Jiangsu Midea Cleaning Appliances Co., Ltd.

File No.: PACK X6_22.2_Lithium

Version: A0

File name: X6 battery pack spec.

Product name	PACK X6_22.2_Lithium	Customer name	
Model#	BP22225B	Date of submission	2022.03.24

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Edited by	Xu Zhengbing	Date	2022.03.24
Signed by	Song Dongjing	Date	2022.03.24
Countersigned	Sun Yumin	Date	2022.03.24
Approved by	Wan Dekang	Date	2022.03.24

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Part one Revision log

No.	Revision	Editor	Version	Date
1	Initial version	Xu Zhengbing	A0	2022.03.24
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Part two Overview

This specification is used to standardize the functional, performance, electrical and inspection requirements of the battery pack of vacuum cleaners produced by Jiangsu Midea Cleaning Appliances Co., Ltd. It only applies to product PACK X6-22.2V-Lithium and will work as the standards of:

1.Product design and material selection; 2.the production and inspection of supplier; 3.Inspection and quality return testing of Midea.

Part three Scope of application

No.	Conditions of use	Spec	Notes
1	Storage Temperature	-20℃～+45℃	
2	Charge temperature	0℃～+50℃	
3	Discharging temperature	-20℃～+75℃	
4	Max continuous discharge current	15A	
5	Max continuous charge current	1.25A	
6	Max input voltage	25.2V	
7	Battery pack type	Lithium 6S1P	nominal voltage 22.2V
8	Rated voltage	22.2V	

Part four Main Function/Spec

Battery pack:

No	Function	Spec	Note
1	Rated Capacity	≥2450mAh	Refer to cell spec: charge the cell with 1.25A current to 4.2V/cell, keep charging at a constant voltage and decrease the current to 150mA, discharge the cell with 0.5A current to 2.5V/cell, total discharge capacity≥2450mAh
2	Default voltage	21.6V~21.9V	
3	3-month storage voltage	≥21.3V	Standards of inspection after long time storage: When voltage is higher than 21.3V, don't need any interventions. When voltage is between 21.3V and 21V, need to recharge the battery; When voltage is lower than 21V, battery is unqualified.
4	Discharge cut-off voltage	16.5V	Refer to the protective board
5	Charging current	0.5±0.05A	
6	Initial resistance	≤150mΩ	Cell resistance: 20*6, Soldering and connecting pieces impedance:5*6
7	Packing matching requirement	Open-circuit voltage difference less than 6mV; Resistance difference less than 2mΩ; Capacity difference less than 30mAh; The use of the same batch of cells is limited	Full inspection of voltage and resistance is required, considering the impact of contact resistance while testing, the internal controlled difference is 2.5 mΩ.
8	Storage temperature	1 month -20~45℃	Refer to cell spec
		2 months -20~35℃	
		1 year -20~25℃	
9	Interface definition	P+(interface 1~4): Discharge output cathode	
		C+（interface 5）:Charge input cathode	When the voltage of single cell reached overcharge value, charging port will close.
		T（interface 6）： Battery pack temperature output electrode	The NTC resistance of electrode T when it output cell temperature to anode.
		P-（Interface7~10）： Battery pack anode	

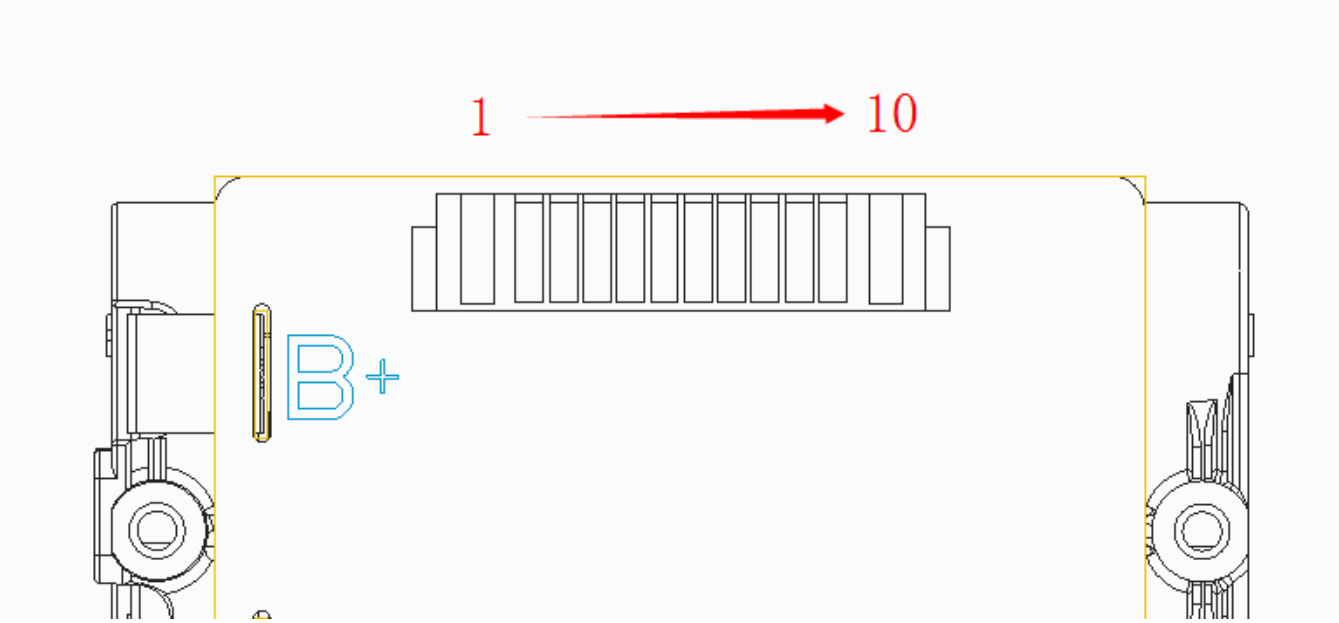
10	Lifespan	300T 70%	Charge the battery at a constant current of 1.25A to 4.175V/cell，and keep charging till the current change to150mA. Discharge the battery at a constant current of 15A till the voltage of cell decrease to 2.75V/cell， cycle for 300T and the capacity≥70% initial capacity.
11	Low Temp-10℃ discharge capacity	≥80% rated capacity	Charge the battery to full capacity at room temperature, discharge the battery at -10℃ and the discharge capacity ≥80% rated capacity.
12	High Temp 60℃ discharge capacity	≥95% rated capacity	Charge the battery at room temperature to full capacity. Discharge the battery at 60℃ and the discharge capacity ≥95% rated capacity.
13	Battery recharge voltage requirement	21.6V-22.5V	The testing voltage when recharge the battery after a long-time storage.

Protective Board:

No.	Function	Spec	Notes
1	Temperature measurement	NTC 10K B3435 Accuracy 1%	PCM measures the surface temperature of battery via NTC, electrode T will output resistance to B-
2	Short circuit protection	25A	Time-lag fuse, connected in series at the P+ side of battery pack
3	Single cell over-charge protection	4.22V±0.025V	The charging will stop if PCM detected the voltage of any battery cell reached 4.22V and stay at that value for 2±0.5S.
4	Single cell over-charge delay	2±0.5S	
5	Single cell over-charge protection 2	4.275V±0.025V	The resistance of electrode T to anode ≤1K if PCM detected the voltage of any battery cell reached 4.275V and stay at that value for 2±0.5S.
6	Single cell over-charge delay 2	2±0.5S	
7	Reverse charge current leakage	≤10uA	The protective board is not allowed to leak current to charger, the leakage current is less than 10uA.
8	Static power consumption	≤10uA	The total power consumption of PCM to battery pack ≤10μA The power consumption of PCM to single battery cell difference ≤1μA
9	Static power consumption max difference(single cell difference)	≤1uA	
10	power consumption difference after Over-charge protection	≤30uA	After over-charge protection, power consumption of PCM to single battery cell difference ≤30μA
11	electrostatic protection	Contact discharge 8KV, Air discharge 15KV	GB/T 17626.2-2006 IEC 61000-4-2:2001

■ Part five Dimensions and Interface definitions

Interface name	Function description	notes
P+（interface 1~4）	Battery pack cathode output	
C+（interface 5）	Battery pack charger cathode	
T（interface 6）	Battery pack temperature electrode	
B-（interface 7~10）	Discharge anode.	



■ Part six Safety requirements

1. Soldering must be robust and reliable, no missing welding, incomplete welding and lap welding.

2. The welding between Wire and PCB need to be fixed with glue, and PCB need to be brushed/ sprayed with silica gel.

3. Eco requirement: all parts need to comply with the requirement of material restrictions required in Q/PST02-2006

4. the base board of PCB need to comply with UL standard.