



Battery Specification Approval Sheet



Cell Model LiFeP04-11198141

PACK Capacity (Ah) 40

Model nubber 4S2P 12.8V40Ah-PCM

Total Page 8

Registered	Checked	Approved

Customer Approve		
Dept.	Signature	Date
QA Dept		
R&D Dept		
Approved		



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1. Modified List

Product Modified Record List

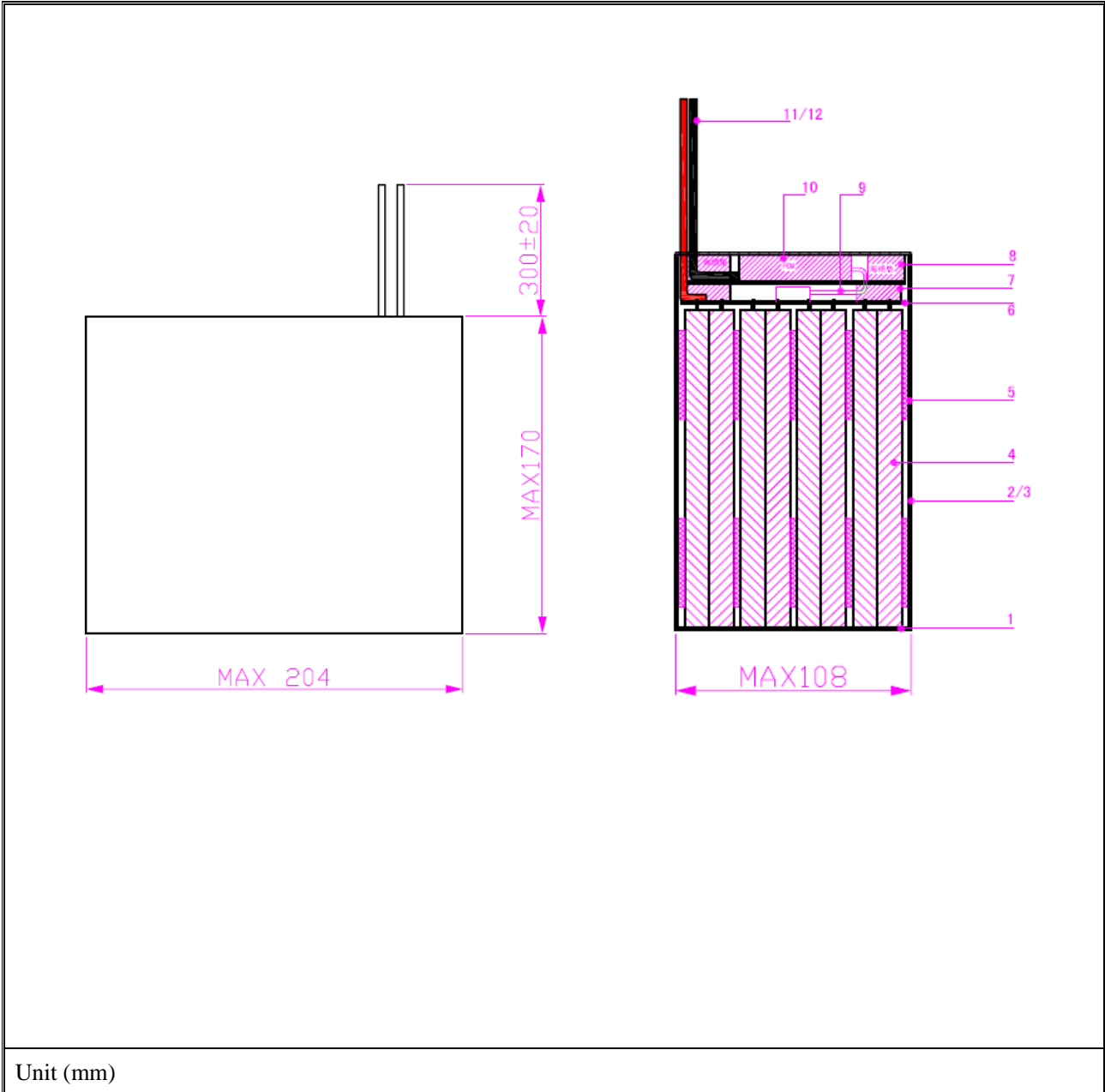
Revision	Date	Mark	Modified content	Approved by
A0	3013-11-1		New release	



2. Scope

This specification describes the basic performance, technical requirement, testing method, warning and caution of the Li-Ion Polymer rechargeable battery. The specification only applies to UTAG Battery pack

3. Initial Dimension





4. Specification

NO.	Item		Specifications	
4.1	Min. Capacity		38 Ah 0.2C Discharge	
4.2	Initial Impedance		$\leq 40 \text{ m}\Omega$	
4.3	Weight		Approx.: 6KG	
4.4	Nominal Voltage Fully Charge Voltage (FC) Fully Discharge Voltage (FD)		12.8V 14.6V Defined in this DOC: FC = 14.6V 8.0 V Defined in this DOC: FD = 8.0 V	
4.5	Standard Charge Current		0.2 C	
4.6	Standard Charging Method		0.2C CC (Constant Current) charge to 14.6V, then CV (Constant Voltage FC) charge till charge current decline to $\leq 0.02C$.	
4.7	Charging Time		Standard charging Approx. 7.0 hr.	
4.8	Standard Discharge Current		Constant Current 0.2C, end voltage FD	
4.9	Max. Charge Current	0°C ~ 15°C	10A	
		15°C ~ 45°C	15A	
4.10	Max. Discharge Current	0°C ~ 45°C	20A	
4.11	Discharge Lower Limit Voltage		8V	
4.12	Charge Upper Limit Voltage		14.6V	
4.13	Discharge Temperature		-20°C ~ 60°C	
4.14	Storage Temperature	-20°C ~ 45°C	≤ 3 month	Percentage of recoverable capacity no less than 80% of the initial capacities.
		-20°C ~ 28°C	≤ 1 year	
4.15	Recoverable Capacity		Constant Current 0.2C charge to FC, then constant voltage FC charge to current declines to 0.02C, rest for 10min, constant current 0.2C discharge to FD, rest for 10min. Repeat above steps 3 times, recording the maximum capacity.	
4.16	Storage Humidity		$\leq 75\% \text{ RH}$	
4.17	Appearance		Without distortion and leakage	
4.18	Standard Testing Condition		Temperature: $23 \pm 5^\circ\text{C}$ Humidity: $\leq 75\% \text{ RH}$ Atmospheric Pressure: 86 ~ 106 KPa	

Remark:

1. From 4.1 to 4.12 and 4.14, the testing condition is following 4.17 (standard testing condition).
2. If the working condition is out of 4.17, the performance will be some shift.



5. General Performance

No.	Item	Test Methods And Condition	Criteria
5.1	0.2C Capacity	At standard testing condition, after standard charging, rest for 30 min, then discharging at 0.2C to voltage FD.	$\geq 38Ah$
5.2	High-Low Temperature Discharge Performance	At standard testing condition, then store it at the constant temperature of $55 \pm 2^{\circ}C$ of 5h (of $-20 \pm 2^{\circ}C$ for 16h) and discharge at 0.2C to 80V.	Discharge Capacity/ Nominal Capacity $\times 100\%$ A) $55^{\circ}C \geq 95.0\%$ B) $-20^{\circ}C \geq 55.0\%$
5.3	Capability of Keeping Electricity	At standard testing condition, after standard charging, no outer loading circuit, rest the cell 28days, discharging at 0.3C to voltage FD.	Residual Capacity $\geq 90\%$; Recoverable Capacity $\geq 90\%$;
5.4	Cycle Life	At standard testing condition, constant current 0.2C charge to 14.6, then constant voltage 14.6 charge to current declines to 0.02C, rest for 30min, constant current 0.2C discharge to 8V, rest for 30min. Repeat above steps till continuously discharging capacity higher than 80% of the initial capacity of the cell.	≥ 1000 times(次)

6. Battery Protection

The battery shall be with the over-charging protection, over-discharging protection, and over-current protection during use. Protective circuit shall have protective functions as follows:

1) Over-charging protection

Overcharging protection stops charging if any cell of the battery pack reaches 15.2V.

2) Over-discharging protection

The Over-discharging protection monitors the voltage of any cell in the pack and works to avoid a drop in the cell voltage to 8.0V or less.

3) Over-current protection

The cell shall be discharged at less than the maximum discharge current specified in the Specification Approval Sheet. A high discharging current may reduce the discharge capacity significantly or cause overheating.



6.1 Charge Protection

Name	Item	Value	Range	Unit
Over-voltage for Single Cell	Over-Voltage	3900	± 25	mV
	Over-voltage Recovery	3800	± 5	mV
Balance Function	Balance Voltage	3600	± 25	mV
	Balance Current	65	± 10	mA
Charge Over-Current	Charge Over-Current	33	± 5	A
	Over-Current Delay Time	-	Dependence on the charger	mS
	Delay-Time Recovery	-		mS

6.2 Discharge Protection

Name	Item	Value	Range	Unit
Discharge Current	Continued Current	8	≤ 15	A
	Max Current Test	30A 5S.		
Under-Voltage for Single Cell	Over-Discharge Voltage	2000	± 5	mV
	Discharge Recovery	2300	± 10	mV
	Delay Time	1.2	± 0.2	S
Discharge Over-Current	Discharge Over-Current	33	± 5	A
	Over-Current Delay Time	45	± 5	mS
Normal Work Current	Normal Work Current	15		A
Internal Resistance	Internal Resistance	≤ 20		m Ω
Short Circuit	Short Circuit	Yes, Equipped with the function.		
	Recovery Condition	Removing the short circuit to automatically recover.		

7. Warnings

To prevent the possibility of the battery from leaking, heating, fire, please observe the following precautions:

- Do not immerse the battery in water and seawater.
- Do not use and leave the battery near a heat source such as fire and heater.
- When recharging, use the battery charger specifically for that purpose.
- Do not reverse the positive and negative terminals.
- Do not connect the battery to an electrical outlet.
- Do not discard the battery in fire or heat it.



- Do not bend the battery tabs. They are made of aluminum.
- Do not transport or store the battery with metal objects such as necklaces, hairpins etc.
- Do not hit or throw the battery.
- Do not directly solder the battery or pierce the battery with a nail or any other sharp object.

8. Cautions

- Do not use or leave the battery in very high temperatures (i.e. strong direct sunlight or a vehicle in extremely hot conditions). Otherwise, it can overheat, ignite, or its service life will be decreased.
- Do not use it in a location where static electricity is great, otherwise, the safety devices may be damaged and cause hidden trouble of safety.
 - If the battery leaks and the electrolyte get into the eyes, do not rub eyes, instead, rinse the eyes, with clean running water, and immediately seek medical attention. Otherwise, eye injury can result.
 - If the battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appear abnormal during use, recharging or storage, immediately remove it from the device or battery charge and stop using it.
 - In case the battery terminals are dirt, clean the terminals with a dry cloth before use. Otherwise power failure or charge failure may occur due to the poor connection with the instrument.
 - Discharged battery may cause fire, tape the terminals to insulate them.
 - The battery should be stored at room temperature, charged to about 40% to 60% of capacity. In case of over-discharge, batteries should be charged with standard charging method for one time every 3 months while storing and batteries should be charging-discharge with standard method for one time after being stored more than a year in order to activate it and restore energy.

9. Handling of PACKS

- Battery must be charged in appropriate charger only
- Never use a modified or damaged charger

10. Period of Warranty

The period of warranty is two year from the date of shipment. UTAG guarantees to give a replacement in case of battery with defects proven due to manufacturing process instead of the customer's abuse.