
Technical Report

[ICR18650-32A]



SAMSUNG

SAMSUNG SDI

Dec. 2013

Cell Business Division

This material is proprietary to Samsung SDI Co., Ltd. It shall not be used, reproduced, copied, disclosed, transmitted, in whole or in part, without the express written consent of Samsung SDI Co., Ltd.



SAMSUNG

SAMSUNG SDI

Preview

1	<i>General Specification</i>
2	<i>Reliability</i>
3	<i>Safety</i>

General Specification

Φ Max 18.4 mm



Max
65.0mm

With Tube

		ICR18650-32A
● Capacity	Nominal Minimum	3,200mAh 3,100mAh
● Nominal Voltage		3.75V
● Charging Method		CC-CV
● Charging Voltage		4.35V
● Charging Current	Standard Rapid For Cycle	1.600A 3.200A Step charge 2,240mA (0.7C) CC 4.2V 960mA (0.3C) CC-CV 4.35V
● Discharging Cut-off Voltage		2.75V
● Discharging Current	Max.	6.4A
● Weight	Max.	50g
● Operating Temperature	Charge Discharge	0 ~ 45 °C -20 ~ 50 °C
● Storage Temperature	1 Year 3 Months 1 Month	-20 ~ 25 °C -20 ~ 45 °C -20 ~ 50 °C

@ Reliability

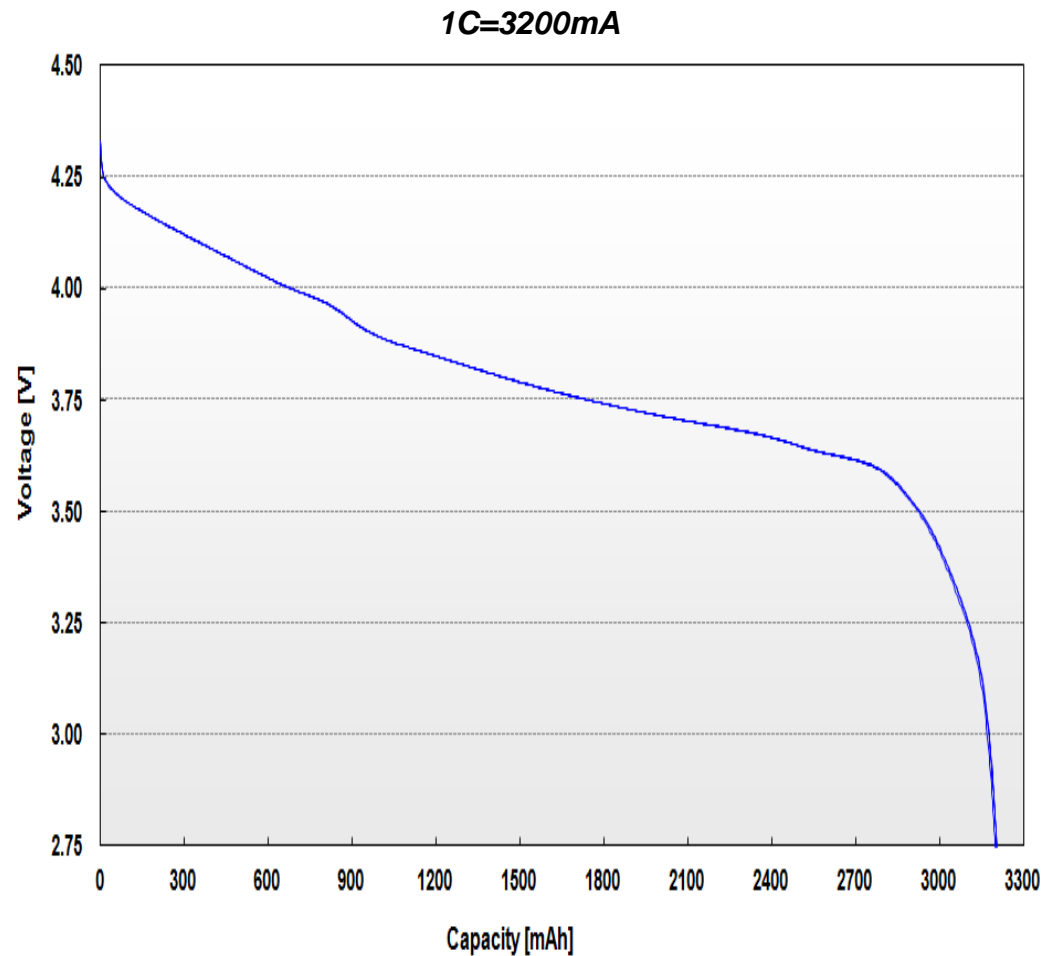
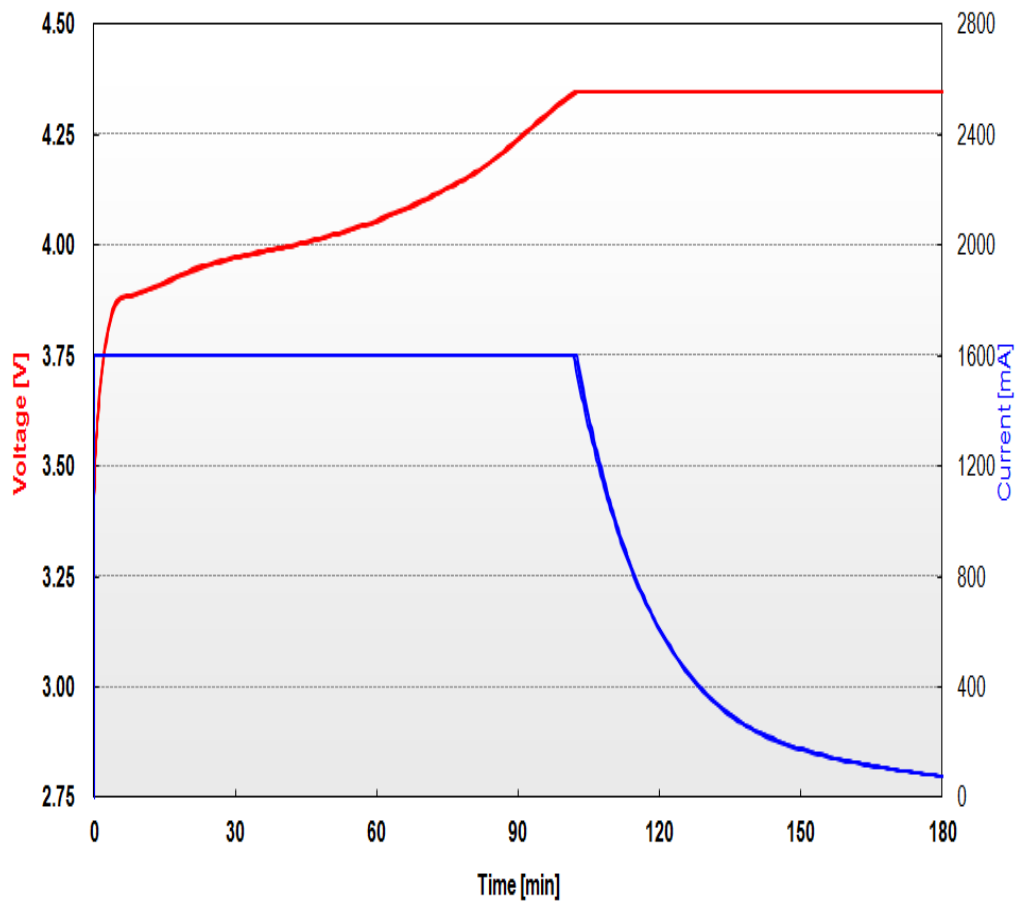
Performance

Standard Charge/Discharge

Model : ICR18650-32A

Method : Charge : CC-CV 0.5C 4.35V 3Hr or 64mA cut off at 25 °C

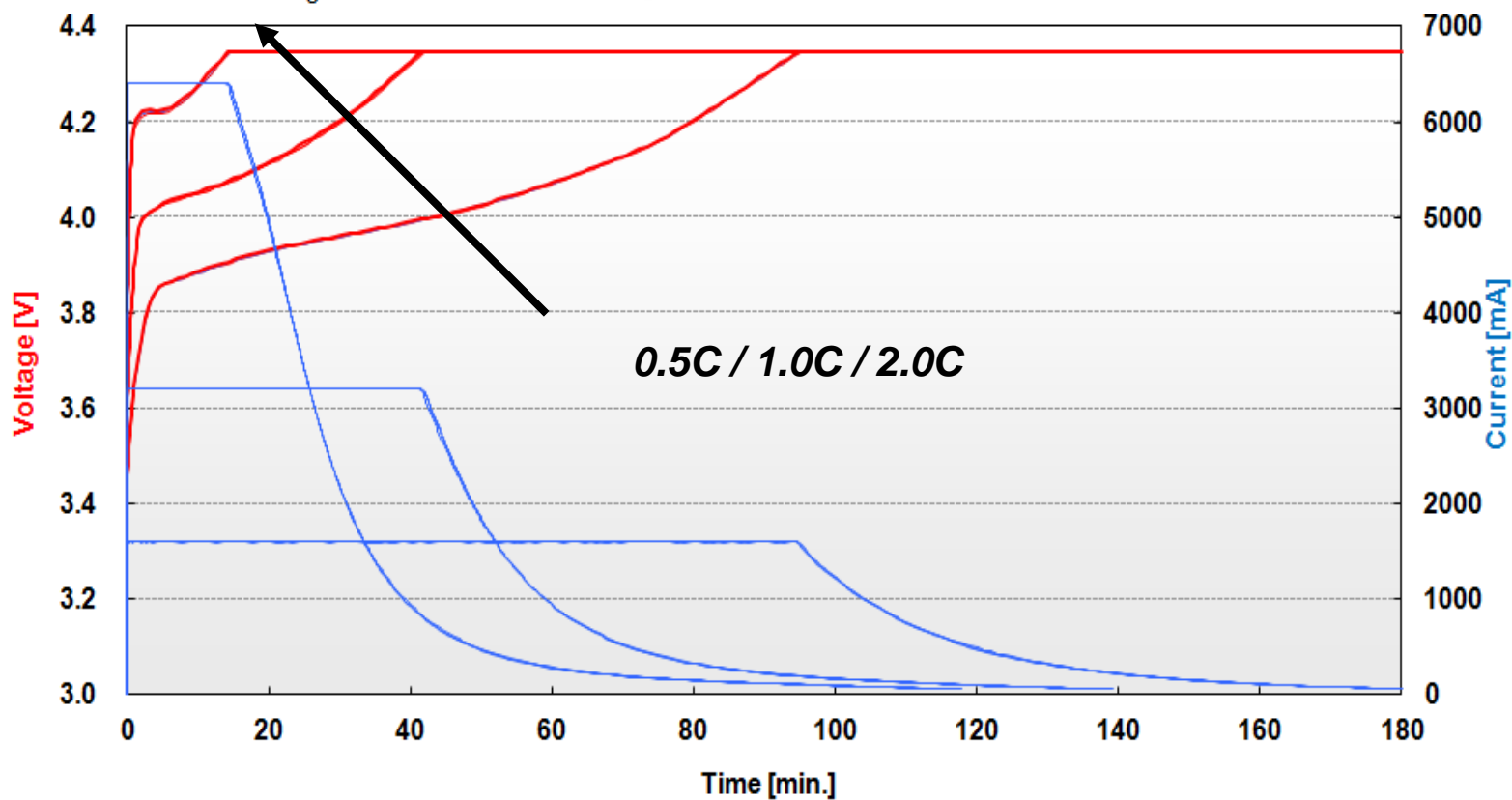
Discharge : CC 0.2C 2.75V cut off at 25 °C



Performance

Rate Charge

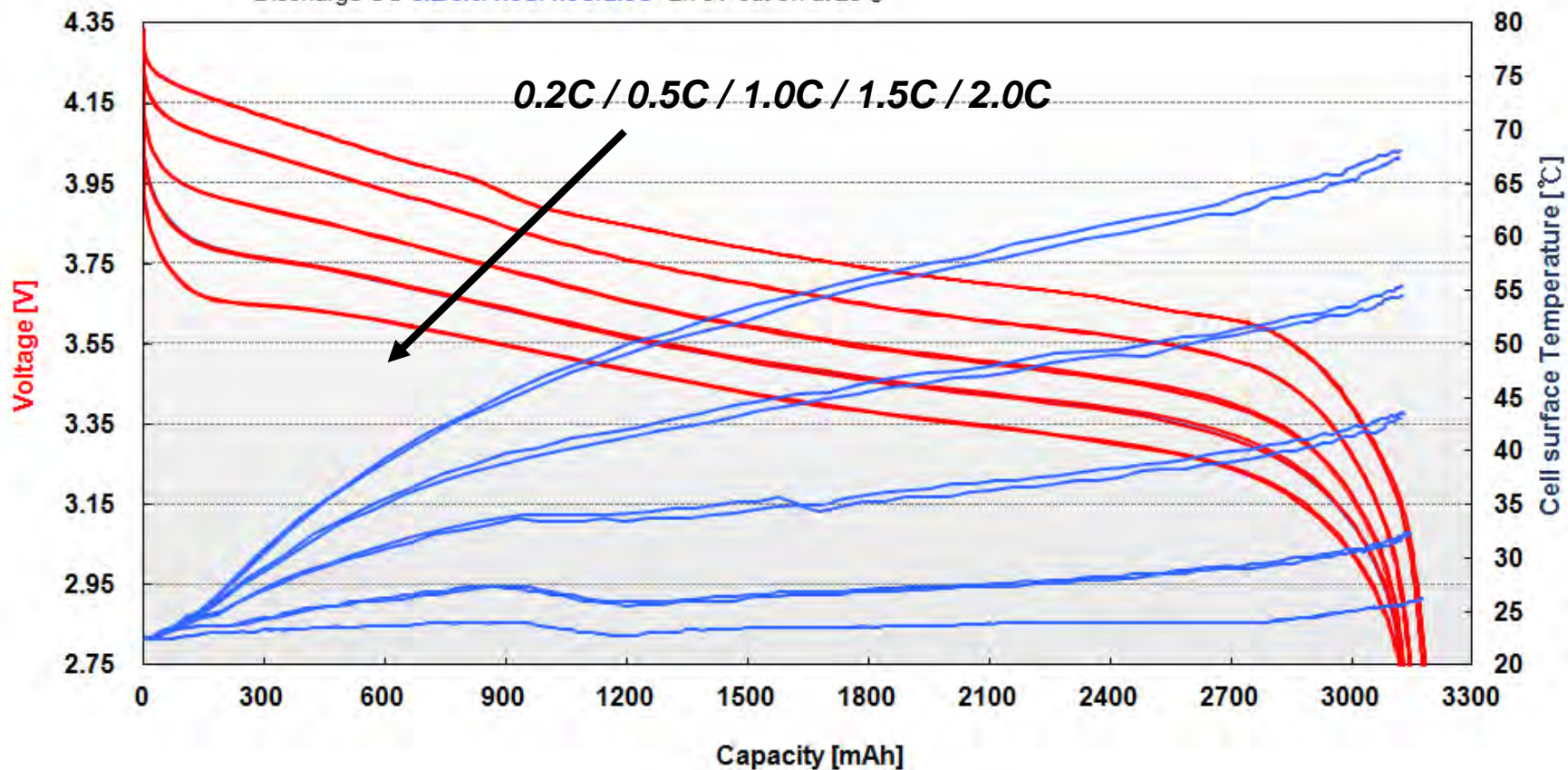
Model : ICR18650-32A, 1C A = 3,200 mA
Method : Charge CC-CV 4.35V **0.5/1.0/2.0C** 0.02C cut off at 25°C
Discharge CC 0.2C 2.75V cut off at 25°C



Performance

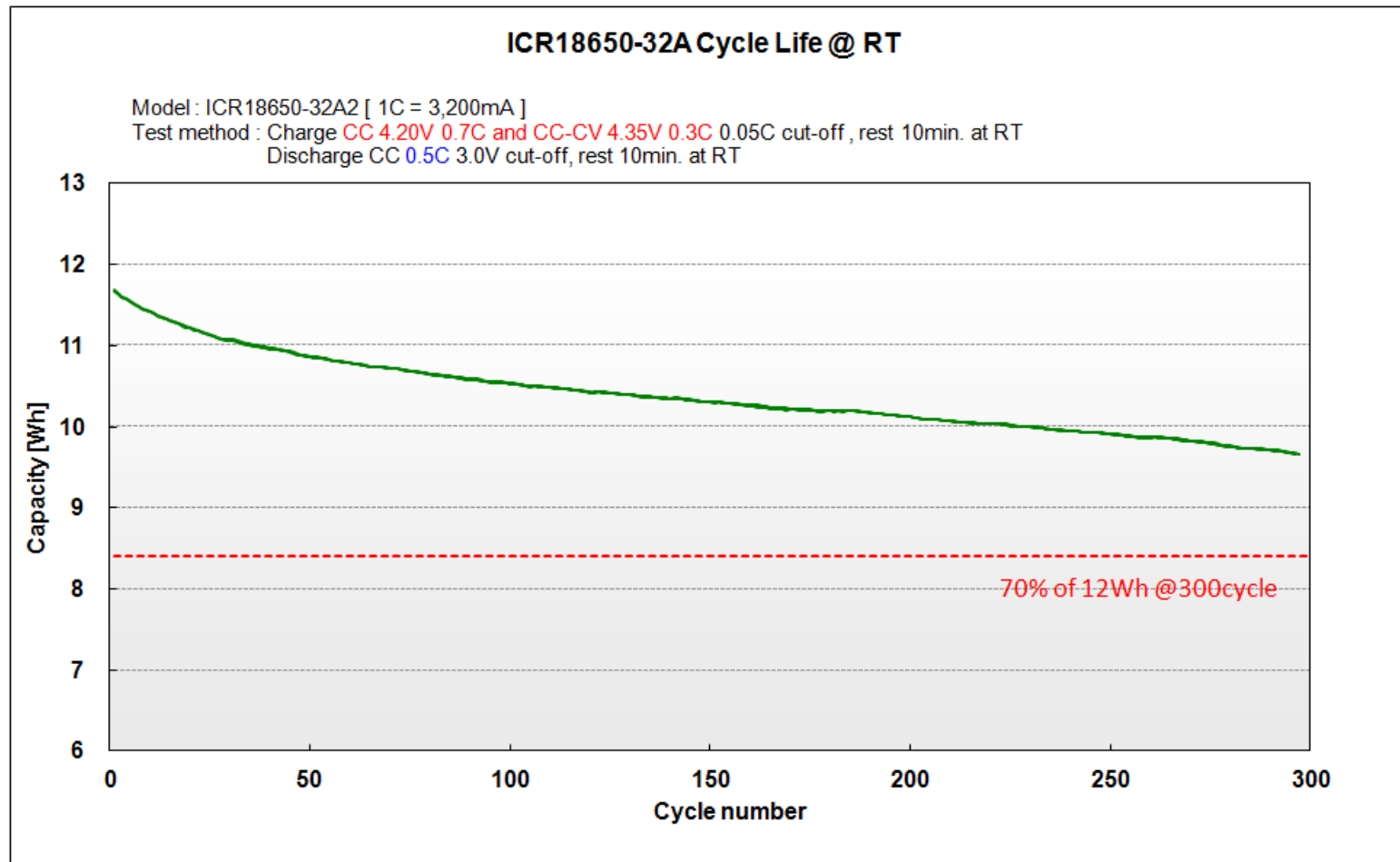
Rate Discharge

Model: ICR18650-32A, 1CA = 3,200 mA
Method: Charge CC-CV 4.35V 0.5C 0.02C or 3hrs cut off at 25°C
Discharge CC **0.2C/0.5C/1.0C/1.5C/2.0C** 2.75V cut off at 25°C



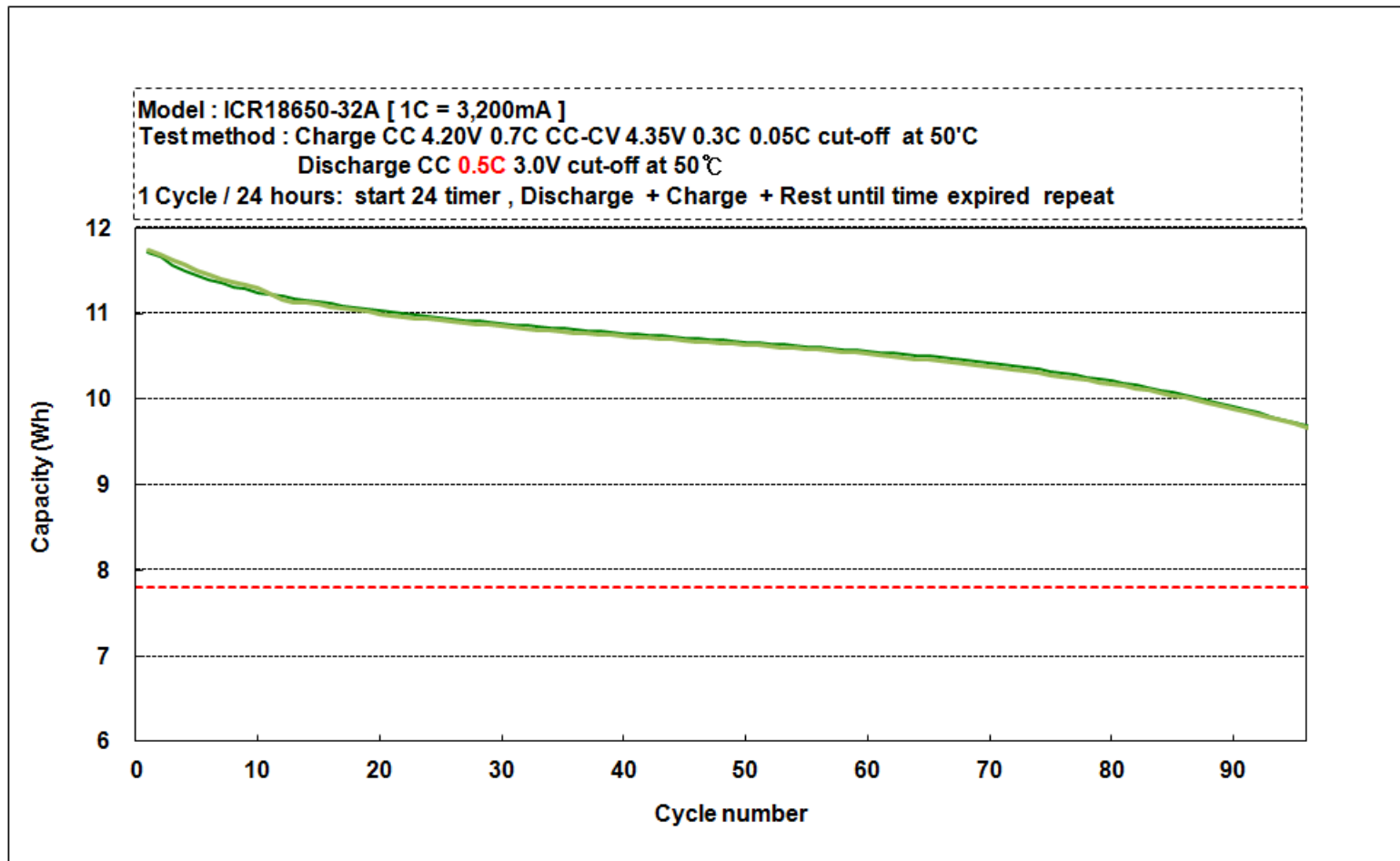
Performance

R.T. Cycle Life



Performance

50°C cycle/day

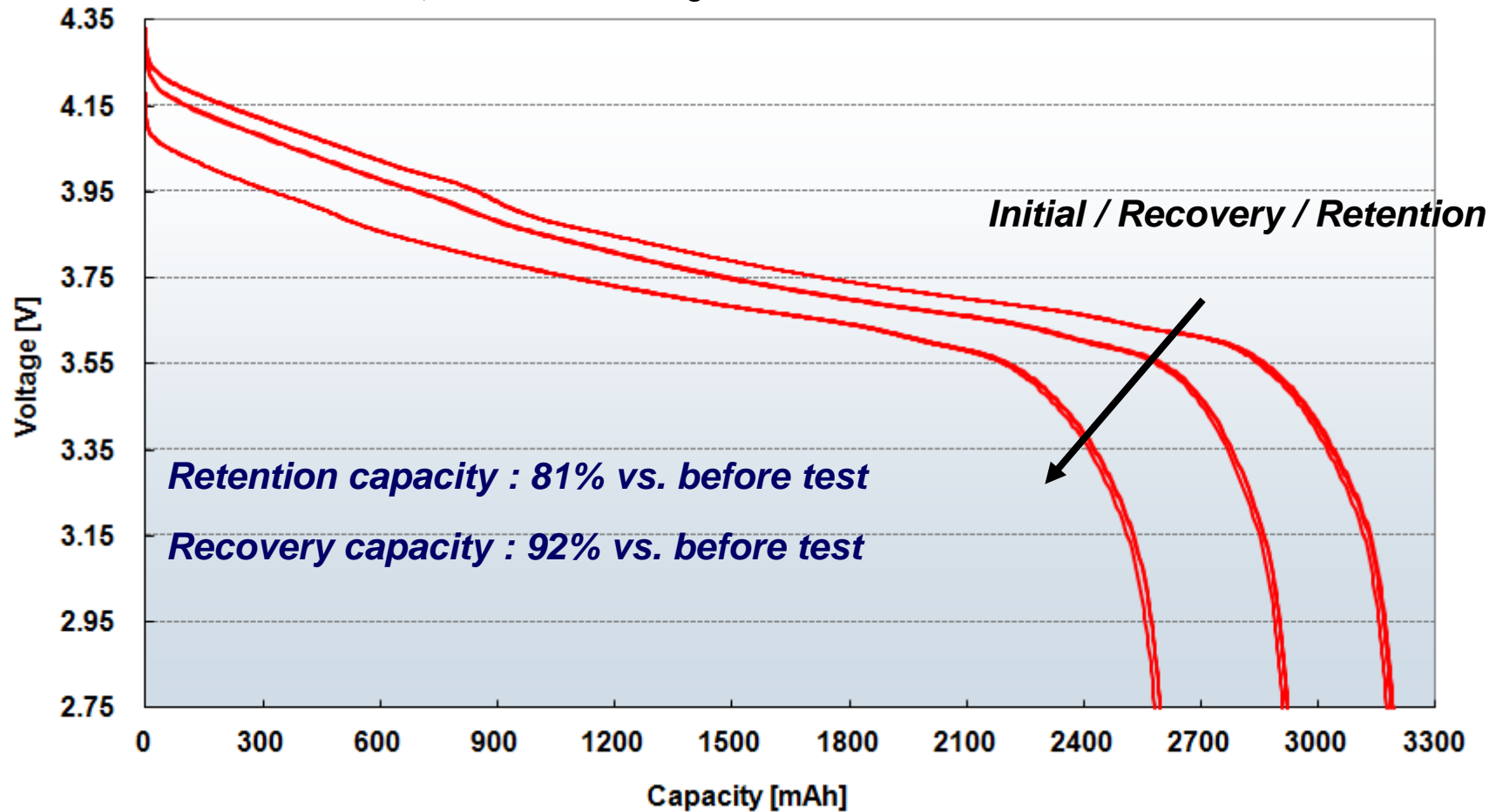


Performance

Storage characteristics at 60 °C

Model : ICR18650-32A

Method : SOC 100%, 60 °C 1 Month storage



@ Safety

Safety

▶ Electrical Abuse

- External Short (25'C)
- External Short (55'C)
- Overcharge at 0.7C
- Overcharge at 2C (insulation)

▶ Mechanical Abuse

- Crush
- Impact

▶ Thermal Abuse

- Hot Oven at 150'C

Level 0
Level 0
Level 0
Level 0

Level 1
Level 1

> 10min.

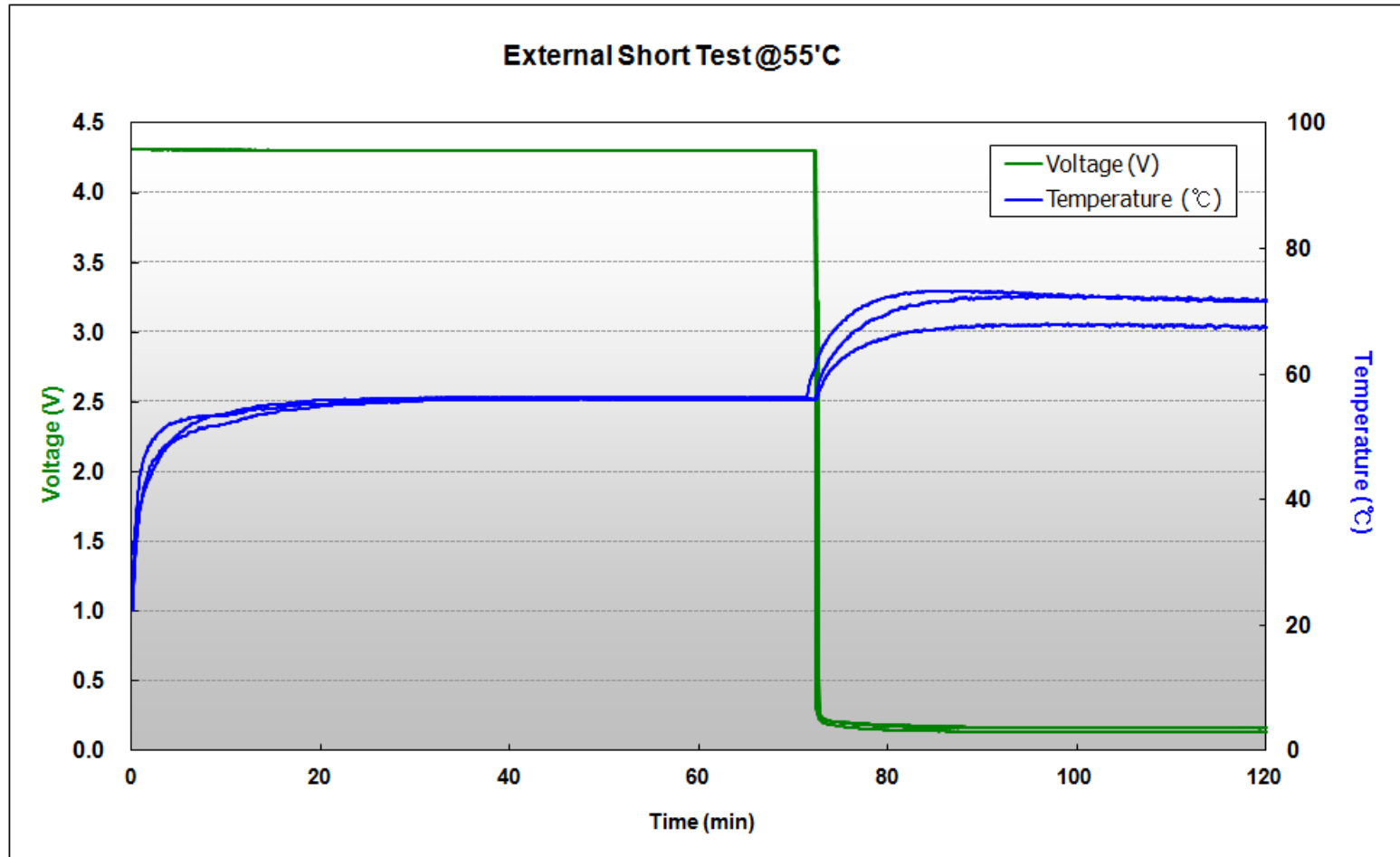
n= 3, all Level 0
n= 3, all Level 0
n= 3, all Level 0
n= 3, all Level 0

n= 5, all Level 1
n= 5, all Level 0

n= 4, all > 10min.

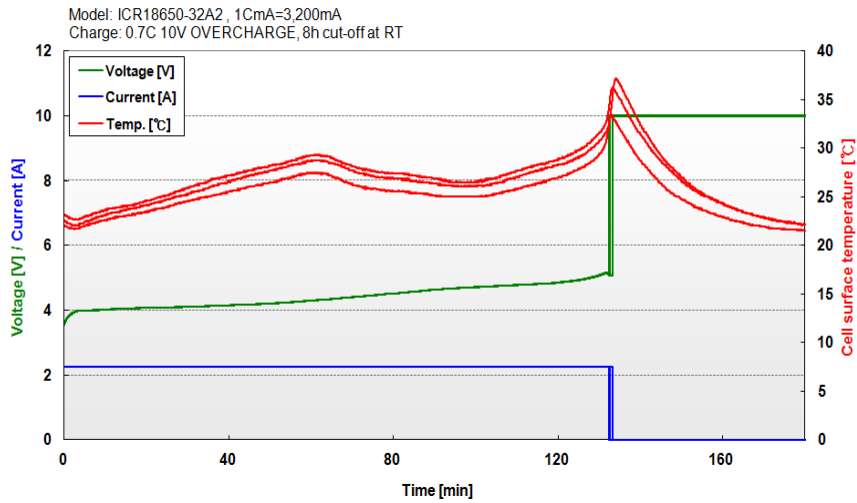
Level	L0	L1	L2	L3	L4	L5
Criteria	No Change	Leak	Smoke, <200°C	Smoke, >200°C	Fire	Explosion

External Short Test



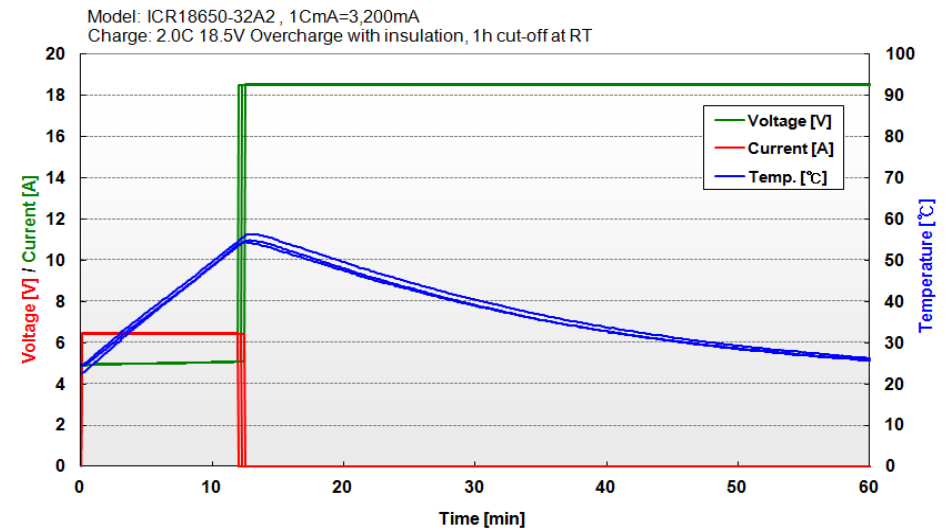
Overcharge Test

0.7C Overcharge



Results 3L0 n=3

2C Overcharge (insulation)



Results 3L0 n=3

Crush & Impact Test

● Crush

- Test method : 0.5C 4.35V 3hr Charged condition, 13KN iron plate
- No Event → 5L1



Results 5L1 n=5

● Impact

- Test method : 0.5C 4.35V 3hr Charged condition ϕ 15.8mm circular rod, 9.1kg 61cm
- No Event → 5L0



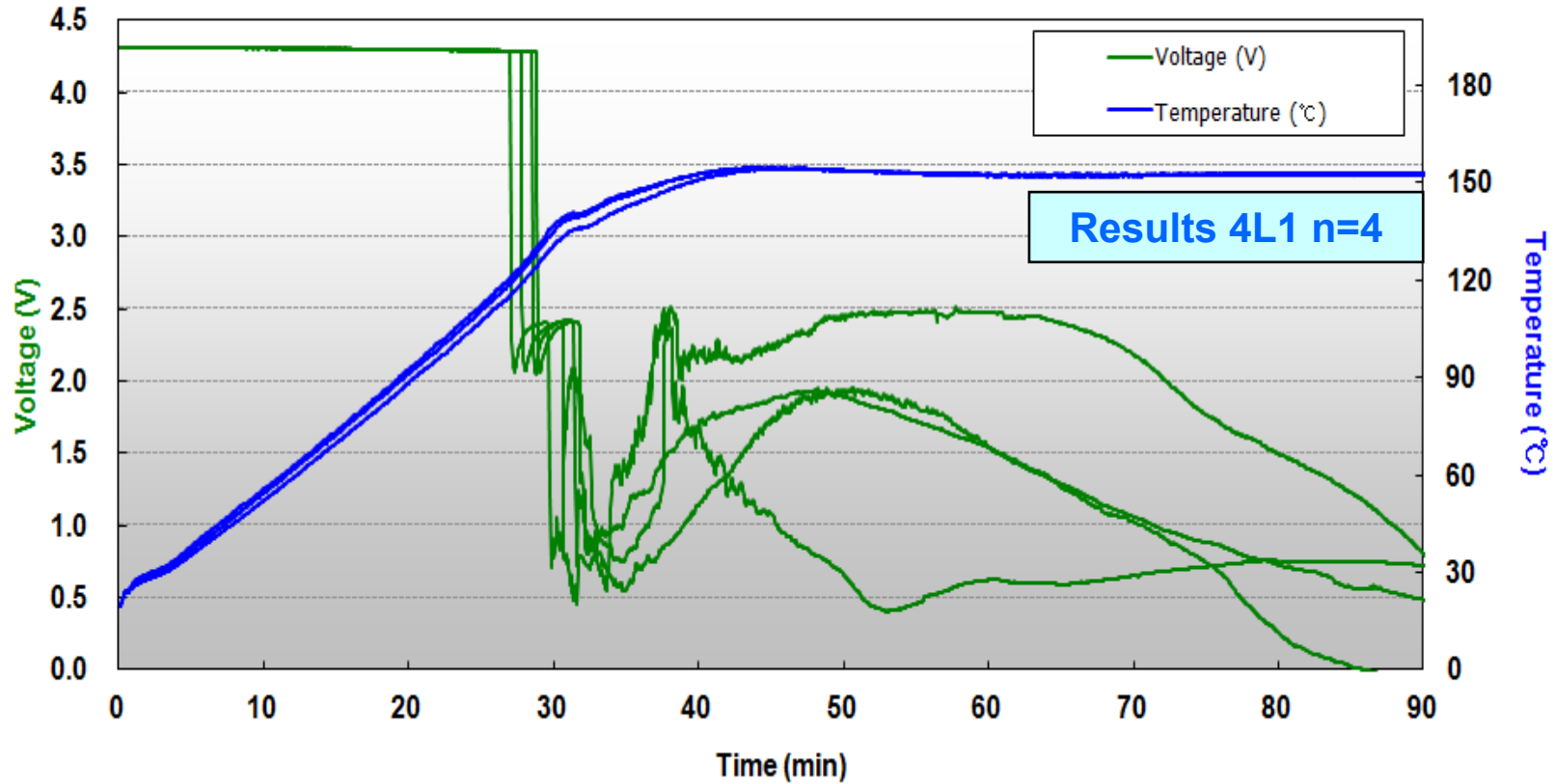
Results 5L0 n=5

Safety

Hot Oven at 150°C

Model: ICR18650-32A, 1C = 3,200mA

Test Method: Standard charged cell. Linear temperature ramp of 5°C/min. to 150°C



Thank you