

# **Technical Information of LG 18650HB2 (1.5Ah)**

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**Mobile Energy Division**



LG Chem

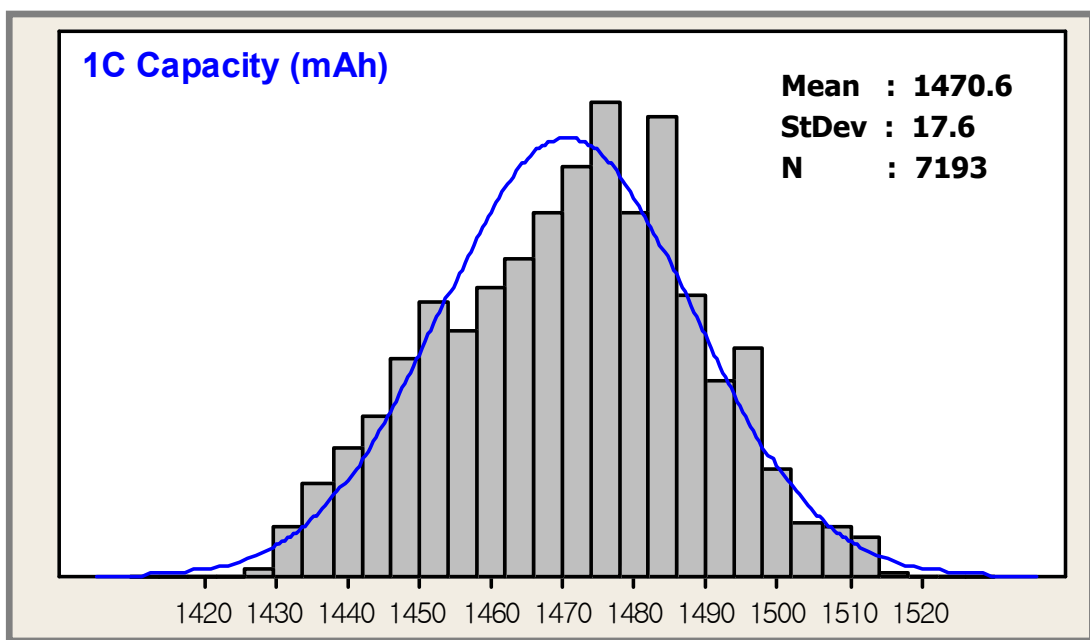
# Summary

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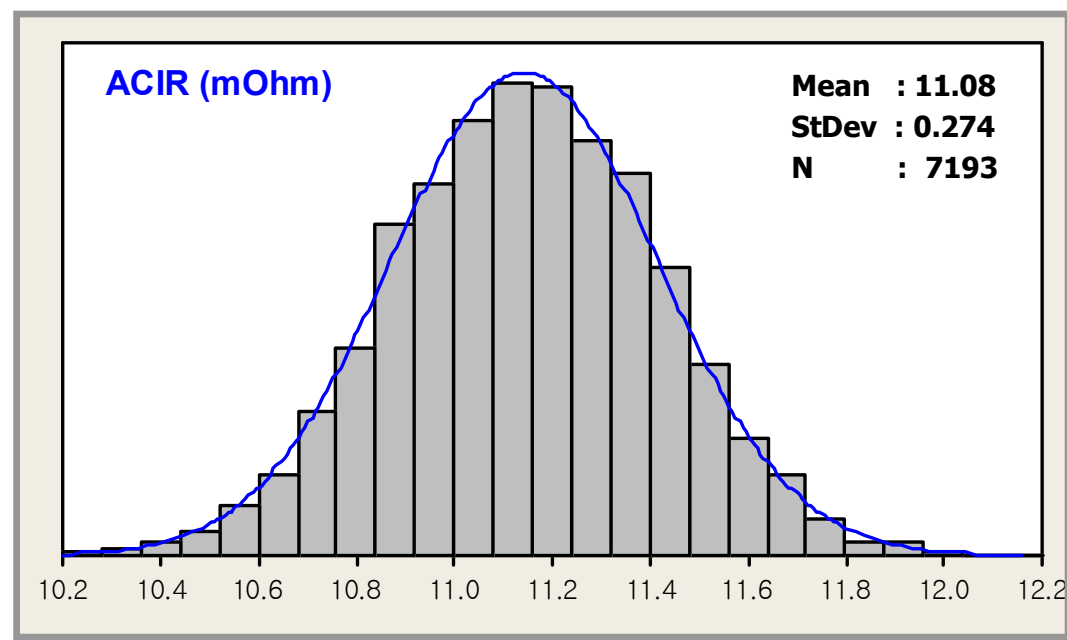
Type		Spec	Actual
Chemistry		Li[NiMnCo]O <sub>2</sub> (NMC)	
Dimensions (mm)	Diameter	18.3 +0.1/-0.3 mm	18.30 mm
	Height	65.0 ± 0.2 mm	64.95 mm
Weight (g)		Max. 48	44.7
Initial IR (mΩ AC 1kHz)		Max. 15	10~12
Initial IR (mΩ DC)		Max. 30	24~26
Nominal Voltage (V)		3.65	
Charge Method		Nominal : 0.75A 4.2V, 50mA End-current (CC-CV)	
		Fast : 4A 4.2V, 100mA End-current (CC-CV)	
Charge Time	Nominal (min)	140	
	Fast (min)	45	
Charge Current	Nominal Current (A)	0.75A	
	Max. Current (A)	4A	
Discharge	End Voltage (A)	2V	
	Max. Current (A)	30A (Continued discharge current)	
Rated Capacity	Nominal (Ah)	1.5 (Min. 1.4)	
Energy Density	Nominal (Wh/kg)	118	

# Capacity & ACIR Distribution

1C Capacity Distribution



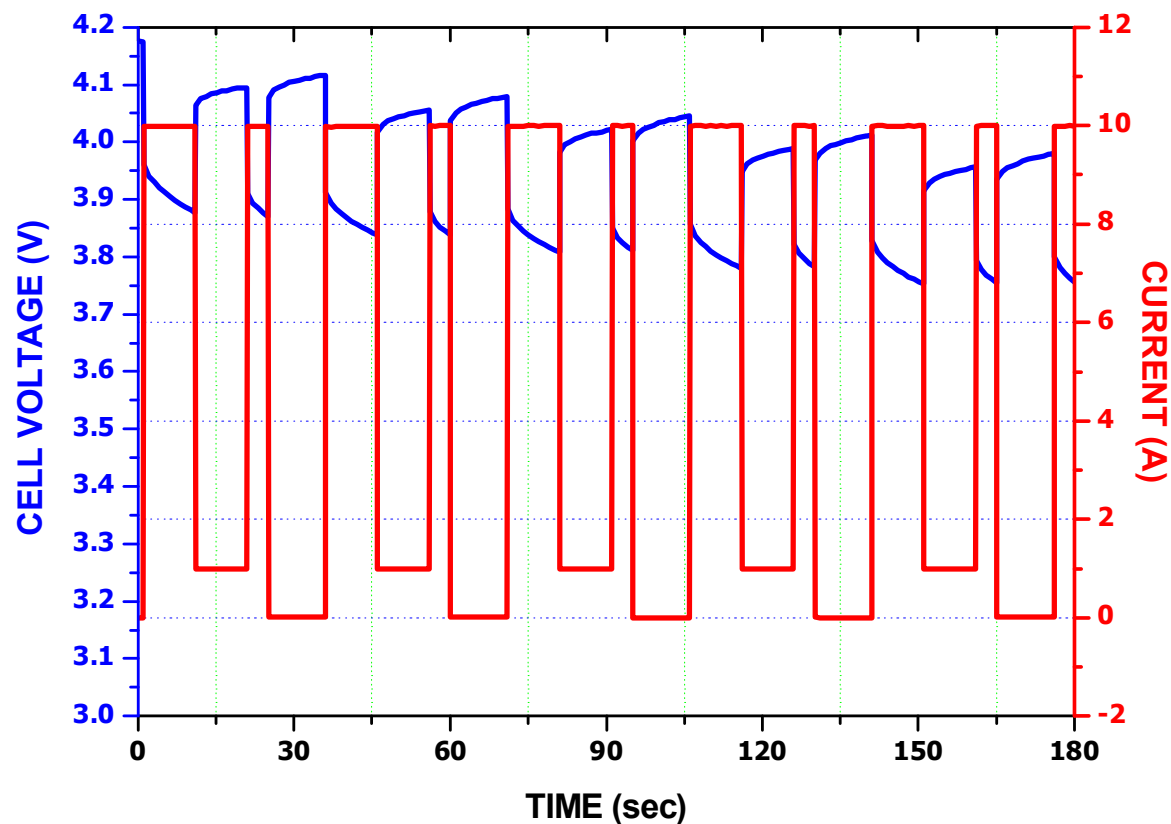
ACIR Distribution



- Charge : 4.2V, 4A, 100mA Cut-off rest time=30min, then to discharge

- Discharge profile

- 1) 10A discharge with 10 sec
- 2) Then 1A discharge with 10 sec
- 3) Then 10A discharge with 4 sec
- 4) Rest 10 sec,
- 5) Repeat 1-4, 5 times



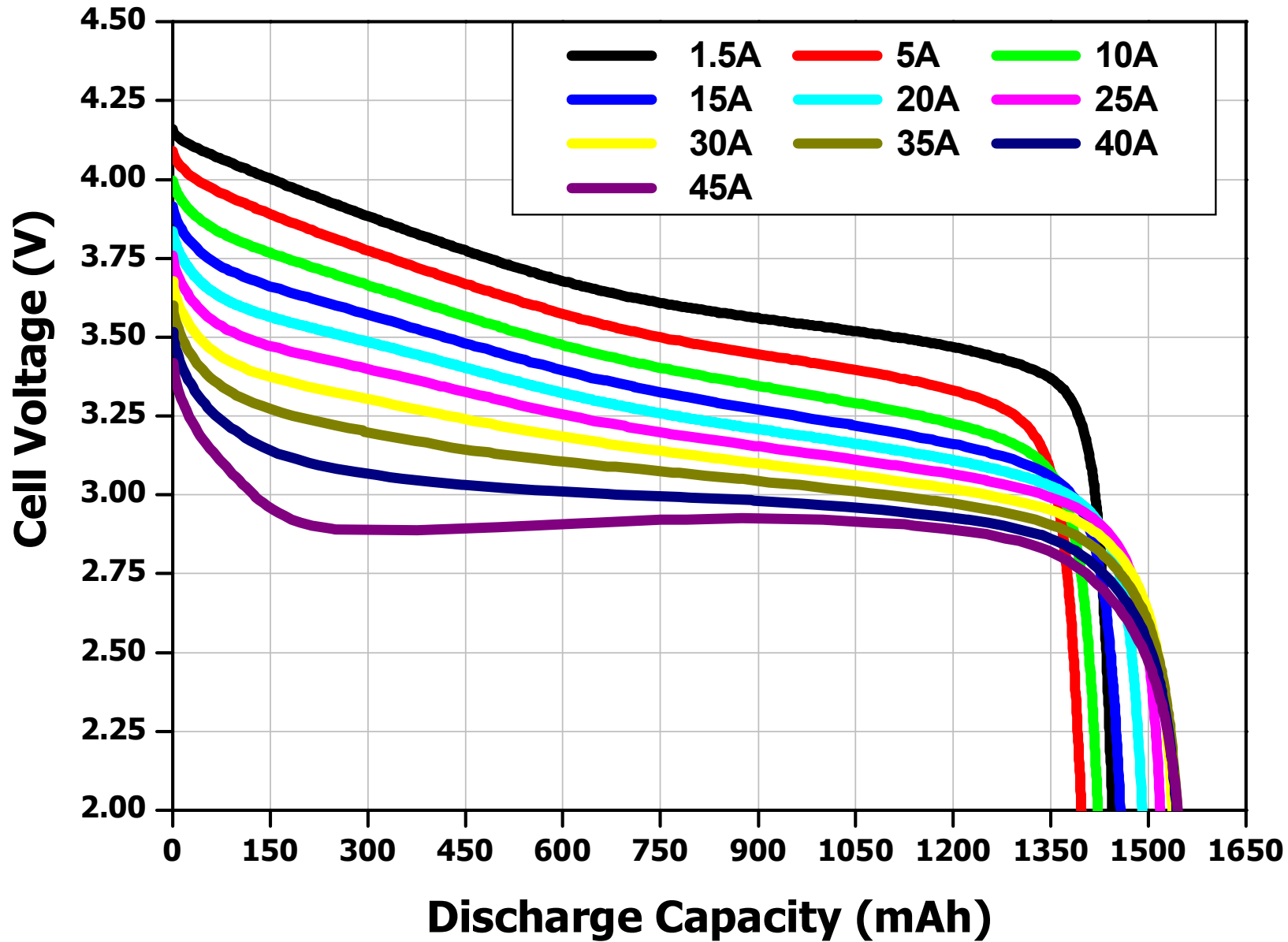
Cell	ACIR (mOhm)	DCIR (mOhm)
1	11.12	25.0
2	11.28	25.1
3	11.11	25.0

# Rate Performance

Discharge Current	Capacity (mAh)	Energy (Wh)	% of 1C Capacity	% of 1C Energy
1.5A	1445	5.3	100.0	100.0
5A	1398	5.0	96.7	94.3
10A	1423	4.9	98.5	92.5
15A	1458	4.9	100.9	92.5
20A	1491	4.9	103.2	92.5
25A	1519	4.9	105.1	92.5
30A	1538	4.8	106.4	90.6
35A	1545	4.7	106.9	88.7
40A	1544	4.6	106.9	86.8
45A	1546	4.5	107.0	84.9

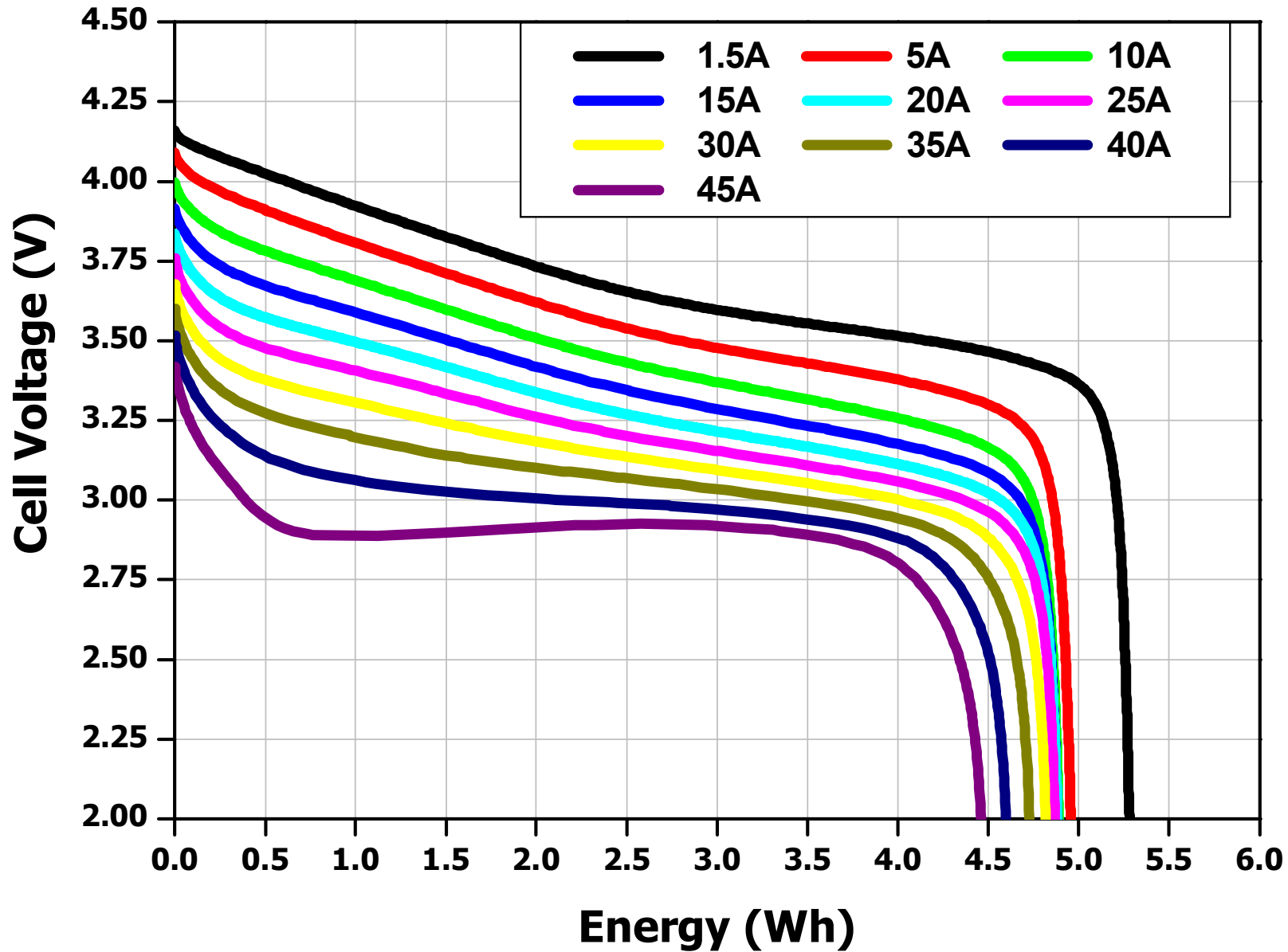
# Rate Performance (Capacity)

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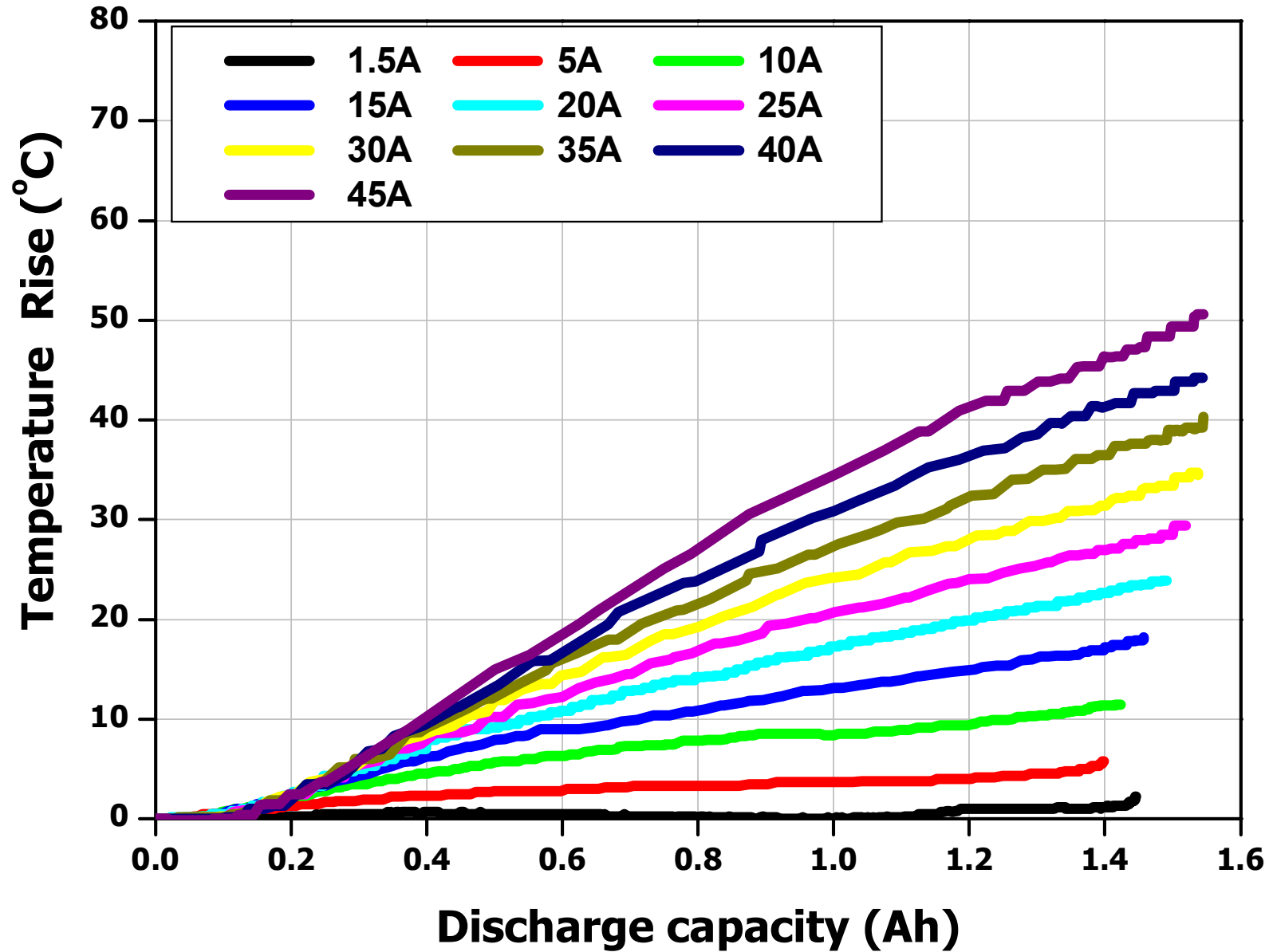
# Rate Performance (Energy)

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# Rate Performance (Temperature Rise)

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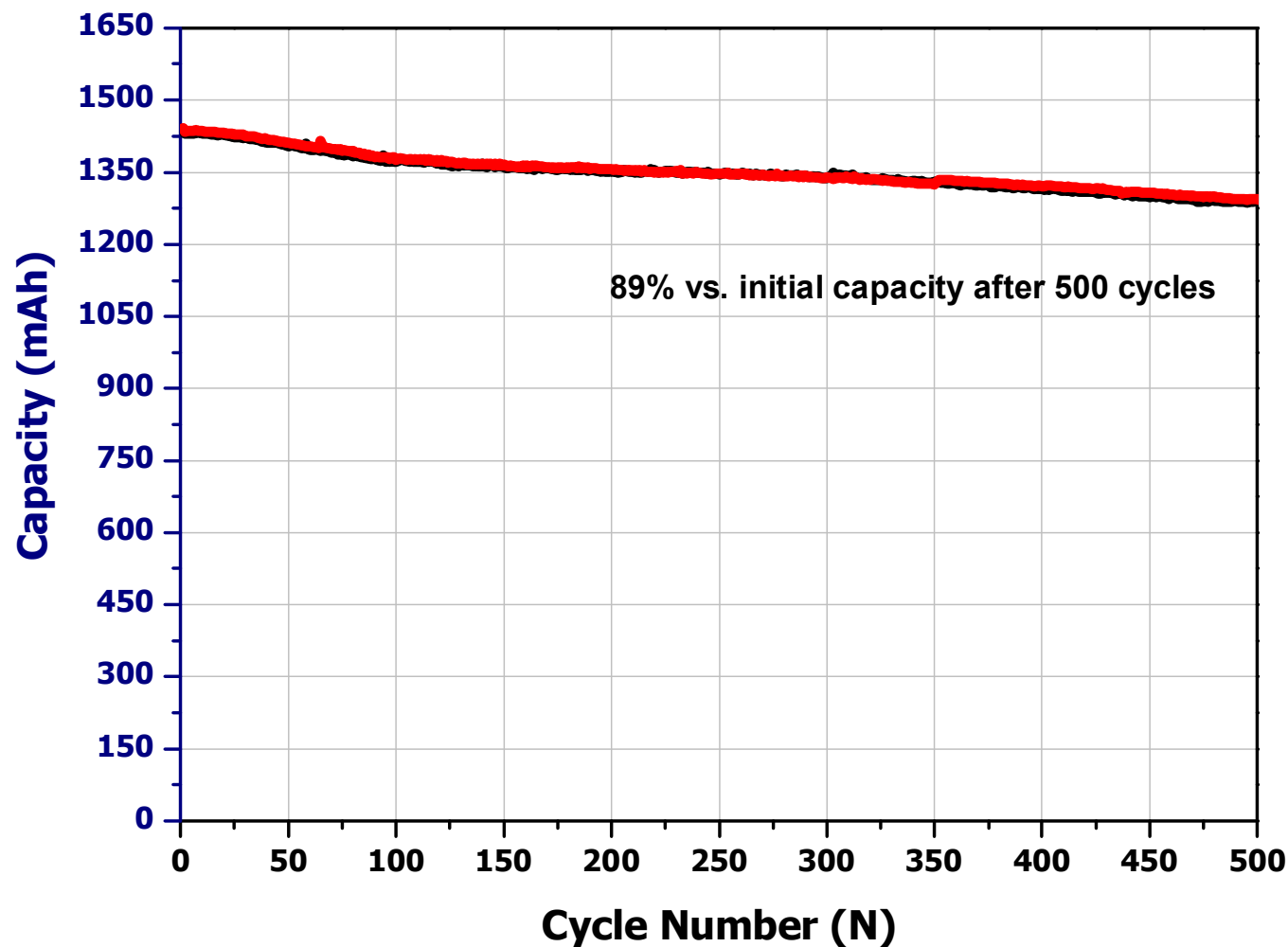


# 4A Charge / 10A Discharge Cycle life (RT)

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## Test Condition

- Charge (CC/CV): 4A charge to 4.2V, 100mA Cut-off
- Discharge (CC) : 10A discharge, 2.0V Cut-off

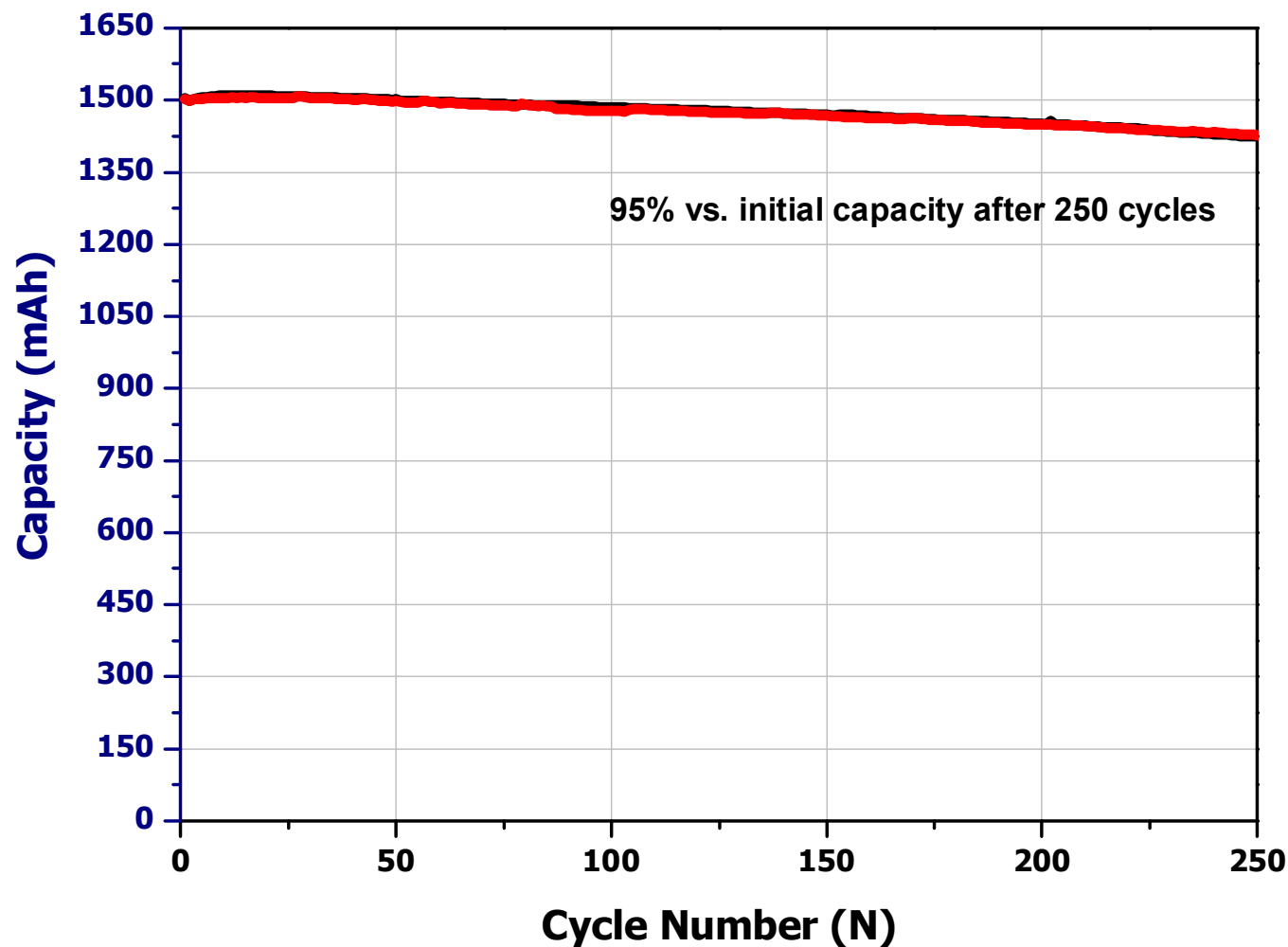


# 4A Charge / 20A Discharge Cycle life (RT)

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## Test Condition

- Charge (CC/CV): 4A charge to 4.2V, 100mA Cut-off
- Discharge (CC) : 20A discharge, 2.0V Cut-off

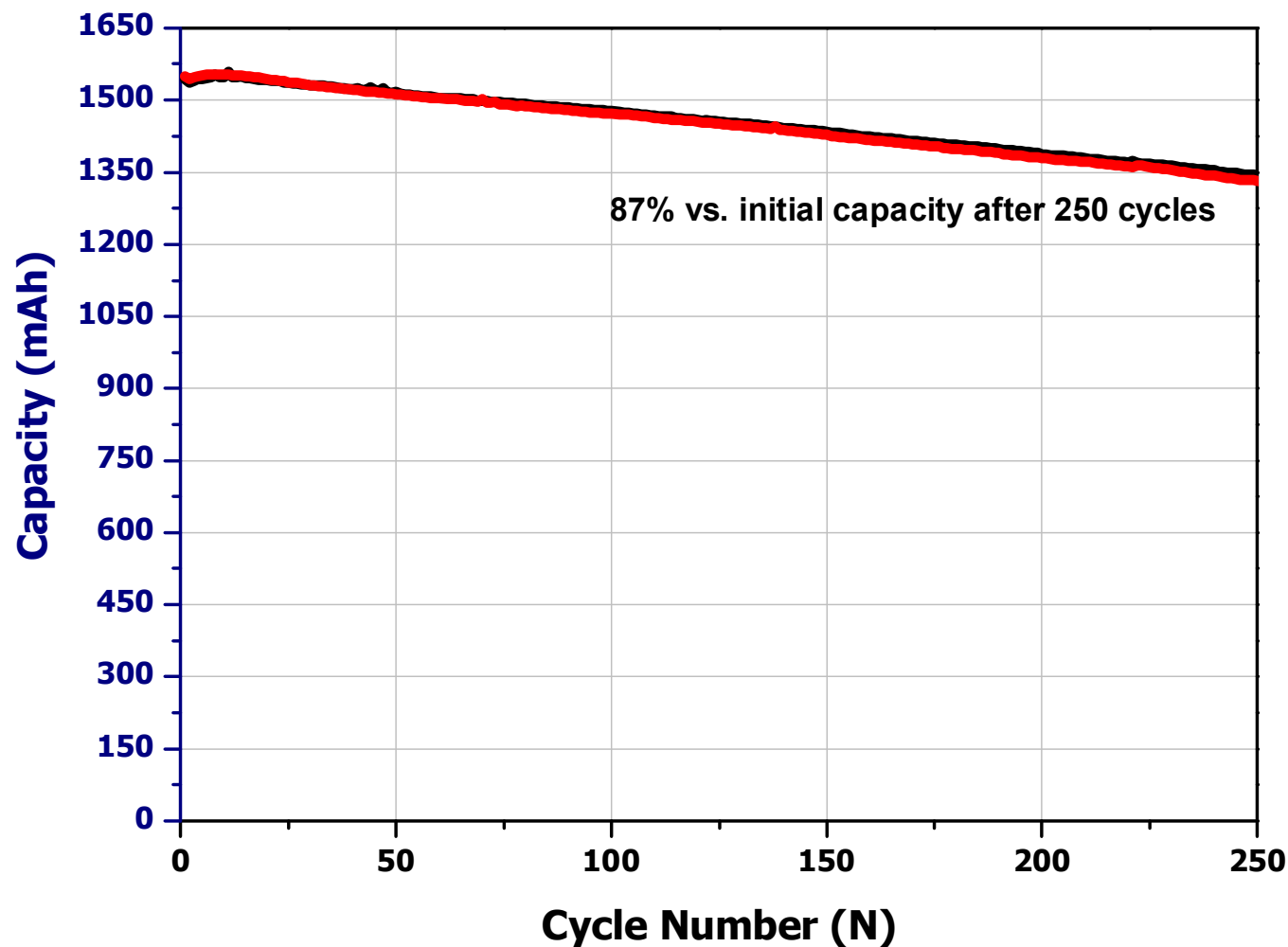


# 4A Charge / 30A Discharge Cycle life (RT)

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## Test Condition

- Charge (CC/CV): 4A charge to 4.2V, 100mA Cut-off
- Discharge (CC) : 30A discharge, 2.0V Cut-off

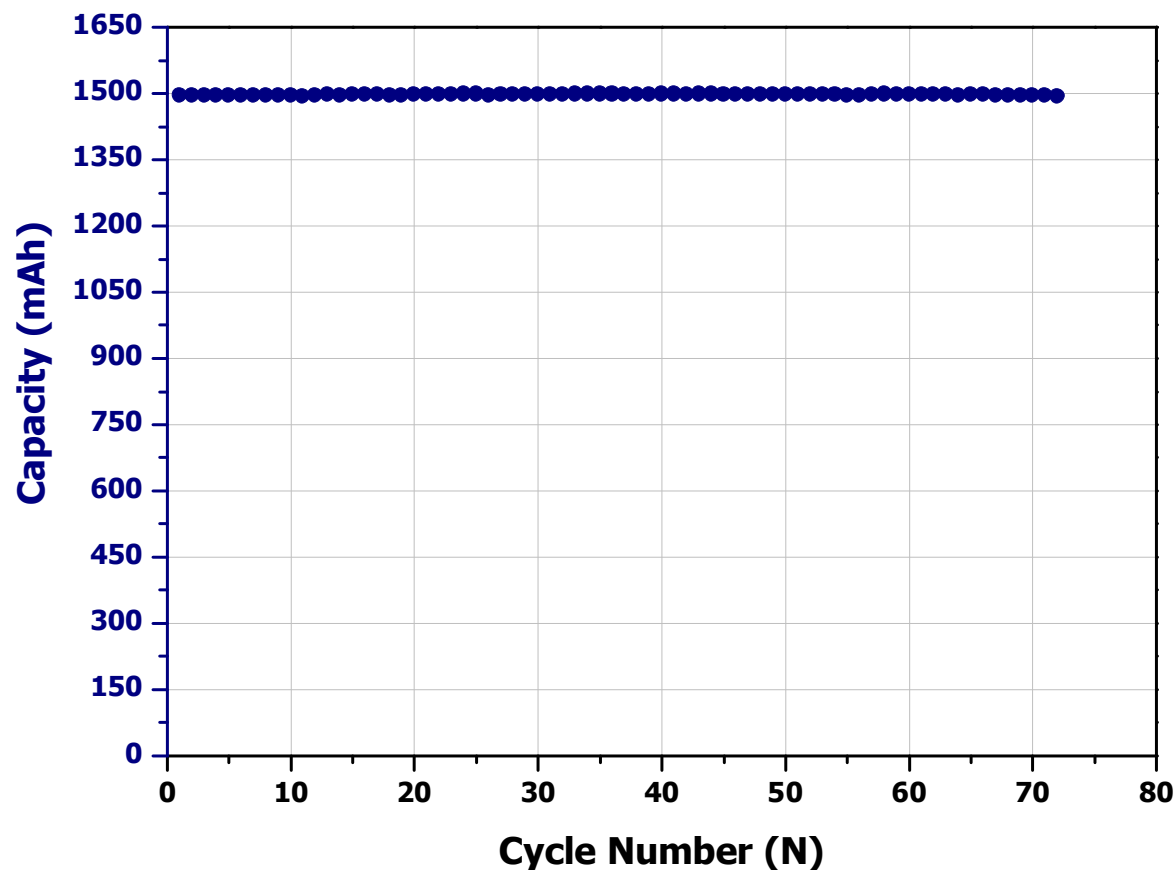


# Pulse Cycle

Charge : 4A CC charge to 4.18, 0.5A CC charge to 4.18V, rest 30min, then to discharge

Discharge profile

- 1) 44A discharge with 0.5S
- 2) Then 30A discharge with 5S, if cell voltage is lower than 2.2V, then go to Item6
- 3) Then 30A discharge with 6S, if cell voltage is lower than 2.2V, then go to Item4
- 4) Rest 4.5S, if cell voltage is lower than 2.2V, then go to Item6
- 5) Repeat 1-4
- 6) Rest 30min, Then to charge



# Safety Test Result (UL 1642)

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Item	Note	Amount	Cell Num.	Max. Temp. (°C)	Description	Result
Short Circuit [60°C]	Storage 30mins before Short Circuit with < 50 mOhm resistance	5	1	121.5	No explosion and No fire	Pass
			2	122.1	No explosion and No fire	Pass
			3	121.1	No explosion and No fire	Pass
			4	118.8	No explosion and No fire	Pass
			5	121.7	No explosion and No fire	Pass
Crush	UL 1642	5	1	Room temp.	No explosion and No fire	Pass
			2	Room temp.	No explosion and No fire	Pass
			3	Room temp.	No explosion and No fire	Pass
			4	Room temp.	No explosion and No fire	Pass
			5	Room temp.	No explosion and No fire	Pass
Impact	UL 1642	5	1	Room temp.	No explosion and No fire	Pass
			2	Room temp.	No explosion and No fire	Pass
			3	Room temp.	No explosion and No fire	Pass
			4	Room temp.	No explosion and No fire	Pass
			5	Room temp.	No explosion and No fire	Pass

# Safety Test Result

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Item	Note	Amount	Cell Num.	Max. Temp. (°C)	Description	Result
Overcharge [1.5C, 12V]	Overcharge from fully discharged	4	1	76.06	No leakage, No explosion and No fire	Pass
			2	78.39	No leakage, No explosion and No fire	Pass
			3	79.24	No leakage, No explosion and No fire	Pass
			4	79.02	No leakage, No explosion and No fire	Pass
Overcharge [3C, 12V]	Overcharge from fully discharged	4	1	90.48	No leakage, No explosion and No fire	Pass
			2	87.75	No leakage, No explosion and No fire	Pass
			3	86.04	No leakage, No explosion and No fire	Pass
			4	96.03	No leakage, No explosion and No fire	Pass

# Safety Test Result

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Item	Note	Amount	Cell Num.	Max. Temp. (°C)	Description	Result
Nail (4.2V, Side)	At 100%SOC, using a 2.5mm nail, penetrate through the sidewall of the cell at a speed of 9m/min	5	1	105.8	No explosion and No fire	Pass
			2	104.1	No explosion and No fire	Pass
			3	99.5	No explosion and No fire	Pass
			4	99.8	No explosion and No fire	Pass
			5	103.8	No explosion and No fire	Pass
Heating [4.2V, 150°C, 1h]	Temperature rise 5°C/min to 150°C, and keep 60min at 150°C	3	1	151.8	No explosion and No fire	Pass
			2	154.7	No explosion and No fire	Pass
			3	152.4	No explosion and No fire	Pass
Drop	Floor : Concrete Height : 1.0m Cycle : Random orientation 3 times	3	1	Room temp.	No explosion and No fire	Pass
			2	Room temp.	No explosion and No fire	Pass
			3	Room temp.	No explosion and No fire	Pass