FCC TEST REPORT
FCC ID:2AZ4X-WS21005

Report Number.....ZKT-2109225032E

Date of Test..... Oct. 01,2021 to Oct.11, 2021

Date of issue.....: Oct.11, 2021

Total number of pages.....21

Test Result.....PASS

Testing Laboratory.....Shenzhen ZKT Technology Co., Ltd.

Address..... 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

Applicant's name.....Dongguan Leaper Electronic Technology CO.,LTD

NO.22 ,Xinbao second Street,Dalang new town, Dongguan City

Manufacturer's name.....Dongguan Leaper Electronic Technology CO.,LTD

NO.22 ,Xinbao second Street,Dalang new town, Dongguan City

Test specification:

Standard..... FCC CFR Title 47 Part 15 Subpart C

Test procedure...../

Non-standard test method.....N/A

Test Report Form No..... TRF-EL-107_V0

Test Report Form(s) Originator..... ZKT Testing

Master TRF..... : Dated: 2020-01-06

This device described above has been tested by ZKT, and 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.
This report shall not be reproduced except in full, without the written approval of ZKT, this document may be altered or revised by ZKT, personal only, and shall be noted in the revision of the document.

Product name.....WIRELESS CHARGER

Trademark.....N/A

Model/Type reference..... WS21005

Ratings.....: Input: 5V/2A, 9V/1.5A,
Wireless Output: 5W/7.5W/10W

Testing procedure and testing location:

Testing Laboratory.....:	**Shenzhen ZKT Technology Co., Ltd.**
Address.....:	1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China
Tested by (name + signature).....:	Alen He
Reviewer (name + signature).....:	Joe Liu
Approved (name + signature).....:	Lake Xie

TABLE OF CONTENTS

1. VERSION **4**
2. TEST SUMMARY **5**
2.1 TEST FACILITY 6
2.2 MEASUREMENT UNCERTAINTY 6
3. GENERAL INFORMATION **7**
3.1 GENERAL DESCRIPTION OF EUT 7
3.2 Test mode 7
3.3 Block Diagram of EUT Configuration 7
3.4 Test Conditions 7
3.5 Description Of Support Units (Conducted Mode) 8
3.6 EQUIPMENTS LIST FOR ALL TEST ITEMS 9
4. CONDUCTED EMISSION TEST **10**
4.1 CONDUCTED EMISSION MEASUREMENT 10
4.1.1 POWER LINE CONDUCTED EMISSION Limits 10
4.1.2 TEST PROCEDURE 10
4.1.3 DEVIATION FROM TEST STANDARD 10
4.1.4 TEST SETUP 11
4.1.5 EUT OPERATING CONDITIONS 11
4.6 Test Result 11
5. RADIATED EMISSION MEASUREMENT **12**
5.1 Radiated Emission Limits 12
5.2 Anechoic Chamber Test Setup Diagram 13
5.3 Test Procedure 13
5.4 DEVIATION FROM TEST STANDARD 13
5.5 Test Result 14
6. BANDWIDTH TEST **19**
7. TEST SETUP PHOTO **21**
8. EUT CONSTRUCTIONAL DETAILS **21**

1. VERSION

Report No.	Version	Description	Approved
ZKT-2109225032E	Rev.01	Initial issue of report	Oct.11, 2021

2. TEST SUMMARY

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Spurious Emission	15.209(a)(f)	Pass
20dB Bandwidth	15.215	Pass

NOTE:

(1) ” N/A” denotes test is not applicable in this Test Report

2.1 TEST FACILITY

Shenzhen ZKT Technology Co., Ltd.
Add. : 1/F, No. 101, Building B, No. 6, Tangwei Community Industrial Avenue, Fuhai Street, Bao'an District, Shenzhen, China

FCC Test Firm Registration Number: 692225
Designation Number: CN1299
IC Registered No.: 27033

2.2 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 %。

No.	Item	Uncertainty
1	3m camber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
3	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
4	Conducted Adjacent channel power	U=1.38dB
5	Conducted output power uncertainty Above 1G	U=1.576dB
6	Conducted output power uncertainty below 1G	U=1.28dB
7	humidity uncertainty	U=5.3%
8	Temperature uncertainty	U=0.59℃
9	Radiated disturbance(30MHz-1000MHz)	U=4.8dB
10	Radiated disturbance(1GHz-6GHz)	U=4.9dB
11	Radiated disturbance(1GHz-18GHz)	U=5.0dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

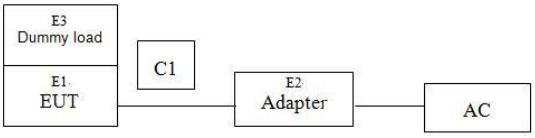
Product Name:	WIRELESS CHARGER
Model No.:	WS21005
Model Difference:	Only for different model name.
Serial No.:	N/A
Hardware version:	H1.0
Software version:	S1.0
Operation Frequency:	115kHz ~ 205KHz
Modulation type:	MSK
Antenna Type:	Inductive loop coil Antenna
Antenna gain:	0dBi
Power supply:	Input: 5V/2A, 9V/1.5A,Wireless Output: 5W/7.5W/10W

3.2 Test mode

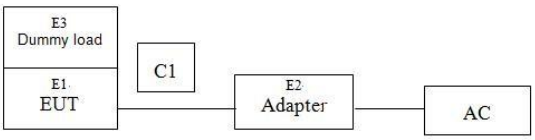
Transmitting mode	Keep the EUT in continuously transmitting mode
Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.	
Function Description: This is a multifunctional wireless charger with 5v1a and 9v1.5a, which can support the fast charging mode of mobile phone Mode 1: 5W; Mode 2: 7.5 W; Mode 3: 10W	

3.3 Block Diagram of EUT Configuration

Conducted Emission



Radiated Emission



3.4 Test Conditions

Temperature: 23~26℃

Relative Humidity: 54~63 %

3.5 Description Of Support Units (Conducted Mode)

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.	Series No.	Note
E1	WIRELESS CHARGER	N/A	WS21005	N/A	EUT
E2	Adapter	N/A	ZKT-002	N/A	Auxiliary
E3	cellphone	XIAOMI	MIX3S	N/A	Auxiliary

Item	Shielded Type	Ferrite Core	Length	Note
C1	NO	NO	1.0M	DC cable unshielded

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.
(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

3.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	9020A	MY45109572	Sep. 22, 2020	Oct.20,2021
2	Spectrum Analyzer (1GHz-40GHz)	Agilent	E4446A	100363	Sep. 22, 2020	Oct.20,2021
3	Test Receiver (9kHz-7GHz)	R&S	ESCI7	101169	Sep. 22, 2020	Oct.20,2021
4	Bilog Antenna (30MHz-1400MHz)	Schwarzbeck	VULB9168	00877	Sep. 22, 2020	Oct.20,2021
5	Horn Antenna (1GHz-18GHz)	SCHWARZBEC K	BBHA9120D	1541	Sep. 22, 2020	Oct.20,2021
6	Horn Antenna (18GHz-40GHz)	A.H. System	SAS-574	588	Sep. 22, 2020	Oct.20,2021
7	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	N/A	Sep. 22, 2020	Oct.20,2021
8	Amplifier (1GHz-40GHz)	全聚达	DLE-161	097	Sep. 22, 2020	Oct.20,2021
9	Loop Antenna (9KHz-30MHz)	SCHWARZBEC K	FMZB1519B	014	Sep. 22, 2020	Oct.20,2021
10	RF cables1 (9kHz-30MHz)	N/A	9kHz-30MHz	N/A	Sep. 22, 2020	Oct.20,2021
11	RF cables2 (30MHz-1GHz)	N/A	30MHz-1GHz	N/A	Sep. 22, 2020	Oct.20,2021
12	RF cables3 (1GHz-40GHz)	N/A	1GHz-40GHz	N/A	Sep. 22, 2020	Oct.20,2021
13	CMW500 Test	R&S	CMW500	106504	Sep. 22, 2020	Oct.20,2021
14	ESG Signal Generator	Agilent	E4421B	GB40051203	Sep. 22, 2020	Oct.20,2021
15	Signal Generator	Agilent	N5182A	MY47420215	Sep. 22, 2020	Oct.20,2021
16	D.C. Power Supply	LongWei	TPR-6405D	\	\	\
17	Software	Frad	EZ-EMC	FA-03A2 RE	\	\

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	Sep. 22, 2020	Oct.20,2021
2	LISN	CYBERTEK	EM5040A	E185040014 9	Sep. 22, 2020	Oct.20,2021
3	Test Cable	N/A	C01	N/A	Sep. 22, 2020	Oct.20,2021
4	Test Cable	N/A	C02	N/A	Sep. 22, 2020	Oct.20,2021
5	EMI Test Receiver	R&S	ESRP3	101946	Sep. 22, 2020	Oct.20,2021
6	Absorbing Clamp	DZ	ZN23201	N/A	Sep. 22, 2020	Oct.20,2021

4. CONDUCTED EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto

4.1.1 POWER LINE CONDUCTED EMISSION Limits

FREQUENCY (MHz)	Limit (dBuV)		Standard
	Quas-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

Note:

(1) *Decreases with the logarithm of the frequency.

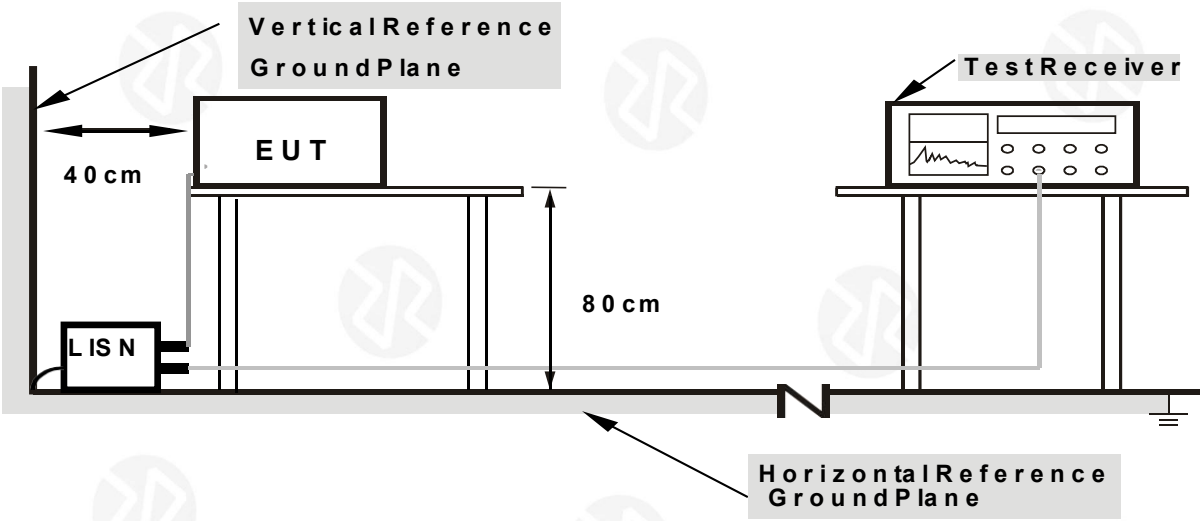
4.1.2 TEST PROCEDURE

a. 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.
b. 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.
c. 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.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



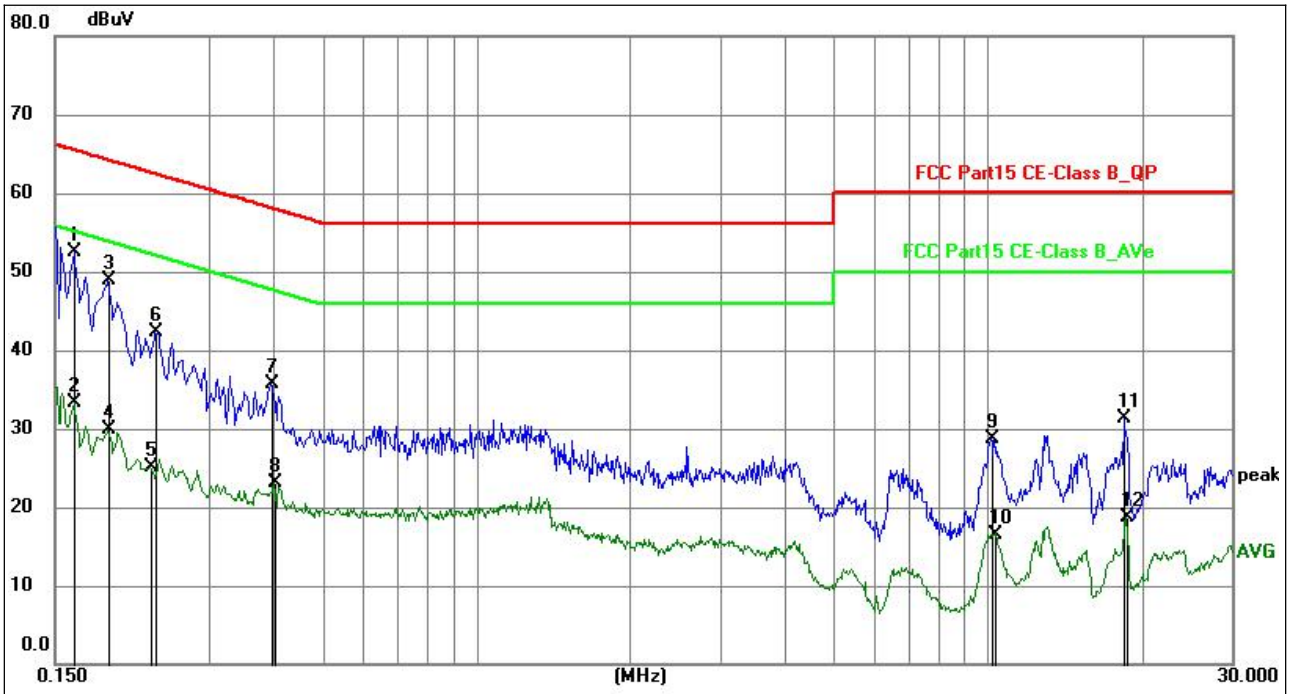
Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

4.1.5 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.

4.6 Test Result

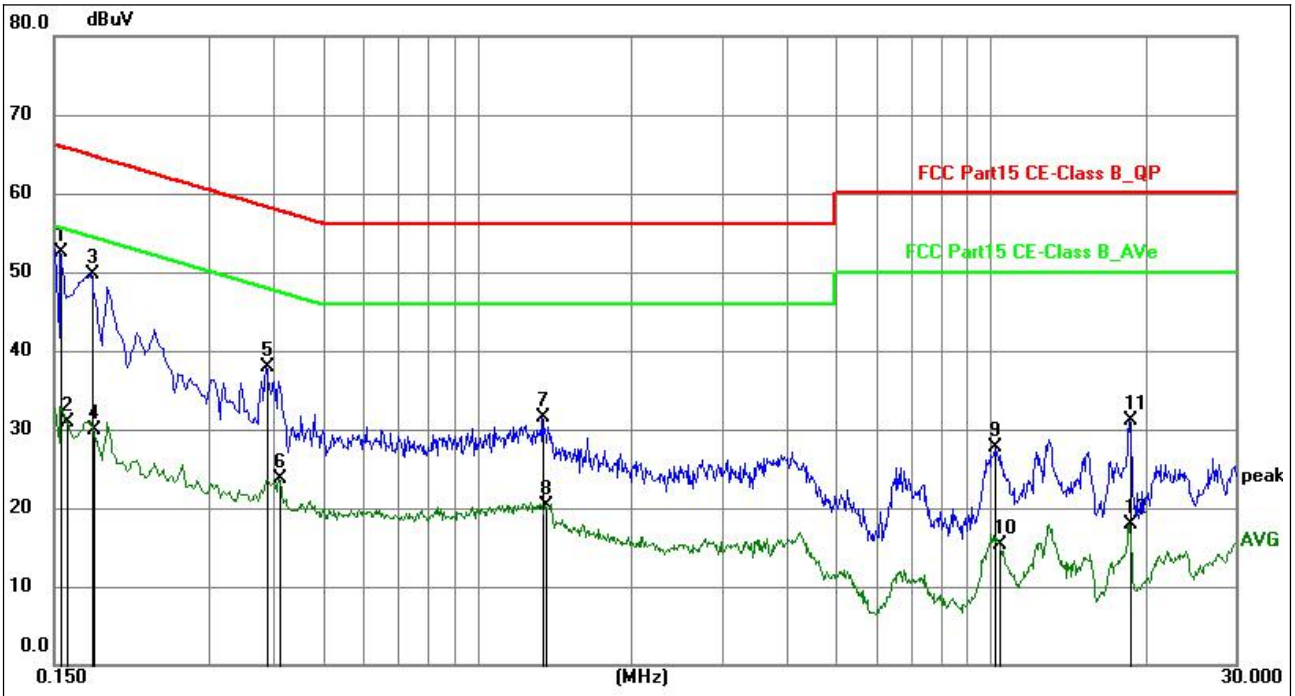
Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	L
Test Voltage :	AC 120V60Hz	Test Mode	Working



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1635	39.81	12.71	52.52	65.28	-12.76	QP	P	
2	0.1635	20.56	12.71	33.27	55.28	-22.01	AVG	P	
3	0.1905	36.81	12.13	48.94	64.01	-15.07	QP	P	
4	0.1905	17.81	12.13	29.94	54.01	-24.07	AVG	P	
5	0.2310	13.39	11.78	25.17	52.41	-27.24	AVG	P	
6	0.2355	30.50	11.75	42.25	62.25	-20.00	QP	P	
7	0.3975	24.61	11.01	35.62	57.91	-22.29	QP	P	
8	0.4020	12.13	10.99	23.12	47.81	-24.69	AVG	P	
9	10.1580	20.29	8.48	28.77	60.00	-31.23	QP	P	
10	10.3245	8.03	8.51	16.54	50.00	-33.46	AVG	P	
11	18.5235	21.58	9.65	31.23	60.00	-28.77	QP	P	
12	18.6315	9.05	9.67	18.72	50.00	-31.28	AVG	P	

Notes:
1.An initial pre-scan was performed on the line and neutral lines with peak detector.
2.Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3.Mesurement Level = Reading level + Correct Factor

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	N
Test Voltage :	AC 120V60Hz	Test Mode	Working



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1545	39.50	12.91	52.41	65.75	-13.34	QP	P	
2	0.1590	18.09	12.81	30.90	55.52	-24.62	AVG	P	
3	0.1770	37.24	12.42	49.66	64.63	-14.97	QP	P	
4	0.1787	17.61	12.39	30.00	54.55	-24.55	AVG	P	
5	0.3885	26.86	11.05	37.91	58.10	-20.19	QP	P	
6	0.4110	12.76	10.95	23.71	47.63	-23.92	AVG	P	
7	1.3425	21.06	10.35	31.41	56.00	-24.59	QP	P	
8	1.3560	10.05	10.35	20.40	46.00	-25.60	AVG	P	
9	10.2299	19.16	8.49	27.65	60.00	-32.35	QP	P	
10	10.4100	6.76	8.52	15.28	50.00	-34.72	AVG	P	
11	18.6765	21.47	9.67	31.14	60.00	-28.86	QP	P	
12	18.6765	8.17	9.67	17.84	50.00	-32.16	AVG	P	

Notes:
1.An initial pre-scan was performed on the line and neutral lines with peak detector.
2.Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3.Mesurement Level = Reading level + Correct Factor

5. RADIATED EMISSION MEASUREMENT

Test Requirement:	FCC Part15 C Section 15.209
Test Method:	ANSI C63.10:2013
Test Frequency Range:	9kHz to 1GHz
Test site:	Measurement Distance: 3m
Receiver setup:	

Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

5.1 Radiated Emission Limits

Limits for frequency below 30MHz

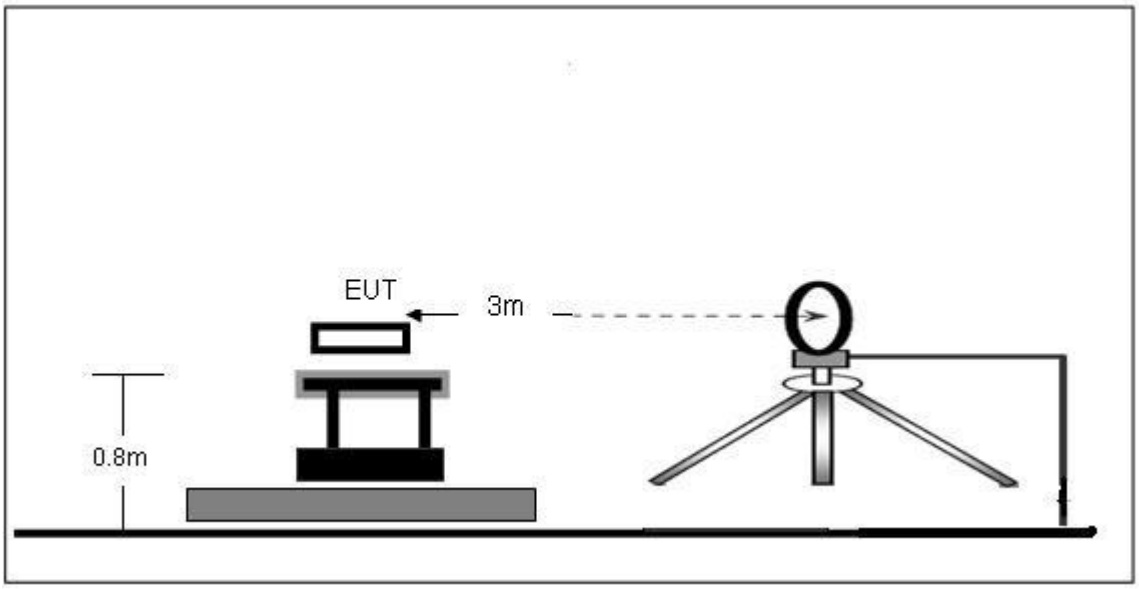
Frequency	Limit (uV/m)	Measurement Distance(m)	Remark
0.009-0.490	2400/F(kHz)	300	Quasi-peak Value
0.490-1.705	24000/F(kHz)	30	Quasi-peak Value
1.705-30	30	30	Quasi-peak Value

Limits for frequency Above 30MHz

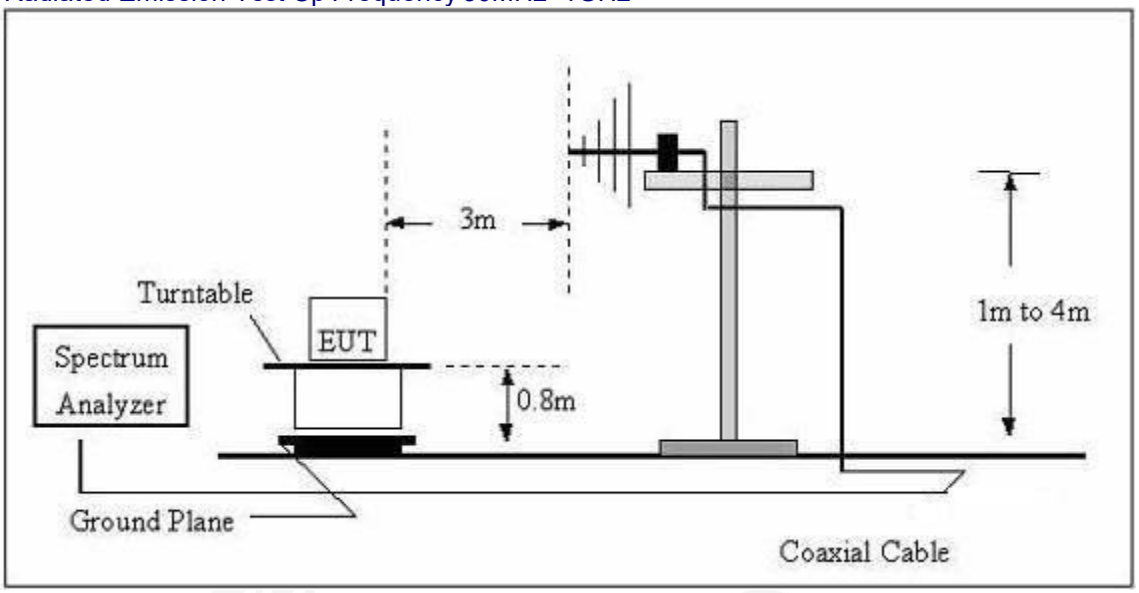
Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.00	Quasi-peak Value
88MHz-216MHz	43.50	Quasi-peak Value
216MHz-960MHz	46.00	Quasi-peak Value
960MHz-1GHz	54.00	Quasi-peak Value
Above 1GHz	54.00	Average Value
	74.00	Peak Value

5.2 Anechoic Chamber Test Setup Diagram

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



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



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.205 limits.

5.3 Test Procedure

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna (calibrated by dipole antenna) are used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on measurement.

5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5 Test Result

Measurement data:

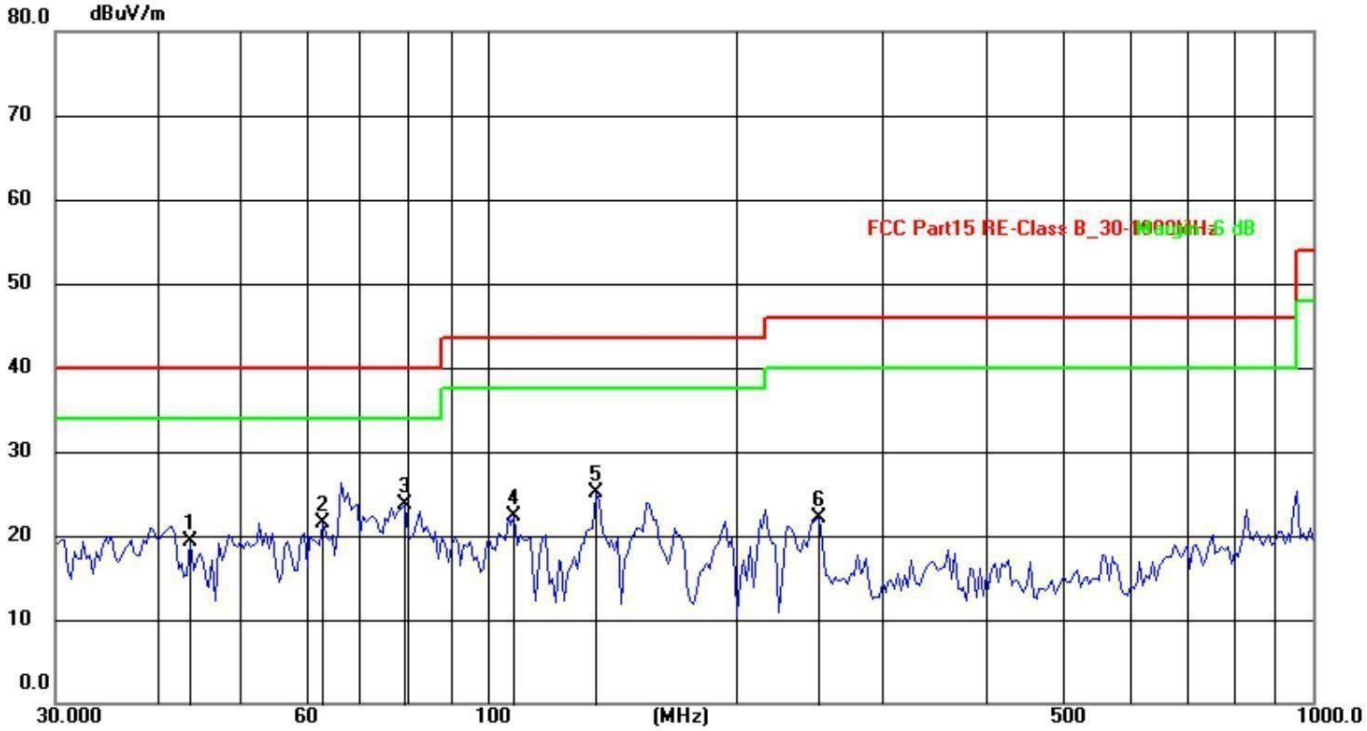
Note: Limit dBuV/m @3m = Limit dBuV/m @300m+ 80
Limit dBuV/m @3m = Limit dBuV/m @30m + 40

9 kHz~30 MHz

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(kHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
24.8000	39.40	20.15	59.55	139.72	-80.17	PK
24.8000	36.13	20.15	56.28	119.72	-63.44	AV
56.7000	50.62	20.33	70.95	132.53	-61.58	PK
56.7000	46.38	20.33	66.71	112.53	-45.82	AV
121.6000	68.25	20.55	88.80	125.91	-37.11	PK
121.6000	63.65	20.55	84.20	105.91	-21.71	AV
685.1000	31.12	20.64	51.76	70.89	-19.13	QP
965.6100	35.16	21.26	56.42	67.91	-11.49	QP
1222.3300	24.65	22.32	46.97	65.86	-18.89	QP

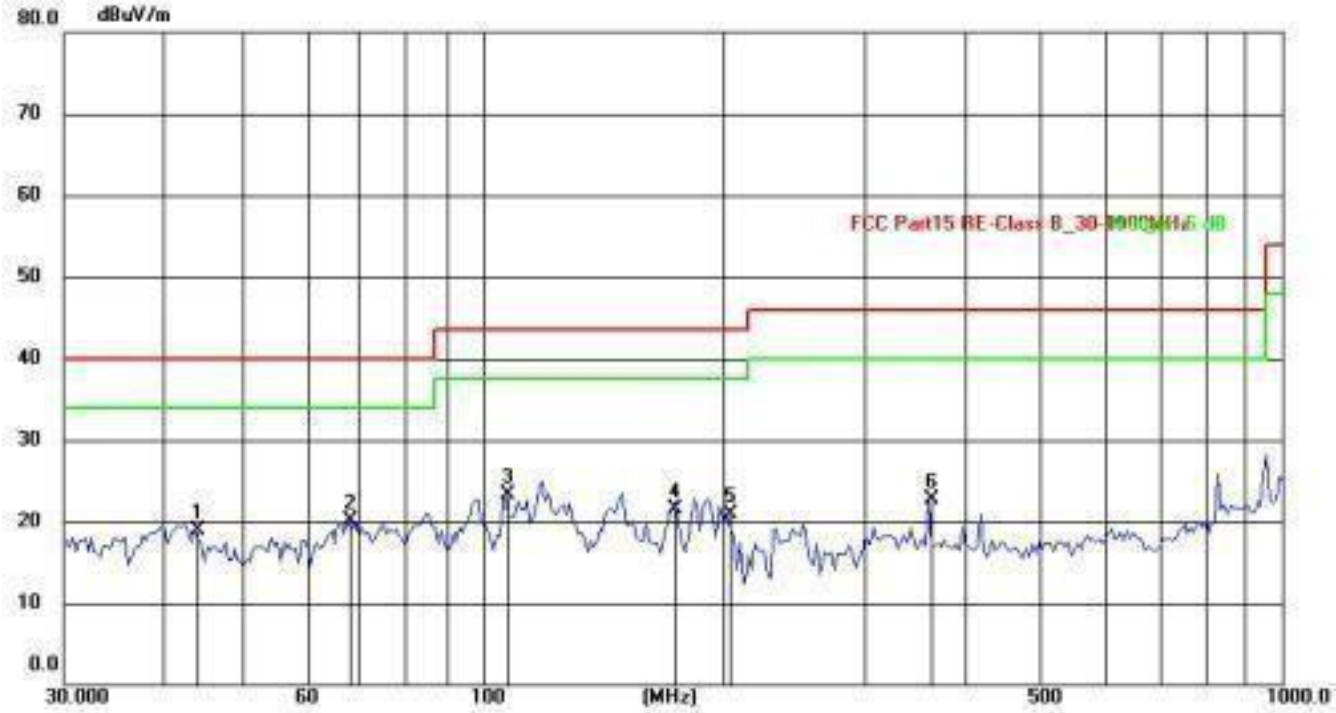
Note:
Pre-scan in the all of mode, the worst case in of was recorded.
Factor = antenna factor + cable loss – pre-amplifier.
Margin = Emission Level- Limit.

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC 9V		



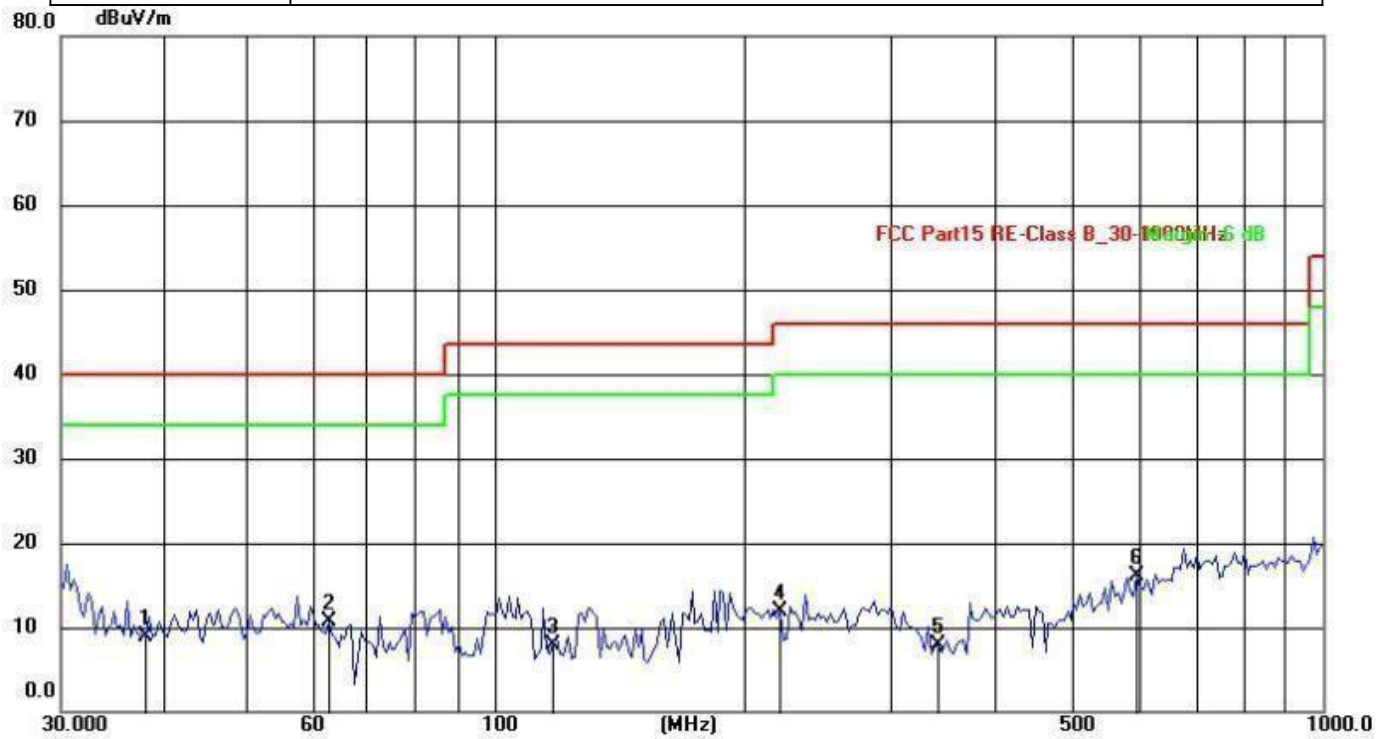
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	43.7351	33.32	-14.09	19.23	40.00	-20.77	QP
2	63.2023	36.55	-15.08	21.47	40.00	-18.53	QP
3	79.3816	43.11	-19.32	23.79	40.00	-16.21	QP
4	107.8877	41.77	-19.41	22.36	43.50	-21.14	QP
5	135.5061	42.76	-17.66	25.10	43.50	-18.40	QP
6	252.5050	39.46	-17.35	22.11	46.00	-23.89	QP

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Vertical
Test Voltage:	DC 9V		



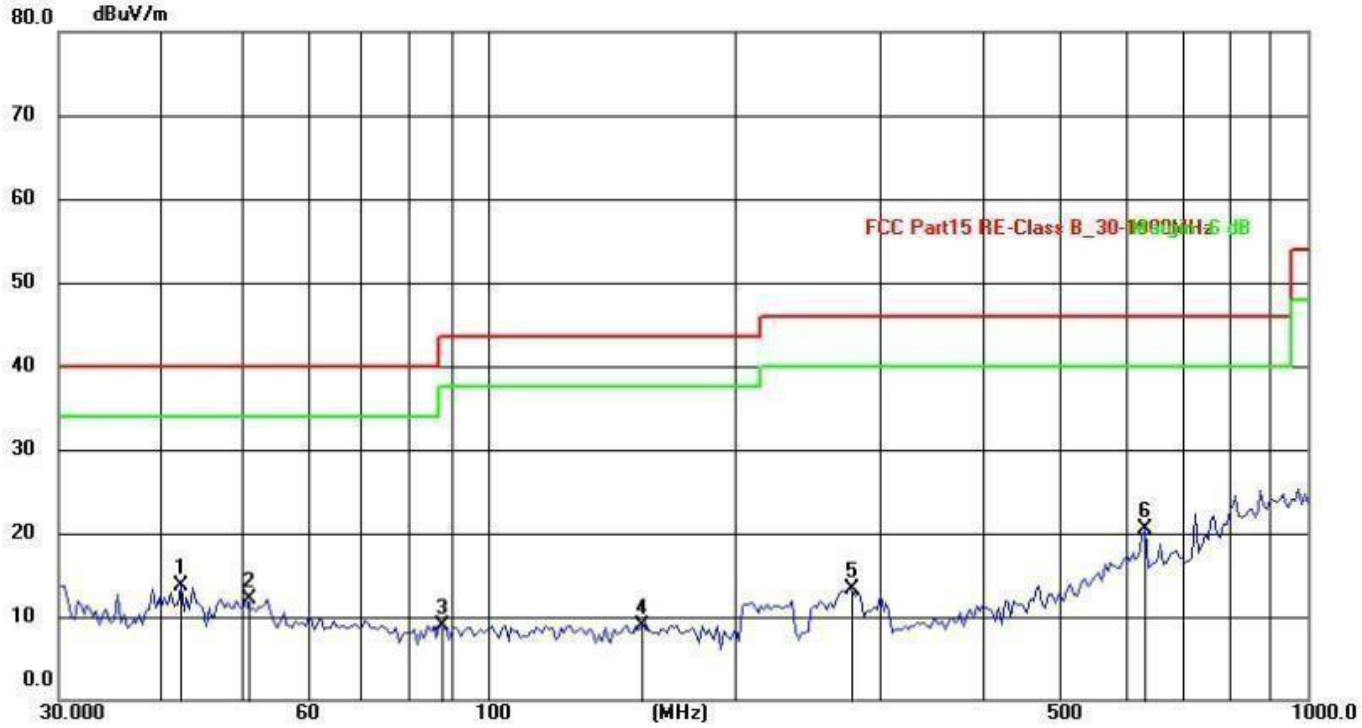
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	43.7352	35.89	-17.02	18.87	40.00	-21.13	QP
2	67.7939	39.24	-19.12	20.12	40.00	-19.88	QP
3	106.9461	44.57	-21.34	23.23	43.50	-20.27	QP
4	173.2051	42.15	-20.69	21.46	43.50	-22.04	QP
5	202.8104	42.58	-21.68	20.90	43.50	-22.60	QP
6	361.7139	41.02	-18.30	22.72	46.00	-23.28	QP

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	DC 5V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	38.0115	23.44	-14.50	8.94	40.00	-31.06	QP
2	63.2023	25.81	-15.08	10.73	40.00	-29.27	QP
3	117.7725	26.89	-18.89	8.00	43.50	-35.50	QP
4	221.3921	30.75	-18.90	11.85	46.00	-34.15	QP
5	343.1800	26.68	-18.81	7.87	46.00	-38.13	QP
6	596.1772	27.10	-10.93	16.17	46.00	-29.83	QP

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Vertical
Test Voltage:	DC 5V		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	42.2281	30.70	-16.96	13.74	40.00	-26.26	QP
2	50.7637	29.51	-17.36	12.15	40.00	-27.85	QP
3	87.4177	30.46	-21.59	8.87	40.00	-31.13	QP
4	154.5493	29.93	-20.93	9.00	43.50	-34.50	QP
5	275.6399	34.08	-20.86	13.22	46.00	-32.78	QP
6	633.9073	30.27	-9.73	20.54	46.00	-25.46	QP

Remarks:
1.Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2.The emission levels of other frequencies are very lower than the limit and not show in test report.

6. BANDWIDTH TEST

1. Set RBW = 3 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

TEST SETUP

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa		

Frequency (KHz)	20dB bandwidth (KHz)	99% bandwidth (KHz)	Result
144.6	20.00	18.220	Pass

7. TEST SETUP PHOTO

Reference to the appendix I for details.

8. EUT CONSTRUCTIONAL DETAILS

Reference to the appendix II for details.

※※※※※ **END OF REPORT** ※※※※※