



TEST REPORT

Report No. : CHTEW20010037 Report Verification: 

Project No..... : SHT1912068003EW

FCC ID..... : 2AVH2EOAIMI

Applicant's name..... : Shenzhen Soga Medical Equipment Co., Ltd.

Address..... : D906 of Yinxing technology building, No. 1301, Guan Guang Road, Xinlan community, Guanlan street, Longhua District ,ShenZhen,Guangdong,China

Manufacturer..... : Shenzhen Soga Medical Equipment Co., Ltd.

Address..... : D906 of Yinxing technology building, No. 1301, Guan Guang Road, Xinlan community, Guanlan street, Longhua District ,ShenZhen,Guangdong,China

Test item description : Electric Oral Anesthesia Injector

Trade Mark : -

Model/Type reference..... : Mini I

Listed Model(s) : Smart I

Standard : FCC CFR Title 47 Part 15 Subpart C

Date of receipt of test sample..... : Dec.25,2019

Date of testing..... : Dec.25,2019 ~ Jan.02,2020

Date of issue..... : Jan.03,2020

Result..... : PASS

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Testing Laboratory Name : Shenzhen Huatongwei International Inspection Co., Ltd.

Address..... : 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

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The test report merely correspond to the test sample.

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1. TEST STANDARDS AND REPORT VERSION

1.1. Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15C](#): Intentional Radiators

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices.

1.2. Report version information

Revision No.	Date of issue	Description
N/A	2020-01-03	Original

2. TEST DESCRIPTION

Report clause	Test Item	Section in CFR 47	Result	Test Engineer
5.1	Antenna requirement	15.203	PASS	Jianquan Wu
5.2	AC Power Line Conducted Emissions	15.207	PASS	Jianquan Wu
5.3	20dB Occupied Bandwidth	15.215(c)	PASS	Jian Li
5.4	Spurious Emissions	15.209	PASS	Jian Li

Remark: The measurement uncertainty is not included in the test result.

3. SUMMARY

3.1. Client Information

Applicant:	Shenzhen Soga Medical Equipment Co., Ltd.
Address:	D906 of Yinxing technology building, No. 1301, Guan Guang Road, Xinlan community, Guanlan street, Longhua District ,ShenZhen,Guangdong,China
Manufacturer:	Shenzhen Soga Medical Equipment Co., Ltd.
Address:	D906 of Yinxing technology building, No. 1301, Guan Guang Road, Xinlan community, Guanlan street, Longhua District ,ShenZhen,Guangdong,China

3.2. Product Description

Name of EUT:	Electric Oral Anesthesia Injector
Trade Mark:	-
Model No.:	Mini I
Listed Model(s):	Smart I
Power supply:	DC 3.7V
Adapter information:	Model:GAT-0501000U Input:AC100-240V 0.4A 50/60Hz Output:5.0Vd.c.1000mA
Hardware Version:	1.0
Software Version:	1.0

3.3. Radio Specification Description

Operation frequency:	400KHz-490KHz
Antenna type:	Coil antenna

3.4. Testing Laboratory Information

Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.	
Laboratory Location	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China	
Qualifications	Type	Accreditation Number
	CNAS	L1225
	A2LA	3902.01
	FCC	762235
	Canada	5377A

4. TEST CONFIGURATION

4.1. Test frequency list

Channel	Frequency (KHz)
00	489

4.2. EUT operation mode

TEST MODE

For RF test items
The EUT was programmed to be in continuously transmitting mode with rating output(5V) for charging
For AC power line conducted emissions:
The EUT was programmed to be in continuously transmitting mode with rating output(5V) for charging
For Radiated suprious emissions test item:
The EUT was programmed to be in continuously transmitting mode with rating output(5V) for charging

4.3. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

1	Adapter	Manufacturer :	LISTED
		Model No. :	GAT-0501000U

4.4. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

4.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors in calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 2" and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system according to ISO/IEC 17025. Further more, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Here after the best measurement capability for Shenzhen Huatongwei is reported:

Test Items	Measurement Uncertainty	Notes
Conducted Disturbance 9KHz-30MHz	3.02 dB	(1)
Radiated emissions below 1GHz	4.90 dB	(1)
Radiated emissions above 1GHz	4.96 dB	(1)
Occupied Bandwidth	15 Hz	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

4.6. Modifications

No modifications were implemented to meet testing criteria.

4.7. Equipments Used during the Test

● Conducted Emission							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Shielded Room	Albatross projects	HTWE0114	N/A	N/A	2018/09/28	2023/09/27
●	EMI Test Receiver	R&S	HTWE0111	ESCI	101247	2019/10/26	2020/10/25
●	Artificial Mains	SCHWARZBECK	HTWE0113	NNLK 8121	573	2019/10/23	2020/10/22
●	Pulse Limiter	R&S	HTWE0033	ESH3-Z2	100499	2019/10/23	2020/10/22
●	RF Connection Cable	HUBER+SUHNER	HTWE0113-02	ENVIROFLE X 142	EF-NM-BNCM-2M	2019/10/23	2020/10/22
●	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

● Radiated emission-6th test site							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0127	SAC-3m-02	C11121	2018/09/30	2021/09/29
●	EMI Test Receiver	R&S	HTWE0099	ESCI	100900	2019/10/26	2020/10/25
●	Loop Antenna	R&S	HTWE0170	HFH2-Z2	100020	2018/04/02	2021/04/01
●	Ultra-Broadband Antenna	SCHWARZBECK	HTWE0119	VULB9163	546	2017/04/05	2020/04/04
●	Pre-Amplifier	SCHWARZBECK	HTWE0295	BBV 9742	N/A	2019/11/14	2020/11/13
●	RF Connection Cable	HUBER+SUHNER	HTWE0062-01	N/A	N/A	2019/08/21	2020/08/20
●	RF Connection Cable	HUBER+SUHNER	HTWE0062-02	SUCOFLEX 104	501184/4	2019/05/27	2020/05/26
●	Test Software	R&S	N/A	ES-K1	N/A	N/A	N/A

● Radiated emission-7th test site							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0122	SAC-3m-01	N/A	2018/09/27	2021/09/26
●	Spectrum Analyzer	R&S	HTWE0098	FSP40	100597	2019/10/26	2020/10/25
●	Horn Antenna	SCHWARZBECK	HTWE0126	9120D	1011	2017/04/01	2020/03/31
●	Horn Antenna	SCHWARZBECK	HTWE0103	BBHA9170	25841	2017/03/27	2020/03/26
●	Broadband Horn Antenna	SCHWARZBECK	HTWE0103	BBHA9170	BBHA9170472	2018/10/11	2021/10/11
●	Pre-amplifier	CD	HTWE0071	PAP-0102	12004	2019/11/14	2020/11/13
●	Broadband Pre-amplifier	SCHWARZBECK	HTWE0201	BBV 9718	9718-248	2019/05/23	2020/05/22
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-01	6m 18GHz S Serisa	N/A	2019/05/10	2020/05/09
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-02	6m 3GHz RG Serisa	N/A	2019/05/10	2020/05/09
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-03	6m 3GHz RG Serisa	N/A	2019/05/10	2020/05/09
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-04	6m 3GHz RG Serisa	N/A	2019/05/10	2020/05/09
●	RF Connection Cable	HUBER+SUHNER	HTWE0121-01	6m 18GHz S Serisa	N/A	2019/05/10	2020/05/09
●	Test Software	Audix	N/A	E3	N/A	N/A	N/A

● RF Conducted Method						
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Signal and spectrum Analyzer	R&S	FSV40	100048	2019/10/26	2020/10/25
●	Spectrum Analyzer	Agilent	N9020A	MY50510187	2019/10/26	2020/10/25
○	Power Meter	Anritsu	ML249A	N/A	2019/10/26	2020/10/25
○	Radio communication tester	R&S	CMW500	137688-Lv	2019/10/26	2020/10/25

5. TEST CONDITIONS AND RESULTS

5.1. Antenna requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

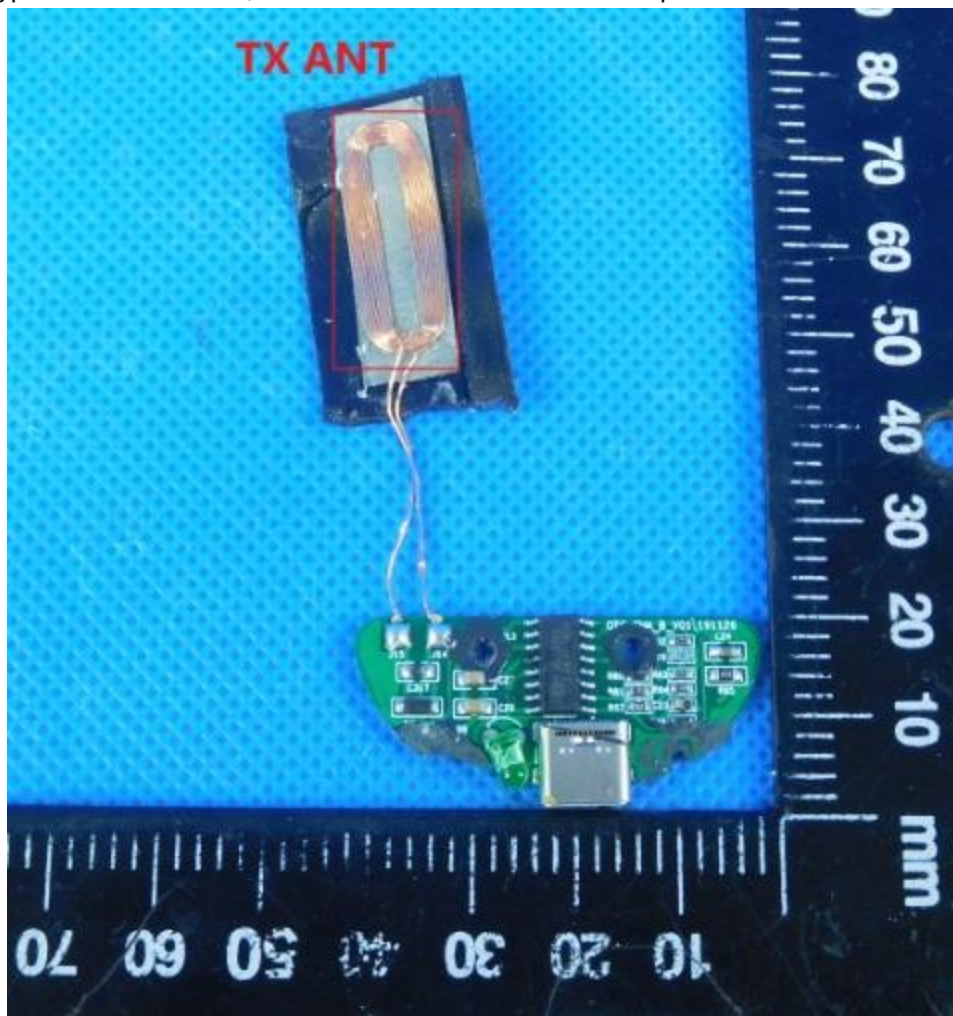
Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

TEST RESULTS

☒ Passed ☐ Not Applicable

The antenna type is a Coil antenna, Please refer to the below antenna photo.



5.2. AC Power Conducted Emissions

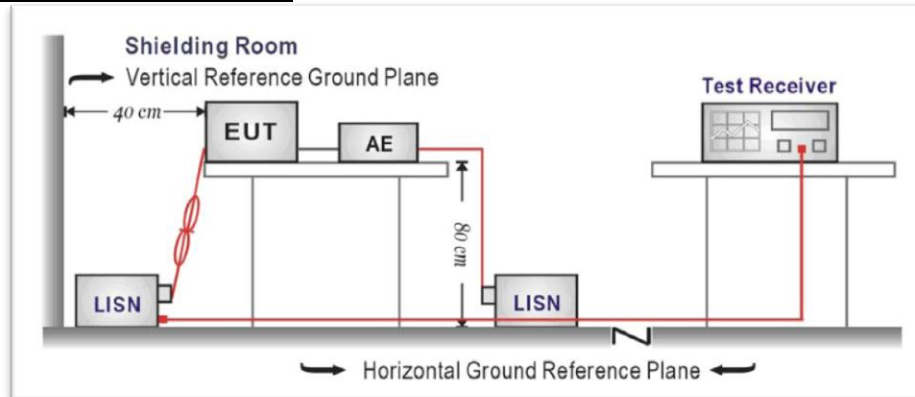
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207:

Frequency range (MHz)	Limit (dBuV)	
	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.

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup according to ANSI C63.10:2013
2. The EUT was placed on a plat form of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50ohm / 50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST MODE:

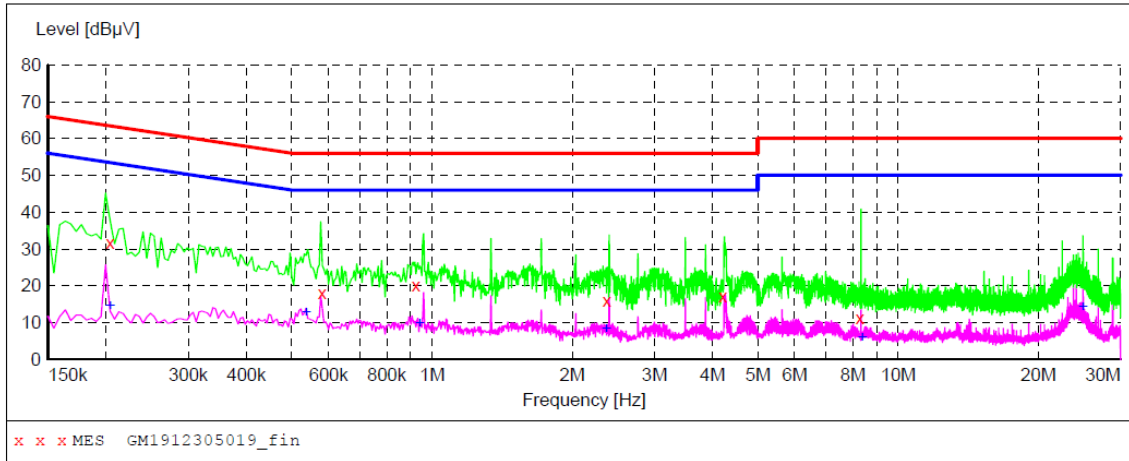
Please refer to the clause 3.3

TEST RESULTS

☒ Passed ☐ Not Applicable

Test Line:

L

**MEASUREMENT RESULT: "GM1912305019_fin"**

12/30/2019 10:56AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.204000	31.60	10.1	63	31.8	QP	L1	GND
0.582000	17.90	10.1	56	38.1	QP	L1	GND
0.924000	20.20	10.1	56	35.8	QP	L1	GND
2.373000	16.10	10.1	56	39.9	QP	L1	GND
4.204500	17.10	10.1	56	38.9	QP	L1	GND
8.281500	11.30	10.2	60	48.7	QP	L1	GND

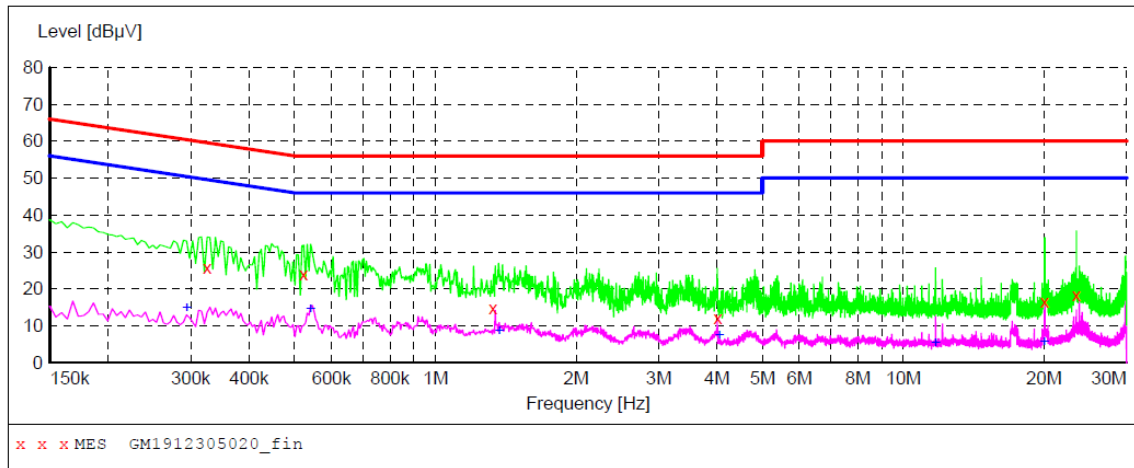
MEASUREMENT RESULT: "GM1912305019_fin2"

12/30/2019 10:56AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.204000	14.50	10.1	53	38.9	AV	L1	GND
0.537000	12.80	10.1	46	33.2	AV	L1	GND
0.942000	9.80	10.1	46	36.2	AV	L1	GND
2.364000	8.40	10.1	46	37.6	AV	L1	GND
8.367000	6.00	10.2	50	44.0	AV	L1	GND
24.904500	14.20	10.3	50	35.8	AV	L1	GND

Test Line:

N

**MEASUREMENT RESULT: "GM1912305020_fin"**

12/30/2019 10:59AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.325500	25.70	10.1	60	33.9	QP	N	GND
0.523500	23.90	10.1	56	32.1	QP	N	GND
1.329000	14.80	10.1	56	41.2	QP	N	GND
4.015500	12.20	10.1	56	43.8	QP	N	GND
20.040000	16.60	10.2	60	43.4	QP	N	GND
23.437500	18.30	10.2	60	41.7	QP	N	GND

MEASUREMENT RESULT: "GM1912305020_fin2"

12/30/2019 10:59AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.294000	14.80	10.1	50	35.6	AV	N	GND
0.541500	14.40	10.1	46	31.6	AV	N	GND
1.369500	8.70	10.1	46	37.3	AV	N	GND
4.047000	7.30	10.1	46	38.7	AV	N	GND
11.719500	5.20	10.2	50	44.8	AV	N	GND
20.013000	5.70	10.2	50	44.3	AV	N	GND

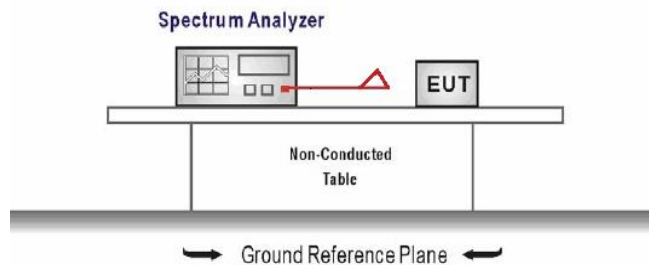
5.3. 20dB Bandwidth

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.215

Intentional radiators must be designed to ensure that the 20dB emission bandwidth in the specific band.

TEST CONFIGURATION



TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously
3. Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
RBW $\geq$ 1% of the 20 dB bandwidth, VBW $\geq$ RBW
Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

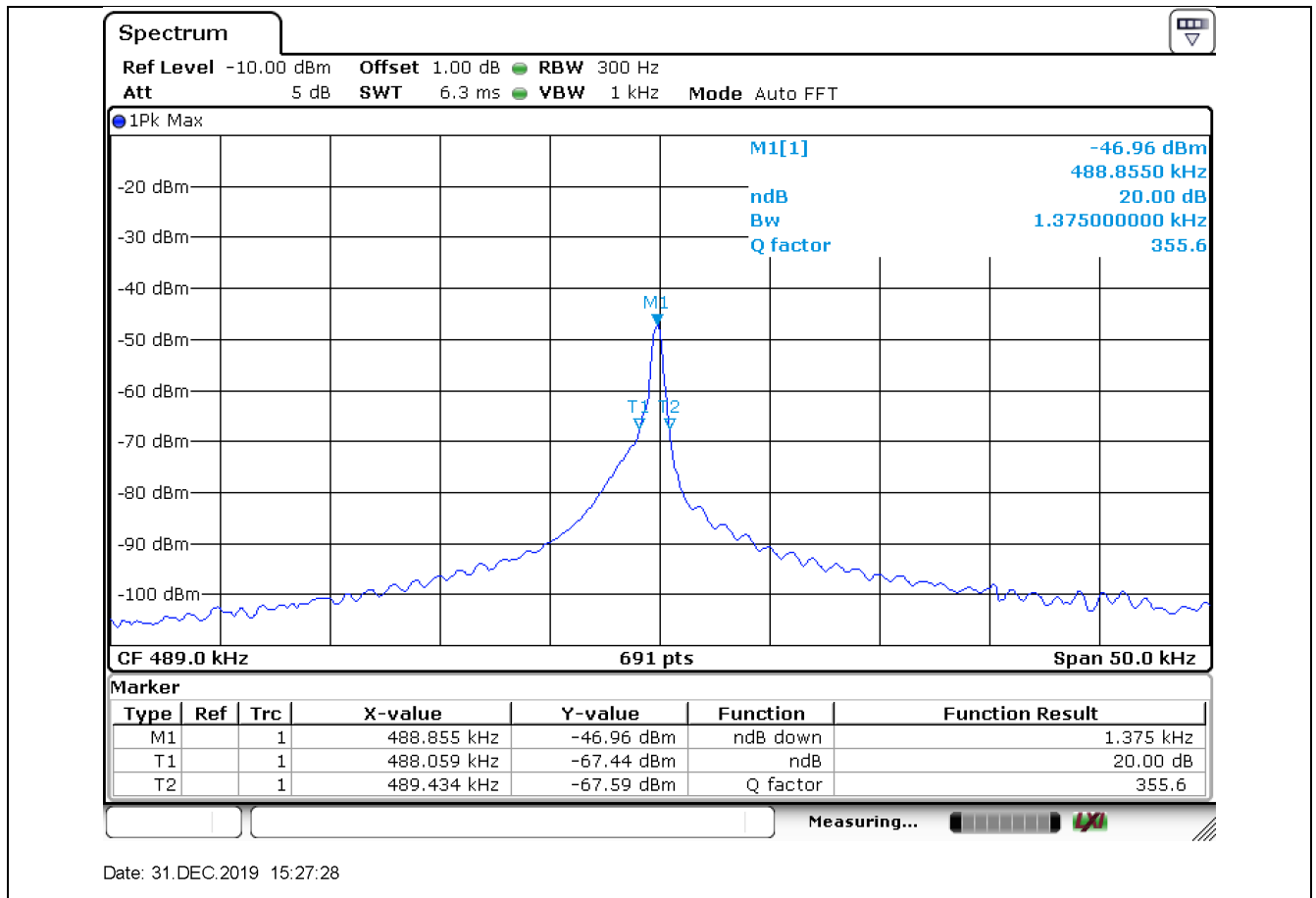
TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

Test Channel	20dB Bandwidth (KHz)	Limit (KHz)	Result
00	1.375	-	Pass



5.4. Radiated Emission

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.209

Limit for frequency below 30MHz:

Frequency	Limit (uV/m)	Measurement Distance(m)	Remark
0.009~0.490	2400/F(kHz)	300	Quasi-peak
0.490~1.705	24000/F(kHz)	30	Quasi-peak
1.705~30.0	30	30	Quasi-peak

Note: Limit dBuV/m @3m = Limit dBuV/m @300m + 40*log(300/3)= Limit dBuV/m @300m +80,

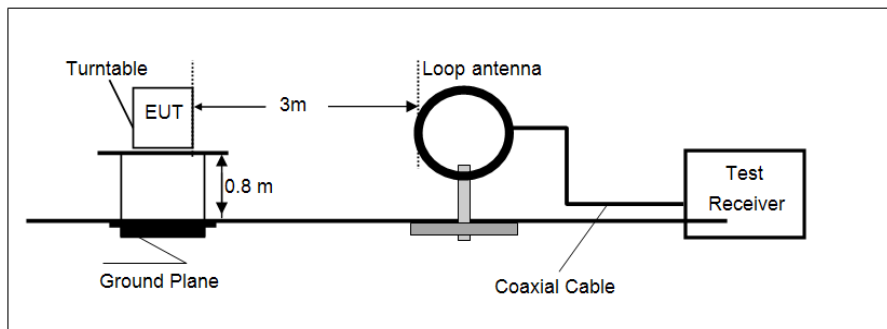
Limit dBuV/m @3m = Limit dBuV/m @30m +40*log(30/3)= Limit dBuV/m @30m + 40.

Limit for frequency above 30MHz:

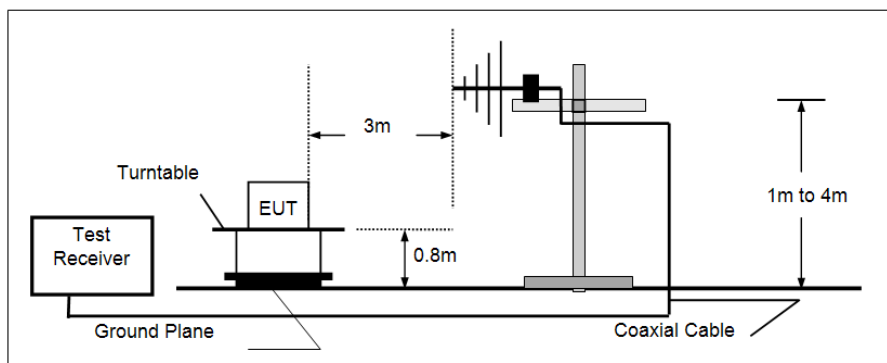
Frequency	Limit (dBuV/m@3m)	Remark
30MHz~88MHz	40.00	Quasi-peak
88MHz~216MHz	43.50	Quasi-peak
216MHz~960MHz	46.00	Quasi-peak
960MHz~1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

TEST CONFIGURATION

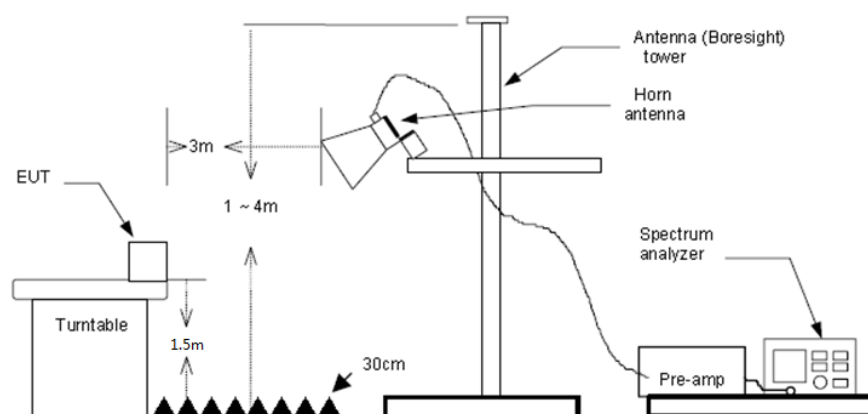
- 9 kHz ~ 30 MHz



- 30 MHz ~ 1 GHz



- Above 1 GHz



TEST PROCEDURE

1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Below 30MHz:
RBW=10 kHz, VBW=30 kHz, Sweep=auto, Detector function=peak, Trace=max hold;
 - (3) 30MHz to 1 GHz:
RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;
If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
 - (4) From 1 GHz to 10th harmonic:
RBW=1MHz, VBW=3MHz Peak detector for Peak value.
RBW=1MHz, VBW=3MHz RMS detector for Average value.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ Passed ☐ Not Applicable

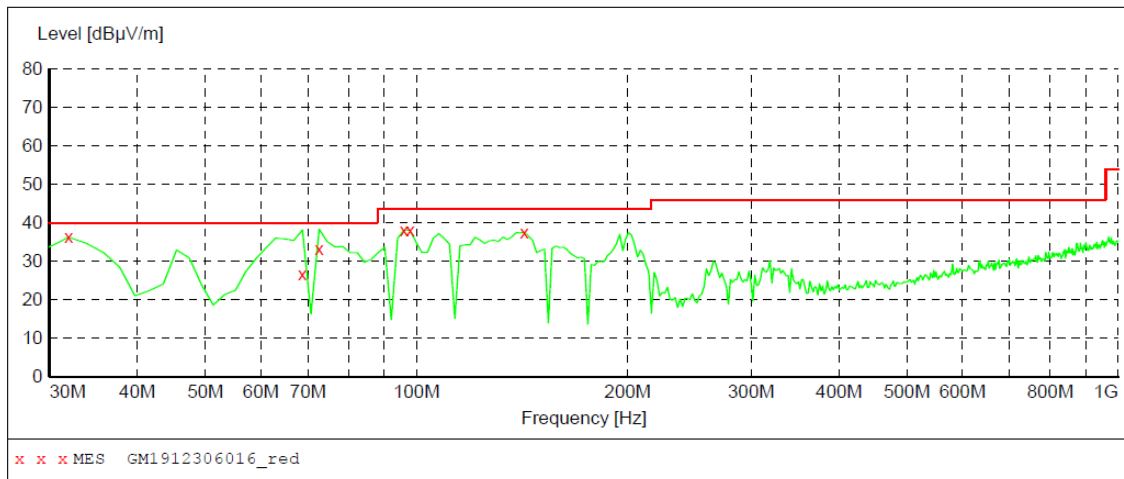
Below 30MHz:

Suspected Data List								
NO.	Freq. [MHz]	Reading [dBμV/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Detector
1	0.0122	20.52	26.48	47.00	125.85	78.85	Vertical	PK
2	0.0347	28.72	26.91	55.63	116.81	61.18	Vertical	PK
3	0.4784	32.25	27.54	59.79	94.01	34.22	Vertical	PK
4	0.9858	22.75	27.75	50.50	67.73	17.23	Vertical	PK
5	5.6424	11.40	28.21	39.61	69.54	29.93	Vertical	PK
6	13.5825	11.96	26.46	38.42	69.54	31.12	Vertical	PK

Above 30MHz:

Polarization:

Vertical

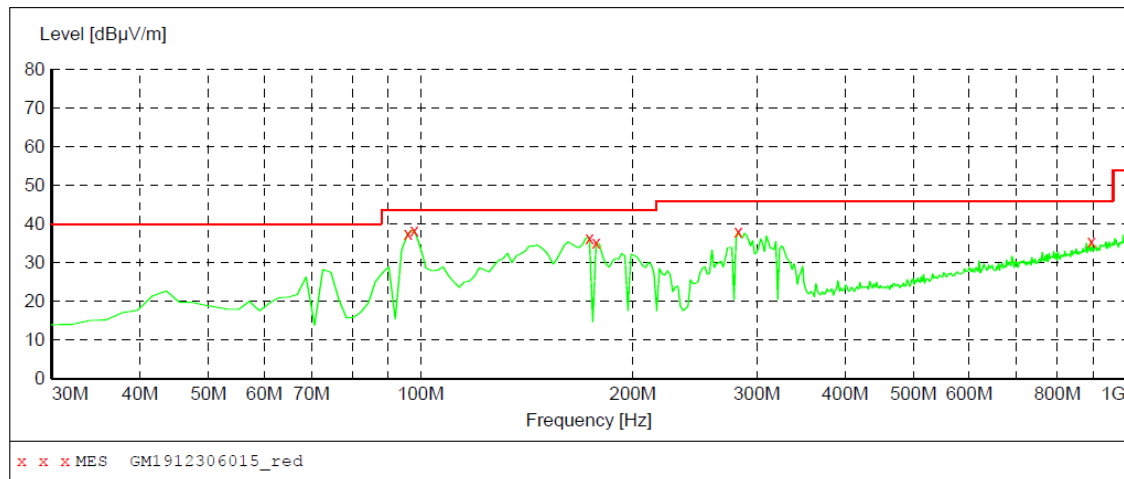
**MEASUREMENT RESULT: "GM1912306016_red"**

12/30/2019 10:16AM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
31.940000	36.30	-12.7	40.0	3.7	QP	100.0	204.00	VERTICAL
68.800000	26.70	-12.4	40.0	13.3	QP	100.0	204.00	VERTICAL
72.680000	33.50	-13.8	40.0	6.5	QP	100.0	204.00	VERTICAL
95.960000	38.10	-10.6	43.5	5.4	QP	100.0	204.00	VERTICAL
97.900000	38.10	-10.4	43.5	5.4	QP	100.0	204.00	VERTICAL
142.520000	37.60	-13.6	43.5	5.9	QP	100.0	204.00	VERTICAL

Polarization:

Horizontal

**MEASUREMENT RESULT: "GM1912306015_red"**

12/30/2019 10:12AM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
95.960000	37.60	-10.6	43.5	5.9	QP	300.0	29.00	HORIZONTAL
97.900000	38.50	-10.4	43.5	5.0	QP	300.0	29.00	HORIZONTAL
173.560000	36.40	-12.4	43.5	7.1	QP	100.0	259.00	HORIZONTAL
177.440000	35.20	-12.2	43.5	8.3	QP	100.0	259.00	HORIZONTAL
282.200000	38.10	-7.0	46.0	7.9	QP	100.0	259.00	HORIZONTAL
893.300000	35.60	7.0	46.0	10.4	QP	300.0	56.00	HORIZONTAL

6. TEST SETUP PHOTOS OF THE EUT

Conducted Emissions (AC Mains)

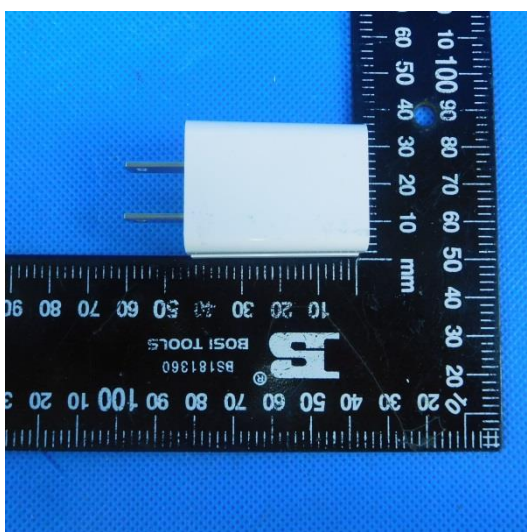
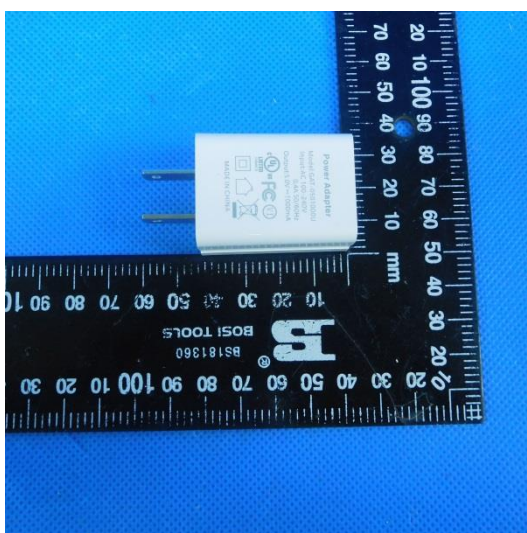


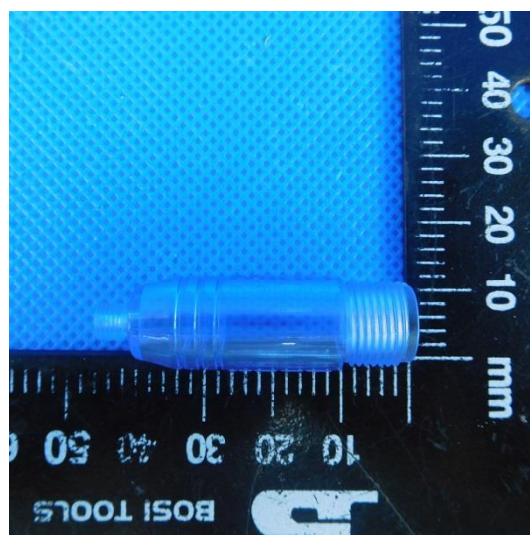
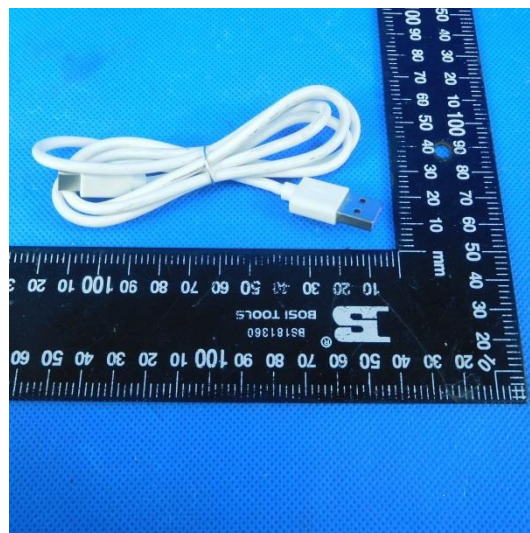
Radiated Emissions

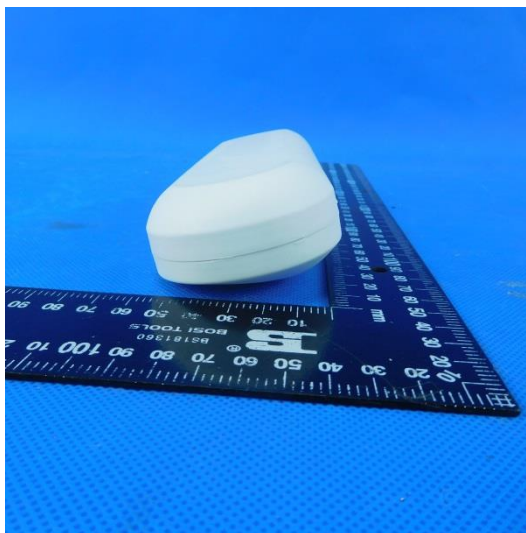
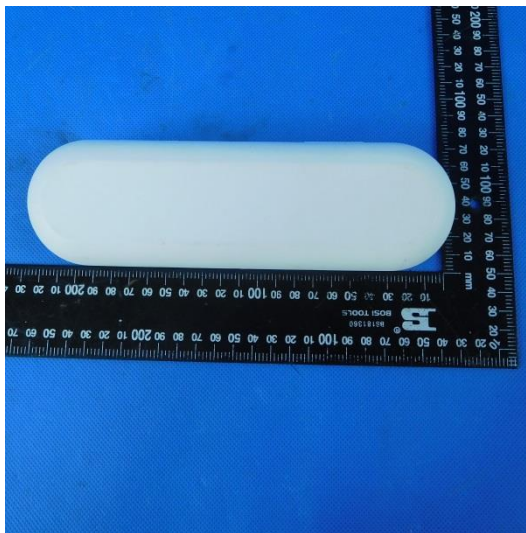
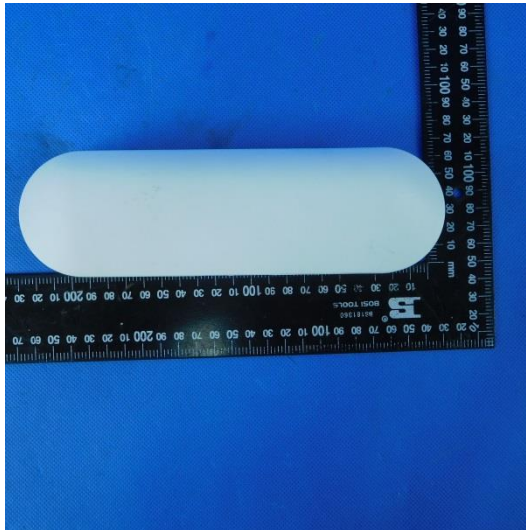


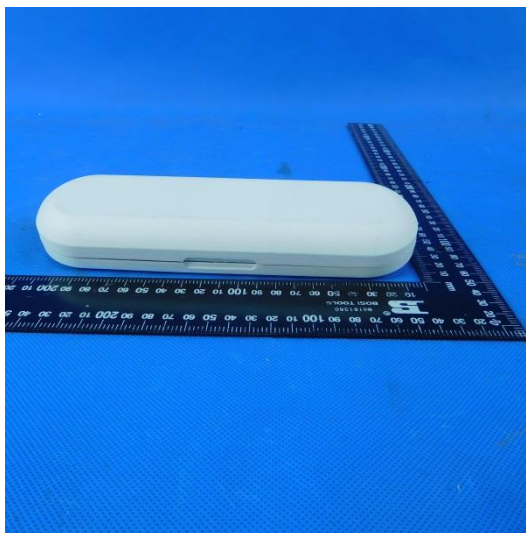
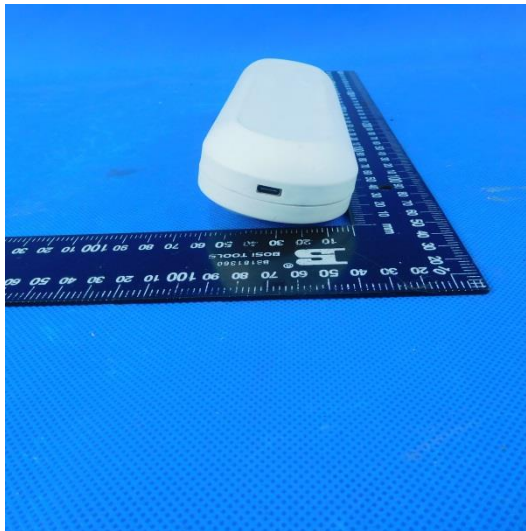
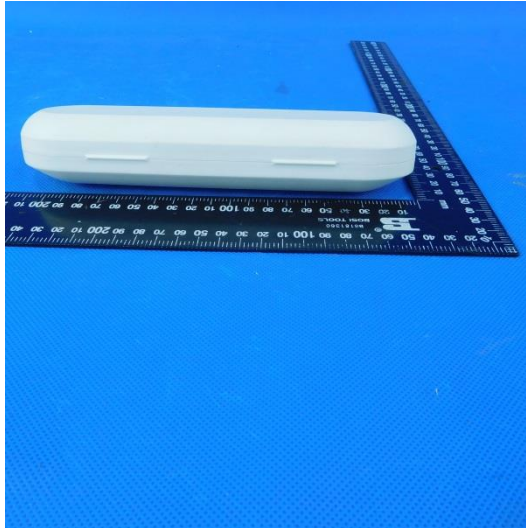
7. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

External Photo

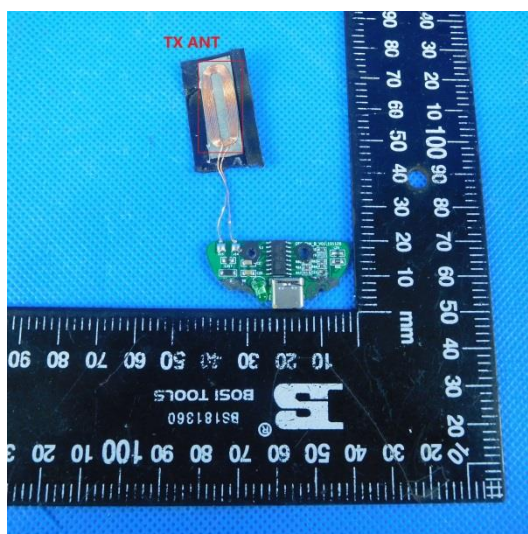


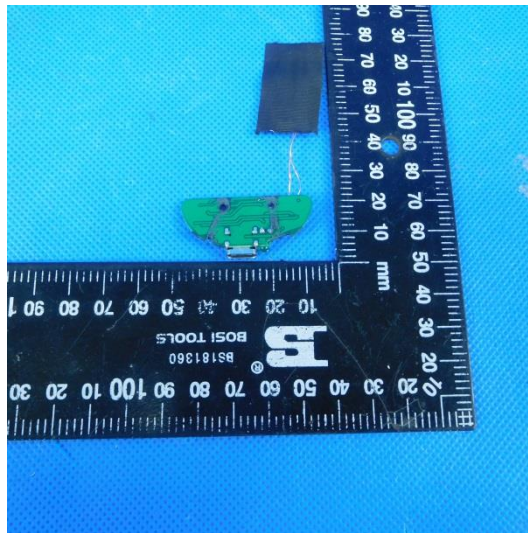






Internal Photo





-----End of Report-----