FCC Test Report

Report No.: AGC00737180709FE03

FCC ID	:	2ABV4-PWC13
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Wireless Charger
BRAND NAME	:	POLAROID
MODEL NAME	:	PWC13
CLIENT	:	Southern Telecom Inc.
DATE OF ISSUE	:	Jul. 17, 2018
STANDARD(S) **TEST PROCEDURE(S)**	:	FCC Part 15 Rules
REPORT VERSION	:	V1.0

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

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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jul. 17, 2018	Valid	Initial Release

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1. VERIFICATION OF CONFORMITY

Applicant	Southern Telecom Inc.
Address	5601 1st Ave, 2nd FloorBrooklyn, NY 11220
Manufacturer	Shenzhen Yanhuizhongchuang Technology Co., Ltd.
Address	3 Floor, Building A , TianRun Smart Innovation Science Park, Jiuwei Community, XiXiang Street ,BaoAn District , Shenzhen, Guangdong , China
Product Designation	Wireless Charger
Brand Name	POLAROID
Test Model	PWC13
Date of test	Jul. 10, 2018 to Jul. 17, 2018
Deviation	None
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BR/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 Section 15.207, 15.209, 15.203 of the FCC Part 15, Subpart C Rules.

The results of testing in this report apply to the product/system which was tested only.

Tested By

Max Zhang(Zhang Yi) Jul. 17, 2018

Reviewed By

Bart Xie(Xie Xiaobin) Jul. 17, 2018

Approved By

Forrest Lei(Lei Yonggang)
Authorized Officer Jul. 17, 2018

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	119.5KHz
Maximum field strength	51.73dBuV/m(Peak)@3m
Number of channels	1
Antenna Designation	Integrated Antenna (Met 15.203 Antenna requirement)
Hardware Version	21286A-Y779-180614
Software Version	V1.0
Power Supply	DC5V

3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI.

- 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

4. DESCRIPTION OF TEST MODES

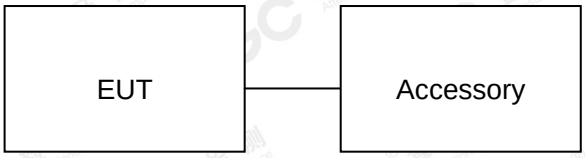
NO.	TEST MODE DESCRIPTION
1	Wireless charging Mode(Full load)
2	Wireless charging Mode(half load)
3	Wireless charging Mode(Null load)

Note:
1. The mode 1 was the worst case and only the data of the worst case record in this report.

5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure :



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Wireless Charger	PWC13	2ABV4-PWC13	EUT
2	Wireless electronic Load	--	Maximum power 10W	Support
3	Adapter	RP-PC007	DC3.6V-6.5V/3A DC6.5V-9V/2A DC9V-12V/2A	Support

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.209	Radiated Emission	Compliant
§15.215	20dB bandwidth	Compliant
§15.207	Conducted Emission	Compliant

6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2F., Bldg.2, No.1-4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District B112-B113, Bldg.12, Baoan Bldg Materials Center, No.1 of Xixiang Inner Ring Road, Baoan District, Shenzhen 518012
NVLAP LAB CODE	600153-0
Designation Number	CN5028
FCC Test Firm Registration Number	682566
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by National Voluntary Laboratory Accreditation program, NVLAP Code 600153-0

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun.12, 2018	Jun.11, 2019
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec.08, 2017	Dec.07, 2018
preamplifier	ChengYi	EMC184045SE	980508	Sep.15, 2017	Sep.14, 2018
Loop Antenna	A.H.Systems,Inc	SAS-562B	--	Feb. 27, 2018	Feb. 26, 2020
Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-205	Jun.12, 2018	Jun.11, 2019
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep.28, 2017	Sep.27, 2018

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Jun.12, 2018	Jun.11, 2019
LISN	R&S	ESH2-Z5	100086	Aug.21, 2017	Aug.20, 2018

7. RADIATED EMISSION

7.1TEST LIMIT

Standard FCC 15.209

Frequency (MHz)	Distance Meters	Field Strengths Limit	
		μ V/m	dB(μV)/m
0.009 ~ 0.490	300	2400/F(kHz)	---
0.490 ~ 1.705	30	24000/F(kHz)	---
1.705 ~ 30	30	30	---
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other:74.0 dB(μV)/m (Peak) 54.0 dB(μV)/m (Average)	

Remark： (1) Emission level dBμ V = 20 log Emission level μ V/m

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

7.2. MEASUREMENT PROCEDURE

1. The EUT was placed on the top of the turntable 0.8 or 1.5 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. 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.

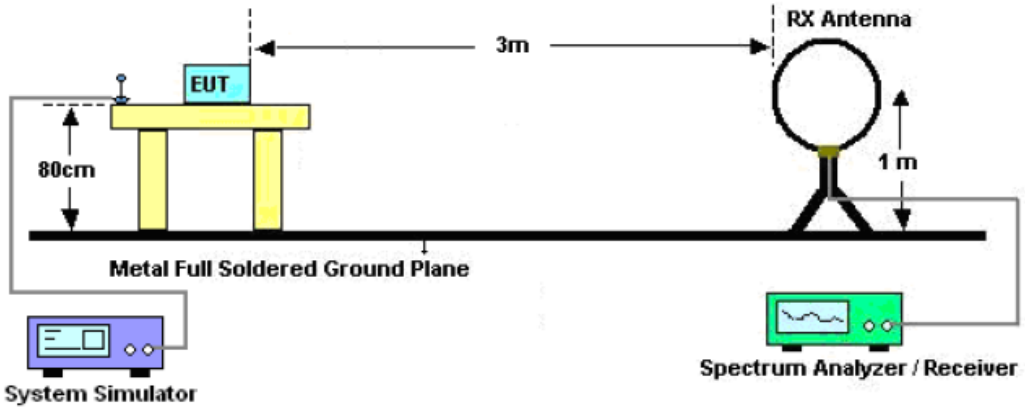
The following table is the setting of spectrum analyzer and receiver.

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

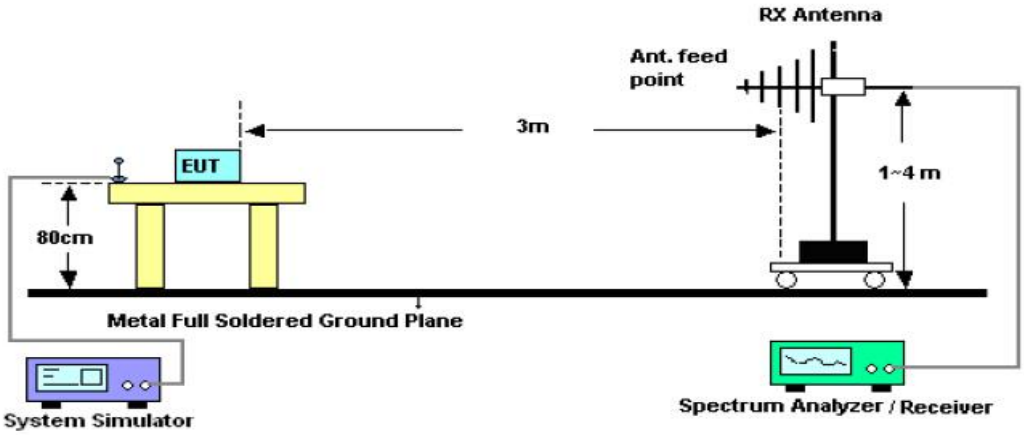
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

7.3. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



7.4. TEST RESULT

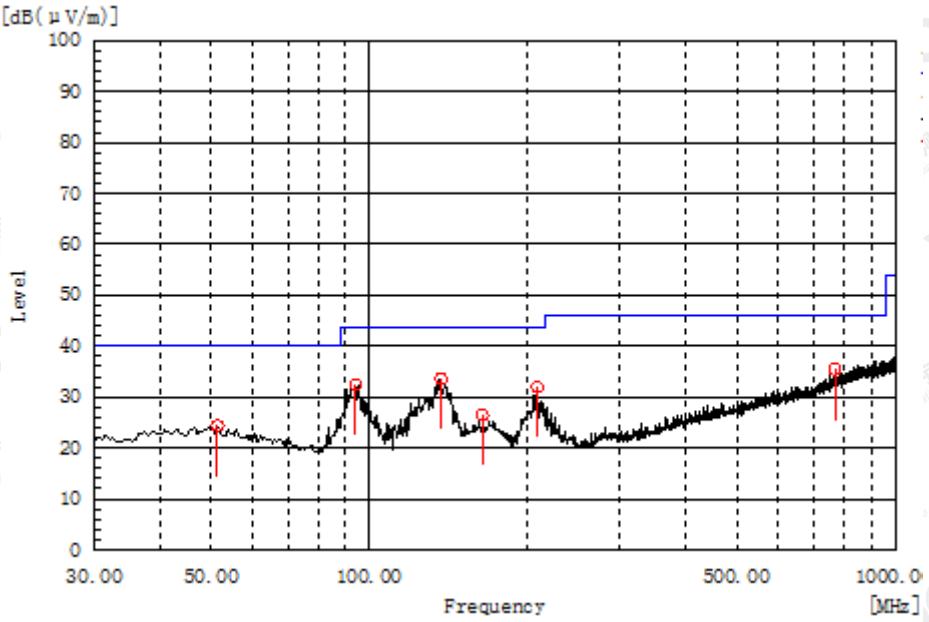
RADIATED EMISSION BELOW 30MHZ

Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) Peak	Limit dB(uV/m) Average	Margin dB	Pass/Fail
0.1195	Face	41.33	10.4	51.73	106.06	54.33	Pass
0.1195	Side	36.17	10.4	46.57	106.06	59.49	Pass

Note: No other emissions found between lowest internal used/generated frequencies to 30MHz. The peak level of the emission is less than the average limit, so the average level shall be less than the limit without test.

RADIATED EMISSION 30MHz- 1GHZ

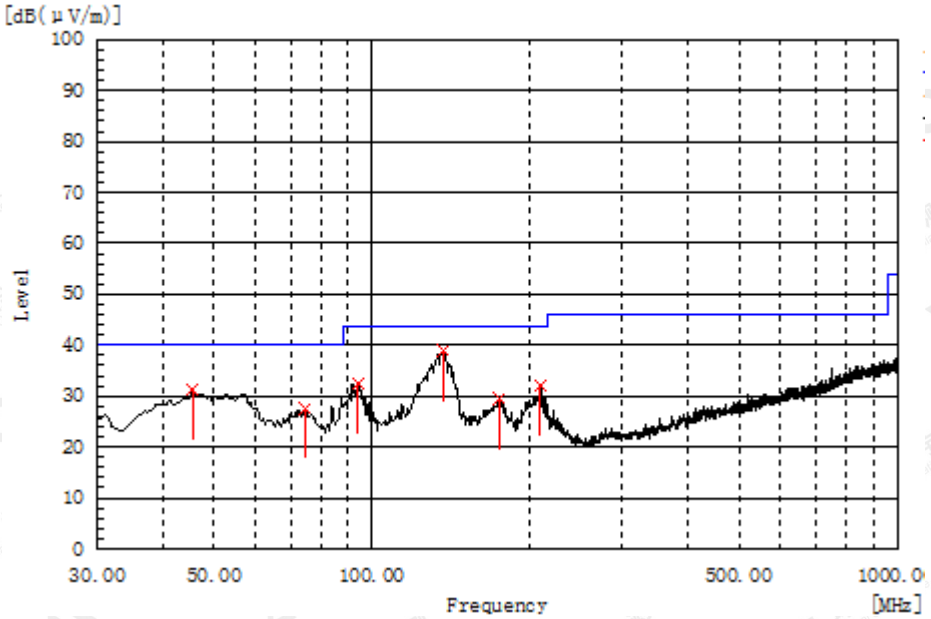
EUT：	Wireless Charger	Model Name. ：	PWC13
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	Normal
Test Mode ：	Mode 1	Polarization :	Horizontal



Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) QP	Margin dB	Pass/Fail	Height cm	Angle deg
51.340	H	7.4	17.0	24.4	40.0	15.6	Pass	200.0	71.5
94.020	H	19.8	12.6	32.4	43.5	11.1	Pass	200.0	57.9
136.700	H	17.0	16.6	33.6	43.5	9.9	Pass	200.0	130.8
163.860	H	10.0	16.5	26.5	43.5	17.0	Pass	150.0	102.5
208.480	H	18.1	13.8	31.9	43.5	11.6	Pass	150.0	86.0
767.685	H	7.5	28.0	35.5	46.0	10.5	Pass	200.0	63.8

RESULT: PASS

EUT：	Wireless Charger	Model Name. ：	PWC13
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	Normal
Test Mode ：	Mode 1	Polarization :	Vertical



Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) QP	Margin dB	Pass/Fail	Height cm	Angle deg
45.520	V	13.9	17.3	31.2	40.0	8.8	Pass	100.0	294.4
74.620	V	14.6	13.1	27.7	40.0	12.3	Pass	100.0	166.5
94.020	V	19.9	12.6	32.5	43.5	11.0	Pass	150.0	191.3
136.215	V	22.3	16.6	38.9	43.5	4.6	Pass	100.0	175.3
174.530	V	14.2	15.3	29.5	43.5	14.0	Pass	100.0	265.5
208.965	V	18.3	13.8	32.1	43.5	11.4	Pass	100.0	38.7

RESULT: PASS

Note:

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

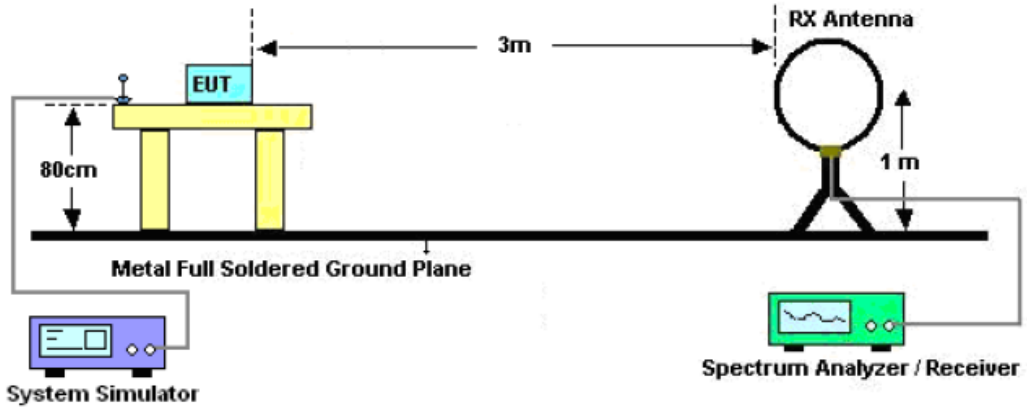
The “Factor” value can be calculated automatically by software of measurement system.

8. 20DB BANDWIDTH

8.1. 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, Set the EUT Work on operation frequency.
3. Set Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a channel
   The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
4. Set SPA Trace 1 Max hold, then View.

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

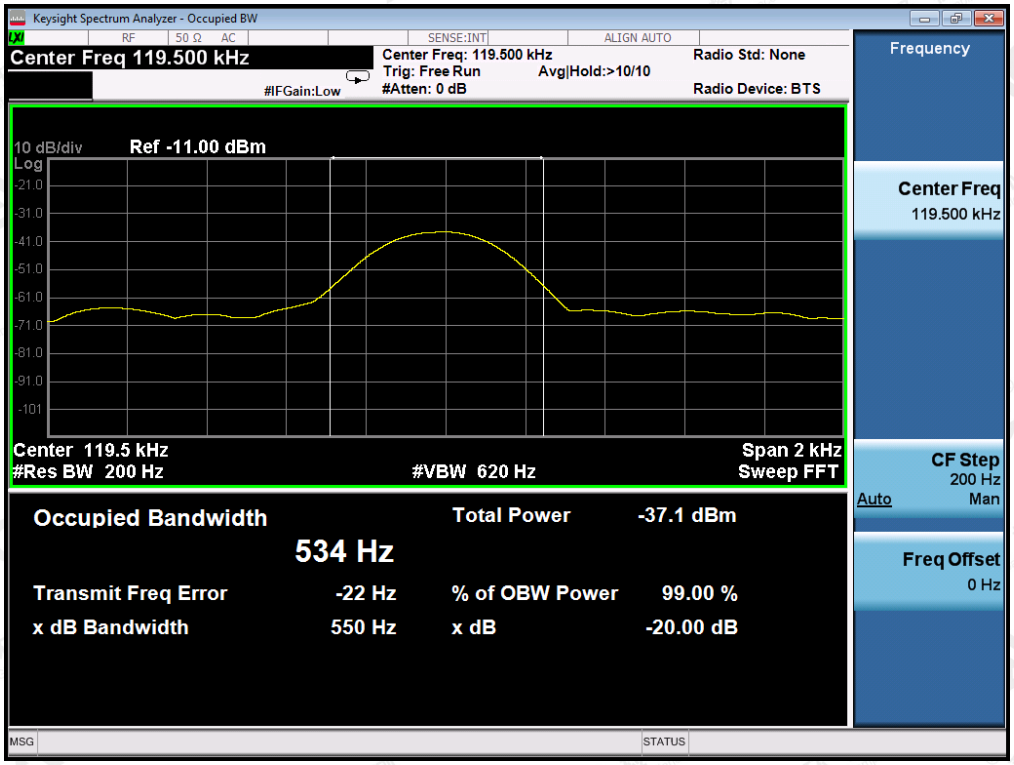


8.3. MEASUREMENT RESULTS

TEST ITEM	20DB BANDWIDTH
TEST MODULATION	FSK

Frequency (KHz)	Test Data (Hz)	Criteria
119.5	550	PASS

TEST PLOT OF BANDWIDTH



9. FCC LINE CONDUCTED EMISSION TEST

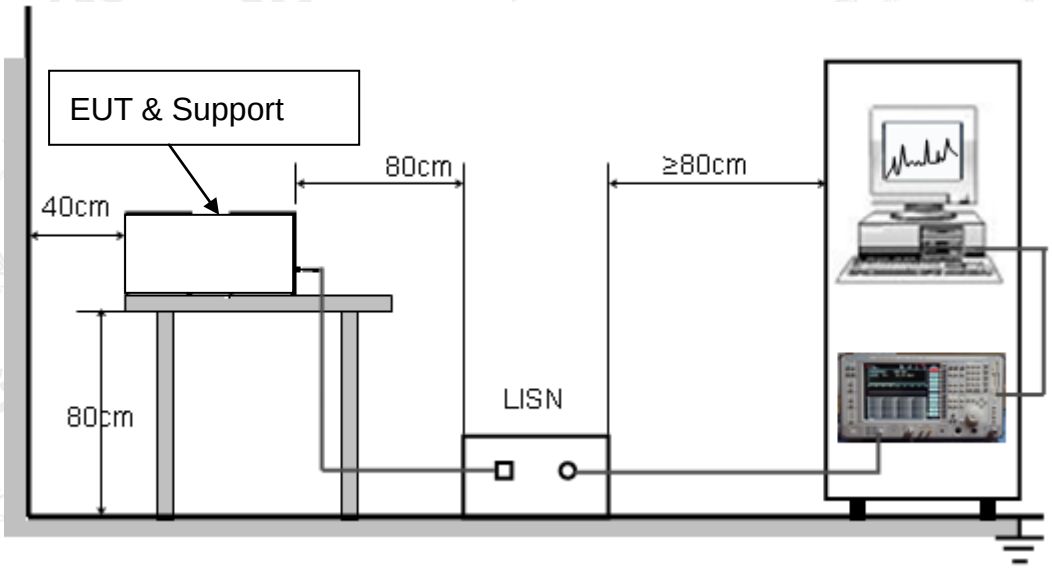
9.1. LIMITS OF LINE CONDUCTED EMISSION TEST

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 0.50MHz.

9.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



9.3. 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.

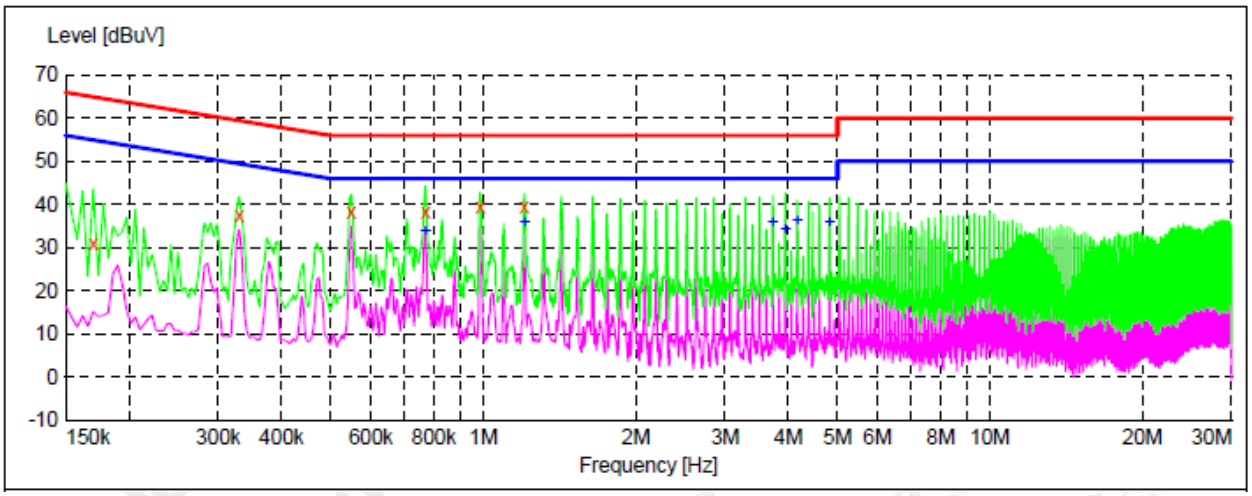
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

9.4. 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.

9.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST-L



MEASUREMENT RESULT:

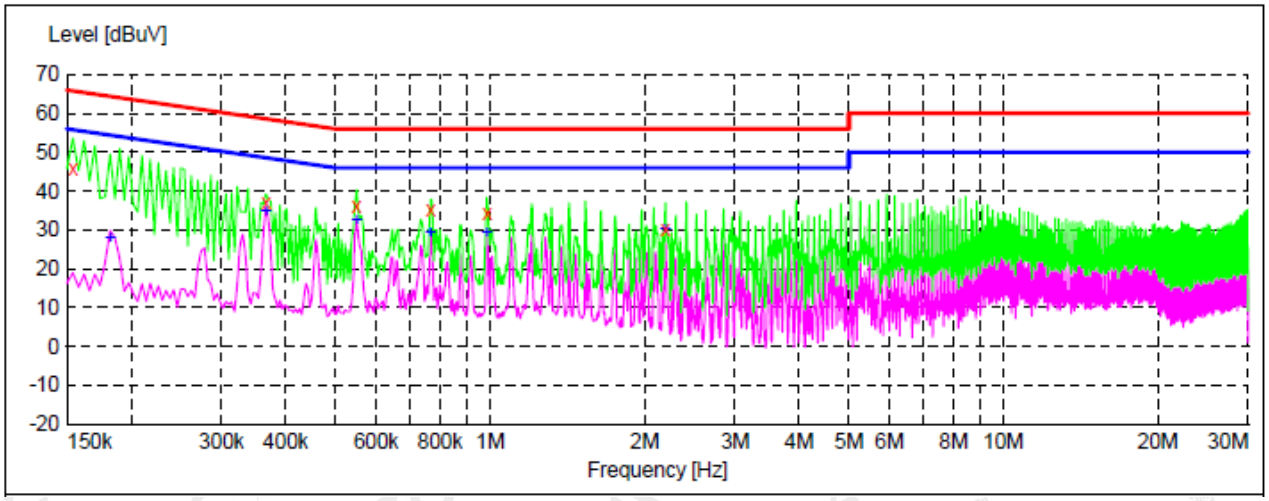
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.170000	31.00	10.0	65	34.0	QP	L1	FLO
0.330000	37.60	10.1	60	21.9	QP	L1	FLO
0.550000	38.30	9.9	56	17.7	QP	L1	FLO
0.770000	38.20	10.0	56	17.8	QP	L1	FLO
0.986000	39.60	10.2	56	16.4	QP	L1	FLO
1.206000	39.60	10.1	56	16.4	QP	L1	FLO

MEASUREMENT RESULT:

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.770000	33.90	10.0	46	12.1	AV	L1	FLO
1.206000	36.00	10.1	46	10.0	AV	L1	FLO
3.730000	35.90	10.1	46	10.1	AV	L1	FLO
3.950000	34.10	10.1	46	11.9	AV	L1	FLO
4.166000	36.30	10.2	46	9.7	AV	L1	FLO
4.826000	36.00	10.3	46	10.0	AV	L1	FLO

RESULT: PASS

LINE CONDUCTED EMISSION TEST-N



MEASUREMENT RESULT:

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.154000	46.00	10.0	66	19.8	QP	N	FLO
0.366000	37.10	10.0	59	21.5	QP	N	FLO
0.550000	36.10	9.9	56	19.9	QP	N	FLO
0.766000	35.00	10.0	56	21.0	QP	N	FLO
0.986000	34.30	10.2	56	21.7	QP	N	FLO
2.198000	30.20	9.9	56	25.8	QP	N	FLO

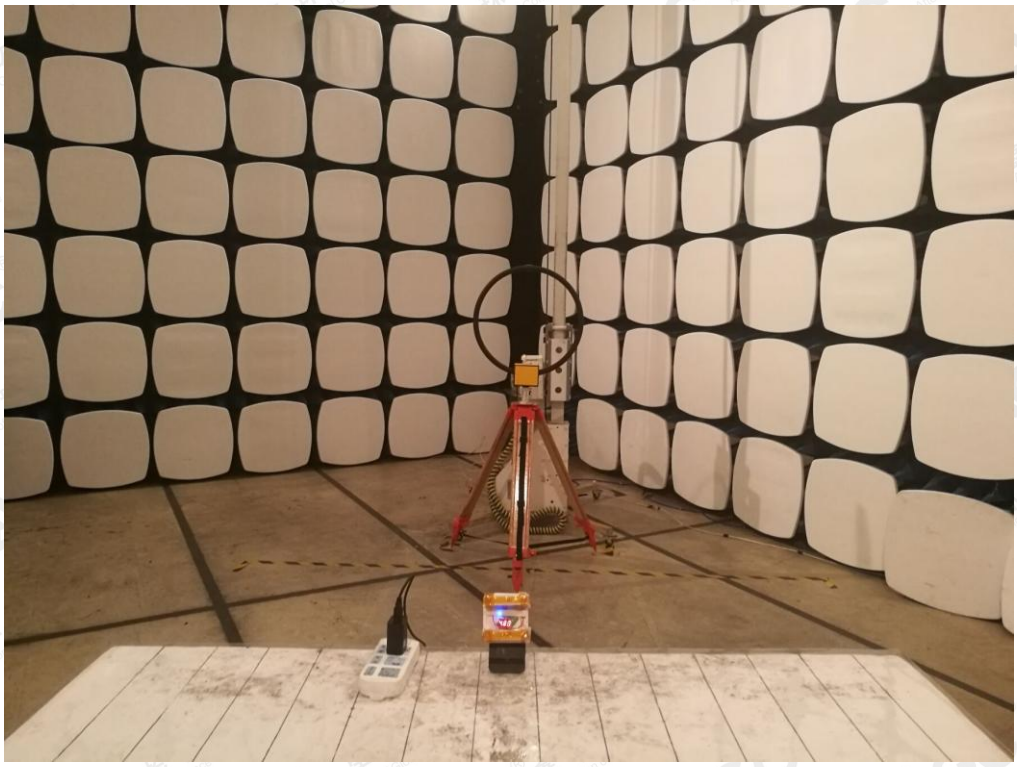
MEASUREMENT RESULT:

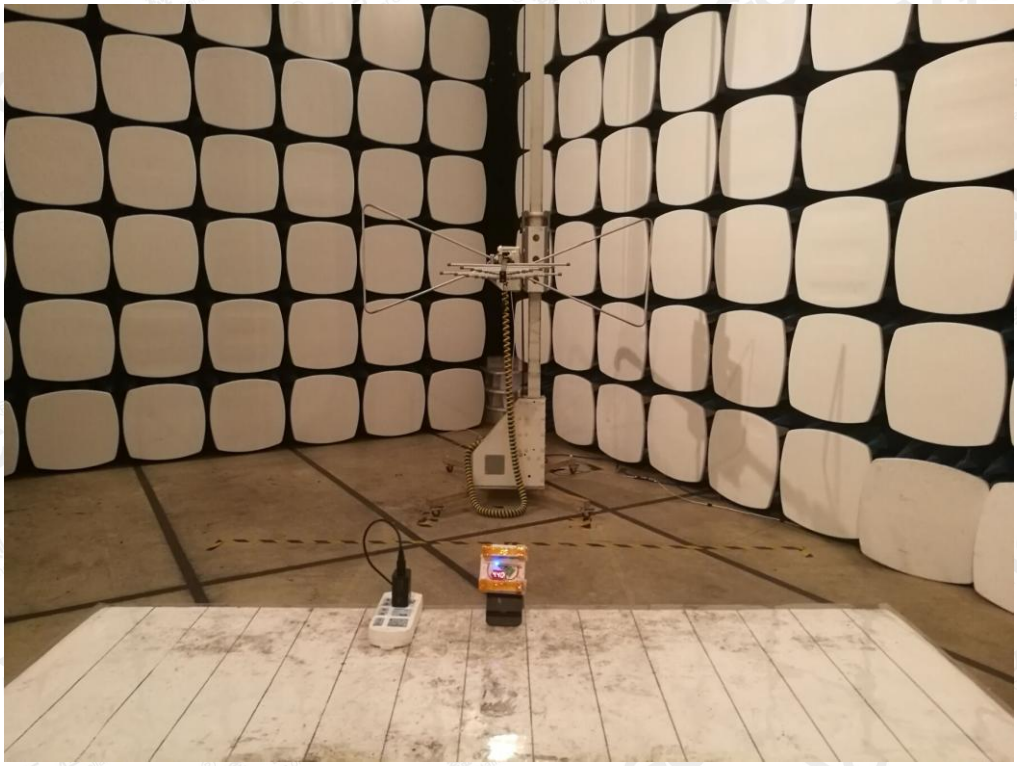
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.182000	27.80	10.0	54	26.6	AV	N	FLO
0.366000	34.70	10.0	49	13.9	AV	N	FLO
0.550000	32.40	9.9	46	13.6	AV	N	FLO
0.766000	29.10	10.0	46	16.9	AV	N	FLO
0.986000	29.40	10.2	46	16.6	AV	N	FLO
2.194000	30.10	9.9	46	15.9	AV	N	FLO

RESULT: PASS

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ

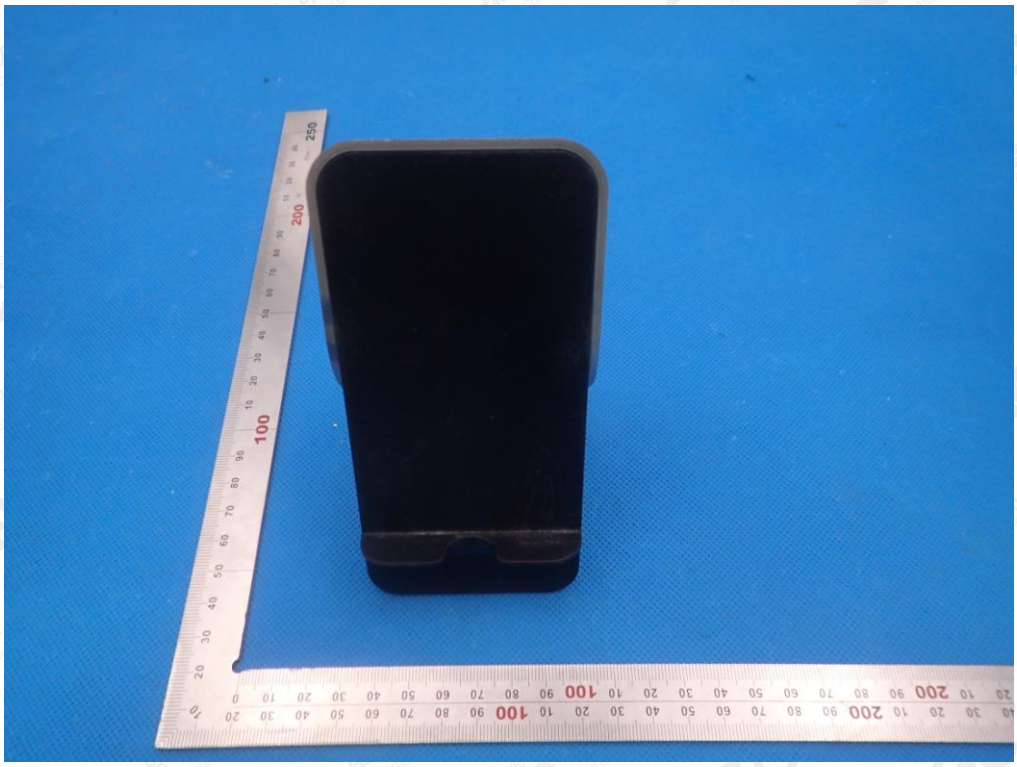




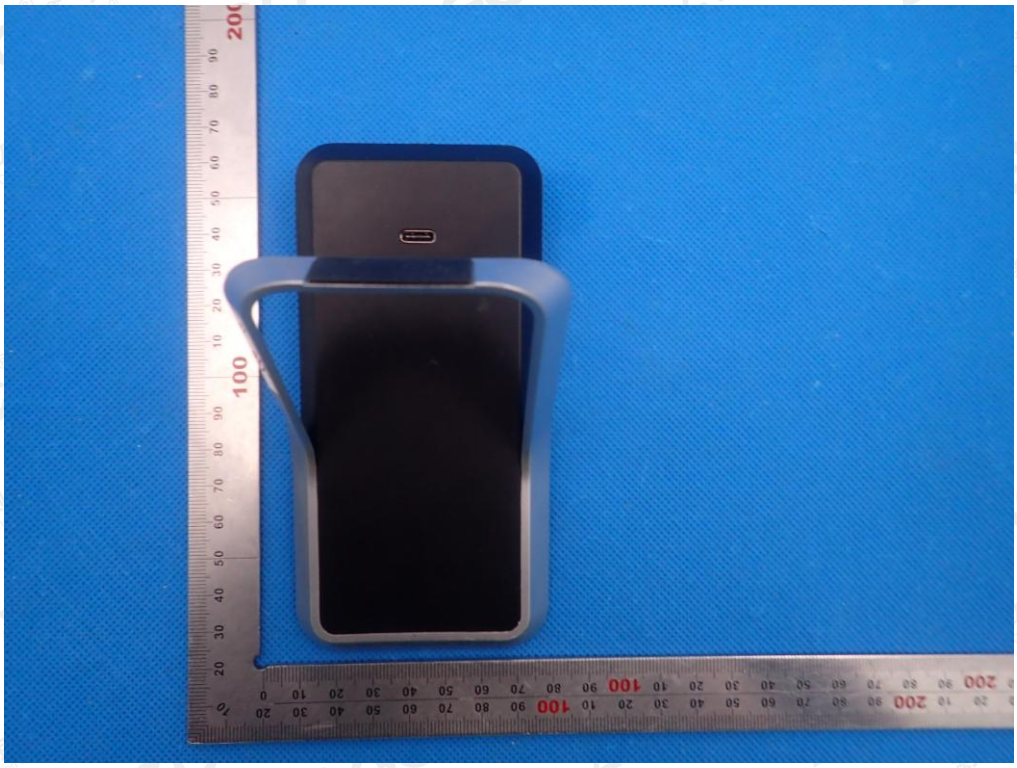
FCC LINE CONDUCTED EMISSION TEST SETUP

APPENDIX B: PHOTOGRAPHS OF EUT

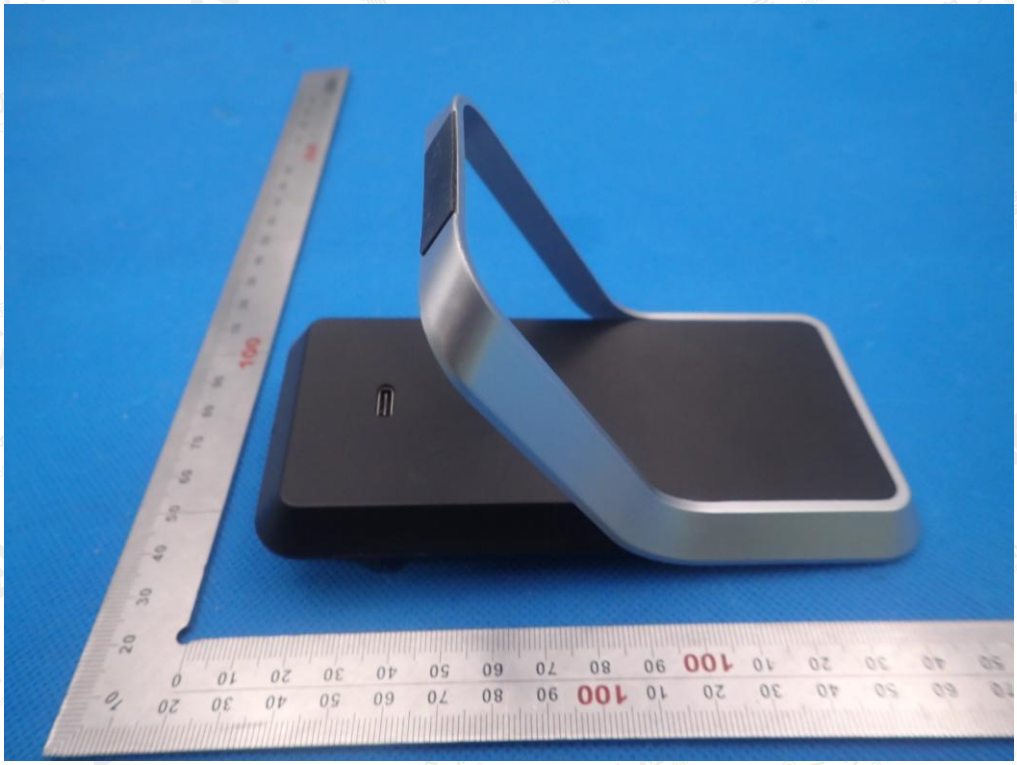
EXTERNAL VIEW OF EUT-1



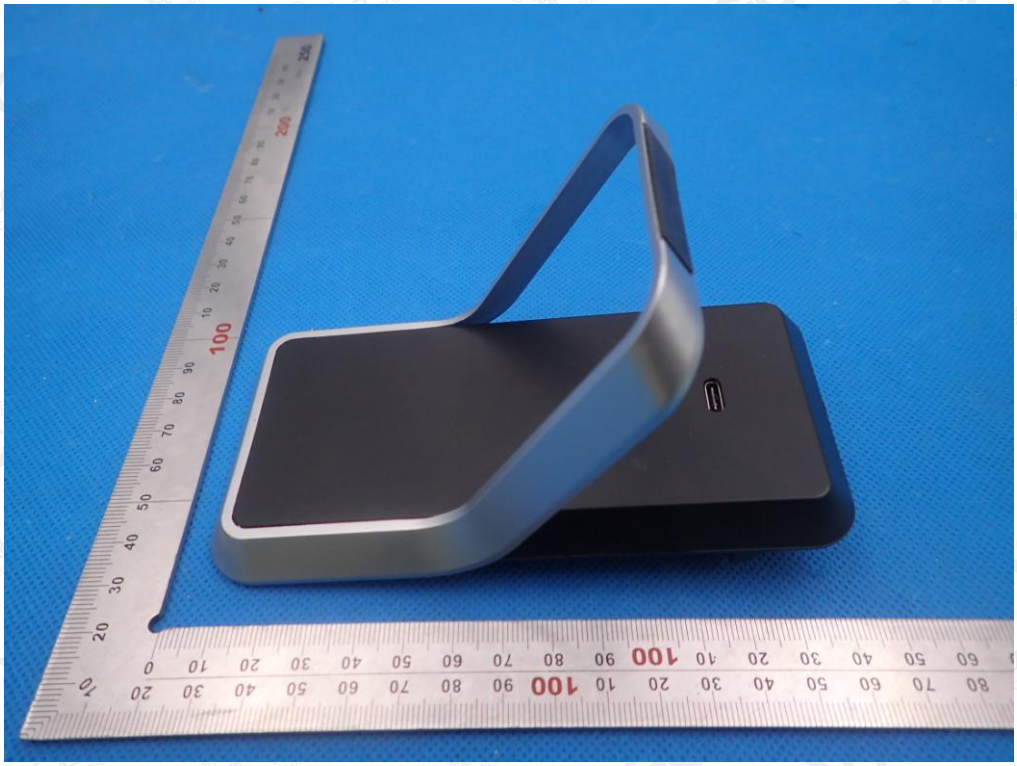
EXTERNAL VIEW OF EUT-2



EXTERNAL VIEW OF EUT-3

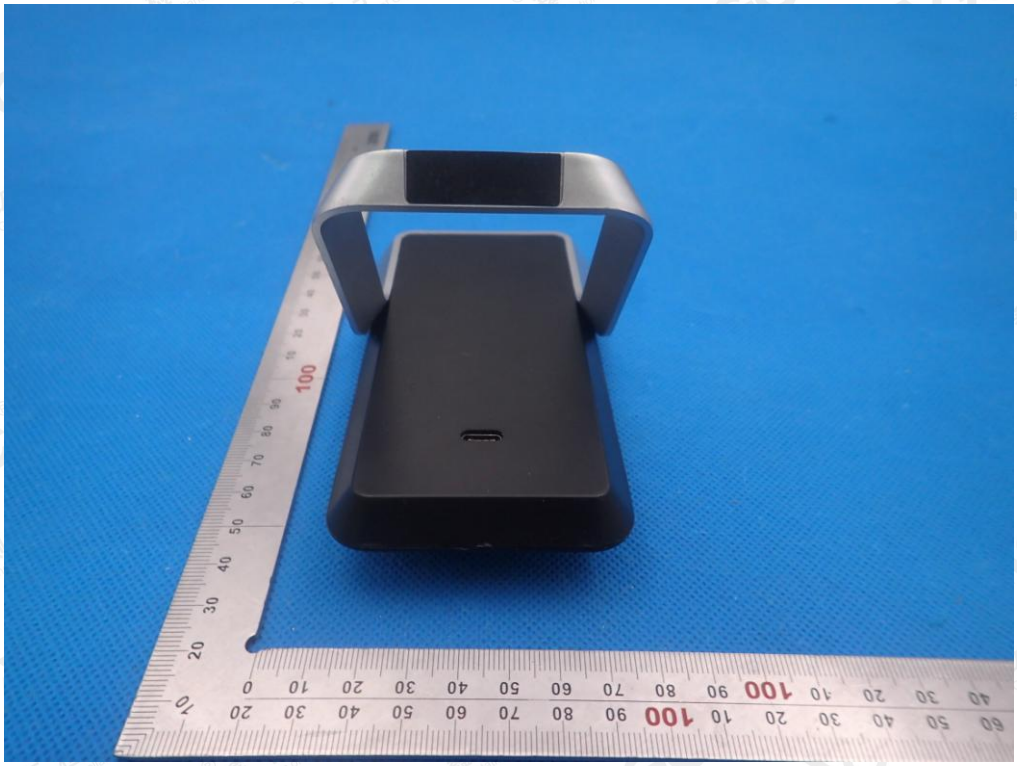


EXTERNAL VIEW OF EUT-4

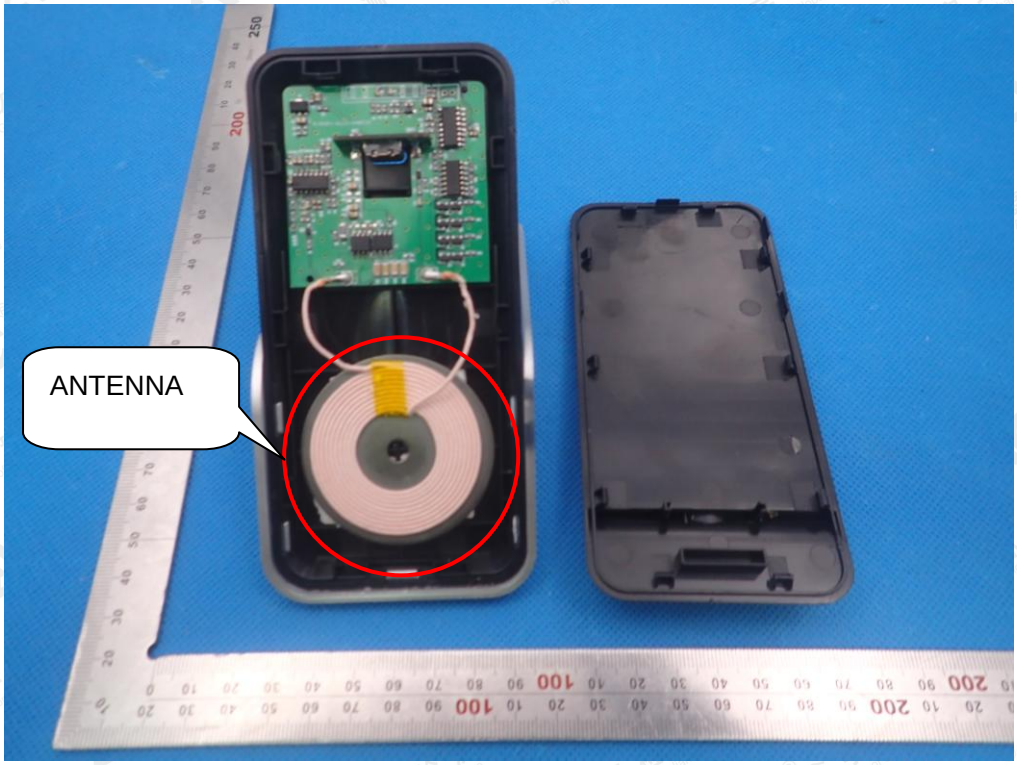


EXTERNAL VIEW OF EUT-5

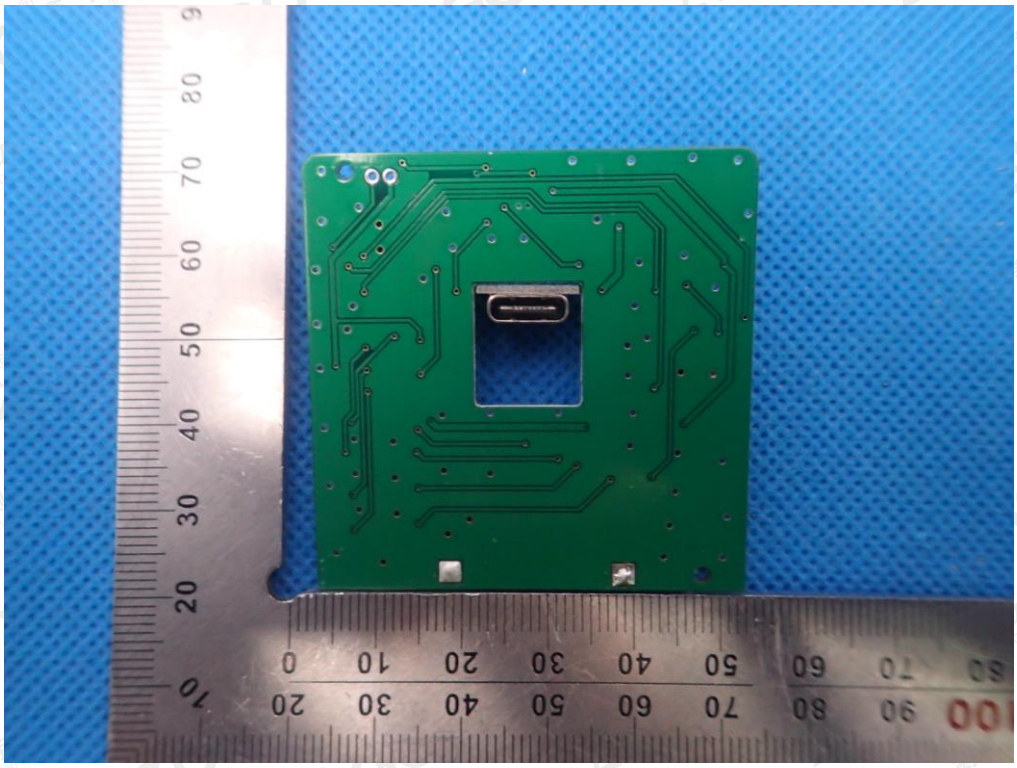
EXTERNAL VIEW OF EUT-6



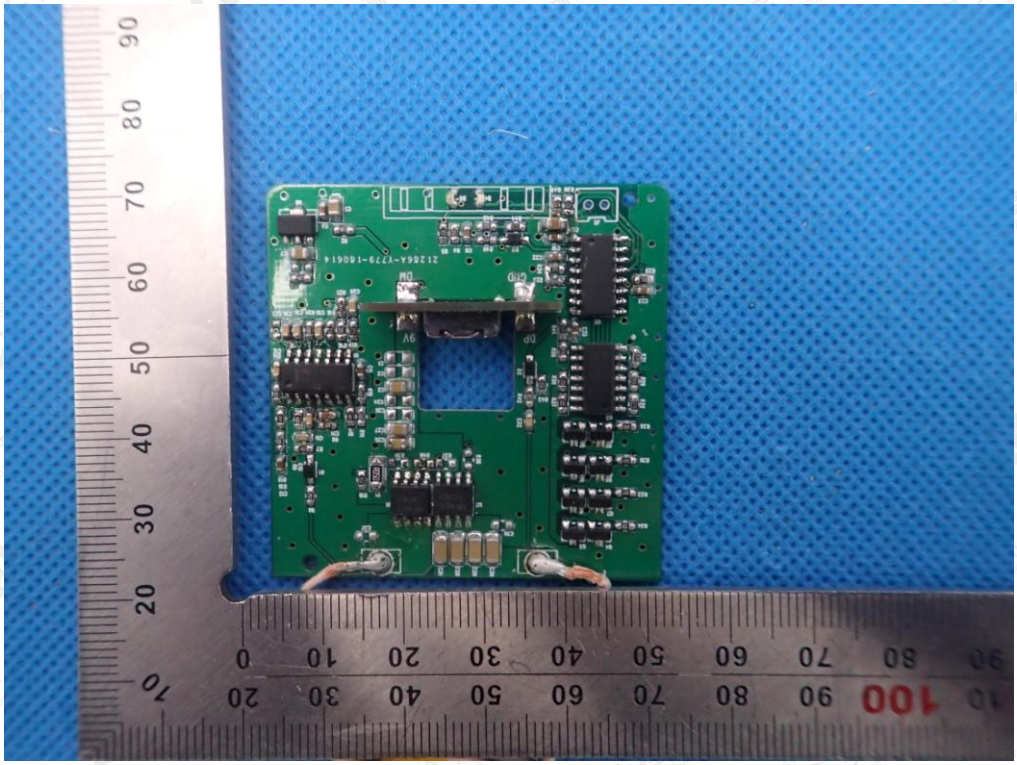
OPEN VIEW-1 OF EUT



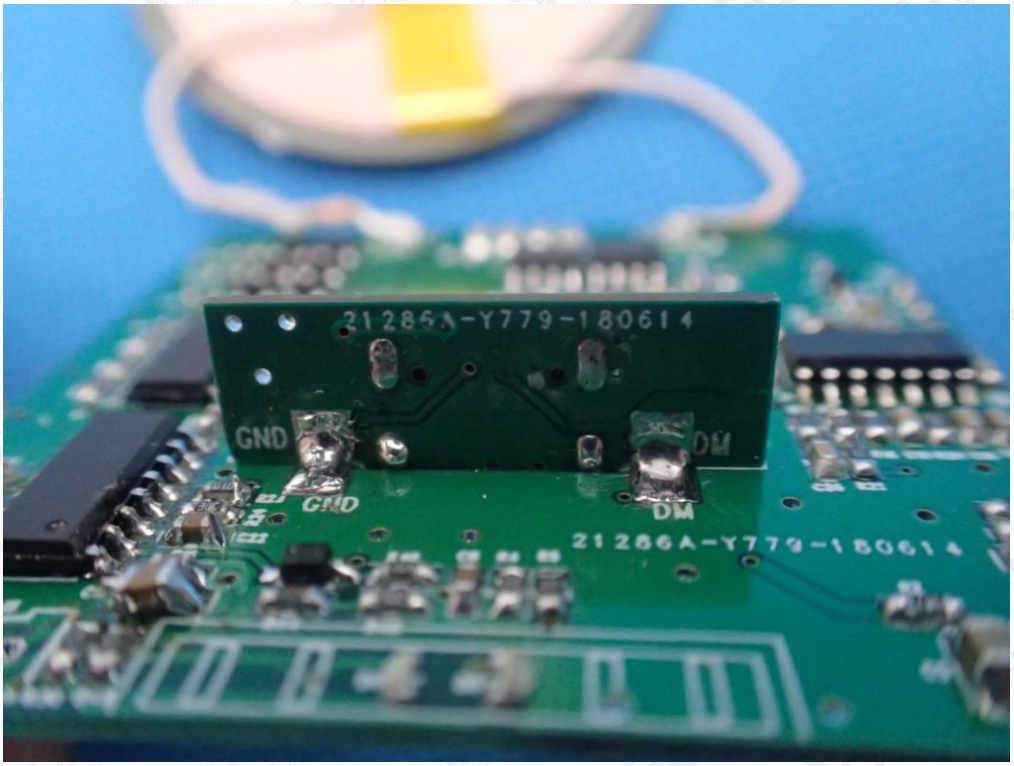
INTERNAL VIEW-1 OF EUT



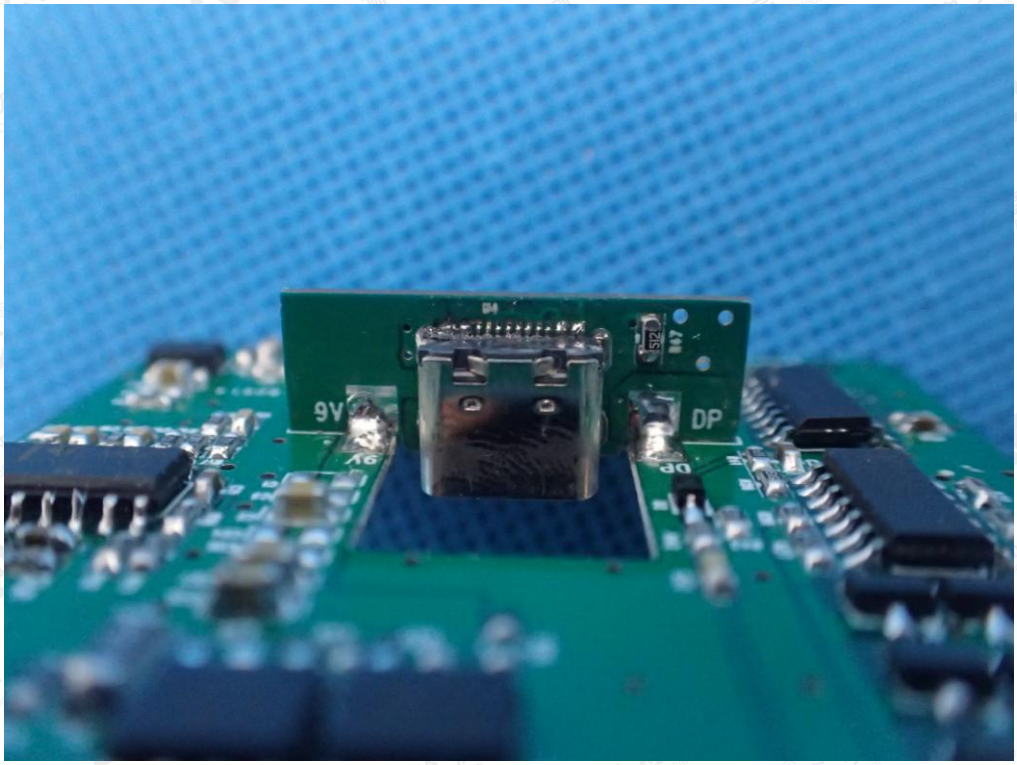
INTERNAL VIEW-2 OF EUT



INTERNAL VIEW-3 OF EUT



INTERNAL VIEW-4 OF EUT



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