



ICP5259113P	REV 0
Part Number: 131127001	27/11/13

HYB Polymer Division

Technical Specification

for Lithium-Ion Pouch Cell

Model: ICP5259113P

4200mAh

Prepared By - Date	Approved By - Date
Fei Chen – 27/11/13	HongliangFeng – 27/11/13
Customer Approval:	
Date:	



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1. Scope

1.1. This document describes the product specifications, performance, electrical and safety characteristics as well as testing methods performed on Li-Ion Pouch cells produced by HYB.

2. Product Type and Model Number

2.1. Product Type

2.1.1. Polymer Lithium-ion Battery

2.2. Model Number

2.2.1. ICP5259113P with TCO Breaker

2.3. Part Number

2.3.1. 131127001

3. Product Specifications

Item	Parameter	Value
1	Nominal Cell Voltage	3.70VDC
2	Maximum Charge Voltage	4.20VDC
3	Cutoff Voltage	3.00VDC
4	Capacity (Typ.)	4350mAh
5	Capacity (Min.)	4200mAh
6	Thermal Cutoff (TCO)	LC77AY
7	Typical 1kHz AC impedance	50m Ω
8	Cell Weight	77.5g
9	Pre-charge, when below operating temp	$\leq C/20$
10	Maximum Discharge Rate	1C
11	Standard Charge, 2.5h (See Appendix B)	0.5C
12	Maximum Charge Rate	0.7C
13	Operating Temperatures Charge Discharge Storage	0°C to 60°C -20°C to 60°C -20°C to 60°C
14	Humidity Range	$\leq 90\%RH$
15	Cycle Life (Charge/Discharge: 0.5C/0.5C) See Appendix C @20°C – Capacity at 80% @40°C – Capacity at 80% @50°C – Capacity at 80%	Cycles ≥ 500 ≥ 400 ≥ 300
16	Self-discharge (remaining capacity after 30 day storage) @20°C @40°C @50°C	Capacity $\geq 95\%$ $\geq 90\%$ $\geq 85\%$



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4. Cell Dimensions

4.1. Please refer the drawing in Appendix A

4.2. Increase in cell thickness over life of cell:

4.2.1. Typical 2% increase: $5.2\text{mm} * 1.02 = 5.30\text{mm}$

4.2.2. Maximum 4% increase: $5.2\text{mm} * 1.04 = 5.41\text{mm}$

5. Cell Appearance

5.1. No cosmetic defects such as scratches or dents

6. Characteristics

6.1. Electrical Characteristics

Item	Parameter	Value	Test Conditions
1	Open Circuit Voltage	3.80 – 3.86V	The cells are measured at $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and at 40% State of Charge (SOC)
2	Standard Rate Capacity	4200mAh	Standard Charge (0.5C), then rest cells for 10 min. Standard rate discharge (0.2C) at $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$.
3	High Rate Capacity	3990mAh	Standard Charge (0.5C), then rest cells for 10 min. High rate discharge (1C) at $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$.
4	Storage Temperature	12 months -20°C to 25°C 3 months: -20°C to 40°C 1 month: -20°C to 60°C	Cells should be cycled every 3 months; Store at 40 – 60% state-of-charge (SOC) Humidity Range: < 75% RH

Note: For fast charging and enhanced cycle life, HYB recommends using a two (2) or three (3) step charge regime. Contact HYB for details & application notes.

For best cycle life performance at elevated operating temperatures (50°C to 60°C) HYB recommends lowering the charge voltage to $4.10 \sim 4.15\text{V}/\text{cell}$.

6.2. Safety Characteristics

6.2.1. HYB product safety conforms to UN38.3 and UL1642 specifications and are based on the customer's requirements.

6.2.2. See Cell Environmental Test Document for details regarding safety testing

6.2.3. Required Protective Functionality

6.2.3.1. To ensure safety, the cells must be assembled with a PTC or thermal/resettable fuse and the protective circuitry



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6.3. Reliability

6.3.1. Standard Testing Environment

6.3.1.1. Temperature : $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$

6.3.1.2. Relative humidity : $45 \pm 20\%$ (unless specified)

6.4. Warranty

6.4.1. UNLESS OTHERWISE STATED IN AN APPLICABLE AGREEMENT OR TERMS OF SALE, THE CELLS AND THIS SPECIFICATION ARE PROVIDED "AS IS" WITHOUT WARRANTY OR CONDITION OF ANY KIND, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. Performance of the cells may vary depending on usage conditions and application. The content of this specification is subject to change without notice.

6.4.2. Refer to the applicable Terms and Conditions for any warranty concerns and/or questions.

6.5. Liability

6.5.1. Unless otherwise stated in an applicable agreement or terms of sale, neither HYB nor anyone else involved in creating, producing, or delivering the cells or this specification shall be liable for any direct, indirect, consequential, or incidental damages relating to the cells, however caused and on any theory of liability (including negligence). Without limiting the foregoing, the user must operate the products according to the instructions printed on the battery label and to follow the guidelines provided by HYB. Without limiting any of the foregoing, in the event the battery is overheated, catches fire or explodes due to mishandling by the end-user, HYB is not liable for any losses.

7. Packaging

7.1. Based on customer requirements

7.2. Battery Packing Label

The following warnings should be indicated on the battery pack labels

- Use a specified charger
- Do not throw the battery into fire, or heat
- Do not short-circuit the battery terminals
- Do not disassemble the battery

7.3. Cell Markings

7.3.1. Based on customers' requirements



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8. Handling precautions for Lithium-ion secondary cells

To assure product safety, potential leaking, overheating or explosion of the cells please review the following precautions:

DANGER!

- Use dedicated chargers and follow the specified conditions when charging the cell.
- Do not heat or put the cell into a fire.
- Do not charge / discharge in conditions above or below listed temperatures.
- Do not put or store cell together with conductive materials.
- Do not short circuit the (+) and (-) terminals of the cell with metal conductors.
- Do not install cell in a device reversing the (+) and (-) cell terminals.
- Do not penetrate cell with a sharp object.
- Do not disassemble the cell.
- Do not weld or solder directly on the cell.
- Do not connect the cell to an electrical outlet.
- Do not use a cell with serious scars or deformations.
- Do not store a cell leaking electrolyte near any heat source.
- Thoroughly read the user's manual before use. Improper handling of lithium ion cell may result in heat, fire, explosion, damage or the performance loss of the cell.

WARNING!

- Use the cell only in specified equipment.
- Do not use a cell if it exhibits a rust color and/or is leaking electrolyte.
- Do not strike or throw the battery against hard surface.
- Do not expose cell to direct sunshine.
- Do not submerge the cell in water
- Do not charge / discharge cell above or below specified temperatures

CAUTION!

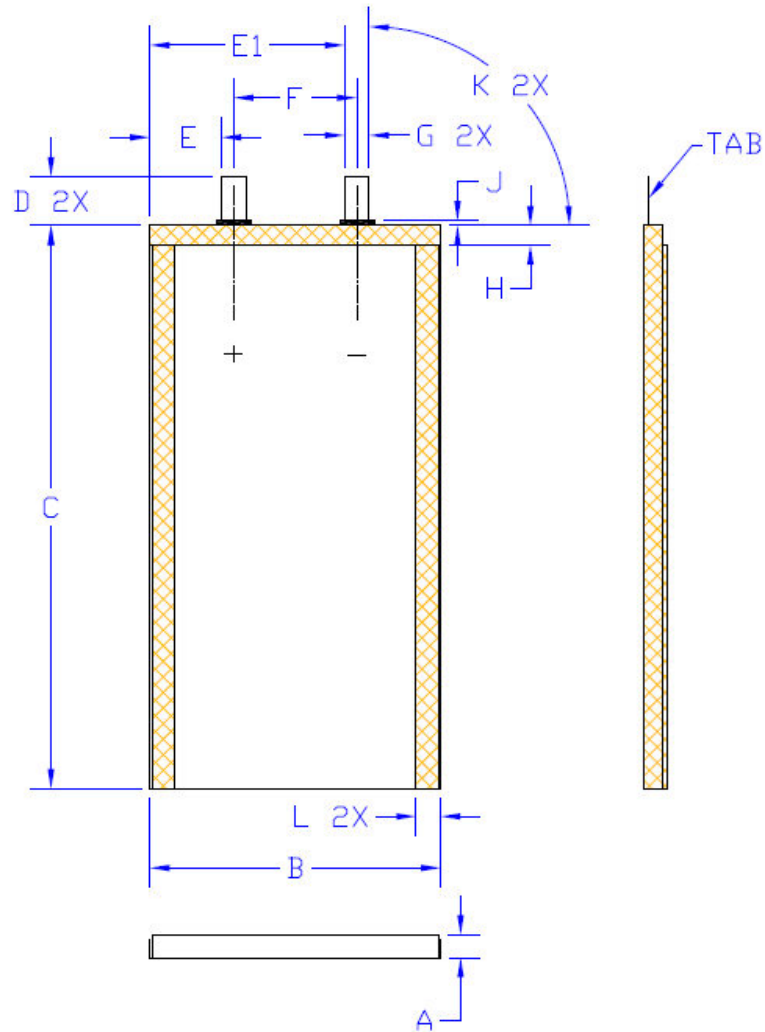
- Store the cell out of reach of children.
- Keep the cell in a cool dry place during periods of storage to minimize decrease in cell performance.
- Avoid clothes, skin and eyes coming into contact with the cell electrolyte from a leaking cell. Wash contaminated area with large amounts of water.
- Keep the cell away from materials that can generate and/or store static electric charges while the cell is charged, used or stored.
- Do not store cell inside of a car where temperature may be above 50°C, this may cause a decrease in cell performance.
- Wipe with a dry cloth before using the cell if the cell terminals become dirty.
- Insulate cell terminals before properly disposing of the cell.



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Appendix E



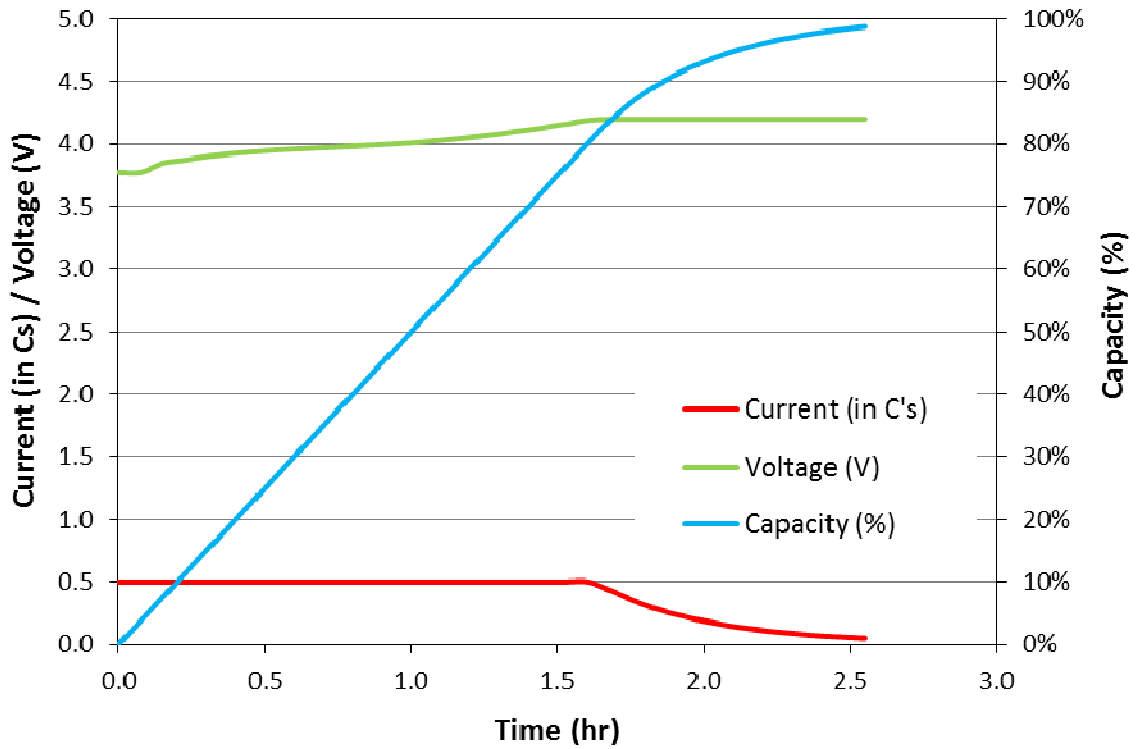
Item	Description	Dimensions
A	Cell Thickness	$\leq 5.2\text{mm}$
B	Cell Width	$\leq 59.0\text{mm}$
C	Cell Length	$\leq 113.0\text{mm}$
D	Tab Length	$10.0 \pm 1.0\text{mm}$
E	Positive TAB Distance	$12.25 \pm 1.0\text{mm}$
E1	Negative TAB Distance	$41.75 \pm 1.0\text{mm}$
F	Tab to Tab Center	/
G	Tab Width	$5.0 \pm 0.2\text{mm}$
H	Top Sealing Width	$4.0 \pm 0.5\text{mm}$
J	Sealant Height	$0.2 \sim 2.0\text{mm}$
K	Angularity of TAB's	$90.0^\circ \pm 3.0^\circ$
L	Insulating Tape Width	$5.0 \pm 2.0\text{mm}$
TAB	Tab Thickness	0.1mm



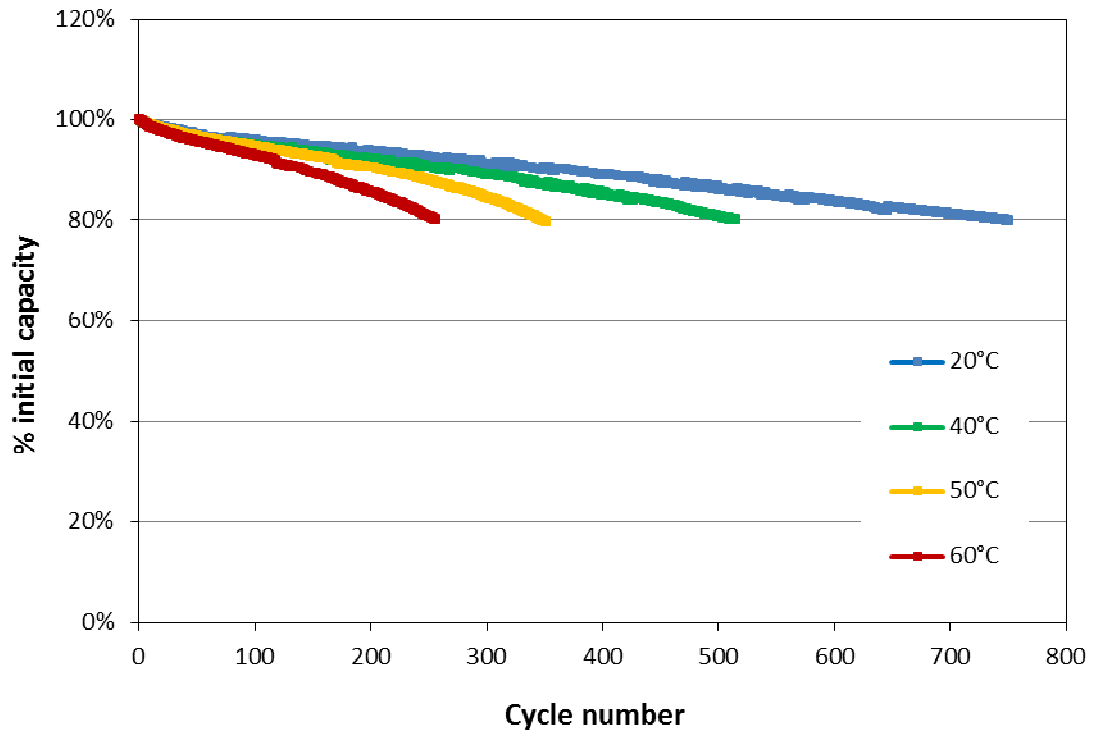
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Appendix A
Typical Charge Curve



Appendix B
Typical cycle life curves

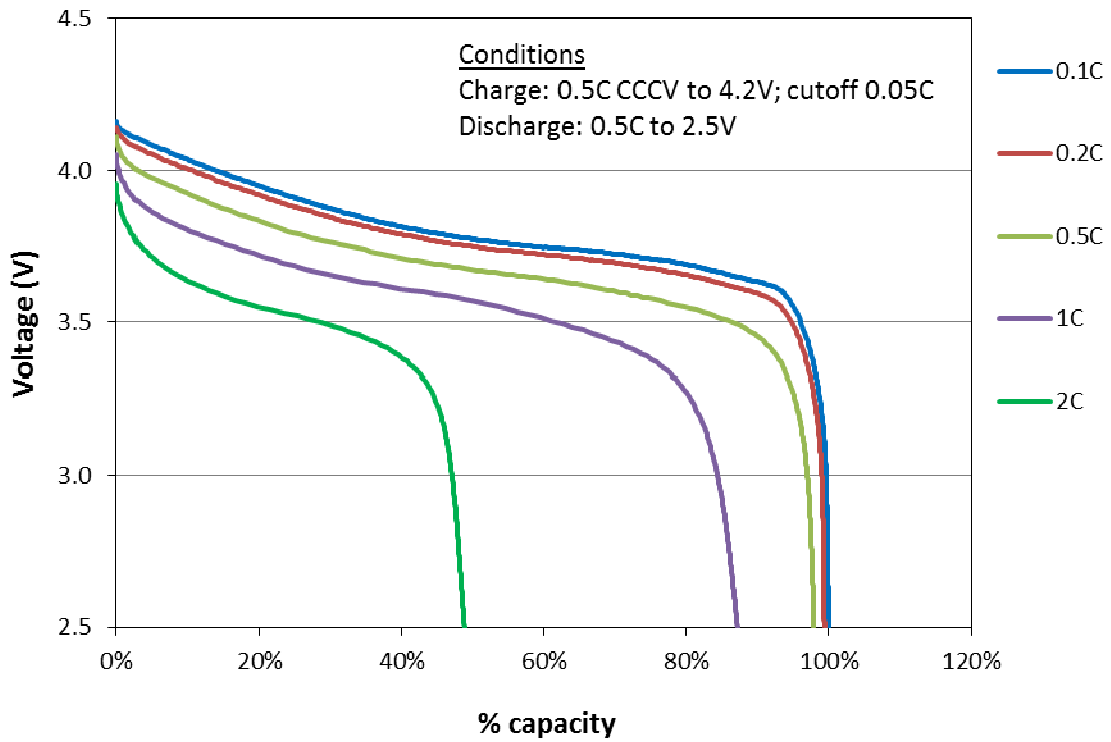




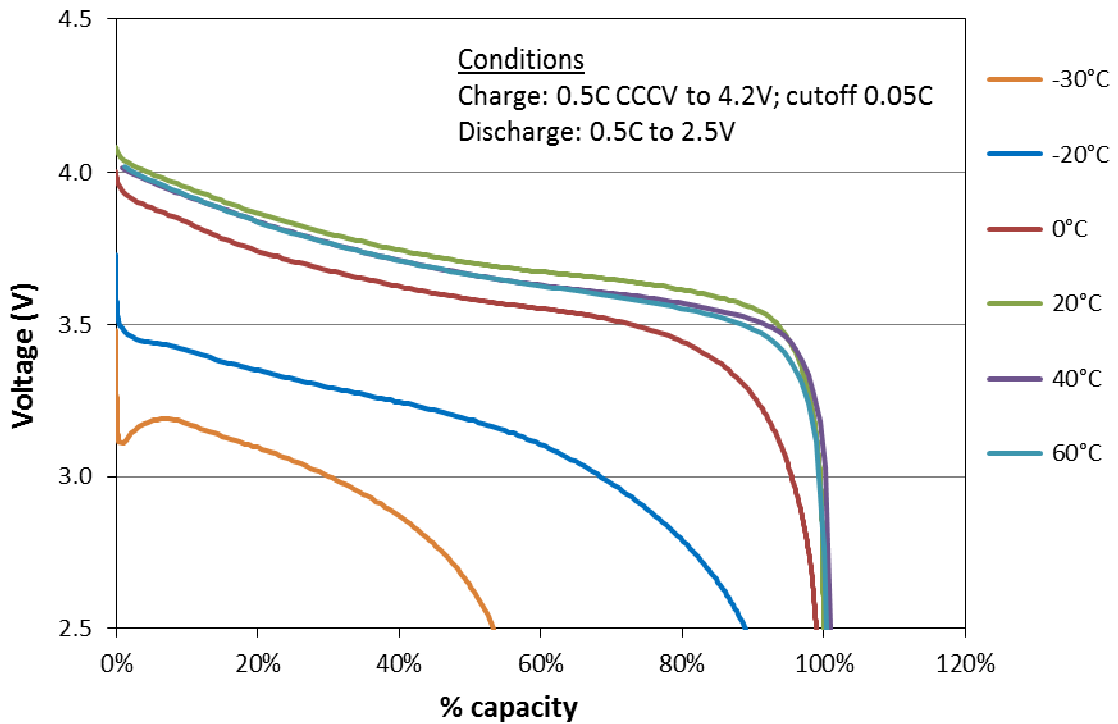
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Appendix C
Typical Discharge Rate Data



Appendix D
Typical Temperature Data

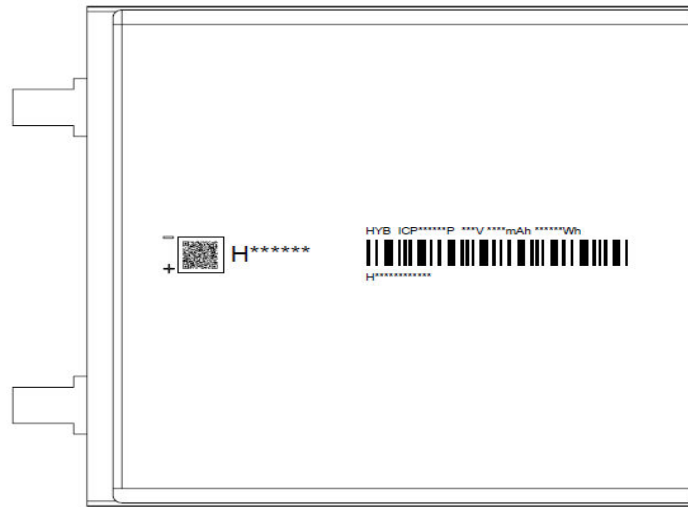




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Pouch cell Sorting Information



Coding Rule

