



ZOXCELL

PRODUCT
SPECIFICATION SHEET



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ZOXCELL GRAPHENE SUPER CAPACITOR TECHNOLOGY



High-Performance Energy Storage Solution based on breakthrough Graphene Material

Supercapacitors are a novel energy storage technology that offers high power density, almost instant recharging and very long lifetimes. Zoxcell graphene based Super Capacitors deliver significant economic benefits across a wide range of markets including motorsports, automotive, aerospace, heavy industry, heavy transportation, maritime, and renewable and grid.

Why Supercapacitor are better than Chemical Battery?

Unlike chemical batteries, Super Capacitors don't use liquid electrolytes & chemical reactions to store energy. This allows them to charge and discharge much faster than batteries. They can also survive thousands of charge and discharge cycles, offering much longer usable life. With power density up to 60 times greater than batteries, they can be connected in parallel to create combined power supply units.



LOWER COST OF OWNERSHIP



≥ 30 YEARS EFFECTIVE LIFE



LOW DISPOSAL FOOTPRINT



LIMITED MAINTAINANCE



-20C TO +60C ENDURANCE

Features	Zoxcell Supercapacitors	Chemical Battery
Battery Life	≥30 Years	3 to 5 Years Maximum
Efficiency	+97% Efficiency	70% to 90% - Efficiency degrades over lifetime
Usable Capacity	100% - Usable Capacity	50% to 80% Capacity that degrades over lifetime
Temperature Range	-20'C to 60'C	-10'C to 40'C
Thermal Runaway	No Risk	Medium to high risk
Environmental Impact	None	Significant environmental waste & disposal cost
Storage Limitation	No Maintenance	Periodic Charging required



ZOXCELL GRAPHENE ENERGY SOLUTIONS



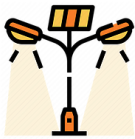
SOLAR ENERGY STORAGE

Supercapacitor energy storage modules with exceptional long life, high depth of discharge & temperature endurance



TELECOM ENERGY STORAGE

Lowest cost of ownership for Telecom Energy needs with anti-theft Battery that lasts FOR decades even in extreme temperature



SOLAR STREET LIGHTING

High temperature endurance all weather solar streets lights batteries with fast charging



MICROGRIDS

Off-Grid & Micro-grids Energy Storage Containers are environment friendly & based on a modular design



EV ENERGY STORAGE

Fast Charging, Light Weight Super Capacitors Energy Storage for Electric Vehicles, eBikes and eLoaders



FORK LIFT BATTERY

Supercapacitor Fork Lift & Golf Cart battery with ultra fast charging, long cycle life & safety



GOLF CART BATTERIES

Long Life Golf cart and Club cart batteries that perform in extreme temperatures & last for decades



SUPERCAPACITOR

High Power Graphene Supercapacitors - 3000F, 21000F, 58000F & 100,000F



SUPERNOVA 7500Wh 48V

ZEM487500312CPARM

SUPERCAPACITOR ENERGY STORAGE MODULE
FOR TELECOM & OFF-GRID SYSTEM



TECHNICAL DATA SHEET

PERFORMANCE	Voltage (Nominal)	48 V
	Maximum Charge Voltage	58.8 V
	Discharge Cut-Off Voltage	40 V
	Total Energy	7500 Wh
	Continuous Discharge Current	100 A
	Peak Discharge Current	312 A _(10sec)
	Continuous Charge Rate	100 A
	Cut off Current	5 A
	ESR/AC @ 1KHZ	< 8 mΩ
PHYSICAL SPECS	Weight	65 kg
	Module Casing Material	Aluminum
	Terminal Type	Anderson
	Dimensions (L x W x H)	655 x 475 x 240 mm
FEATURES	Alarm	Alarm for under/over Voltage, Over Current, Out of Range Temperature
SERVICE LIFE	Projected Calendar Life ³	≥30 years
	Shelf Life	10 Years
SAFETY PERFORMANCE	Over/under voltage	Unit shut down
	Over Current	Unit shut down
ENVIRONMENT	Over temperature	Unit shut down
	Cell Operating Temperature ³	-20 °C to 60 °C
	Operating Humidity	Non-Condensing
ADDITIONAL	Parallel Connection	YES
	Series Connection	Custom Option
	Self-Discharge	2-3% month
	Recommended Discharge Depth	90%

PRODUCT SPECIFICATION SHEET

PARALLEL CONNECTION	
Maximum Parallel Connection Per Stack	10
Parallel Connector Required	YES
Parallel Communication	RS-485

PROTECTIONS		
Cell Balancing	Active	Loss less active balancing
Short Circuit Protection	600A	Replace Internal Fuse
Charging Cut-off Voltage	58.8V	Charging disconnected
Discharge Protection Voltage	40V	Load disconnected

PART NUMBER: ZEM487500312CPARM		
MODEL	EM75	
VERSION	001	
ENERGY	7500 Wh	
VOLTAGE	48 V	
USAGE	TELECOM & SOLAR	
TERMINAL	Anderson	
DISPLAY	Module Volt, SOC,Temp	Included
COMMUNICATION	C - RS485	Included
ANTI-THEFT	G - GPS	Optional
COMPLIANCE	EN55032:2015,EN55024:2010, EN61000-4-2:2009, EN61000-4-3:2006+A1:2008+A2:2010	

(1)The temperature range indicates the range in which the supercapacitor cells can operate. The performance of the cells may vary if they are continuously operated outside a temperature range of -20°C to 60°C, and/or at C-rates higher than the maximum charge/discharge rate specified in this specification sheet.

(2)Projected life of supercapacitor cells. Cycle life will vary if cycled more than 4 times a day. Additional terms and conditions, including a limited warranty, will apply at the time of purchase.

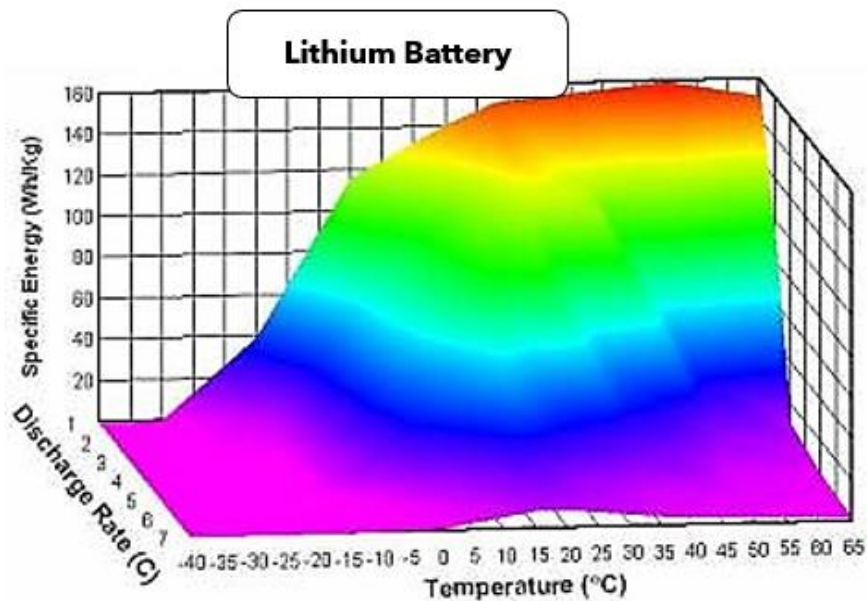
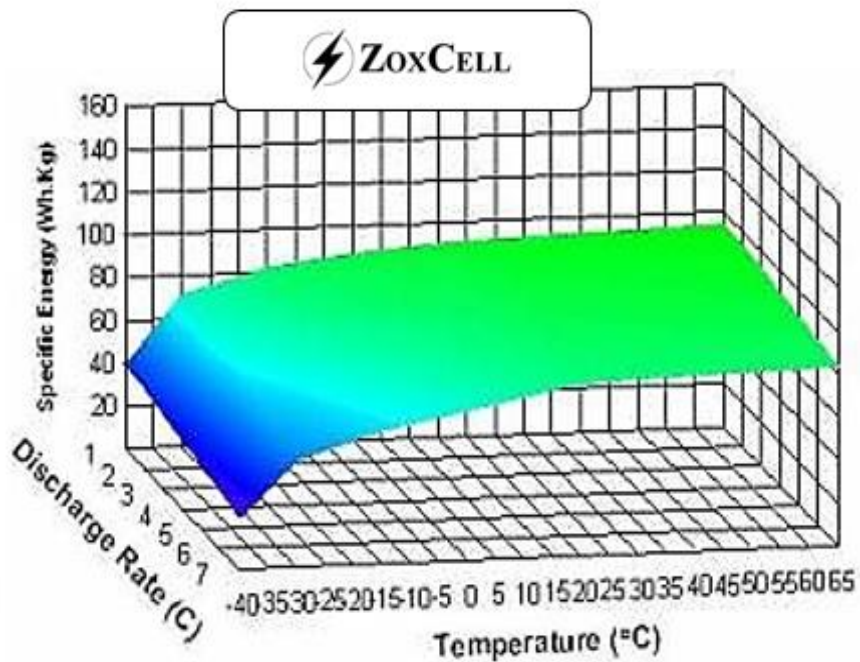
(3)Projected Calendar life of supercapacitor cells from the date of first operation.

Note:
Specifications subject to change without prior notice.

SUPERCAPACITOR VS LITHIUM

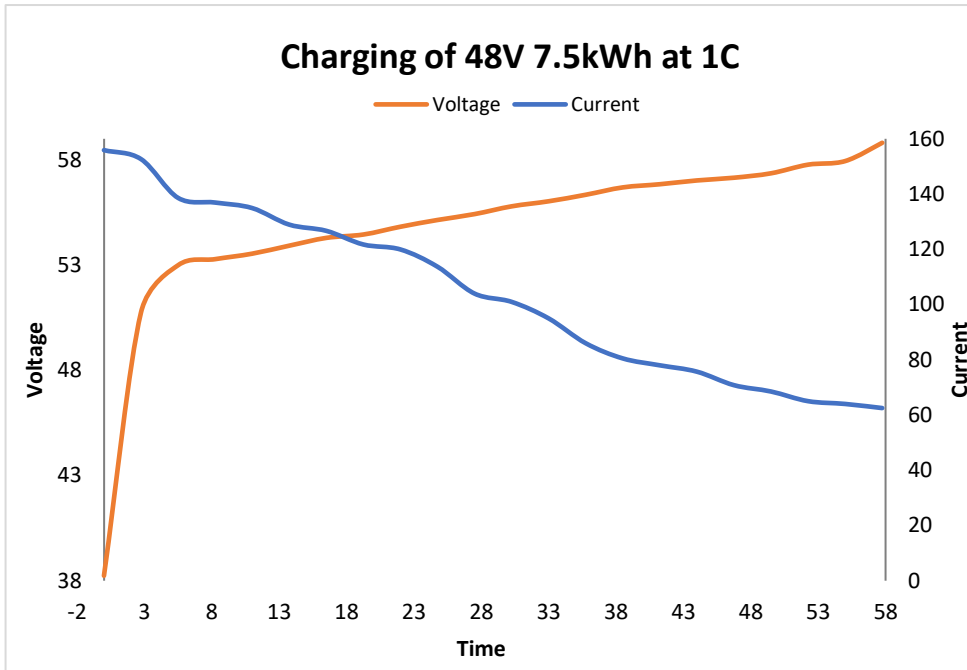
EXTREME TEMPERATURE:

- Zoxcell supercapacitor charge and discharge in temperatures as low as -50°C .
- Other lithium-ion technologies possess virtually no charging capabilities at temperatures below
- Zoxcell supercapacitor modules also perform at high temperatures up to 85°C .

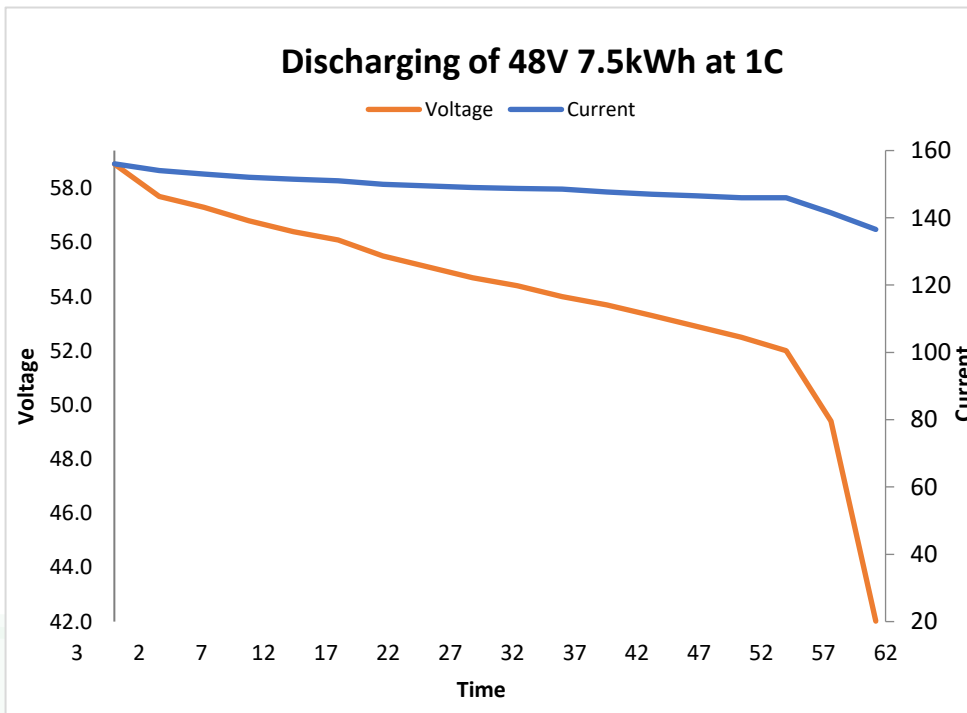


SUPERCAPACITOR CELL PERFORMANCE DATA

CHARGING GRAPH



DISCHARGING GRAPH

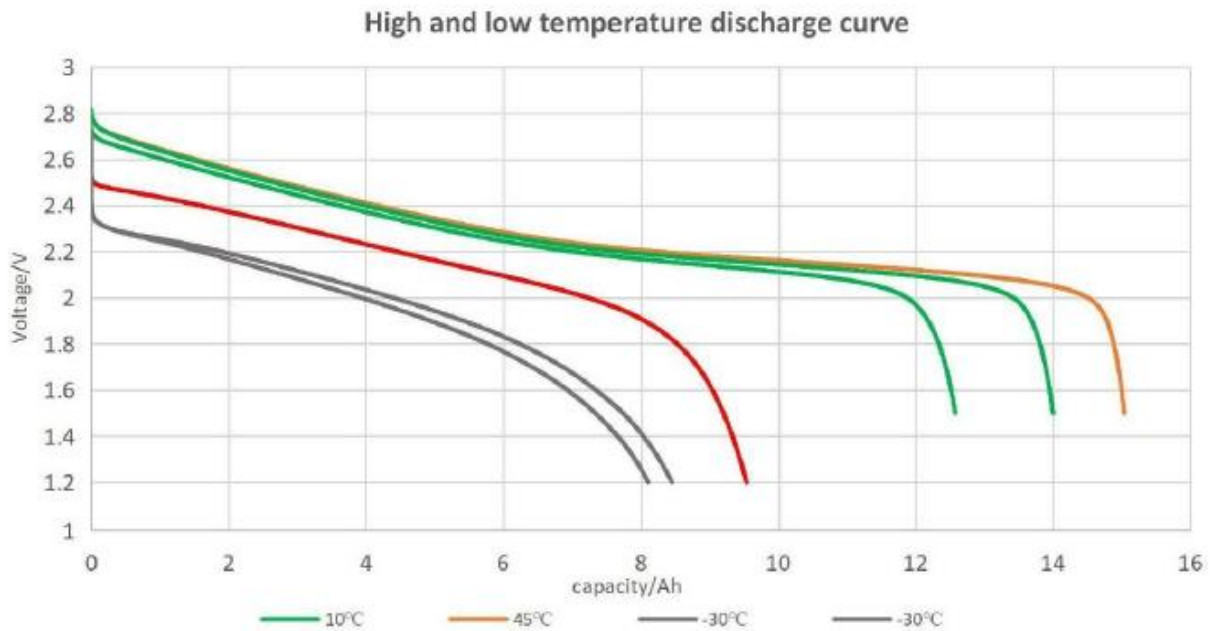


PRODUCT PERFORMANCE DATA

Cycle life vs DoD at different temperature

DOD(%)	Average Cell Temperature (°C)						
	25	30	35	40	45	50	55
	Cycle Life (cycles to 80% of initial charge capacity)						
100	25,682	18,957	16,895	15,682	12,650	10,125	8,652
90	36,845	28,956	25,652	23,652	21,565	18,652	11,250
80	85,685	68,954	55,862	52,652	48,652	38,562	31,562
70	95,472	85,625	69,855	61,253	56,825	52,460	45,862
60	98,568	95,246	86,569	80,652	75,869	68,565	62,582
50	150,188	125,623	116,505	106,523	95,862	86,598	72,586
40	258,810	225,601	205,698	186,523	168,952	125,620	105,620
30	496,505	456,825	425,685	386,521	326,521	268,532	186,523
20	1,000,500	856,925	786,952	756,231	725,622	658,216	558,641
10	1,600,292	1,280,215	1,026,505	1,001,650	986,588	886,525	768,523

Voltage and capacity at high and low temperature



FREQUENTLY ASKED QUESTIONS

1. What is the warranty?

Answer: Zoxcell provides 10 years warranty.

2. What is/are the certification of the supercapacitor?

Answer: These are CE and RoHS certified.

3. Can I connect supernova in series?

Answer: No, the BMS of the module is designed for a nominal voltage of 48V, maximum charging voltage of 58.8V and, the cut-off voltage of 42V.

4. How many modules can I connect in parallel?

Answer: Supernova module is plug-and-play energy storage. Fifteen (15) modules can be connected in parallel to the standard unit of 48V 2500Wh, 48V 3600Wh, and 48V 5000Wh. Ten (10) modules for the standard unit of 48V 7500Wh.

5. What will be the ideal solution if I increase my energy storage using a supernova module of more than 75kWh?

Answer: Additional protection will be needed such as a specific circuit breaker, larger conductor cable, and bus bar to handle a large amount of current. Contact Zoxcell or the distributor for assistance.

6. I will need a specific dimension for mounting, can you customize it?

Answer: A standard module can be mounted in a 19-inch rack, cabinet for the stack, or on your specific storage. We can also customize and adjust the dimension depending on your requirement, thus, it will require a minimum order quantity (MOQ).

7. What is the recommended charger/inverter for the supernova module?

Answer: Any standard, hybrid, and branded inverter/charger is compatible with supernova module i.e SMA, Solax, Sungrow, Victron, Goodwe, Copex, Must, Echo Solar, etc.

8. How will I know the parameters of the module?

Answer: Voltage, current, SOC, alarm, and cycles are available in the 3 inches display of the supernova module, however, if you wish to see more of the parameter such as SOH, residual capacity, temperature for packs and cells, data logs, real-time monitoring, etc. you can view it through our BMS software connected to a laptop.

9. Can I view data remotely?

Answer: Yes. You need internet for your desktop connected to the module; then you can access it anywhere you are.

10. For more questions and clarification, kindly contact Zoxcell or the nearest distributor in your vicinity.