

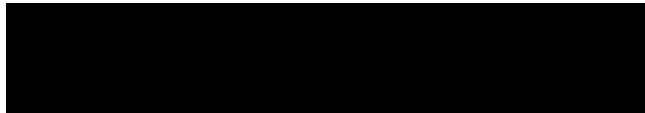
File MH48852
Project 12CA06443

June 07, 2012

REPORT

On

COMPONENT - Lithium Batteries



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DESCRIPTION

PRODUCT COVERED:

USR Component - Secondary, lithium-ion cells as noted below.

Model Number	Chemistry	Shape/Type
FST18650-2000mAh, FST18650BE-2000mAh , FST18650-2200mAh, FST18650NB-2200mAh , FST18650-2600mAh, FST18650-2500mAh	Cathode: $\text{LiNi}_x\text{Mn}_y\text{Co}_{(1-x-y)}\text{O}_2$ ===== $\text{Li}_{(1-a)}\text{Ni}_x\text{Mn}_y\text{Co}_{(1-x-y)}\text{O}_2 + a\text{Li}^+ + (1-a)\text{e}^-$ Anode: $6\text{C} + a\text{Li}^+ + (1-a)\text{e}^-$ ===== Li_aC_6	Cylindrical

ELECTRICAL RATING:

See also Conditions of Acceptability for charge limit specifications.

Model Number	Voltage (Nominal), Vdc	Capacity, (Nominal), Ah
FST18650-2000mAh	3.6	2.0
FST18650BE-2000mAh	3.6	2.0
FST18650-2200mAh	3.6	2.2
FST18650NB-2200mAh	3.6	2.2
FST18650-2600mAh	3.6	2.6
FST18650-2500mAh	3.6	2.5

Model Number	Upper limit charging voltage, Vdc	Maximum charging current, mA	Upper temperature limit	Lower temperature
FST18650-2000mAh	4.25	2000	45 degree C	10 degree C
FST18650BE-2000mAh	4.25	2000	45 degree C	10 degree C
FST18650-2200mAh	4.25	2200	45 degree C	10 degree C
FST18650NB-2200mAh	4.25	2200	45 degree C	10 degree C
FST18650-2600mAh	4.2	2600	45 degree C	10 degree C
FST18650-2500mAh	4.25	2500	45 degree C	10 degree C

TECHNICAL CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

USR indicates compliance with the requirements in the UL Standard for Safety for Lithium Batteries, UL 1642 Fifth Edition, Dated March 13, 2012. including revisions through June 23, 2015.

Use - For use only in products where the acceptability of the combination is determined by UL LLC.

Model Different:

Models FST18650BE-2000mAh, FST18650NB-2200mAh are identical to Models FST18650-2000mAh, FST18650-2200mAh except for model designation.

Conditions of Acceptability - The use of these cells may be considered generally acceptable under the conditions given below:

1. The cells are intended for use at ordinary temperatures where anticipated high temperature excursions are not expected to exceed 100°C (212°F) or as noted below.

Model	Manufacturer's Maximum Specified Charge and Discharge Temperature, °C
FST18650-2000mAh, FST18650BE-2000mAh, FST18650-2200mAh,	Charge : Max.45 degree C; Discharge: Max.60 degree C.
FST18650-2600mAh, FST18650-2500mAh	Charge: 0 to 45 degree C; Discharge: -20 to 60 degree C.

2. These cells are to be used only in devices where servicing of the cell circuit and installation and replacement of the lithium-ion cells will be done by a trained technician. These cells are intended to be installed in a protective enclosure in the end use application that prevents access to the cells and associated cell circuitry by the user during charging and discharging of the cells.
3. These cells shall be installed within an enclosure that provides mechanical protection in the end use application, so that they protected from physical abuse that could result in damage to the cells including internal short circuits or shorting of terminals. Enclosures provided in the end use application shall prevent access to the cells through the use of simple tools or through openings.
4. The suitability of these cells for multi cell applications including series or parallel connections shall be determined in the end use. Cells used in multi-cell applications shall be of the same type, ratings and age to prevent the potential for explosions and fire due to cell imbalance.
5. For cells intended for series applications, protection shall be provided in the end use application to prevent cell reversal due to a forced discharge condition. A forced discharge test shall be conducted in the end use application for series connected cell applications.

6. These cells have been subjected to an abnormal charge test which subjects the cells to a constant current (CC) charge method followed by a constant voltage (CV) charge method. The test limit parameters for the abnormal charge test are outlined in the table below. The charging circuit in the end use application shall limit the charging current and charging voltage to the levels noted in the table under both normal and single fault condition. If the charging current and voltage in the end use application cannot be maintained at or below the levels noted in the table or if the charging method is different from the CC/CV method noted above, additional evaluation and testing may be necessary.

Model	Maximum Charging Current (Ic), A	Maximum Charging Voltage (Vc), V dc
FST18650- 2000mAh	2.0	4.2
FST18650BE- 2000mAh	2.0	4.2
FST18650- 2200mAh	2.2	4.25
FST18650NB- 2200mAh	2.2	4.25
FST18650- 2600mAh	2.6	4.25
FST18650- 2500mAh	2.5	4.25

*

- *7. The following marking and instruction information is provided as guidance for replaceable battery packs that can be installed by other than trained technicians that would employ the cells covered in this report. These marking and instruction recommendations do not apply to the cells themselves. The need to include these markings and instructions shall be determined in the end use application.
- A. A user replaceable lithium ion battery pack that employs these cells shall be marked with the following or equivalent:
- "WARNING - Risk of Fire, Explosion, and Burns. Do No Disassembly, Crush, Heat Above [(manufacturer's recommended charge/discharge temperature)/(100C (212F))] or Incinerate.
- B. The packaging of a user replaceable lithium ion battery pack that employs these cells shall be marked with the following or equivalent:
- "CAUTION - Risk of Fire and Burns. Do No Disassemble, Heat Above [(manufacturer's recommended charge/discharge temperature)/ (100°C (212°F))] or Incinerate. Keep Battery Out of Reach of Children and in Original Package Until Ready to Use. Dispose of Used Batteries Promptly According to Local Recycling or Waste Regulations.
- C. Instructions packaged with a user replaceable lithium ion battery pack that uses these cells shall include the following or equivalent:
- "CAUTION - The battery used in this device may present a risk of fire or explosion when heated above [(manufacturer's recommended charge/discharge temperature)/(100°C (212°F))] or incinerated. Replace battery with (battery manufacturer's name or end product manufacturer's name and part number) only. Use of another battery may present a risk of fire or explosion."
- The instructions shall also include information regarding how to replace the battery pack ending with the following statement or equivalent:
- "Dispose of used battery promptly. Keep away from children. Do not disassemble and do not dispose of in fire."

MARKINGS/INSTRUCTIONS:

The Recognized manufacturer's name, trade name or trademark, or other descriptive markings or traceable ID code; Catalog number or model designation or equivalent; and date of manufacturer on the cell not exceeding any three consecutive months.

The cell or smallest package containing the cell shall be marked with the UL Recognition Mark.

The date of manufacture may be in the form of a code: YMDD;

Y represent the year in which the cell was manufactured, Y beginning from letter 'T', represent year 2011, and 'U' represent year 2012...etc;

M represent the month in which the cell was manufactured, M beginning from letter 'J' to 'U', represent months from January to December.

DD represent the date in which the cell was manufactured, DD beginning from number '01' to '31', represent date.

Lithium-ion Cylindrical Cells - Fig(s) 1 & 2
General - See Ill(s). 1 for additional details of construction.

1. Cell Case - Consists of material, overall dimensions, and thickness of plating as noted below.

Model	Case Material	Case Dimensions, mm		Case Thickness, mm	Plating Thickness
		Length	OD		
FST18650-2000mAh	Steel: SPCC	68.5±0.05	18.15±0.05	0.22±0.05	2□7μm
FST18650BE-2000mAh		68.5±0.05	18.15±0.05	0.22±0.05	2□7μm
FST18650-2200mAh		68.5±0.05	18.15±0.05	0.22±0.05	2□7μm
FST18650NB-2200mAh		68.5±0.05	18.15±0.05	0.22±0.05	2□7μm
FST18650-2600mAh		68.5±0.05	18.15±0.05	0.22±0.05	2□7μm
FST18650-2500mAh		68.5±0.05	18.5±0.05	0.22±0.05	2□7μm

2. Cell Lid - Consists of: Al welding plate/PP gasket/CID/PTC/top plate, See Ill.1 for details.
Secured to case by crimping.
3. Electrode Assemblies - Consists of positive and negative electrodes rolled in a "jelly roll" assembly within the case and constructed as noted below.

Model No.	Positive Electrode		Negative Electrode		Negative Electrode/ Positive Electrode Capacity ratio (AhNE/AhPE)
	Drawing No.	Dimensions, mm (L*W)	Drawing No.	Dimensions, mm (L*W)	
FST18650-2000mAh	Ill.2	(650~700) * (56~57.5)	Ill.2	(670~720) * (58~59)	≥1.0
FST18650BE-2000mAh	Ill.2	(650~700) * (56~57.5)	Ill.2	(670~720) * (58~59)	≥1.0
FST18650-2200mAh	Ill.6	(660~710) * (56~57.5)	Ill.6	(680~730) * (58~59)	≥1.0
FST18650NB-2200mAh	Ill.6	(660~710) * (56~57.5)	Ill.6	(680~730) * (58~59)	≥1.0
FST18650-2600mAh	Ill.6	(660~710) * (56~57.5)	Ill.6	(680~730) * (58~59)	≥1.0
FST18650-2500mAh	Ill.7	630~700) * (56~57.5)	Ill.7	(670~730) * (58~59)	≥1.0

4. Separator - UnListed component battery separator Located between the electrodes and constructed as noted below. The separator is sized to extend beyond the electrodes as noted below for reliable insulation.

Cell Model	Separator Mfg.	Type Designation	Report Reference (UnListed Component)		Dimensions, mm		Minimum Extension beyond electrodes, mm
			File Number	Report Date	Length	Width	
FST18650-2000mAh	UBE	3085	MH48852	2012-06-08	1540	60.5±0.5	2*0.75
FST18650BE-2000mAh	UBE	3085	MH48852	2012-06-08	1540	60.5±0.5	2*0.75
FST18650-2200mAh	UBE	3074	MH48852	2012-06-08	1580	60.5±0.5	2*0.75
FST18650NB-2200mAh	UBE	3074	MH48852	2012-06-08	1580	60.5±0.5	2*0.75
FST18650-2600mAh	DongGao	16μ	MH48852	2012-06-08	1580	60.5±0.5	2*0.75
FST18650-2500mAh	Xinxiang Zhongke	GRE-20P	MH48852	2012-06-08	1500~1600	60.5±0.5	2*0.75

5. Electrolyte - Constructed as noted below.

Cell Model	Generic Composition	Drawing No.
FST18650-2000mAh	DMC/EC/EMC	TestRef.1, I11.1
FST18650BE-2000mAh	DMC/EC/EMC	TestRef.1, I11.1
FST18650-2200mAh	DMC/EC/EMC	TestRef.1, I11.1
FST18650NB-2200mAh	DMC/EC/EMC	TestRef.1, I11.1
FST18650-2600mAh	DMC/EC/EMC	TestRef.1, I11.1
FST18650-2500mAh	LiPF6/DMC/EC/EMC	TestRef.1, I11.2

6. Protection Mechanism - Located within cell. Consist of either one or a combination of the methods outlined below.

a. PTC - R/C (XPGU2) located below cell cover and its integral leads are secured to cell circuit by: welding.

Cell Model	PTC Manufacturer	PTC Model No.
FST18650-2000mAh, FST18650BE-2000mAh , FST18650-2200mAh, FST18650NB-2200mAh	Chang Zhou ZhongRui Electronic Industrial Co., Ltd(E340030)	PTC18R
FST18650-2600mAh	Chang Zhou ZhongRui Electronic Industrial Co., Ltd(E340030)	PTC18RH6
FST18650-2500mAh	Shanghai Line On Polymer Electronics Co., Ltd.(E350630)	RFS350

b. Circuit Interrupt Device (CID) - (Pressure activated protection mechanism that opens cell circuit when pressure within the cell reaches a certain limit.) Constructed as noted below. The circuit interrupt device is located within the cell cover as shown in the illustration(s).

Cell Model	CID Ills. No.
FST18650-2000mAh, FST18650BE-2000mAh , FST18650-2200mAh, FST18650NB-2200mAh , FST18650-2600mAh, FST18650-2500mAh	Ill.1 & Ill.3

7. Insulators - Consists of the following parts within the cell:
Information on the materials employed, location and construction information are as noted in the illustrations below.

Cell Model	Insulation Parts	Ill. Nos.
FST18650-2000mAh, FST18650BE-2000mAh , FST18650-2200mAh, FST18650NB-2200mAh , FST18650-2600mAh, FST18650-2500mAh	Top Insulators Bottom Insulators	Ill.4

8. Electrode Tabs - (Provided for the electrical connection of the electrodes to the cell terminals). Tabs constructed as noted below:

Model	Tab Construction Ill. Nos.
FST18650-2000mAh, FST18650BE-2000mAh , FST18650-2200mAh, FST18650NB-2200mAh , FST18650-2600mAh, FST18650-2500mAh	Ill.5 Al□ positive tab 50~80mm. Ni□ negative tab 40~70mm.

9. Vent Mechanism - The vent mechanism is constructed as noted below.

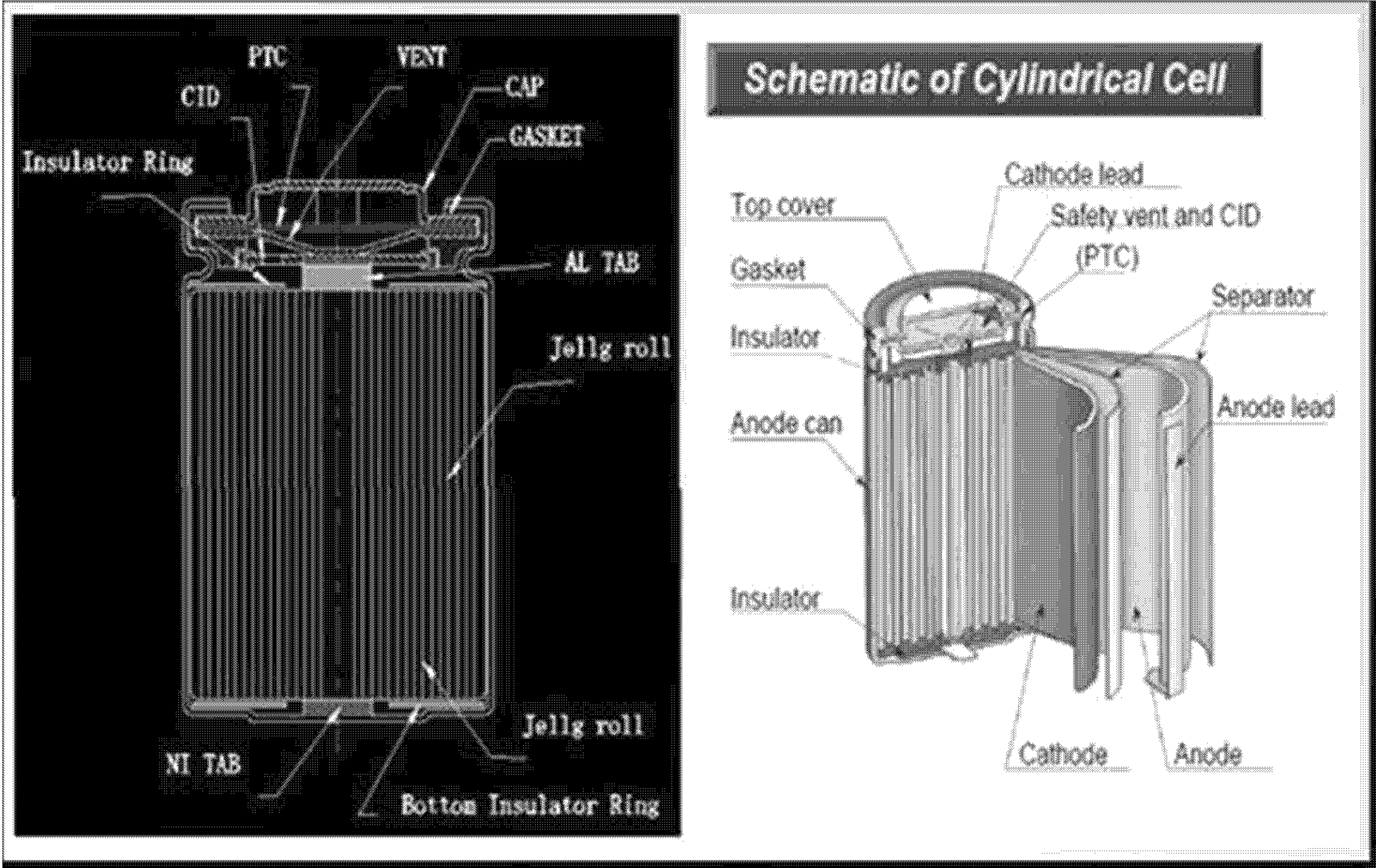
Model	Vent Ill. No.
FST18650-2000mAh	Ill.3
FST18650BE-2000mAh	Ill.3
FST18650-2200mAh	Ill.3
FST18650NB-2200mAh	Ill.3
FST18650-2600mAh	ILL.3
FST18650-2500mAh	ILL.8

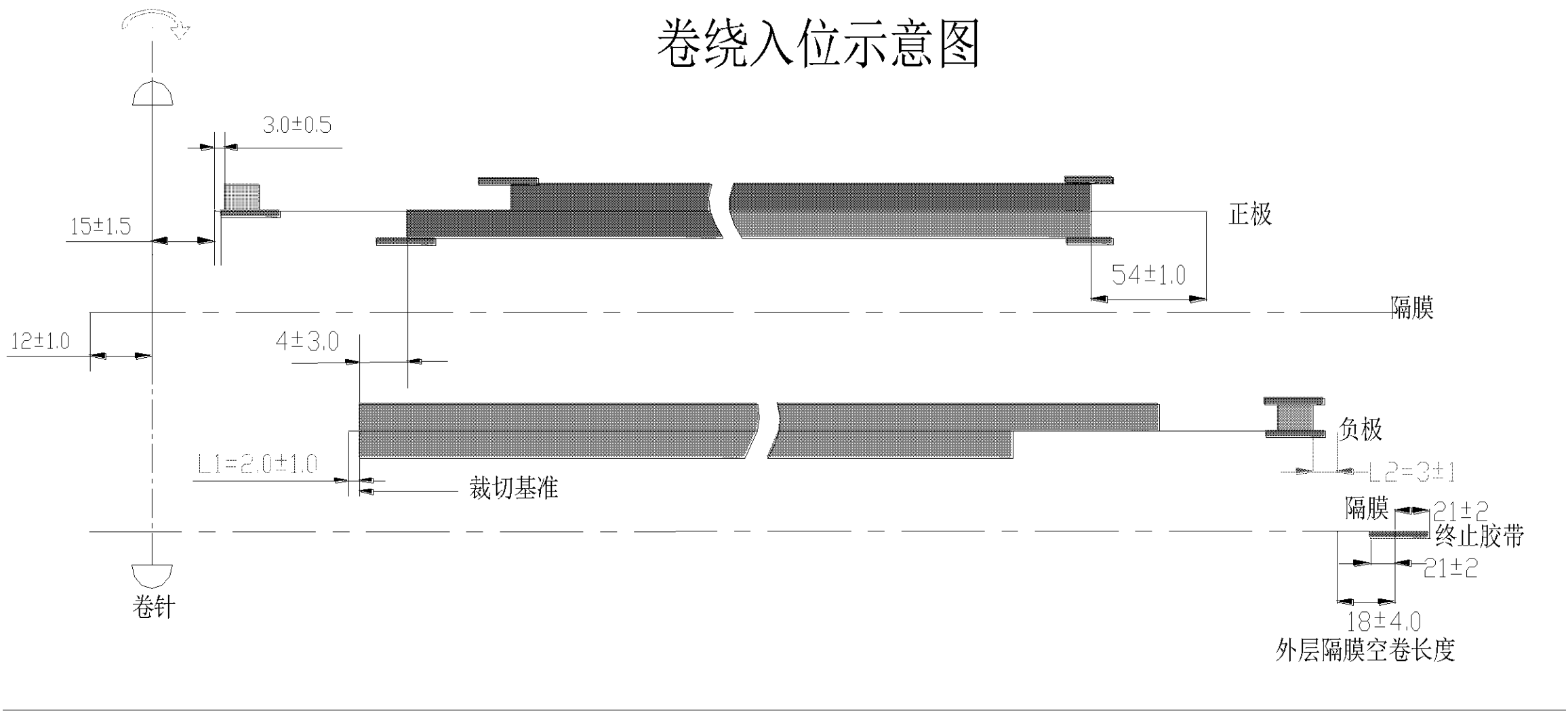


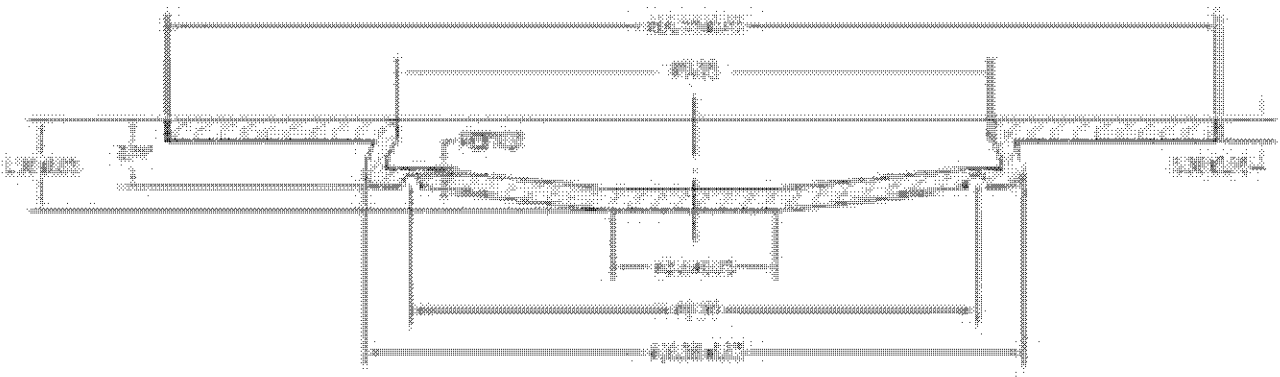
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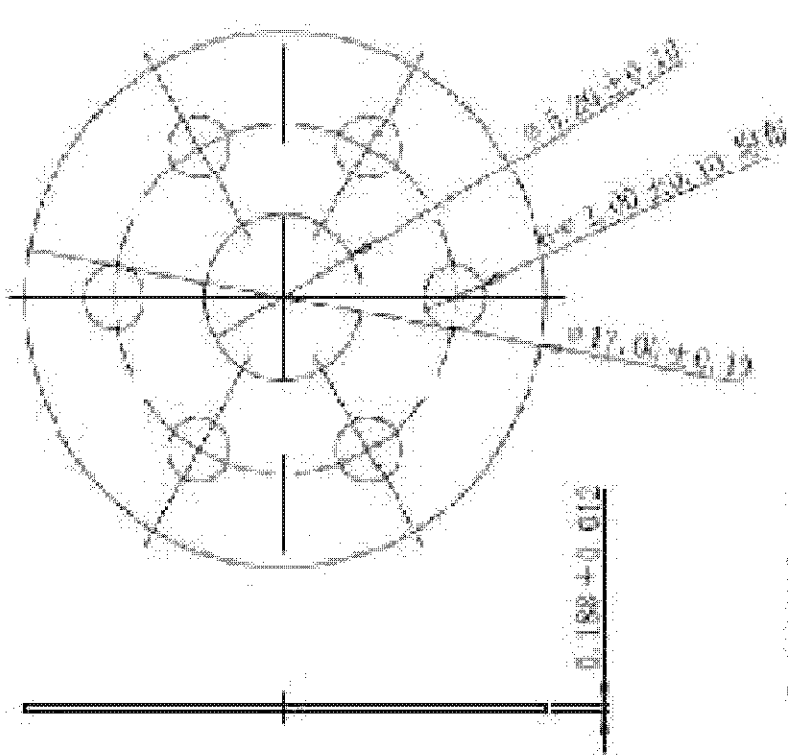






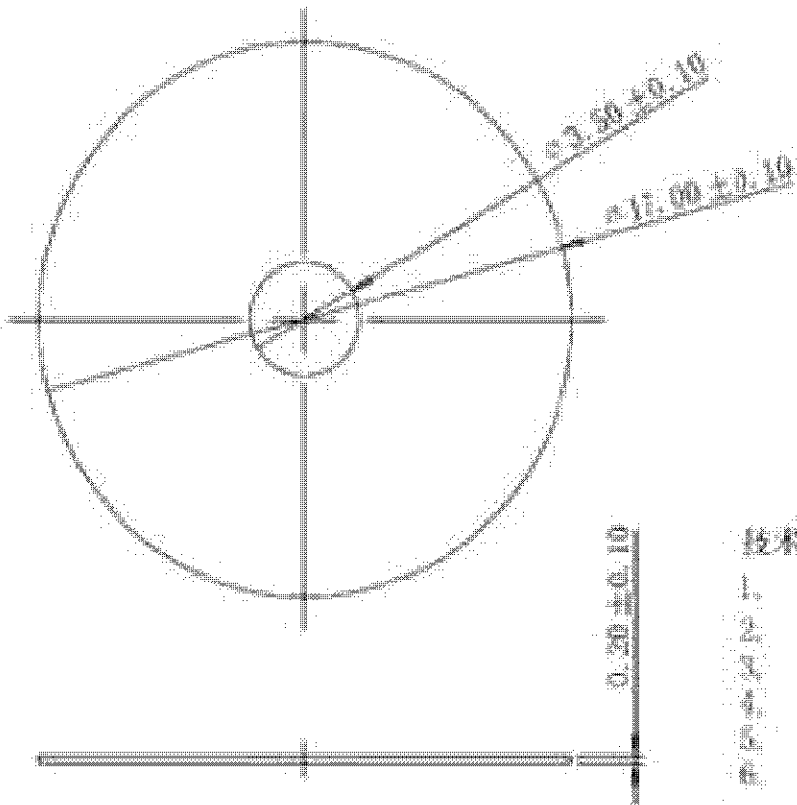
- 注:
1. 外观光滑, 平整, 无毛刺, 无划痕, 缺口等缺陷。
 2. 未注明圆角R. 2, 未注明公差±0.05mm。
 3. 用湿布擦拭零件表面无金属屑, 用无纺布擦拭零件表面后在10倍显微镜下无油污。
 4. ILL-3为参考尺寸, 实际以开闭力为准。

Unit:mm



- 技术要求
1. 表面要有一定的粗糙度：孔部毛刺、锐角
 2. 软化温度：>200℃
 3. 材质：PTFE
 4. 颜色：象牙白
 5. 密封塑料袋包装，1000个/袋
 6. 耐腐蚀性：在3%电解液中浸泡24小时后无褪色，无腐蚀

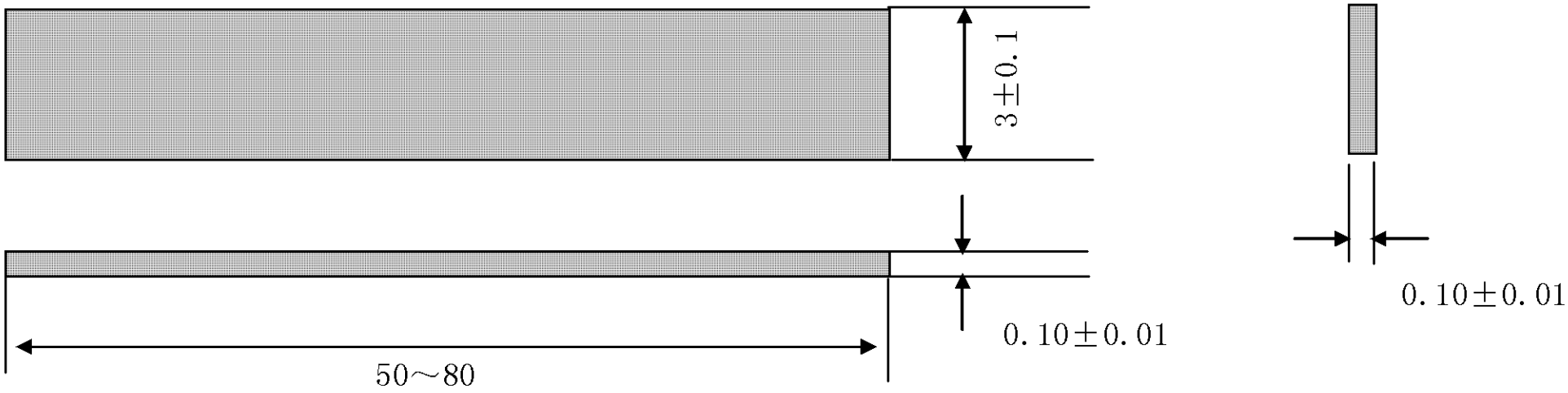
Attachment II



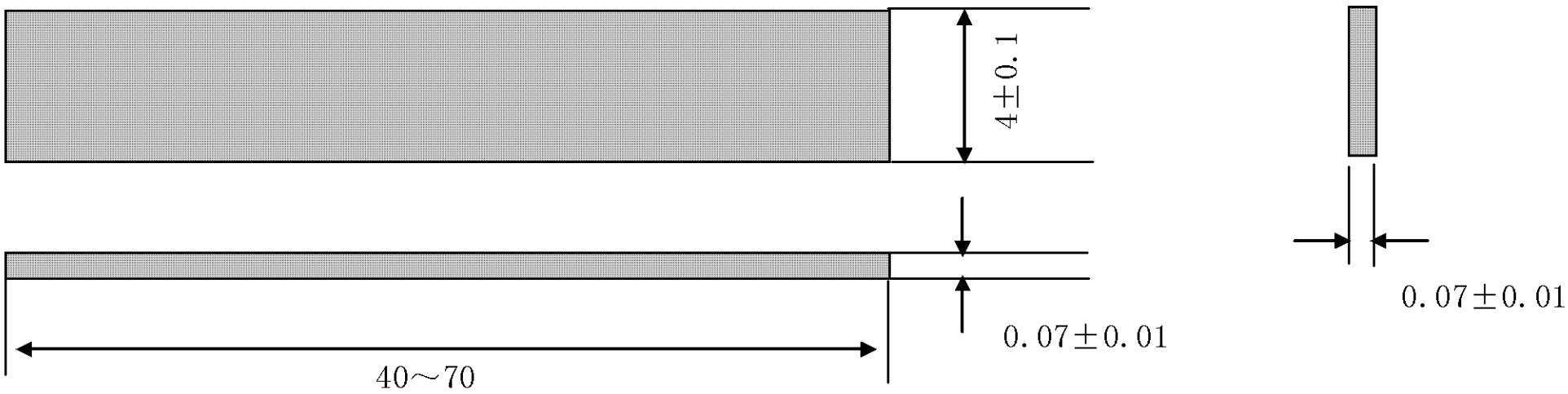
- 技术要求
1. 表面要有一定的粗糙度：孔部毛刺、锐角
 2. 软化温度：>200℃
 3. 材质：PTFE
 4. 颜色：象牙白
 5. 密封塑料袋包装，1000个/袋
 6. 耐腐蚀性：在3%电解液中浸泡24小时后无褪色，无腐蚀

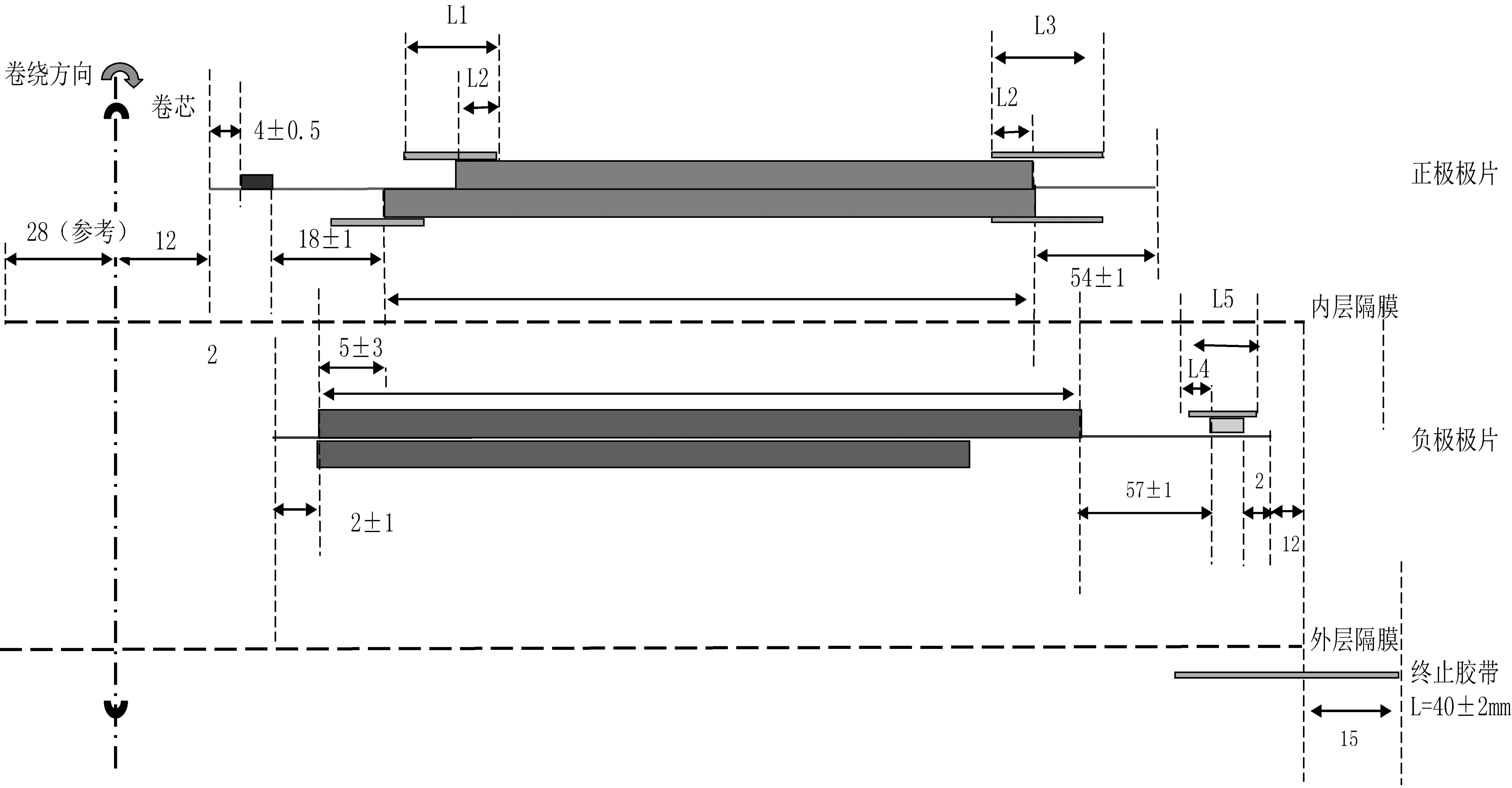
Unit:mm

Negative Tab Unit:mm

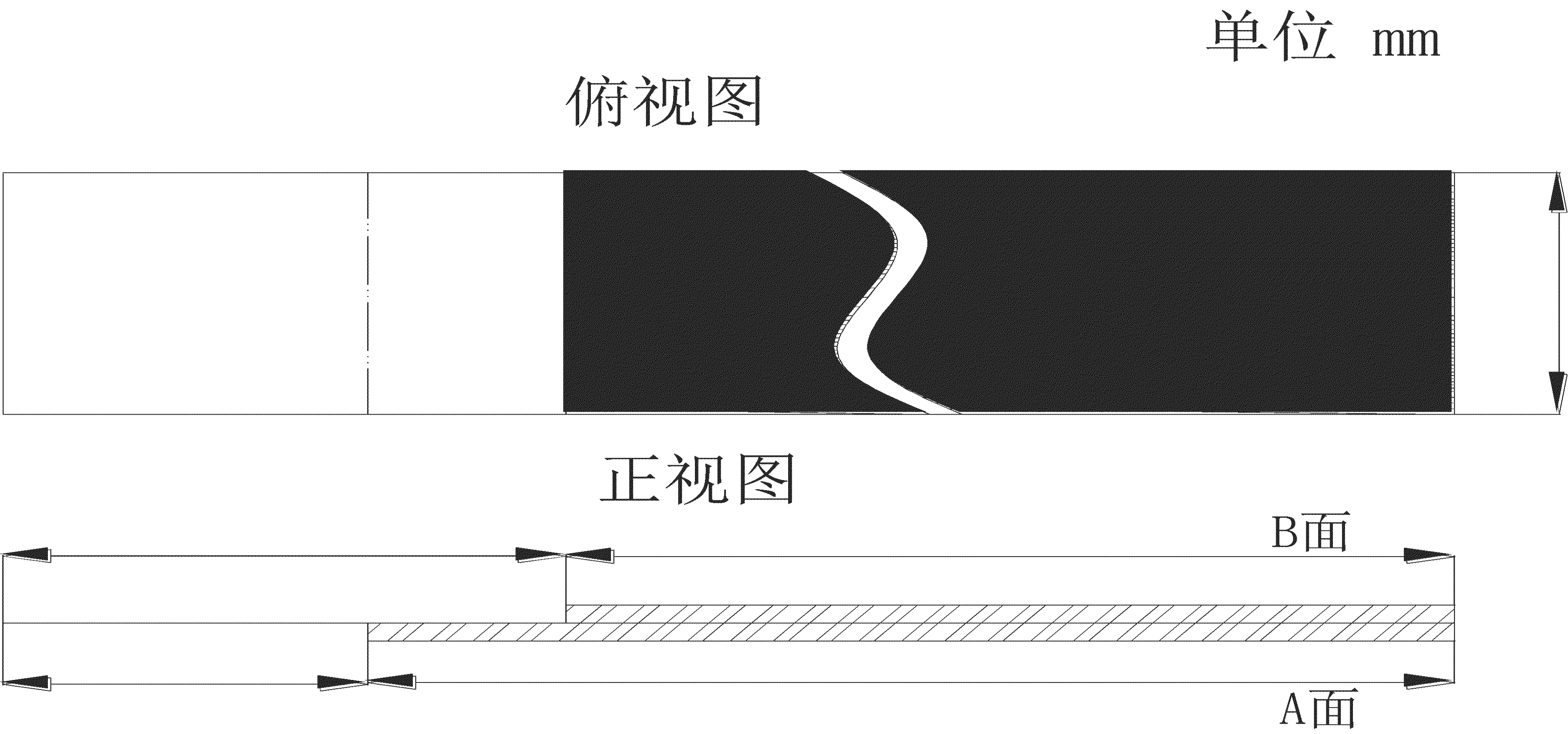


Postive Tab Unit: mm

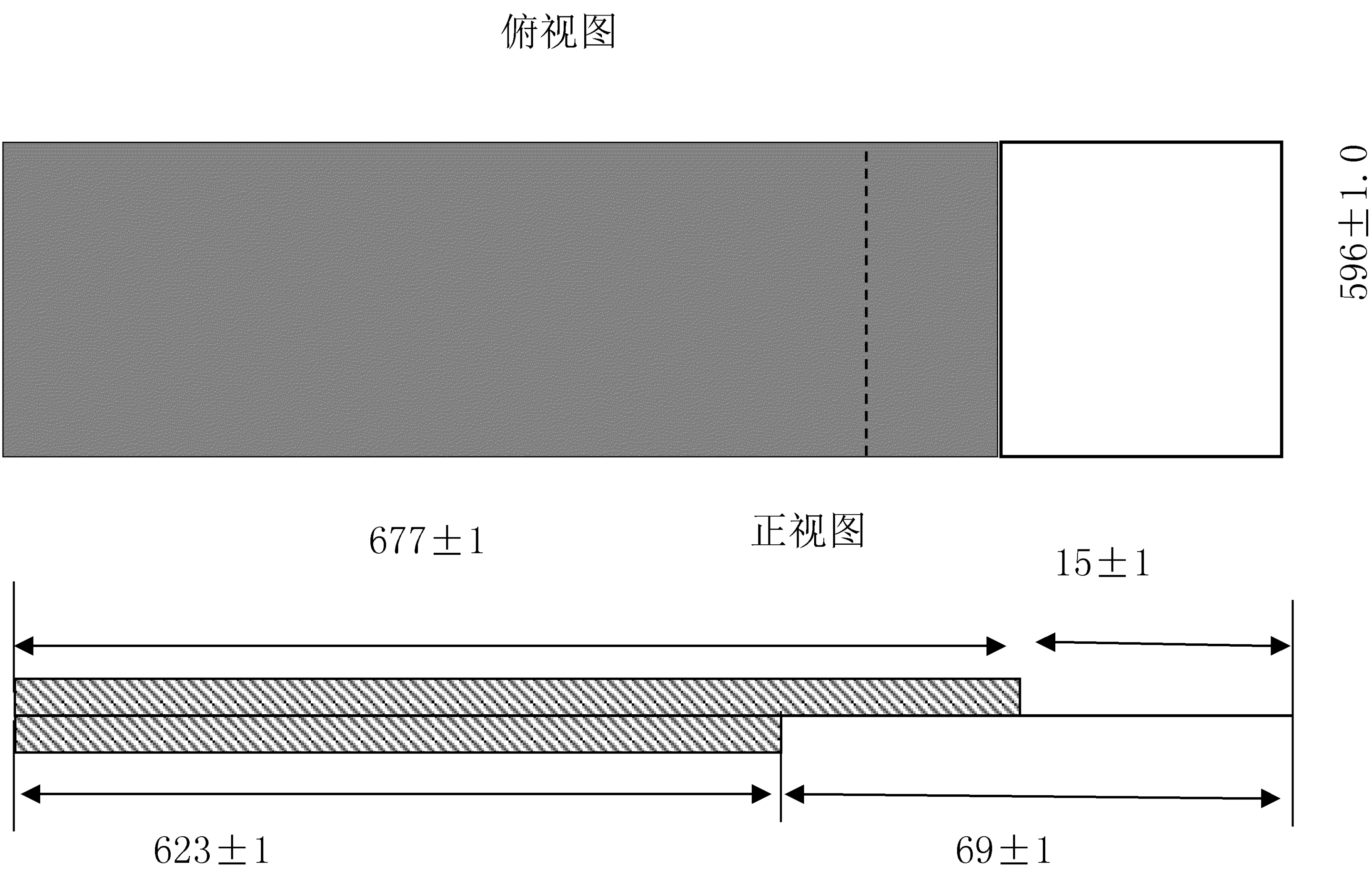


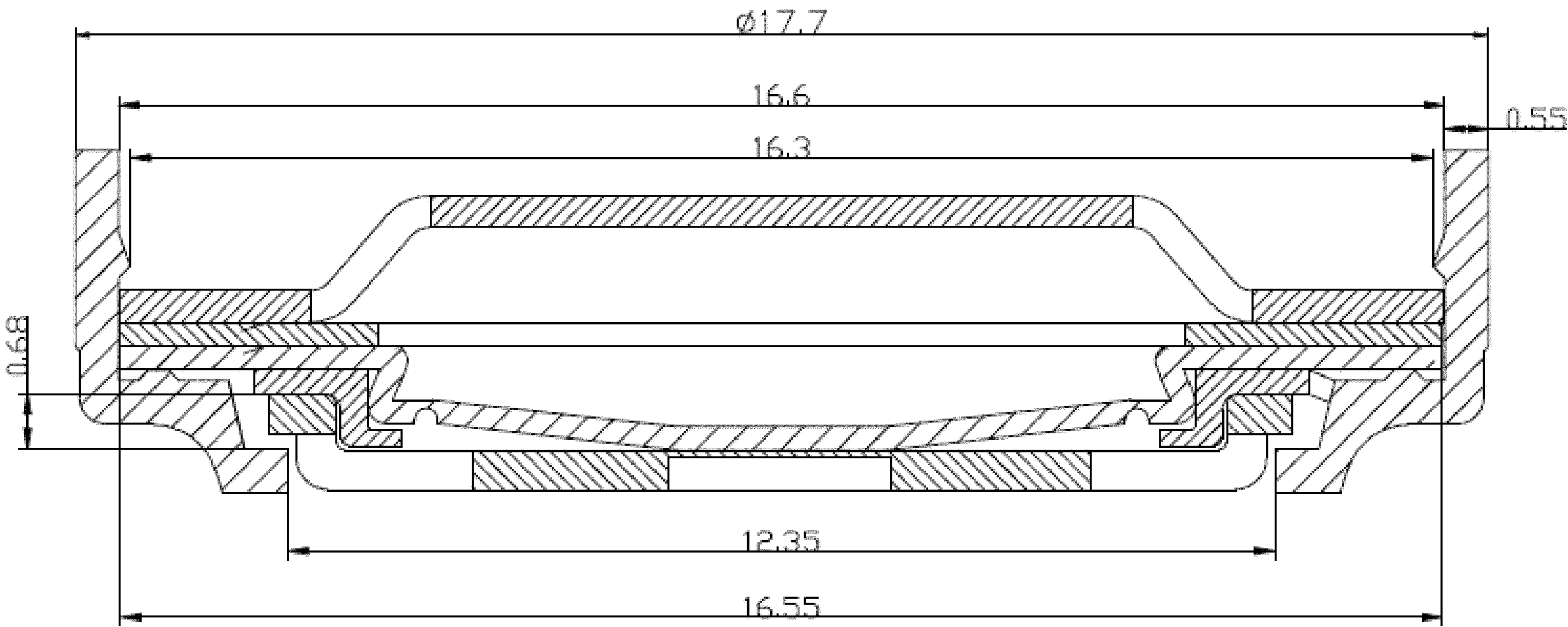


Positive Electrode: 673*57*0.145mm



Negative Electrode: 692*59*0.154mm





TEST RECORD NO. 1

SAMPLES:

A sample of the lithium-ion cell as indicated below and constructed as described herein, was submitted by the manufacturer for examination and test.

MODEL	CELL CHEMI STRY	CELL SHAPE	ENERGY DENSITY, MAH/MM3	NOMINAL VOLTAGE RATING, V DC	END POINT VOLTAGE , V DC	CAPACIT Y, MAH	MAXIMUM CHARGING CURRENT, MA	MAXIMUM CHARGIN G VOLTAGE , V DC
FST18650BE-2000MAH	LiNi _x Mn _y Co _(1-x-y) O ₂	CYLINDRI CAL	0.112906	3.6	2.75	2000	2000	4.25

GENERAL:

Test results relate only to the items tested.

Full test program will conduct on Model FST18650BE-2000mAh, fresh samples, as first submittal for UL1642 certification.

Full test program except projectile test will conduct on Model FST18650BE-2000mAh, cycled samples, as first submittal for UL1642 certification.

The following tests were conducted

Models	Test	UL 1642, Section	Complied, Y, N Or N/A	Comments
FST18650BE-2000mAh, Fresh sample; FST18650BE-2000mAh, cycled sample	Short Circuit Test: (At Room Temperature)	10	Y	compliant
	Short Circuit Test: (At 55°C)	10	Y	compliant
	Abnormal Charging Test: (Secondary)	11	Y	compliant
	Crush Test:	13	Y	compliant
	Impact Test:	14	Y	compliant
	Shock Test:	15	Y	compliant
	Vibration Test:	16	Y	compliant
	Heating Test:	17	Y	compliant
	Temperature Cycling Test:	18	Y	compliant
FST18650BE-2000mAh, Fresh sample	Low Pressure (Altitude Simulation) Test:	19	Y	compliant
	Projectile Test:	20	Y	compliant

The test methods and results of the above tests (unless otherwise specified in the table) have been reviewed and found in accordance with the requirements in the Standard for Lithium Batteries, UL 1642, Fourth Edition, Dated September 19, 2005 and contains revisions through and including November 25, 2009.

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the UL Standard for Safety for Lithium Batteries, UL 1642 Fourth Edition, Dated September 19, 2005 and contains revisions through and including November 25, 2009, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report. Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

TEST RECORD NO. 2

SAMPLES:

A sample of the lithium-ion cell as indicated below and constructed as described herein, was submitted by the manufacturer for examination and test.

MODEL	CELL CHEMIST RY	CELL SHAPE	ENERGY DENSITY, MAH/MM3	NOMINA L VOLTAGE RATING , V DC	END POINT VOLTAGE, V DC	CAPACIT Y, MAH	MAXIMUM CHARGING CURRENT, MA	MAXIMU M CHARGING VOLTAGE, V DC
FST1865 0NB- 2200MAH	LI _x MN _y CO _(1-x-y) O ₂	CYLINDR ICAL	0.133074 443	3.6	2.75	2200	2200	4.25

GENERAL:

Test results relate only to the items tested.

The tests were conducted at UL.

Due to construction similarity of Models FST18650NB-2200mAh to R/C Model FST18650BE-2000mAh in Vol.1 Sec.1 for this manufacturer except for capacity, weight, dimension, separator type and energy density, only the following UL1642 tests were conducted necessary.

Abbreviated V1 tests program on Model FST18650NB-2200mAh cell with max energy density in the submitted series.

The following tests were conducted

Models	Test	UL 1642, Section	Complied, Y, N Or N/A	Comments
FST18650NB- 2200mAh	Short Circuit Test: (At 55°C)	10	Y	compliant
	Abnormal Charging Test: (Secondary)	11	Y	compliant
	Crush Test:	13	Y	compliant
	Impact Test:	14	Y	compliant
	Heating Test:	17	Y	compliant
	Projectile Test:	20	N	Not Complied and COA added in description.

The test methods and results of the above tests have been reviewed and found in accordance with the requirements in the Standard for Lithium Batteries, UL 1642, Fifth Edition, Dated March 13, 2012.

UL1642 Tests were considered covered as follows:

Test	File Reference	Report Date	Test Record No.
Short Circuit Test (At Room Temperature), Shock, Vibration, Temperature Cycling, Low Pressure	MH48852	2012-06-07	1

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the UL Standard for Safety for Lithium Batteries, UL 1642 Fifth Edition, Dated March 13, 2012, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report. Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Test Record by:
SELINA SHI
Associate Project Engineer

Reviewed by:
NELSON CHEN
Project Engineer

ALVIN PENG (T)
Project Engineer

TEST RECORD NO. 3

SAMPLES:

A sample of the lithium-ion cell as indicated below and constructed as described herein, was submitted by the manufacturer for examination and test.

Model	Cell Chemistry	Cell Shape	Energy Density, mAh/mm ³	Nominal Voltage Rating, V dc	End Point Voltage, V dc	Capacity, mAh	Maximum Charging Current, mA	Maximum Charging Voltage, V dc
FST18650-2600mAh	LiNi _x Mn _y Co _(1-x-y) O ₂	Cylindrical	0.157269796	3.6	2.75	2600	2600	4.25

GENERAL:

Test results relate only to the items tested.

The tests were conducted at UL.

Due to construction similarity of Model FST18650-2600mAh to R/C Models in Vol.1 Sec.1 for this manufacturer except for capacity, weight, dimension, separator type and energy density, only the following UL1642 tests were conducted necessary.

Abbreviated V1 tests program on Model FST18650-2600mAh cell.

The following tests were conducted

Models	Test	UL 1642, Section	Complied, Y, N Or N/A	Comments
FST18650-2600mAh	Short Circuit Test: (At 55°C)	10	Y	compliant
	Abnormal Charging Test: (Secondary)	11	Y	compliant
	Crush Test:	13	Y	compliant
	Impact Test:	14	Y	compliant
	Heating Test:	17	Y	compliant
	Projectile Test:	20	Y	compliant

The test methods and results of the above tests have been reviewed and found in accordance with the requirements in the Standard for Lithium Batteries, UL 1642, Fifth Edition, Dated March 13, 2012, including revisions through July 30, 2013.

UL1642 Tests were considered covered as follows:

Test	File Reference	Report Date	Test Record No.
Short Circuit Test (At Room Temperature), Shock, Vibration, Temperature Cycling, Low Pressure	MH48852	2012-06-07	1-2

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the UL Standard for Safety for Lithium Batteries, UL 1642 Fifth Edition, Dated March 13, 2012, including revisions through July 30, 2013, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report. Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Test Record by:
JUDY FU
Associate Project Engineer

Reviewed by:
ALVIN PENG
Project Engineer

TEST RECORD NO. 4

SAMPLES:

A sample of the lithium-ion cell as indicated below and constructed as described herein, was submitted by the manufacturer for examination and test.

Model	Cell Chemistry	Cell Shape	Energy Density, mAh/mm ³	Nominal Voltage Rating, V dc	End Point Voltage, V dc	Capacity, mAh	Maximum Charging Current, mA	Maximum Charging Voltage, V dc
FST18650NB-2200MAH	LiNi _x M _y CO _(1-x-y) O ₂	CYLINDRICAL	0.133074443	3.6	2.75	2200	2200	4.25

GENERAL:

Test results relate only to the items tested.

The tests were conducted under WTDP program at Dongguan UTL Electronic Technology Co Ltd (100571-863), addressed 1F, HENGZHENG BLDG, NORTH RD OF STATION, NANCHENG DISTRICT DONGGUAN, GUANGDONG, 523078 CHINA.

Only Projectile test was re-conducted on Model FST18650NB-2200mAh due to only decrease the vent pressure limited value for cell FST18650NB-2200mAh failure of projectile test in test record 2.

The following tests were conducted

Models	Test	UL 1642, Section	Complied, Y, N Or N/A	Comments
FST18650NB-2200mAh	Projectile Test:	20	Y	compliant

The test methods and results of the above tests have been reviewed and found in accordance with the requirements in the Standard for Lithium Batteries, UL 1642, Fifth Edition, Dated March 13, 2012, including revisions through July 30, 2013.

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the UL Standard for Safety for Lithium Batteries, UL 1642 Fifth Edition, Dated March 13, 2012, including revisions through July 30, 2013, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report. Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Test Record by:

ALVIN PENG
Project Engineer

TEST RECORD NO. 5

SAMPLES:

A sample of the lithium-ion cell as indicated below and constructed as described herein, was submitted by the manufacturer for examination and test.

Model	Cell Chemistry	Cell Shape	Energy Density, mAh/mm ³	Nominal Voltage Rating, V dc	End Point Voltage, V dc	Capacity, mAh	Maximum Charging Current, mA	Maximum Charging Voltage, V dc
*FST18650-2500mAh	LiNi _x Mn _y CO _(1-x-y) O ₂	CYLINDRICAL	0.144495299	3.6	2.75	2500	2500	4.25

GENERAL:

Test results relate only to the items tested.

The tests were conducted under WTDP program at Dongguan UTL Electronic Technology Co Ltd (100571-863), addressed 1F, HENGZHENG BLDG, NORTH RD OF STATION, NANCHENG DISTRICT DONGGUAN, GUANGDONG, 523078 CHINA.

The following tests were conducted

Models	Test	UL 1642, Section	Complied, Y, N Or N/A	Comments
FST18650-2500mAh	Short Circuit Test: (At 55°C)	10	Y	compliant
	Abnormal Charging Test: (Secondary)	11	Y	compliant
	Crush Test:	13	Y	compliant
	Impact Test:	14	Y	compliant
	Heating Test:	17	Y	compliant
	Projectile Test:	20	Y	compliant

The test methods and results of the above tests have been reviewed and found in accordance with the requirements in the Standard for Lithium Batteries, UL 1642, Fifth Edition, Dated March 13, 2012, including revisions through June 23, 2015.

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the UL Standard for Safety for Lithium Batteries, UL 1642 Fifth Edition, Dated March 13, 2012, including revisions through June 23, 2015, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report. Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Test Record by:

Devin He
Engineer

Review by:

Fancy Liang
Engineer Project Associate

TEST RECORD NO. 6

No test was considered necessary due to revise model name from FST18650BE-2000mAh, FST18650NB-2200mAh to FST18650-2000mAh & FST18650-2200mAh.

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the UL Standard for Safety for Lithium Batteries, UL 1642 Fifth Edition, Dated March 13, 2012, including revisions through June 23, 2015, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report. Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Test Record by:

KINGDY

Engineer

CONCLUSION

Samples of the component covered by this Report have been found to comply with the requirements covering the category and the components are found to comply with UL's applicable requirements. The description and test result in this Report are only applicable to the sample(s) investigated by UL and does not signify the product(s) described as being covered under UL's Follow-Up Service Program. When covered under UL's Follow-Up Service Program, the manufacturer is authorized to use the Recognized Marking on such products which comply with UL's Follow-Up Service Procedure and any other applicable requirements of Underwriters Laboratories Inc. The Recognized Component Mark of Underwriters Laboratories Inc. on the product, or the Recognized Marking symbol on the product and the Recognized Component Mark on the smallest unit container in which the product is packaged, is the only method to identify products investigated by UL to published requirements and manufactured under UL's Recognition and Follow-Up Service.

This Report is intended solely for the use of UL and the Applicant for establishment of UL certification coverage of the product under UL's Follow-Up Service. Any use of the Report other than to indicate that the sample(s) of the product covered by the Report has been found to comply with UL's applicable requirements is not authorized and renders the Report null and void. UL shall not incur any obligation or liability for any loss, expense, or punitive damages, arising out of or in connection with the use or reliance upon the contents of this Report to anyone other than the Applicant as provided in the agreement between UL and Applicant. Any use or reference to UL's name or certification mark(s) by anyone other than the Applicant in accordance with the agreement is prohibited without the express written approval of UL. Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Report by:
Emily Ji
Engineer

Reviewed by:
Claire Zhang
Associate Project Engineer