FCC Test Report

Report No.: AGC12647211015FE04

FCC ID	:	2A34H-IT01118
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Blue-Bot Programming TacTile Reader
BRAND NAME	:	TTS
MODEL NAME	:	IT01118
APPLICANT	:	RM Educational Resources Ltd
DATE OF ISSUE	:	Nov. 15, 2021
STANDARD(S)	:	FCC Rules and Regulations Part 15 Subpart C Section 15.225
REPORT VERSION	:	V1.0

***A**ttestation of **G**lobal **C**ompliance (Shenzhen) Co., Ltd*

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Nov. 15, 2021	Valid	Initial Release

TABLE OF CONTENTS

1. VERIFICATION OF COMPLIANCE

Applicant	RM Educational Resources Ltd
Address	Building 1, Harrier Business Park, Heyworth Road, Hucknall, NG15 6XJ
Manufacturer	RM Educational Resources Ltd
Address	Building 1, Harrier Business Park, Heyworth Road, Hucknall, NG15 6XJ
Product Designation	Blue-Bot Programming TacTile Reader
Brand Name	TTS
Test Model	IT01118
Date of test	Oct. 25, 2021 to Nov. 15, 2021
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-SRD/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC part 15.225.

Prepared By	Bibo Zhang (Project Engineer)	Nov. 15, 2021
Reviewed By	Calvin Liu (Reviewer)	Nov. 15, 2021
Approved By	Max Zhang (Authorized Officer)	Nov. 15, 2021

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	13.56MHz
Max field strength	51.09dBuV/m(PK)@3m
Modulation	ASK
Number of channels	1 Channel
Antenna Designation	PCB Antenna (Comply with requirements of the FCC part 15.203)
Antenna Gain	0dBi
Hardware Version	DTTS09-000A2
Software Version	V1.0
Power Supply	DC 3.7V by battery or DC 5V by adapter

2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
13.110~14.010 MHz	01	13.56 MHz

2.3. RELATED SUBMITTAL(S)/GRANT(S)

This submittal(s) (test report) is intended for **FCC ID: 2A34H-IT01118** filing to comply with the FCC Part 15.225 requirements.

2.4. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013). Radiated testing was performed at an antenna to EUT distance 3 meters.

2.5. SPECIAL ACCESSORIES

Refer to section 5.2.

2.6. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2.7. ANTENNA REQUIREMENT

This intentional radiator is designed with a permanently attached antenna of an antenna to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
For more information of the antenna, please refer to the APPENDIX B: PHOTOGRAPHS OF EUT.

3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

- Uncertainty of Conducted Emission, Uc = ±3.2 dB
- Uncertainty of Radiated Emission below 1GHz, Uc = ±3.9 dB
- Uncertainty of Radiated Emission above 1GHz, Uc = ±4.8 dB
- Uncertainty of total RF power, conducted, Uc = ±0.8 dB
- Uncertainty of RF power density, conducted, Uc = ±2.6 dB
- Uncertainty of spurious emissions, conducted, Uc = ±2.7 dB
- Uncertainty of Occupied Channel Bandwidth: Uc = ±2 %

4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Charge + NFC Mode

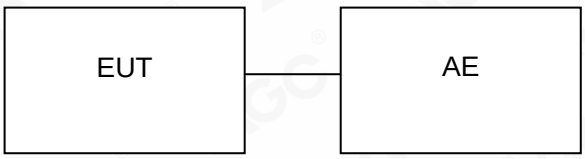
Note:

1. Only the result of the worst case was recorded in the report, if no other cases.
2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.
3. For Conducted Test method, a temporary antenna connector is provided by the manufacture.
4. Ten antennas can transmit at the same time.

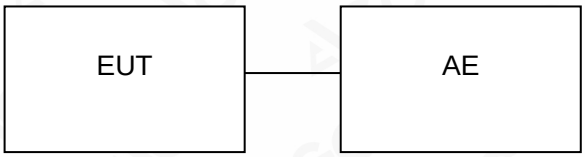
5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF TESTED SYSTEM

Radiated Emission Configure:



Conducted Emission Configure:



5.2. EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Blue-Bot Programming TacTile Reader	IT01118	2A34H-IT01118	EUT
2	Adapte	ZL-PCB0100020502000	N/A	AE
3	Cable	N/A	N/A	AE

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
15.215(c)	20dB Spectrum Bandwidth	Compliant
15.225(e)	Frequency Stability	Compliant
15.225(a)(b)(c)	Field Strength of Fundamental Emissions	Compliant
15.225(d)&15.209	Radiated Emission	Compliant
15.207	AC Power Line Conducted Emissions	Compliant

6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance (Shenzhen) Co., Ltd is accredited by A2LA

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	May 15, 2021	May 14, 2022
LISN	R&S	ESH2-Z5	100086	Jun. 09, 2021	Jun. 08, 2022
Test software	R&S	ES-K1(Ver.V1.71)	N/A	N/A	N/A

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	May 15, 2021	May 14,2022
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 07, 2020	Dec. 06, 2021
2.4GHz Filter	EM Electronics	2400-2500MHz	N/A	Mar. 23, 2020	Mar. 22, 2022
Attenuator	ZHINAN	E-002	N/A	Sep. 07, 2021	Sep. 06, 2022
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 19, 2021	Sep. 18, 2023
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	May 22, 2020	May 21, 2022
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	Apr. 23, 2021	Apr. 22, 2023
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Sep. 03, 2020	Sep. 02, 2022
ANTENNA	SCHWARZBECK	VULB9168	494	Jan. 08, 2021	Jan. 07, 2023
Test software	Tonscend	JS32-RE (Ver.2.5)	N/A	N/A	N/A

7.RADIATED EMISSION

3.1. TEST LIMIT

Rules and specifications	FCC CFR 47 Part 15 section 15.225			
Description	Compliance with the spectrum mask is tested with RBW set to 9kHz.			
Freq. of Emission (MHz)	Field Strength (μV/m) at 30m	Field Strength (dBμV/m) at 30m	Field Strength (dBμV/m) at 10m	Field Strength (dBμV/m) at 3m
1.705~13.110	30	29.5	48.58	69.5
13.110~13.410	106	40.5	59.58	80.5
13.410~13.553	334	50.5	69.58	90.5
13.553~13.567	15848	84.0	103.08	124.0
13.567~13.710	334	50.5	69.58	90.5
13.710~14.010	106	40.5	59.58	80.5
14.010~30.000	30	29.5	48.58	69.5

According to 15.35, on any frequency or frequencies below or equal to 1000 MHz, the limits Shown are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths, unless otherwise specified the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test.

The field strength of any emissions which appear outside of 13.110 ~14.010MHz band shall not exceed the general radiated emissions limits.

Frequencies (MHz)	Field Strength (μV/m)	Measurement Distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

7.2. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

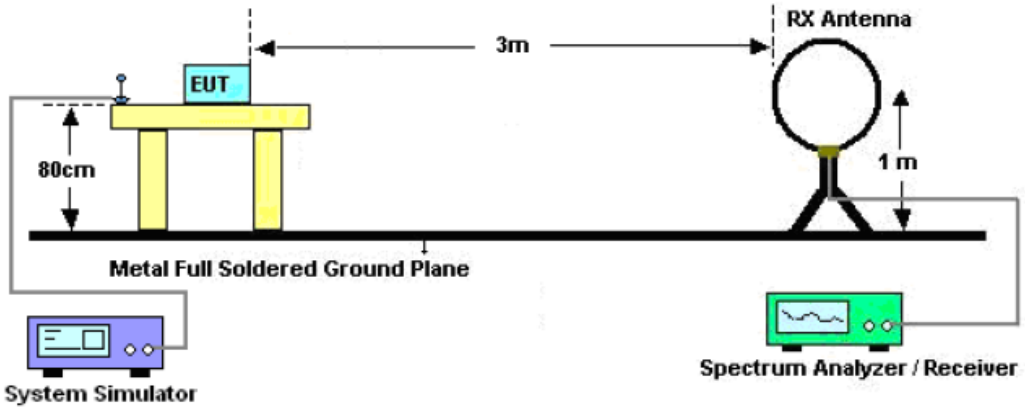
The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP
Start ~Stop Frequency	1GHz~26.5GHz 1MHz/1MHz for Peak, 1MHz/10Hz for Average

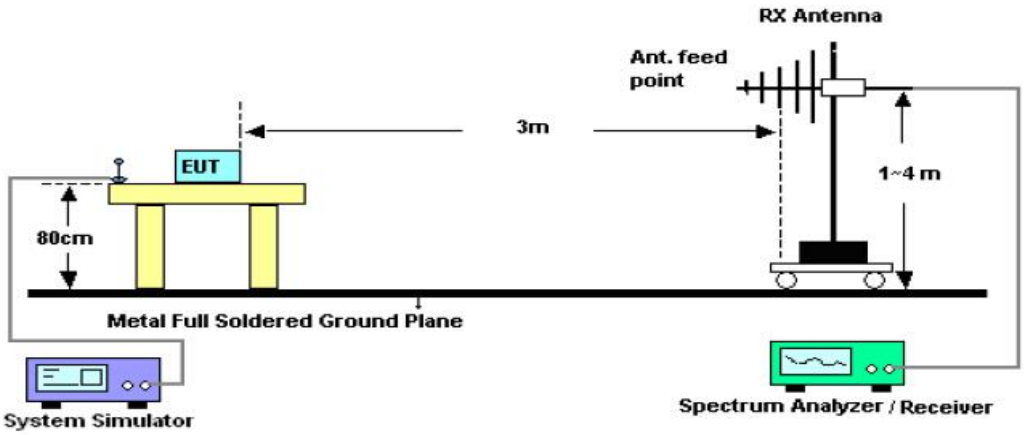
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

7.3. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



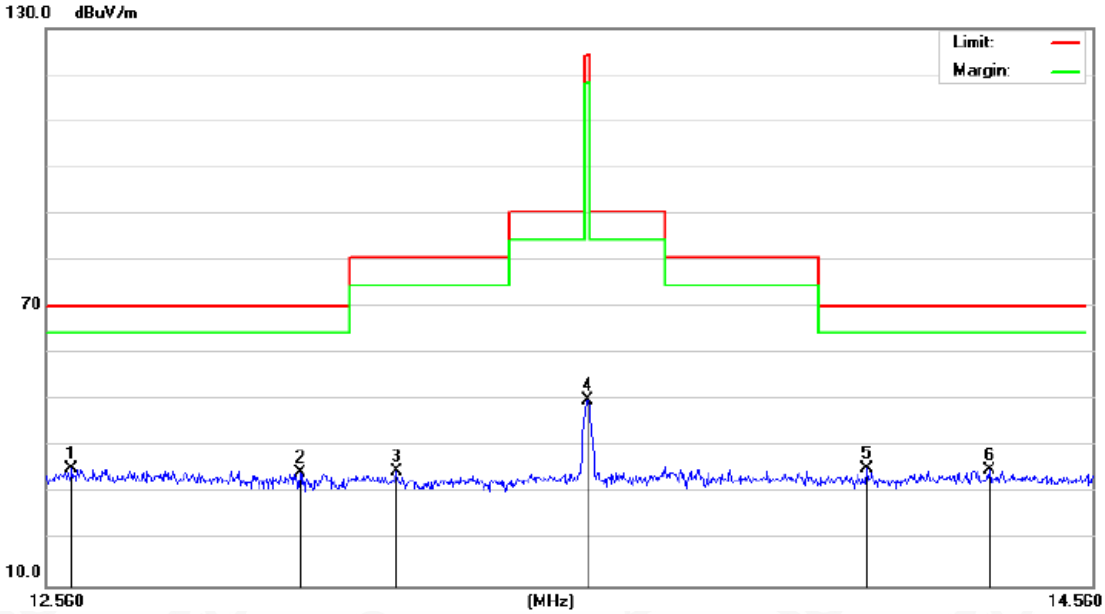
RADIATED EMISSION TEST SETUP 30MHz-1000MHz



7.4. TEST RESULT

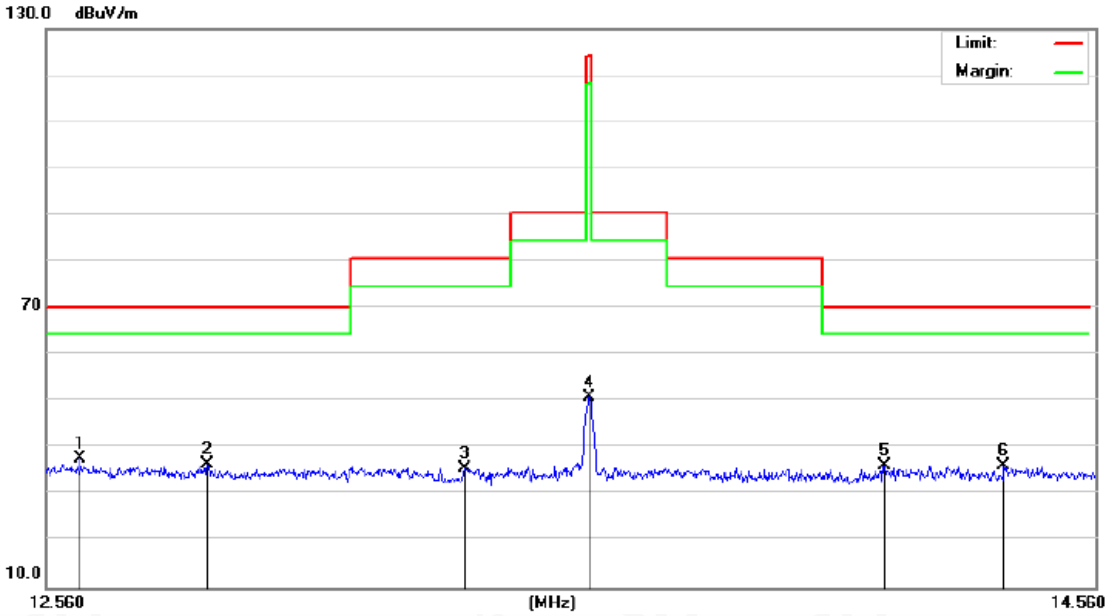
RADIATED EMISSION BELOW 30MHZ

EUT：	Blue-Bot Programming TacTile Reader	Model Name	IT01118
Temperature：	20 ℃	Relative Humidtity：	53%
Pressure：	1010hPa	Test Voltage ：	DC 3.70V
Test Mode ：	Mode 1	Polarization :	Face



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		12.6080	10.65	24.57	35.22	69.50	-34.28	peak
2		13.0198	9.87	24.60	34.47	69.50	-35.03	peak
3		13.1980	10.04	24.61	34.65	80.50	-45.85	peak
4		13.5600	25.45	24.64	50.09	124.0	-73.91	peak
5	*	14.1059	10.59	24.68	35.27	69.50	-34.23	peak
6		14.3520	10.24	24.70	34.94	69.50	-34.56	peak

EUT：	Blue-Bot Programming TacTile Reader	Model Name	IT01118
Temperature：	20 ℃	Relative Humidtity：	53%
Pressure：	1010 hPa	Test Voltage ：	DC3.70V
Test Mode ：	Mode 1	Polarization :	Side

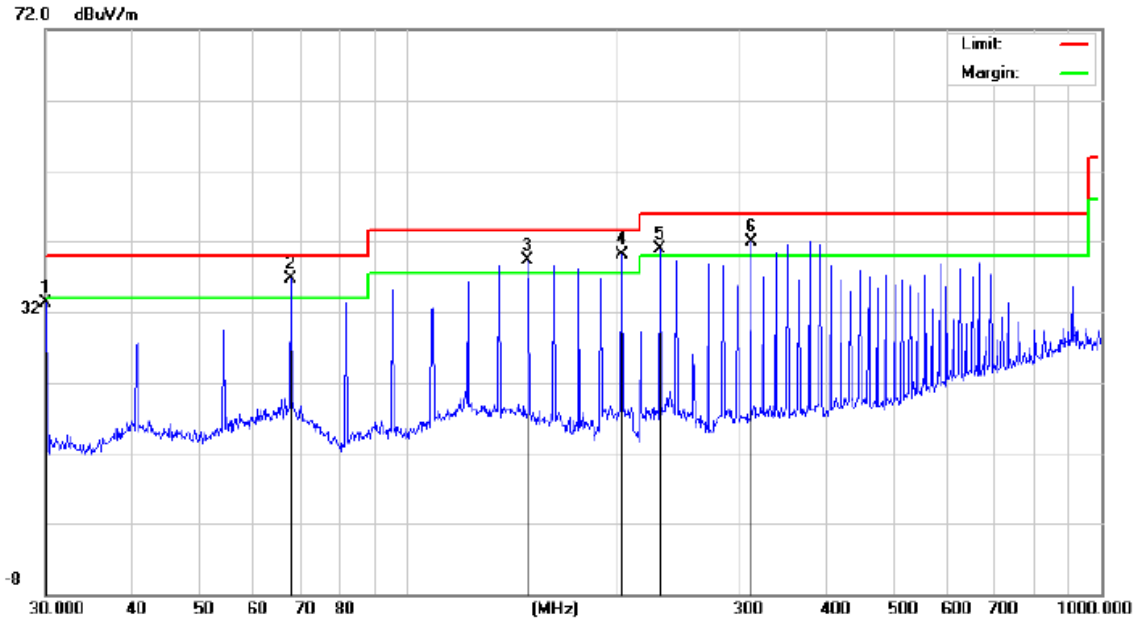


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	12.6219	13.10	24.57	37.67	69.50	-31.83	peak
2		12.8498	11.94	24.59	36.53	69.50	-32.97	peak
3		13.3239	11.01	24.62	35.63	80.50	-44.87	peak
4		13.5600	26.45	24.64	51.09	124.0	-72.91	peak
5		14.1340	11.47	24.68	36.15	69.50	-33.35	peak
6		14.3740	11.40	24.70	36.10	69.50	-33.40	peak

Note: Other emissions from 9 kHz to 30 MHz are considered as ambient noise. No recording in the test report.

RADIATED EMISSION 30MHz- 1GHZ

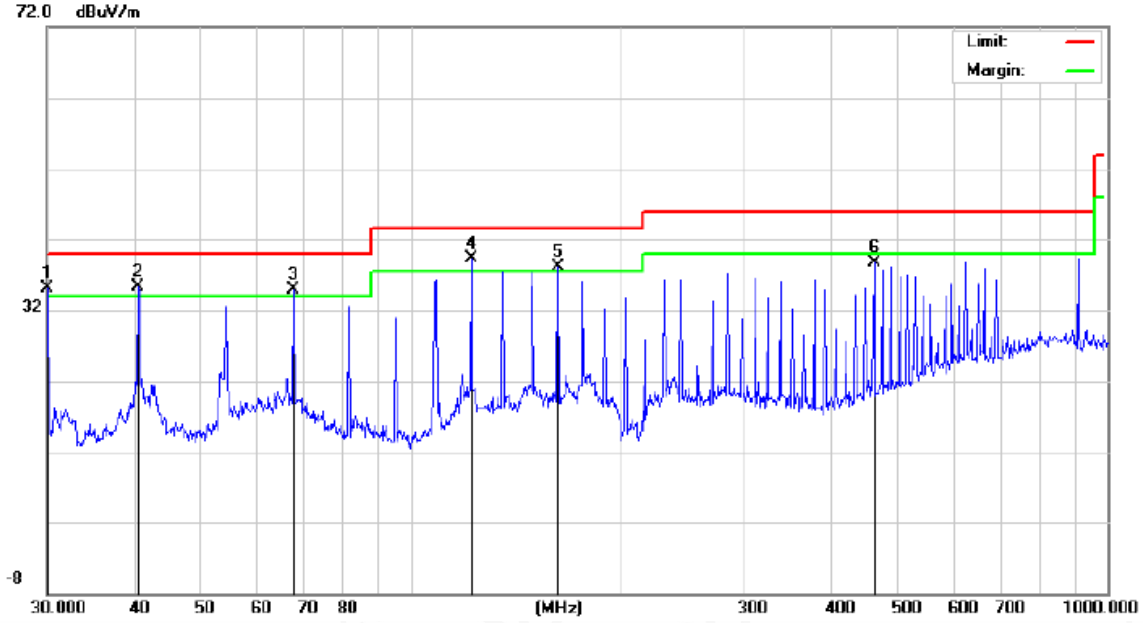
EUT：	Blue-Bot Programming TacTile Reader	Model Name	IT01118
Temperature：	20 ℃	Relative Humidtity：	53%
Pressure：	1010 hPa	Test Voltage ：	DC3.70V
Test Mode ：	Mode 1	Polarization :	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		30.0000	26.05	7.17	33.22	40.00	-6.78	peak
2	*	67.6751	24.74	11.96	36.70	40.00	-3.30	peak
3	!	148.9625	27.40	11.99	39.39	43.50	-4.11	peak
4	!	203.5227	31.39	8.74	40.13	43.50	-3.37	peak
5	!	230.9068	32.89	8.01	40.90	46.00	-5.10	peak
6	!	312.1792	30.53	11.32	41.85	46.00	-4.15	peak

RESULT: PASS

EUT：	Blue-Bot Programming TacTile Reader	Model Name	IT01118
Temperature：	20 ℃	Relative Humidtity：	53%
Pressure：	1010 hPa	Test Voltage ：	DC3.70V
Test Mode ：	Mode 1	Polarization :	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	!	30.1052	27.95	7.17	35.12	40.00	-4.88	peak
2	!	40.5591	25.23	9.99	35.22	40.00	-4.78	peak
3	!	67.6751	22.87	12.05	34.92	40.00	-5.08	peak
4	*	121.9754	26.27	13.00	39.27	43.50	-4.23	peak
5	!	162.6106	26.80	11.31	38.11	43.50	-5.39	peak
6		462.3455	22.91	15.86	38.77	46.00	-7.23	peak

RESULT: PASS

Note:

Factor=Antenna Factor + Cable loss, Margin= Limit-Result.

The “Factor” value can be calculated automatically by software of measurement system.

8. FREQUENCY STABILITY

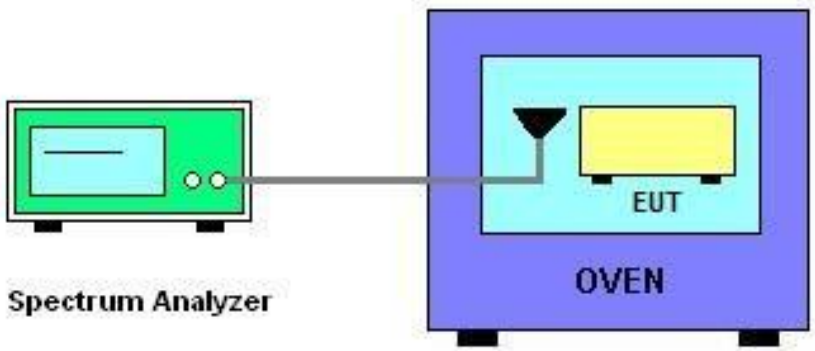
8.1. TEST LIMIT

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% (100ppm) of the operating frequency over a temperature variation of 0 degrees to +40 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

8.2. MEASUREMENT PROCEDURE

1.The spectrum analyzer connected via a receive antenna placed near the EUT.
2.EUT have transmitted signal and fixed channelize.
3.Set the spectrum analyzer span to view the entire emissions bandwidth.
4.Set RBW = 1 kHz, VBW = 3 kHz with peak detector and maxhold settings.
5.The fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10^6 ppm and the limit is less than ±100ppm.
6.Extreme temperature rule is -30°C~50°C.

8.3. TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)



8.4. MEASUREMENT RESULTS

Operating frequency: 13.56MHz

Voltage vs. Frequency Stability (Test Temperature: 20℃)

Voltage(V)	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
3.70	13.56074	+55	±100	PASS
3.15	13.56069			
4.20	13.56062			

Temperature vs. Frequency Stability (Test Voltage: 3.85V)

Temperature	Measurement Frequency (MHz)	Max. Deviation (ppm)	Limit(ppm)	Conclusion
-30℃	13.56072	+63	±100	PASS
-20℃	13.56062			
-10℃	13.56018			
0℃	13.56045			
10℃	13.56085			
20℃	13.56066			
30℃	13.56059			
40℃	13.56042			
50℃	13.56048			

9. 20 dB SPECTRUM BANDWIDTH

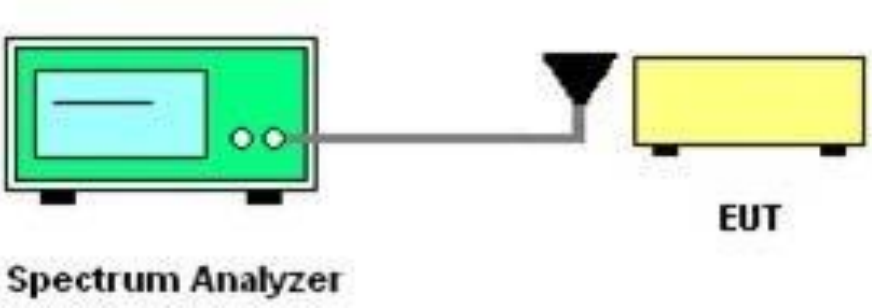
9.1. TEST LIMIT

Intentional radiators must be designed to ensure that the 20dB and 99% emission bandwidth in the specific band 13.553~13.567MHz

9.2. MEASUREMENT PROCEDURE

1. The spectrum analyzer connected via a receive antenna placed near the EUT in peak Max hold mode.
2. The resolution bandwidth of 10 kHz and the video bandwidth of 30 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.
4. Measured the 99% OBW.

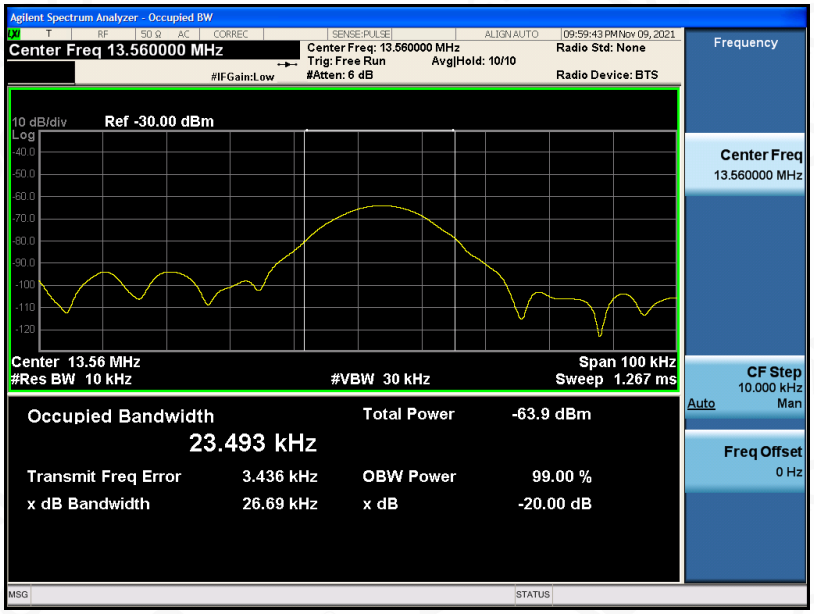
9.3. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



9.4. MEASUREMENT RESULTS

TEST ITEM	BANDWIDTH
TEST MODE	Mode1

Test Data (kHz)		Criteria
Occupied Bandwidth	23.493	PASS
-20dB Bandwidth	26.69	PASS



10. AC LINE CONDUCTED EMISSION TEST

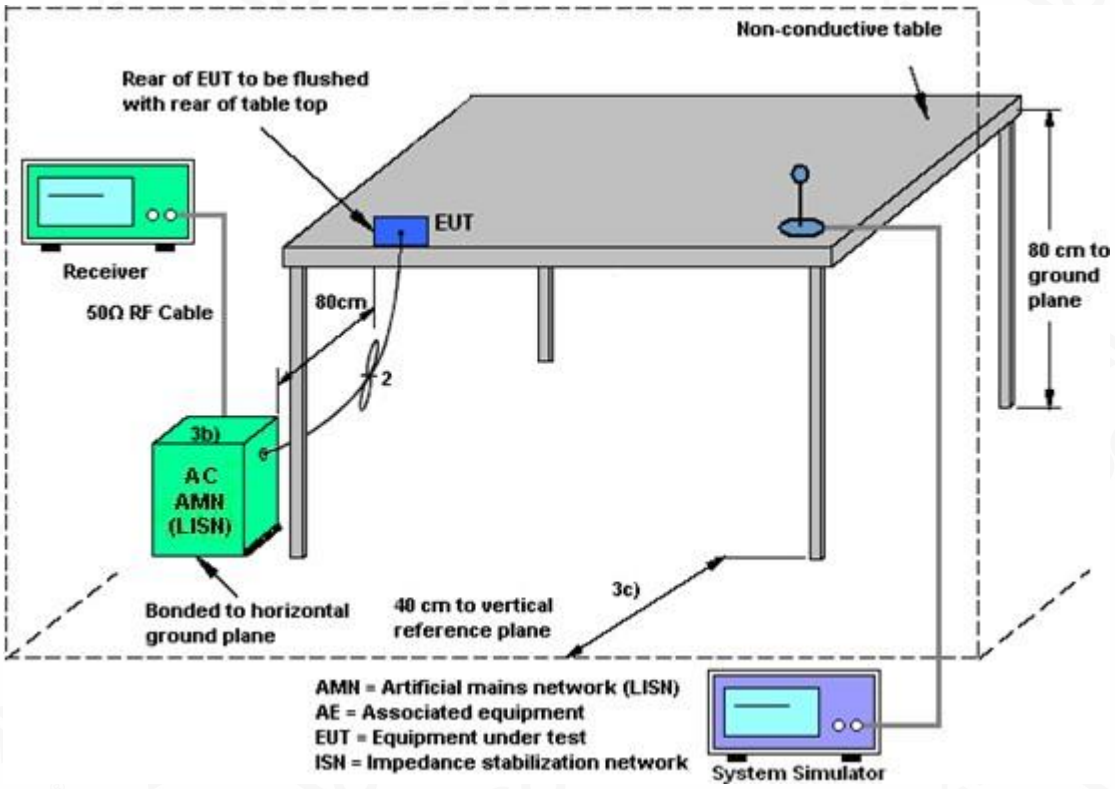
10.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

10.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



10.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hzpower by a LISN..
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

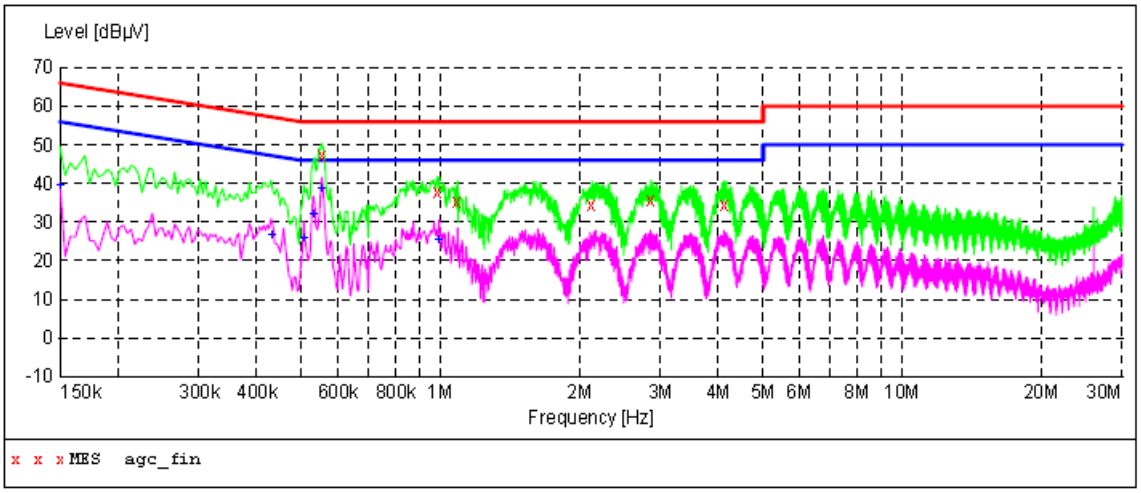
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

10.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

10.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST LINE 1-L



MEASUREMENT RESULT: "agc_fin"

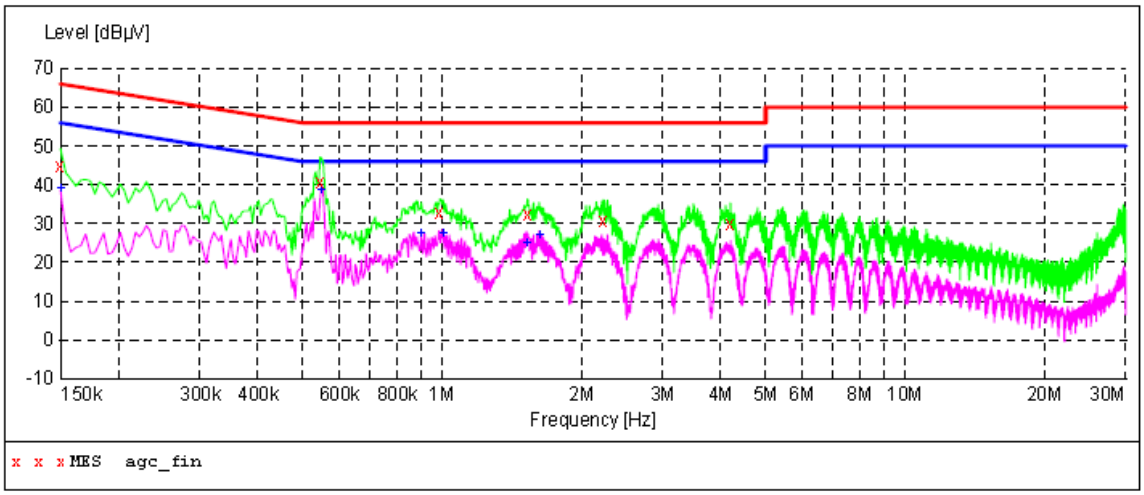
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.554000	47.20	5.4	56	8.8	QP	L1
0.986000	37.60	5.4	56	18.4	QP	L1
1.090000	35.20	5.6	56	20.8	QP	L1
2.130000	34.60	6.5	56	21.4	QP	L1
2.858000	35.80	6.5	56	20.2	QP	L1
4.126000	34.60	6.5	56	21.4	QP	L1

MEASUREMENT RESULT: "agc_fin2"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000	39.40	6.9	56	16.6	AV	L1
0.430000	26.50	5.6	47	20.8	AV	L1
0.506000	25.70	5.4	46	20.3	AV	L1
0.530000	32.00	5.4	46	14.0	AV	L1
0.554000	38.70	5.4	46	7.3	AV	L1
0.994000	25.40	5.4	46	20.6	AV	L1

RESULT: PASS

Line Conducted Emission Test Line 2-N



MEASUREMENT RESULT: "agc_fin"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000	44.70	6.9	66	21.3	QP	N
0.546000	40.50	5.4	56	15.5	QP	N
0.990000	32.90	5.4	56	23.1	QP	N
1.530000	32.40	6.1	56	23.6	QP	N
2.230000	30.70	6.5	56	25.3	QP	N
4.194000	29.70	6.5	56	26.3	QP	N

MEASUREMENT RESULT: "agc_fin2"

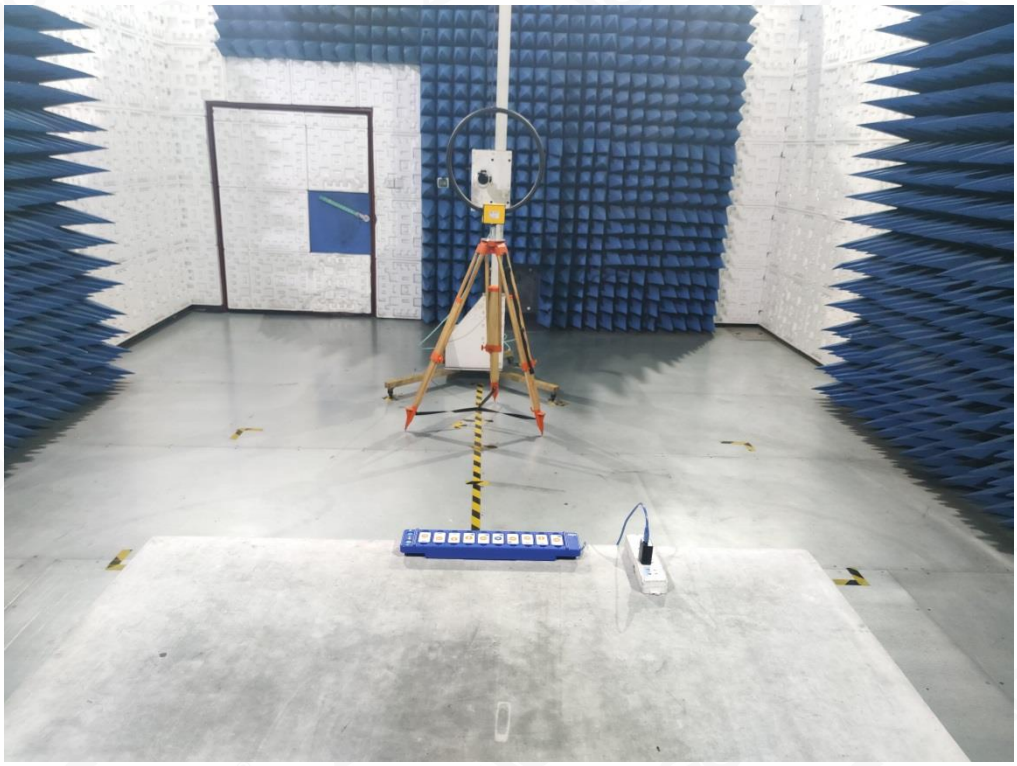
Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000	39.00	6.9	56	17.0	AV	N
0.550000	38.40	5.4	46	7.6	AV	N
0.902000	27.60	5.4	46	18.4	AV	N
1.006000	27.30	5.4	46	18.7	AV	N
1.522000	24.80	6.1	46	21.2	AV	N
1.622000	27.20	6.2	46	18.8	AV	N

RESULT: PASS

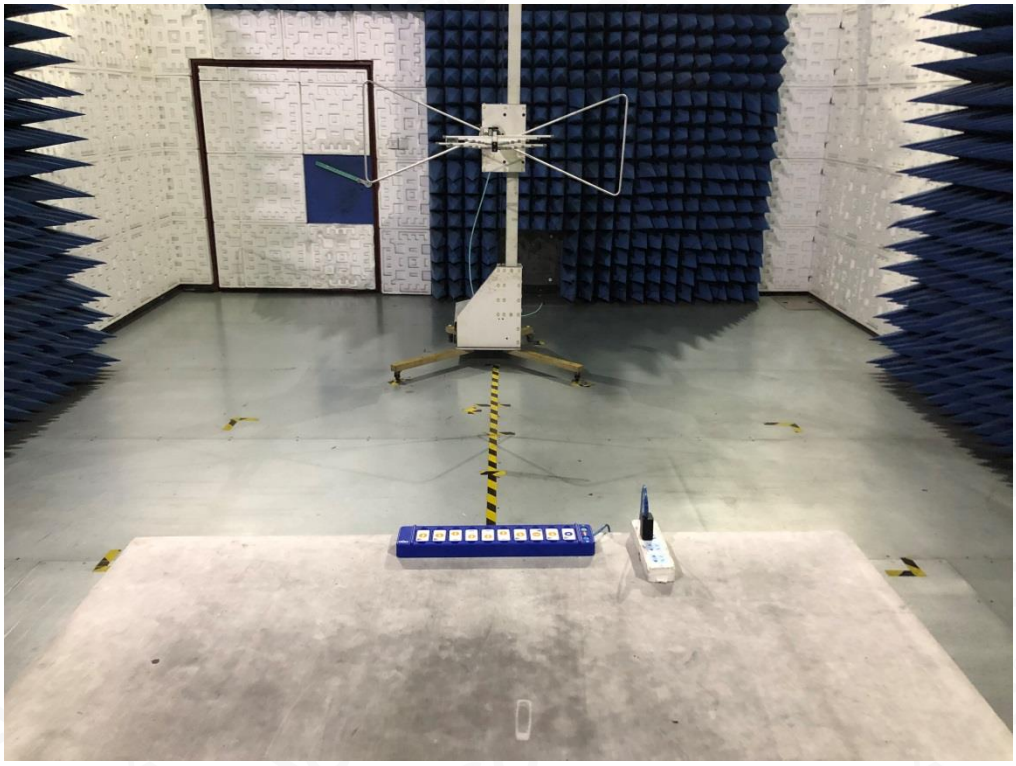
APPENDIX A: PHOTOGRAPHS OF TEST SETUP

LINE CONDUCTED EMISSION TEST SETUP

RADIATED EMISSION TEST SETUP BELOW 30MHz



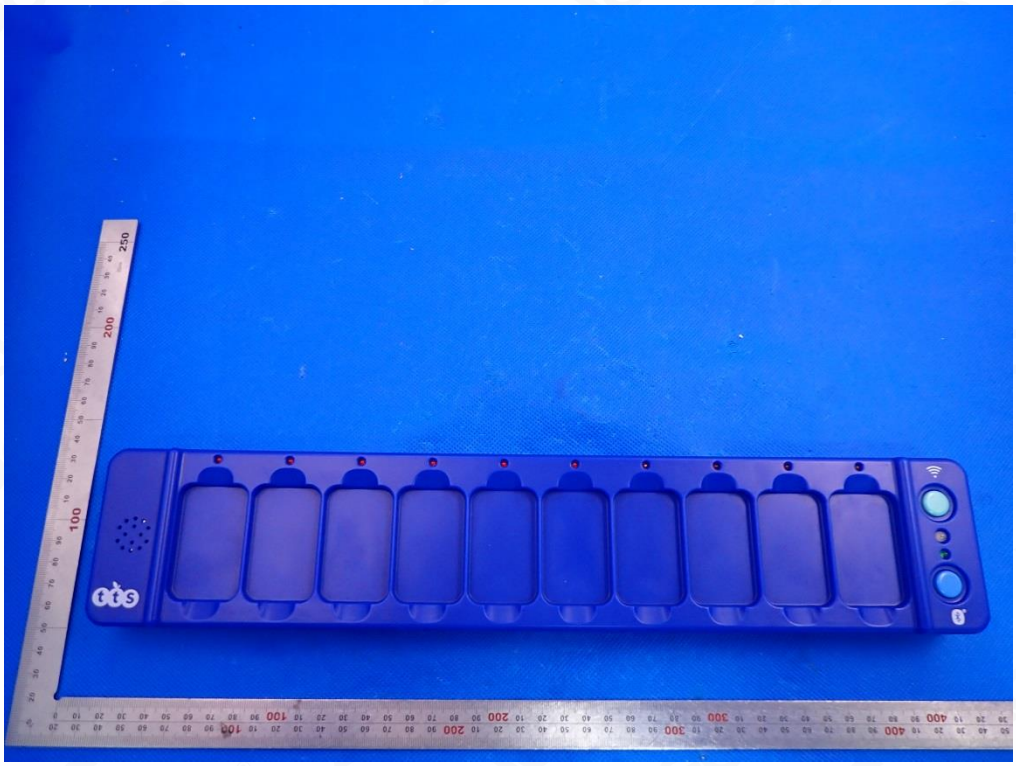
RADIATED EMISSION TEST SETUP BELOW 1GHZ



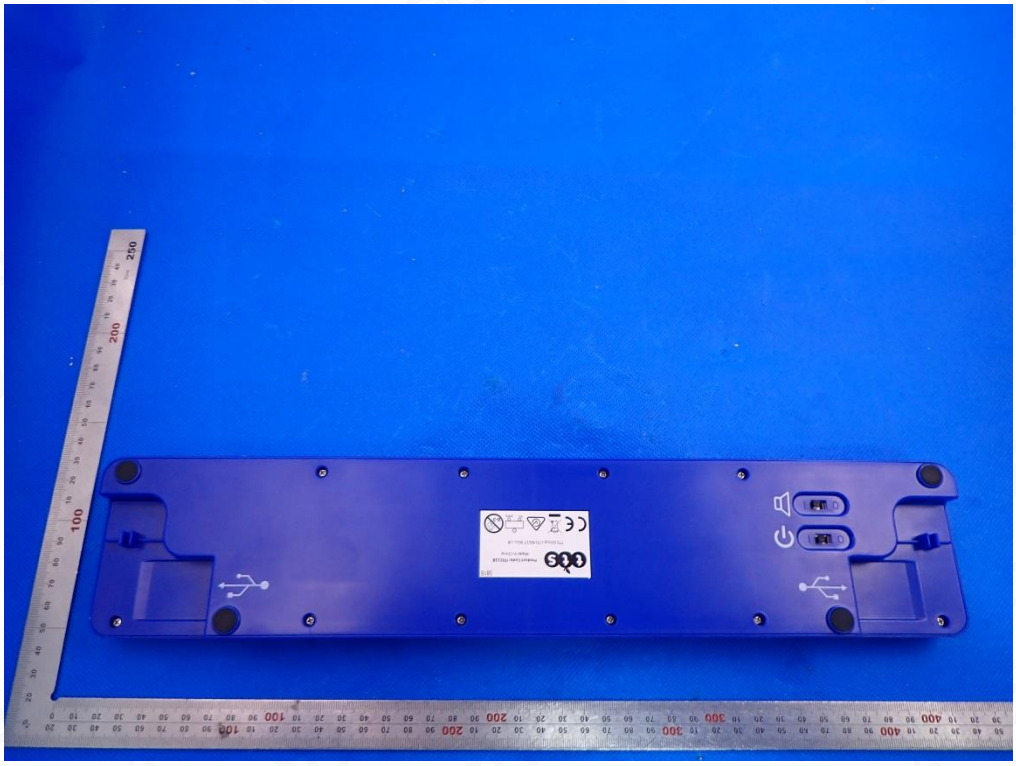
APPENDIX B: PHOTOGRAPHS OF EUT

WHOLE VIEW OF EUT

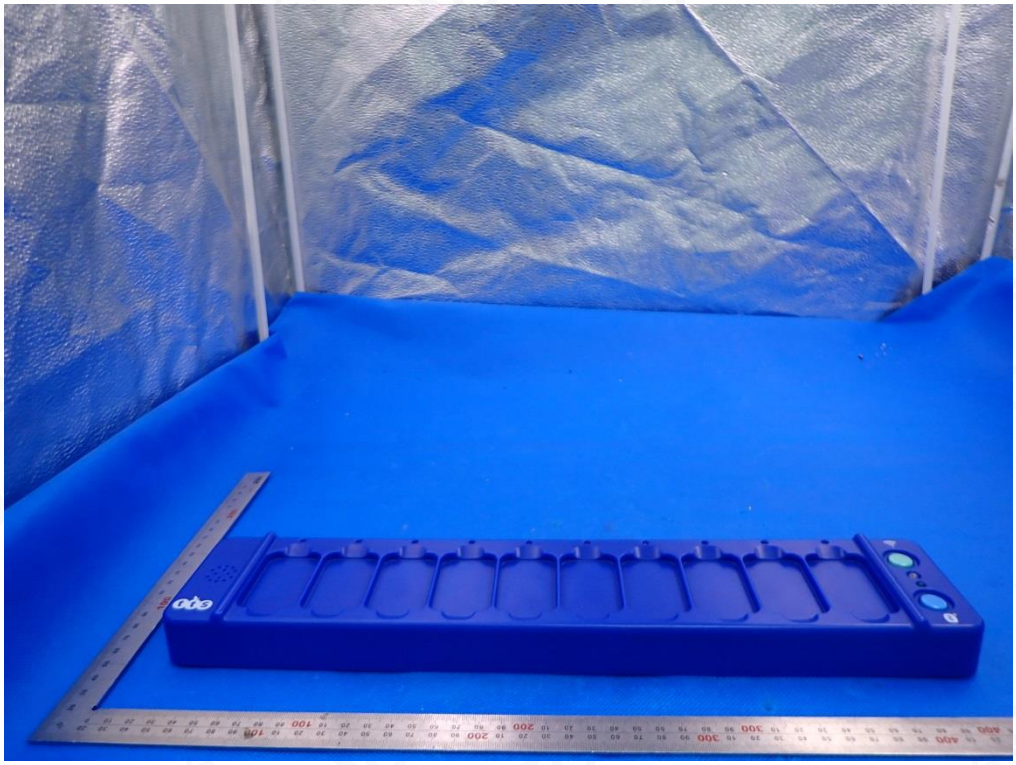
TOP VIEW OF EUT



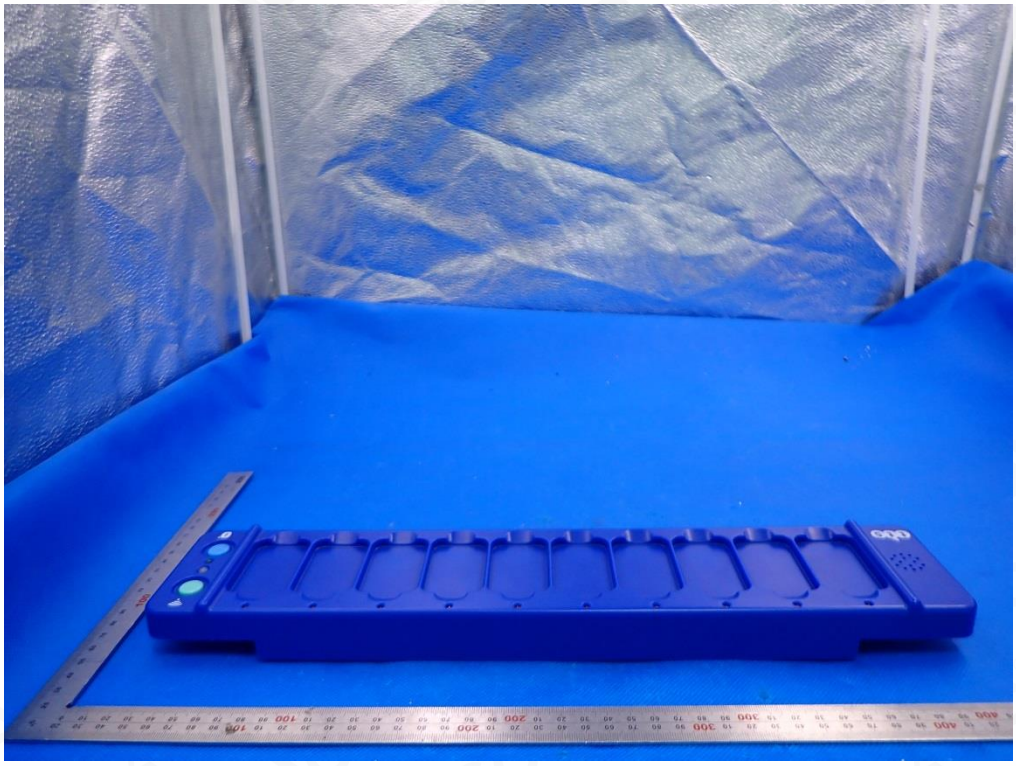
BOTTOM VIEW OF EUT



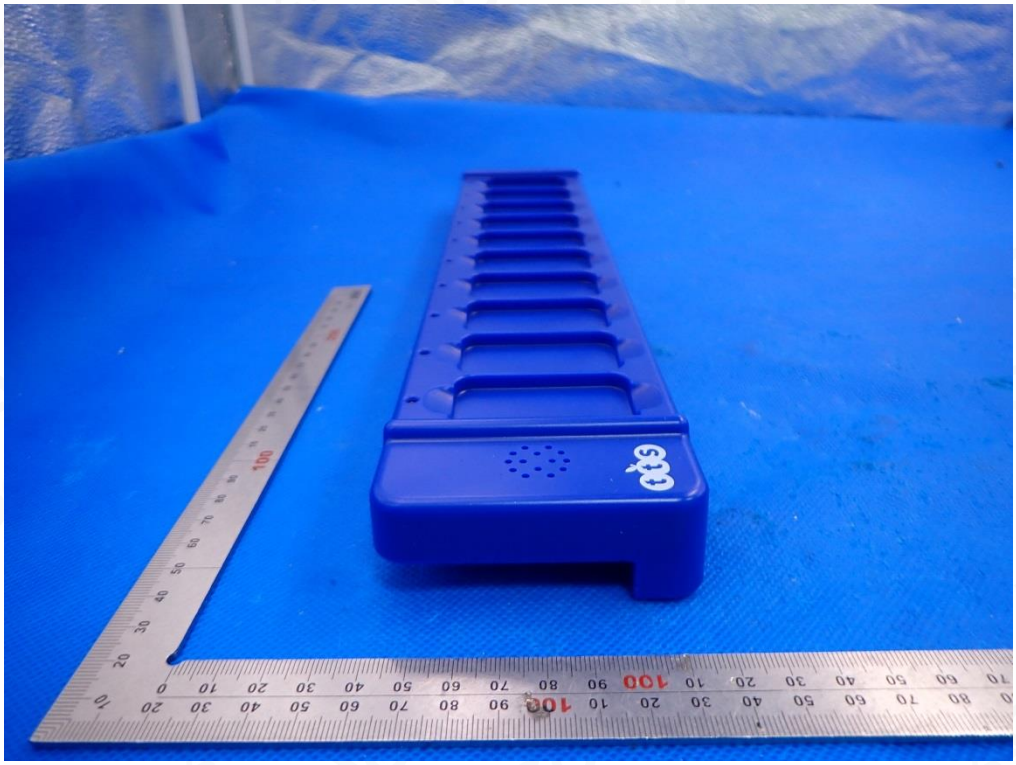
FRONT VIEW OF EUT



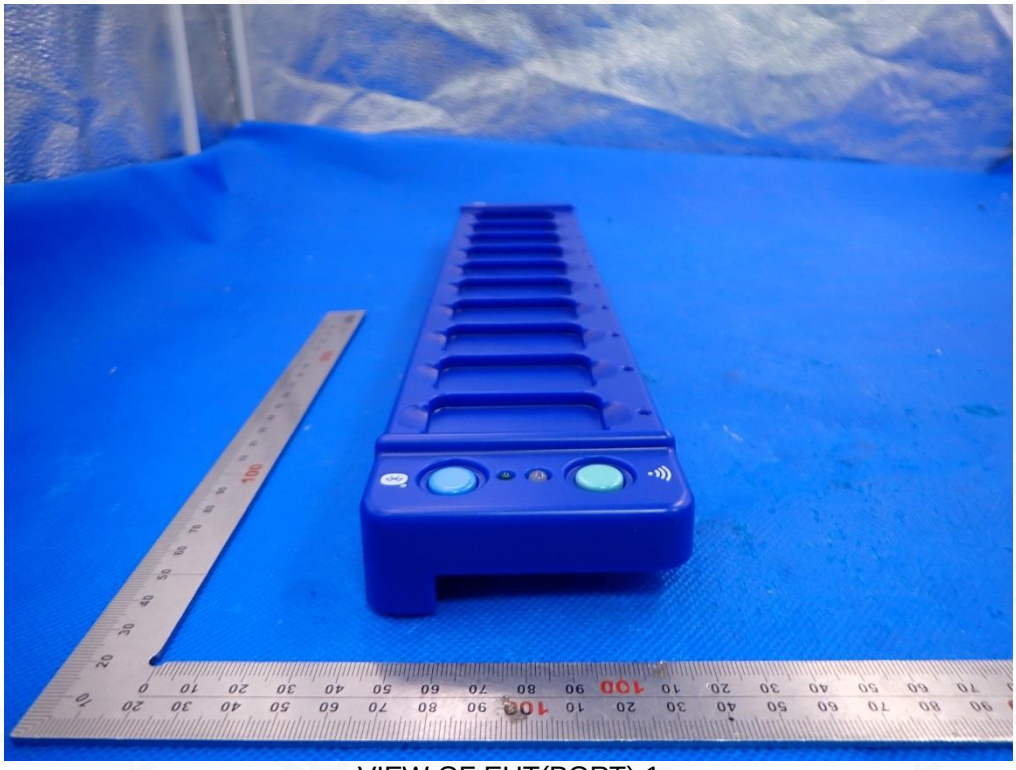
BACK VIEW OF EUT



LEFT VIEW OF EUT



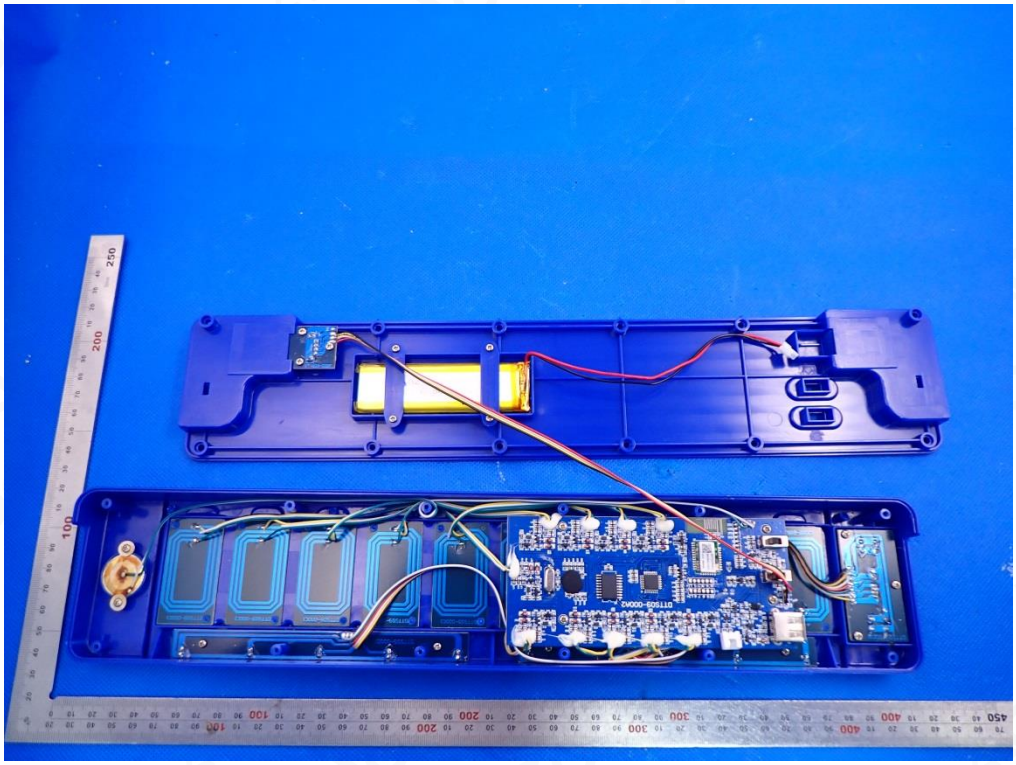
RIGHT VIEW OF EUT



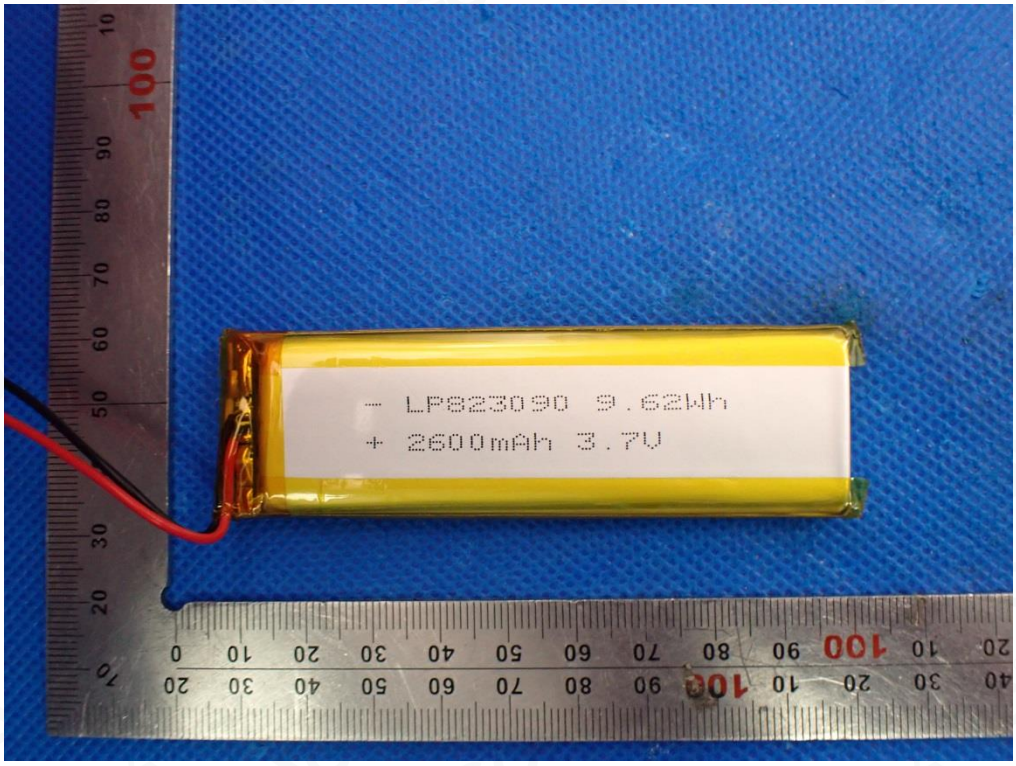
VIEW OF EUT(PORT)-1

VIEW OF EUT(PORT)-2

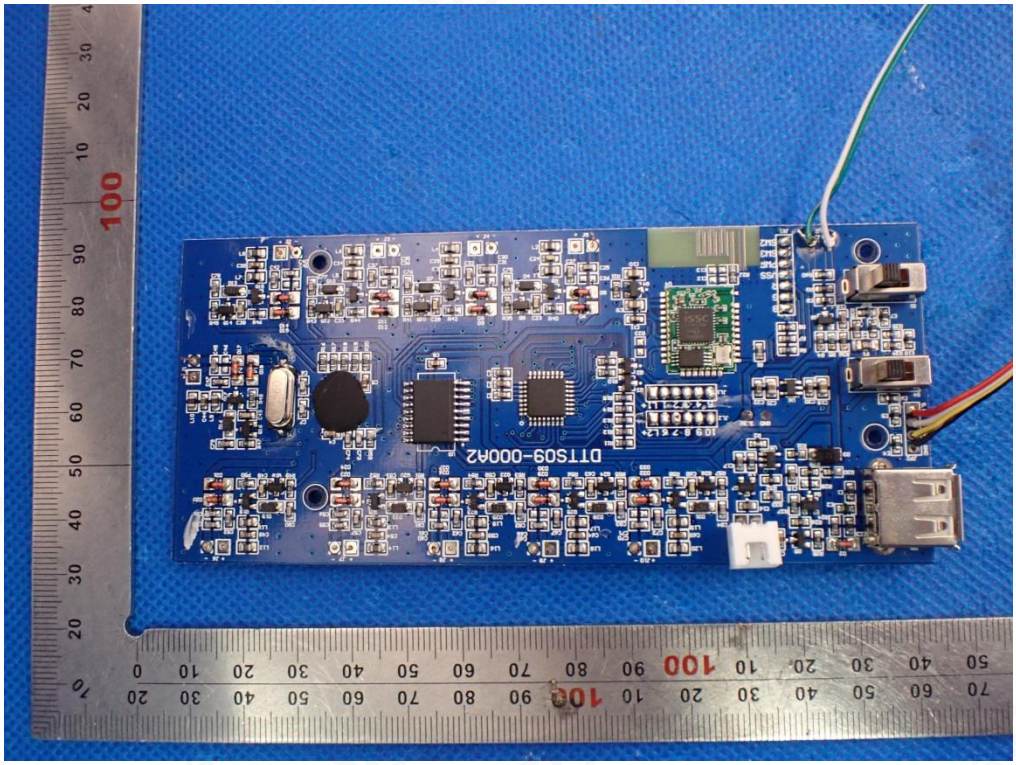
OPEN VIEW OF EUT



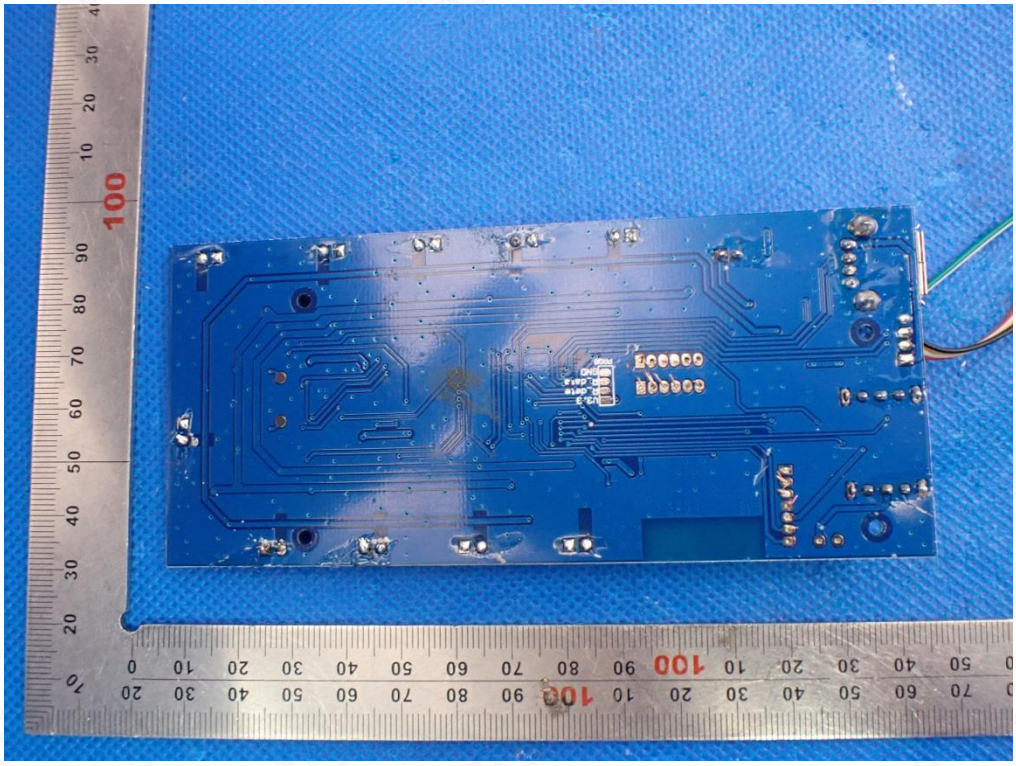
VIEW OF BATTERY



INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3