



FCC RADIO TEST REPORT

Applicant : Cooler Master Technology Inc.
Address : 8F., No. 788-1, Zhongzheng Rd., Zhonghe Dist., New Taipei City
Equipment : Gaming Satellite
Model No. : GS750
Trademark : Cooler Master
FCC ID : 2AR8X-GS750

I HEREBY CERTIFY THAT :

The sample was received on Apr. 02, 2019 and the test items were conducted during Apr. 18, 2019 at Cerpass Technology (Suzhou) Co., Ltd. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology (Suzhou) Co., Ltd., the test report shall not be reproduced except in full.

Approved by:

Miro Chueh
EMC/RF Manager

Laboratory Accreditation:

Cerpass Technology Corporation Test Laboratory



TAF LAB Code: 1439

Cerpass Technology (SuZhou) Co., Ltd.



A2LA LAB Code: 4981.01



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History of this test report

■ ORIGINAL

Additional attachment as following record:



1. Report of Measurements and Examinations

1.1 List of Measurements and Examinations

FCC CFR Title 47 Part 15 Subpart C Section 15.209

FCC Rule	Description of Test	Result
§ 15.203	. Antenna Requirement	Pass
§ 15.207(a)	. Conducted Emission	Pass
§ 15.209(a)	. Radiated Emission	Pass



2. Test Configuration of Equipment under Test

2.1 Feature of Equipment under Test

Product	Gaming Satellite
Test Model	GS750
Frequency Range	127.4KHz~128KHz
Antenna Type	Loop antenna
Modulation Type	MSK
Power Rating	Input: 12V 1.5A Output: 9V 1.1A
Adapter Spec.	Model:2ABB018F US Input: 100-240V~50/60Hz 0.6A Output: 12V 1.5A

Note: The EUT is a headset stand With Qi Wireless Charging, USB Hub, and Onboard 7.1 Surround Sound; It could support the following operating mode and frequency band: 127.4KHz~ 128KHz. For more details, please refer to the User's manual of the EUT.

2.2 Carrier Frequency of Channels

Channel	Frequency (KHz)
00	127.4
*01	127.7
02	128.0

Note: Channels marked * are selected to perform test.

2.3 Description of the test mode

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.

The following test mode was performed for conduction and radiation test:

Test Mode 1: TX+ Wireless Charging

2.4 Description of Test System

No	Device	Manufacturer	Model No.	Description
1	LOAD	N/A	9 Ω	N/A
2	Adapter	CWT	2ABB018F	N/A

Use Cable:

No.	Cable	Quantity	Description
1	DC Cable	1	1.2m Non Shielding



2.5 General Information of Test

<input type="checkbox"/>	Test Site	Cerpass Technology Corporation Test Laboratory Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881 Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C. Tel: +886-2-2663-8582
	FCC	TW1079, TW1061, TW1439
<input checked="" type="checkbox"/>	IC	4934E-1, 4934E-2
	VCCI	T-2205 for Telecommunication Test C-4663 for Conducted emission test R-4399, R-4218 for Radiated emission test G-10812, G-10813 for radiated disturbance above 1GHz
<input checked="" type="checkbox"/>	Test Site	Cerpass Technology (Suzhou) Co.,Ltd Address: No.66, Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China Tel: +86-512-6917-5888 Fax: +86-512-6917-5666
	CNAS	L5515
<input checked="" type="checkbox"/>	FCC	CN1243
	A2LA	4981.01
<input checked="" type="checkbox"/>	IC	7290A-1, 7290A-2
	VCCI	T-1945 for Telecommunication Test C-2919 for Conducted emission test R-2670 for Radiated emission test G-227 for radiated disturbance above 1GHz

2.6 Measurement Uncertainty

Measurement Item	Measurement Uncertainty
Conducted Emission	±2.71 dB
Radiation test (10m) below 1GHz	Vertical : ±3.89 dB
	Horizontal: ±4.11 dB
Radiation test (3m) below 1GHz	Vertical : ±4.11 dB
	Horizontal: ±4.10 dB



3. Test Equipment and Ancillaries Used for Tests

Instrument/Ancillary	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date.
Test Receiver	R&S	ESCI	100565	2018.07.18	2019.07.17
AMN	R&S	ESH2-Z5	100182	2018.08.25	2019.08.24
LISN	FCC	FCC-LISN-50-200-2-02	112087	2018.08.25	2019.08.24
LISN	SCHWARZBECK	NSLK 8127	8127-920	2018.08.25	2019.08.24
LISN	R&S	ENV216	100325	2018.08.25	2019.08.24
Pulse Limiter	R&S	ESH3-Z2	100529	2019.03.11	2020.03.10
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-004	2019.03.17	2020.03.16
EZ-EMC	Fala	Ver CT3A1	N/A	N/A	N/A
EMI Test Receiver	R&S	ESCI	101183	2018.07.05	2019.07.04
Preamplifier	songyi	EM330	60618	2019.03.11	2020.03.10
Preamplifier	HP	8447F	3113A05582	2019.03.11	2020.03.10
Bilog Antenna	Sunol Science	JB1	A072414-1	2018.07.07	2019.07.06
Loop Antenna	R&S	HFH2-Z2	100150	2019.03.11	2020.03.10
Temperature/ Humidity Meter	Zhicheng	ZC1-11	CEP-TH-002	2019.03.17	2020.03.16
EZ-EMC	Fala	Ver CT3A1	N/A	N/A	N/A



4. Antenna Requirements

4.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, 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.

4.2 Antenna Construction

The antenna is Coil Antenna, and the antenna connector is de-signed with permanent attachment and on consideration of replacement. Please see the EUT photo for details.

4.3 Result

The EUT antenna is a Loop Antenna. It complies with the standard requirement.



5. Test of Conducted Emission

5.1 Test Limit

According to §15.207: For all the consumer devices which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

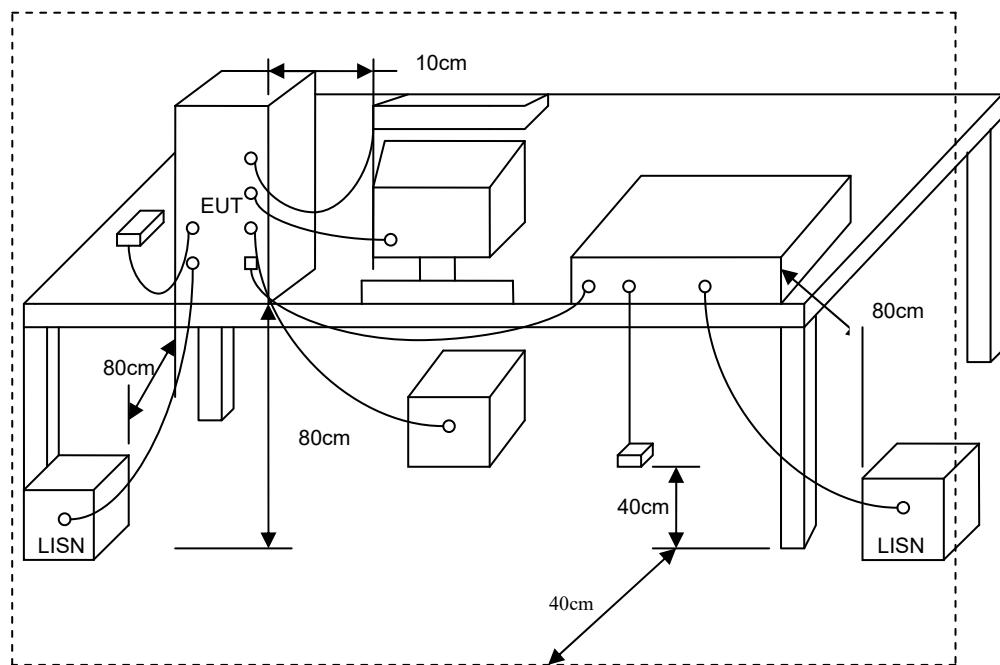
Remark: (1)*Decreases with the logarithm of the frequency.

(2)The lower limit shall apply at the transition frequency.

5.2 Test Procedures

- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connecting to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

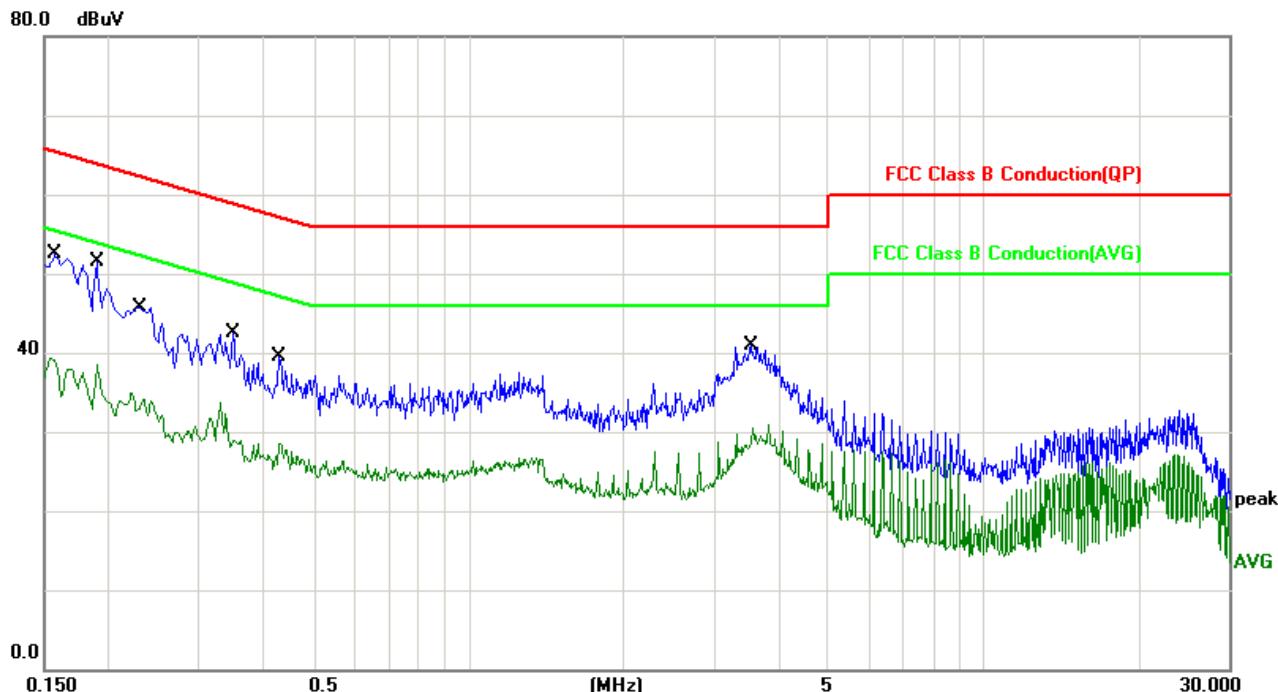
5.3 Typical Test Setup





5.4 Test Result and Data

Test Mode :	TX+ Wireless Charging	Phase :	Line
Temperature :	20°C	Humidity:	51%
Pressur(mbar) :	1002	Date:	Apr. 16, 2019

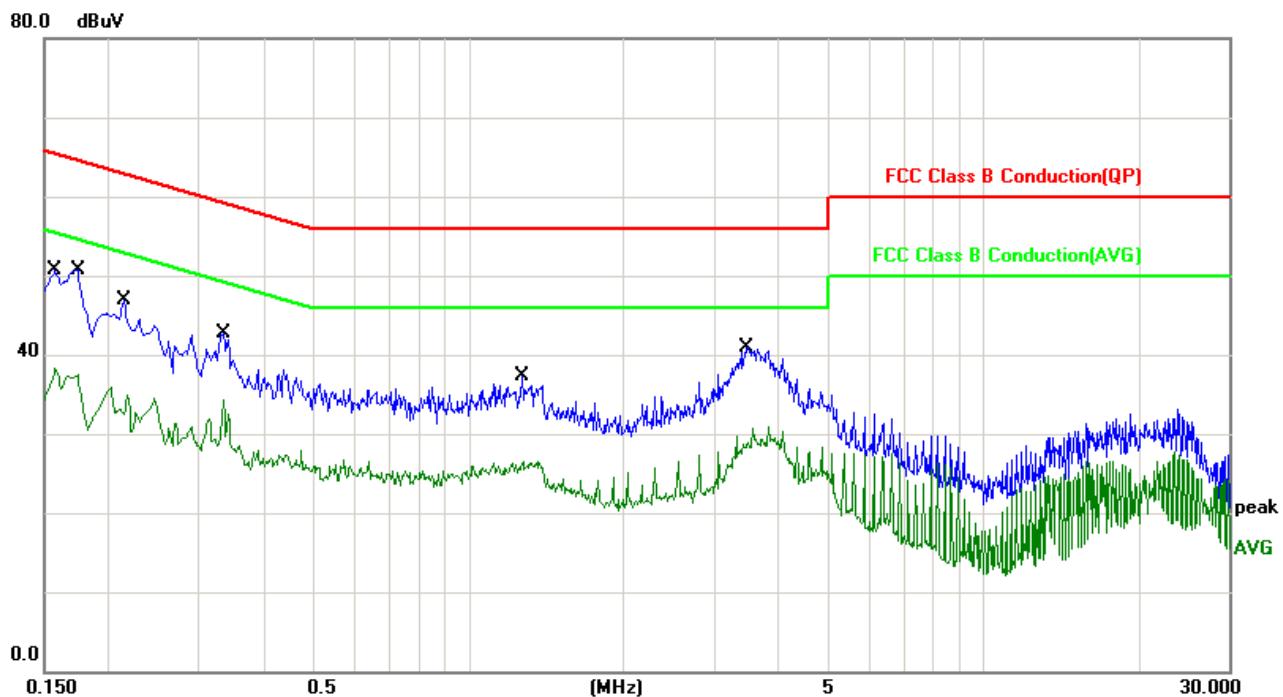


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	10.06	37.58	47.64	65.56	-17.92	QP
2	0.1580	10.06	26.31	36.37	55.56	-19.19	AVG
3	0.1900	10.06	36.51	46.57	64.03	-17.46	QP
4	0.1900	10.06	24.89	34.95	54.03	-19.08	AVG
5	0.2300	10.04	30.90	40.94	62.45	-21.51	QP
6	0.2300	10.04	23.34	33.38	52.45	-19.07	AVG
7	0.3500	9.97	25.76	35.73	58.96	-23.23	QP
8	0.3500	9.97	19.56	29.53	48.96	-19.43	AVG
9	0.4300	9.93	23.36	33.29	57.25	-23.96	QP
10	0.4300	9.93	17.13	27.06	47.25	-20.19	AVG
11	3.5420	10.64	24.57	35.21	56.00	-20.79	QP
12	3.5420	10.64	17.91	28.55	46.00	-17.45	AVG

Note: Measurement Level = Reading Level + Correct Factor+ Attenuator



Test Mode :	TX+ Wireless Charging	Phase :	Neutral
Temperature :	20°C	Humidity:	51%
Pressur(mbar) :	1002	Date:	Apr. 16, 2019



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	10.06	35.19	45.25	65.56	-20.31	QP
2	0.1580	10.06	25.81	35.87	55.56	-19.69	AVG
3	0.1740	10.06	36.00	46.06	64.76	-18.70	QP
4	0.1740	10.06	27.33	37.39	54.76	-17.37	AVG
5	0.2140	10.05	30.96	41.01	63.04	-22.03	QP
6	0.2140	10.05	22.49	32.54	53.04	-20.50	AVG
7	0.3339	9.98	28.94	38.92	59.35	-20.43	QP
8	0.3339	9.98	21.43	31.41	49.35	-17.94	AVG
9	1.2740	10.14	21.05	31.19	56.00	-24.81	QP
10	1.2740	10.14	15.95	26.09	46.00	-19.91	AVG
11	3.4900	10.21	25.17	35.38	56.00	-20.62	QP
12	3.4900	10.21	18.14	28.35	46.00	-17.65	AVG

Note: Measurement Level = Reading Level + Correct Factor+ Attenuator



6. Test of Radiated Emission

6.1 Test Limit

In any 100kHz bandwidth outside the frequency band, the radio frequency power produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level. In addition, radiated emissions which fall in restricted bands, as defined in Section 15.205 Section 8.10 table 6 must also comply with the radiated emission limits specified as below.

Radiated Emission Limit (9KHz~1000MHz)

FREQUENCIES(MHz)	FIELD STRENGTH(microvolts/meter)	MEASUREMENT DISTANCE(meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level(uV/m)



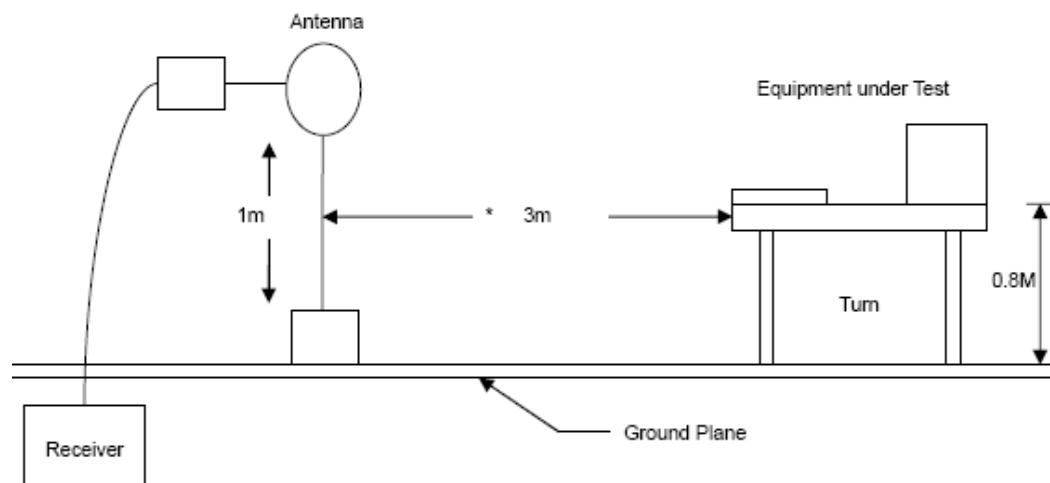
6.2 Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

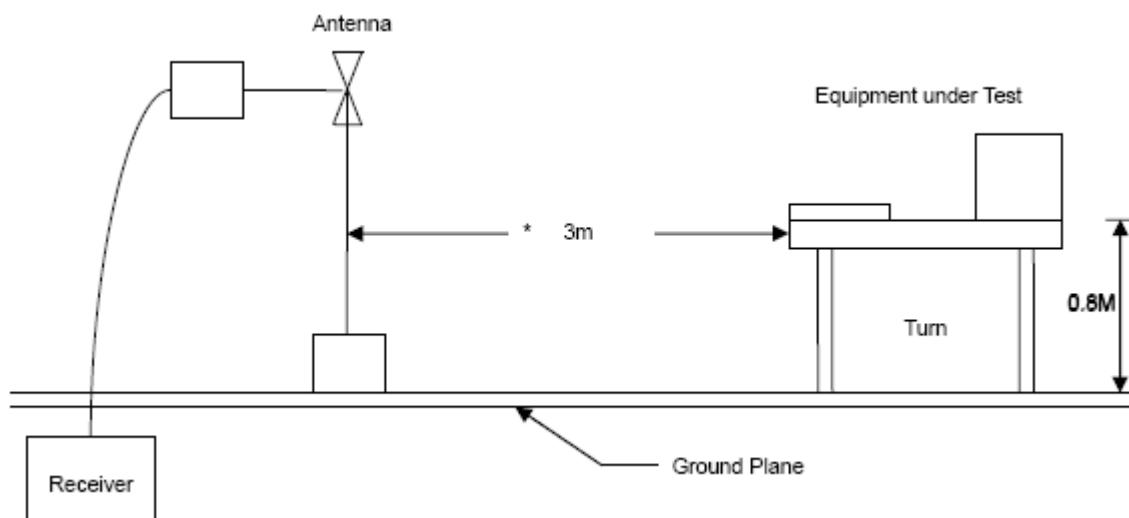


6.3 Typical Test Setup

Below 30MHz Test Setup



30M - 1GHz Test Setup





6.4 Test Result and Data

9KHz~30MHz

Power	: AC 120V/60Hz	Temperature	: 23°C
Test Mode	: TX+ Wireless Charging	Humidity	: 64 %
Test Date	: Apr. 16, 2019	Polarization	: X



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.0639	20.70	57.98	78.68	131.49	-52.81	peak
2	0.0639	20.70	55.12	75.82	111.49	-35.67	AVG
3	0.1277	20.53	77.25	97.78	125.48	-27.7	peak
4	0.1277	20.53	74.88	95.41	105.48	-10.07	AVG
5	2.5540	20.78	34.58	55.36	89.54	-34.18	QP

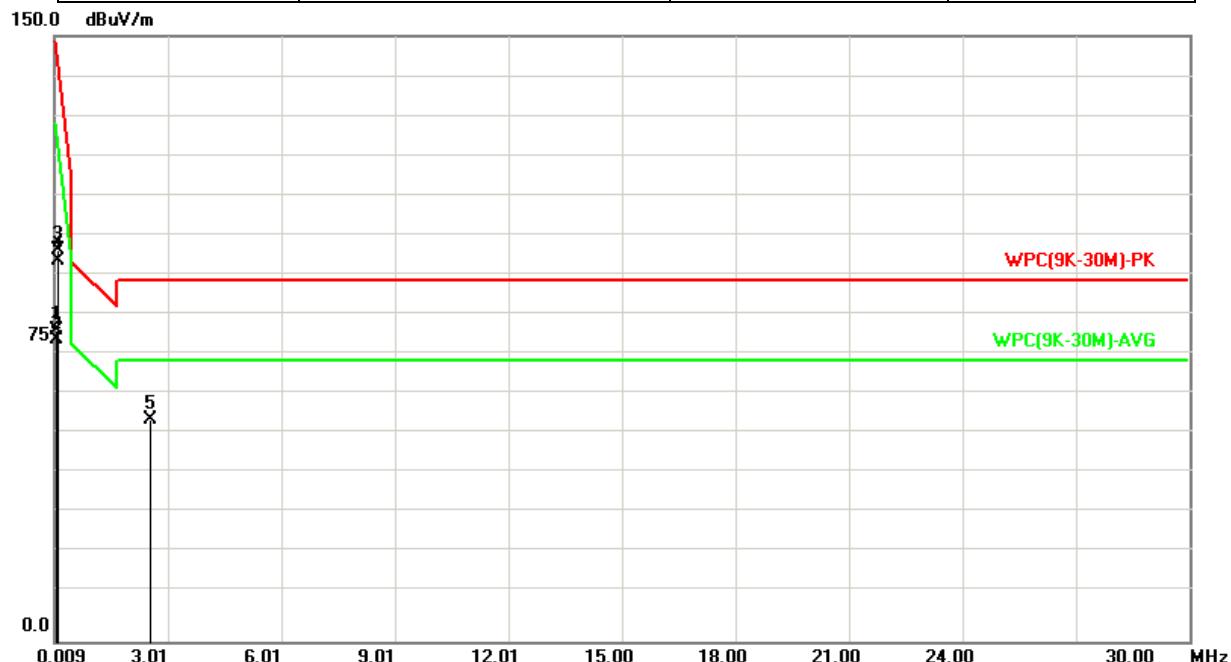
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V/60Hz	Temperature	: 23°C
Test Mode	: TX+ Wireless Charging	Humidity	: 64 %
Test Date	: Apr. 16, 2019	Polarization	: Y



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.0639	20.70	56.43	77.13	131.49	-54.36	peak
2	0.0639	20.70	54.19	74.89	111.49	-36.60	AVG
3	0.1277	20.53	76.54	97.07	125.48	-28.41	peak
4	0.1277	20.53	73.82	94.35	105.48	-11.13	AVG
5	2.5540	20.78	34.23	55.01	89.54	-34.53	QP

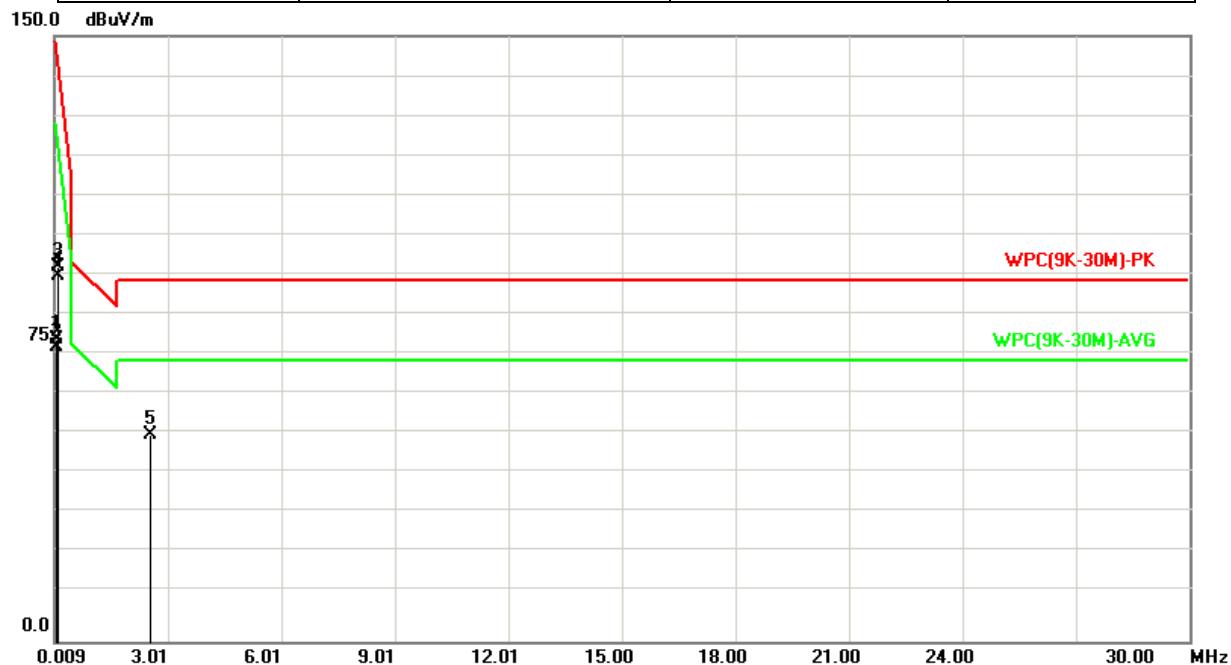
Note: Level = Reading + Factor

Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V/60Hz	Temperature	: 23°C
Test Mode	: TX+ Wireless Charging	Humidity	: 64 %
Test Date	: Apr. 16, 2019	Polarization	: Z



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.0639	20.70	54.12	74.82	131.49	-56.67	peak
2	0.0639	20.70	52.33	73.03	111.49	-38.46	AVG
3	0.1277	20.53	72.13	92.66	125.48	-32.82	peak
4	0.1277	20.53	69.85	90.38	105.48	-15.10	AVG
5	2.5540	20.78	30.28	51.06	89.54	-38.48	QP

Note: Level = Reading + Factor

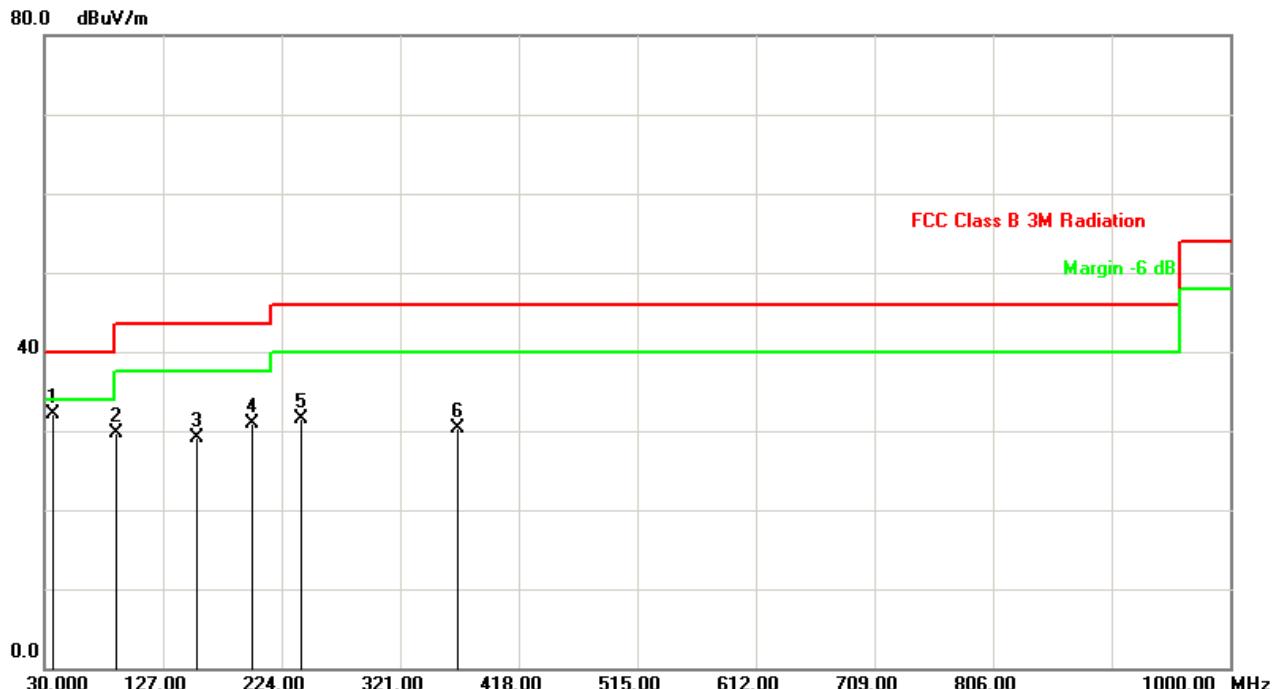
Margin = Level – Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



30MHz~1GHz

Power	AC 120V/60Hz	Pol/Phase	VERTICAL
Test Mode	TX+ Wireless Charging	Temperature	18 °C
Test Date	Apr. 03, 2019	Humidity	49 %
Memo	CH 00	Atmospheric Pressure	1008 hpa



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	36.7899	-9.79	41.87	32.08	40.00	-7.92	peak	100	142
2	89.1700	-13.75	43.39	29.64	43.50	-13.86	peak	100	53
3	155.1299	-13.86	42.96	29.10	43.50	-14.40	peak	100	167
4	200.7199	-8.76	39.73	30.97	43.50	-12.53	peak	100	115
5	239.5200	-8.93	40.38	31.45	46.00	-14.55	peak	100	35
6	367.5600	-6.06	36.42	30.36	46.00	-15.64	peak	100	108

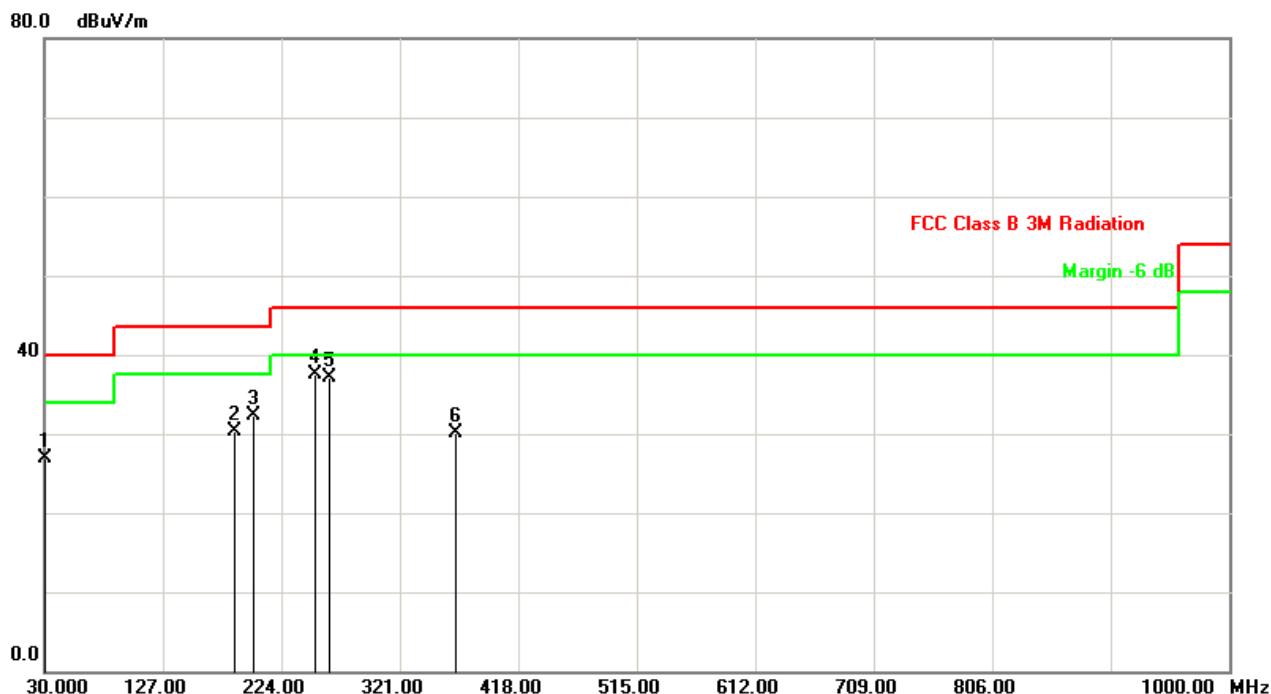
Note: Level = Reading + Factor

Margin = Level - Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor



Power	: AC 120V/60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: TX+ Wireless Charging	Temperature	: 18 °C
Test Date	: Apr. 03, 2019	Humidity	: 49 %
Memo	: CH 00	Atmospheric Pressure	: 1008 hpa



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	30.0000	-5.62	32.52	26.90	40.00	-13.10	peak	100	103
2	186.1699	-10.07	40.39	30.32	43.50	-13.18	peak	200	56
3	201.6899	-9.74	42.09	32.35	43.50	-11.15	peak	100	117
4	252.1299	-6.19	43.65	37.46	46.00	-8.54	peak	200	84
5	263.7699	-6.33	43.49	37.16	46.00	-8.84	peak	100	139
6	366.5899	-6.03	36.23	30.20	46.00	-15.80	peak	100	72

Note: Level = Reading + Factor

Margin = Level - Limit

Factor= Antenna Factor + Cable Loss - Amplifier Factor

----- End of the report -----