



# MOLICEL® INR-21700-P42A 4.2Ah Power cell

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E-ONE MOLI ENERGY CORP

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- ❖ **MOLICEL® INR-21700-P42A 4.2Ah power cell**
- ❖ **Cell is capable of continuous cycling at high rates up to 8C**
- ❖ **Key Characteristics:**
  - Low cell impedance: <20mOhm DCR at 10s
  - 2C (8.4A) charge capability
  - -40°C discharge capability





LITHIUM-ION RECHARGEABLE BATTERY

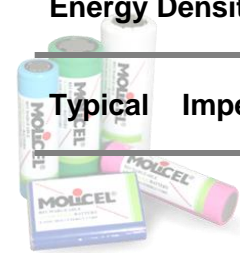
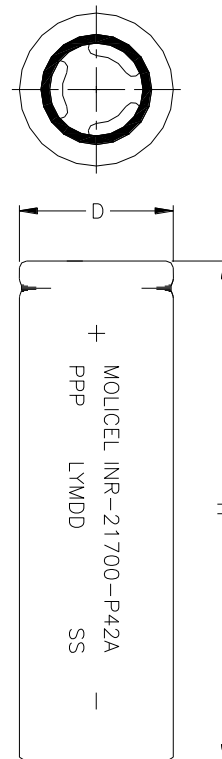
PRODUCT DATA SHEET  
**MODEL INR-21700-P42A**

Performance Characteristics

Capacity	Typical	4200 mAh 15.5 Wh
	Minimum	4000 mAh 14.7 Wh
Cell Voltage	Nominal	3.6 V
	Charge	4.2 V
	Discharge	2.5 V
Charge Current	Standard	4.2 A
Charge Time	Standard	1.5 hr
Discharge Current	Continuous	45 A
Temperature	Charge	0°C to 60°C
	Discharge	-40°C to 60°C
Energy Density	Volumetric	615 Wh/l
	Gravimetric	230 Wh/kg
Typical Impedance	AC(1 KHz)	<10 mΩ
	DC (10A/1s)	16 mΩ

Physical Characteristics

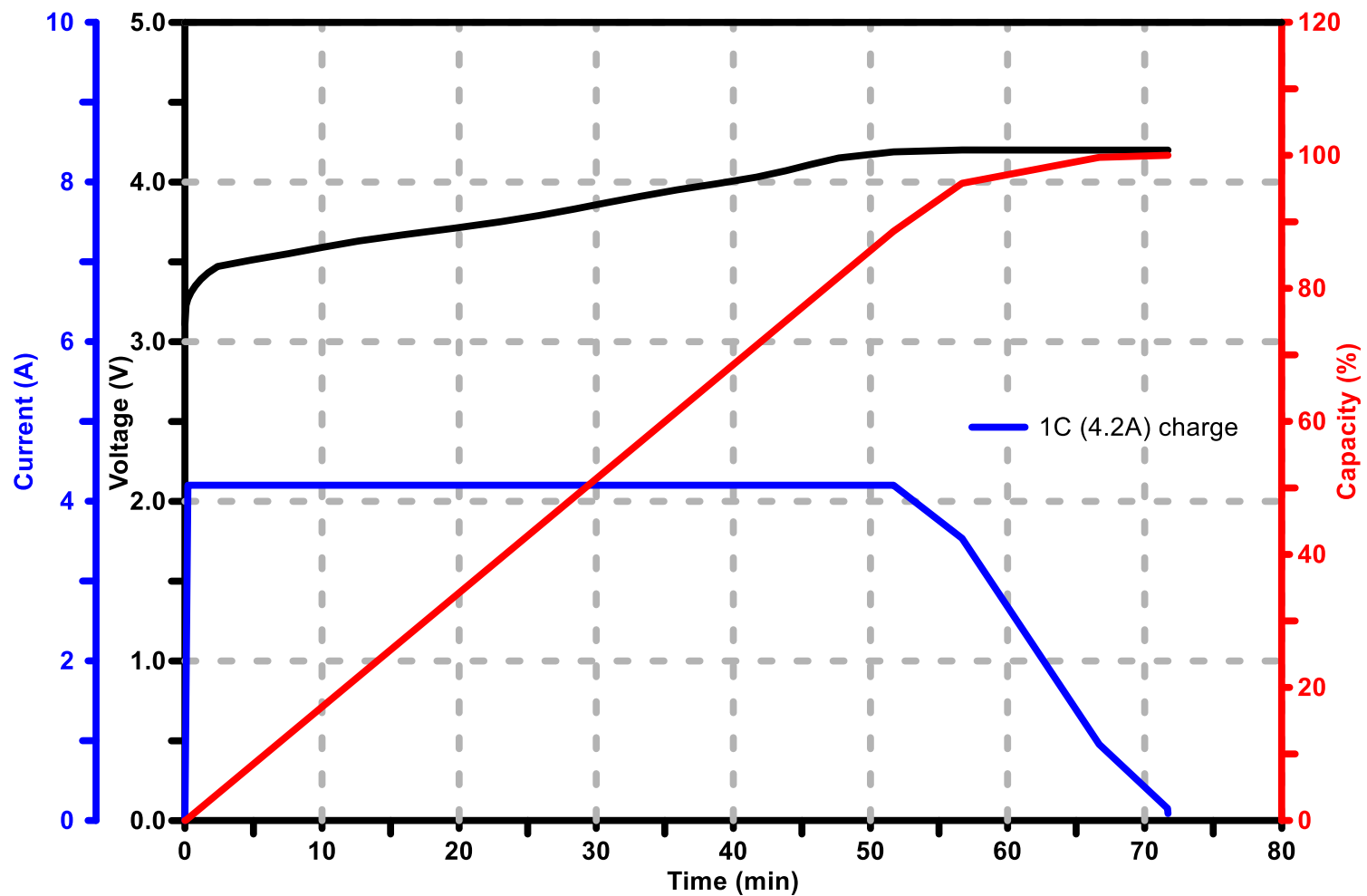
Shape	Cylindrical
Can	Steel
Diameter	21.55 mm (Max)
Height	70.15 mm (Max)
Weight	67 g (Typical)



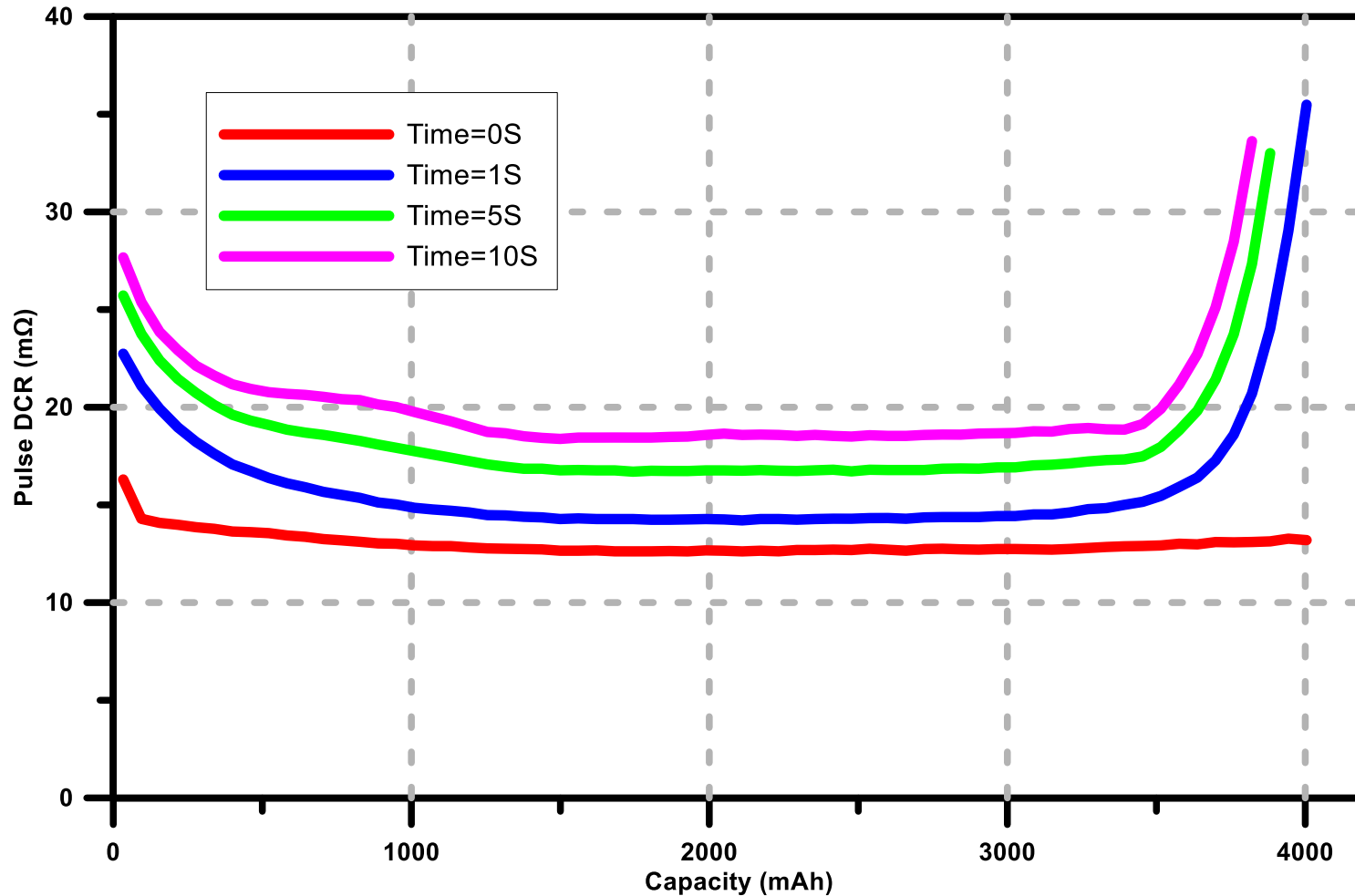
# Charge / Discharge Characteristics



# 23 °C Charge Characteristics



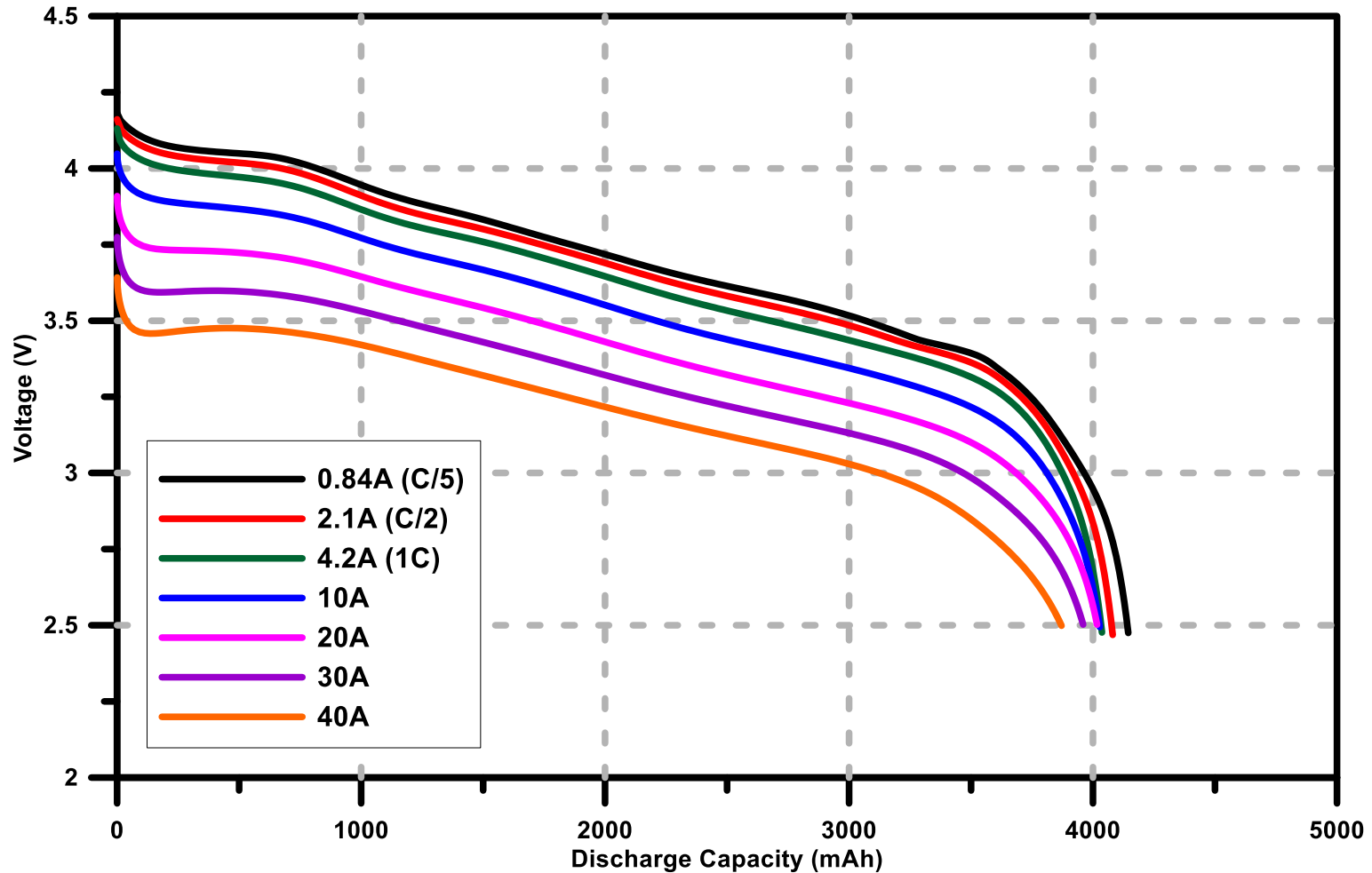
# 1A/10A Pulse DCR



- ❖ Charge: CCCV 4.2A/4.2V (50mA current taper)
  - ❖ Discharge: 1A with 10A/10s pulses to 2.5V
- Ambient Temperature: 23°C

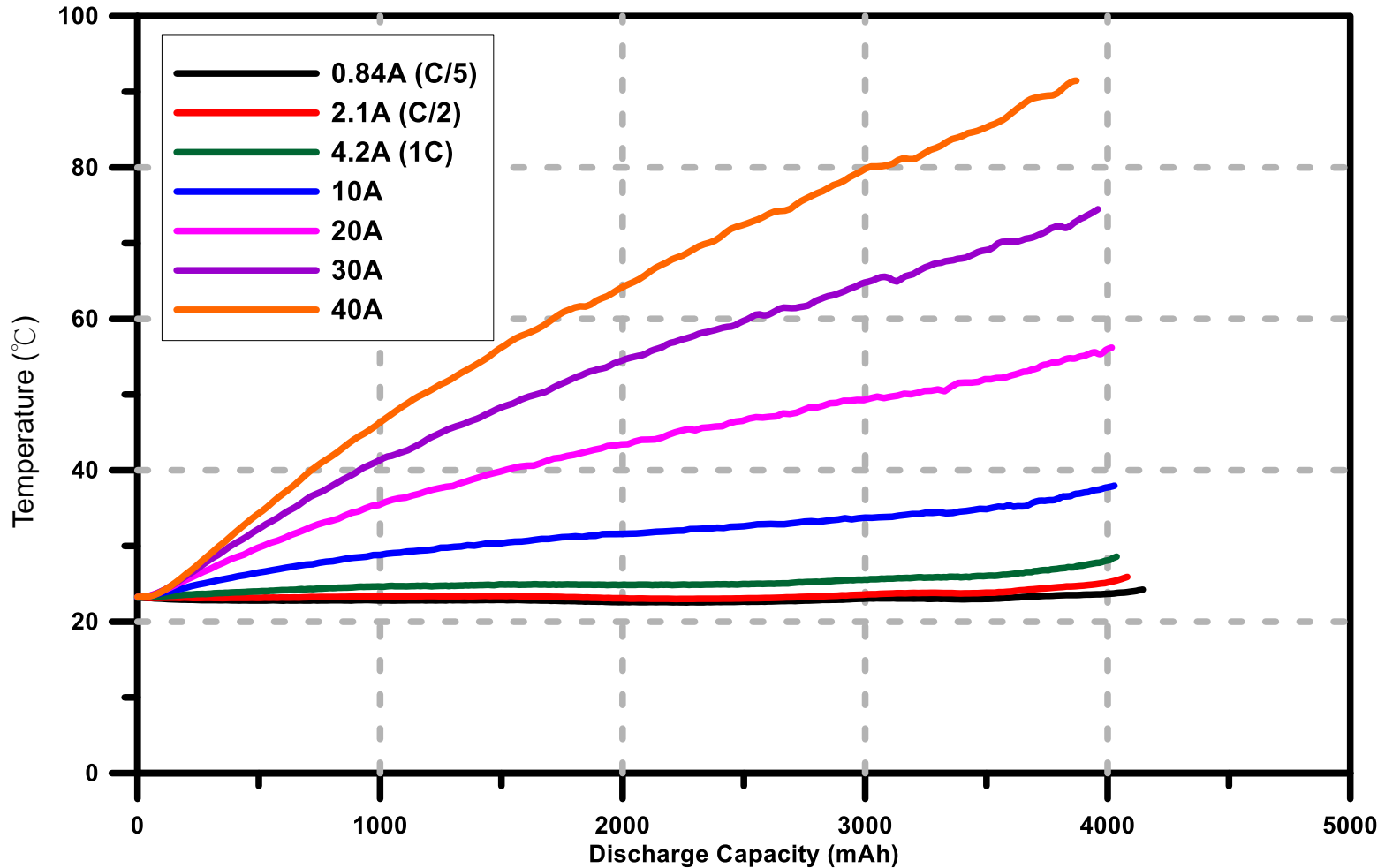


# Constant Current Discharge Rate Map



- ❖ Charge: CCCV 4.2A/4.2V (50mA current taper)
- ❖ Discharge: Constant Current to 2.5V
- Ambient Temperature: 23°C

# Constant Current Discharge Rate Map



- ❖ Charge: CCCV 4.2A/4.2V (50mA current taper)
- ❖ Discharge: Constant Current to 2.5V
- Ambient Temperature: 23°C

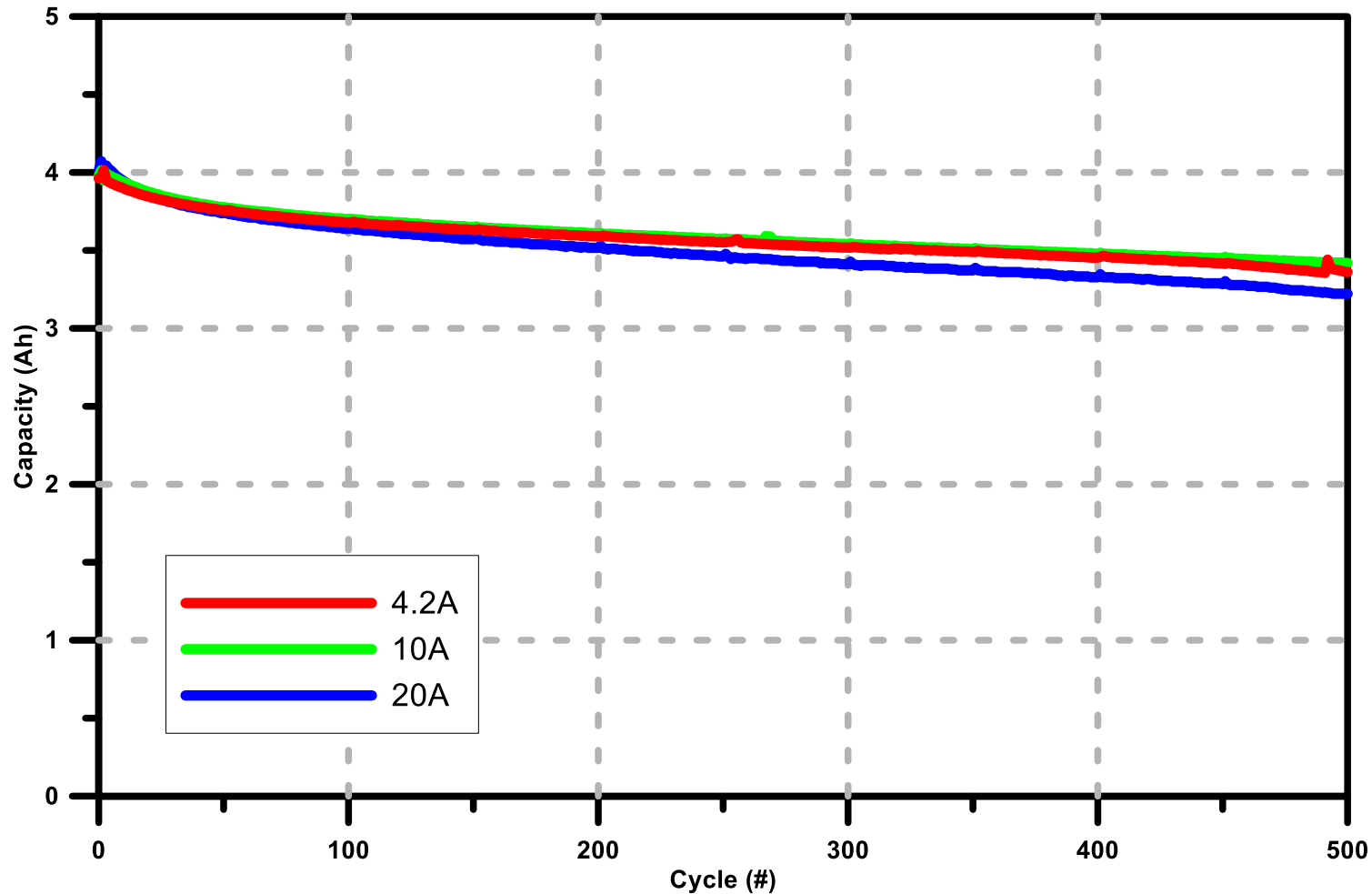




# Cycle Life



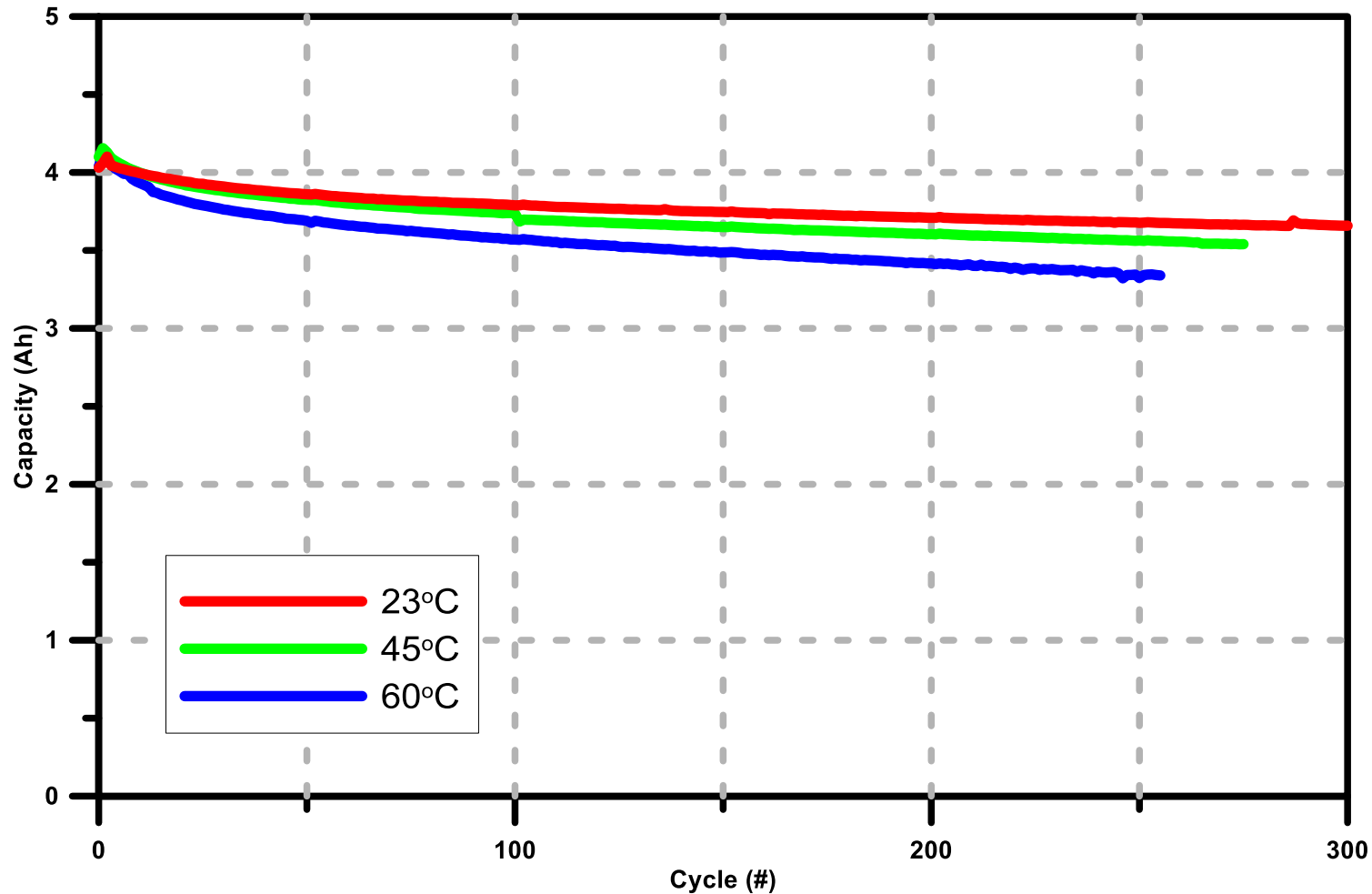
# High Rate Discharge



- ❖ Charge: CCCV 4.2A/4.2V (50mA current taper)
  - ❖ Discharge: Constant Current 4.2A, 10A, or 20A to 2.5V
- Ambient Temperature: 23°C



# ±2A at Various Temperatures

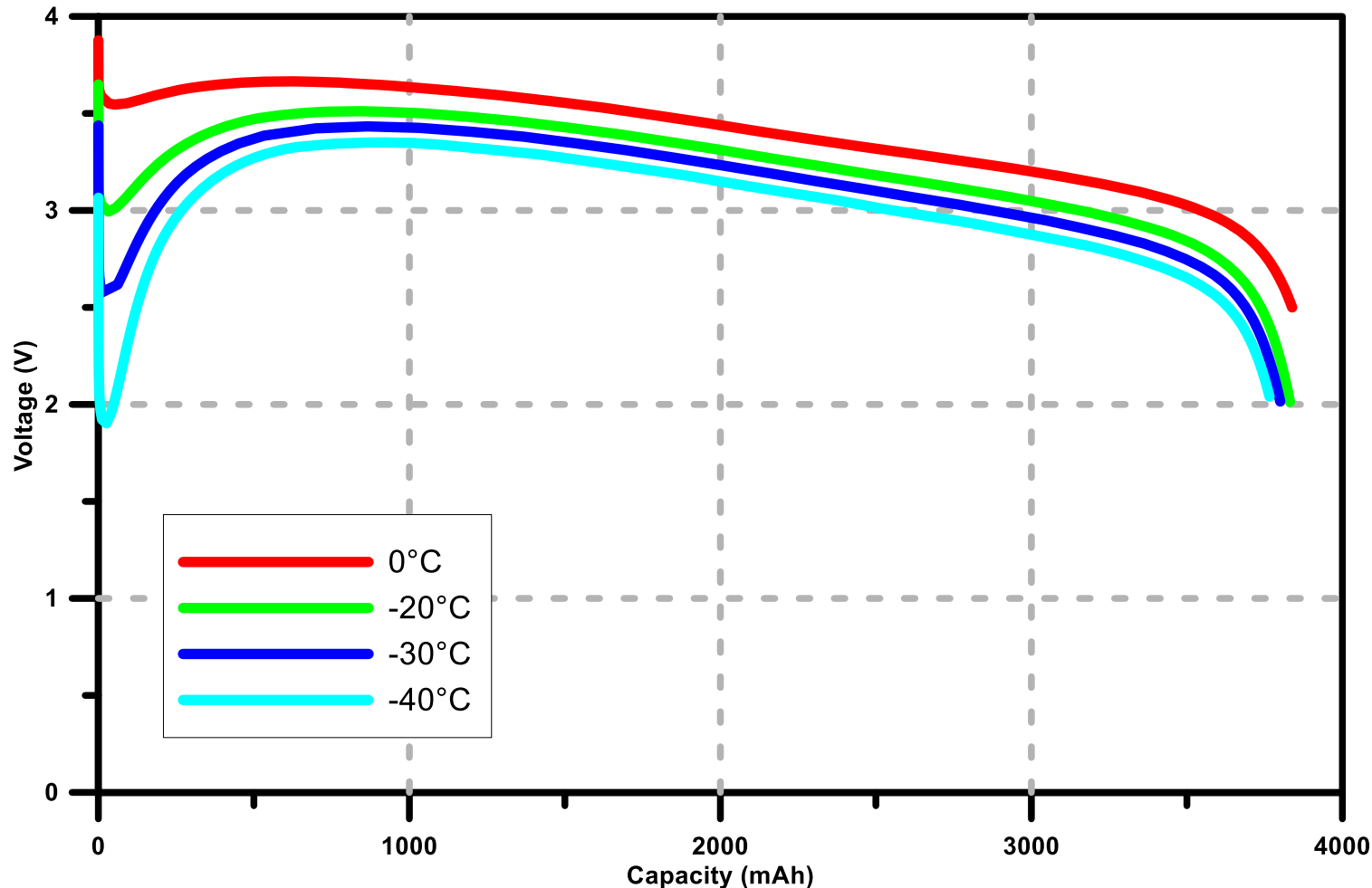


- ❖ Charge: CCCV 2A/4.2V (50mA current taper)
- ❖ Discharge: Constant Current 2A to 2.5V
- Ambient Temperature: 23°C, 45°C, and 60°C

# Low Temperature Performance



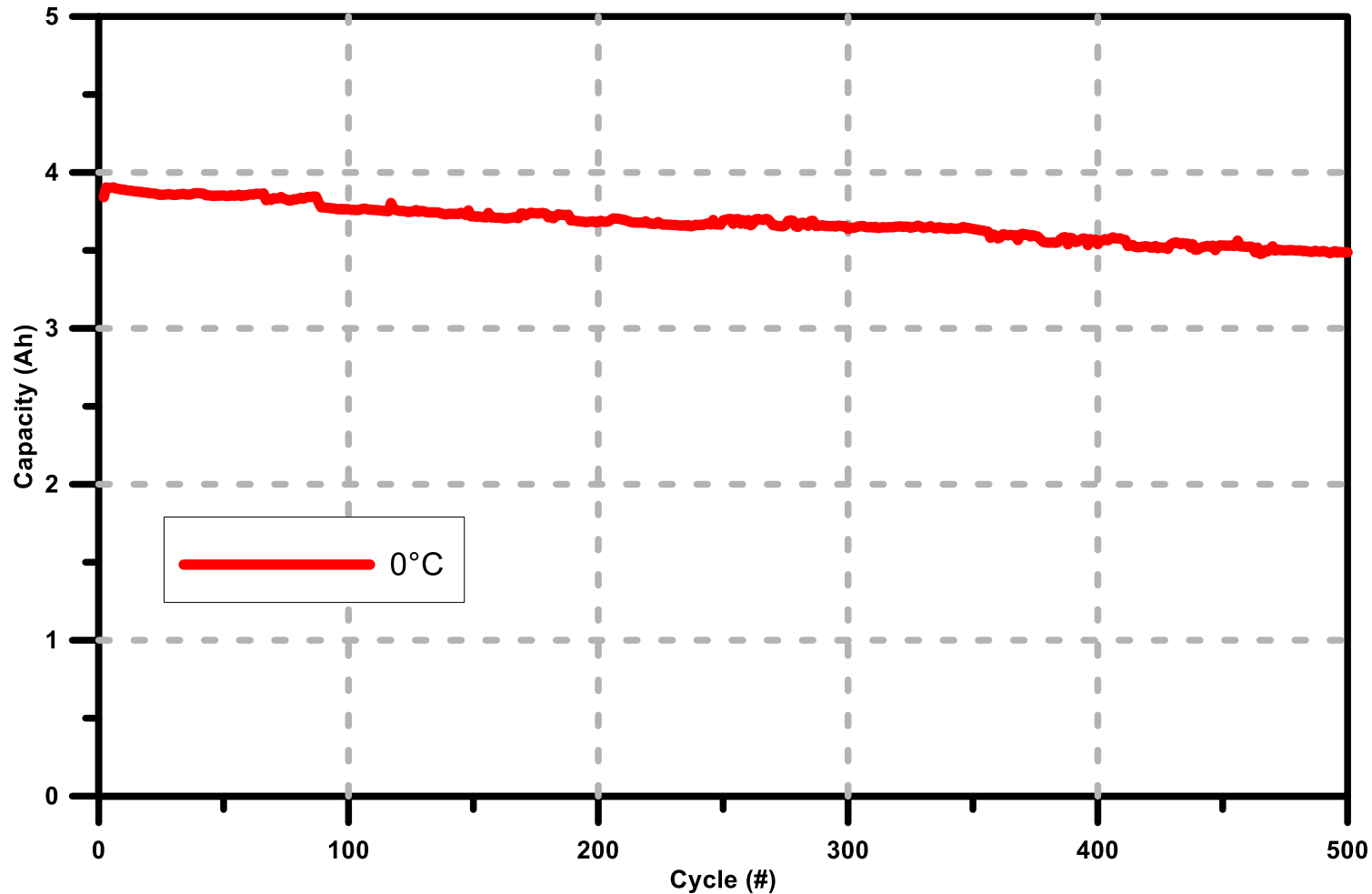
# Low Temperature Rate Map



- ❖ Charge: CCCV 4.2A/4.2V (50mA current taper)
- ❖ Discharge: Constant Current at 10A to 2.5V
- Ambient Temperature: 0 °C, -20 °C, -30 °C, and -40 °C



# Low Temperature Cycle Life



- ❖ Charge: CCCV 2A/4.2V (50mA current taper)
- ❖ Discharge: Constant Current 2A to 2.5V
- Ambient Temperature: 0°C



# Safety Data








Test	Condition	Result	Typical Max Temperature
Hotbox	4.2V, 130 ° C (UL)	Pass	132 ° C
Short Circuit	50 mΩ, 23 ° C	Pass	101 ° C
	32 mΩ, 23 ° C	Pass	132 ° C
	5 mΩ, 60 ° C	Pass	77 ° C
Overcharge 23 ° C, 100% DOD	4.2A, 15 V, Insulated	Pass	71 ° C
	9A,15 V (UL)	Pass	74 ° C
Flat Plate Crush	4.2V, 23 ° C, 13 kN (UL)	Pass	26 ° C
Impact	4.2V, 23 ° C (UL)	Pass	44 ° C





# Safety Data

Cell no.	ACR/mΩ	OCV/V	Photo after testing	Results
1	8.85	4.17		Pass Can no crack
2	8.74	4.17		Pass Can no crack
3	8.81	4.17		Pass Can no crack
4	8.68	4.17		Pass Can no crack, J/R extrusion out.
5	8.74	4.17		Pass Can no crack

Nail condition:

Nail type → SS, Ø 3mm  
 Speed → 15mm/s  
 Depth: 3mm  
 Position → center of cell



# Storage



# 100% SOC, 28 Day Storage

Design	Storage	Capacity		ACZ		
	Temperature	Retained	Recovered	Before	After	Change
	°C	%	%	mΩ	mΩ	%
INR-21700-P42	23	97	98	9.8	10.0	3
	60	89	95	9.7	10.6	9

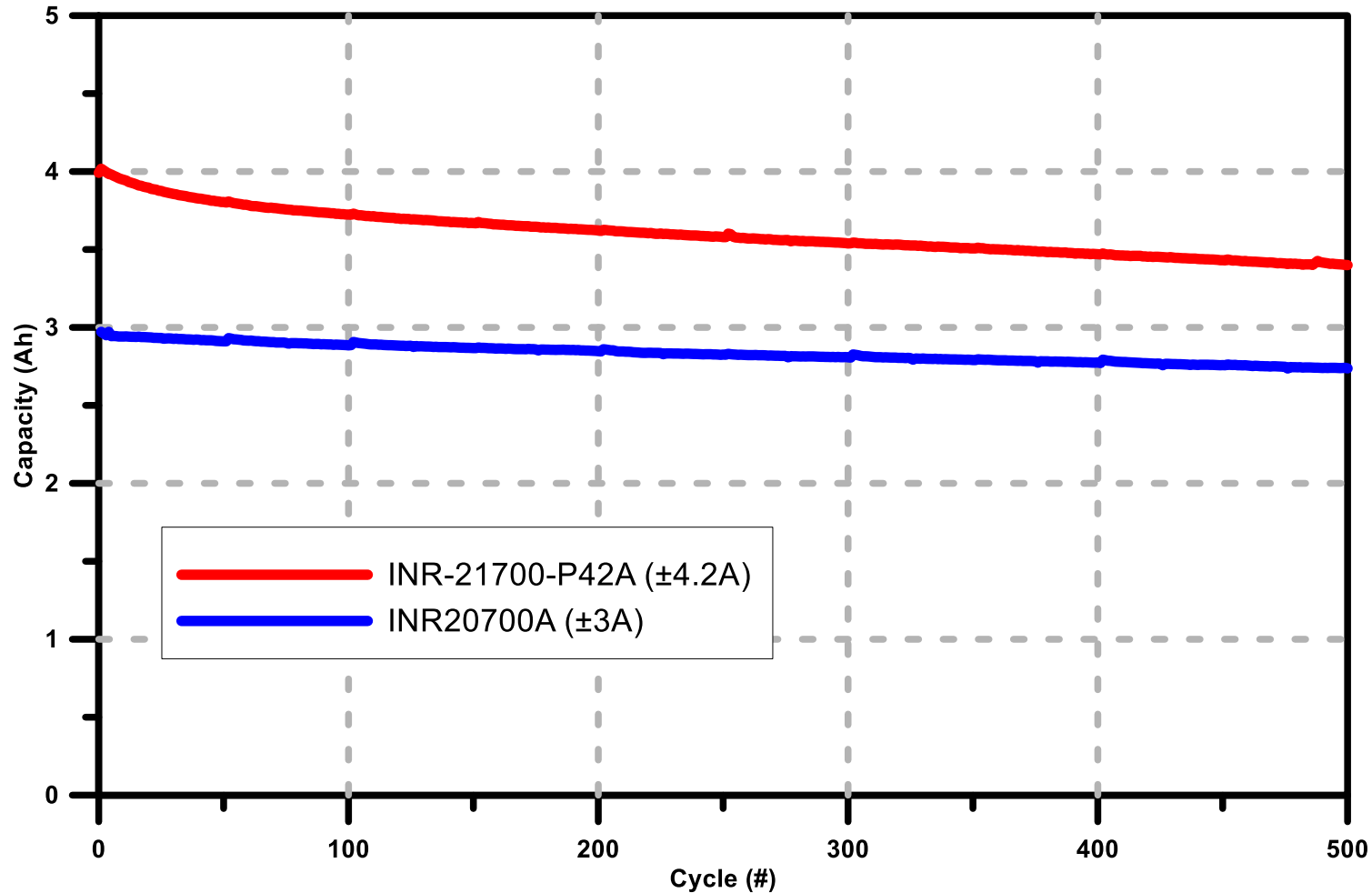
❖ Typical values shown.



# Comparative Data



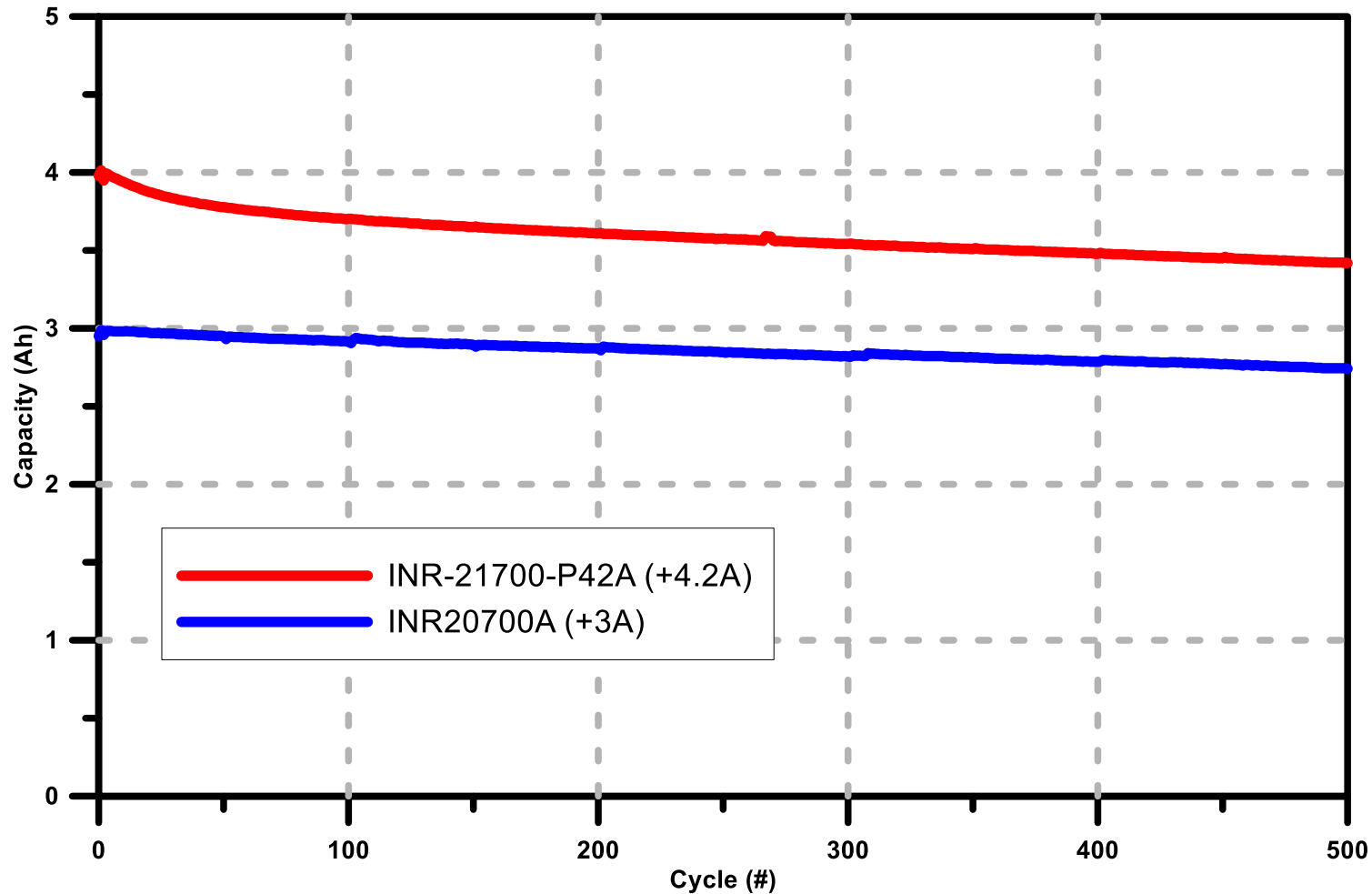
# 23°C, 1C Cycling Life Comparison



- ❖ Charge: CCCV 1C/4.2V (50mA current taper)
  - ❖ Discharge: Constant Current 1C to 2.5V
- Ambient Temperature: 23°C

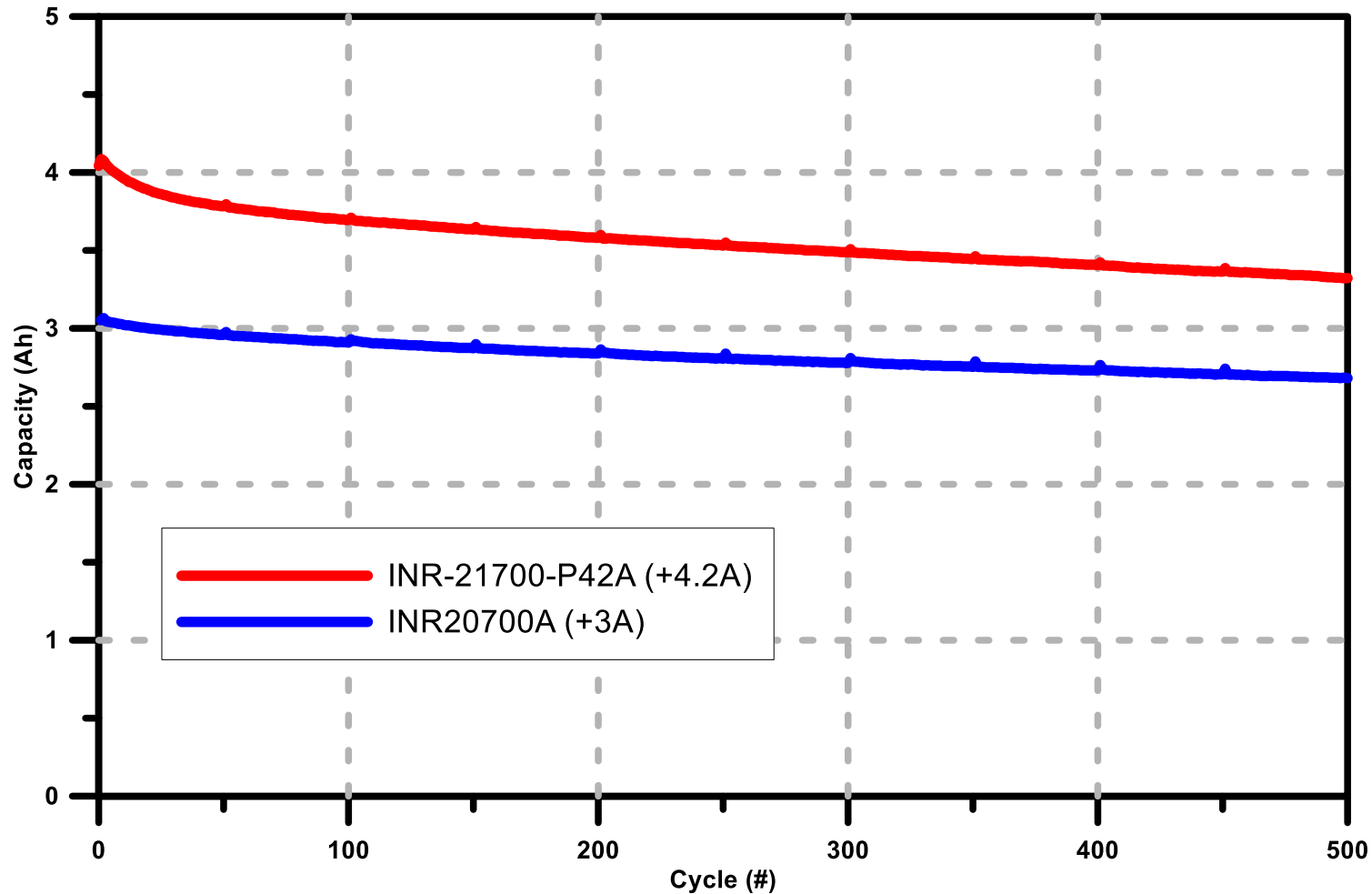


# 23 °C, 10A Discharge Cycling Comparison



- ❖ Charge: CCCV 1C/4.2V (50mA current taper)
  - ❖ Discharge: Constant Current at 10A to 2.5V
- Ambient Temperature: 23 °C

# 45°C, 10A Discharge Cycling Comparison



- ❖ Charge: CCCV 1C/4.2V (50mA current taper)
- ❖ Discharge: Constant Current 10A to 2.5V
- Ambient Temperature: 45°C

**Thank you for your attention**

