

Customer: _____

MOBILE POWER Specification

Model: K3

Checked & Approved by	Prepared by	Date
Wang xiaohui	Li Wenqun	2016-01-19

History of revisions				
Edition	Description	Prepared by	Approved by	Date
A0	First Edition	Li Wenqun	Liu Can	2015-09-22
A1	2 nd Edition Add to TyPe-C	Li Wenqun	Wang xiaohui	2016-01-19

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Note: 1.Kindly please sign on the underneath and send it back to us if the sample is approved.
2.Kindly please contact us as soon as possible if the sample isn't approved. Thanks!

Client Confirmation	
Date	

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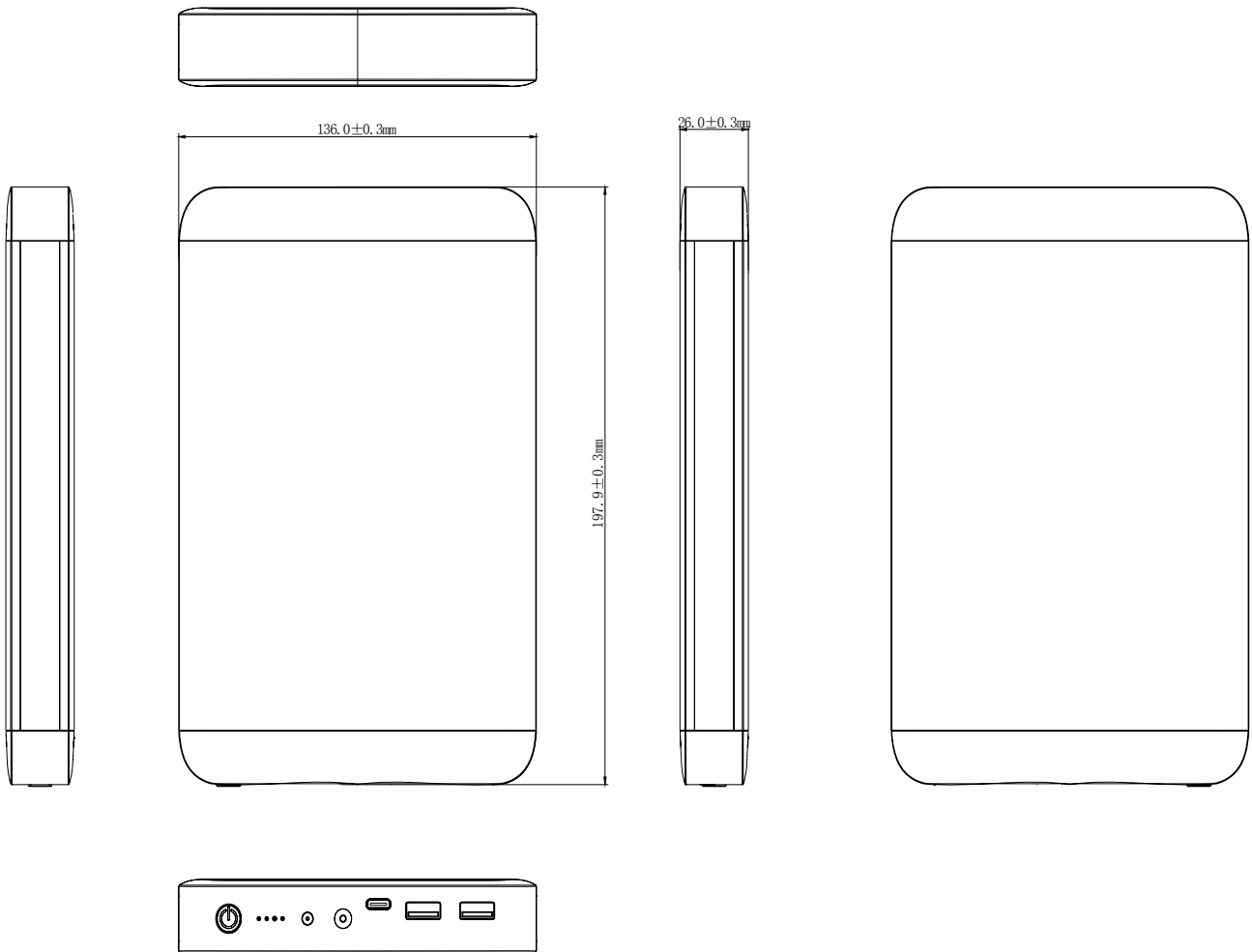
1.Scope

This specification is applied to K3 MOBILE POWER Manufactured by KAYO MAXTAR Battery Limited.

2.Product Configuration

No.	Item	Criteria	Number	Remark
1	Li-ion Polymer Cell	KPL6560122 6250mAh 3.7V	6pcs	3S2P
2	PCM	K3 PCM Output : 5V 2.1A*2 ; TyPe-C port ; 16.8V 3.5A Input: 12.6V/2.5A	1pcs	
		8254AAW+A0D403*2	1pcs	
3	Connector 连接头	DC 2.5	1pcs	For charge
4		DC 3.5	1pcs	For discharge
5		USB	2pcs	For discharge
6		TyPe-C	1pcs	For discharge
7	PLASTIC BOX	ABS+ PC+ Aluminum	1pcs	

3.Product Dimension





4.Product Specification

4.1 Size : L (197.9±0.3mm) *W(136.0±0.3mm)*T(26.0±0.3mm)

4.2 Weight: Approx 988.0g

4.3 Charging:

Charge for K3 by connecting it to the special K3 charger, normal charging, The current power LED lights flashing , Below the current voltage normally on the LED lamp; Fully Charged, Four LED lights normally on .

Input voltage/current: 12.6V/2.5A Charging time: approx. 6-8 hours

4.4 Working:

Connect the Mobile POWER and your mobile phones with USB cable, normal discharging, The current power led normally on, below the current power LED lights.

Output1 voltage/current: 5.0V/2.1A,

Output2 voltage/current: 5.0V/2.1A,

Type-C port voltage/current: 5.0V/3.0A, 9.0V/3.0A, 12.0V/3.0A

Output4 voltage/current: 16.8V/3.5A.

Output power \geq 85% rated power

4.5 The temperature performance

Discharge Temperature	-20℃	0℃	23℃	60℃
Discharge Capacity (0.2C)	50%	80%	100%	95%

4.6 Cycle life

No.	Item	Criteria	Test Conditions
1	Cycle Life	Higher than 70% of the Initial Capacity of the Cells	Carry out 500 cycles charging/ Discharging in the below condition. ◆ Charge: Standard Charge, ◆ Discharge: 2.1A to cut-off voltage ◆ Rest Time between charge/discharge: 30min. ◆ Temperature: 20±5℃

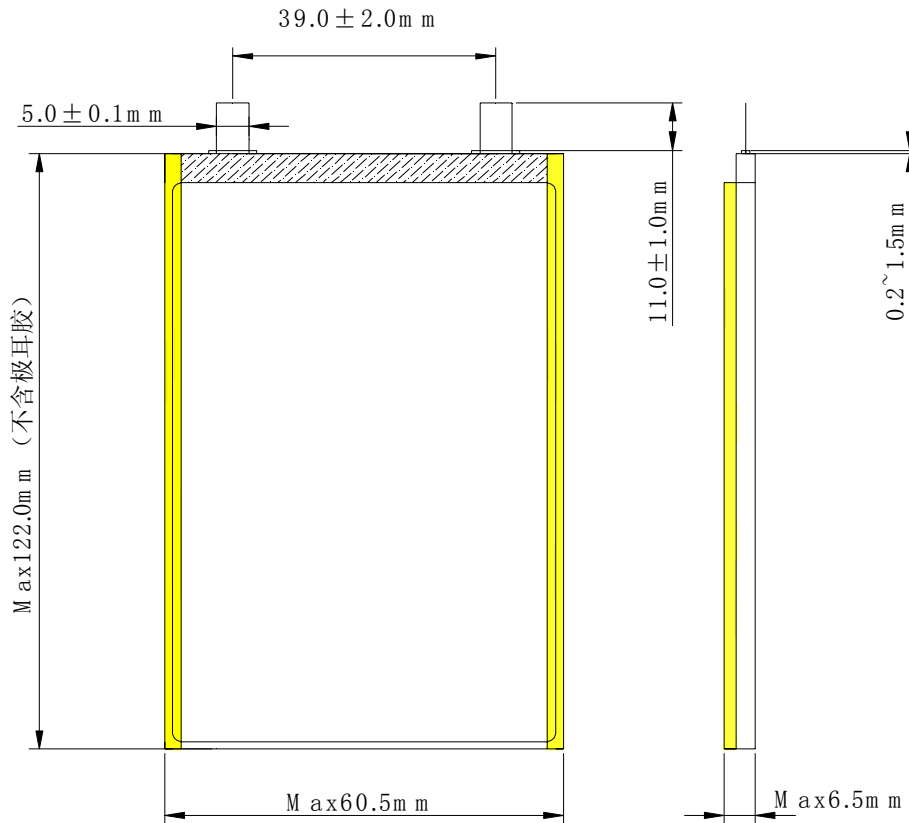
5. Cell Specification

5.1 Cell Performance

No.	Item	Rated Performance		Remark
1	Rated Capacity	Typical	6250mAh	Discharge at 0.2C after standard charge fully.
		Minimum	5900mAh	
2	Nominal Voltage	3.7V		Mean operation voltage during standard discharge.
3	Voltage at end of Discharge	3.0V		Discharge cut-off voltage.
4	Charging Voltage	4.2±0.03V		
5	AC (1KHz) Impedance New Cell Max.(mΩ)	≤45mΩ		
6	Standard Charge	Constant Current 0.2C Constant Voltage 4.2V 0.01C cut-off		Charge time : Approx 6.5h.
7	Standard Discharge	Constant current 0.2C end voltage 3.0V		
8	Fast Continuous Charge	Constant Current 0.5C Constant Voltage 4.2V 0.01C cut-off		

9	Fast Discharge	Continuous	Constant current 1.0C end voltage 3.0V	
10	Maximum Charge Current	Continuous	0.5C	23 ± 2°C is recommend Operation Temperature, 60±25%RH Bare Cell.
11	Maximum Discharge Current	Discharge	1.0C	23 ± 2°C is recommend Operation Temperature, 60±25%RH Bare Cell.
12	Operation Temperature Range	Temperature	Charge: 5~45°C	5~15°C 0.2C Max to 4.2V
				16~35°C 0.5C Max to 4.2V
				36~45°C 0.2C Max to 4.2V
			Discharge: -20~60°C	23 ± 2°C is recommend Operation Temperature, 60±25%RH Bare Cell
13	Storage Temperature Range		Less than 1 year: -20~25°C	23±2 °C is recommend storage temperature
			Less than 3 months: -20~40°C	
14	Storage Humidity Range		60±25%RH.	
15	Product Dimension		Length : Max122.0mm	Initial dimension
			width: Max60.5mm	
			Thickness: Max6.5mm	

5.2 Cell Dimension



Description	Dimension and specification
Thickness	Max6.5mm

Width	Max60.5mm
Length (Not including tab-film)	Max122.0mm
Tab width	5.0±0.1mm
Tab length	11.0±1.0mm
Tab center distance	39.0±2.0mm
Cell tab glue	0.2~1.5mm

6. PCM Specification

6.1 Using scope: The document applies to K3 POWER MOBILE PCM for KAYO MAXTAR battery LIMITED.

6.2 Battery capacity: 36000mAh

6.3 Environment request: RoHS.

6.4 Function description:

Input voltage/current: 12.6V/2.5A

Output1 voltage/current: 5.0V/2.1A,

Output2 voltage/current: 5.0V/2.1A,

Type-C port voltage/current: 5.0V/3.0A, 9.0V/3.0A, 12.0V/3.0A

Output4 voltage/current: 16.8V/3.5A.

6.5 Electric features:

6.5.1 Produce Specification

No. 序号	Item 项目	Condition 条件	Specification 参数
1	输入电压/input Voltage	B+/B-间输入电压/input Voltage B+ to B-	-0.3~+26V
2	过充电 Overcharge	保护电压/Detection voltage	4.250±0.050V
3		恢复电压/ Release voltage	4.100±0.100V
4		保护延迟时间/ Detection delay time	1.0±0.5 S
5	过放电 Over discharge	保护电压/Detection voltage	2.500±0.080V
6		恢复电压/ Release voltage	3.000±0.100V
7		保护延迟时间/ Detection delay time	100±50 mS
8	放电过流 Over discharge current	放电过流保护电流 Detection Over discharge current	9.0-12.0A

9		放电过流保护延时 Discharge Over current detection delay time	10±5 mS
10	短路保护 Short protection	短路保护延时/ Short detection delay time	100~600uS
11		恢复条件/Release Conditions	断开负载/Cut off load
12	自耗电 Normal current consumption	工作状态自耗电 Normal current consumption of PCM	Max 150.00uA
13	建议工作条件 Suggest working conditions	建议最大持续充/放电电流	10.00A
14		建议工作温度/suggest working temperature	-20℃~+60℃
15	OV 充电/0V charger	是否允许 0V 充电/allowed 0V change	NO
16	NTC 规格		-
17	内阻/IR resistance	PCM 内阻/ IR of PCM	≤65.00 mΩ
18	均衡性能	均衡电压	4.200±0.025V
19		均衡电流	93±10mA
20	PCM 尺寸 The size of final PCM	长度/ The length of final PCM	/
21		宽度/ The width of final PCM	/
22		厚度/ The thickness of final PCM	/

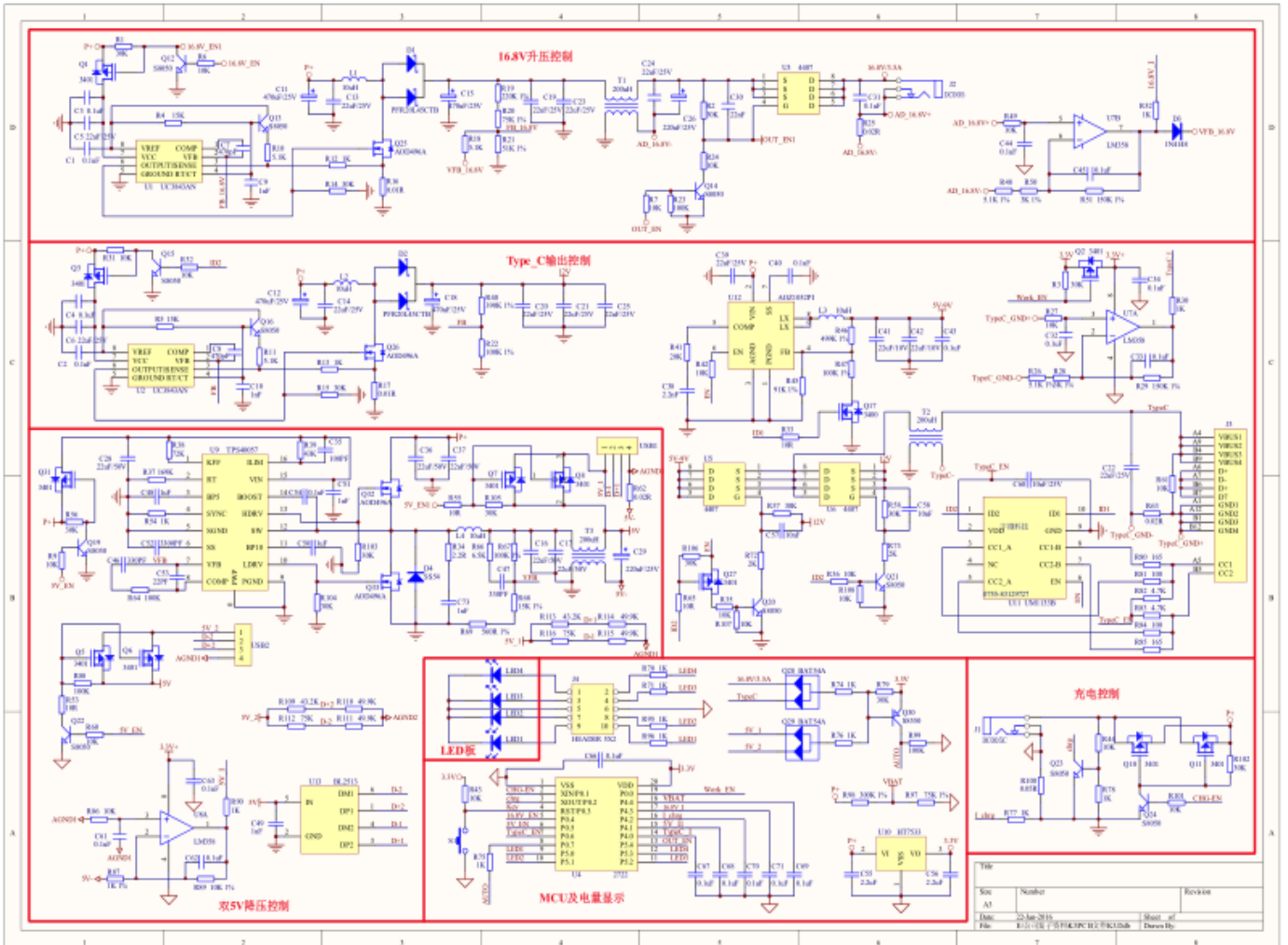
6.5.2 Internal charger management 内置充电管理

No 序号	Item 项目	Condition 条件	Remark 备注
1	充电输入电压/charge voltage	12.6V/2.5A	/
2	涓流充电阈值/ Charge Threshold	$V_{bat(th)}=2.9V$	0.15C 充电(0-200mA)
3	终止充电电流/Termination Current Threshold	4.2±0.05V	0.15C 充电(0-200mA)
4	工作温度范围 Operating Junction Temperature	-40 to +85 ° C	<105℃

6.5.3 Parameters of step up circuit 升压电路参数

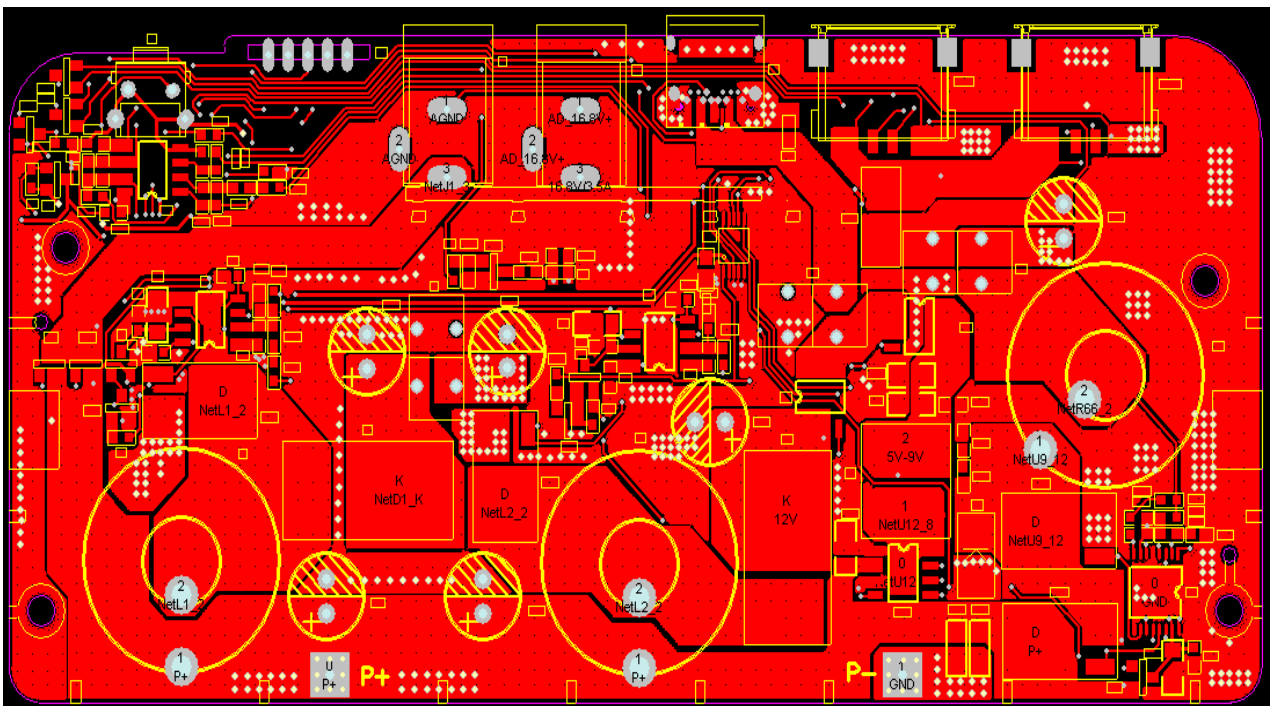
No 序号	Item 项目	Condition 条件	Remark 备注
1	充电输入电压/charge voltage	12.6V/2.5A	V_{bat}
2 (USB1 组)	空载电压		$5 \pm 0.25V$
	带载电压		$5 \pm 0.25V$
	输出过流保护/Over current Protection		$2.5 \pm 0.2A$
	降压转换效率/ Buck efficiency	$V_{bat} > 11V ; I_{OUT} = 2.1A$	$\geq 85\%$
3 (USB2 组)	空载电压		$5 \pm 0.25V$
	带载电压		$5 \pm 0.25V$
	输出过流保护/Over current Protection		$2.8 \pm 0.2A$
	降压转换效率/ Buck efficiency	$V_{bat} > 11V ; I_{OUT} = 2.1A$	$\geq 85\%$
3	空载电压	5.0V/3.0A	5.0-5.3V
	带载电压		4.75~5.3V
	空载电压	9.0V/3.0A	9.0-9.5V
	带载电压		8.5-9.5V
	空载电压	12.0V/3.0A	12.0-12.5V
	带载电压		11.5-12.5V
	输出过流保护/Over current Protection		$3.0 \pm 0.2A$
	降压转换效率/ Buck efficiency	$V_{bat} > 11V , I_{OUT} = 3.0A$	$\geq 85\%$
4	空载电压		16.8~17.3V
	带载电压	$V_{bat} > 11V , I_{OUT} = 3A$	16.5~17V
	输出过流保护/Over current Protection		$4.0 \pm 0.2A$
	升压转换效率/ Boost efficiency	$V_{bat} > 11V ; I_{OUT} = 3.5A$	$\geq 85\%$

6.6 PCM Circuit

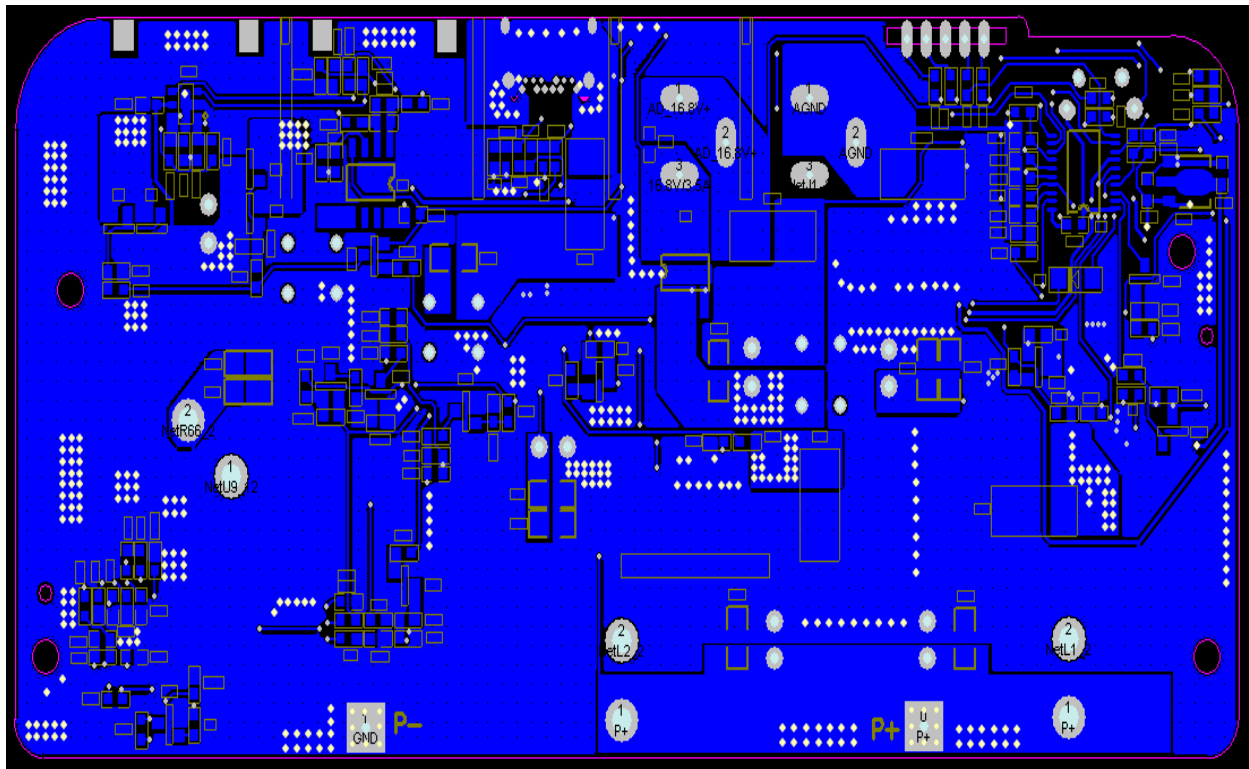


6.7 PCB Layout

PCB 顶层线路图



PCB 底层线路图



6.8 Reliability test

A	Appearance	The dimension specification is fit to engineer drawing, samples and assembling were met the requirement.
		Silk screen in PCB is the same as sample, and clear, error-free.
		Component spec.& model, patch and welding type are the same as sample.
		Components were weld firmly, cold solder joint ,tack weld and joined tin were not allowed.
		The edge of PCM can't be more than 0.1mm, and can't affect assemble.
		The out leakage of LED & USB are accord with engineer drawing requirement, and flat, the same height.
		The surface of PCB & Component weren't allowed to have the obvious pollution and other impurities.
B	Reliability test	The metal in PCB including to USB port, button and out leakage metal can't be oxidation and rust in 5% salt atmosphere condition for 24 hours
		After press button 2000 times continuously, it is still flexible, well resilience and regularly conduction.

		After insert & raise USB port 2000 times continuously, it is still well contact, not fall off and regularly conduction
		Make sure all of materials are Eco-friendly ones.
		After buckling 10 times by 10-20 Degree forward & reverse, there isn't Al foil warp, component break and sealing-off.

7. Mini USB and DC Specification

Normal USB CABLE.

DC adapter cable and TyPe-C Connector

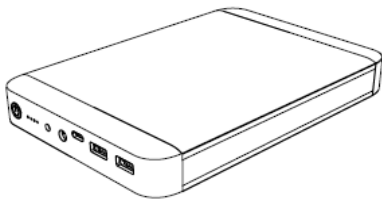
8.Security Testing Standard(Single cell)

Item	Battery Condition	Test Method	Requirements
Over charge test	Fresh, Fully Charged	At standard testing condition, charging cells with constant current 3C to voltage 4.6V, then with constant voltage 4.6V till current decline to 0A. Charging time no less than 8h.	No explode No fire
Over discharge test	Fresh, Fully Charged	Cell be discharged at constant current 0.5C to 3.0V, then discharged at 0.2C to .0V.	No explode no fire, nor smoke
Heat shock test	Fresh, Fully Charged	Cell is to be heated in a circulating air oven, the temperature of the oven is to be raised at a rate of $5\pm 2^{\circ}\text{C}$ per minute to $130\pm 2^{\circ}\text{C}$ and remain for 10 minutes at that temperature.	No explode No fire
Impact test	Fresh, Fully Charged	After standard charging, then put the battery in the plane, Place a 15.8mm steel in middle of the battery, using 9.1KG steel block to hitting the battery from 610mm free fall.	No explode No fire
Crush test	Fresh, Fully Charged	Fully charged the battery in accordance with standard charge condition, the battery is to crusher between two flat plates .Continuous to applied force on battery of 13kN(17.2Mpa),stopped until a pressure reading of 13kN(17.2Mpa) is reached on the hydraulic ram.	No explode, No fire
Short Circuit test	Fresh, Fully Charged	After the standard charge ,a cell is to be short circuited by connecting the positive and negative terminals of the cell with copper wire having a maximum resistance ≤ 100 milli ohm. Stop the test when the surface temperature of the cell decays to about 10°C from the maximum	No explode, No fire Top temperature no exceed 150°C
Rate test	Fresh, Fully Charged	0.2C/0.5C/1C charge & discharge.	

Vibrate test	Fresh, Fully Charged	After standard charged, keep for 0.5h~1h,then installed onto the vibration test with clamps. Equipment parameters of frequency and amplitude are as follows(the frequency is to be varied at the rate of 1oct/min between 10Hz~55Hz, and repeat vibration for 30min. The battery is to be tested in three mutually perpendicular directions): frequency:10Hz~30Hz amplitude: 0.38mm frequency:30Hz~55Hz amplitude: 0.19mm	No rupture, no fire Nor critical damage
Drop test	Fresh, Fully Charged	Drop the cell from 1m above onto concrete board with 18~20mm thickness for one time each from every direction after rated charge. After test, cells are discharged at 1C and charged at 1C,cycles 3times to obtain the time of discharging.	No rupture, no fire Nor critical damage

9. Product Usage Instruction

K3
Laptop Power Bank



After-sale service commitment 18 month warranty
Email:service@kayomaxtar.com
web:www.kayomaxtar.com
we suggest fully charge our K3 power bank every six months

Product Parameter







Battery: Li-Polymer
Capacity: 3600mAh
Input: 12.6V/2.5A
Output: USB1 5V/2.1A
 USB2 5V/2.1A
 Type-C 5V·9V·12V/3A
 DC 16.8V/3.5A
Charging Time: 5-8 hours
Life Cycles: ≥1000 times
Working Temperature: 0°C-45°C
Storage Temperature: -10°C-45°C
Product Size: 198X136X26mm

Package Includes


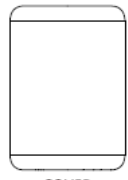

K3 Power Bank ----- X1
K3 charger ----- X1
DC to Macbook T Connector ----- X1
DC to Macbook F Connector ----- X1
Type-C to Type-C Cable ----- X1
Multifunctional Bag ----- X1
Manual ----- X1

Safety Guidelines

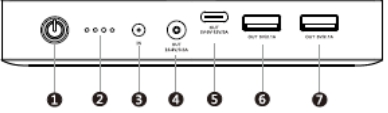
- Do not use K3 in damp environment.
- Keep K3 out of children's reach.
- Do not put K3 into the fire or high temperature(above 60 °C) environment.
- Do not bump/beat/shake K3 to avoid damaging the internal circuit.
- Use the original adapter to charge K3.
- Only our company's technicians or authorized maintenance agencies are allowed to disassemble or repair K3.
- Please check the charging voltage of laptop, cell phone first, make sure the charging voltage is consistent with the output voltage of K3.

Product Introduction








SIDE COVER FRONT



- ❶ On-off Function Button
- ❷ Capacity indicating lights
- ❸ Input port: 12.6V/2.5A
- ❹ Output port: DC16.8V/3.5A
- ❺ Output port: Type-C5V·9V·12V/3A
- ❻ Output port: DC5V/2.1A
- ❼ Output port: DC5V/2.1A

⚠ Attention Please!
Please do not charge your cell phone (or other 5V USB powered devices)with output port❹, it may damage your device.

<p>Function instruction</p> <ol style="list-style-type: none"> 1. K3 supports charging and discharging at the same time. 2. Power on: press "On/Off" button to switch on, Led lights shows current capacity of the power bank. 3. Power off: long press (2s) to switch off. 4. Automatic Power off: K3 will power off automatically after 60 seconds if there is no charging or discharging. 5. LED discharging display: 0~25%: 1st led light (on the left) on 25%~50%: 1st-2nd led light on 50%~75%: 1st-3rd led light on 75%~100%: 1st-4th led light on Low voltage indicating: When 1st led light (on the left) blinks, please charge the power bank in time 6. LED charging display 0~25%: 1st led light blinks (on the left) blinks 25%~50%: 1st led light on, 2nd led light blinks 50%~75%: 1st-2nd light on, 3rd led light blinks 75%~100%: 1st-3rd led light on, 4th led light blinks Fully charged: 1st-4th led light on 	<p>How to use K3 charge digital device</p> <p>This product has a smart identification function, can charge apple laptops, smart phones and other digital devices, especially devices with Type-C connector.</p> <ol style="list-style-type: none"> 1. Charge Apple laptop, cell phone <ul style="list-style-type: none"> • Two USB output ports: 5V/2.1A, can charge Apple and other brand cell phone and tablet. • Type-C output ports: can charge cell phone and tablet with Type-C connector. • Power bank starts charging automatically when connected with the charging device. Power bank turns off automatically after 60s when disconnected the charging device.  <ol style="list-style-type: none"> 2. How to charge MacBook <ul style="list-style-type: none"> • Please check the input voltage of your Macbook carefully to choose the appropriate output port before charging your MacBook. • Type-C output ports: 5V-9V-12V/3A, can charge 12inch Type-C MacBook, as pic 1. • Output port: DC16.8V/3.5A, can charge Apple laptop - MacBook with T head or F head, as pic 2. • Power bank starts charging automatically when connected with the charging device. Power bank turns off automatically after 60s when disconnected the charging device. 	<p>Warranty Card</p> <p>Manufacture Date _____ Sale Date _____ File No. _____ Manufacturer _____</p> <p>Warranty Instructions</p> <ol style="list-style-type: none"> 1. 18-months warranty 2. In warranty period, if any quality problem happens, Please contact service@kayomaxtar.com for free service 3. Following situations will go against the warranty terms: <ol style="list-style-type: none"> A. Any problems, malfunction or damages due to incorrect using methods or caused by unauthorized disassembly or repair. B. The damage caused by force majeure, fire and other extreme abnormal conditions. C. Without the warranty card or the card records is not clear, complete, or without the sales company seal
<p>How to Charge K3 Power Bank</p> <p>Connect the DC port of the charger to the input port of K3 power bank, and the other end to the wall outlet</p> 		

10. Storage and Transportation

10.1 Storage:

- 10.1.1 The Li-ion battery pack should be stored in a cool, dry and well-ventilated area. and should be far from the fire and the high temperature.
- 10.1.2 The best capacity in storage is 30%-50% (voltage between 14.4-15.6V).
- 10.1.3 The battery should store in the product specification book stipulation temperature range. the best storage temp. is 0 to 25°C. The best humidity is 60±25%.
- 10.1.4 If has surpasses above for 3 months the long time storage, suggested you should carry on additional charge to the battery.

10.2 Transportation:

- 10.2.1 Do not mix the battery products with other cargo.
- 10.2.2 Do not immerse the battery products in water or allow it to get wet.
- 10.2.3 Do not over 7 layers staking and upside-down.
- 10.2.4 The highest temperature in transportation is lower than 65°C.

11. Use Attention:

To ensure proper use of the battery please read the manual carefully before using it.

11.1 Handling:

- 11.1.1 Do not expose to, dispose of the battery in fire.
- 11.1.2 Do not put the battery in a charger or equipment with wrong terminals connected.
- 11.1.3 Avoid shorting the battery
- 11.1.4 Avoid excessive physical shock or vibration.
- 11.1.5 Do not disassemble or deform the battery.

11.1.6 Do not immerse in water.

11.1.7 Do not use the battery mixed with other different make, type, or model batteries.

11.1.8 Keep out of the reach of children.

11.2 Charge:

11.2.1 Battery must be charged in appropriate charger only.

11.2.2 Never use a modified or damaged charger.

11.2.3 Do not leave battery in charger over 24 hours.

11.2.4 Charging current: Can not surpass the biggest charging current which in this specification book stipulated.

11.2.5 Charging voltage: Does not have to surpass the highest amount which in this specification book stipulated to decide the voltage.

11.2.6 Charge temperature: The battery must carry on the charge in the ambient temperature scope which this specification book stipulated.

11.2.7 Uses the constant electric current and the constant voltage way charge, the prohibition reverse charges. If the battery positive electrode and the cathode meet instead, can damage the battery.

11.3 Discharge:

11.3.1 The discharging current does not have to surpass this specification book stipulation the biggest discharging current, the over sized electric current electric discharge can cause the battery capacity play to reduce and to cause the battery heat.

11.3.2 Electric discharge temperature: The battery discharge must carry on in the ambient temperature scope which this specification book stipulated.

11.3.3 Over-discharges: After the short time excessively discharges charges immediately cannot affect the use, but the long time excessively discharges can cause the battery the performance, battery function losing. The battery long-term has not used, has the possibility to be able to be at because of its automatic flash over characteristic certain excessively discharges the condition, for prevented excessively discharges the occurrence, the battery should maintain the certain electric quantity.

11.4 Disposal:

Regulations vary for different countries. Dispose of in accordance with local regulations.

12. Period of Warranty

There is a twelve-month warranty for our export batteries from the date of shipment. If the problem happened during the warranty period, we are responsible to replace the defective ones according to the accurate analysis results. However, we won't take any responsibility if the problem is caused by the battery-related applications and related products.

13. Others

Because batteries utilize a chemical reaction, battery performance will deteriorate over time even if stored for a long period of time without being used. In addition, if the various usage conditions such as charge, discharge, ambient temperature, etc. are not maintained within the specified ranges the life expectancy of the battery may be shortened or the device in which the battery is used may be damaged by electrolyte leakage. If the batteries cannot maintain a charge for long periods of time, even when they are charged correctly, this may indicate it is time to change the battery.

14. Note:

Any other items which are not covered in this specification shall be agreed by both parties.