



The TLI rechargeable Li - Ion cell:

C. Menachem and H. Yamin

Tadiran Batteries Ltd. K. Ekron 70500, Israel

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Development of TLM cells

Outline

- Background
- Description of the TLI cell
- PERFORMANCE:
- Self discharge
- Power capabilities
- Cycling



The ***PulsesPlus***TM Battery

The Pulses PlusTM battery is Tadiran's unique solution for applications requiring high current pulses.

It combines the bobbin type Li/SOCl₂ with a novel hermetically sealed **Hybrid Layer Capacitor** (HLC).

This HLC is a patented battery-like capacitor consisted of intercalation compounds modified for Li/SOCl₂ system.



HLC characteristics

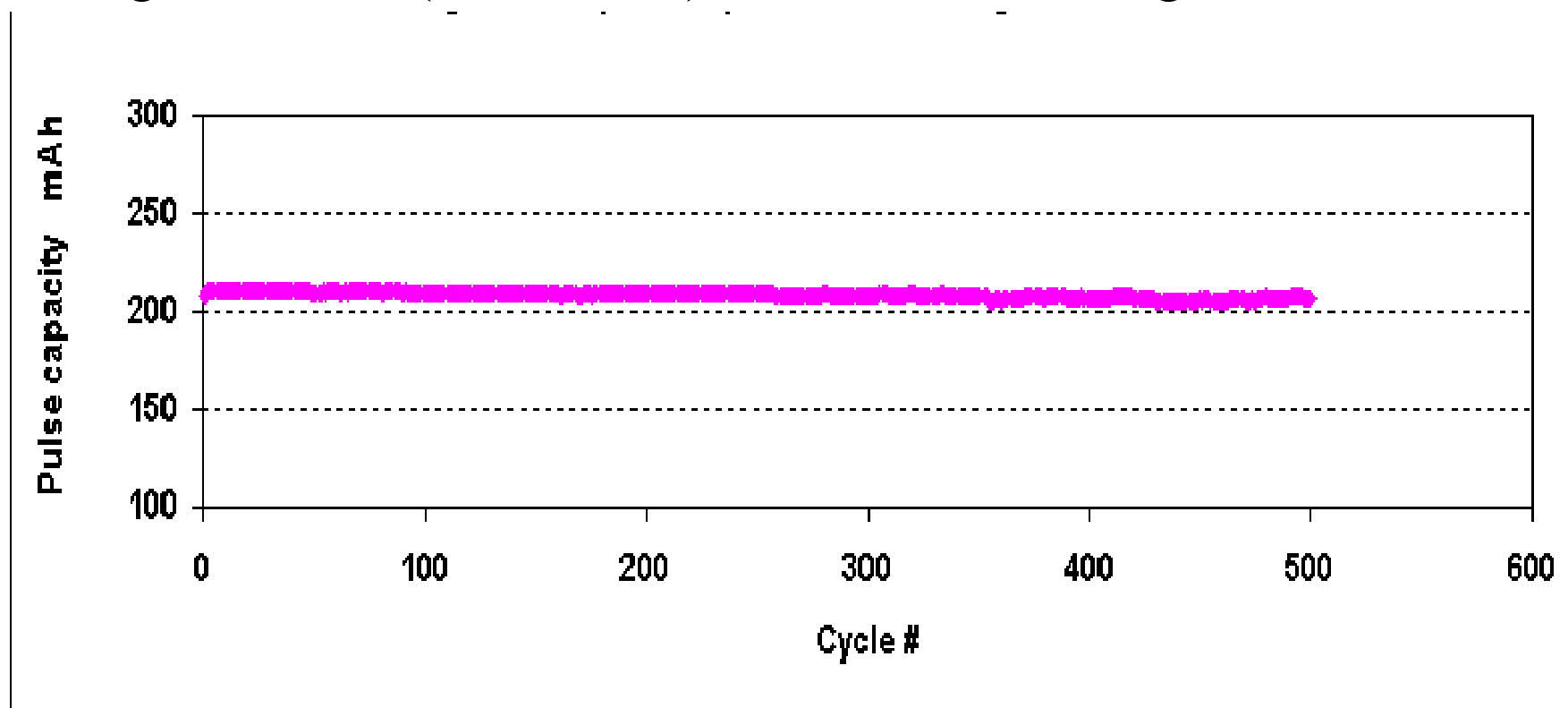
- Pulse capacity up to 300 mAh (1550: 3.90 V to 2.5V cut-off voltage).
- Thousands stable cycles (especially at 3.67 V).
- High discharge rate.
- Wide operating temperature range: -40 to 85°C .
- Excellent stability of performance after long-term storage.
- Low self discharge.



Pulse capacity for HLC1550

Pulse capacity vs. cycles for HLC1550 at RT

Charge: 440 mA (ooc 20 mA) to 3.67 V. Discharge: 250mA to 2.5 V



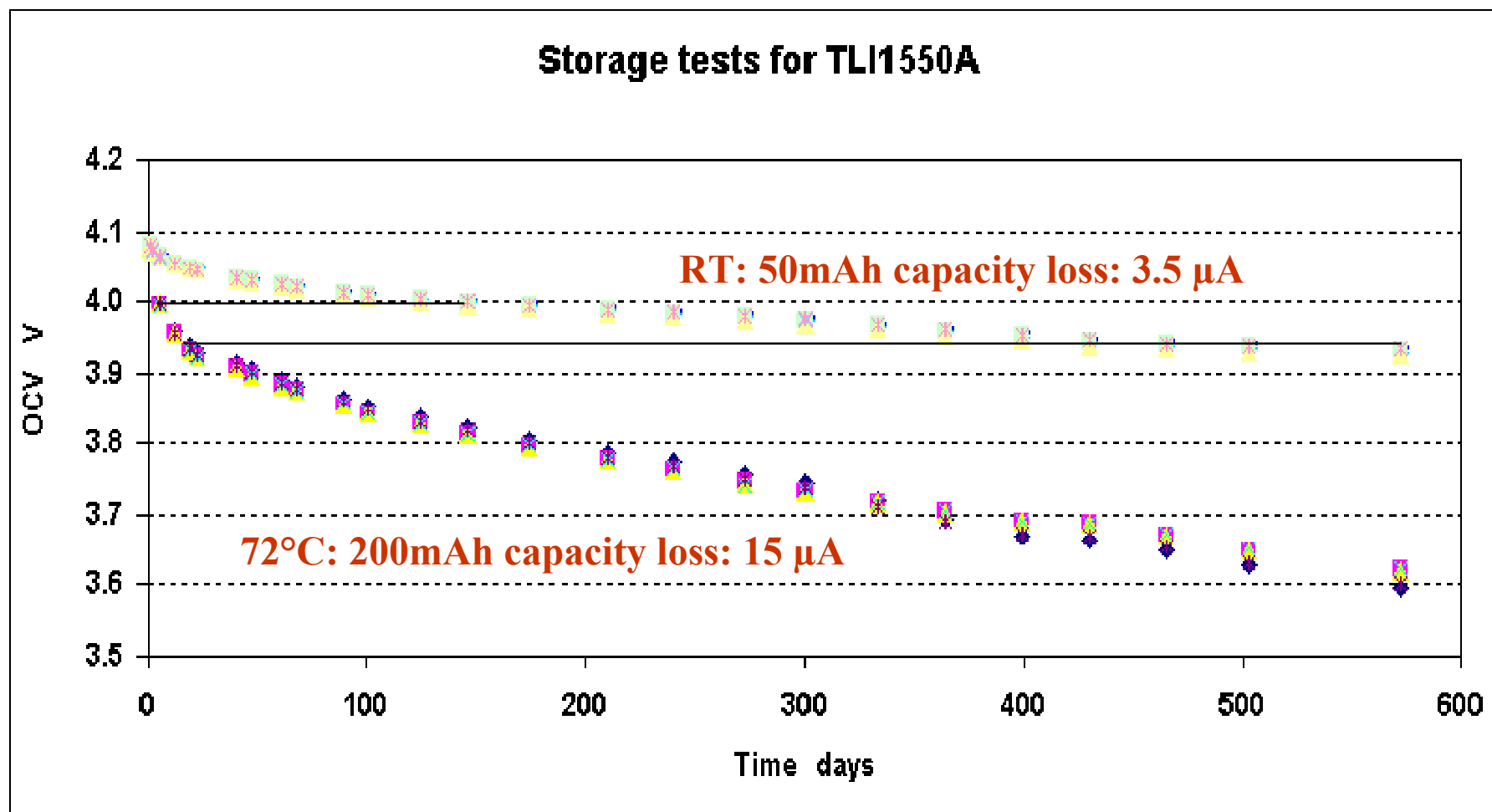


Experimental: TLI1550A

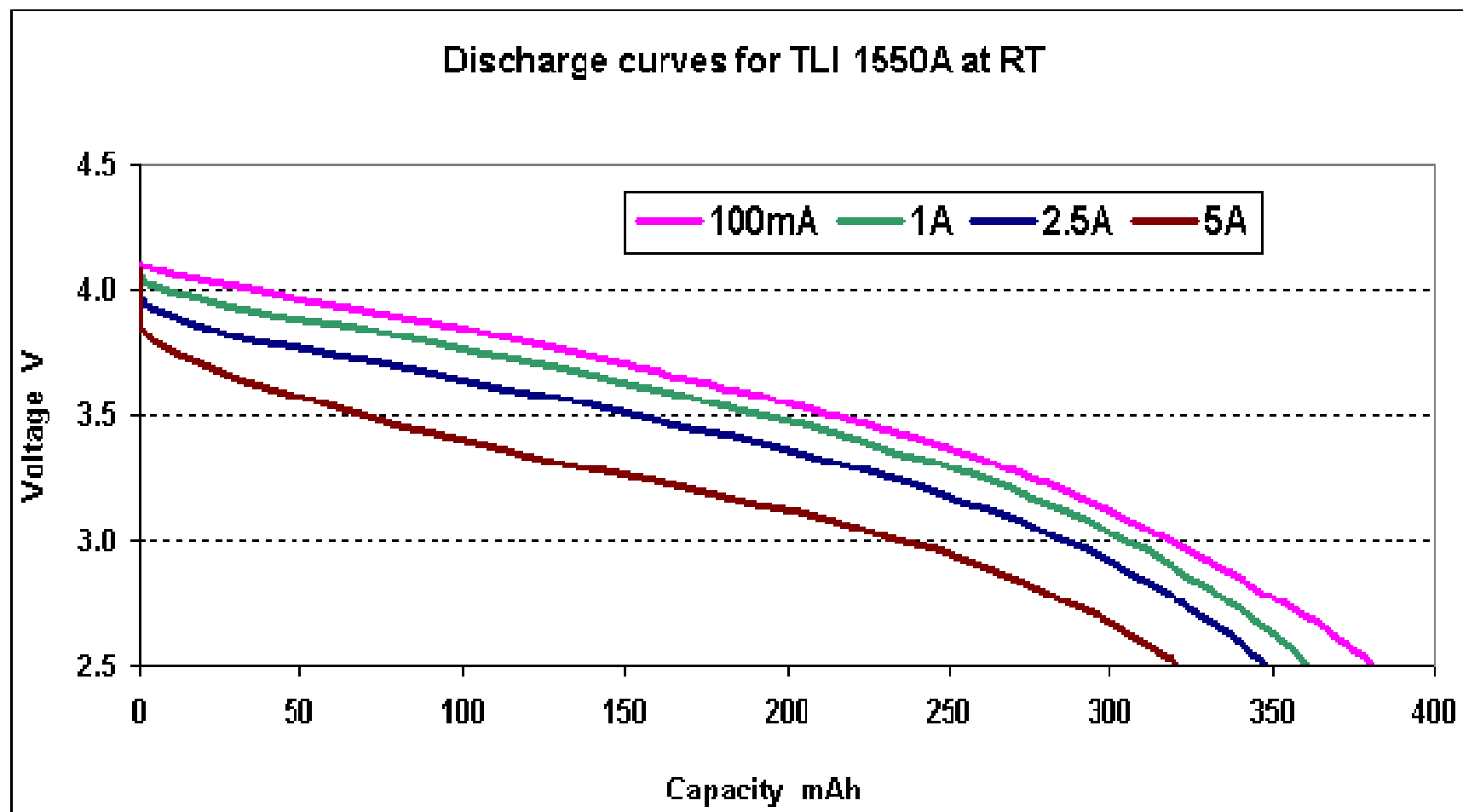
**TLI1550A (Standard AA size):
Hermetically sealed Li-Ion rechargeable cell.**

- **Electrodes area: 360cm².**
- **Cathode: Multi-metals oxide.**
- **Anode: Nobel carbon.**
- **Micro-porous separator.**
- **Electrolyte: LiPF₆ dissolve in carbonates mixture.**

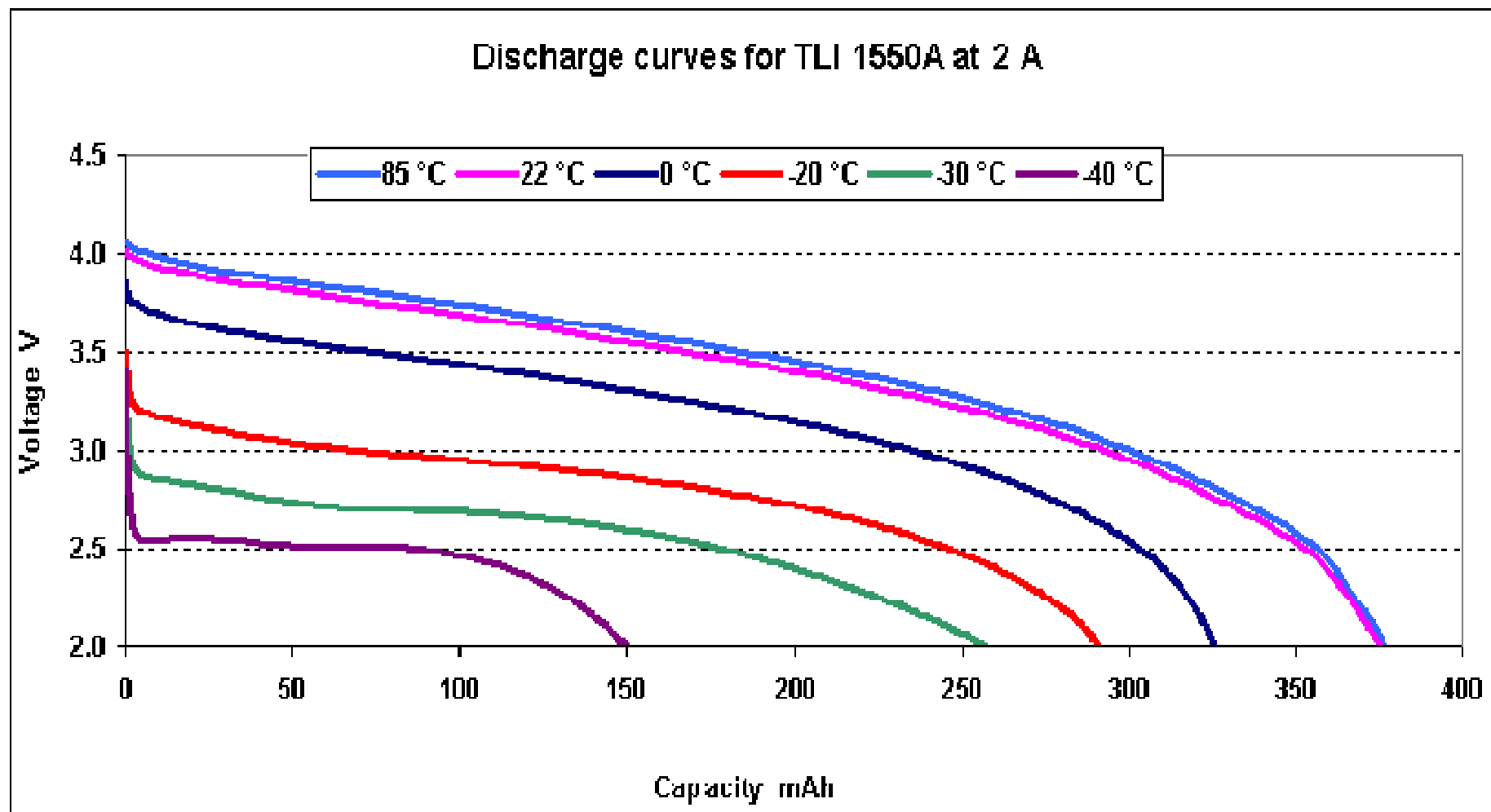
TLI1550A – Self discharge



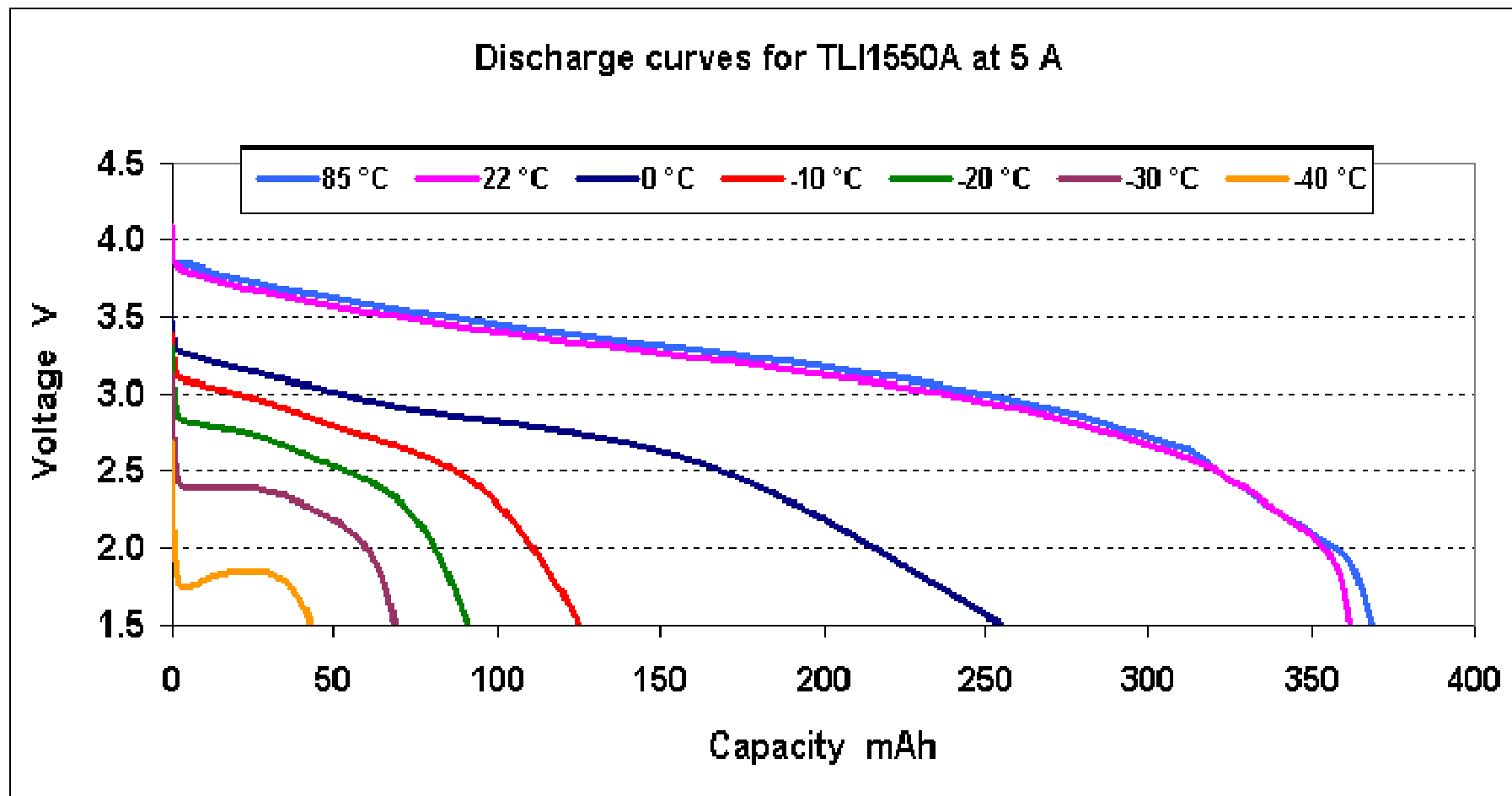
TLI1550A – Power capabilities



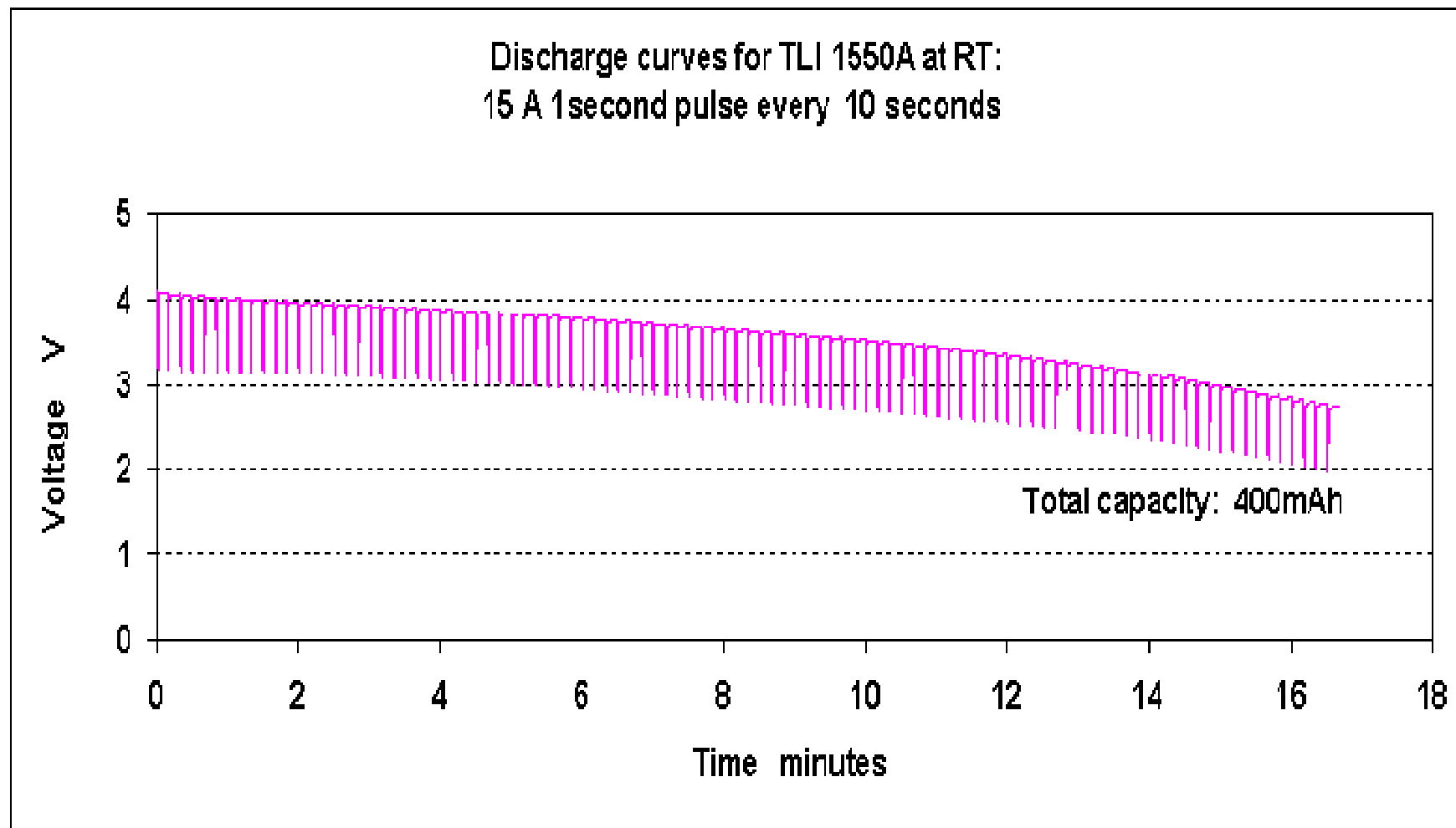
TLI1550A – Power capabilities



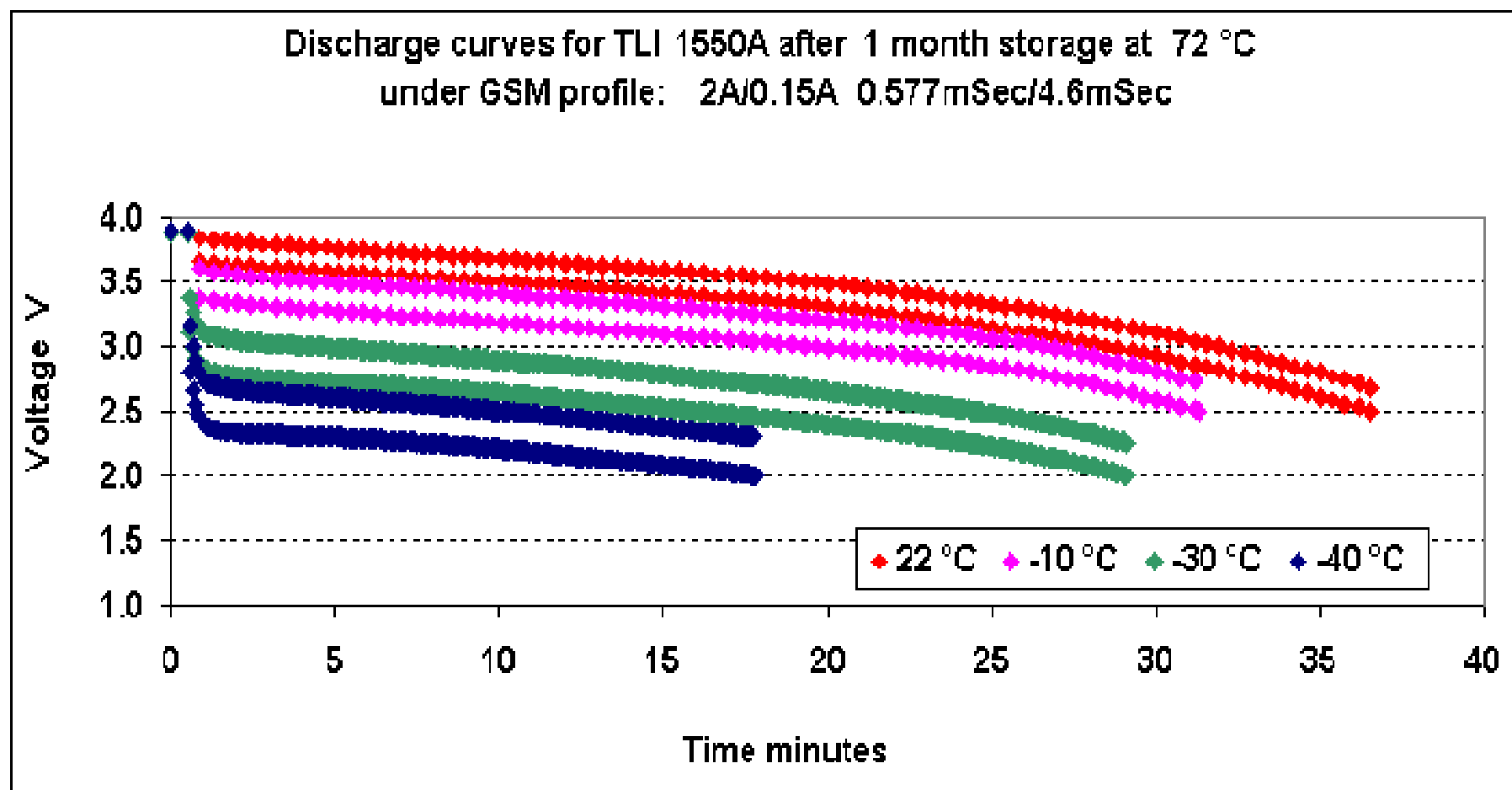
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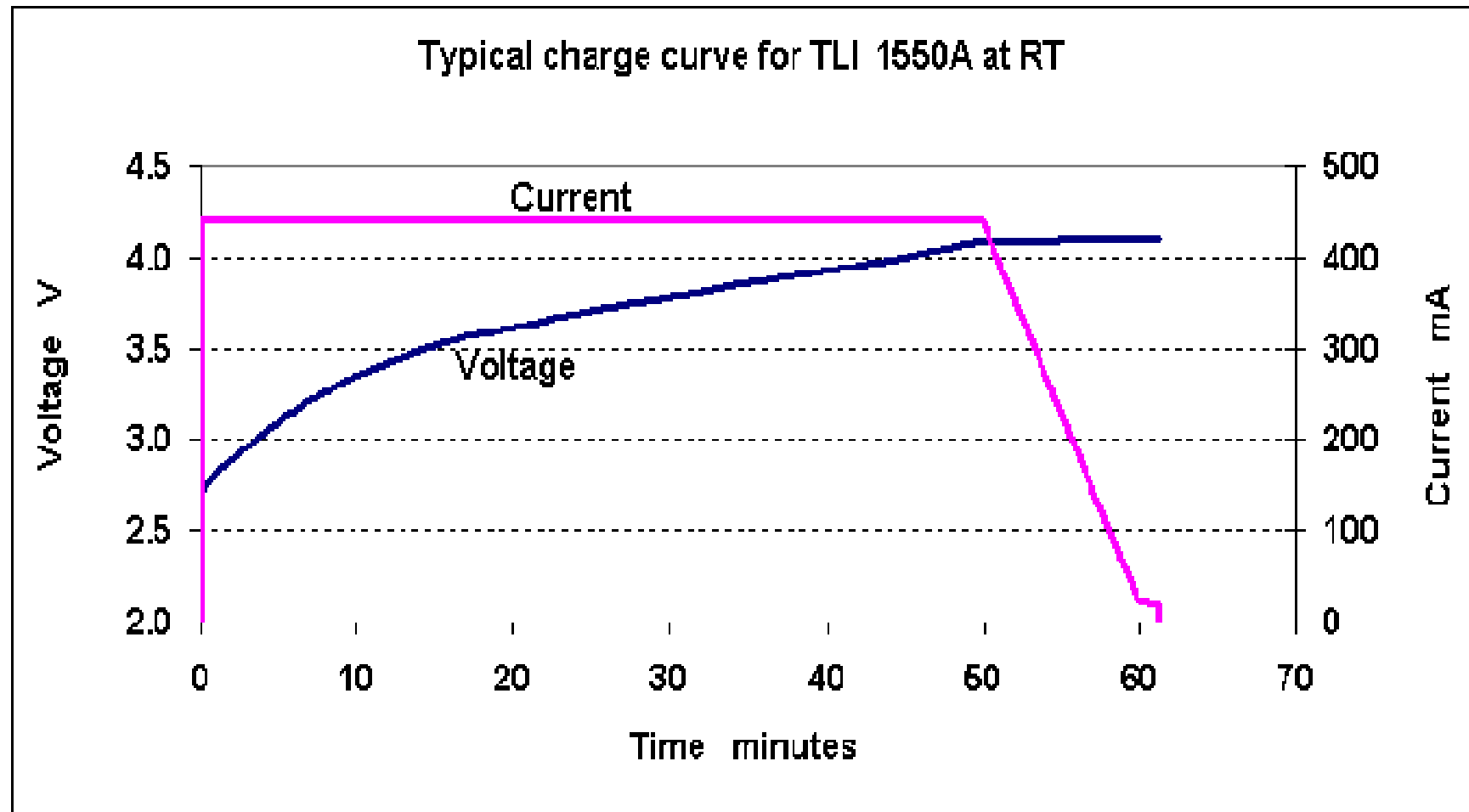


TLI1550A – Cycling tests

Charge (CCCV): 440 mA to 4.1 V, EOC 20 mA.

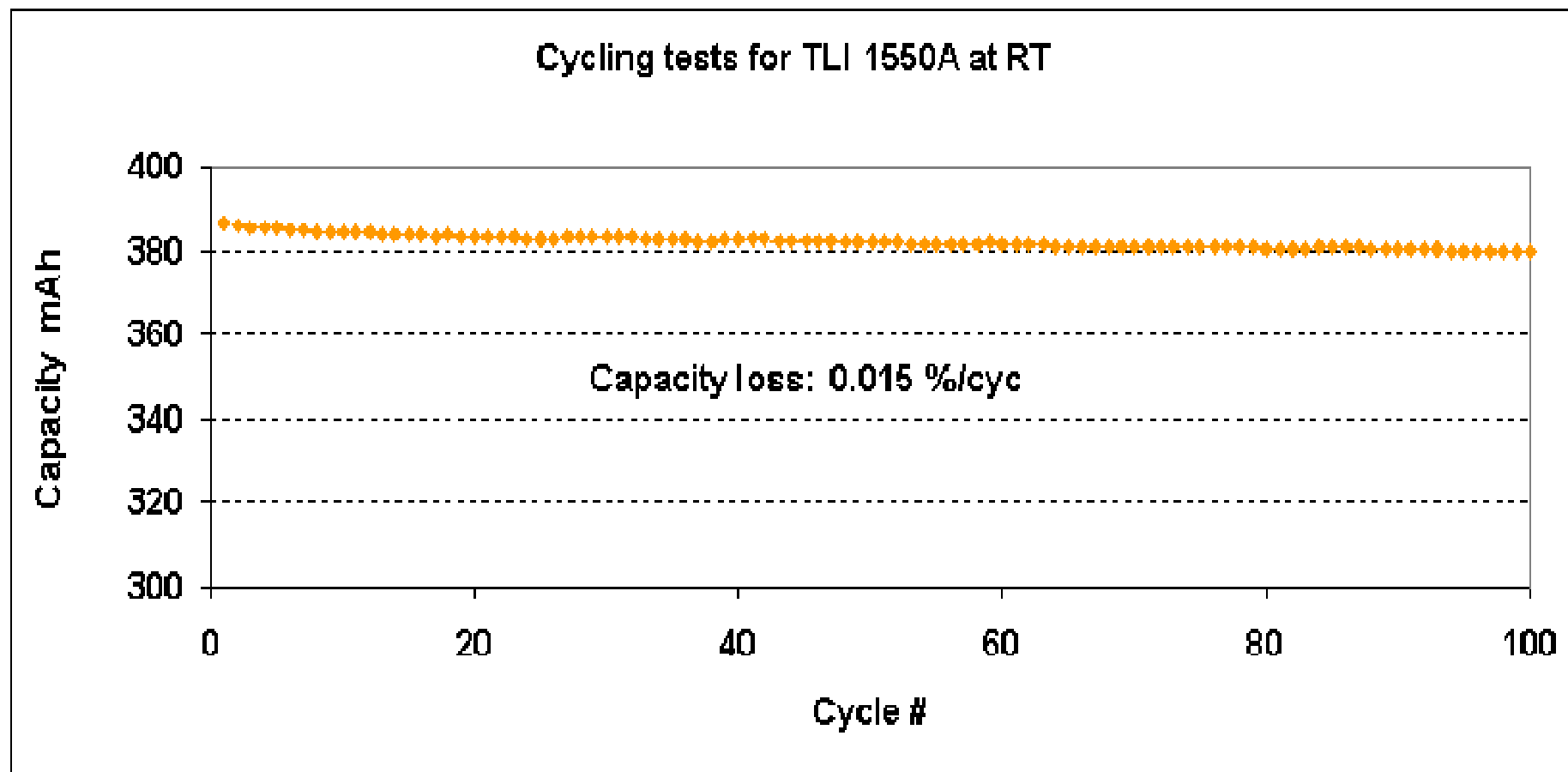
Discharge (CC): 250 mA to 2.5 V

TLI1550A – Cycling capabilities

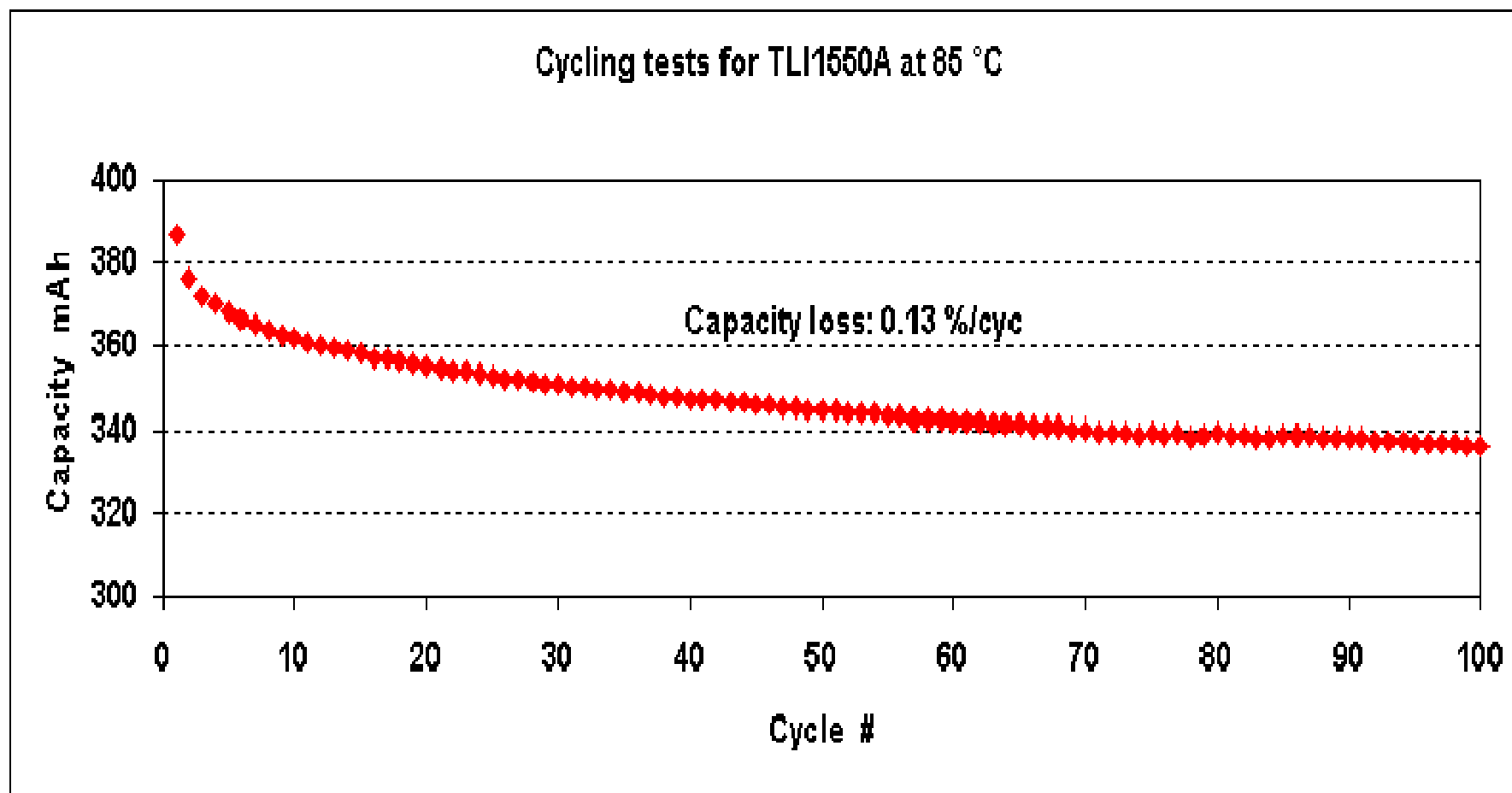




TLI1550A – Cycling capabilities

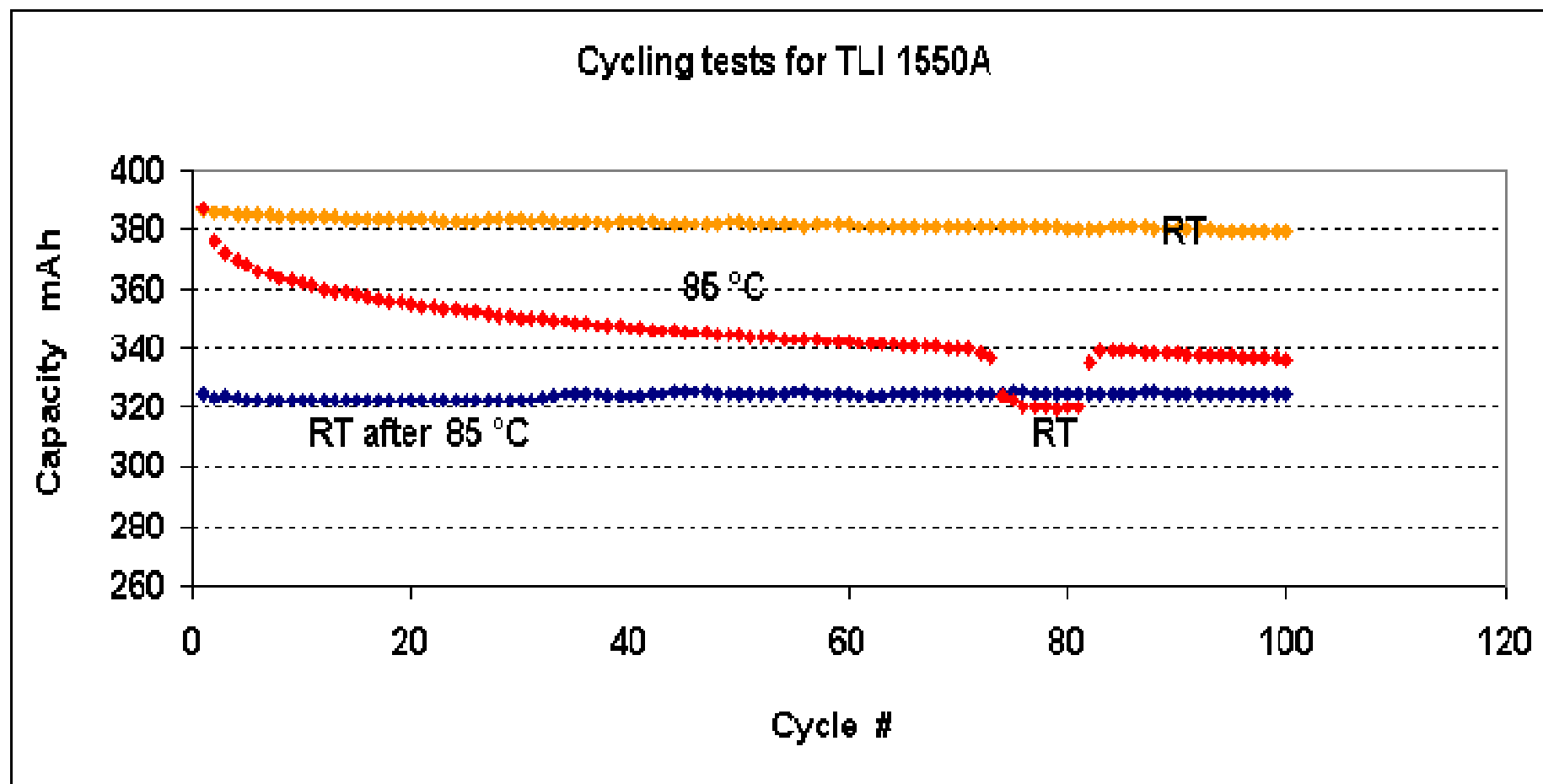


TLI1550A – Cycling capabilities

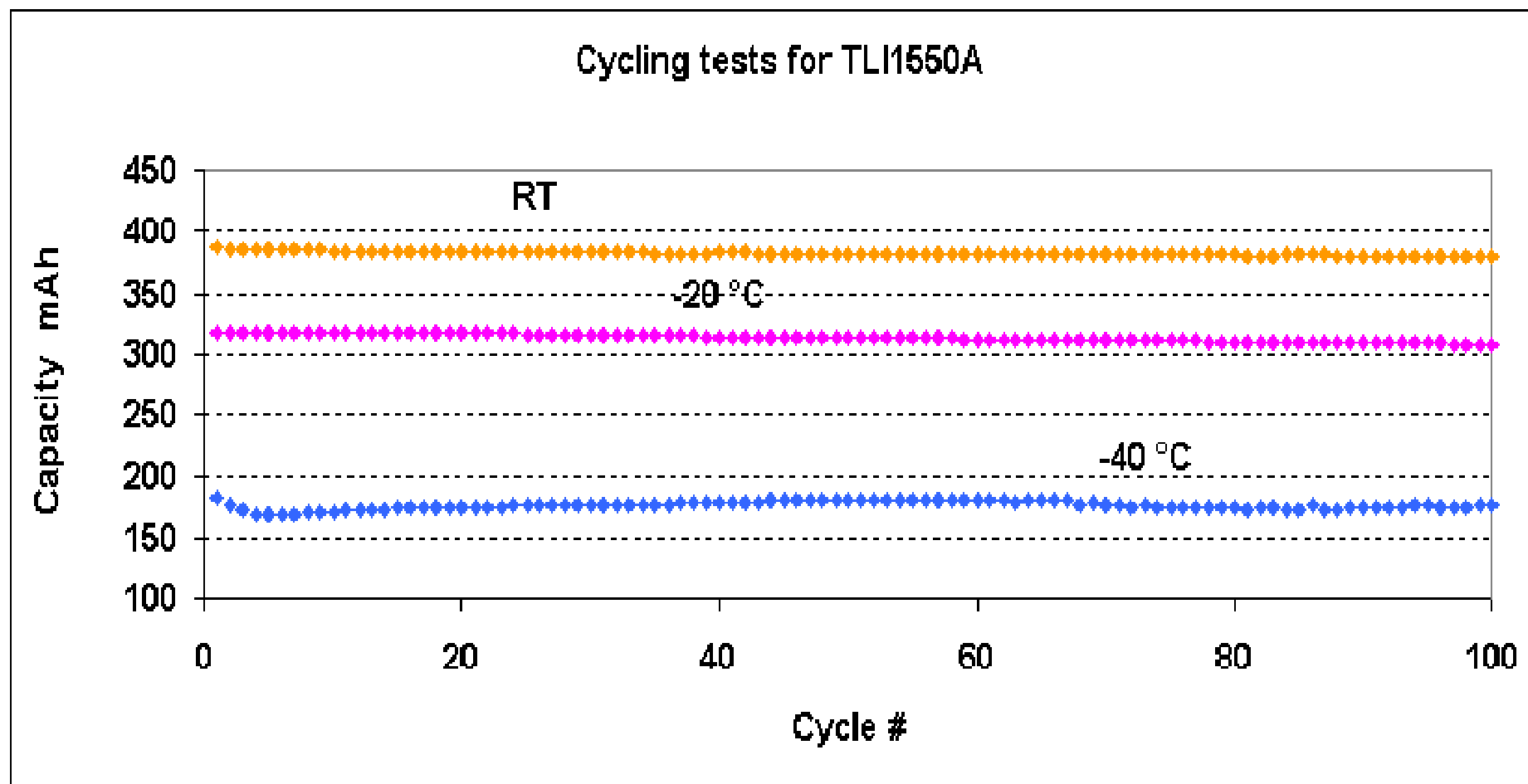




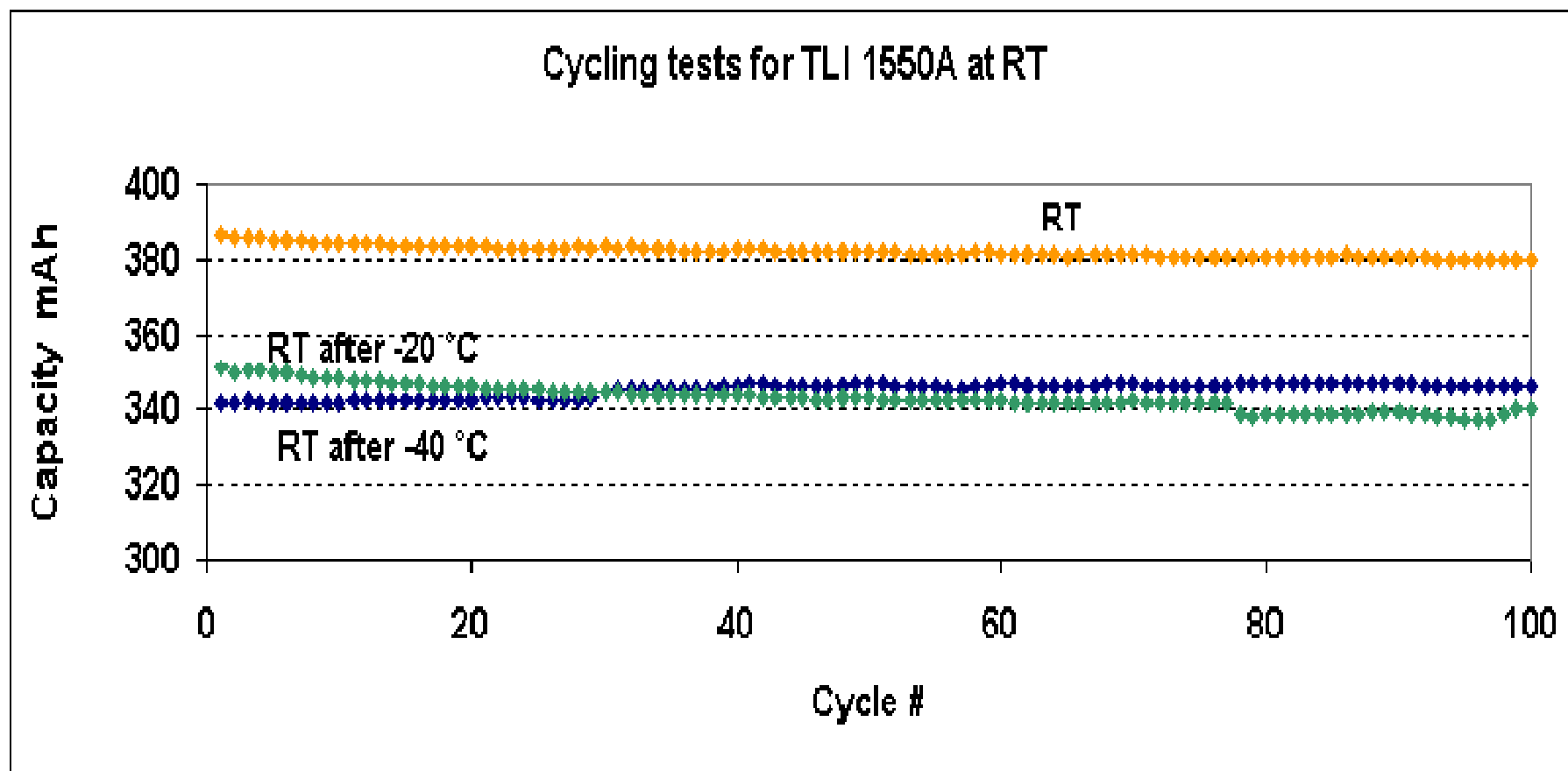
TLI1550A – Cycling capabilities



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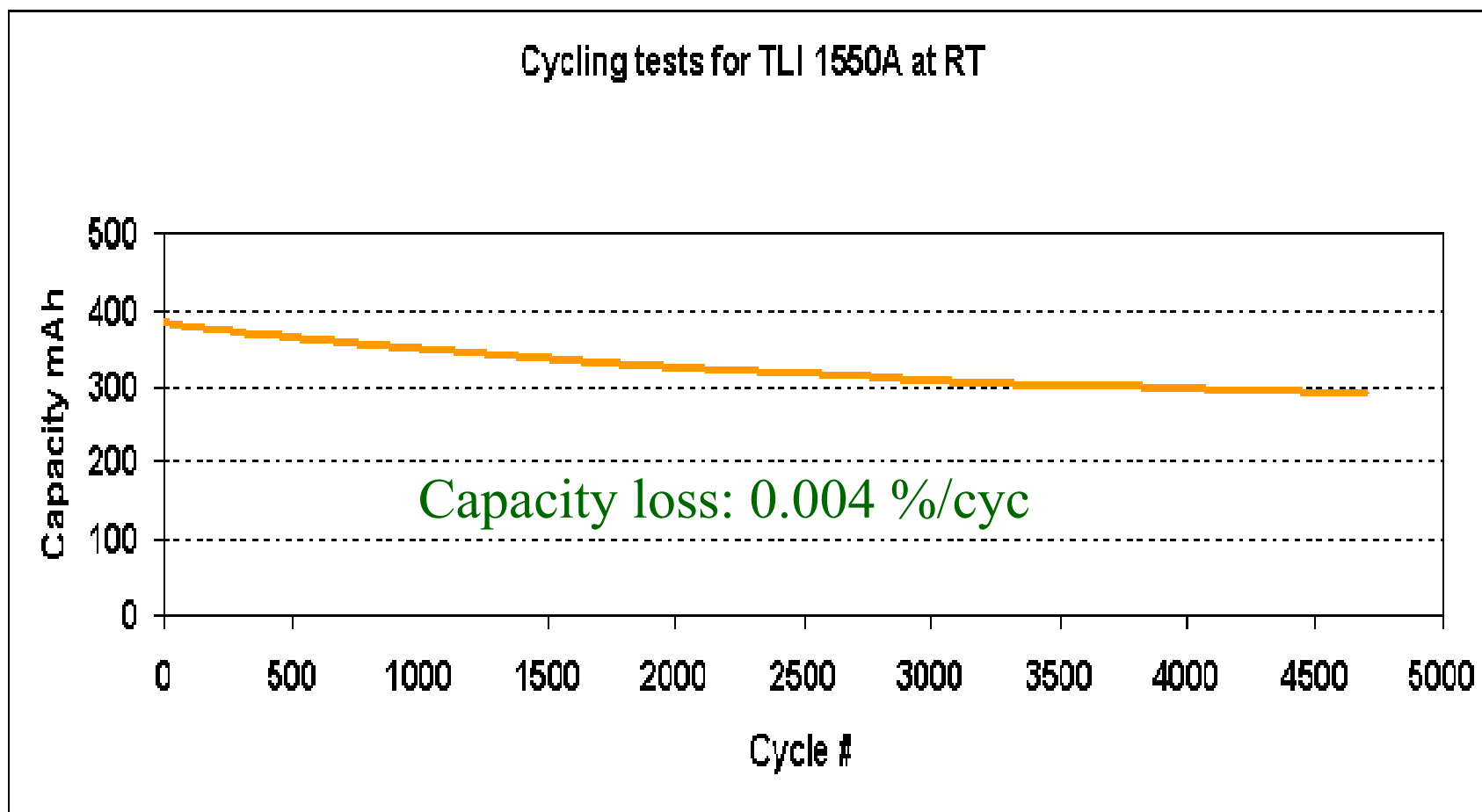


TLI1550A – Cycling capabilities





TLI1550A – Cycling capabilities





TLM 1550HP- Safety Tests

The cell passed Successfully the following tests:

- **Short circuit @ RT and 55°C.**
- **Oven to 150°C.**
- **Impact.**
- **Crash (UL1642).**
- **Over charge and over discharge.**



Comparison to standard Li-Ion cells

	UR14500P (Sanyo)	TLI1550A
Nominal Capacity [mAh]	720	380
Max. Dis. Curr. [A]	2	>5
Charge time [h]	2.5	1
Charge temp. [°C]	0 - 40	-40 - 85
Discharge temp. [°C]	-20 - 60	-40 - 85
Storage temp.[°C]	-20 - 50	-40 - 85
Cycles to 80% capacity	300	5000



THANKS...

The technical staff at our electrical lab.

The technical R&D group:

Mrs. S. Meir, Mr. S. Stachi and Mr. Z. Madar

The VP of R&D: Dr. H. Yamin.



R&D



Thank
You

