



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

EMC TEST REPORT

Applicant :	Shenzhen Hailei New Energy Co.,Ltd
Address :	Room 101, Building A, No.7, Xiusheng 1st road, Xiuxin Community, Kengzi street,Pingshan district, Shenzhen City, Guangdong Province, China
Manufacturer :	Shenzhen Hailei New Energy Co.,Ltd
Address :	Room 101, Building A, No.7, Xiusheng 1st road, Xiuxin Community, Kengzi street,Pingshan district, Shenzhen City, Guangdong Province, China
Factory :	Shenzhen Hailei New Energy Co.,Ltd
Address :	Room 101, Building A, No.7, Xiusheng 1st road, Xiuxin Community, Kengzi street,Pingshan district, Shenzhen City, Guangdong Province, China
This document includes : 47 pages	

Product :	Rechargeable Lithium Ion Battery Module	
Model name :	LV51314H	
Trade mark :	Hailei	
Rated voltage :	51.2Vdc	
Rated capacity :	314 Ah, 16.076.4Wh	
Highest clock frequency :	≤108 MHz	
Protection class :	--	
Tests realised :	On one sample	
Test date :	Oct.24 to Nov.05, 2025	
Standards used (date) :	EN IEC 61000-6-4:2019 EN IEC 61000-6-3:2021 EN IEC 61000-6-2:2019 EN IEC 61000-6-1:2019	
Clauses examined :	All Clauses Relevant.	

CONCLUSION :The sample does satisfy the clauses examined .

Test done by:	Approved by:
	
Name : Yuan ZHANG	Name : Sean YU
Date : Dec.23, 2025	Date : Dec.23, 2025

This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

LCIE China Company Limited 必维欧亚电气技术咨询服务(上海)有限公司	Building 4, No. 518, Xin Zhuan Road, CaoHejing Songjiang High-Tech Park, Shanghai, CHINA Page 1 of 47	Tel: +86 21 6195 7000 Fax: +86 21 6195 7001 Email: BVLCIEMKT@bureauveritas.com
TEST REPORT EN IEC 61000-6-3:2021 VER.1.0		



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

Table of Content

Table of Content.....	2
Release control record.....	4
1 Summary of test results	5
2 General information of laboratory	6
2.1 Test facility.....	6
2.2 Measurement uncertainty.....	6
3 General product information.....	7
3.1 Specification of product.....	7
3.2 Description of auxiliary equipment and associated equipment	8
3.3 Operation conditions	8
3.4 Photograph of sample	8
4 Test instruments.....	9
5 Test procedure and results for emission.....	10
5.1 Continuous disturbances, AC mains port (150kHz – 30 MHz).....	10
5.1.1 Test condition	10
5.1.2 Test results.....	11
5.2 Continuous disturbances, DC power port (150kHz – 30 MHz).....	12
5.2.1 Test condition	12
5.2.2 Test results.....	13
5.3 Continuous disturbances, other wired ports (150kHz – 30 MHz)	14
5.3.1 Test condition	14
5.3.2 Test results.....	15
5.4 Discontinuous disturbances (9 kHz – 30 MHz).....	16
5.4.1 Test condition	16
5.4.2 Test results.....	17
5.5 Radiated emission (below 1GHz)	18
5.5.1 Test condition	18
5.5.2 Test results.....	19
5.6 Radiated emission (above 1GHz).....	27
5.6.1 Test condition	27
5.6.2 Test results.....	28
5.7 Harmonics current emissions	29
5.7.1 Test condition	29
5.7.2 Test results.....	30
5.8 Voltage fluctuation and flicker.....	31
5.8.1 Test condition	31
5.8.2 Test results.....	32
6 Test condition and results for immunity	33
6.1 General information.....	33
6.2 Electrostatic discharge immunity test (ESD)	34
6.2.1 Test condition	34
6.2.2 Test results.....	35
6.3 Radiated, Radio-frequency, Electromagnetic field immunity test (RS).....	36
6.3.1 Test condition	36
6.3.2 Test results.....	37
6.4 Electrical fast transient/Burst immunity test (EFT).....	38
6.4.1 Test condition	38
6.4.2 Test results.....	39
6.5 Surges.....	40
6.5.1 Test condition	40
6.5.2 Test results.....	40
6.6 Immunity to conducted disturbances induced by RF fields (CS), 0.15 MHz to 80 MHz	41



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

6.6.1	Test condition	41
6.6.2	Test results	41
6.7	Power frequency magnetic field	42
6.7.1	Test condition	42
6.7.2	Test results	42
6.8	Voltage dips and short interruptions	43
6.8.1	Test condition	43
6.8.2	Test results	43
7	Conclusion	44
	Appendix A: Photograph of sample	45



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1
Release control record

Report No.	Description	Date Issued
CNDQ-ESH-P25101000B-1	Original release	Dec.23, 2025

LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

**Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA**

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

Page 4 of 47

TEST REPORT EN IEC 61000-6-3:2021 VER.1.0



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

1 Summary of test results

No.	Item	Result
Emission part:		
1	Continuous disturbances	N/A
2	Discontinuous disturbances	N/A
3	Radiated emission	PASS
4	Harmonic current emission	N/A
5	Voltage fluctuation and flicker	N/A
Immunity part:		
6	Electrostatic discharge	PASS
7	RF electromagnetic fields	PASS
8	Electrical fast transient/Burst	PASS
9	Surge	N/A
10	Injected current	N/A
11	Power frequency magnetic field	PASS
12	Voltage dips and short interruptions	N/A



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

2 General information of laboratory

2.1 Test facility

☒ The tests done in this report are subcontracted to :

Laboratory name: KSIGN(Guangdong) Testing Co., Ltd.

Testing location: West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park,
Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China
(CNAS L13261)

2.2 Measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

This lab's measurement uncertainty U_{Lab} , is low than U_{Cispr} , Table 1 – Values of U_{Cispr} of CISPR 16-4-2, therefore compliance is deemed to occur if no measured disturbance exceeds the disturbance limit.

Measurement		Value
Radiated disturbance (3 m)	30 MHz ~200 MHz	4.51 dB
	200 MHz ~1000 MHz	4.98 dB



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

3 General product information

3.1 Specification of product

Operating modes: ☒ Mode A: Charging mode.
☒ Mode B: Discharging mode.
☐ Mode C:

Types of port: ☐ AC power port
☒ DC power port
☒ wired network port: LAN port for BMS
☐ signal/control port
☒ enclosure port

Special comments: N/A.

Rating label:

 Rechargeable Lithium Ion Battery Module Battery Type:LiFePO4		 Rechargeable Lithium Ion Battery Module Battery Type:LiFePO4	
Model	LV51314H	Model	LV51314H
Total Energy	16.076kWh	Total Energy	16.076kWh
Operating Voltage Range	44.8-57.6V	Operating Voltage Range	44.8-57.6V
Efficiency	97%	Efficiency	97%
Nominal Voltage	51.2V	Nominal Voltage	51.2V
Standard charging current	100A	Standard charging current	100A
Maximum discharge current	150A	Maximum discharge current	150A
Charging Temperature	From 0℃ to 50℃	Charging Temperature	From 0℃ to 50℃
Discharging Temperature	From -20℃ to 60℃	Discharging Temperature	From -20℃ to 60℃
Dimension(W"H"D)mm	580*772*240mm	Dimension(W"H"D)mm	580*772*240mm
Nominal Capacity	314Ah	Nominal Capacity	314Ah
IP Rating	IP66	IP Rating	IP66
Max numbers of parallel connection	15	Max numbers of parallel connection	15
Name of manufacturer	Shenzhen Hailei New Energy Co., LTD.	Name of manufacturer	Shenzhen Hailei New Energy Co., LTD.
Battery designation	IFpP/73/175/208/[16S]M/-20+50/95	Battery designation	IFpP/72/174/208/[16S]M/-10+50/95
Recommended charge instructions	100A CC charging to 57. 6V, 57. 6V CV charging until current reduce to 15. 7A	Recommended charge instructions	100A CC charging to 57. 6V, 57. 6V CV charging until current reduce to 15. 7A
16kWh -Heating function type  SN : LV51314YYWW0001		16kWh -Heating function type  SN : LV51314YYWW0001	
 Made in China		 Made in China	

LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

Page 7 of 47

TEST REPORT EN IEC 61000-6-3:2021 VER.1.0



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

3.2 Description of auxiliary equipment and associated equipment

N/A

3.3 Operation conditions

The EUT operating and testing at below conditions:

Ambient conditions:	Temperature	:	24.5.0-25.5 °C
	Relative humidity	:	45.0-50.0 %
	Atmospheric pressure	:	101.0 kPa

3.4 Photograph of sample

Refer to Appendix A

**LCIE****TEST REPORT N°: CNDQ-ESH-P25101000B-1**

4 Test instruments

Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
Radiated Emission				
Log Periodic Antenna	Schwarzbeck	VULB 9163	1230	2026-01-11
Pre-Amplifier	Schwarzbeck	BBV 9745	9745#129	2025-12-22
EMI Test Receiver	R&S	ESR	102525	2026-01-10
Electrostatic Discharge				
ESD Simulator	TESEQ	NSG 437	1364	2025-12-24
Radio Frequency electromagnetic field				
RF Switch	JS TOYO	NS 4903	1901-214	2025-12-22
Signal Generator	Agilent	N5181A	MY50141283	2025-12-22
Power Meter	Agilent	E4419	GB40202778	2025-12-22
Power Sensor	Agilent	E9304A	MY50390009	2025-12-22
Power Sensor	Agilent	E9300A	MY41498315	2025-12-22
Transmit Antenna	Schwarzbeck	VULP 9118 E	00996	2025-12-25
Transmit Antenna	Schwarzbeck	STLP 9149	00652	2025-12-25
Power Amplifier	Vectawave	VBA1000-150	123821	2025-12-22
Dual Directional Coupler	Werlatone	C5597-10	118142	2025-12-22
Power Amplifier	Milmega	AS0706-50	1085571	2025-12-22
Electrical Fast Transient/burst Immunity				
Test Host	LIONCEL	LSG-433C-05AC	433C05AC - 0231102	2025-12-22
Power Frequency Magnetic Field Immunity				
Test Host	EMC partner	IMU4000 F-S-D	106754-2085	2025-12-22
Magnetic Field Coil	EMC partner	MF1000-1	1605	2025-12-22



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

5 Test procedure and results for emission

5.1 Continuous disturbances, AC mains port (150kHz – 30 MHz)

5.1.1 Test condition

Applicable Standard:	EN IEC 61000-6-4:2019, EN IEC 61000-6-3:2021	
Test setup description:	☐	Setup Type A (40 cm distance to vertical ground plane, 80 cm over ground plane)
	☐	Setup Type B (40 cm distance to horizontal ground plane)
	☐	Floor standing equipment setup (10 cm over ground plane)
	☐	Other: --
	☐	Artificial hand applied
Test method applied:	☐	Artificial mains network
	☐	Other: --
Remark:	--	

Limits for conducted emissions - low voltage AC mains port		
Frequency range (MHz)	Quasi-peak (dB μ V)	Average (dB μ V)
0.15-0.5	79	66
0.5-30	73	60

Limits for conducted emissions - low voltage AC mains port		
Frequency range (MHz)	Quasi-peak (dB μ V)	Average (dB μ V)
0.15-0.5	66-56	56-46
0.5-5	56	46
5-30	60	50



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

5.1.2 Test results

N/A

LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

**Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA**

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

Page 11 of 47

TEST REPORT EN IEC 61000-6-3:2021 VER.1.0

**LCIE****TEST REPORT N°: CNDQ-ESH-P25101000B-1****5.2 Continuous disturbances, DC power port (150kHz – 30 MHz)****5.2.1 Test condition**

Applicable Standard:	EN IEC 61000-6-4:2019, EN IEC 61000-6-3:2021	
Test setup description:	☐	Setup Type A (40 cm distance to vertical ground plane, 80 cm over ground plane)
	☐	Setup Type B (40 cm distance to horizontal ground plane)
	☐	Floor standing equipment setup (10 cm over ground plane)
	☐	Other: --
	☐	Artificial hand applied
Test method applied:	☐	Artificial mains V-network
	☐	Artificial Δ -network
	☐	Other: --
Remark:	The total length of the cable which connected to DC power port does not exceed 3 m according to the manufacturer's functional specification.	

EN IEC 61000-6-4:2019 Limits for conducted emissions - DC power port		
Frequency range (MHz)	Quasi-peak (dBμV)	Average (dBμV)
0.15-0.5	89	76
0.5-30	83	70

EN IEC 61000-6-3:2021 Limits for conducted emissions - DC power port		
Measurement network: V-AN		
Frequency range (MHz)	Quasi-peak (dBμV)	Average (dBμV)
0.15-0.5	79	66
0.5-30	73	60
Measurement network: Δ-AN		
Frequency range (MHz)	Quasi-peak (dBμV)	Average (dBμV)
0.15-0.5	84-74	74-64
0.5-30	74	64



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

5.2.2 Test results

N/A

LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

**Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA**

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

Page 13 of 47

TEST REPORT EN IEC 61000-6-3:2021 VER.1.0



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

5.3 Continuous disturbances, other wired ports (150kHz – 30 MHz)

5.3.1 Test condition

Applicable Standard:	EN IEC 61000-6-3:2021	
Test setup description:	☐	Setup Type A (40 cm distance to vertical ground plane, 80 cm over ground plane)
	☐	Setup Type B (40 cm distance to horizontal ground plane)
	☐	Floor standing equipment setup (10 cm over ground plane)
	☐	Other: --
	☐	Artificial hand applied
Test method applied:	☐	Current probe
	☐	Capacitive voltage probe (CVP)
	☐	ISN
	☐	Other: --
Remark:	The total length of the cable which connected to LAN port for BMS does not exceed 3 m according to the manufacturer's functional specification.	

EN IEC 61000-6-3:2021 Limits for conducted emissions - other wired ports				
Frequency range (MHz)	Voltage limits		Current limits	
	Quasi-peak (dBμV)	Average (dBμV)	Quasi-peak (dBμA)	Average (dBμA)
0.15-0.5	84-74	74-64	40-30	30-20
0.5-30	74	64	30	20



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

5.3.2 Test results

N/A

LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

**Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA**

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

Page 15 of 47

TEST REPORT EN IEC 61000-6-3:2021 VER.1.0



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

5.4 Discontinuous disturbances (9 kHz – 30 MHz)

5.4.1 Test condition

Applicable Standard:	EN IEC 61000-6-4:2019 / EN IEC 55014-1:2021 EN IEC 61000-6-3:2021 / EN IEC 55014-1:2021	
Test setup description:	☐	Setup Type A (40 cm distance to vertical ground plane, 80 cm over ground plane)
	☐	Setup Type B (40 cm distance to horizontal ground plane)
	☐	Floor standing equipment setup (10 cm over ground plane)
	☐	Other: --
	☐	Artificial hand applied
CDN applied:	☐	Artificial mains network
	☐	Other: --
Applied method for discontinuous disturbances:	☐	Click rate determined on base of switching operations
	☐	Click rate determined on base of clicks measurements
	☐	Other: --
Remark:	--	



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

5.4.2 Test results

N/A

LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

**Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA**

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

Page 17 of 47

TEST REPORT EN IEC 61000-6-3:2021 VER.1.0

**LCIE****TEST REPORT N°: CNDQ-ESH-P25101000B-1****5.5 Radiated emission (below 1GHz)****5.5.1 Test condition**

Applicable Standard:	EN IEC 61000-6-4:2019, EN IEC 61000-6-3:2021	
Test set up description:	☒	Equipment on a table of 80 cm height
	☐	Equipment on the floor (isolated from ground plane)
	☐	Other (e.g. height of pallet):
Supplementary test set-up description for SAC :	Measurements were made in semi-anechoic chamber that complies to CISPR 16. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements with quasi-peak detector for below 1GHz were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.	
Test method applied (30 MHz to 1000 MHz):	☒	OATS or SAC with measurement distance [m]: 3 m
	☐	TEM Waveguide according to IEC 61000-4-20
	☐	FAR with measurement distance [m]: 3 m
Remark:	--	

EN IEC 61000-6-4:2019 Limits for SAC 3 m distance

Frequency range (MHz)	Quasi-peak (dB μ V/m)
30-230	50
230-1000	57

EN IEC 61000-6-3:2021 Limits for SAC 3 m distance

Frequency range (MHz)	Quasi-peak (dB μ V/m)
30-230	40
230-1000	47

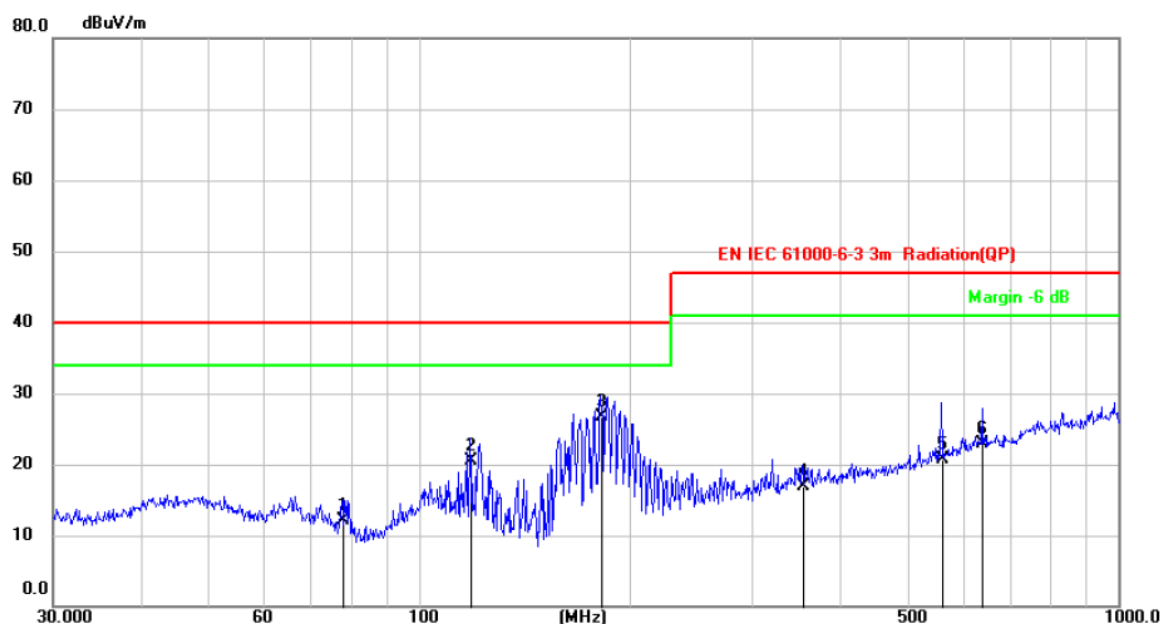


LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

5.5.2 Test results

Model:	LV51314H(The battery cell is by Ganfeng)
Test mode:	Mode A
Test voltage:	DC57.6V/100A
Remark:	Horizontal



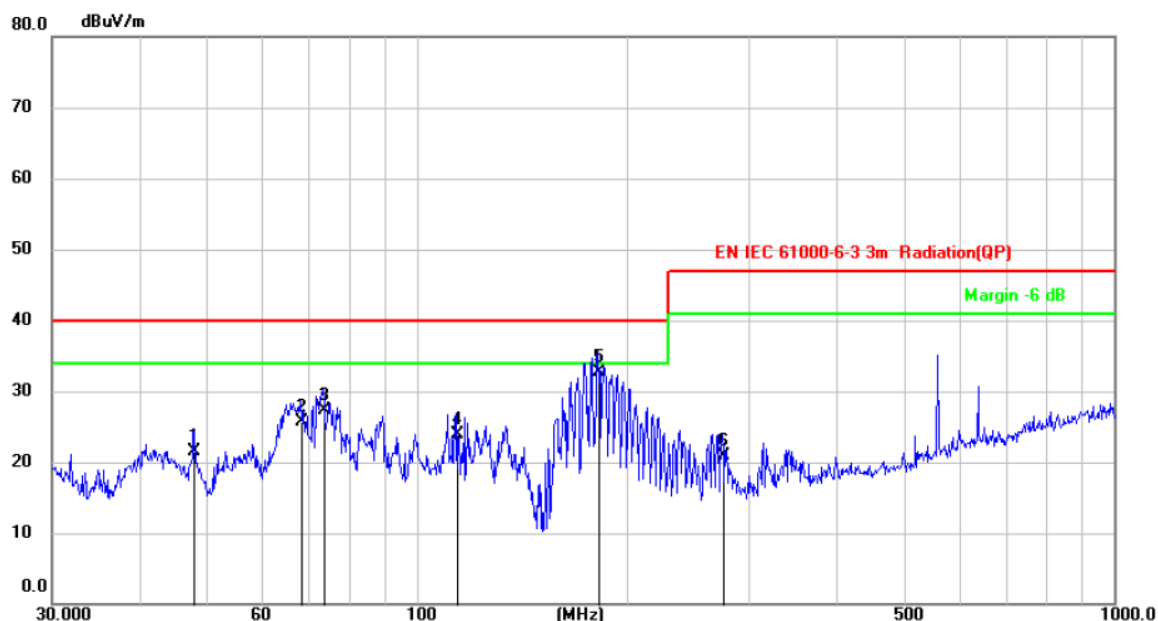
No.	Mk.	Freq. MHz	Reading Level (dBuV)	Correct Factor (dB/m)	Measurement (dBuV/m)	Limit (dBuV/m)	Over (dB)	Detector
1		77.7017	27.48	-15.37	12.11	40.00	-27.89	QP
2		118.3936	33.76	-13.16	20.60	40.00	-19.40	QP
3	*	182.3992	40.29	-13.66	26.63	40.00	-13.37	QP
4		353.6247	24.64	-7.82	16.82	47.00	-30.18	QP
5		560.1033	24.99	-4.26	20.73	47.00	-26.27	QP
6		640.0496	25.72	-2.76	22.96	47.00	-24.04	QP



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

Model:	LV51314H(The battery cell is by Ganfeng)
Test mode:	Mode A
Test voltage:	DC57.6V/100A
Remark:	Vertical



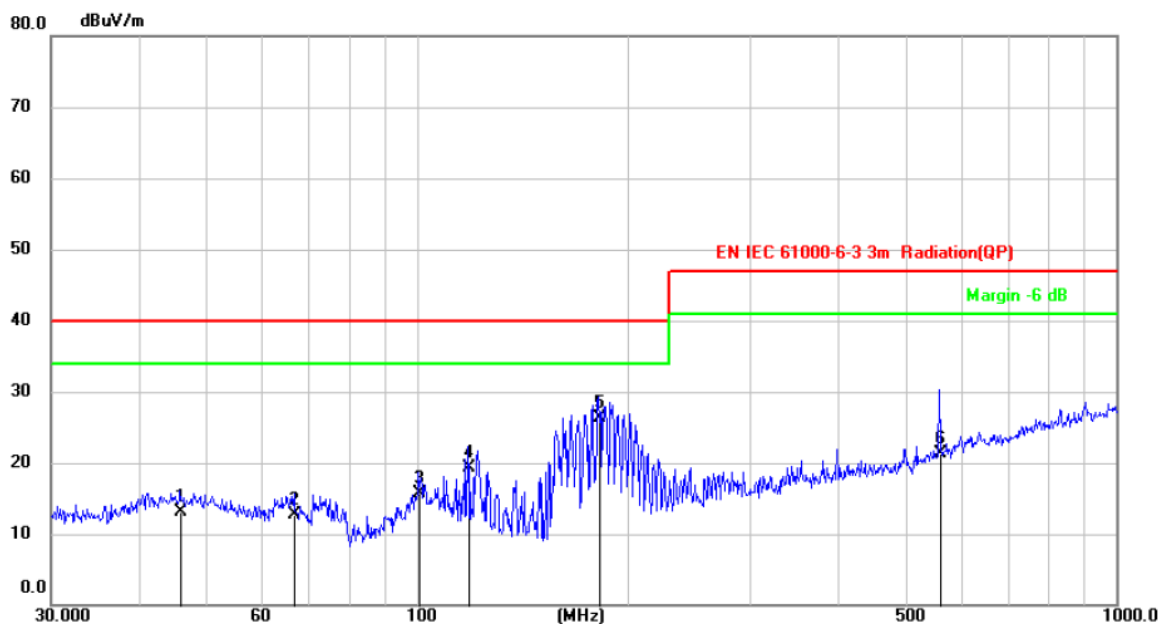
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		47.9434	30.65	-9.15	21.50	40.00	-18.50	QP
2		68.2351	38.41	-12.70	25.71	40.00	-14.29	QP
3		73.5654	42.11	-14.84	27.27	40.00	-12.73	QP
4		114.4142	36.27	-12.45	23.82	40.00	-16.18	QP
5	*	182.3992	46.41	-13.66	32.75	40.00	-7.25	QP
6		274.3861	31.02	-10.06	20.96	47.00	-26.04	QP



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

Model:	LV51314H(The battery cell is by Ganfeng)
Test mode:	Mode B
Test voltage:	DC51.2V/150A
Remark:	Horizontal



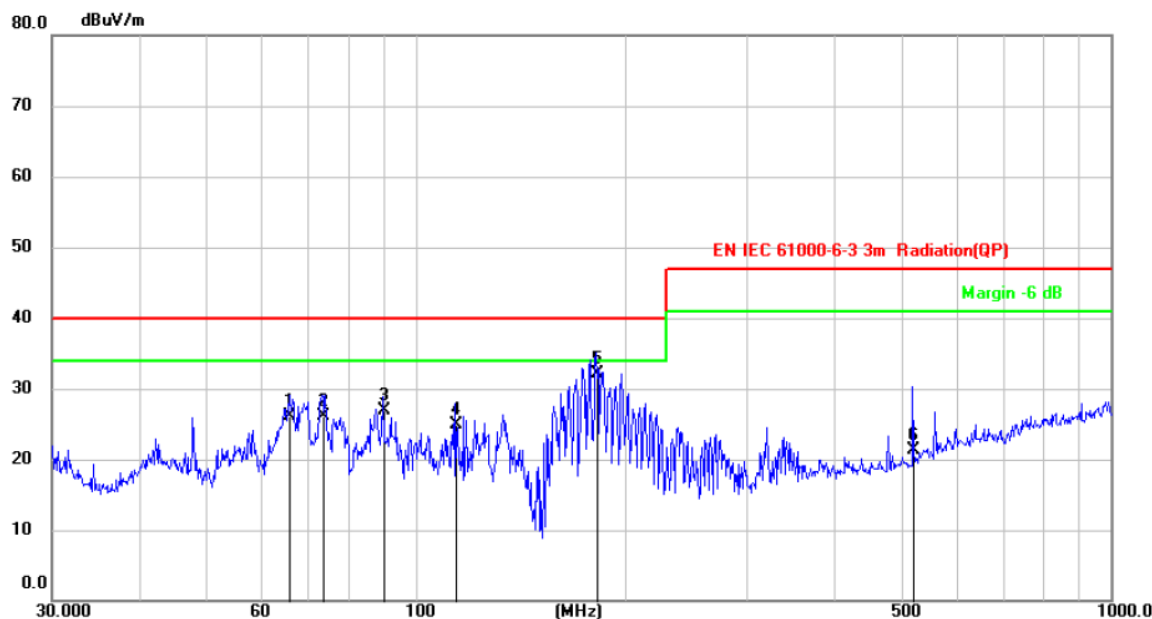
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		45.9518	22.46	-9.30	13.16	40.00	-26.84	QP
2		66.8730	24.76	-12.06	12.70	40.00	-27.30	QP
3		100.8455	27.04	-11.38	15.66	40.00	-24.34	QP
4		118.4143	32.50	-13.16	19.34	40.00	-20.66	QP
5	*	182.3992	40.06	-13.66	26.40	40.00	-13.60	QP
6		560.0051	25.55	-4.26	21.29	47.00	-25.71	QP



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

Model:	LV51314H(The battery cell is by Ganfeng)
Test mode:	Mode B
Test voltage:	DC51.2V/150A
Remark:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		65.8492	37.91	-11.86	26.05	40.00	-13.95	QP
2		73.5009	40.92	-14.82	26.10	40.00	-13.90	QP
3		89.9835	39.87	-13.06	26.81	40.00	-13.19	QP
4		114.3741	37.37	-12.44	24.93	40.00	-15.07	QP
5	*	182.3992	45.67	-13.66	32.01	40.00	-7.99	QP
6		519.9757	26.49	-5.13	21.36	47.00	-25.64	QP

LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

Page 22 of 47

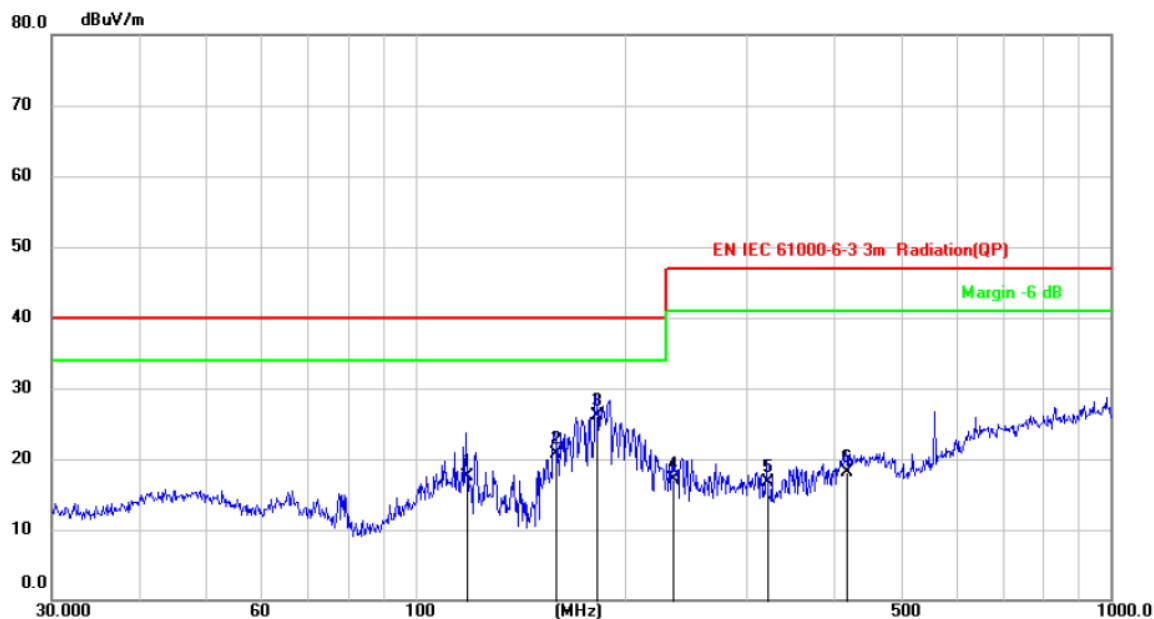
TEST REPORT EN IEC 61000-6-3:2021 VER.1.0



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

Model:	LV51314H(The battery cell is by EVE)
Test mode:	Mode A
Test voltage:	DC57.6V/100A
Remark:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		118.3936	30.76	-13.16	17.60	40.00	-22.40	QP
2		159.1971	35.74	-15.02	20.72	40.00	-19.28	QP
3	*	182.3992	39.79	-13.66	26.13	40.00	-13.87	QP
4		234.4148	28.18	-11.08	17.10	47.00	-29.90	QP
5		319.9929	25.65	-8.93	16.72	47.00	-30.28	QP
6		416.4710	24.72	-6.58	18.14	47.00	-28.86	QP

LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA

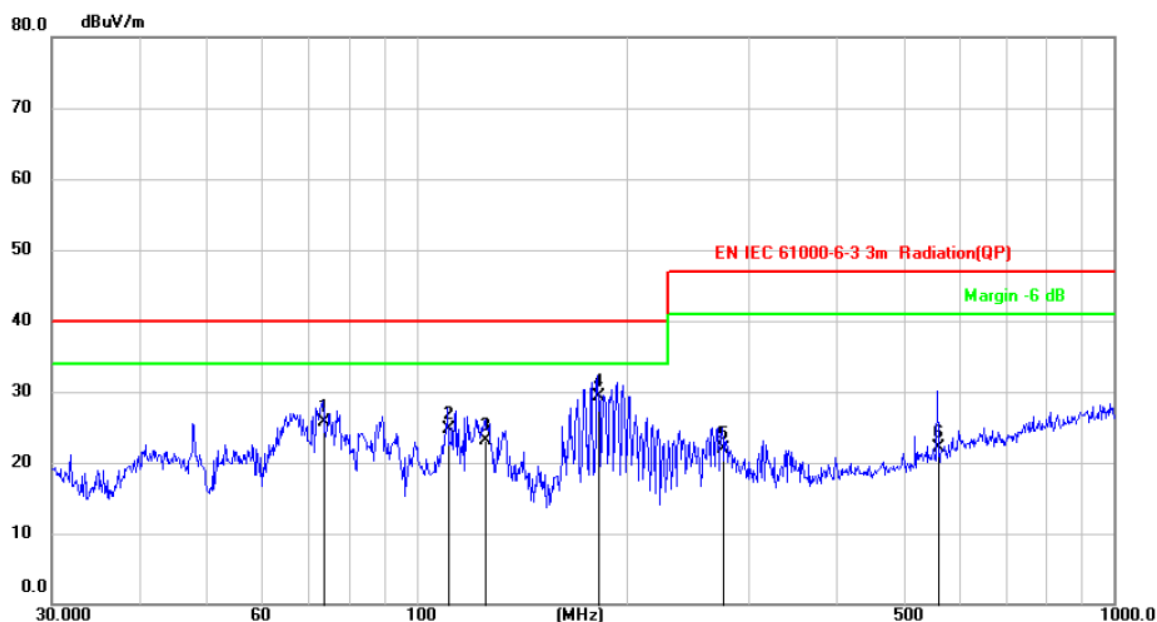
Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

Model:	LV51314H(The battery cell is by EVE)
Test mode:	Mode A
Test voltage:	DC57.6V/100A
Remark:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		73.5652	40.61	-14.84	25.77	40.00	-14.23	QP
2		111.1710	36.51	-11.86	24.65	40.00	-15.35	QP
3		125.7539	37.71	-14.58	23.13	40.00	-16.87	QP
4	*	182.3992	42.91	-13.66	29.25	40.00	-10.75	QP
5		274.3860	32.02	-10.06	21.96	47.00	-25.04	QP
6		560.0049	26.35	-4.26	22.09	47.00	-24.91	QP

LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

Page 24 of 47

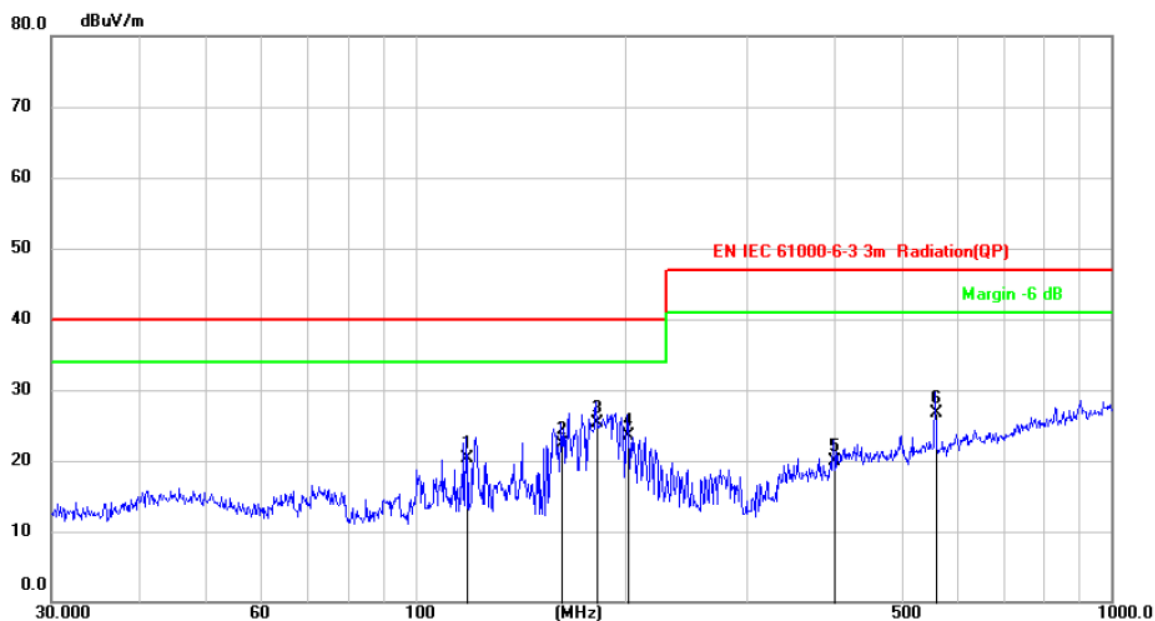
TEST REPORT EN IEC 61000-6-3:2021 VER.1.0



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

Model:	LV51314H(The battery cell is by EVE)
Test mode:	Mode B
Test voltage:	DC51.2V/150A
Remark:	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		118.4141	33.50	-13.16	20.34	40.00	-19.66	QP
2		162.4110	37.25	-14.89	22.36	40.00	-17.64	QP
3	*	182.3992	39.06	-13.66	25.40	40.00	-14.60	QP
4		201.6400	35.49	-12.08	23.41	40.00	-16.59	QP
5		400.0108	26.97	-7.13	19.84	47.00	-27.16	QP
6		560.0049	31.05	-4.26	26.79	47.00	-20.21	QP

LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

Page 25 of 47

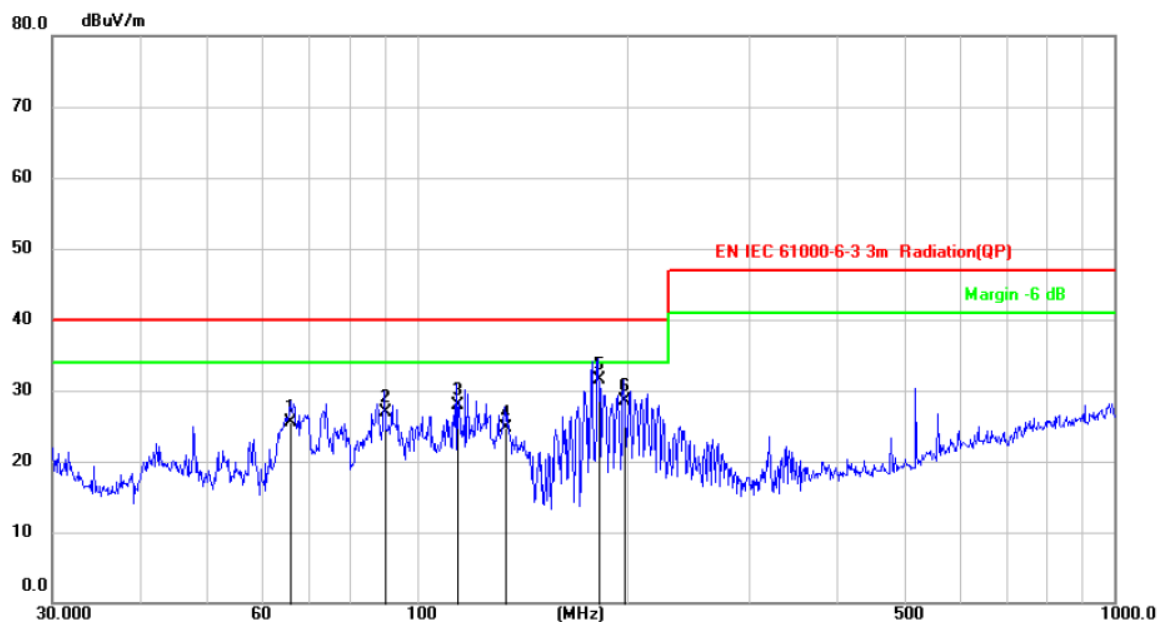
TEST REPORT EN IEC 61000-6-3:2021 VER.1.0



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

Model:	LV51314H(The battery cell is by EVE)
Test mode:	Mode B
Test voltage:	DC51.2V/150A
Remark:	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	Detector
1		65.8491	37.41	-11.86	25.55	40.00	-14.45	QP
2		89.9835	39.87	-13.06	26.81	40.00	-13.19	QP
3		114.3739	40.37	-12.44	27.93	40.00	-12.07	QP
4		133.7589	40.07	-15.32	24.75	40.00	-15.25	QP
5	*	182.3992	45.17	-13.66	31.51	40.00	-8.49	QP
6		198.4139	40.63	-12.09	28.54	40.00	-11.46	QP

LCIE China Company Limited
必维欧亚电气技术咨询服务有限公司

Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

Page 26 of 47

TEST REPORT EN IEC 61000-6-3:2021 VER.1.0



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

5.6 Radiated emission (above 1GHz)

5.6.1 Test condition

Applicable Standard:	EN IEC 61000-6-4:2019, EN IEC 61000-6-3:2021	
Test set up description:	☐	Equipment on a table of 80 cm height
	☐	Equipment on the floor (isolated from ground plane)
	☐	Other:
Supplementary test set-up description for SAC :	Measurements were made in semi-anechoic chamber with RF absorber on the RGP which complies to CISPR 16. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements with peak and average detector were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.	
Test method applied (1000 MHz to 6000 MHz):	☐	FSOATS with measurement distance [m]: 3 m
	☐	OATS with measurement distance [m]: 3 m
	☐	FAR with measurement distance [m]: 3 m
	☐	SAC with measurement distance [m]: 3 m
Remark:	The highest operation frequency is below 108MHz.	

EN IEC 61000-6-4:2019 Limits for 3 m distance

Frequency range (MHz)	Peak (dBµV/m)	Average (dBµV/m)
1000 – 3000	76	56
3000 – 6000	80	60

EN IEC 61000-6-3:2021 Limits for 3 m distance

Frequency range (MHz)	Peak (dBµV/m)	Average (dBµV/m)
1000 – 3000	70	50
3000 – 6000	74	54



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

5.6.2 Test results

N/A

LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

**Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA**

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

Page 28 of 47

TEST REPORT EN IEC 61000-6-3:2021 VER.1.0



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

5.7 Harmonics current emissions

5.7.1 Test condition

Applicable Standard:	EN IEC 61000-6-3:2021 (EN IEC 61000-3-2:2019+A1:2021)	
Test set up description:	Floor standing equipment set-up (10 cm over ground plane)	
Limit classification in accordance with the standard:	☐	Class A
	☐	Class B
	☐	Class C, rated power > 25 W
	☐	Class C, 5 W ≤ rated power ≤ 25 W
	☐	Class D
Observation period	2.5 min	
Remark:	The EUT is powered by DC.	



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

5.7.2 Test results

N/A

LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

**Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA**

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

Page 30 of 47

TEST REPORT EN IEC 61000-6-3:2021 VER.1.0



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

5.8 Voltage fluctuation and flicker

5.8.1 Test condition

Applicable Standard:	EN IEC 61000-6-3:2021 (EN 61000-3-3:2013+A1:2019+A2:2021)	
Test set up description:	Floor standing equipment set-up (10 cm over ground plane)	
Test method:	☐	4.2.2 Flickermeter according to IEC 61000-4-15
	☐	4.2.3 Simulation
	☐	4.2.4 Analytical method
	☐	4.2.5 Use of $P_{st} = 1$ curve
	☐	4.3 Long-Term flicker value P_{lt}
Observation time selected:	☐	10 Minutes
	☐	120 Minutes
	☐	24 times switching
	☐	Other: --
Limit for d_{max} applied:	☐	4 %
	☐	6 %
	☐	7 %
Remark:	The EUT is powered by DC.	



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

5.8.2 Test results

N/A

LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

**Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA**

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

Page 32 of 47

TEST REPORT EN IEC 61000-6-3:2021 VER.1.0



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

6 Test condition and results for immunity

6.1 General information

Performance criteria as defined by the standard EN IEC 61000-6-2:2019, EN IEC 61000-6-1:2019	
Criterion	Description from standard
A	The EUT 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 EUT is used as intended. If the performance level is not specified by the manufacturer, this may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.
B	The EUT 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 EUT is used as intended. The performance level may be replaced by a permissible loss of performance. However, during the test degradation of performance is allowed but 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 equipment if used as intended.
C	Temporary loss of function is allowed during the test, provided the function is self-recoverable or can be restored by the operation of the controls.
Other:	--

**LCIE****TEST REPORT N°: CNDQ-ESH-P25101000B-1****6.2 Electrostatic discharge immunity test (ESD)****6.2.1 Test condition**

Basic standard:	IEC 61000-4-2:2008 / EN 61000-4-2:2009	
Test set up:	☒	Table-top equipment
	☐	Floor standing equipment
	☐	Wall or ceiling mounted equipment (Treated as table top)
Supplementary test set up description:	Measurements were made on a ground plane that extends 0.5 m minimum beyond all sides of the system under test and the minimum distance between the equipment under test and any laboratory walls or any other metallic surfaces shall be at least 1 m. Air discharges were applied to non-metallic parts of the system. Contact discharges were applied to all accessible metallic parts. Discharges were also applied to the Horizontal and Vertical Coupling Planes, where applicable.	
Discharge impedance:	330 ohm / 150 pF	
Size of horizontal coupling plate:	1.6 x 0.8 m	
Size of vertical coupling plate:	0.5 x 0.5 m	
Number of discharges for each test point:	10	
Discharge interval:	1 s	
Performance criterion:	B	
Remark:	--	



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

6.2.2 Test results

Operating mode:	Mode A and Mode B			
Ambient temperature:	22.1 °C			
Relative humidity:	53.1 %			
Atmospheric pressure:	101.2 kPa			
Supplementary information:	--			
Location of discharge	Test level (kV)	Polarity	Type	Observations
Vertical coupling plate	2,4	+	Contact discharge	Note 1
Vertical coupling plate	2,4	-	Contact discharge	Note 1
Horizontal coupling plate	2,4	+	Contact discharge	Note 1
Horizontal coupling plate	2,4	-	Contact discharge	Note 1
Points on conductive surface as indicated in the picture below	2,4	+	Contact discharge	Note 1
Points on conductive surface as indicated in the picture below	2,4	-	Contact discharge	Note 1
Points on non-conductive surface as indicated in the picture below	2, 4, 8	+	Air discharge	Note 1
Points on non-conductive surface as indicated in the picture below	2, 4, 8	-	Air discharge	Note 1

Note 1: EUT worked as intended during and after test.

Photos of test points:

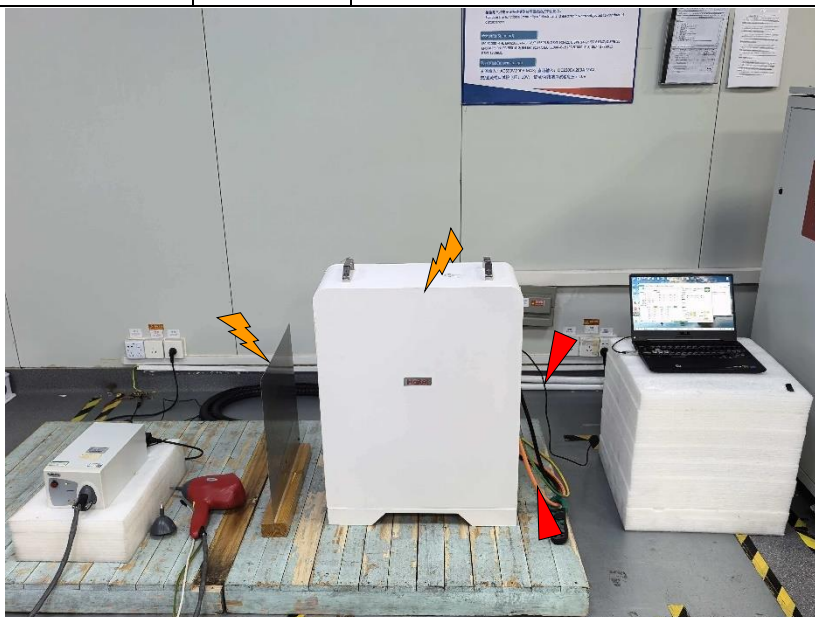
Symbols identifying discharge applied:



Contact discharge



Air discharge



**LCIE****TEST REPORT N°: CNDQ-ESH-P25101000B-1****6.3 Radiated, Radio-frequency, Electromagnetic field immunity test (RS)****6.3.1 Test condition**

Basic standard:	IEC 61000-4-3:2020 / EN IEC 61000-4-3:2020	
Test setup:	☒	Table-top equipment
	☐	Floor standing equipment
	☐	Other: --
Supplementary test set up description:	Measurements were made in a semi or full anechoic chamber or TEM or reverberation chamber and the indicated field strength was pre-calibrated prior to placement of the system under test. For semi or full anechoic chamber the tests were performed in both the horizontal and vertical polarities, where applicable. The antenna was placed between 1 and 3 m from the product under test.	
Antenna height:	1.5 m	
Distance antenna to EUT:	3 m	
Modulation:	80 % AM with 1 kHz	
Dwell time:	3 s	
Step size:	1%	
Applied testing method:	☒	IEC 61000-4-3 Radiated Field with Antenna
	☐	IEC 61000-4-22 Radiated emission and immunity measurements in fully anechoic rooms (FARs)
	☐	IEC 61000-4-20 Emission and immunity testing in transverse electromagnetic (TEM) waveguides
Performance criterion:	A	
Remark:	--	



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

6.3.2 Test results

Operating mode:		Mode A and Mode B			
Supplementary information:		--			
Frequency range	Test level (V/m)	Polarization	Azimuth	Modulation	Observations
80 MHz – 1000 MHz	3 & 10	Horizontal/ Vertical	0°	AM 1 kHz, 80 %	Note 1
			90°		
			180°		
			270°		
1.4 GHz – 6 GHz	3	Horizontal/ Vertical	0°	AM 1 kHz, 80 %	Note 1
			90°		
			180°		
			270°		
Note 1: EUT worked as intended during and after test.					



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

6.4 Electrical fast transient/Burst immunity test (EFT)

6.4.1 Test condition

Basic standard:	IEC 61000-4-4:2012 / EN 61000-4-4:2012	
Test setup:	☒	Table-top equipment
	☐	Floor standing equipment
	☐	Artificial hand applied
Supplementary test set up description:	The ground reference plane shall project beyond the EUT by at least 0.1 m on all sides. The minimum distance between the EUT and all other conductive structures (including the generator, AE and the walls of a shielded room), except the ground reference plane, shall be more than 0.5 m. All cables to the EUT shall be placed on the insulation support 0.1 m above the ground reference plane. Cables not subject to test shall be routed as far as possible from the cable under test to minimize the coupling between the cables. Either a direct coupling network or a capacitive clamp shall be used for the application of the test voltages.	
Test time:	1 min	
Repetition frequency:	5 kHz	
Impulse wave shape:	5/50 ns	
Burst duration:	15 ms for 5kHz repetition frequency	
Burst period:	300 ms	
Performance criterion:	B	
Remark:	The total length of the cable which connected to LAN port for BMS does not exceed 3 m according to the manufacturer's functional specification.	



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

6.4.2 Test results

Operating mode:	Mode A and Mode B				
Supplementary information:	--				
Port	Test line	Test level (kV)	Polarity	Coupling method	Observations
Input and Output DC power ports	Positive/ Negative polarity	0.5 & 1	+/-	CDN	Note 1
Note 1: EUT worked as intended during and after test.					



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

6.5 Surges

6.5.1 Test condition

Basic Standard:	IEC 61000-4-5:2014+A1:2017 / EN 61000-4-5:2014+A1:2017
Test set up description:	Floor standing equipment set-up (10 cm over ground plane)
Supplementary test set up description:	Tests were conducted with the product connected to a Coupling/Decoupling Network (CDN)
Wave-Shape:	1.2/50 μ s open circuit voltage, 8/20 μ s short circuit current
Repetition rate:	60 s
Number of pulses for each coupling:	5 positive and 5 negative
Performance criterion:	B
Remark:	The total length of the cable which connected to LAN port for BMS and DC power port does not exceed 3 m and the cable is inside a building according to the manufacturer's functional specification.

6.5.2 Test results

N/A



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

6.6 Immunity to conducted disturbances induced by RF fields (CS), 0.15 MHz to 80 MHz

6.6.1 Test condition

Basic Standard:	IEC 61000-4-6:2013 / EN 61000-4-6:2014	
Test setup:	☐	Equipment located (0,1 ± 0,05) m above ground plane
	☐	Elevated ground plane.
	☐	Artificial hand applied.
Supplementary test set up description:	Measurements were made on a ground plane that extends 0.5 m minimum beyond all sides of the system under test. The EUT was located 0.1 m above the reference ground plane and any associated cables attached to the EUT were located between 30 - 50mm above the ground plane. The indicated field was pre-calibrated prior to placement of the system under test.	
Modulation:	80 % AM with 1 kHz	
Dwell time:	3 s	
Step size:	1%	
Performance criterion:	A	
Remark:	The total length of the cable which connected to LAN port for BMS and DC power port does not exceed 3 m and the cable is inside a building according to the manufacturer's functional specification.	

6.6.2 Test results

N/A

**LCIE****TEST REPORT N°: CNDQ-ESH-P25101000B-1****6.7 Power frequency magnetic field****6.7.1 Test condition**

Basic standard:	IEC 61000-4-8:2009 / EN IEC 61000-4-8:2010	
Test setup:	☒	Single Coil. Dimensions: 1 x 1 m
	☐	Single Coil. Dimensions: 1 x 2.6 m
	☐	0,1 m above metal surface
	☐	Homogeneous field (Helmholtz coil). Dimensions:
	☐	Radiating loop swept along test item surface
Supplementary test set up description:	All cables shall be exposed to the magnetic field for 1 m of their length.	
Performance criterion:	A	
Remark:	--	

6.7.2 Test results

Operating mode:	Mode A and Mode B			
Supplementary information:	--			
Axis	Test frequency (Hz)	Test level (A/m)	Duration (s)	Observations
X	50	3 & 30	60	Note 1
Y	50	3 & 30	60	Note 1
Z	50	3 & 30	60	Note 1
Note 1: EUT worked as intended during and after test.				



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

6.8 Voltage dips and short interruptions

6.8.1 Test condition

Basic Standard:	IEC 61000-4-11:2020 / EN IEC 61000-4-11:2020
Test set up description:	Floor standing equipment set-up (10 cm over ground plane)
Supplementary test set up description:	Testing was performed with the product connected directly to a generator capable of simulating the voltage drops.
Repetition rate:	10 s
Number of dips or interruptions:	3
Performance criterion:	B for voltage dips C for voltage interruptions
Remark:	The EUT is powered by DC.

6.8.2 Test results

N/A



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1

7 Conclusion

The apparatus Rechargeable Lithium Ion Battery Module and model LV51314H is in compliance with the requirements of the standards EN IEC 61000-6-4:2019, EN IEC 61000-6-3:2021, EN IEC 61000-6-2:2019 and EN IEC 61000-6-1:2019.



LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

**Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA**

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

Page 44 of 47

TEST REPORT EN IEC 61000-6-3:2021 VER.1.0



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1
Appendix A: Photograph of sample





LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1



LCIE China Company Limited
必维欧亚电气技术咨询服务(上海)有限公司

**Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai, CHINA**

Page 46 of 47

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: BVLCIEMKT@bureauveritas.com

TEST REPORT EN IEC 61000-6-3:2021 VER.1.0



LCIE

TEST REPORT N°: CNDQ-ESH-P25101000B-1



333

LCIE China Company Limited 必维欧亚电气技术咨询服务(上海)有限公司	Building 4, No. 518, Xin Zhuan Road, CaoHejing Songjiang High-Tech Park, Shanghai, CHINA	Tel: +86 21 6195 7000 Fax: +86 21 6195 7001 Email: BVLCIEMKT@bureauveritas.com
Page 47 of 47		TEST REPORT EN IEC 61000-6-3:2021 VER.1.0