



TEST REPORT

FCC Part 15C

Equipment under test Wireless Charger

Model name KWS-211

FCC ID 2ACCKWS-211

Applicant KOMATECH Co.,Ltd.

Manufacturer KOMATECH Co.,Ltd.

Date of test(s) 2015.05.28~2015.06.04

Date of issue 2015.06.11

Issued to

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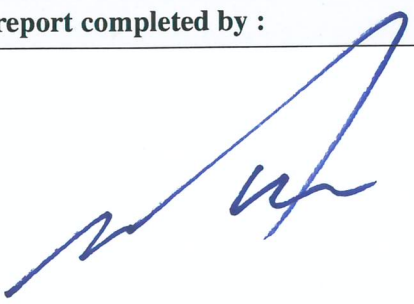
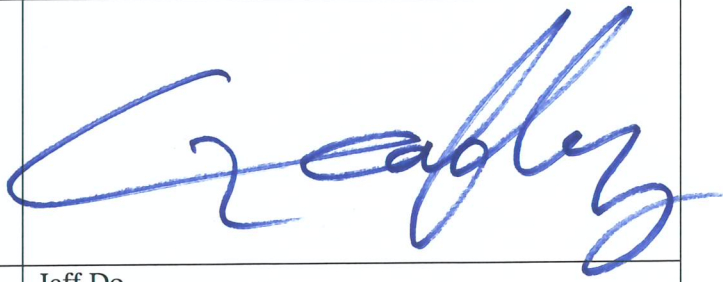
Issued by

KES Co., Ltd.

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Test and report completed by :	Report approval by :
	
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Revision history

Revision	Date of issue	Test report No.	Description
-	2015.06.11	KES-RF-15T0047	Initial



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1. General information

Applicant KOMATECH Co.,Ltd.
Applicant address 62-16 19th st. Gamjeong-ro, Gimpo-si, Gyeonggi-do, Korea
Test site KES Co., Ltd.
Test site address C-3701, Simin-daero 365-40, Dongan-gu, Anyang-si, Gyeonggi-do, 431-716, Korea
473-29, Gayeo-ro, Yeoju-si, Gyeonggi-do, Korea
Rule part(s) Part 15C
Test device serial No. ☒ Production ☐ Pre-production ☐ Engineering

1.1. EUT description

Equipment under test Wireless Charger
Frequency range 112 kHz ~205 kHz
Modulation type ASK
Model: KWS-211
Antenna specification Internal type(Coil antenna)
Power source AC 120 V Adapter

1.2. Test frequency

	Frequency Range
Frequency (kHz)	112 kHz ~205 kHz

1.3. Information about derivative model

N/A

1.4. Device modifications

N/A

1.5 Device information

KWS-211 that wireless charger can be used only normal position.
Therefore the test was carried out only normal position.

2.1 Summary of tests

FCC Part Sections	Parameter	Test results
15.209	Radiated spurious emission	Pass
15.207	AC conducted emissions	Pass

Statement;

The measurement procedures described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C63.4-2003/ 2009) were used in the measurement of the DUT.

2.2 Test mode

Mode	Charging current	Description
Charging mode With load	295 mA	Using Max load
	584 mA	Using Mid load
	1140 mA	Using Min load
Charging mode With Mobile Phone	-	< 1% of Battery status
	-	50% of Battery status

2.3 Battery status during charging

< 1% of Battery, 50 % of Battery

2.4 Fundamental emission comparison

The level of call connecting of WCDMA mode was more than airplane mode, charging with Mobile Phone in standby mode and charging with Mobile Phone turned off mode. So WCDMA mode was selected.

3. Test results

3.1. Radiated spurious emission

Test location

Testing was performed at a test distance of 3 meter Open Area Test Site

Test procedures

[9 kHz to 30 MHz]

The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation. Then antenna is a loop antenna is fixed at one meter above the ground to determine the maximum value of the field strength. Both parallel and perpendicular of the antenna are set to make the measurement. For each suspected emission, the EUT was arranged to its worst case and then the table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to Quasi-peak function and specified bandwidth with maximum hold mode.

The spectrum analyzer is set to:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer 200 Hz / 300 Hz for peak detection (PK) at frequency below 9 kHz~ 150 kHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer 9 kHz / 10 kHz for peak detection (PK) at frequency below 150 kHz~ 30 MHz.
3. For the frequency bands 9~ 90 kHz, 110~490 kHz the radiated emission limits are based on measurements employing an average detector.

[30 MHz to 1 GHz]

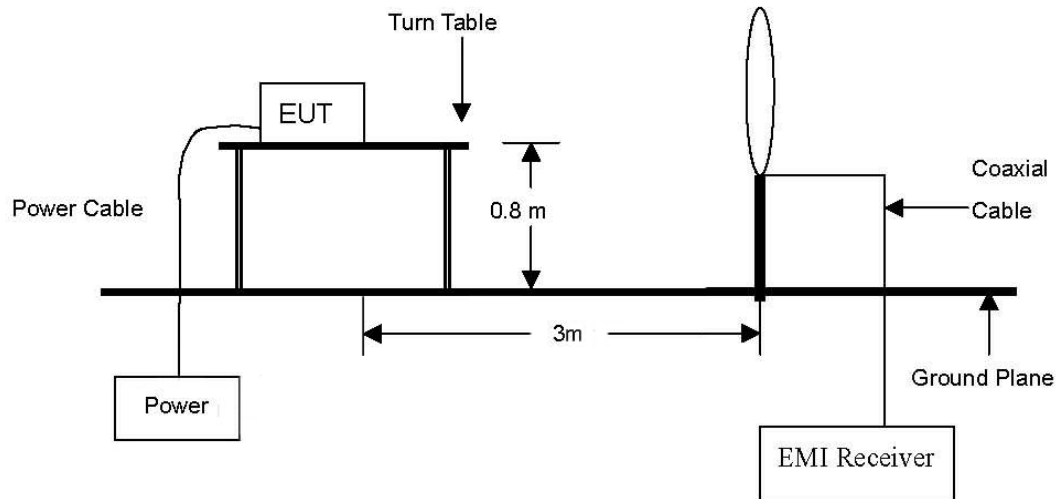
The height of the measuring antenna was varied between 1 to 4 m and the table was rotated a full revolution in order to obtain maximum values of the electric field intensity.

The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.

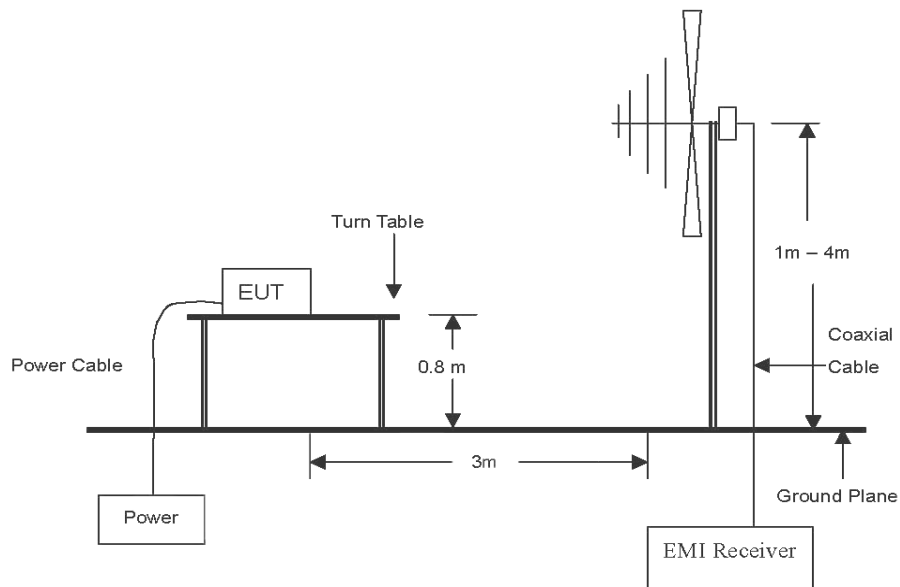
The spectrum analyzer is set to:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer 120 kHz for Peak detection (PK) or Quasi-peak detection (QP) at frequency below 1 GHz.

The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 30 MHz Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz emissions.



Limit

According to 15.209(a), for an intentional radiator devices, the general required of field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values :

Frequency (MHz)	Distance (Meters)	Radiated ($\mu\text{V/m}$)
0.009 ~ 0.490	300	2400 / F(kHz)
0.490 ~ 1.705	30	24000 / F(kHz)
1.705 ~ 30.0	30	30
30 ~ 88	3	100**
88 ~ 216	3	150**
216 ~ 960	3	200**
Above 960	3	500

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 ~ 72 MHz, 76 ~ 88 MHz, 174 ~ 216 MHz or 470 ~ 806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

Test results (Below 30 MHz)

The frequency spectrum from 9 kHz to 30 MHz was investigated.

- Pad type / charging with load (Max)

Radiated emissions			Correction factors			Total	Limit	
Frequency (MHz)	Detect	Reading (dB μ V)	Ant. factor (dB/m)	Cable loss (dB)	F _d (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
0.109 9*	Peak	21.37	19.50	0.02	-80	-39.11	26.78	65.89
	-	-				-		-
0.117 3**	Peak	33.45	19.50	0.02	-80	-27.03	26.22	53.25
	Avg	33.39				-27.09		53.31
0.351 9	Peak	27.24	19.47	0.05	-80	-33.24	16.68	49.92
	Avg	27.15				-33.33		50.01
0.586 5	Peak	23.16	19.40	0.06	-40	2.62	32.24	29.62
	-	-				-		-
0.821 1	Peak	21.69	19.40	0.08	-40	1.17	29.32	28.15
	-	-				-		-

- Pad type / charging with load (Mid)

Radiated emissions			Correction factors			Total	Limit	
Frequency (MHz)	Detect	Reading (dB μ V)	Ant. factor (dB/m)	Cable loss (dB)	F _d (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
0.103 4*	Peak	21.82	19.50	0.02	-80	-38.66	27.31	65.97
	-	-				-		-
0.121 2**	Peak	33.76	19.50	0.02	-80	-26.72	25.93	52.65
	Avg	33.69				-26.79		52.72
0.363 6	Peak	27.52	19.47	0.05	-80	-32.96	16.39	49.35
	Avg	27.47				-33.01		49.40
0.606 0	Peak	24.75	19.40	0.06	-40	4.21	31.95	27.74
	-	-				-		-
0.848 4	Peak	21.77	19.40	0.08	-40	1.25	29.03	27.78
	-	-				-		-

- Pad type / charging with load (Min)

Radiated emissions			Correction factors			Total	Limit	
Frequency (MHz)	Detect	Reading (dB μ V)	Ant. factor (dB/m)	Cable loss (dB)	F _d (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
0.101 6*	Peak	23.96	19.50	0.02	-80	-36.52	27.47	63.99
	-	-				-		-
0.112 0**	Peak	34.18	19.50	0.02	-80	-26.30	26.62	52.92
	Avg	34.10				-26.38		53.00
0.336 2	Peak	27.81	19.48	0.05	-80	-32.66	17.07	49.73
	Avg	27.75				-32.72		49.79
0.510 9	Peak	25.06	19.40	0.05	-40	4.51	33.44	28.93
	-	-				-		-
0.781 8	Peak	22.39	19.40	0.08	-40	1.87	29.74	27.87
	-	-				-		-

- Pad type / charging with Mobile Phone (< 1% of Battery)

Radiated emissions			Correction factors			Total	Limit	
Frequency (MHz)	Detect	Reading (dB μ V)	Ant. factor (dB/m)	Cable loss (dB)	F _d (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
0.103 6*	Peak	17.24	19.50	0.02	-80	-43.24	27.30	70.54
	-	-				-		-
0.143 7**	Peak	31.26	19.50	0.02	-80	-29.22	24.46	53.68
	Avg	31.19				-29.29		53.75
0.431 2	Peak	25.36	19.43	0.05	-80	-35.16	14.91	50.07
	Avg	25.30				-35.22		50.13
0.718 8	Peak	21.04	19.40	0.08	-40	0.52	30.47	29.95
	-	-				-		-
0.998 9	Peak	16.94	19.40	0.08	-40	-3.58	27.61	31.19
	-	-				-		-

- Pad type / charging with Mobile Phone (50% of Battery)

Radiated emissions			Correction factors			Total	Limit	
Frequency (MHz)	Detect	Reading (dBμV)	Ant. factor (dB/m)	Cable loss (dB)	F _d (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
0.105 3*	Peak	18.54	19.50	0.02	-80	-41.94	27.16	69.10
	-	-				-		-
0.133 6**	Peak	31.36	19.50	0.02	-80	-29.12	25.09	54.21
	Avg	31.32				-29.16		54.25
0.400 5	Peak	25.45	19.45	0.05	-80	-35.05	15.55	50.60
	Avg	25.34				-35.16		50.71
0.671 3	Peak	21.15	19.40	0.07	-40	0.62	31.07	30.45
	-	-				-		-

※ Remark

1. “*” means Restricted frequency.
2. “**” means Fundamental frequency.
3. Measurement distance : 3 m.
4. Actual = Reading + Ant. factor + Cable loss + F_d
5. F_d = 40log(D_m / D_s)

Where:

F_d = Distance factor in dB

D_m = Measurement distance in meters

D_s = Specification distance in meters

For 300m: 40log(300/3) = 80 dB for frequency band 0.009 MHz to 0.490 MHz

For 30m: 40log(30/3) = 40 dB for frequency band 0.490 MHz to 30 MHz

Test results (Below 1 000 MHz)

The frequency spectrum from 30 MHz to 1 000 MHz was investigated.

- Pad type / charging with load (Max)

Radiated emissions		Ant.	Correction factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Pol.	Ant. factor (dB/m)	Cable loss (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
No emissions were detected at a level greater than 20 dB below limit							

- Pad type / charging with load (Mid)

Radiated emissions		Ant.	Correction factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Pol.	Ant. factor (dB/m)	Cable loss (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
No emissions were detected at a level greater than 20 dB below limit							

- Pad type / charging with load (Min)

Radiated emissions		Ant.	Correction factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Pol.	Ant. factor (dB/m)	Cable loss (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
No emissions were detected at a level greater than 20 dB below limit							



- Pad type / charging with Mobile Phone (< 1% of Battery)

Radiated emissions		Ant.	Correction factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Pol.	Ant. factor (dB/m)	Cable loss (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
No emissions were detected at a level greater than 20 dB below limit							

- Pad type / charging with Mobile Phone (50% of Battery)

Radiated emissions		Ant.	Correction factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Pol.	Ant. factor (dB/m)	Cable loss (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
No emissions were detected at a level greater than 20 dB below limit							

※ Remark

1. Actual = Reading + Ant. factor + Cable loss

3.2. AC conducted emissions

Frequency range of measurement

150 kHz to 30 MHz

Instrument settings

IF Band Width: 9 kHz

Test procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m. Amplitude measurements were performed with a quasi-peak detector and an average detector.

Limit

According to 15.207(a), for an intentional radiator that 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 the limits in the following table, as measured using a 50uH/50 ohm line impedance stabilization network (LISN). Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequencies ranges.

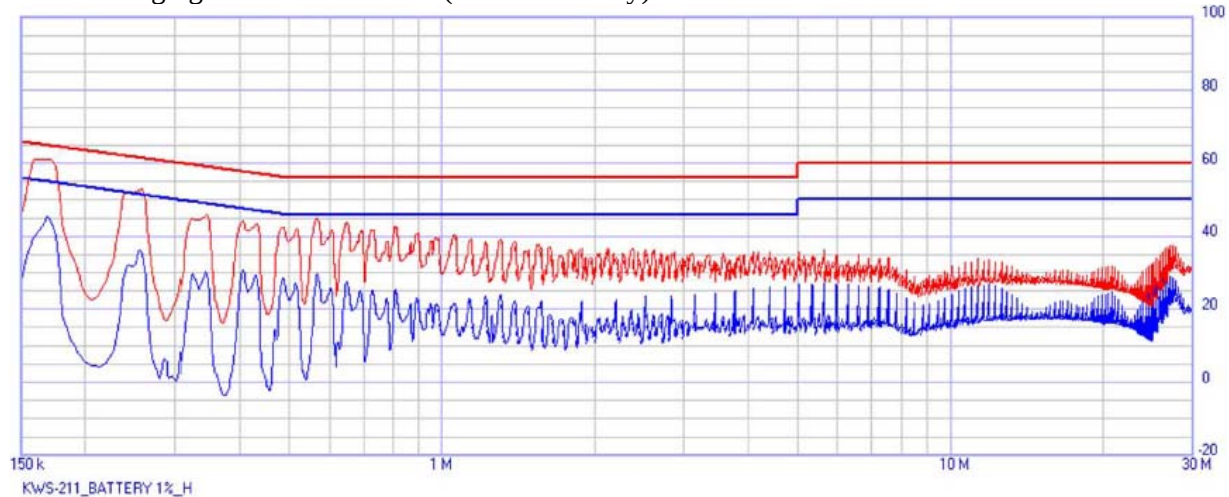
Frequency of Emission (MHz)	Conducted limit (dBμV/m)	
	Quasi-peak	Average
0.15 – 0.50	66 - 56*	56 - 46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

※ Remark

1. Decreases with the logarithm of the frequency.

Test results

Mode : charging with Mobile Phone (< 1% of Battery)/ H



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C FCC qp-b FCC av-b	1500 ms	9 kHz	0	ON	ON	---	---

Ancillary = General

Limit:

FCC qp-b

FCC av-b

Factors:

1 LISN L1(150210)

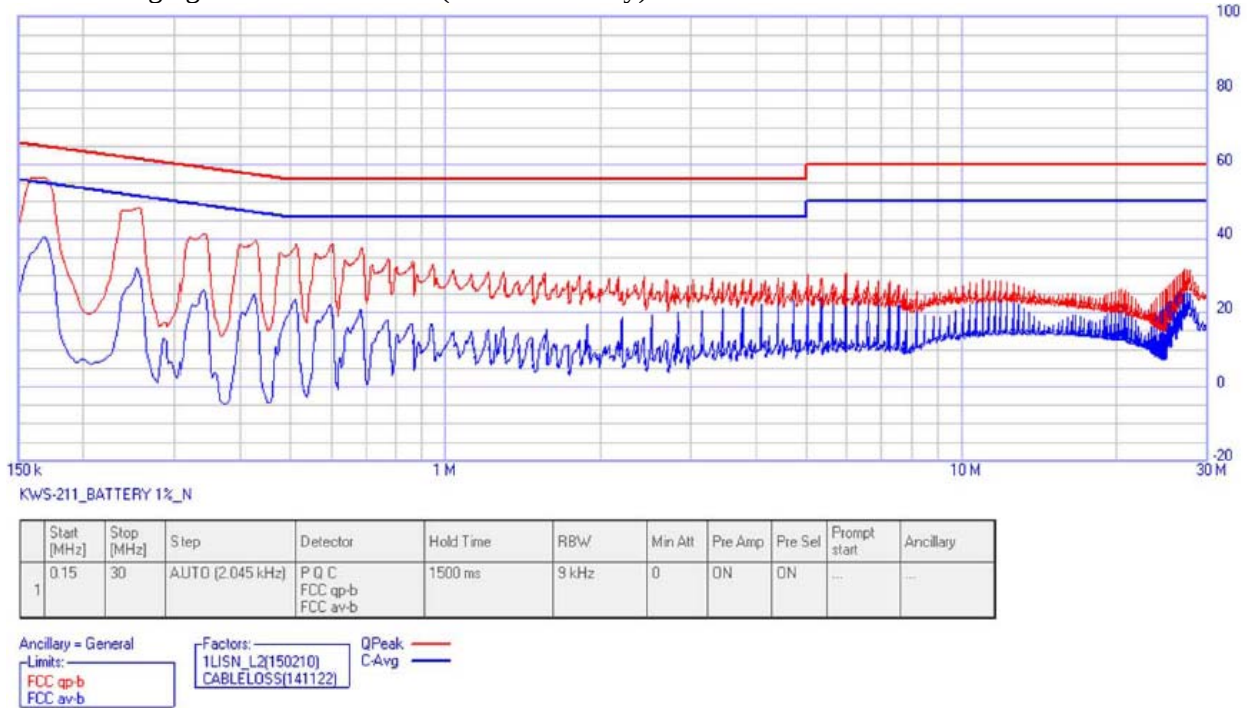
CABLELOSS(141122)

QPeak

C-Avg

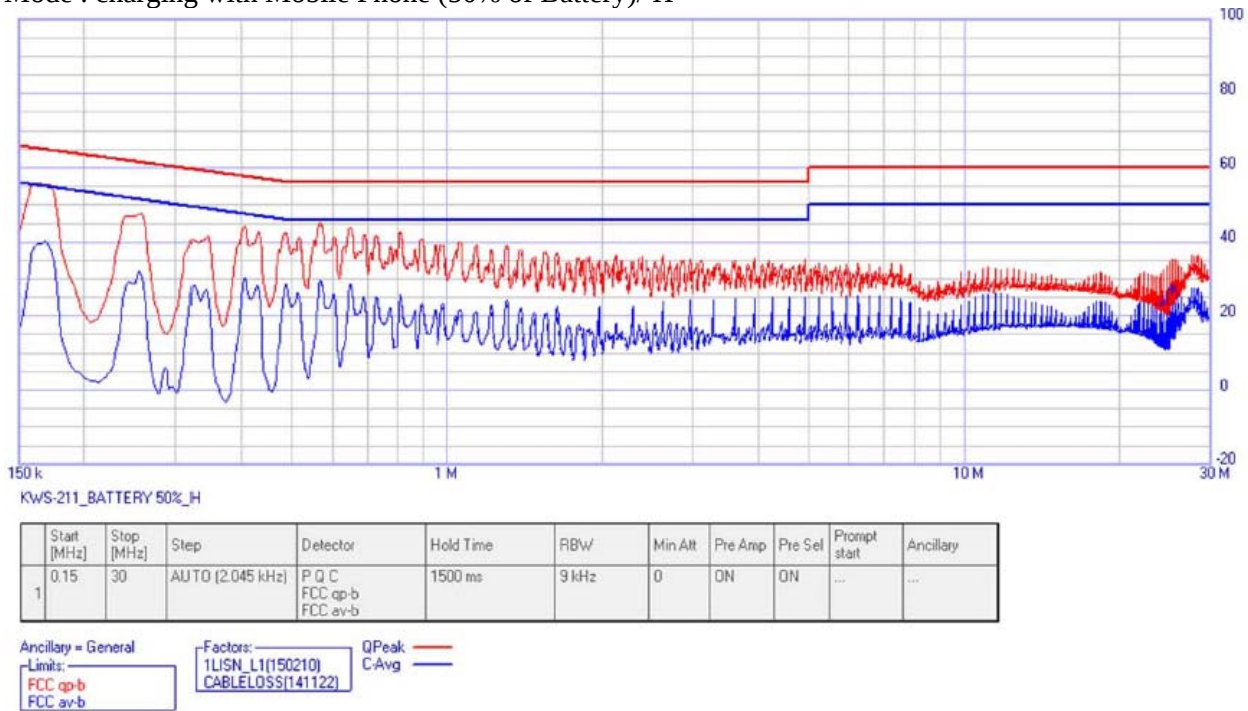
Frequency [MHz]	Q-Peak [dBμV]	Limit [dBμV]	Margin [dB]	C-Avg [dBμV]	Limit [dBμV]	Margin [dB]	Factor (LISN) [dB]	Factor (Cable Loss) [dB]
0.152	50.620	65.890	-15.270	33.040	55.890	-22.850	9.650	0.020
0.160	61.230	65.450	-4.220	40.290	55.450	-15.160	9.650	0.030
0.258	52.830	61.480	-8.650	35.400	51.480	-16.080	9.650	0.030
0.344	45.750	59.100	-13.350	29.600	49.100	-19.500	9.650	0.030
0.518	41.940	56.000	-14.060	26.200	46.000	-19.800	9.650	0.030
0.567	44.860	56.000	-11.140	29.640	46.000	-16.360	9.650	0.030
0.649	43.600	56.000	-12.400	27.560	46.000	-18.440	9.650	0.030
0.651	43.600	56.000	-12.400	27.560	46.000	-18.440	9.650	0.040
0.811	42.710	56.000	-13.290	25.430	46.000	-20.570	9.650	0.050
0.813	42.710	56.000	-13.290	25.430	46.000	-20.570	9.650	0.050

Mode : charging with Mobile Phone (< 1% of Battery)/ N



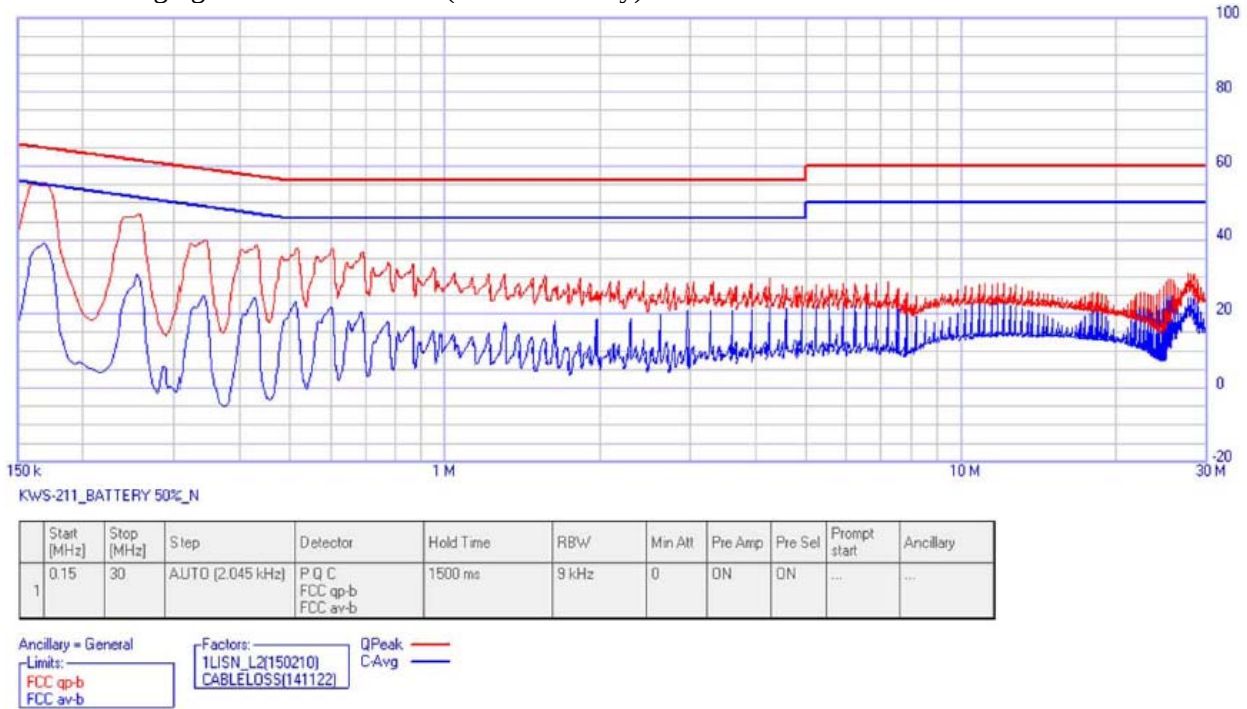
Frequency [MHz]	Q-Peak [dBμV]	Limit [dBμV]	Margin [dB]	C-Avg [dBμV]	Limit [dBμV]	Margin [dB]	Factor (LISN) [dB]	Factor (Cable Loss) [dB]
0.152	48.230	65.890	-17.660	29.800	55.890	-26.090	9.630	0.020
0.160	56.570	65.450	-8.880	36.390	55.450	-19.060	9.630	0.030
0.256	48.360	61.550	-13.190	31.180	51.550	-20.370	9.640	0.030
0.342	41.350	59.150	-17.800	24.950	49.150	-24.200	9.640	0.030
0.514	38.440	56.000	-17.560	22.560	46.000	-23.440	9.650	0.030
0.516	38.440	56.000	-17.560	22.560	46.000	-23.440	9.650	0.030
0.600	38.350	56.000	-17.650	21.390	46.000	-24.610	9.650	0.030
0.688	37.290	56.000	-18.710	18.780	46.000	-27.220	9.650	0.040
0.690	37.290	56.000	-18.710	18.780	46.000	-27.220	9.650	0.040
0.774	34.600	56.000	-21.400	16.570	46.000	-29.430	9.650	0.050

Mode : charging with Mobile Phone (50% of Battery)/ H



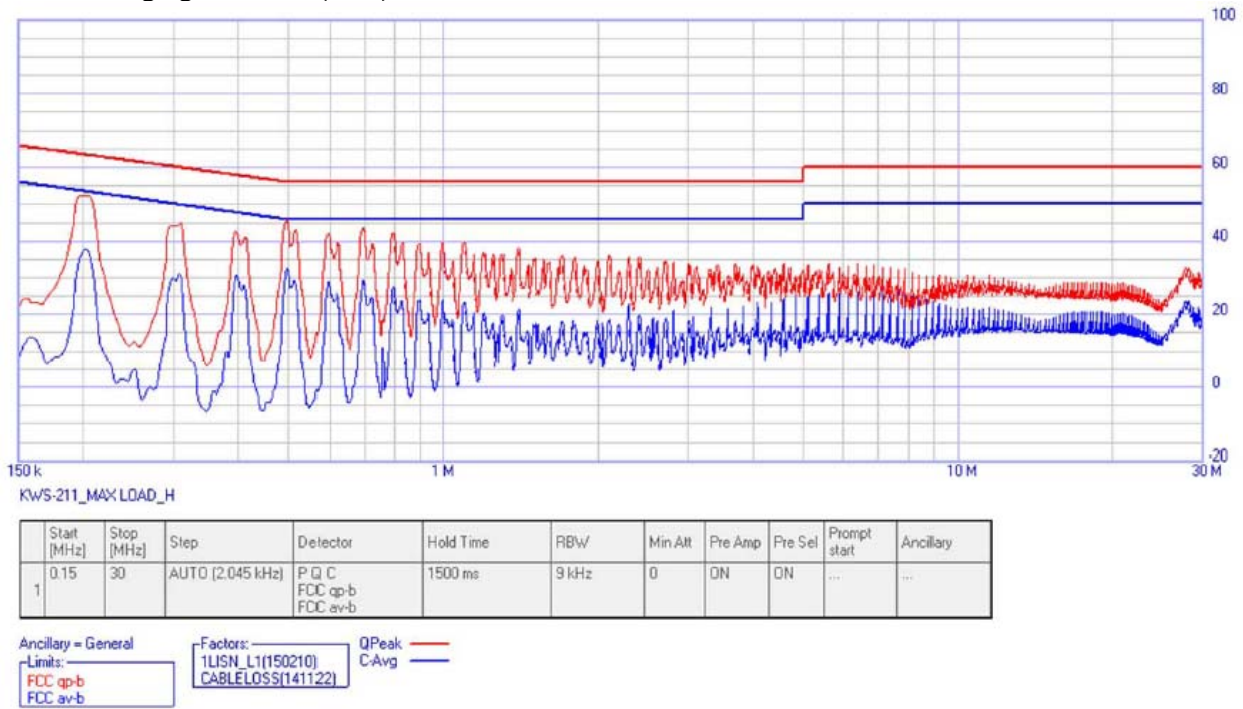
Frequency [MHz]	Q-Peak [dBμV]	Limit [dBμV]	Margin [dB]	C-Avg [dBμV]	Limit [dBμV]	Margin [dB]	Factor (LISN) [dB]	Factor (Cable Loss) [dB]
0.152	46.910	65.890	-18.980	20.900	55.890	-34.990	9.650	0.020
0.160	55.830	65.450	-9.620	38.480	55.450	-16.970	9.650	0.030
0.258	47.630	61.480	-13.850	30.700	51.480	-20.780	9.650	0.030
0.404	44.150	57.780	-13.630	29.910	47.780	-17.870	9.650	0.030
0.567	45.020	56.000	-10.980	29.690	46.000	-16.310	9.650	0.030
0.649	43.790	56.000	-12.210	28.430	46.000	-17.570	9.650	0.030
0.651	43.790	56.000	-12.210	28.430	46.000	-17.570	9.650	0.040
0.690	41.970	56.000	-14.030	25.000	46.000	-21.000	9.650	0.040
0.811	42.580	56.000	-13.420	25.720	46.000	-20.280	9.650	0.050
0.813	42.580	56.000	-13.420	25.720	46.000	-20.280	9.650	0.050

Mode : charging with Mobile Phone (50% of Battery) / N



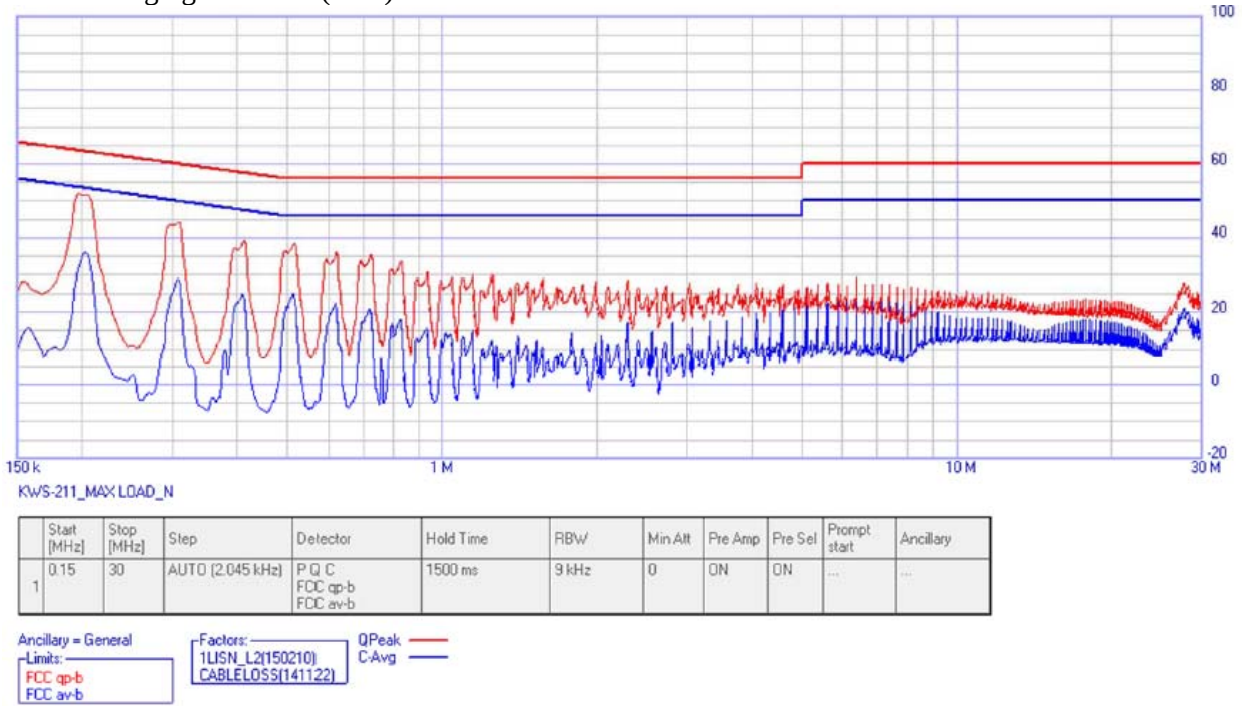
Frequency [MHz]	Q-Peak [dBμV]	Limit [dBμV]	Margin [dB]	C-Avg [dBμV]	Limit [dBμV]	Margin [dB]	Factor (LISN) [dB]	Factor (Cable Loss) [dB]
0.152	46.420	65.890	-19.470	21.590	55.890	-34.300	9.630	0.020
0.160	55.080	65.450	-10.370	36.570	55.450	-18.880	9.630	0.030
0.256	46.950	61.550	-14.600	30.430	51.550	-21.120	9.640	0.030
0.344	40.000	59.100	-19.100	23.400	49.100	-25.700	9.640	0.030
0.516	37.780	56.000	-18.220	22.350	46.000	-23.650	9.650	0.030
0.604	37.850	56.000	-18.150	19.940	46.000	-26.060	9.650	0.030
0.690	36.810	56.000	-19.190	19.470	46.000	-26.530	9.650	0.040
0.778	34.010	56.000	-21.990	16.040	46.000	-29.960	9.650	0.050

Mode : charging with load (Max)/ H



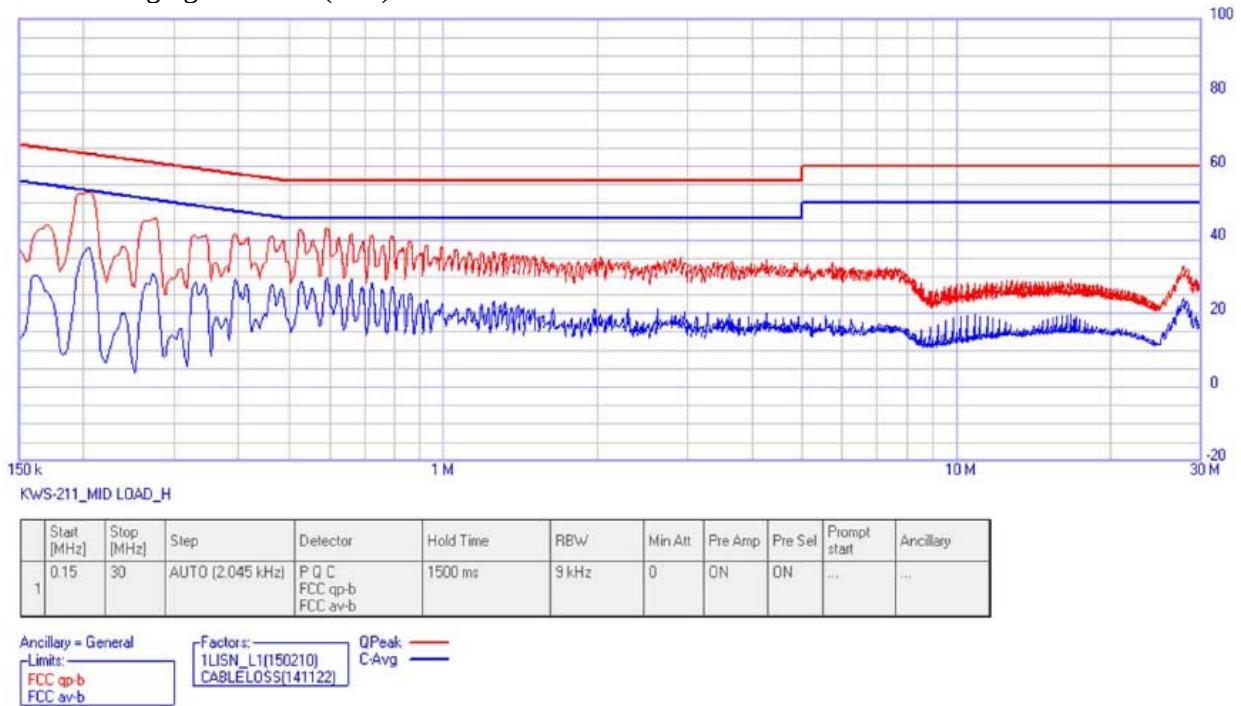
Frequency [MHz]	Q-Peak [dBμV]	Limit [dBμV]	Margin [dB]	C-Avg [dBμV]	Limit [dBμV]	Margin [dB]	Factor (LISN) [dB]	Factor (Cable Loss) [dB]
0.197	52.380	63.730	-11.350	34.800	53.730	-18.930	9.650	0.030
0.310	44.790	59.980	-15.190	29.940	49.980	-20.040	9.650	0.030
0.395	42.530	57.950	-15.420	30.090	47.950	-17.860	9.650	0.030
0.496	45.550	56.070	-10.520	32.350	46.070	-13.720	9.650	0.030
0.518	43.130	56.000	-12.870	27.770	46.000	-18.230	9.650	0.030
0.596	42.010	56.000	-13.990	28.960	46.000	-17.040	9.650	0.030
0.598	42.010	56.000	-13.990	28.960	46.000	-17.040	9.650	0.030
0.694	43.560	56.000	-12.440	29.280	46.000	-16.720	9.650	0.040
0.696	43.560	56.000	-12.440	29.280	46.000	-16.720	9.650	0.040
0.794	42.150	56.000	-13.850	27.430	46.000	-18.570	9.650	0.050

Mode : charging with load (Max)/ N



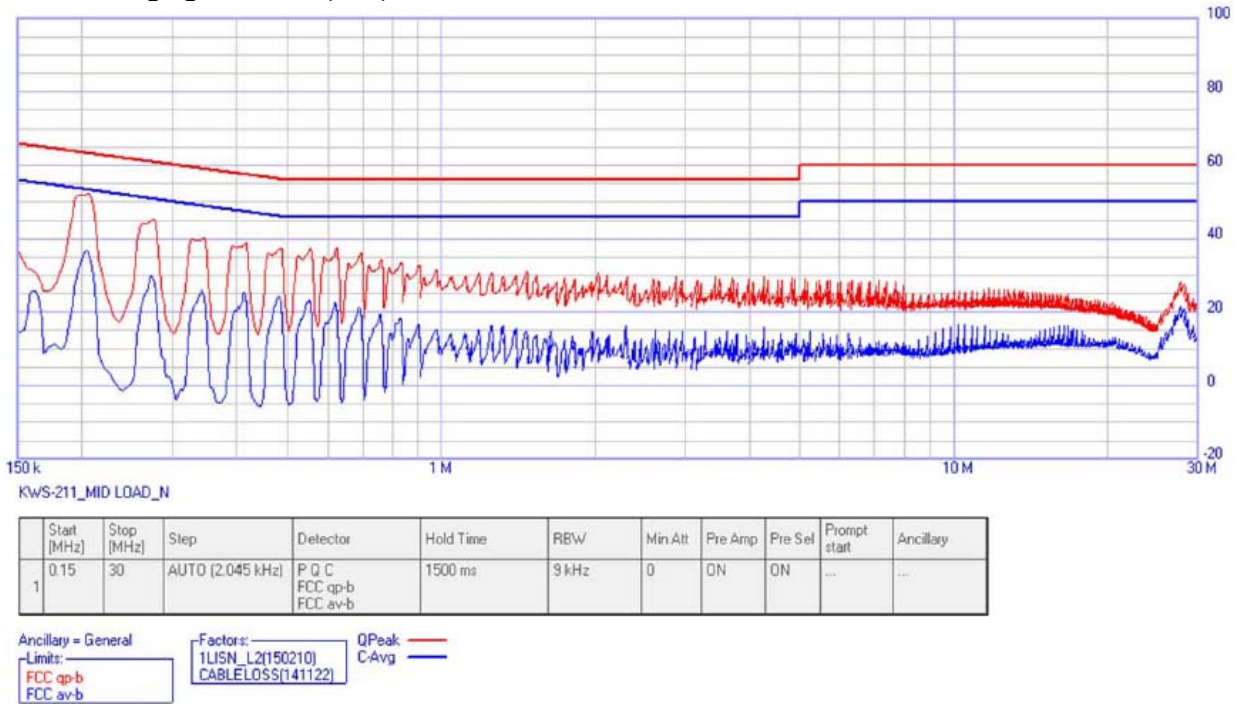
Frequency [MHz]	Q-Peak [dBμV]	Limit [dBμV]	Margin [dB]	C-Avg [dBμV]	Limit [dBμV]	Margin [dB]	Factor (LISN) [dB]	Factor (Cable Loss) [dB]
0.197	51.710	63.730	-12.020	31.540	53.730	-22.190	9.640	0.030
0.310	44.100	59.980	-15.880	28.050	49.980	-21.930	9.640	0.030
0.414	39.060	57.570	-18.510	23.270	47.570	-24.300	9.640	0.030
0.494	36.320	56.110	-19.790	19.660	46.110	-26.450	9.650	0.030
0.518	38.490	56.000	-17.510	22.920	46.000	-23.080	9.650	0.030
0.622	36.010	56.000	-19.990	20.060	46.000	-25.940	9.650	0.030
0.725	35.230	56.000	-20.770	19.930	46.000	-26.070	9.650	0.040
0.727	35.230	56.000	-20.770	19.930	46.000	-26.070	9.650	0.040
0.829	33.610	56.000	-22.390	17.300	46.000	-28.700	9.650	0.050

Mode : charging with load (Mid)/ H



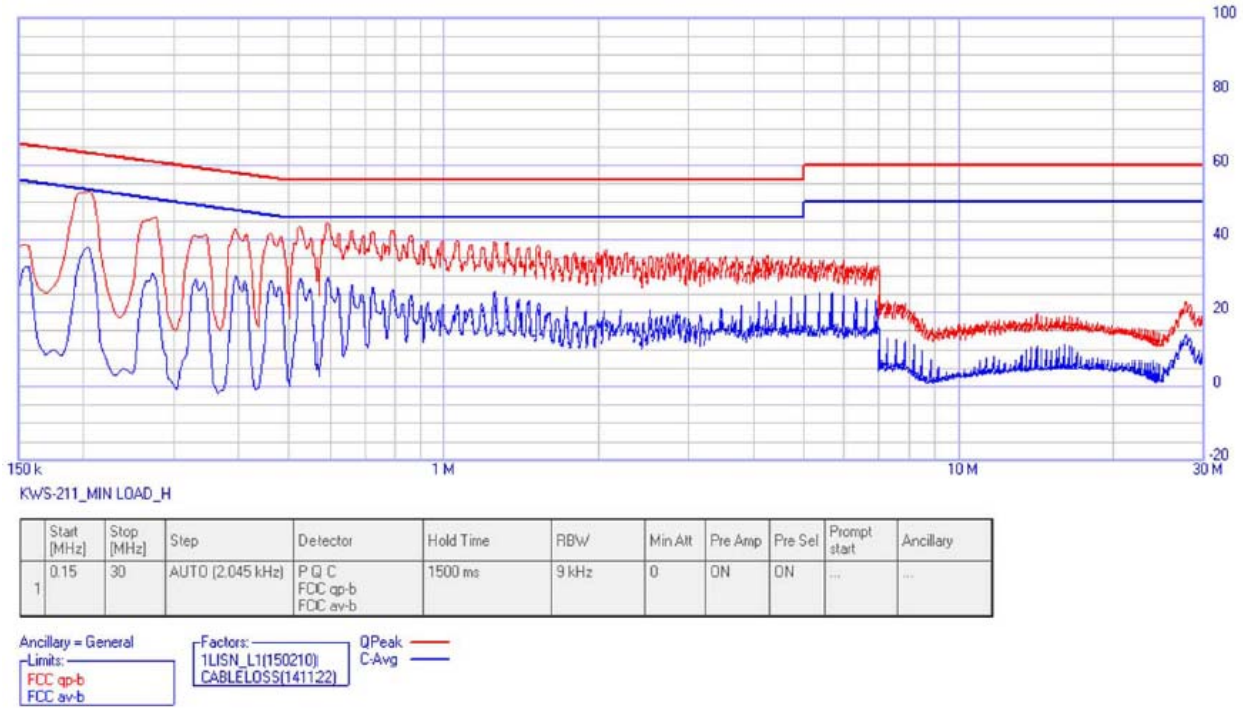
Frequency [MHz]	Q-Peak [dBμV]	Limit [dBμV]	Margin [dB]	C-Avg [dBμV]	Limit [dBμV]	Margin [dB]	Factor (LISN) [dB]	Factor (Cable Loss) [dB]
0.170	43.960	64.940	-20.980	25.730	54.940	-29.210	9.650	0.030
0.205	53.080	63.400	-10.320	37.590	53.400	-15.810	9.650	0.030
0.277	46.030	60.910	-14.880	29.430	50.910	-21.480	9.650	0.030
0.393	41.740	57.990	-16.250	28.440	47.990	-19.550	9.650	0.030
0.526	42.720	56.000	-13.280	28.650	46.000	-17.350	9.650	0.030
0.592	43.240	56.000	-12.760	29.580	46.000	-16.420	9.650	0.030
0.659	41.640	56.000	-14.360	29.240	46.000	-16.760	9.650	0.040
0.661	41.640	56.000	-14.360	29.240	46.000	-16.760	9.650	0.040
0.723	41.310	56.000	-14.690	27.370	46.000	-18.630	9.650	0.040

Mode : charging with load (Mid)/ N



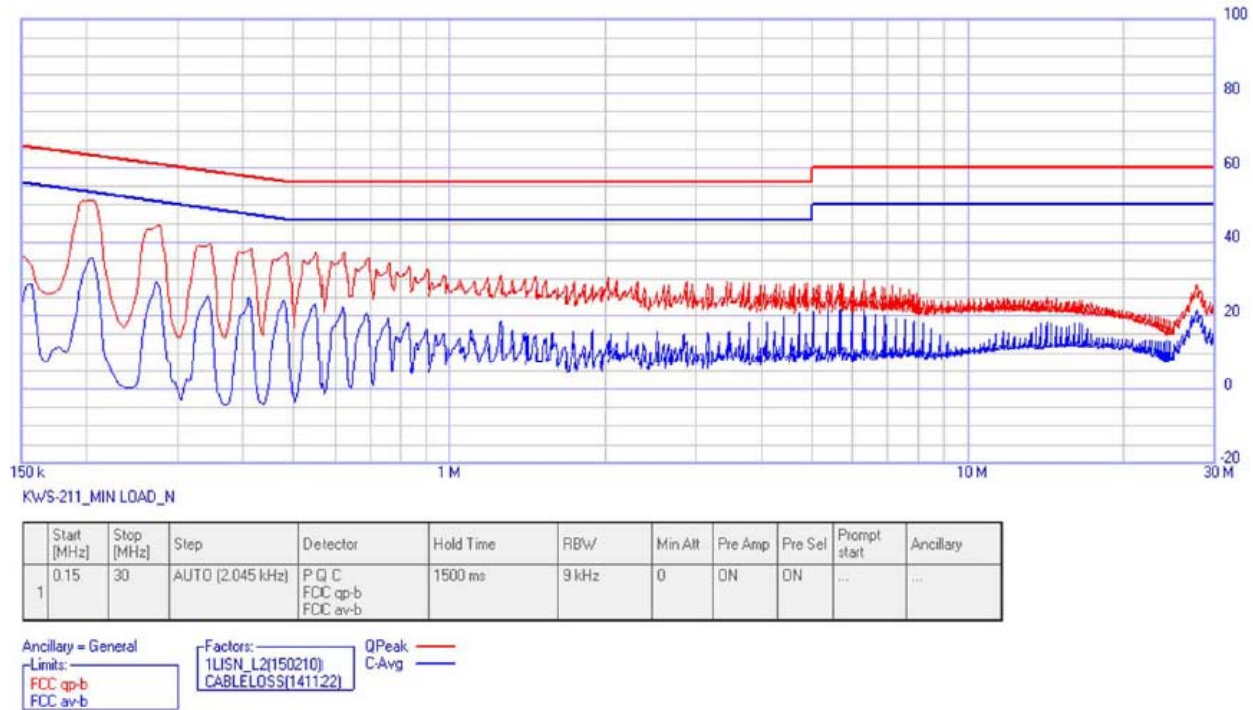
Frequency [MHz]	Q-Peak [dBμV]	Limit [dBμV]	Margin [dB]	C-Avg [dBμV]	Limit [dBμV]	Margin [dB]	Factor (LISN) [dB]	Factor (Cable Loss) [dB]
0.205	52.140	63.400	-11.260	36.360	53.400	-17.040	9.640	0.030
0.275	45.170	60.970	-15.800	29.620	50.970	-21.350	9.640	0.030
0.344	40.120	59.100	-18.980	25.560	49.100	-23.540	9.640	0.030
0.416	38.680	57.530	-18.850	23.050	47.530	-24.480	9.640	0.030
0.555	37.310	56.000	-18.690	20.740	46.000	-25.260	9.650	0.030
0.624	37.330	56.000	-18.670	20.450	46.000	-25.550	9.650	0.030
0.694	36.000	56.000	-20.000	19.050	46.000	-26.950	9.650	0.040
0.764	34.310	56.000	-21.690	17.330	46.000	-28.670	9.650	0.050

Mode : charging with load (Min)/ H



Frequency [MHz]	Q-Peak [dBμV]	Limit [dBμV]	Margin [dB]	C-Avg [dBμV]	Limit [dBμV]	Margin [dB]	Factor (LISN) [dB]	Factor (Cable Loss) [dB]
0.205	52.800	63.400	-10.600	37.300	53.400	-16.100	9.650	0.030
0.275	45.930	60.970	-15.040	30.460	50.970	-20.510	9.650	0.030
0.393	42.560	57.990	-15.430	29.100	47.990	-18.890	9.650	0.030
0.461	41.610	56.680	-15.070	28.490	46.680	-18.190	9.650	0.030
0.526	43.410	56.000	-12.590	29.120	46.000	-16.880	9.650	0.030
0.592	44.300	56.000	-11.700	29.210	46.000	-16.790	9.650	0.030
0.659	42.490	56.000	-13.510	27.620	46.000	-18.380	9.650	0.040
0.661	42.490	56.000	-13.510	27.620	46.000	-18.380	9.650	0.040
0.790	42.340	56.000	-13.660	26.230	46.000	-19.770	9.650	0.050

Mode : charging with load (Min)/ N



Frequency [MHz]	Q-Peak [dBμV]	Limit [dBμV]	Margin [dB]	C-Avg [dBμV]	Limit [dBμV]	Margin [dB]	Factor (LISN) [dB]	Factor (Cable Loss) [dB]
0.205	51.310	63.400	-12.090	35.570	53.400	-17.830	9.640	0.030
0.275	44.420	60.970	-16.550	28.790	50.970	-22.180	9.640	0.030
0.344	39.450	59.100	-19.650	24.830	49.100	-24.270	9.640	0.030
0.414	38.180	57.570	-19.390	24.260	47.570	-23.310	9.640	0.030
0.553	36.990	56.000	-19.010	22.290	46.000	-23.710	9.650	0.030
0.624	37.110	56.000	-18.890	20.720	46.000	-25.280	9.650	0.030
0.694	35.770	56.000	-20.230	18.530	46.000	-27.470	9.650	0.040
0.766	34.090	56.000	-21.910	16.890	46.000	-29.110	9.650	0.050

Appendix A. Measurement equipment

Equipment	Manufacturer	Model	Serial number	Cal Interval	Calibration due.
Spectrum analyzer	R&S	FSV30	101389	1 year	2016.01.22
Vector signal generator	R&S	SMBV2100A	1407.6004K02	1 year	2015.07.24
Radio Communication Tester	R&S	CMU200	107627	1 year	2015.07.24
Loop antenna	R&S	HFH2-Z2.335.4711.52	826532	2 years	2017.03.03
Trilog-broadband antenna	Schwarzbeck	VULB 9168	9168-461	2 years	2017.04.03
Preamplifier	HP	8447F	2805A02570	1 year	2016.01.23
AC power supply	HP	6813A	3729A00754	1 year	2016.01.22
EMI Test Receiver	LIG NEX1	ISA-80	L0912K014	1 year	2015.11.14
EMI Receiver/Signal Analyzer	Narda S.T.S./PMM	R&S	PMM 9010F	1 year	2016.04.01
LISN	R&S	ENV216	101137	1 year	2016.02.10

Peripheral device

Device	Manufacturer	Model No.	Note
Wireless Charging Cover(with load)	KOMATECH Co.,Ltd.	N/A	-
Mobile Phone	SAMSUNG ELECTRONICS CO., LTD.	SHV-E210S (FCC ID : A3LSHVE210S)	-

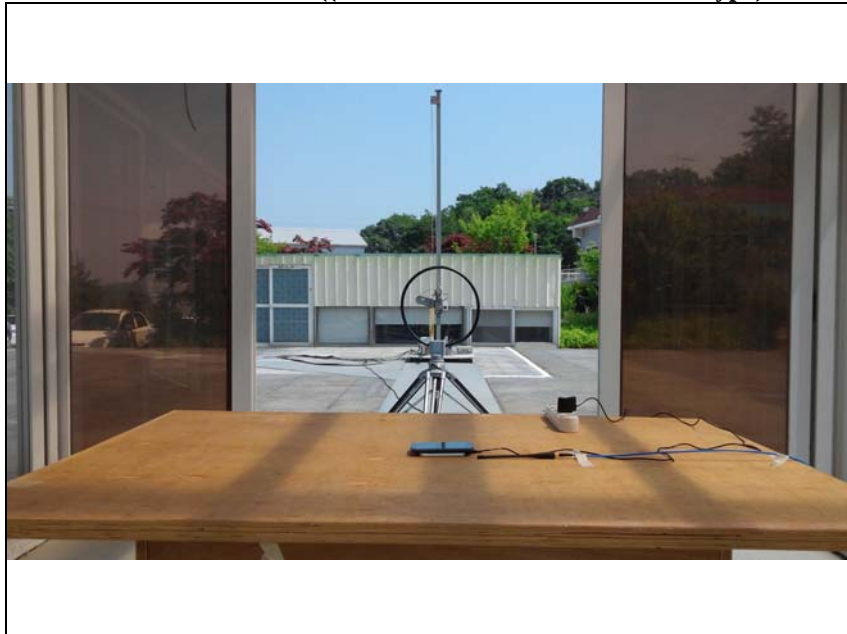
-The above devices were supported by manufacturer.

Appendix B. Test setup photo

Radiated Emission (below 30 MHz_with Load, Pad type)



Radiated Emission ((below 30 MHz_with Phone, Pad type)



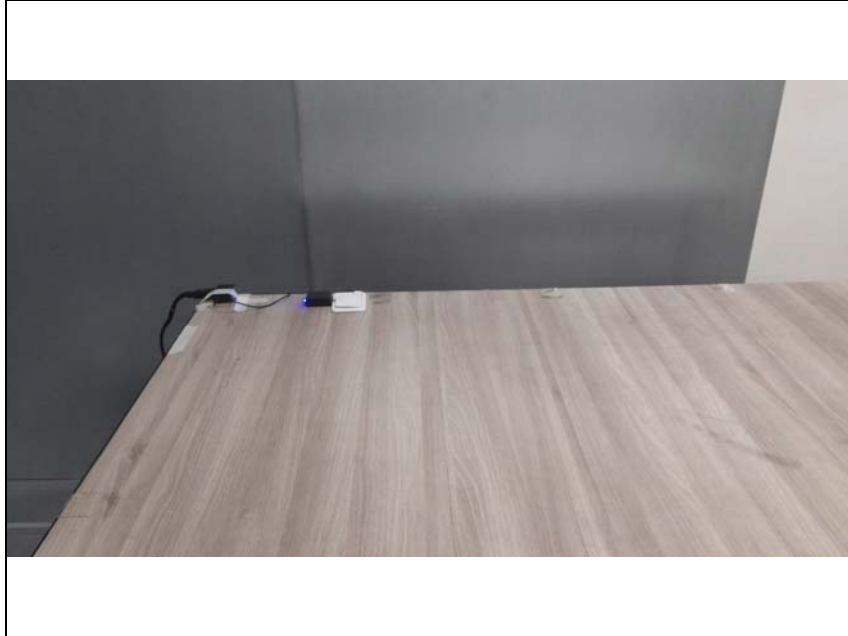
Radiated Emission (below 1 GHz_with Load, Pad type)



Radiated Emission ((below 1 GHz_with Phone, Pad type)



AC conducted Emission (with Load)



AC conducted Emission (with Phone)



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