

EMC TEST REPORT

Radio Frequency Devices - Unintentional Radiators

Test Report No. :	SRC220401F001	
Date of issue :	April. 01, 2022	
Testing laboratory..... :	WESTERN INDUSTRY CO.,LTD	
Testing location/ address :	HUAN ZHEN ROAD#227 , SHANGDONG INDUSTRY ZONE ,QISHI TOWN,DONGGUAN ,GUANGDONG CITY,GUANGDONG PROVINCE,CHINA	
Applicant's name :	WESTERN INDUSTRY CO.,LTD	
Address..... :	HUAN ZHEN ROAD#227 , SHANGDONG INDUSTRY ZONE ,QISHI TOWN,DONGGUAN ,GUANGDONG CITY,GUANGDONG PROVINCE,CHINA	
Manufacturer's name :	WESTERN INDUSTRY CO.,LTD	
Address..... :	HUAN ZHEN ROAD#227 , SHANGDONG INDUSTRY ZONE ,QISHI TOWN,DONGGUAN ,GUANGDONG CITY,GUANGDONG PROVINCE,CHINA	
Standard(s) :	FCC 47 CFR Part 15 Subpart B	
Test item description :	Vibrator egg	
Trade Mark :	N/A	
Model/Type reference :	EW013	
Rating(s) :	Keyboard: DC 3 V(2*AAA Battery) Dongle: DC 5 V	
Date of receipt of test item.....:	Feb. 28, 2022	
Date (s) of performance of test:	Feb. 28, 2022 - Mar. 08, 2022	
Tested by (+signature)..... :	Ronaldo LUO	<i>Ronaldo Luo</i>
Check by (+signature) :	Howie LYU	<i>Howie Lyu</i>
Approved by (+signature) :	Tomsin	<i>Tomsin</i>

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1. General Product Information

1.1.EUT description

Test item description	: keyboard
Model/Type reference	: VTK-6800
Rating(s)	: Keyboard: DC 3 V(2*AAA Battery) Dongle: DC 5 V
Highest internal frequency F_x	: <input type="checkbox"/> $F_x \leq 108$ MHz <input type="checkbox"/> 108 MHz < $F_x \leq 500$ MHz <input type="checkbox"/> 500 MHz < $F_x \leq 1$ GHz <input checked="" type="checkbox"/> $F_x > 1$ GHz
USB-C Line	: <input type="checkbox"/> Shielded <input checked="" type="checkbox"/> Unshielded, <input checked="" type="checkbox"/> Detachable <input type="checkbox"/> Un-detachable <input type="checkbox"/> No applicable <input checked="" type="checkbox"/> Length: 2.4 m

1.2.Model(s) list

No.	Model No.	Tested with
1	VTK-6800	<input checked="" type="checkbox"/>
Other models	VTK-6801, VTK-6802, VTK-6803, VTK-6800A, VTK-6801A, VTK-6802A, VTK-6803A	<input type="checkbox"/>

Note: VTK-6800 is tested model, other models are derivative models . The models are identical in circuit and PCB layout, different on the model names and appearance. So the test data of VTK-6800 can represent the remaining models.

2. Test Information

2.1.EUT operation mode(s)

Mode #	Operating mode description	Test voltage
1	Working(Wired Connection)	DC 5 V(Notebook Computer Input AC 120 V/ 60 Hz)
2	Working(Dongle 2.4G Connection)	Keyboard: DC 3 V Dongle: DC 5 V(Notebook Computer Input AC 120 V/ 60 Hz)
3	Working(BT Connection)	DC 3 V

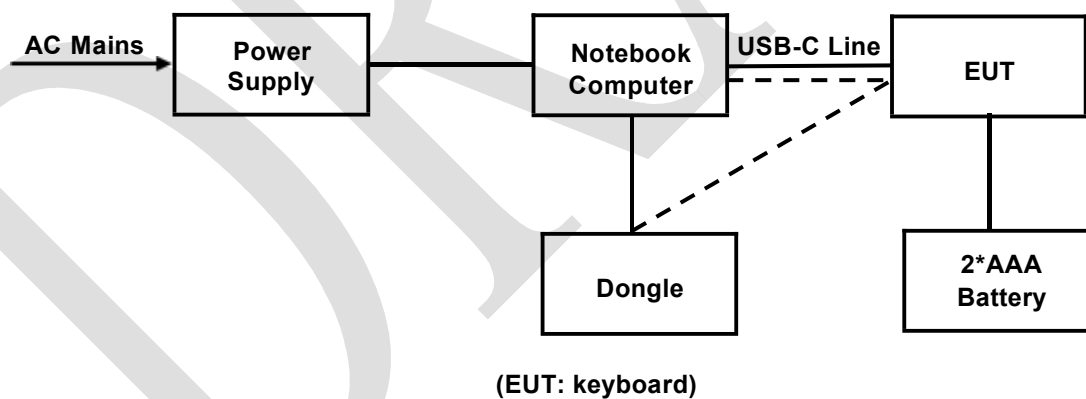
Test worst operating mode	
Disturbance voltage at mains terminals	Mode 1
Radiated emission(30 MHz- 1 GHz)	Mode 1
Radiated emission(1 GHz-6 GHz)	Mode 3

Remark: The worst measurement data and graphical presentation show in this report.

2.2.Special accessories and auxiliary equipment

Product Type	Manufacturer	Model No.	Serial No.
Notebook Computer	DELL	G3 3500	00342-36088-99832-AAOEM
Power supply	DELL	HA130PM190	CN-0CY0JM-CH200-0B6-7405-A01

2.3.Configuration of system under test



2.4. General test conditions

Environmental reference conditions

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment.

The climatic conditions during the tests were within the following limits:

Temperature	Humidity	Atmospheric pressure
15 °C – 35 °C	30 % - 60 %	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product standard the climatic values are recorded and documented separately in this test report.

Measurement uncertainties

Test Item	Uncertainty
Uncertainty for Disturbance voltage at the mains terminals	3.10 dB
Uncertainty for Radiated emission (30 MHz to 1 GHz)	4.56 dB
Uncertainty for Radiated emission (above 1 GHz)	4.22 dB

The overall measurement uncertainty of a measurement is defined as the range of which can be supposed that it contains the true value with a specified probability.

This probability is 95 % for the generally specified measurement uncertainty (so-called expanded measurement uncertainty).

The limits for emission measurements and the Test levels for immunity tests in the applied standards were defined taking into consideration the accuracy limits for measurement and testing equipment required by the Basic standards. All measurement and test results of the EMC laboratory of Shenzhen SRC Testing Services Co., Ltd. fulfil the requirements for measurement uncertainties according to the standards applied.

Decision rule for statement(s) of conformity is based on accuracy method specified in Clause 4.4.3 in IEC Guide 115:2021.

3. Test Result Summary

FCC 47 CFR Part 15 Subpart B	
Requirement – Test case	Verdict
Classification Class (<input type="checkbox"/> A <input checked="" type="checkbox"/> B)	—
Disturbance voltage at the mains terminals	Pass
Radiated emission	Pass
Remark:---	

Test case verdicts	
- Test case does not apply to the test object	N/A
- Test object does meet the requirement.....	P (Pass)
- Test object does not meet the requirement	F (Fail)

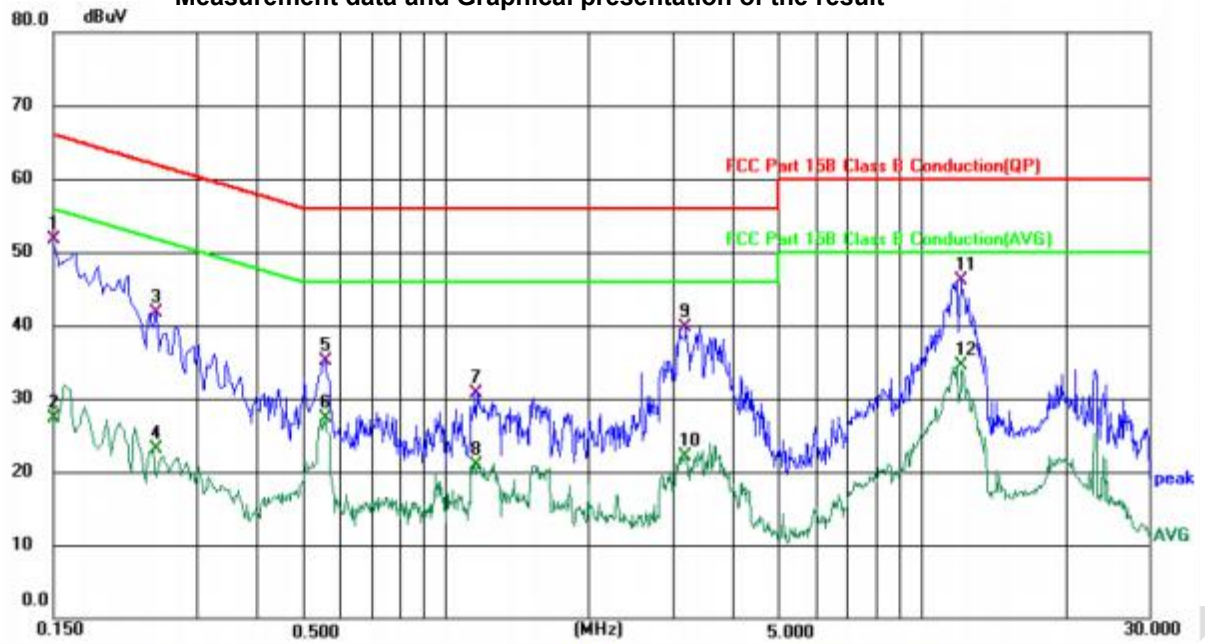
4. List of Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Cal. Due
Disturbance voltage at mains terminals				
EMI Test Receiver	R&S	ESC13	100898	2022/07/07
LISN	Schwarzbeck	NSLK 8126	8126453	2022/03/11
Attenuator	N/A	10 dB	164080	2022/07/07
Radiated emission (30 MHz to 1 GHz)				
Broadband Antenna	Schwarzbeck	VULB9163	340	2022/09/04
EMI Test Receiver	R&S	ESIB7	100197	2022/07/07
Pre-amplifier	HP	8447D	2727A05017	2022/07/07
Radiated emission (above 1 GHz)				
Horn Antenna	Schwarzbeck	BBHA 9120 D	02372	2023/03/06
EMI Test Receiver	R&S	ESIB7	100197	2022/07/07
Pre-amplifier	SKET	LNPA_0118G-4 5	SK2021012102	2022/03/11

5. Test Conditions and Results

5.1. Disturbance voltage at mains terminals

Test requirement	FCC 47 CFR Part 15 Subpart B		
Basic standard	ANSI C63.4: 2014		
Test frequency range . :	150 kHz to 30 MHz		
Limits :	Limits for Class A		
	Frequency (MHz)	dBμV Quasi-peak	dBμV Average
	0.15 to 0.5	79	66
	0.5 to 30	73	60
	Limits for Class B		
	Frequency (MHz)	dBμV Quasi-peak	dBμV Average
	0.15 to 0.5	66 to 56	56 to 46
	0.5 to 5	56	46
	5 to 30	60	50
	Test method	The AMN placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0.8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN).	
Ambient temperature . :	25.0 °C		
Relative humidity	55 %		
Test location	No. 5, Chongqing Road, Fuhai street, Bao'an District, Shenzhen, China, 518103		
Test model(s)	VTK-6800		
EUT operation mode .. :	Mode 1		
Test results	Pass		
Remark	/		

Measurement data and Graphical presentation of the result


Site 844 Shielding Room

 Phase: **L1**

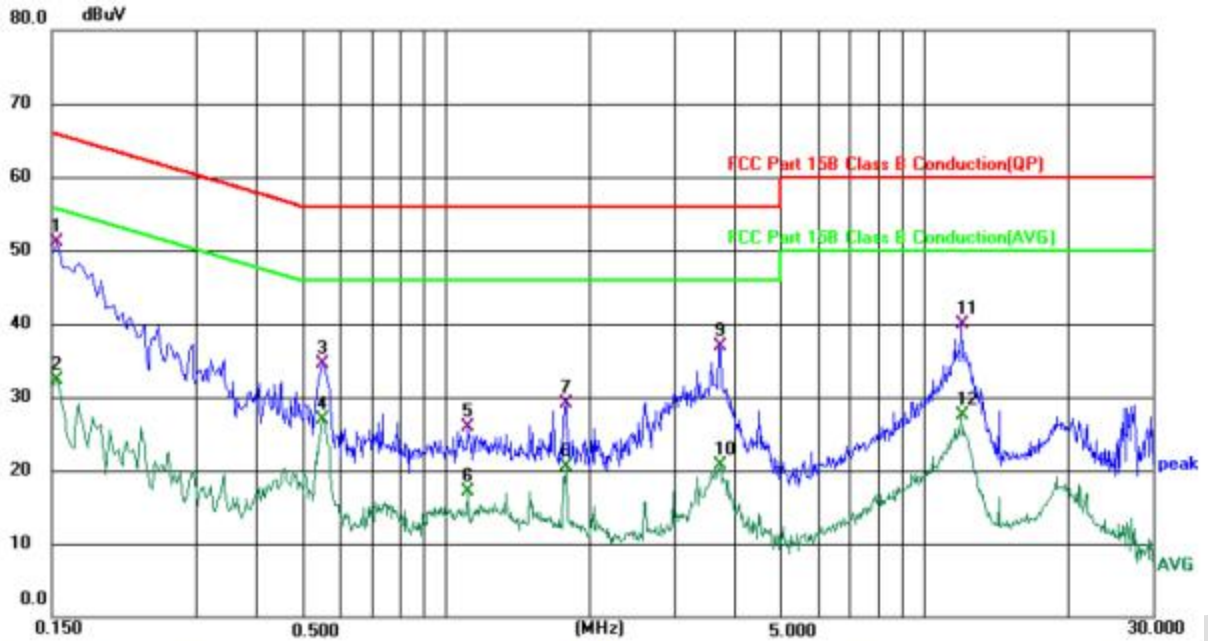
Temperature: 25 (°C)

Humidity: 55 %

Limit: FCC Part 15B Class B Conduction(QP)

Power: DC 5V(Notebook Computer Input AC 120V/60Hz)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1500	42.05	9.60	51.65	66.00	-14.35	QP	
2		0.1500	17.78	9.60	27.38	56.00	-28.62	AVG	
3		0.2459	32.42	9.35	41.77	61.89	-20.12	QP	
4		0.2459	13.68	9.35	23.03	51.89	-28.86	AVG	
5		0.5580	25.90	9.19	35.09	56.00	-20.91	QP	
6		0.5580	18.18	9.19	27.37	46.00	-18.63	AVG	
7		1.1539	21.35	9.33	30.68	56.00	-25.32	QP	
8		1.1539	11.61	9.33	20.94	46.00	-25.06	AVG	
9		3.1979	30.24	9.52	39.76	56.00	-16.24	QP	
10		3.1979	12.61	9.52	22.13	46.00	-23.87	AVG	
11	*	12.1500	36.39	9.62	46.01	60.00	-13.99	QP	
12		12.1500	24.84	9.62	34.46	50.00	-15.54	AVG	



Site: 844 Shielding Room

 Phase: *N*

Temperature: 25 (°C)

Humidity: 55 %

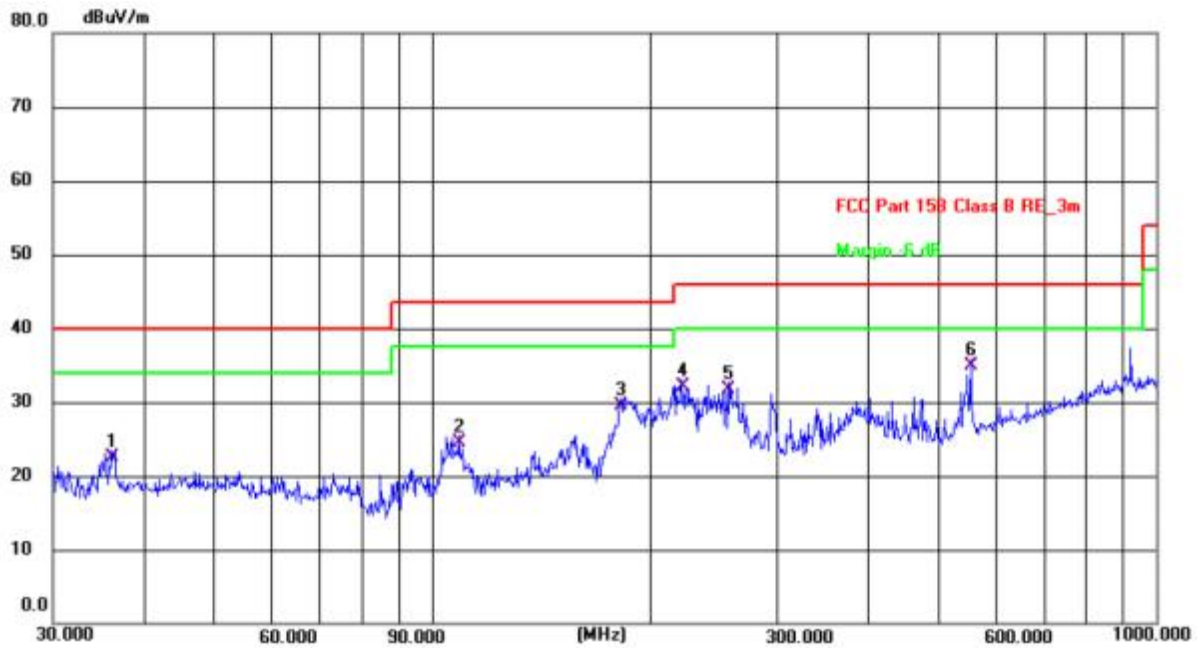
Limit: FCC Part 15B Class B Conduction(QP)

Power: DC 5V(Notebook Computer Input AC 120V/60Hz)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1539	41.50	9.59	51.09	65.79	-14.70	QP	
2		0.1539	22.68	9.59	32.27	55.79	-23.52	AVG	
3		0.5540	25.30	9.19	34.49	56.00	-21.51	QP	
4		0.5540	17.80	9.19	26.99	46.00	-19.01	AVG	
5		1.1140	16.55	9.33	25.88	56.00	-30.12	QP	
6		1.1140	7.82	9.33	17.15	46.00	-28.85	AVG	
7		1.7820	19.79	9.41	29.20	56.00	-26.80	QP	
8		1.7820	11.14	9.41	20.55	46.00	-25.45	AVG	
9		3.7379	27.28	9.54	36.82	56.00	-19.18	QP	
10		3.7379	11.21	9.54	20.75	46.00	-25.25	AVG	
11		11.9779	30.29	9.62	39.91	60.00	-20.09	QP	
12		11.9779	17.95	9.62	27.57	50.00	-22.43	AVG	

5.2. Radiated emission

Test requirement	FCC 47 CFR Part 15 Subpart B				
Basic standard	ANSI C63.4: 2014				
Test frequency range . :	30 MHz to 40 GHz				
Limits :	Frequency (MHz)	3 m measurement distance			
		Quasi-peak (dBμV/m)			
		Class A	Class B		
	30 to 88	49	40		
	88 to 216	53.5	43.5		
	216 to 960	56.4	46		
	960 to 1000	59.5	54		
	Frequency (MHz)	3 m measurement distance			
		Class A		Class B	
		Peak (dBμV/m)	Average (dBμV/m)	Peak (dBμV/m)	Average (dBμV/m)
Above 1000	79.5	59.5	74	54	
Test method	Measurements were made in a 3-meter semi-anechoic chamber that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 meters with the receive antenna located at 1 to 4-meter height in both horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.				
Ambient temperature . :	25.3 °C				
Relative humidity	54 %				
Test location	No. 5, Chongqing Road, Fuhai street, Bao'an District, Shenzhen, China, 518103				
Test model(s)	VTK-6800				
EUT operation mode .. :	Mode 1, Mode 3				
Test results	Pass				
Remark	/				

Measurement data and Graphical presentation of the result


Site #1 3m Anechoic Chamber

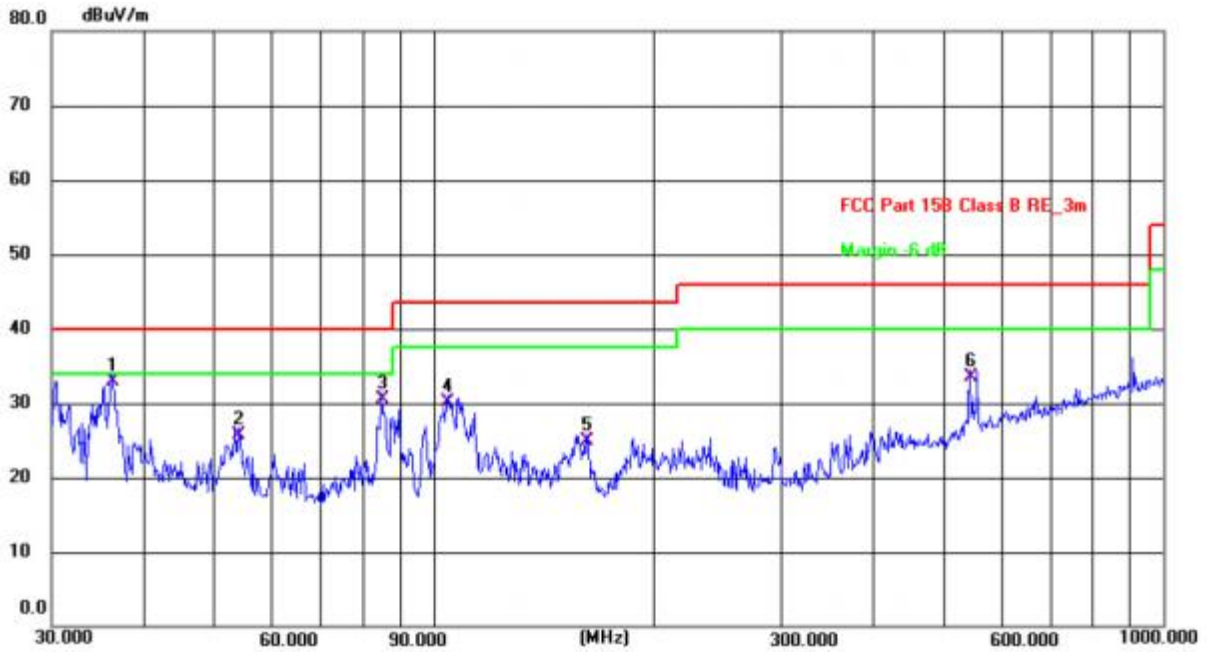
 Polarization: *Horizontal*

Temperature: 25.3(C) Humidity: 54 %

Limit: FCC Part 15B Class B RE_3m

Power: DC 5V(Notebook Computer Input AC 120V/60Hz)

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1	36.1272	8.87	13.58	22.45	40.00	-17.55	QP	P	
2	109.0286	13.36	11.18	24.54	43.50	-18.96	QP	P	
3	182.5592	17.80	11.76	29.56	43.50	-13.94	QP	P	
4	221.3921	20.58	11.48	32.06	46.00	-13.94	QP	P	
5	256.5211	18.87	12.83	31.70	46.00	-14.30	QP	P	
6 *	554.8254	14.62	20.33	34.95	46.00	-11.05	QP	P	



Site #1 3m Anechoic Chamber

 Polarization: **Vertical**

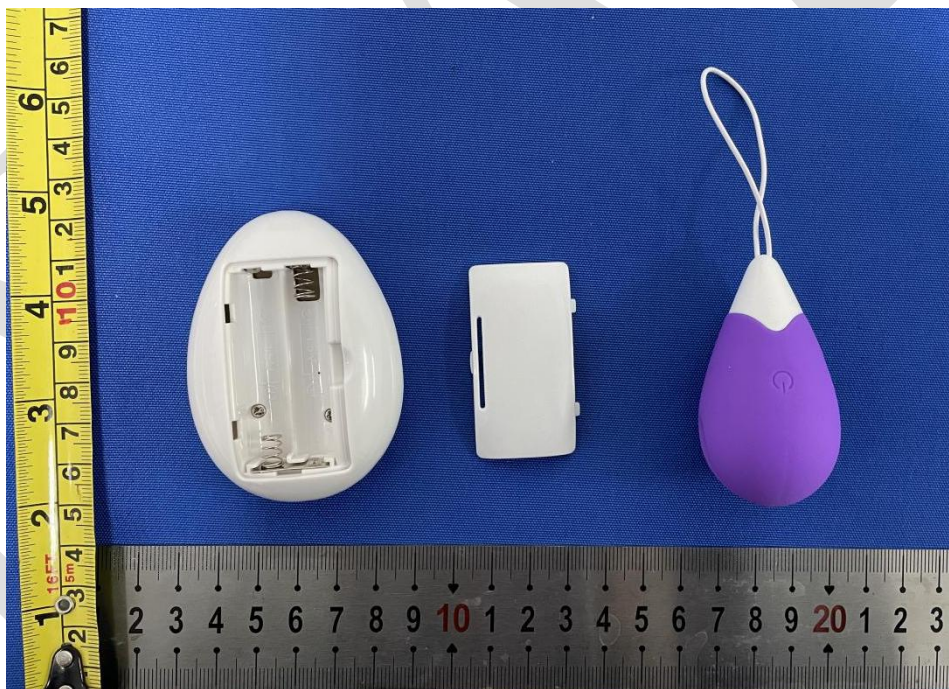
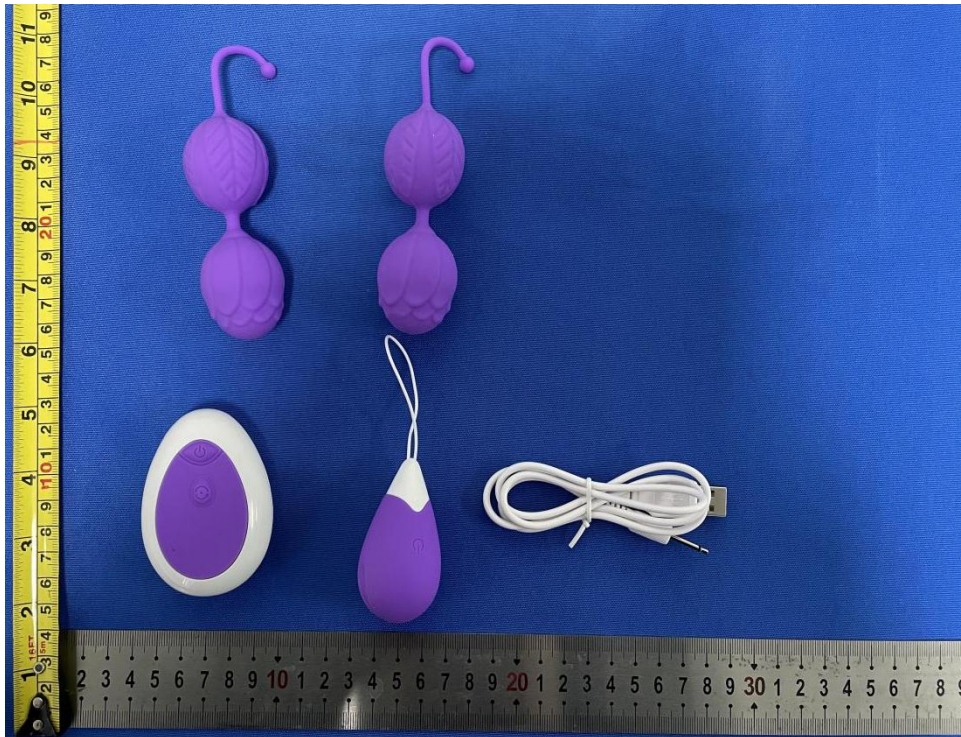
Temperature: 25.3(C) Humidity: 54 %

Limit: FCC Part 15B Class B RE_3m

Power: DC 5V(Notebook Computer Input AC 120V/60Hz)

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	P/F	Remark
1 *	36.2541	19.28	13.60	32.88	40.00	-7.12	QP	P	
2	54.0710	12.43	13.26	25.69	40.00	-14.31	QP	P	
3	84.9995	21.41	9.15	30.56	40.00	-9.44	QP	P	
4	104.5361	19.21	10.80	30.01	43.50	-13.49	QP	P	
5	162.6105	11.23	13.64	24.87	43.50	-18.63	QP	P	
6	543.2742	13.44	20.05	33.49	46.00	-12.51	QP	P	

6. Photo of the EUT



*******END OF REPORT*******