

Performance Test-1

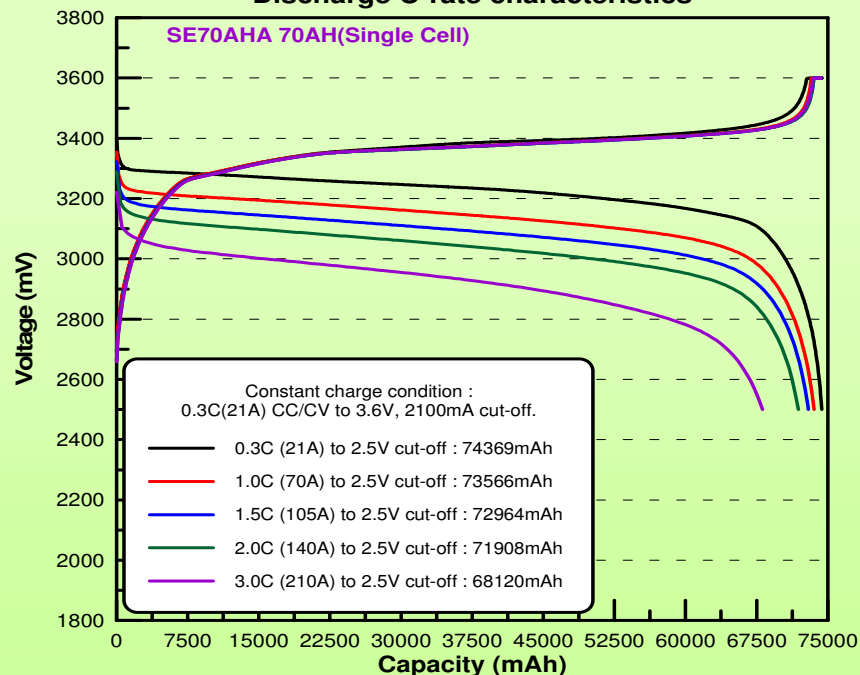
■ Discharge rate characteristics @RT

■ Test sample: SE70AHA 70Ah single cell

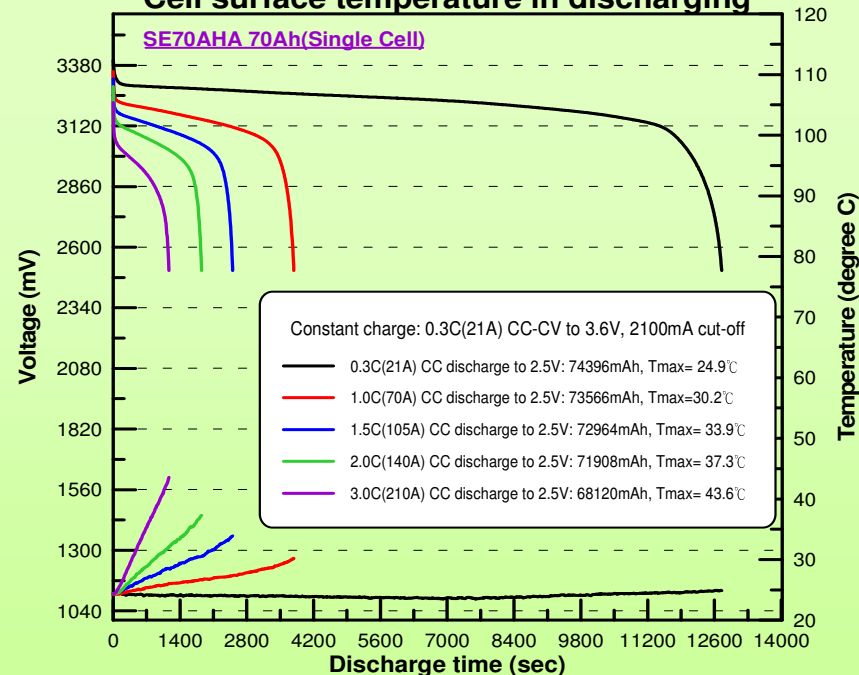
Item	Discharge condition				
Discharge Current	0.3C(21A)	1C(70A)	1.5C(105A)	2C(140A)	3C(210A)
Discharge Capacity	74369 mAh	73565 mAh	72963 mAh	71907 mAh	68120 mAh
Relative Capacity	100.0 %	98.9 %	98.1 %	96.7 %	91.6 %
Average working voltage	3.20 V	3.12 V	3.07 V	3.02 V	2.92 V
Maximum temperature	24.9 °C	30.2 °C	33.9 °C	37.3 °C	43.6 °C
Discharge time	212.5 min	63.1 min	41.7 min	30.8 min	19.5 min

Note: Percentage as an index of the discharge capacity at 0.3C is 100%.

Discharge C-rate characteristics



Cell surface temperature in discharging



Performance Test-2

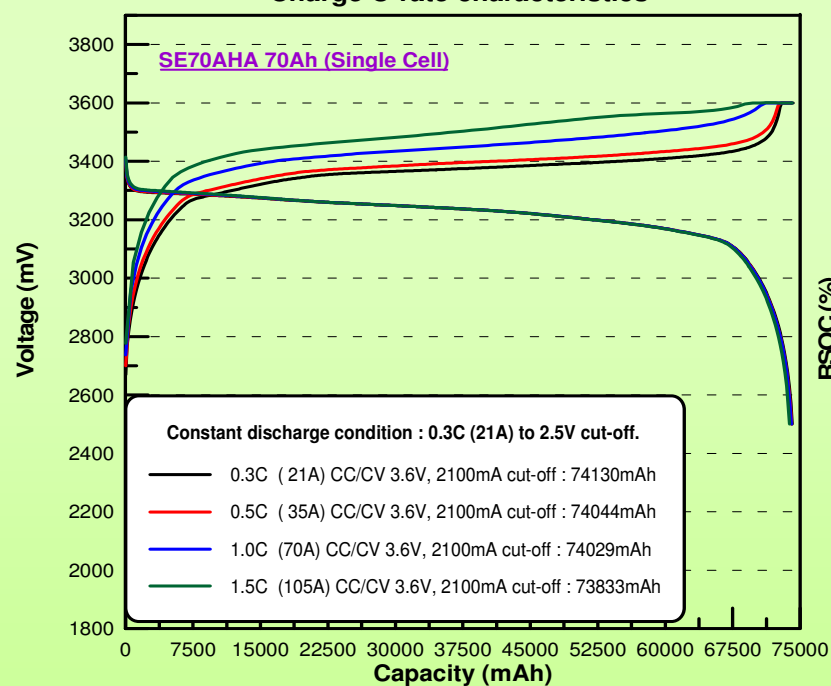
■ Charge rate characteristics @RT

■ Test sample: SE70AHA 70Ah single cell

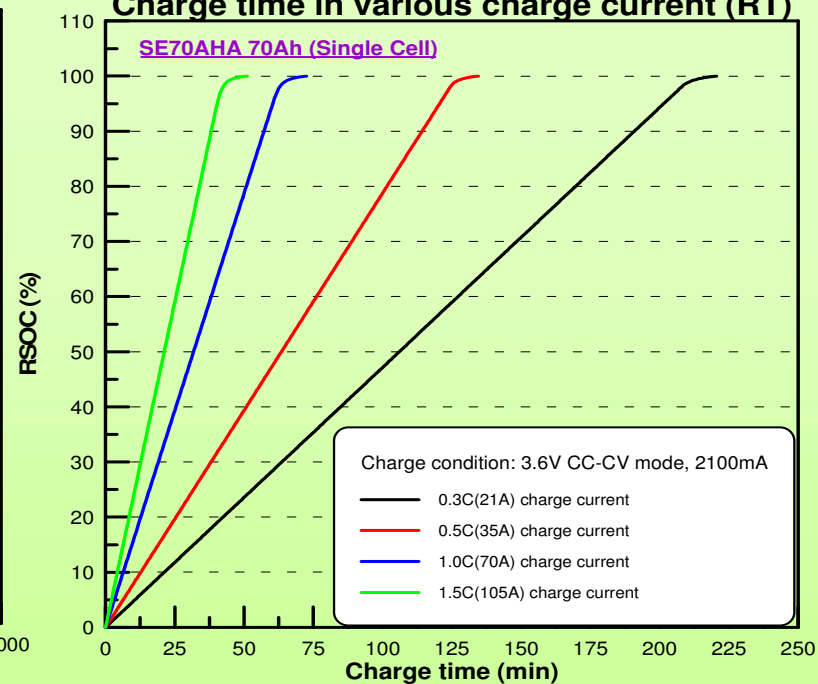
Item	Charge condition			
Charge Current	0.3C(21A)	0.5C(35A)	1C(70A)	1.5C(105A)
Charge time	220.5 min	134.7 min	72.6 min	51.2 min
Discharge Capacity	74130 mAh	74044 mAh	74029 mAh	73833 mAh
Relative Capacity	100.0 %	99.9 %	99.9 %	99.6 %

Note: Percentage as an index of the discharge capacity at 0.3C is 100%.

Charge C-rate characteristics



Charge time in various charge current (RT)



Performance Test-3

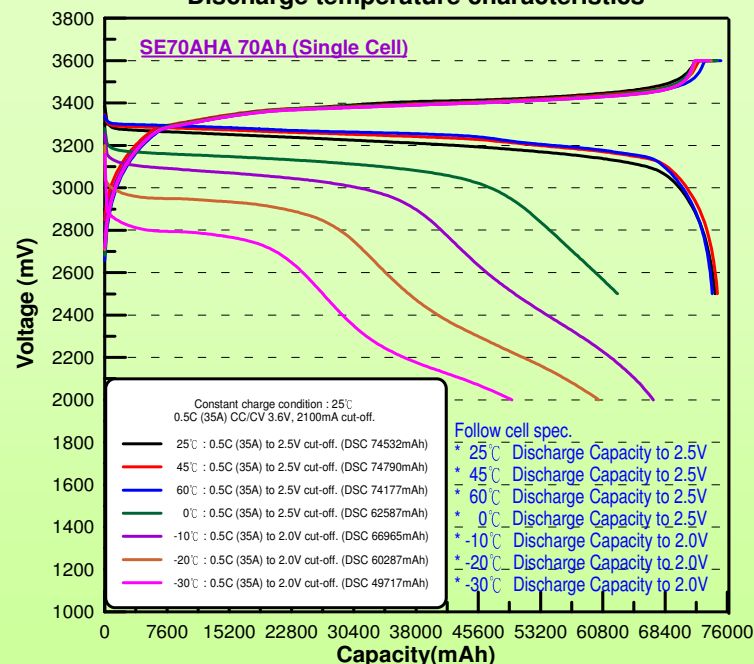
1. Sample Type: Single cell

2. Temperature Effect on Discharge

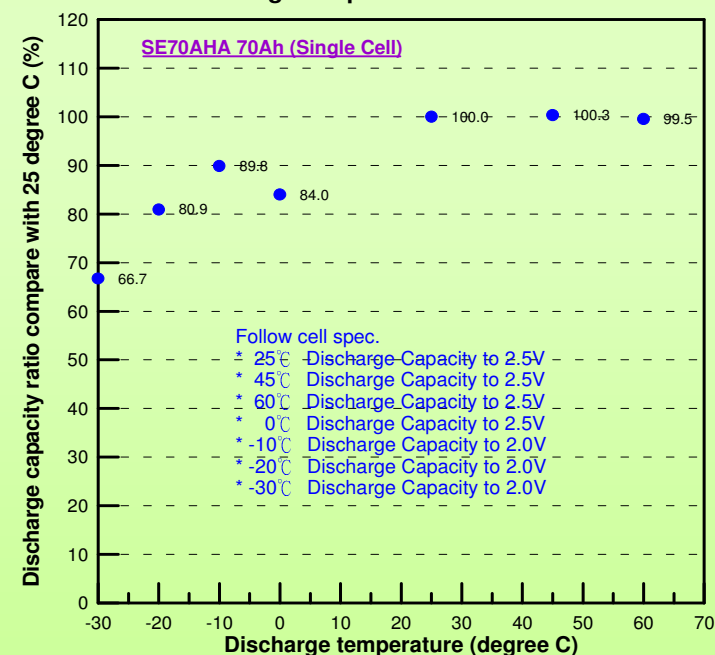
Item	Discharge temperature						
Temperature	-30℃	-20℃	-10℃	0℃	25℃	45℃	60℃
Discharge Capacity	49717	60287	66965	62587	74532	74790	74177
Relative Capacity	66.7%	80.9%	89.8%	84.0%	100.0%	100.3%	99.5%
Requirement	---	---	50.0%	80.0%	100.0%	95.0%	---
Judgment	reference	reference	pass	pass	pass	pass	reference

Note: Percentage as an index of the discharge capacity at 25℃ is 100%

Discharge temperature characteristics



Discharge temperature characteristics



Performance Test-4

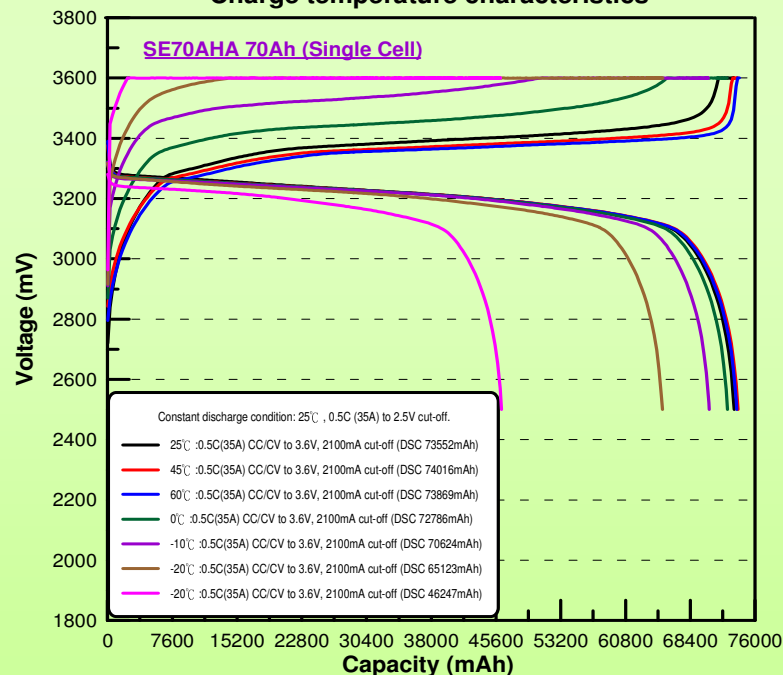
1. Sample Type: Single

2. Temperature Effect on Charge

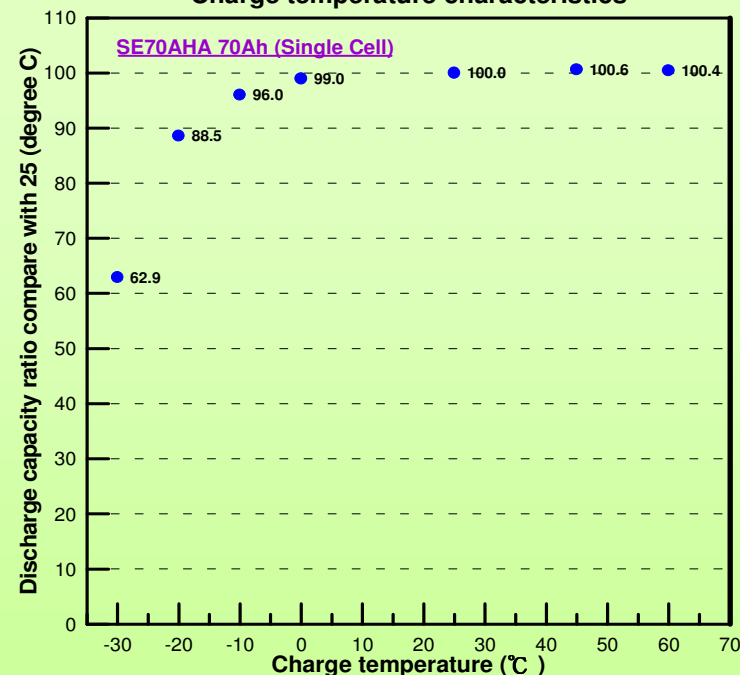
Item	Charge temperature						
Temperature	-30℃	-20℃	-10℃	0℃	25℃	45℃	60℃
Discharge Capacity	46247	65123	70624	72786	73552	74016	73869
Relative Capacity	62.9%	88.5%	96.0%	99.0%	100.0%	100.6%	100.4%
Requirement	---	---	50.0%	80.0%	100.0%	95.0%	---
Judgment	reference	reference	pass	pass	pass	pass	reference

Note: Percentage as an index of the discharge capacity at 25℃ is 100%.

Charge temperature characteristics



Charge temperature characteristics



Short test

Before test



Short

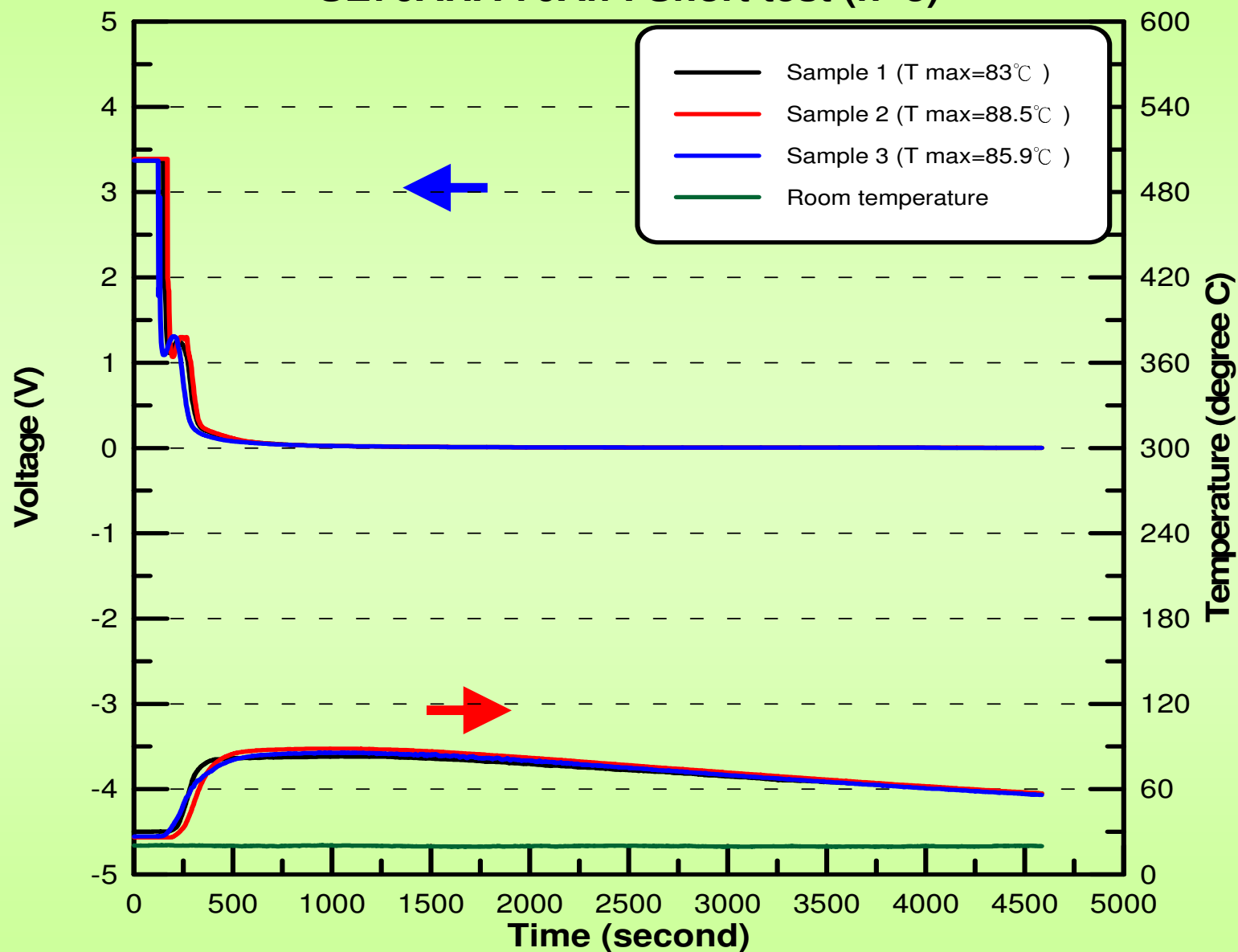


After test



Item	Sample 1	Sample 2	Sample 3
OCV & IR (before test)	3.402/0.54	3.429/0.76	3.387/0.53
Temperature rise	83°C	88.5°C	85.9°C
Result	L1	L1	L1

SE70AHA 70Ah : Short test (n=3)



Overcharge test

Before test

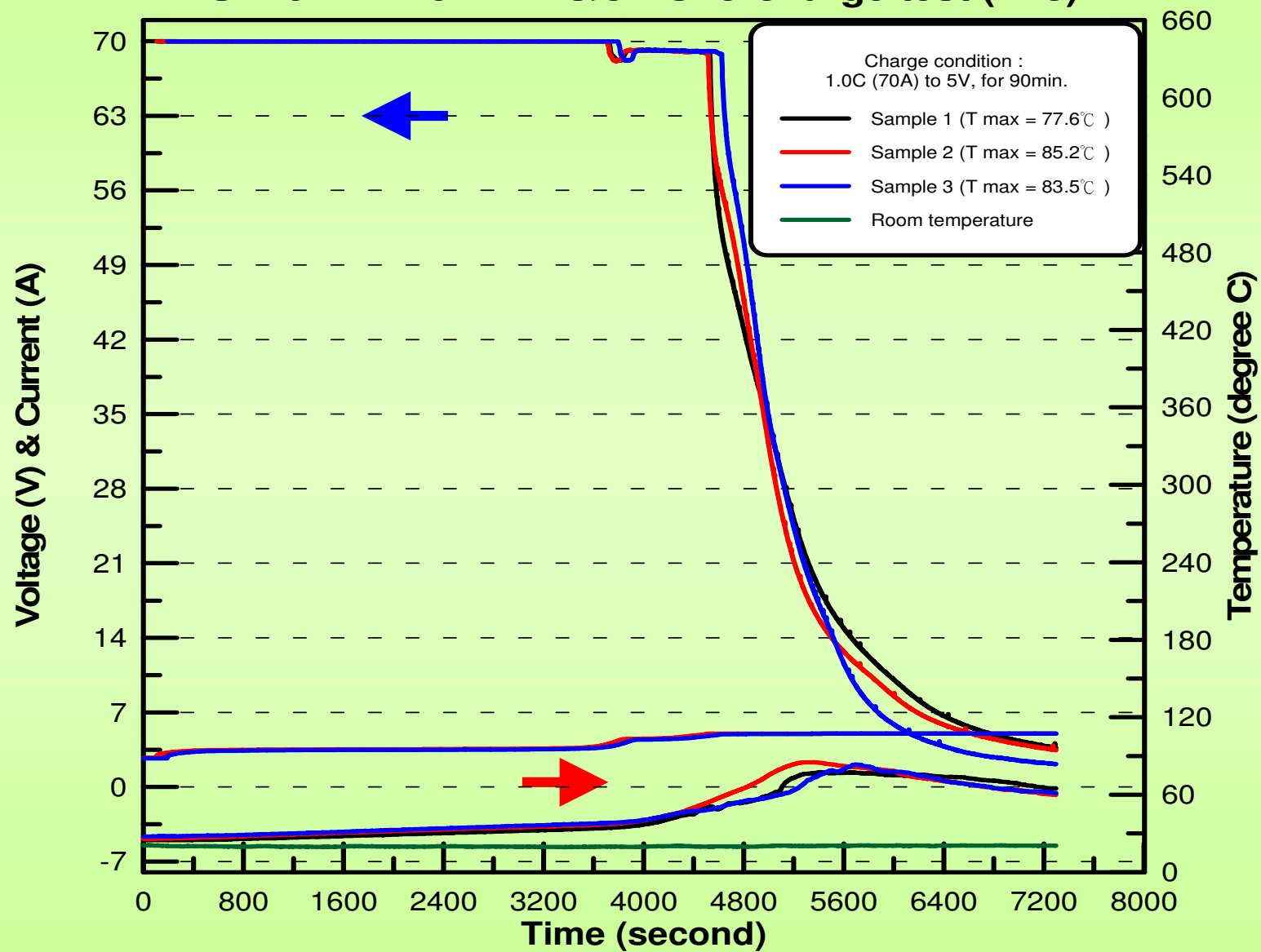


After test



Item	Sample 1	Sample 2	Sample 3
OCV & IR (before test)	2.704/0.6	2.667/0.55	2.661/0.54
Temperature rise	77.6°C	85.2°C	83.5°C
Result	L1	L0	L0

SE70AHA 70Ah : 1C/5V Overcharge test (n=3)



Over discharge test

Before test

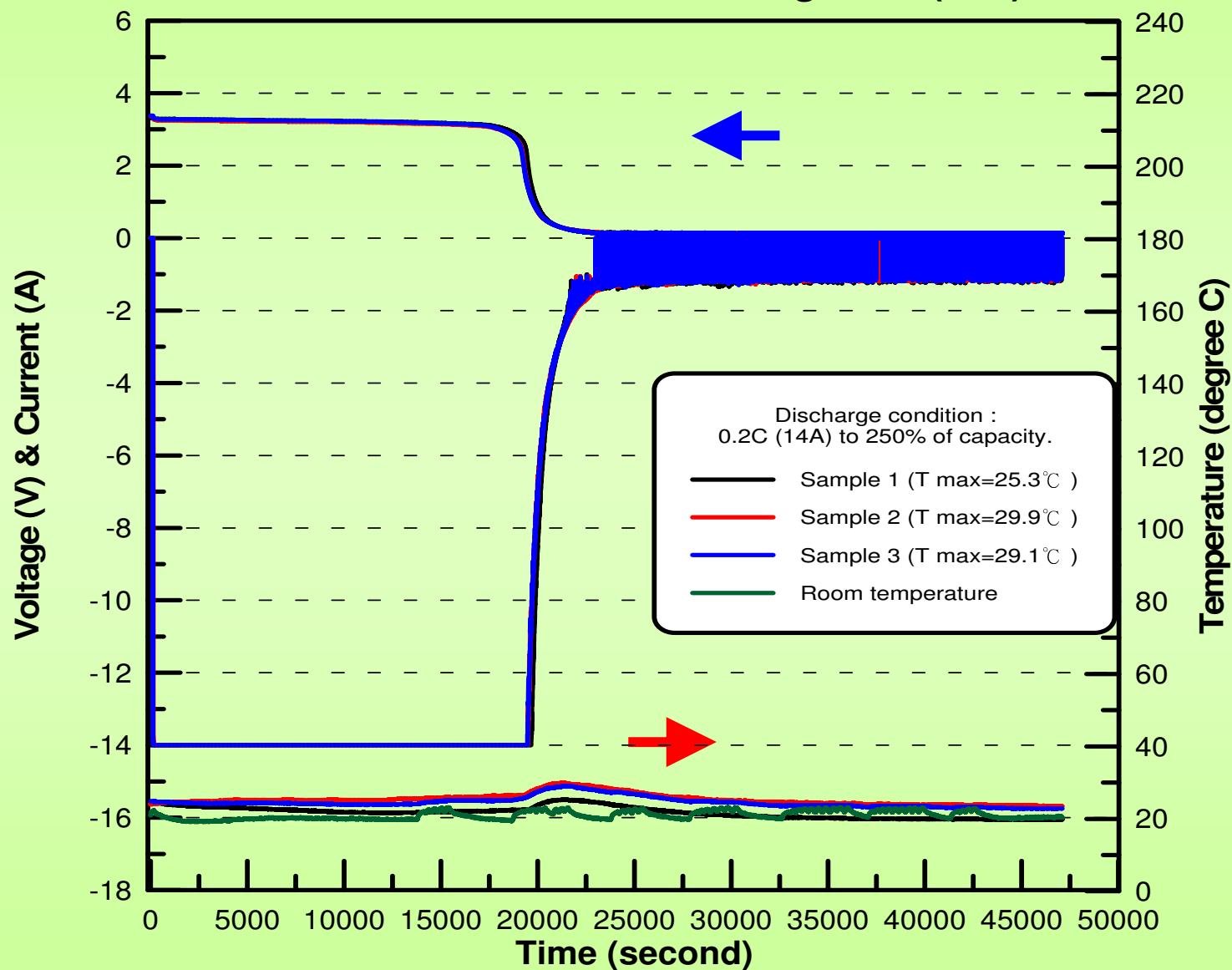


After test



Item	Sample 1	Sample 2	Sample 3
OCV & IR (before test)	3.426/0.74	3.425/0.92	3.390/0.53
Temperature rise	25.3°C	29.9°C	29.1°C
Result	L0	L0	L0

SE70AHA 70Ah : Overdischarge test (n=3)



Heating

Before test

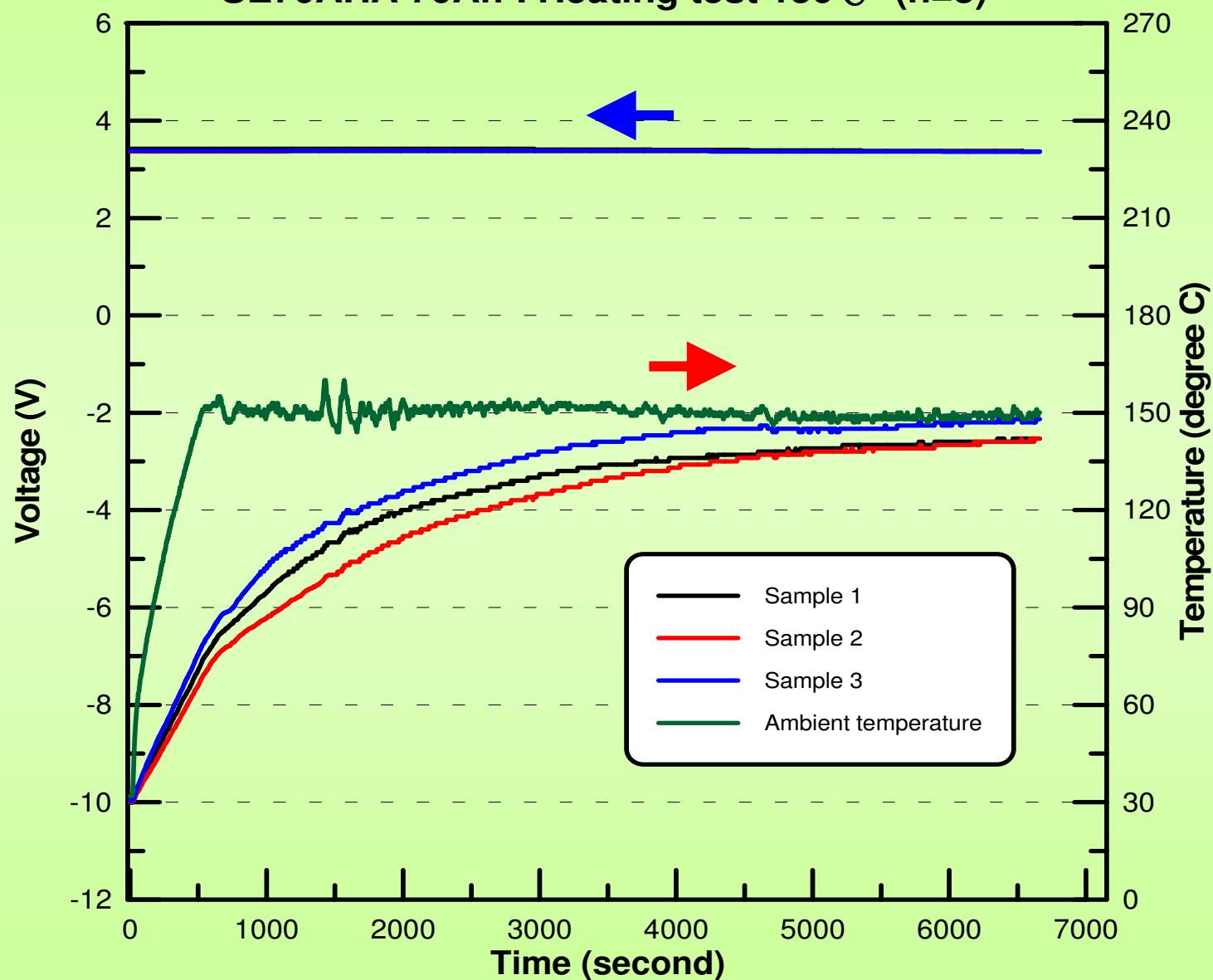


After test



Item	Sample 1	Sample 2	Sample 3
OCV & IR (before test)	3.429/0.61	3.379/0.5	3.386/0.68
Result	L0	L0	L0

SE70AHA 70Ah : Heating test 150°C (n=3)



Immersion in water

Before test



After test



Item	Sample 1	Sample 2	Sample 3
OCV & IR (before test)	3.374/0.74	3.374/0.52	3.372/0.63
Result	L1	L1	L1

Vibration

Before test



After test



Item	Sample 1	Sample 2	Sample 3
OCV & IR (before test)	3.380/0.69	3.381/0.52	3.376/0.5
OCV & IR (after test)	3.378/0.71	3.379/0.54	3.375/0.51
Difference	-0.002/+0.02	-0.002/+0.02	-0.001/+0.01
Result	L0	L0	L0

Impact

Before test

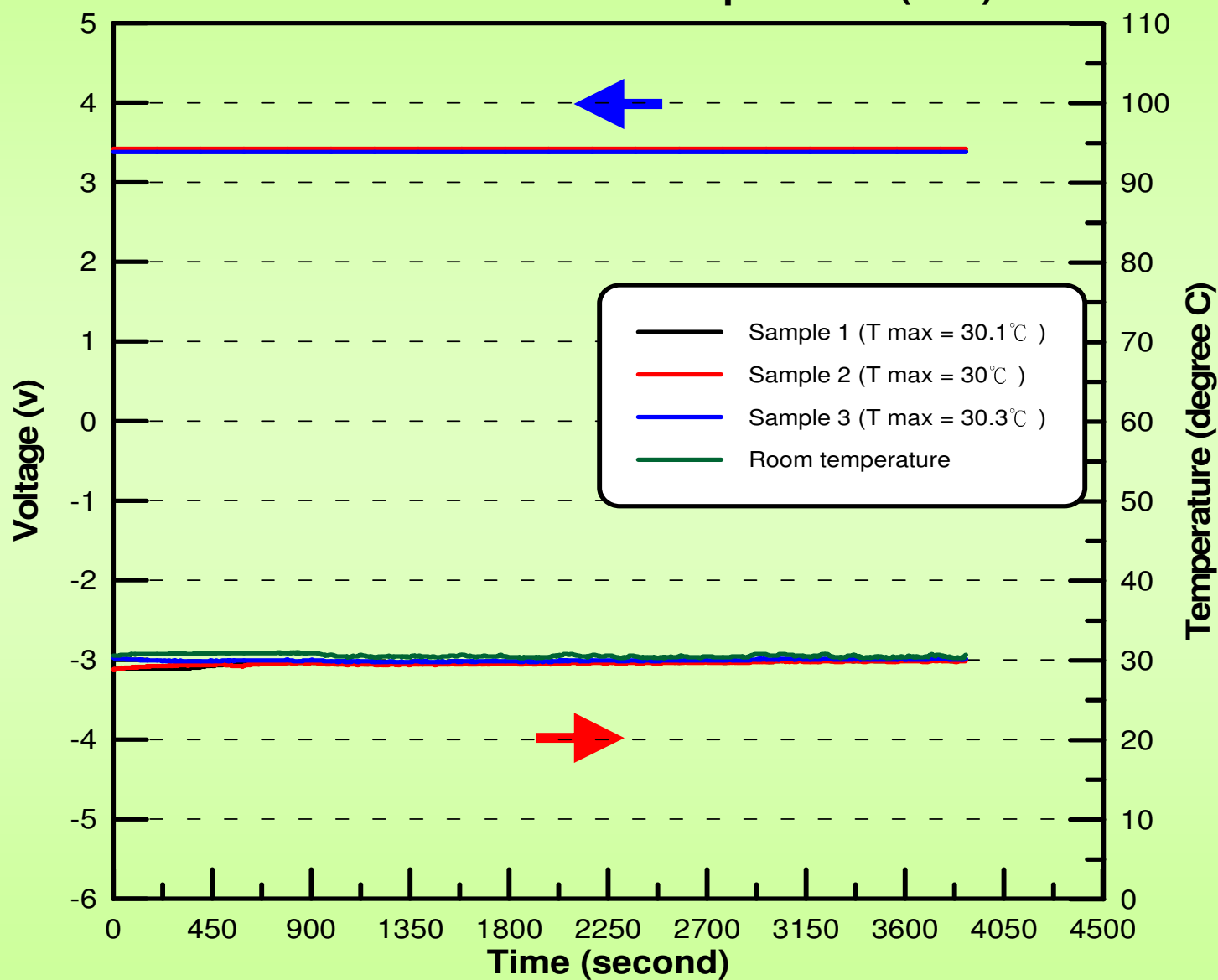


After test



Item	Sample 1	Sample 2	Sample 3
OCV & IR (before test)	3.398/0.65	3.428/0.63	3.389/0.48
Temperature rise	30.1℃	30℃	30.3℃
Result	L0	L0	L0

SE70AHA 70Ah: 7.9mm Impact test (n=3)



Drop

Before test



After test



Item	Sample 1	Sample 2	Sample 3
OCV & IR (before test)	3.453/0.55	3.396/0.59	3.356/0.52
OCV & IR (after test)	3.439/0.45	3.365/0.61	3.354/0.54
Difference	-0.013/-0.1	-0.031/+0.02	-0.002/+0.02
Result	L0	L0	L0

Nail

Before test

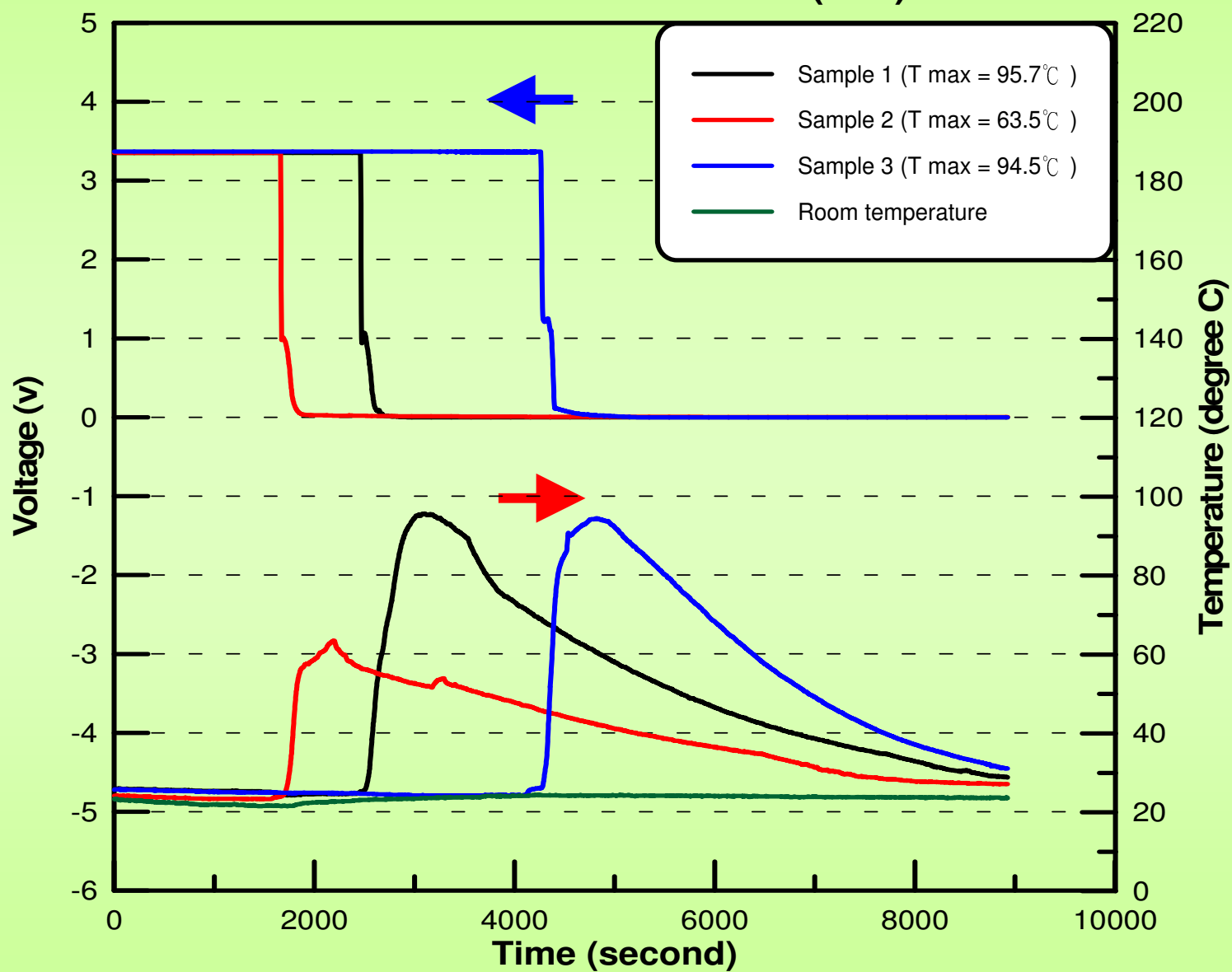


After test



Item	Sample 1	Sample 2	Sample 3
OCV & IR (before test)	3.358/0.47	3.362/0.51	3.387/0.48
Temperature rise	95.7°C	63.5°C	94.5°C
Result	L1	L1	L1

SE70AHA 70Ah: Nail test (n=3)



Crush

Before test



After test



Item	Sample 1	Sample 2	Sample 3
OCV & IR (before test)	3.383/0.59	3.409/0.6	3.402/0.6
Temperature rise	23.6°C	23.3°C	23.3°C
Result	L0	L0	L0

SE70AHA 70Ah: Crush test (n=3)

