TEST REPORT

Product Name : HOTO Electric Precision Screwdriver Set
Model Number : QWLSD010

Prepared for	:	Shanghai HOTO Technology Co., Ltd.
Address	:	Building 45, No. 50 Moganshan Rd, Putuo District, Shanghai, PRC, 200060
Prepared by	:	EMTEK (SHENZHEN) CO., LTD.
Address	:	Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China Tel: (0755) 26954280 Fax: (0755) 26954282
Report Number	:	ENS2107160108E00301R
Date(s) of Tests	:	June 21, 2021 to June 26, 2021
Date of issue	:	July 24, 2021

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Test Report Description **Page**

TEST REPORT DESCRIPTION

Applicant	:	Shanghai HOTO Technology Co., Ltd.
Manufacturer	:	Shanghai HOTO Technology Co., Ltd.
Trade Mark	:	N/A
EUT	:	HOTO Electric Precision Screwdriver Set
Model No.	:	QWLSD010
Rating	:	DC 5V from adapter, DC 3.7V by internal battery

Measurement Procedure Used:

FCC CFR Title 47, Part 15, Subpart B
ANSI C63.4-2014

The device described above is tested by EMTEK (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (SHENZHEN) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (SHENZHEN) CO., LTD.

Date of Test : June 21, 2021 to June 26, 2021

Prepared by : Jessie Hu/Editor

Reviewer : Kaimin Guo/Supervisor

Approved & Authorized Signer : Lisa Wang/Manager

Modified Information

Version	Report No.	Revision Data	Summary
Ver.1.0	ENS2107160108E00301R	/	Original Version

1. SUMMARY OF TEST RESULTS

EMISSION		
Description of Test Item	Standard & Limits	Results
Conducted Emission at Mains Terminals	FCC Part 15, Subpart B, Class B ANSI C63.4-2014	Pass
Radiated Emission	FCC Part 15, Subpart B, Class B ANSI C63.4-2014	Pass

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT	:	HOTO Electric Precision Screwdriver Set
Model Number	:	QWLSD010
Sample number	:	1#
Test Voltage	:	DC 5V from adapter, DC 3.7V
Applicant	:	Shanghai HOTO Technology Co., Ltd.
Address	:	Building 45, No. 50 Moganshan Rd, Putuo District, Shanghai, PRC, 200060
Manufacturer	:	Shanghai HOTO Technology Co., Ltd.
Address	:	Building 45, No. 50 Moganshan Rd, Putuo District, Shanghai, PRC, 200060
Factory	:	Dongguan Charles Electrical Technology Co., Ltd.
Address	:	No. 6 Huanggongkeng Road, Tongsha Industrial zone, Dongcheng district, Dongguan city, 523127, Guangdong province, China
Date of Received	:	June 21, 2021
Date of Test	:	June 21, 2021 to June 26, 2021

Note: This report change trademark, EUT name, model number and appearance of product is based on ES210617028E, this change does not affect the test results, and its original data and records refer to ES210617028E.

2.2. Independent Operation Modes

A. On
   1. Charging
   2. ON (CW)
   3. ON (CCW)

2.3. Test Manner

Test Items	Test Voltage	Operation Modes	Worst case
Conducted Emission	DC 5V from adapter	Mode A.1	Mode A.1
Radiated emissions(Up to 1 GHz)	DC 5V from adapter, DC 3.7V	Mode A	Mode A.3 (DC 3.7V)

2.4. Description of Test Facility

Site Description

EMC Lab. : **Accredited by CNAS**
The Certificate Registration Number is L2291.
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01 (identical to ISO/IEC 17025:2017)

Accredited by FCC
Designation Number: CN1204
Test Firm Registration Number: 882943

Accredited by A2LA
The Certificate Number is 4321.01.

Accredited by Industry Canada
The Conformity Assessment Body Identifier is CN0008

Name of Firm : EMTEK (SHENZHEN) CO., LTD.

Site Location : Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

2.5. Test Software

Item	Software
Conducted Emission	: EMTEK(Ver.CON-03A1)-Shenzhen
Radiated Emission	: EMTEK(Ver.RA-03A1)-Shenzhen

2.6. Description of Support Device

Adapter : Manufacturer: Aohai
Model: A121A-050200U-EU3
Input: 100-240~50/60Hz, 0.35A
Output: 5.0V ⎓ 2A

2.7. Measurement Uncertainty

Test Item	Uncertainty
Conducted Emission Uncertainty	: 3.16dB(9k~150kHz Conduction 2#) 2.90dB(150k-30MHz Conduction 2#)
Radiated Emission Uncertainty (3m 1# Chamber)	: 4.46dB (30M~1GHz Polarize: H) 5.04dB (30M~1GHz Polarize: V)
Uncertainty for test site temperature and humidity	: 0.6℃ 4%

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For Conducted Emission Measurement

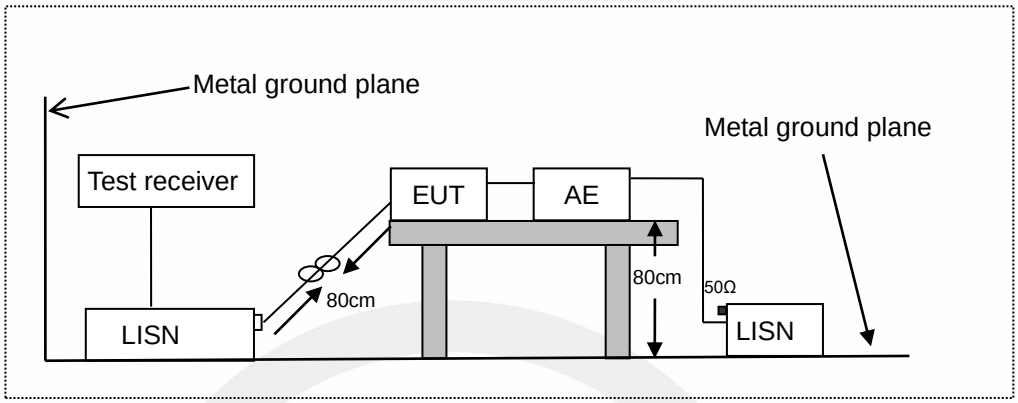
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	EMI Test Receiver	Rohde & Schwarz	ESCI	101045	May 15, 2021	1 Year
☑	PULSE LIMTER	Rohde & Schwarz	ESH3-Z2	100107	May 15, 2021	1 Year
☑	AMN	Rohde & Schwarz	ESH3-Z5	100191	May 15, 2021	1 Year

3.2. For Radiated Emission Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Pre-Amplifier	HP	8447F	2944A07999	May 15, 2021	1 Year
☑	EMI Test Receiver	Rohde & Schwarz	ESCI	101414	May 15, 2021	1 Year
☑	Bilog Antenna	Schwarzbeck	VULB9163	712	Sep 22, 2019	2 Year

4. POWER LINE CONDUCTED EMISSION MEASUREMENT

4.1. Block Diagram of Test Setup



LISN: Line Impedance Stabilization Network
AE: Associated equipment
EUT: Equipment under test

4.2. Limits

FCC Part 15, Subpart B, Class B

Frequency (MHz)			Limit (dBμV)	
			Quasi-peak Level	Average Level
0.15	~	0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50	~	5.00	56.0	46.0
5.00	~	30.00	60.0	50.0
NOTE1-The lower limit shall apply at the transition frequencies. NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.				

4.3. Test Procedure

The EUT was placed on a plank 0.8 m height from the metal ground plane and 0.4 m from the conducting wall of the shielding room and it was kept at least 0.8 m from any other grounded conducting surface.

All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units.

Connect EUT to the power mains through a artificial mains network (AMN). Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

All the support units are connecting to the other LISN.

The LISN provides 50 ohm coupling impedance for the measuring instrument.

Both sides of AC line were checked for maximum conducted interference.

The frequency range from 150 kHz to 30 MHz was sweep.

Set the test-receiver system to quasi peak detect function and average detect function, and to measure the conducted emissions values.

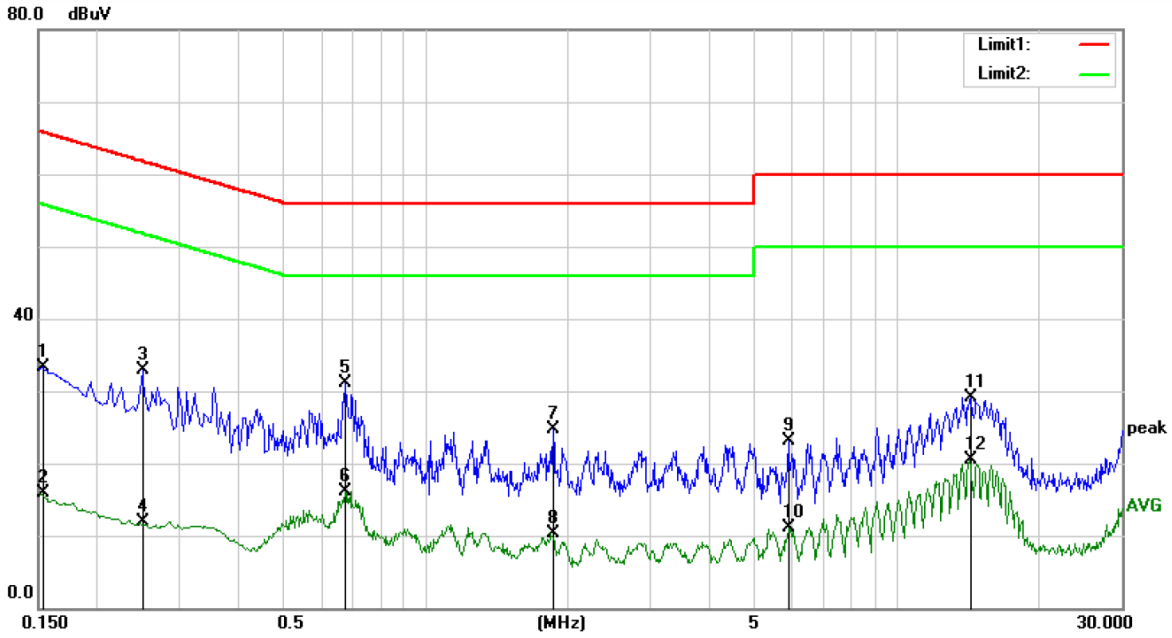
Test results were obtained from the following equation:
Emission Level (dBμV) = LISN Factor (dB) + Cable Loss (dB) + Reading (dBμV)
Margin (dB) = Emission Level (dBμV) - Limit (dBμV)

4.4. Measuring Results

PASS.

Please reference to the following pages.

Temperature	:	24.4 °C
Humidity	:	52%
Atmospheric Pressure	:	101kpa
Test Engineer	:	LQ
Test Date	:	2021-06-21



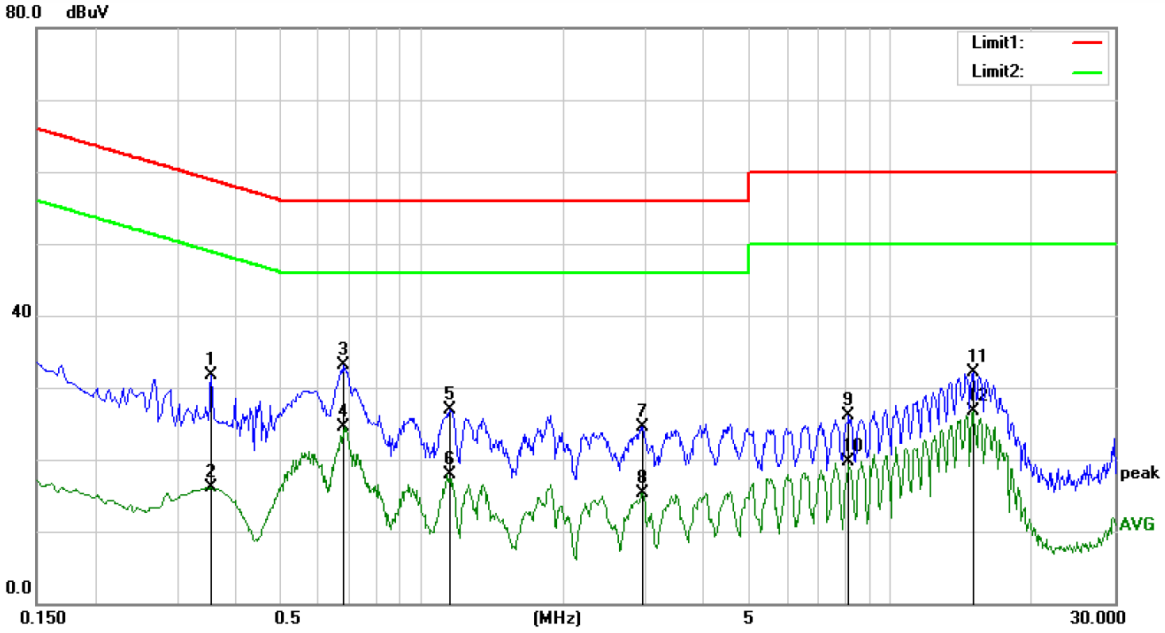
Site Conduction #2 Phase: *L1* Temperature: 24.4

Limit: (CE)FCC PART 15 class B_QP Power: DC 5V from adapter Humidity: 52 %

Mode: charging

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1540	22.78	10.48	33.26	65.78	-32.52	QP	
2		0.1540	5.49	10.48	15.97	55.78	-39.81	AVG	
3		0.2500	22.48	10.42	32.90	61.76	-28.86	QP	
4		0.2500	1.46	10.42	11.88	51.76	-39.88	AVG	
5	*	0.6740	20.77	10.35	31.12	56.00	-24.88	QP	
6		0.6740	5.73	10.35	16.08	46.00	-29.92	AVG	
7		1.8620	14.29	10.34	24.63	56.00	-31.37	QP	
8		1.8620	-0.11	10.34	10.23	46.00	-35.77	AVG	
9		5.8740	12.52	10.55	23.07	60.00	-36.93	QP	
10		5.8740	0.52	10.55	11.07	50.00	-38.93	AVG	
11		14.3220	18.47	10.71	29.18	60.00	-30.82	QP	
12		14.3220	9.76	10.71	20.47	50.00	-29.53	AVG	



Site Conduction #2 Phase: *N* Temperature: 24.4

Limit: (CE)FCC PART 15 class B_QP Power: DC 5V from adapter Humidity: 52 %

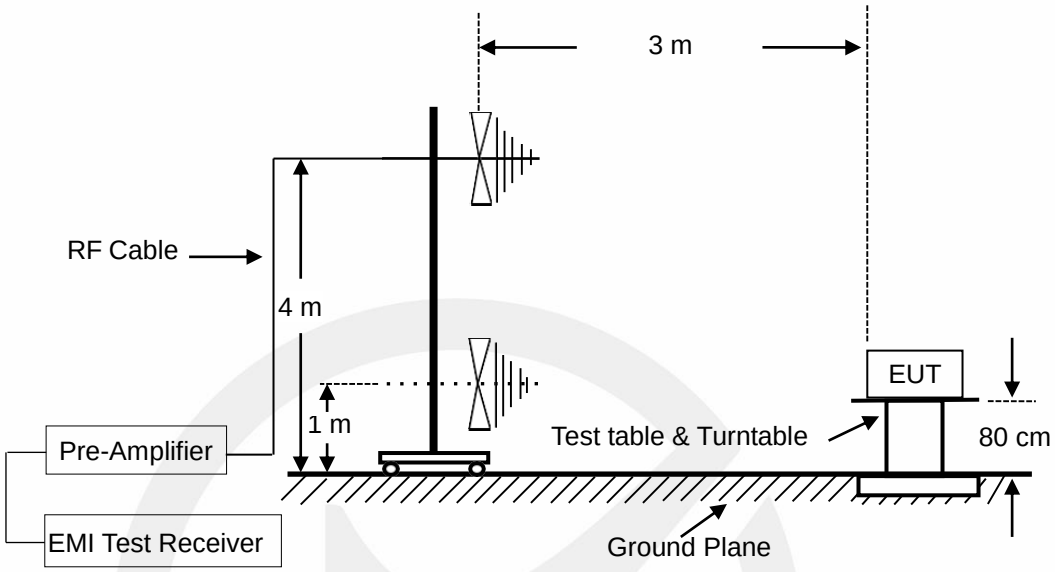
Mode: charging

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.3540	21.39	10.38	31.77	58.87	-27.10	QP	
2		0.3540	5.71	10.38	16.09	48.87	-32.78	AVG	
3		0.6780	22.66	10.35	33.01	56.00	-22.99	QP	
4	*	0.6780	14.08	10.35	24.43	46.00	-21.57	AVG	
5		1.1460	16.57	10.40	26.97	56.00	-29.03	QP	
6		1.1460	7.54	10.40	17.94	46.00	-28.06	AVG	
7		2.9500	14.22	10.37	24.59	56.00	-31.41	QP	
8		2.9500	4.93	10.37	15.30	46.00	-30.70	AVG	
9		8.1100	15.38	10.68	26.06	60.00	-33.94	QP	
10		8.1100	9.09	10.68	19.77	50.00	-30.23	AVG	
11		14.9380	21.43	10.70	32.13	60.00	-27.87	QP	
12		14.9380	15.91	10.70	26.61	50.00	-23.39	AVG	

5. RADIATED EMISSION MEASUREMENT (UP TO 1GHz)

5.1. Block Diagram of Test Setup



5.2. Radiated Limit

FCC Part 15, Subpart B, Class B

Frequency MHz			Distance Meters	Field Strengths Limit	
				μV/m	dB(μV)/m
30	~	88	3	100	40.0
88	~	216	3	150	43.5
216	~	960	3	200	46.0
960	~	1000	3	500	54.0

5.3. Test Procedure

The EUT was placed on a non-conductive plank whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units.

The EUT was set 3 meters (or 10 meters) away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The bandwidth of the Receiver is set at 120 kHz.

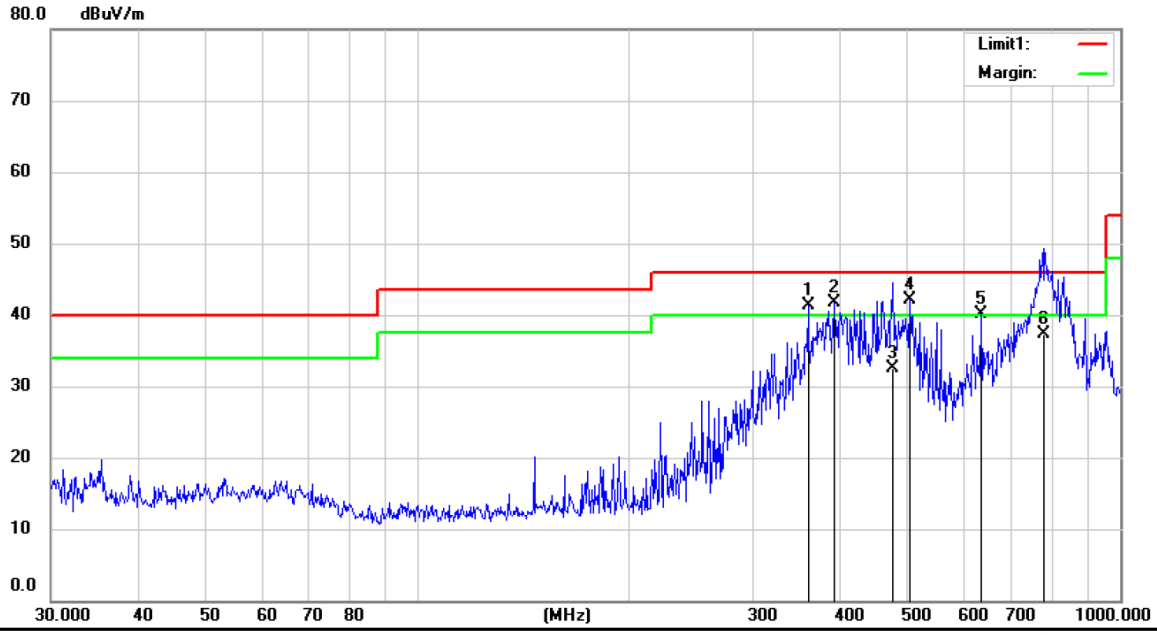
Test results were obtained from the following equation:
Emission level (dBμV/m) = Antenna Factor -Amp Factor +Cable Loss + Reading
Margin (dB) = Emission Level (dBμV/m) - Limit (dBμV/m)

5.4. Measuring Results

PASS.

Please reference to the following pages.

Temperature	:	29.5 °C
Humidity	:	48%
Atmospheric Pressure	:	101kpa
Test Engineer	:	XXH
Test Date	:	2021-06-22



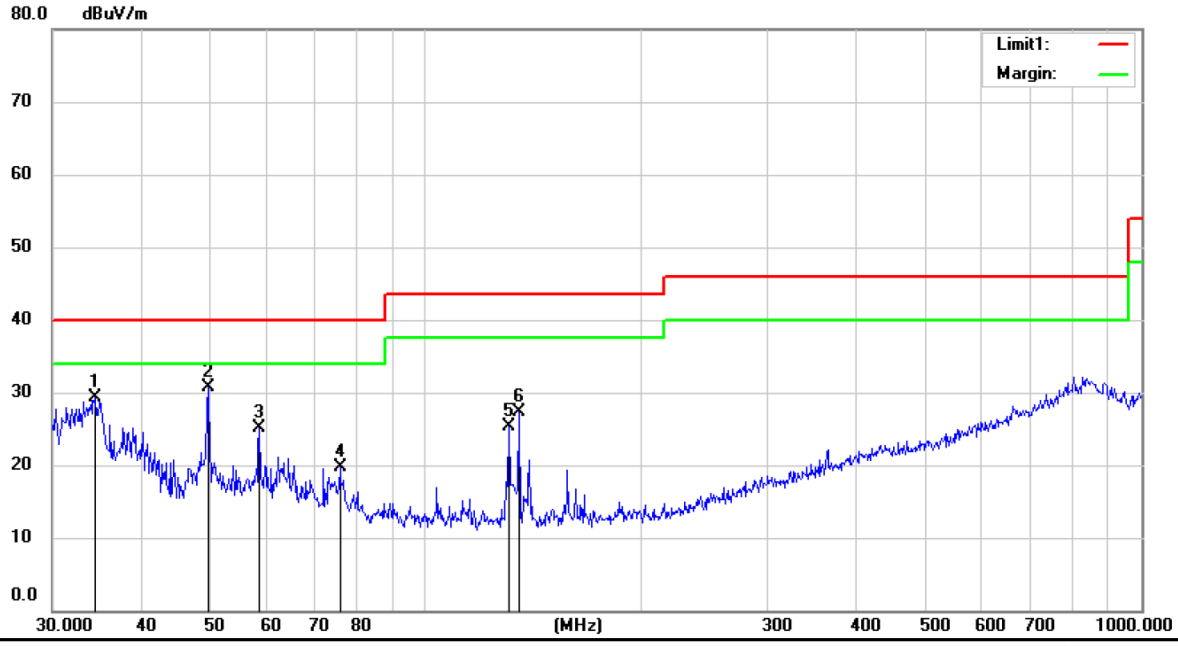
Site 3m Chamber #1 Polarization: *Horizontal* Temperature: 29.5 C

Limit: (RE)FCC PART 15 CLASS B Power: DC3.7V Humidity: 48 %

Mode:CCW

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	!	359.6586	48.84	-7.45	41.39	46.00	-4.61	QP			
2	!	392.6110	48.25	-6.64	41.61	46.00	-4.39	QP			
3		475.0824	38.06	-5.56	32.50	46.00	-13.50	QP			
4	*	502.4988	47.14	-4.97	42.17	46.00	-3.83	QP			
5	!	633.9073	42.55	-2.36	40.19	46.00	-5.81	QP			
6		781.6598	36.02	1.38	37.40	46.00	-8.60	QP			



Site 3m Chamber #1 Polarization: *Vertical* Temperature: 29.5 C

Limit: (RE)FCC PART 15 CLASS B Power: DC3.7V Humidity: 48 %

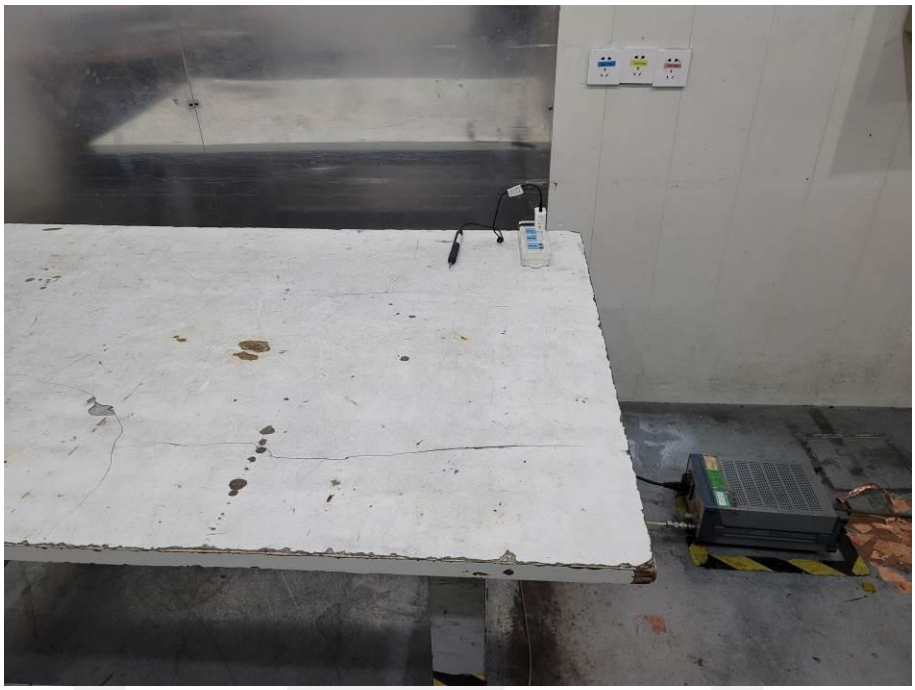
Mode:CCW

Note:

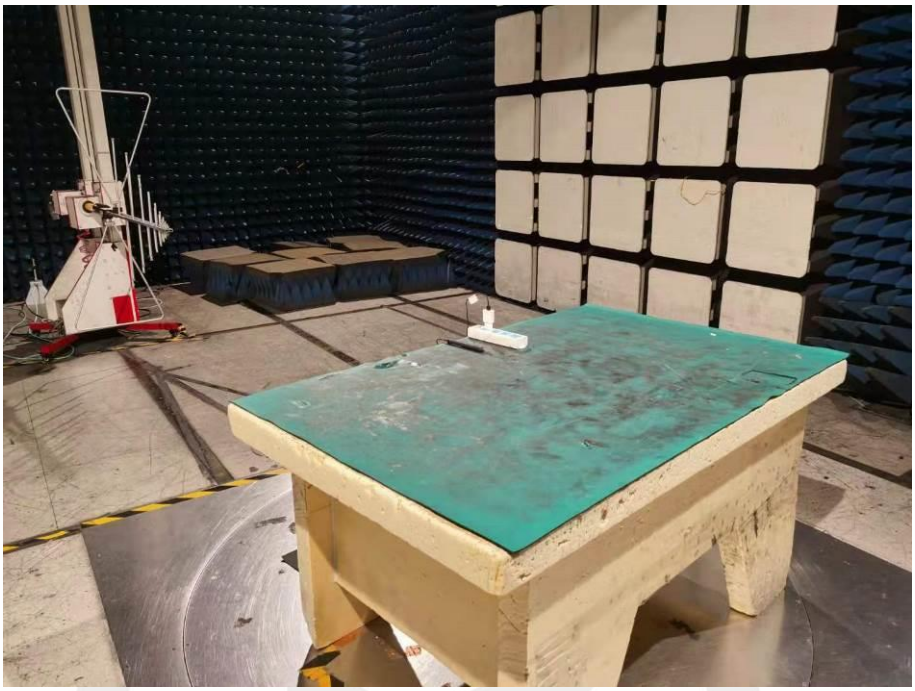
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		34.4115	43.23	-14.02	29.21	40.00	-10.79	QP			
2	*	49.5762	42.80	-12.11	30.69	40.00	-9.31	QP			
3		58.4331	37.20	-12.07	25.13	40.00	-14.87	QP			
4		75.7114	34.00	-14.29	19.71	40.00	-20.29	QP			
5		130.6650	39.60	-14.24	25.36	43.50	-18.14	QP			
6		134.9727	41.46	-14.20	27.26	43.50	-16.24	QP			

6. PHOTOGRAPHS

6.1. Photos of Conducted Emission Measurement



6.2. Photos of Radiation Emission Measurement



APPENDIX A: Label Requirements

(1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under part 73 of this chapter, land mobile operation under part 90 of this chapter, etc., shall bear the following statement in a conspicuous location on the device:
This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful
interference.

(2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:
This device complies with part 15 of the FCC Rules for use with cable television service.

(3) All other devices shall bear the following statement in a conspicuous location on the device:
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

APPENDIX B: Warning Statement

(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

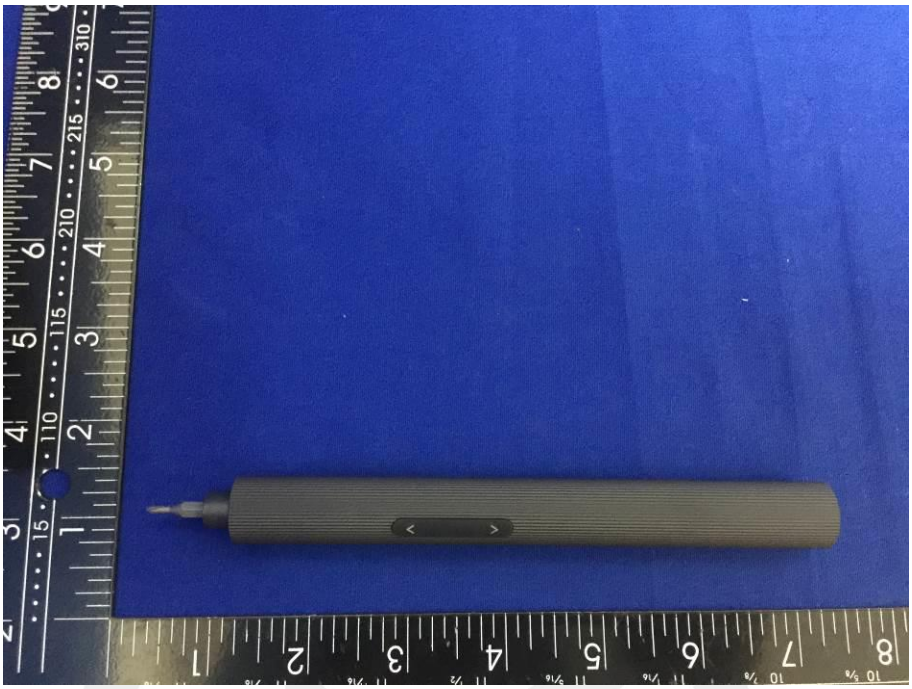
NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

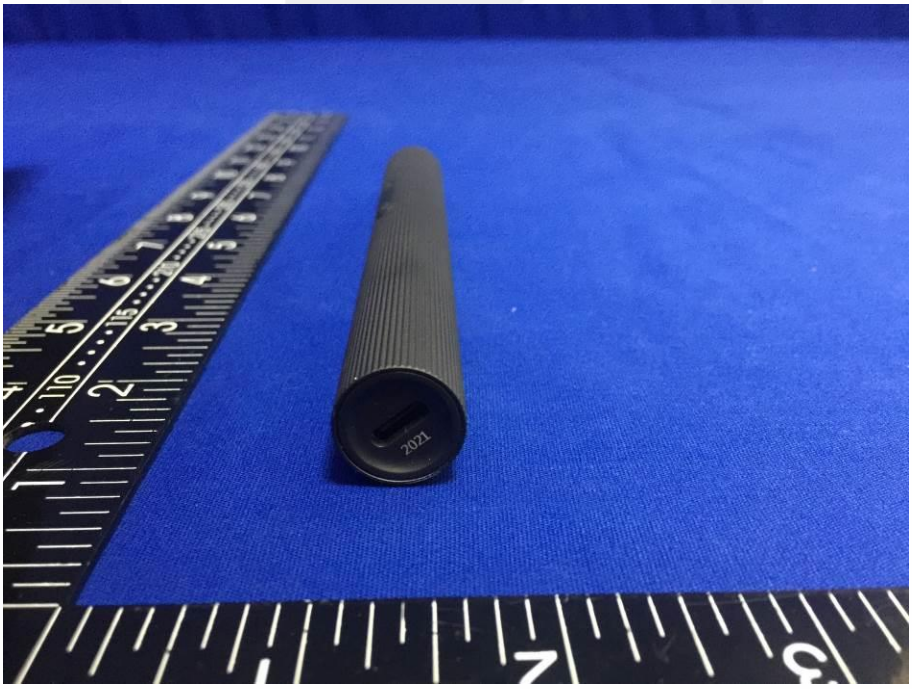
(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

Warning: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

APPENDIX C: Photos of EUT

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End of Report

Statement

1．This report will be void without authorized signature or special seal for testing report.

2．This report shall not be copied partly without authorization.

3．The test results or observations are applicable only to tested sample. Client shall be responsible for representativeness of the sample and authenticity of the material.

4．The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.

5．The test results or observations are provided in accordance with measured value, without taking risks caused by uncertainty into account. Without explicit stipulation in special agreements, standards or regulations, EMTEK shall not assume any responsibility.

6．Objections shall be raised within 20 days from the date receiving the report.