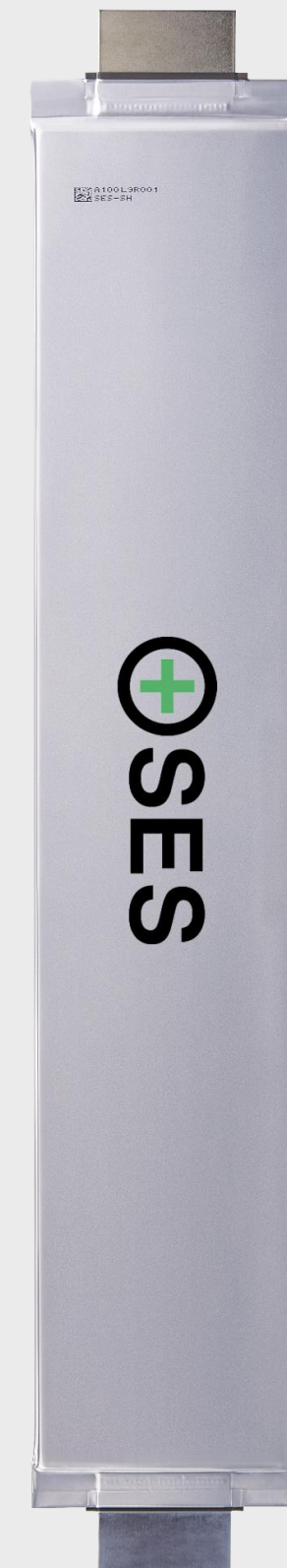




SES 50Ah Li-Metal Cell Data Report

December 2022



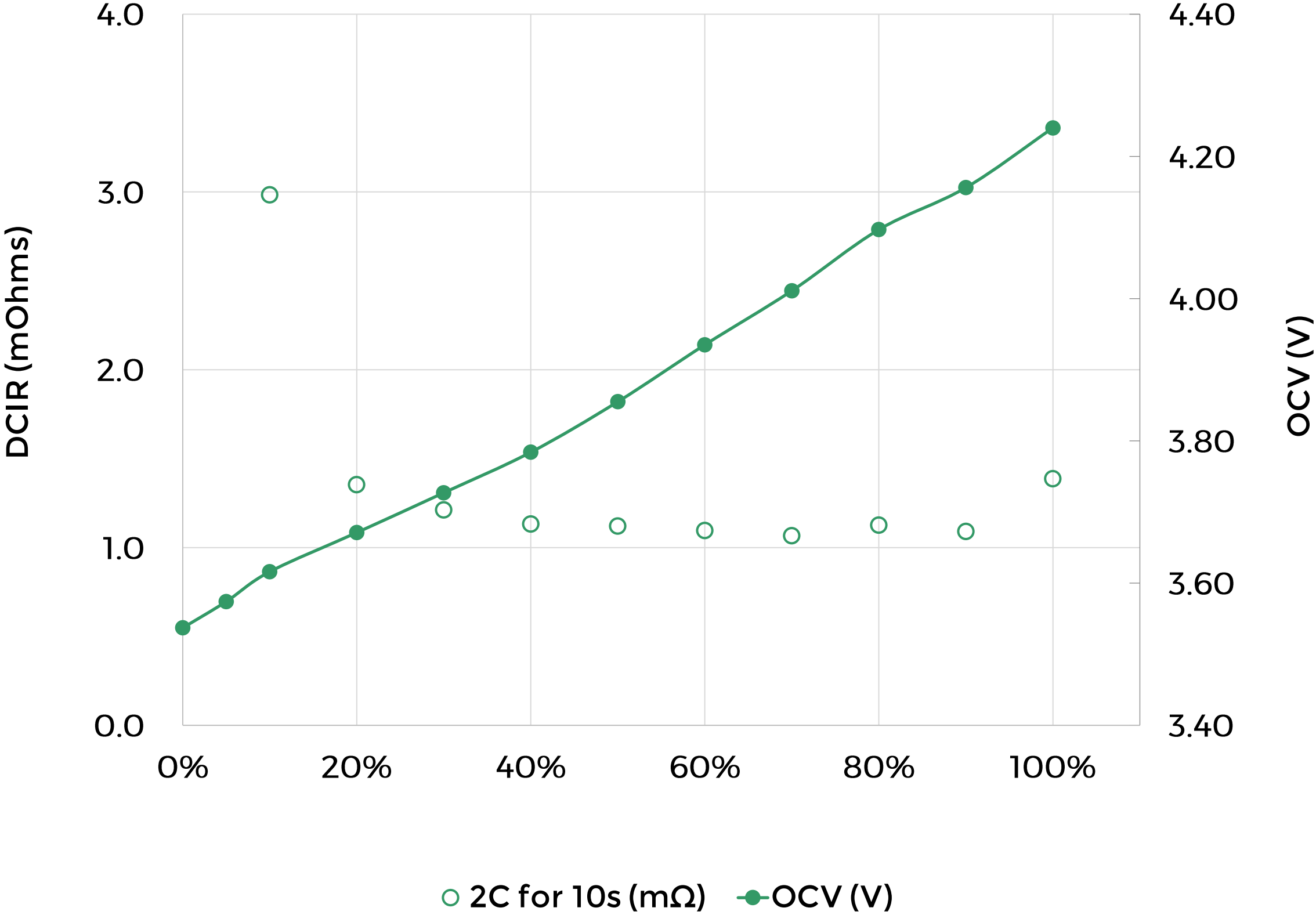
CELL TEST DATA SUMMARY TABLE (4Ah vs. 50Ah vs. 100Ah)

	Cell Type	4.2Ah (25+ layer) at 25°C	50.7Ah (16+ layer) at 25°C	102.8Ah (32+ layer) at 25°C
Room Temperature (25°C) Energy Density	Low power C/20	>375 Wh/Kg	-	-
	Low power C/10	375 Wh/Kg (= 700 Wh/L at SOC 30%)	357 Wh/Kg (= 773 Wh/L at SOC 30%)	383 Wh/Kg (= 853 Wh/L at SOC 30%)
	Medium power C/3	-	342 Wh/Kg (=743 Wh/L)	Ongoing
	Medium power 1C	339 Wh/Kg	-	Ongoing
	High power 3C	-	303 Wh/Kg	Ongoing
	High power 5C	321 Wh/Kg	-	Ongoing
Low Temperature (0°C) Energy Density	Low power C/10	324 Wh/Kg	-	Ongoing
	Medium power 1C	298 Wh/Kg	-	Ongoing
	High power 5C	282 Wh/Kg	-	Ongoing
Lifetime (Ch-Dch)	C/10 - C/3	600 cycles (80% retention)	>200 cycles (Ongoing)	Ongoing
	C/6 - C/3	-	Ongoing	Ongoing
	C/5 - 1C	700 cycles (80% retention)	Ongoing	Ongoing
Fast Charging	Charge at 4C	80% in <15min	Ongoing	Ongoing
Safety	Thermal	Electrolyte is stable with Li above Li melting point	PASS TEST	Ongoing
	Nail Penetration	PASS TEST	PASS TEST	Ongoing
	Overcharge	PASS TEST	PASS TEST	Ongoing
	External Short Circuit	PASS TEST	PASS TEST	Ongoing
Certification		UN38.3	UN38.3, IATF16949	Ongoing
Manufacturability		Highly similar to Li-ion	Highly similar to Li-ion	Highly similar to Li-ion
Tested Operating Temperature		-30 °C to 60 °C	-10 °C to 45 °C	-10 °C to 45 °C

CELL OCV AND DCIR vs. SOC

Enable high power performances

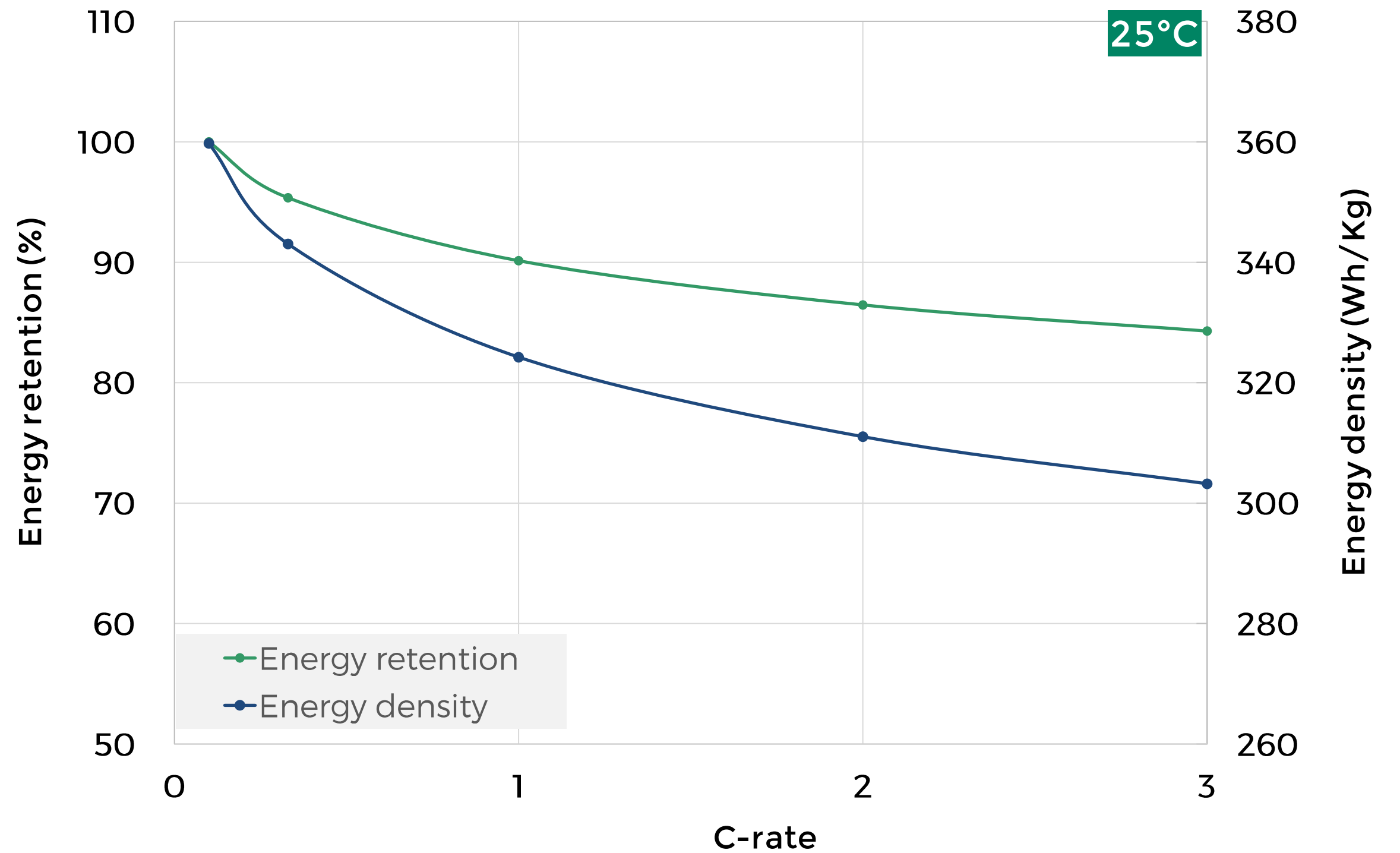
~ 1 mΩ of DCIR at SOC 50% during 2C discharge for 10 sec



Source: SES internal test data

ENERGY DENSITY AND POWER RATINGS

~ 84% energy retention
at 25°C for C-rates up
to 3C

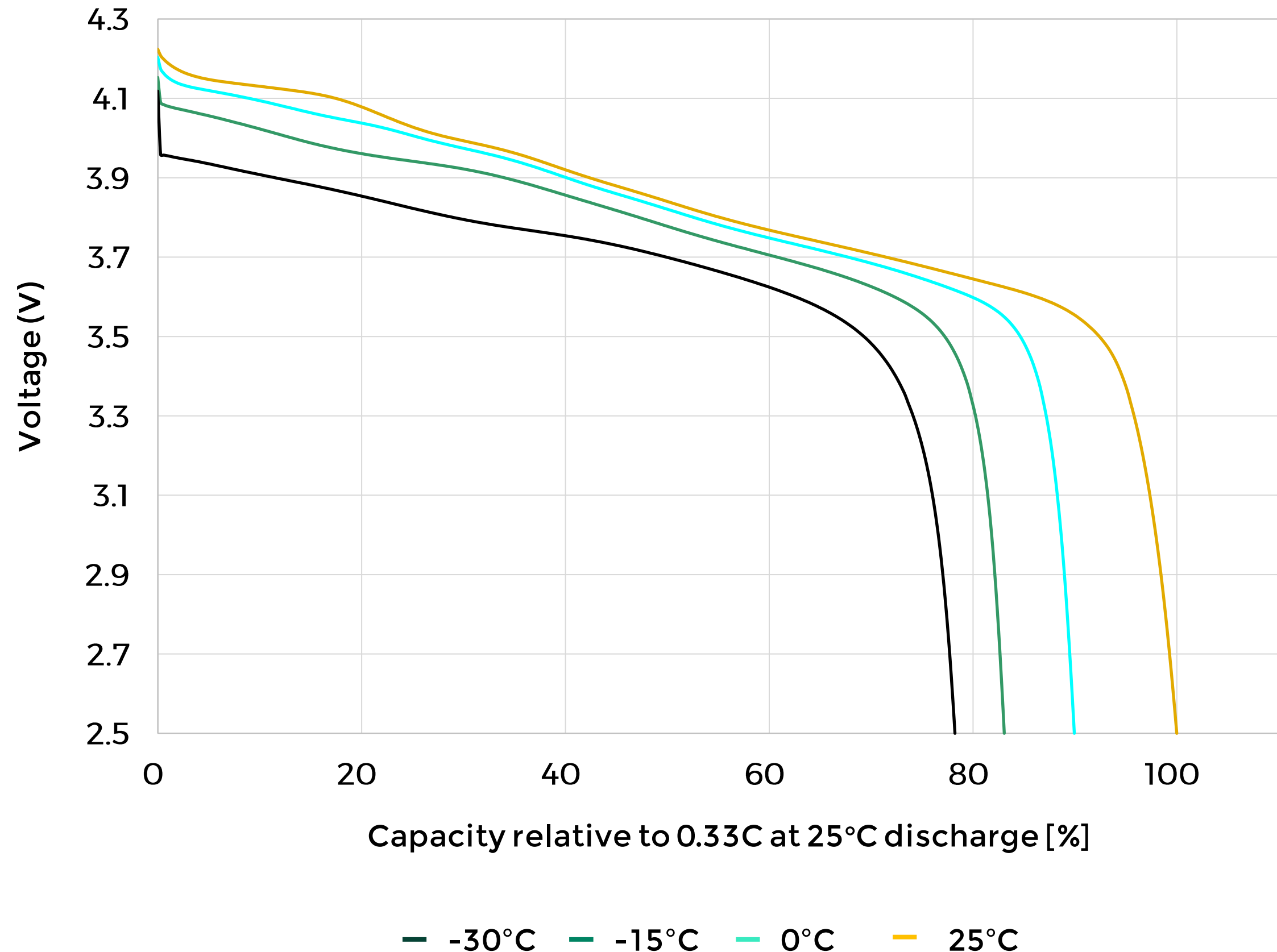


LOW TEMPERATURE PERFORMANCE

Excellent performance in cold weather climates

Low resistance even at sub-zero temperatures

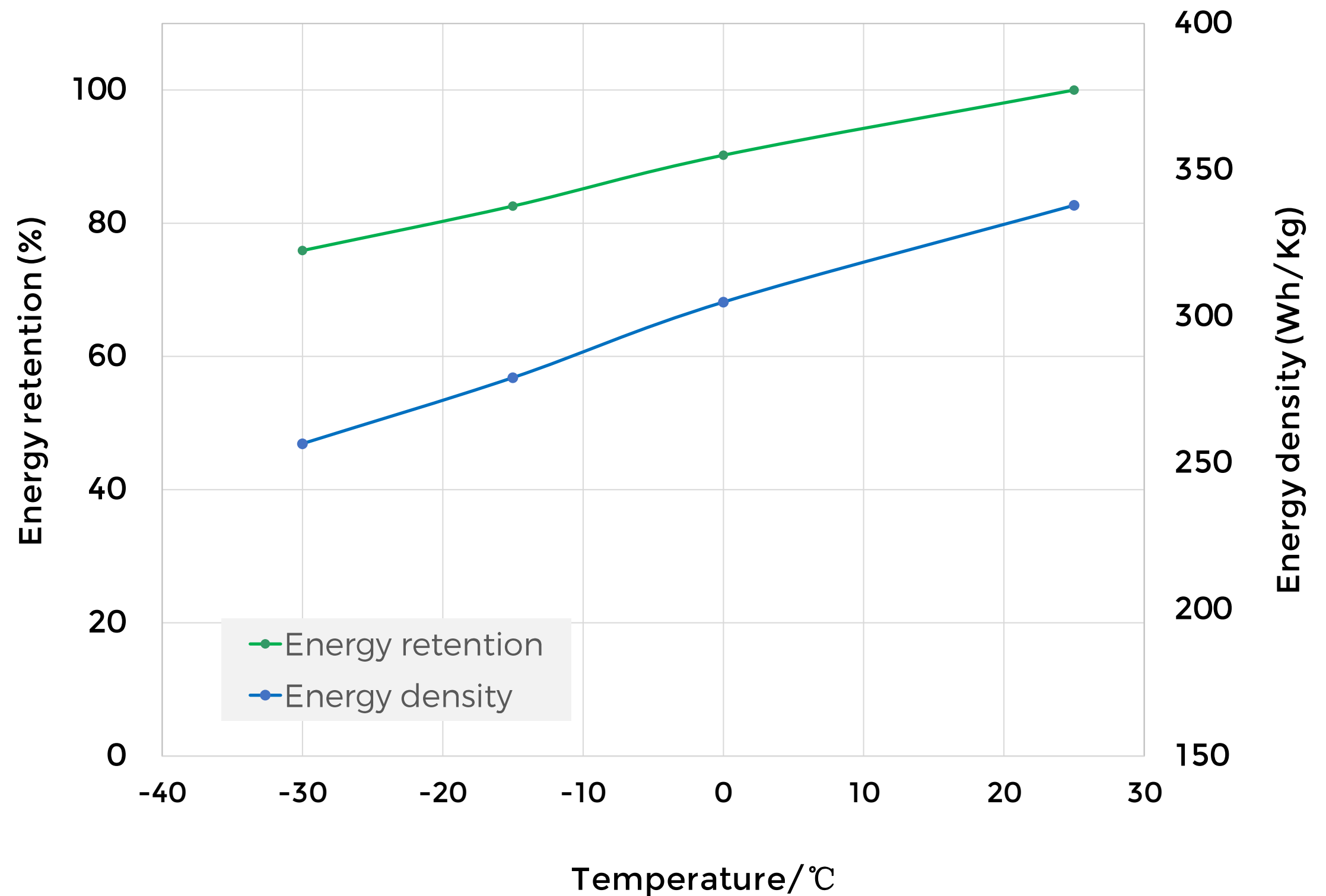
Retains 78% capacity (C/3 at 25°C) even at -30°C



LOW TEMPERATURE PERFORMANCE

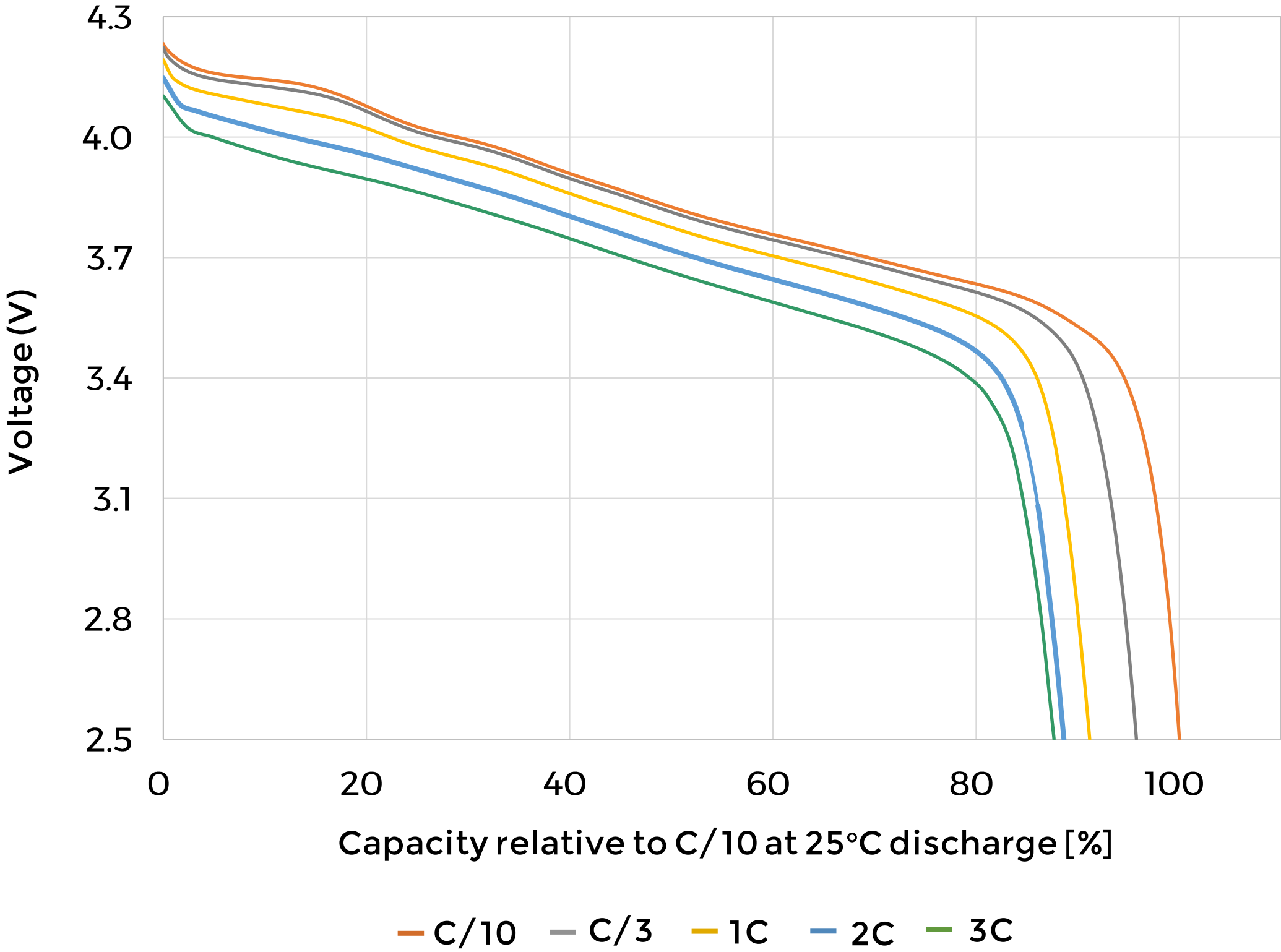
Excellent performance in cold weather climates

~76% energy retention at -30°C relative to C/3 discharge at 25°C



HIGH ENERGY DENSITY AT ALL POWER REQUIREMENTS

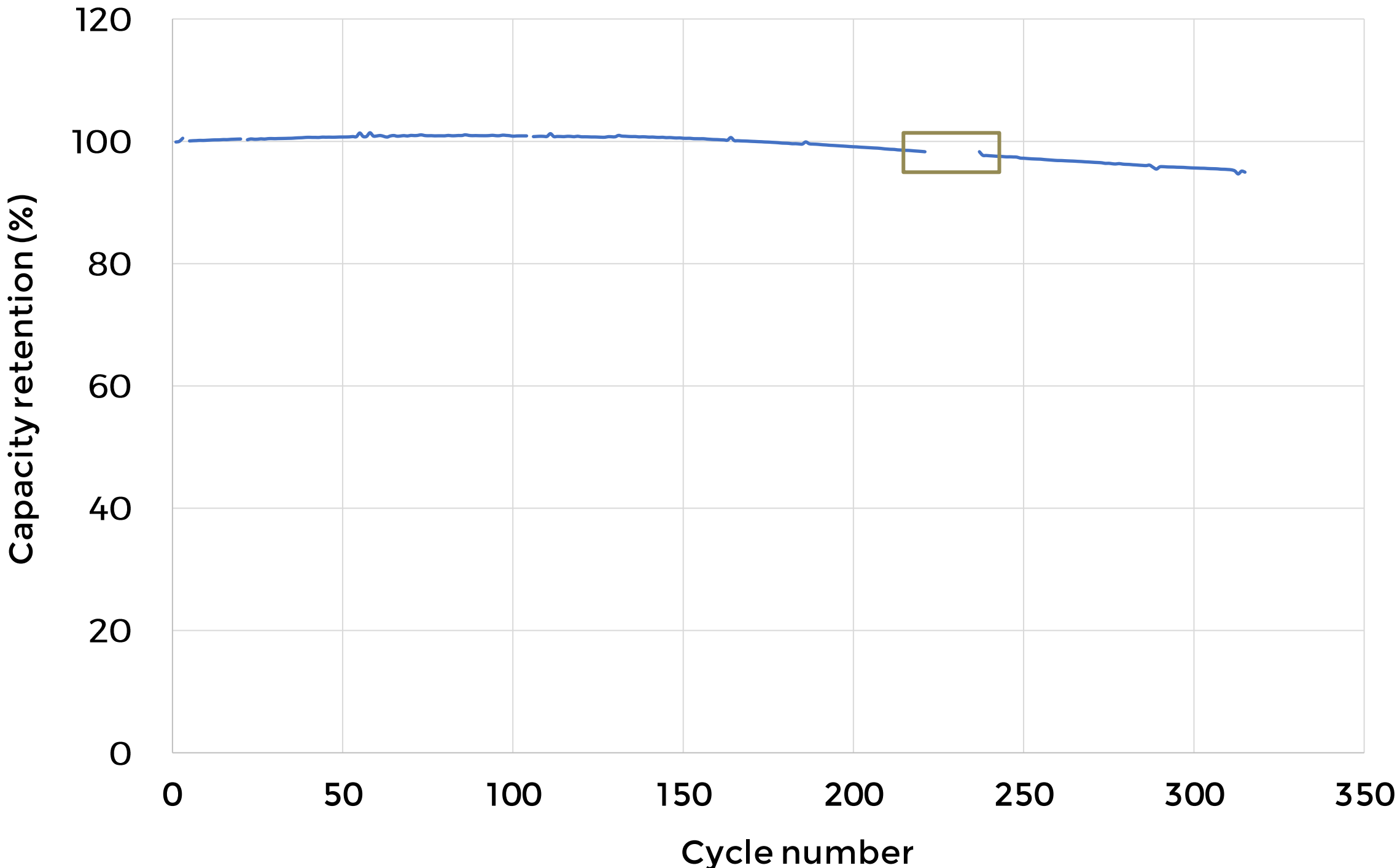
Retains ~87% capacity at 3C discharge rates



Source: SES internal test data

EV LIFETIME (C/10 CHARGE C/3 DISCHARGE)

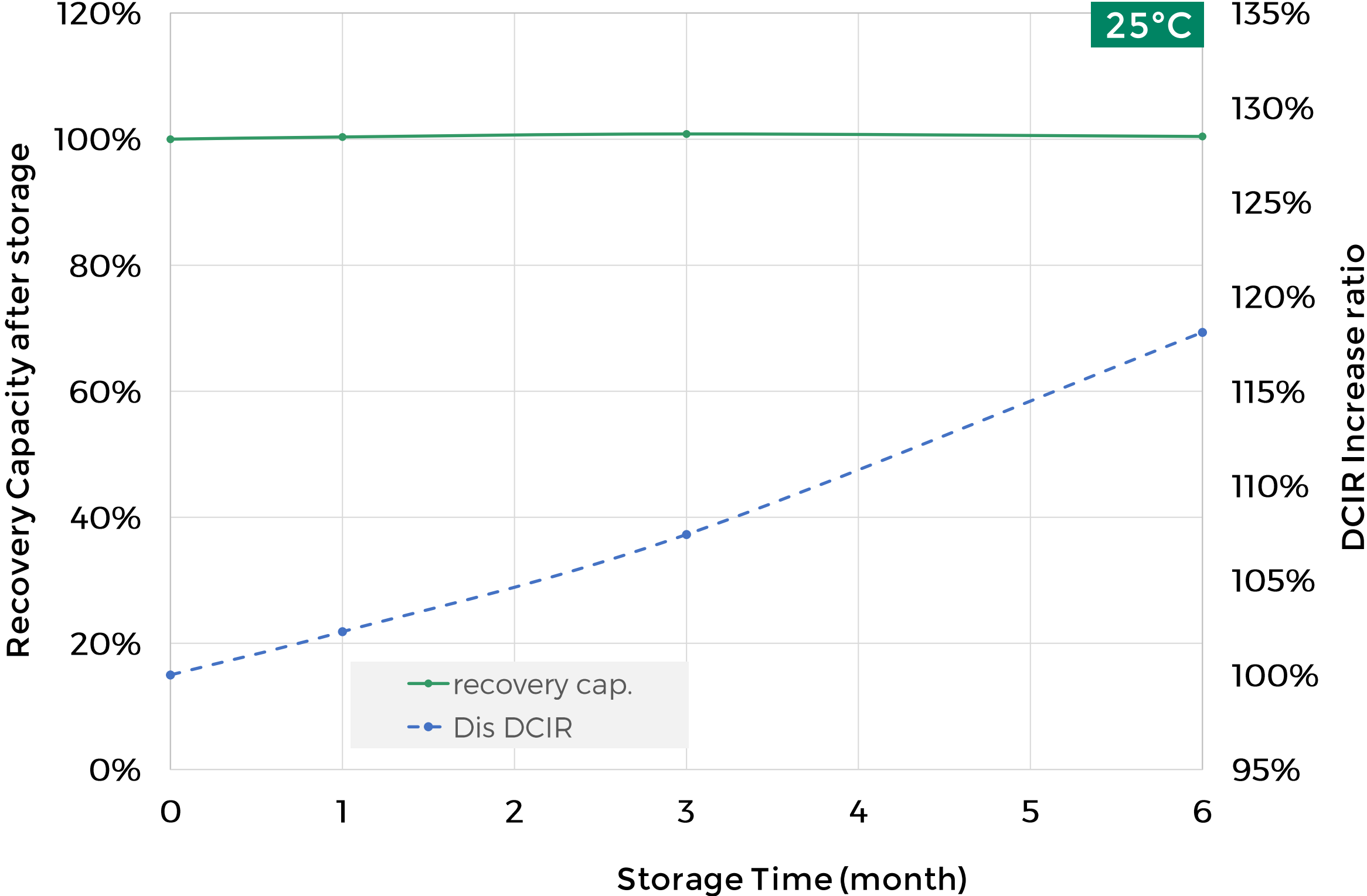
Capacity retention of 95% at 315 cycles



Remark: some data were missing due to machine issue.

CALENDAR LIFE

~ 100% capacity recovery after 6 months storage at 90%SOC and 25°C



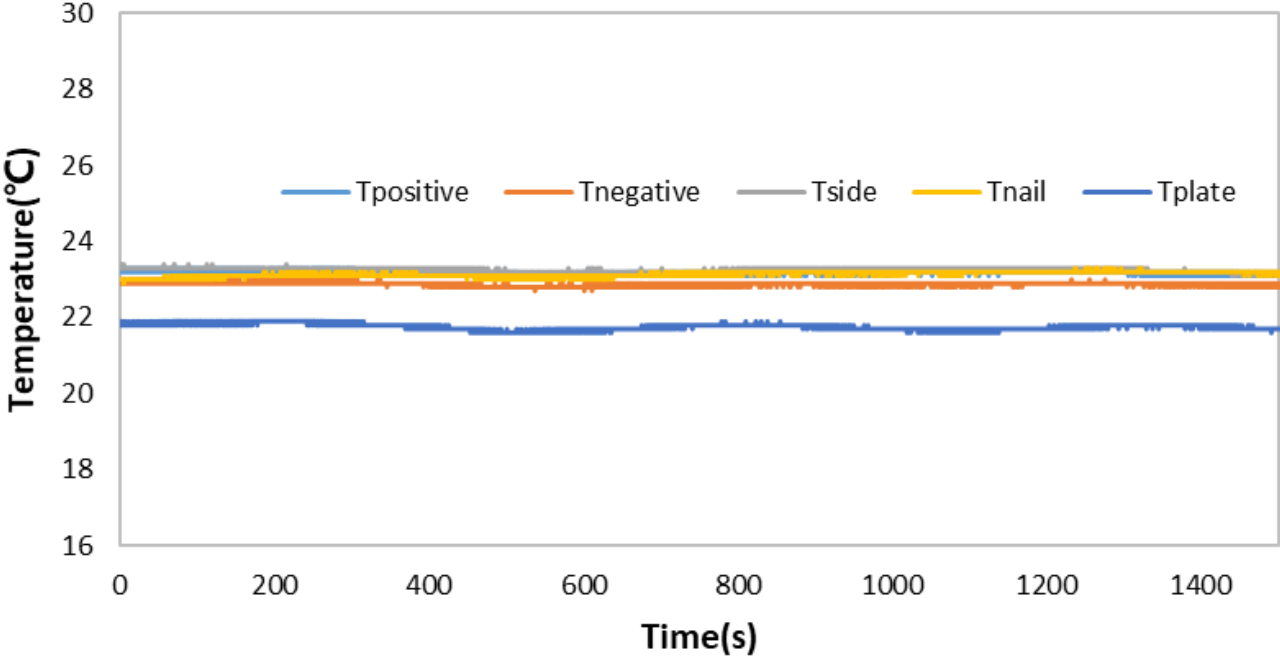
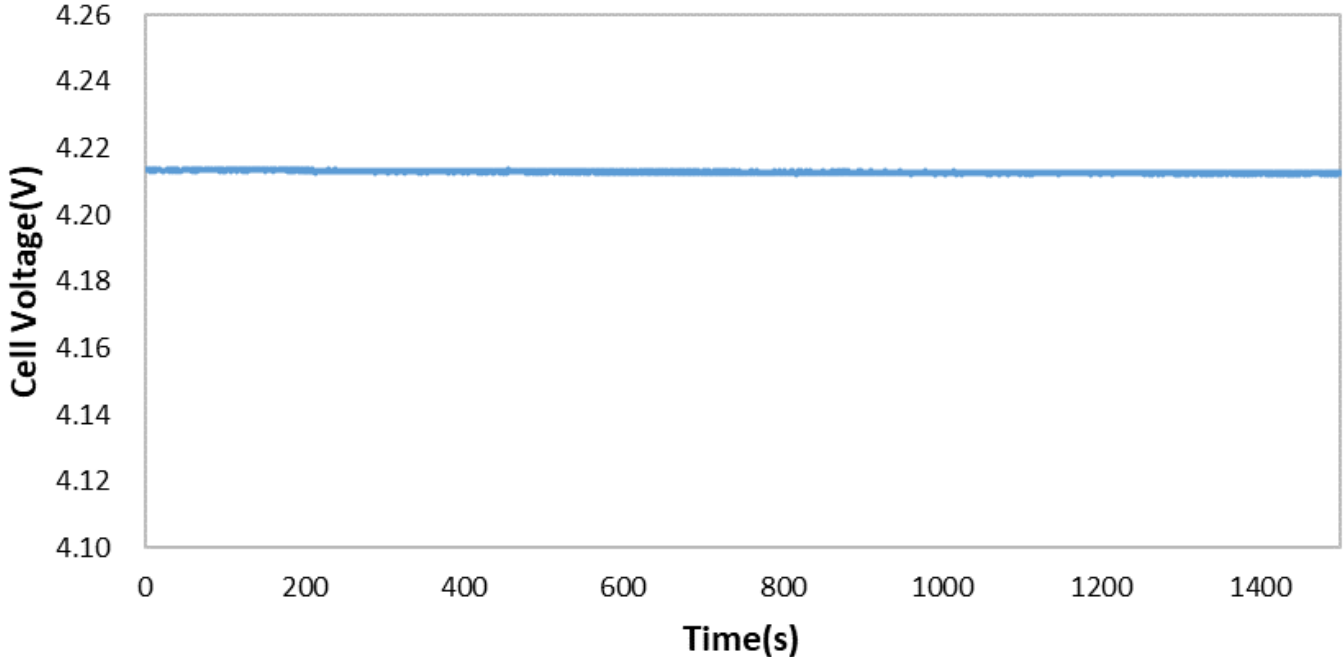
Source: SES internal test data

SAFETY PERFORMANCE - NAIL PENETRATION

Condition:

Ø 3mm, 30 mm/s

✓ PASSED



No thermal runaway even with complete nail penetration

Note: all data from 3rd-party testing

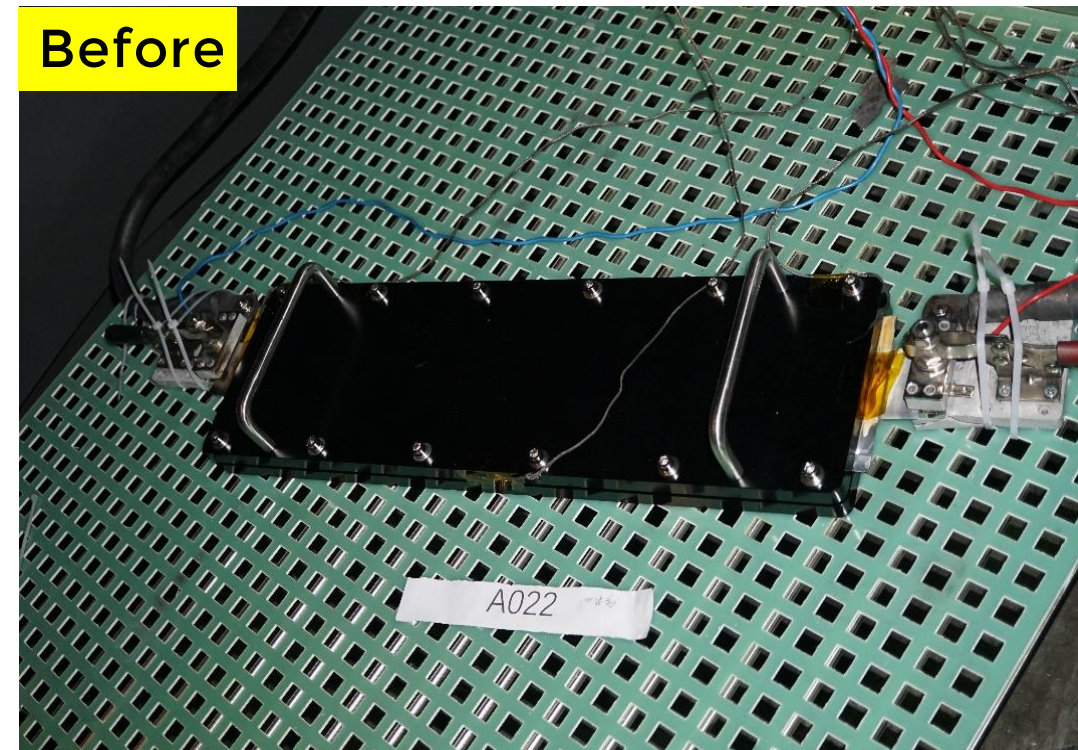
SAFETY PERFORMANCE - OVERCHARGE

Condition:

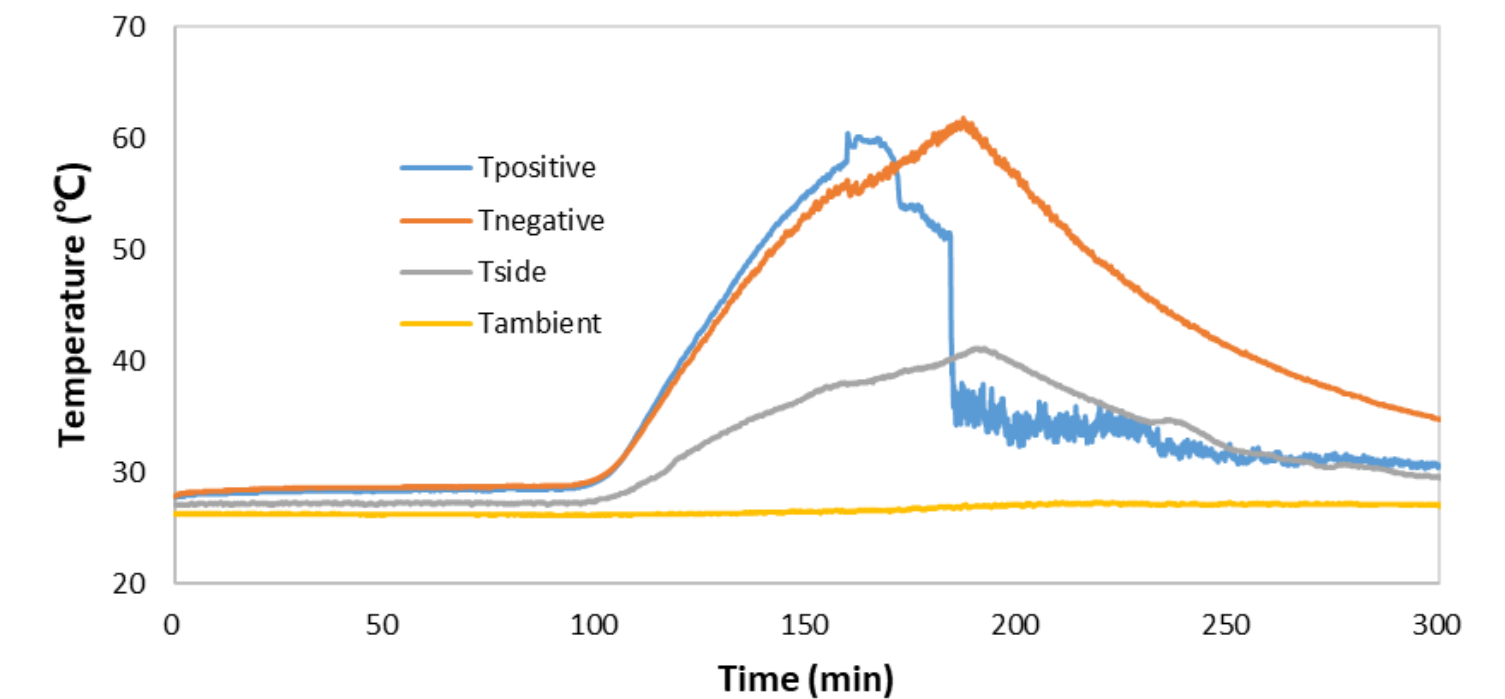
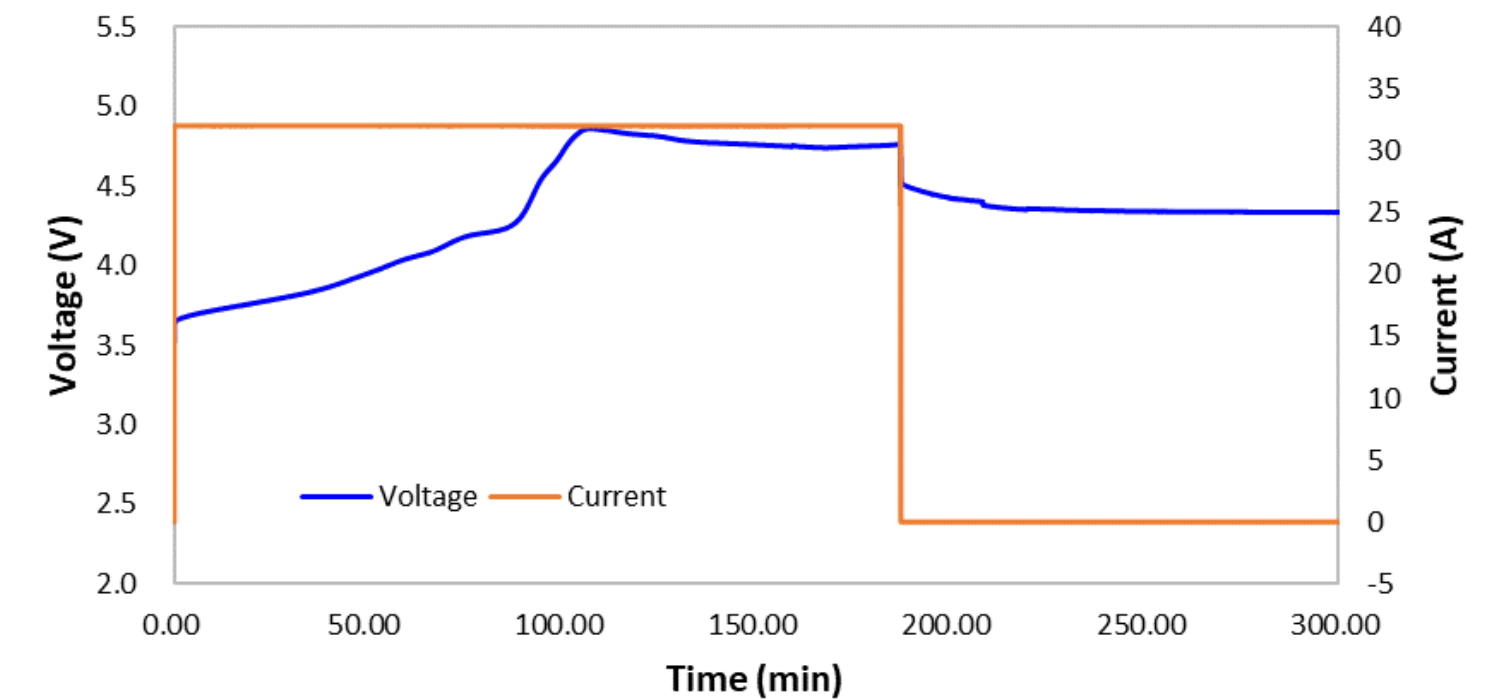
32A CCCV Charge to 9V, 0.005C end or SOC reach 200%

✓ PASSED

Note: all data from 3rd-party testing



No thermal runaway

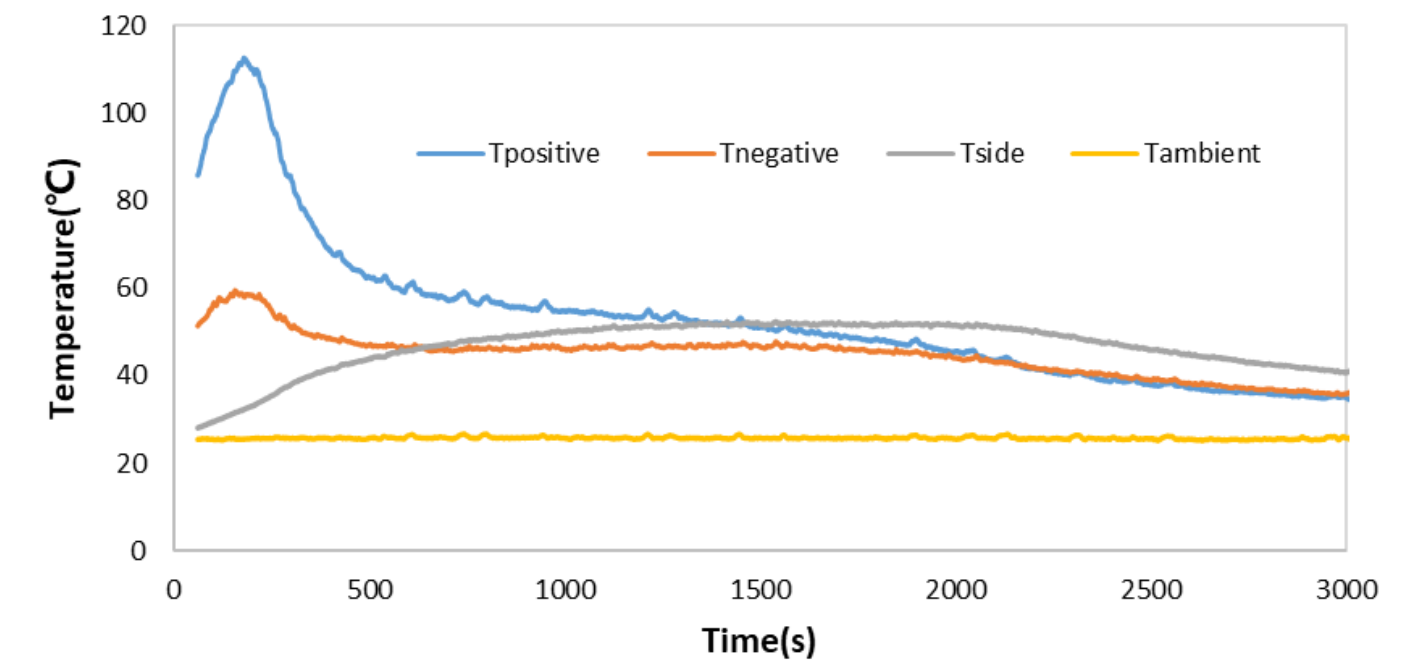
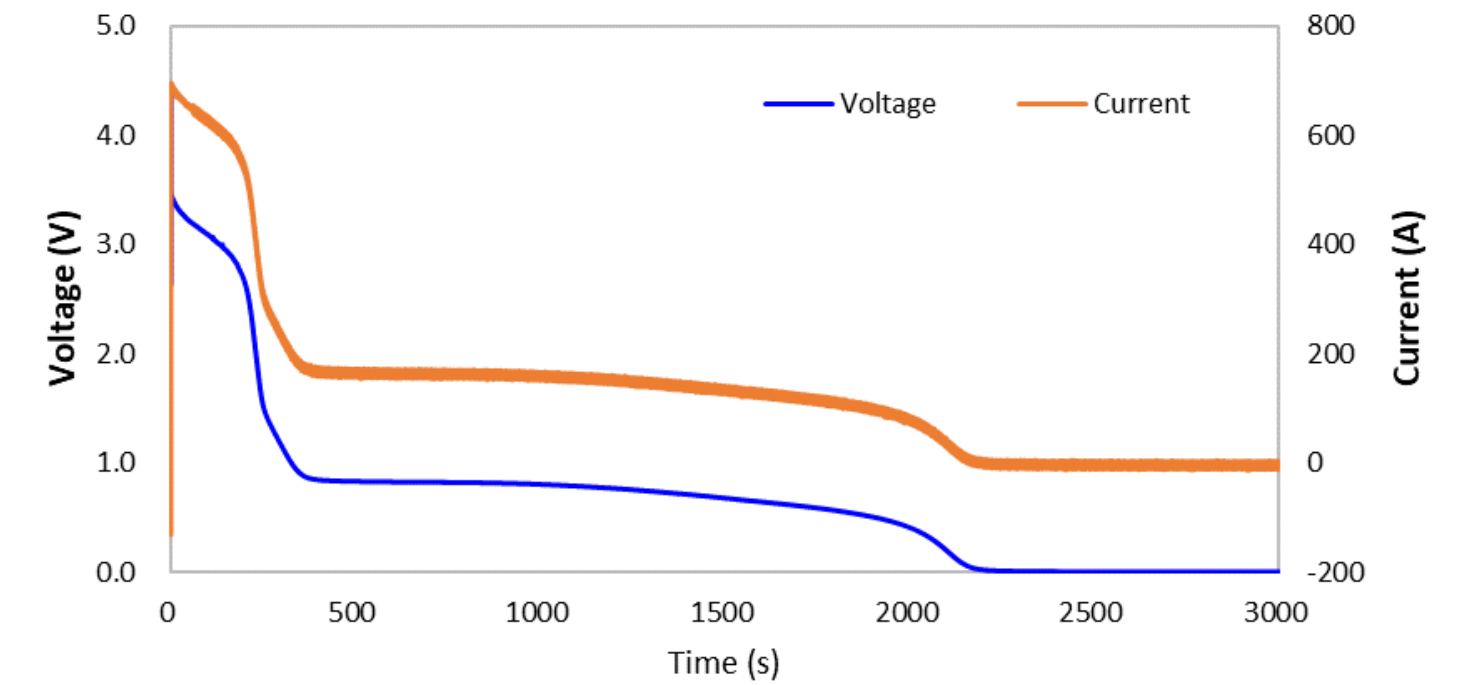


SAFETY PERFORMANCE - EXTERNAL SHORT CIRCUIT

Condition:

$R < 5\text{m}\Omega$, 2.5h

✓ PASSED



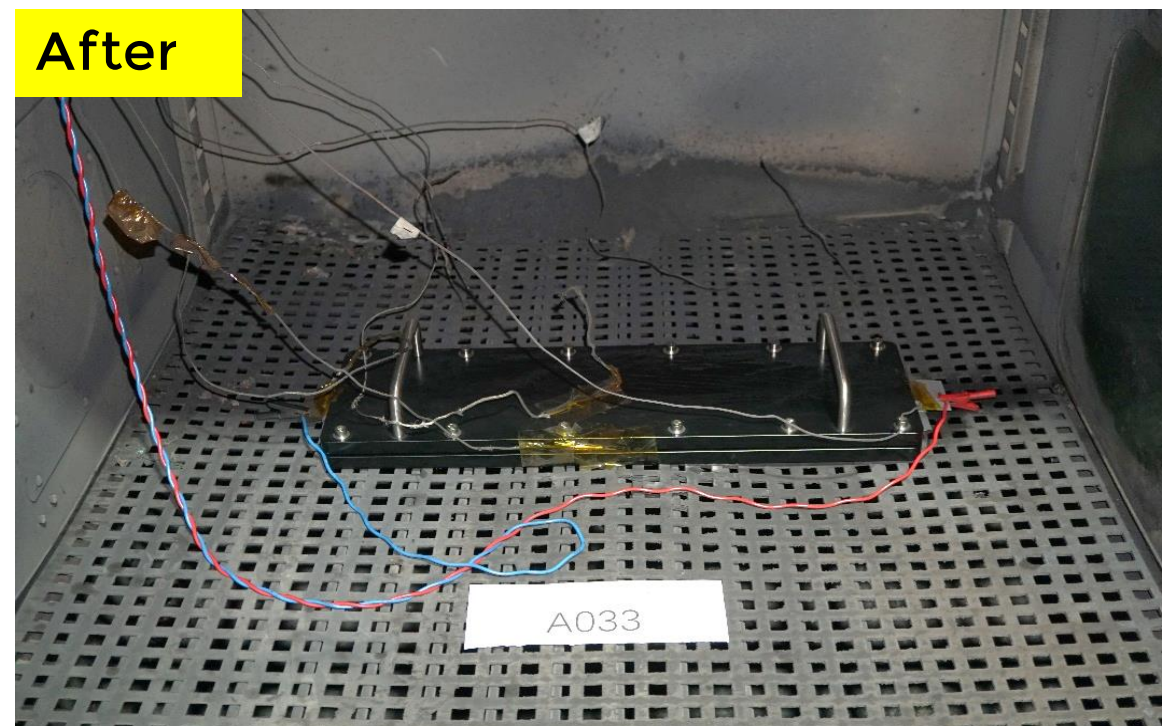
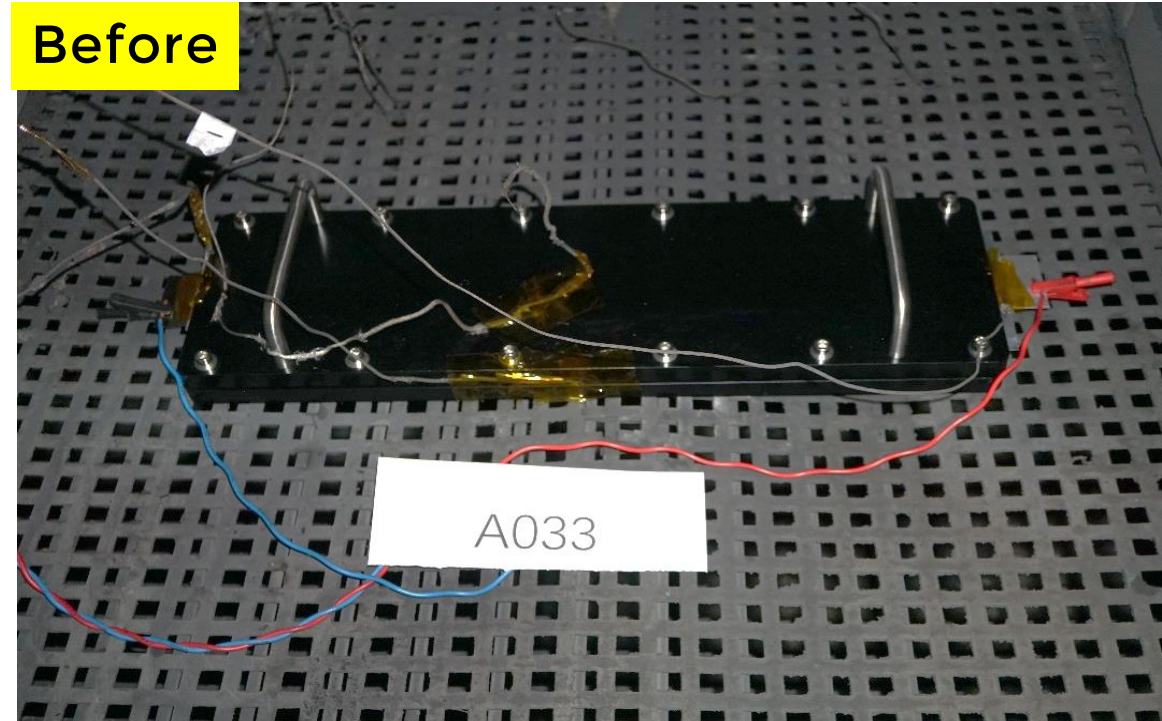
Note: all data from 3rd-party testing

No thermal runaway even when cell is short circuited

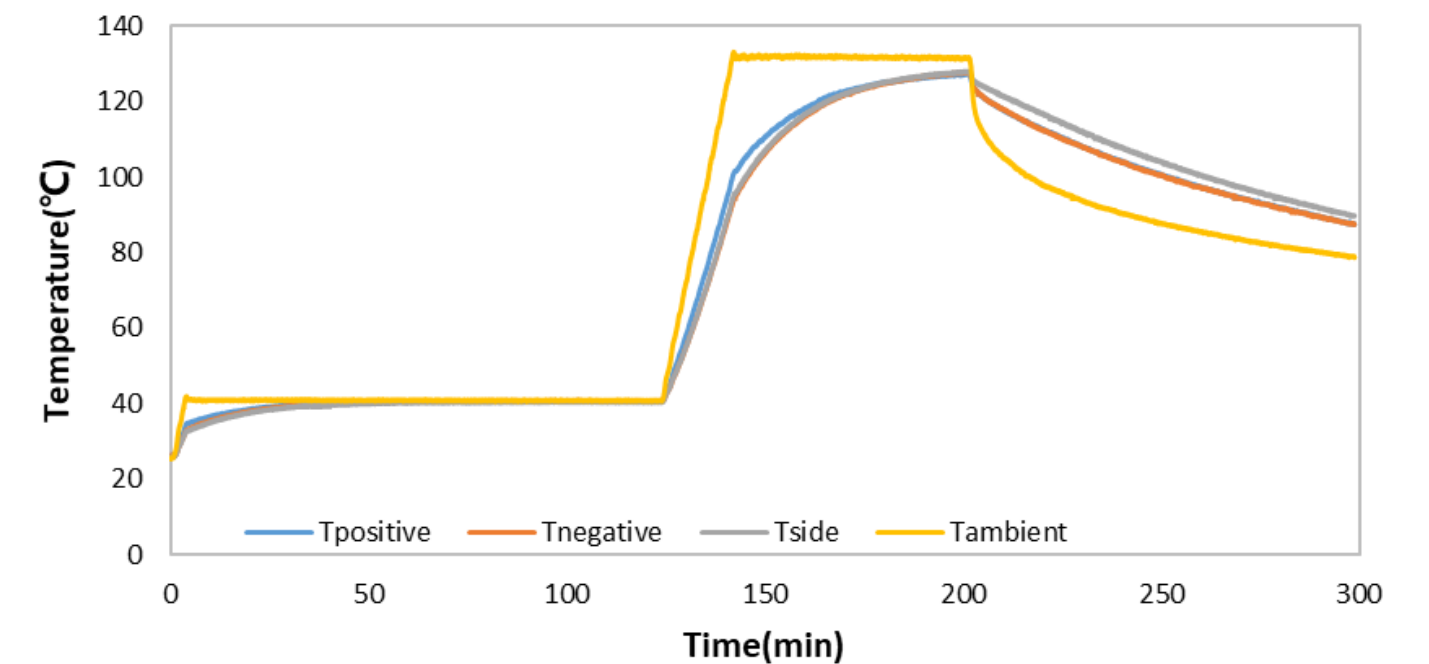
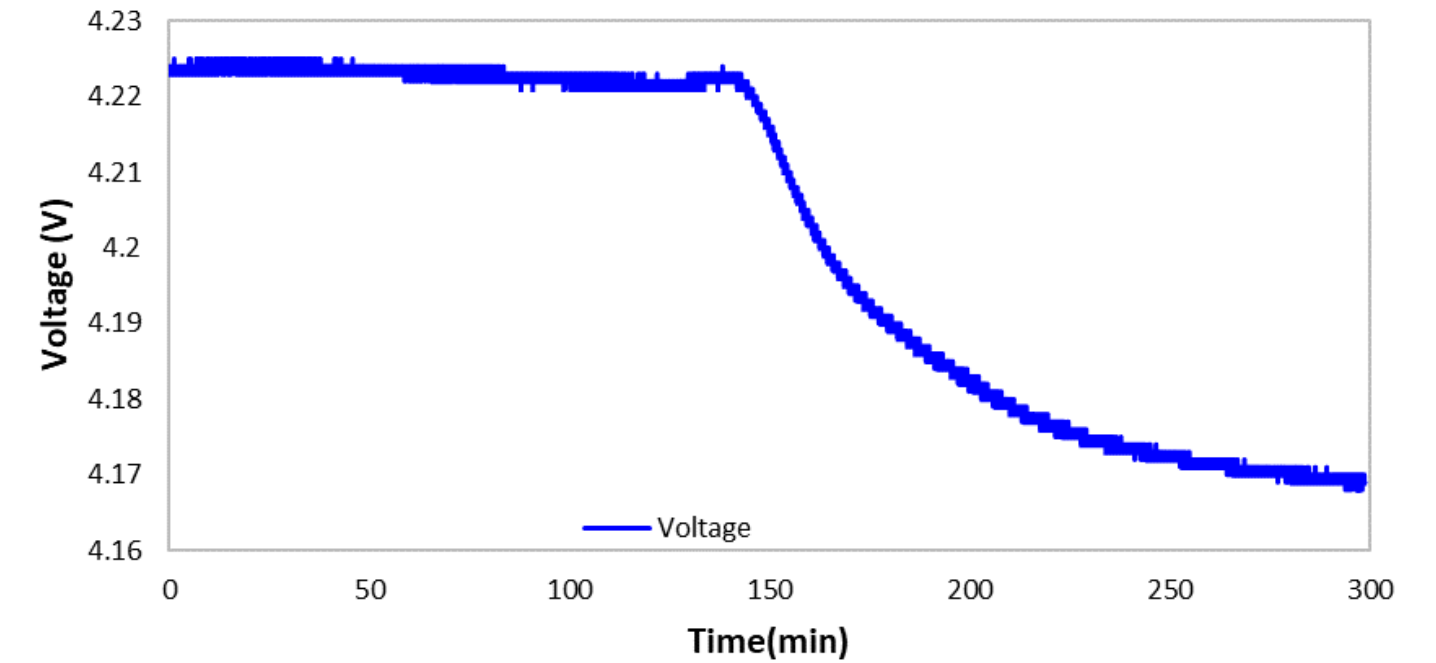
SAFETY PERFORMANCE - THERMAL STABILITY (50Ah CELL)

Condition:
SOC 100%, 1 hour at 130°C

✓ PASSED



No thermal runaway



Note: all data from 3rd-party testing

UN38.3 CERTIFICATION



UN 38.3

Test Report

New Application Modification Other

Report ID: 20220706J18449

Sample Name: Rechargeable lithium battery cell

Model/Type: 37B0582
3.82V 47.4Ah 181Wh

Applicant: SES AI Corporation



CQC Intime Testing Technology Co.,Ltd.



UN38.3

LITHIUM CELLS OR BATTERIES TEST SUMMARY
IN ACCORDANCE WITH SUB-SECTION 38.3
OF UN MANUAL OF TESTS AND CRITERIA

NO. CQCIT2206J0297

Sample Description:

Cell/battery Name:
Rechargeable lithium battery cell

Mass:
0.51kg

Specification Parameter:
 Li-ion battery/cell 3.82 V 47.4 Ah 181 Wh
 Li-metal battery/cell ___ V ___ Ah ___ Wh

Physical Description:
Pouch Cell

Model Numbers:
37B0582

Applicant:

SES AI Corporation
35 Cabot Road, Woburn, MA 01801 USA
www.ses.ai

Sample Manufacturer:

SES AI Corporation
35 Cabot Road, Woburn, MA 01801 USA
www.ses.ai

UN38.3 Test Lab:

CQC Intime Testing Technology Co., Ltd.
East Taihu Technology and Finance City,
No.1368 Wuzhong Dadao Road, Wuzhong
Economic Development Zone, Suzhou, Jiangsu.
0512-66303623
cqc_jszlb@126.com
http://www.cqc-it.com

Sample Test Information:

Test Report Number:
20220706J18449

Date of Test Report:
2022-09-06

Edition of UN Manual of Tests and Criteria Used:
Recommendations on the Transport of Dangerous
Goods, Manual of Tests and Criteria, ST/SG/AC.10/11/
Rev.7/Amend.1/Section 38.3

List of Tests Conducted and Results(Pass/Fail):

T1	Altitude simulation	Pass
T2	Thermal test	Pass
T3	Vibration	Pass
T4	Shock	Pass
T5	External short circuit	Pass
T6	Impact/Crush	Pass
T7	Overcharge	Not applicable
T8	Forced discharge	Pass

Assembled Lithium Battery Test Requirement:

38.3.3(f) 38.3.3(g) N/A

Technical Leader

Date of issue: 2022-09-06