



CATL

ESS280Ah LFP Cell

Specification and Performance Summary

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1. Summary

Cell Specification

Parameters

Dimension, mm	71.7×173.9×207.2
Cell capacity @ 25°C, 0.25P, Ah	≥280
Nominal voltage, V	3.2
Nominal energy @ 25°C, 0.25P, Wh	896
Cell weight, g	5.34±0.30Kg
Energy density, Wh/kg	167
Energy density (without terminal) , Wh/L	352
DCR (25°C,30s,50%SOC), mΩ	~0.40
Cycle life (25°C 0.25P/0.25P @80% Ret.)	~6000Cycle
Storage life (25°C 100% SOC @80% Ret.)	~15Year
Operating temperature (case dependent)	-20°C ~ 60°C
Storage temperature (case dependent)	-30°C ~ 60°C



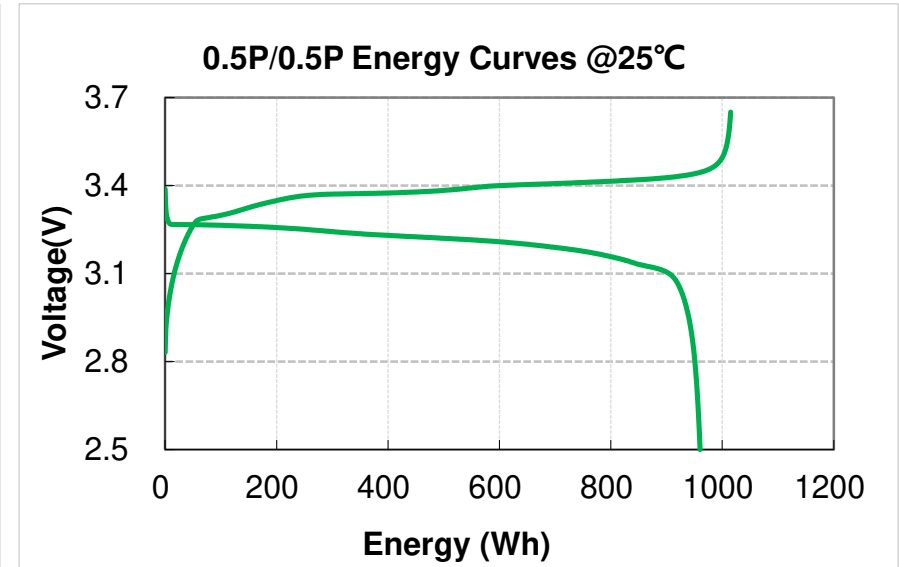
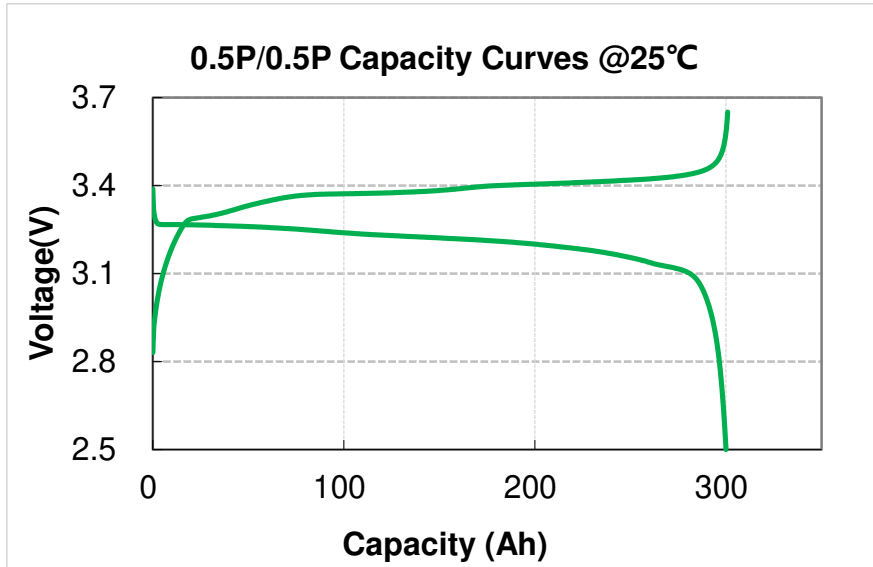
Item

GBT 36276

Over charge	HL3
Drop	HL2
Crush	HL2
Overdischarge	HL3
Short	HL2
Heating	HL3

2.1 Capacity & Energy

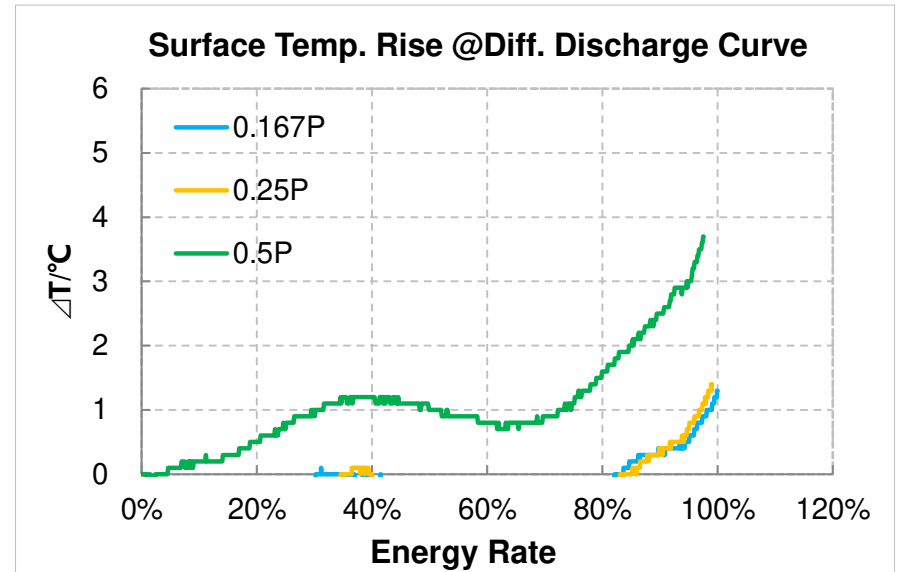
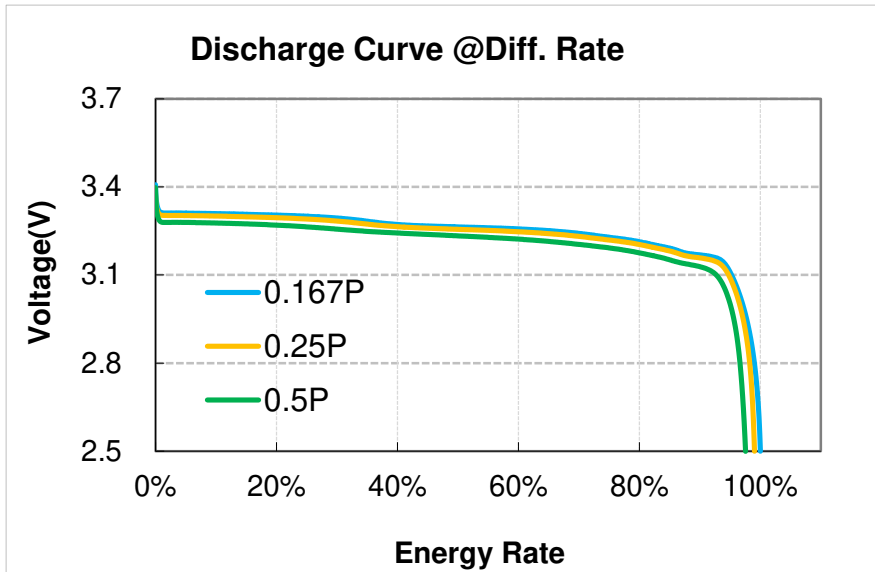
Test Condition: 25°C, 0.5P CP to 3.65V, Rest 30 min; 0.5P DP to 2.5V, Rest 30 min;



- ◆ Minimum discharge capacity is 280Ah @25°C, 0.5P
- ◆ Minimum discharge energy is 896Wh @25°C, 0.5P

2.2 Rate Discharge Energy @ 25°C

Test Condition: (1) Rest 30 min at 25°C; (2) 0.5P CP to 3.65V; (3) Rest 30min; (4) 0.25P CP to 3.65V ;(5) n*P DP to 2.5V(n=0.167,0.25,0.5); (5) Repeat step 1 to step 4 until all the rates are tested; (6) Rest 30min.

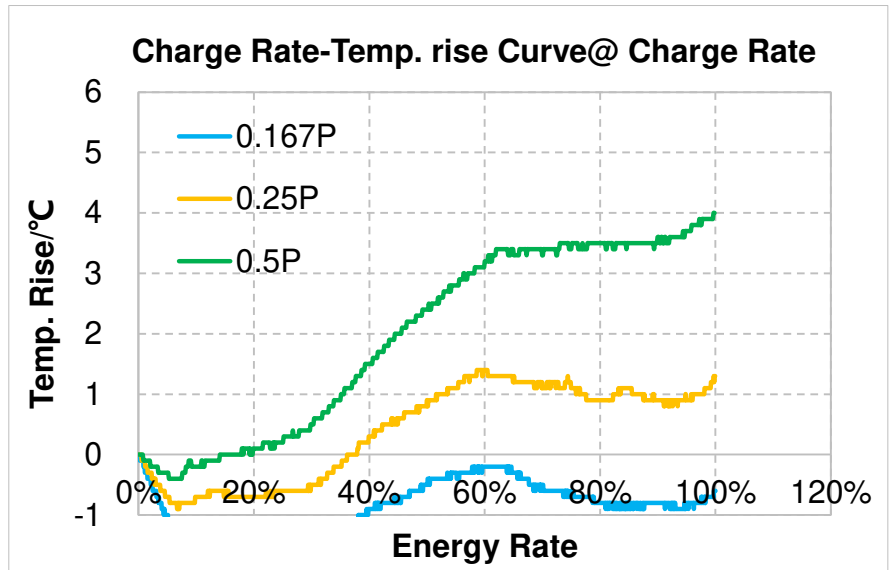
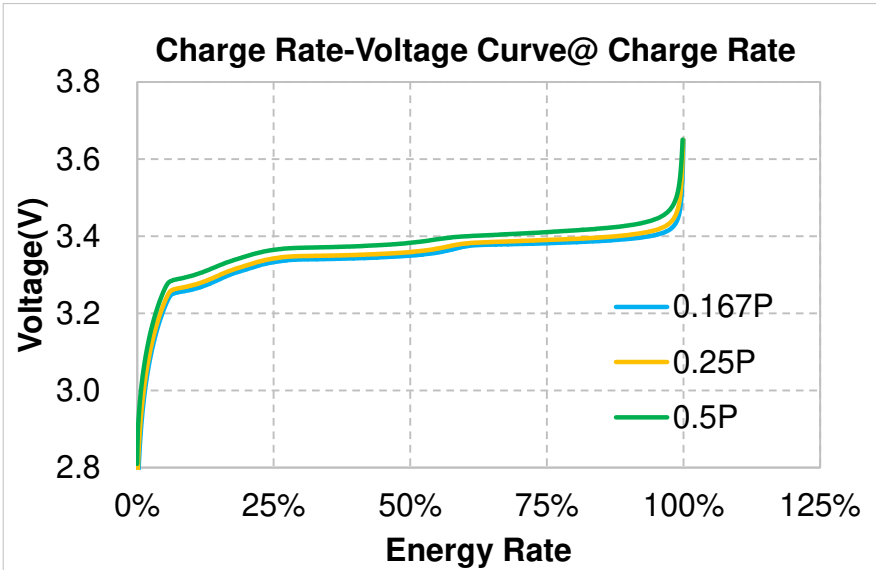


Rate Discharge Performance			
Rate	0.167P	0.25P	0.5P
Energy Rate	100.0%	99.03%	97.55%
Temp. Rise(°C)	1.3	1.4	3.7

2.3 Rate Charge Energy @ 25°C

Test Condition: Charge condition: n*P CP to 3.65V, (n=0.167,0.25,0.5)

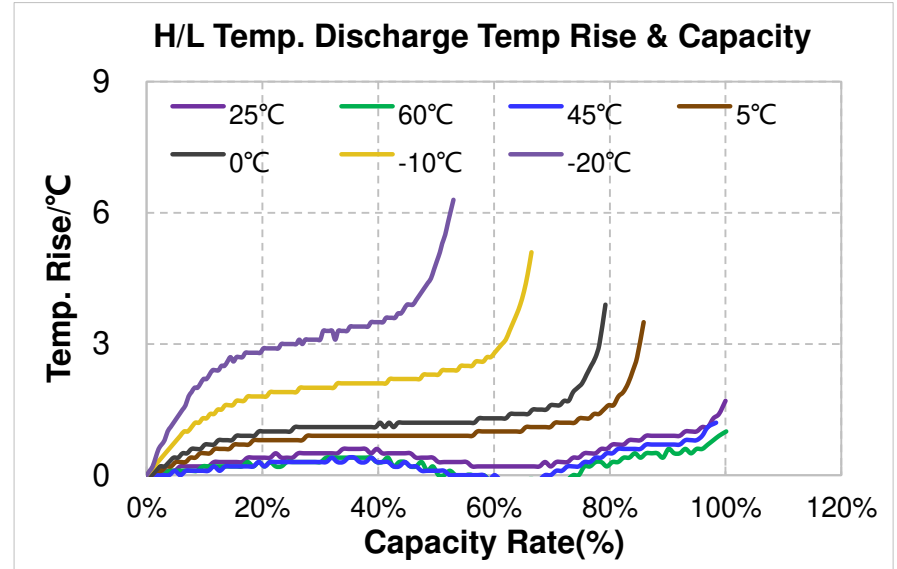
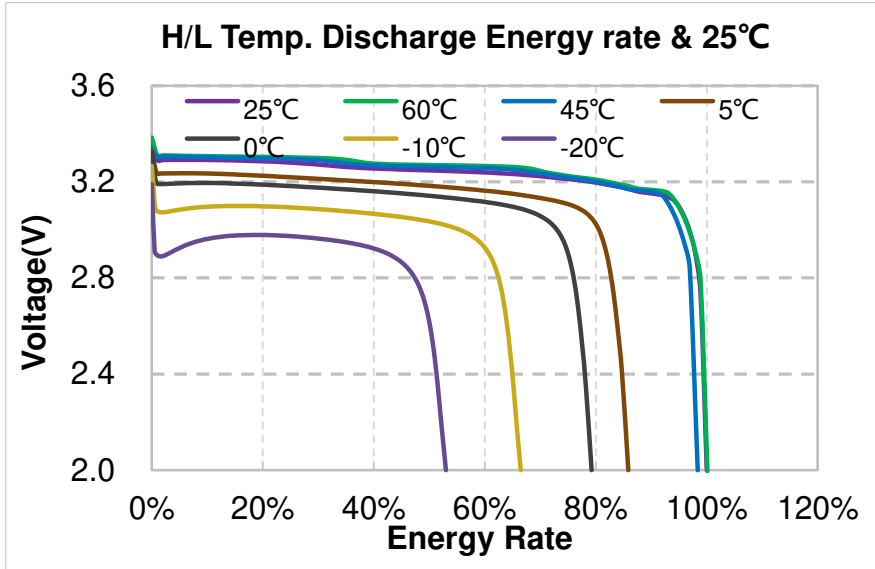
Discharge condition: 0.5P DP to 2.5V



Rate Discharge Performance			
Rate	0.167P	0.25P	0.5P
Energy Rate	100%	99.84%	99.94%
Temp. Rise(°C)	0	1.3	4.0

2.5 High & Low Temp. Energy

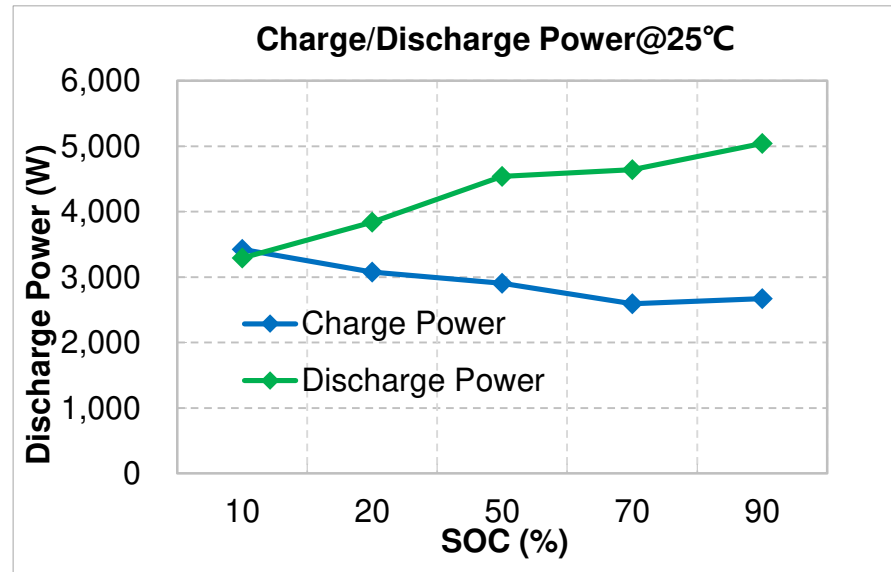
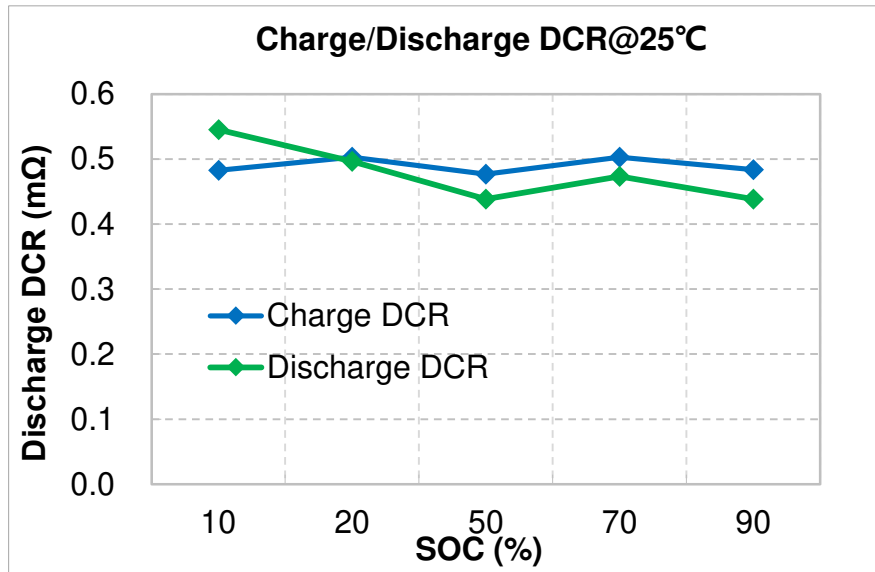
Test Condition: XX°C , 0.25P CP to 3.65V (XX=25°C, 60°C, 45°C, 5°C, 0°C, -10°C, -20°C,); Discharge condition: 0.25P DP to 2.0V



High/Low Temp Discharge Performance							
Temp. (°C)	25°C	60°C	45°C	5°C	0°C	-10°C	-20°C
Energy Rate	100.0%	100.1%	98.4%	86.0%	79.3%	66.5%	53.0%
Temp. Rise(°C)	1.7	1.0	1.2	3.5	3.9	5.1	6.3

2.6 Internal Resistance (DCR) & HPPC Power

Test Condition: Discharge@ 560A DC 30s, Charge@ 420A CC 30s



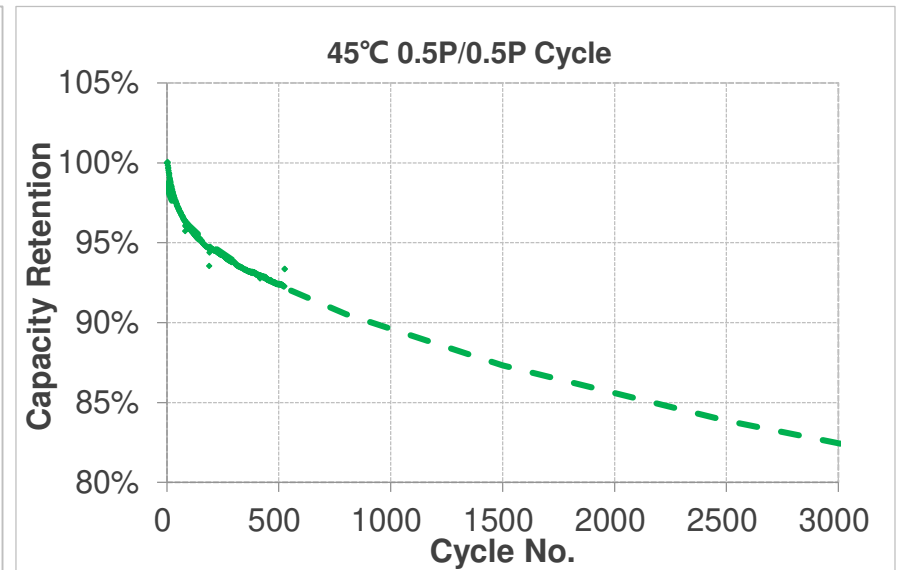
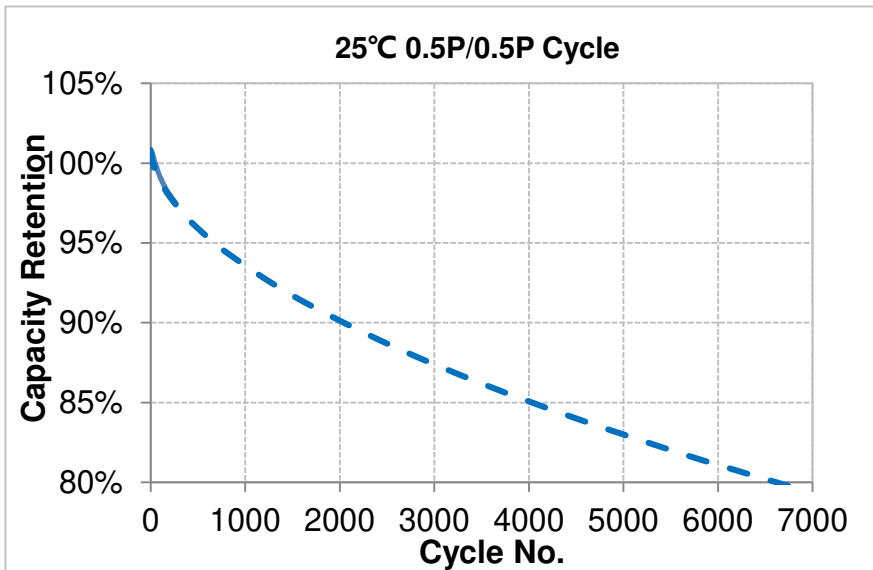
1. DCR for 30s pulse discharge is 0.44mohm@25°C, 50%SOC
2. DCR for 30s pulse charge is 0.48mohm@25°C, 50%SOC
3. 30s Pulse discharge power is 4541W@ 25°C, 50% SOC
4. 30s Pulse charge power is 2905W@ 25°C, 50% SOC

Note: Power is calculated from DCR based on Freedom Bus/Car method, Discharge cut off voltage $\geq 2.5V$, charge cut-off voltage $\leq 3.65V$

2.7 Cycle Performance

Test Condition :

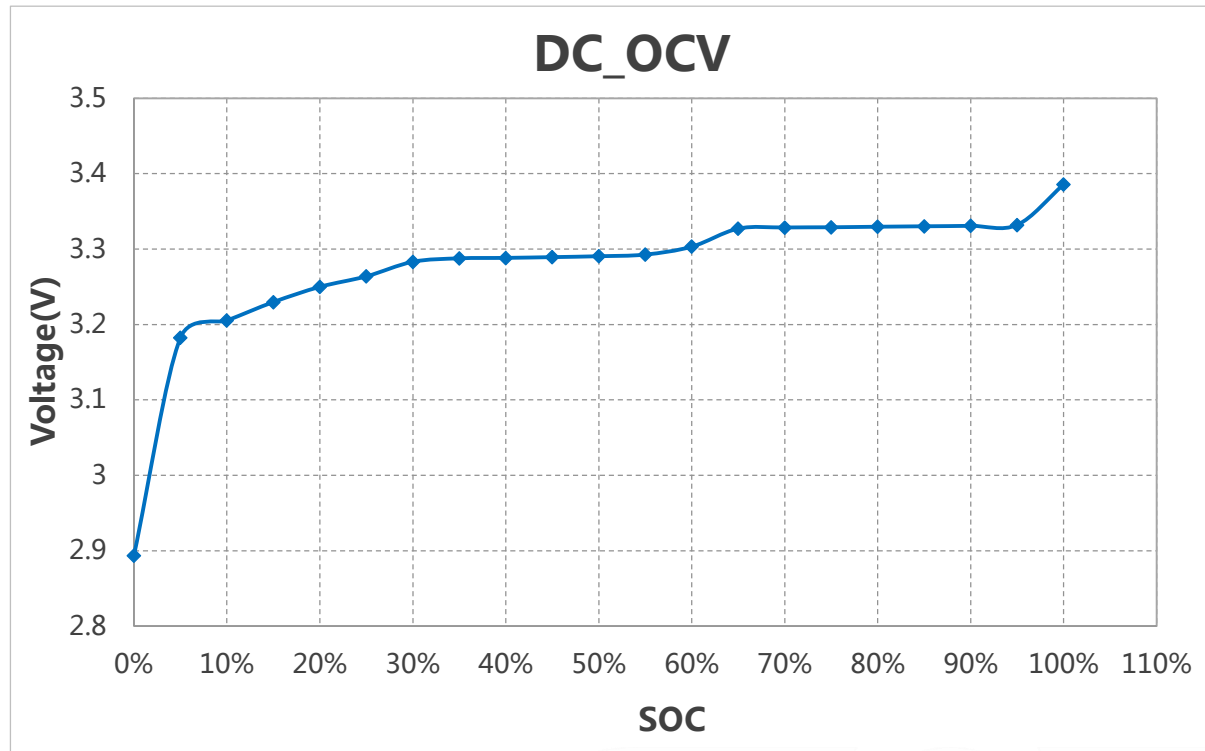
25°C/45°C , 2.5V~3.65V(100%DOD), 0.5P/0.5P Cycle



- ◆ ~80% reversible capacity retention @ 25 °C ~6000cycle
- ◆ ~80% reversible capacity retention @ 45 °C ~3000cycle

2.8 DC OCV-SOC Curve

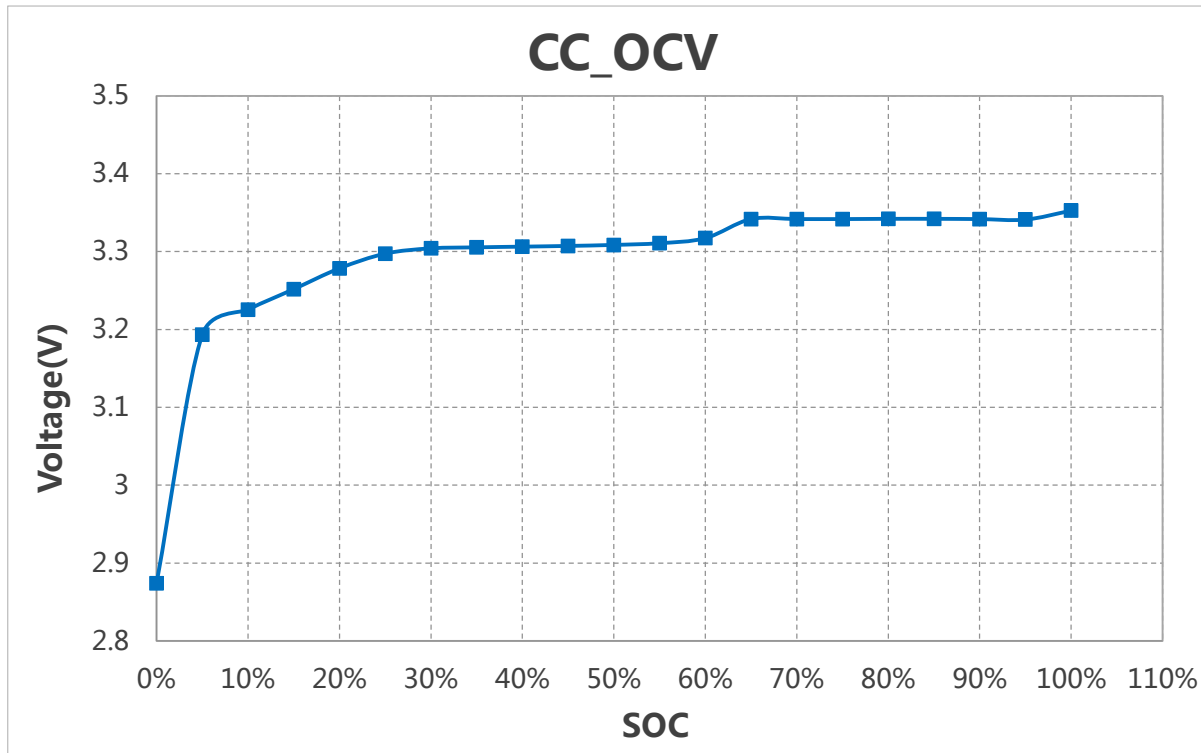
Test condition: 25°C , 0.33C CC to 3.65V , CV to 0.05C , Stand by 3h , OCV test ; 0.33C DC to 95%SOC, Rest 3h test OCV; Test OCV per 5% SOC.



SOC	100%	95%	90%	85%	80%	75%	70%	65%	60%	55%	50%	45%	40%	35%	30%	25%	20%	15%	10%	5%	0%
Voltage (V)	3.386	3.332	3.331	3.330	3.330	3.329	3.329	3.327	3.303	3.293	3.290	3.289	3.288	3.288	3.283	3.264	3.250	3.230	3.205	3.182	2.893

2.8 CC OCV-SOC Curve

Test condition: 25°C , 0.33C DC to 2.5V , Stand by 3h , OCV test ; 0.33C CC to 5%SOC, Rest 3h test OCV; Test OCV per 5% SOC.



SOC	0%	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%
Voltage (V)	2.874	3.193	3.225	3.252	3.278	3.297	3.304	3.305	3.306	3.307	3.309	3.311	3.317	3.342	3.342	3.342	3.342	3.342	3.342	3.341	3.352

2.9 Abuse Test Results

Item	Testing Item	Testing condition (According to GBT 36276-2018)	Hazard level
1	Over charge	-100%SOC, RT -1C charge 1h or voltage of one of cells reaches 1.5 times of charged ended voltage	HL3
2	Drop	-100%SOC, RT; -1.5 m height to concrete floor with both terminal downward, 1h observation	HL2
3	Crush	-100%SOC, RT, -Crush head: 75mm, Crush to 30% displacement or 0V or the crush force reaches to 13KN	HL2
4	Over discharge	-100%SOC, RT -1C discharge 1.5h or voltage of one of cells falls down and reaches 0V	HL2
5	Short	-100%SOC, RT -External resistance<5mohm, hold short circuit for 10min	HL2
6	Heating	-100%SOC, RT -Heating from RT to $130 \pm 2^{\circ}\text{C}$ at the rate $5^{\circ}\text{C}/\text{min}$. Keep the temperature for 30min	HL3

2.10 EUCAR Hazard Level Description

Hazard Level	Description	Classification Criteria & Effects
0	No effect	No effect ,No loss of functionality.
1	Passive protection activated	No defect; no leakage; no venting, fire or flame; no rupture; no explosion; no exothermic reaction or thermal runaway. cell reversibly damaged. Repair of protection device needed.
2	Defect/Damage	No leakage; no venting, fire, or flame; no rupture; no explosion; no exothermic reaction or thermal runaway. cell irreversibly damaged. repair needed.
3	Leakage $\Delta\text{mass} < 50\%$	no venting, fire, or flame; no rupture; no explosion; Weight loss $< 50\%$ of electrolyte weight (electrolyte=solvent+salt)
4	Venting $\Delta\text{mass} \geq 50\%$	no fire or flame; no rupture; no explosion; Weight loss $\geq 50\%$ of electrolyte weight (electrolyte=solvent+salt)
5	Fire or Flame	no rupture; no explosion (i.e., no flying parts)
6	Rupture	no explosion, but flying parts of active mass
7	Explosion	Explosion (i.e., disintegration of the cell)

An aerial architectural rendering of a city development project. The scene shows a large-scale urban plan with a central river or canal. On the left bank, there are several tall, modern skyscrapers. The right bank features a mix of mid-rise residential or commercial buildings, some with flat roofs, and a large green field. A prominent road or highway runs diagonally across the middle of the image. The overall atmosphere is bright and hazy, suggesting a clear day with some light fog or mist. The text "Thanks !" is overlaid in the center in a bold, blue font.

Thanks !