NanoPower
Battery 2600mAh

Datasheet
Lithium Ion 18650 cells for space flight products – 2600mAh

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1 Table of Contents

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2 Introduction

When choosing batteries for a satellite mission it is important to make sure that they can withstand the hostile environment encountered in space. The GomSpace batteries provide flight heritage and extensive testing and are chosen specifically for their suitability in satellite missions.

3 Characteristics

The battery available from GomSpace are lithium ion and from the rugged and space proven 18650 form factor.

3.1 Electrical and thermal characteristics

Parameter	Condition	Min.	Typ.	Max	Unit
Nominal Capacity		2500	2600		mAh
Voltage		2.75	3.6	4.2	V
Current - Charge	0 – +45 °C		1250	2500	mA
Current - Discharge	-20 – +5 °C +5 – +60 °C		1250	1250 3750	mA mA
Temperature – Storage (recommended)	3 months 12 months	-20 -20		45 20	°C °C
Temperature - Operating	Charge Discharge	0 -20		45 60	°C °C
Internal impedance				70	mΩ

	Current [mA]				
Ambient Temperature	250	500	1250	2500	5000
	Relative Discharge Capacity [%]				
5 °C	93	91	89	89	94
15 °C	98	97	94	94	97
25 °C	100	100	98	98	99
35 °C	102	102	100	100	98
45 °C	102	102	101	101	99

4 Cycle Life

The cycle life of any rechargeable battery depends on a number of factors, but most importantly the Depth-Of-Discharge (DOD) of the cycles, temperature, charge/discharge current and End of Charge Voltage (EOCV). General rules are that:

- The lower the DOD, the better the cycle life.
- The lower the temperature, the better the cycle life (unless too low for charging).
- The lower the charge/discharge current, the better the cycle life.
- The lower the EOCV, the better the cycle life.

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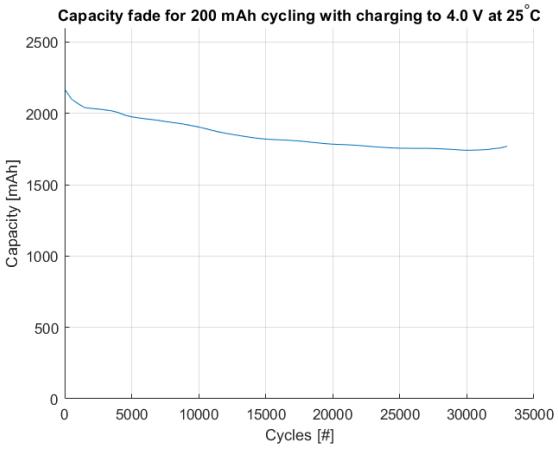

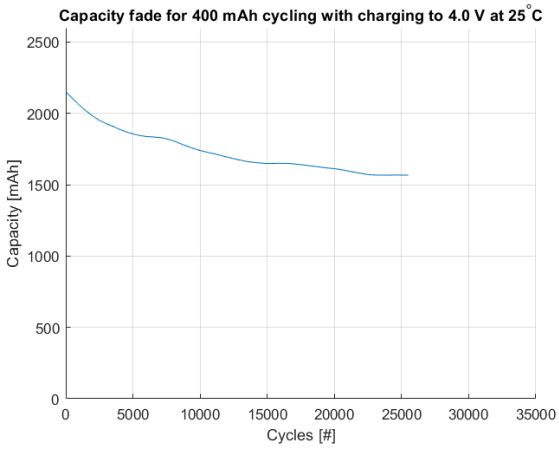

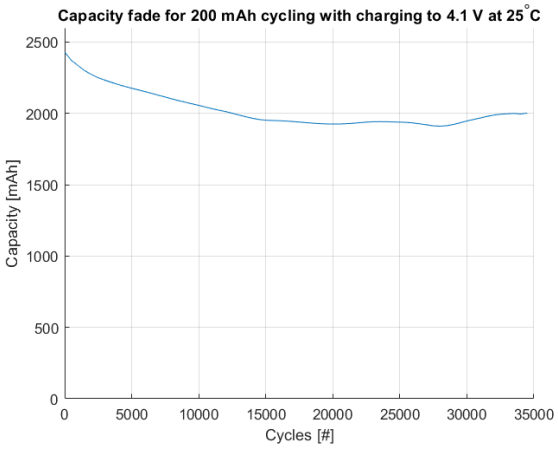

Experimentally measured data:

- For aging: the cells were cycled at a specific DOD (200 or 400 mAh) and charged to a specific charging cut-off voltage (4.0 or 4.1 V).
- The presented remaining capacity is related to the respective charging conditions (charging to the charging cut-off voltage of 4.0 or 4.1 V)
- Please note that charging to a lower voltage than the nominal charging cut-off voltage (4.2 V) results in a lower available capacity than the nominal value.

5 Storage

For prolonged storage, it is recommended to charge the batteries to 30 – 60 % SOC and keep temperatures lower than 25°C (preferably 0 - 10°C).

6 Quality control

Samples from every LOT are tested according to “Requirements for flight certification and acceptance of commercial off the shelf (COTS) Lithium-Ion (Li-Ion) batteries,” JSC 66548, for physical characteristics, overcharge and external short.

Every cell goes through the flight acceptance test (FAT), which is based on the documents “Flight Acceptance Test Requirements for Lithium-ion Cells and Battery Packs” by NANORACKS, document no.: NR-SRD-139 Rev. C and “NASA Aerospace Flight Battery Program” by NASA, document no.: RP-08-75 Rev. 1.0. The cells are checked for their physical and electromechanical characteristics, i.e., any occurrence of deformations, open-circuit voltage, capacity and internal resistance.

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