

Overview

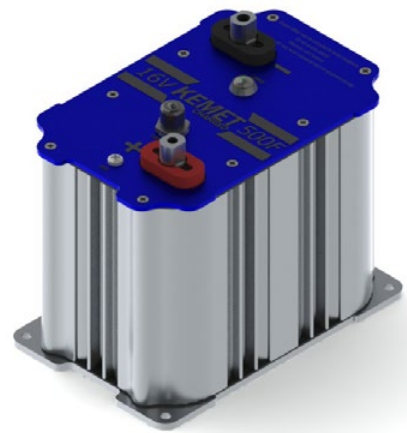
KEMET S02 Series Supercapacitors are bank modules with cells in extruded metal holder.

Applications

Renewable energy systems
Starting systems
Automotive subsystems
Backup power/UPS
Ride through/power conditioning
Hybrid drive systems

Benefits

- 16 – 48 V rated voltage
- Individually balanced cells
- IP-65 rated, (IP-67 optional)
- Threaded, protected terminals
- Operating temperature range of -40°C to +65°C
- Optional state of charge indicator
- Cycle life > 500,000 cycles
- RoHS Compliant
- Made in USA

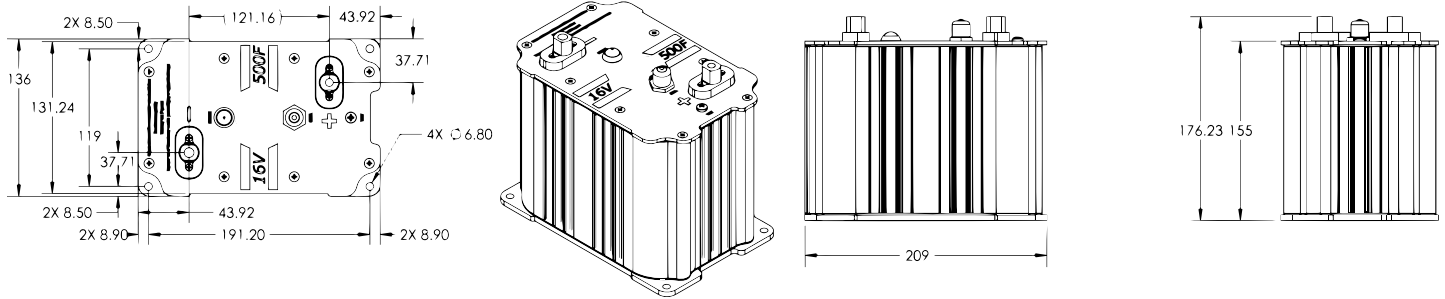


Part Number System

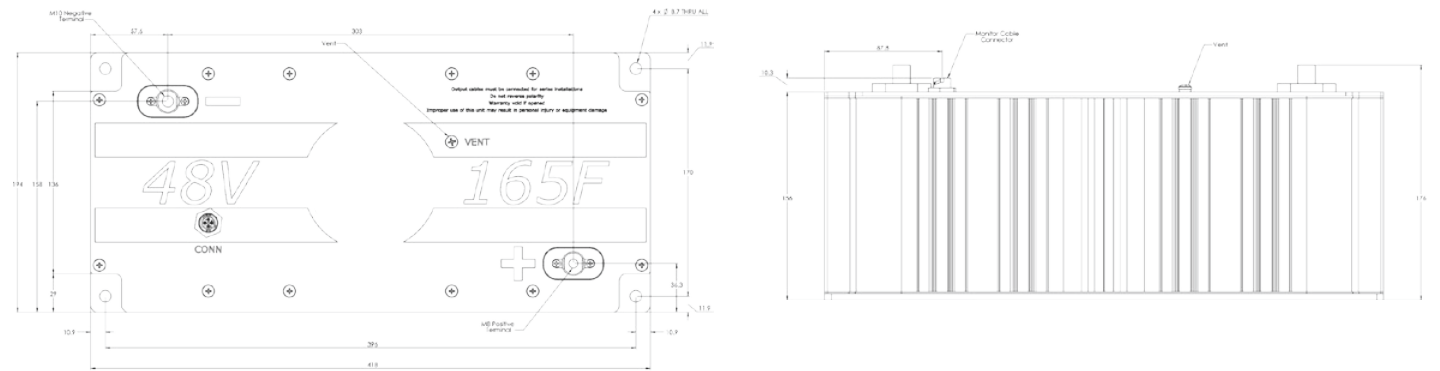
S02	A	T	5006	R	016	A	U808
Series	Configuration Code Balancing	Configuration Code Capacitor Type	Capacitance Code (μF)	Capacitance Tolerance	Rated Voltage (VDC)	Termination Code	C-Spec
Supercapacitor, Bank Modules with cells in extruded metal holder	A = Analog with clamping	T = Array, 2 dimensions D = Array, 3 dimensions	Digits 6 to 8 indicate the first three digits of the capacitance value. Digit 9 indicates the number of zeros to be added.	R = -0%	016 = 16 V 048 = 48 V	A = The first mechanical configuration of a particular part number	Blank = No monitor U808 = Digital Overvoltage and analog over temperature monitor

Dimensions – Millimeters

S02AT5006R016AU808



S02AT1656R048AU808



Part Number	L		W		H	
	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
S02AT5006R016AU808	209	+/-1.0	136	+/-1.0	156	+/-1.0
S02AT1656R048AU808	194	+/-1.0	418	+/-1.0	156	+/-1.0

Performance Characteristics

Item	Performance Characteristics
Rated Voltage	16 – 48 V
Peak Voltage	17.1 – 15.1 V
Rated Voltage/Cell	2.7 V
Surge Voltage/Cell	2.85 V
Capacitance Range	165 F – 500 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
	$\Delta C < 20\%$ decrease, ESR $< 100\%$ increase
Life, Endurance	1,000 hours, rated voltage, 65°C
	$\Delta C < 20\%$ decrease, ESR $< 100\%$ increase
Life, Shelf	2 years, no voltage, 70°C
	$\Delta C < 10\%$ decrease, ESR $< 100\%$ increase
Life, Cycle	1,000,000 cycles, rated to half rated voltage, 25°C
	$\Delta C < 20\%$ decrease, ESR $< 100\%$ increase
Standards Compliance	RoHS

Environmental Compliance

All KEMET supercapacitors are RoHS Compliant.



RoHS Compliant

Table 1 – Ratings & Part Number Reference

Part Number	S02AT5006R016AU808 ¹	S02AT1656R048AU808 ¹
Parameter		
Capacitance (F)	500	165
Capacitance Tolerance	-0	-0
Rated Voltage (V)	16	48
Peak Voltage (V)	17.1	53.1
Impedance [AC 1 kHz] (mΩ)	1.3	4.0
ESR, DC ≤ (mΩ) [10ms]	1.5	5.0
ESR [DC] (mΩ) IEC (reference)	2.15	6.0
Overvoltage Monitor	Yes	Yes
Peak Current 1s (A)	2300	2200
Continuous Current (A)*	85	85
Short Circuit Current (A)	10,000	12,000
Balancing Method	Active	Active
Overvoltage & Over Temperature Monitor	YES	YES
Energy/Power		
Maximum Stored Energy (Wh)	18.2	54.1
Energy Density (Wh/kg)	4.1	3.9
Energy Density (Wh/L)	3.6	4.4
Power Density (kW/kg)	9.9	10.5
Power Density (kW/L)	8.6	11.9
Maximum Power (kW/kg)	4.1	4.0
Physical		
Configuration Code	AT	AD
L x W x H (mm)	209 x 136 x 156	194 x 418 x 156
Weight (kg)	5.1	14
Volume (L)	4.4	12.4

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

¹Preliminary (See Prototype Sample Disclaimer)

Mounting

Specific users guide with mounting instructions ship with module.

Packaging Quantities

Part Number	Capacitance (F)	Rated Voltage	Package Type	Package Quantity	Box Weight	Box Length	Box Width	Box Height
S02AT5006R016AU808	500	16	Box	1	13.0 lbs (5.9 Kgs)	11.0" (279 mm)	8.0" (203 mm)	10.5" (267 mm)
S02AT1656R048AU808	165	48	Box	1	33.0 lbs (15.0 Kgs)	18.25" (464 mm)	12.25" (311 mm)	11.0" (279 mm)

Standard Marking

- Model number
- Serial number
- Date
- Rated voltage
- Capacitance value
- Terminal markings

KEMET Corporation World Headquarters

2835 KEMET Way
Simpsonville, SC 29681

Mailing Address:
P.O. Box 5928
Greenville, SC 29606

www.kemet.com
Tel: 864-963-6300
Fax: 864-963-6521

Corporate Offices
Fort Lauderdale, FL
Tel: 954-766-2800

North America

Southeast
Lake Mary, FL
Tel: 407-855-8886

Northeast
Wilmington, MA
Tel: 978-658-1663

Central
Novi, MI
Tel: 248-994-1030

West
Milpitas, CA
Tel: 408-433-9950

Mexico
Guadalajara, Jalisco
Tel: 52-33-3123-2141

Europe

Southern Europe
Paris, France
Tel: 33-1-4646-1006

Sasso Marconi, Italy
Tel: 39-051-939111

Central Europe
Landsberg, Germany
Tel: 49-8191-3350800

Kamen, Germany
Tel: 49-2307-438110

Northern Europe
Bishop's Stortford, United Kingdom
Tel: 44-1279-460122

Espoo, Finland
Tel: 358-9-5406-5000

Asia

Northeast Asia
Hong Kong
Tel: 852-2305-1168

Shenzhen, China
Tel: 86-755-2518-1306

Beijing, China
Tel: 86-10-5829-1711

Shanghai, China
Tel: 86-21-6447-0707

Taipei, Taiwan
Tel: 886-2-27528585

Southeast Asia
Singapore
Tel: 65-6586-1900

Penang, Malaysia
Tel: 60-4-6430200

Bangalore, India
Tel: 91-806-53-76817

Note: KEMET reserves the right to modify minor details of internal and external construction at any time in the interest of product improvement. KEMET does not assume any responsibility for infringement that might result from the use of KEMET Capacitors in potential circuit designs. KEMET is a registered trademark of KEMET Electronics Corporation.

Other KEMET Resources

Tools	
Resource	Location
Configure A Part: CapEdge	http://capacitoredge.kemet.com
SPICE & FIT Software	http://www.kemet.com/spice
Search Our FAQs: KnowledgeEdge	http://www.kemet.com/keask
Electrolytic LifeCalculator	http://www.kemet.com:8080/elc

Product Information	
Resource	Location
Products	http://www.kemet.com/products
Technical Resources (Including Soldering Techniques)	http://www.kemet.com/technicalpapers
RoHS Statement	http://www.kemet.com/rohs
Quality Documents	http://www.kemet.com/qualitydocuments

Product Request	
Resource	Location
Sample Request	http://www.kemet.com/sample
Engineering Kit Request	http://www.kemet.com/kits

Contact	
Resource	Location
Website	www.kemet.com
Contact Us	http://www.kemet.com/contact
Investor Relations	http://www.kemet.com/ir
Call Us	1-877-MyKEMET
Twitter	http://twitter.com/kemetcapacitors

Disclaimer

All product specifications, statements, information and data (collectively, the "Information") in this datasheet are subject to change. The customer is responsible for checking and verifying the extent to which the Information contained in this publication is applicable to an order at the time the order is placed.

All Information given herein is believed to be accurate and reliable, but it is presented without guarantee, warranty, or responsibility of any kind, expressed or implied.

Statements of suitability for certain applications are based on KEMET Electronics Corporation's ("KEMET") knowledge of typical operating conditions for such applications, but are not intended to constitute – and KEMET specifically disclaims – any warranty concerning suitability for a specific customer application or use. The Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by KEMET with reference to the use of KEMET's products is given gratis, and KEMET assumes no obligation or liability for the advice given or results obtained.

Although KEMET designs and manufactures its products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated or that other measures may not be required.

Prototype Sample Disclaimer

The Customer acknowledges the following limitations of the prototype samples:

- (1) Prototype samples are manufactured from preliminary designs and manufacturing processes, may not represent final designs, have not been released for commercial use and are not subject to the same quality control procedures applicable to released products;*
- (2) Prototype samples are not qualified parts and are provided as-is by KEMET Electronics Corporation, which specifically disclaims any and all warranties and guarantees, explicit or implied, including without limitation the warranties of merchantability and fitness for a particular purpose or use;*
- (3) Prototype samples are not intended for commercial use, are provided for engineering evaluation only and are not recommended for use in the Customer's production line; and*
- (4) The Customer assumes the risk of any and all uses that the Customer makes of the prototype samples.*

Prototype Copyright Notice

COPYRIGHT KEMET ELECTRONICS CORPORATION 2013, all rights reserved