S301 Series, Screw Termination, 2.7 V, 65ºC

Overview

KEMET S301 Series Supercapacitors utilize a proprietary electrode design to deliver a very high power density. This product features high power performance up to 3,000 F capacity in a weldable axial screw termination cell.

Applications

Typical applications include automotive subsystems, engine starting, rail systems, hybrid drive trains, material handling/utility vehicles, regenerative brake energy capture, backup power, grid/power correction, and UPS/carry through power.

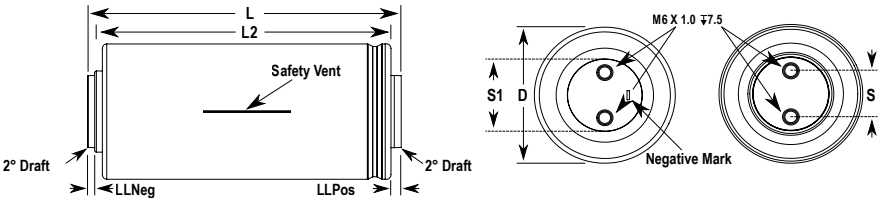
Benefits

- Weldable screw terminals
- Highest power performance available
- High power
- High rate cycling
- Long life
- Operating temperature range of -40˚C to +65˚C
- High cycle life > 1,000,000 cycles
- RoHS Compliant
- Made in USA

Part Number System

S301	RV	308	T	2R7	W
Series	Size Code (D x L)	Capacitance Code (µF)	Capacitance Tolerance	Rated Voltage (VDC)	Termination Code
Supercapacitor, Screw Termination	RE = 60.5 x 57.5 RP = 60.5 x 80.5 RS = 60.5 x 108.5 RV = 60.5 x 144	First two digits represent significant figures. Third digit specifies number of zeros.	R = -0%	2R7 = 2.7	2 threaded inserts per end, 20 mm lead spacing, M6

Dimensions – Millimeters



Part Number	D		L		L2		S		S1		LLNeg		LLPos	
	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
S301RE657R2R7W	60.7	+/-0.3	57.5	+/-0.5	49.8	+/-0.5	20	+/-0.2	32.1	+/-0.1	4.6	+/-0.2	3.2	+/-0.1
S301RP128R2R7W	60.7	+/-0.3	80	+/-0.5	72.3	+/-0.5	20	+/-0.2	32.1	+/-0.1	4.6	+/-0.2	3.2	+/-0.1
S301RS208R2R7W	60.7	+/-0.3	108.5	+/-0.5	100.8	+/-0.5	20	+/-0.2	32.1	+/-0.1	4.6	+/-0.2	3.2	+/-0.1
S301RV308R2R7W	60.7	+/-0.3	144	+/-0.5	136.3	+/-0.5	20	+/-0.2	32.1	+/-0.1	4.6	+/-0.2	3.2	+/-0.1

Performance Characteristics

Item	Performance Characteristics
Rated Voltage	2.7 VDC
Surge Voltage	2.85 VDC
Capacitance Range	650 – 3,000 F
Capacitance Tolerance	-0%
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	> 1,000,000 cycles, rated to half rated voltage, 25°C
	Δ C < 20% decrease, ESR < 100% increase
Standards Compliance	RoHS, UL810a, BS EN 60068-2-14, Chinese RoHS, CE SAE

Approvals

Series / Partnumber	Test Type	Test Standard	Date completed (or estimated)
S301RP128R2R7W S301RV308R2R7W	Vibration	IEC 60068-2-6	May 2013
		SAE J2380	
		ISO 16750-3	
	Mechanical shock	IEC 60068-2-27	
	Underwriters Laboratory	UL-810A [2]	by Part number
	SAE Safety And Abuse	SAE J24645 [3]	pending 12/31/2013
S301RE657R2R7W S301RS208R2R7W	pending [1]		

[1] *Pending Part Numbers require significant production runs and UL Certification*

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

[3] *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.

RoHS Compliant

Table 1 – Ratings & Part Number Reference

Part Number	S301RE657R2R7W[1]	S301RP128R2R7W	S301RS208R2R7W	S301RV308R2R7W
Electrical				
Capacitance (F)	650	1200	2000	3000
Capacitance Tolerance	-0	-0	-0	-0
Rated Voltage (V)	2.7	2.7	2.7	2.7
Surge Voltage (V)	2.85	2.85	2.85	2.85
ESR, DC ≤ (mΩ) [10 ms]	0.32	0.3	0.27	0.26
ESR, AC 1 kHz ≤ (mΩ)	0.26	0.25	0.23	0.2
Inductance ±20 (nH)	60	60	60	60
72 Hour Leakage ≤ (mA)	1.5	2	2	5
Cycling				
Current, Peak [1s] (A)	750	1200	1800	2200
Continuous Current (A)*	65	90	130	145
Current, Short Circuit (A)	10,000	10,000	10,000	10,000
Thermal				
Resistance, Thermal (°C/W)	6	5	3.5	4
Energy/Power				
Maximum Stored Energy (Wh)	0.66	1.22	2.03	3.04
Energy Density (Wh/kg)	3.6	4.1	5.5	6
Energy Density (Wh/L)	4.4	6.2	6.5	7.7
Power Density (kW/kg)	30.8	20	18.2	13.7
Power Density (kW/L)	38.5	31	21.7	17.7
Maximum Power (kW/kg)	14.8	9.9	8.8	6.6
Physical				
Size Code	RE	RP	RS	RV
D x L (mm)	60.7 x 57.5	60.7 x 80	60.7 x 108.5	60.7 x 144
Weight (kg)	0.185	0.29	0.37	0.51
Volume (L)	0.148	0.196	0.196	0.397
Volume of ACN (L)	0.05	0.093		0.24
Screw Threads	M6X1	M6X1	M6X1	M6X1
Maximum Torque	5 Nm (44 Inch/Lbs)	5 Nm (44 Inch/Lbs)	5 Nm (44 Inch/Lbs)	5 Nm (44 Inch/Lbs)

**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.

Packaging Quantities

Part Number	Capacitance (F)	Rated Voltage	Package Type	Package Quantity	Box Weight	Box Length	Box Width	Box Height
S301RE657R2R7W	650	2.7		30				
S301RP128R2R7W	1200	2.7	Box with Cardboard Separators	15	10.1 lbs (4.6 Kgs)	13.0" (330 mm)	8.0" (203 mm)	4.0" (102 mm)
S301RS208R2R7W	2000	2.7		15	15.0 lbs (6,8 Kgs)	13.0" (330 mm)	8.0" (203 mm)	4.0" (102 mm)
S301RV308R2R7W	3000	2.7		6	8 lbs (3.7 kgs)	9.0" (229 mm)	7.0" (178 mm)	6.5" (165 mm)

Standard Marking

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

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