FCC TEST REPORT
FCC ID:2BAWT-F16

Report Number:	**ZKT-241030L14183E**
Date of Test:	Oct. 09, 2024 to Oct. 23, 2024
Date of issue:	Oct. 23, 2024
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 :	**Shenzhen Aibaofeng Electronic Technology Co., Ltd.**
Address :	South of 3rd Floor, Building B7, Xiufeng Industrial Zone, Buji Street, Longgang District, Shenzhen
Manufacturer's name :	**Shenzhen Aibaofeng Electronic Technology Co., Ltd.**
Address :	South of 3rd Floor, Building B7, Xiufeng Industrial Zone, Buji Street, Longgang District, Shenzhen
Test specification:	
Standard:	FCC CFR Title 47 Part 15 Subpart C
Test procedure:	/
Non-standard test method :	N/A

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.
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Product name:	**3-in-1 Car Wireless Charging**
Trademark :	/
Model/Type reference:	F16, F16S
Model Difference:	F16 is tested model, other models are derivative models .The models are identical in circuit, only different on the model names. So the test data of F16 can represent the remaining models.
Ratings:	Input: 9 V⎓2.5 A Outout1: 15W Max (Wireless phone) Output2: 5W Max (TWS) Output3: 2.5W Max (Watch)

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

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1. VERSION

Report No.	Version	Description	Approved
ZKT-241030L14183E	Rev.01	Initial issue of report	Oct. 23, 2024

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	Conducted Emission Test	±1.38dB
2	RF conducted power	±0.16dB
3	Conducted spurious emissions	±0.21dB
4	All radiated emissions (9k-30MHz)	±4.68dB
5	All radiated emissions (<1G)	±4.68dB
6	All radiated emissions (>1G)	±4.89dB
7	Temperature	±0.5°C
8	Humidity	±2%
9	Occupied Bandwidth	±4.96%

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

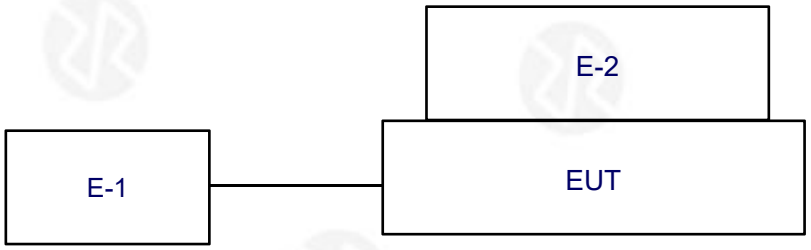
Product Name:	3-in-1 Car Wireless Charging
Test Model No.:	F16
Hardware version:	V1.0
Software version:	V1.0
Operation Frequency:	Wireless phone: 110.2-205KHz TWS: 110.2-205KHz Watch: 110.2-350KHz
Modulation type:	MSK
Antenna Type:	Coil Antenna
Antenna gain:	0dBi
Remark: All full load, half load, and no-load tests have been conducted in each mode, only the worst-case was recorded in the report. Mode 8 full load is the worst mode.	

3.2 Test mode

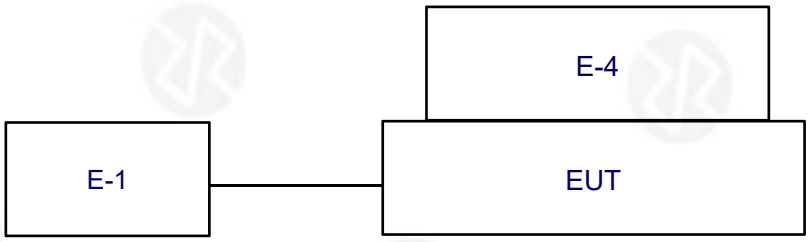
Test Modes:	
Mode 1	AC Adapter+Wireless charging mode (Wireless phone: 15W)
Mode 2	AC Adapter+Wireless charging mode (Wireless phone: 10W)
Mode 3	AC Adapter+Wireless charging mode (Wireless phone: 5W)
Mode 4	AC Adapter+Wireless charging mode (TWS: 5W)
Mode 5	AC Adapter+Wireless charging mode (Watch: 2.5W)
Mode 6	AC Adapter+Wireless phone (15W)+Watch (2.5W)
Mode 7	AC Adapter+Wireless phone (15W)+TWS (5W)
Mode 8	AC Adapter+Wireless phone (15W)+TWS (5W)+Watch (2.5W)
Note: All modes and coil were tested, only the worst-case was recorded in the report. Mode 8 is the worst mode.	

3.3 Block Diagram of EUT Configuration

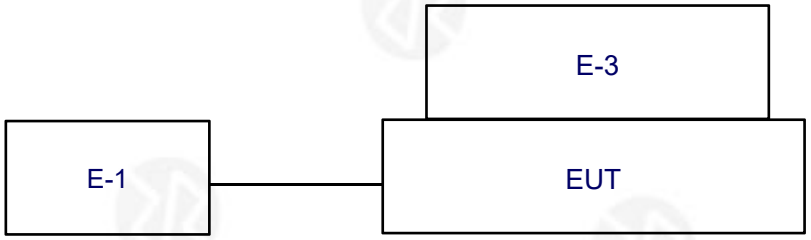
Mode 1 and 2 and 3



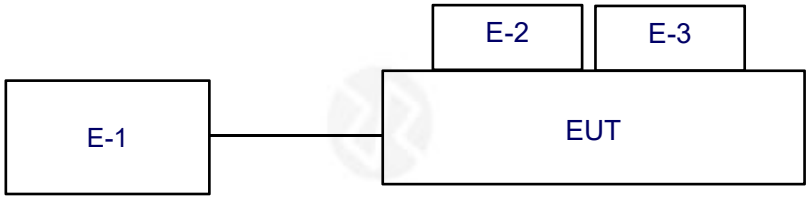
Mode 4



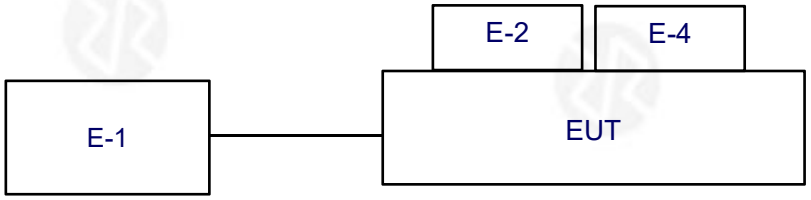
Mode 5



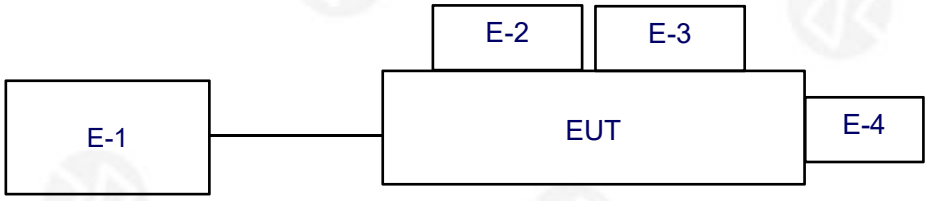
Mode 6



Mode 7



Mode 8



3.4 Test Conditions

Temperature: 25.6℃

Relative Humidity: 54.3 %

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
E-1	Adapter	HUAWEI	HW-059200CHQ	/	AE
E-2	Wireless charging load	/	EESON	/	AE
E-3	Wired headset	Hege Technology Co.,Ltd	EA125	Wired headset	AE
E-4	Smart watch	Hege Technology Co.,Ltd	SW506	AE	AE

Item	Shielded Type	Ferrite Core	Length	Note

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 emissions& Radio Test equipment

Item	Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	Spectrum Analyzer (9kHz-26.5GHz)	KEYSIGHT	9020A	MY55370835	A.17.05	Nov. 02, 2023	Nov. 01, 2024
2	Spectrum Analyzer (10kHz-39.9GHz)	R&S	FSV40-N	100363	1.71 SP2	Nov. 02, 2023	Nov. 01, 2024
3	EMI Test Receiver (9kHz-7GHz)	R&S	ESCI7	100969	4.32	Nov. 02, 2023	Nov. 01, 2024
4	Bilog Antenna (30MHz-1500MHz)	Schwarzbeck	VULB9168	N/A	N/A	Nov. 13, 2023	Nov. 12, 2024
5	Horn Antenna (1GHz-18GHz)	Agilent	AH-118	071145	N/A	Nov. 13, 2023	Nov. 12, 2024
6	Horn Antenna (15GHz-40GHz)	A.H.System	SAS-574	588	N/A	Nov. 13, 2023	Nov. 12, 2024
7	Loop Antenna	TESEQ	HLA6121	58357	N/A	Nov. 16, 2023	Nov. 15, 2024
8	Amplifier (30-1000MHz)	EM Electronics	EM330 Amplifier	60747	N/A	Nov. 02, 2023	Nov. 01, 2024
9	Amplifier (1GHz-26.5GHz)	HuiPu	8449B	3008A00315	N/A	Nov. 02, 2023	Nov. 01, 2024
10	Amplifier (500MHz-40GHz)	QuanJuDa	DLE-161	097	N/A	Nov. 02, 2023	Nov. 01, 2024
11	Test Cable	N/A	R-01	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
12	Test Cable	N/A	R-02	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
13	Test Cable	N/A	R-03	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
14	Test Cable	N/A	RF-01	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
15	Test Cable	N/A	RF-02	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
16	Test Cable	N/A	RF-03	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
17	ESG Signal Generator	Agilent	E4421B	N/A	B.03.84	Nov. 02, 2023	Nov. 01, 2024
18	Signal Generator	Agilent	N5182A	N/A	A.01.87	Nov. 02, 2023	Nov. 01, 2024
19	Magnetic Field Probe Tester	Narda	ELT-400	0-0344	N/A	Nov. 16, 2023	Nov. 15, 2024
20	Wideband Radio Communication Test	R&S	CMW500	106504	V 3.7.22	Nov. 02, 2023	Nov. 01, 2024
21	MWRF Power Meter Test system	MW	MW100-RFCB	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
22	D.C. Power Supply	LongWei	TPR-6405D	N/A	N/A	\	\
23	EMC Software	Frad	EZ-EMC	Ver.EMC-CON 3A1.1	N/A	\	\
24	RF Software	MW	MTS8310	V2.0.0.0	N/A	\	\
25	Turntable	MF	MF-7802BS	N/A	N/A	\	\
26	Antenna tower	MF	MF-7802BS	N/A	N/A	\	\

Conducted emissions Test

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Firmware Version	Last calibration	Calibrated until
1	LISN	R&S	ENV216	101471	N/A	Nov. 14, 2023	Nov. 13, 2024
2	LISN	CYBERTEK	EM5040A	E1850400149	N/A	Nov. 02, 2023	Nov. 01, 2024
3	Test Cable	N/A	C-01	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
4	Test Cable	N/A	C-02	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
5	Test Cable	N/A	C-03	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
6	EMI Test Receiver	R&S	ESCI3	101393	4.42 SP3	Nov. 02, 2023	Nov. 01, 2024
7	Triple-Loop Antenna	N/A	RF300	N/A	N/A	Nov. 02, 2023	Nov. 01, 2024
8	Absorbing Clamp	DZ	ZN23201	15034	N/A	Nov. 07, 2023	Nov. 06, 2024
9	EMC Software	Frad	EZ-EMC	Ver.EMC-CON 3A1.1	N/A	\	\

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
	QP	AVG	
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.

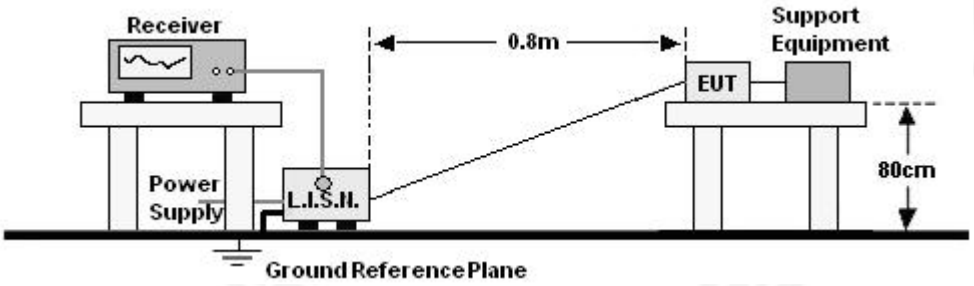
4.1.2 TEST PROCEDURE

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

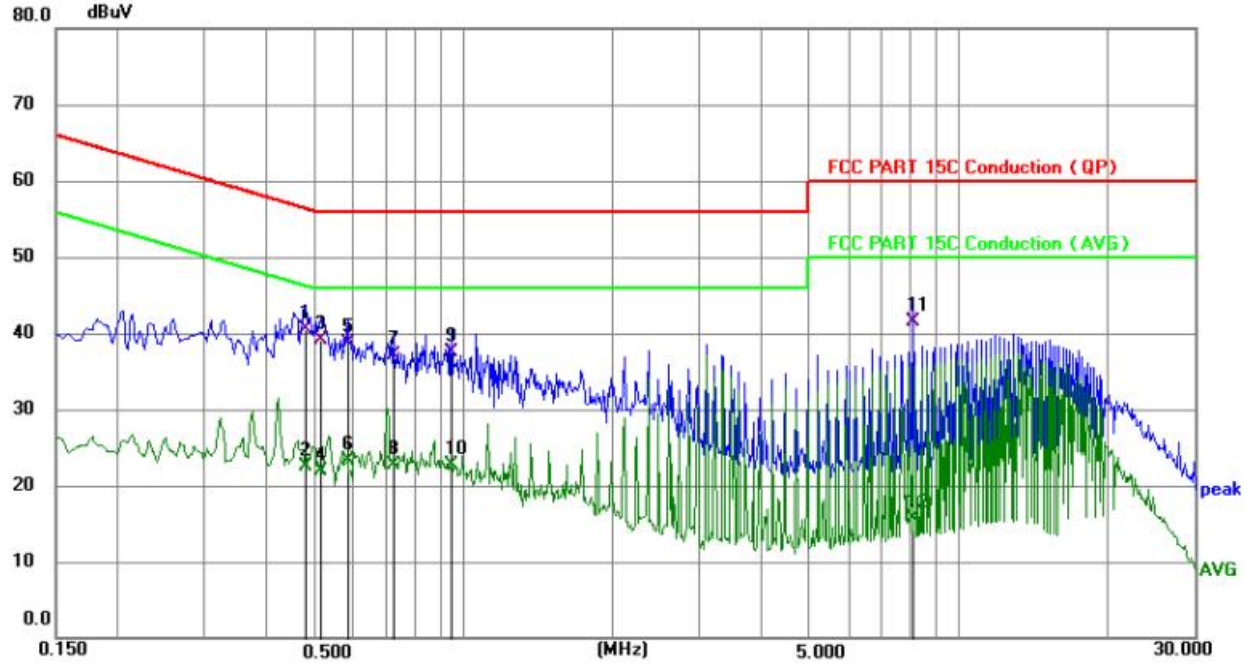


4.1.5 EUT OPERATING CONDITIONS

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.

4.1.6 Test Result

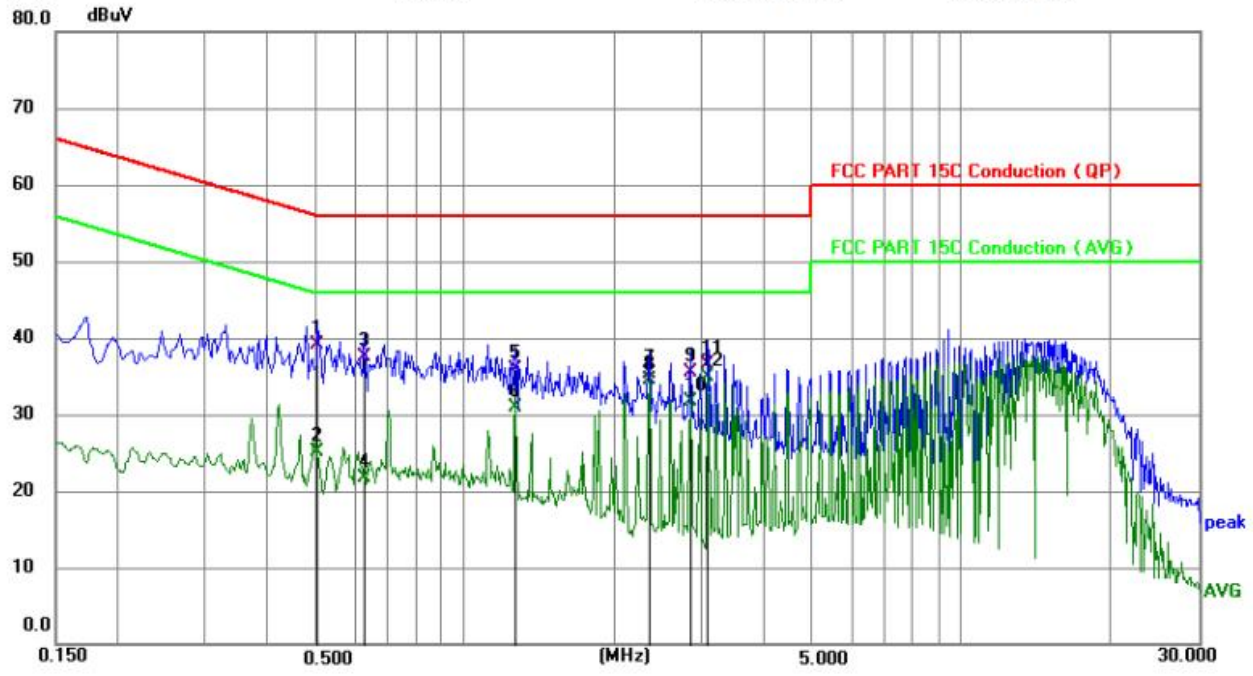
Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	L
Test Voltage:	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.4786	30.49	10.01	40.50	56.36	-15.86	QP	P	
2	0.4786	12.48	10.01	22.49	46.36	-23.87	AVG	P	
3	0.5155	29.17	10.02	39.19	56.00	-16.81	QP	P	
4	0.5155	11.86	10.02	21.88	46.00	-24.12	AVG	P	
5	0.5823	28.68	10.03	38.71	56.00	-17.29	QP	P	
6	0.5823	13.26	10.03	23.29	46.00	-22.71	AVG	P	
7	0.7198	27.04	10.04	37.08	56.00	-18.92	QP	P	
8	0.7198	12.72	10.04	22.76	46.00	-23.24	AVG	P	
9	0.9431	27.35	10.06	37.41	56.00	-18.59	QP	P	
10	0.9431	12.64	10.06	22.70	46.00	-23.30	AVG	P	
11	8.0624	31.38	10.09	41.47	60.00	-18.53	QP	P	
12	8.0624	5.64	10.09	15.73	50.00	-34.27	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
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	N
Test Voltage:	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.5054	29.01	10.02	39.03	56.00	-16.97	QP	P	
2	0.5054	15.01	10.02	25.03	46.00	-20.97	AVG	P	
3	0.6270	27.50	10.03	37.53	56.00	-18.47	QP	P	
4	0.6270	11.63	10.03	21.66	46.00	-24.34	AVG	P	
5	1.2660	25.79	10.06	35.85	56.00	-20.15	QP	P	
6	1.2660	20.77	10.06	30.83	46.00	-15.17	AVG	P	
7	2.3550	25.26	10.07	35.33	56.00	-20.67	QP	P	
8	2.3550	24.36	10.07	34.43	46.00	-11.57	AVG	P	
9	2.8410	25.40	10.07	35.47	56.00	-20.53	QP	P	
10	2.8410	21.63	10.07	31.70	46.00	-14.30	AVG	P	
11	3.0884	26.46	10.07	36.53	56.00	-19.47	QP	P	
12 *	3.0884	24.81	10.07	34.88	46.00	-11.12	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
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

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

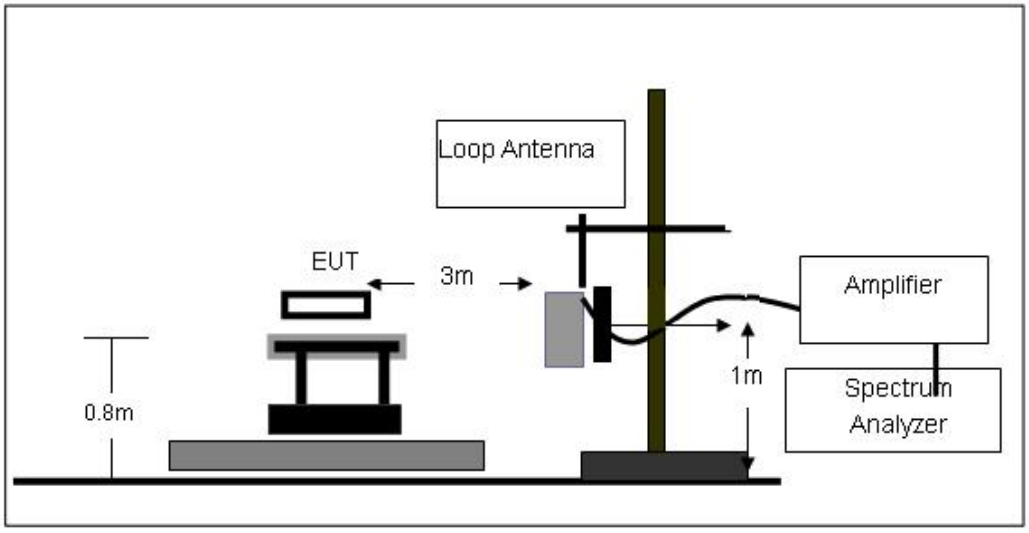
Frequency	Limit (uV/m)	Measurement Distance(m)	Remark
0.009-0.490	2400/F(kHz)	300	Peak Value
0.490-1.705	24000/F(kHz)	30	Quasi-peak Value
1.705-30	30	30	Quasi-peak Value

Limits for frequency Above 30MHz

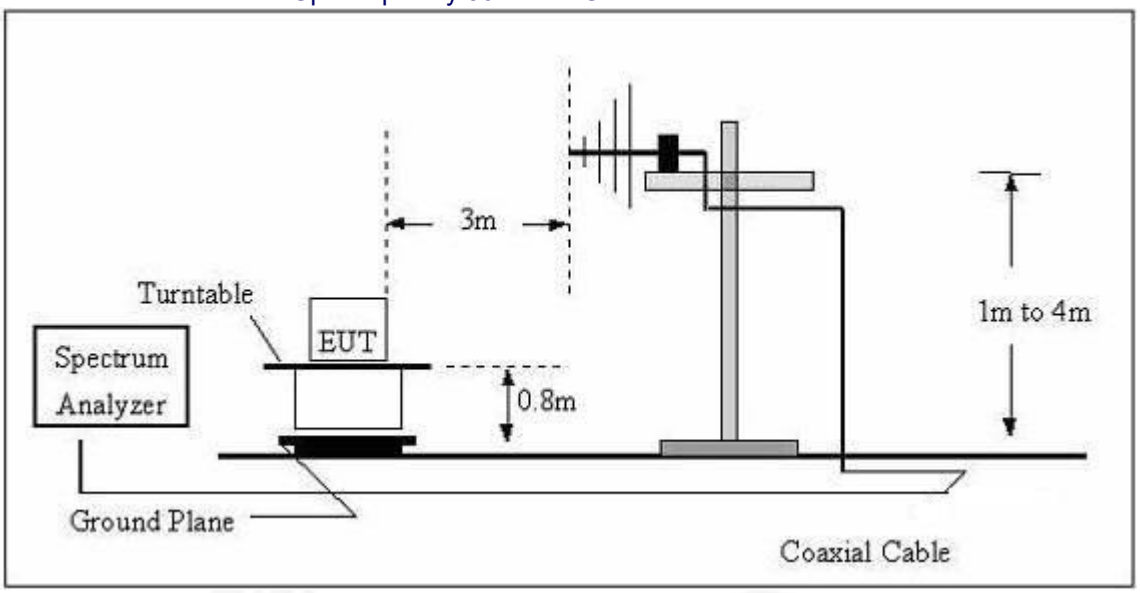
Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.00	Quasi-peak Value
88MHz-216MHz	43.50	Quasi-peak Value
216MHz-960MHz	46.00	Quasi-peak Value
960MHz-1GHz	54.00	Quasi-peak Value
Above 1GHz	54.00	Average Value
	74.00	Peak Value

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

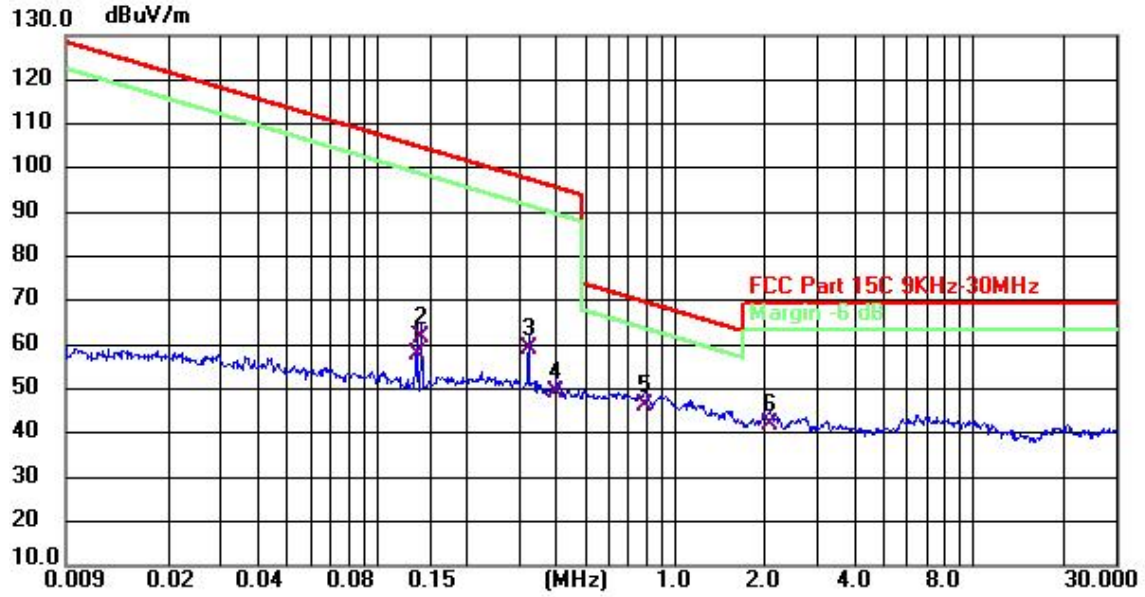
No deviation

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

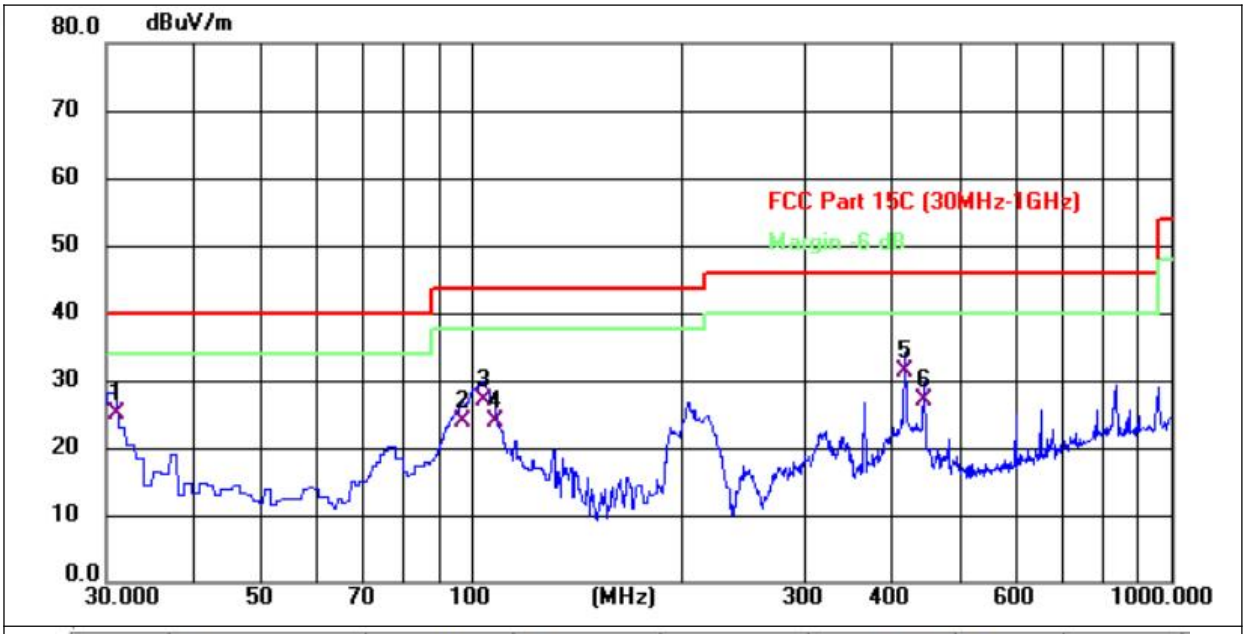


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.135	60.52	0.16	60.68	105.00	-44.32	Peak
2	0.141	64.36	0.16	64.52	104.63	-40.11	Peak
3	0.322	61.47	0.77	62.24	97.45	-35.21	Peak
4	0.398	51.22	0.92	52.14	95.61	-43.47	Peak
5 *	0.792	44.62	1.69	46.31	69.63	-23.32	QP
6	2.080	37.62	4.32	41.94	69.54	-27.60	QP

Note:
Pre-scan in the all of mode, the worst case in of was recorded.
Factor = antenna factor + cable loss – pre-amplifier.
Emission Level = Meter Reading - Factor
Margin = Emission Level- Limit.
The amplitude of emissions which are attenuated by more than 20db below the permissible value has no need to be reported.

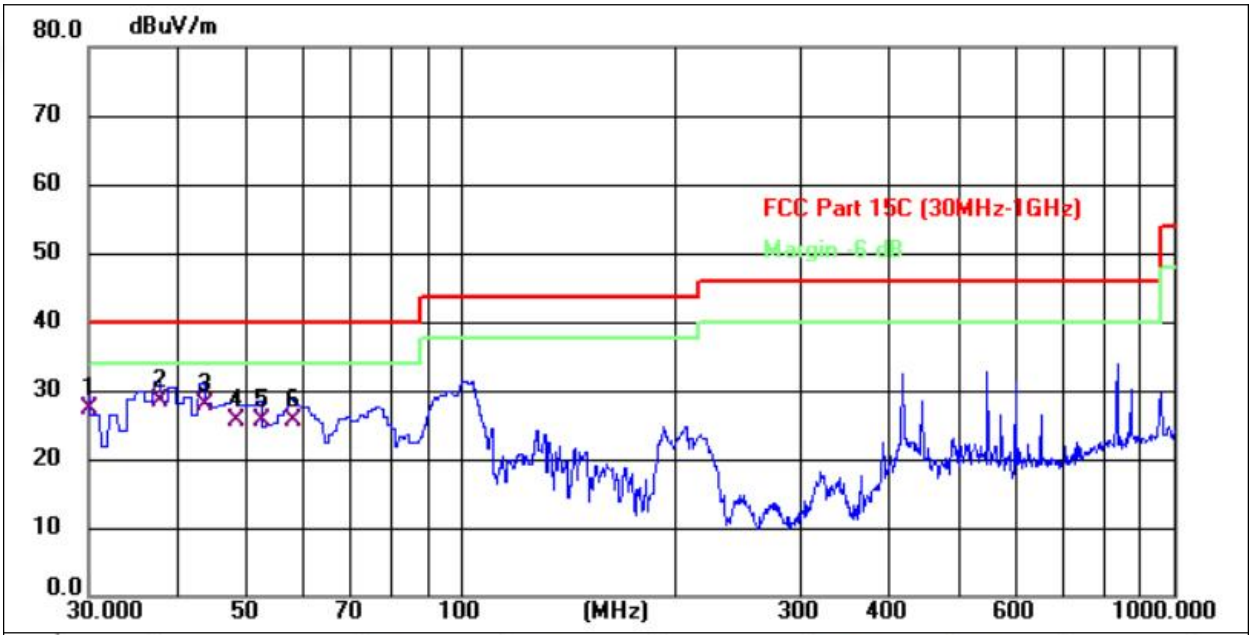
30MHz-1GHz

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101 kPa	Polarization:	Horizontal
Test Voltage:	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.970	37.96	-12.84	25.12	40.00	-14.88	QP
2	96.930	42.82	-18.84	23.98	43.50	-19.52	QP
3	103.720	45.96	-19.02	26.94	43.50	-16.56	QP
4	107.600	42.71	-18.98	23.73	43.50	-19.77	QP
5 *	416.060	43.26	-12.07	31.19	46.00	-14.81	QP
6	442.250	38.40	-11.44	26.96	46.00	-19.04	QP

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101kPa	Polarization:	Vertical
Test Voltage:	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.000	40.01	-12.84	27.17	40.00	-12.83	QP
2 *	37.760	41.13	-12.84	28.29	40.00	-11.71	QP
3	43.580	41.80	-13.82	27.98	40.00	-12.02	QP
4	48.430	40.62	-15.12	25.50	40.00	-14.50	QP
5	52.310	41.17	-15.73	25.44	40.00	-14.56	QP
6	58.130	41.81	-16.15	25.66	40.00	-14.34	QP

Remarks:
1. Factor = Antenna Factor + Cable Loss – Preamplifier Factor
2. Level = Reading + Factor
3. Margin = Emission Level- Limit.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.

6. BANDWIDTH TEST

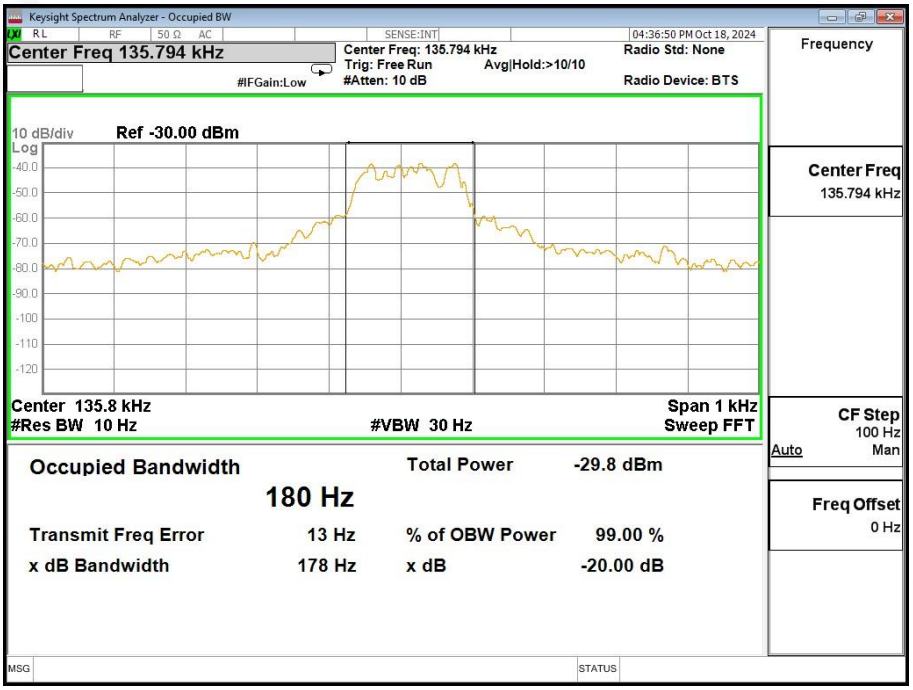
1. Set RBW = 10 Hz for 1%-5%OBW.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

TEST SETUP

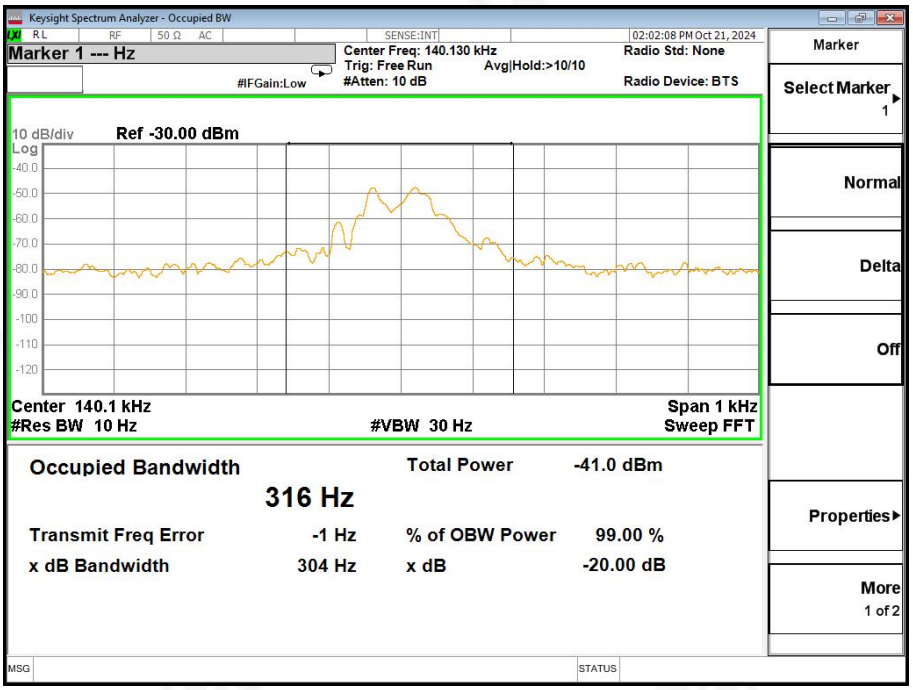
Temperature：	25.7 ℃	Relative Humidity：	55%
Pressure：	101kPa		

	Frequency (KHz)	20dB bandwidth (KHz)	Result
Wireless phone Antenna	135.8	0.178	Pass
TWS Antenna	140.1	0.304	Pass
Watch Antenna	322.2	0.223	Pass

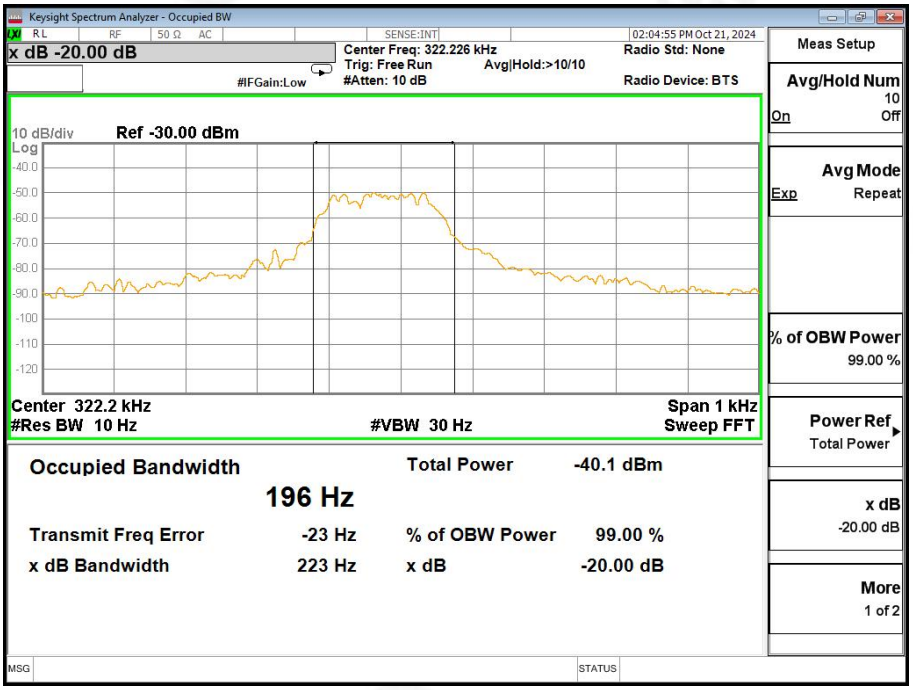
Wireless phone Antenna



TWS Antenna



Watch Antenna



ANTENNA REQUIREMENT

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
EUT Antenna:	
The antenna is Coil Antenna, the best case gain of the antennas is 0dBi, reference to the appendix II for details	

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 ※※※※※