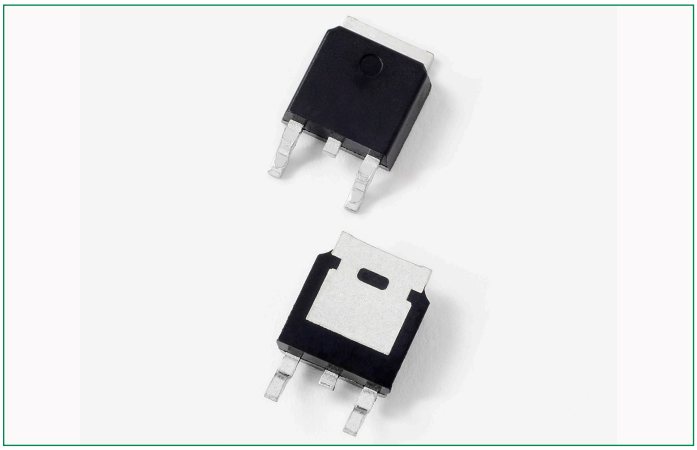
SRU6008xSx

8 A Sensitive SCR (reverse undefined)

RoHS



Description:

The SRU6008xSx SCR series is specifically designed for high voltage capacitor discharge applications.

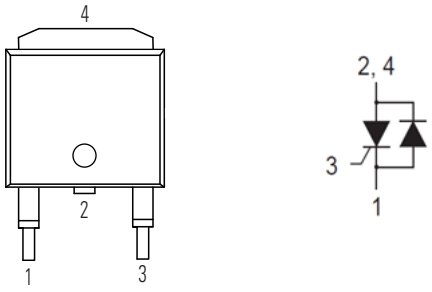
Features and Benefits:

- High forward blocking voltage of 600 V
- High pulse current handling capacity
- High di/dt of 100 A/µs
- Reverse direction not desgined to function

Applications:

Typical applications are high voltage pulse generation by capacitor discharge for electric fences, CEWs (contact electric weapon) and high-power strobe lights.

Pinout Diagram



1: Cathode; **2:** Anode; **3:** Gate; **4:** Anode

Product Summary

Characteristic	Value	Unit
$I_{T(RMS)}$	8	A
V_{DRM}	600	V
V_{RRM}	N/A	V
I_{GT}	0.2	mA

Revised: TK.07/03/2023

Absolute Maximum Ratings – Sensitive SCRs

Symbol	Characteristics	Conditions	Value	Units
V_{DSM}	Non-repetitive Peak Off-state Voltage	T_J = 25°C	800	V
$I_{T(RMS)}$	RMS On-state Current	T_C = 130°C	8	A
$I_{T(AV)}$	Average On-state Current		5.1	
I_{TSM}	Peak Non-repetitive Surge Current	Single Half Cycle, f = 50 Hz, T_J (initial) = 25°C	83	A
		Single Half Cycle, f = 60 Hz, T_J (initial) = 25°C	100	
I^2t	I^2t Value for Fusing	t_p = 8.3 ms	41	A^2s
di/dt	Critical Rate-of-Rise of On-state Current	T_J = 150°C f = 60 Hz	100	A/µs
I_{GM}	Peak Gate Current	P_W = 20 µs T_J = 150°C	0.5	A
$P_{G(AV)}$	Average Gate Power Dissipation	T_J = 150°C	0.1	W
T_{stg}	Storage Temperature Range	–	–40 to 150	°C
T_J	Operating Junction Temperature Range	–	–40 to 150	°C

Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol	Characteristic	Conditions	Value			Unit
			Min.	Typ.	Max.	
I_{GT}	Gate Trigger Current	V_D = 12 V R_L = 60 Ω	20	–	–	µA
			–	–	200	
V_{GT}	Gate Trigger Voltage		–	–	0.8	V
dv/dt	Critical Rate of Rise of Off-stage Voltage	$V_D = V_{DRM}$; RGK = 220 Ω; T_J = 125°C	15	–	–	V/µs
V_{GD}	Gate Non-trigger Voltage	$V_D = V_{DRM}$ R_L = 3.3 kΩ T_J = 150°C	0.1	–	–	V
I_H	Holding Current	I_T = 200 mA (initial)	–	–	6	mA
t_q	Turn-off Time	I_T = 0.5 A; t_p = 50 µs; dv/dt = 5 V/µs; di/dt = -30 A/µ	–	55	–	µs
t_{gt}	Turn-on Time	I_G = 2 x I_{GT} P_W = 15 µs I_T = 16 A	–	1	–	µs
V_{GRM}	Peak Reverse Gate Voltage	I_{GR} = 10 µA	6	–	–	V

Static Characteristics

Symbol	Characteristic	Conditions		Value			Unit
				Min.	Typ.	Max.	
V_{TM}	Peak On-state Voltage Drop	I_T = 16A; t_p = 380 µs		–	–	1.6	V
I_{DRM}	Repetitive Peak Off-state Current	$V_D = V_{DRM}$ = 600 V	T_J = 25°C	–	–	5	µA
			T_J = 150°C; RGK = 220 Ω	–	–	2	mA

Thermal Resistances

Symbol	Characteristic	Conditions	Value	Unit
$R_{\theta(JC)}$	Thermal Resistance, Junction to case (AC)	–	1.2	°C/W

Characteristic Curves

Fig. 1. Normalized DC Gate Trigger Current vs. Junction Temperature

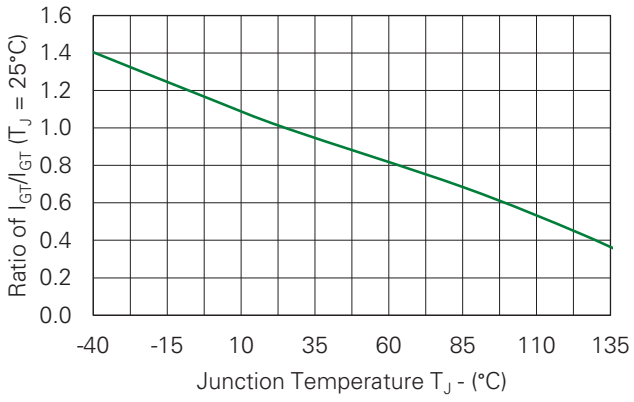


Fig. 2. Normalized DC Gate Trigger Voltage vs. Junction Temperature

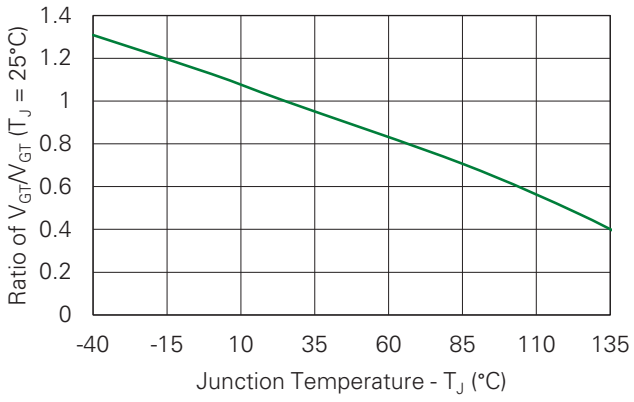


Fig. 3. Normalized DC Holding Current vs. Junction Temperature

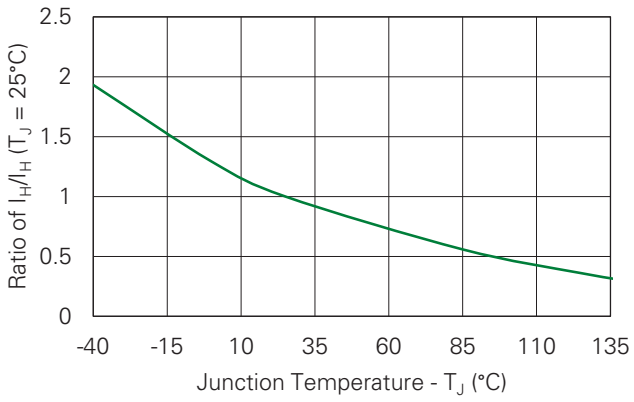


Fig. 4. Typical On-state Current vs. On-state Voltage

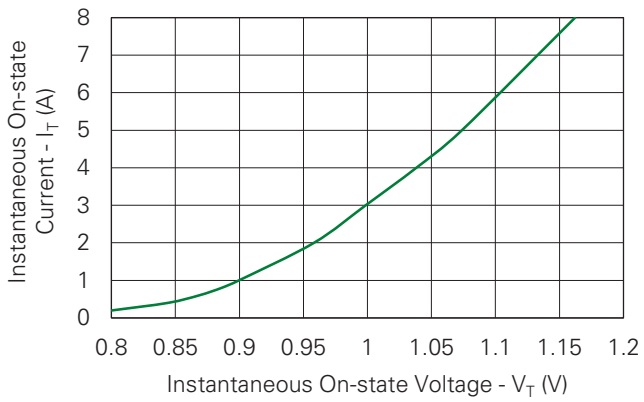


Fig. 5. Typical Power Dissipation vs. RMS On-state Current

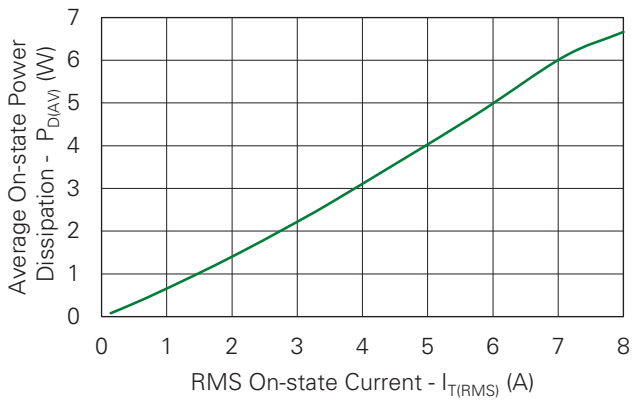


Fig. 6. Maximum Allowable Case Temperature vs. RMS On-state Current

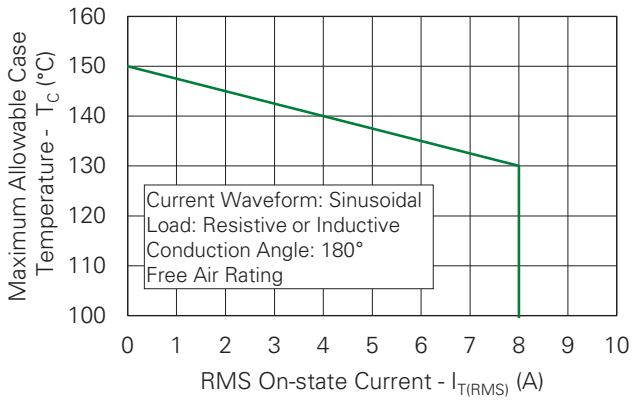


Fig. 7. Maximum Allowable Case Temperature vs. Average On-state Current

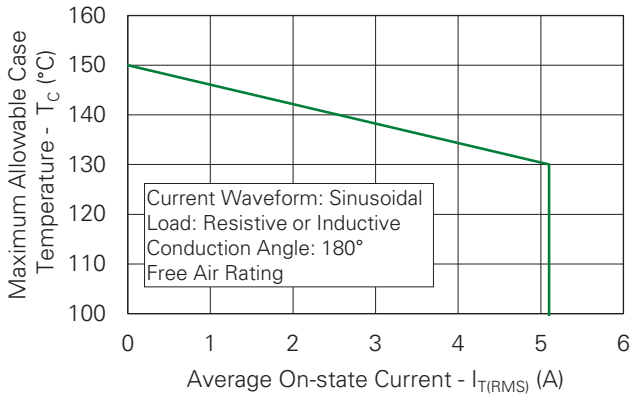
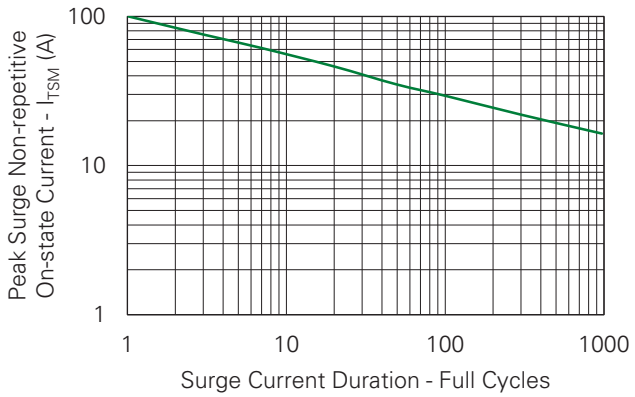


Fig. 8. Surge Peak On-state Current vs. Number of Cycles

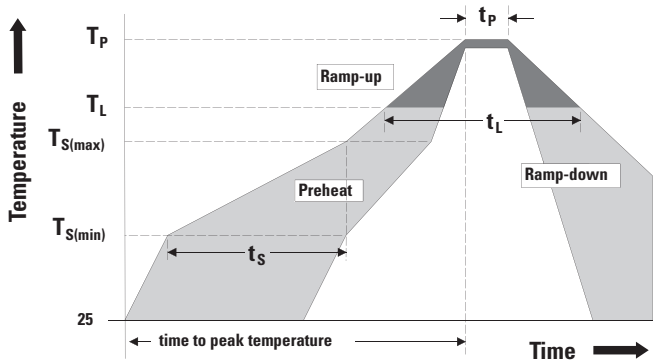


SUPPLY FREQUENCY: 60 Hz Sinusoidal
LOAD: Resistive
RMS On-State Current: [$I_{T(RMS)}$]: Maximum Rated Value at Specified Case Temperature

Notes:
1. Gate control may be lost during and immediately following surge current interval.
2. Overload may not be repeated until junction temperature has returned to steady-state rated value.

Soldering Parameters

Characteristic		Value
Reflow Condition		Pb – Free assembly
Pre-heat	Temperature Min ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max) (t_s)	60 – 120 secs
Average ramp up rate (Liquidus Temp)(T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (t_L)	60 – 150 seconds
Peak Temperature (T_P)		$260^{+0/-5}$ °C
Time within 5°C of actual peak Temperature (t_p)		30 seconds max
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes max
Do Not Exceed		260°C



Physical Specifications

Characteristic	Value
Terminal Finish	100% Matte Tin-plated
Body Material	UL Recognized compound meeting flammability rating V-0
Lead Material	Copper Alloy

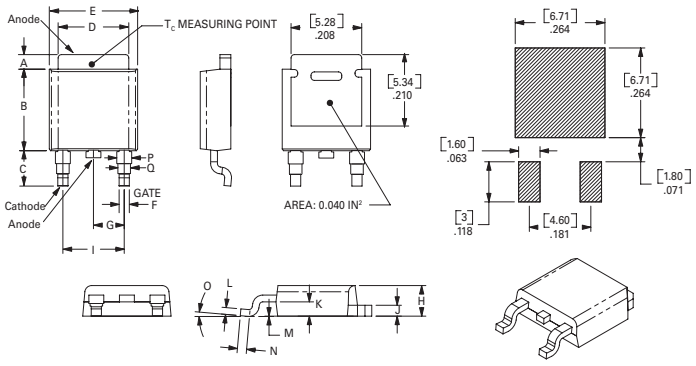
Design Considerations

Careful selection of the correct component for the application's operating parameters and environment will go a long way toward extending the operating life of the Thyristor. Good design practice should limit the maximum continuous current through the main terminals to 75% of the component rating. Other ways to ensure long life for a power discrete semiconductor are proper heat sinking and selection of voltage ratings for worst case conditions. Overheating, overvoltage (including dv/dt), and surge currents are the main killers of semiconductors. Correct mounting, soldering, and forming of the leads also help protect against component damage.

Environmental Specifications

Test	Specifications and Conditions
AC Blocking	MIL-STD-750, M-1040, Cond A Applied Peak AC voltage for 1008 hours
Temperature/Humidity	EIA / JEDEC, JESD22-A101, 1008 hours; 160V - DC: 85°C; 85% relative humidity
Temperature Cycling	MIL-STD-750, M-1051, 1000 cycles; -55°C to +150°C; 15-min dwell-time
Resistance to Solder Heat	MIL-STD-750 Method 2031
Solderability	ANSI/J-STD-002, category 3, Test A
Moisture Sensitivity Level	Level 1

Part Outline Drawing (TO-252AA) (D Package) – DPAK Surface Mount)

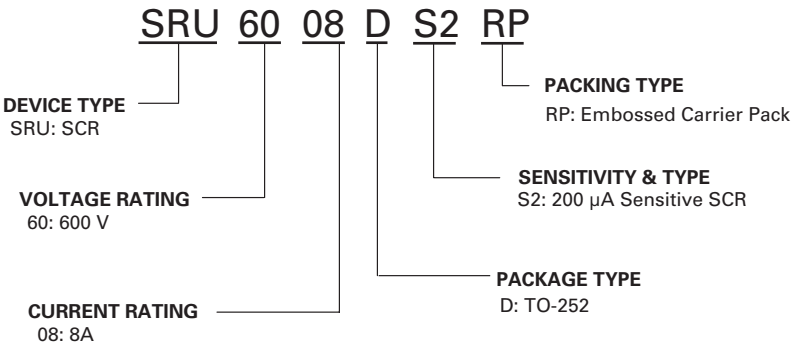


Symbol	Inches			Millimeters		
	Min.	Typical	Max.	Min.	Typical	Max
A	0.037	0.040	0.043	0.94	1.01	1.09
B	0.235	0.243	0.245	5.97	6.16	6.22
C	0.106	0.108	0.113	2.69	2.74	2.87
D	0.205	0.208	0.213	5.21	5.29	5.41
E	0.255	0.262	0.265	6.48	6.65	6.73
F	0.027	0.031	0.033	0.69	0.80	0.84
G	0.087	0.090	0.093	2.21	2.28	2.36
H	0.085	0.092	0.095	2.16	2.33	2.41
I	0.176	0.179	0.184	4.47	4.55	4.67
J	0.018	0.020	0.023	0.46	0.51	0.58
K	0.035	0.037	0.039	0.90	0.95	1.00
L	0.018	0.020	0.023	0.46	0.51	0.58
M	0.000	0.000	0.004	0.00	0.00	0.10
N	0.021	0.026	0.027	0.53	0.67	0.69
O	0°	0°	5°	0°	0°	5°
P	0.042	0.047	0.052	1.06	1.20	1.32
Q	0.034	0.039	0.044	0.86	1.00	1.11

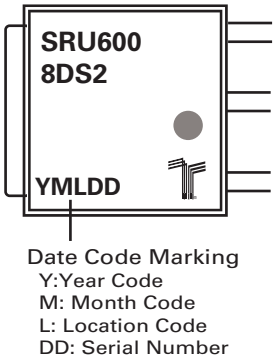
Packing Options

Part Number	Marking	Package	Type	Weight	Packing Mode	Base Quantity
SRU6008DS2RP	SRU6008DS2	TO-252	Sensitive SCR	0.3 g	Embossed Carrier	2500

Part Numbering and Marking



TO-252AA - (D Package)



TO-252 Embossed Carrier Reel Pack (RP) Specifications

Meets all EIA-418-2 Standards