



WAMA ELECTRONICS TECH CO.,LTD

1. SCOPE

This specification describes the related technical standard and requirements of the rechargeable Li-ion battery pack supplied by WaMa. Battery packs produced with the 17280 cell will meet the specification.

2. BATTERY PACK SPECIFICATION

ITEMS	SPECIFICATION		REMARK
Model	RCR123A		
Constant Voltage	3.0V		No Load of Specification 3.7V
Capability	Nominal	600mAh	
	Minimal	550mAh	
Cell Type	17280		
Dimensions	$\Phi 16.3(+0.3)*34.3(\pm 0.2)$ mm		
Color	/		
Weight	20.0(± 2)g		

3. STANDARD TESTING CONDITIONS (No Load)

ITEMS	REGISTER		
Standard charge	CC/CV model, constant voltage 4.2V, constant current 0.2C, end current 0.01C		
General charge.	CC/CV model, constant voltage 4.2V, constant current 0.5C, end current 0.01C		
Standard discharge	Constant current 0.2C, end voltage 3.0V		
General discharge	Constant current 0.5C, end voltage 3.0V		
Environment temperature	Charge	0 -- +45°C	
	Discharge	-20°C -- +60°C	
	Storage temperature	One month	-20°C -- +55°C
		Three months	-20°C -- +45°C
		One year	-5°C -- +30°C
	General temperature	20°C \pm 5°C	
	Atmospheric pressure	86 -- 106Kpa	
Relative humidity	45% -- 85%		



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4. APPEARANCES

ITEMS	TEST CONDITION	REQUIRE
APPEARANCE	Under light lamp 40W	Shall be free noticeable flaws breaks, age, Discoloration, deformation, uneven, and other Defects which impair the value of the commodity

5. ELECTRICAL CHARACTERISTICS

ITEMS	TEST CONDITION	REQUIRE
Complete Charge	The battery is charged with constant current 1CmA and constant voltage 4.2v until the charging current is less than 0.01CmA. The longest charging time is less than 3 hours.	
Initial capacity	The capacity measured after the battery is discharged with constant current 0.2C until the voltage reaches 3.0V cut-off in one hour after complete charge.	600mAh
Cycle life	The capacity measured after 500 cycles of complete charge and discharge at 1C current to 3.0V cut-off.	Capacity more than 70% of Initial capacity
Impedance	Internal resistance measured at 1KHz after complete charge.	$\leq 200\text{m}\Omega$

6. TEMPERATURE ADAPABILITY

ITEMS	TEST CONDITION	REQUIRE
High temperature discharge	After complete charge, at 60°C , discharging current 0.2C to 3.0V-END discharge.	No explosion, fire, or smoke. Discharge efficiency $\geq 85\%$.
High temperature exposure	After relative charge, all batteries being tested are stored in chamber of 150°C for 0.5 hour. After taking the batteries out of the chamber, all the batteries are visually examined.	No explosion, fire, or smoke.
Low temperature discharge	After complete charge. At -20°C , discharging current 0.2CmA to 3.0V-END discharge.	No explosion, fire, or smoke. Discharge efficiency $\geq 80\%$.



7. DESTROY ADAPTABILITY

ITEMS	TEST CONDITION	REQUIRE
E.S.D TEST	To apply 33Ω resistance and stasis Electricity energy of 1500PF capacitor. To All terminals (+, -) apply the below for 10 times each, 1. Contact : ±8KV 2. Air : ±15KV	No malfunction. No damage.
Vibration Test	Subject to 1 hour 10-55Hz 3.5mm amplitude Vibration for any direction at shipment (complete packing) state. Then test discharge and rated charge at 25±2°C.	No xplosion.fire ,or Smoke.No leakage or damage
Drop Test	Drop test battery 1.2m above steel board of more than 10mm thickness. One time drop each for 6 surface,4 ride direction of a battery pack	No leakage or damage No explosion, fire or Smoke. Discharge time Less than 50 minute.

8.8.1 PCM SPECIFICATION

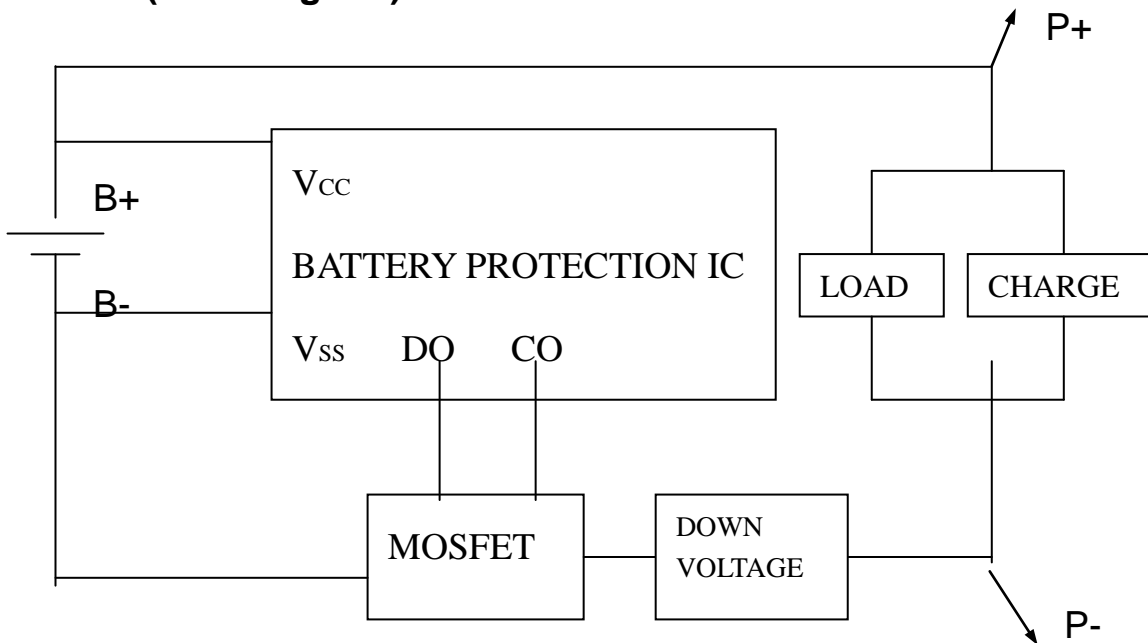
ITEMS	TEST CONDITION
Over charge protection	The battery should be charged under 5.0V/1C. The charging should be shut off when the internal cell voltage becomes more than the specified protection voltage.
Over discharge protection	The battery should be discharged with 1C, The discharging should be shut off when the internal cell voltage becomes less than the specified protection voltage.
Short protection	After rated charge, (+) and (-) terminals are connected with 10m mental resistor or equivalence.
Current consumption	Ordinary current consumption: consumption current of the protection circuit when internal cell voltage reaches 3.7V(Max:6μ A)
General current consumption	Shut off current consumption: consumption current of the Protection circuit when internal cell voltage reaches 3.0v(Max:3 μ A)



8.2 PCM STANDARD

Symbol	Name	Conditions	MIN.	TYP.	MAX.	Unit
V _{DET1}	Over-Charge detect voltage		4.25	4.28	4.31	V
V _{HVS1}	Over-Charge reset voltage					V
T _{VDDDET1}	Output delay of over-Charge	C ₃ =0.01uF, V _{DD} =3.6, V->4.4V	175	250	325	ms
V _{DET2}	Over-discharge detect voltage		2.24	2.3	2.36	V
T _{VDET2}	Output delay of over-Discharge	V _{DD} =3.6V, V->2.4V	14	20	26	ms
V _{DET3}	Excess current detect voltage		0.105	0.125	0.145	V
I _{EC}	Excess current theshold			2.1		A
T _{VDET3}	Output delay of Excess current	V _{DD} =3.0V	8	12	16	ms
I _{DD}	Supply current	V _{DD} =3.9V, V-=0V		3	6	μ A
I _{STANDBY}	Standby current	V _{DD} =2.0V			0.2	μ A

8.3(PCMDiagram)





9. CAUTIONS IN USE

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

. Handling

- Do not expose to, dispose of the battery in fire.
- Do not put the battery in a charger or equipment with wrong terminals connected.
- Avoid shorting the battery
- Avoid excessive physical shock or vibration.
- Do not disassemble or deform the battery.
- Do not immerse in water.
- Do not use the battery mixed with other different make, type, or model batteries.
- Keep out of the reach of children.

. charge and discharge

- Battery must be charged in appropriate charger only.
- Never use a modified or damaged charger.
- Do not leave battery in charger over 24 hours.

. storage

- Store the battery in a cool, dry and well-ventilated area.

. disposal

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