



Li Polymer Rechargeable Battery

LFB Lithium Polymer Cell Advantage presentation

LFB Power Polymer material is LiFePO_4 and it has advantages as follows.

一、 High Reliability

Test item	Test phenomena	Test result	Remark
Short-circuit test	No explosion, No fire	pass	Attached picture 1
Impact test	No explosion, No fire	pass	Attached picture 2
150℃ Thermal exposure Test	No explosion, No fire	pass	Attached picture 3
Puncture test	No explosion, No fire	pass	Attached picture 4
Overcharge test(3C 10V)	No explosion, No fire	pass	Attached picture 5

二、 Ultra-light in weight

三、 ROHS compliance

四、 long cycling life

五、 Excellent high temperature performance

LFB Polymer cell safety test -Short-circuit test

Attached picture 1

LFB 10867220 cell

Short-circuit test

Test methods: To fully charge the cell at 0.5C and the cell is subjected to a short-circuit condition with a metal wire of resistance less than 50m Ω , and the cell surface temperature is not over 150 $^{\circ}\text{C}$, the pass result is no explosion and no fire for the cell.



Fully Charged
to 3.85V before
test



Max surface
temperature
of 60 $^{\circ}\text{C}$ was
observed

Results: No Explosion, No fire

LFB Polymer cell safety test Impact test

Attached picture 2

LFB 10867220

Impact test

Test method: To fully charge the cell and put it on the striking support, then use 9.1kg's hammer to drop onto the cell from 1m. The impact fixed up in clamped batter, the pass result is no explosion and no fire for the cell.



Fully
Charged to
3.85V before
test



Cell after
impact test

Result: No Explosion, No Fire after impact test.

LFB Polymer cell safety test Thermal Exposure test

LFB 10867220

Attached picture 3

Test method: After fully charged to 3.85V, the cell is placed in an oven and the temperature increases to 150 °C with the rate 5 ± 2 °C every minute, then place the cell in an oven at 150 °C for 30min, the criteria are no explosion and no fire.



Fully Charged
to 3.85V



Cell after thermal
exposure test

Results: No Explosion, No fire

LFB Polymer cell safety test Nail Penetration test

LFB 10867220

Attached picture 4

Test Methods: To fully charge the cell and to penetrate the cell with a nail(dia.3.5mm) the pass result is no explosion and no fire for the cell.



Fully
Charged to
3.85V before
test



Cell after Nail
Penetration
Test

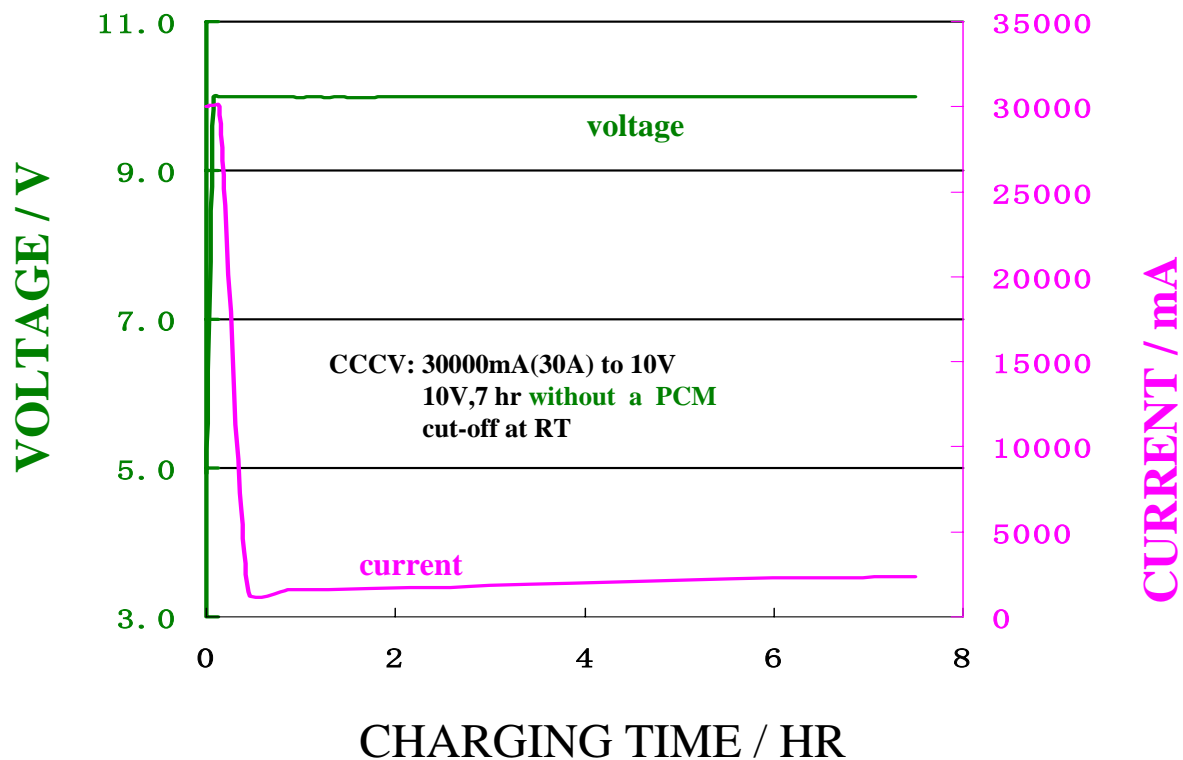
Results: No Explosion, No Fire

LFB Polymer cell safety test -Overcharging test

Overcharge test (LFB 10867220) 10000mAh(min)

Attached picture 5

Test Methods: CC, 30000mA(30A) to 10V;CV 10V,7hrs.the pass result is no explosion and no fire for the cell. otherwise failed.



Results: The cell without PCM after 30A 10V overcharging test are no explosion, no fire.

LFB10867220 10 Ah 10V Overcharging test

LFB Polymer cell safety test

Test methods: Charged to 3.85V with 10A current, then use DC POWER with 30A/10V to charge, when the current decrease to 100mA, the pass result is no explosion and no fire for the cell, otherwise failed.



(LFB 10867220) 10000mAh (Typ.) (30A 10V) overcharging test, no explosion, no fire.



Li Polymer Rechargeable Battery

LFB Power Li Polymer battery have an ultra-light advantage in weight

Detailed weight comparison is as follows:

Battery Category	Voltage(V)	Capacity(Ah)	Weight(kg)
Power Li Polymer Battery	32V	10Ah	3.0kg
Lead Acid Battery	36V	10Ah	12.9kg
NIMH Battery	36V	10Ah	8.5kg
<p>Our power battery 24V/10AH Li Polymer battery weight is about 2.0KG,32V/10AH Li Polymer battery weight is about 3.0KG,it is lighter about 30% compared with relative steel Li-ion battery.</p>			
<p>Conclusion: Our LFB Li Polymer Battery is lighter th an other battery which NIMH battery is heavier 3times and Lead Acid battery is heavier 5times from above data,and it is convenient for user.</p> <p>For example: To use battery in power bicycle ,Our LFB Li Polymer batt ery is very light and it is very easier to install or disassemble compared with other battery.</p>			



Li Polymer Rechargeable Battery

Power Li Polymer battery ROHS compliance
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LFB Power Li Polymer battery which don't include 6 kinds of deleterious elements limited in ROHS and it is ROHS compliance.



Li Polymer Rechargeable Battery

LFB Lithium Polymer Cell presentation

Cell Series is as follows mostly:

Series	Cell	Min. Capacity mAh	Typ. Capacity mAh	Cell Weight	7S Battery Weight
49220P	LFB5849220	3800	4000	about 120.0g	
67220P	LFB10867220	9700	10500	about 260.0g	About 2000.0g



Li Polymer Rechargeable Battery

LFB10867220 Battery Cell

Performance and Charging

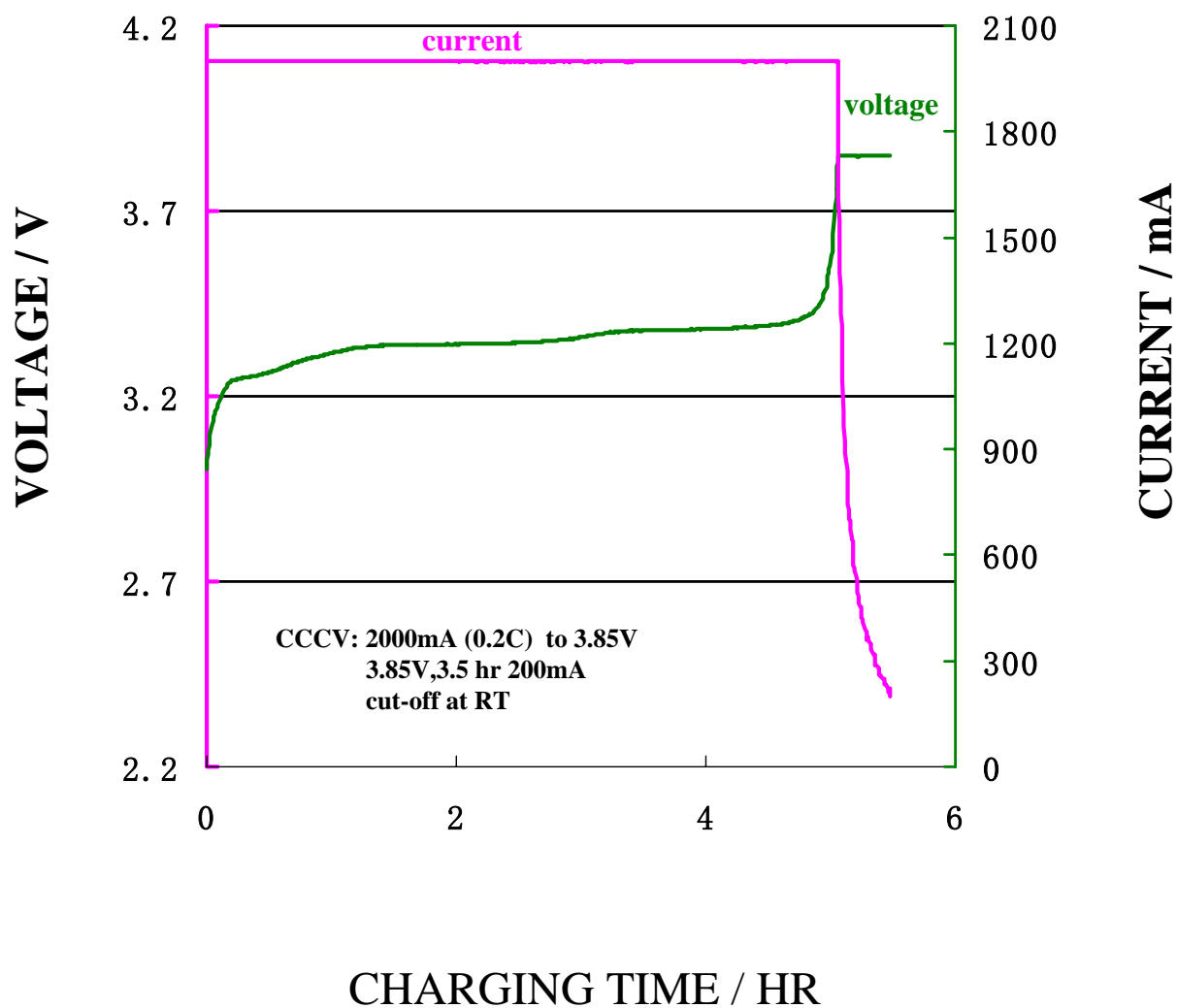


Li Polymer Rechargeable Battery

LFB10867220 Battery Cell **charging curve**

CHARGING PERFORMANCE (LFB10867220)

10000mAh(min)

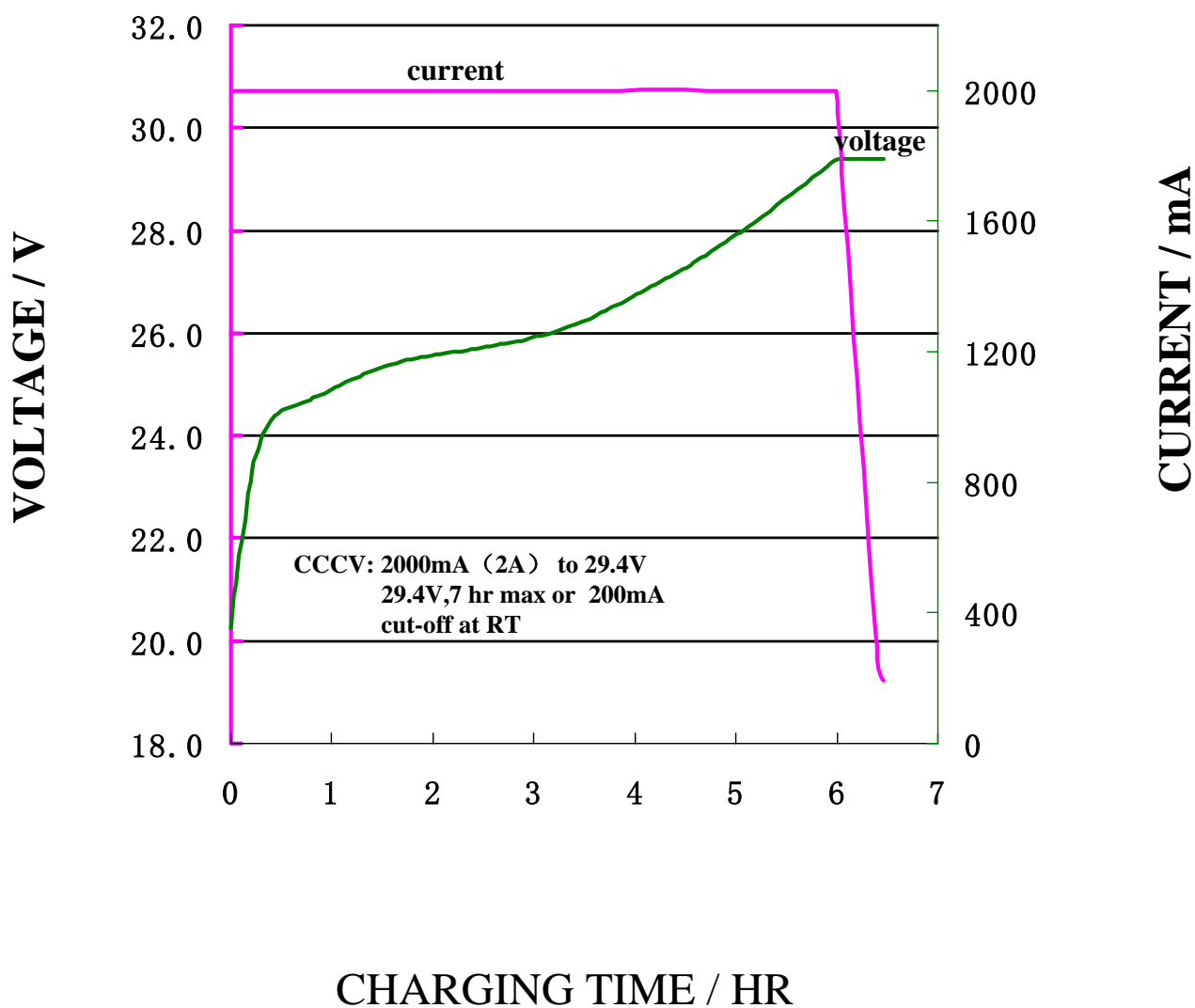




Li Polymer Rechargeable Battery

LFB 10867220 (7S)- charging curve

CHARGING PERFORMANCE (LFB 10867220 -7S) 10000mAh(min)

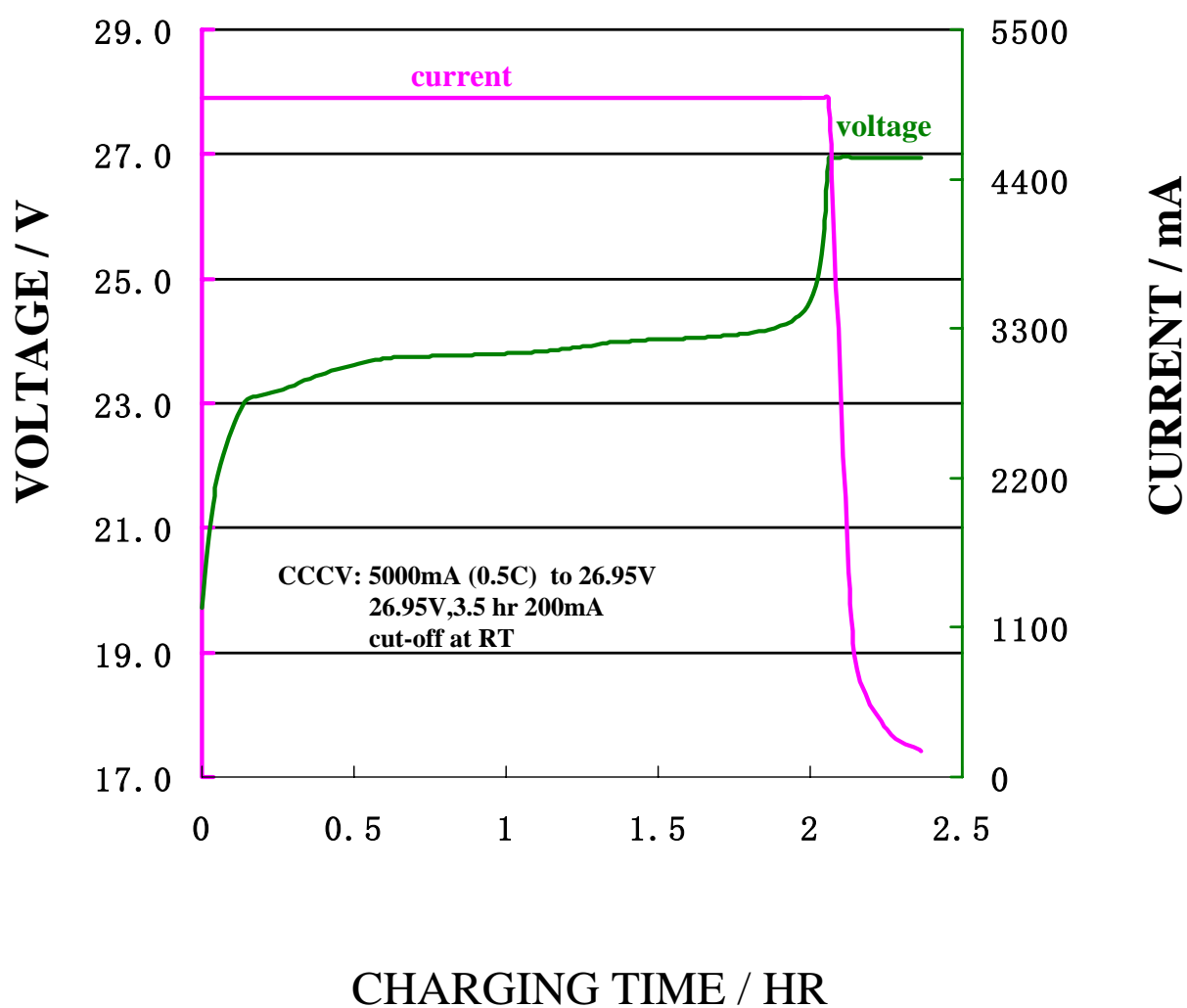




Li Polymer Rechargeable Battery

LFB 10867220 (7S) - Charging Curve

Charging Performance (LFB 10867220 -7S) 10000mAh(min)



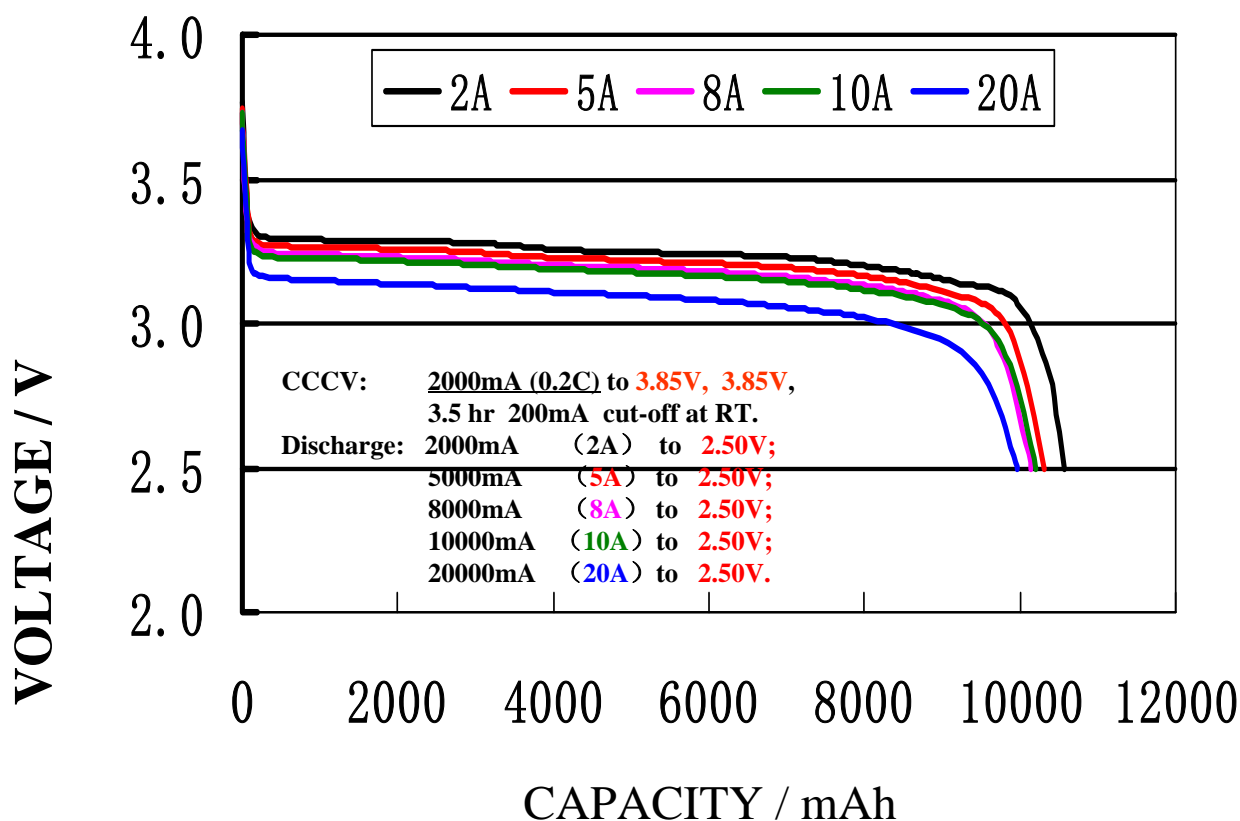


Li Polymer Rechargeable Battery

LFB 10867220 Cell and Battery Discharging performance

LFB 10867220 (Cell)- Discharging curve

DISCHARGING PERFORMANCE (10867220PFH-Cell) 10000mAh(min)



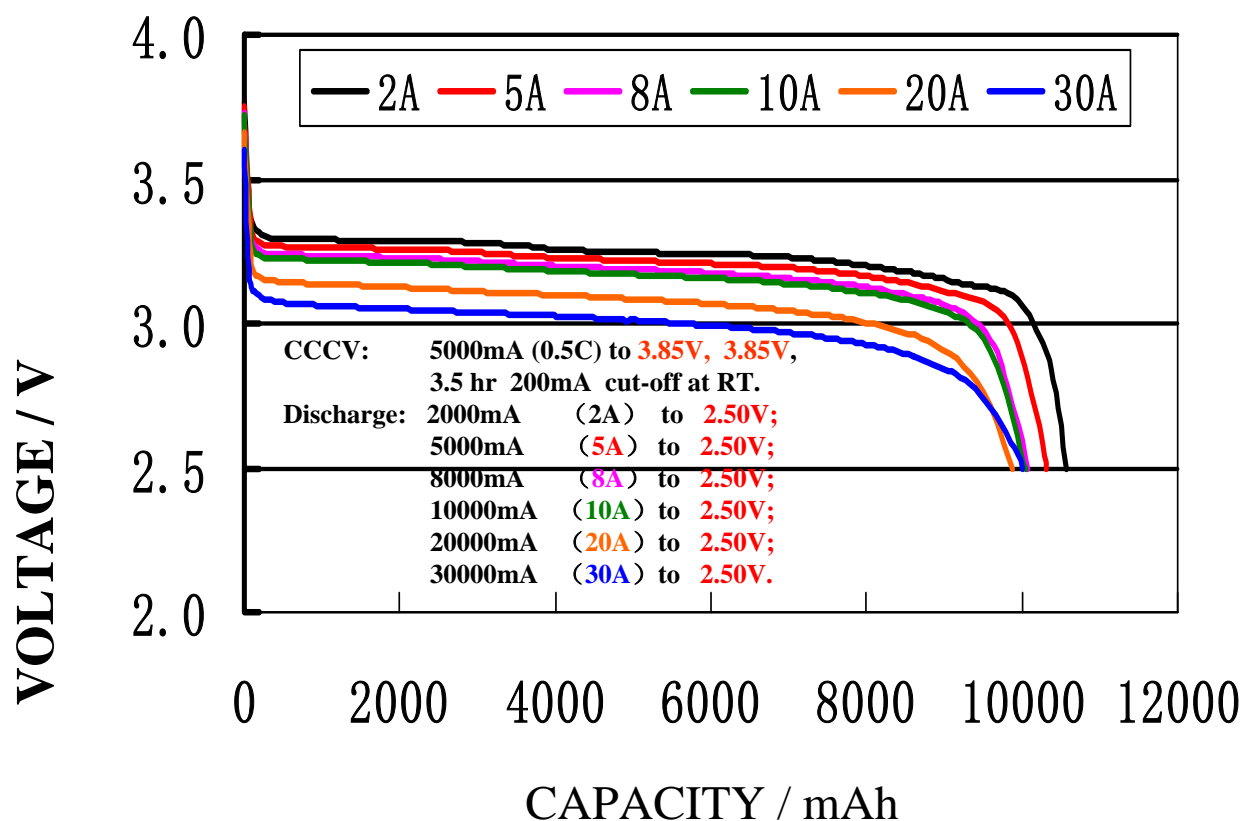
Discharge Rate	Discharging Data			
	Average Voltage(V)	Initial Discharge Voltage(V)	Discharge Capacity (mAh)	Discharge Time (Min)
2A	3.225	3.765	10563.46	317.27
5A	3.193	3.746	10301.12	123.60
8A	3.170	3.733	10147.72	76.03
10A	3.155	3.727	10194.84	61.17
20A	3.086	3.672	9964.98	29.90



Li Polymer Rechargeable Battery

LFB 10867220 (Cell)- Discharging Curve

DISCHARGING PERFORMANCE (LFB 10867220 -Cell) 10000mAh(min)



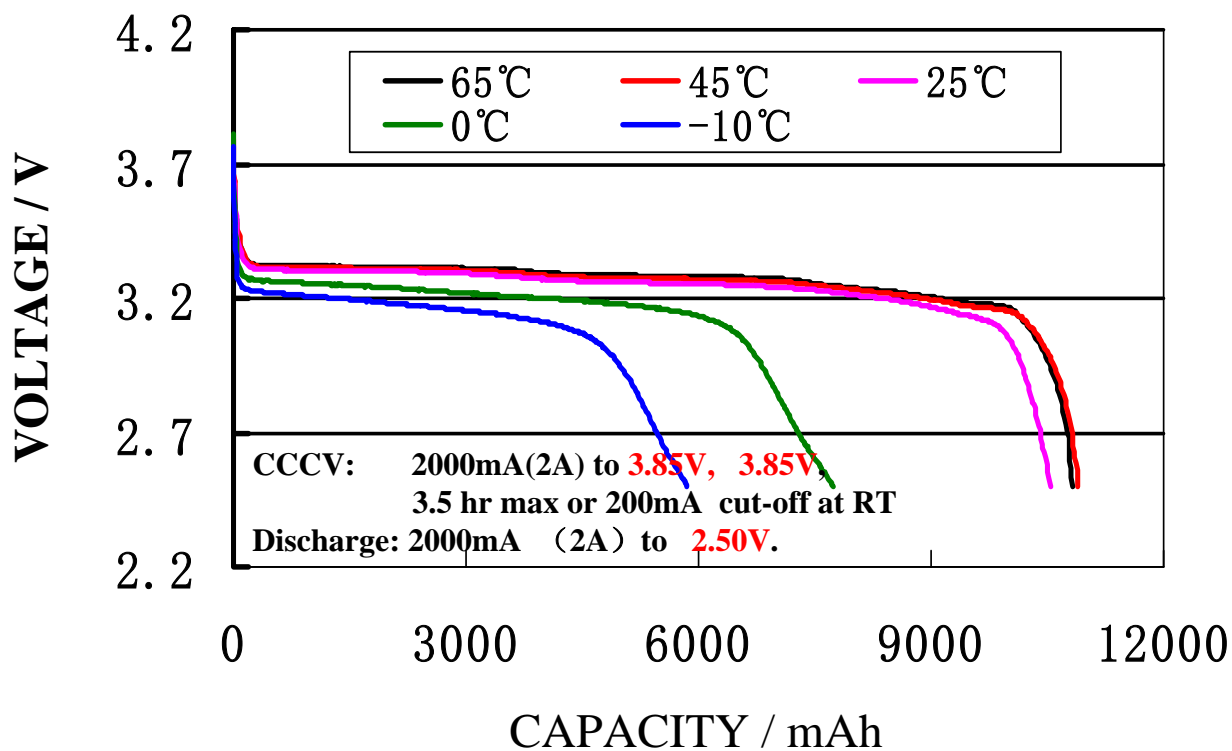
Discharge Rate	Discharging Data			
	Average Voltage)	Initial Discharge Voltage)	Discharge Capacity (mAh)	Discharge Time (Min)
2A	3.223	3.766	10576.37	317.6
5A	3.207	3.750	10318.12	123.93
8A	3.162	3.729	10082.18	75.60
10A	3.160	3.721	10049.23	60.33
20A	3.076	3.664	9867.90	29.60
30A	2.996	3.605	9998.31	20.00



Li Polymer Rechargeable Battery

HIGH & LOW DISCHARGING PERFORMANCE

(LFB 10867220 -CELL) 10000mAh(Min)



Discharge Temperature	2A Discharge Data			
	Average Voltage)	Initial Discharge Voltage)	Discharge Capacity (mAh)	Discharge Time (min)
65°C	3.284	3.621	10822.6	324.9
45°C	3.273	3.791	10890.9	327.0
25°C	3.258	3.774	10542.9	316.5
0°C	3.202	3.812	7738.3	232.3
-10°C	3.156	3.765	5853.1	175.7



Li Polymer Rechargeable Battery

LFB 10867220 Cell and Battery Cycling performance

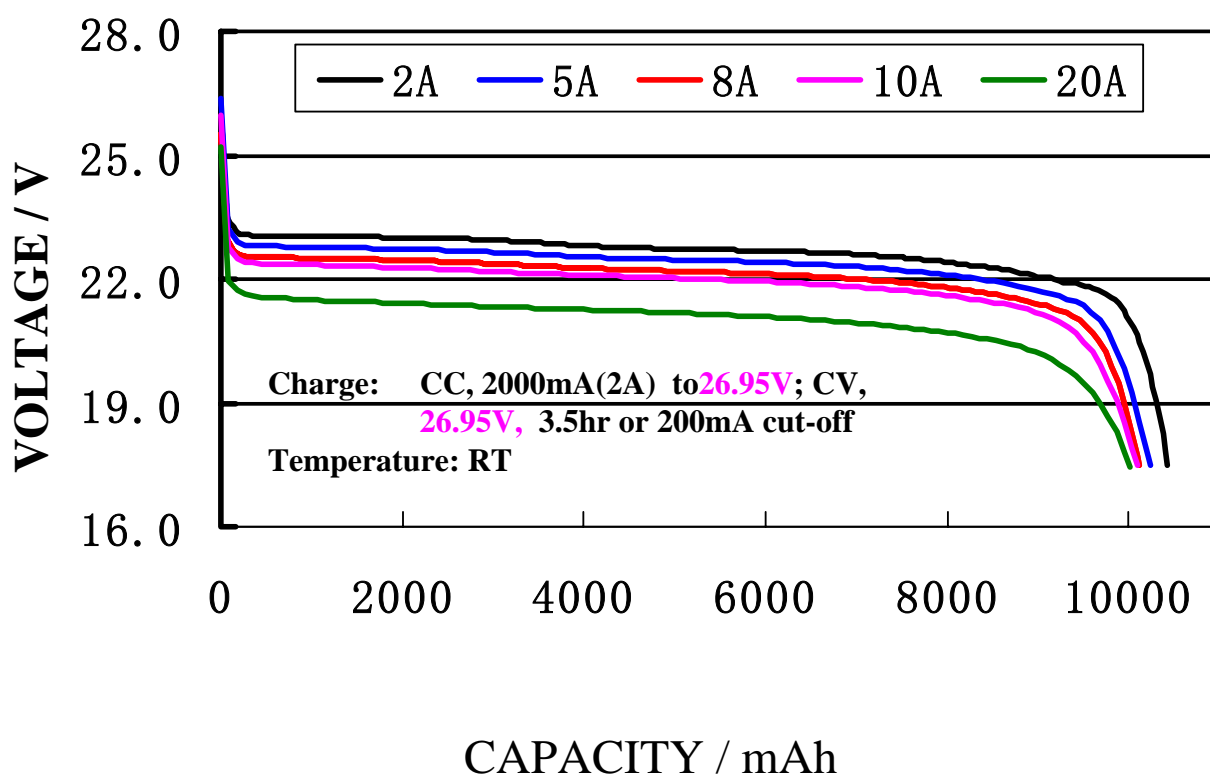


Li Polymer Rechargeable Battery

LFB10867220 (7S) - Discharging Performance

DISCHARGING PERFORMANCE(LFB10867220-7S)

-- 10000mAh(Min)



Discharge Rate	Discharge Time (Min)	Discharge Capacity (mAh)	Average Voltage (V)	Initial Discharge Voltage (V)
2A	312.90	10430.2	22.593	26.151
5A	122.87	10232.5	22.398	26.385
8A	75.90	10119.9	22.091	25.532
10A	60.57	10092.0	21.887	25.961
20A	30.03	10010.1	21.041	25.212

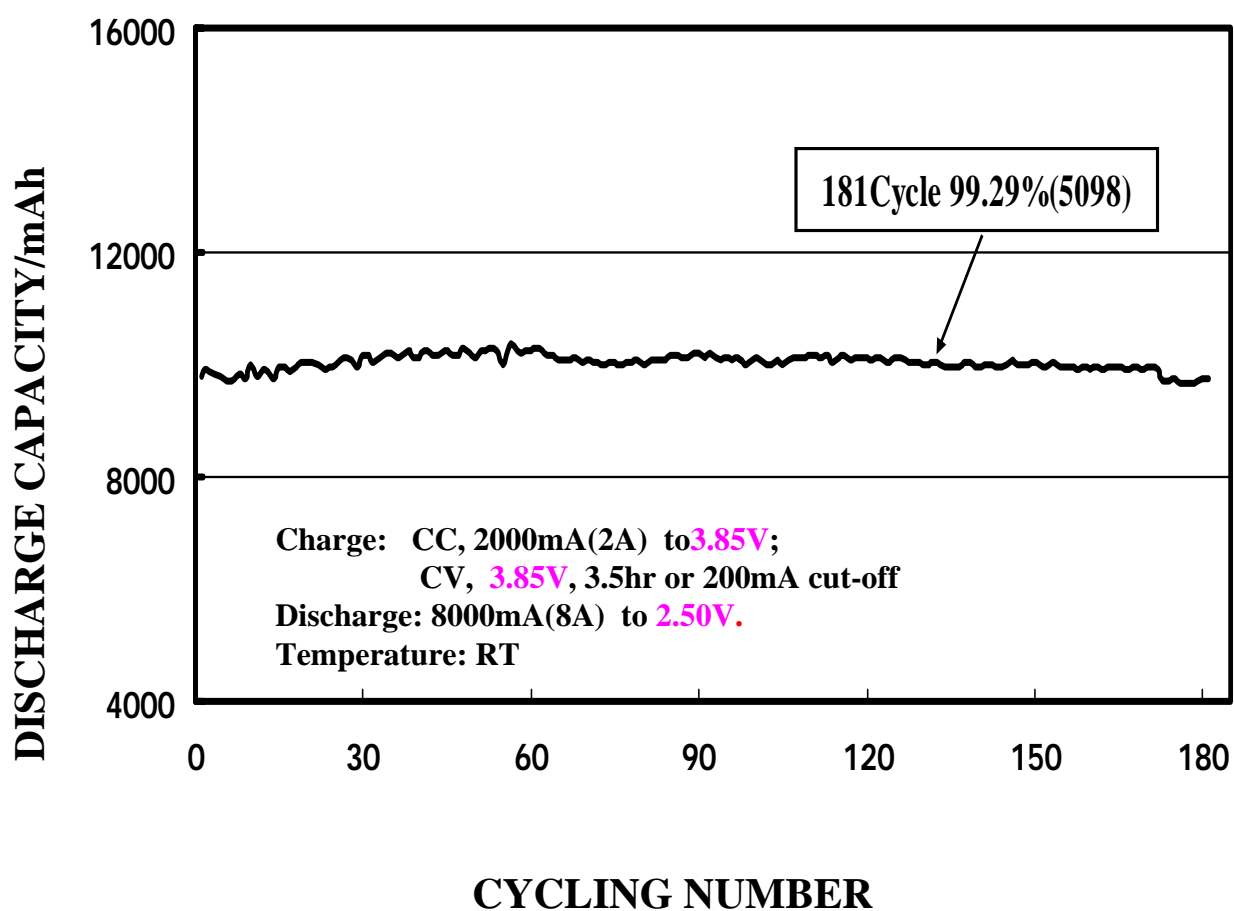


Li Polymer Rechargeable Battery

LFB 10867220 (Cell) -Life curve

CYCLING LIFE (LFB10867220-Cell)

2A charge 8A discharging cycle





Li Polymer Rechargeable Battery

PFH Power Li Polymer cell **LFB 10867220** (Cell) -Life curve

CYCLING LIFE (LFB 10867220 -Cell)

2A charge 8A discharging cycling

