RF TEST REPORT

Test Equipment	:	Wireless Charger
Model Name	:	G-FC-01A
Variant Model Name	:	G-FC-01B
FCC ID	:	2ARMSGFC01A
Date of receipt	:	2018.11.14
Test duration	:	2018.11.29 ~ 2018.12.04
Date of issue	:	2018.12.12

Applicant : moa company

801, 20, Pangyo-ro 289 beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488, South Korea

Test Laboratory : Lab-T, Inc.

2182-42, 2182-40 Baegok-daero, Mohyeon-myeon, Cheoin-gu, Yongin-si Gyeonggi-do 17036, South Korea

Test specification	:	FCC CFR Title 47 Part 15 Subpart C 15.203 FCC CFR Title 47 Part 15 Subpart C 15.207 FCC CFR Title 47 Part 15 Subpart C 15.209
Test result	:	Pass

The above equipment was tested by Lab-T Testing Laboratory for compliance with the requirements of FCC Rules and Regulations.
The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose.
This test report shall not be reproduced except in full, without the written approval of Lab-T, Inc

Tested by:

Engineer
Namhyoung Kwon

Reviewed by:

Technical Manager
SangHoon Yu

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APPENDIX I **25**

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1. Applicant Information

Applicant	:	moa company
Address	:	801, 20, Pangyo-ro 289beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488, South Korea
Telephone No.	:	+82-01-9811-7965
Person in charge	:	mobileislandstudio@gmail.com
Manufacturer	:	moa company
Address	:	801, 20, Pangyo-ro 289beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488, South Korea

2. Laboratory Information

Test Laboratory	:	Lab-T, Inc.
Address	:	2182-42, 2182-40 Baegok-daero, Mohyeon-myeon, Cheoin-gu, Yongin-si Gyeonggi-do 17036, South Korea
Telephone No.	:	+82 31-322-6767
Facsimile No.	:	+82 31-322-6768

Certificate

Designation No.	:	KR0159
Registration No.	:	133186

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3. Information About Test Equipment

3.1 Equipment Information

Equipment type	Wireless Charger
Equipment model name	G-FC-01A
Variant model name	G-FC-01B
Frequency range	110 kHz ~ 205 kHz
Modulation type	FSK
Power supply	DC 5.00 V, DC 9.00 V

Note1:The above EUT information was declared by the manufacturer.
Note2:Variant model names are used for each other different Buyers.

3.2 Antenna Information

type	Inductive Loop Coil Antenna

3.3 Tested Companion Device Information

Type	Manufacturer	Model	Note
Smart phone	sumsung	SM-G928K	-
AC Adapter	Dongguan Yingiu Power Co., Ltd.	EP-TA20KBK	-

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4. Test Report

4.1 Summary

FCC Part 15			
Reference	Parameter	Clause	Status
Transmitter Requirements			
2.1049	20 dB Bandwidth	4.4.5	C
15.209(a)	Radiated Emission	4.4.6	C
15.207(a)	Conducted Emissions	4.4.7	C
15.203	Antenna Requirements	4.4.8	C
NOTE 1 : C = Comply N/C = Not Comply N/T = Not Tested N/A = Not Applicable			

* The general test methods used to test this device is ANSI C63.10:2013

4.2 Measurement Uncertainty

Mesurement items	Expanded Uncertainty
Radiated Spurious Emissions (1 GHz under)	±4.560 dB (The confidence level is about 95 %, *k*=2)
Conducted emission	±4.080 dB (The confidence level is about 95 %, *k*=2)

4.3 Test Report Version

Test Report No.	Date	Description
TRRFCC18-0016	18.12.12	Initial issue

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4.4 Test Report

4.4.1 20 dB Bandwidth

4.4.1.1 Measurement Procedure

The 20 dB Bandwidth is measured with a spectrum anaylyzer connecterd via a receiving antenna placed near the EUT while the EUT is operating.

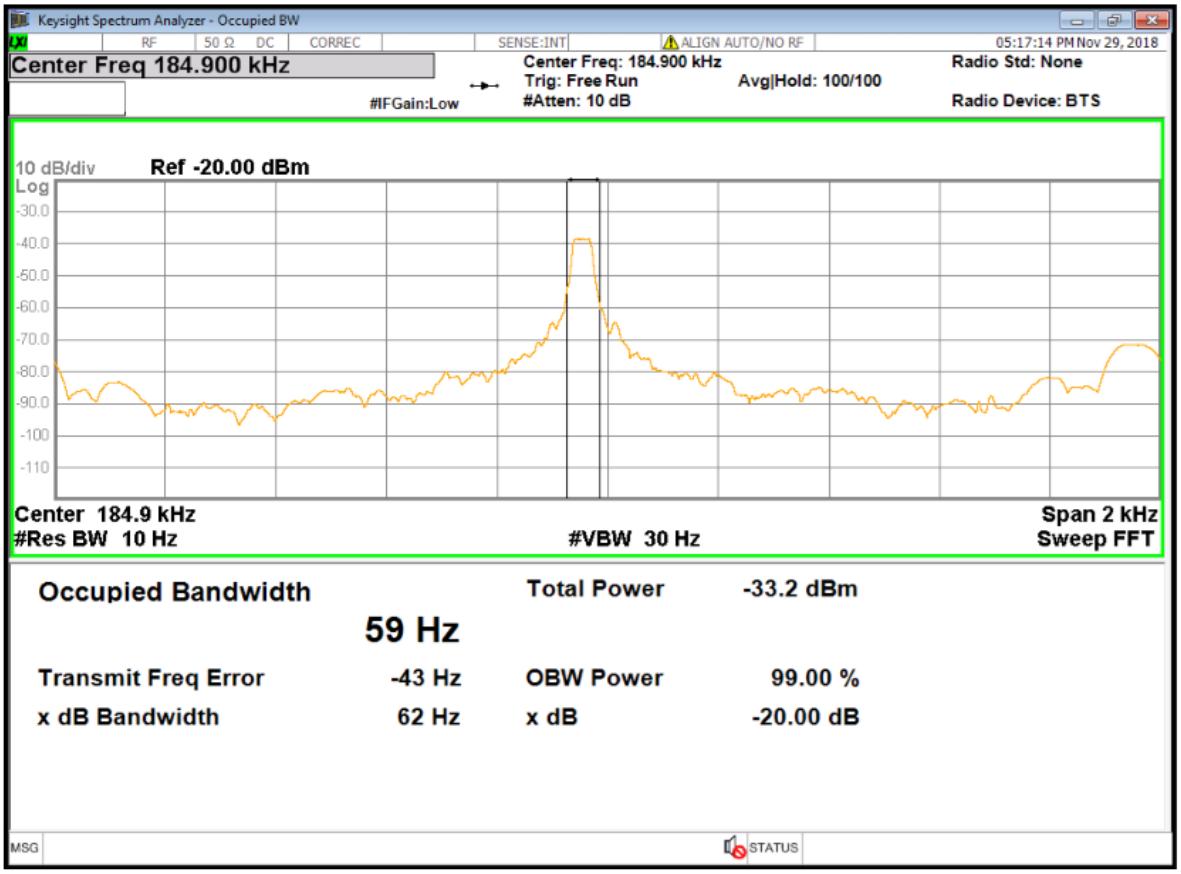
4.4.1.2 Result

Comply (measurement data : refer to below)

4.4.1.3 Measurement data

Test mode : 5 V Charging Mode

Tested Frequency(kHz)	Test Results(kHz)
184.9	0.062



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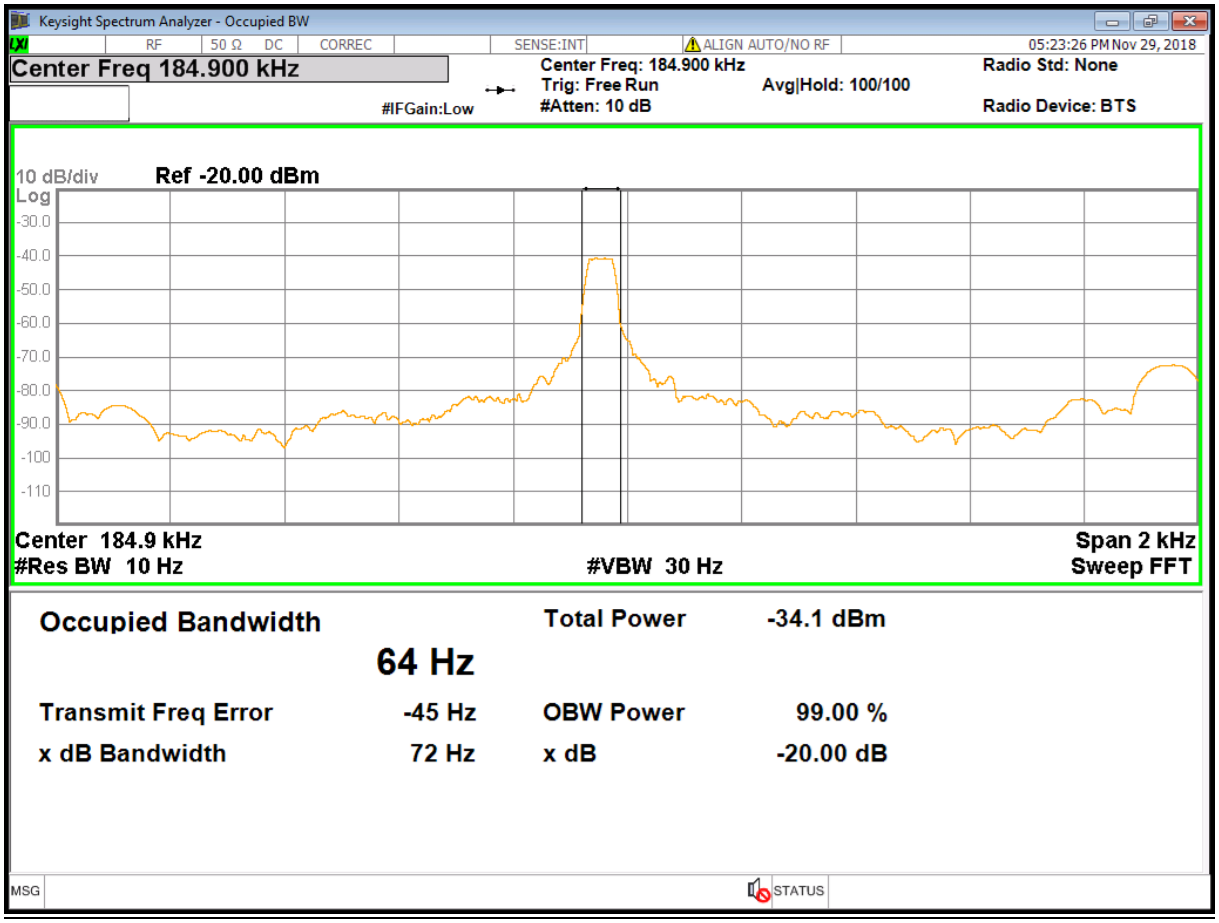
Test mode : 9 V Charging Mode

Tested Frequency(kHz)	Test Results(kHz)
184.9	0.072



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4.4.2 Radiated Emission

4.4.2.1 Regulation

According to §15.209(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall notexceed the field strength levels specified in the following table:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009 - 0.490	2 400/F(kHz)	300
0.490 - 1.705	24 000/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

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shallnot 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 permltted under other sections of this part, e.g., §§15.231 and 15.241.

4.4.2.2 Measurement Procedure

1) The EUT was placed on a turn table which is 0.8m above ground plane.
2) Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3) And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4) Repeat above procedures until all frequency measurements have been completed.

4.4.2.3 Test mode

In order to check all kinds of possible configurations, EUT was evaluated with appropriate client and under each charging condition as below table.

EUT Voltage	Cal.Date
5 V Charging Mode	Battery less than 1% charged
	Battery less than 50% charged
	Battery 100% fully charged
9 V Charging Mode	Battery less than 1% charged
	Battery less than 50% charged
	Battery 100% fully charged

4.4.2.4 Result

Comply (measurement data : refer to the next page)

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4.4.2.5 Measurement data_Radiated Spurious Emissions

Test mode : 5 V Charging Mode_9 kHz ~ 30 MHz (Battery less than 1% charged)

Frequency (MHz)	Detector	Note 1	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Cable Loss (dB)	Result at 3m (dBμV/m)	Result at 300m (dBμV/m)	Limit at 300m (dBμV/m)	Margin (dB)
0.182	QP	F	H	57.8	11.3	0.1	69.2	-10.8	22.4	33.2
0.182	QP	F	V	54.2	11.3	0.1	65.6	-14.4	22.4	36.8

Frequency (MHz)	Detector	Note 1	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Cable Loss (dB)	Result at 3m (dBμV/m)	Result at 30m (dBμV/m)	Limit at 30m (dBμV/m)	Margin (dB)
0.545	QP	S	V	36.3	11.1	0.1	69.2	29.2	62.4	33.2
0.546	QP	S	H	39.8	11.1	0.1	65.6	25.6	62.4	36.8
19.660	QP	S	H	25.0	8.6	0.6	34.2	-5.8	29.5	35.3
24.213	QP	S	V	25.2	7.7	0.6	33.5	-6.5	29.5	36.0

Note 1 : "F" : Fundamental, "S" : Spurious
Note 2 : Result : Reading + Ant Factor + Cable Loss
Note 3 : According to §15.31 (f)(2);
Result at 30m (dBμV/m) = Result at 3m(dBμV/m)-40log(30/3) (dBμV/m)
Result at 300m (dBμV/m) = Result at 3m(dBμV/m)-40log(300/3) (dBμV/m)
Note 4 : The radiation measurements are performed in X, Y, Z axis positioning. And worst case mode is recorded in the report.

Test mode : 5 V Charging Mode_9 kHz ~ 30 MHz (Battery less than 50% charged)

Frequency (MHz)	Detector	Note 1	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Cable Loss (dB)	Result at 3m (dBμV/m)	Result at 300m (dBμV/m)	Limit at 300m (dBμV/m)	Margin (dB)
0.182	QP	F	H	58.0	11.3	0.1	69.4	-10.6	22.4	33.0
0.182	QP	F	V	54.2	11.3	0.1	65.6	-14.4	22.4	36.8

Frequency (MHz)	Detector	Note 1	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Cable Loss (dB)	Result at 3m (dBμV/m)	Result at 30m (dBμV/m)	Limit at 30m (dBμV/m)	Margin (dB)
0.541	QP	S	V	36.6	11.1	0.1	47.8	7.8	32.9	25.1
0.549	QP	S	H	39.7	11.1	0.1	50.9	10.9	32.8	21.9
19.660	QP	S	H	25.5	8.6	0.6	34.7	-5.3	29.5	34.8
19.662	QP	S	V	24.1	8.6	0.6	33.3	-6.7	29.5	36.2

Note 1 : "F" : Fundamental, "S" : Spurious
Note 2 : Result : Reading + Ant Factor + Cable Loss
Note 3 : According to §15.31 (f)(2);
Result at 30m (dBμV/m) = Result at 3m(dBμV/m)-40log(30/3) (dBμV/m)
Result at 300m (dBμV/m) = Result at 3m(dBμV/m)-40log(300/3) (dBμV/m)
Note 4 : The radiation measurements are performed in X, Y, Z axis positioning. And worst case mode is recorded in the report.

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Test mode : 5 V Charging Mode_9 kHz ~ 30 MHz (Battery 100% fully charged)

Frequency (MHz)	Detector	Note 1	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Cable Loss (dB)	Result at 3m (dBμV/m)	Result at 300m (dBμV/m)	Limit at 300m (dBμV/m)	Margin (dB)
0.182	QP	F	H	57.9	11.3	0.1	69.3	-10.7	22.4	33.1
0.182	QP	F	V	54.2	11.3	0.1	65.6	-14.4	22.4	69.8

Frequency (MHz)	Detector	Note 1	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Cable Loss (dB)	Result at 3m (dBμV/m)	Result at 30m (dBμV/m)	Limit at 30m (dBμV/m)	Margin (dB)
0.545	QP	S	H	41.2	11.1	0.1	52.4	12.4	32.9	20.5
0.546	QP	S	V	37.9	11.1	0.1	49.1	9.1	32.9	23.8
19.661	QP	S	H	25.5	8.6	0.6	34.7	-5.3	29.5	34.8
24.122	QP	S	V	27.2	7.7	0.6	35.5	-4.5	29.5	34.0

Note 1 : "F" : Fundamental, "S" : Spurious
Note 2 : Result : Reading + Ant Factor + Cable Loss
Note 3 : According to §15.31 (f)(2);
Result at 30m (dBμV/m) = Result at 3m(dBμV/m)-40log(30/3) (dBμV/m)
Result at 300m (dBμV/m) = Result at 3m(dBμV/m)-40log(300/3) (dBμV/m)
Note 4 : The radiation measurements are performed in X, Y, Z axis positioning. And worst case mode is recorded in the report.

Test mode : 9 V Charging Mode_9 kHz ~ 30 MHz (Battery less than 1% charged)

Frequency (MHz)	Detector	Note 1	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Cable Loss (dB)	Result at 3m (dBμV/m)	Result at 300m (dBμV/m)	Limit at 300m (dBμV/m)	Margin (dB)
0.186	QP	F	H	57.7	11.3	0.1	69.1	-10.9	22.2	33.1
0.186	QP	F	V	54.0	11.3	0.1	65.4	-14.6	22.2	36.8

Frequency (MHz)	Detector	Note 1	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Cable Loss (dB)	Result at 3m (dBμV/m)	Result at 30m (dBμV/m)	Limit at 30m (dBμV/m)	Margin (dB)
0.553	QP	S	H	38.9	11.1	0.1	50.1	10.1	32.7	22.6
0.558	QP	S	V	36.3	11.1	0.1	47.5	7.5	32.7	25.2
19.517	QP	S	H	25.3	8.6	0.6	34.5	-5.5	29.5	35.0
19.669	QP	S	V	26.9	8.6	0.6	36.1	-3.9	29.5	33.4

Note 1 : "F" : Fundamental, "S" : Spurious
Note 2 : Result : Reading + Ant Factor + Cable Loss
Note 3 : According to §15.31 (f)(2);
Result at 30m (dBμV/m) = Result at 3m(dBμV/m)-40log(30/3) (dBμV/m)
Result at 300m (dBμV/m) = Result at 3m(dBμV/m)-40log(300/3) (dBμV/m)
Note 4 : The radiation measurements are performed in X, Y, Z axis positioning. And worst case mode is recorded in the report.

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Test mode : 9 V Charging Mode_9 kHz ~ 30 MHz (Battery less than 50% charged)

Frequency (MHz)	Detector	Note 1	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Cable Loss (dB)	Result at 3m (dBμV/m)	Result at 300m (dBμV/m)	Limit at 300m (dBμV/m)	Margin (dB)
0.185	QP	F	H	57.4	11.3	0.1	68.8	-11.2	22.3	33.5
0.186	QP	F	V	54.1	11.3	0.1	65.5	-14.5	22.2	36.7

Frequency (MHz)	Detector	Note 1	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Cable Loss (dB)	Result at 3m (dBμV/m)	Result at 30m (dBμV/m)	Limit at 30m (dBμV/m)	Margin (dB)
0.546	QP	S	V	35.3	11.1	0.1	46.5	6.5	32.7	26.2
0.547	QP	S	H	39.5	11.1	0.1	50.7	10.7	32.7	22.0
19.558	QP	S	H	25.3	8.6	0.6	34.5	-5.5	29.5	35.0
19.680	QP	S	V	24.3	8.6	0.6	33.5	-6.5	29.5	36.0

Note 1 : "F" : Fundamental, "S" : Spurious
Note 2 : Result : Reading + Ant Factor + Cable Loss
Note 3 : According to §15.31 (f)(2);
Result at 30m (dBμV/m) = Result at 3m(dBμV/m)-40log(30/3) (dBμV/m)
Result at 300m (dBμV/m) = Result at 3m(dBμV/m)-40log(300/3) (dBμV/m)
Note 4 : The radiation measurements are performed in X, Y, Z axis positioning. And worst case mode is recorded in the report.

Test mode : 9 V Charging Mode_9 kHz ~ 30 MHz (Battery 100% fully charged)

Frequency (MHz)	Detector	Note 1	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Cable Loss (dB)	Result at 3m (dBμV/m)	Result at 300m (dBμV/m)	Limit at 300m (dBμV/m)	Margin (dB)
0.185	QP	F	V	53.8	11.3	0.1	65.2	-14.8	22.3	37.1
0.186	QP	F	H	57.9	11.3	0.1	69.3	-10.7	22.2	32.9

Frequency (MHz)	Detector	Note 1	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Cable Loss (dB)	Result at 3m (dBμV/m)	Result at 30m (dBμV/m)	Limit at 30m (dBμV/m)	Margin (dB)
0.546	QP	S	V	37.4	11.1	0.1	48.6	8.6	32.9	24.3
0.549	QP	S	H	38.7	11.1	0.1	49.9	9.9	32.8	22.9
19.517	QP	S	H	25.7	8.6	0.6	34.9	-5.1	29.5	34.6
29.964	QP	S	V	27.6	6.5	0.6	34.7	-5.3	29.5	34.8

Note 1 : "F" : Fundamental, "S" : Spurious
Note 2 : Result : Reading + Ant Factor + Cable Loss
Note 3 : According to §15.31 (f)(2);
Result at 30m (dBμV/m) = Result at 3m(dBμV/m)-40log(30/3) (dBμV/m)
Result at 300m (dBμV/m) = Result at 3m(dBμV/m)-40log(300/3) (dBμV/m)
Note 4 : The radiation measurements are performed in X, Y, Z axis positioning. And worst case mode is recorded in the report.

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Test mode : : 5 V Charging Mode_30 MHz ~ 1 GHz (Worst Case : Battery less than 50% charged)

Frequency (MHz)	Detector	Note 1	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Loss (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
41.519	QP	S	V	49.3	18.4	-29.7	38.0	40.0	2.0
150.0.5	QP	S	V	34.1	19.2	-28.3	25.0	43.5	18.5
504.802	QP	S	H	30.5	23.9	-26.8	27.6	46.0	18.4

Note 1 : "F" : Fundamental, "S" : Spurious
Note 2 : Loss : Cable loss - Amp gain
Note 3 : Result : Reading + Ant Factor + Loss

Test mode : : 9 V Charging Mode_30 MHz ~ 1 GHz (Worst Case : Battery 100% fully charged)

Frequency (MHz)	Detector	Note 1	Pol. (V/H)	Reading (dBμV)	Ant Factor (dB)	Loss (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
41.761	QP	S	V	50.0	18.4	-29.7	38.7	40.0	1.3
150.762	QP	S	V	35.0	19.2	-28.3	25.9	43.5	17.6
281.830	QP	S	H	34.8	19.0	-27.3	26.5	46.0	19.5

Note 1 : "F" : Fundamental, "S" : Spurious
Note 2 : Loss : Cable loss - Amp gain
Note 3 : Result : Reading + Ant Factor + Loss

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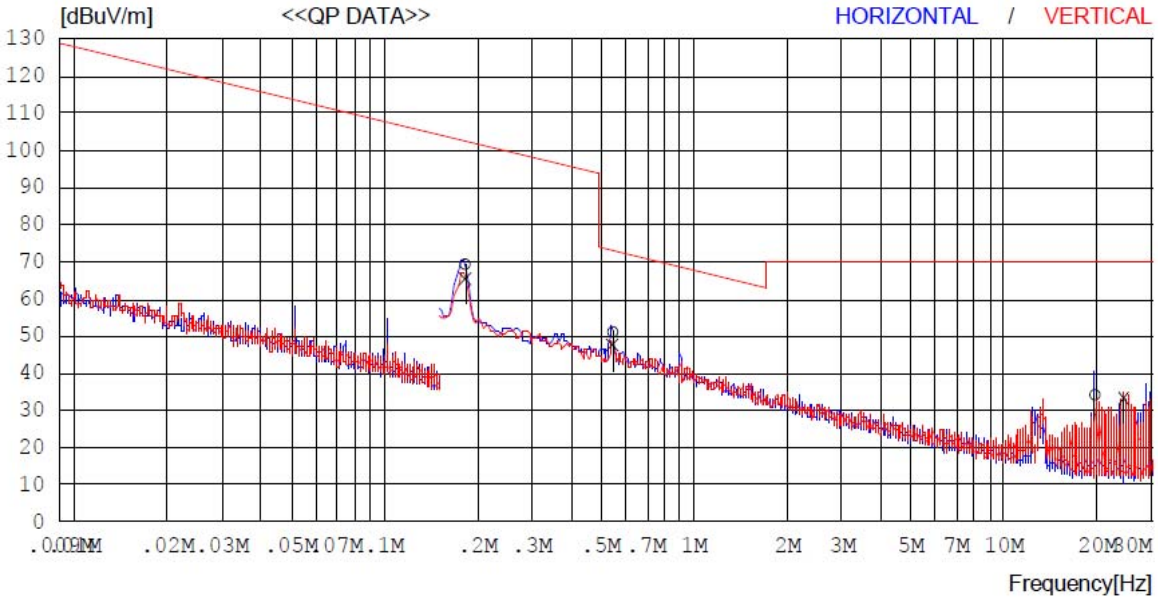
4.4.2.5 Measurement Plot

Test mode : 5 V Charging Mode_9 kHz ~ 30 MHz (Battery less than 1% charged)



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	0.182	57.8	11.3	0.1	0.0	69.2	102.4	33.2	100	274
2	0.546	39.8	11.1	0.1	0.0	51.0	72.9	21.9	100	98
3	19.660	25.0	8.6	0.6	0.0	34.2	69.5	35.3	100	74
----- Vertical ------										
4	0.182	54.2	11.3	0.1	0.0	65.6	102.4	36.8	100	208
5	0.545	36.3	11.1	0.1	0.0	47.5	72.9	25.4	100	198
6	24.213	25.2	7.7	0.6	0.0	33.5	69.5	36.0	100	193

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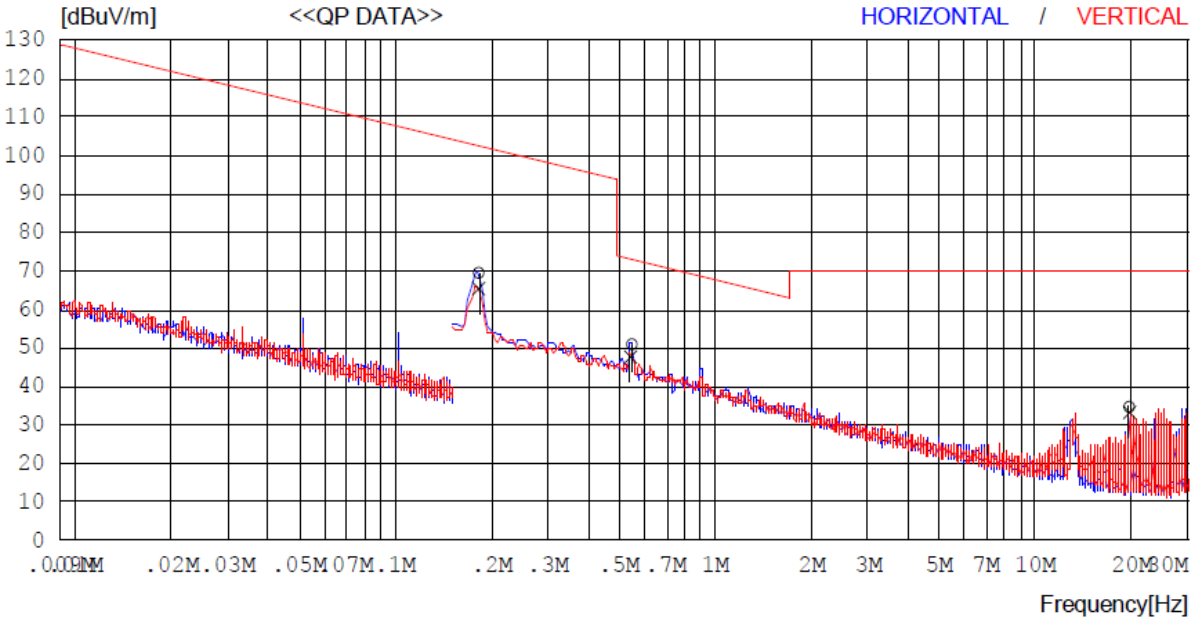
Test mode : 5 V Charging Mode_9 kHz ~ 30 MHz (Battery less than 50% charged)



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	0.182	58.0	11.3	0.1	0.0	69.4	102.4	33.0	100	80
2	0.549	39.7	11.1	0.1	0.0	50.9	72.8	21.9	100	120
3	19.660	25.5	8.6	0.6	0.0	34.7	69.5	34.8	100	68
----- Vertical ------										
4	0.182	54.2	11.3	0.1	0.0	65.6	102.4	36.8	100	198
5	0.541	36.6	11.1	0.1	0.0	47.8	72.9	25.1	100	186
6	19.662	24.1	8.6	0.6	0.0	33.3	69.5	36.2	100	300

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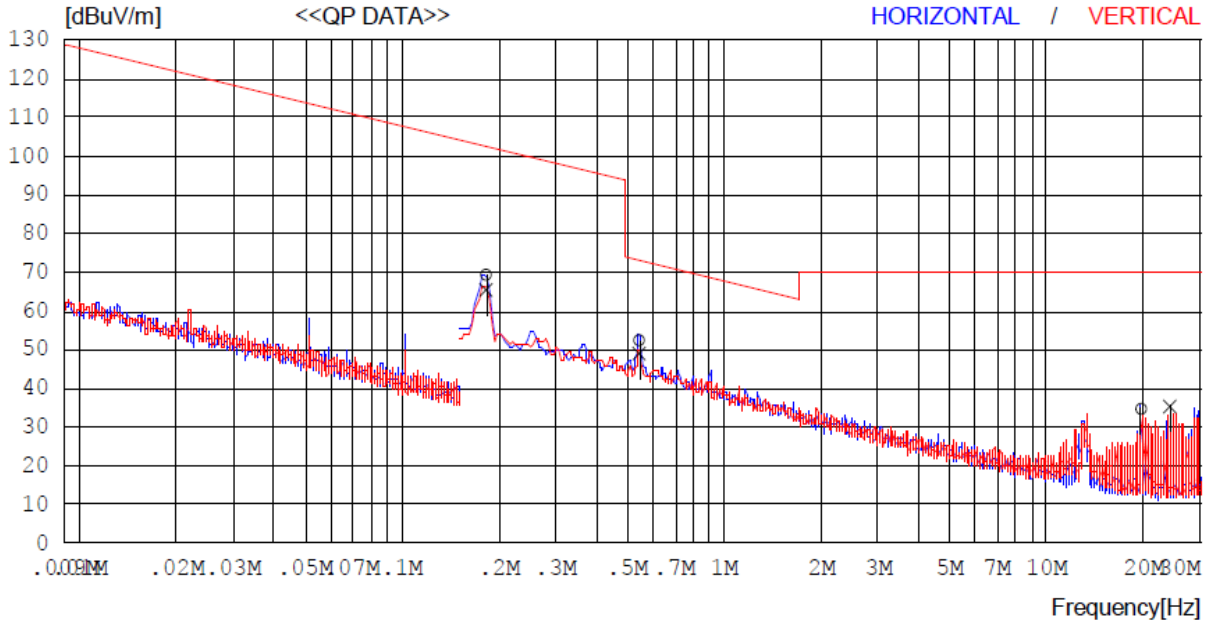
Test mode : 5 V Charging Mode_9 kHz ~ 30 MHz (Battery 100% fully charged)



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	0.182	57.9	11.3	0.1	0.0	69.3	102.4	33.1	100	230
2	0.545	41.2	11.1	0.1	0.0	52.4	72.9	20.5	100	187
3	19.661	25.5	8.6	0.6	0.0	34.7	69.5	34.8	100	196
----- Vertical ------										
4	0.182	54.2	11.3	0.1	0.0	65.6	102.4	36.8	100	188
5	0.546	37.9	11.1	0.1	0.0	49.1	72.9	23.8	100	11
6	24.122	27.2	7.7	0.6	0.0	35.5	69.5	34.0	100	223

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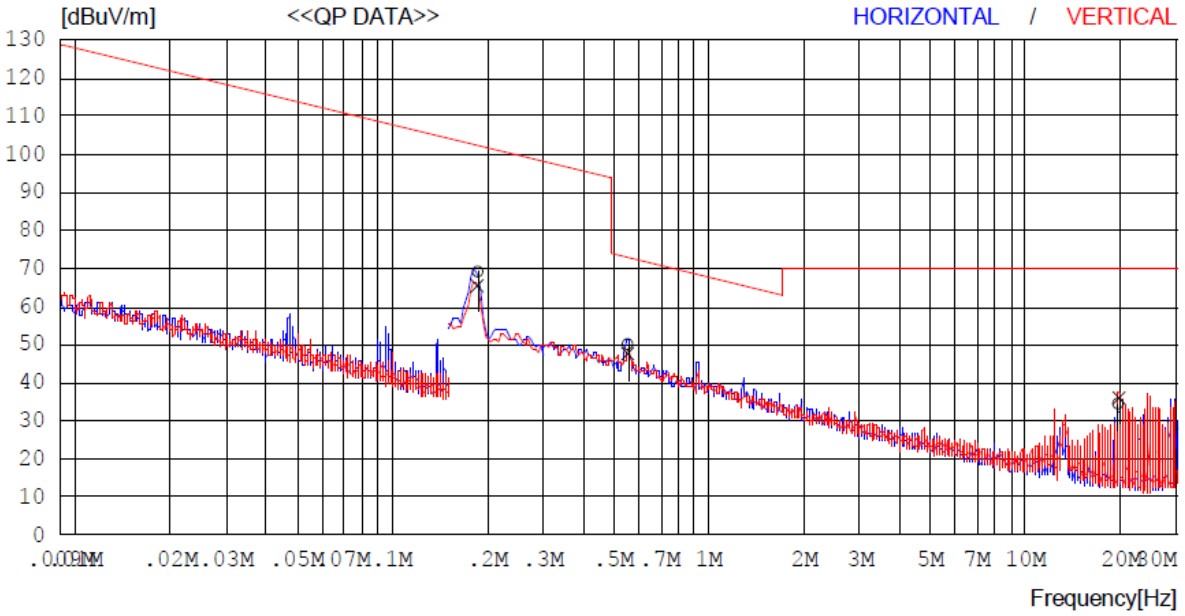
Test mode : 9 V Charging Mode_9 kHz ~ 30 MHz (Battery less than 1% charged)



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	0.186	57.7	11.3	0.1	0.0	69.1	102.2	33.1	100	298
2	0.553	38.9	11.1	0.1	0.0	50.1	72.7	22.6	100	94
3	19.517	25.3	8.6	0.6	0.0	34.5	69.5	35.0	100	257
----- Vertical ------										
4	0.186	54.0	11.3	0.1	0.0	65.4	102.2	36.8	100	178
5	0.558	36.3	11.1	0.1	0.0	47.5	72.7	25.2	100	270
6	19.669	26.9	8.6	0.6	0.0	36.1	69.5	33.4	100	301

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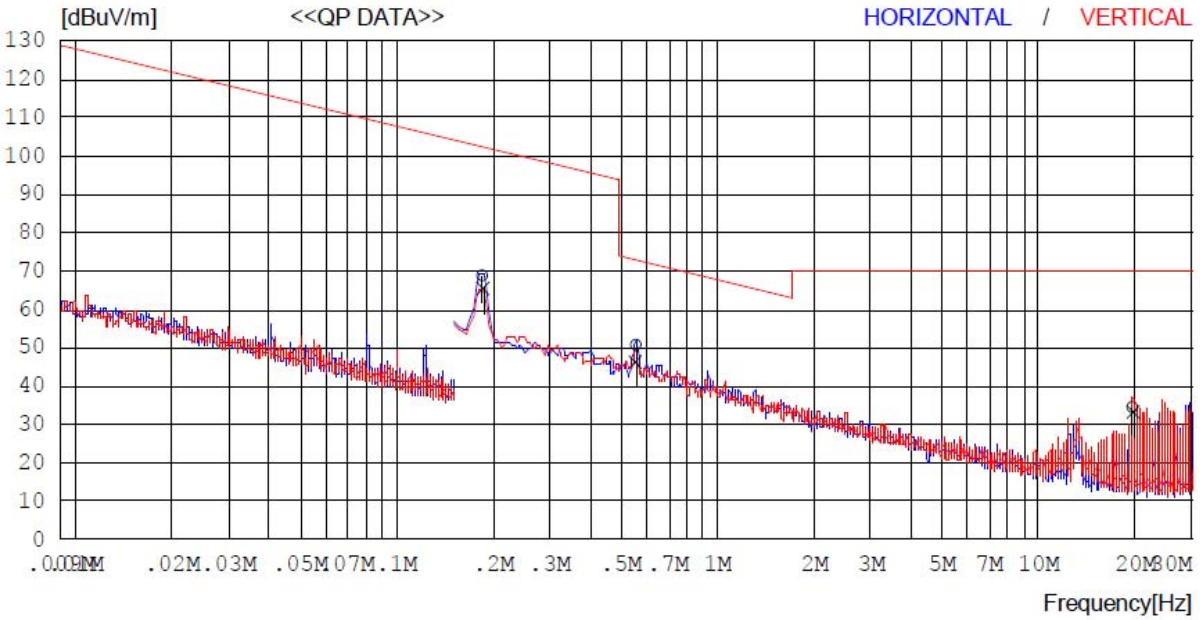
Test mode : 9 V Charging Mode_9 kHz ~ 30 MHz (Battery less than 50% charged)



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	0.185	57.4	11.3	0.1	0.0	68.8	102.3	33.5	100	293
2	0.557	39.5	11.1	0.1	0.0	50.7	72.7	22.0	100	277
3	19.558	25.3	8.6	0.6	0.0	34.5	69.5	35.0	100	42
----- Vertical ------										
4	0.186	54.1	11.3	0.1	0.0	65.5	102.2	36.7	100	187
5	0.556	35.3	11.1	0.1	0.0	46.5	72.7	26.2	100	12
6	19.680	24.3	8.6	0.6	0.0	33.5	69.5	36.0	100	168

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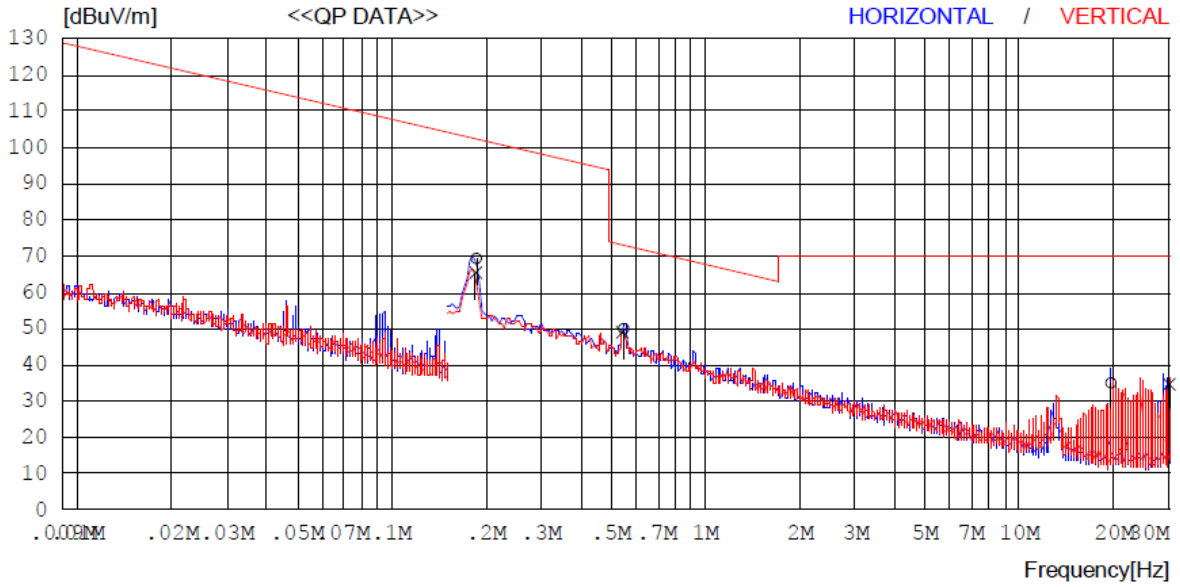
Test mode : 9 V Charging Mode_9 kHz ~ 30 MHz (Battery 100% fully charged)



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	0.186	57.9	11.3	0.1	0.0	69.3	102.2	32.9	100	112
2	0.549	38.7	11.1	0.1	0.0	49.9	72.8	22.9	100	77
3	19.517	25.7	8.6	0.6	0.0	34.9	69.5	34.6	100	133
----- Vertical ------										
4	0.185	53.8	11.3	0.1	0.0	65.2	102.3	37.1	100	185
5	0.546	37.4	11.1	0.1	0.0	48.6	72.9	24.3	100	23
6	29.964	27.6	6.5	0.6	0.0	34.7	69.5	34.8	100	201

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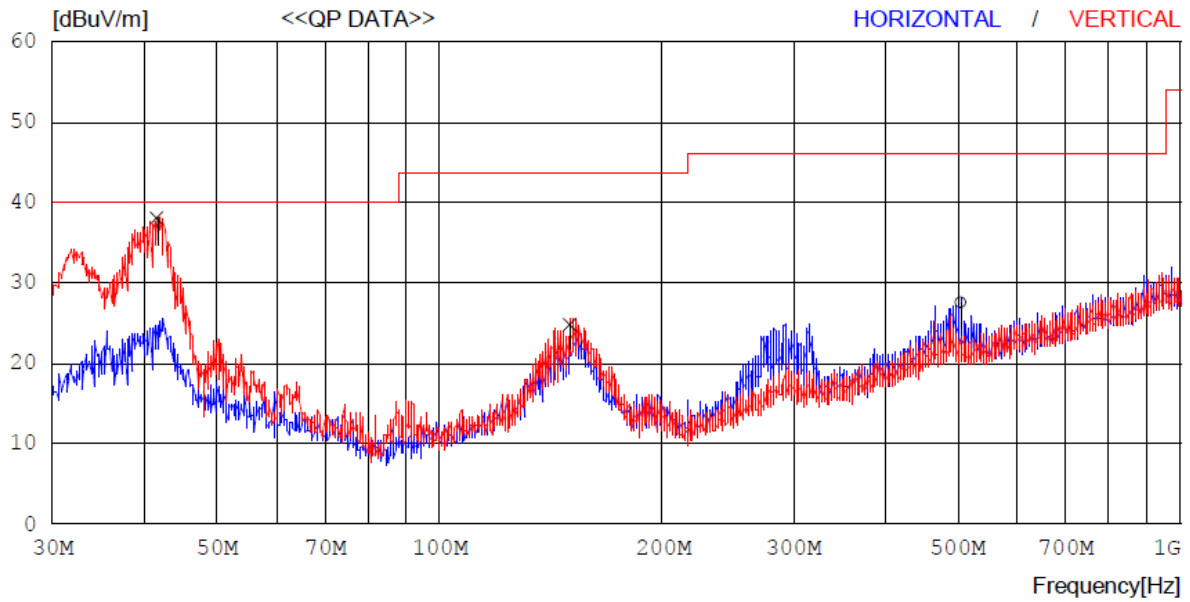
Test mode : 5 V Charging Mode_30 MHz ~ 1 GHz (Worst Case : Battery less than 50% charged)



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	504.802	30.5	23.9	-26.8	0.0	27.6	46.0	18.4	200	1
----- Vertical ------										
2	41.519	49.3	18.4	-29.7	0.0	38.0	40.0	2.0	100	359
3	150.035	34.1	19.2	-28.3	0.0	25.0	43.5	18.5	100	1

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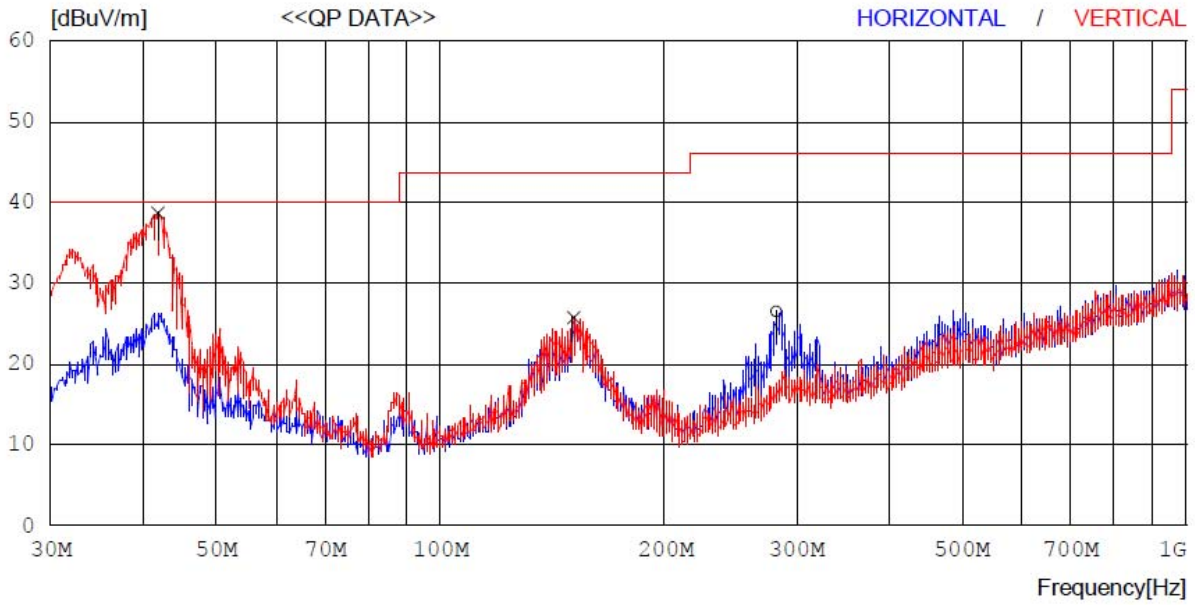
Test mode : 9 V Charging Mode_30 MHz ~ 1 GHz (Worst Case : Battery 100% fully charged)



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	281.830	34.8	19.0	-27.3	0.0	26.5	46.0	19.5	100	123
----- Vertical ------										
2	41.761	50.0	18.4	-29.7	0.0	38.7	40.0	1.3	100	1
3	150.762	35.0	19.2	-28.3	0.0	25.9	43.5	17.6	100	1

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4.4.3 Conducted Emission

4.4.3.1 Regulation

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 50 μH/50 Ω line impedance stabilization network (LISN).
Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Qausi-peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency.

According to §15.107(a), for unintentional device, except for Class A digital devices, line conducted emission limits are the same as the above table.

4.4.3.2 Measurement Procedure

1) The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 cm in which is located 40 cm away from the vertical wall and 1.5 m away from the side wall of the shielded room.

2) Each current-carrying conductor of the EUT power cord was individually connected through a 50 Ω/50 μH LISN, which is an input transducer to a Spectrum Analyzer or an EMI/Field Intensity Meter, to the input power source.

3) Exploratory measurements were made to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.

4) The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 MHz to 30 MHz.

5) The measurements were made with the detector set to PEAK amplitude within a bandwidth of 10 kHz or to QUASIPEAK and AVERAGE within a bandwidth of 9 kHz. The EUT was in transmitting mode during the measurements.

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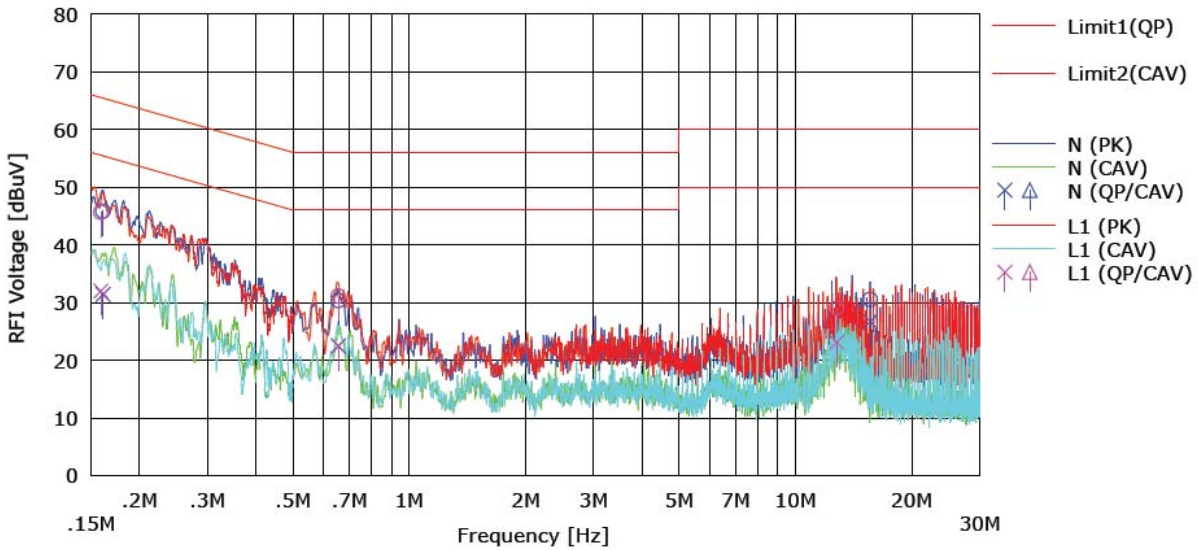
4.4.3.3 Result

Test Condition : refer to the clause 4.4.2.3 test coditions

Comply (measurement data : refer to below)

Test mode : 5 V Charging Mode (Worst Case : Battery less than 50% charged)



NO	FREQ [MHz]	READING QP [dBuV]	READING CAV [dBuV]	C.FACTOR [dB]	RESULT QP [dBuV]	RESULT CAV [dBuV]	LIMIT QP [dBuV]	LIMIT CAV [dBuV]	MARGIN QP [dBuV]	MARGIN CAV [dBuV]	PHASE
1	0.16109	25.9	11.5	19.9	45.8	31.4	65.4	55.4	19.6	24.0	N
2	0.65464	10.3	2.5	20.0	30.3	22.5	56.0	46.0	25.7	23.5	N
3	15.61501	10.1	6.3	20.4	30.5	26.7	60.0	50.0	29.5	23.3	N
4	0.15902	25.7	12.1	19.9	45.6	32.0	65.5	55.5	19.9	23.5	L1
5	0.65488	11.1	2.4	20.0	31.1	22.4	56.0	46.0	24.9	23.6	L1
6	12.78638	8.7	2.8	20.3	29.0	23.1	60.0	50.0	31.0	26.9	L1

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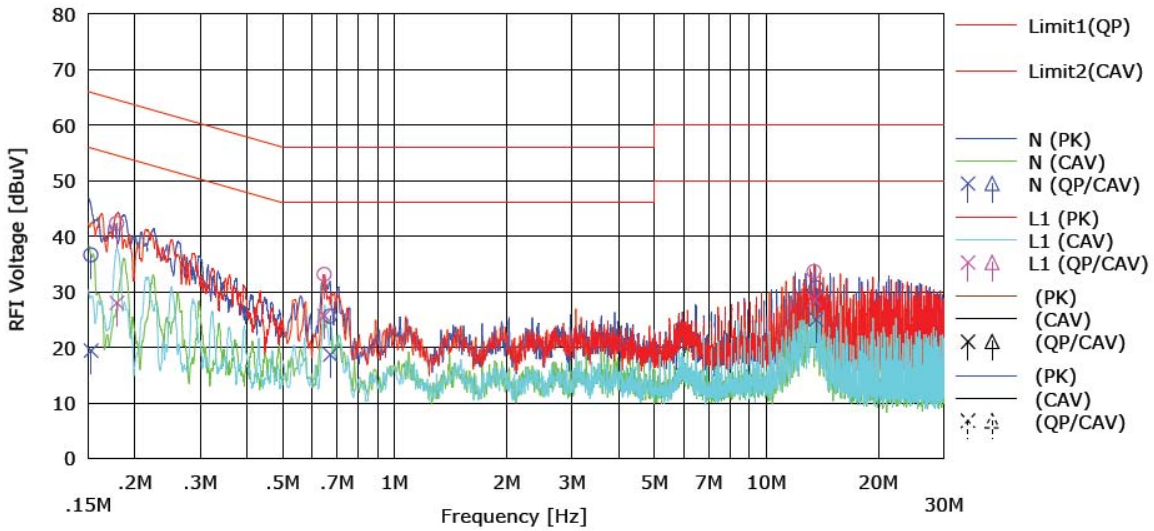
Test mode : 9 V Charging Mode (Worst Case : Battery 100% fully charged)



NO	FREQ [MHz]	READING QP [dBuV]	READING CAV [dBuV]	C.FACTOR [dB]	RESULT QP [dBuV]	RESULT CAV [dBuV]	LIMIT QP [dBuV]	LIMIT CAV [dBuV]	MARGIN QP [dBuV]	MARGIN CAV [dBuV]	PHASE
1	0.15258	16.8	-0.4	19.8	36.6	19.4	65.9	55.9	29.3	36.5	N
2	0.67146	5.6	-1.3	20.0	25.6	18.7	56.0	46.0	30.4	27.3	N
3	13.60838	10.4	4.7	20.3	30.7	25.0	60.0	50.0	29.3	25.0	N
4	0.17898	22.3	8.0	20.0	42.3	28.0	64.5	54.5	22.2	26.5	L1
5	0.64672	13.1	5.7	20.0	33.1	25.7	56.0	46.0	22.9	20.3	L1
6	13.44599	13.3	8.3	20.3	33.6	28.6	60.0	50.0	26.4	21.4	L1

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4.4.4 Antenna Requirements

4.4.4.1 Regulation

According to §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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4.4.4.2 Result

Comply (The antenna of this EUT is Inductive Loop Coil Antenna Type. Therefore the antenna is permanently attached. Please refer to the internal photo. Therefore this EUT Complies with the requirement of §15.203)

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APPENDIX I

TEST EQUIPMENT USED FOR TESTS

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To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment.

Equipment	Manufacturer	Model	Serial No.	Cal. Date (yy.mm.dd)	Next Cal.Date (yy.mm.dd)
PXA Signal Analyzer	KEYSIGHT	N9030A	MY54410264	18.01.11	19.01.11
AC POWER SUPPLY	PCR 500L	KIKUSUI	FE002647	18.04.24	19.04.24
HUMIDITY/TEMP DATA RECORDER	LUTRON	MHB-382SD	79735	18.04.24	19.04.24
Digital MultiMeter	HP	34401A	US36025428	18.01.11	19.01.11
Signal Generator	ROHDE&SCHWARZ	SMB100A	178384	18.10.15	19.10.15
EMI Test Receiver	ROHDE&SCHWARZ	ESU40	100445	17.12.15	18.12.15
BiLog Antenna	Schwarzbeck	VULB9160	3381	17.06.15	19.06.15
Preamplifier	TSJ	MLA-10k01-b01-27	1870369	18.04.23	19.04.23
Antenna Mast(10 m)	TOKIN	5977	-	-	-
Controller(10 m)	TOKIN	5909L	141909L-1	-	-
Turn Table(10 m)	TOKIN	5983-1.5	-	-	-
10 m Semi-Anechoic Chamber	SY CORPORATION	-	-	-	-
Active Loop H-Field	ETS	6502	00150598	17.06.01	19.06.01

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