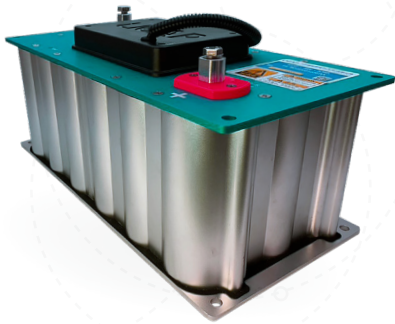


## SM0165-048-ATH



### APPLICATIONS

- Wind Turbine Pitch Control
- Engineering Machinery
- Industrial Equipment
- UPS and Telecom Systems



### FEATURES & ADVANTAGES

- One Million Cycle Life
- High Power Density
- Voltage Monitoring
- Wide Temperature Range: -50°C to +65°C



### Specifications

Capacitance	Rated <sup>1</sup>	165F
	Tolerance	-0/+20%
Voltage	Rated	48V DC
	Surge <sup>2</sup>	51V DC
ESR	ESR (DC) - maximum initial	6mΩ
Current	Maximum leakage <sup>3</sup>	6mA
	Maximum peak	2000A
	Maximum continuous (ΔT = 15°C) <sup>4</sup>	80A RMS
	Maximum continuous (ΔT = 40°C) <sup>4</sup>	131A RMS
Energy Storage	Maximum energy <sup>5</sup>	52.8Wh
	Usable energy <sup>6</sup>	39.6Wh
	Volumetric energy density <sup>7</sup>	3.5Wh/L
	Gravametric energy density <sup>8</sup>	3.7Wh/kg
Power	Power density <sup>9</sup>	3245W/kg

### Temperature

Temperature Characteristics	Operating temperature range	-40°C to +65°C
	Storage temperature range	-40°C to +70°C

### Monitor and Control

Alarm Monitor	Over voltage	YES
	Temperature sensor	YES

### Safety

Safety	Short circuit current	2500A
	500V DC Insulation resistance	≥100MΩ
	2500V DC Leakage current	≤10mA
	Environmental ingress protection	IP54

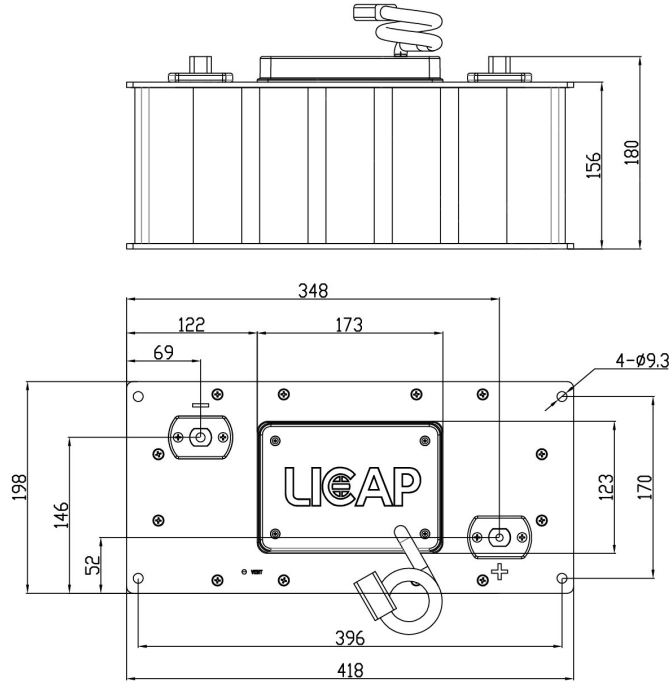
### Service Lifetime

Endurance	<b>Product held at rated voltage in 65°C environment for 1500 hours</b>	
	Change in capacitance (% drop from rated)	≤20%
	Change in ESR (% increase from maximum initial)	≤100%
DC Life	<b>Product held at rated voltage in 25°C environment</b>	
	Life (projected)	10+ years
	Change in capacitance (% drop from rated)	≤20%
	Change in ESR (% increase from maximum initial)	≤100%
Cycle Life	<b>Cycling from rated voltage to 50% voltage under constant current in 25°C environment</b>	
	Life (projected)	1,000,000 cycles
	Change in capacitance (% drop from rated)	≤20%
	Change in ESR (% increase from maximum initial)	≤100%
Storage	<b>Stored uncharged in original packaging in 25°C environment</b>	
	Life	4 years

### Physical Characteristics

Mechanical	Vibration	GB/T 11287-2000
	Transportation vibration	GB/T 4798.2-2008
	Shock	GB/T 14537-1993

## Outline Drawings:



## Weight and Size:

**Weight:** ≤14.2 kg | **Size: (Typical value):** 418\*198\*180 (L\*W\*H) mm

## Naming Rules:

Type	Capacitance	Dash	Rated Voltage	Dash	CMS - Capacitor Management/Monitoring
SM Supercapacitor Module	0165 = 165F	-	048 = 48V	-	ATH = Active with temp and OV monitoring

## Notes:

1. Measure capacitance and DC internal resistance at 25°C under specified test current per Figure 1
2. Maximum voltage is non-repeatable and duration cannot exceed 1s
3. Corresponding current value after 72 hours of rated voltage at 25°C

$$4. \Delta T = I_{rms}^2 \times ESR \times R_{ca}$$

$$5. 0.5C(V_{nom}^2)/3600$$

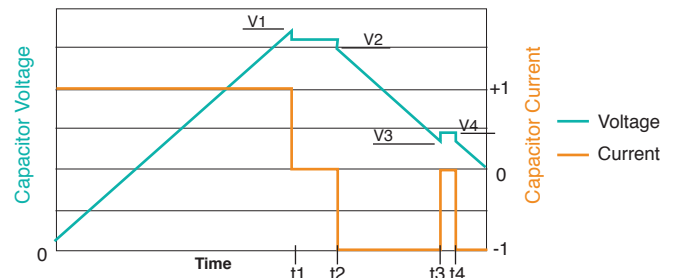
$$6. 0.5C(V_{nom}^2 - 0.5V_{nom}^2)/3600$$

$$7. \text{Max energy (Wh)} / \left( \frac{L \times W \times H \text{ (mm)}}{1 \times 10^6} \right)$$

$$8. \text{Max energy (Wh)} / \text{Weight (kg)}$$

$$9. \text{Per IEC62391-2, } P_d = \frac{0.12V^2}{ESR_{DC} \times \text{Weight(kg)}}$$

**CAP/ESR Measurement Waveform**



$$V1 = V_{rated} \quad t2 - t1 = 15 \text{ seconds} \quad \text{Capacitance} = I \times (t3 - t2) / (V2 - V3)$$

$$V3 = 0.5 \times V_{rated} \quad t4 - t3 = 5 \text{ seconds} \quad \text{ESR} = (V4 - V3) / I$$

Figure 1

### Precautions:

- This product may vent or rupture if overcharged, reverse charged, incinerated or heated above 100°C
- Do not crush, mutilate, or disassemble
- Do not dispose of unit in trash

 Specifications are subject to change without notice.