

TEST REPORT

Application No.: SHEM1907014761BA
Applicant: CHANGXING DELI TECHNOLOGY CO, LTD
Address of Applicant: 1st Floor, Building 2, Changxing National University Science Park, Taihu Road And Chen Wang Road Intersection, Taihu Street, Changxing County, HuZhou City, China
Manufacturer: CHANGXING DELI TECHNOLOGY CO, LTD
Address of Manufacturer: 1st Floor, Building 2, Changxing National University Science Park, Taihu Road And Chen Wang Road Intersection, Taihu Street, Changxing County, HuZhou City, China
Factory: CHANGXING DELI TECHNOLOGY CO, LTD
Address of Factory: 1st Floor, Building 2, Changxing National University Science Park, Taihu Road And Chen Wang Road Intersection, Taihu Street, Changxing County, HuZhou City, China
Equipment Under Test (EUT):
EUT Name: lithium battery
Model No.: 36V/10AH
Trade mark: Danster
Standard(s) : EN 15194:2017
Date of Receipt: 2019-07-02
Date of Test: 2019-07-02 to 2019-07-11
Date of Issue: 2019-07-26

Test Result:	Pass*
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Parlan Zhan

Parlan Zhan
E&E Section Manager



The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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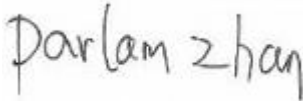
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Revision Record			
Version	Description	Date	Remark
00	Original	2019-07-26	/

Authorized for issue by:				
				
		Bruce Tang / Project Engineer		
				
		Parlam Zhan / Reviewer		

2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Radiated Emissions (30MHz-1GHz)	EN 15194:2017	CISPR 16-2-3	N/A	Pass

N/A: Not applicable

Immunity Part				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN 15194:2017	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Radiated Immunity(80MHz- 2.7GHz)	EN 15194:2017	EN 61000-4-3:2006 +A1:2008+A2:2010	3V/m, 80%, 1kHz Amp. Mod. 3V/m, 80%, 1kHz Amp. Mod. 1V/m, 80%, 1kHz Amp. Mod.	Pass

N/A: Not applicable



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4 General Information

4.1 Details of E.U.T.

Power supply: DC36V output

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conducted Emission at mains port using AMN	±2.6dB (9kHz to 150kHz)
		±2.3dB (150kHz to 30MHz)
2	Conducted Emission at mains port using VP	±1.9 dB (9kHz to 30MHz)
3	Conducted Emission at telecommunication port using AAN	±4.1 dB (150kHz to 30MHz)
4	Radiated Power	±3.0dB
5	Radiated emission	±4.4dB (30MHz-1GHz)
		±4.8dB (1GHz-6GHz)
		±5.2dB (6GHz-18GHz)

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **NVLAP (Certificate No. 201034-0)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). Certificate No. 201034-0.

- **FCC –Designation Number: CN5033**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN5033. Test Firm Registration Number: 479755.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

IC Registration No.: 8617A-1. CAB identifier: CN0020.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

4.8 Monitoring of EUT for All Immunity Test

Visual: work status

5 Equipment List

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI test receiver	Rohde & Schwarz	ESU40	SHEM051-1	2018-12-20	2019-12-19
CONTROLLER	INNCO	CO200	SHEM047-1	N/A	N/A
ANTENNA MAST	INNCO	MA400-EP	SHEM047-2	N/A	N/A
TURN DEVICE	INNCO	DE 3600-RH	SHEM047-3	N/A	N/A
Broadband UHF-VHF ANTENNA	SCHWARZBECK	VULB9168	SHEM048-1	2017-02-28	2020-02-27
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2017-07-22	2020-07-21
Low Amplifier	CLAVIO	BDLNA-0001-412010	SHEM164-1	2018-08-13	2019-08-12

Electrostatic Discharge					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Electrostatic Discharge Simulator	TESEQ	NSG 437	SHEM041-2	2018-08-13	2019-08-12

Radiated Immunity(80MHz-2.7GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Signal generator	Rohde & Schwarz	SMJ100A	SHEM141-1	2018-08-13	2019-08-12
Power Meter	Rohde & Schwarz	NRP	SHEM057-1	2018-12-20	2019-12-19
Power meter sensor	Rohde & Schwarz	NRP-Z91	SHEM057-2	2018-12-20	2019-12-19
Antenna	SCHWARZBECK	STLP9128D	SHEM130-1	N/A	N/A
Antenna	SCHWARZBECK	STLP9149	SHEM131-1	N/A	N/A
Amplifier	MILMEGA	80RF1000-250	SHEM132-1	2018-12-20	2019-12-19
Amplifier	MILMEGA	AS0840-55-55	SHEM133-1	2018-12-20	2019-12-19
Power meter sensor	Rohde & Schwarz	NRP-Z22	SHEM136-1	2018-12-20	2019-12-19
ElectroMagnetic Field Probe	ETS-Lindgren	HI-6105	SHEM134-1	2018-12-11	2019-12-10
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2017-07-22	2020-07-21

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Digital pressure meter	YONGZHI	DYM3-01	SHEM082-1	2018-01-25	2021-01-24
Temperature&humidity recorder	ShangHai weather meter work	ZJ 1-2B	SHEM042-1~6	2018-08-31	2019-08-30
Digital Multimeter	FLUKE	17B	SHEM043-3	2018-09-03	2019-09-02
Autoformer regulator	Guangzhou bao de	TDGC2-5KVA	SHEM150-1	N/A	N/A
Multi-purpose tong tester	FLUKE	316	SHEM001-1	2018-12-20	2019-12-19

6 Emission Test Results

6.1 Radiated Emissions (30MHz-1GHz)

Test Requirement:	EN 15194:2017
Test Method:	CISPR 16-2-3
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Limit:	
30MHz-230MHz	40 dB(μ V/m) quasi-peak
230MHz-1GHz	47 dB(μ V/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

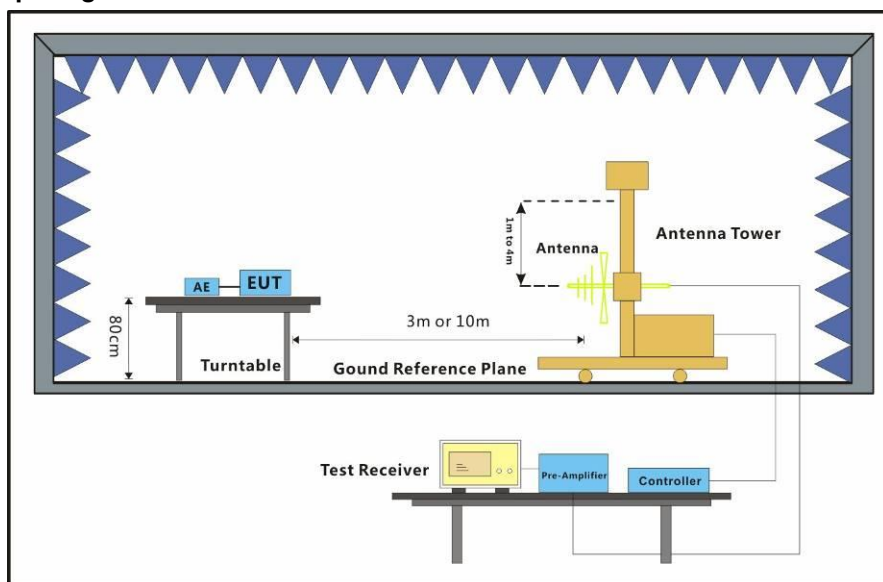
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode:
a: Charging_keep battery charging continual .
b: Discharging_keep battery discharging continual .

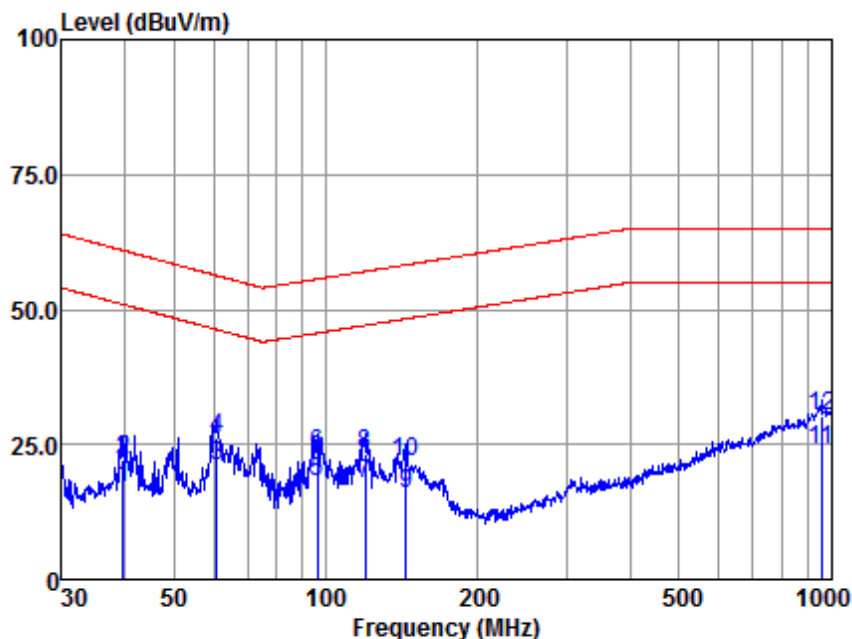
6.1.2 Test Setup Diagram



6.1.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

Mode:a; Polarization:Horizontal

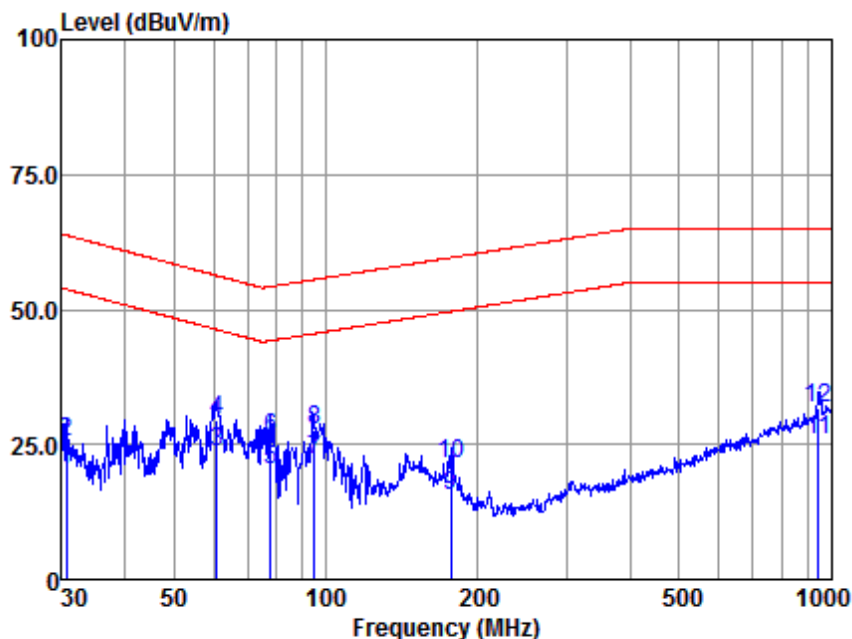


Antenna Polarity :HORIZONTAL
EUT/Project :14761BA
Test mode :a

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	39.715	42.58	16.28	0.30	42.33	16.83	50.94	-34.11	Average
2	39.715	47.86	16.28	0.30	42.33	22.11	60.94	-38.83	QP
3	60.704	50.21	12.53	0.59	42.32	21.01	46.31	-25.30	Average
4	60.704	55.57	12.53	0.59	42.32	26.37	56.31	-29.94	QP
5	96.099	50.18	8.99	1.08	42.31	17.94	45.63	-27.69	Average
6	96.099	55.35	8.99	1.08	42.31	23.11	55.63	-32.52	QP
7	119.856	48.78	10.00	1.33	42.28	17.83	47.08	-29.25	Average
8	119.856	54.04	10.00	1.33	42.28	23.09	57.08	-33.99	QP
9	144.335	45.16	11.56	1.37	42.24	15.85	48.30	-32.45	Average
10	144.335	51.23	11.56	1.37	42.24	21.92	58.30	-36.38	QP
11	955.438	37.34	23.35	4.71	41.38	24.02	55.00	-30.98	Average
12	955.438	43.48	23.35	4.71	41.38	30.16	65.00	-34.84	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:a; Polarization:Vertical



Antenna Polarity :VERTICAL

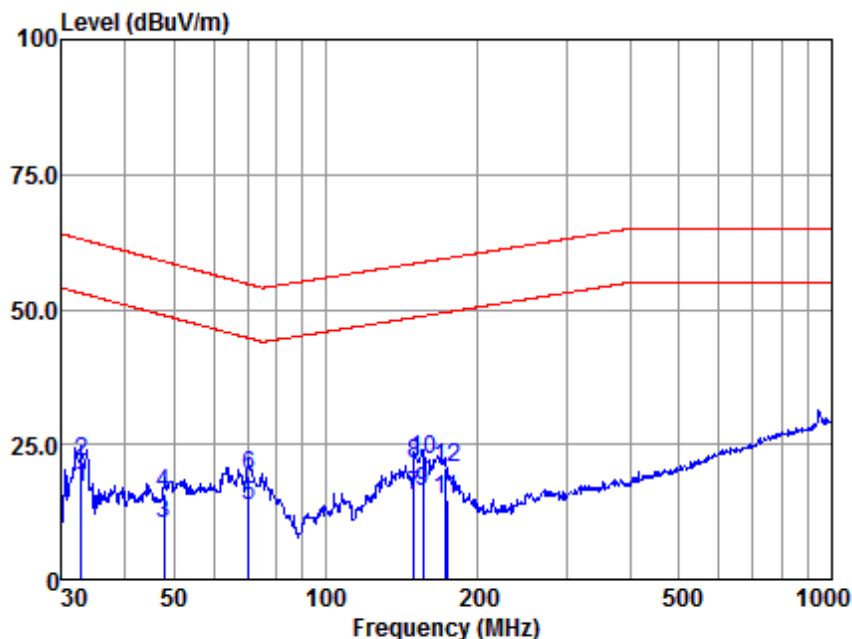
EUT/Project :14761BA

Test mode :a

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	30.638	46.90	15.38	0.50	42.38	20.40	53.77	-33.37	Average
2	30.638	52.00	15.38	0.50	42.38	25.50	63.77	-38.27	QP
3	60.704	52.85	12.53	0.59	42.32	23.65	46.31	-22.66	Average
4	60.704	58.88	12.53	0.59	42.32	29.68	56.31	-26.63	QP
5	77.865	53.24	8.70	0.73	42.27	20.40	44.25	-23.85	Average
6	77.865	58.93	8.70	0.73	42.27	26.09	54.25	-28.16	QP
7	94.760	54.44	8.80	1.06	42.30	22.00	45.54	-23.54	Average
8	94.760	60.24	8.80	1.06	42.30	27.80	55.54	-27.74	QP
9	176.888	44.32	11.80	1.60	42.20	15.52	49.64	-34.12	Average
10	176.888	50.25	11.80	1.60	42.20	21.45	59.64	-38.19	QP
11	945.440	39.21	23.20	4.73	41.44	25.70	55.00	-29.30	Average
12	945.440	45.21	23.20	4.73	41.44	31.70	65.00	-33.30	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:b; Polarization:Horizontal

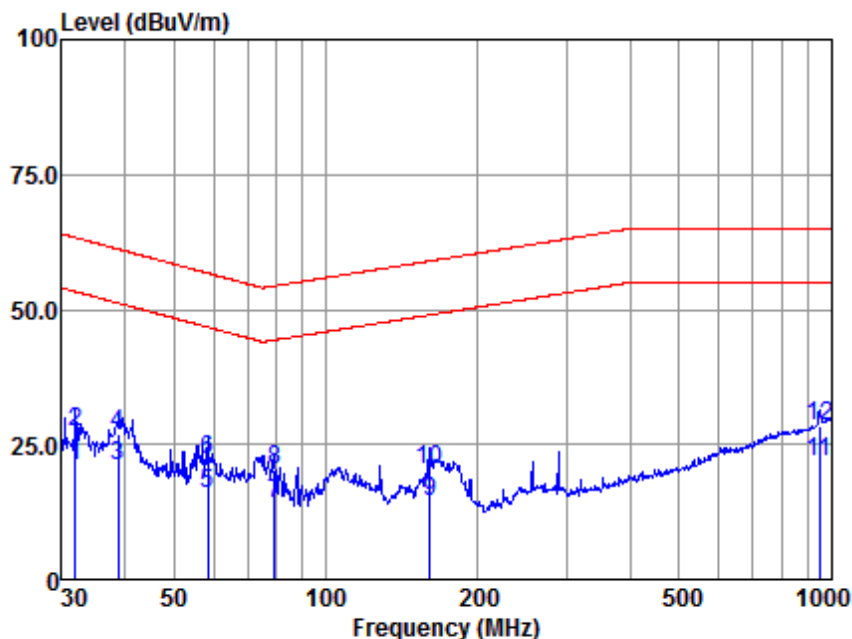


Antenna Polarity :HORIZONTAL
EUT/Project :14761BA
Test mode :b

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	32.864	43.28	15.62	0.39	42.36	16.93	53.01	-36.08	Average
2	32.864	48.22	15.62	0.39	42.36	21.87	63.01	-41.14	QP
3	47.826	40.45	11.76	0.44	42.33	10.32	48.91	-38.59	Average
4	47.826	46.00	11.76	0.44	42.33	15.87	58.91	-43.04	QP
5	70.337	44.04	11.28	0.65	42.26	13.71	44.70	-30.99	Average
6	70.337	49.35	11.28	0.65	42.26	19.02	54.70	-35.68	QP
7	149.486	44.36	11.90	1.36	42.23	15.39	48.53	-33.14	Average
8	149.486	50.49	11.90	1.36	42.23	21.52	58.53	-37.01	QP
9	155.364	44.33	12.59	1.40	42.22	16.10	48.79	-32.69	Average
10	155.364	50.37	12.59	1.40	42.22	22.14	58.79	-36.65	QP
11	173.205	43.71	11.70	1.58	42.21	14.78	49.50	-34.72	Average
12	173.205	49.57	11.70	1.58	42.21	20.64	59.50	-38.86	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:b; Polarization:Vertical



Antenna Polarity :VERTICAL

EUT/Project :14761BA

Test mode :b

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	31.955	47.38	15.53	0.45	42.37	20.99	53.31	-32.32	Average
2	31.955	53.58	15.53	0.45	42.37	27.19	63.31	-36.12	QP
3	38.888	47.13	16.20	0.13	42.33	21.13	51.17	-30.04	Average
4	38.888	53.06	16.20	0.13	42.33	27.06	61.17	-34.11	QP
5	58.407	45.14	12.30	0.58	42.33	15.69	46.73	-31.04	Average
6	58.407	51.54	12.30	0.58	42.33	22.09	56.73	-34.64	QP
7	79.243	47.29	8.23	0.75	42.27	14.00	44.36	-30.36	Average
8	79.243	53.54	8.23	0.75	42.27	20.25	54.36	-34.11	QP
9	160.346	42.21	12.99	1.46	42.22	14.44	48.99	-34.55	Average
10	160.346	48.01	12.99	1.46	42.22	20.24	58.99	-38.75	QP
11	948.761	35.28	23.25	4.73	41.44	21.82	55.00	-33.18	Average
12	948.761	41.83	23.25	4.73	41.44	28.37	65.00	-36.63	QP

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

7 Immunity Test Results

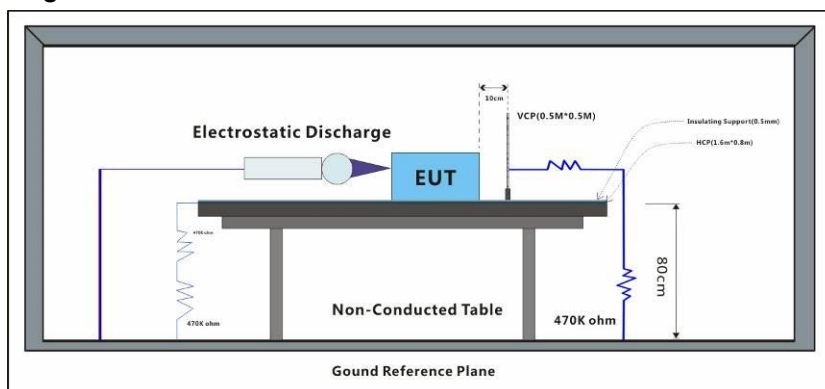
7.1 Performance Criteria Description in EN 15194:2017

Criterion A	The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.
Criterion B	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.
Criterion C	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

7.2 Electrostatic Discharge

Test Requirement:	EN 15194:2017
Test Method:	EN 61000-4-2:2009
Performance Criterion:	B
Discharge Impedance:	330Ω/150pF
Number of Discharge:	Minimum 10 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

7.2.1 Test Setup Diagram



7.2.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode:
a: Charging_keep battery charging continual .
b: Discharging_keep battery discharging continual .

7.2.3 Test Results:

Observations: Test Point:

1. All insulated enclosure and seams.
2. All accessible metal parts of the enclosure.
3. All side

Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	2,4,8	+	1	A
Air Discharge	2,4,8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

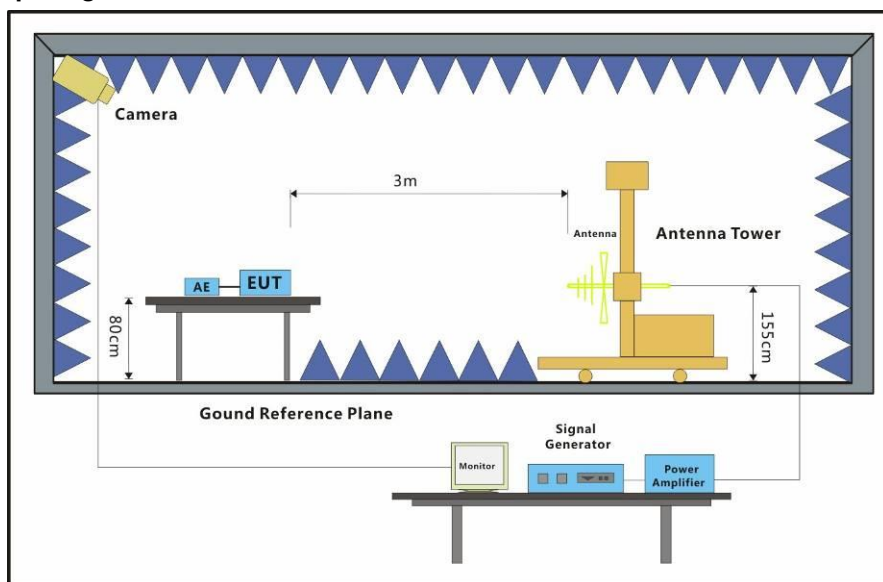
Results:

A: No degradation in the performance of the EUT was observed.

7.3 Radiated Immunity(80MHz-2.7GHz)

Test Requirement: EN 15194:2017
 Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010
 Performance Criterion: A
 Frequency Range: 80MHz to 1GHz, 1.4GHz to 2GHz, 2GHz to 2.7GHz
 Antenna Polarisation: Vertical and Horizontal
 Modulation: 1kHz,80% Amp. Mod,1% increment

7.3.1 Test Setup Diagram



7.3.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode:
 a: Charging_keep battery charging continual .
 b: Discharging_keep battery discharging continual .

7.3.3 Test Results:

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	2s	A
80MHz-1GHz	3	Back	2s	A
80MHz-1GHz	3	Left	2s	A
80MHz-1GHz	3	Right	2s	A
80MHz-1GHz	3	Top	2s	A
80MHz-1GHz	3	Underside	2s	A
1.4GHz-2GHz	3	Front	2s	A
1.4GHz-2GHz	3	Back	2s	A
1.4GHz-2GHz	3	Left	2s	A
1.4GHz-2GHz	3	Right	2s	A
1.4GHz-2GHz	3	Top	2s	A
1.4GHz-2GHz	3	Underside	2s	A
2GHz-2.7GHz	1	Front	2s	A
2GHz-2.7GHz	1	Back	2s	A
2GHz-2.7GHz	1	Left	2s	A



2GHz-2.7GHz	1	Right	2s	A
2GHz-2.7GHz	1	Top	2s	A
2GHz-2.7GHz	1	Underside	2s	A

Results:

A: No degradation in the performance of the EUT was observed.

8 Photographs

8.1 Radiated Emissions (30MHz-1GHz) Test Setup



8.2 Electrostatic Discharge Test Setup



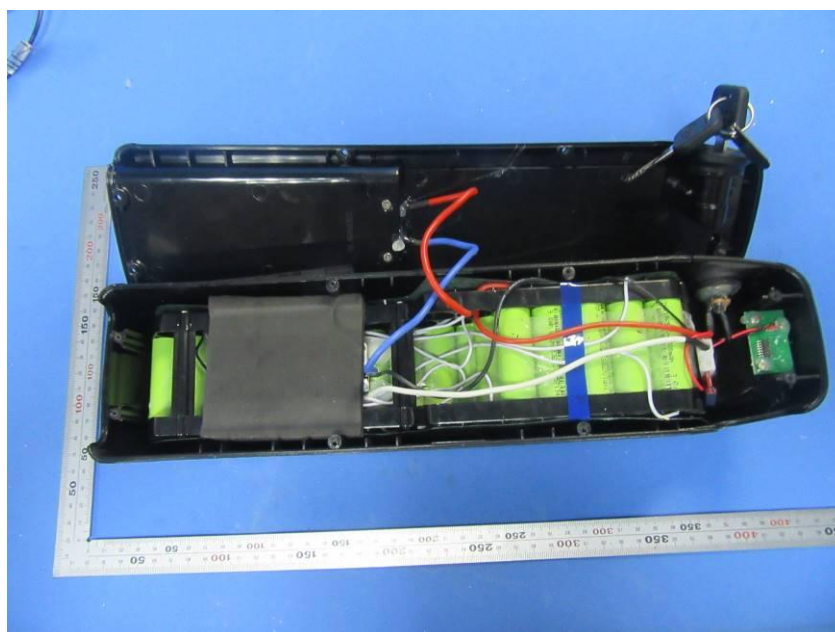
8.3 Radiated Immunity(80MHz-2.7GHz) Test Setup

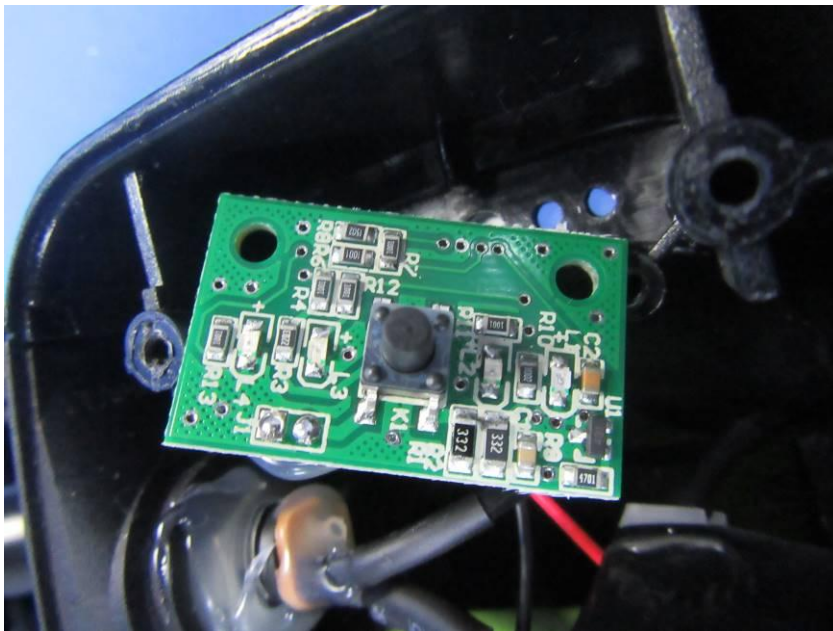
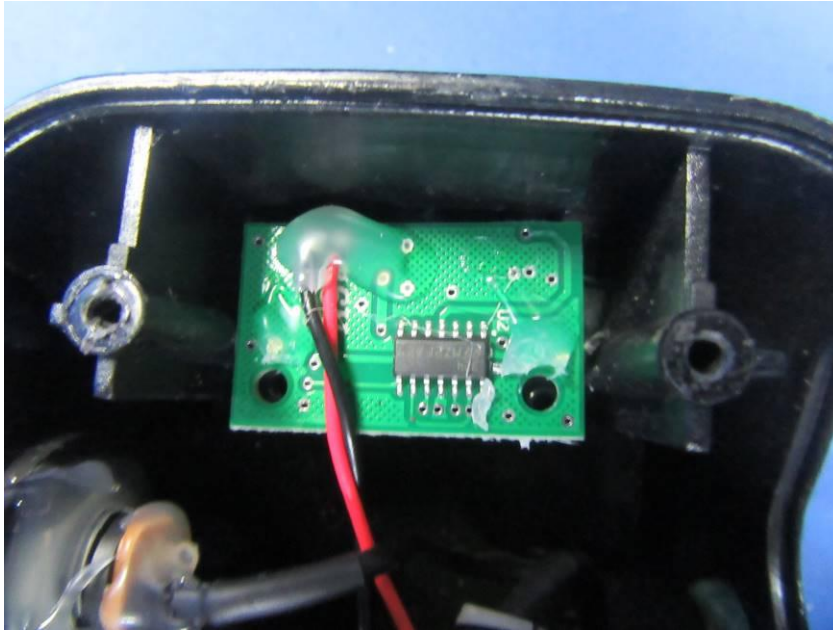


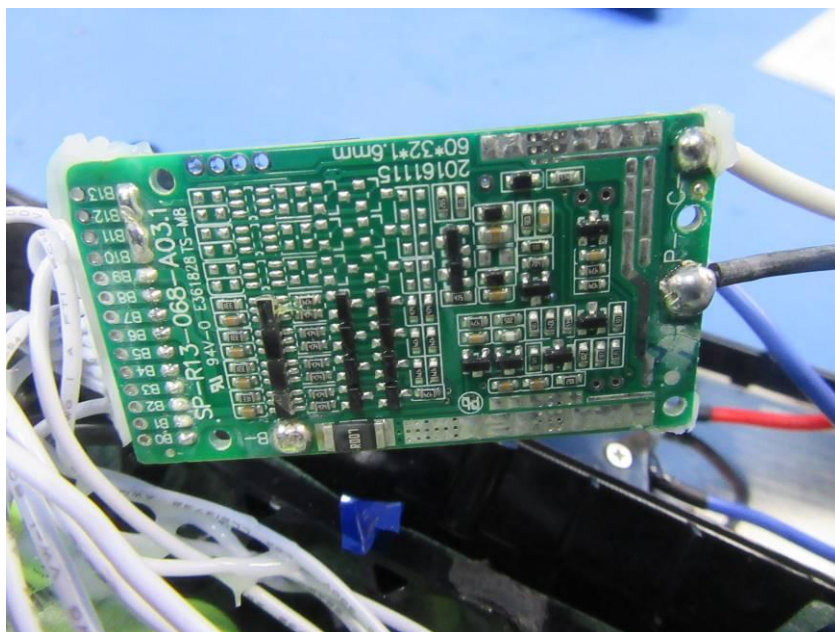
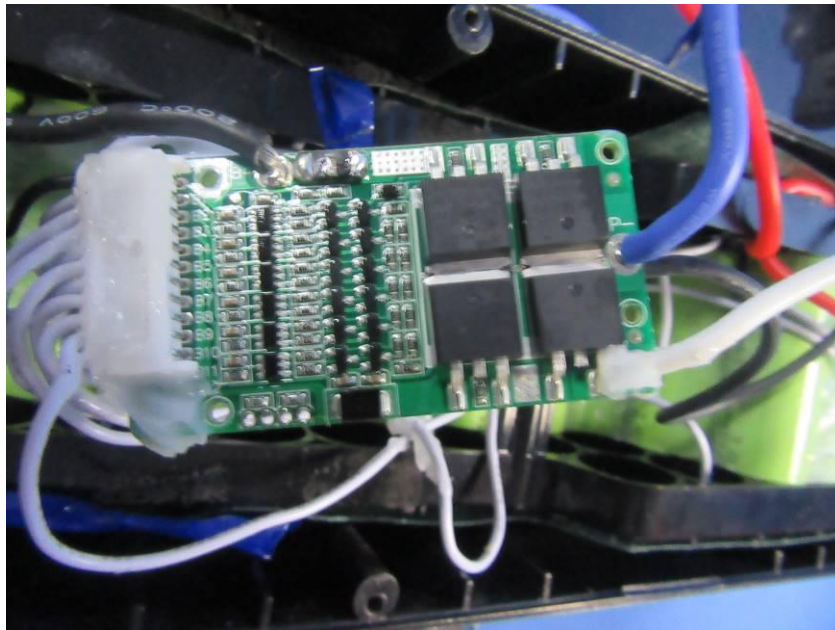


8.4 EUT Constructional Details (EUT Photos)









- End of the Report -