

Panasonic

Cadnica[®]

Cadnica GT series
for Extreme Low Temperature

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Panasonic Group,
Automotive & Industrial Systems Company,
Sanyo Electric Co., Ltd.
Portable Rechargeable Battery Business Division

1. Comparison between secondary battery systems
2. Features of Cadnica GT series
3. New application proposal
4. Characteristics of GT series

1. Comparison between secondary battery systems

Battery Systems	Ni-Cd	Ni-MH	Lead Acid	Li-Ion
Voltage	1.2V	1.2V	2.0V	3.6-3.7V
Energy density	△	○	×	◎
Lifetime	◎	○	△	○
Weight	○	○	×	◎
Price	○	△	◎	△
Application	Emergency Lighting, Power Tools	Consumer battery, E/L, HEV	Vehicle, Back-up	Mobile phone, PC, DSC, Pedelec, etc.



	Strength	Weakness
Ni-Cd	High durability, Safety, Deep discharge Easy control for charge	Energy density Environmental image
Ni-MH	Environmental image	Risk of resources (Rare metal)
Li-ion	Small and light weight High energy density	Safety Cost
Lead Acid	Low Cost	Deep discharge & High rate Environmental image

○Model Name: GT Series(TBD)

○Features: Charging and discharging at sub-freezing temp.

○Application: Lighting for freezing warehouse, etc.

Cell Size	AA	SC	C	D	F
Diameter(mm)	14.3	22.9	26.0	33.2	33.2
Height(mm)	48.9	43.0	50.0	59.5	91.0
Voltage(V)	1.2	1.2	1.2	1.2	1.2
Capacity(mAh)	600	1200~ 1500	2000~ 2300	4000	6000

- Development of SC size is now ongoing. Other cell size to follow on request.
- Above size is with tube.

<Charge condition>

For stand-by use: 0.02~0.05It(-40~0deg.C), 0.02~0.1It(0~60deg.C)

For cycle use: 0.02~0.05It(-40~0deg.C), ~0.1It(0~10deg.C), 0.4~1It(10~45deg.C、-ΔV)

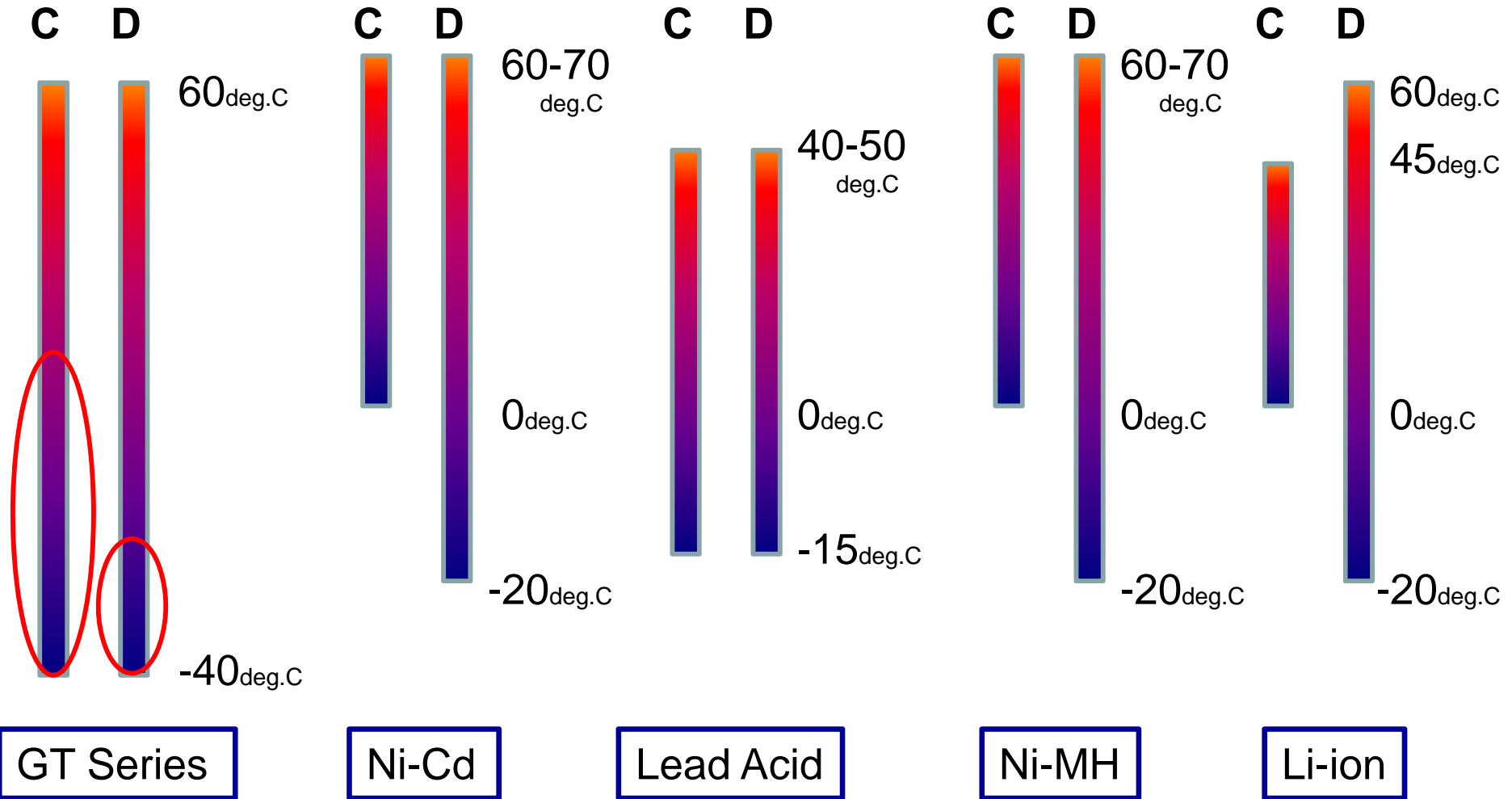
<Discharge condition>

Below 4It(-40~60deg.C) * Need to discuss according to actual usage.

Temperature Range Comparison

- Usable at wide temperature range!
- Charging at below 0 deg.C!

C: Charge
D: Discharge



*Above temperature range is general data. The value could be different by manufacturer or by model.

3. New application proposal

1. Emergency light for freezing warehouse

2. Equipment for cold region

Radio set, Measurement, Mountaineering tools, Handy terminal, Equipments for ship, Lights on street, etc.

3. Back-up for outdoor facility (need to discuss for spec.)

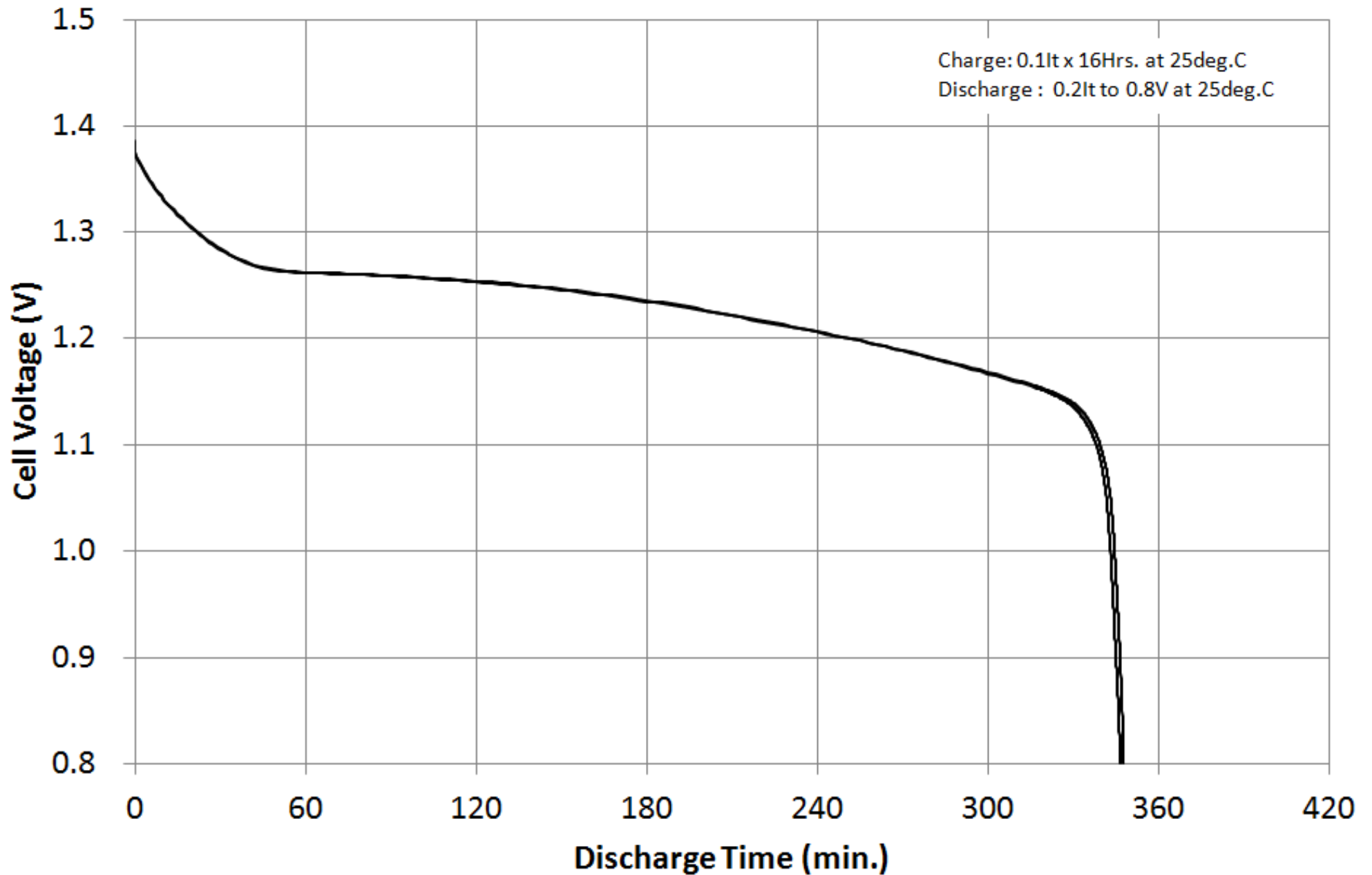
Base station, Street lamps, Emergency lights, etc.



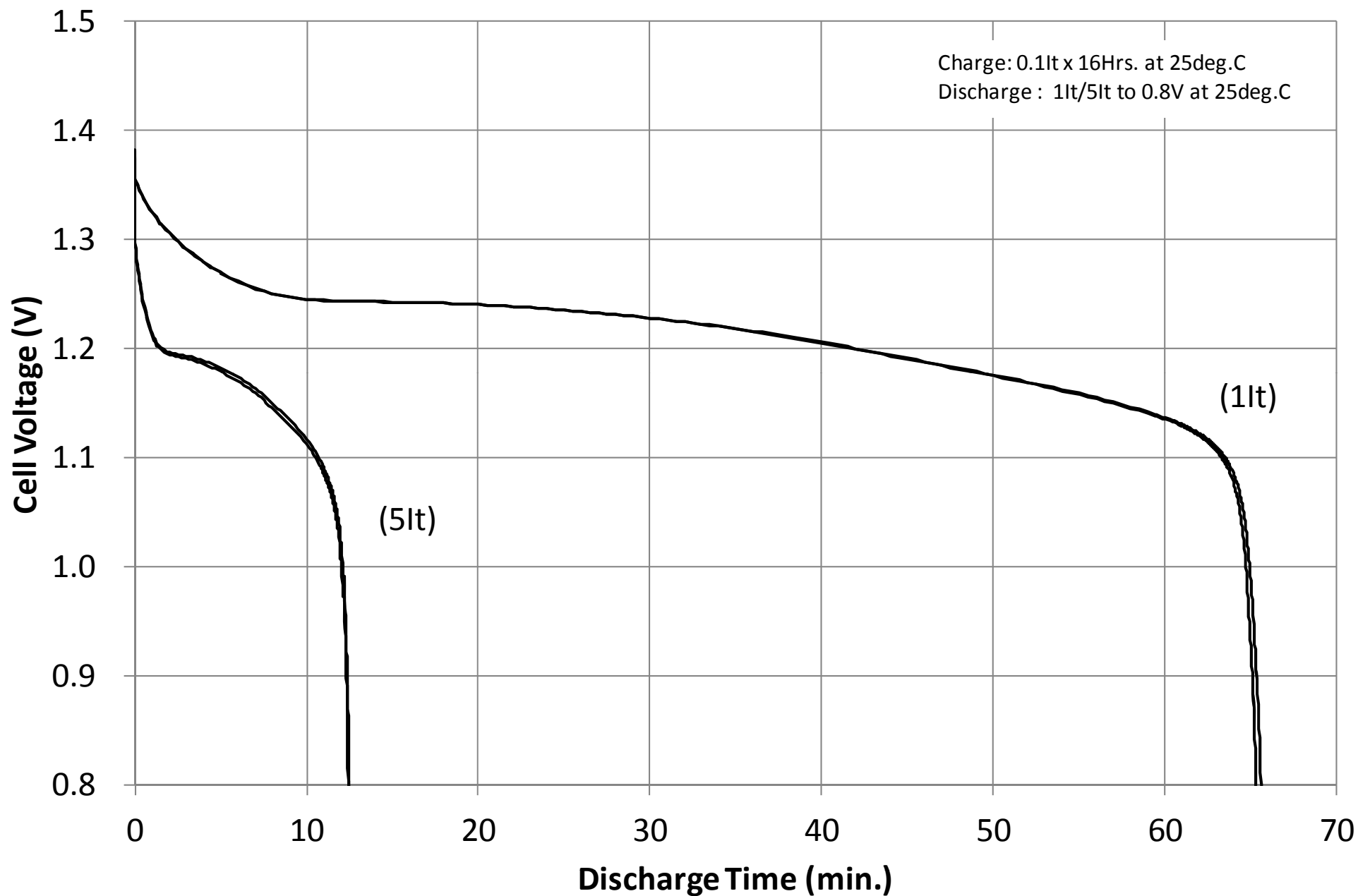
4. Characteristics of GT Series

* Actual data of SC-size. It would be similar characteristics even for other size.

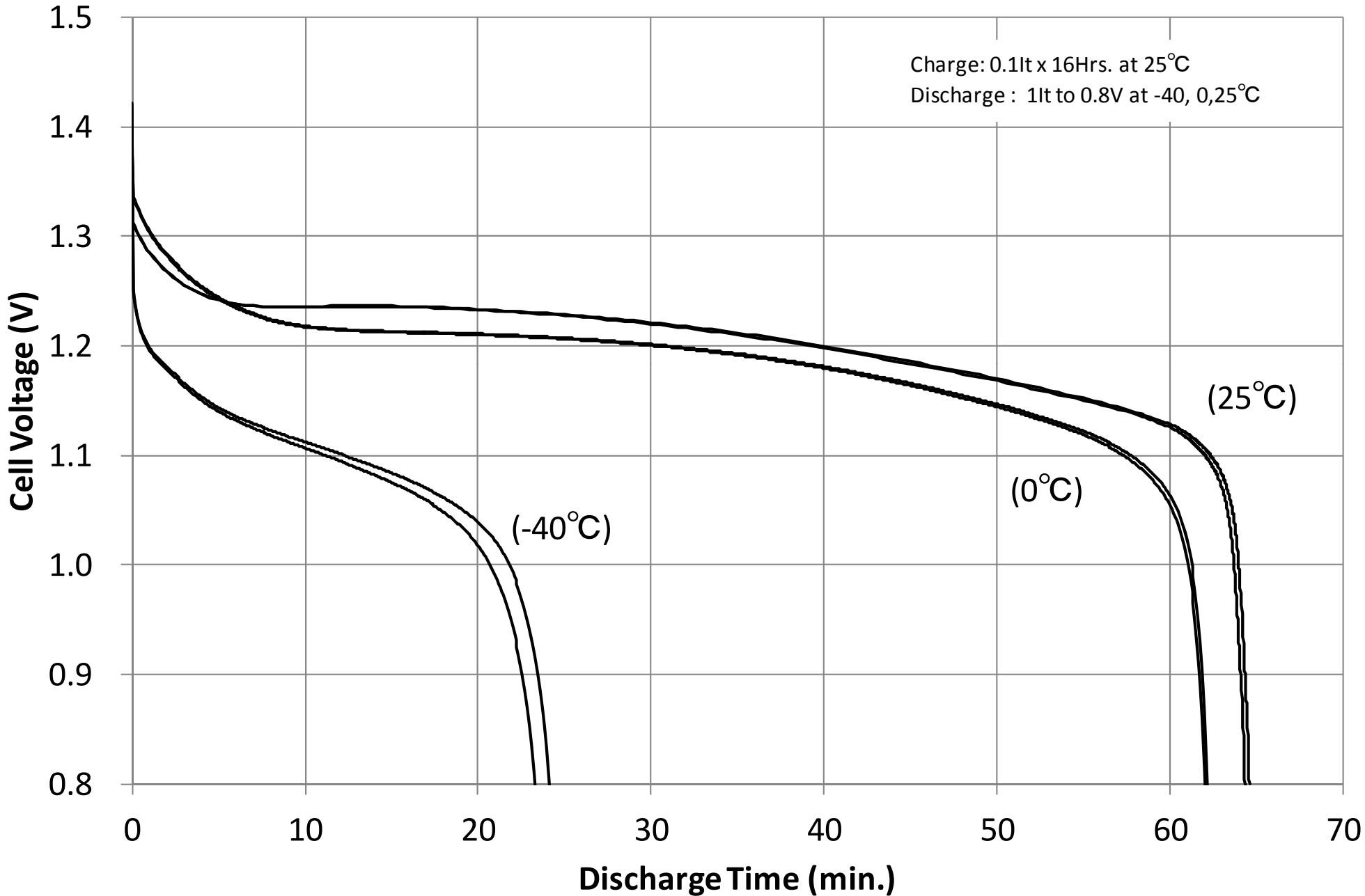
Discharge Rate Characteristics (0.2It)



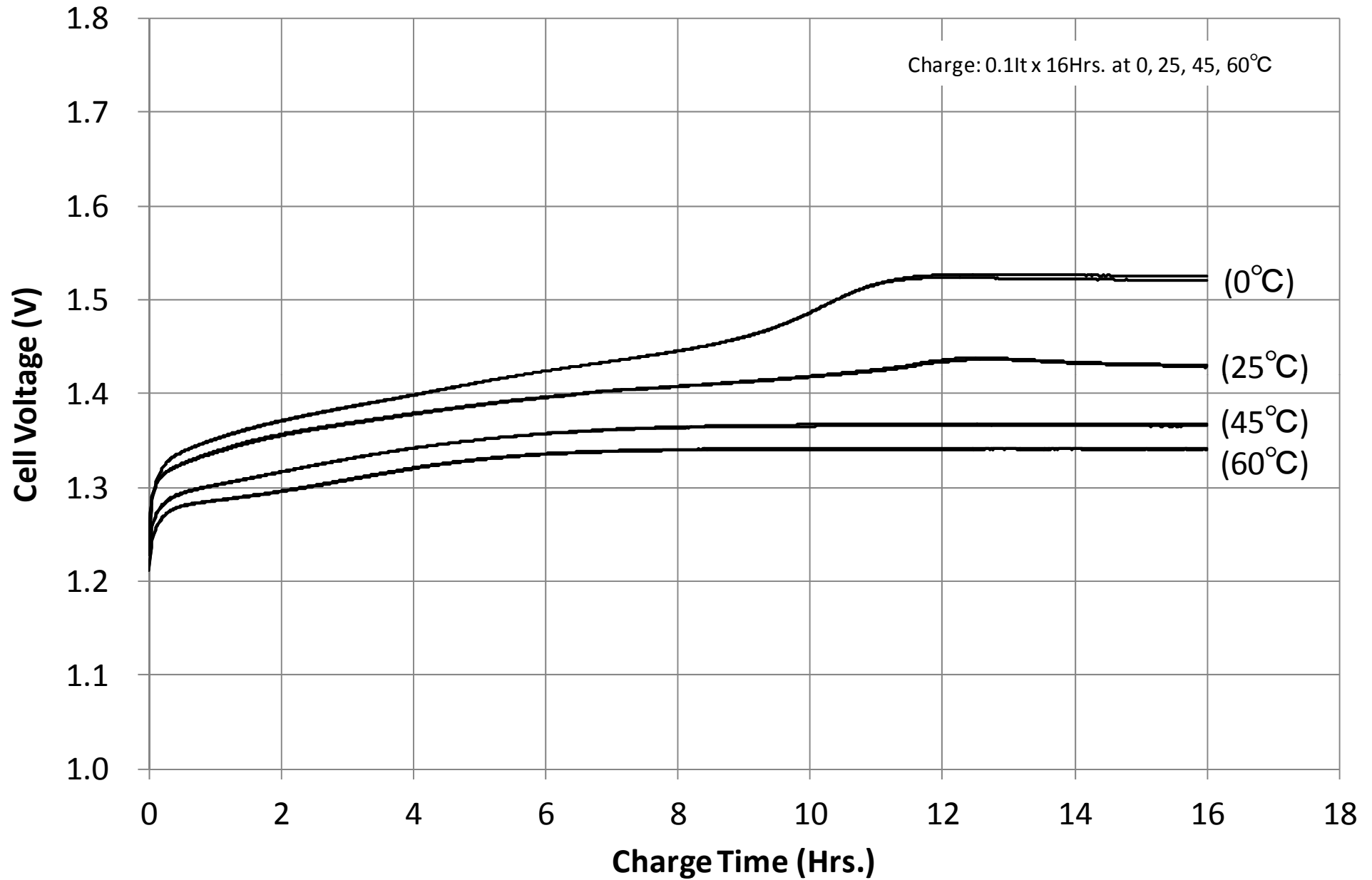
Discharge Rate Characteristics (1It, 5It)



Discharge Temperature Characteristics



Charge Temp. Characteristics (0.1It, 0 to 60deg.C)



Charge Temp. Characteristics(0.05It, -40 to 25deg.C)

