

3.2V LIFEP04 CELL INFORMATION

Units of Measurement	V—Volt A— Ampere Ah— Ampere-hour Wh— Watt-hour Ω— Ohm mΩ— MilliOhm °C— Degree Celsius mm— Millimetre s— Second Hz— Hertz
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Description/ Item	Specifications	Remarks
Nominal Capacity	99 .0Ah	<ul style="list-style-type: none"> • 2.5~3.65V • 46.5A Discharge Current • Initial Status
Minimum Capacity	100.0 Ah	<ul style="list-style-type: none"> • 2.5~3.65V • 46.5A Discharge Current • Initial Status
Operating Voltage Range	2.50 - 3.65V	<ul style="list-style-type: none"> • N.A.
Initial Inner Resistance (1KHz)	≤0.45mΩ	<ul style="list-style-type: none"> • Initial Status • 50% SOC (46.5Ah)
Outgoing Voltage	≥3.250V	<ul style="list-style-type: none"> • Initial Status • 50% SOC (46.5Ah)
Initial SOC	≈40%SOC (37.2 Ah)	<ul style="list-style-type: none"> • N.A.
Charge Temperature Range	0 ~ 55°C	<ul style="list-style-type: none"> • Refer to 2.2
Discharge Temperature Range	-20 ~ 55°C	<ul style="list-style-type: none"> • Refer to 2.3
Weight	≤2.15Kg	<ul style="list-style-type: none"> • N.A.

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Self-discharge	≤3.5% per month	25°C / 50% SOC / Within 3 months since Date of Manufacture
Dimensions	45*173*135mm	• N.A.

Charge Mode & Specifications

Description/ Item	Specifications	Remarks
Standard Charge Current	0.5C	25°C
Standard Charge Voltage	≤3.65V	
Standard Charge Mode	Using 0.5C Constant Current (CC) to charge to 3.65V, then Constant Voltage (CV) at 3.65V to charge until charge current reaches the lower limit of 4.65±0.5A.	
Standard Charge Temperature	25°C	Cell Temperature
Absolute Charge Temperature	0~55°C	Terminating charge process, once the cell temperature is beyond Absolute Charge Temperature.
Absolute Charge Voltage	≤3.8V	Terminating charge process, once the cell OCV is beyond Absolute Charge Voltage.

Other Charge Mode

Cell Temperature	Standard Charge	Rapid Charge	Cell Temperature
<0°C	Prohibited to charge	Prohibited to charge	<0°C
0~10°C	Charge Current 0.1C	Prohibited to charge	0~10°C
10~15°C	Charge Current 0.2C	Charge Current 0.3C	10~15°C
15~25°C	Charge Current 0.3C	Charge Current 0.5C	15~25°C
25~45°C	Charge Current 0.5C	Charge Current 1.0C	25~45°C
45~55°C	Charge Current 0.3C		
>55°C	Prohibited to charge		

Discharge Mode

Description	Parameters	Remarks
Standard Discharge Current	50A	• 25°C
Maximum Continuous Discharge Current	100.0A	• N.A.
Maximum Discharge Long-Pulse Current	200.0A	• 3 minutes maximum
Maximum Discharge Short-Pulse Current	300.0A	• Cell temperature lower than 50°C • When SOC > 40%, 60s maximum

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Regenerate Pulse Charge Mode

Regenerate Pulse Charge must be carried out under the circumstances stated below. Pulse current and duration need to be strictly controlled according to cell temperature and SOC. Any violation may cause permanent damage to batteries for which seller will be relieved from its liability. The maximum regenerate pulse charge voltage 3.65V.

Regenerate pulse charge current and duration

SOC	Cell Temperature				
	≤0°C	0°C~10°C	10°C~20°C	20°C~55°C	≥55°C
>95%	Prohibited	Prohibited	Prohibited	Prohibited	Prohibited
80%~95%	Prohibited	Prohibited	≤1C / ≤5s	≤1C / ≤10s	Prohibited
50%~80%	Prohibited	≤1C / ≤5s	≤1C / ≤10s	≤1.5C / ≤10s	Prohibited
<50%	Prohibited	≤1.0C / ≤10s	≤1.5C / ≤10s	≤2.0C / ≤10s	Prohibited

Rest intervals between pulses ought to be no shorter than the pulse duration. Any charge current is prohibited during rest intervals, whereas discharge current or no current is allowed.

Capacity at Low Temperature (Initial Status)

Description	Specifications	Remarks
Capacity at 25°C	≥100.00Ah	Charge/Discharge at 25±2°C
Capacity at 0°C	≥90.05Ah	Charge at 25±2°C/Discharge at 0°C with 1.0C (2.0~3.65V)
Capacity at -10°C	≥75.75 Ah	Charge at 25±2°C/Discharge at -10°C with 1.0C (2.0~3.65V)
Capacity at -20°C	≥65.10Ah	Charge at 25±2°C/Discharge at -20°C with 1.0C (2.0~3.65V)

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Temperature Rise

During the measurement of temperature rise, battery cells should be set upright (according to 9. Cell Design Drawing) and placed in a large room with a stable temperature and enough convection. Temperature sensors should record both cell temperature and time. Temperature rise equals to cell temperature after discharge minus that before discharge.

Description/ Item	Specifications	Remarks
Continuous Discharge Temperature Rise	$\leq 10^{\circ}\text{C}$	<ul style="list-style-type: none">• Discharge Current of 50A• Duration of 2 hours
Pulse Discharge Temperature Rise	$\leq 5^{\circ}\text{C}$	<ul style="list-style-type: none">• Discharge Current of 300.0A• Duration of 10s at any SOC

Storage Specifications

Description/ Item	Specifications	Remarks
Capacity Recovery (Short-term)	$\geq 98.21\text{Ah}$	At initial status with 50% SOC, stored in a room with ambient temperature of 25°C for 60 days.
Capacity Recovery (Long-term)	$\geq 93.35\text{Ah}$	At initial status with 50% SOC, stored in a room with ambient temperature of 25°C for 183 days.
Absolute Storage Temperature	-20~55°C	N.A.
Capacity Retention	$\geq 85.4\text{ Ah}$ (3000 Cycles)	After storage, using standard charge/discharge mode.

Termination of Battery Life

A customer should monitor and record the inner resistance of each battery cell. Both parties should agree on the method to measure inner resistance. When the inner resistance of a cell reaches 250% of that of its initial status, it should be terminated immediately. Any violation may cause safety hazards

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Working Conditions

Description	Specifications	Protections
Charge cut-off Voltage	3.65V	Terminating charge process when cell OCV reaches 3.65V.
First Over-charge Protection	$\geq 3.8V$	Limiting charge current to 0 when cell OCV reaches 3.8V.
Second Over-charge Protection	$\geq 4.0V$	Limiting charge current to 0 when cell OCV reaches 4.0V. Locking BMS before the problem is identified and resolved.
Discharge cut-off Voltage	2.5V	Terminating discharge process when cell OCV reaches 2.5V.
First Over-discharge Protection	2.0V	Limiting discharge current to 0 when cell OCV reaches 2.0V.
Second Over-discharge Protection	1.8V	Limiting discharge current to 0 when cell OCV reaches 1.8V. Locking BMS before the problem is identified and resolved.
Short Circuit Protection	Prohibit Short Circuit	Cutting off overcurrent devices (fuses, circuit breakers).
Overcurrent Protection	Referring to 2.3	Limiting current within specified range according to 2.3.
Overheating Protection	Referring to 2.2 & 2.3	Terminating charge/discharge process when cell temperature is beyond the limits specified in 2.3 & 2.3.
Charging Time Protection	$\leq 8h$	Terminating charge process when charging time exceeds 8 hours.