Snap-In Supercapacitors

S501 Series, Snap-In, 2.7 V, 65ºC

Electronic Components

KEMET CHARGED.

Overview

KEMET S501 Series Supercapacitors use a proprietary electrode design to deliver a very high power density. This product features high power performance of up to 350 F capacity in a single ended, board mountable, snap-in termination construction.

Applications

Typical applications include automotive subsystems, backup power/UPS, handheld/portable devices, hybrid energy storage, hybrid drivetrains, windmill pitch control, emergency lighting, medical devices, power correction, engine starting, and renewable energy.

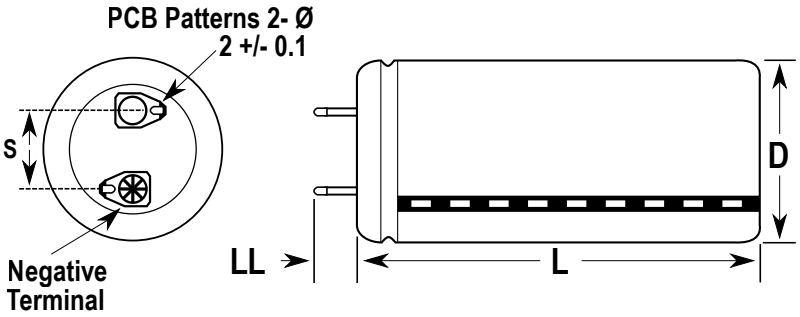
Benefits

- Board mountable
- Solderable
- High power
- High rate cycling
- Long life
- Operating temperature range of -40˚C to +65˚C
- High cycle life > 500,000 cycles
- RoHS Compliant
- Made in USA

Part Number System

S501	DC	107	V	2R7	A
Series	Size Code (D x L)	Capacitance Code (µF)	Capacitance Tolerance	Rated Voltage (VDC)	Termination Code
Supercapacitor, Snap-In Termination	DC = 22 x 45 LF = 35 x 60 LI = 35 x 69 LR = 35 x 89	First two digits represent significant figures. Third digit specifies number of zeros.	V = -5/+10% W = -0/+20%	2R7 = 2.7	A = 2 pin, 10 mm lead spacing, 5.9 mm terminal length U = 4 pin standard snap-in style

Dimensions – Millimeters



Part Number	D		L		S		LL	
	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
S501DC107W2R7A	22	+1.0/-0	45	+/-2.0	10	+/-0.1	5.9	+/-1.0
S501LF357V2R7A	35	+1.0/-0	59	+/-2.0	10	+/-0.1	5.9	+/-1.0
S501LF357V2R7U	35	+0.6/-0.3	62	+/-1.0	23	+/-0.1	5.9	+/-1.0

Performance Characteristics

Item	Performance Characteristics
Rated Voltage	2.7 VDC
Surge Voltage	2.85 VDC
Capacitance Range	100 – 350 F
Capacitance Tolerance	-5/+10%; [100 F -0/+20%]
Temperature Range	-40°C to +65°C
Storage Temperature Range	-40°C to +70°C
Life, DC	10 years, rated voltage, 25°C
	Δ C < 20% decrease, ESR < 100% increase
Life, Endurance	1,000 hours, rated voltage, 65°C
	Δ C < 20% decrease, ESR < 100% increase
Life, Shelf	1,000 hours, no voltage, 70°C
	Δ C < 20% decrease, ESR < 100% increase
Life, Cycle	> 500,000 cycles, rated to half rated voltage, 25°C
	Δ C < 20% decrease, ESR < 100% increase
Standards Compliance	RoHS, UL810a, BS EN 60068-2-6,27,29, IEC 60068-2-14, SAE J2464, J2390, J1455, ASTM B117, IP65, MIL–STD–810 B, Test Methods 516.3-5, 514.3-1, 509.2-1

Approvals

Series	Test Type	Test Standard	Date completed (or estimated)
S501	Vibration	IEC 60068-2-6	May 2013
		SAE J2380	
		ISO 16750-3	
	Mechanical shock	IEC 60068-2-27	
	Underwriters Laboratory	UL-810A [1]	by Partnumber
	SAE Safety And Abuse	SAE J24645 [2]	pending 12/31/2013

[1] *UL-810A includes the following tests: Short Circuit, Abnormal Charge, Heating, Crush, Impact, Shock, Vibration*

[2] *SAE J2464 Includes the following tests: Nail Penetration, Crush, Thermal Stability, Thermal Shock, Short Ciruit, Overcharge, Forced Vent*

Environmental Compliance

All KEMET supercapacitors are RoHS Compliant.

Table 1 – Ratings & Part Number Reference

Part Number	S501DC107W2R7A	S501LF357V2R7A	S501LF357V2R7U
Electrical			
Capacitance (F)	100	350	350
Capacitance Tolerance	-0/+20%	-5/+10%	-5/+10%
Rated Voltage (V)	2.7	2.7	2.7
Surge Voltage (V)	2.85	2.85	2.85
ESR, DC ≤ (mΩ) [10ms]	4.2	3.2	2.7
ESR, AC 1 kHz ≤ (mΩ)	3.6	3.1	2.4
Inductance ±30 (nH)	120	150	150
72 Hour Leakage ≤ (mA)	0.27	1	1
Cycling			
Current, Peak [1s] (A)	95	223	243
Continuous Current (A)*	13	24	24
Current, Short Circuit (A)	643	844	750
Thermal			
Resistance, Thermal (°C/W)	22	11	10
Energy/Power			
Maximum Stored Energy (Wh)	0.1	0.35	0.35
Energy Density (Wh/kg)	5.1	5.4	5.4
Energy Density (Wh/L)	5.9	6.2	5.9
Power Density (kW/kg)	21.7	8.6	10.2
Power Density (kW/L)	25.5	10	11.2
Maximum Power (kW/kg)	10.4	4.1	4.9
Physical			
Case Size	DC	LF	LF
D x L (mm)	22 x 45	35 x 59	35 x 62
Weight (kg)	0.02	0.066	0.066
Volume (L)	0.017	0.057	0.06
Volume of ACN (L)	0.008	0.027	0.027

**Rated current = continuous current with 20°C temperature rise.*

Mounting

Do not scratch or file the lead terminals. The terminals are plated with metal and the removal of the plated material will cause poor solderability.

Do not overheat when soldering. Solder temperature lower than 260°C and time shorter than 5 seconds are recommended. For hand soldering, tip temperature should be no higher than 350°C (662°F) for a maximum contact time of 3 seconds. Only the snap-in terminals should come into contact with liquid solder or iron. Excessive heat on the snap-in terminal boards can cause damage to seals, shrink sleeve, and electrodes resulting in shortened life or premature part failure.

IMPORTANT! DO NOT DEFORM, PULL or TWIST the terminals. The terminals are attached to the electrodes in the interior of the aluminum casing and are tightly embedded in the rubber-plug sealing the casing. Repeated or forceful bending, pulling, or twisting of the terminal may create a path opening along the terminal in the rubber for electrolyte to leak out. The electrolyte leakage may not only shorten the useful life of the product, but it may also cause corrosion and/or short-circuit of neighboring circuitry. If deforming the terminal is unavoidable or essential to the assembly process, please use needle-nose pliers to bend the lead wire while holding the base of the same terminal using another needle-nose pliers so that the force applied to the wire is not transmitted to the rubber seal.

KEMET recommends utilizing a PC board when connecting the cells to the circuit or electronic devices. In addition, avoid placing exothermic components near the supercapacitor or on the opposite side of the PC board.

Please maintain a minimum distance of 3 mm between the bottom surface (opposite terminals) of the cell and other components/ housings in order to allow for unimpeded venting of gas through the safety vent.

Packaging Quantities

Part Number	Capacitance (F)	Rated Voltage	Package Type	Package Quantity	Box Weight	Box Length	Box Width	Box Height
S501DC107W2R7A	100	2.7	Box with Cardboard Separators	128	7 lbs (3.2 kgs)	15.0" (381 mm)	8.0" (203 mm)	3.5" (89 mm)
S501LF357V2R7A	350	2.7		50	8 lbs (3.7 kgs)	15.0" (381 mm)	8.0" (203 mm)	3.5" (89 mm)
S501LF357V2R7U	350	2.7		50	9 lbs (4.1 kgs)	15.0" (381 mm)	8.0" (203 mm)	3.5" (89 mm)

Standard Marking

- KEMET logo
- Rated capacitance
- Rated voltage
- Product number
- Negative terminal marking
- Energy in Wh

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