



# TEST REPORT

Report No..... : ZHT-221010005E  
 Product..... : Power assisted electric bicycle  
 Trademark..... : **HAPPYRUN**  
 Model(s)..... : HR-G50  
 Applicant..... : Shenzhen Happyrun Intelligent Technology Co.,Ltd.  
 Address..... : 3F, Building A, Runfa Tech Park, NO.25, Mudun Road, First Industry Park, Lou Cun, Gongming, Guangming, Shenzhen, China  
 Manufacturer..... : Shenzhen Happyrun Intelligent Technology Co.,Ltd.  
 Address..... : 3F, Building A, Runfa Tech Park, NO.25, Mudun Road, First Industry Park, Lou Cun, Gongming, Guangming, Shenzhen, China  
 Prepared by..... : Guangdong Zhonghan Testing Technology Co., Ltd.  
 Address..... : Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China  
 Date of Receipt..... : Oct. 09, 2022  
 Date of Test(s)..... : Oct. 09, 2022 - Oct. 14, 2022  
 Date of Issue..... : Oct. 14, 2022  
 Test Standard(s)..... : 47CFR Part 15 Subpart B  
 ANSI C63.4:2014

In the configuration tested, the EUT complied with the standards specified above.

Tested by:

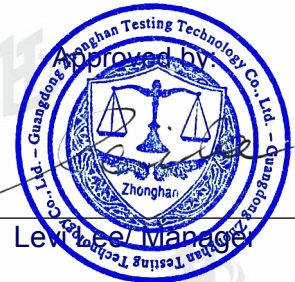
*Eric Jiang*

Kimi Lu/ Engineer

Reviewed by:

*Baret Wu*

Baret Wu/ Director



**Note:** The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report shall not be reproduced except in full, without prior written approval of ZHT. This document may be altered or revised by ZHT, personnel only, and shall be noted in the revision of the document.



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### 1. Revision History

Report No.	Issue Date	Description	Approved
ZHT-221010005E	Oct. 14, 2022	Original	Valid



## 2. Test Summary

Emission			
Requirement - Test	Test Method	Limit	Result
Conducted Emission	47CFR Part 15 Subpart B ANSI C63.4:2014	Class B	PASS
Radiated Emission	47CFR Part 15 Subpart B ANSI C63.4:2014	Class B	PASS

Remark: N/A is abbreviation for Not Applicable.



### 3. General Information

#### 3.1. Description of EUT

Product:	Power assisted electric bicycle
Model Name:	HR-G50
Model Difference:	/
Rated Power Supply:	Input: AC 100-240V, 50/60Hz, 2A
Normal Testing Voltage:	AC 230V/50Hz, AC 110V/60Hz
DC Line	Short than 3m
I/O Ports	Refer to User Manual
Highest Frequency Generated	Below108 MHz

#### 3.2. Description of Adapter

Product:	Li-ion Charger
Model Name:	JY-546200
Model Difference:	/
Rated Power Supply:	Input: AC 100-240V, 50/60Hz, 2A Output: 54.6V --- 2A
Normal Testing Voltage:	AC 230V/50Hz, AC 110V/60Hz
DC Line	Short than 3m
I/O Ports	Refer to User Manual
Highest Frequency Generated	Below108 MHz

Note:

#### 1. Other Accessory Device List and Details

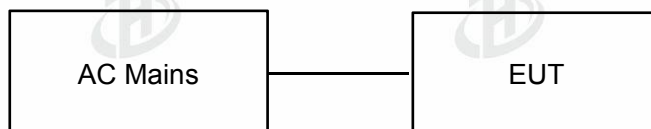
Description	Manufacturer	Model	Note

2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

#### 3.3. Test conditions

Temperature: 15-35°C  
Relative Humidity: 30-60 %  
Atmospheric pressure: 800hPa-1060hPa

#### 3.4. Block diagram of EUT configuration





### 3.5. Test Mode

Conducted Emission	Charging mode
Radiated Emission	Charging mode, Working mode

\* Only the worst-case data is represented in the report.

### 3.6. Test Site Environment

Test Item	Required (IEC 60068-1)		Actual
Conducted Emission	Temperature (°C)	15-35	26
	Humidity (%RH)	25-75	54
	Barometric pressure (mbar)	860-1060	1014
Radiated Emission	Temperature (°C)	15-35	26
	Humidity (%RH)	25-75	54
	Barometric pressure (mbar)	860-1060	1014



## 4. Facilities

### 4.1. Test Facility

Test address : Guangdong Zhonghan Testing Technology Co., Ltd.

Room 104, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

### 4.2. Test Instruments

#### Conducted emissions Test

Equipment	Manufacturer	Model	Last Cal.	Next Cal.
Receiver	R&S	ESCI	Apr. 27, 2022	Apr. 26, 2023
LISN	R&S	ENV216	Apr. 27, 2022	Apr. 26, 2023

#### Radiated emissions Test (966 chamber)

Equipment	Manufacturer	Model	Last Cal.	Next Cal.
Receiver	R&S	ESPI 7	Apr. 27, 2022	Apr. 26, 2023
Amplifier	Schwarzbeck	BBV 9743 B	Apr. 27, 2022	Apr. 26, 2023
Amplifier	Schwarzbeck	BBV 9718 B	Apr. 27, 2022	Apr. 26, 2023
TRILOG Broadband Antenna	schwarzbeck	VULB9162	Apr. 27, 2022	Apr. 26, 2023
Horn Antenna	schwarzbeck	BBHA9120D	Apr. 27, 2022	Apr. 26, 2023

### 4.3. Measurement uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product 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.

Test item	Value (dB)
Conducted Emission (150kHz-30MHz)	2.60
Radiated Emission(30MHz~1GHz)	4.60
Radiated Emission(1GHz~6GHz)	4.30

#### Decision Rule

- Uncertainty is not included  
 Uncertainty is included

## 5. Emission

### 5.1. Conducted Emission

#### 5.1.1. Limit

For Class B devices:

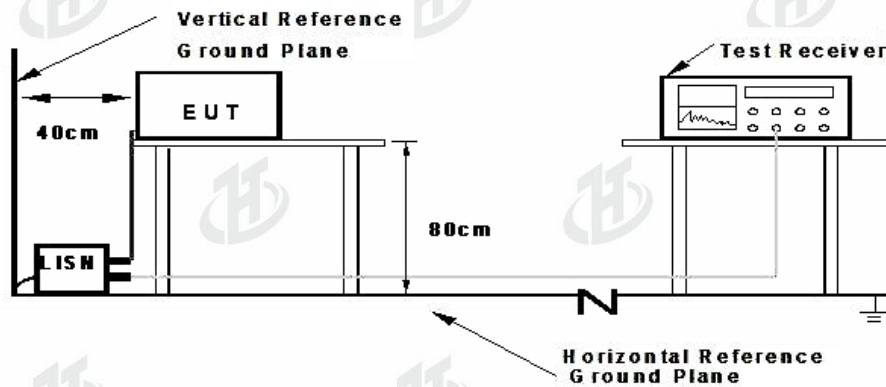
Frequency of emission (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

For Class A devices:

Frequency of emission (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	79	66
0.5-30	73	60

#### 5.1.2. Test setup



**Note: 1. Support units were connected to second LISN.**

**2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes**

The setup of EUT is according with ANSI C63.4 measurement procedure. Specification used with FCC Part 15 limits.





### 5.2. Test procedure

Measurement was performed in shielded room, and instruments used were followed clause 4 of ANSI C63.4.

Detailed test procedure was following clause 7 of ANSI C63.4.

Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

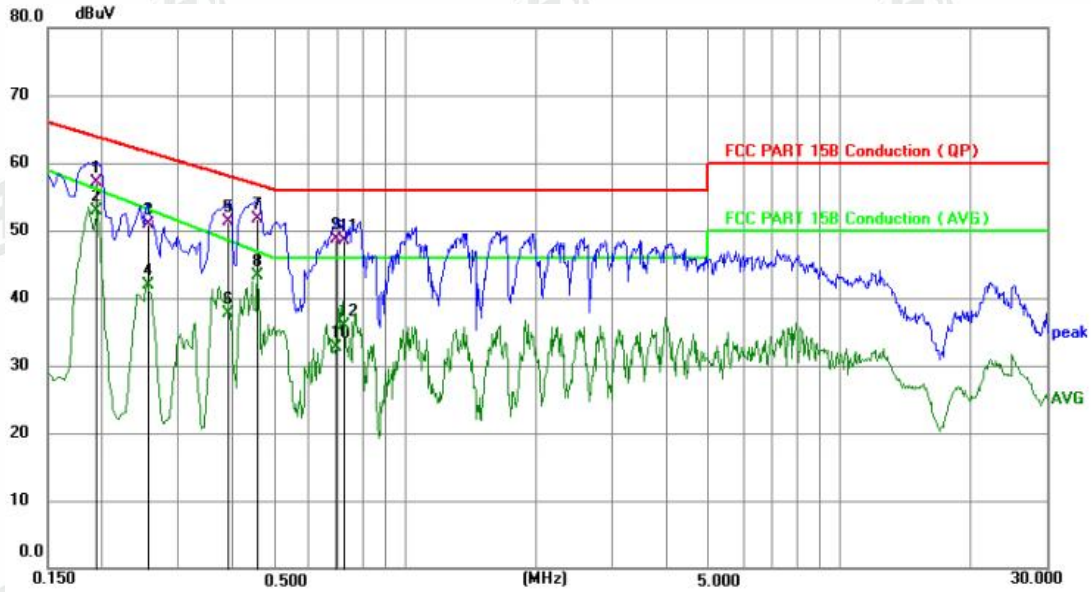
### 5.3. Test results

**PASS**

Please refer to the following page.



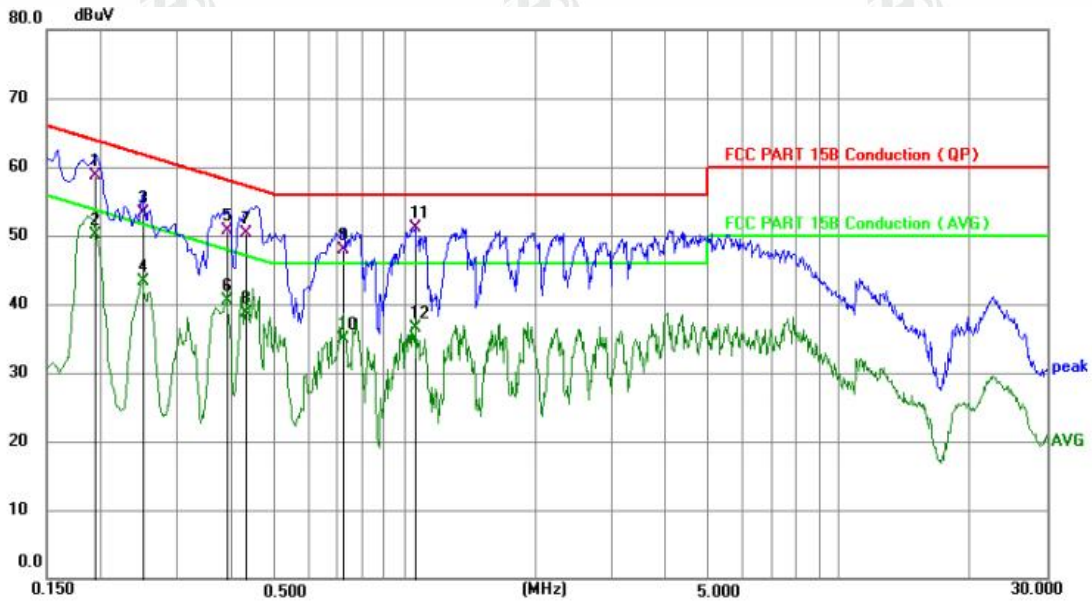
Phase: Live



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1952	47.10	9.91	57.01	63.81	-6.80	QP	P	
2 *	0.1952	43.07	9.91	52.98	56.16	-3.18	AVG	P	
3	0.2545	40.94	9.93	50.87	61.61	-10.74	QP	P	
4	0.2545	31.98	9.93	41.91	53.29	-11.38	AVG	P	
5	0.3933	41.36	9.99	51.35	57.99	-6.64	QP	P	
6	0.3933	27.72	9.99	37.71	48.59	-10.88	AVG	P	
7	0.4561	41.62	10.01	51.63	56.76	-5.13	QP	P	
8	0.4561	33.32	10.01	43.33	46.99	-3.66	AVG	P	
9	0.6935	38.58	10.04	48.62	56.00	-7.38	QP	P	
10	0.6935	22.62	10.04	32.66	46.00	-13.34	AVG	P	
11	0.7235	38.52	10.04	48.56	56.00	-7.44	QP	P	
12	0.7235	25.95	10.04	35.99	46.00	-10.01	AVG	P	



Phase: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1949	48.78	9.91	58.69	63.83	-5.14	QP	P	
2 *	0.1949	40.28	9.91	50.19	53.83	-3.64	AVG	P	
3	0.2490	43.36	9.93	53.29	61.79	-8.50	QP	P	
4	0.2490	33.34	9.93	43.27	51.79	-8.52	AVG	P	
5	0.3885	40.72	9.98	50.70	58.10	-7.40	QP	P	
6	0.3885	30.50	9.98	40.48	48.10	-7.62	AVG	P	
7	0.4290	40.24	9.99	50.23	57.27	-7.04	QP	P	
8	0.4290	28.62	9.99	38.61	47.27	-8.66	AVG	P	
9	0.7260	37.95	10.04	47.99	56.00	-8.01	QP	P	
10	0.7260	24.91	10.04	34.95	46.00	-11.05	AVG	P	
11	1.0544	41.10	10.06	51.16	56.00	-4.84	QP	P	
12	1.0544	26.47	10.06	36.53	46.00	-9.47	AVG	P	

Note: Level=Reading + Factor

Margin=Level – Limit

**5.4. Radiated emissions**

**5.5. Limit**

For Class B devices (at 3m):

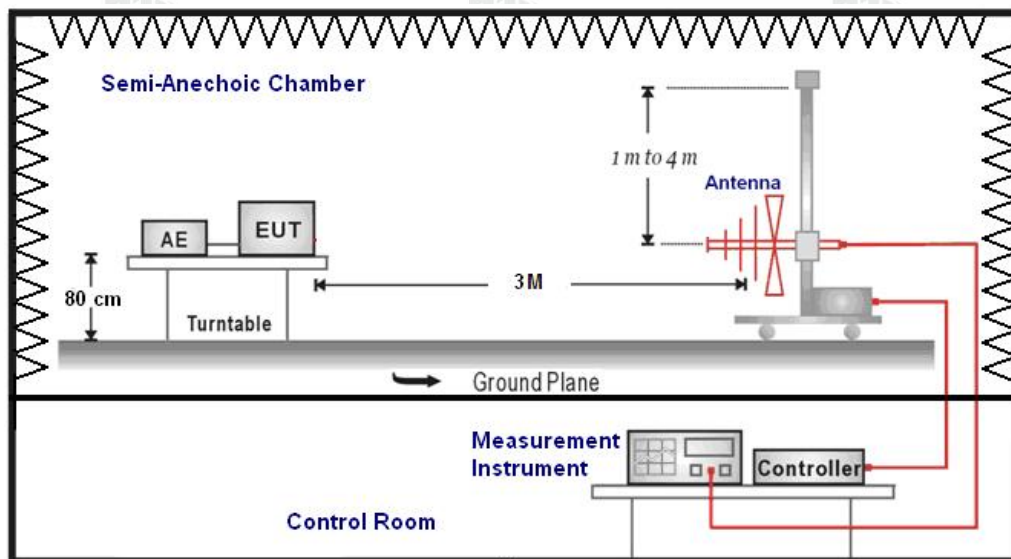
Frequency of emission (MHz)	(microvolts/meter)	(dB $\mu$ V/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

For Class A devices (at 10m):

Frequency of emission (MHz)	(microvolts/meter)	(dB $\mu$ V/m)
30-88	90	39
88-216	150	43.5
216-960	210	46.4
Above 960	300	49.5

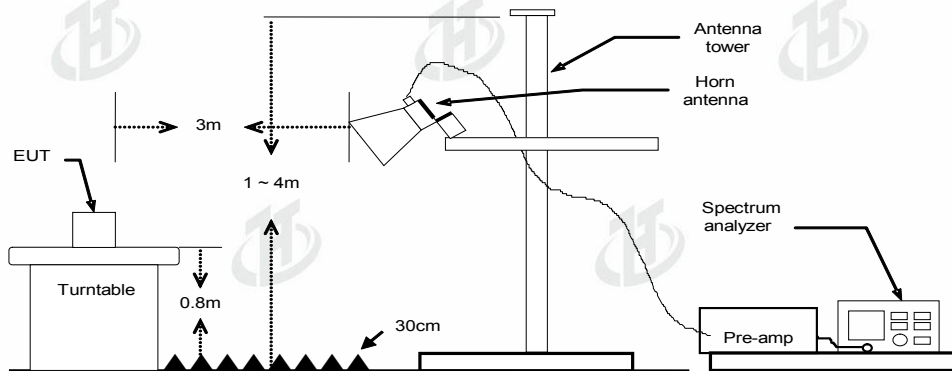
**5.6. Test setup**

Radiated Emission Test Set-Up Frequency Below 1 GHz





### Radiated Emission Test Set-Up Frequency Above 1GHz



The radiated tests were performed in semi-anechoic(3m) test site, using the setup accordance with the ANSI C63.4:2014.

### 5.7. EMI Test Receiver Setup and Spectrum Analyzer Setup

During the radiated emission test, the EMI test receiver and Spectrum Analyzer were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz-1000MHz	100kHz	300kHz	120kHz	QP
Above 1GHz	1MHz	3MHz	/	PK
	1MHz	10Hz	/	AVG

### 5.8. Test procedure

The measurement was performed in a 3m semi-anechoic chamber, and instruments used were followed clause 4 of ANSI C63.4.

Detailed test procedure was following clause 8 of ANSI C63.4.

Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.

### 5.9. Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

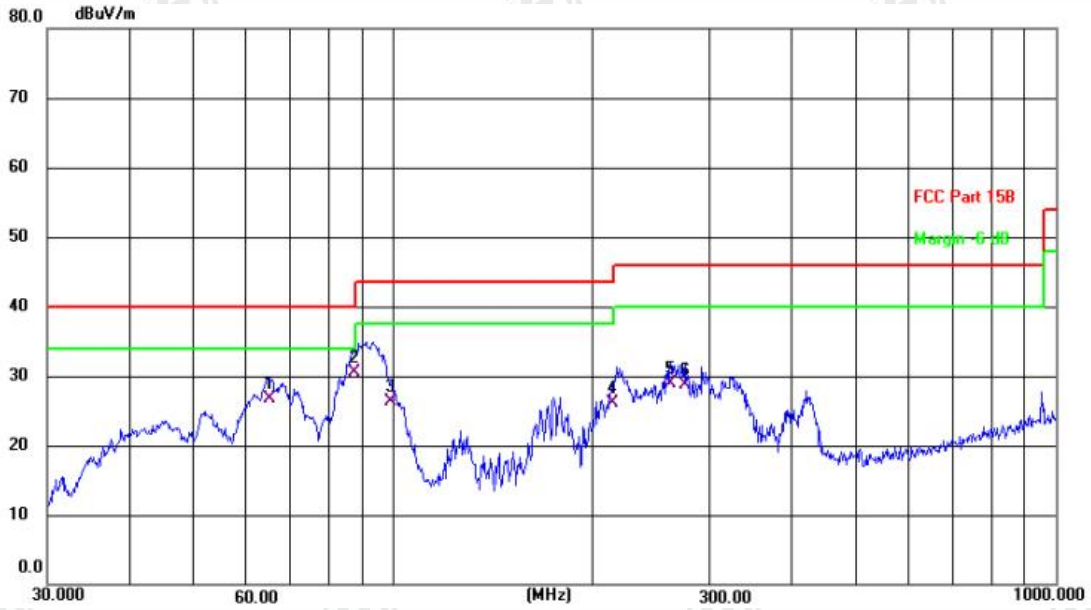
### 5.10. Test results

**PASS**

Please refer to the following page.



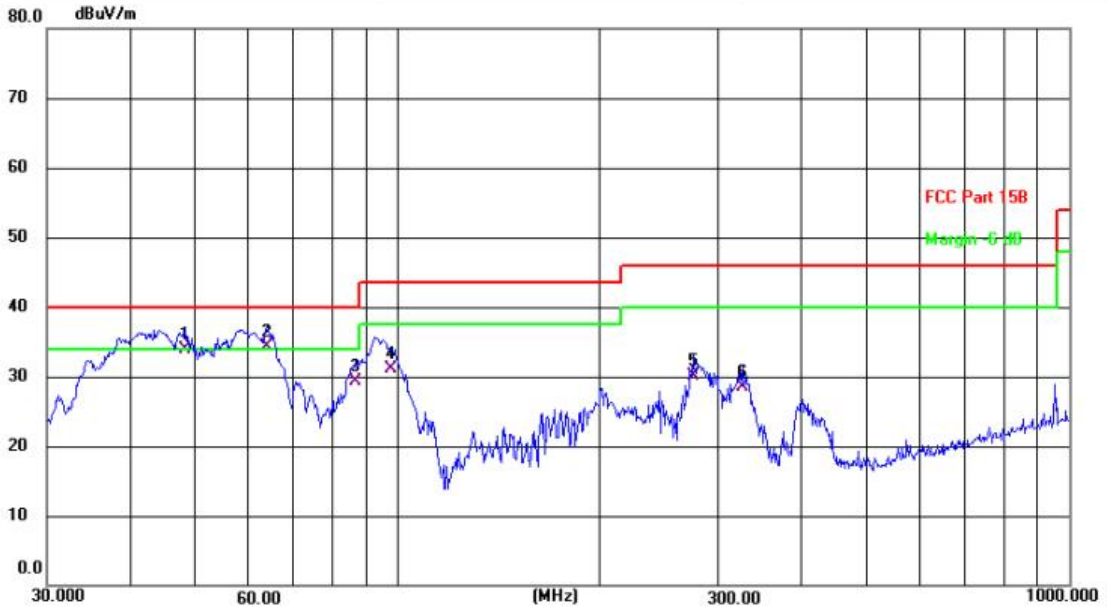
Polarization: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	64.8864	43.97	-17.27	26.70	40.00	-13.30	QP			P	
2 *	87.1115	49.79	-19.20	30.59	40.00	-9.41	QP			P	
3	99.5279	43.13	-16.81	26.32	43.50	-17.18	QP			P	
4	214.5141	42.24	-16.19	26.05	43.50	-17.45	QP			P	
5	261.9751	43.61	-14.71	28.90	46.00	-17.10	QP			P	
6	275.1570	43.08	-14.45	28.63	46.00	-17.37	QP			P	



Polarization: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	48.1625	48.61	-14.70	33.91	40.00	-6.09	QP			P	
2 *	63.7588	51.21	-16.91	34.30	40.00	-5.70	QP			P	
3	86.5027	48.66	-19.33	29.33	40.00	-10.67	QP			P	
4	97.4560	48.23	-17.20	31.03	43.50	-12.47	QP			P	
5	275.1570	44.46	-14.45	30.01	46.00	-15.99	QP			P	
6	325.5957	41.90	-13.36	28.54	46.00	-17.46	QP			P	

Note: Level=Reading + Factor  
Margin=Level – Limit



## 6. Photographs of EUT

EUT Photo 1



EUT Photo 2





EUT Photo 3



EUT Photo 4





EUT Photo 5



EUT Photo 6





EUT Photo 7



EUT Photo 8





EUT Photo 9

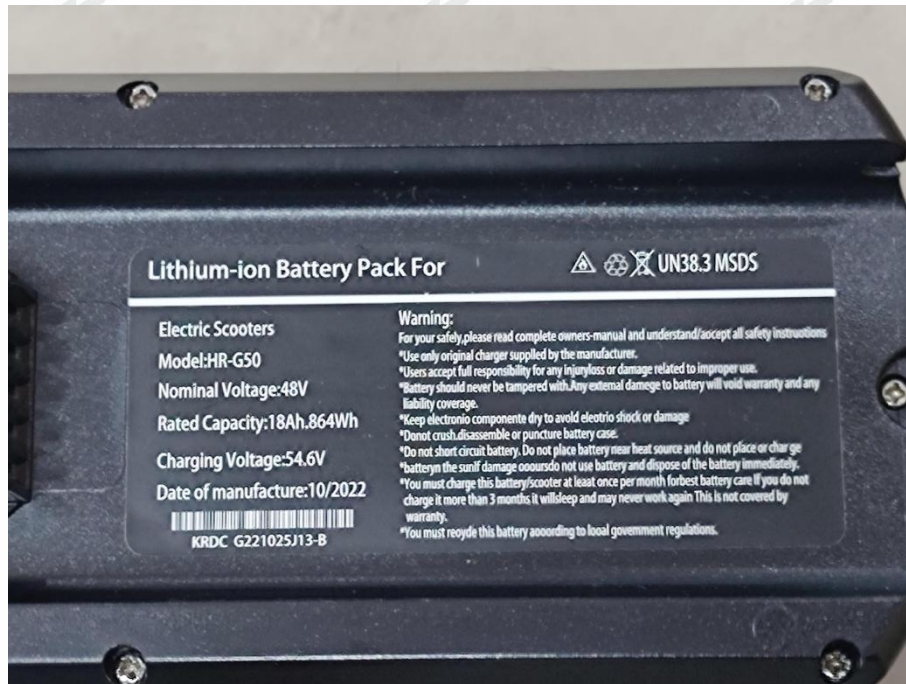


EUT Photo 10





EUT Photo 11





## 7. Test Setup Photographs

CE:



RE:



\*\*\*End of report\*\*\*