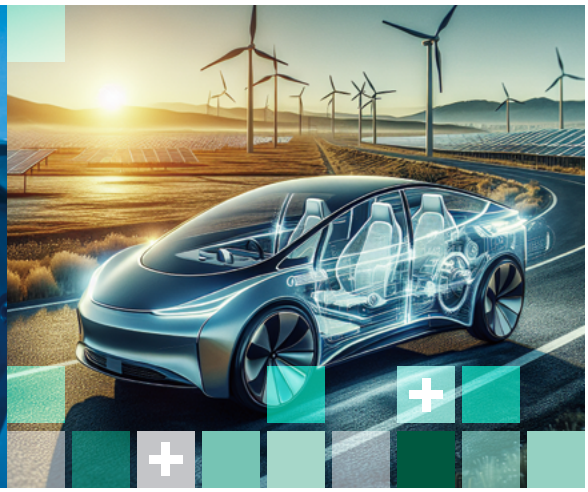
# ENERTECH™

*Lithium-Ion Battery Solution Provider*



# HISTORY

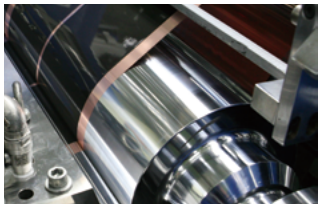
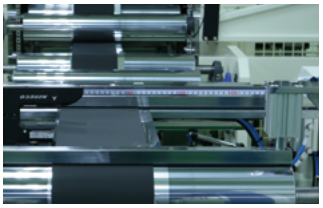
Established April 1st, 2001
Location Chung-ju Factory
Products Customized Electrodes, Li-Ion Cells, Packs

*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)<br>Signed up 6-Giga Factory feasibility contract in South Africa<br>P55A (HEV) cell development complete |
| 2023 | E60A cell and module mass production commence<br>Automated module MFG facility_1GWh/year<br>Narrow Type Cell Line SOP |
| 2022 | Executed contract for license of silicon andoe material (Enevate) ▶ E-Bike market<br>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<br>Co-developing HEV and EV cells with Hyundai Motors' R&D situated in Namyang, Kyeongi-do |
| 2019 | Accumulated cell-equivalent production reached 40M<br>Supplied ESS for various application<br>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<br>(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)<br>ISO9001, 14001, TS16949 certified |
| 2010 | Started operating automated manufacturing line for large format cell<br>(Capacity : 120K cells/month, 150MWh) |
| 2008 | Company's name has been changed to EnerTech International, Inc.<br>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<br>Supplied LIPB batteries for KCTC Project of Ministry of Defense<br>USPTO patent registered on manufacturing Lithium Polymer Sceondary 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<br>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

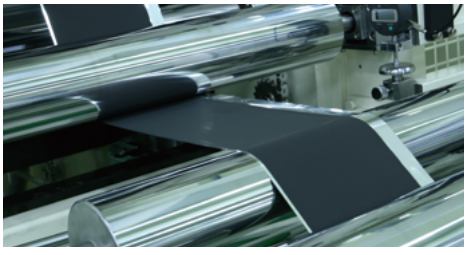
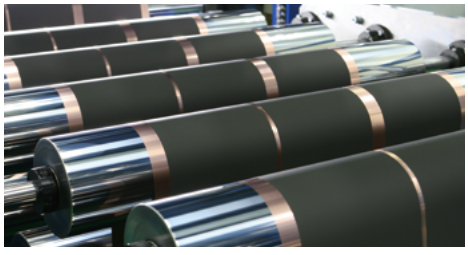
OVER **20** YEARS
EnerTech International has more than 20 years of experience in coating and pressing active materials since its establishment in 2001

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**

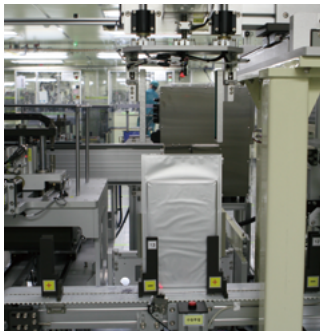
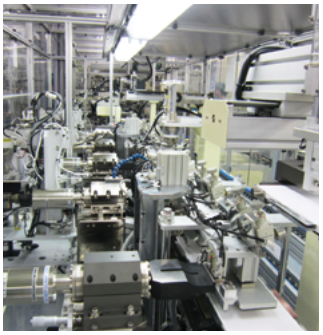
| Electrode | | Coating | | Press |
|---|---|---|---|---|
| | | Continuous | Intermittent | |
| Dimension | Width | 10~680mm | 10~680mm | 10~680mm |
| | Length | 3,500m | Coating: 50mm~ ∞<br>Non-C: 20~100mm | Max. 1,500m |
| | Thickness | 15~300㎛ | 15~300㎛ | 15~300㎛ |
| | Loading Density | 10~50mg/㎠ | 10~50mg/㎠ | 10~50mg/㎠ |
| | Tolerance | ±2mg/㎠ | ±2mg/㎠ | ±3㎛ |
| Current Collector | Thickness | Al: 10~50㎛, Cu: 6~25㎛ | | |
| | Diameter(mm) | Ø 172~1000/Roll | Ø 172~1000/Roll | Ø 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.*

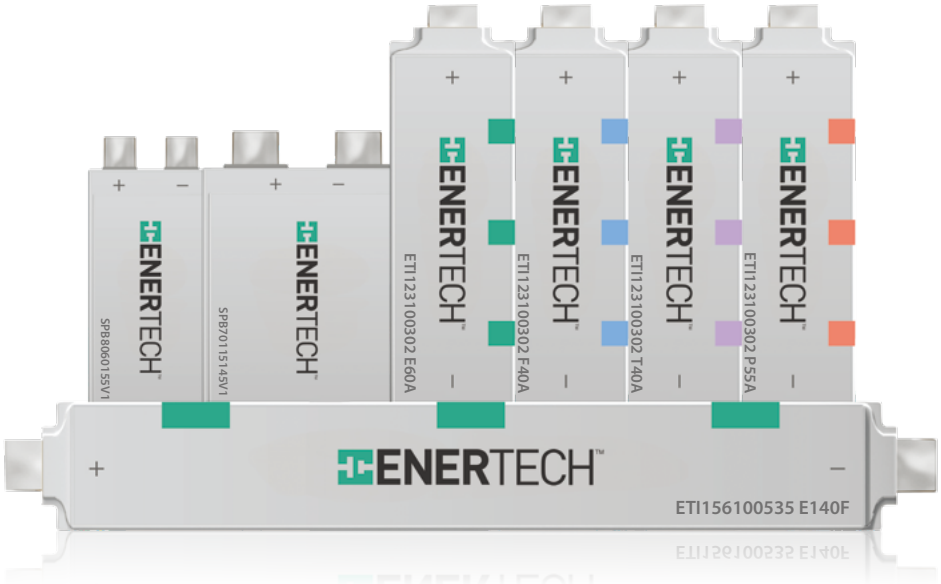



OVER
**20** YEARS
Company has more than 20 years of experience in high volume production of Lithium ion Cells

MAX.
**140** Ah
Company has more than 20 years of experience in high volume production of Lithium ion Cells

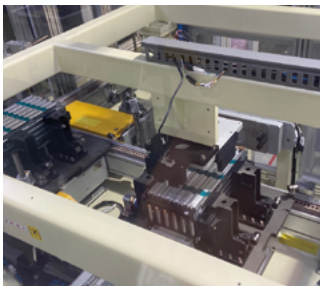
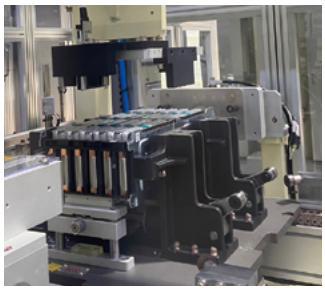
MAX.
**25** C-RATE
For RC Application and High Drain Purpose

- 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(E60A 4S3P)

**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** : ETI123100302 E60A
**Cell Configuration : 4S3P**

## NE1200-025(E60A 6S2P)

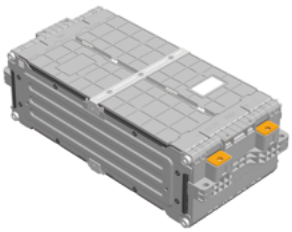
**Nominal Voltage(V) : 22.2V**
**Capacity(Ah) : 120Ah**
**Chemistry** : NCM Energy Cell
**Dimension(mm)** : (L)360.0 (W)165.0 (H)109.5
**Weight(kg)** : 12.2kg
**Temperature** : Charge (-20~60°C)
Discharge (-20~60°C)
Storage (0 to 25 ≤1year)
**Cell Spec** : ETI123100302 E60A
**Cell Configuration : 6S2P**

## NP550-050(P55A 12S1P)

**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** : ETI123100302 P55A
**Cell Configuration : 12S1P**

## NF1200-015(F40A 4S3P)

**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** : ETI123100302 F40A
**Cell Configuration : 4S3P**

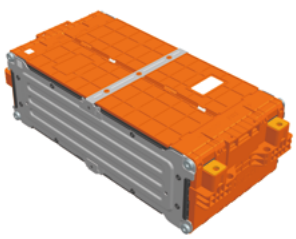


## NE1400-025(E70A 6S2P)

**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** : ETI123100302 E70A
**Cell Configuration : 6S2P**

## NE750-050(E75A 12S1P)

**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** : ETI123100302 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℃

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

### NE1800-403DH

**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 and Electrical heater
**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

# VIRTUAL POWER PLANT

** ESS remote monitoring & Control system

## SBMS - Web UI

- STORE BATTERY DATA FROM OPC-UA SERVER TO DISPLAY ON THE WEB OR TO STORE IN DB
- DATA STORED IN THE DB IS NECESSARY TO REPRESENT DATA FOR A SPECIFIC PERIOD OF TIME
- BANK CONTIANER AND BATTERY RACK DATA ARE IT

## PMS - Web UI

- STORE BATTERY DATA FROM OPC-UA SERVER TO DISPLAY ON THE WEB OR TO STORE IN DB
- DATA STORED IN THE DB IS NECESSARY TO REPRESENT DATA FOR A SPECIFIC PERIOD OF TIME
- POWER RELATED DATA SUCH PCS DATA, HVAC DATA AND PVB DATA ARE IT

# R&D CENTER TESTING SERVICE

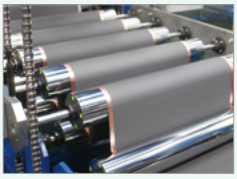
## HOW WE CAN HELP

*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)

ENERTECH™

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 | • Temp Rate Capability<br>• HPPC<br>• OCV Data<br>• Temp Rate Cycle life | • Temp : 0°C, 25°C, 45°C<br>Charge, Discharge : Requirement<br>• Cycle life : over 1,000cycle |
| | Long Term Test | | |
| Module Evaluation | BMA Performance | • Temp Rate Capability<br>• Heat Generation | • Temp : 0°C, 25°C, 45°C<br>Charge, Discharge : Requirement |
| Pack Evaluation | BSA Performance | • Temp Rate Capability<br>• Cooling performance<br>• Profile | • Temp : 0°C, 25°C, 45°C<br>Charge, Discharge : Requirement<br>• Driving Data(Power/Time) |
| BMS Validation | BMS | • Protection<br>• SOC, SOH Accuracy | • Protection operation<br>• Temp : 0°C, 25°C, 45°C<br>Charge, Discharge : Requirement |
| Reuse Evaluation | Reuse | • DCIR, SOH | • Temp : 0°C, 25°C, 45°C<br>Charge, Discharge : Requirement<br>• DCIR calculation |
| Small Pack/Module/DOT | UN38.3 Test | • UNDOT | • T1~T8<br>Altitude Simulation,<br>Thermal, Humidity, Vibration, Shock Test<br>External Short Circuit, Crush<br>Forced Discharge, Cold Plate |
| Reliability Test | Reuse | • Environment Test<br>• Machinery Test<br>• Safety Test | |

## Sample Production Equipment

| Item | Availability | Test Items | Test Condition |
|---|---|---|---|
| Sample Production | Electrode, Cell, Module & Battery System | • Anode / Cathode Slurry Fabrication<br>• Sample Electrode Coating / Drying / Pressing | • Volume : 50L |
| Electrode Evaluation | Performance Test | • Performance<br>• Capacity | • Temp : 25℃, Charge : 0.2C, Discharge : 0.2C |
| Cell Evaluation | Short Term Test | • Temp Rate Capability<br>• HPPC<br>• Temp Rate cycle life | • Temp : 0℃, 25℃, 45℃ Charge, Discharge : Requirement<br>• Cycle life : over 1,000cycle |
| | Long Term Test | | |

R&D Mixer

R&D Coater

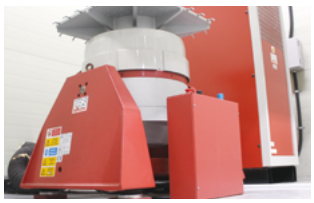
Pressing Machine

Blanking Machine

## Testing Equipment

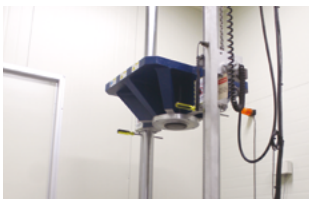
| Item | Availability | Test Items | Test Condition |
|---|---|---|---|
| Performance Test | Li-ion Polymer Cell | • Rate Capability / Cycle Life | • Voltage:5V~48V |
| | Module | • Module Validation | • Ampere: Min. 25A ~ Max. 500A |
| | BSA | • Charge & Discharge | 1000V / 1000A / 1CH |
| Environment Test | Cell | • Li-ion Polymer Cell Performance | • Voltage : 5V<br>• Ampere : Min. 25A ~ Max. 500A<br>• Temp Range : -40~150℃ |
| | Module | • Module Performance<br>• Impact Performance | • Voltage : 48V<br>• Ampere : Min. 60A ~ Max. 100A<br>• Temp Range : -70~150℃<br>• Max Acceleration : 600gn<br>• Max Velocity change : 7.3m/sec<br>• Max Payload : 227kg |
| | BMA & BSA | • Temperature / Humidity<br>• Cold Plate | • Temp : -60℃ ~ 150℃<br>• Humidity Range : 30~95%<br>• Max Force : 2,000Kgf<br>• Max Acceleration : 100gn<br>• Max Velocity Change : 2.0m/s<br>• Max Payload : 300kg |
| Machinery Test | Cell | • Vibration<br>• Shock | • Temp : 0℃, 25℃, 45℃ Charge, Discharge : Requirement<br>• Cycle life : over 1,000cycle |
| | BMA & BSA | | |

Work-in Chamber



Vibration Tester

Cell Cycler



Shock Tester

# 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

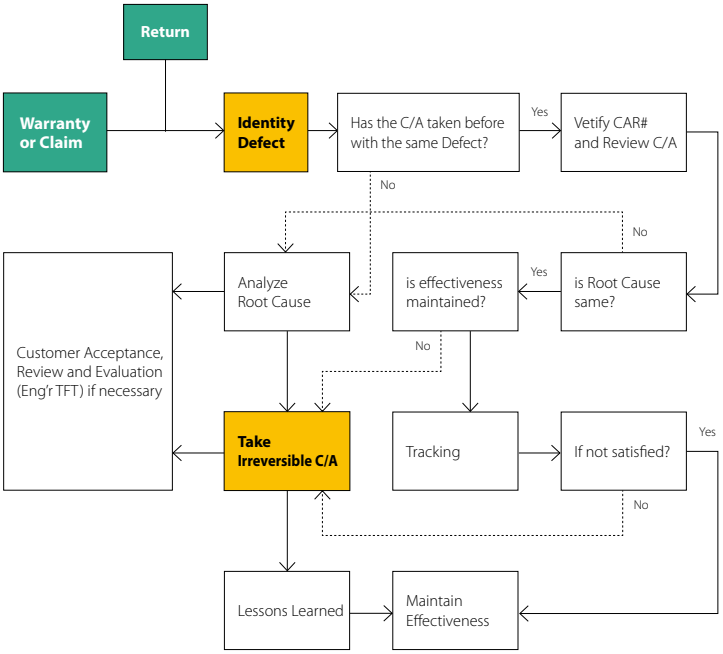
ISO 14001:2015

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 | 548 Wh/ℓ |
| | Gravimetric | 191 Wh/kg | 203 Wh/kg | 248 Wh/kg |
| Weight | | 150 ±3.0 g | ≤ 820 g | ≤ 820 g |
| Nominal Voltage | | 3.70V | 3.70V | 3.70 V |
| Operating Voltage Range | Max. | 4.20 V | 4.20 V | 4.20 V |
| | Min. | 2.80 V | 2.70 V | 2.70 V |
| Standard Current | Charge | 3.95 A | 22.5 A | 27.5 A |
| | Discharge | 3.95 A | 22.5 A | 27.5 A |
| Maximum Current | Charge | 15.8 A | 90.0 A | 110.0 A |
| | Discharge | 63.2 A | 180.0 A | 220.0 A |
| | Peak Discharge | - | 270.0 A (< 10s) | 330.0 A (< 10s) |
| Internal Resistance | | < 3.0mΩ | < 1.5mΩ | < 1.0mΩ |
| Operating Temperature | Charge | 0℃ ~ 45℃ | -20℃ ~ 60℃ | -20℃ ~ 60℃ |
| | Discharge | -20℃ ~ 55℃ | -20℃ ~ 60℃ | -20℃ ~ 60℃ |
| | Recommend | 25 ± 3℃ | 25 ± 3℃ | 25 ± 3℃ |
| Storage Temperature | < 1 month | -20℃ ~ 55℃ | -40℃ ~ 60℃ | -40℃ ~ 60℃ |
| | < 3 month | 0℃ ~ 45℃ | -20℃ ~ 45℃ | 0℃ ~ 45℃ |
| | < 1 year | 0℃ ~ 25℃ | -20℃ ~ 25℃ | 0℃ ~ 25℃ |
| Cycle Life | 0℃ | 300 Cycle | 400 Cycle | 300 Cycle |
| | 25℃ | 800 Cycle | 1,500 Cycle | 1,500 Cycle |
| | 45℃ | 500 Cycle | 800 Cycle | 400 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 | 12.3mm ± 0.2mm |
| | Width | 60.0mm -2.0/+1.0mm | 100mm -0.5/+1.5mm | 100mm -0.5/+1.5mm |
| | Length | 155.0mm -1.0/+2.0mm | 302mm ± 1mm | 302mm ± 1mm |
| Technical Data | | | | |

## Energy Cell

| Item | | SPB70115145V1 | ETI123100302 E60A | ETI156100535 E140F | ETI123100302 E58A | ETI123100302 E70A | ETI123100302 E75A |
|---|---|---|---|---|---|---|---|
| Nominal Capacity | | 12.0 Ah | 60.0 Ah | 135.0 Ah | 58.0 Ah | 70.0 Ah | 75.0 Ah |
| Energy Density | Volumetric | 380 Wh/ℓ | 598 Wh/ℓ | 598 Wh/ℓ | 594 Wh/ℓ | 700 Wh/ℓ | 748 Wh/ℓ |
| | Gravimetric | 185 Wh/kg | 262Wh/kg | 262 Wh/kg | 259 Wh/ | 285 Wh/kg | 322 Wh/kg |
| Weight | | ≤ 240 g | 845.0g +5g/-20g | ≤ 1900 g | ≤ 870 g | ≤ 920 g | ≤ 860 g |
| Nominal Voltage | | 3.70 V | 3.70 V | 3.70 V | 3.77 V | 3.70 V | 3.70 V |
| Operating Voltage Range | Max. | 4.20 V | 4.20 V | 4.20 V | 4.35 V | 4.20 V | 4.20 V |
| | Min. | 3.00 V | 2.70 V | 2.70 V | 2.70 V | 2.70 V | 2.70 V |
| Standard Current | Charge | 6.0 A | 0.3C(18.0A) | 40.5A | 17.4A | 21.0A | 22.5A |
| | Discharge | 6.0 A | 0.3C(18.0A) | 40.5A | 17.4A | 21.0A | 22.5A |
| Maximum Current | Charge | 12.0 A | 1.5C(90.0A) | 135.0 A | 87.0 A | 105.0 A | 75.0 A |
| | Discharge | 24.0 A | 2.0C(120.0A) | 202.5 A | 116.0 A | 140.0 A | 112.5 A |
| | Peak Discharge | - | 3.0C(180.0A) (< 60s) | 270.0 A (< 10s) | 174.0 A (< 10s) | 210.0 A (< 10s) | 150.0 A (< 10s) |
| Internal Resistance | | < 3.0mΩ | < 1.5mΩ | < 2mΩ | < 1.5mΩ | < 2mΩ | < 1.5mΩ |
| Operating Temperature | Charge | 0℃ ~ 45℃ | -20℃ ~ 60℃ | 0℃ ~ 55℃ | -20℃ ~ 60℃ | -20℃ ~ 60℃ | -20℃ ~ 60℃ |
| | Discharge | -20℃ ~ 55℃ | -20℃ ~ 60℃ | -20℃ ~ 50℃ | -20℃ ~ 60℃ | -20℃ ~ 60℃ | -20℃ ~ 60℃ |
| | Recommend | 25 ± 3℃ | 25 ± 3℃ | 25 ± 3℃ | 25 ± 3℃ | 25 ± 3℃ | 25 ± 3℃ |
| Storage Temperature | < 1 month | -20℃ ~ 55℃ | -40℃ ~ 60℃ | -20℃ ~ 55℃ | -40℃ ~ 60℃ | -40℃ ~ 60℃ | -40℃ ~ 60℃ |
| | < 3 month | 0℃ ~ 45℃ | 0℃ ~ 45℃ | -20℃ ~ 45℃ | -20℃ ~ 45℃ | -20℃ ~ 45℃ | -20℃ ~ 45℃ |
| | < 1 year | 0℃ ~ 25℃ | 0℃ ~ 25℃ | -20℃ ~ 25℃ | -20℃ ~ 25℃ | -20℃ ~ 25℃ | -20℃ ~ 25℃ |
| Cycle Life | 0℃ | 300 Cycle | 700 Cycle | 400 cycle | 250Cycle | 200 Cycle | 250 Cycle |
| | 25℃ | 800 Cycle | 1,200 Cycle | 1,000 cycle | 1,600 Cycle | 800 Cycle | 700 Cycle |
| | 45℃ | 500 Cycle | 400 Cycle | 300 cycle | 400 Cycle | 300 Cycle | 300 Cycle |
| Storage Humidity | | 45 ~ 85%RH | Max. 60%RH | Max. 60%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 | 12.3mm ± 0.2mm | 12.3mm ± 0.2mm | 12.3mm ± 0.2mm |
| | Width | 115mm ± 2mm | 100mm -0.5/+1.5mm | 100mm ± 2mm | 100mm-0.5 ± 1.5mm | 100mm-0.5 ± 1.5mm | 100mm-0.5 ± 1.5mm |
| | Length | 145mm± 2mm | 302mm ± 1mm | 535mm ± 1mm | 302mm ± 1mm | 302mm ± 1mm | 302mm ± 1mm |
| Technical Data | | | | | | | |

## LFP Cell

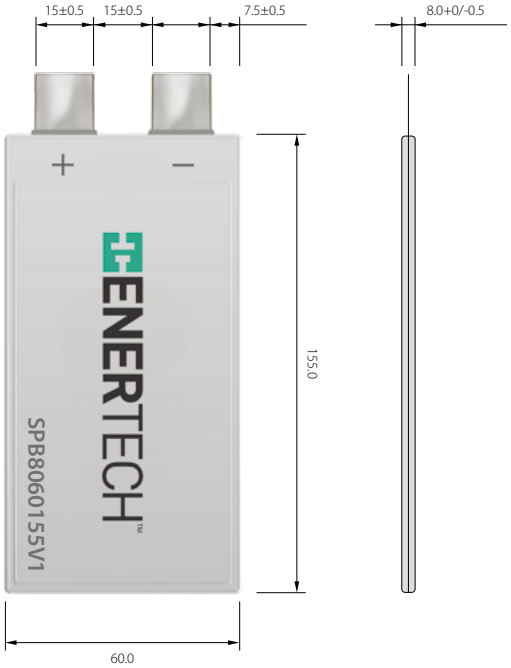
| Item | | ETI123100302 F40A | ETI123100302 M40A |
|---|---|---|---|
| Nominal Capacity | | 40.0 Ah | 40.0 Ah |
| Energy Density | Volumetric | 344 Wh/ℓ | 398 Wh/ℓ |
| | Gravimetric | 160 Wh/kg | 185 Wh/kg |
| Weight | | ≤ 800 g | ≤ 800 g |
| Nominal Voltage | | 3.20 V | 3.70 V |
| Operating Voltage Range | Max. | 3.65 V | 4.20 V |
| | Min. | 2.50 V | 2.50 V |
| Standard Current | Charge | 12.0 A | 12.0A |
| | Discharge | 12.0 A | 12.0A |
| Maximum Current | Charge | 40.0 A | 40.0 A |
| | Discharge | 120.0 A | 120.0 A |
| | Peak Discharge | 200.0A (< 10s) | 200.0A (< 10s) |
| Internal Resistance | | < 2.0mΩ | < 1.5mΩ |
| Operating Temperature | Charge | 0℃ ~ 60℃ | 0℃ ~ 60℃ |
| | Discharge | -20℃ ~ 60℃ | -20℃ ~ 60℃ |
| | Recommend | 25 ± 3℃ | 25 ± 3℃ |
| Storage Temperature | < 1 month | -40℃ ~ 60℃ | -40℃ ~ 60℃ |
| | < 3 month | -20℃ ~ 45℃ | -20℃ ~ 45℃ |
| | < 1 year | -20℃ ~ 25℃ | -20℃ ~ 25℃ |
| Cycle Life | 0℃ | 300 Cycle | 300 Cycle |
| | 25℃ | 1,500 Cycle | 1,200 Cycle |
| | 45℃ | 500 Cycle | 500 Cycle |
| Storage Humidity | | Max. 60%RH | Max. 60%RH |
| Cell Dimensions | Thickness | 12.3mm ± 0.2mm | 12.3mm ± 0.2mm |
| | Width | 100mm-0.5 ± 1.5mm | 100mm-0.5 ± 1.5mm |
| | Length | 302mm ± 1mm | 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 | | 2.30 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℃ ~ 60℃ |
| | Discharge | -20℃ ~ 60℃ |
| | Recommend | 25 ± 3℃ |
| Storage Temperature | < 1 month | -40℃ ~ 60℃ |
| | < 3 month | -20℃ ~ 45℃ |
| | < 1 year | -20℃ ~ 25℃ |
| Cycle Life | 0℃ | 2,000 Cycle |
| | 25℃ | 10,000 Cycle |
| | 45℃ | 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

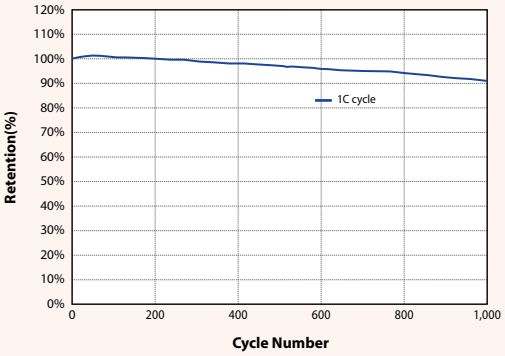
# SPB8060155V1




| 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 |

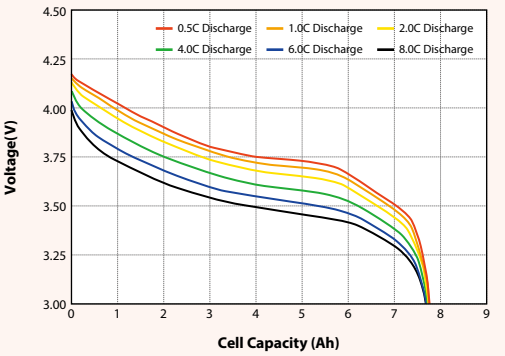
### Cell Cycle
**SPB8060155V1 1C/1C cycle at 25˚C**

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



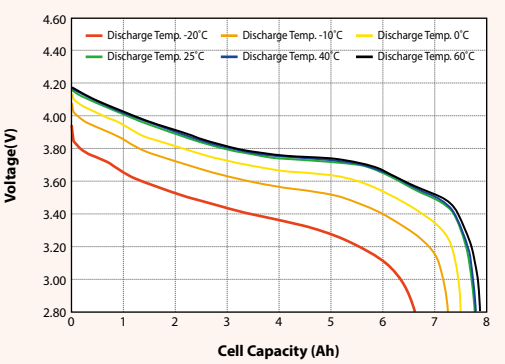

### Discharge Rate Capacity
**SPB8060155V1 Discharge Capability at various Discharge rate**

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



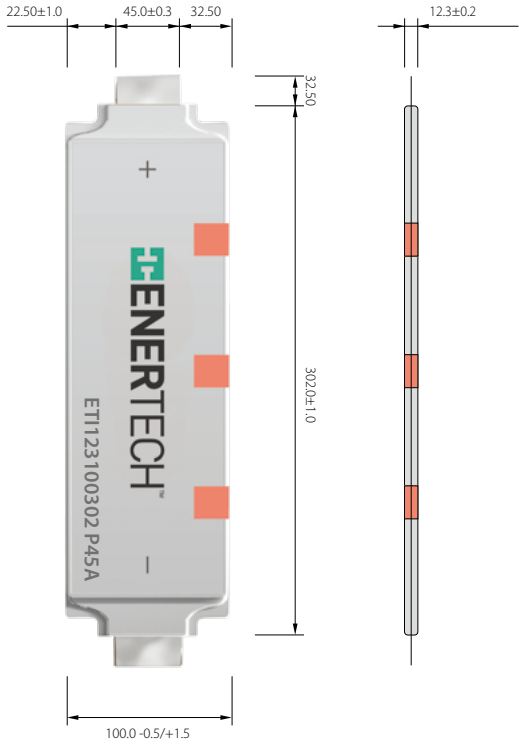

### Discharge at Various Temperatures
**SPB8060155V1 Discharge Capability at various Temperature**

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

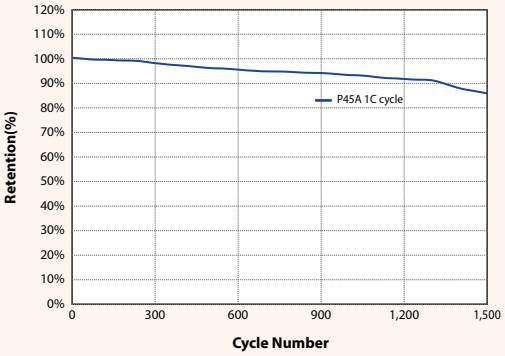



| Item | | ETI123100302 P45A |
|---|---|---|
| Nominal Capacity | | 45.0 Ah |
| Energy Density | Volumetric | 448 Wh/ℓ |
| | Gravimetric | 203 Wh/kg |
| Weight | | ≤ 820 g |
| Nominal Voltage | | 3.70 V |
| Operating Voltage Range | Max. | 4.20 V |
| | Min. | 2.70 V |
| Standard Current | Charge | 22.5 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<br>-30°C~20°C (At only limited condition) |
| | Discharge | -20°C~60°C<br>-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**

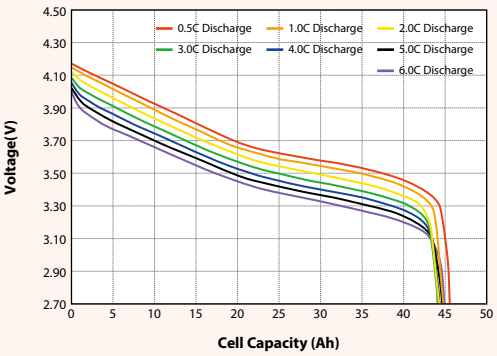
Model : ETI123100302 P45A
Charge: CC-CV 1.0C(45A) 4.2V cut off 0.05C at 25˚C
Discharge : CC 1.0C(45A) 2.7V cut-off at 25˚C
Rest : 10min. Rest each step




### Discharge Rate Capacity

**ETI123100302 P45A Discharge Capability at various Discharge Rate**

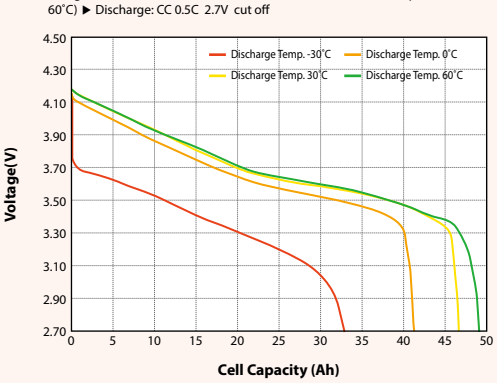
Model : ETI123100302 P45A
Charge : CC-CV 0.5C 4.2V cut off 0.05C at 25˚C
Discharge : CC, Each rate(0.5C, 1.0C, 2.0C, 3.0C, 4.0C, 5.0C, 6.0C), 2.7V cut off at RT




### Discharge at Various Temperatures

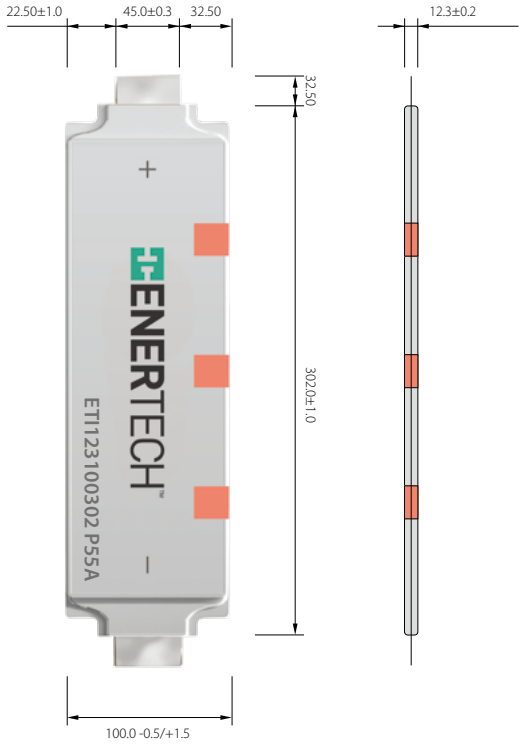
**ETI123100302 P45A Discharge Capability at various Temperature**

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

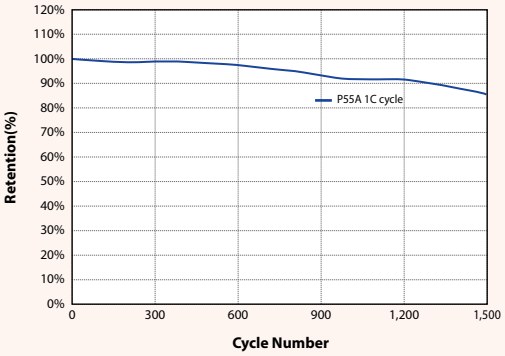



| Item | | ETI123100302 P55A |
|---|---|---|
| Nominal Capacity | | 55.0 Ah |
| Energy Density | Volumetric | 548 Wh/ℓ |
| | Gravimetric | 248 Wh/kg |
| Weight | | 820 g |
| Nominal Voltage | | 3.70 V |
| Operating Voltage Range | Max. | 4.20 V |
| | Min. | 2.70 V |
| Standard Current | Charge | 27.5A |
| | 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<br>-30°C~20°C (At only limited condition) |
| | Discharge | -20°C~60°C<br>-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**

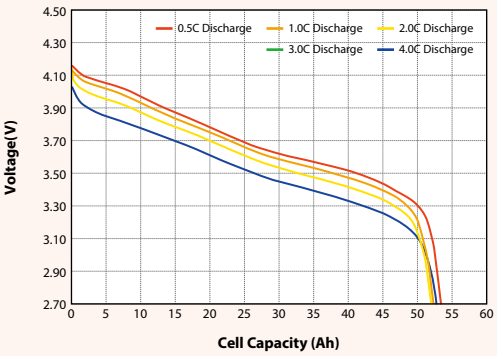
Model : ETI123100302 P55A
Charge : CC-CV, 1.0C(55A) 4.2V cut off 0.05C at 25˚C
Discharge : CC 1.0C(55A) 2.7V cut-off at 25˚C
Rest : 10min. Rest each step




### Discharge Rate Capacity

**ETI123100302 P55A Rate Capability at Various Discharge Rate**

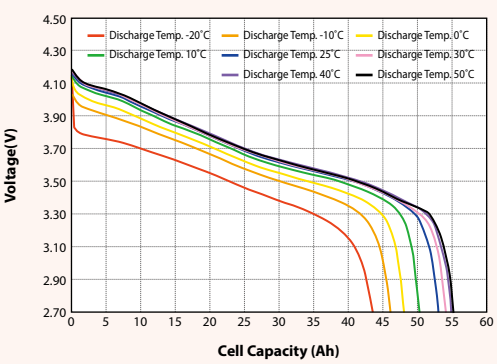
Model : ETI123100302 P55A
Charge : CC-CV, 0.5C 4.2V cut off 0.05C at RT
Discharge : CC Each Rate(0.5C, 1.0C, 2.0C, 3.0C, 4.0C) 2.7V cut-off at RT




### Discharge at Various Temperatures

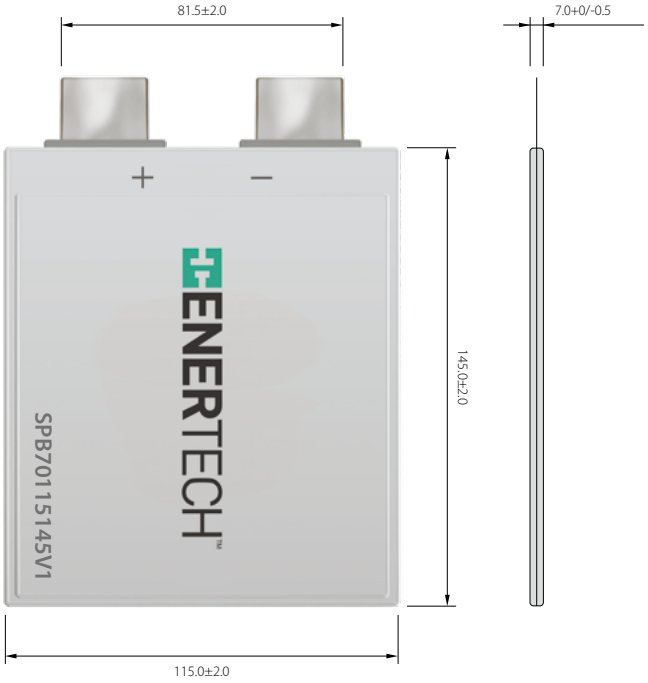
**ETI123100302 P55A Discharge Capability at Various Temperature**

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

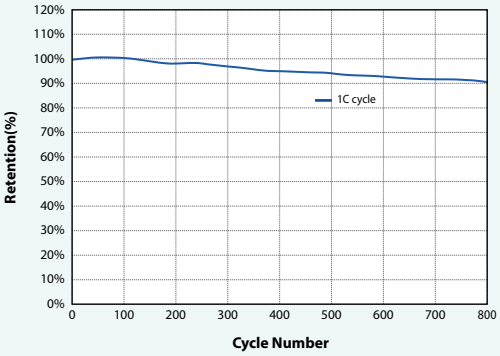



| Item | | SPB70115145V1 |
|---|---|---|
| Nominal Capacity | | 12.0 Ah |
| Energy Density | Volumetric | 380 Wh/ℓ |
| | Gravimetric | 185 Wh/kg |
| Weight | | ≤ 240 g |
| Nominal Voltage | | 3.70 V |
| Operating Voltage Range | Max. | 4.20 V |
| | Min. | 3.00 V |
| Standard Current | Charge | 6.0 A |
| | 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**

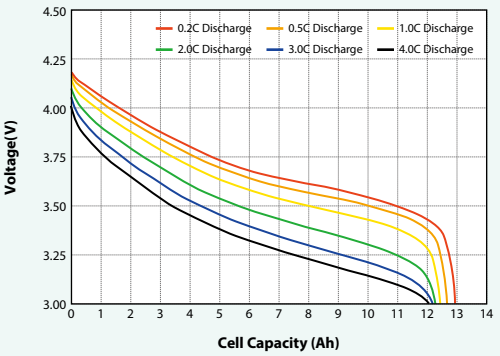
Model : SPB70115145 V1
Charge : CC-CV 1.0C(12.0A) 4.2V cut off 0.05C at 25˚C
Discharge : CC 1.0C(12.0A) 3.0V cut off at 25˚C




### Discharge Rate Capacity

**SPB70115145V1 Discharge Capability at various Discharge rate**

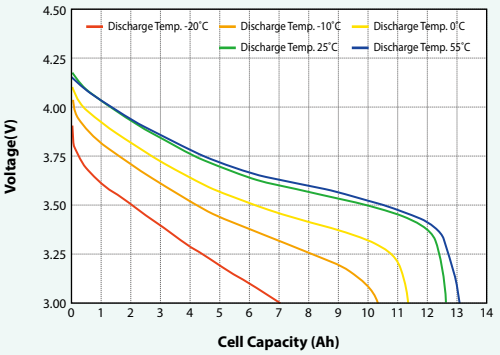
Model : SPB70115145 V1
Charge : CC-CV, 0.5C 4.2V cut off 0.05C at RT
Discharge: CC, Each Rate(0.5C, 1.0C, 2.0C, 3.0C, 4.0C, 5.0C) 3.0V cut off at RT




### Discharge at Various Temperatures

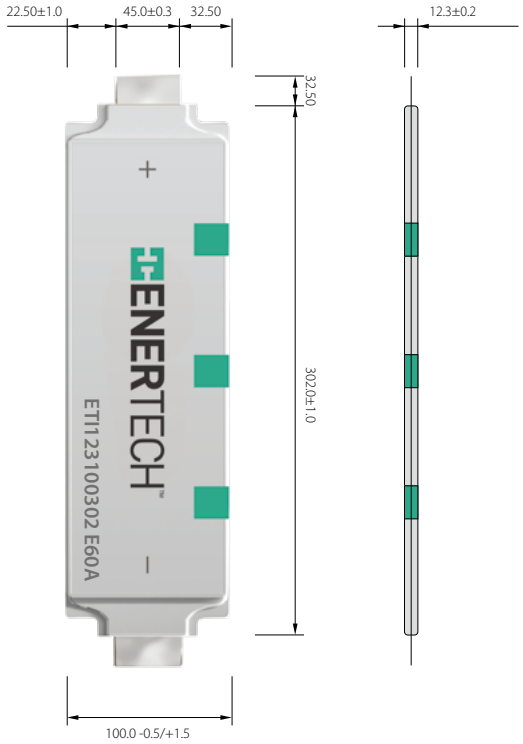
**SPB70115145V1 Discharge Capability at various Temperature**

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

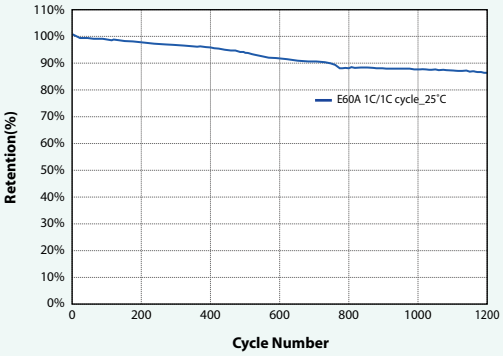



| Item | | ETI123100302 E60A |
|---|---|---|
| Nominal Capacity | | 60.0 Ah |
| Energy Density | Volumetric | 598 Wh/ℓ |
| | Gravimetric | 262Wh/kg |
| Weight | | 845.0g +5g / -20g |
| Nominal Voltage | | 3.70 V |
| Operating Voltage Range | Max. | 4.20 V |
| | Min. | 2.70 V |
| Standard Current | Charge | 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<br>-30°C~20°C (At only limited condition) |
| | Discharge | -20°C~60°C<br>-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**

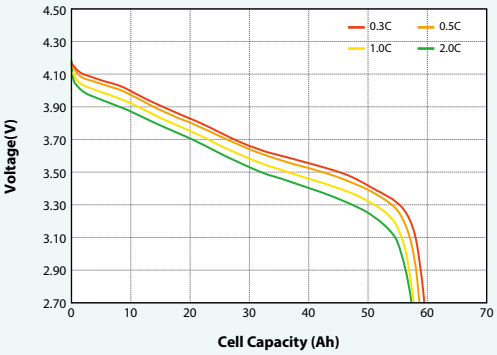
Model : ETI123100302 E60A
Charge: CC-CV, 1.0C(60A) 4.2V cut off 0.05C at 25˚C
Discharge : CC 1.0C(60A) 2.7V cut-off at 25˚C
Rest : 10min. Rest each step




### Discharge Rate Capacity

**ETI123100302 E60A Rate Capability at various Disharge rate**

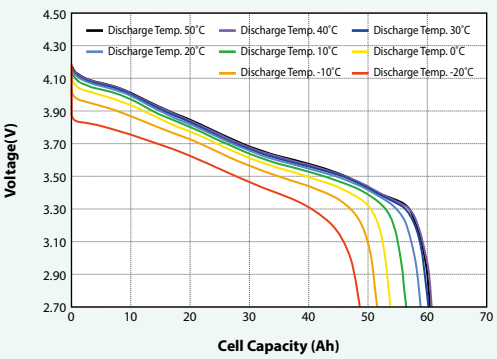
Model : ETI123100302 E60A
Charge: CC-CV, 0.3C 4.2V cut-off 0.05C at 25oC
Discharge : CC, Each Rate(0.3C, 0.5C, 1.0C, 2.0C) 2.7V cut-off at 25˚C




### Discharge at Various Temperatures

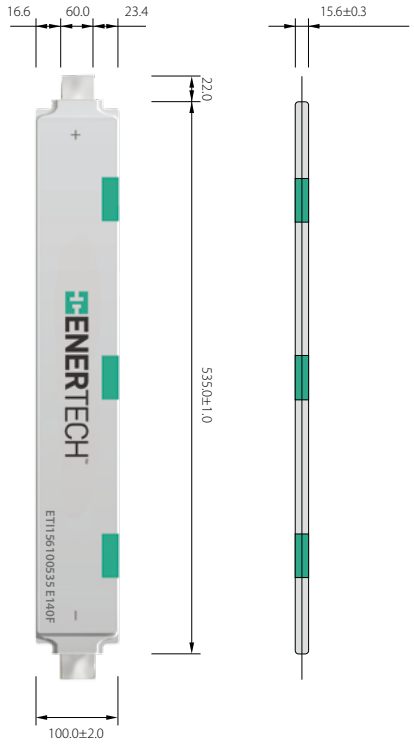
**ETI123100302 E60A Discharge Capability at various Temperature**

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

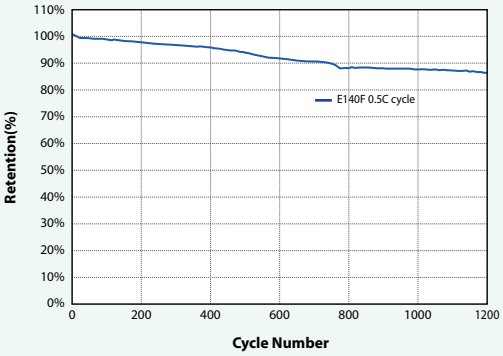



| Item | | ETI156100535 E140F |
|---|---|---|
| Nominal Capacity | | 135.0 Ah |
| Energy Density | Volumetric | 598 Wh/ℓ |
| | Gravimetric | 262 Wh/kg |
| Weight | | ≤ 1900 g |
| Nominal Voltage | | 3.70 V |
| Operating Voltage Range | Max. | 4.20 V |
| | Min. | 2.70 V |
| Standard Current | Charge | 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<br>-10°C~0°C (At only limited condition) |
| | Discharge | -20°C~50°C<br>-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**

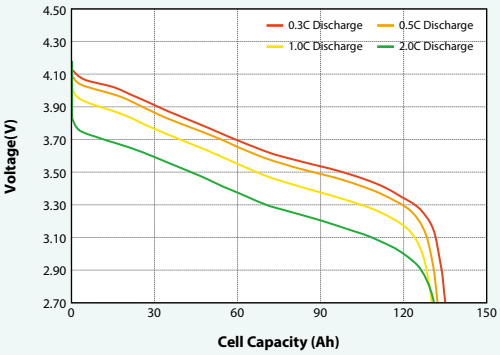
Model : ETI156100535 E140F
Charge: CC-CV, 0.5C(67.5A) 4.2V cut off 0.05C at RT
Discharge : CC, 0.5C(67.5A) 2.7V cut-off at RT
Rest : 10min. Rest each step




### Discharge Rate Capacity

**ETI156100535 E140F Rate Capability at various Discharge Rate**

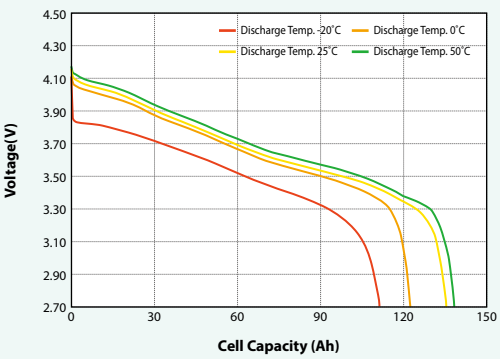
Model : ETI156100535 E140F
Charge: CC-CV, 0.3C 4.2V cut-off 0.05C at RT
Discharge : CC, Each Rate(0.3C, 0.5C, 1.0C, 2.0C) 2.7V cut-off at RT




### Discharge at Various Temperatures

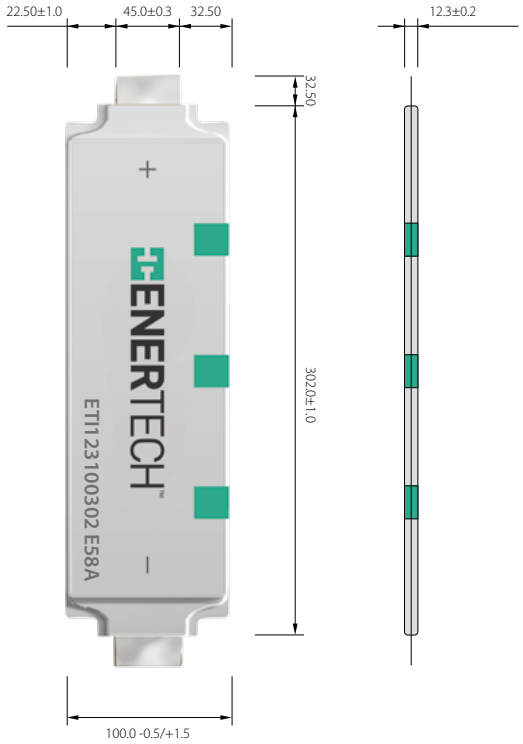
**ETI156100535 E140F Discharge Capability at various Temperature**

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

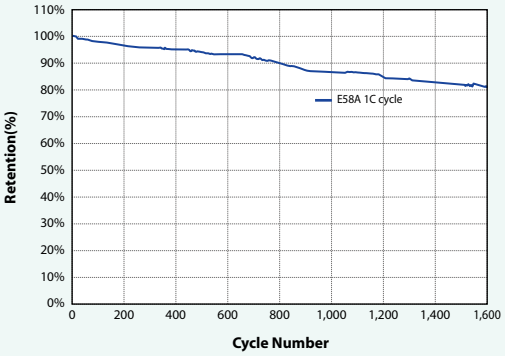



| Item | | ETI123100302 E58A |
|---|---|---|
| Nominal Capacity | | 58.0 Ah |
| Energy Density | Volumetric | 594 Wh/ℓ |
| | Gravimetric | 259 Wh/kg |
| Weight | | ≤ 870 g |
| Nominal Voltage | | 3.77 V |
| Operating Voltage Range | Max. | 4.35 V |
| | Min. | 2.70 V |
| Standard Current | Charge | 17.4A |
| | 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<br>-30°C~20°C (At only limited condition) |
| | Discharge | -20°C~60°C<br>-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**

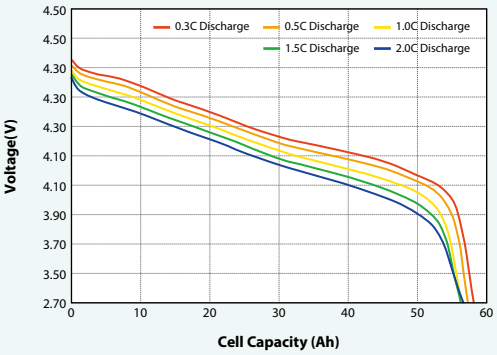
Model : ETI123100302 E58A
Charge: CC-CV, 1.0C(58A) 4.35V cut off 0.05C at 25°C
Discharge : CC 1.0C(58A) 2.7V cut-off at 25°C
Rest : 10min. Rest each step




### Discharge Rate Capacity

**ETI123100302 E58A Rate Capability at various Discharge rate**

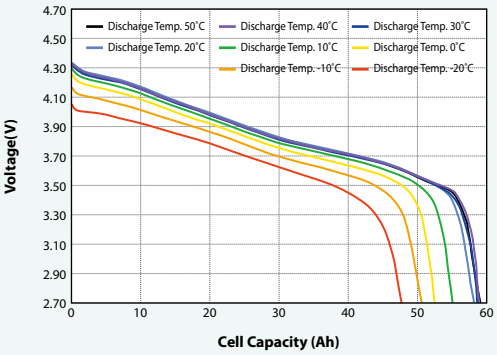
Model : ETI123100302 E58A
Charge: CC-CV, 0.5C 4.35V cut-off 0.05C at RT
Discharge : CC, Each Rate(0.3C, 0.5C, 1.0C, 1.5C, 2.0C) 2.7V cut-off at RT




### Discharge at Various Temperatures

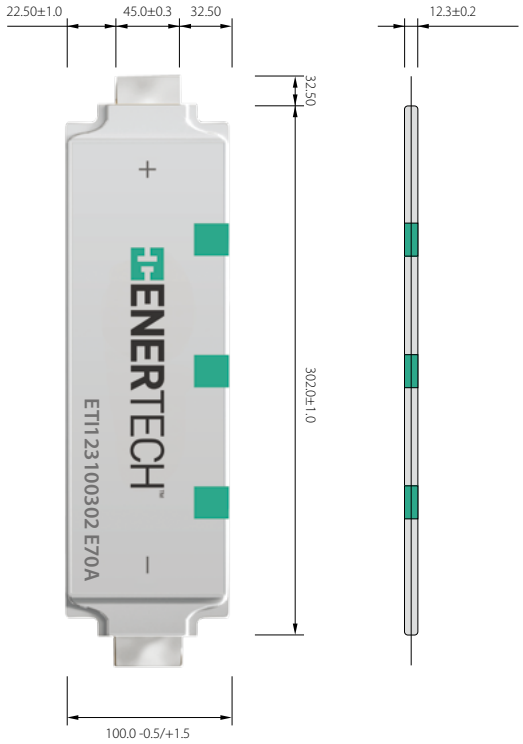
**ETI123100302 E58A Discharge Capability at various Temperature**

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



## Energy Cell

# ETI123100302 E70A

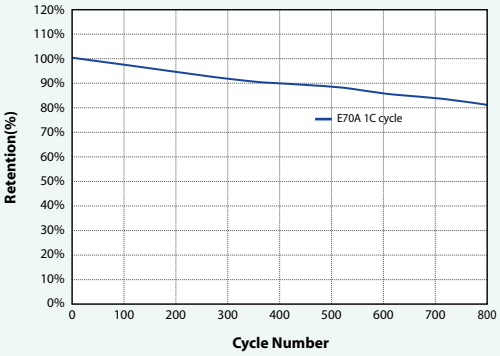



| Item | | ETI123100302 E70A |
|---|---|---|
| Nominal Capacity | | 70 Ah |
| Energy Density | Volumetric | 700 Wh/ℓ |
| | Gravimetric | 285 Wh/kg |
| Weight | | ≤ 920 g |
| Nominal Voltage | | 3.70 V |
| Operating Voltage Range | Max. | 4.20 V |
| | Min. | 2.70 V |
| Standard Current | Charge | 21.0 A |
| | Discharge | 21.0 A |
| Maximum Current | Charge | 105.0 A |
| | Discharge | 140 A |
| | Peak Discharge | 210.0 A (< 10s) |
| Internal Resistance | | < 2mΩ |
| Operating Temperature | Charge | -20°C~60°C<br>-30°C~20°C (At only limited condition) |
| | Discharge | -20°C~60°C<br>-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 | 200 Cycle |
| | 25°C, 1.0C / 1.0C | 800 Cycle |
| | 45°C, 1.0C / 1.0C | 300 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 E70A 2.7~4.2V 1C/1C cycle at 25˚C**

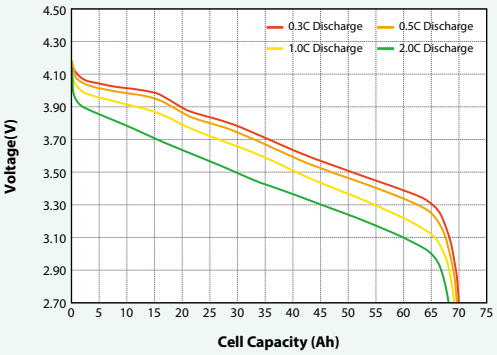
Model : ETI123100302 E70A
Charge: CC-CV, 1.0C(70A) 4.2V cut off 0.05C at 25˚C
Discharge : CC 1.0C(70A) 2.7V cut-off at 25˚C
Rest : 10min. Rest each step




### Discharge Rate Capacity

**ETI123100302 E70A Rate Capability at Various Discharge Rate**

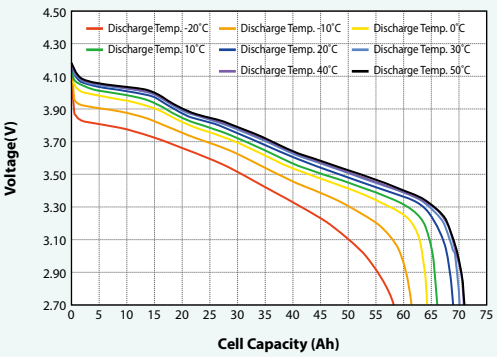
Model : ETI123100302 E70A
Charge: CC-CV, 0.3C 4.2V cut off 0.05C at RT
Discharge : CC Each Rate(0.3C, 0.5C, 1.0C, 2.0C) 2.7V cut-off at RT




### Discharge at Various Temperatures

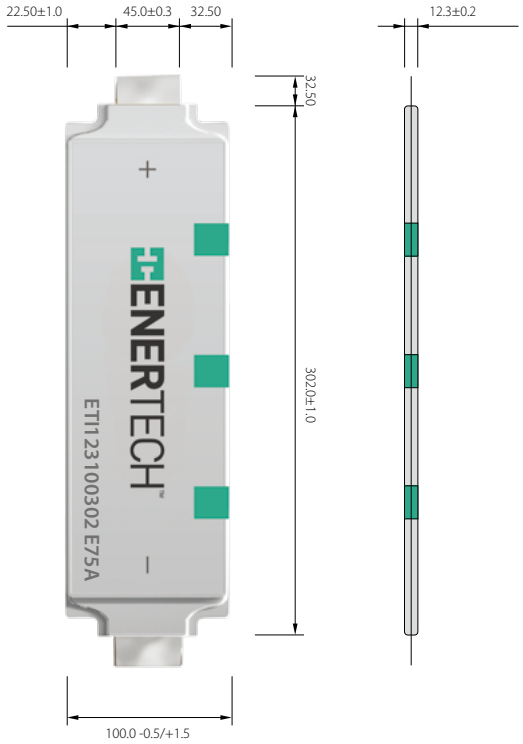
**ETI123100302 E70A Discharge Capability at Various Temperature**

Model : ETI123100302 E70A
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

# ETI123100302 E75A

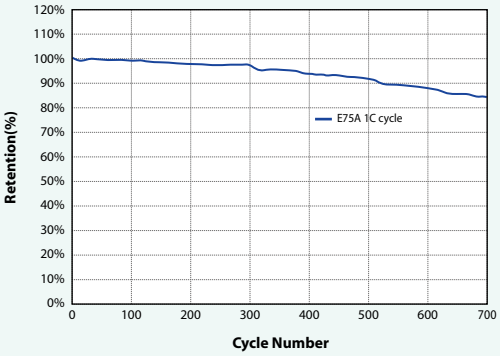



| Item | | ETI123100302 E75A |
|---|---|---|
| Nominal Capacity | | 75.0 Ah |
| Energy Density | Volumetric | 748 Wh/ℓ |
| | Gravimetric | 322 Wh/kg |
| Weight | | ≤ 860 g |
| Nominal Voltage | | 3.70 V |
| Operating Voltage Range | Max. | 4.20 V |
| | Min. | 2.70 V |
| Standard Current | Charge | 22.5A |
| | Discharge | 22.5A |
| Maximum Current | Charge | 75.0 A |
| | Discharge | 112.5 A |
| | Peak Discharge | 150.0 A (< 10s) |
| Internal Resistance | | < 1.5mΩ |
| Operating Temperature | Charge | -20°C~60°C<br>-30°C~20°C (At only limited condition) |
| | Discharge | -20°C~60°C<br>-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 | 700 Cycle |
| | 45°C, 1.0C / 1.0C | 300 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 E75A 2.7V~4.2V 1C/1C cycle at 25˚C**

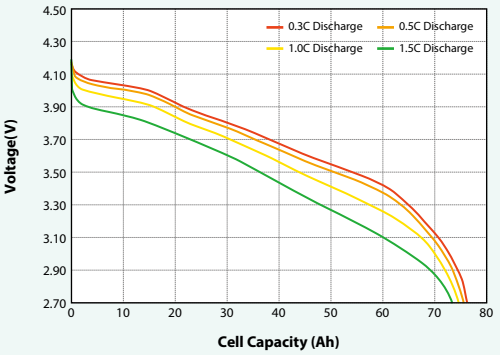
Model : ETI123100302 E75A
Charge: CC-CV, 1.0C(75A) 4.2V cut off 0.05C at RT
Discharge : CC, 1.0C(75A) 2.7V cut-off at RT
Rest : 10min. Rest each step




### Discharge Rate Capacity

**ETI123100302 E75A Rate Capability at various Discharge Rate**

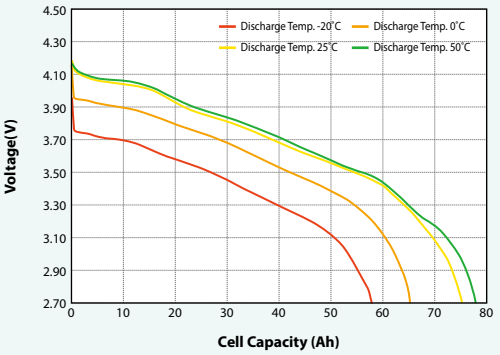
Model : ETI123100302 E75A
Charge: CC-CV, 0.3C 4.2V cut-off 0.05C at RT
Discharge : CC, Each Rate(0.3C, 0.5C, 1.0C, 1.5C) 2.7V cut-off at RT




### Discharge at Various Temperatures

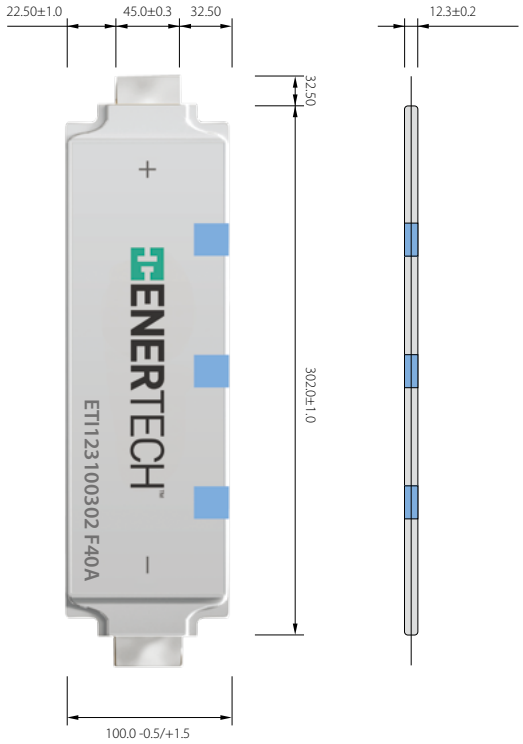
**ETI156100535 E75A Discharge Capability at various Temperature**

Model : ETI123100302 E75A
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



## LFP Cell

# ETI123100302 F40A

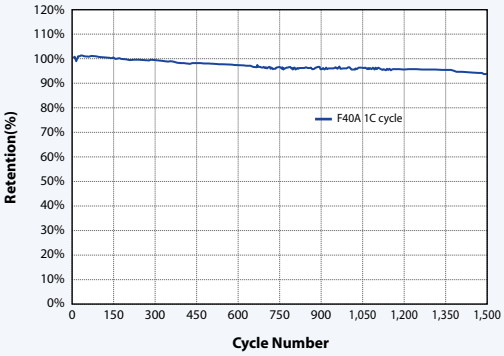



| Item | | ETI123100302 F40A |
|---|---|---|
| Nominal Capacity | | 40.0 Ah |
| Energy Density | Volumetric | 344 Wh/ℓ |
| | Gravimetric | 160 Wh/kg |
| Weight | | ≤ 800 g |
| Nominal Voltage | | 3.20 V |
| Operating Voltage Range | Max. | 3.65 V |
| | Min. | 2.50 V |
| Standard Current | Charge | 12.0 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<br>-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 | 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**

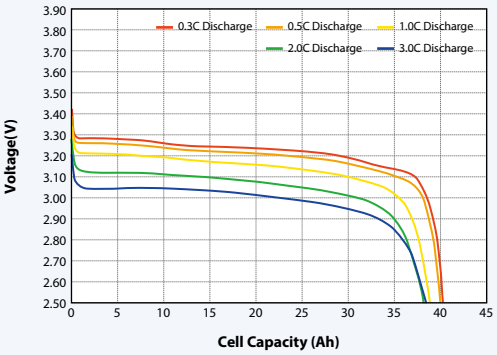
Model : ETI123100302 F40A
Charge: CC-CV, 1.0C(40A) 3.65V cut off 0.05C at 25˚C
Discharge : CC 1.0C(40A) 2.5V cut-off at 25˚C
Rest : 10min. Rest each step




### Discharge Rate Capacity

**ETI123100302 F40A Discharge Capability at Various Discharge Rate**

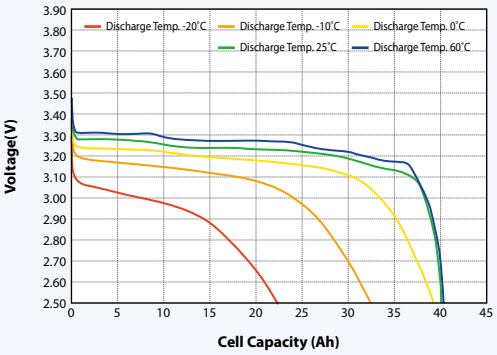
Model : ETI123100302 F40A
Charge: CC-CV, 0.3C 3.65V cut off 0.05C at RT
Discharge : CC Each Rate(0.3C, 0.5C, 1.0C, 2.0C, 3.0C) 2.5V at RT




### Discharge at Various Temperatures

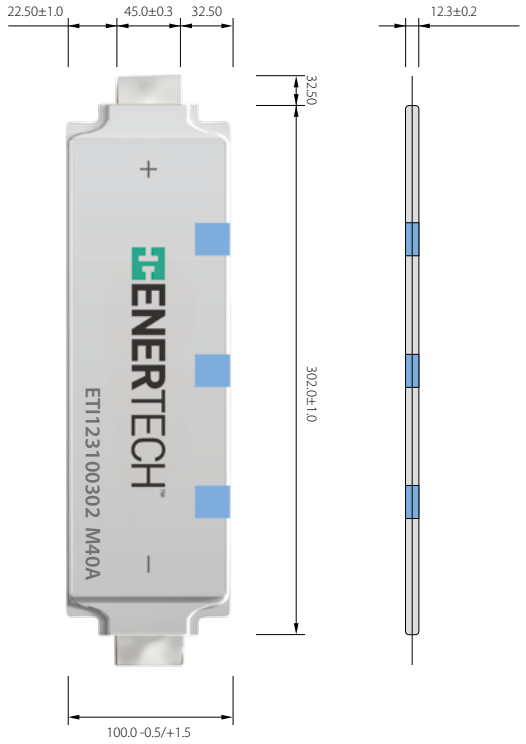
**ETI123100302 F40A Discharge Capability at Various Temperature**

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




| 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<br>-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 |

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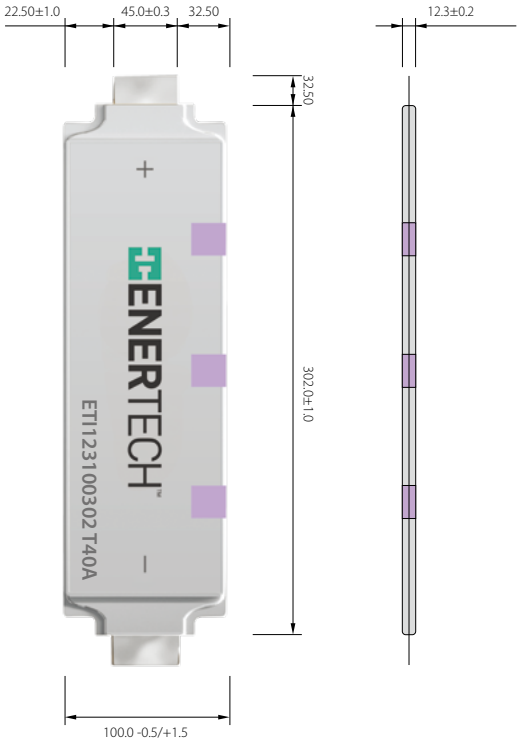
## LTO Cell

# ETI123100302 T40A




| 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<br>-30°C~20°C (At only limited condition) |
| | Discharge | -20°C~60°C<br>-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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