



GREEN TECH

BETTER ENERGY BETTER LIFE

ULTRA LONG LIFE • FAST CHARGE • SAFEST

Graphene Supercapacitor Battery System Solution Provider

BATTERY CELL

Breaking through energy storage technology, changing future energy landscape



www.greenteche.com



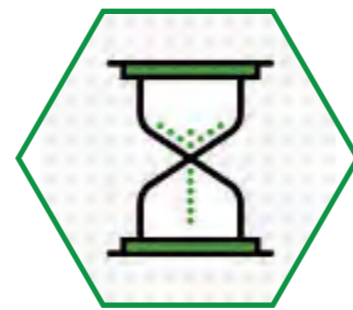
Smart Energy Strategy



Safest



Fast Charge



Long Life



Extreme Temperature



Smart BMS



All for the protection of the earth

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GREEN TECH

WHO WE ARE?

Shanghai Green Tech Company is an advanced capacitors manufacturer and graphene super capacitor energy storage system innovator with over 20 years of experience in the design, development, and production of super capacitors. Since 1998, we provided super capacitors and graphene super capacitor energy storage system products and solutions to over 1000 customers around the world. It is the state-certified new and high-tech enterprise in the new energy storage industry.

Today, the world runs on critical infrastructure and technology i.e. planes, hospitals, factories, data centers, vehicles, the electrical grid, industrial, consumer electronics, tele-communications.

These are things people depend on every day and the companies behind them depend on us to help solve some of the toughest power & storage challenges globally. At Green Tech, we're dedicated to improve people's lives and the environment with power & Storage systems that are more reliable, efficient, safe and sustainable.

We offer significant competitive advantages including delivery and production capabilities optimized to suit each individual customer inventory requirements, and global engineering teams experienced in developing new-to-market product solutions especially designed to fulfill customer's unique application requirements.



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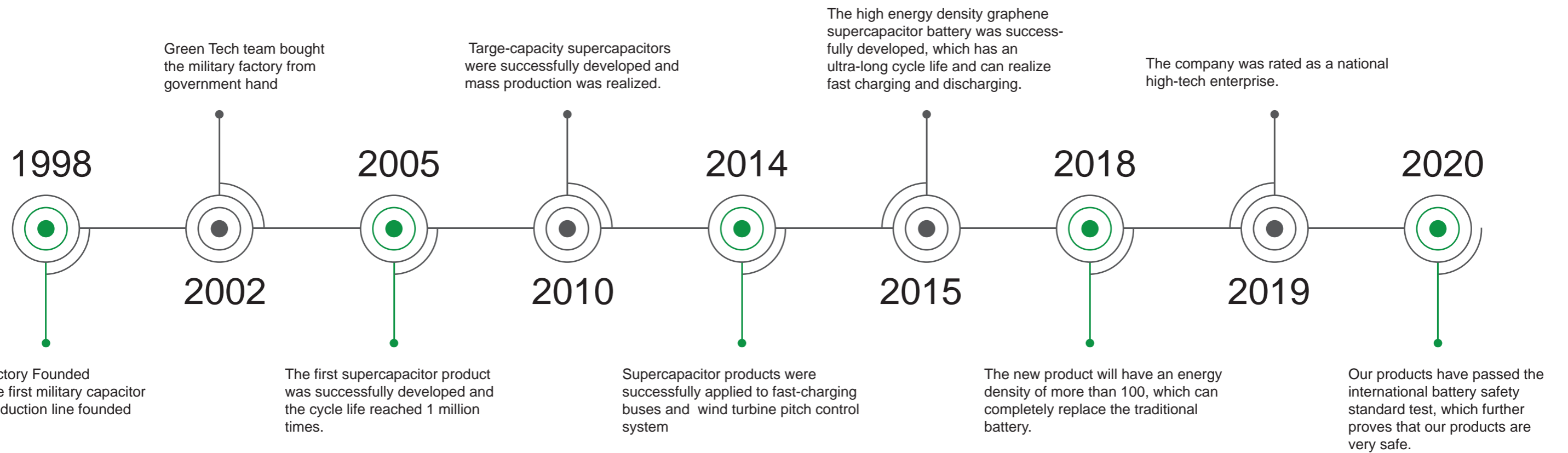
CE



RoHS

FC

Development



The Global Market



Green Tech Energy works with partners globally to bring the right solutions to market, manufactured both locally and overseas allowing Green Tech Energy to service the ever growing global demand for battery storage.





Production Procedure



Vertical Integration

Green Tech vertical integration strategy extends from core battery chemistry, including cathode and anode materials, electrolyte, and membrane separators, to application technologies including battery management systems(BMS)andother power electronics.

By integrating the process from raw material to system assembly, Green Tech is able to provide customized solutions with reduced project development time and controllable costs. Vertical integration also allows us to control product quality from top to bottom with our high standards.

>> Material Technology Know-How

>> Reduced Project Development Time

>> Efficient Quality Control

>> Cost Effective

Green Tech R&D Target

Green Tech set its R&D target of “ultra-fast charging, long-life, and non-flammable”



Green Tech innovative hybrid technology offers exceptional long life, high depth of discharge, safety & energy efficiency. Our Intelligent Battery Management Software provides utmost safety and performance even in most harsh conditions.

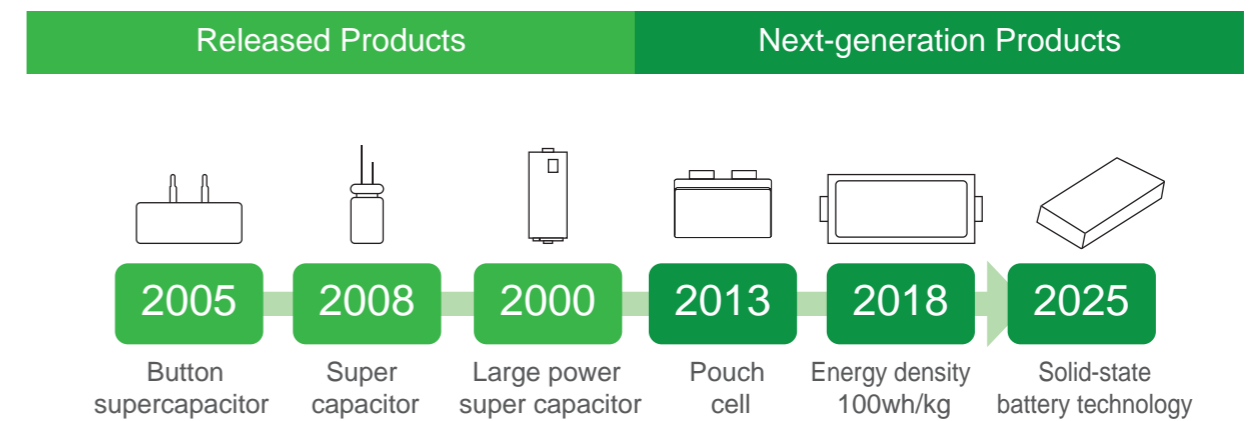
R&D target

- >> Reduce the levelized cost of energy under 0.02USD
- >> Longer life time up to 25years
- >> Higher round trip efficiency >98%
- >> Easier installation
- >> Remote controllable
- >> Smarter system management

R&D Product Roadmap



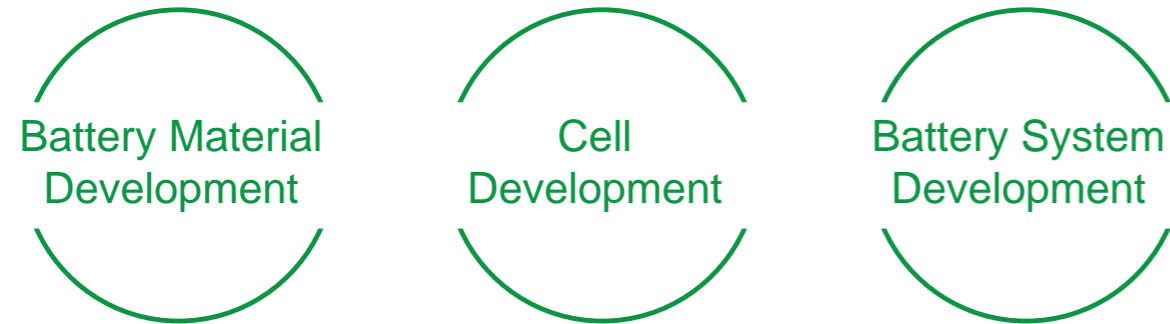
- >> 10-15 minute ultra-fast charging, long life and non-flammable
- >> Improving energy density



Technology strategy

- >> Insist on the "fast charging, long life, high safety" three leading technology
- >> Master four core technologies of battery materials (anode and cathode, diaphragm and electrolyte)
- >> Intelligent lean manufacturing technology
- >> 10-15 minute ultra-fast charging, long life and non-flammable with improved energy density

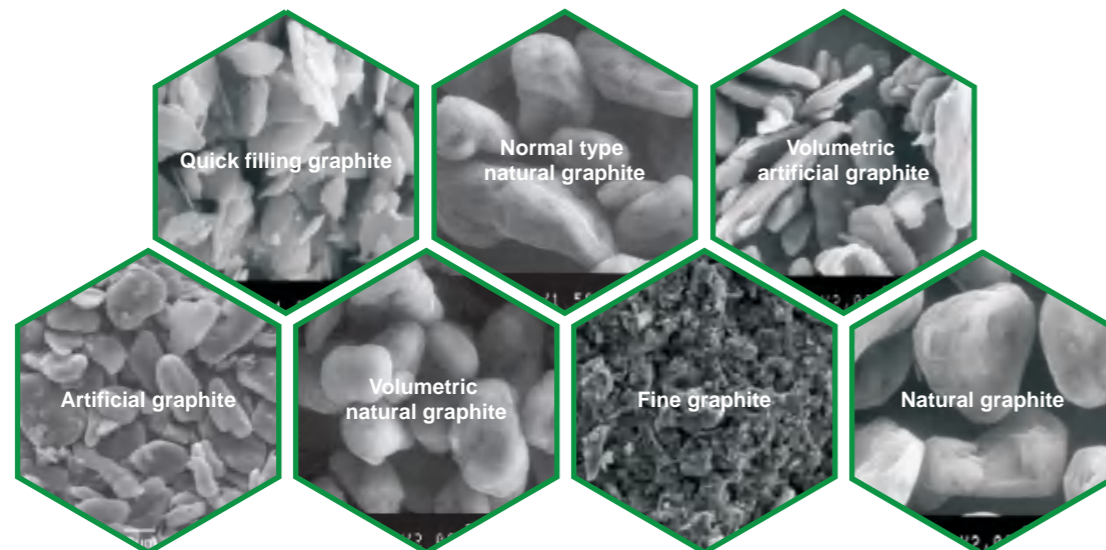
The R&D



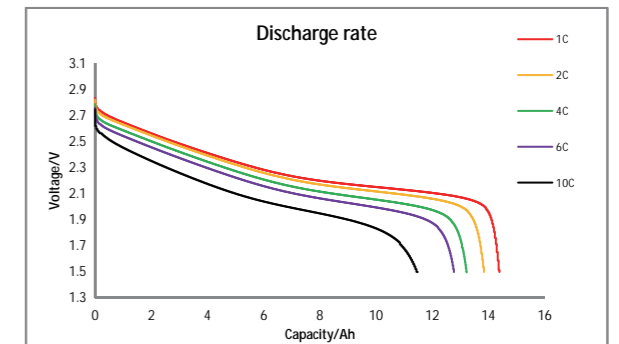
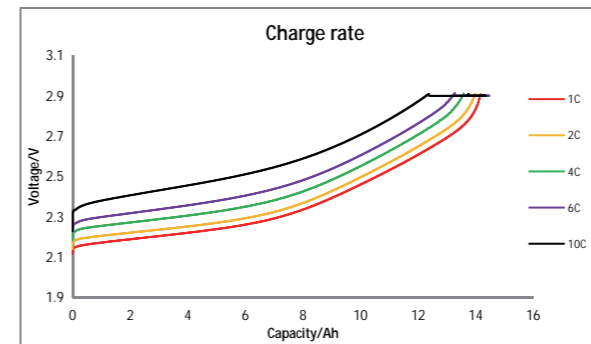
Green Tech has its material, cell and product R&D centers in Israel, U.S. and Germany.

Green tech focuses on material and product development in its own R&D center, and ensures all the products pass the complete and qualified tests before outgoing. Meanwhile, Green tech also enhances the close cooperation with Japan, US and Israel scientific research institutions to lead this field ahead.

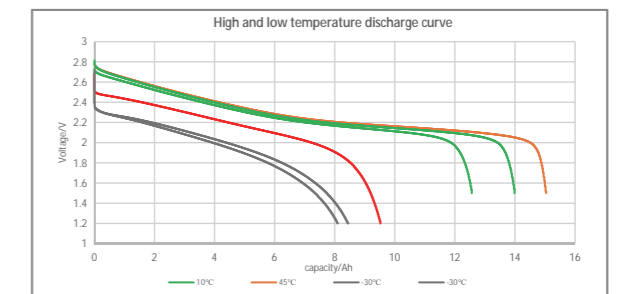
Cathode Material For Graphene Ultracapacitor Batteries



EG Series Test Result



Discharge temperature (°C)	Capacity (Ah)	Test C/capacity at 25°C (%)
-20	9.54	67.63%
25	14.10	100.00%
55	15.25	108.13%



Non-flammable Electrolyte



Non-flammable



10-15 minute fast charge



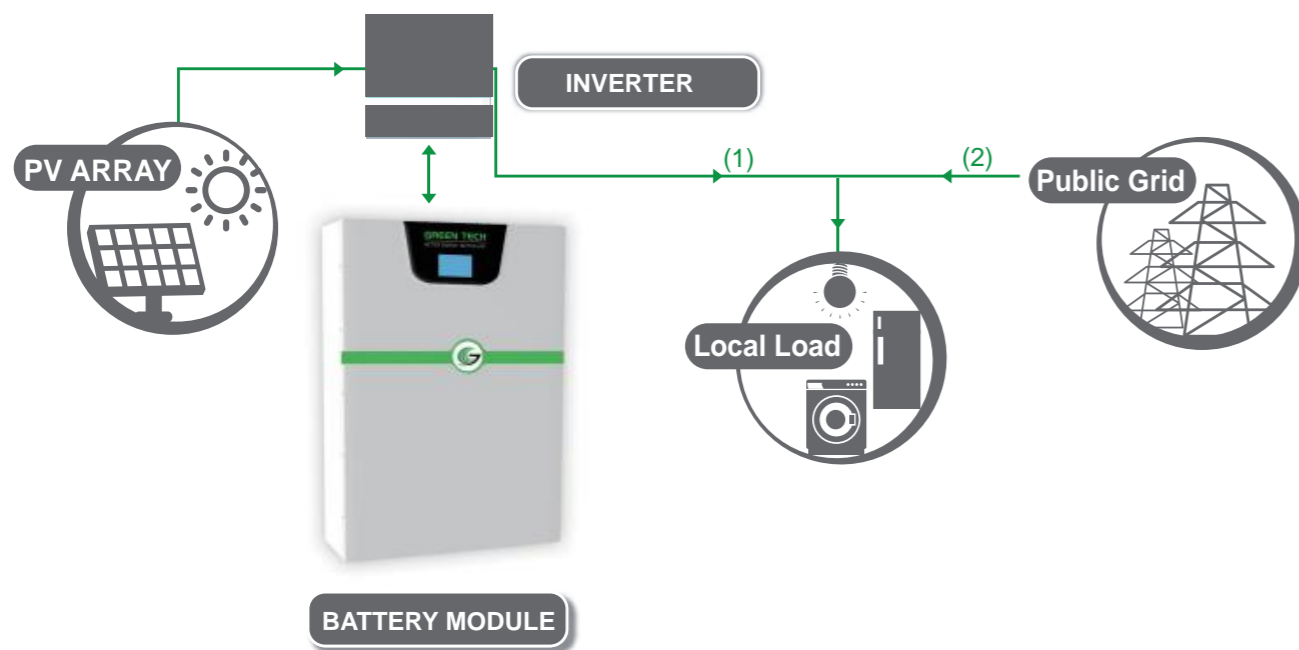
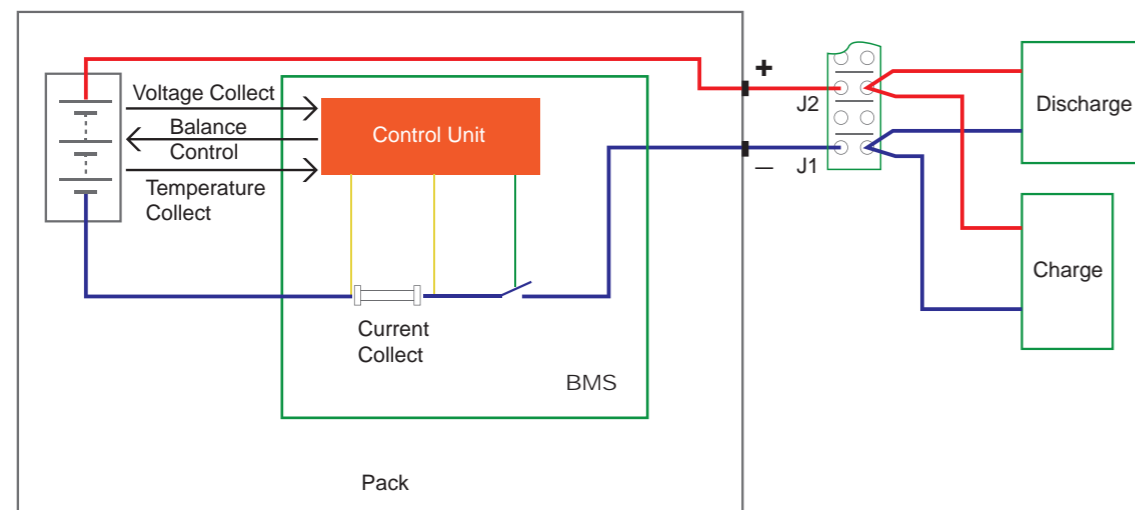
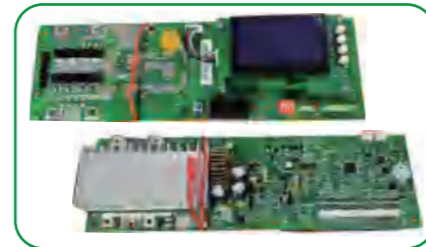
Long cycle life

Green Tech electrolyte is not only non-flammable, but also ensures fast charging within 10-15 minutes with a long cycle life.

Smart Manage System

The Green Tech supercapacitor battery system is function modularity design.

- The interface of charge and discharge is integrated.
- The cell voltage and module temperature is detected by BMS.
- Support fast charging and discharging
- Active monitoring of the system
- Smart action when protection function activated



Products Performance

Products Series	EM Series	EF Series	EG Series
Cell Cycle Life (Projected)	20,000 times	5,000 times	50,000 times
Charge Temperature Range	-5 °C ~ 50 °C	-20 °C ~ 50 °C	-40 °C ~ 65 °C
Discharge Temperature Range	-20 °C ~ 60 °C	-20 °C ~ 55 °C	-40 °C ~ 65 °C
Max. Rate of Charge	6C	2C	10C
Max. Rate of Discharge	6C	2C	6C
Peak discharge current (10s)	8C	5C	12C
Cells Energy Density (Wh/kg)	160	240	90
Operation outside Temperature Range	Yes	Yes	Yes
Thermal Runaway	No Risk	No Risk	No Risk
Usable Capacity (% of rated capacity)	100% (constant over life)	100% (constant over life)	100% (constant over life)
DC to DC efficiency (@25°C)	99% (constant over life)	98% (constant over life)	99% (constant over life)
Short/Medium/Long Duration	Long	Medium	Long
Maintenance	Rarely maintenance	Rarely maintenance	Rarely maintenance



PACK Production

- >> PACK production line includes automatic sorting, stacking, laser welding, AGV flexible assembly and other fully
- >> automated/semi-automatic equipment, which increase production efficiency and ensures the product quality.

Production and Quality Control

Cell Production

- Automatic proportioning system, double-sided coating equipment, pole pieces of high-speed; cutting equipment, automatic assembly line, in the junction measurement surface density, viscosity testing equipment are adopted during production process;
- ABB robot, KUKA robot and spider hand, lead a significant reduction in the number of operators;
- Intelligent MES management system can automatically generate manufacturing, quality control, equipment maintenance data and the battery product bar code retrospective management, timely feedback abnormalities and guide the production management;
- Production line strictly controls the humidity and cleanliness.



Capwall SERIES

FEATURES

- >> Graphene supercapacitor cells
- >> Safest technology
- >> Ultra long cycle life
- >> Extreme temperature
- >> Highest energy transfer efficiency
- >> Easy to install
- >> Rarely maintenance



PERFORMANCE SPECIFICATIONS

Part Number	GTEM-48V5500-W	GTEM-48V8500-W	GTEM-48V15000-W
Energy storage	5.5KWh	8.5KWh	15KWh
Nominal Voltage	48V/DC	48V/DC	48V/DC
Maximum Charge Voltage	58V/DC	58.8V/DC	58.8V/DC
Discharge Cut-off Voltage	37.8V/DC	37.8V/DC	39.2V/DC
ESR/AC @1KHz 50% SOC	<10mΩ	<8mΩ	<6mΩ
Max. Continuous Charge Current	100A	100A	100A
Max. Continuous Discharge Current	100A	100A	100A
Power/Energy	0.926	0.617	0.347
Cells Self-discharge Rate	2% per month	2% per month	2% per month
Dimensions(mm)	470x675x194	700x785x194	700x990x194
Weight	65Kg	88Kg	116Kg
Round Trip Efficiency*1	95%	96%	98%
Recommended Depth of Discharge		≤90%	
Maximum Depth of Discharge		100%	
Cooling Method		Natural	
Shell Material		Metal & ABS plastic	
Parallel Connection		Up to 5sets	
Monitoring Data	System voltage,current, temperature,SOC,SOH,cycle, cell's voltage		

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PERFORMANCE SPECIFICATIONS

Part Number	GTEM-400V14400-W
Energy storage	14.4KWh
Nominal Voltage	400V/DC
Maximum Charge Voltage	453V/DC
Discharge Cut-off Voltage	292V/DC
ESR/AC @1KHz 50% SOC	<150mΩ
Max. Continuous Charge Current	60A
Max. Continuous Discharge Current	60A
Power/Energy	1.66
Cells Self-discharge Rate	2% per month
Dimensions(mm)	700x840x194
Weight	115Kg
Round Trip Efficiency*1	96%
Recommended Depth of Discharge	≤90%
Maximum Depth of Discharge	100%
Cooling Method	Natural
Shell Material	Metal & ABS plastic
Parallel Connection	CANbus
Monitoring Data	System voltage,current, temperature,SOC,SOH,cycle,cell's voltage

Capess SERIES

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PERFORMANCE SPECIFICATIONS

Part Number	GTEM-48V2500-E	GTEM-48V3600-E
Energy storage	2.5KWh	3.6KWh
Nominal Voltage	48V/DC	48V/DC
Maximum Charge Voltage	58V/DC	58V/DC
Discharge Cut-off Voltage	37.8V/DC	37.8V/DC
ESR/AC @1KHz 50% SOC	<20mΩ	<15mΩ
Max. Continuous Charge Current	100A	100A
Max. Continuous Discharge Current	100A	100A
Power/Energy	1.85	1.38
Round Trip Efficiency*1	93%	95%
Cells Self-discharge Rate	2% per month	2% per month
Dimensions(mm)	475x365x177	475x465x177
Weight	28Kg	35Kg
Recommended Depth of Discharge	≤90%	
Maximum Depth of Discharge	100%	
Cooling Method	Natural	
Shell Material	Metal & ABS plastic	
Parallel Connection	Up to 10sets	
Monitoring Data	System voltage,current, temperature,SOC,SOH,cycle,cell's voltage	

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PERFORMANCE SPECIFICATIONS

Part Number	GTEM-48V5500-E	GTEM-48V7500-E
Energy storage	5.5KWh	7.5KWh
Nominal Voltage	48V/DC	48V/DC
Maximum Charge Voltage	58V/DC	58V/DC
Discharge Cut-off Voltage	37.8V/DC	37.8V/DC
ESR/AC @1KHz 50% SOC	<10mΩ	<8mΩ
Max. Continuous Charge Current	100A	100A
Max. Continuous Discharge Current	100A	100A
Power/Energy	0.926	0.695
Round Trip Efficiency*1	95%	96%
Cells Self-discharge Rate	2% per month	2% per month
Dimensions(mm)	475x665x177	475x685x177
Weight	58Kg	65Kg
Recommended Depth of Discharge	≤90%	
Maximum Depth of Discharge	100%	
Cooling Method	Natural	
Shell Material	Metal & ABS plastic	
Parallel Connection	Up to 10sets	
Monitoring Data	System voltage,current, temperature,SOC,SOH,cycle,cell's voltage	

Caprack SERIES

FEATURES

- >> Graphene supercapacitor cells
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PERFORMANCE SPECIFICATIONS

Part Number	GTEM-388V14.4K-R	GTEM-400V50K-R
Energy storage	14.4KWh	50KWh
Nominal Voltage	388V/DC	400V/DC
Maximum Charge Voltage	453V/DC	453V/DC
Discharge Cut-off Voltage	292V/DC	292V/DC
ESR/AC @1KHz 50% SOC	<200mΩ	<100mΩ
Max. Continuous Charge Current	60A	130A
Max. Continuous Discharge Current	60A	130A
Configuration	108S3P	108S10P
Round Trip Efficiency*1	96%	98%
Weight	208Kg	602Kg
Dimensions(mm)	520x702x842	520x702x842
Recommended Depth of Discharge	≤90%	≤90%
Maximum Depth of Discharge	100%	100%
Cooling Method	Natural	Natural
Shell Material	Metal & ABS plastic	Metal & ABS plastic
Parallel connection optional	Up to 4sets (400V 60KWh)	Up to 4sets (400V 200KWh)
Mount Options	On floor	On floor
Monitoring Data	System voltage,current, temperature,SOC,SOH,cycle,cell's voltage	

EM SERIES

FEATURES

- >> Graphene supercapacitor cells
- >> Safest technology
- >> Ultra long cycle life
- >> Extreme temperature
- >> Highest energy transfer efficiency
- >> Fast rechargeable
- >> Easy maintainability



PERFORMANCE SPECIFICATIONS

Part Number	GTEM-48V4500-G	GTEM-48V8500-G
Energy storage	4.66KWh	8.5KWh
Nominal Voltage	48V/DC	48V/DC
Maximum Charge Voltage	58.8V/DC	58.8V/DC
Discharge Cut-off Voltage	40V/DC	40V/DC
ESR/AC @1KHz 50% SOC	<30mΩ	<15mΩ
Max. Continuous Charge Current	200A	200A
Max. Continuous Discharge Current	100A	200A
Cut-off Current (charging)	4A	4A
Dimensions (mm)	720x355x252	950x400x251
Weight	55Kg	75Kg
Projected Calendar Life	25 years	
Recommended Depth of Discharge	≤90%	
Maximum Depth of Discharge	100%	
Shell Material	Metal & ABS plastic	
Monitoring Data	SOC,voltage, module	
Series Connection	Not allowed	
Parallel Connection	Recommend within 10sets	
Series-Parallel Connection	Not allowed	

EM SERIES

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PERFORMANCE SPECIFICATIONS

Part Number	GTEM-48V30240-F	GTEM-24V5000-F	GTEM-72V18720-F
Energy storage	30.24KWh	5.0KWh	18.72KWh
Nominal Voltage	48V/DC	24V/DC	72V/DC
Maximum Charge Voltage	58V/DC	29V/DC	84V/DC
Discharge Cut-off Voltage	40V/DC	20V/DC	56V/DC
ESR/AC @1KHz 50% SOC	<50mΩ	<10mΩ	<50mΩ
Max. Continuous Charge Current	400A	150A	150A
Max. Continuous Discharge Current	400A	150A	150A
Peak Current	500A	300A	300A
Dimensions (mm)	965x670x700	645x565x245	740x540x320
Weight	960Kg	190Kg	230Kg
Projected Calendar Life	25 years		
Recommended Depth of Discharge	≤90%		
Maximum Depth of Discharge	100%		
Shell Material	Metal & ABS plastic		
Monitoring Data	SOC, voltage, module		
Series Connection	Not allowed		
Parallel Connection	Recommend within 10sets		
Series-Parallel Connection	Not allowed		

EM SERIES

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PERFORMANCE SPECIFICATIONS

Part Number	GTEM-48V1248-M	GTEM-60V1560-M	GTEM-48V1920-M
Energy storage	1248Wh	1560Wh	1920Wh
Nominal Voltage	48V/DC	60V/DC	48V/DC
Maximum Charge Voltage	58.8V/DC	71.4V/DC	58.8V/DC
Discharge Cut-off Voltage	42V/DC	47.6V/DC	42V/DC
ESR/AC @1KHz 50% SOC	<12mΩ	<30mΩ	<10mΩ
Max. Continuous Charge Current	80A	80A	80A
Max. Continuous Discharge Current	80A	80A	80A
Cut-off current (charging)	4A	4A	4A
Dimensions (mm)	230x180x300	230x180x360	230x180x430
Weight	15.5Kg	20Kg	22Kg
Projected Calendar Life	25 years		
Recommended Depth of Discharge	≤90%		
Maximum Depth of Discharge	100%		
Shell Material	Metal & ABS plastic		
Monitoring Data	SOC, voltage, module		
Series Connection	Not allowed		
Parallel Connection	Recommend within 10sets		
Series-Parallel Connection	Not allowed		

Classic case

Large Power Grid Frequency Regulation System

Advantages:

- >> Large power density up to 240W/kg
- >> High discharge rate up to 5C
- >> Ultra long cycle life up to 50000 times
- >> 10 times cost-effective than regular battery system

Topical application:

- >> Peak loading shaving
- >> Grid frequency stabilization
- >> Grid voltage stabilization
- >> Heave crane machinery starting
- >> Industry power compensation
- Charging station power supplier



Qingdao State Grid Project

Project Scale:10MWh Project Location: Qingdao, Shandong Project Completion Time: June 2017

This project is a State Grid energy storage power station. Green Tech provides a full set of energy storage system solutions for the project. The energy storage system is the core part of it and this kind of project will be widely used in the future. After technical research, the system of this product can operate stably in wet natural environment. This product is also suitable for harsh environments such as severe wind and sand.

Green Tech owns the ability to independently undertake such large-scale energy storage projects in complex environments. The projects include photovoltaic, wind power, diesel power, and energy storage systems.

Classic case ○ ○



UPS

Project Scale: 2MWH Project Location: Jiangsu Project Completion Time: March 2018

This series of battery products adopt a modular design and the system structure is extremely flexible. The design concept of the power module is that the power module can be removed and installed optionally without affecting the operation and output of the system while the system is running, so that the investment plan can be expanded on demand to allow users to achieve .

Supercapacitor Battery for Electromobile

Nominal Voltage: 388V/DC

Nominal Capacity: 67KWh

Nominal Current: 400A

Discharge Pulse Current: 500A

Discharge Temperature: -20℃~+60℃

Dimensions: 990x450x120mm

Enclosure protection class: IP67

Certificates Compliant: CE, UN38.3 MSDS



Electric Motorcycle Use Supercapacitor Battery

Nominal Voltage: 72V/DC

Nominal Capacity: 1872KWh

Nominal Current: 80A

Discharge Pulse Current: 100A

Discharge Temperature: $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$

Dimensions: 230x180x400mm

Certificates Compliant: CE, UN38.3 MSDS

Feature: Fast Charge, Strong Power, Safety



Supercapacitor Battery for Forklift

Nominal Voltage: 48V/DC

Nominal Capacity: 30.24KWh

Nominal Current: 400A

Discharge Pulse Current: 500A

Discharge Temperature: $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$

Dimensions: 965x670x700mm

Certificates Compliant: CE, UN38.3 MSDS

Feature: Extreme Temperature, Fast Charge





After-sales Service ○ ○

- >> With rich management experience, efficient after-sales service management organization;
- >> Experienced, responsive and conscientious service team;
- >> Improve the effective service management system;
- >> The spare parts warehouse in the factory center as the core, the secondary spare parts warehouse in
- >> the regional service station and the tertiary spare parts warehouse in the customer concentration
- >> area as the auxiliary spare parts guarantee;
- >> The GPRS remote terminal platform is established to conduct remote monitoring and fault prediction of battery operation data.

