



# Test Report


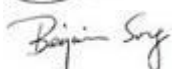
**Report No.:** V20181207-ZDJ12-PSE-S

**Applicant:** Hangzhou Dongjian Energy Tech Co., Ltd

**Product:** Lithium ion battery

**Standard(s):** METI ordinance establishing technical requirements for electrical appliances and materials, Paragraph 1, Appendix 9

**VIC TESTING AND CERTIFICATION LTD**

<b>TEST REPORT</b> <b>METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS</b> <b>paragraph 1, Appendix 9</b> <b>(in the Technical Requirements of ministerial ordinance for electrical appliance)</b> <b>Lithium ion secondary batteries</b>	
Report Number.....:	V20181207-ZDJ12-PSE-S
Tested by (name + signature).....:	Gary Zhong 
Approved by (+ signature).....:	Benjamin Song 
Date of issue.....:	2018-12-07
Total number of pages.....:	29
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<b>Applicant's name.....:</b>	Hangzhou Dongjian Energy Tech Co., Ltd
<b>Address.....:</b>	Qunli Village, Guali Town, Xiaoshan, Hangzhou, Zhejiang, China
<b>Manufacturer's name.....:</b>	Hangzhou Dongjian Energy Tech Co., Ltd
<b>Address.....:</b>	Qunli Village, Guali Town, Xiaoshan, Hangzhou, Zhejiang, China
<b>Test specification:</b>	
<b>Standard.....:</b>	METI ordinance establishing technical requirements for electrical appliances and materials, Paragraph 1, Appendix 9
<b>Test procedure.....:</b>	PSE Circle Mark
<b>Test item description.....:</b>	Lithium ion battery
<b>Trade Mark.....:</b>	-
<b>Model/Type reference.....:</b>	DJ-24v10ah, HD-24v20ah, HD-48v10ah, HD-3.2v10ah, HD-3.7v10ah, HD-6v10ah, HD-6v20ah, HD-12v10ah, HD-12v20ah, HD-12v40ah, HD-24v60ah, HD-24v100ah, HD-36v10ah, HD-36v15ah, HD-36v20ah, HD-48v15ah, HD-48v20ah, HD-48v40ah, HD-60v10ah, HD-60v20ah, HD-60v40ah, HD-72v20ah, HD-72v40ah, HD-84v20ah, HD-84v50ah, HD-96v40ah
<b>Ratings.....:</b>	See page 4 for details.



**Summary of testing:**

**Tests performed (name of test and test clause):**


Full tests of the following standard:

- METI ordinance establishing technical requirements for electrical appliances and materials, Paragraph 1, Appendix 9

HD-24v100ah, HD-96v40ah and HD-6v10ah were chosen as representative models to perform all relevant tests.

The submitted samples were found to comply with the requirements of above standards.

**Copy of marking plate:**

Lithium ion battery	
HD-24v100ah	
Capacity: 100000 mAh	
Nominal Voltage: 24V <sub>—</sub>	
Rated Charge Voltage: 29.4V <sub>—</sub>	
Rated Charge Current: 3000mA	
Hangzhou Dongjian Energy Tech Co.,Ltd	

0-50°C

<b>Test item particulars..... :</b> <b>Classification of installation and use..... :</b> - <b>Supply Connection..... :</b> - <b>Recommend charging method declared by the manufacturer..... :</b> CC/CV <b>Discharge current (0,2 It A)..... :</b> 0,2 It A; Refer to specification. <b>Specified final voltage..... :</b> Refer to specification. <b>Upper limit charging voltage per cell..... :</b> Refer to specification. <b>Maximum charging current..... :</b> Refer to specification. <b>Charging temperature upper limit..... :</b> 50°C <b>Charging temperature lower limit..... :</b> - <b>Polymer cell electrolyte type..... :</b> <input type="checkbox"/> gel polymer <input type="checkbox"/> solid polymer <input checked="" type="checkbox"/> N/A
<b>Possible test case verdicts:</b> - test case does not apply to the test object..... : N/A - test object does meet the requirement..... : P (Pass) - test object does not meet the requirement..... : F (Fail)
<b>Testing..... :</b> <b>Date of receipt of test item..... :</b> 2018-11-20 <b>Date (s) of performance of tests..... :</b> 2018-11-20 to 2018-12-07
<b>General remarks:</b>  Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.  The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the Laboratory, responsible for this Test Report.

**General product information:**

1. The product is intended to be used as secondary Lithium-ion batteries.
2. The model list is shown below:

No.	Model	Nominal Voltage (V)	Capacity (mAh)	Rated Charge Voltage (V)	Rated Charge Current (mA)	Maximum Charge Temperature
1	DJ-24v10ah	24	10000	29.4	5000	50
2	HD-24v20ah	24	20000	29.4	10000	50
3	HD-48v10ah	48	10000	54.6	5000	50
4	HD-3.2v10ah	3.2	10000	3.65	5000	50
5	HD-3.7v10ah	3.7	10000	4.2	5000	50
6	HD-6v10ah	6	10000	7.3	5000	50
7	HD-6v20ah	6	20000	7.3	10000	50
8	HD-12v10ah	12	10000	14.6	5000	50
9	HD-12v20ah	12	20000	14.6	10000	50
10	HD-12v40ah	12	40000	14.6	10000	50
11	HD-24v60ah	24	60000	29.4	20000	50
12	HD-24v100ah	24	100000	29.4	30000	50
13	HD-36v10ah	36	10000	42	5000	50
14	HD-36v15ah	36	15000	42	5000	50
15	HD-36v20ah	36	20000	42	10000	50
16	HD-48v15ah	48	15000	54.6	5000	50
17	HD-48v20ah	48	20000	54.6	10000	50
18	HD-48v40ah	48	40000	54.6	20000	50
19	HD-60v10ah	60	10000	73	5000	50
20	HD-60v20ah	60	20000	73	10000	50
21	HD-60v40ah	60	40000	73	20000	50
22	HD-72v20ah	72	20000	84	5000	50
23	HD-72v40ah	72	40000	84	10000	50
24	HD-84v20ah	84	20000	102	10000	50
25	HD-84v50ah	84	50000	102	20000	50
26	HD-96v40ah	96	40000	117	20000	50

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9			
Clause	Requirement + Test	Result - Remark	Verdict
<b>1</b>	<b>Basic design</b>		P
(1)	Insulation and wiring		P
	a) The insulation resistance between the positive terminal and a metal surface exposed to outside the battery, and which, as mounted on the equipment, may be touched by a human, shall be 5 MΩ or more at 500 VDC.	Test voltage: 500VDC; Insulation resistance: >100 MΩ	P
	b) Internal wiring and its insulation shall sufficiently withstand anticipated maximum current, maximum voltage, and maximum temperature.	Can sufficiently withstand anticipated maximum current, maximum voltage, and maximum temperature.	P
	c) Equipment having connection terminals shall be wired to maintain an appropriate clearance and creepage distance between terminals.	No applicable	N/A
(2)	Inner pressure reduction mechanism		P
	a) Battery cases and cells shall be designed with a gas release mechanism, or shall be designed to reduce excessive internal pressure when the equipment reaches a value or rate set so as to protect against explosion or fire.		P
	b) If support material is used to fix cells within the battery case, the type of support material and method of fixing cells shall not inhibit pressure relief, and the battery shall not induce overheating during normal use of the battery.		N/A
(3)	Temperature and current management		P
	The battery shall be designed so that abnormal temperature-rise conditions are prevented.		P
	Provided that this does not apply if a current limiter is installed outside the battery to control abnormal temperature-rise during charging and discharging within a safety level.		N/A
(4)	Terminal contacts		P
	a) The battery shall be marked positive (+) or negative (-) for terminals on its external surface or be designed with no fear of misconnection.		P
	b) Batteries having a terminal contact plate shall be sized and shaped to ensure the flow of maximum current anticipated.		P

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9			
Clause	Requirement + Test	Result - Remark	Verdict

	c) Batteries having a terminal contact plate shall be designed so that the surface of the terminal contact plate will be a conductive material with good mechanical strength and corrosion resistance.		P
(5)	Assembly of cells into a battery		P
	Batteries made of series connected cell blocks shall be designed so that cells are assembled to make the cell blocks the same capacity, and cell polarity reversal is prevented.	Two cells	P
	Provided that this does not apply to the battery controlled by itself or the equipment as cell polarity reversal is prevented.		N/A

<b>2</b>	<b>Intended use</b>		P
(1)	Continuous charging at constant voltage	See table 1	P
(2)	Vibration	See table 2	P
	a) A simple harmonic motion with an amplitude of 0.76 mm and a total maximum excursion of 1.52 mm shall be applied to the charged cells		P
	b) The frequency shall be increased at a rate of 1 Hz/minute from 10 Hz and reduced at a rate of 1 Hz/minute after it reaches 55 Hz, and then it shall be ensured that the frequency has reached 10 Hz.		P
	c) The entire range of frequency (10 Hz to 55 Hz) shall be tested for 90 ± 5 minutes in each of the three mutually perpendicular directions of vibration (X, Y, and Z axes).		P
	d) The vibration shall be applied in each of mutually perpendicular direction (X, Y, and Z axes) in the sequence specified below according to conditions a) to c) Provided that the order of steps 2 to 4 can be changed.		P
(3)	Battery enclosure test at high ambient temperature	See table 3	P
(4)	Temperature cycling	See table 4	P

<b>3</b>	<b>Reasonably foreseeable misuse</b>		P
(1)	External short circuit	See table 5	P

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9			
Clause	Requirement + Test	Result - Remark	Verdict
	a) The charged cell shall be left at an ambient temperature of $55 \pm 5^{\circ}\text{C}$ . With the positive and negative terminals short-circuited via connection to a total external resistance of $80 \pm 20 \text{ m}\Omega$ , the battery shall be left for 24 hours or until the difference between the surface temperature of the charged cell and the ambient temperature becomes not more than 20% of the maximum difference (whichever is the sooner), and the battery shall not fire or explode.		P
	b) The charged battery shall be left at an ambient temperature of $20 \pm 5^{\circ}\text{C}$ . With the positive and negative terminals short-circuited via connection to a total external resistance of $80 \pm 20 \text{ m}\Omega$ , the battery shall be left for 24 hours or until the difference between the temperature of the battery container and the ambient temperature becomes not more than 20% of the maximum difference, and the battery shall not fire or explode.		P
(2)	Free fall	See table 6	P
	Charged cell or battery is dropped three times from a level of 1,000 mm onto a concrete floor in a random direction, the battery shall not fire or explode.		P
	Provided that this does not apply to charged batteries weighing more than 7 kg.		P
(3)	Mechanical shock (crash hazard)	See table 7	P
	c) The charged cell or battery shall be secured to on an impact testing machine by means of a rigid mount. Then shock of the equal magnitude shall be applied to the battery in each of three mutually perpendicular directions (X, Y, and Z axes).		P
	d) The shock applied to the charged cell or battery shall be accelerated so that the minimum average acceleration will be $735 \text{ m/s}^2$ during the first 3 ms. The peak acceleration shall be between $1,228 \text{ m/s}^2$ and $1,716 \text{ m/s}^2$ .		P
(4)	Thermal abuse	See table 8	P
	The charged cell at $20 \pm 5^{\circ}\text{C}$ shall be placed in a gravity or circulating air-convection oven.		P
	The oven temperature shall then be increased to $130 \pm 2^{\circ}\text{C}$ at a rate of $5 \pm 2^{\circ}\text{C}/\text{min.}$ , left for 10 minutes, and then the battery shall not fire or explode.		P



METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9			
Clause	Requirement + Test	Result - Remark	Verdict
(5)	Crushing of cells	See table 9	P
	a) a) A charged cell shall be placed between two flat surfaces and a force of $13 \pm 1$ kN shall be applied by a crushing apparatus.		P
	b) The force shall be released when any of the following occurs: 1. the maximum force is applied 2. an abrupt voltage drop of one-third of the original voltage has been obtained, or 3. (3) there is 10% deformation of the battery height.		P
	c) Force shall be applied to charged cells so that the longitudinal axis of the cells becomes parallel with the flat surface of the crushing apparatus For charged cells that are prismatic, a similar test shall be performed by rotating a cell 90° around its longitudinal axis and it shall be ensured that force is applied to both the wide and narrow sides of the prismatic cells. At that time, one sample shall receive force in a single direction.		P
(6)	Low pressure	See table 10	P
	A charged cell shall be placed in a vacuum chamber, the chamber shall be closed, and then the chamber shall be gradually reduced to a pressure equal to or less than 11.6 kPa.		P
	After being kept in that pressure of the value in the vacuum chamber for six hours, the cell shall not fire, explode, or leak.		P
(7)	Overcharge	See table 11	P
	The cell discharged under the conditions specified in Annex Table 1-2 shall be provided. Then by using a power supply of not less than 10V, the battery shall be energized until it reaches 250% of the rated capacity or the test voltage with the designed charging current, and the battery shall not fire or explode.		P
(8)	Forced discharge	See table 12	P
	Polarity reversely charged at 1 ItA for 90 minutes, the discharged cell shall not fire or explode.		P
(9)	Cell protection against a high charging rate	See table 13	P
	The discharged cells shall not fire or explode when charged at a current three times the designed charging current, thereby fully charging it, or when a protective device used in the equipment or battery cuts off the charge current.		P

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9			
Clause	Requirement + Test	Result - Remark	Verdict
(10)	Forced internal short circuit of cells	See table 14	P
(11)	Function of the overcharge protection of batteries		P
	a) For batteries made of a one cell block, the voltage applied to the cell block during charging shall be measured.		N/A
	b) For batteries consisting of a series of two pieces or more of cell blocks, it shall be charged while measuring the voltage of each cell block and at the same time, one cell block shall forcibly be discharged and the voltages of the other cell blocks shall gradually be measured.	A series of two pieces of cell blocks.	P
	c) For batteries consisting of a series of connection of two pieces or more of cell blocks, a voltage exceeding the upper limited charging voltage specified in Annex Table 1-2 shall be applied to the cell block while measuring the voltage of each cell block. When the charging stops, the voltage shall be measured.		N/A
(12)	Free fall of appliance	See table 14	P
<b>4</b>	<b>Labeling</b>		P
	Rated voltage		P
	Rated capacity		P
	Method of labeling		P

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9			
Clause	Requirement + Test	Result - Remark	Verdict

<b>Table 1</b>	<b>Continuous low-rate charging</b>					P
Cell for HD-24V100AH(Single cell was chosen for test)						
		Charge temperature(°C)..... :			24,3	-
		Test temperature(°C)..... :			45,1	-
Constant charging voltage(V)					Result after 28 days	-
No.1	No.2	No.3	No.4	No.5		
4.23	4.23	4.25	4.25	4.23	Not fire, explode, or leak.	P
Cell for HD-96V40AH and HD-6V10AH(Single cell was chosen for test)						
		Charge temperature(°C)..... :			24,7	-
		Test temperature(°C)..... :			45,3	-
Constant charging voltage(V)					Result after 28 days	-
No.1	No.2	No.3	No.4	No.5		
4.23	4.23	4.25	4.25	4.23	Not fire, explode, or leak.	P

<b>Table 2</b>	<b>Vibration</b>					P	
Cell for HD-24V100AH(Single cell was chosen for test)							
		Charge temperature(°C)..... :			25,0	-	
		Test temperature(°C)..... :			24,6	-	
		Range of frequency(Hz)..... :			10-55(For X-axis, Y-axis and Z-axis)	-	
Vibration time(min)					Result after vibration	-	
Direction of vibration	No.1	No.2	No.3	No.4			No.5
X-axis direction	90	90	90	90			90
Y-axis direction	91	91	91	91			91
Z-axis direction	90	90	90	90	90	Not fire, explode, or leak. No damage.	
HD-24V100AH							
		Charge temperature(°C)..... :			23,9	-	
		Test temperature(°C)..... :			26,0	-	
		Range of frequency(Hz)..... :			10-55(For X-axis, Y-axis and Z-axis)	-	
Vibration time(min)					Result after vibration	-	

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9							
Clause	Requirement + Test					Result - Remark	Verdict
<b>Table 2</b>	<b>Vibration</b>						P
Direction of vibration	No.1	No.2	No.3	No.4	No.5		
X-axis direction	94	94	94	94	94	Not fire, explode, or leak. No damage.	P
Y-axis direction	90	90	90	90	90		
Z-axis direction	92	92	92	92	92		
Cell for HD-96V40AH and HD-6V10AH(Single cell was chosen for test)							
	Charge temperature(°C)..... :					24,7	-
	Test temperature(°C)..... :					24,5	-
	Range of frequency(Hz)..... :					10-55(For X-axis, Y-axis and Z-axis)	-
Vibration time(min)							-
Direction of vibration	No.1	No.2	No.3	No.4	No.5	Result after vibration	
X-axis direction	94	94	94	94	94	Not fire, explode, or leak. No damage.	P
Y-axis direction	92	92	92	92	92		
Z-axis direction	92	92	92	92	92		
HD-96V40AH							
	Charge temperature(°C)..... :					26,0	-
	Test temperature(°C)..... :					25,7	-
	Range of frequency(Hz)..... :					10-55(For X-axis, Y-axis and Z-axis)	-
Vibration time(min)							-
Direction of vibration	No.1	No.2	No.3	No.4	No.5	Result after vibration	
X-axis direction	91	91	91	91	91	Not fire, explode, or leak. No damage.	P
Y-axis direction	92	92	92	92	92		
Z-axis direction	90	90	90	90	90		

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METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS  
FOR ELECTRICAL APPLIANCES AND MATERIALS  
Paragraph 1, Appendix 9

Clause	Requirement + Test	Result - Remark	Verdict
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<b>Table 2</b>		<b>Vibration</b>					P	
HD-6V10AH								
	Charge temperature(°C)..... :					25,0	-	
	Test temperature(°C)..... :					23,9	-	
	Range of frequency(Hz)..... :					10-55(For X-axis, Y-axis and Z-axis)	-	
Vibration time(min)						Result after vibration	-	
Direction of vibration	No.1	No.2	No.3	No.4	No.5			
X-axis direction	91	91	91	91	91			Not fire, explode, or leak. No damage.
Y-axis direction	94	94	94	94	94			
Z-axis direction	94	94	94	94	94			

<b>Table 3</b>		<b>Battery enclosure test at high ambient temperature</b>					P	
	Charge temperature(°C)..... :					24,7	-	
	Test temperature(°C)..... :					50,1	-	
Test duration(hour)						Result	-	
Model	No.1	No.2	No.3					
HD-24V100AH	7.1	7.1	7.1					Not fire, explode, or leak. No damage.
HD-96V40AH	7.1	7.1	7.1					
HD-6V10AH	7.1	7.1	7.1					

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9					
Clause	Requirement + Test			Result - Remark	Verdict
<b>Table 4</b>	<b>Temperature cycling</b>				P
	Step 1 Leave the charged cells or batteries at $75 \pm 2^{\circ}\text{C}$ for four hours. Step 2 Change the temperature to $20 \pm 5^{\circ}\text{C}$ within 30 minutes and left the equipment for at least two hours. Step 3 Change the temperature to – (minus) $20 \pm 2^{\circ}\text{C}$ within 30 minutes and the equipment shall be left for four hours. Step 4 Change the temperature to $20 \pm 5^{\circ}\text{C}$ within 30 minutes and left the equipment for at least two hours. Step 5 Steps 1 to 4 repeat another four times. Step 6 Store the charged cells at $20 \pm 5^{\circ}\text{C}$ for seven days, and then conduct a visual inspection.				-
Test Result					-
	HD-24V100AH	HD-96V40AH	HD-96V40AH		-
No.1	Not fire, explode, or leak. No damage.	Not fire, explode, or leak. No damage.	Not fire, explode, or leak. No damage.		P
No.2	Not fire, explode, or leak. No damage.	Not fire, explode, or leak. No damage.	Not fire, explode, or leak. No damage.		P
No.3	Not fire, explode, or leak. No damage.	Not fire, explode, or leak. No damage.	Not fire, explode, or leak. No damage.		P
No.4	Not fire, explode, or leak. No damage.	Not fire, explode, or leak. No damage.	Not fire, explode, or leak. No damage.		P
No.5	Not fire, explode, or leak. No damage.	Not fire, explode, or leak. No damage.	Not fire, explode, or leak. No damage.		P

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9						
Clause	Requirement + Test				Result - Remark	Verdict
<b>Table 5</b>	<b>External short circuit</b>					P
a.	External short circuit for cell					P
Cell for HD-24V100AH(Single cell was chosen for test)						
	Charge temperature(°C)..... :				50,0	-
	Test temperature(°C)..... :				55,3	-
Test Result						-
No.1	No.2	No.3	No.4	No.5		
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.		P
	Charge temperature(°C)..... :				10	-
	Test temperature(°C)..... :				56,1	-
Test Result						-
No.6	No.7	No.8	No.9	No.10		
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.		P
Cell for HD-96V40AH and HD-6V10AH(Single cell was chosen for test)						
	Charge temperature(°C)..... :				50,2	--
	Test temperature(°C)..... :				55,7	--
Test Result						--
No.1	No.2	No.3	No.4	No.5		
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.		P
	Charge temperature(°C)..... :				10,2	--
	Test temperature(°C)..... :				55,3	--
Test Result						--
No.6	No.7	No.8	No.9	No.10		
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.		P
b.	External short circuit for battery					P
HD-24V100AH						
	Charge temperature(°C)..... :				45,2	--
	Test temperature(°C)..... :				24,7	--
Test Result						--
No.1	No.2	No.3	No.4	No.5		

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9						
Clause	Requirement + Test				Result - Remark	Verdict
<b>Table 5</b>	<b>External short circuit</b>					P
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
	Charge temperature(°C)..... : 10,1					--
	Test temperature(°C)..... : 26,0					--
Test Result						
No.6	No.7	No.8	No.9	No.10		--
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
HD-96V40AH						
	Charge temperature(°C)..... : 45,1					--
	Test temperature(°C)..... : 25,0					--
Test Result						
No.1	No.2	No.3	No.4	No.5		--
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
	Charge temperature(°C)..... : 10,0					--
	Test temperature(°C)..... : 26,1					--
Test Result						
No.6	No.7	No.8	No.9	No.10		--
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
HD-6V10AH						
	Charge temperature(°C)..... : 45,1					--
	Test temperature(°C)..... : 24,1					--
Test Result						
No.1	No.2	No.3	No.4	No.5		--
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
	Charge temperature(°C)..... : 10,0					--
	Test temperature(°C)..... : 25,1					--
Test Result						
No.6	No.7	No.8	No.9	No.10		--
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P



METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9						
Clause	Requirement + Test				Result - Remark	Verdict
<b>Table 6</b>	<b>Free fall</b>					P
HD-24V100AH						
	Charge temperature(°C)..... :				24,6	--
	Test temperature(°C)..... :				23,9	--
Test Result						--
No.1	No.2	No.3	No.4	No.5		
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.		P
HD-96V40AH						
	Charge temperature(°C)..... :				24,0	--
	Test temperature(°C)..... :				23,7	--
Test Result						--
No.1	No.2	No.3	No.4	No.5		
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.		P
HD-6V10AH						
	Charge temperature(°C)..... :				24,1	--
	Test temperature(°C)..... :				23,5	--
Test Result						--
No.1	No.2	No.3	No.4	No.5		
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.		P

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9						
Clause	Requirement + Test				Result - Remark	Verdict
<b>Table 7</b>	<b>Mechanical shock (crash hazard)</b>					P
	Charge temperature(°C)..... :				25,0	--
	Test temperature(°C)..... :				24,7	--
	Average acceleration during the first 3 ms (m/s <sup>2</sup> )... :				741	--
	Peak acceleration(m/s <sup>2</sup> )..... :				1459	--
Test Result						--
	No.1	No.2	No.3	No.4	No.5	--
HD-24V100AH	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
HD-96V40AH	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
HD-6V10AH	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9						
Clause	Requirement + Test				Result - Remark	Verdict
<b>Table 8</b>	<b>Thermal abuse</b>					P
Cell for HD-24V100AH(Single cell was chosen for test)						
	Charge temperature(°C)..... :				45,0	-
	Test temperature(°C)..... :				131,6	-
Test Result						-
No.1	No.2	No.3	No.4	No.5		
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P	
	Charge temperature(°C)..... :				10,0	-
	Test temperature(°C)..... :				131,3	-
Test Result						-
No.6	No.7	No.8	No.9	No.10		
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P	
Cell for HD-96V40AH and HD-6V10AH(Single cell was chosen for test)						
	Charge temperature(°C)..... :				45,3	-
	Test temperature(°C)..... :				131,1	-
Test Result						-
No.1	No.2	No.3	No.4	No.5		
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P	
	Charge temperature(°C)..... :				10,0	-
	Test temperature(°C)..... :				131,6	-
Test Result						-
No.6	No.7	No.8	No.9	No.10		
Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P	

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9						
Clause	Requirement + Test				Result - Remark	Verdict
<b>Table 9</b>	<b>Thermal abuse</b>					P
Cell for HD-24V100AH(Single cell was chosen for test)						
	Charge temperature(°C)..... :				45,5	-
	Test temperature(°C)..... :				45,3	-
Test Result						-
Wide side	No.1	No.2	No.3	No.4	No.5	P
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	
Narrow side	No.6	No.7	No.8	No.9	No.10	-
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
	Charge temperature(°C)..... :				10,1	-
	Test temperature(°C)..... :				10,0	-
Test Result						-
Wide side	No.1	No.2	No.3	No.4	No.5	P
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	
Narrow side	No.6	No.7	No.8	No.9	No.10	-
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
Cell for HD-96V40AH and HD-6V10AH(Single cell was chosen for test)						
	Charge temperature(°C)..... :				45,1	-
	Test temperature(°C)..... :				45,1	-
Test Result						-
Wide side	No.1	No.2	No.3	No.4	No.5	P
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	
Narrow side	No.6	No.7	No.8	No.9	No.10	-
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
	Charge temperature(°C)..... :				10,0	-

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9			
Clause	Requirement + Test	Result - Remark	Verdict

<b>Table 9</b>	<b>Thermal abuse</b>					P
	Test temperature(°C)..... :		10,0			-
Test Result						-
Wide side	No.1	No.2	No.3	No.4	No.5	P
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	
Narrow side	No.6	No.7	No.8	No.9	No.10	-
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P

<b>Table 10</b>	<b>Thermal abuse</b>			P
	Charge temperature(°C)..... :		24,5	-
	Test pressure(kPa)..... :		10,9	-
	Test duration(hour)..... :		7,5	-
Test Result				-
Cell for HD-24V100AH	No.1	No.2	No.3	P
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	
Cell for HD-96V40AH and HD-6V10AH	No.1	No.2	No.3	-
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9						
Clause	Requirement + Test				Result - Remark	Verdict
<b>Table 11</b>	<b>Overcharge</b>					P
	Test condition: <input checked="" type="checkbox"/> Reach 250% of the rated capacity. <input type="checkbox"/> Reach the test voltage with the designed charging current. Test voltage:					-
	Charge temperature(°C).....:				45,1	-
Test Result						-
HD-24V100AH	No.1	No.2	No.3	No.4	No.5	P
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	
HD-96V40AH	No.1	No.2	No.3	No.4	No.5	-
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
HD-6V10AH	No.1	No.2	No.3	No.4	No.5	-
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
	Charge temperature(°C).....:				10,0	-
Test Result						-
HD-24V100AH	No.6	No.7	No.8	No.9	No.10	P
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	
HD-96V40AH	No.6	No.7	No.8	No.9	No.10	-
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
HD-6V10AH	No.6	No.7	No.8	No.9	No.10	-
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9							
Clause	Requirement + Test					Result - Remark	Verdict
<b>Table 12</b>	<b>Forced discharge</b>						P
	Charge temperature(°C)..... :					45,3	-
	Charge current(mA)..... :					In accordance with specification.	-
	Charge duration(minute)..... :					94	-
Test Result							-
HD-24V100AH	No.1	No.2	No.3	No.4	No.5		
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P	
HD-96V40AH	No.1	No.2	No.3	No.4	No.5	-	
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P	
HD-6V10AH	No.1	No.2	No.3	No.4	No.5	-	
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P	
	Charge temperature(°C)..... :					10,0	-
	Charge current(mA)..... :					In accordance with specification.	-
	Charge duration(minute)..... :					97	-
Test Result							-
HD-24V100AH	No.6	No.7	No.8	No.9	No.10		
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P	
HD-96V40AH	No.6	No.7	No.8	No.9	No.10	-	
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P	
HD-6V10AH	No.6	No.7	No.8	No.9	No.10	-	
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P	

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METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9							
Clause	Requirement + Test					Result - Remark	Verdict
<b>Table 13</b>	<b>Cell protection against a high charging rate</b>						P
	Charge temperature(°C)..... :					45,1	-
	Charge current(mA)..... :					In accordance with specification.	-
Test Result							-
Cell for HD-24V100AH	No.1	No.2	No.3	No.4	No.5		
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.		P
Cell for HD-96V40AH and HD-6V10AH	No.1	No.2	No.3	No.4	No.5		-
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.		P
	Charge temperature(°C)..... :					10,0	-
	Charge current(mA)..... :					In accordance with specification.	-
Test Result							-
Cell for HD-24V100AH	No.6	No.7	No.8	No.9	No.10		
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.		P
Cell for HD-96V40AH and HD-6V10AH	No.6	No.7	No.8	No.9	No.10		-
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.		P



METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9						
Clause	Requirement + Test				Result - Remark	Verdict
<b>Table 14</b>	<b>Forced internal short circuit of cells</b>					P
	<p>Step 1 At an ambient temperature of 20 ± 5°C and the dew point of -25°C or below, the sample charged cell shall be dismantled and the winding core shall be removed from the charged cell enclosure. Then a small L-shaped piece of metallic nickel (0.2-mm high by 0.1-mm wide, with each side 1-mm long) shall be inserted between the positive active material and negative active material as laid out in Table 2.</p> <p>Step 2 After inserting the small piece, the winding core shall be reassembled to its original form, and sealed into a bag without permeability of electrolyte vapors. The time period between dismantling of the charged cell and closing of the bag shall be within 30 minutes.</p> <p>Step 3 The closed bag containing the winding core shall be stored for 45 ± 15 minutes at each the highest test temperature and the lowest test temperature specified in Annex Table 1-2. Then the winding core shall be taken out from the bag.</p> <p>Step 4 Immediately after taking out the winding core from the bag, a pressing jig as shown in Table 2 shall touch on the winding core, where said small piece of metallic nickel is inserted, and the pressing jig shall be lowered at a rate of 0.1mm/second at the highest and the lowest test temperatures specified in Annex Table 1-2.</p> <p>Step 5 The lowering of the pressing jig shall be stopped when a voltage drop of over 50 mV is obtained or the pressure reaches 800 N (whichever occurs earlier). Provided that, for prismatic cells, the lowering of the pressing jig shall be stopped when the pressure reaches 400 N.</p> <p>Step 6 The test shall be conducted from steps 1 to 5 until five samples prove to have undergone a voltage drop. Provided that there is a maximum number of ten test samples.</p>					-
	Charge temperature(°C)..... :				45,1	-
	Test temperature(°C)..... :				45,2	-
Test Result						-
Cell for HD- 24V100AH	No.1	No.2	No.3	No.4	No.5	P
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	
Cell for HD- 96V40AH and HD- 6V10AH	No.1	No.2	No.3	No.4	No.5	-
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
	Charge temperature(°C)..... :				10,1	-
	Test temperature(°C)..... :				10,0	-
Test Result						-
Cell for	No.6	No.7	No.8	No.9	No.10	

METI ORDINANCE ESTABLISHING TECHNICAL REQUIREMENTS FOR ELECTRICAL APPLIANCES AND MATERIALS Paragraph 1, Appendix 9							
Clause	Requirement + Test					Result - Remark	Verdict

<b>Table 14</b>	<b>Forced internal short circuit of cells</b>					P
HD-24V100AH	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
Cell for HD-96V40AH and HD-6V10AH	No.6	No.7	No.8	No.9	No.10	--
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P

<b>Table 15</b>	<b>Forced internal short circuit of cells</b>					P
	Test temperature(°C)..... :			23,5		-
	Drop height (mm)..... :			1000		-
Test Result						-
HD-24V100AH	No.1	No.2	No.3	No.4	No.5	P
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	
HD-96V40AH	No.1	No.2	No.3	No.4	No.5	-
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P
HD-6V10AH	No.1	No.2	No.3	No.4	No.5	-
	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	Not fire, explode, or leak.	P

Photo document

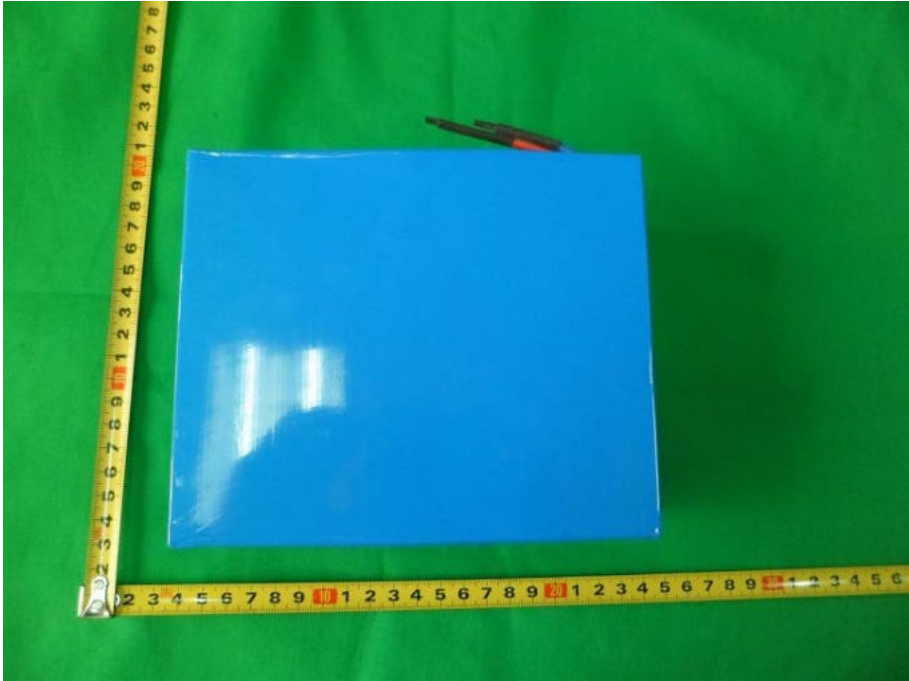


Fig. 1 Overview



Fig. 2 Overview

Photo document

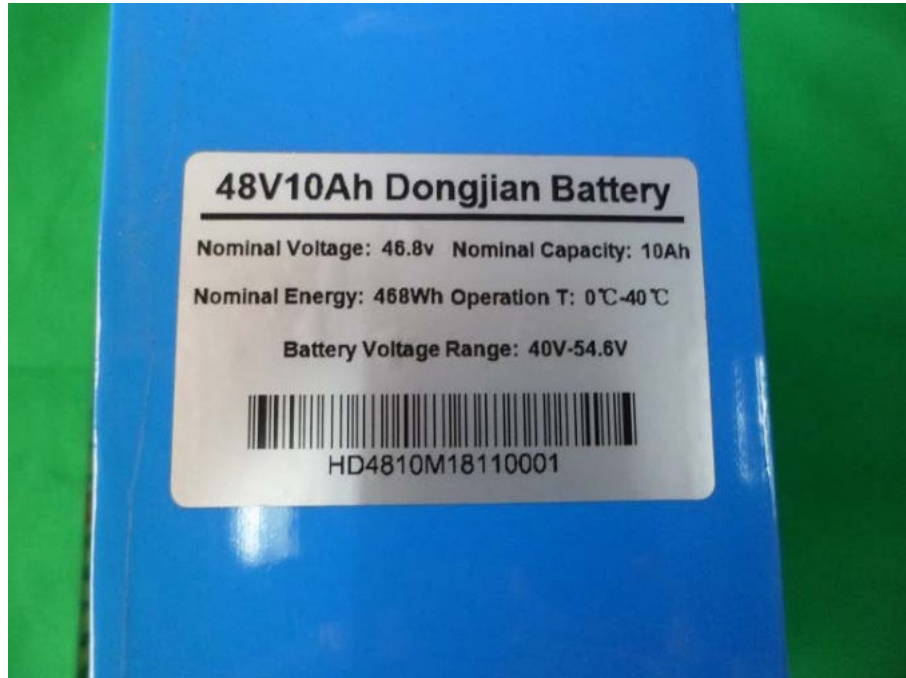


Fig. 3 Overview



Fig. 4 Open view

Photo document

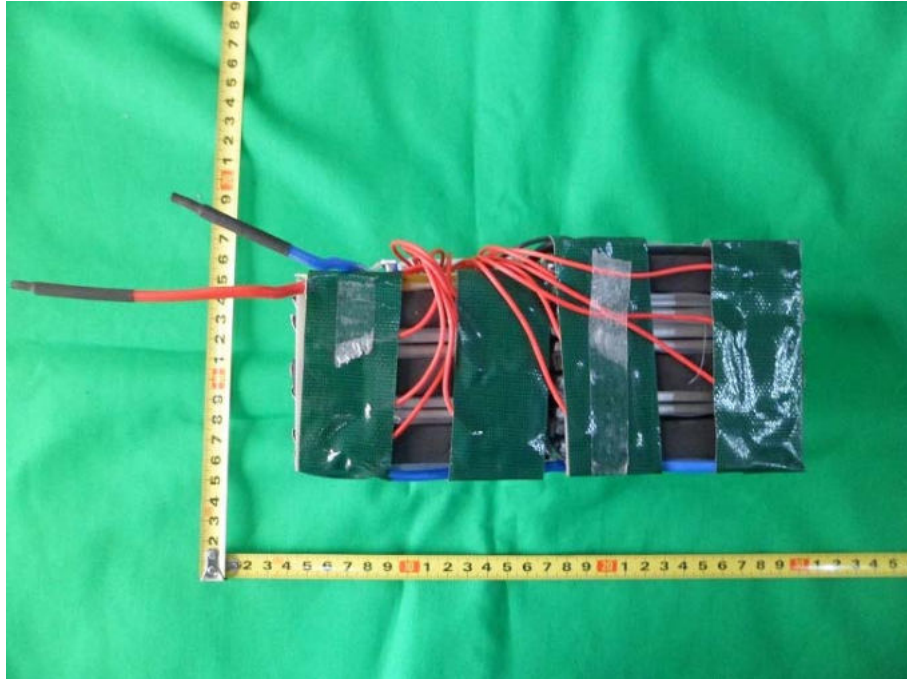


Fig. 5 Open view

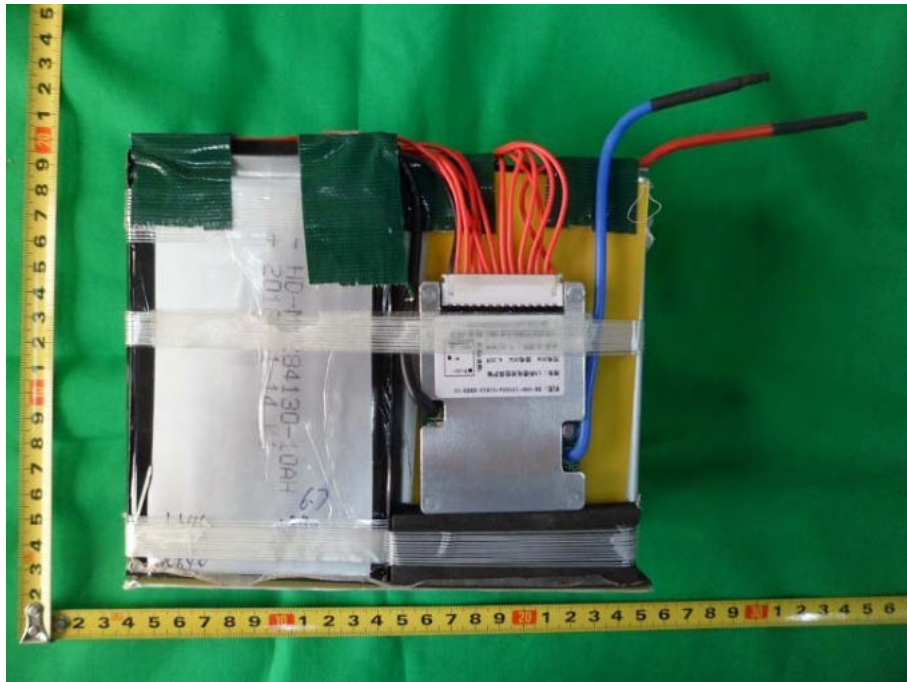


Fig. 6 Open view

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Fig. 7 Open view

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The logo for VIC Testing and Certification Ltd, featuring the letters 'VIC' in a bold, blue, serif font with a slight 3D effect.