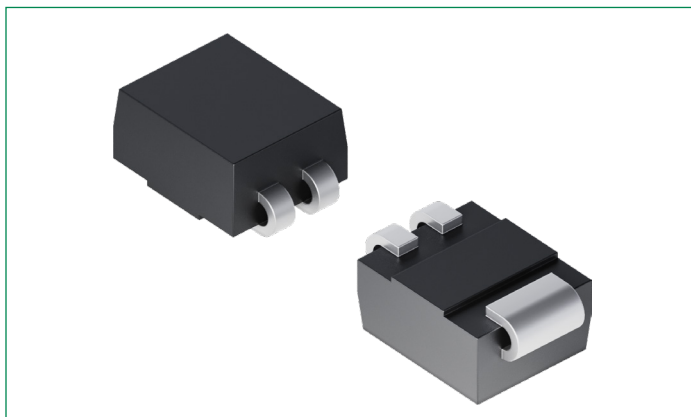


S6002CASRP

2 A Sensitive SCRs

HF **RoHS** **AUTOMOTIVE GRADE**



Description

The S6002CASRP device offers very high di/dt capability through small die planar construction design. It is glass-passivated to ensure long term reliability and parametric stability.

Features

- Surge capability of 25 A at 60 Hz half cycle
- High di/dt capability of 500 A/ μ s
- Improved turn-off time (t_q) < 55 μ sec
- AEC-Q101 qualified
- Sensitive gate for direct microprocessor interface
- Halogen-free and RoHS-compliant

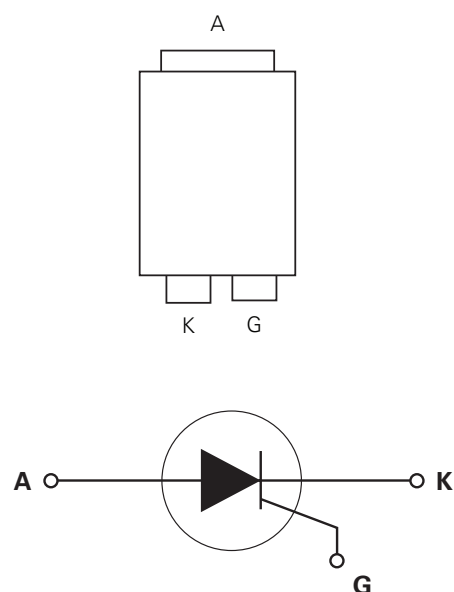
Applications

The S6002CASRP is specifically designed for capacitor discharge applications such as high-power gas flame ignition.

Product Summary

Characteristic	Value	Unit
$I_{T(RMS)}$	2	A
V_{DRM}/V_{RRM}	600	V
I_{GT}	200	μ A

Pinout Diagram Compak (C Package)



K: Cathode; **A:** Anode; **G:** Gate

Maximum Ratings

Symbol	Characteristics	Conditions	Value	Units
$I_{T(RMS)}$	RMS On-state Current (Full Sine Wave)	$T_c = 75\text{ }^{\circ}\text{C}$	2	A
$I_{T(AV)}$	Mean On-state Current	$T_c = 75\text{ }^{\circ}\text{C}$	1.2	A
I_{TSM}	Non-repetitive Surge On-state Current	full cycle; $T_{vj} \text{ (initial)} = 25\text{ }^{\circ}\text{C}$	f = 50 Hz 22.5 f = 60 Hz 25	A
I^2t	I^2t Value	f = 50 Hz; $t_p = 10\text{ ms}$	2.5	A^2s
$di/dt_{(cr)}$	Critical Rate of Rise of On-state Current	$I_G = 10\text{ mA}$; $T_{vj} = 25\text{ }^{\circ}\text{C}$	500	$\text{A}/\mu\text{s}$
I_{GM}	Peak Gate Current	$t_p = 20\text{ }\mu\text{s}$; $T_{vj} = 125\text{ }^{\circ}\text{C}$	1	A
$P_{G(AV)}$	Mean Gate Power Dissipation	$T_{vj} = 125\text{ }^{\circ}\text{C}$	0.2	W
T_{stg}	Storage Temperature Range	–	–40 to 150	$^{\circ}\text{C}$
T_{vj}	Virtual Junction Temperature Range	–	–40 to 125	$^{\circ}\text{C}$

Electrical Characteristics ($T_{vj} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

Symbol	Characteristics	Conditions	Value		Units
			Min.	Max.	
I_{GT}	DC Gate Trigger Current	$V_D = 6\text{ V}$, $R_L = 100\text{ }\Omega$	20	200	μA
V_{GT}	DC Gate Trigger Voltage	$V_D = 6\text{ V}$, $R_L = 100\text{ }\Omega$	–	0.8	V
V_{GRM}	Peak Reverse Gate Voltage	$I_{RG} = 10\text{ }\mu\text{A}$	5	–	V
V_{GD}	Gate Non-trigger Voltage	$V_D = V_{DRM}$, $R_{GK} = 1\text{ k}\Omega$, $T_{vj} = 125\text{ }^{\circ}\text{C}$	0.2	–	V
I_H	Holding Current	$R_{GK} = 1\text{ k}\Omega$	–	5	mA
$dv/dt_{(cr)}$	Critical Rate-of-rise of Off-state Voltage	$V_D = 2/3 V_{DRM}$, $T_{vj} = 125\text{ }^{\circ}\text{C}$, Exponential Waveform, $R_{GK} = 1\text{ k}\Omega$	25	–	$\text{V}/\mu\text{s}$
t_q	Turn-off Time	$I_T = 0.5\text{ A}$	–	55	μs
t_{gt}	Turn-on Time	$I_G = 10\text{ mA}$; $P_W = 15\text{ }\mu\text{sec}$, $I_T = 3\text{ A}_{(PK)}$	–	5	μs

Thermal Characteristics

Symbol	Characteristics	Value	Units
$R_{th(j-c)}$	Thermal Resistance, Junction to Case (AC)	$I_T = 1.5\text{ A}_{(RMS)}$ 25	K/W

Static Characteristics

Symbol	Characteristics	Conditions	Value		Units
			Min.	Max.	
V_{TM}	Peak On-state Voltage	$I_{TM} = 3\text{ A}_{(PK)}$; $t_p = 380\text{ }\mu\text{s}$	–	1.5	V
I_{DRM}/I_{RRM}	Off-state Current, Peak Repetitive	$T_{vj} = 25\text{ }^{\circ}\text{C}$ @ $V_D = V_{DRM}$; $R_{GK} = 1\text{ k}\Omega$	–	5	μA
		$T_{vj} = 125\text{ }^{\circ}\text{C}$ @ $V_D = V_{DRM}$; $R_{GK} = 1\text{ k}\Omega$	–	500	μA

Characteristic Curves

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

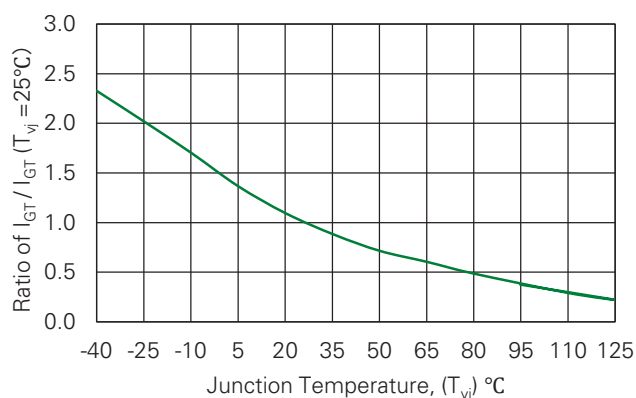


Fig. 2. Normalized DC Gate Trigger Voltage vs. Junction Temperature

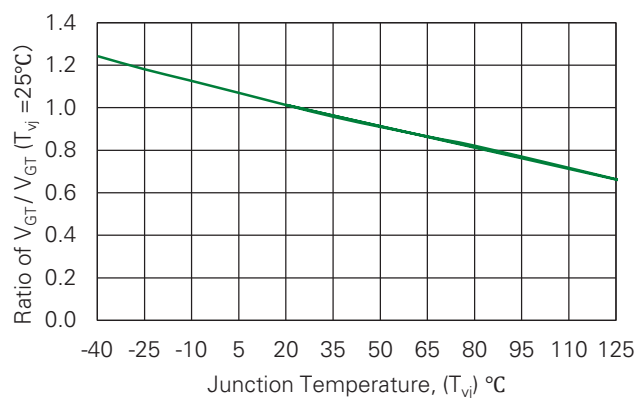


Fig. 3. Normalized DC Holding Current vs. Junction Temperature

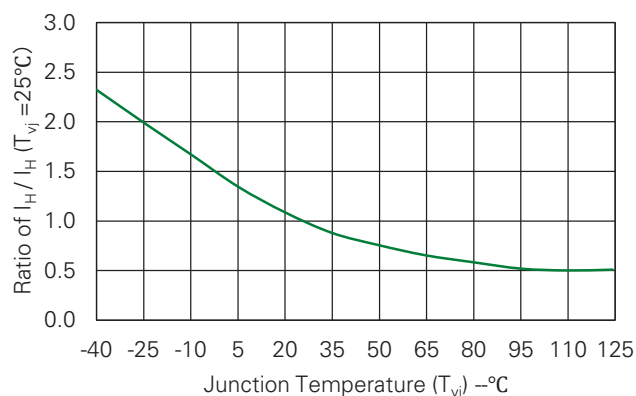


Fig. 4. Typical On-state Current vs. On-state Voltage

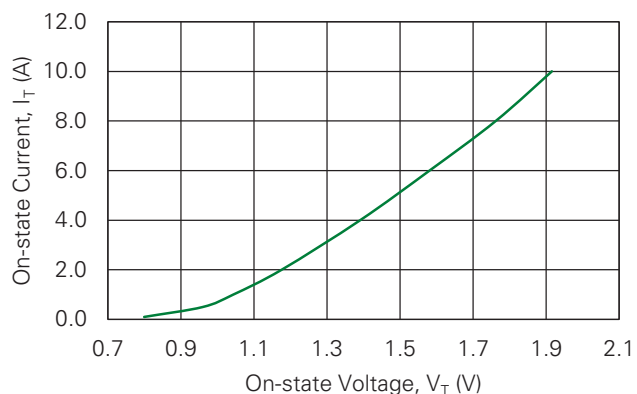


Fig. 5. Typical Power Dissipation vs. RMS On-state Current

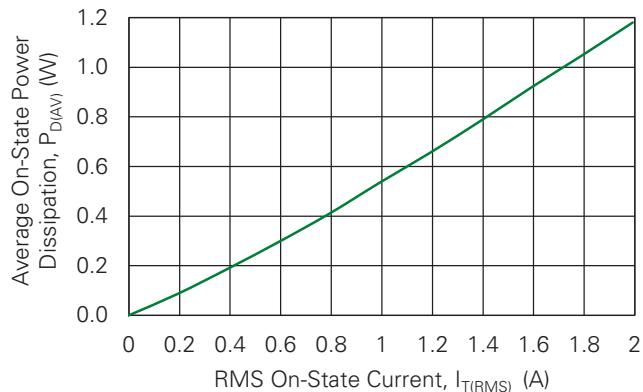


Fig. 6. Maximum Allowable Case Temperature vs. RMS On-state Current

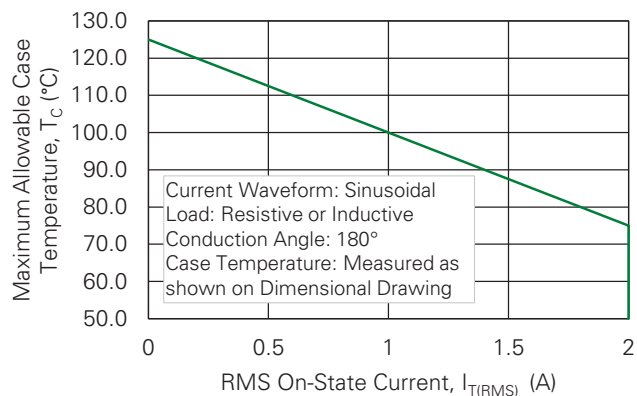
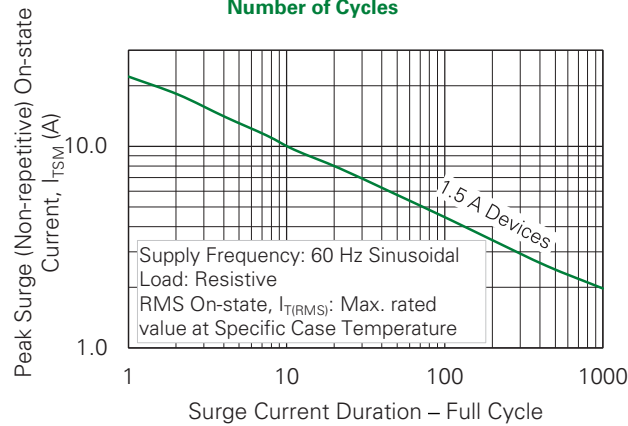


Fig. 7. Surge Peak On-state Current vs. Number of Cycles



- 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.

Fig. 8. Peak Repetitive Capacitor Discharge Current

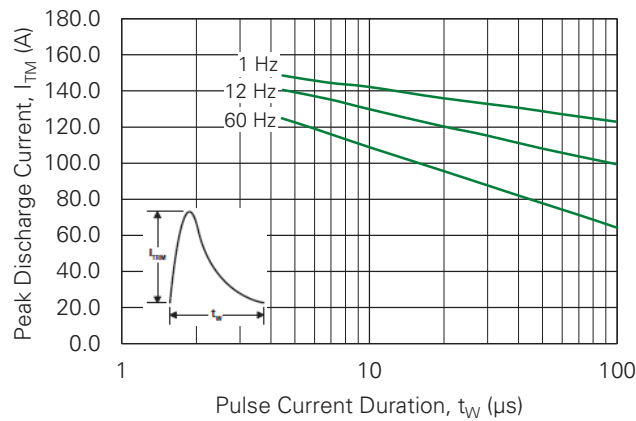
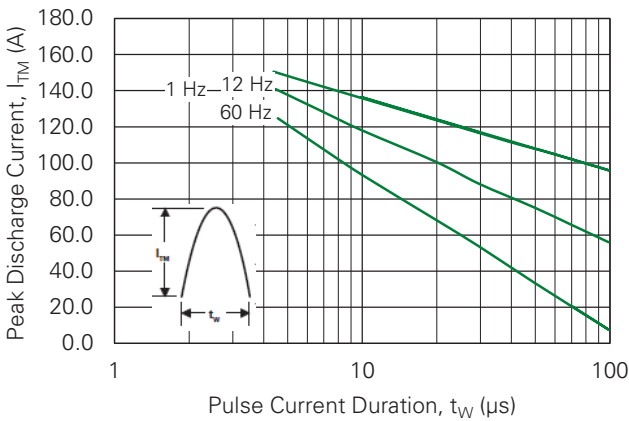


Fig 9. Peak Repetitive Sinusoidal Pulse Current

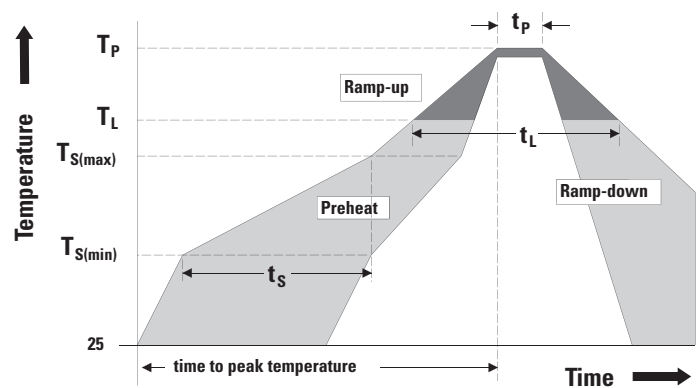


Soldering Parameters

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 – 180 seconds
Average ramp up rate (Liquidus Temp) (T_L) to peak		5°C/second max.
$T_{s(max)}$ to T_L - Ramp-up Rate		5°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)		20 – 40 seconds
Ramp-down Rate		5°C/second max.
Time 25°C to peak Temperature (T_P)		8 minutes max.
Do Not Exceed		280°C

Physical Specifications

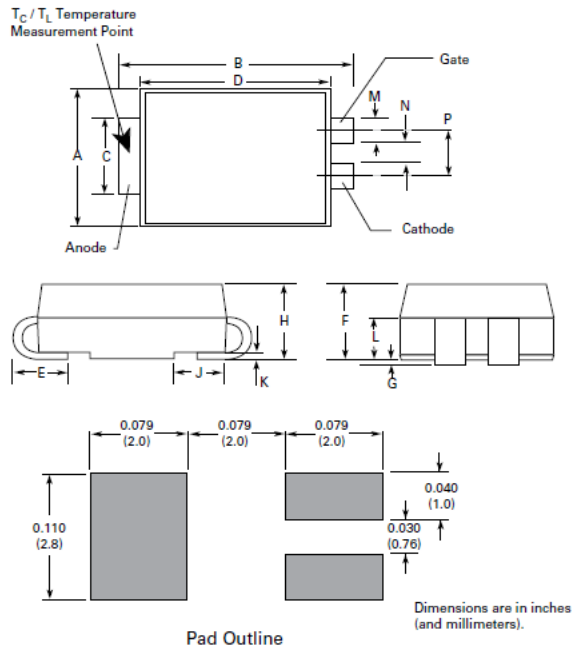
Characteristic	Value
Terminal Finish	100% Matte Tin-plated
Body Material	UL Recognized Epoxy meeting flammability rating 94 V-0
Terminal Material	Copper Alloy



Environmental Specifications

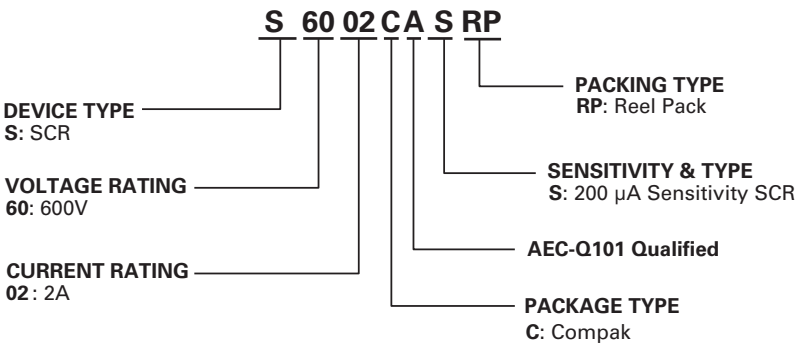
Test	Specifications and Conditions
AC Blocking	MIL-STD-750, M-1040, Cond A Applied Peak AC voltage @150°C for 1008 hours
Temperature Cycling	MIL-STD-750, M-1051, 1000 cycles; -55°C to +150°C; 15-min dwell-time
Temperature/Humidity	EIA / JEDEC, JESD22-A101, 1008 hours; 160 V - DC: 85°C; 85% relative humidity
Resistance to Solder Heat	MIL-STD-750: Method 2031
Solderability	ANSI/J-STD-002, category 3, Test A
Lead Bend	MIL-STD-750, M-2036 Cond E
Moisture Sensitivity Level	Level 1, JEDEC-J-STD-020D
UHAFT	JESD22-A118, 96 hours, 130°C, 85% relative humidity
IOL	MIL-STD-750 Method 1037

Package Dimensions Compak (C-Package)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max
A	3.30	3.95	0.130	0.156
B	5.10	5.60	0.201	0.220
C	1.95	2.20	0.077	0.087
D	4.05	4.60	0.159	0.181
E	0.75	1.60	0.030	0.063
F	1.90	2.45	0.075	0.096
G	0.05	0.20	0.002	0.008
H	1.95	2.65	0.077	0.104
J	1.09	1.35	0.043	0.053
K	0.15	0.41	0.006	0.016
L	0.76	1.40	0.030	0.055
M	0.56	0.71	0.022	0.028
N	0.69	0.84	0.027	0.033
P	1.32	1.47	0.052	0.058

Part Numbering and Marking



Compak (C Package)



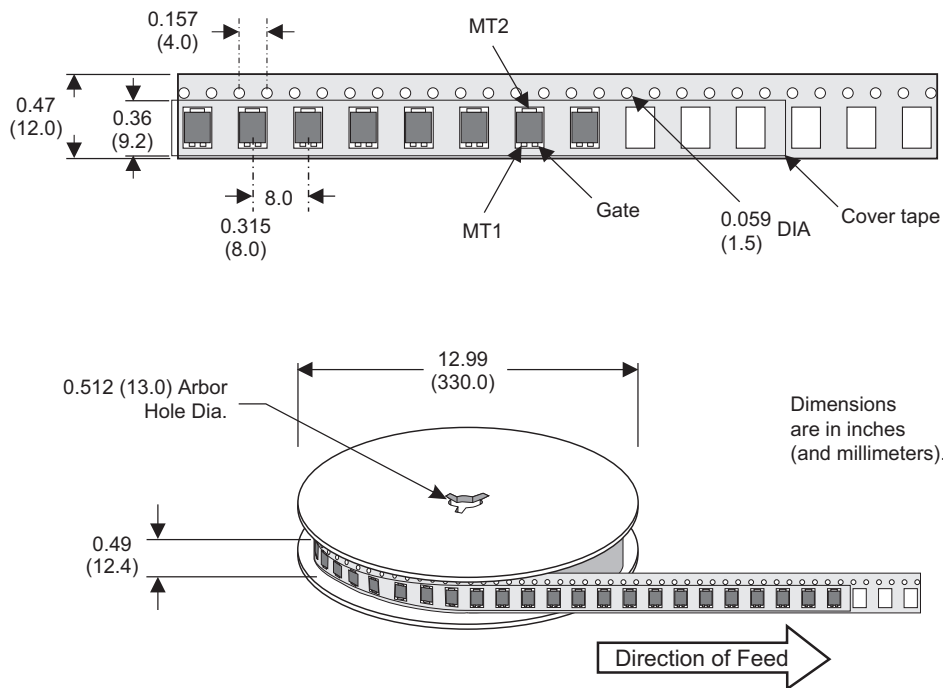
Date Code Marking
Y: Year Code
M: Month Code
XXX: Lot Trace Code

Packing Options

Part Number	Marking	Weight	Packing Mode	M.O.Q.
S6002CASRP	S6002CAS	0.120g	Tape & Reel	2500

Compak Embossed Carrier Reel Pack (RP) Specifications

Meets all EIA-481-1 Standards



Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications.
Read complete Disclaimer Notice at <http://www.littelfuse.com/disclaimer-electronics>.



Part of:

