--	15	

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	35	--	V/μs
Repetitive Critical Rate of Rise of On-State Current I _{PK} =20A, P _W = 10μs, di/dt = 1A/μs, I _{GT} = 20mA	di/dt	--	--	50	A/μs

Note:

5. RGK Current not included in measurement.

RATING AND CHARACTERISTIC CURVES
S1U50700A

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

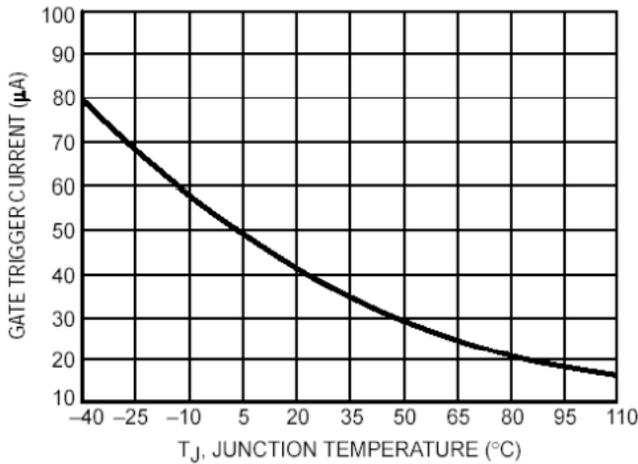
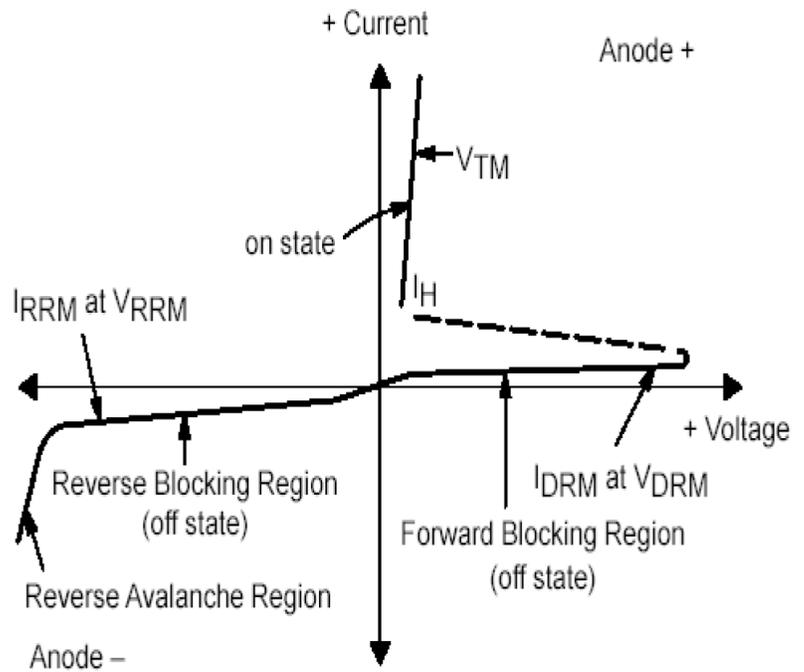


Figure 1. Typical Gate Trigger Current versus Junction Temperature

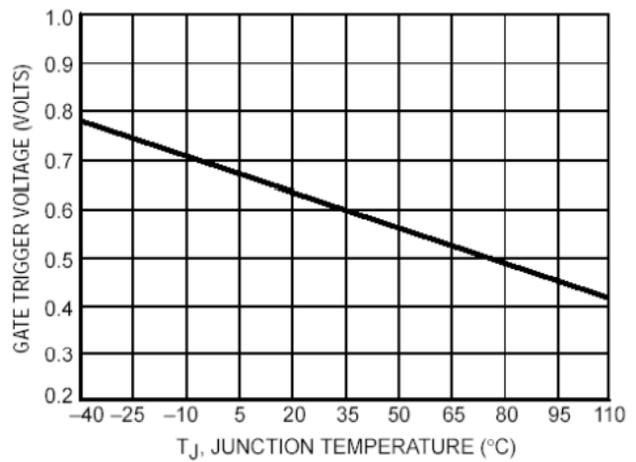


Figure 2. Typical Gate Trigger Voltage versus Junction Temperature

RATING AND CHARACTERISTIC CURVES
S1U50700A

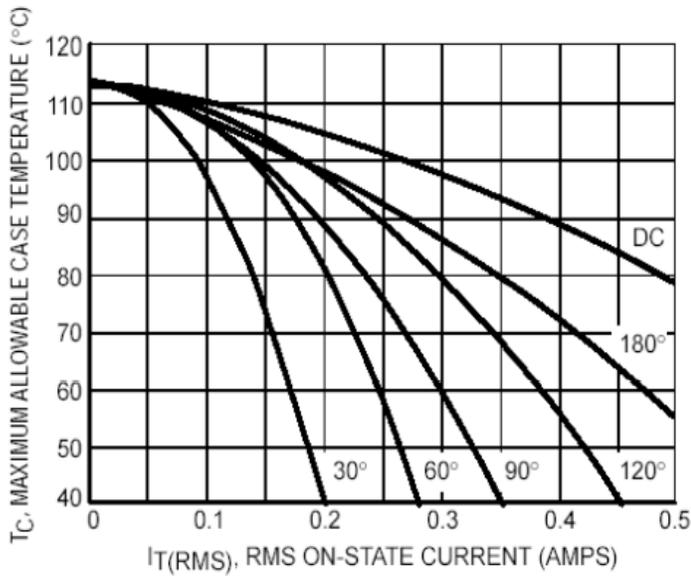
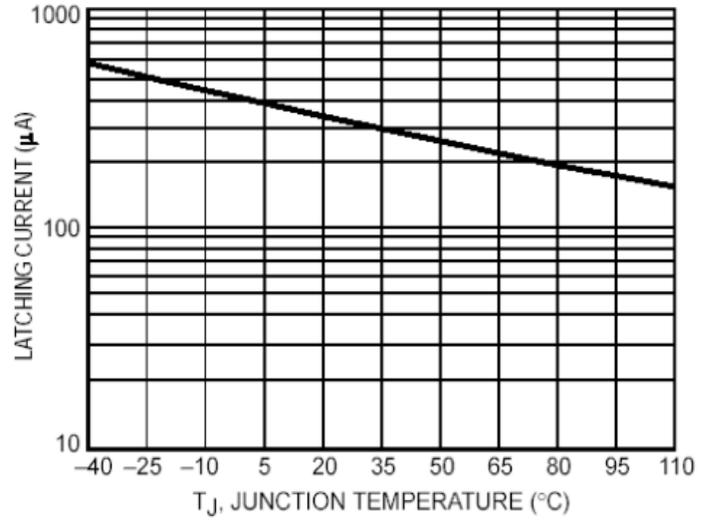
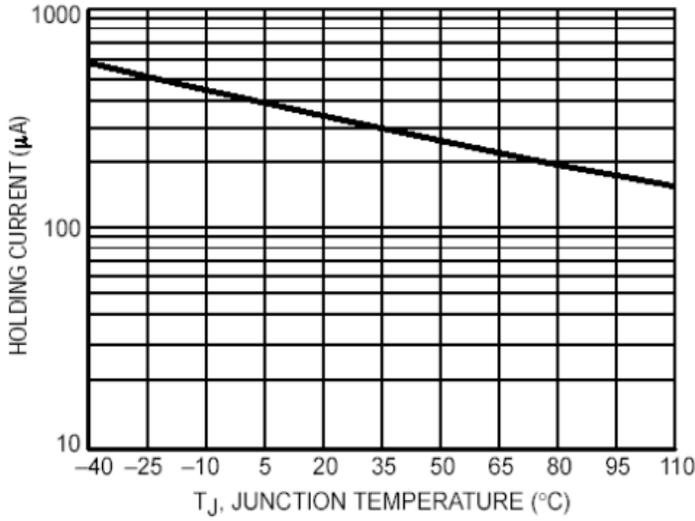


Figure 5. Typical RMS Current Derating

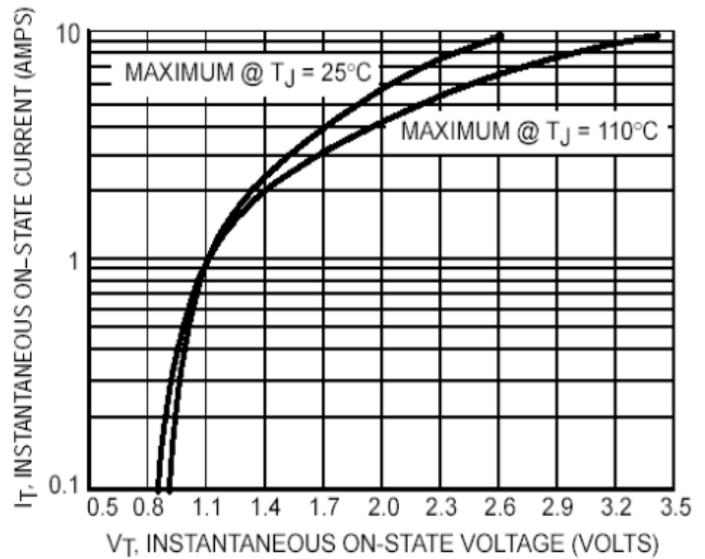
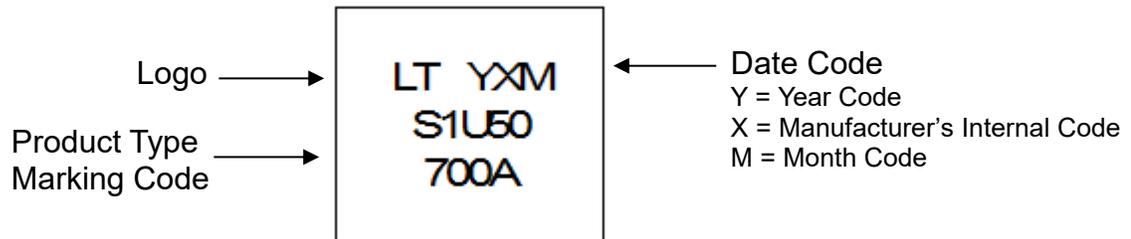


Figure 6. Typical On-State Characteristics

Ordering Information:

Part Number	Package	Packing	
		Qty.	Carrier
S1U50700A	TO-92	2000	T&R
S1U50700A_HF	TO-92	2000	T&R

Marking Information:



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