

ENERTECH™

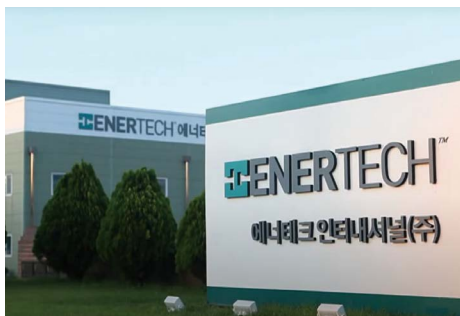
Lithium-Ion Battery Solution Provider



HISTORY

Established April 1st, 2001
 Location Chung-ju Factory
 Products Customized Electrodes, Li-Ion Cells, Packs

OEM for Electrodes, Cell and Battery from EnerTech International are available for any potential battery manufacturers or users.



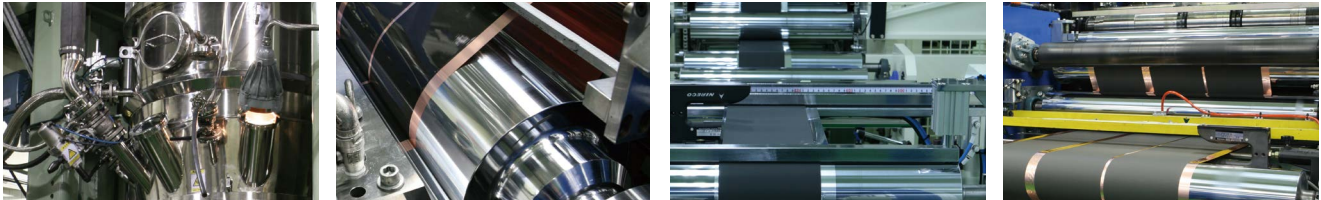
- 2024~ Start LFP & LTO cell development (40Ah)
Signed up 6-Giga Factory feasibility contract in South Africa
P55A (HEV) cell development complete
- 2023 E60A cell and module mass production commence
Automated module MFG facility_1GWh/year
Narrow Type Cell Line SOP
- 2022 Executed contract for license of silicon anode material (Enegate) ▶ E-Bike market
60Ah Narrow cell (E60A) development completion (Dec. 2022)
- 2021 Executed contract with LG Energy Solution for supplying electrodes for R&D testing
- 2020 Over 5M EV/ESS cells had been supplied
Co-developing HEV and EV cells with Hyundai Motors' R&D situated in Namyang, Kyeonggi-do
- 2019 Accumulated cell-equivalent production reached 40M
Supplied ESS for various application
Contracted to develop EV electrodes/cells for R&D with BMW (3 years)
- 2018 Developed and supplied battery system on Hybrid EV (5KWh, Limousine)
- 2017 Executed electrode OEM supply with LG Chemical (Cathode/Anode for cylindrical cells) 3M cell-equivalent production/month
- 2015 Developed EV/ESS battery packs
(ESS : 15KWh, 22KWh, 130KWh & MWh level ESS System)
- 2012 Over 1M EV/ESS cells (17.5Ah) had been supplied (2010~2012)
- 2011 Supplied 37 battery systems (84KWh) for E-Bus to HFG (Edison Motors)
ISO9001, 14001, TS16949 certified
- 2010 Started operating automated manufacturing line for large format cell
(Capacity : 120K cells/month, 150MWh)
- 2008 Company's name has been changed to EnerTech International, Inc.
Exclusively supplied EV cell (17.5Ah) to Think Automobile
- 2007 Supplied SPB562540 (540mAh) cell to Samsung Electronics for Byonce Phone
- 2006 Supplied electrode (PVDF) to Samsung SDI (until 2011)
- 2004 Supplied SPB473352 (820mAh) cell to Samsung Electronics
Supplied LIPB batteries for KCTC Project of Ministry of Defense
USPTO patent registered on manufacturing Lithium Polymer Secondary Battery (U.S.)
- 2003 Supplied 1M/month battery packs for mobile phones
- 2002 Supplied Barcode Scanner OEM battery packs to Symbol Technology (Zebra Technology)
- 2001 Supplied laptop battery to Samsung Electronics and US Market
Company founded - Saehan EnerTech

ELECTRODE

EnerTech International can design electrodes based on the following specifications for OEM suppliers, Custom designs can also be developed through its development team.

The finest quality of secondary battery technologies begin with company's strong background in materials handling and automated production techniques.

The customer first mindset of providing the product to meet customers' needs across a variety of industries.



WORLD-CLASS COATING TECHNOLOGY

OVER

20 YEARS

EnerTech International has more than 20 years of experience in coating and pressing active materials since its establishment in 2001

OVER

15 YEARS

Company has strong background in variety of materials such NCM, LFP, LCO, LMO and etc.

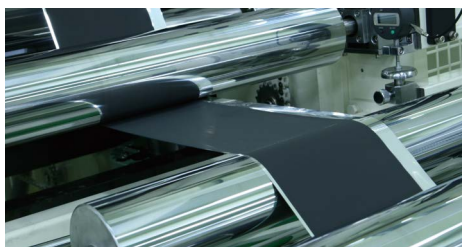
OVER

10 KINDS

Company has more than 10 kinds of electrode chemistries of pre-production

PVDF & SBR BINDER BOTH EXPERIENCED

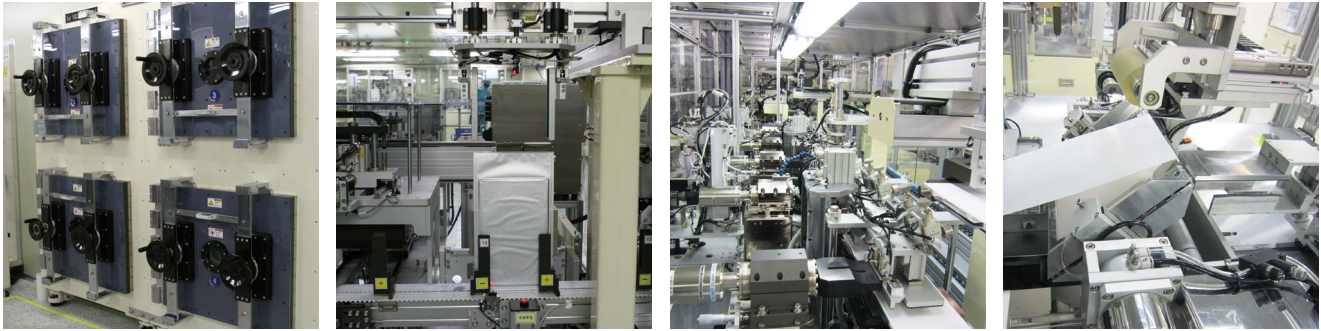
Electrode		Coating		Press
		Continuous	Intermittent	
Dimension	Width	10~680mm	10~680mm	10~680mm
	Length	3,500m	Coating: 50mm~∞ Non-C: 20~100mm	Max. 1,500m
	Thickness	15~300μm	15~300μm	15~300μm
	Loading Density	10~50mg/cm ²	10~50mg/cm ²	10~50mg/cm ²
	Tolerance	±2mg/cm ²	±2mg/cm ²	±3μm
Current Collector	Thickness	Al: 10~50μm, Cu: 6~25μm		
	Diameter(mm)	∅ 172~1000/Roll	∅ 172~1000/Roll	∅ 172~1000/Roll
Dimensions of Electrode roll	Weight	Max. 800kg/Roll	Max. 800kg/Roll	Max. 800kg/Roll
	Core(mm)	ID: 76~152		



Electrode	Active Material	Conducting Agent	Binder	Current Collector
Cathode	NCM / LFP / LCO / NCA / LMO	Carbon Black / Acetylene Black / VGCF / CNT	PVdF	Al / Carbon Coater Foil
Anode	Graphite / Si / LTO	Carbon Black / Acetylene Black / CNT	PVdF or CMC / SBR	Cu / Carbon Coater Foil

LITHIUM-ION CELL

*EnerTech International proudly presents various types of cells that have been developed based on Top-notch level of electrode production technologies
State-of-the-art manufacturing facilities
Know-how on the Lithium-Ion Batteries.
EnerTech International and its various types of Batteries will rise and shine.*



OVER

20 YEARS

Company has more than 20 years of experience in high volume production of Lithium ion Cells

MAX.

140 Ah

Company has more than 20 years of experience in high volume production of Lithium ion Cells

CONTINUOUS

4 C-RATE

EV/ESS Application

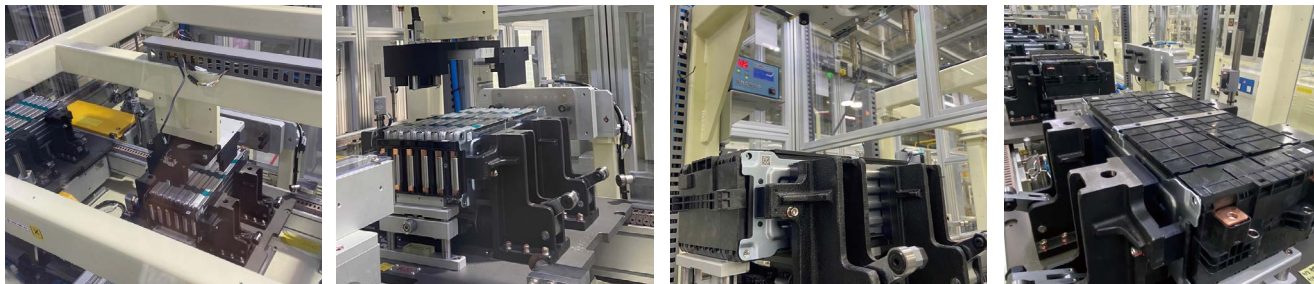


- Experienced our own Process Design and Development for batteries with different capacity
- Accumulated Design Technology through various application such as, HEV(6Ah to 12 Ah), and EV(16Ahto 60Ah) and ESS(50Ah to 3240Ah)
- Experienced high volume production
- Automatic Production System with Automatic assembly for narrow type cell



MODULE

*EnerTech International is capable of supplying elements and modules for customers' own battery system to meet their demands through an integrated approach,
EnerTech International is capable of providing a complete battery solution from design to production, to meet customers' specific needs.*



MORE THAN

3 KINDS

Company can manufacture the modules in various cell configuration (4S3P, 6S2P, 12S1P and etc.)

MAX.

180 Ah

EnerTech and its module with abundant capacity has max 180.0 Ah of capacity

MAX.

360 Ah

EnerTech and its power overwhelming modules have max 360.0 Ah of discharging current

NE1800-017

Nominal Voltage(V) : 14.8V

Capacity(Ah) : 180Ah

Chemistry : NCM Energy Cell

Dimension(mm) : (L)360.0 (W)165.0 (H)109.5

Weight(kg) : 12.2kg

Temperature : Charge (-20~60°C)

Discharge (-20~60°C)

Storage (0 to 25 ≤ 1year)

Cell Spec : ET1123100302 E60A

Cell Configuration : 4S3P

NE1200-025

Nominal Voltage(V) : 22.2V

Capacity(Ah) : 120Ah

Chemistry : NCM Energy Cell

Dimension(mm) : (L)360.0 (W)165.0 (H)109.5

Weight(kg) : 12.2kg

Temperature : Charge (-20~60°C)

Discharge (-20~60°C)

Storage (0 to 25 ≤ 1year)

Cell Spec : ET1123100302 E60A

Cell Configuration : 6S2P

NP550-050

Nominal Voltage(V) : 44.4V

Capacity(Ah) : 55Ah

Chemistry : NCM Power Cell

Dimension(mm) : (L)360.0 (W)165.0 (H)109.5

Weight(kg) : 12kg

Temperature : Charge (-20~60°C)

Discharge (-20~60°C)

Storage (0 to 25 ≤ 1year)

Cell Spec : ET1123100302 P55A

Cell Configuration : 12S1P

NF1200-015

Nominal Voltage(V) : 12.8V

Capacity(Ah) : 120Ah

Chemistry : LFP Cell

Dimension(mm) : (L)360.0 (W)165.0 (H)109.5

Weight(kg) : 12.1kg

Temperature : Charge (0~60°C)

Discharge (-20~60°C)

Storage (-20 to 25 ≤ 1 year)

Cell Spec : ET1123100302 F40A

Cell Configuration : 4S3P

NE1400-025

Nominal Voltage(V) : 22.2V

Capacity(Ah) : 140Ah

Chemistry : NCM Energy Cell

Dimension(mm) : (L)360.0 (W)165.0 (H)109.5

Weight(kg) : 13.2kg

Temperature : Charge (-20~60°C)

Discharge (-20~60°C)

Storage (-20 to 25 ≤ 1 year)

Cell Spec : ET1123100302 E70A

Cell Configuration : 6S2P

NE750-050

Nominal Voltage(V) : 44.4V

Capacity(Ah) : 75Ah

Chemistry : NCM Energy Cell

Dimension(mm) : (L)360.0 (W)165.0 (H)109.5

Weight(kg) : 12.3kg

Temperature : Charge (-20~60°C)

Discharge (-20~60°C)

Storage (-20 to 25 ≤ 1 year)

Cell Spec : ET1123100302 E75A

Cell Configuration : 12S1P



EV PACKS



The lithium-ion transportation battery has been commercialized in recent years for various industries. Starting from one of the world's first commercial service application (Namsan area of Seoul, CV Electric Bus), EnerTech International has been following that trend and developing energy sources for offering high levels of specific energy, power, cycle life, wide range of temperatures and its reliability.

Modular building design leads ease of installation

Cooling & Heating

Company's battery pack has its liquid and air cooling & electrical type heating system

-20~60°C

Company and its safest packs allow you to operate your vehicle in various temperatures

BMS

Company could supply the customers' packs with in-house developed BMS



MP412300-2107010-10

Battery Pack Specification

Nominal Voltage (V) : 321.2V
Capacity (Ah) : 16.0 Ah (5.139 kWh) / Usable energy SOC 10 ~ 95%
Voltage Range : 220.0 ~ 360.8V
Configuration : 88S 1P
Charging current : Continuous 40A, Max 80A
Discharging current : Continuous 40A, Max 80A, Peak 250A(@10sec)
Dimension (mm) : 938(L) x 485(W) x 218(H)
Weight : <103kg
Temperature Management : Liquid and Electrical heater
Protection Rate : IP67



NE1800-403D

Battery Pack Specification

Nominal Voltage (V) : 355.2V
Capacity (Ah) : 180.0 Ah (63.936 kWh) / Usable energy SOC 10 ~ 95%
Voltage Range : 259.2 ~ 403.2V
Configuration : 96S 3P
Charging current : Continuous 54A, Max 180A, Peak 270A(@10sec)
Discharging current : Continuous 54A, Max 360A, Peak 540A(@60sec)
Dimension (mm) : 1562(L) x 1302(W) x 150(H)
Weight : <415kg
Temperature Management : Liquid
Protection Rate : IP68, IP69K



PE500-705

Battery Pack Specification

Nominal Voltage (V) : 621.6V
Capacity (Ah) : 50.0 Ah (31.08 kWh) / Usable energy SOC 10 ~ 95%
Voltage Range : 453.6 ~ 705.6V
Configuration : 168S 2P
Charging current : Continuous 16.6A, Max 100A
Discharging current : Continuous 16.6A, Max 100A, Peak 250A(@10sec)
Dimension (mm) : 1405(L) x 651(W) x 384(H)
Weight : <320kg
Temperature Management : FAN(air)
Protection Rate : IP55



PE500-1008H

Battery Pack Specification

Nominal Voltage (V) : 888V
Capacity (Ah) : 50.0 Ah (44.4 kWh) / Usable energy SOC 10 ~ 95%
Voltage Range : 648 ~ 1008V
Configuration : 240S 2P
Charging current : Continuous 16.6A, Max 100A
Discharging current : Continuous 16.6A, Max 150A
Dimension (mm) : 1206(L) x 1147(W) x 403(H)
Weight : <450kg
Temperature Management : FAN(air) and Electrical Heater
Protection Rate : IP42



ENERGY STORAGE SYSTEM



EnerTech International's Energy Storage System (ESS) provides advanced yet reasonable and long-duration energy storage solutions. For the purpose of power dispatch, management and energy smoothing, our ESS is fully developed and produced starting from electrode to complete ESS. EnerTech International provides the best solutions with our proficiency and competence

Scalable

Company can expand its ESS as much as the customer needs with standard battery module

Flexible

Depending on the customers' purpose, the whole system is designed and veteran engineers are ready and awaiting

Reliable

IATF 16949 certified product has no quality problem at field that lasts 10 years

ADVANTAGES

SCALABLE : EXPANDABLE AS MUCH AS WANTED WITH STANDARD BATTERY MODULE

SAFE : AUTOMATICALLY MANUFACTURED CELLS, EVEN CERTIFIED IATF16949 HAVE NO QUALITY PROBLEM AT FILED LAST 10 YEARS

SERVICE : A LOT OF QUALIFIED ENGINNERS ARE READY TO SURPORT CUSTOMERS

FLEXIBLE USAGE : BASED ON PURPOSE, THE WHOLE SYSTEM IS DESIGNED AND MANUFACTURED

Applications	Category/ Purpose	Power	Energy	Cycle life	Calendar life	Cost	Safety	ETI ESS with Energy cell	ETI ESS with Power cell
Frequency regulation	Stabilization	Very Important	Important	Very Important	Very Important	Very Important	Very Important		Excellently work
Ramping/Spinning reserve	Stabilization	Important	Important	Important	Very Important	Very Important	Very Important		Excellently work
Voltage or reactive power support	Stabilization	Very Important	Important	Very Important	Very Important	Very Important	Very Important		Excellently work
Load following	Load shift	Important	Very Important	Important	Very Important	Very Important	Very Important		Excellently work
System peak shaving	Load shift	Less Important	Very Important	Important	Very Important	Very Important	Very Important	Excellently work	
Load management	Load shift	Less Important	Very Important	Important	Very Important	Very Important	Very Important	Excellently work	
Excess wind and solar generation	Renewable	Less Important	Important	Important	Very Important	Very Important	Very Important	Excellently work	
Arbitrage	load shift	Less Important	Very Important	Important	Very Important	Very Important	Very Important	Excellently work	
Backup power	Back up	Less Important	Important	Important	Very Important	Very Important	Very Important	Excellently work	
Transmission and distribution deferral	Load shift	Less Important	Very Important	Important	Very Important	Very Important	Very Important	Excellently work	
Co-located renewable firming	Renewable	Less Important	Important	Important	Very Important	Very Important	Very Important	Excellently work	

HOME ESS

Battery Tray Specification

Voltage (Nominal) : 88.8V (64.8 ~ 100.8V)
Capacity (Ah) : 120.0 Ah, 10.656kWh (4 module / Tray)
Configuration : 24S 2P

Battery Pack Specification

Capacity : 53.28kWh (5 Tray / Pack)
Configuration : 120S 2P
Nominal Voltage : 444V (324 ~ 504V)
Charging Voltage : 504V
Charging Current : Std. 30.0A (0.25C), Max 60A (0.5C)
Discharging Current : Std. 30.0A (0.25C), Max 60A (0.5C)
Dimension (mm) : 880(W) x 492(D) x 1,250(H)
Weight : 400kg



KILO ESS RACK

Battery Drawer Specification

Voltage (Nominal) : 59.2V (43.2 ~ 67.2V)
Capacity (Ah) : 180.0Ah, 10.656kWh (4 module / Drawer)
Configuration : 16S 3P

Battery Rack Specification

Capacity : 149.18kWh (14 Drawer / Rack)
Configuration : 224S 3P
Nominal Voltage : 808.8V (604.8 ~ 940.8V)
Charging Voltage : 940.8V
Charging Current : Std. 45.0A (0.25C), Max 90A (0.5C)
Discharging Current : Std. 45.0A (0.25C), Max 90A (0.5C)
Dimension (mm) : 1,624(W) x 1,022(D) x 2,500(H)
Weight : 1,500kg



MEGA ESS

Battery Rack Specification

Capacity : 180Ah, 223.78kWh / String
Configuration : 336S 3P
Nominal Voltage : 1,243.2V (907.2 ~ 1,411.2V)
Charging Voltage : 1,411.2V
Charging Current : Std. 45.0A (0.25C), Max 90A (0.5C)
Discharging Current : Std. 45.0A (0.25C), Max 90A (0.5C)
Dimension (mm) : 1,530(W) * 720(D) * 2,200(H)

Bank Container Specification

Capacity : 1.11MWh (223.78kWh * 5 Strings) / Container
Weight : Approx. 9.5 ~ 10 Ton
IP : IP54



R&D CENTER TESTING SERVICE

HOW WE CAN HELP

Enertech International Inc. provides professional battery pack, module and cell performance testing in our R&D center.

We create precise simulation of electrical, thermal or climatic loads and other conditions that your batteries may be exposed to in real-life use. As an expert in battery performance testing, we can support throughout the development and manufacturing process to optimize the capacity, reliability and safety of battery packs, cells and modules.

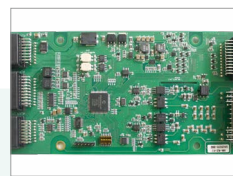
With lithium battery expertise and over 20 years' experience of the requirements and test methods of vehicle manufacturers, we can meet all your battery testing needs.



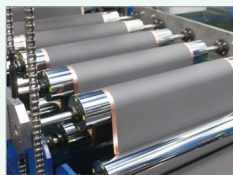
Product Evaluation
(Electrode, Cell, Module and Pack)



Sample Production
(Module & Pack)



BMS Evaluation
(Performance & Accuracy)



Sample Production
(Electrode & Cell)



Reliability Test
(Customer Demands & UN DOT)

Service Availability

Item	Availability	Test Items	Test Condition
Sample Production	Electrode, Cell, Module & Battery System		
Cell Evaluation	Short Term Test	<ul style="list-style-type: none"> Temp Rate Capability HPPC OCV Data Temp Rate Cycle life 	<ul style="list-style-type: none"> Temp : 0°C, 25°C, 45°C Charge, Discharge : Requirement Cycle life : over 1,000cycle
	Long Term Test		
Module Evaluation	BMA Performance	<ul style="list-style-type: none"> Temp Rate Capability Heat Generation 	<ul style="list-style-type: none"> Temp : 0°C, 25°C, 45°C Charge, Discharge : Requirement
Pack Evaluation	BSA Performance	<ul style="list-style-type: none"> Temp Rate Capability Cooling performance Profile 	<ul style="list-style-type: none"> Temp : 0°C, 25°C, 45°C Charge, Discharge : Requirement Driving Data(Power/Time)
BMS Validation	BMS	<ul style="list-style-type: none"> Protection SOC, SOH Accuracy 	<ul style="list-style-type: none"> Protection operation Temp : 0°C, 25°C, 45°C Charge, Discharge : Requirement
Reuse Evaluation	Reuse	<ul style="list-style-type: none"> DCIR, SOH 	<ul style="list-style-type: none"> Temp : 0°C, 25°C, 45°C Charge, Discharge : Requirement DCIR calculation
Small Pack/Module/DOT	UN38.3 Test	<ul style="list-style-type: none"> UNDOT 	<ul style="list-style-type: none"> T1~T8 Altitude Simulation, Thermal, Humidity, Vibration, Shock Test External Short Circuit, Crush Forced Discharge, Cold Plate
Reliability Test	Reuse	<ul style="list-style-type: none"> Environment Test Machinery Test Safety Test 	

CERTIFICATIONS

EnerTech International's products have already proven their outstanding quality in the field by being used by global companies. Since 2010, over 100 identical products have been delivered for electric vehicles and energy storage systems.

Based on IATF16949 and ISO14001 certifications, EnerTech is operating a reliable quality system according to strict proven processes in every stage from product development to mass-production and sales. From quality control of raw materials to monitoring every pre-production process to address the needs of our customers



ISO 9001:2015



ISO 14001:2015



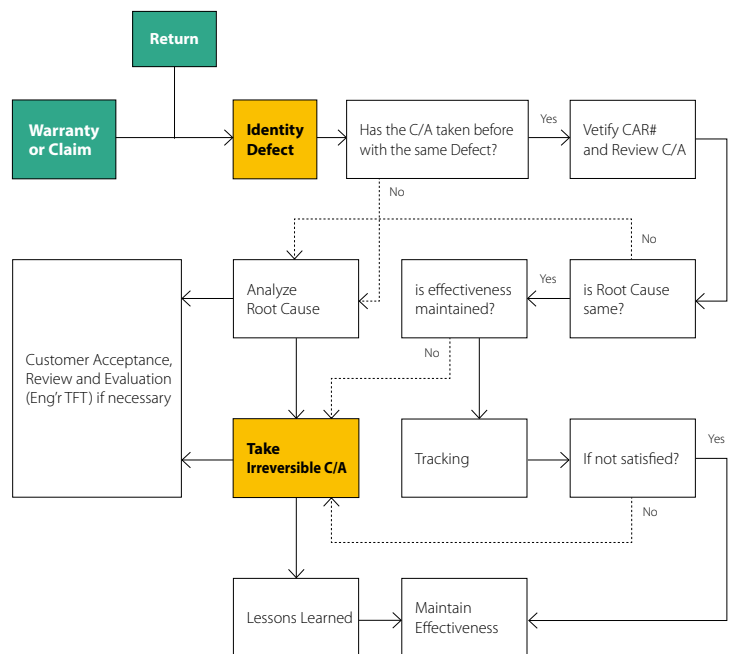
IATF 16949:2016

Quality Strategy

In order to provide high quality product to customers, EnerTech International is focusing on incoming inspection, process inspection and outgoing inspection. Our goal of the product quality is to minimize the defectiveness and to prioritize customer satisfaction.



Problem Solving Action Process



** CAR : Corrective Action Report
** TFT : Task Force Team

Power Cell

Item	SPB8060155V1	ETI123100302 P45A	ETI123100302 P55A
Nominal Capacity	7.9Ah	45.0 Ah	55.0 Ah
Energy Density	Volumetric	393 Wh/ℓ	448 Wh/ℓ
	Gravimetric	191 Wh/kg	203 Wh/kg
Weight	150 ±3.0 g	≤ 820 g	≤ 820 g
Nominal Voltage	3.70V	3.70V	3.70V
Operating Voltage Range	Max.	4.20V	4.20V
	Min.	2.80V	2.70V
Standard Current	Charge	3.95 A	22.5 A
	Discharge	3.95 A	22.5 A
Maximum Current	Charge	15.8 A	90.0 A
	Discharge	63.2 A	180.0 A
	Peak Discharge	-	270.0 A (< 10s)
Internal Resistance	< 3.0mΩ	< 1.5mΩ	< 1.0mΩ
Operating Temperature	Charge	0°C ~ 45°C	-20°C ~ 60°C
	Discharge	-20°C ~ 55°C	-20°C ~ 60°C
	Recommend	25 ± 3°C	25 ± 3°C
Storage Temperature	< 1 month	-20°C ~ 55°C	-40°C ~ 60°C
	< 3 month	0°C ~ 45°C	-20°C ~ 45°C
	< 1 year	0°C ~ 25°C	0°C ~ 25°C
Cycle Life	0°C	300 Cycle	400 Cycle
	25°C	800 Cycle	1,500 Cycle
	45°C	500 Cycle	800 Cycle
Storage Humidity	45 ~ 85%RH	Max. 60%RH	Max. 60%RH
Cell Dimensions	Thickness	8.0mm -0.6/+0.0mm	12.3mm ± 0.2mm
	Width	60.0mm -2.0/+1.0mm	100mm -0.5/+1.5mm
	Length	155.0mm -1.0/+2.0mm	302mm ± 1mm
Technical Data			

Energy Cell

Item	SPB70115145V1	ETI123100302 E60A	ETI156100535 E140F	ETI123100302 E58A
Nominal Capacity	12.0 Ah	60.0 Ah	135.0 Ah	58.0 Ah
Energy Density	Volumetric	380 Wh/ℓ	598 Wh/ℓ	594 Wh/ℓ
	Gravimetric	185 Wh/kg	262Wh/kg	259 Wh/kg
Weight	≤ 240 g	845.0g +5g/-20g	≤ 1900 g	≤ 870 g
Nominal Voltage	3.70V	3.70V	3.70V	3.77V
Operating Voltage Range	Max.	4.20V	4.20V	4.35V
	Min.	3.00V	2.70V	2.70V
Standard Current	Charge	6.0 A	0.3C(18.0A)	40.5A
	Discharge	6.0 A	0.3C(18.0A)	40.5A
Maximum Current	Charge	12.0 A	1.5C(90.0A)	135.0 A
	Discharge	24.0 A	2.0C(120.0A)	202.5 A
	Peak Discharge	-	3.0C(180.0A) (< 60s)	270.0 A (< 10s)
Internal Resistance	< 3.0mΩ	< 1.5mΩ	< 2mΩ	< 1.5mΩ
Operating Temperature	Charge	0°C ~ 45°C	-20°C ~ 60°C	0°C ~ 55°C
	Discharge	-20°C ~ 55°C	-20°C ~ 60°C	-20°C ~ 50°C
	Recommend	25 ± 3°C	25 ± 3°C	25 ± 3°C
Storage Temperature	< 1 month	-20°C ~ 55°C	-40°C ~ 60°C	-20°C ~ 55°C
	< 3 month	0°C ~ 45°C	0°C ~ 45°C	-20°C ~ 45°C
	< 1 year	0°C ~ 25°C	0°C ~ 25°C	-20°C ~ 25°C
Cycle Life	0°C	300 Cycle	700 Cycle	400 cycle
	25°C	800 Cycle	1,200 Cycle	1,000 cycle
	45°C	500 Cycle	400 Cycle	300 cycle
Storage Humidity	45 ~ 85%RH	Max. 60%RH	Max. 60%RH	Max. 60%RH
Cell Dimensions	Thickness	7.0mm +0.0/- 0.5mm	12.3mm ± 0.2mm	15.6mm ± 0.3mm
	Width	115mm ± 2mm	100mm -0.5/+1.5mm	100mm ± 2mm
	Length	145mm± 2mm	302mm ± 1mm	535mm ± 1mm
Technical Data				

LFP Cell

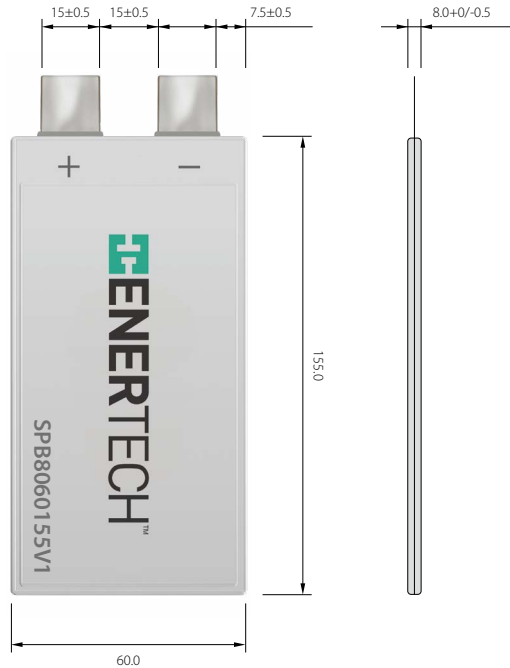
Item	ETI123100302 F40A	ETI123100302 M40A
Nominal Capacity	40.0 Ah	40.0 Ah
Energy Density	Volumetric	344 Wh/ℓ
	Gravimetric	160 Wh/kg
Weight	≤ 800 g	≤ 800 g
Nominal Voltage	3.20V	3.70V
Operating Voltage Range	Max.	3.65V
	Min.	2.50V
Standard Current	Charge	12.0 A
	Discharge	12.0 A
Maximum Current	Charge	40.0 A
	Discharge	120.0 A
	Peak Discharge	200.0A (< 10s)
Internal Resistance	< 2.0mΩ	< 1.5mΩ
Operating Temperature	Charge	0°C ~ 60°C
	Discharge	-20°C ~ 60°C
	Recommend	25 ± 3°C
Storage Temperature	< 1 month	-40°C ~ 60°C
	< 3 month	-20°C ~ 45°C
	< 1 year	-20°C ~ 25°C
Cycle Life	0°C	300 Cycle
	25°C	1,500 Cycle
	45°C	500 Cycle
Storage Humidity	Max. 60%RH	Max. 60%RH
Cell Dimensions	Thickness	12.3mm ± 0.2mm
	Width	100mm-0.5 ± 1.5mm
	Length	302mm ± 1mm
Technical Data		

LTO Cell

Item	ETI123100302 T40A	
Nominal Capacity	40.0 Ah	
Energy Density	Volumetric	245 Wh/ℓ
	Gravimetric	100 Wh/kg
Weight	≤ 920 g	
Nominal Voltage	2.30V	
Operating Voltage Range	Max.	3.00V
	Min.	1.50V
Standard Current	Charge	20.0 A
	Discharge	20.0 A
Maximum Current	Charge	160.0 A
	Discharge	240.0 A
	Peak Discharge	400.0A (< 10s)
Internal Resistance	< 2.0mΩ	
Operating Temperature	Charge	-20°C ~ 60°C
	Discharge	-20°C ~ 60°C
	Recommend	25 ± 3°C
Storage Temperature	< 1 month	-40°C ~ 60°C
	< 3 month	-20°C ~ 45°C
	< 1 year	-20°C ~ 25°C
Cycle Life	0°C	2,000 Cycle
	25°C	10,000 Cycle
	45°C	3,000 Cycle
Storage Humidity	Max. 60%RH	
Cell Dimensions	Thickness	12.3mm ± 0.2mm
	Width	100mm-0.5 ± 1.5mm
	Length	302mm ± 1mm
Technical Data		

Power Cell

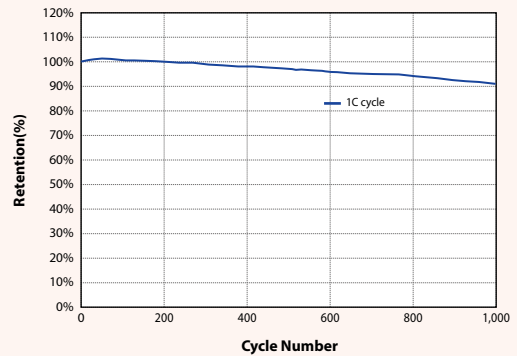
SPB8060155V1



Item	SPB8060155V1	
Nominal Capacity	7.9Ah	
Energy Density	Volumetric	393 Wh/ℓ
	Gravimetric	191 Wh/kg
Weight	150 ±3.0g	
Nominal Voltage	3.70V	
Operating Voltage Range	Max.	4.20 V
	Min.	2.80 V
Standard Current	Charge	3.95 A
	Discharge	3.95 A
Maximum Current	Charge	15.8 A
	Discharge	63.2 A
	Peak Discharge	-
Internal Resistance	< 3.0mΩ	
Operating Temperature	Charge	0°C ~ 45°C
	Discharge	-20°C ~ 55°C
	Recommend	25 ± 3°C
Storage Temperature	< 1 month	-20°C ~ 55°C
	< 3 month	0°C ~ 45°C
	< 1 year	0°C ~ 25°C
Cycle Life	0°C, 0.5C / 0.5C	300 Cycle
	25°C, 1.0C / 1.0C	800 Cycle
	45°C, 0.5C / 0.5C	500 Cycle
Storage Humidity	45 ~ 85%RH	
Cell Dimensions	Thickness	8.0mm -0.6/+0.0mm
	Width	60.0mm -2.0/+1.0mm
	Length	155.0mm -1.0/+2.0mm

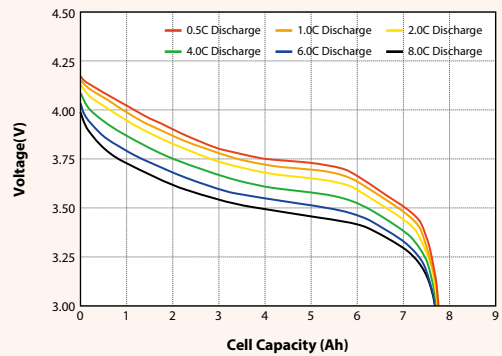
Cell Cycle SPB8060155V1 1C/1C cycle at 25°C

Model : SPB8060155 V1
 Charge : CC-CV 1.0C(7.9A) 4.2V cut off 0.05C at 25°C
 Discharge : CC 1.0C(7.9A) 2.8V cut off at 25°C
 Rest : 10min, Rest each step



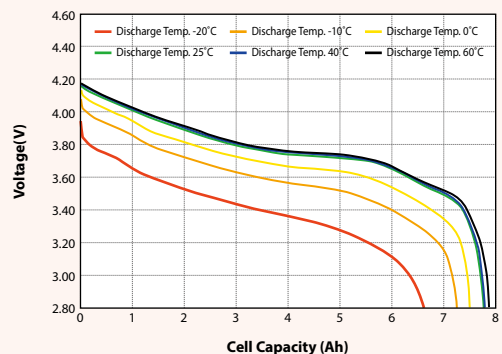
Discharge Rate Capacity SPB8060155V1 Discharge Capability at various Discharge rate

Model : SPB8060155 V1
 Charge : CC-CV, 0.5C 4.2V cut off 0.05C at RT
 Discharge : CC, Each Rate(0.5C, 1.0C, 2.0C, 4.0C, 6.0C, 8.0C) 2.8V cut off at RT



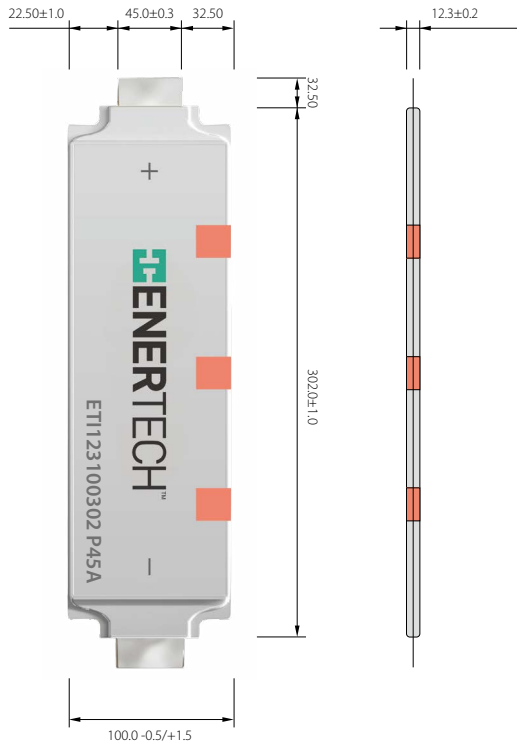
Discharge at Various Temperatures SPB8060155V1 Discharge Capability at various Temperature

Model : SPB8060155 V1
 Charge : CC-CV, 0.5C 4.2V cut off 0.05C at RT ▶ Soak at Each Temp.(-20°C, -10°C, 0°C, 25°C, 40°C, 60°C) ▶ Discharge : CC, 0.5C 2.8V cut off



Power Cell

ETI123100302 P45A

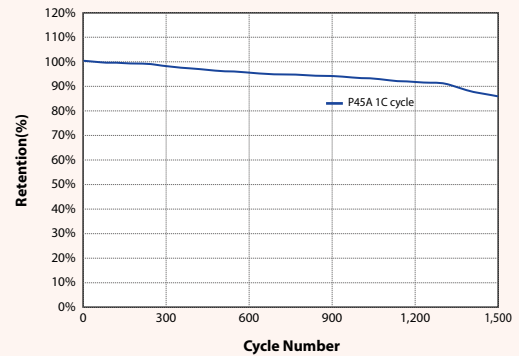


Item		ETI123100302 P45A
Nominal Capacity		45.0 Ah
Energy Density	Volumetric	448 Wh/ℓ
	Gravimetric	203 Wh/kg
Weight		≤ 820 g
Nominal Voltage		3.70 V
Operating Voltage Range	Max.	4.20 V
	Min.	2.70 V
Standard Current	Charge	22.5 A
	Discharge	22.5 A
Maximum Current	Charge	90.0 A
	Discharge	180.0 A
	Peak Discharge	270.0 A (< 10s)
Internal Resistance		< 1.5mΩ
Operating Temperature	Charge	-20°C~60°C -30°C~20°C (At only limited condition)
	Discharge	-20°C~60°C -30°C~20°C (At only limited condition)
	Recommend	25 ± 3°C
Storage Temperature	< 1 month	-40°C ~ 60°C
	< 3 month	-20°C ~ 45°C
	< 1 year	-20°C ~ 25°C
Cycle Life	0°C, 1.0C / 1.0C	400 Cycle
	25°C, 1.0C / 1.0C	1500 Cycle
	45°C, 1.0C / 1.0C	800 Cycle
Storage Humidity		Max. 60%RH
Cell Dimensions	Thickness	12.3mm ± 0.2mm
	Width	100mm-0.5 ± 1.5mm
	Length	302mm ± 1mm

Cell Cycle

ETI123100302 P45A 2.7~4.2V 1C/1C cycle at 25°C

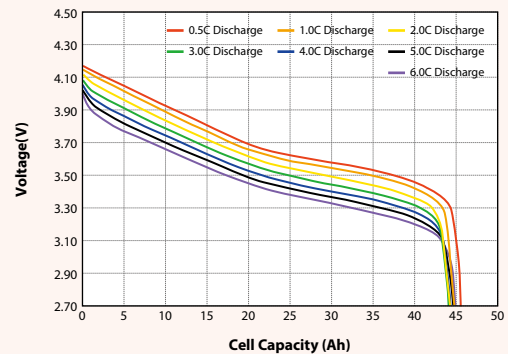
Model : ETI123100302 P45A
 Charge : CC-CV 1.0C(45A) 4.2V cut off 0.05C at 25°C
 Discharge : CC 1.0C(45A) 2.7V cut-off at 25°C
 Rest : 10min. Rest each step



Discharge Rate Capacity

ETI123100302 P45A Discharge Capability at various Discharge Rate

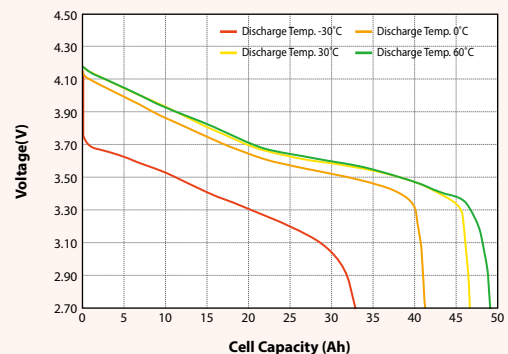
Model : ETI123100302 P45A
 Charge : CC-CV 0.5C 4.2V cut off 0.05C at 25°C
 Discharge : CC, Each rate(0.5C, 1.0C, 2.0C, 3.0C, 4.0C, 5.0C, 6.0C), 2.7V cut off at RT



Discharge at Various Temperatures

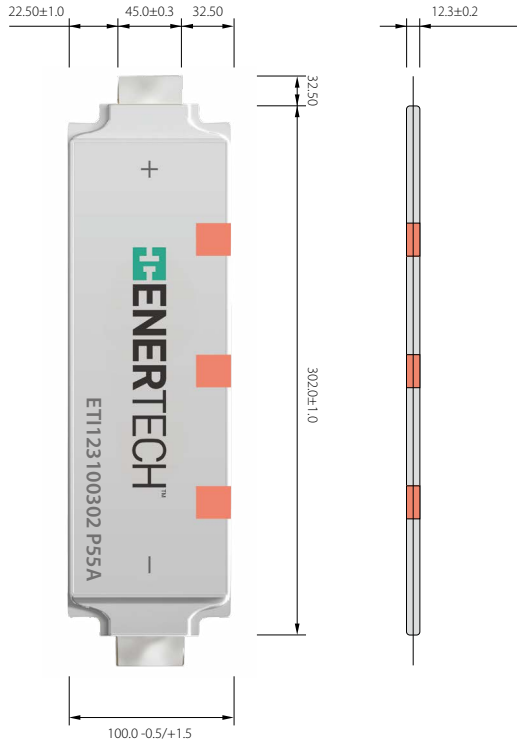
ETI123100302 P45A Discharge Capability at various Temperature

Model : ETI123100302 P45A
 Charge : CC-CV, 0.5C 4.2V cut off 0.05C at RT ▶ Soak at Each Temp.(-30°C, 0°C, 30°C, 60°C) ▶ Discharge : CC 0.5C 2.7V cut off



Power Cell

ETI123100302 P55A

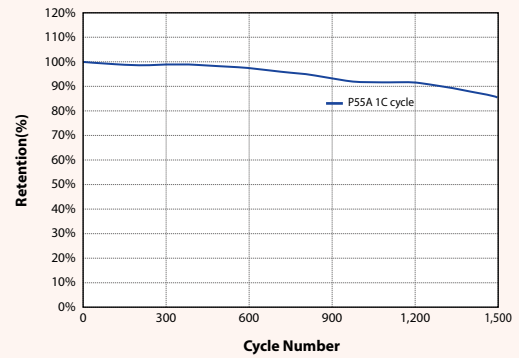


Item		ETI123100302 P55A
Nominal Capacity		55.0 Ah
Energy Density	Volumetric	548 Wh/ℓ
	Gravimetric	248 Wh/kg
Weight		820 g
Nominal Voltage		3.70 V
Operating Voltage Range	Max.	4.20 V
	Min.	2.70 V
Standard Current	Charge	27.5A
	Discharge	27.5A
Maximum Current	Charge	110.0 A
	Discharge	220.0 A
	Peak Discharge	330.0 A (< 10s)
Internal Resistance		< 1.0mΩ
Operating Temperature	Charge	-20°C~60°C -30°C~20°C (At only limited condition)
	Discharge	-20°C~60°C -30°C~20°C (At only limited condition)
	Recommend	25 ± 3°C
Storage Temperature	< 1 month	-40°C ~ 60°C
	< 3 month	0°C ~ 45°C
	< 1 year	-20°C ~ 25°C
Cycle Life	0°C, 1C / 1C	300 Cycle
	25°C, 1C / 1C	1500 Cycle
	45°C, 1C / 1C	400 Cycle
Storage Humidity		Max. 60%RH
Cell Dimensions	Thickness	12.3mm ± 0.2mm
	Width	100mm -0.5/+1.5mm
	Length	302mm ± 1mm

Cell Cycle

ETI123100302 P55A 2.7~4.2V 1C/1C cycle at 25°C

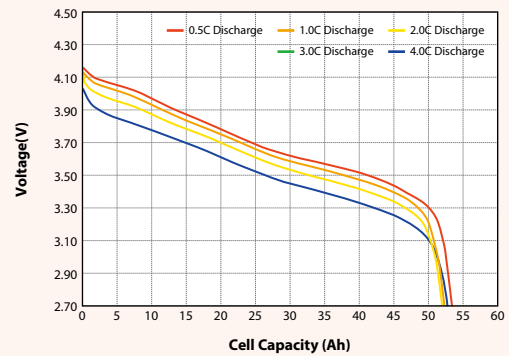
Model : ETI123100302 P55A
 Charge : CC-CV, 1.0C(55A) 4.2V cut off 0.05C at 25°C
 Discharge : CC 1.0C(55A) 2.7V cut-off at 25°C
 Rest : 10min. Rest each step



Discharge Rate Capacity

ETI123100302 P55A Rate Capability at Various Discharge Rate

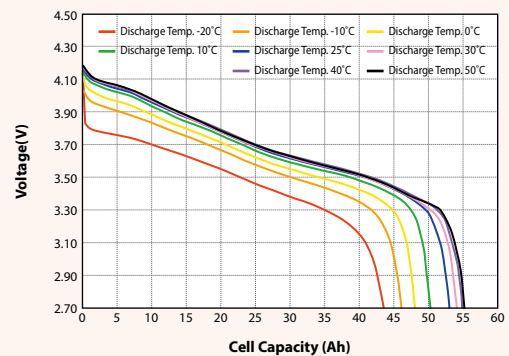
Model : ETI123100302 P55A
 Charge : CC-CV, 0.5C 4.2V cut off 0.05C at RT
 Discharge : CC Each Rate(0.5C, 1.0C, 2.0C, 3.0C, 4.0C) 2.7V cut-off at RT



Discharge at Various Temperatures

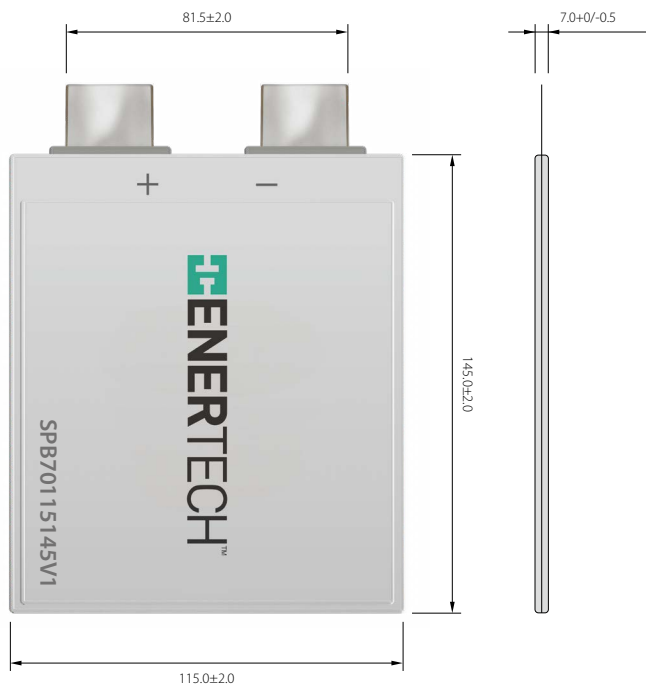
ETI123100302 P55A Discharge Capability at Various Temperature

Model : ETI123100302 P55A
 Charge : CC-CV, 0.5C 4.2V cut off 0.05C at RT ▶ Soak at Each Temp.(-20°C, -10°C, 0°C, 10°C, 25°C, 30°C, 40°C, 50°C) ▶ Discharge : CC 0.5C 2.7V cut off



Energy Cell

SPB70115145V1

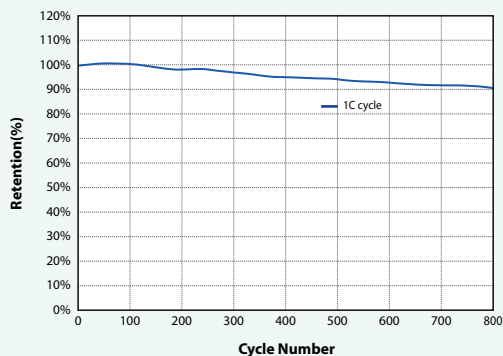


Item		SPB70115145V1
Nominal Capacity		12.0 Ah
Energy Density	Volumetric	380 Wh/ℓ
	Gravimetric	185 Wh/kg
Weight		≤ 240 g
Nominal Voltage		3.70 V
Operating Voltage Range	Max.	4.20 V
	Min.	3.00 V
Standard Current	Charge	6.0 A
	Discharge	6.0 A
Maximum Current	Charge	12.0 A
	Discharge	24.0 A
	Peak Discharge	-
Internal Resistance		< 3.0mΩ
Operating Temperature	Charge	0°C ~ 45°C
	Discharge	-20°C ~ 55°C
	Recommend	25 ± 3°C
Storage Temperature	< 1 month	-20°C ~ 55°C
	< 3 month	0°C ~ 45°C
	< 1 year	0°C ~ 25°C
Cycle Life	0°C, 0.5C / 0.5C	300 Cycle
	25°C, 1.0C / 1.0C	800 Cycle
	45°C, 0.5C / 0.5C	500 Cycle
Storage Humidity		45 ~ 85%RH
Cell Dimensions	Thickness	7.0mm +0.0/- 0.5mm
	Width	115mm ± 2mm
	Length	145mm± 2mm

Cell Cycle

SPB70115145V1 1C/1C cycle at 25°C

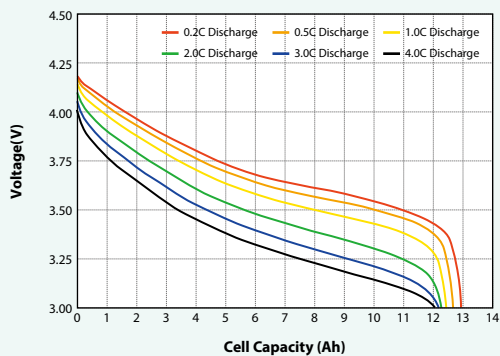
Model : SPB70115145 V1
Charge : CC-CV 1.0C(12.0A) 4.2V cut off 0.05C at 25°C
Discharge : CC 1.0C(12.0A) 3.0V cut off at 25°C



Discharge Rate Capacity

SPB70115145V1 Discharge Capability at various Discharge rate

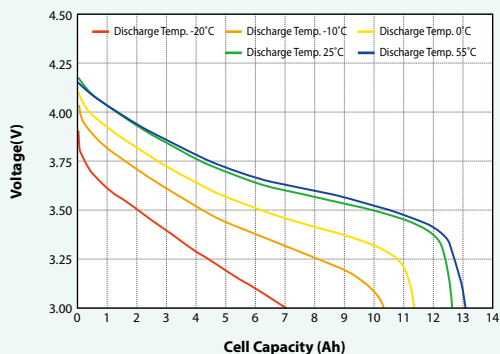
Model : SPB70115145 V1
Charge : CC-CV, 0.5C 4.2V cut off 0.05C at RT
Discharge : CC, Each Rate(0.5C, 1.0C, 2.0C, 3.0C, 4.0C, 5.0C) 3.0V cut off at RT



Discharge at Various Temperatures

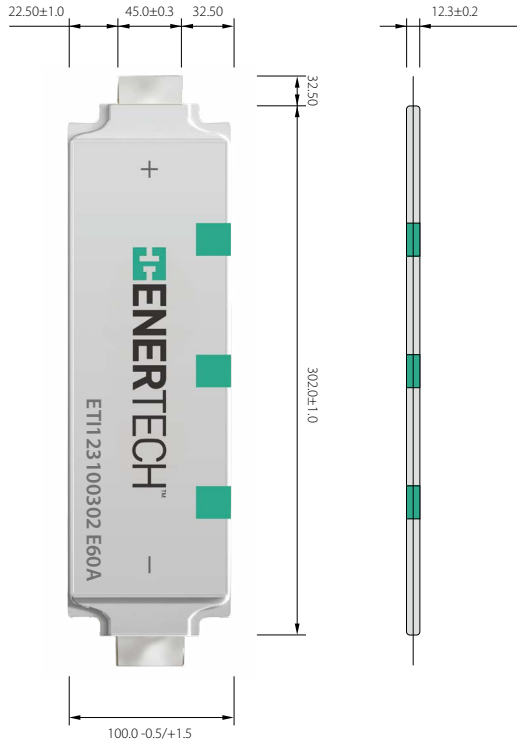
SPB70115145V1 Discharge Capability at various Temperature

Model : SPB70115145 V1
Charge : CC-CV, 0.5C 4.2V cut off 0.05C at RT ▶ Soak at Each Temp.(-20°C, -10°C, 0°C, 10°C, 25°C, 30°C, 40°C, 50°C) ▶ Discharge : CC, 0.5C 3.0V cut off



Energy Cell

ETI123100302 E60A

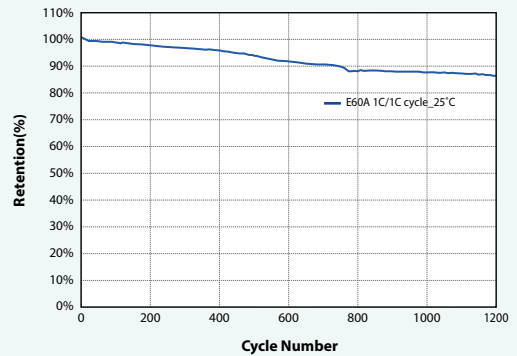


Item		ETI123100302 E60A
Nominal Capacity		60.0 Ah
Energy Density	Volumetric	598 Wh/ℓ
	Gravimetric	262Wh/kg
Weight		845.0g +5g / -20g
Nominal Voltage		3.70 V
Operating Voltage Range	Max.	4.20 V
	Min.	2.70 V
Standard Current	Charge	0.3C(18.0A)
	Discharge	0.3C(18.0A)
Maximum Current	Charge	1.5C(90.0A)
	Discharge	2.0C(120.0A)
	Peak Discharge	3.0C(180.0A) (< 60s)
Internal Resistance		< 1.5mΩ
Operating Temperature	Charge	-20°C~60°C -30°C~20°C (At only limited condition)
	Discharge	-20°C~60°C -30°C~20°C (At only limited condition)
	Recommend	25 ± 3°C
Storage Temperature	< 1 month	-40°C ~ 60°C
	< 3 month	0°C ~ 45°C
	< 1 year	0°C ~ 25°C
Cycle Life	0°C, 0.5C / 0.5C	700 Cycle
	25°C, 1.0C / 1.0C	1200 Cycle
	45°C, 1.0C / 1.0C	400 Cycle
Storage Humidity		Max. 60%RH
Cell Dimensions	Thickness	12.3mm ± 0.2mm
	Width	100mm-0.5 ± 1.5mm
	Length	302mm ± 1mm

Cell Cycle

ETI123100302 E60A 2.7~4.2V 1C/1C Cycle at 25°C

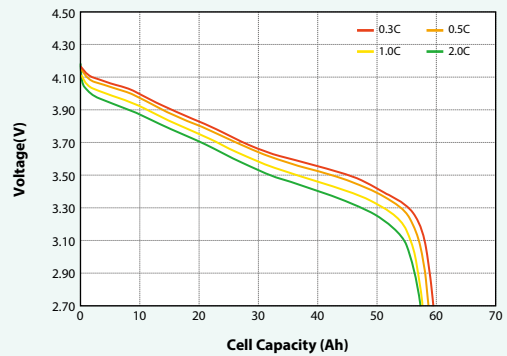
Model : ETI123100302 E60A
 Charge : CC-CV, 1.0C(60A) 4.2V cut off 0.05C at 25°C
 Discharge : CC 1.0C(60A) 2.7V cut-off at 25°C
 Rest : 10min. Rest each step



Discharge Rate Capacity

ETI123100302 E60A Rate Capability at various Discharge rate

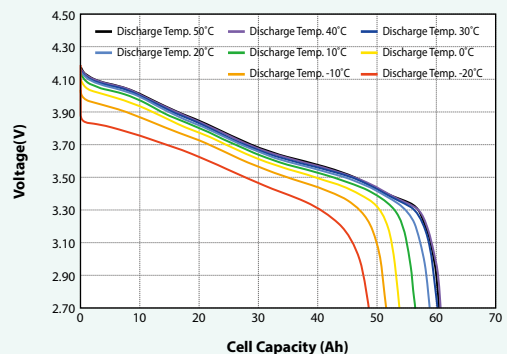
Model : ETI123100302 E60A
 Charge : CC-CV, 0.3C 4.2V cut-off 0.05C at 25°C
 Discharge : CC, Each Rate(0.3C, 0.5C, 1.0C, 2.0C) 2.7V cut-off at 25°C



Discharge at Various Temperatures

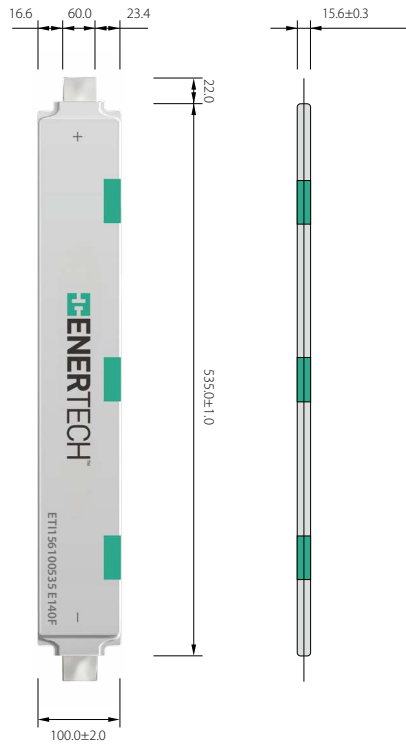
ETI123100302 E60A Discharge Capability at various Temperature

Model : ETI123100302 E60A
 Charge : CC-CV, 0.3C 4.2V cut-off 0.05C at RT ▶ Soak at Each Temp.(-20°C, -10°C, 0°C, 10°C, 20°C, 30°C, 40°C, 50°C) ▶ Discharge : CC 0.3C 2.7V cut-off



Energy Cell

ETI156100535 E140F

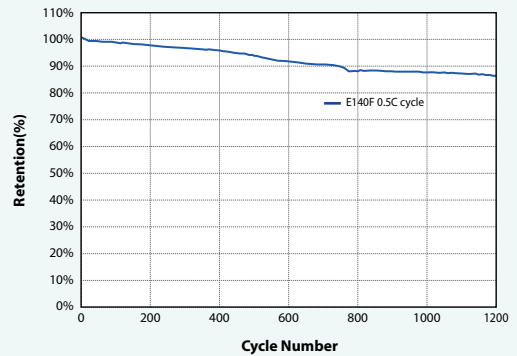


Item		ETI156100535 E140F
Nominal Capacity		135.0 Ah
Energy Density	Volumetric	598 Wh/ℓ
	Gravimetric	262 Wh/kg
Weight		≤ 1900 g
Nominal Voltage		3.70 V
Operating Voltage Range	Max.	4.20 V
	Min.	2.70 V
Standard Current	Charge	40.5 A
	Discharge	40.5 A
Maximum Current	Charge	135.0 A
	Discharge	202.5 A
	Peak Discharge	270.0 A (< 10s)
Internal Resistance		< 2.0mΩ
Operating Temperature	Charge	0°C~55°C -10°C~0°C (At only limited condition)
	Discharge	-20°C~50°C -30°C~20°C (At only limited condition)
	Recommend	25 ± 3°C
Storage Temperature	< 1 month	-20°C ~ 55°C
	< 3 month	-20°C ~ 45°C
	< 1 year	-20°C ~ 25°C
Cycle Life	0°C, 0.5C / 0.5C	400 cycle
	25°C, 0.5C / 0.5C	1,000 cycle
	45°C, 0.5C / 0.5C	300 cycle
Storage Humidity		Max. 60%RH
Cell Dimensions	Thickness	15.6mm ± 0.3mm
	Width	100mm ± 2mm
	Length	535mm ± 1mm

Cell Cycle

ETI156100535 E140F 2.7V~4.2V 0.5C/0.5C cycle at 25°C

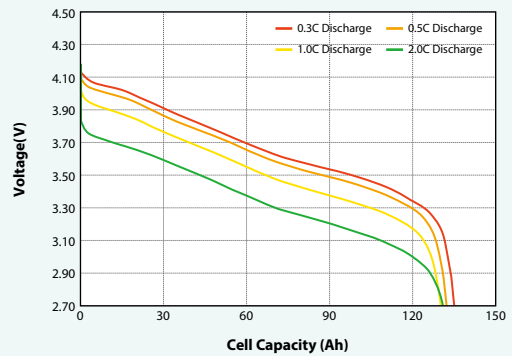
Model : ETI156100535 E140F
 Charge : CC-CV, 0.5C(67.5A) 4.2V cut off 0.05C at RT
 Discharge : CC, 0.5C(67.5A) 2.7V cut-off at RT
 Rest : 10min. Rest each step



Discharge Rate Capacity

ETI156100535 E140F Rate Capability at various Discharge Rate

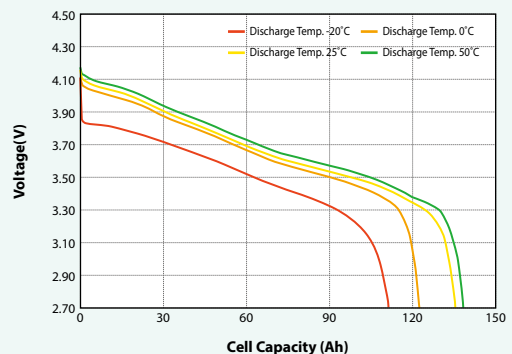
Model : ETI156100535 E140F
 Charge : CC-CV, 0.3C 4.2V cut-off 0.05C at RT
 Discharge : CC, Each Rate(0.3C, 0.5C, 1.0C, 2.0C) 2.7V cut-off at RT



Discharge at Various Temperatures

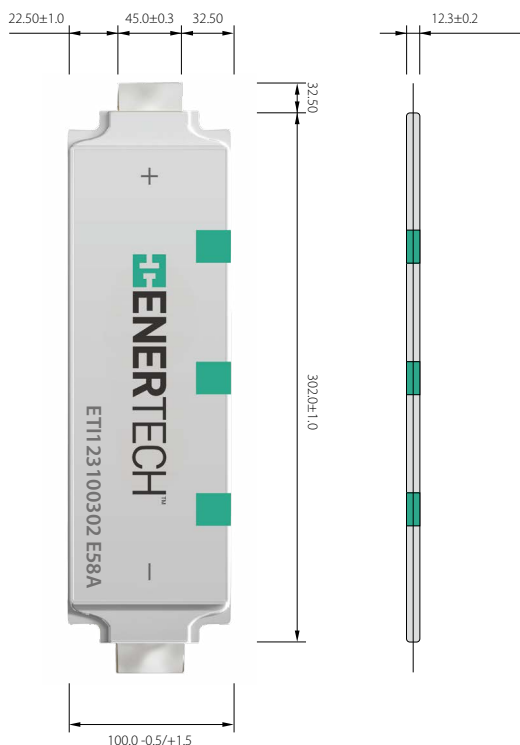
ETI156100535 E140F Discharge Capability at various Temperature

Model : ETI156100535 E140F
 Charge : CC-CV, 0.3C 4.2V cut-off 0.05C at RT ▶ Soak at Each temp.(-20°C, 0°C, 25°C, 50°C) ▶ Discharge : CC 0.3C 2.7V cut-off



Energy Cell

ETI123100302 E58A

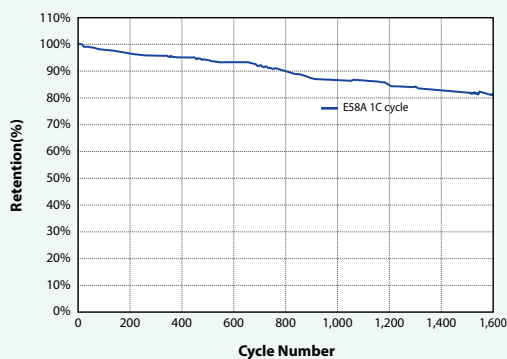


Item		ETI123100302 E58A
Nominal Capacity		58.0 Ah
Energy Density	Volumetric	594 Wh/ℓ
	Gravimetric	259 Wh/kg
Weight		≤ 870 g
Nominal Voltage		3.77 V
Operating Voltage Range	Max.	4.35 V
	Min.	2.70 V
Standard Current	Charge	17.4A
	Discharge	17.4A
Maximum Current	Charge	87.0 A
	Discharge	116.0 A
	Peak Discharge	174.0 A (< 10s)
Internal Resistance		< 1.5mΩ
Operating Temperature	Charge	-20°C~60°C -30°C~20°C (At only limited condition)
	Discharge	-20°C~60°C -30°C~20°C (At only limited condition)
	Recommend	25 ± 3°C
Storage Temperature	< 1 month	-40°C ~ 60°C
	< 3 month	-20°C ~ 45°C
	< 1 year	-20°C ~ 25°C
Cycle Life	0°C, 1.0C / 1.0C	250 Cycle
	25°C, 1.0C / 1.0C	1600 Cycle
	45°C, 1.0C / 1.0C	400 Cycle
Storage Humidity		Max. 60%RH
Cell Dimensions	Thickness	12.3mm ± 0.2mm
	Width	100mm-0.5 ± 1.5mm
	Length	302mm ± 1mm

Cell Cycle

ETI123100302 E58A 2.7 ~ 4.35V 1C/1C Cycle at 25°C

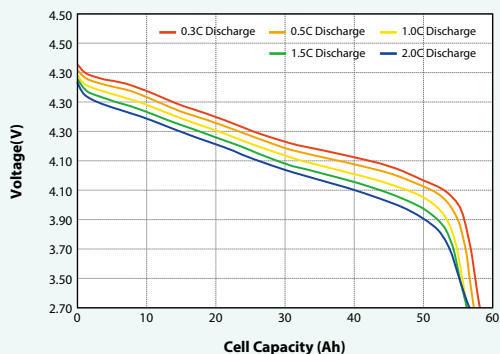
Model : ETI123100302 E58A
 Charge : CC-CV, 1.0C(58A) 4.35V cut off 0.05C at 25°C
 Discharge : CC 1.0C(58A) 2.7V cut-off at 25°C
 Rest : 10min. Rest each step



Discharge Rate Capacity

ETI123100302 E58A Rate Capability at various Discharge rate

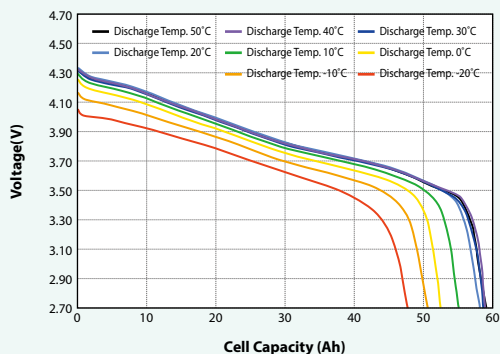
Model : ETI123100302 E58A
 Charge : CC-CV, 0.5C 4.35V cut-off 0.05C at RT
 Discharge : CC, Each Rate(0.3C, 0.5C, 1.0C, 1.5C, 2.0C) 2.7V cut-off at RT



Discharge at Various Temperatures

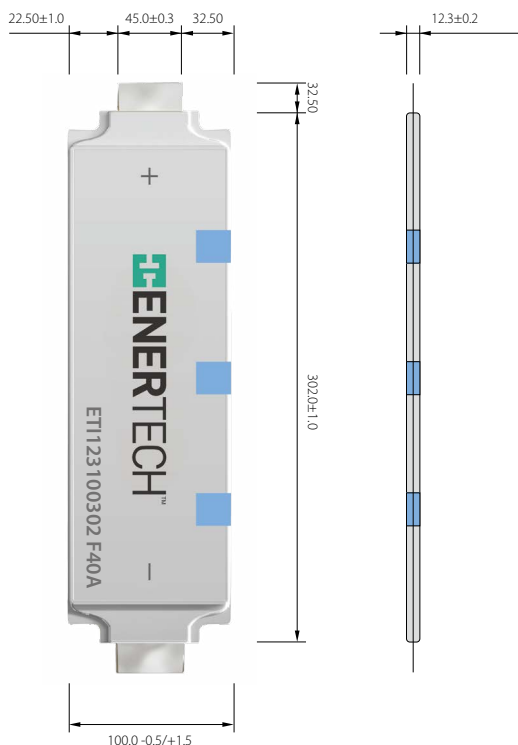
ETI123100302 E58A Discharge Capability at various Temperature

Model : ETI123100302 E58A
 Charge : CC-CV, 0.5C 4.35V cut-off 0.05C at RT ▶ Soak at Each Temp.(-20°C, -10°C, 0°C, 10°C, 20°C, 30°C, 40°C, 50°C) ▶ Discharge : CC 0.5C 2.7V cut-off



LFP Cell

ETI123100302 F40A

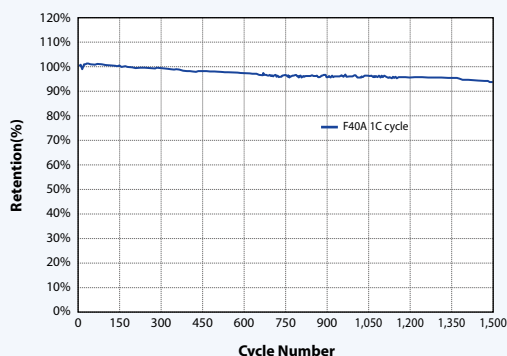


Item		ETI123100302 F40A
Nominal Capacity		40.0 Ah
Energy Density	Volumetric	344 Wh/ℓ
	Gravimetric	160 Wh/kg
Weight		≤ 800 g
Nominal Voltage		3.20 V
Operating Voltage Range	Max.	3.65 V
	Min.	2.50 V
Standard Current	Charge	12.0 A
	Discharge	12.0 A
Maximum Current	Charge	40.0 A
	Discharge	120.0 A
	Peak Discharge	200.0A (< 10s)
Internal Resistance		< 2.0mΩ
Operating Temperature	Charge	0°C ~ 60°C
	Discharge	-20°C~60°C
	Recommend	25 ± 3°C
Storage Temperature	< 1 month	-40°C ~ 60°C
	< 3 month	-20°C ~ 45°C
	< 1 year	-20°C ~ 25°C
Cycle Life	0°C, 1.0C / 1.0C	300 Cycle
	25°C, 1.0C / 1.0C	1500 Cycle
	45°C, 1.0C / 1.0C	500 Cycle
Storage Humidity		Max. 60%RH
Cell Dimensions	Thickness	12.3mm ± 0.2mm
	Width	100mm-0.5 ± 1.5mm
	Length	302mm ± 1mm

Cell Cycle

ETI123100302 F40A 2.5~3.65V 1C/1C Cycle at 25°C

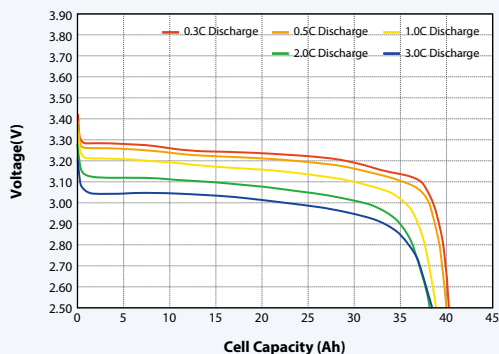
Model : ETI123100302 F40A
 Charge : CC-CV, 1.0C(40A) 3.65V cut off 0.05C at 25°C
 Discharge : CC 1.0C(40A) 2.5V cut-off at 25°C
 Rest : 10min. Rest each step



Discharge Rate Capacity

ETI123100302 F40A Discharge Capability at Various Discharge Rate

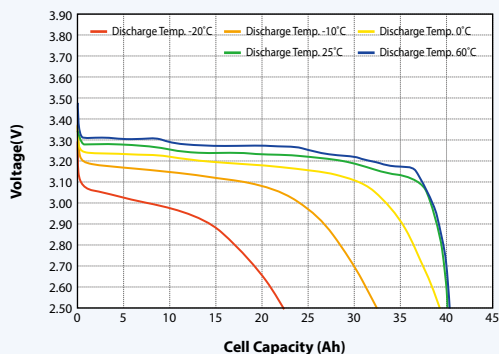
Model : ETI123100302 F40A
 Charge : CC-CV, 0.3C 3.65V cut off 0.05C at RT
 Discharge : CC Each Rate(0.3C, 0.5C, 1.0C, 2.0C, 3.0C) 2.5V at RT



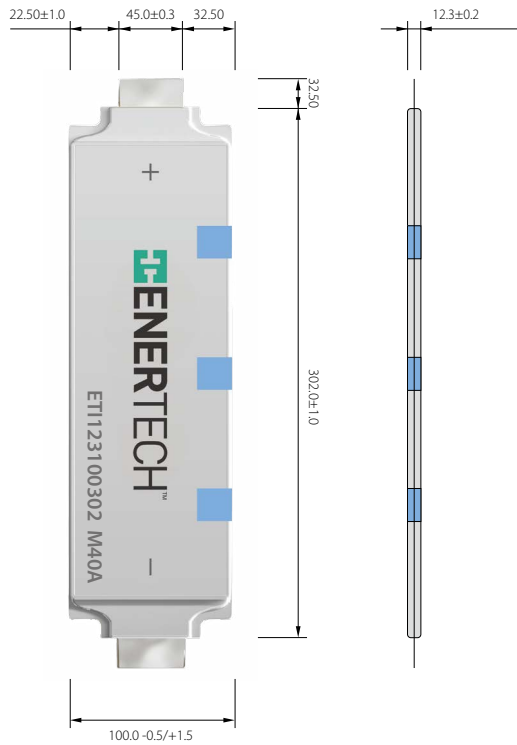
Discharge at Various Temperatures

ETI123100302 F40A Discharge Capability at Various Temperature

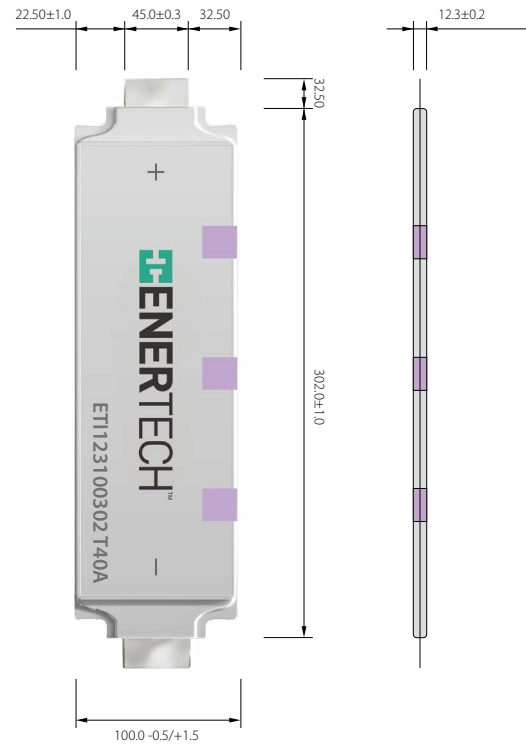
Model : ETI123100302 F40A
 Charge : CC-CV, 0.3C 3.65V cut off 0.05C at RT ▶ Soak at Each Temp.(-20°C, -10°C, 0°C, 25°C, 60°C) ▶ Discharge : CC 0.3C 2.5V cut off



LFP Cell ETI123100302 M40A



LTO Cell ETI123100302 T40A



Item		ETI123100302 M40A
Nominal Capacity		40.0 Ah
Energy Density	Volumetric	398 Wh/ℓ
	Gravimetric	185 Wh/kg
Weight		≤ 800 g
Nominal Voltage		3.70 V
Operating Voltage Range	Max.	4.20 V
	Min.	2.50 V
Standard Current	Charge	12.0 A
	Discharge	12.0 A
Maximum Current	Charge	40.0 A
	Discharge	120.0 A
	Peak Discharge	200.0A (< 10s)
Internal Resistance		< 1.5mΩ
Operating Temperature	Charge	0°C ~ 60°C
	Discharge	-20°C~60°C -30°C~20°C (At only limited condition)
	Recommend	25 ± 3°C
Storage Temperature	< 1 month	-40°C ~ 60°C
	< 3 month	-20°C ~ 45°C
	< 1 year	-20°C ~ 25°C
Cycle Life	0°C, 0.5C / 0.5C	300 Cycle
	25°C, 0.5C / 0.5C	1200 Cycle
	45°C, 0.5C / 0.5C	500 Cycle
Storage Humidity		Max. 60%RH
Cell Dimensions	Thickness	12.3mm ± 0.2mm
	Width	100mm-0.5 ± 1.5mm
	Length	302mm ± 1mm

*DEVELOPMENT ON PROGRESS **Available by the end of 2025

Item		ETI123100302 T40A
Nominal Capacity		40.0 Ah
Energy Density	Volumetric	245 Wh/ℓ
	Gravimetric	100 Wh/kg
Weight		≤ 920 g
Nominal Voltage		2.30 V
Operating Voltage Range	Max.	3.00 V
	Min.	1.50 V
Standard Current	Charge	20.0 A
	Discharge	20.0 A
Maximum Current	Charge	160.0 A
	Discharge	240.0 A
	Peak Discharge	400.0A (< 10s)
Internal Resistance		< 2.0mΩ
Operating Temperature	Charge	-20°C~60°C -30°C~20°C (At only limited condition)
	Discharge	-20°C~60°C -30°C~20°C (At only limited condition)
	Recommend	25 ± 3°C
Storage Temperature	< 1 month	-40°C ~ 60°C
	< 3 month	-20°C ~ 45°C
	< 1 year	-20°C ~ 25°C
Cycle Life	0°C, 4.0C / 4.0C	2000 Cycle
	25°C, 4.0C / 4.0C	10000 Cycle
	45°C, 4.0C / 4.0C	3000 Cycle
Storage Humidity		Max. 60%RH
Cell Dimensions	Thickness	12.3mm ± 0.2mm
	Width	100mm-0.5 ± 1.5mm
	Length	302mm ± 1mm

*DEVELOPMENT ON PROGRESS **Available by the end of 2025

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