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FCC TEST REPORT

Report No: STS1802023W01

Issued for

iOttie, Inc

33 West 46th Street, 6th FL. New York, NY USA

Product Name:	Wireless charging pad
Brand Name:	iOttie
Model Name:	CHWRIO105
Series Model:	N/A
FCC ID:	2AMRO-CHWRIO105
Test Standard:	FCC Part 15 Subpart C

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Shenzhen STS Test Services Co., Ltd.
1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
TEL: +86-755 3688 6288 FAX: +86-755 3688 6277 E-mail: sts@stsapp.com



**TEST RESULT CERTIFICATION**

Applicant's name: iOttie, Inc
Address.....: 33 West 46th Street, 6th FL. New York, NY USA
Manufacture's Name: iOttie, Inc
Address.....: 33 West 46th Street, 6th FL. New York, NY USA

Product description

Product Name: Wireless charging pad
Brand Name: iOttie
Model Name.....: CHWRIO105
Series Model: N/A

Test Standards.....: FCC Part 15 Subpart C
Test Procedure : ANSI C63.10-2013

This device described above has been tested by STS, the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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Date of performance of tests: 01 Mar. 2018 ~ 06 Mar. 2018
Date of Issue : 08 Mar. 2018
Test Result : **Pass**

Testing Engineer :

(Chris chen)

Technical Manager :

(Sean she)

Authorized Signatory :

(Vita Li)





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**Revision History**

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	08 Mar. 2018	STS1802023W01	ALL	Initial Issue





1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.209 (a)	Radiated emission, Spurious Emission	PASS	
2.1049	20 dB Bandwidth	PASS	

1.1 TEST FACTORY

Shenzhen STS Test Services Co., Ltd.

Add. : 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China

CNAS Registration No.: L7649; FCC Registration No.: 625569

IC Registration No.: 12108A; A2LA Certificate No.: 4338.01;

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, 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 %** .

No.	Item	Uncertainty
1	Conducted Emission (9KHz-150KHz)	$\pm 2.88\text{dB}$
2	Conducted Emission (150KHz-30MHz)	$\pm 2.67\text{ dB}$
3	All emissions,radiated(<1G) 30MHz-200MHz	$\pm 2.83\text{dB}$
4	All emissions,radiated(<1G) 200MHz-1000MHz	$\pm 2.94\text{dB}$
5	Temperature	$\pm 0.5^{\circ}\text{C}$
6	Humidity	$\pm 2\%$

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name	Wireless charging pad
Trade Name	iOttie
Model Name	CHWRIO105
Series Model	N/A
Model Difference	N/A
Channel List	Please refer to the Note 2.
Equipemnt Category	Non-ISM frequency
Operating frequency	111.25KHz-152.5KHz
Modulation Type	ASK
Power Adapter	Input: DC 5V, 3A/ DC 9V,1.67A Output: USB DC 5V, 2.4A/wireless: DC 5V,1A, DC 5V, 3A MAX
Antenna Gain	0dBi
Hardware version number	N/A
Software version number	N/A
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 2.

Channel List					
Channel	Frequency (KHz)	Channel	Frequency (KHz)	Channel	Frequency (KHz)
00	111.25	01	131.8	02	152.5

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	NOTE
1	iOttie	CHWRIO105	Coil	NA	Antenna

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Charging+TX Mode

For Conducted Emission	
Final Test Mode	Description
Mode 1	Charging+TX Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	Charging+TX Mode

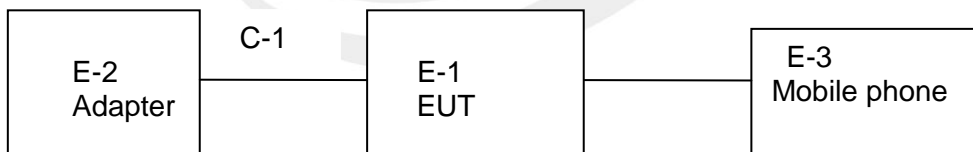
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Conducted Emission Test



Radiated Emission Test





2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-2	Adapter	CHWRIO105	CHWRIO105	N/A	N/A
E-3	Mobile phone	N/A	N/A	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
C-1	USB Cable (FTP)	NO	50cm	N/A

Note:

- (1) FCC DOC approved.
- (2) FTP is Foiled Twisted Pair.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2017.10.15	2018.10.14
Bilog Antenna	TESEQ	CBL6111D	34678	2017.03.24	2018.03.23
50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2017.10.15	2018.10.14
PreAmplifier	Agilent	8449B	60538	2017.10.15	2018.10.14
Loop Antenna	EMCO	6502	9003-2485	2017.10.15	2018.10.14
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2017.10.15	2018.10.14

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2017.10.15	2018.10.14
LISN	R&S	ENV216	101242	2017.10.15	2018.10.14
LISN	EMCO	3810/2NM	000-23625	2017.10.15	2018.10.14

3.CONDUCTED EMISSION TEST RESULT(SECTION 15.207)

3.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 15.207 limit in the table below has to be followed.

FREQUENCY (MHz)	Class B (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

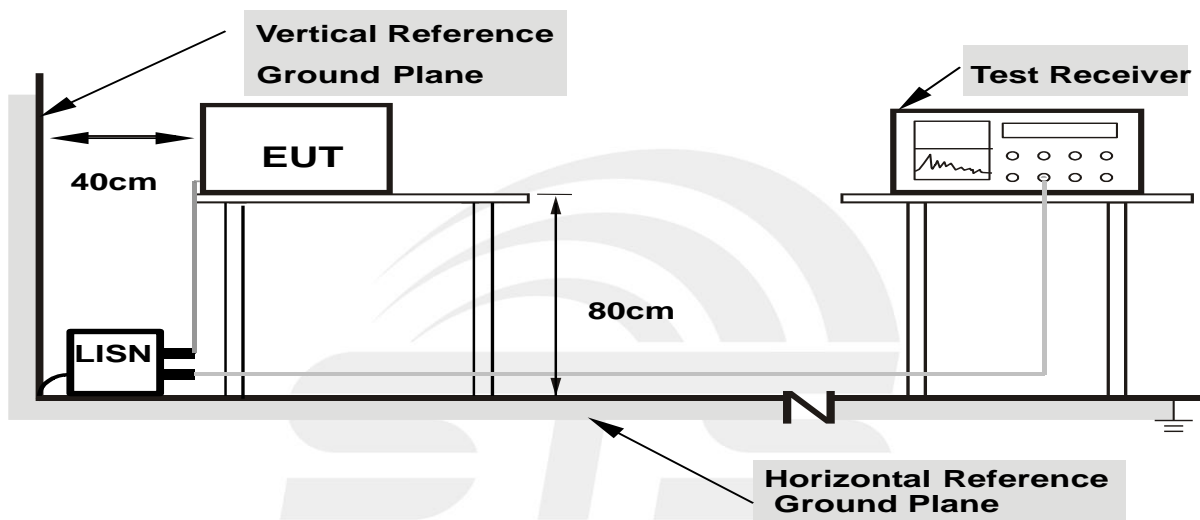
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.



3.5 TEST RESULTS

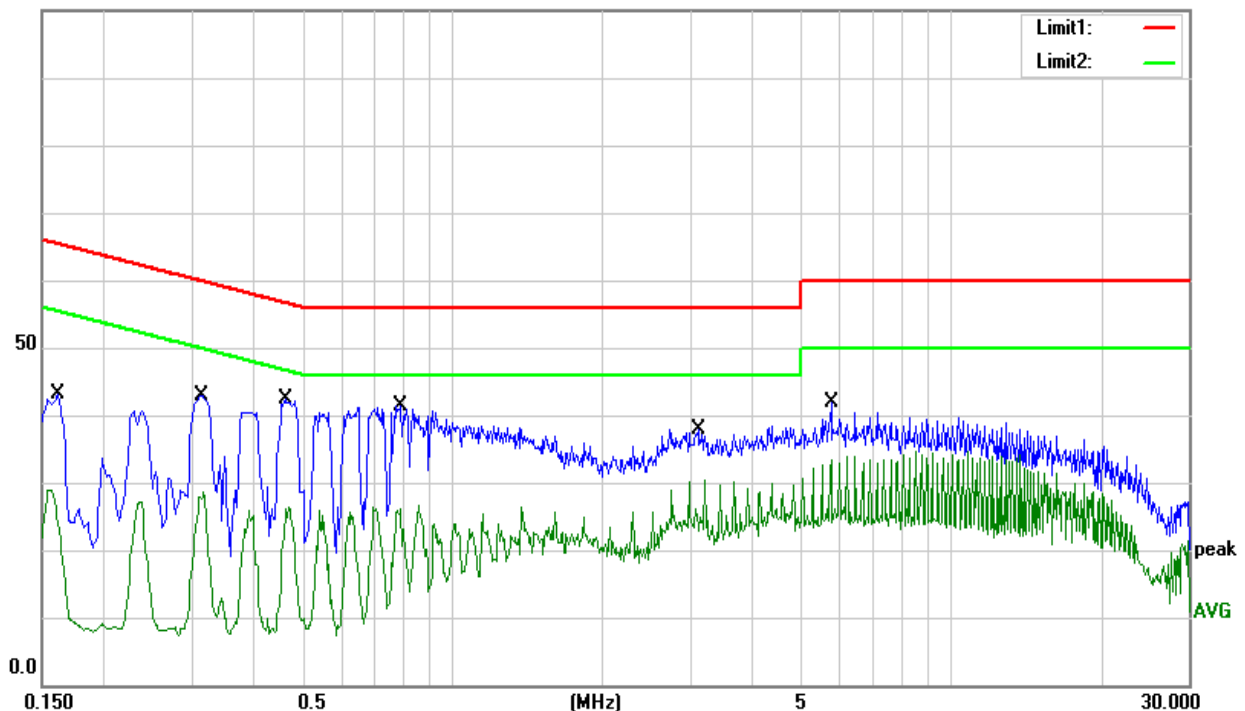
Temperature:	23.5 °C	Relative Humidity:	59%
Test Voltage:	AC 120V/60Hz	Phase:	L
Test Mode:	Mode 1		

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.1620	33.35	9.79	43.14	65.36	-22.22	QP
2	0.1620	14.05	9.79	23.84	55.36	-31.52	AVG
3	0.3140	32.67	10.20	42.87	59.86	-16.99	QP
4	0.3140	17.40	10.20	27.60	49.86	-22.26	AVG
5	0.4620	32.40	10.03	42.43	56.66	-14.23	QP
6	0.4620	14.86	10.03	24.89	46.66	-21.77	AVG
7	0.7900	31.60	9.84	41.44	56.00	-14.56	QP
8	0.7900	16.38	9.84	26.22	46.00	-19.78	AVG
9	3.1140	28.01	9.81	37.82	56.00	-18.18	QP
10	3.1140	13.07	9.81	22.88	46.00	-23.12	AVG
11	5.7460	31.99	9.86	41.85	60.00	-18.15	QP
12	5.7460	14.33	9.86	24.19	50.00	-25.81	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result = Reading + Factor) – Limit

100.0 dBuV





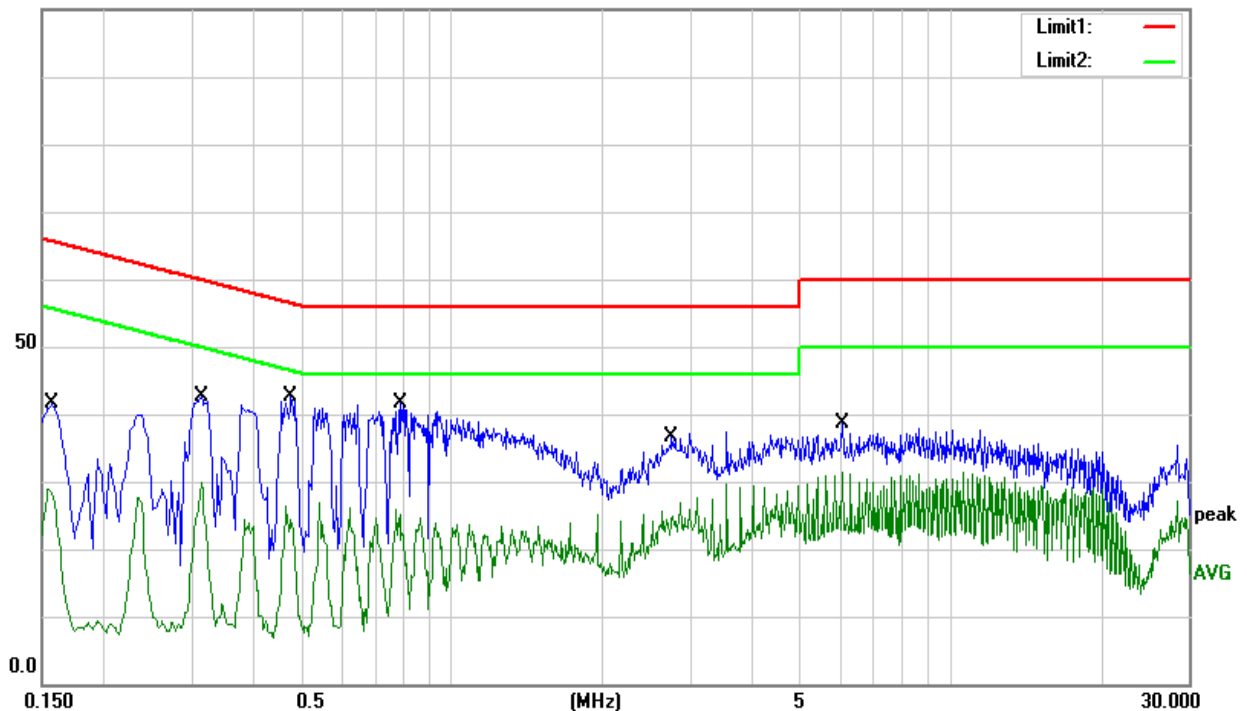
Temperature:	23.5 °C	Relative Humidity:	59%
Test Voltage:	AC 120V/60Hz	Phase:	N
Test Mode:	Mode 1		

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.1580	31.79	9.77	41.56	65.57	-24.01	QP
2	0.1580	18.33	9.77	28.10	55.57	-27.47	AVG
3	0.3140	32.30	10.24	42.54	59.86	-17.32	QP
4	0.3140	19.61	10.24	29.85	49.86	-20.01	AVG
5	0.4740	32.51	10.00	42.51	56.44	-13.93	QP
6	0.4740	14.45	10.00	24.45	46.44	-21.99	AVG
7	0.7860	31.86	9.84	41.70	56.00	-14.30	QP
8	0.7860	11.48	9.84	21.32	46.00	-24.68	AVG
9	2.7540	26.69	9.90	36.59	56.00	-19.41	QP
10	2.7540	14.39	9.90	24.29	46.00	-21.71	AVG
11	6.0820	28.73	9.90	38.63	60.00	-21.37	QP
12	6.0820	21.37	9.90	31.27	50.00	-18.73	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result = Reading + Factor) - Limit

100.0 dBuV



4. RADIATED& FIELD EMISSION TEST RESULT(SECTIOU 15.209)

4.1 Limit

Frequency [MHz]	Field Strength [uV/m]	Measurement Distance [Meters]
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

§ 15.209(d)The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

4.2 TEST PROCEDURE

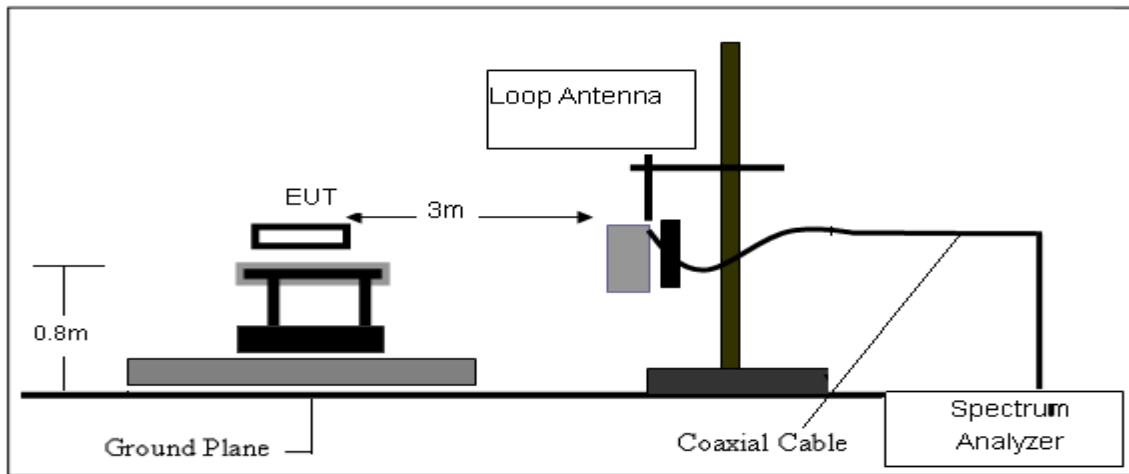
- a. The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz.
- b. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- d. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

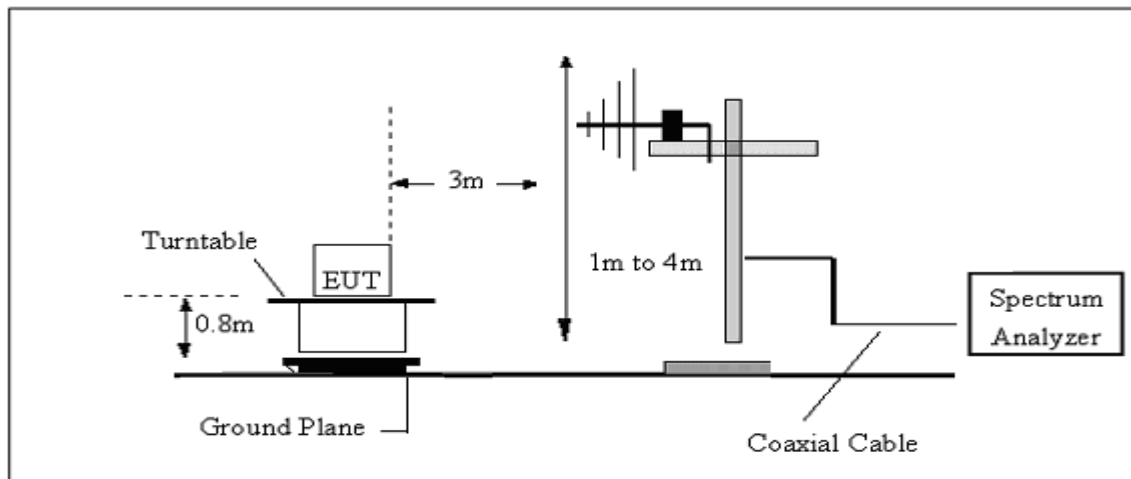
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

4.3 TEST SETUP

(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz





4.4 TEST RESULTS

Temperature :	25 °C	Relative Humidity :	50%
Test Voltage :	AC 120V/60Hz	Test Mode :	TX Mode

4.4.1 Spurious Radiated Emission Below 30 MHz

Frequency	Reading	Detector	Ant. Factor	Cable	Emission	Limits	Margin
(KHz)	(dBμV)	(PK/QP/AV)	(dB/m)	Loss	Level (dBμV/m)	(dBμV/m)	(dB)
36	73.63	PK	22.03	0.1	95.76	136.48	-40.72
36	55.39	AV	22.03	0.1	77.52	116.48	-38.96
110	79.35	PK	10.04	0.1	89.49	126.78	-37.29
110	63.41	AV	10.04	0.1	73.55	106.78	-33.23
131.8	95.35	PK	8.72	0.1	104.17	125.21	-21.04
131.8	80.41	AV	8.72	0.1	89.23	105.21	-15.98
554	54.57	QP	-16.36	0.1	38.31	72.73	-34.42
23214	42.33	QP	-17.9	0.9	25.33	69.54	-44.21

1. “*” Means Fundamental frequency

2. Emission Level [dBμV/m] = Reading [dBμV] + Ant. Factor [dB/m] + Cable Loss [dB]

3. Margin [dB] = Emission Level [dBμV/m] – Limit [dBμV/m]

4. Limit calculation: Limit at specified distance + $40\log(300/3)$ = Limit + 80 dB for up to 0.49 MHz

Limit at specified distance + $40\log(30/3)$ = Limit + 40 dB for above 0.49 MHz, Below 30 MHz

4.4.2 Spurious Radiated Emission below 1 GHz

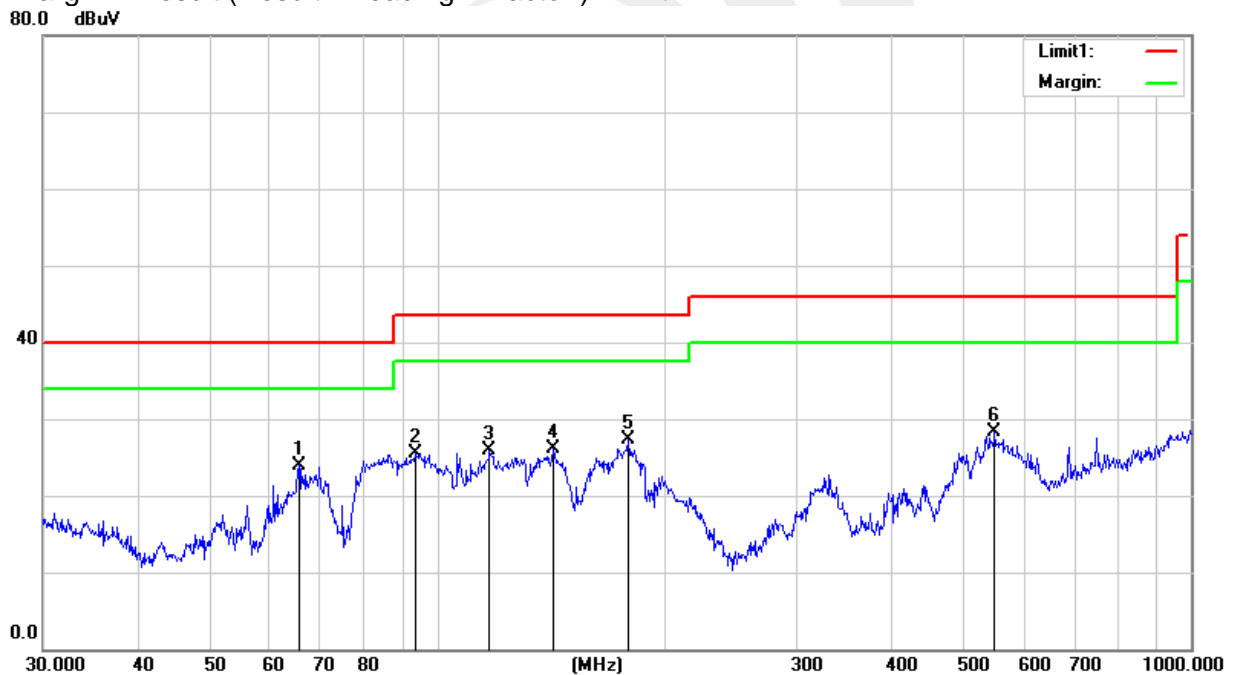
Temperature :	24.6 °C	Relative Humidity :	58%
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 1

The following table shows the highest levels of radiated emissions on polarizations of vertical

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
65.5727	48.21	-24.21	24.00	40.00	-16.00	QP
93.7685	45.39	-19.82	25.57	43.50	-17.93	QP
117.3603	43.86	-17.86	26.00	43.50	-17.50	QP
142.3243	43.73	-17.62	26.11	43.50	-17.39	QP
179.3863	46.77	-19.43	27.34	43.50	-16.16	QP
549.0195	35.14	-6.80	28.34	46.00	-17.66	QP

Remark:

1. Margin = Result (Result =Reading + Factor)–Limit





Temperature :	24.6°C	Relative Humidity :	58%
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 1

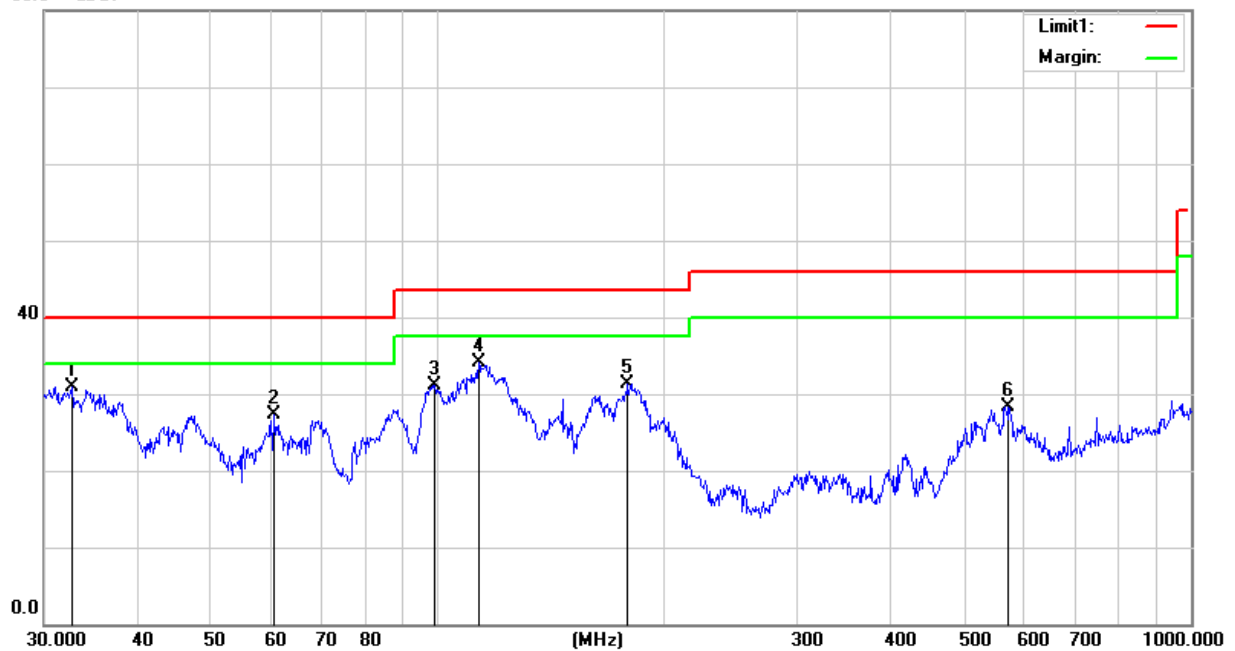
The following table shows the highest levels of radiated emissions on polarizations of horizontal

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
32.7486	43.55	-12.60	30.95	40.00	-9.05	QP
60.4920	51.55	-24.33	27.22	40.00	-12.78	QP
99.1797	50.37	-19.26	31.11	43.50	-12.39	QP
113.3163	52.24	-18.13	34.11	43.50	-9.39	QP
178.7584	50.83	-19.44	31.39	43.50	-12.11	QP
570.6100	35.00	-6.64	28.36	46.00	-17.64	QP

Remark:

1. Margin = Result (Result = Reading + Factor) – Limit

80.0 dBuV





5. 20 DB BANDWIDTH TEST

5.1 Limit

FCC Part 2.1049, Only applicable to report.

5.2 TEST SETUP

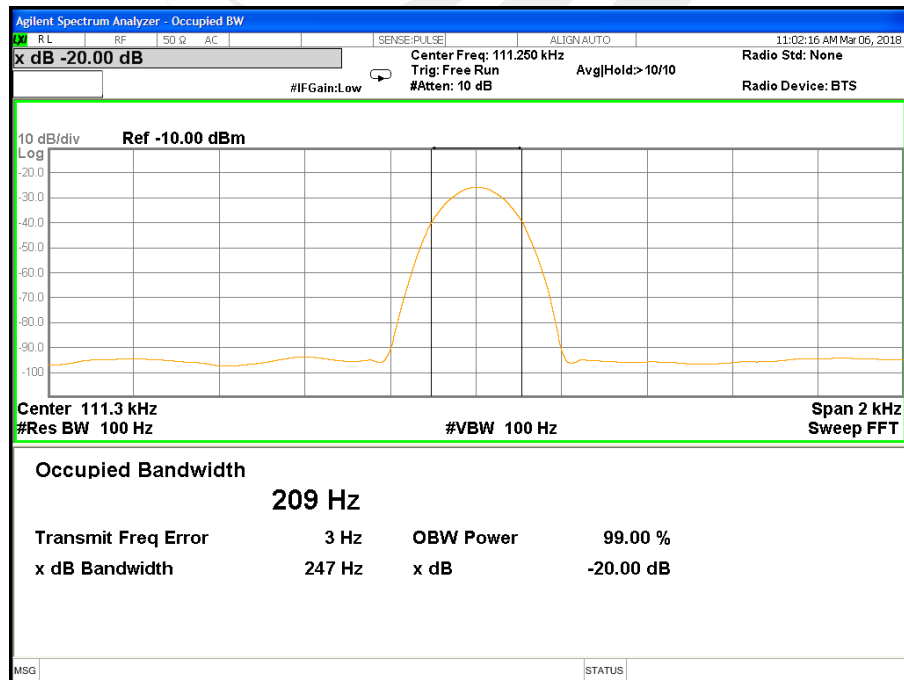
Spectrum Parameter	Setting
Span Frequency	approximately 2 to 3 times the 20 dB bandwidth
RB	greater than 1 % of the 20 dB bandwidth,
VB	equal to the RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

The test program and configuration, Refer to 4.2 and 4.3

5.3 TEST RESULTS

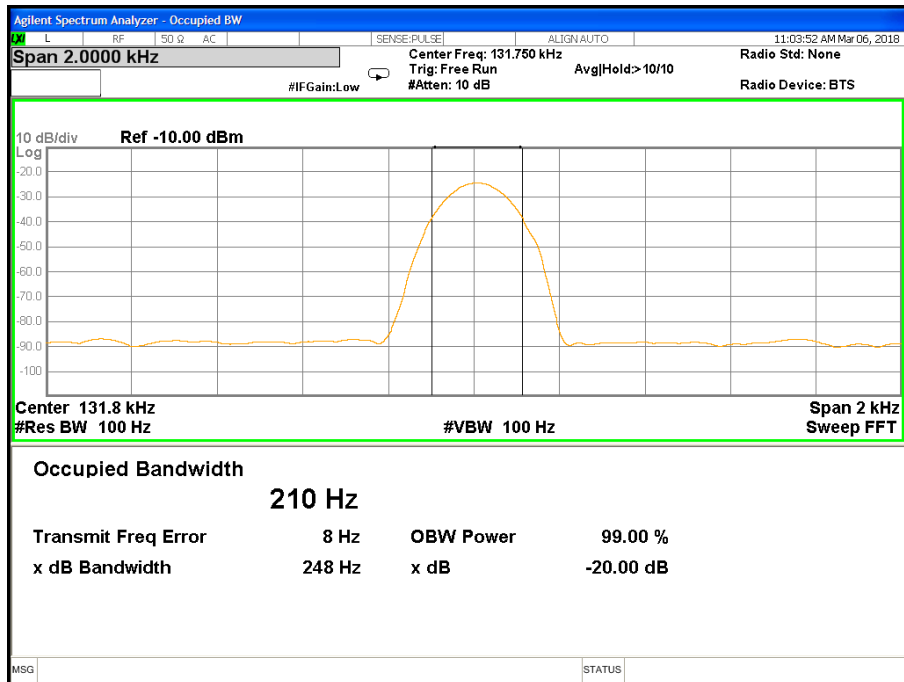
Operating Frequency (kHz)	20 dB Bandwidth(Hz)
111.25	247
131.8	248
152.5	249

CH00

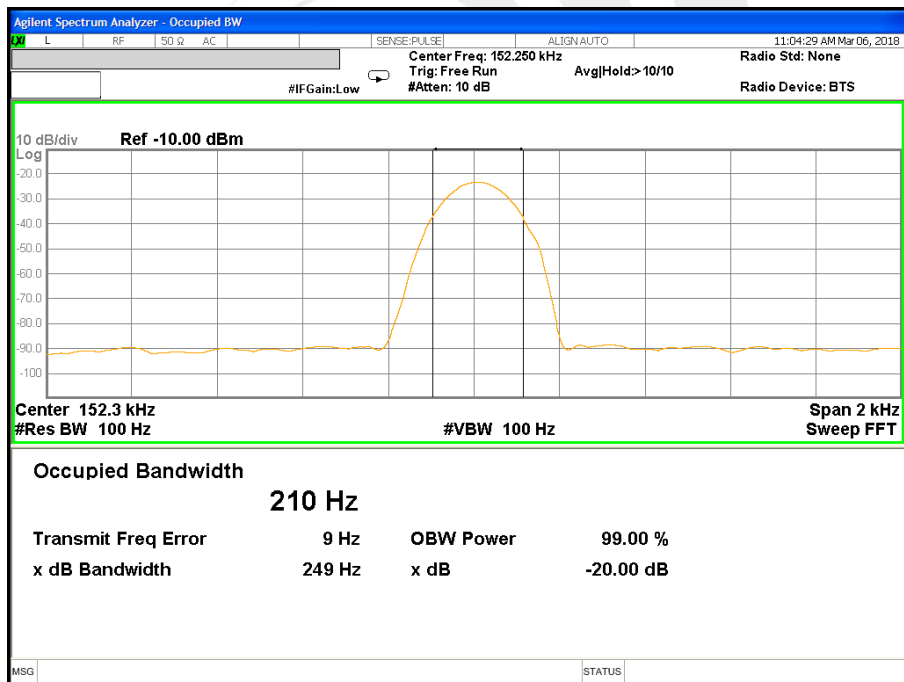




CH01

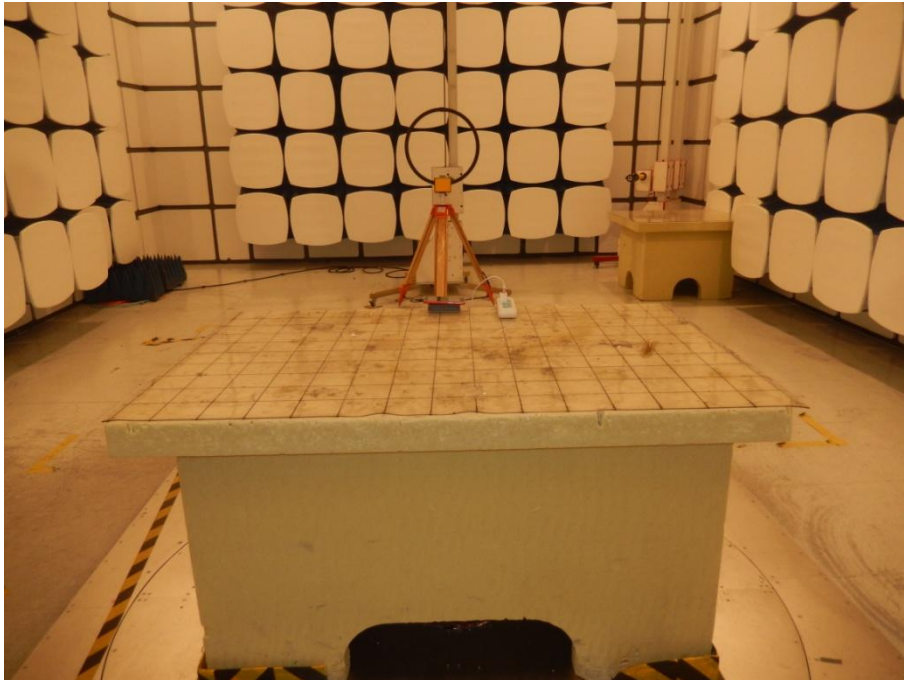


CH02

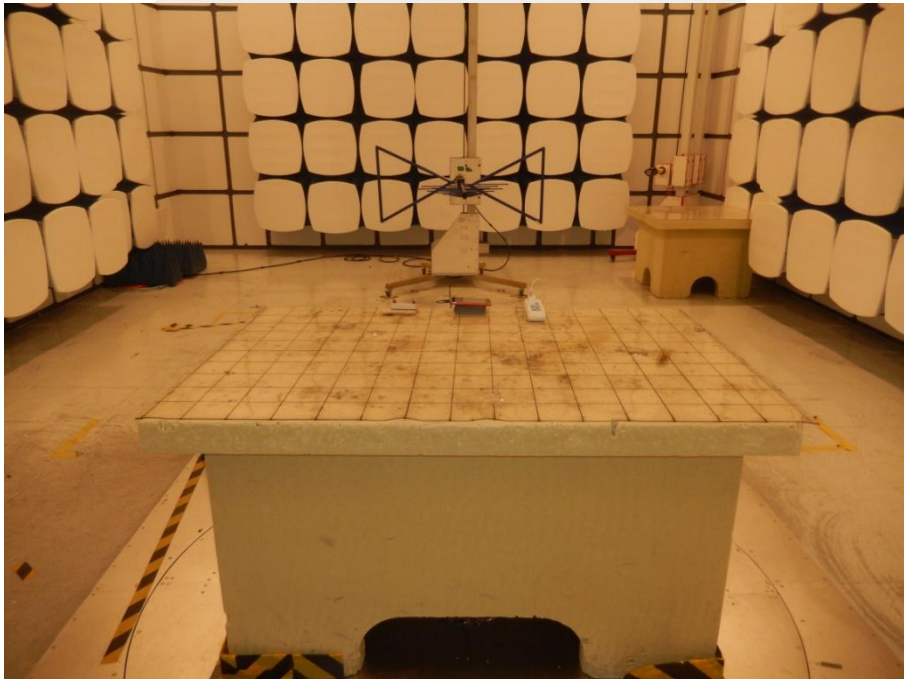


APPENDIX-PHOTOS OF TEST SETUP

Radiated emission Measurement Photos(9KHz-30MHz)



Radiated emission Measurement Photos(30MHz-1000MHz)



ConductionMeasurement Photos



※※※※※END OF THE REPORT※※※※※