FCC Test Report

Report No.: AGC01147190402FE03

FCC ID	:	2AHHEMN3IN1CHRG
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	3in1 Super Charger
BRAND NAME	:	N/A
MODEL NAME	:	MN-3IN1CHRG
CLIENT	:	THUMBS UP (UK) LTD
DATE OF ISSUE	:	Jun. 14, 2019
STANDARD(S) **TEST PROCEDURE(S)**	:	FCC Part 15 Rules
REPORT VERSION	:	V1.0

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

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jun. 14, 2019	Valid	Initial Release

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1. VERIFICATION OF CONFORMITY

Applicant	THUMBS UP (UK) LTD
Address	Unit L,Braintree Industrial Estate,Braintree Road HA4 0EJ,Ruislip LONDON United Kingdom
Manufacturer	THUMBS UP (UK) LTD
Address	Unit L,Braintree Industrial Estate,Braintree Road HA4 0EJ,Ruislip LONDON United Kingdom
Factory	THUMBS UP (UK) LTD
Address	Unit L,Braintree Industrial Estate,Braintree Road HA4 0EJ,Ruislip LONDON United Kingdom
Product Designation	3in1 Super Charger
Brand Name	N/A
Test Model	MN-3IN1CHRG
Date of test	Apr. 10, 2019 to Jun. 14, 2019
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	Erik Yang	
	Erik Yang(Yang Jianmin)	Jun. 14, 2019
Reviewed By	Max Zhang	
	Max Zhang(Zhang Yi)	Jun. 14, 2019
Approved By	Forrest Lei	
	Forrest Lei(Lei Yonggang) Authorized Officer	Jun. 14, 2019

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

A major technical description of EUT is described as following

Operation Frequency	114.8kHz
Maximum field strength	55.57dBuV/m(PK)@3m
Modulation	FSK
Number of channels	1
Antenna Gain	0dBi
Antenna Designation	Integrated Antenna (Met 15.203 Antenna requirement)
Hardware Version	JN-154V2.0
Software Version	V1.0
Power Supply	DC 3.7V by Battery

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

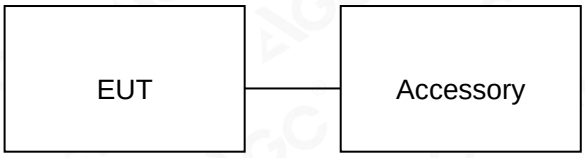
NO.	TEST MODE DESCRIPTION
1	Connected to the smart phone(1% battery)
2	Connected to the smart phone(50% battery)
3	Connected to the smart phone(99% battery)

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	3in1 Super Charger	MN-3IN1CHRG	2AHHEMN3IN1CHRG	EUT
2	Resistor	--	--	Accessory
3	smart phone	N/A	5W	Accessory

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	N/A

Note: N/A stands for not applicable. Wireless charging does not work while charging.

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 RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun.10, 2019	Jun.09, 2020
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 20, 2018	Dec. 19, 2019
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Jun. 14, 2018	Jun. 13, 2020
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep. 28, 2017	Sep. 27, 2019

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 dBμV = 20 log Emission level μV/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.

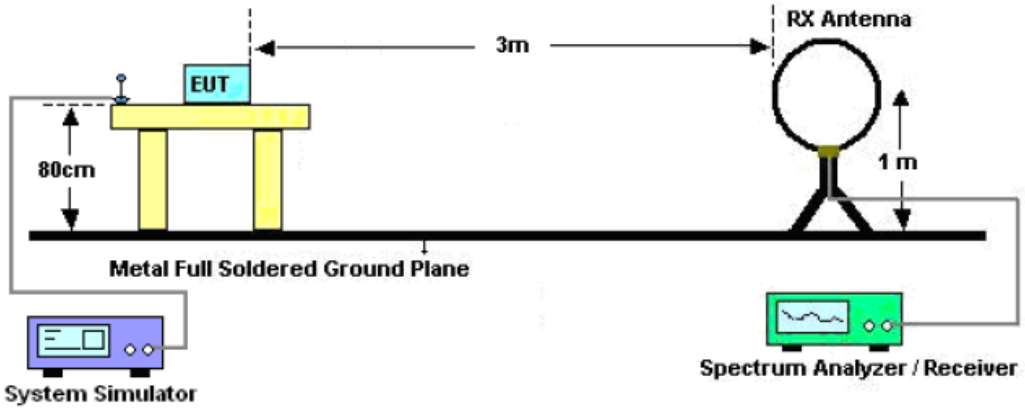
The following table is the setting of spectrum analyzer and receiver.

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

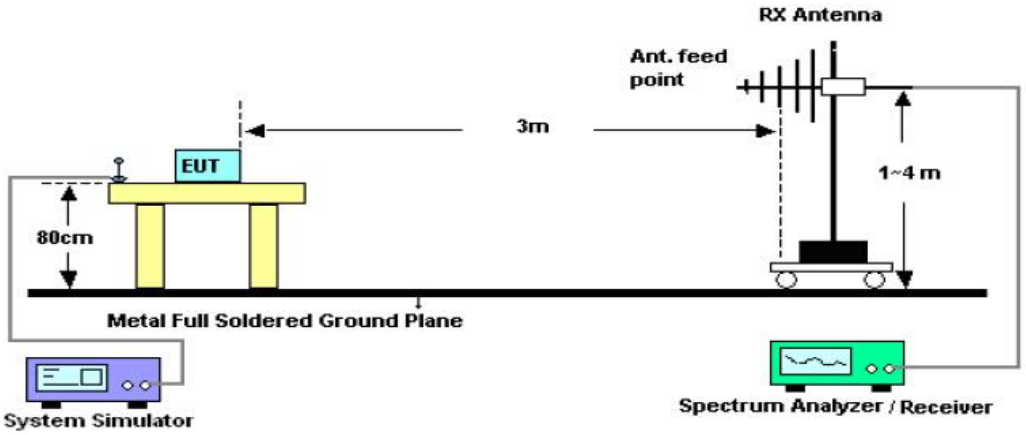
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

7.3. TEST SETUP

Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



7.4. TEST RESULT

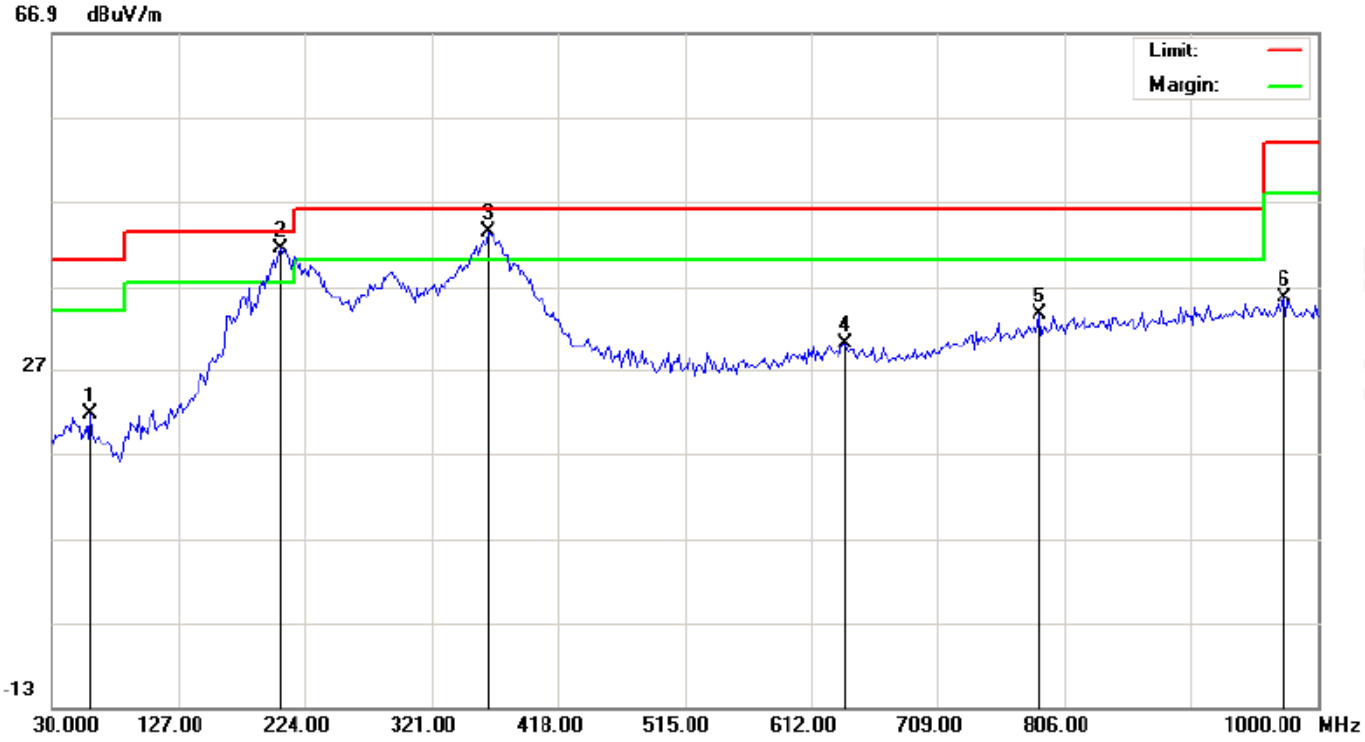
RADIATED EMISSION BELOW 30MHZ

Frequency MHz	Polarization	Reading dB(uV) PK	Factor dB (1/m)	Level dB(uV/m) PK	Limit dB(uV/m) PK	Margin dB	Pass/Fail
0.1148	Face	45.17	10.40	55.57	106.41	-50.84	Pass
0.1148	Side	35.09	10.40	45.49	106.41	-60.92	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

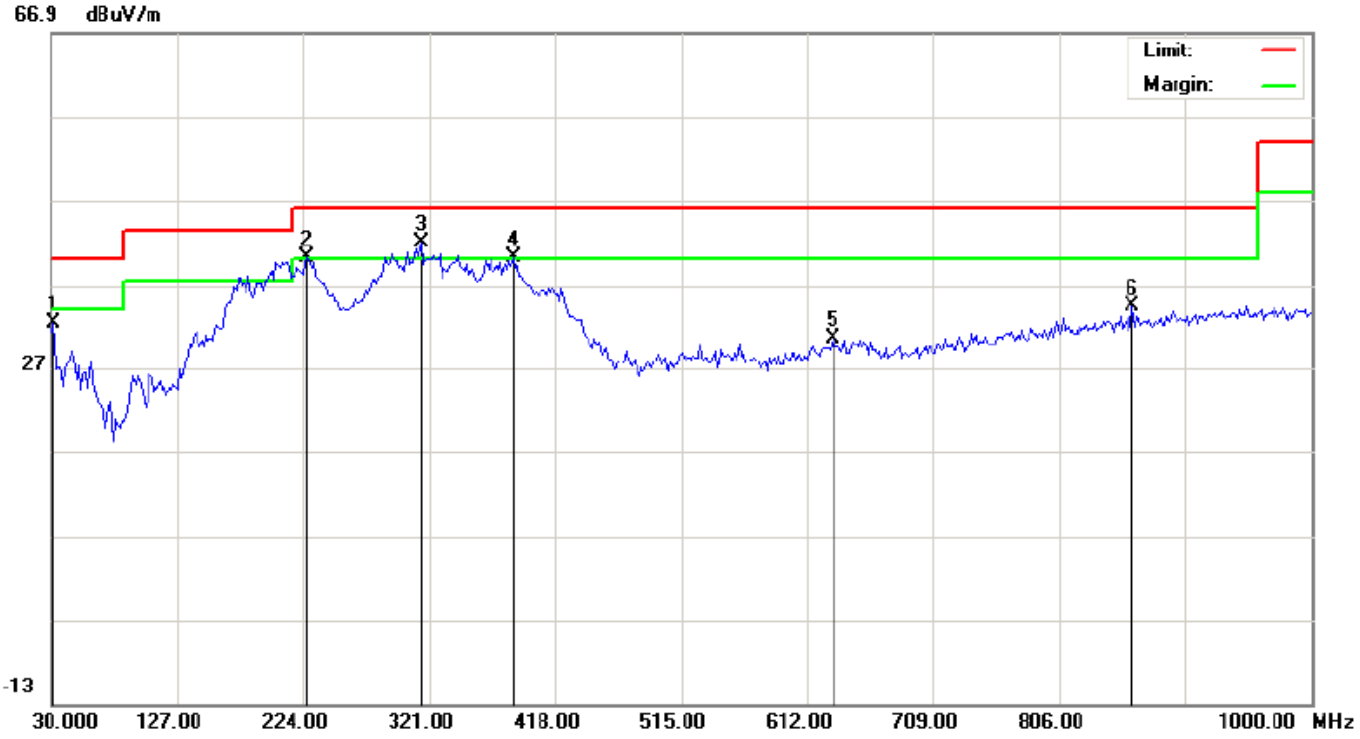
EUT：	3in1 Super Charger	Model Name. ：	MN-3IN1CHRG
Temperature：	20.8℃	Relative Humidity：	48.5%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization :	Horizontal



No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		59.1000	2.66	18.95	21.61	40.00	-18.39	peak			
2	*	204.6000	25.07	16.33	41.40	43.50	-2.10	peak			
3	!	364.6500	21.65	21.74	43.39	46.00	-2.61	peak			
4		637.8667	2.85	27.40	30.25	46.00	-15.75	peak			
5		786.6000	3.44	30.11	33.55	46.00	-12.45	peak			
6		974.1333	3.32	32.34	35.66	54.00	-18.34	peak			

RESULT: PASS

EUT：	3in1 Super Charger	Model Name. ：	MN-3IN1CHRG
Temperature：	20.8℃	Relative Humidity：	48.5%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V
Test Mode ：	Mode 1	Polarization :	Vertical



No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		31.6167	14.21	18.22	32.43	40.00	-7.57	peak			
2	!	227.2333	22.54	17.75	40.29	46.00	-5.71	peak			
3	*	314.5333	22.12	19.98	42.10	46.00	-3.90	peak			
4	!	385.6667	17.68	22.48	40.16	46.00	-5.84	peak			
5		631.4000	3.25	27.33	30.58	46.00	-15.42	peak			
6		862.5833	3.14	31.22	34.36	46.00	-11.64	peak			

RESULT: PASS

Note:

Factor=Antenna Factor + Cable loss, Over=Measurement-Limit.

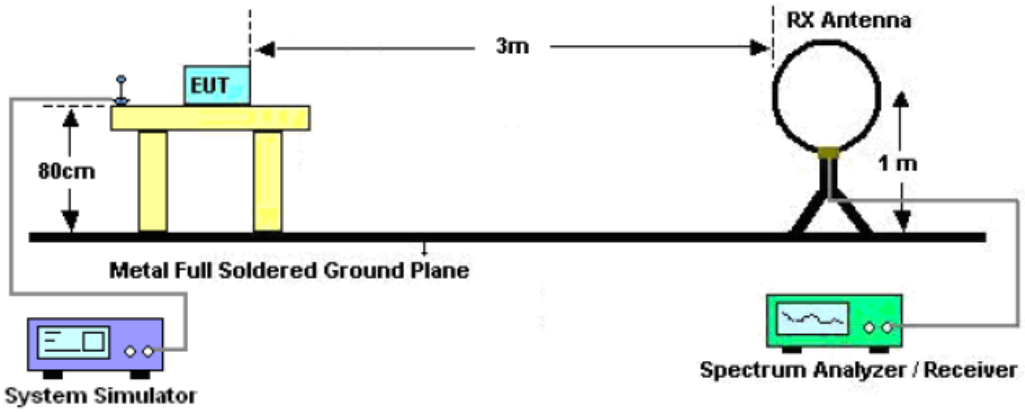
The “Factor” value can be calculated automatically by software of measurement system.

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

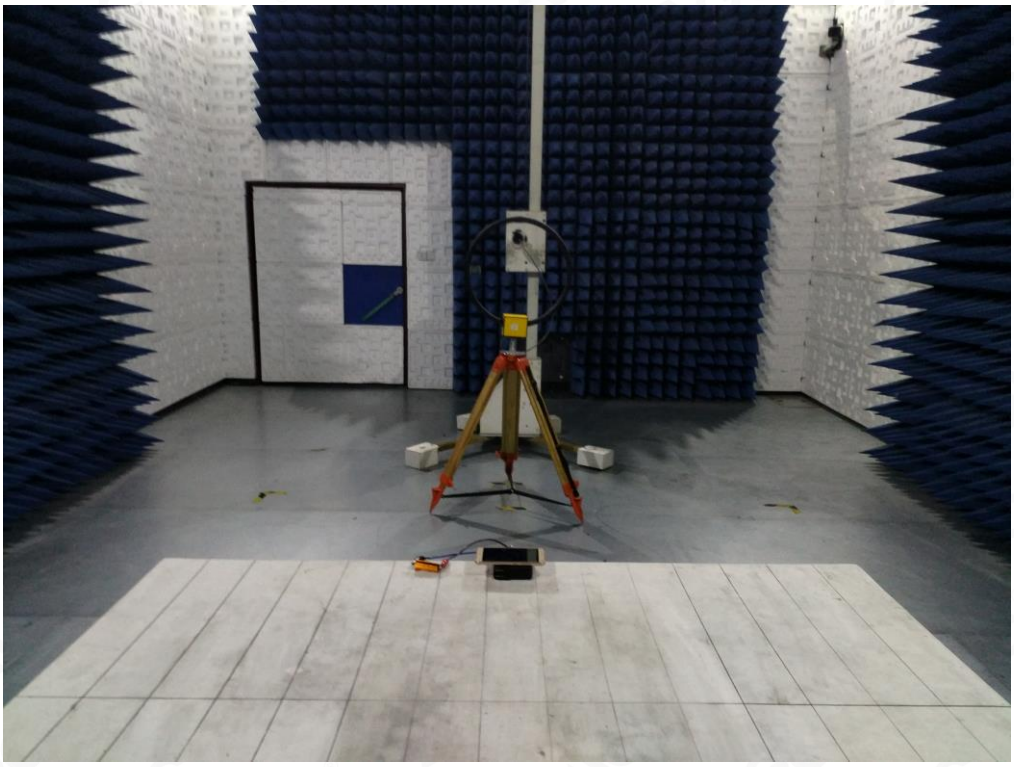
TEST ITEM	20DB BANDWIDTH
TEST MODULATION	FSK

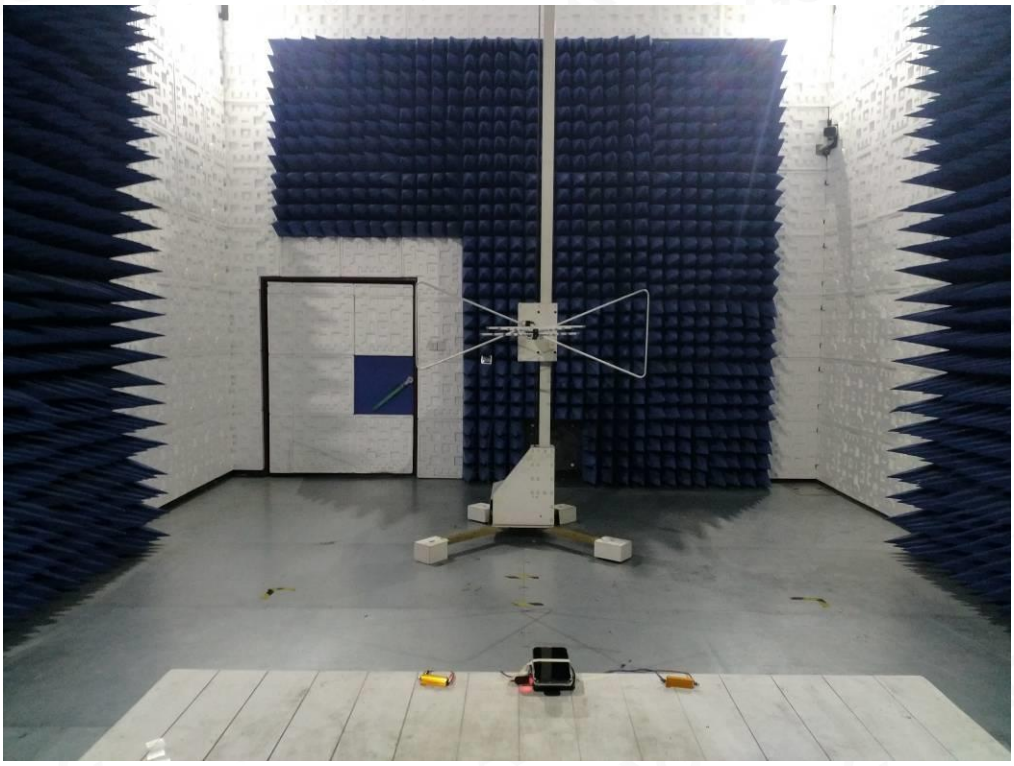
Test Data (Hz)		Criteria
Operate Channel	817	PASS

TEST PLOT OF BANDWIDTH

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

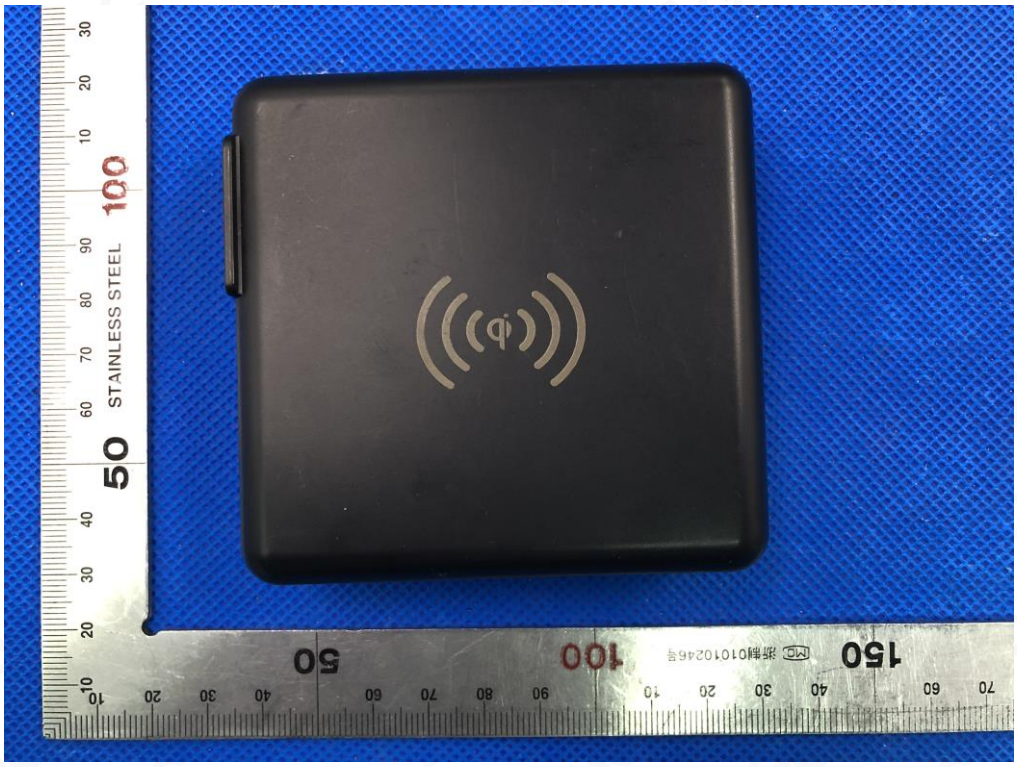
FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ



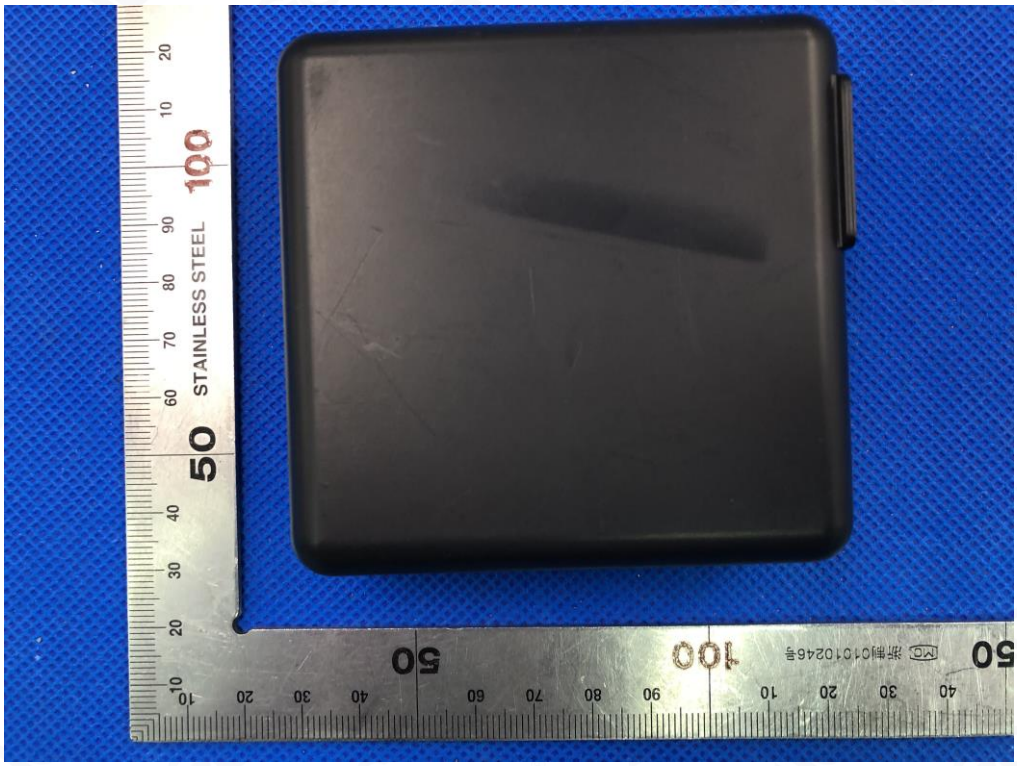


APPENDIX B: PHOTOGRAPHS OF EUT

TOP VIEW OF EUT



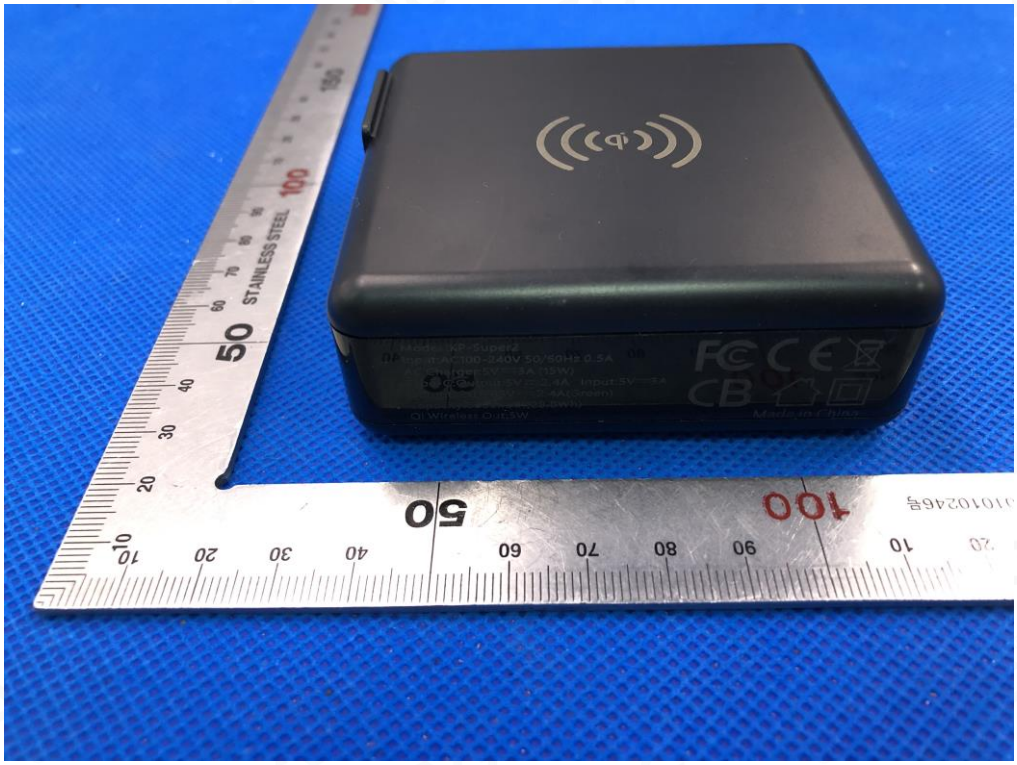
BOTTOM VIEW OF EUT



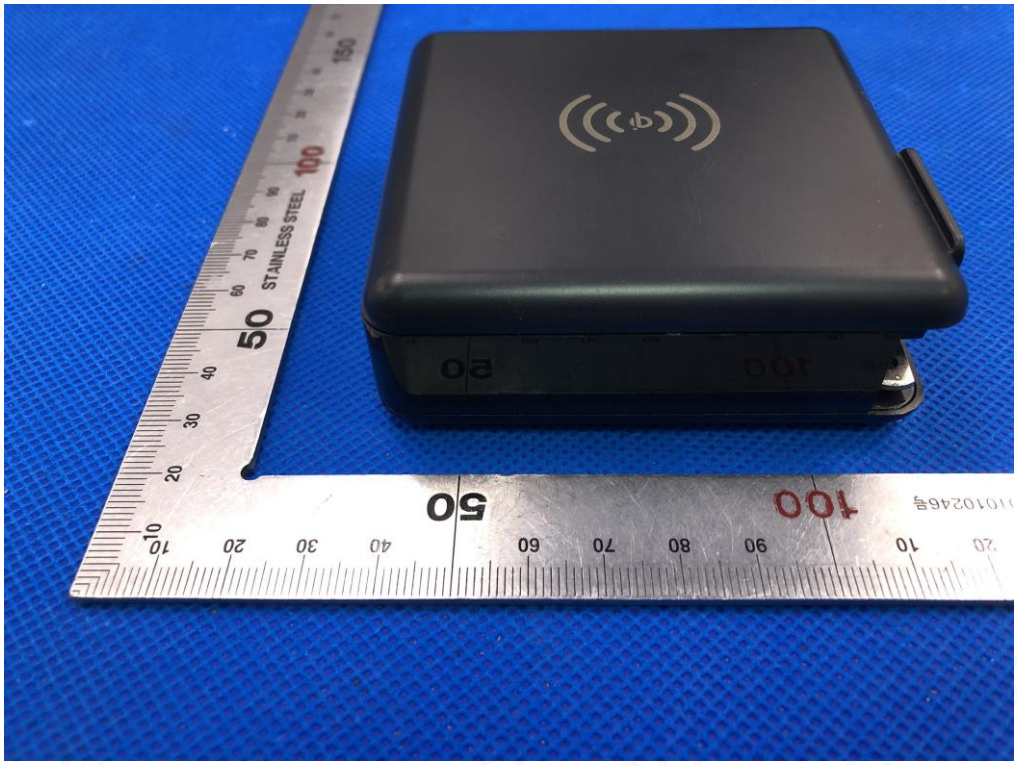
FRONT VIEW OF EUT

BACK VIEW OF EUT

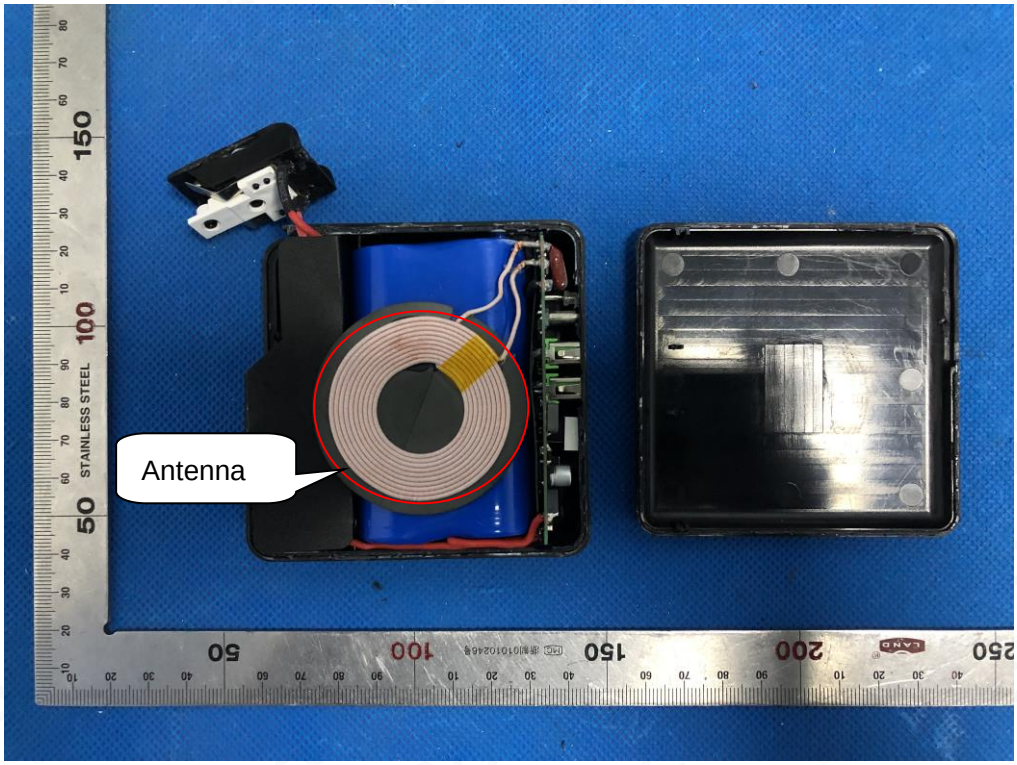
LEFT VIEW OF EUT



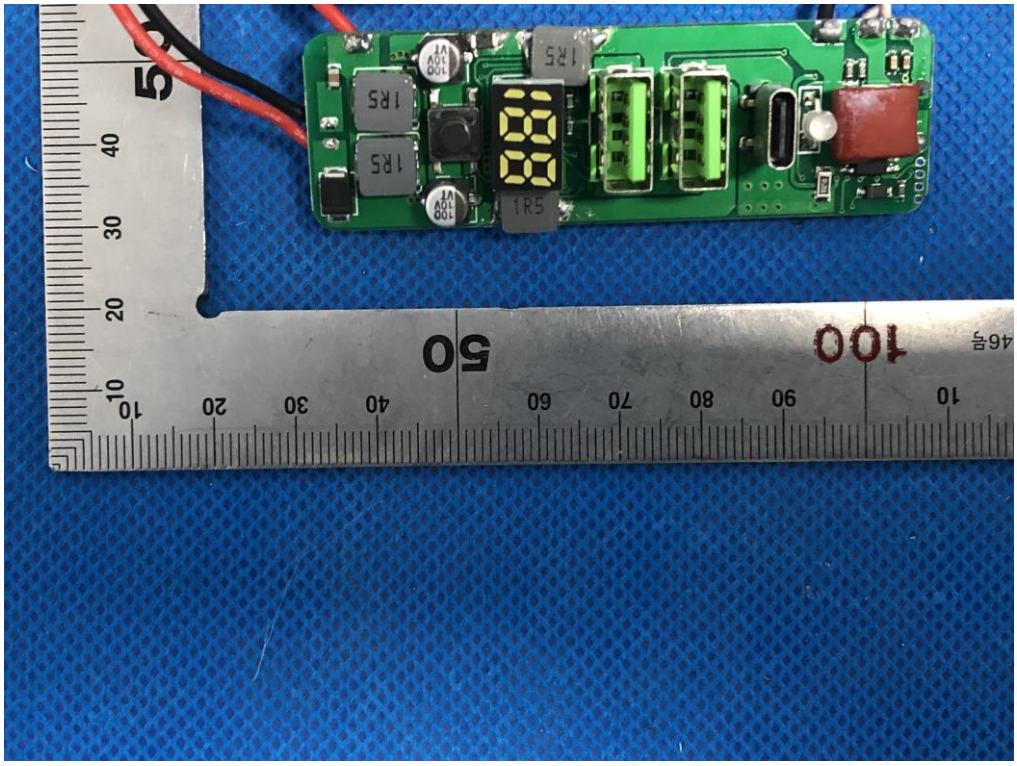
RIGHT VIEW OF EUT



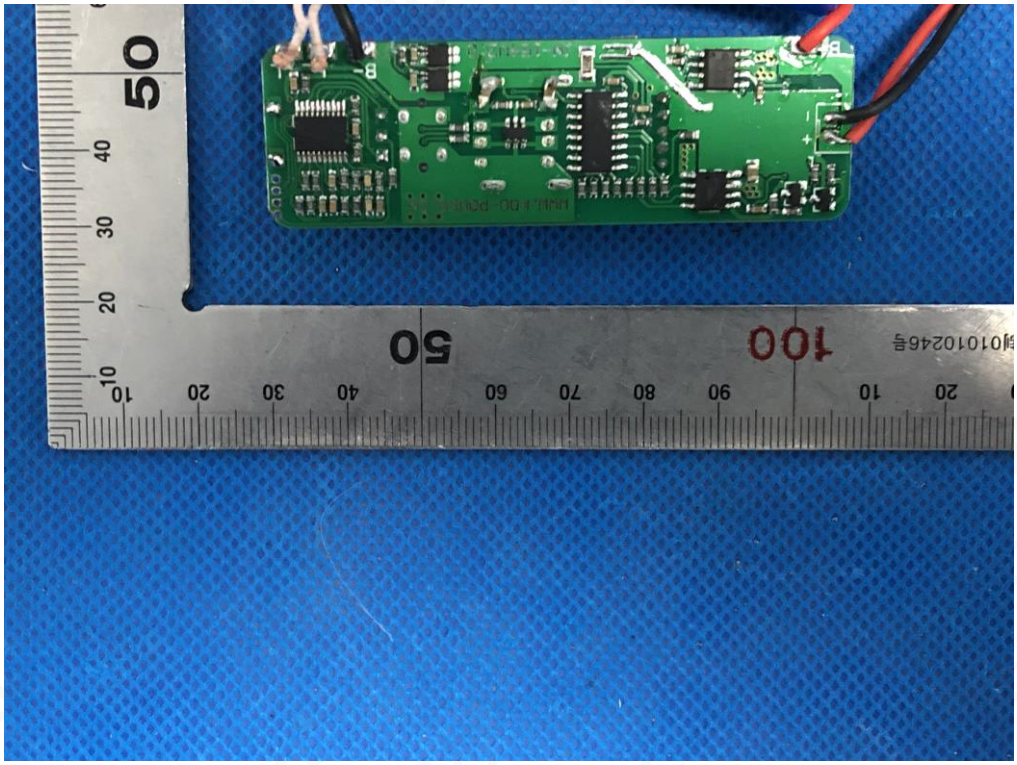
OPEN VIEW OF EUT



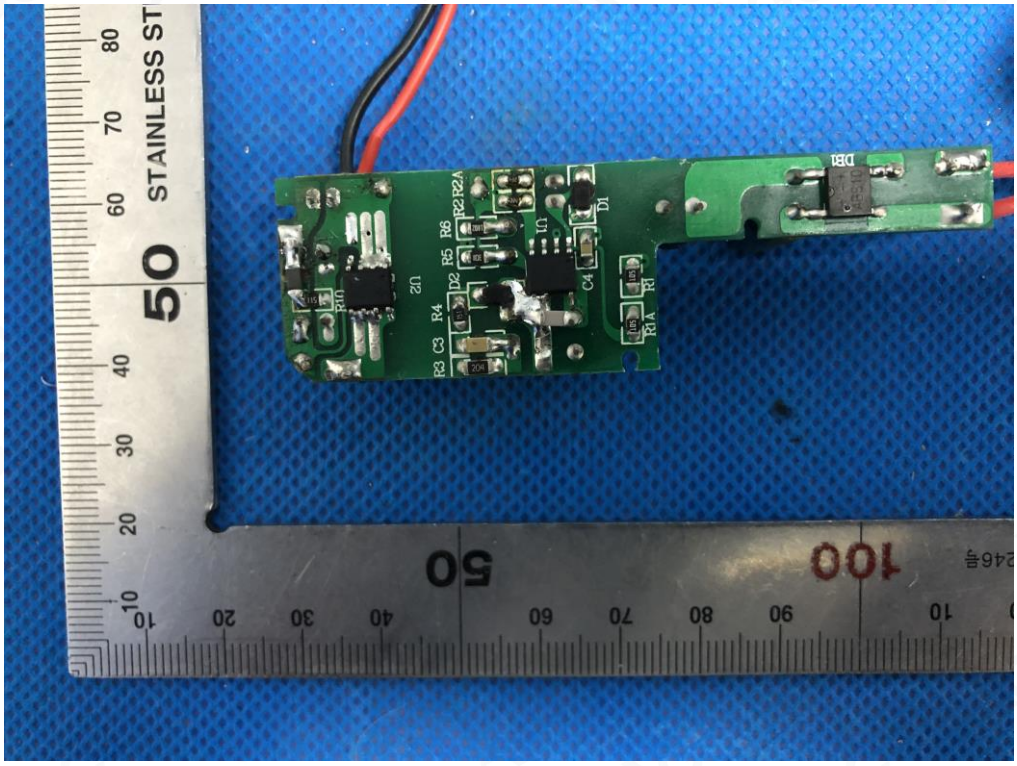
INTERNAL VIEW-1 OF EUT



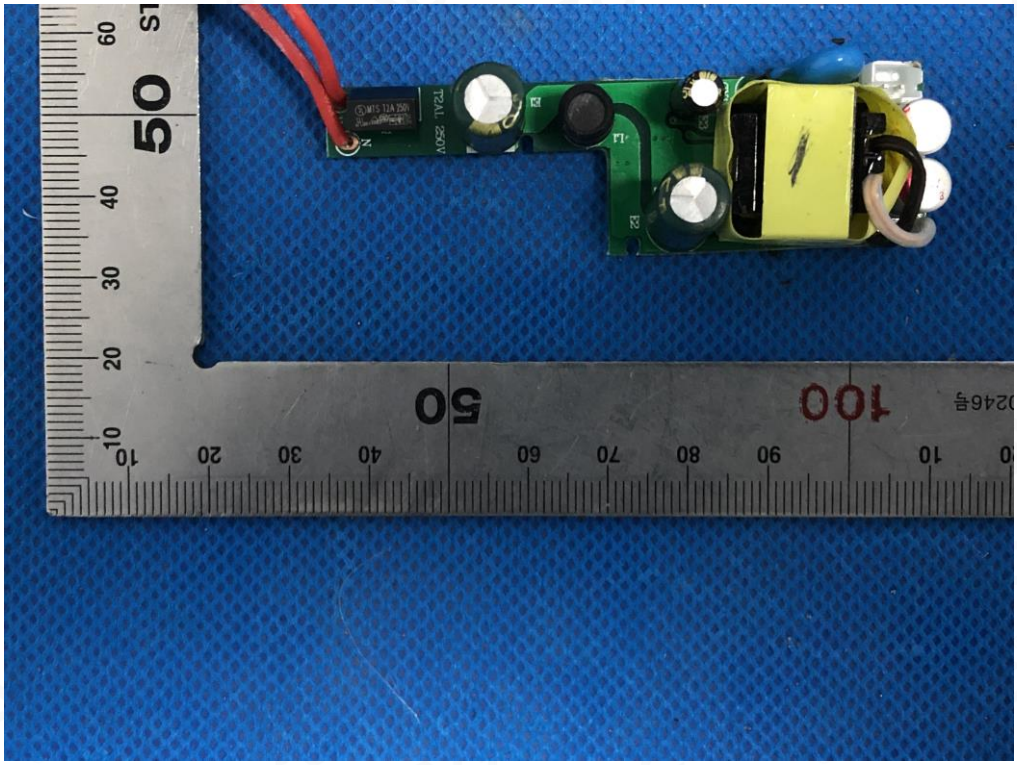
INTERNAL VIEW-2 OF EUT



INTERNAL VIEW-3 OF EUT



INTERNAL VIEW-4 OF EUT



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