

TEST REPORT
EN 60086-4
Primary batteries
Part 4: Safety of lithium batteries

Report Number : MTS/JNY/E18060371 Rev.0
Date of issue : June 29, 2018
Total number of pages 12

Applicant's name : WUHAN FANSO TECHNOLOGY CO., LTD
Address : Sitai Road 5, Sitai Industrial Park, Hanyang District, Wuhan City, China

Test specification:

Standard : EN 60086-4: 2015
Test procedure : Test report
Non-standard test method : N/A

Test Report Form No. : IEC60086_4B
Test Report Form(s) Originator : Intertek Semko AB
Master TRF : Dated 2015-03


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Test item description	3.6V Lithium battery
Trade Mark	FANSO
Manufacturer	Same as applicant
Model/Type reference	ER14250H, ER14550H, ER14505M, ER26500H, ER26500M, ER17505H, ER17505M , ER18505H , ER18505M, ER34615H , ER34615M, ER17335, ER17335M , ER2450 , ER14335, ER14335M, ER13150, ER10450, ER341245H, ER261020, ER14505S, ER26500S, ER14250S, ER251020S, ER341245S, ER331270MS, ER331270MRS, ER9V, ER14250M, ER32L100, ER32L065
Ratings	3.6VDC, 4000mAh

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):	
<input checked="" type="checkbox"/> CB Testing Laboratory:	Shenzhen Most Technology Service Co., Ltd.
Testing location/ address.....:	No.5, 2nd, Langshan Road, North District, Hi-tech Industry Park Nanshan, Shenzhen, Guangdong, China
<input type="checkbox"/> Associated CB Testing Laboratory:	
Testing location/ address.....:	
Tested by (name, function, signature)	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  <p>Jordan Yi</p> </div> <div style="text-align: center;"> <p><i>Jordan Yi</i></p> </div> </div>
Approved by (name, function, signature)....:	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> <p>Jack Cheng</p> </div> <div style="text-align: center;"> <p><i>Jack Cheng</i></p> </div> </div>
<input type="checkbox"/> Testing procedure: TMP/CTF Stage 1:	
Testing location/ address.....:	
Tested by (name, function, signature)	
Approved by (name, function, signature)....:	
<input type="checkbox"/> Testing procedure: WMT/CTF Stage 2:	
Testing location/ address.....:	
Tested by (name + signature)	
Witnessed by (name, function, signature)..:	
Approved by (name, function, signature)....:	
<input type="checkbox"/> Testing procedure: SMT/CTF Stage 3 or 4:	
Testing location/ address.....:	
Tested by (name, function, signature)	
Witnessed by (name, function, signature)..:	
Approved by (name, function, signature)....:	
Supervised by (name, function, signature) :	

<p>List of Attachments (including a total number of pages in each attachment):</p> <p>Attachment: Photo documentation (3 pages)</p>																													
<p>Summary of testing:</p>																													
<p>Tests performed (name of test and test clause):</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 15%;">Clause(s)</th> <th style="text-align: left;">Test(s)</th> </tr> </thead> <tbody> <tr><td>6.4.1</td><td>Altitude</td></tr> <tr><td>6.4.2</td><td>Thermal cycling</td></tr> <tr><td>6.4.3</td><td>Vibration</td></tr> <tr><td>6.4.4</td><td>Shock</td></tr> <tr><td>6.5.1</td><td>External short-circuit</td></tr> <tr><td>6.5.2</td><td>Impact</td></tr> <tr><td>6.5.3</td><td>Crush</td></tr> <tr><td>6.5.4</td><td>Forced discharge</td></tr> <tr><td>6.5.5</td><td>Abnormal charging</td></tr> <tr><td>6.5.6</td><td>Free fall</td></tr> <tr><td>6.5.7</td><td>Thermal abuse</td></tr> <tr><td>6.5.8</td><td>Incorrect installation</td></tr> <tr><td>6.5.9</td><td>Overdischarge</td></tr> </tbody> </table>	Clause(s)	Test(s)	6.4.1	Altitude	6.4.2	Thermal cycling	6.4.3	Vibration	6.4.4	Shock	6.5.1	External short-circuit	6.5.2	Impact	6.5.3	Crush	6.5.4	Forced discharge	6.5.5	Abnormal charging	6.5.6	Free fall	6.5.7	Thermal abuse	6.5.8	Incorrect installation	6.5.9	Overdischarge	<p>Testing location:</p> <p>No.5, 2nd, Langshan Road, North District, Hi-tech Industry Park Nanshan, Shenzhen, Guangdong, China</p>
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6.5.9	Overdischarge																												
<p>Summary of compliance with National Differences:</p> <p>N/A</p> <p><input type="checkbox"/> The product fulfils the requirements of _____ (insert standard number and edition and delete the text in parenthesis, leave it blank or delete the whole sentence, if not applicable)</p>																													

Copy of marking plate

The artwork below may be only a draft.

3.6V Lithium battery
ER18505H 3.6V 4000mAh
manufacturer: WUHAN FANSO TECHNOLOGY CO., LTD
date of manufacture: 2018/03/16
caution:
No disassembly, impact, or extrusion. In case of serious
expansion, do not continue to use. Do not place in high
temperature. Do not use the battery after it is immersed in water!

Test item particulars:					
Classification of installation and use: N/A					
Supply Connection: N/A					
.....:					
Possible test case verdicts:					
- 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)					
Testing:					
Date of receipt of test item: 2018-05-21					
Date (s) of performance of tests: 2018-05-21 to 2018-06-21					
General remarks:					
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.					
Throughout this report a <input type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.					
Manufacturer's Declaration per sub-clause 4.2.5 of IEC60086-2:					
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:					<input type="checkbox"/> Yes <input type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.					
Name and address of factory (ies): Same as applicant					
General product information:					
The main features of these batteries are shown as below:					
Nominal capacity	Nominal voltage	Maximum Discharge Current	Cut-off Voltage	Upper operating temperature	lower operating temperature
4000mAh	3.6V	70mA	2.0V	-55°C	85°C
Weight: Approx. 29.0g					
Dimension: 49.5 x 18.5mm					

EN 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict
4	REQUIREMENTS FOR SAFETY		
4.1	Design consideration		P
	a) Abnormal temperature rise above the critical value		
	b) Control of temperature increases in the battery		
	c) Lithium cells and batteries shall be designed to relieve excessive internal pressure or to preclude a violent rupture under conditions of transport, intended use and reasonably foreseeable misuse.		P
4.2	Quality plan		P
	The manufacturer shall prepare and implement a quality plan defining the procedures for the inspection of materials, components, cells and batteries during the course of manufacture, to be applied to the total process of producing a specific type of battery. Manufactures should understand their process capabilities and should institute the necessary process controls as they relate to product safety.	Considered.	P
5	SAMPLING		
5.1	General		P
5.2	Test samples	(See table 1)	P
6	TESTING AND REQUIREMENTS		P
6.1	General		P
6.1.1	Test application	(See 6.2)	P
	s: cell or single cell battery		P
	m: multi cell battery		N/A
6.1.3	Ambient temperature	24°C	P
6.1.4	Parameter measurement tolerances	Considered.	P
6.1.5	Predischarge	Considered.	P
6.1.6	Additional cells		--
6.2	Evaluation of test criteria		--
6.2.1	Short-circuit		--
6.2.2	Excessive temperature rise		--
6.2.3	Leakage		--
6.2.4	Venting		--
6.2.5	Fire		--
6.2.6	Rupture		--
6.2.7	Explosion		--

EN 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict
6.3	Tests and requirements – Overview	(See table 4 in the standard)	P
6.4	Tests for intended use See the standard		P
6.4.1	Test A: Altitude	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.4.2	Test B: Thermal cycling	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.4.3	Test C: Vibration	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.4.4	Test D: Shock	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5	Tests for reasonably foreseeable misuse	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.1	Test E: External short-circuit	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.2	Test F: Impact	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.3	Test G: Crush	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.4	Test H: Forced discharge	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.5	Test I: Abnormal charging	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.6	Test J: Free fall	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.7	Test K: Thermal abuse	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.8	Test L: Incorrect installation	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.5.9	Test M: Overdischarge	(See appended Table 1 and Table 6.4.1 – 6.5.9)	P
6.6	Information to be given in the relevant specification	Considered.	P
	a) Predischage current or resistive load and end-point voltage specified by the manufacturer		P
	b) Shape: prismatic, flexible, coin or cylindrical Diameter: not more than 20 mm or greater than 20 mm.		P
	c) Maximum continuous discharge current specified by the manufacturer for test H; NOTE Forced discharge of a cell can occur when it is connected in series with other cells and when it is not protected with a bypass diode.		P
	d) Rated capacity specified by the manufacturer for test H.....		P

EN 60086-4			
Clause	Requirement + Test	Result - Remark	Verdict
	<p>e) Abnormal charging current declared by the manufacturer for test I:</p> <p>NOTE Abnormal charging of a cell can occur when it is connected in series with other cells and one cell is reversed or when it is connected in parallel with a power supply and the protective devices do not operate correctly.</p> <p>and</p>		P
	<p>f) Normal reverse current declared by the manufacturer which can be applied to the battery during its operating life.....:</p> <p>NOTE Normal reverse current flow through a cell can occur when it is connected in parallel with a power supply and the protected devices are operating properly.</p>		P
7	INFORMATION FOR SAFETY		P
7.1	Safety precautions during design of equipment		P
7.1.1	General		P
7.1.2	Charge protection		P
7.1.3	Parallel connection		N/A
7.2	Safety precautions during handling of batteries		P
7.3	Packaging		P
7.4	Handling of battery cartons		P
7.5	Transport	Considered.	P
7.5.1	General	UN38.3 test report provided.	P
7.5.2	Air transport		P
7.5.3	Sea transport		P
7.5.4	Land transport		P
7.6	Display and storage		P
7.7	Disposal		P
8	INSTRUCTIONS FOR USE		p
9	MARKING		P
9.1	General		P
9.2	Small batteries		N/A
9.3	Safety pictograms		N/A

		TABLE 1 and 6.4.1 – 6.5.9			P
Tests A-E	Cells and single cell batteries	Undischarged	10	NM, NL, NV, NC, NR, NE, NF	P
		Fully discharged	10	NM, NL, NV, NC, NR, NE, NF	P
	Multi cell batteries	Undischarged	4	--	--
		Fully discharged	4	--	--
Test F or G	Cells and single cell batteries	Undischarged	5	NT, NE, NF	P
		Fully discharged	5	NT, NE, NF	P
	Multi cell batteries	Undischarged	5 component cells	--	--
		Fully discharged	5 component cells	--	--
Test H	Cells and single cell batteries	Fully discharged	10	NE, NF	P
	Multi cell batteries		10 component cells	--	--
Test I to K	Cells and single cell batteries	Undischarged	5	NV, NE, NF	P
	Multi cell batteries		5	--	--
Test L	Cells and single cell batteries	Undischarged	5 (+15)	NE, NF	P
	Multi cell batteries		N/A	--	--
Test M	Cells and single cell batteries	50% predischarged	5 (+15)	NE, NF	P
	Multi cell batteries		N/A	--	--
	Cells and single cell batteries	75% predischarged	5 (+15)	NE, NF	P
	Multi cell batteries		N/A	--	--

Supplementary information:

NC: No short-circuit, NE: No explosion, NF: No fire, NL: No leakage, NM: No mass loss, NR: No rupture
 NT: No excessive temperature rise, NV: No venting.

Attachment: Photos of the product

Photo 1

Description: Outer view



Photo 2

Description: Outer view

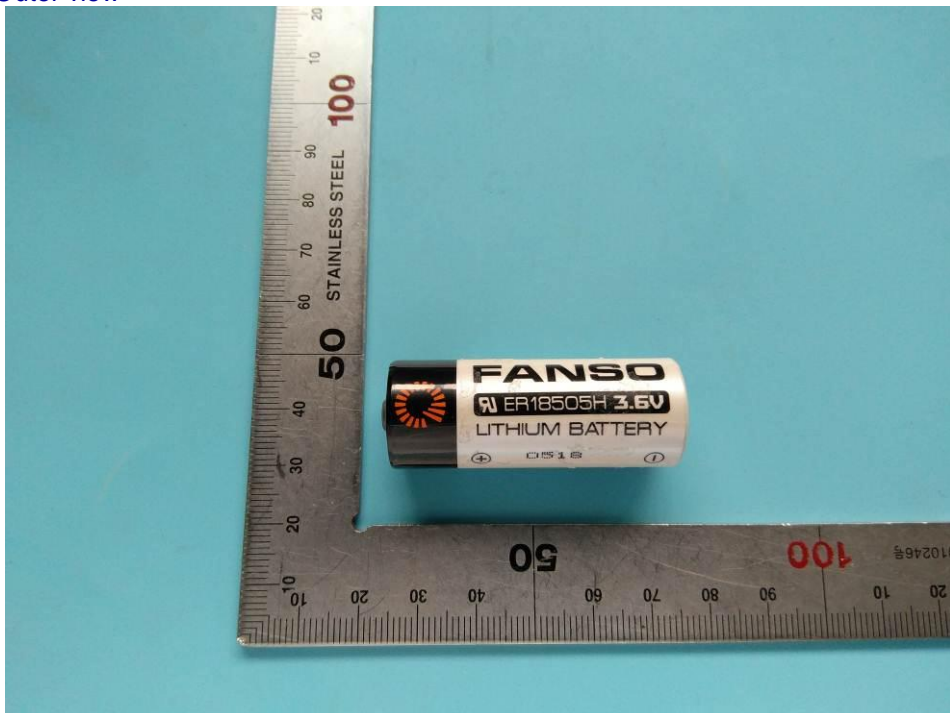


Photo 3

Description: Outer view



Photo 4

Description: Outer view



Photo 5

Description: Internal view



-- End of Report --