1. Scope and application

These specifications apply to the lithium ion rechargeable battery

. The cells described in these specifications are to be used for power-needed applications.

2. Product

Product name:

Emmerich Lilon Mangan Akku 18650V1, ULF

3. Product ratings & general specifications

No.	*Item*	*Specification*
1	Nominal voltage*	3.7 V
2	Rated capacity*	1450 mAh
3	Charge voltage	4.20±0.05 V
4	Maximum charge current	2.0 A
5	Charge method	CC-CV (Constant Current - Constant Voltage)
6	Maximum discharge current	25 A
7	Discharge end voltage	2.50 V
8	Charge temperature range	0 ～ +45℃
9	Discharge temperature range	-20 ～ +60℃
10	Storage environment	-20 ～ +50℃ within 30 days (shipped conditions)
11	Long term storage environment	-20 ～ +35℃ within 90 days (shipped conditions)
12	Relative humidity	65±20%
13	Weight	About 43 g

** When discharged at 2400 mA to 2.50 V after 1000 mA, 4.20 V CC-CV charge at 25 ℃*

4. Dimensions & appearance

For detailed diagrams please refer to attached drawing, No. 0443818004 in Appendix A. Appearance shall be free from noticeable flaws, breaks, damage, discoloration, deformation, inconsistency and any other defect which may impair the value of the product.

Packaging & identification: For packaging specification please refer to attached drawing, No. 0443818006-00 in Appendix B. For identification, the manufacturers code, country of origin and item name shall be indicated on the surface of the cell.

5. Manufacture code

Table5.1 Rank of Capacity

Rank	Minimum Capacity (mAh)	Maximum Capacity (mAh)
A	1525	＜1550
B	1500	＜1525
C	1475	＜1500
D	1450	＜1475

6. Required functions for charger and required protection functions

To ensure safety, the charger and the protection circuit should be used in combination with a thermal fuse, positive temperature coefficient thermistor or thermostat. The standard charging method is CC-CV (Constant Current - Constant Voltage).

6.1 Required functions for charger

No.	***Item***	***Condition***	***Notes***
1	Charging method	CC-CV	
2	Maximum charge current	2400 mA	Per cell
3	Rated charge voltage	4.20 V	Per cell
4	Maximum charge voltage	4.25 V	Per cell
5	Timer	5 hours charge	Current: 50 mA
6	Charge temperature	0～+45 ℃	

6.2 Required protection functions

No.	*Item*	*Condition*	*Notes*
1	Over-voltage Limit	4.25 V	Per Cell
2	Charge enable voltage	4.20 V	Per Cell
3	Under-voltage limit	2.0 V	Per Cell
4	Discharge enable voltage	2.0 V	Per Cell
5	Charge prohibition voltage	1.0 V	Per Cell
6	Over-current limit	40 A	within 1 second

7. Performance

The cell shall satisfy all electrical (Table 7.1), mechanical (Table 7.2) and safety (Table 7.3) characteristics as detailed below.

7.1 Electrical specifications

No.	*Item*	*Performance requirement*	*Conditions*	*Test methods*
1	Open circuit voltage	More than 3.60 V	Measured within 20 days of delivery	8.2(2)
2	Impedance	Less than 25 mΩ	AC 1KHz	8.3.2(3)
3	Discharge capacity	More than 36 min. discharge (more than 1450 mAh)	Discharge at 2400 mA	8.3.2(1)
4	Charge recovery	More than 30 min. discharge (more than 1230 mAh)	Stored at 20℃ for 28 days, Re-charge, Discharge at 2400 mA	8.3.2(2)
5	Endurance in cycles	More than 21 min. discharge (more than 840 mAh)	After 500 cycles Discharge at 2400 mA	8.3.2(4)

7.2 Mechanical specifications

No.	*Item*	*Performance requirement*	*Conditions*	*Test Methods*
1	Drop	No explosion and no fire	1 meter height onto an oak board.	8.3.3(1)

7.3 Safety specifications

No.	*Item*	*Performance requirement*	*Conditions*	*Test Methods*
1	Terminal short circuit	No explosion and no fire	Short circuit at 10 mΩ	8.3.4(1)