SMART POWER PROTECTOR FOR AC PORTS

FUSE

DESCRIPTION

The SP511301A is a unique multi-function resettable protective module, specifically designed for the small power AC port overall safety protection.

FEATURES

- Dual Protection: Over-Voltage and Over-Current
- High Voltage Endurance
- Fast Response Time
- Compliant with IEC 60738 Thermistors: Directly Heated Positive Temperature Coefficient
- Compliant with IEC 61643: Low Voltage Power Distribution Systems - Requirements and Tests
- Compliant with UL 1434 Thermistors
- Compliant with UL 1449_ED3 Surge Protective Devices
- RoHS & REACH Compliant

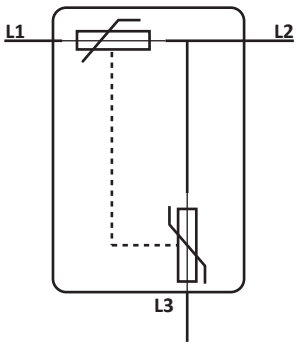
APPLICATIONS

- Small Power Charger
- Small Power Energy Saving Lights
- Other Small AC Power Equipment

MECHANICAL CHARACTERISTICS

- Approximate Weight: 2.75 grams
- Lead-Free

CIRCUIT DIAGRAM



TYPICAL DEVICE CHARACTERISTICS

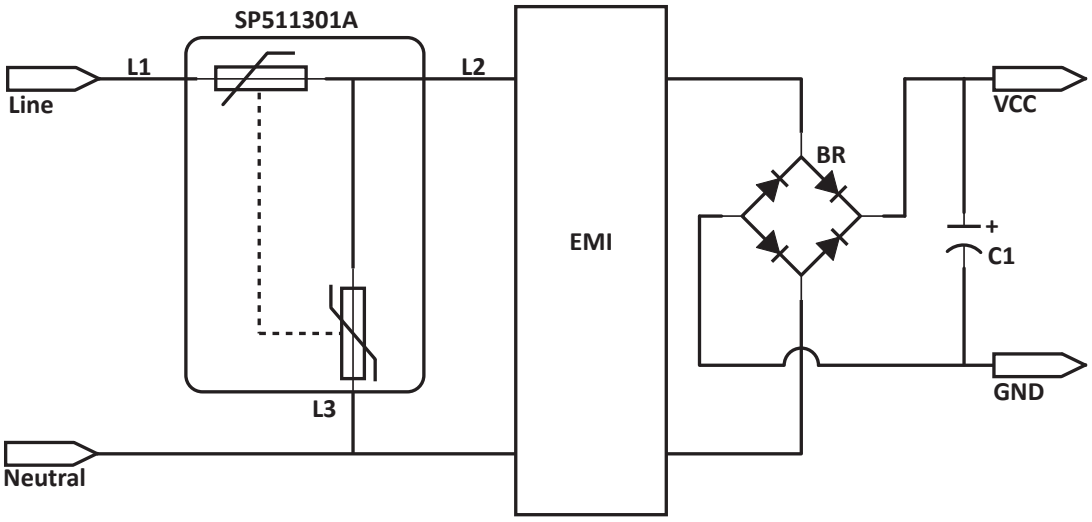
MAXIMUM RATINGS @ 25°C Unless Otherwise Specified			
PARAMETER	**SYMBOL**	**VALUE**	**UNITS**
Rated Voltage (RMS)	U_R	220	Volts
Maximum Voltage (RMS)	U_{Max}	240	Volts
Operating Temperature Range	T_W	-40 ~ +60	°C

ELECTRICAL CHARACTERISTICS @ 25°C Unless Otherwise Specified			
PARAMETER	**SYMBOL**	**VALUE**	**UNITS**
Rated Working Voltage	U_R	220	Volts AC
Maximum Continuously Working Voltage	U_{MAX}	240	Volts AC
Resistance of Internal Series PTC	R_{25}	6±20%	Ohms
PTC Hold Current @ 25°C, 230V_{AC}	I_{HD}	≤ 400	mA
PTC Hold Current @ 60°C, 230V_{AC}	I_{HD}	≤ 300	mA
PTC Trip Current: 230V_{AC}	I_{SW}	≥ 800	mA
PTC Residual Current: 230V_{AC}	I_{RES}	≤ 12	mA
PTC Switching Time: 230V_{AC}, 2A	t_{SW}	≤ 4	Seconds
PTC Recovery Time @ 25°C, in Still Air	t_R	< 90	Seconds
PTC Over-Current Withstanding @ 25°C, 230V_{AC}	I_{SMAX}	< 20	Amps
PTC Over-Temperature Protection	T_{OTP}	> 125	°C
Embedded MOV Varistor Voltage @ 1mA	U_{1mA}	> 450	V_{DC}
Limit-Current, Over Voltage Withstanding: R_S = 100Ω, UL 1449ED3	U_{OV}	> 480	V_{AC}
Lightning Surge Protection Level: 1.25/50µs Waveform, R_S = 2Ω	V_{LS}	≤ 4	KVp
Clamping Output Voltage @ 4kV, 1.25/50µs Waveform, R_S = 2Ω	V_{CLP}	< 1.1	KVp
Temporary Overvoltage Withstanding: 600V_{AC}, 1A, 1 second	N	> 20	Times
Leakage Current @ 230V_{AC}, 25°C	I_{LK}	< 10	µA
Coating Dielectric Strength @ 25°C, V_{DC}	U_{INS}	≥ 1500	V_{DC}

TYPICAL DEVICE CHARACTERISTICS

ENVIRONMENTAL TESTING		
PARAMETER	**CONDITIONS**	**CRITERIA**
Terminal Strength	Pull the pin axially, stepping add the force to 9.8N, keep 10 seconds, then measure the resistance.	|ΔR25/R25|≤20% |ΔU1mA/U1mA |≤20%
Solderability	Dip Soldering, Temperature 235°C	Good Soldering
Solder Heat Withstand	Dip Soldering, Temperature 350°C, Dip Time 3.5±0.5 seconds, then measure the device resistance.	|ΔR25/R25|≤20% |ΔU1mA/U1mA |≤20%
Vibration	Fix the device on the testing plate. Vibrate along X-axis and Y-axis respectively. Frequency 10Hz to 55Hz within 1 minute.; Displacement 0.75mm, time 45 minutes, then measure the device resistance	|ΔR25/R25|≤20% |ΔU1mA/U1mA |≤20%
Collision	Fix the device on the collision plate. Acceleration 10m/s2, time 11ms. Frequency 60-80 cycle/minute along X-axis and Y-axis respectively, 1000 cycles, then measure the resistance	|ΔR25/R25|≤20% |ΔU1mA/U1mA |≤20%
Constant Humidity and Temperature	Place the device in the condition 40°C 90%-95%, 48 hours, then measure the resistance	|ΔR25/R25|≤20% |ΔU1mA/U1mA |≤20%
High Temperature	Place the device at 70°, then measure the resistance	|ΔR25/R25|≤20% |ΔU1mA/U1mA |≤20%
Low Temperature	Place the device at -40°C, then measure the resistance	|ΔR25/R25|≤20% |ΔU1mA/U1mA |≤20%
Temperature Change	Place the device alternately between low temperature (-40°C) and high temperature (70°C), 2 minute transfer, 5 cycles, then measure the resistance	|ΔR25/R25|≤20% |ΔU1mA/U1mA |≤20%
After the environmental testing, keep the device in still air for 2 hours under normal atmospheric conditions, then being to verify the other parameters.		

FIGURE 1
TYPICAL PROTECTION CIRCUIT



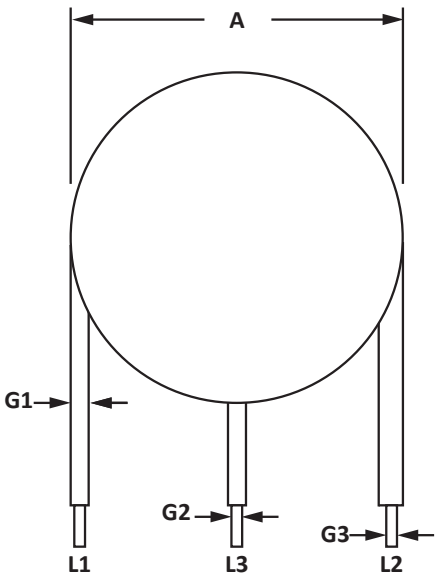
Layout safety spacing requirements (in accordance with requirements of 4KV 1.25/50μs lightning protection level):

- The spacing between pad edge of pin L1 and L2 is 5mm minimum.
- The spacing between pad edge of pin L1 and pin L3 is 6mm minimum.
- The spacing between pad edge of pin L2 and pin L3 is 3mm minimum and preferably increasing insulation by slotting.

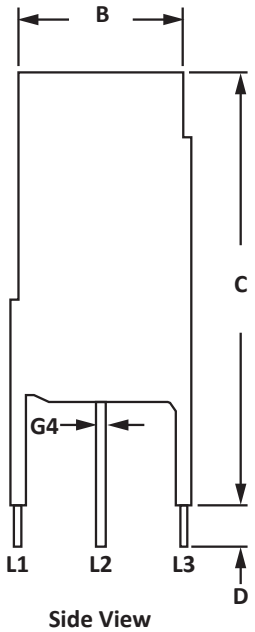
PACKAGE OUTLINE AND PAD LAYOUT INFORMATION

OUTLINE DIMENSIONS				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	-	13	-	0.51
B	-	8	-	0.31
C	-	16	-	0.63
D	3.0	3.5	0.12	0.14
E	4.6	5.6	0.18	0.22
F	3.4	4.4	0.13	0.17
G1	0.5	0.7	0.02	0.03
G2	0.5	0.7	0.02	0.03
G3	0.5	0.7	0.02	0.03
G4	0.2	0.4	0.008	0.016
J1	2.5	3.5	0.10	0.14
J2	2.0	3.0	0.08	0.12

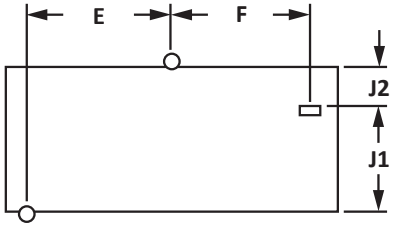
NOTES
1. L1 - Line in.
2. L2 - Line out.
3. L3 - Neutral.



Front View



Side View



Bottom View

ORDERING INFORMATION	
BASE PART NUMBER	MARKING
SP511301A	Part Number and Date Code

COMPANY INFORMATION

COMPANY PROFILE

In business more than 20 years, ProTek Devices™ is a privately-held company located in Tempe, Arizona, that offers a product line of transient voltage suppressors (TVS); avalanche breakdown diodes; steering diode TVS arrays and other surge suppressor component products. These TVS devices protect electronic systems from the effects of lightning, electrostatic discharge (ESD), nuclear electromagnetic pulses (NEMP), inductive switching and EMI / RFI. ProTek Devices also offers high performance interface and linear products that include analog switches; multiplexers; LED drivers; audio control ICs; RF and related high frequency products. The analog devices work in a host of consumer; industrial; automotive and other applications.

CONTACT US

Corporate Headquarters
2929 South Fair Lane
Tempe, Arizona 85282
USA

By Telephone
General: 602-431-8101
Sales: & Marketing: 602-414-5109
Customer Service: 602-414-5114
Product Technical Support: 602-414-5107

By Fax
General: 602-431-2288

By E-mail:
Sales: sales@protekdevices.com
Customer Service: service@protekdevices.com
Technical Support: support@protekdevices.com

ProTek Devices (Asia Pacific) Pte. Ltd.
8 Ubi Road 2, #06-19
Zervex
Singapore - 408538
Tel: +65-67488312
Fax: +65-67488313

Web
www.protekdevices.com