

The Highest Capacity High Power 21700 50S

2021

Contents

I . Target Application

II. Specification

III. Performance

1. Capacity / Impedance
2. Discharge Characteristics (CC/CP)
3. Cycle Life
4. Low temperature discharge / High Temperature Storage
5. Safety Summary

Target Application

50S is a product developed by applying the latest material

This 50S is the most optimized product for runtime application



1

P/Tool

Compatible with 18V Battery Platform
Increase Pack Capacity

5s1p 5Ah → 5s2p 10Ah → 5s3p 15Ah

2

OPE

(Outdoor Power Equipment)

More Working time in Push mower

- 600W 34min* with 10s2p (25R 17min)

Back pack solution (10s8p, 1.44kWh)

3

Cleaner

Better Runtime for Stick Cleaner

- 80W per cell : Runtime 11min

※ 480W(6s1p) / 400W(5s1p) : Runtime 11min.

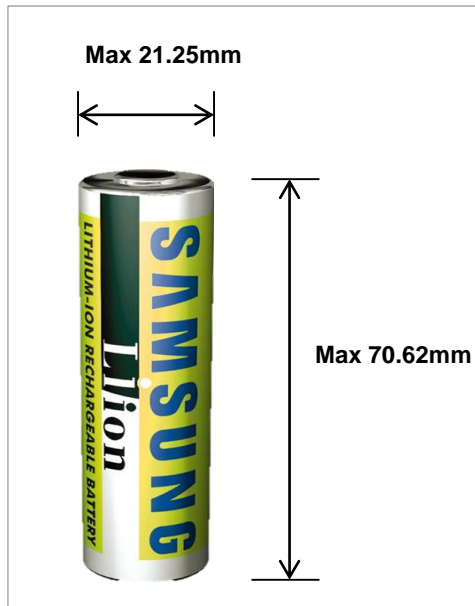
※ The change in runtime by cell arrangement and pack design is not considered.

30W/cell CP discharge time 34min → 600W(20cells) 34min.(estimation)

80W/cell CP discharge time(80°C T-cut) 11min → 480W(6cells), 400W(5cells) 11min. (estimation)

It may be different from the actual value by predicting the pack runtime as a result of cell evaluation.

Specification



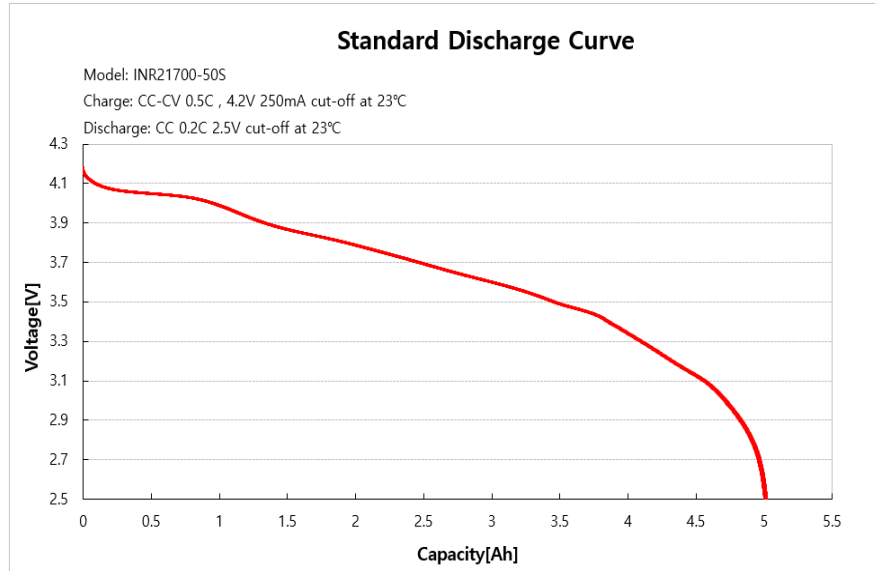
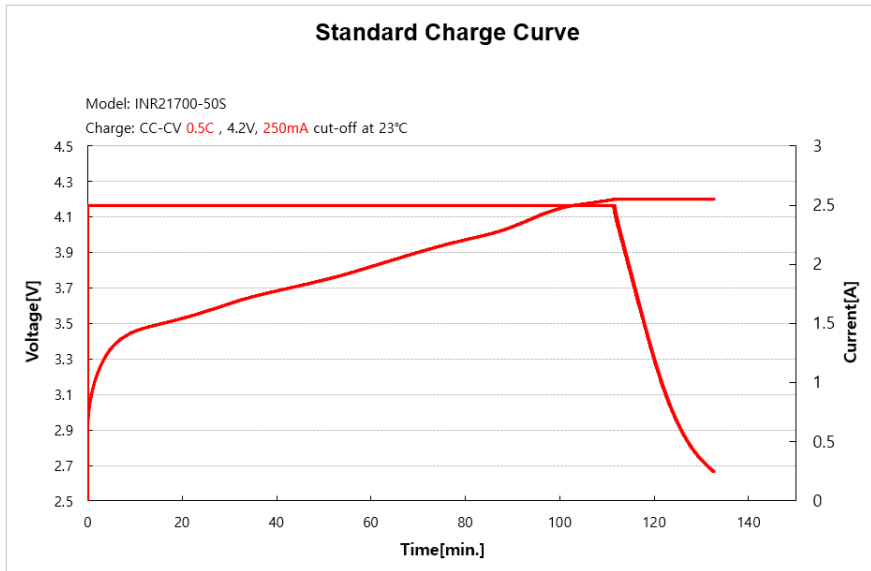
Type		Specification
Capacity	Standard (mAh) (0.2C)	Typical 5,000
	Rated (mAh) (10A)	Min. 4,800
IR	Initial IR (mΩ AC 1kHz)	≤ 14
	Initial IR (mΩ DC (10A-1A))	≤ 22
Nominal Voltage (V)		3.60
Charge Time (CC-CV)	Standard (min), 0.5C ¹⁾	150min
	Rapid (min), 6A ²⁾	100min
Charge Current	Standard current (A)	2.5
	Max. current (A)	6.0
Discharge	End voltage (V)	2.5
	Max. discharge capability (with 80°C T-Cut) (A) Max discharge capability (without T-cut) : 25A	45
Cycle	Charge 6A 4.2V/Discharge 25A 2.5V w/o T-cut	60%250cycle
	Charge 6A 4.2V/Discharge 45A 2.5V 80°C T-cut	60%100cycle

1) Test Method : CC-CV 0.5C, 4.2V, 250mAh cut-off, 23°C

2) Test Method : CC-CV 6A, 4.2V, 100mAh cut-off, 23°C

Performance

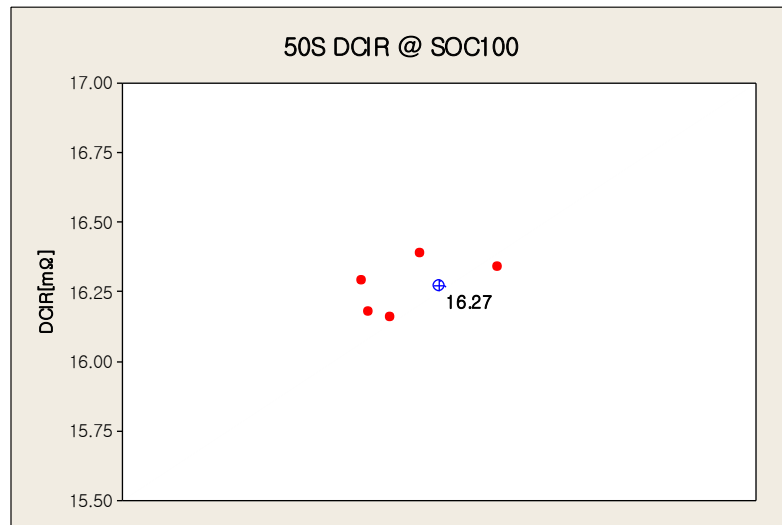
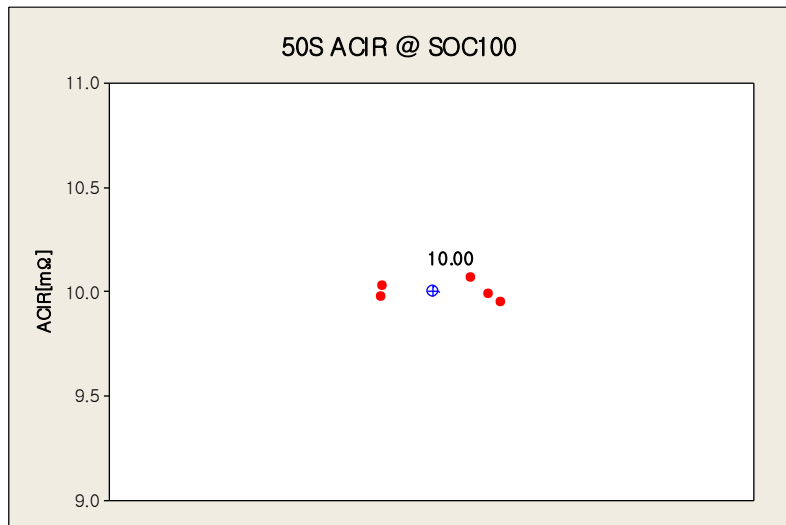
Capacity



0.5C Charge 0.2C Discharge	Standard Capacity	5,003mAh
	Discharging Runtime	299min.
	Charging Time	133min

Performance

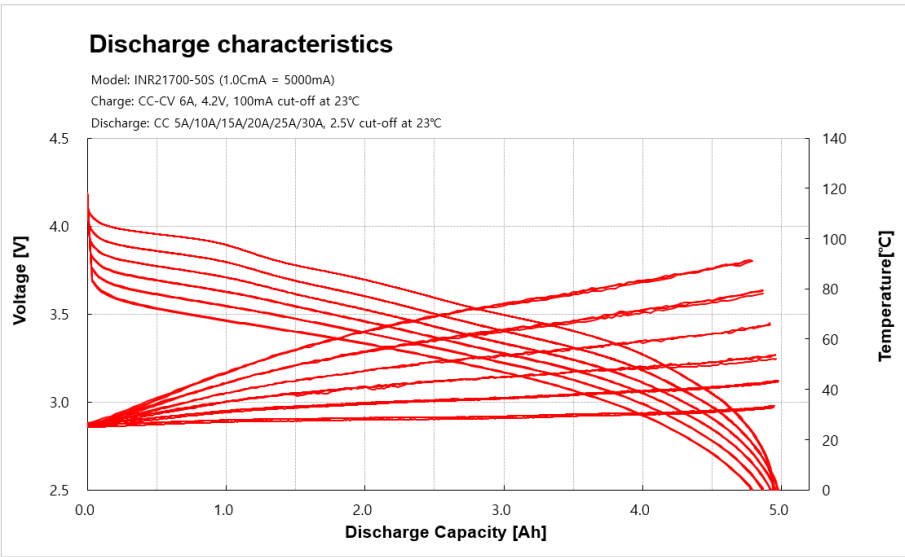
Impedance



	AC-IR @SOC100	DC-IR @SCO100 (1A-10A)
Average	10.00±2mΩ	16.27±2mΩ

Performance

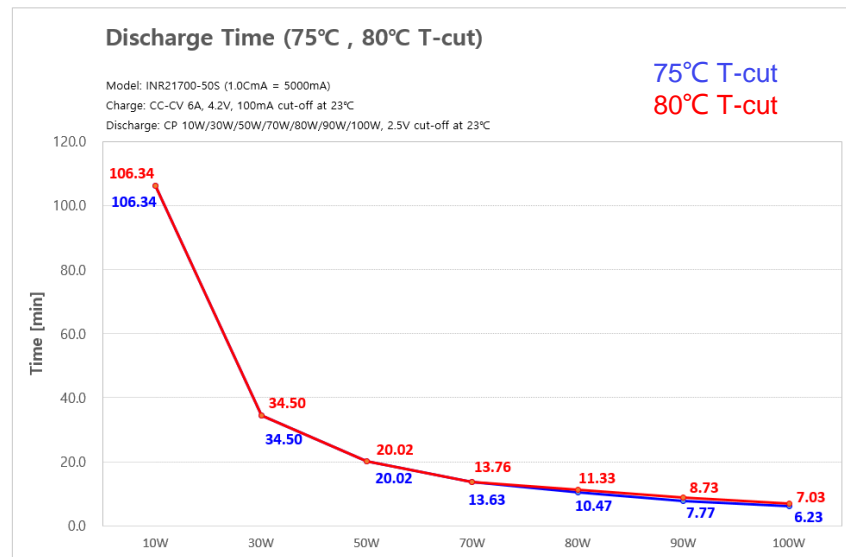
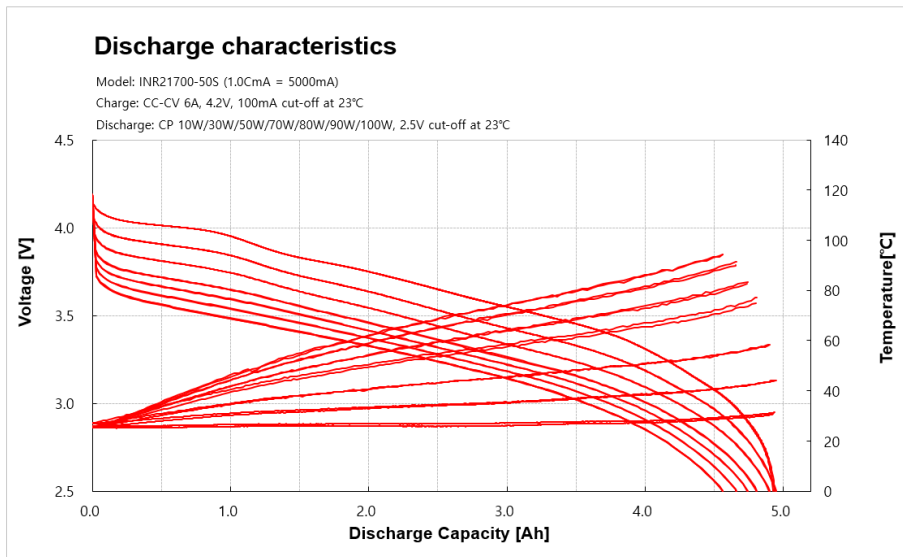
Discharge Capability ① CC



	Discharge current					
	5A	10A	15A	20A	25A	30A
Capacity (Ah)	4.945	4.975	4.956	4.921	4.865	4.787
Temperature (°C)	32.8	42.9	53.7	65.9	79.3	91.2
Time (min.)	59.3	29.9	19.8	14.8	11.7	9.6
Energy (Wh)	17.58	17.22	16.81	16.39	15.93	15.41

Performance

Discharge Capability ② CP

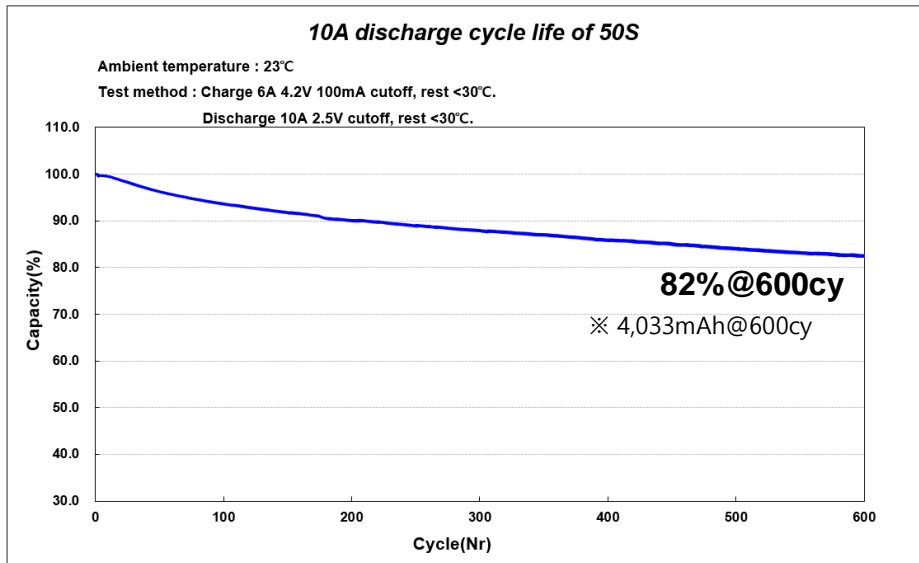


Continuous Power	10W	30W	50W	70W	80W	90W	100W
Capacity (Ah)	4.933	4.945	4.898	4.808	4.740	4.660	4.562
Temperature (°C)	31.1	44.1	58.3	76.0	82.9	90.8	94.4
Time (min.) w/o T-cut	106.3	34.5	20.0	13.7	11.7	10.1	8.8

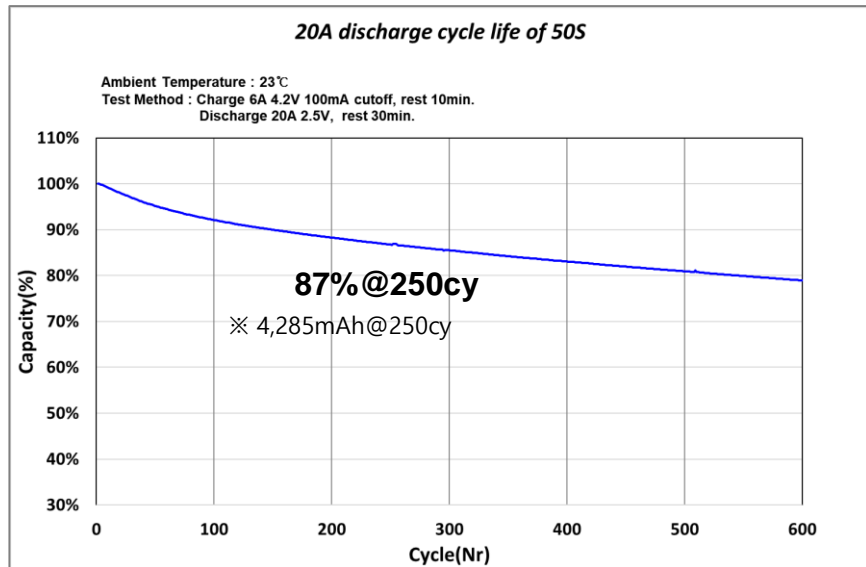
Performance

Cycle Life ① 10A / 20A

□ 10A Cycle Life

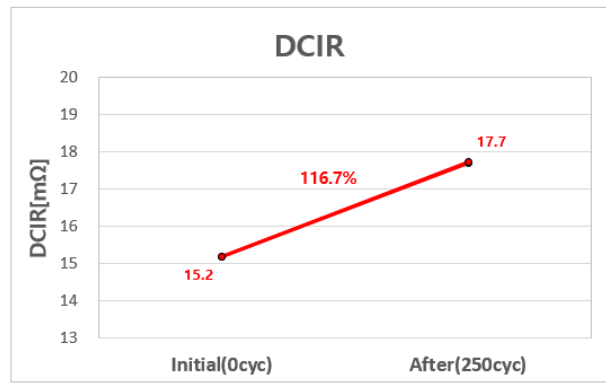
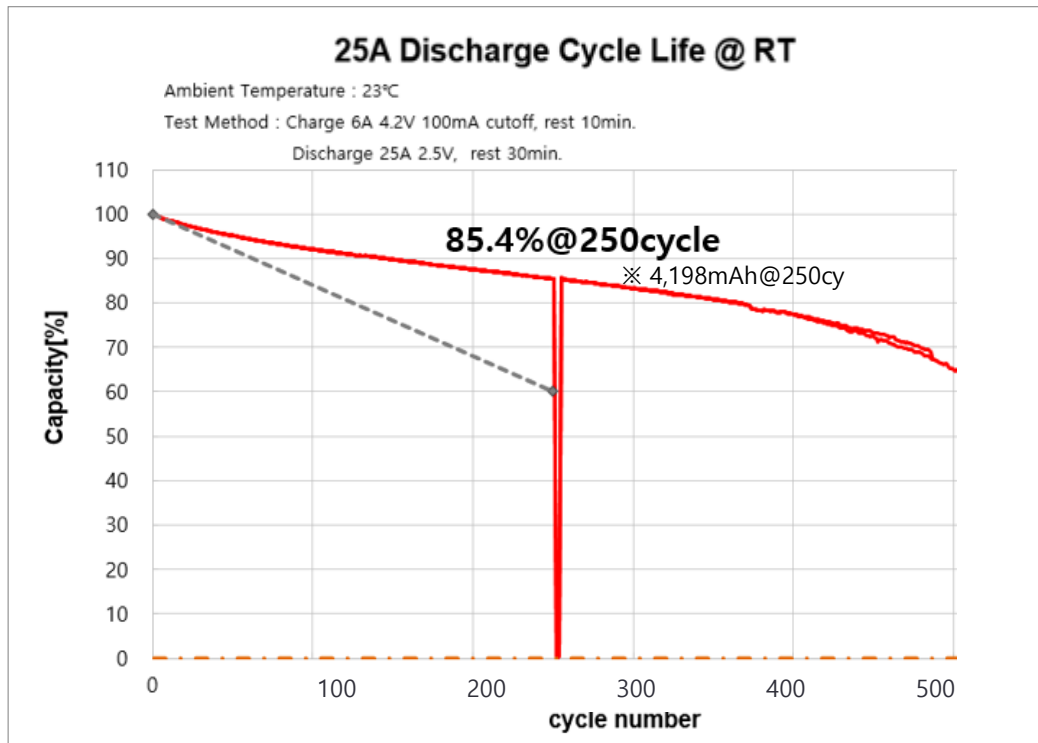


□ 20A Cycle Life



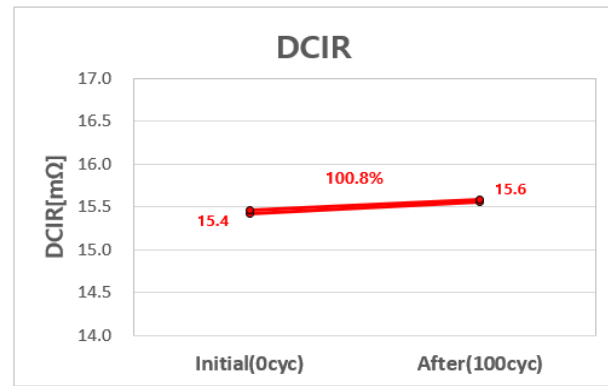
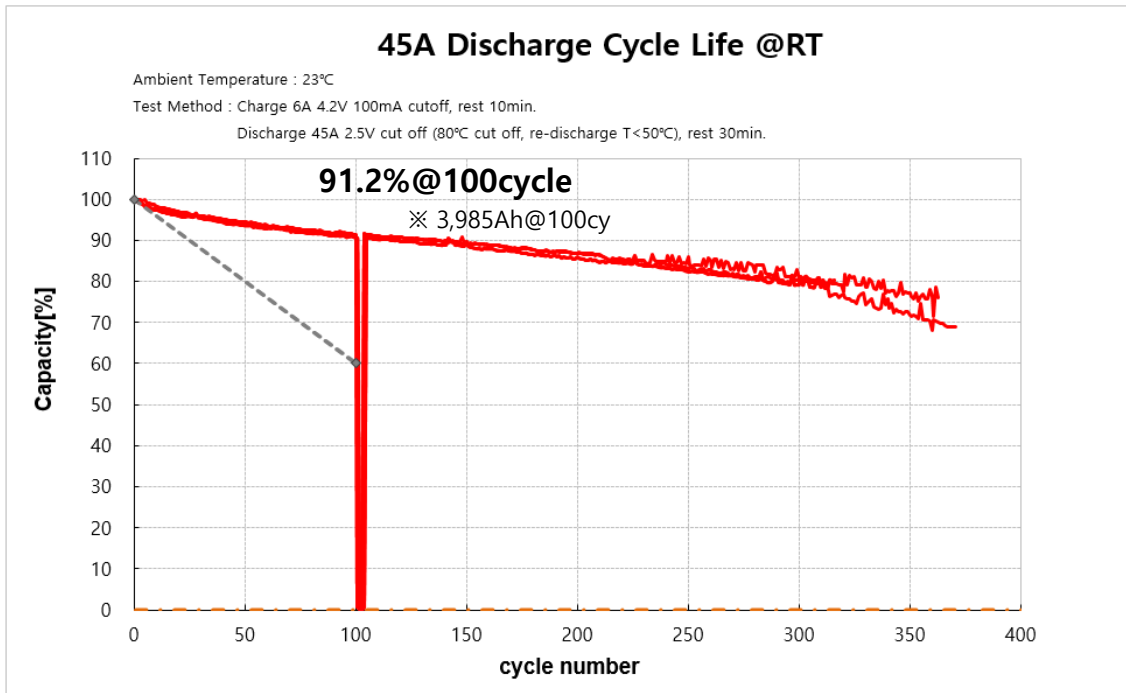
Performance

Cycle Life ② 25A



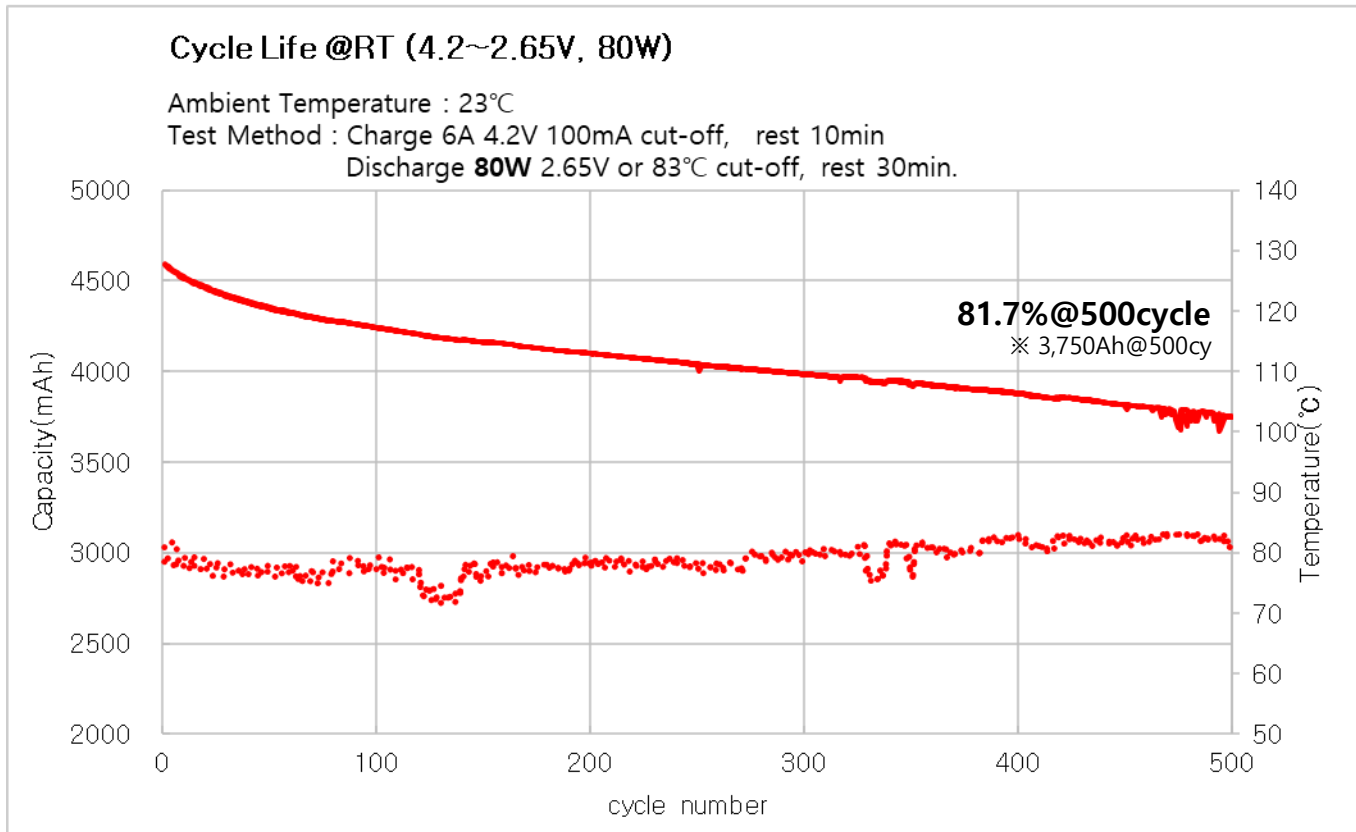
Performance

Cycle Life ③ 45A (80°C cut off)



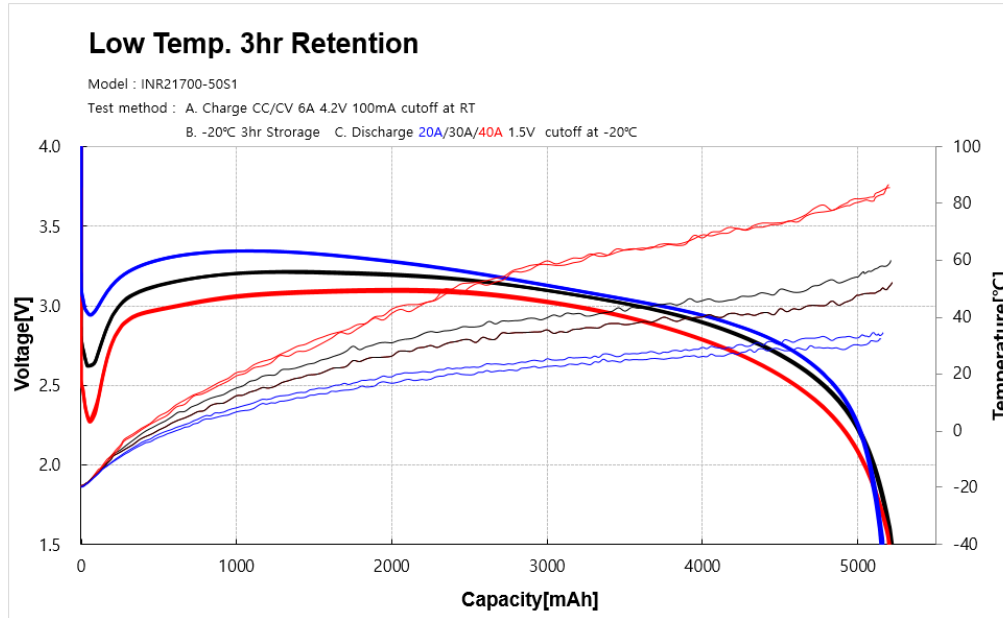
Performance

Cycle Life ④ 80W (83°C cut off)



Performance

Low Temp performance



-20°C discharge	20A discharge	30A discharge	40A discharge
1 st hump voltage	2.94V	2.62V	2.28V
Capacity (1.5V cut off)	5,147mAh	5,210mAh	5,197mAh
Capacity (2.5V cut off)	4,832mAh	4,750mAh	4,555mAh

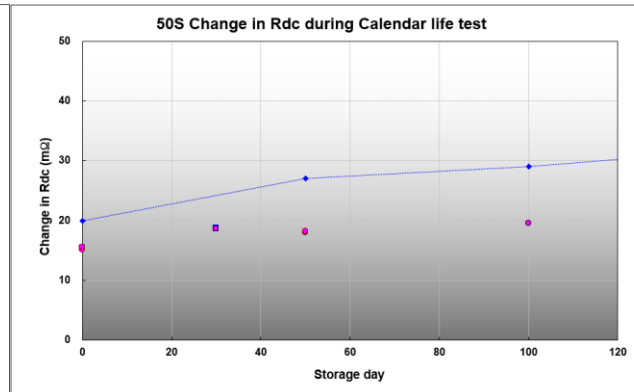
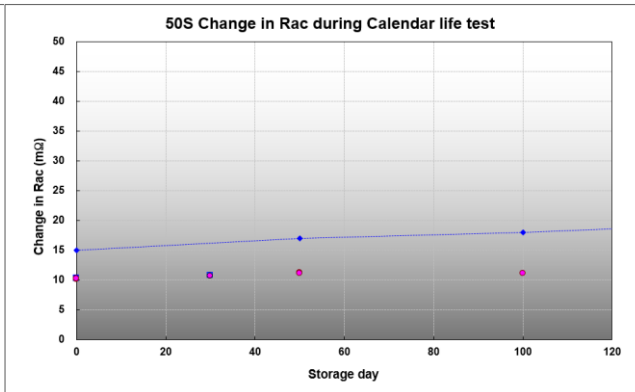
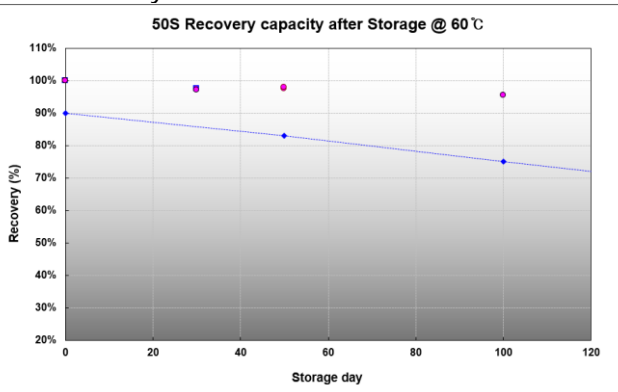
Performance

High Temp performance

Recovery

AC-IR

DC-IR



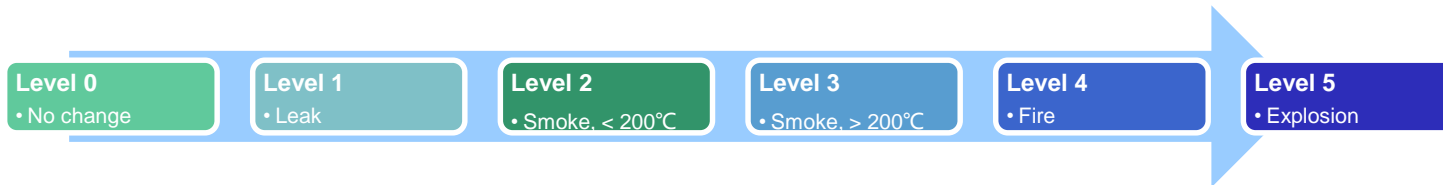
Storage at 60°C

storage day	initial				after storage				Ratio(%)			
	ACIR	DCIR	Capacity	vs C _N (%)	ACIR	DCIR	Retention	Recovery	ACIR	DCIR	Retention	Recovery
30	10.2	15.4	4951	99.0	10.8	18.7	4517	4824	104.7	121.5	91.2	97.4
50	10.2	15.3	5015	100.3	10.9	18.1	4508	4902	106.9	118.3	89.9	97.7

Performance

Safety Test

Test item			Spec.	Results	OK/NG
Electrical Abuse	Overcharge	30A 4.6V (UL)	L1	10L1	OK
	Short circuit	80mΩ at 23°C (UL)	L0	5L0	OK
		80mΩ at 60°C (UL)	L0	5L0	OK
Mechanical Abuse	Impact	UL	L0	10L0	OK
	Crush	UL	L1	10L0	OK
Thermal Abuse	Hot oven	130°C	-	10L1	OK



[Appendix] Certification

Certification

Certification	Status
UL 1642	Certified
CB 62133 (2017)	Certified
PSE	Certified
BSMI	Certified
UN	Certified
BIS(IS16046:2018)	Certified
CQC(GB 31241)	Certified
UL 62133	Certified