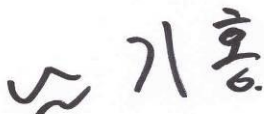


ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER


Test Report No. : E151R-107
AGR No. : A14NA-010
Applicant : InBody Co., Ltd.
Address : InBody Bldg., 54, Nonhyeon-ro 2-gil, Gangnam-gu, Seoul 135-960 KOREA
Manufacturer : InBody Co., Ltd.
Address : 15, Heugam-gil, Ipjang-myeon, Seobuk-gu, Cheonan-si, Chungcheongnam-do, 331-824, South Korea
Type of Equipment : Activity Tracker
FCC ID. : F6OINLAB3
Model Name : InLab3
Serial number : N/A
Total page of Report : 37 pages (including this page)
Date of Incoming : December 10, 2014
Date of issue : January 30, 2015

SUMMARY

The equipment complies with the regulation; *FCC PART 15 SUBPART C Section 15.247*
 This test report only contains the result of a single test of the sample supplied for the examination.
 It is not a generally valid assessment of the features of the respective products of the mass-production.

Reviewed by: 

 Ki-Hong, Nam / Senior Engineer
 ONETECH Corp.

Approved by: 

 Sung-ik, Han/ Managing Director
 ONETECH Corp.

CONTENTS

	PAGE
1. VERIFICATION OF COMPLIANCE	5
2. TEST SUMMARY.....	6
2.1 TEST ITEMS AND RESULTS	6
2.2 ADDITIONS, DEVIATIONS, EXCLUSIONS FROM STANDARDS.....	6
2.3 RELATED SUBMITTAL(S) / GRANT(S)	6
2.4 PURPOSE OF THE TEST	6
2.5 TEST METHODOLOGY.....	6
2.6 TEST FACILITY.....	6
3. GENERAL INFORMATION.....	7
3.1 PRODUCT DESCRIPTION.....	7
3.2 ALTERNATIVE TYPE(S)/MODEL(S); ALSO COVERED BY THIS TEST REPORT.....	7
4. EUT MODIFICATIONS.....	7
5. SYSTEM TEST CONFIGURATION	8
5.1 JUSTIFICATION.....	8
5.2 PERIPHERAL EQUIPMENT	8
5.3 MODE OF OPERATION DURING THE TEST	8
5.4 CONFIGURATION OF TEST SYSTEM.....	9
5.5 ANTENNA REQUIREMENT	9
6. PRELIMINARY TEST	9
6.1 AC POWER LINE CONDUCTED EMISSIONS TESTS.....	9
6.2 GENERAL RADIATED EMISSIONS TESTS	9
7. MIMIMUM 6 DB BANDWIDTH	10
7.1 OPERATING ENVIRONMENT	10
7.2 TEST SET-UP	10
7.3 TEST EQUIPMENT USED.....	10
7.4 TEST DATA.....	11
8. MAXIMUM PEAK OUTPUT POWER.....	13
8.1 OPERATING ENVIRONMENT	13
8.2 TEST SET-UP	13
8.3 TEST EQUIPMENT USED.....	13
8.4 TEST DATA.....	14

9. 100 KHZ BANDWIDTH OUTSIDE THE FREQUENCY BAND.....	16
9.1 OPERATING ENVIRONMENT	16
9.2 TEST SET-UP FOR CONDUCTED MEASUREMENT	16
9.3 TEST SET-UP FOR RADIATED MEASUREMENT.....	16
9.4 TEST EQUIPMENT USED.....	16
9.5 TEST DATA FOR CONDUCTED EMISSION	17
9.6 TEST DATA FOR RADIATED EMISSION.....	22
<i>9.6.1 Radiated Emission which fall in the Restricted Band.....</i>	<i>22</i>
<i>9.6.2 Spurious & Harmonic Radiated Emission.....</i>	<i>23</i>
10. PEAK POWER SPECTRAL DENSITY	25
10.1 OPERATING ENVIRONMENT	25
10.2 TEST SET-UP	25
10.3 TEST EQUIPMENT USED.....	25
10.4 TEST DATA.....	26
11. RADIATED EMISSION TEST	28
11.1 OPERATING ENVIRONMENT	28
11.2 TEST SET-UP	28
11.3 TEST EQUIPMENT USED.....	28
11.4 TEST DATA FOR CHARGING MODE.....	29
<i>11.4.1 Test data for 30 MHz ~ 1 GHz</i>	<i>29</i>
<i>11.4.2 Test data for Below 30 MHz.....</i>	<i>30</i>
<i>11.4.3 Test data for above 1 GHz</i>	<i>30</i>
11.5 TEST DATA FOR TRANSMITTING MODE	31
<i>11.5.1 Test data for 30 MHz ~ 1 GHz</i>	<i>31</i>
<i>11.5.2 Test data for Below 30 MHz.....</i>	<i>34</i>
<i>11.5.3 Test data for above 1 GHz</i>	<i>34</i>
15. CONDUCTED EMISSION TEST.....	35
15.1 OPERATING ENVIRONMENT	35
15.2 TEST SET-UP	35
15.3 TEST EQUIPMENT USED.....	35
15.4 TEST DATA FOR CHARGING MODE.....	36

Revision History

Issued Report No.	Issued Date	Revisions	Effect Section
E151R-107	January 30, 2015	Initial Issue	All

1. VERIFICATION OF COMPLIANCE

Applicant : InBody Co., Ltd.
 Address : InBody Bldg., 54, Nonhyeon-ro 2-gil, Gangnam-gu, Seoul 135-960 KOREA
 Contact Person : Kyung Keun, Kim / Manager
 Telephone No. : +82-2-2182-8968
 FCC ID : F6OINLAB3
 Model Name : InLab3
 Serial Number : N/A
 Date : January 30, 2015

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	Activity Tracker
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2009
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C Section 15.247
Modifications on the Equipment to Achieve Compliance	None
Final Test was Conducted On	3 m, Semi Anechoic Chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.247 (a) (2)	Minimum 6 dB Bandwidth	Met the Limit / PASS
15.247 (b) (3)	Maximum Peak Conducted Output Power	Met the Limit / PASS
15.247 (d)	100 kHz Bandwidth Outside the Frequency Band	Met the Limit / PASS
15.247 (d)	Radiated Emission which fall in the Restricted Band	Met the Limit / PASS
15.247 (e)	Peak Power Spectral Density	Met the Limit / PASS
15.209	Radiated Emission Limits	Met the Limit / PASS
15.207	Conducted Limits	Met the Limit / PASS
15.203	Antenna Requirement	Met requirement / PASS

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in FCC PART 15 SUBPART C Section 15.247.

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10: 2009. Radiated testing was performed at a distance of 3 m from EUT to the antenna.

2.6 Test Facility

The Onetech Corp. has been designated to perform equipment testing in compliance with ISO/IEC 17025.

The Electromagnetic compatibility measurement facilities are located at 301-14, Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-862 Korea.

-. Site Filing:

VCCI (Voluntary Control Council for Interference) – Registration No. R-4112/ C-4617/ G-666/ T-1842 IC (Industry Canada) – Registration No. Site# 3736-3

-. Site Accreditation:

KOLAS (Korea Laboratory Accreditation Scheme) - Accreditation No. 85

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) – Designation No. KR0013

3. GENERAL INFORMATION

3.1 Product Description

The InBody Co., Ltd., Model InLab3 (referred to as the EUT in this report) is a Activity Tracker. The product specification described herein was obtained from product data sheet or user’s manual.

Device Type	Activity Tracker
Temperature Range	-10 °C ~ +50 °C
Operating Frequency	2 402 MHz ~ 2 480 MHz
RF Output Power	1.65 dBm
Number of Channel	40 Channel
Modulation Type	GFSK
Antenna Type	Chip Antenna
USED RF CHIP	Marker: Partron Co., Ltd Model Name: SDBTPTR3015
Antenna Gain	1.99 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	32.768 kHz, 16 MHz

3.2 Alternative type(s)/model(s); also covered by this test report.

-. None

4. EUT MODIFICATIONS

-. None

5. SYSTEM TEST CONFIGURATION

5.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	InBody Co., Ltd.	INLAB4-K0714	N/A
LED	InBody Co., Ltd.	INLAB4-K2114	N/A
Battery	InBody Co., Ltd.	N/A	N/A

5.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	Description	Connected to
InLab3	InBody Co., Ltd.	Activity Tracker (EUT)	Notebook PC
Pavilion g6	HP	Notebook PC	EUT

5.3 Mode of operation during the test

For the testing, software used to control the EUT for staying in continuous transmitting is programmed.

For final testing, the EUT was set at 2 402 MHz, 2 440 MHz, and 2 480 MHz to get a maximum emission levels from the EUT. The EUT was moved throughout the XY, XZ, and YZ planes and the worst case is “XZ” axis, but the worst data was recorded in this report.

5.4 Configuration of Test System

Line Conducted Test: The EUT was tested in a charging mode. The EUT was connected to USB and the power of USB was connected to Notebook PC. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.10: 2009 7.3.3 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10: 2009 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meter open area test site.
The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

5.5 Antenna Requirement

For intentional device, according to 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.

Antenna Construction:

The antenna of the EUT is a Chip antenna on the main board in the EUT, so no consideration of replacement by the user.

6. PRELIMINARY TEST

6.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Charging Mode	X

6.2 General Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	The Worse operating condition (Please check one only)
Charging Mode	-
Transmitting Mode	X

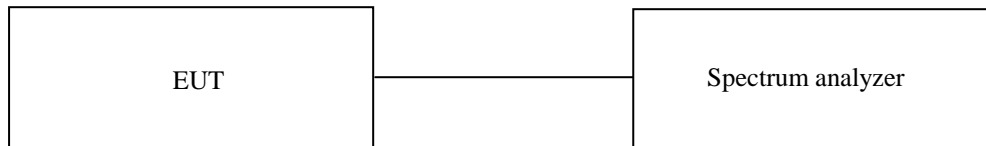
7. MIMIMUM 6 dB BANDWIDTH

7.1 Operating environment

Temperature : 21.6 °C
 Relative humidity : 43.0 % R.H.

7.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, and peak detection was used. The 6 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 6 dB.



7.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ - FSV30	Rohde & Schwarz	Signal Analyzer	101372	Apr. 28, 2014(1Y)

All test equipment used is calibrated on a regular basis.

7.4 Test data

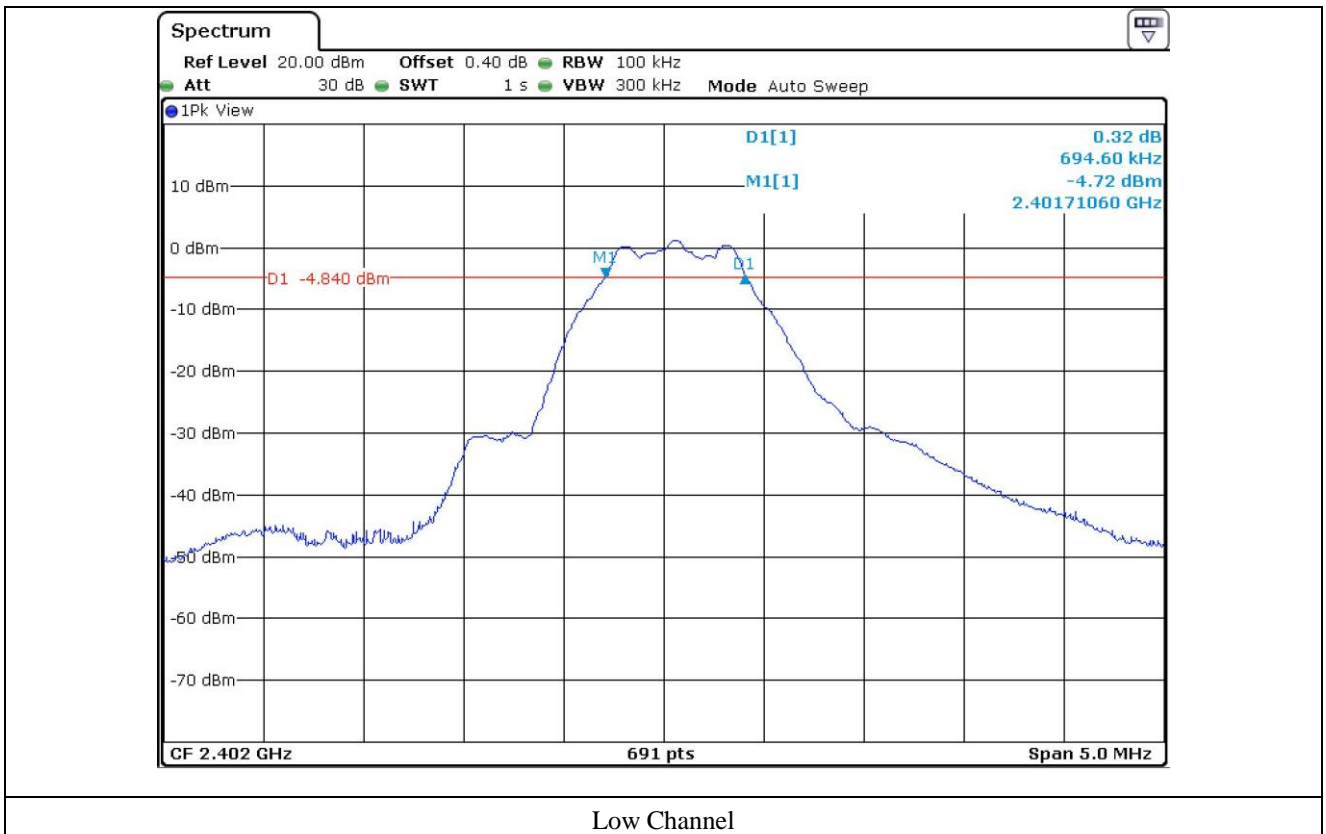
- Test Date : December 29, 2014
- Test Result : Pass

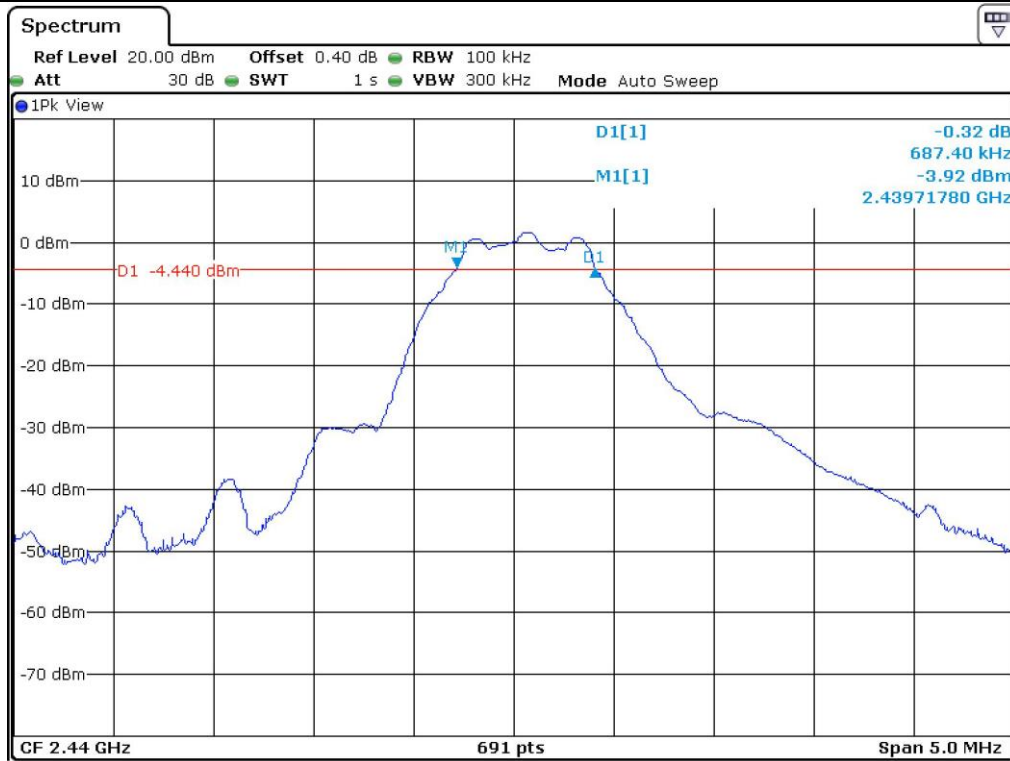
CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	2 402	690	500	190
Middle	2 440	690	500	190
High	2 480	690	500	190

Remark. Margin = Measured Value - Limit

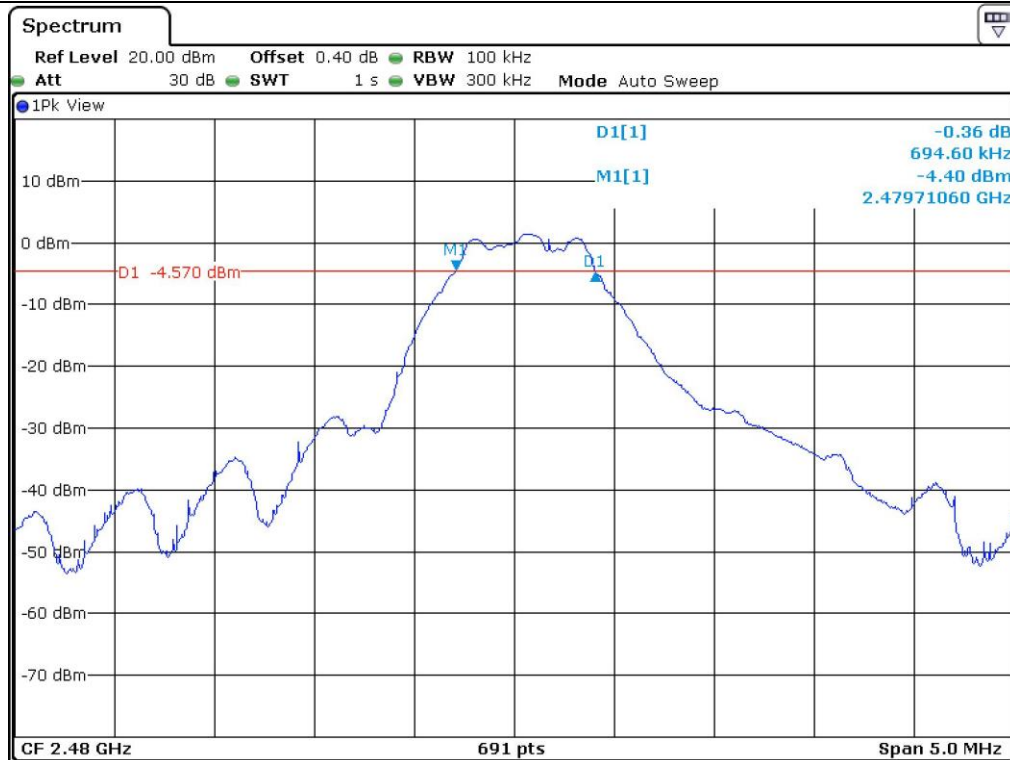


Tested by: hyung-kwon, Oh / Engineer





Middle Channel



High Channel

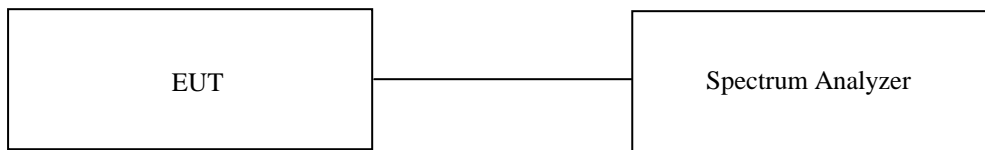
8. MAXIMUM PEAK OUTPUT POWER

8.1 Operating environment

Temperature : 21.6 °C
 Relative humidity : 43.0 % R.H.

8.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 1 MHz, the video bandwidth is set to 3 times the resolution bandwidth.



8.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ - FSV30	Rohde & Schwarz	Signal Analyzer	101372	Apr. 28, 2014(1Y)

All test equipment used is calibrated on a regular basis.

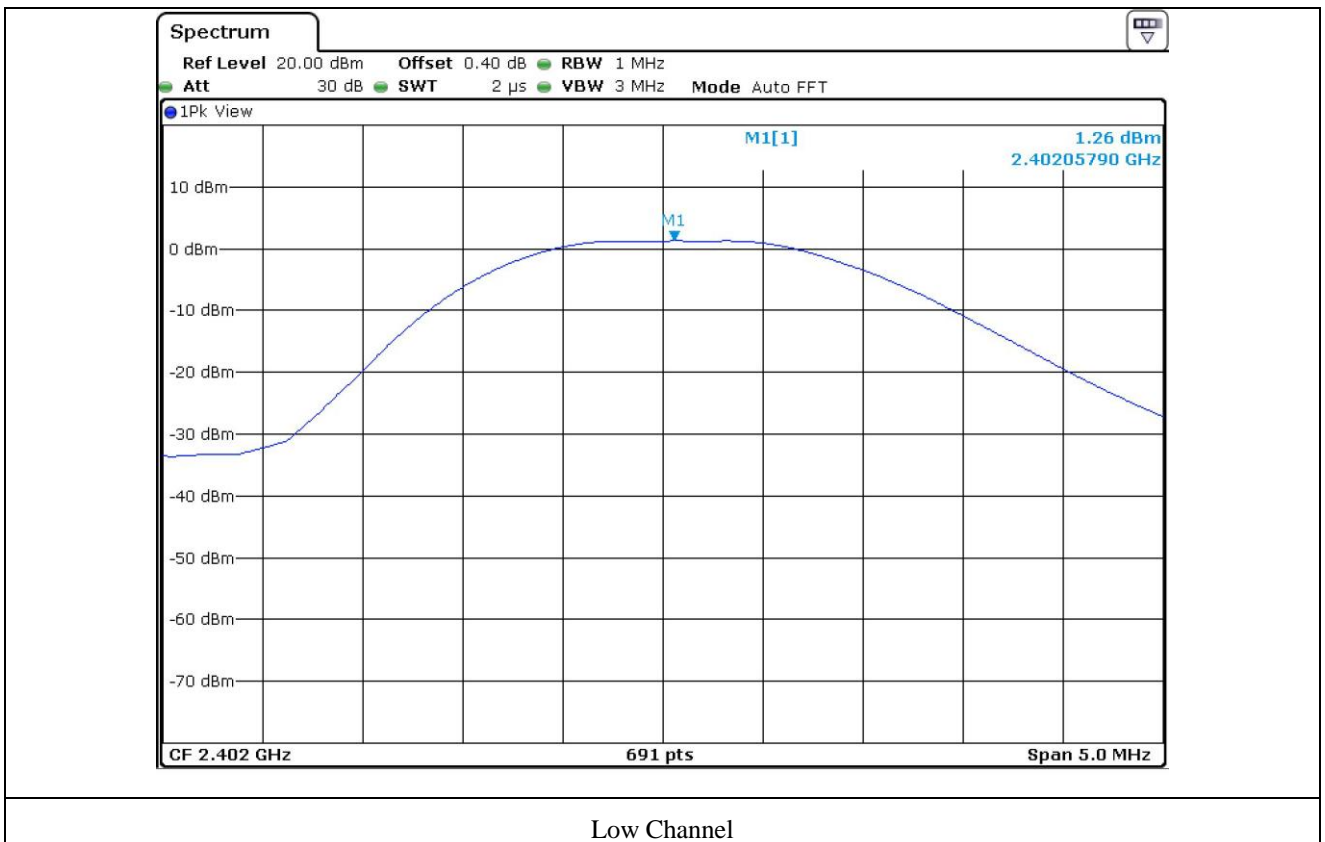
8.4 Test data

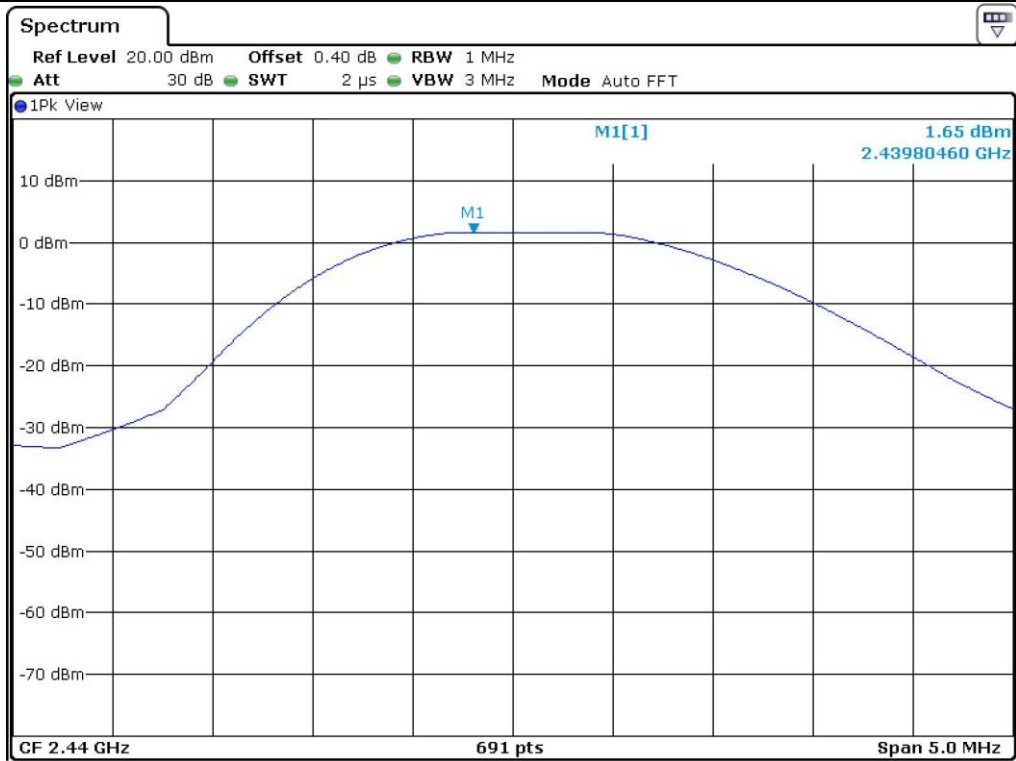
- Test Date : December 29, 2014
- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 402	1.26	30	28.74
MIDDLE	2 440	1.65	30	28.35
HIGH	2 480	1.59	30	28.41

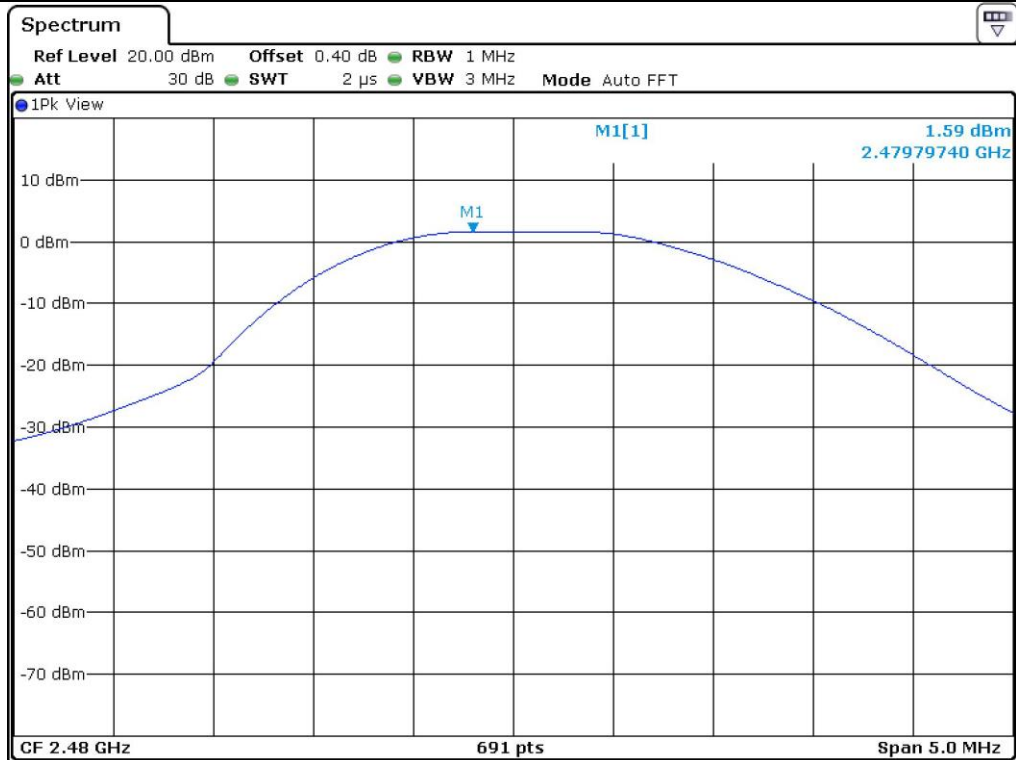
Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

Tested by: hyung-kwon, Oh / Engineer





Middle Channel



High Channel

9. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

9.1 Operating environment

Temperature : 21.6 °C
 Relative humidity : 43.0 % R.H.

9.2 Test set-up for conducted measurement

The antenna output of the EUT was connected to the spectrum analyzer. The resolution and video bandwidth is set to 100 kHz, and peak detection was used.



9.3 Test set-up for radiated measurement

The radiated emissions measurements were performed on the 3 m, open-field test site. The EUT was placed on a non-conductive turntable approximately 0.8 m above the ground plane.

The frequency spectrum from 30 MHz to 26.5 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

9.4 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
□ -	ESCI	Rohde & Schwarz	EMI Test Receiver	101012	Nov. 03, 2014(1Y)
■ -	ESU	Rohde & Schwarz	EMI Test Receiver	100261	Apr. 29, 2014(1Y)
□ -	8564E	HP	Spectrum Analyzer	3650A00756	Apr. 28, 2014(1Y)
□ -	FSP	Rohde & Schwarz	Spectrum Analyzer	100017	Oct. 08, 2014(1Y)
■ -	310N	Sonoma Instrument	AMPLIFIER	312544	Apr. 28, 2014(1Y)
■ -	FSV30	Rohde & Schwarz	Signal Analyzer	101372	Apr. 28, 2014(1Y)
■ -	SCU-18	Rohde & Schwarz	PRE-AMPLIFIER	10041	Nov. 25, 2014(1Y)
■ -	MA240	HD GmbH	Antenna Master	N/A	N/A
■ -	HD100	HD GmbH	Position Controller	N/A	N/A
■ -	DS420S	HD GmbH	Turn Table	N/A	N/A
■ -	HFH2-Z2	Rohde & Schwarz	Loop Antenna	879 285/26	Dec. 09, 2014(2Y)
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-255	May 02, 2014(2Y)
■ -	BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D295	Sep. 05, 2013(2Y)
■ -	BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Sep. 05, 2013(2Y)
■ -	83051A	Agilent	Microwave System Preamplifier	3950M00201	Apr. 30, 2014(1Y)

All test equipment used is calibrated on a regular basis.

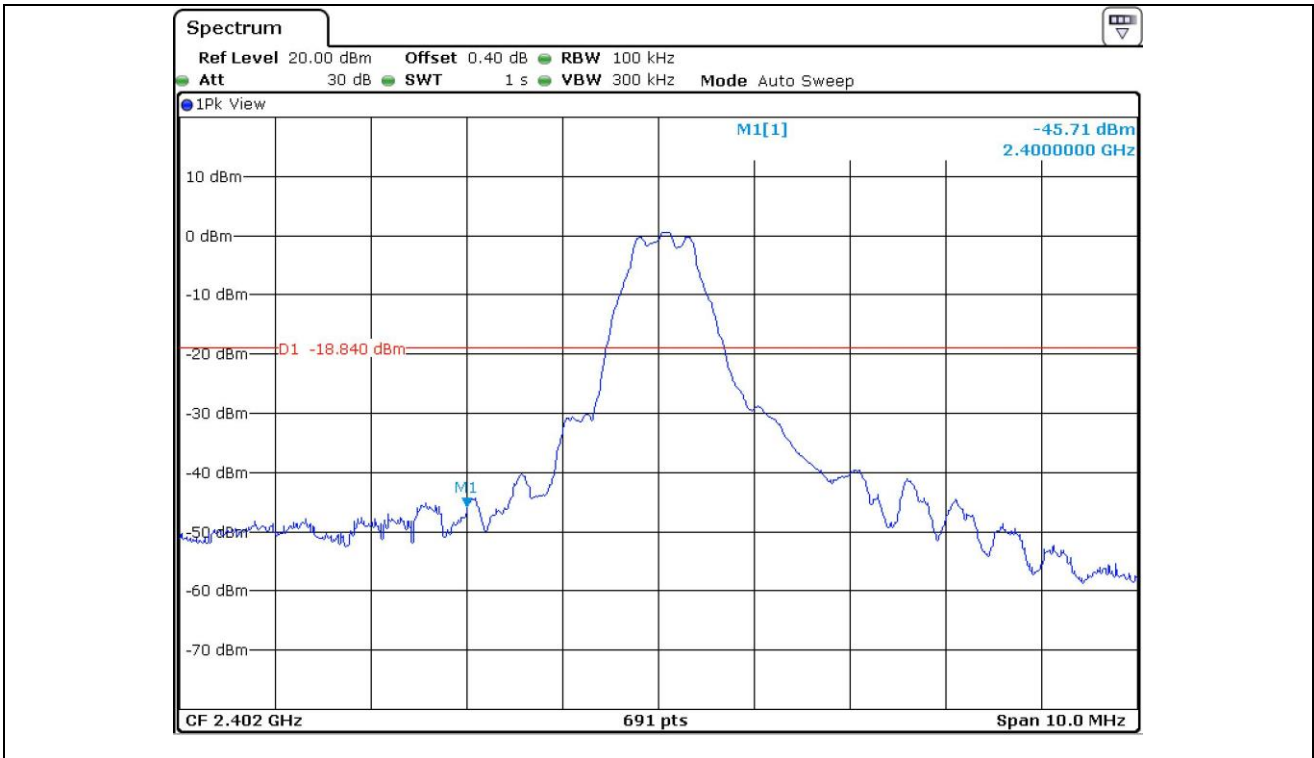
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EMC-003 (Rev.2)

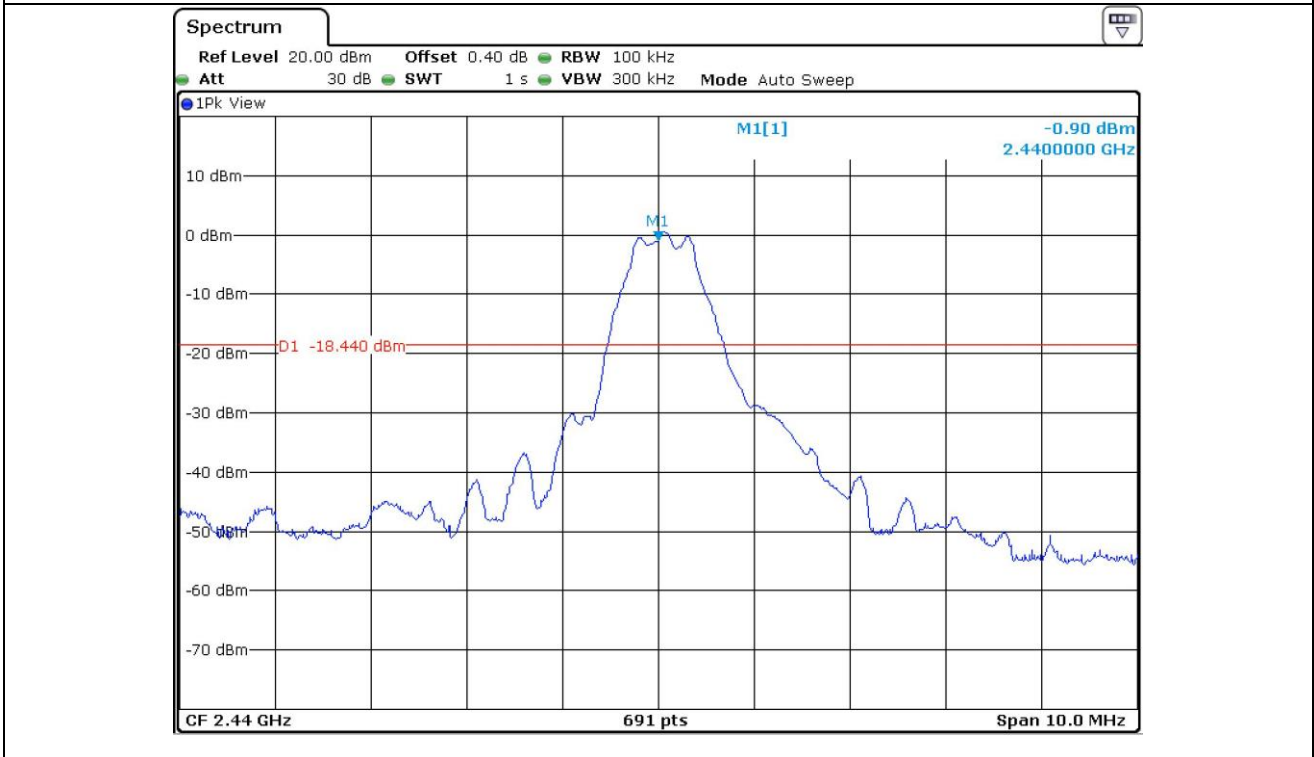
HEAD OFFICE : #505 SK APT. Factory 223-28, Sangdaewon 1 Dong, Jungwon-Gu, Seongnam-City, Gyunggi-Do, 462-121, Korea
 (TEL: +82-31-746-8500 FAX: +82-31-746-8700)

EMC Testing Div. : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea (TEL: 82-31-765-8289, FAX: 82-31-766-2904)

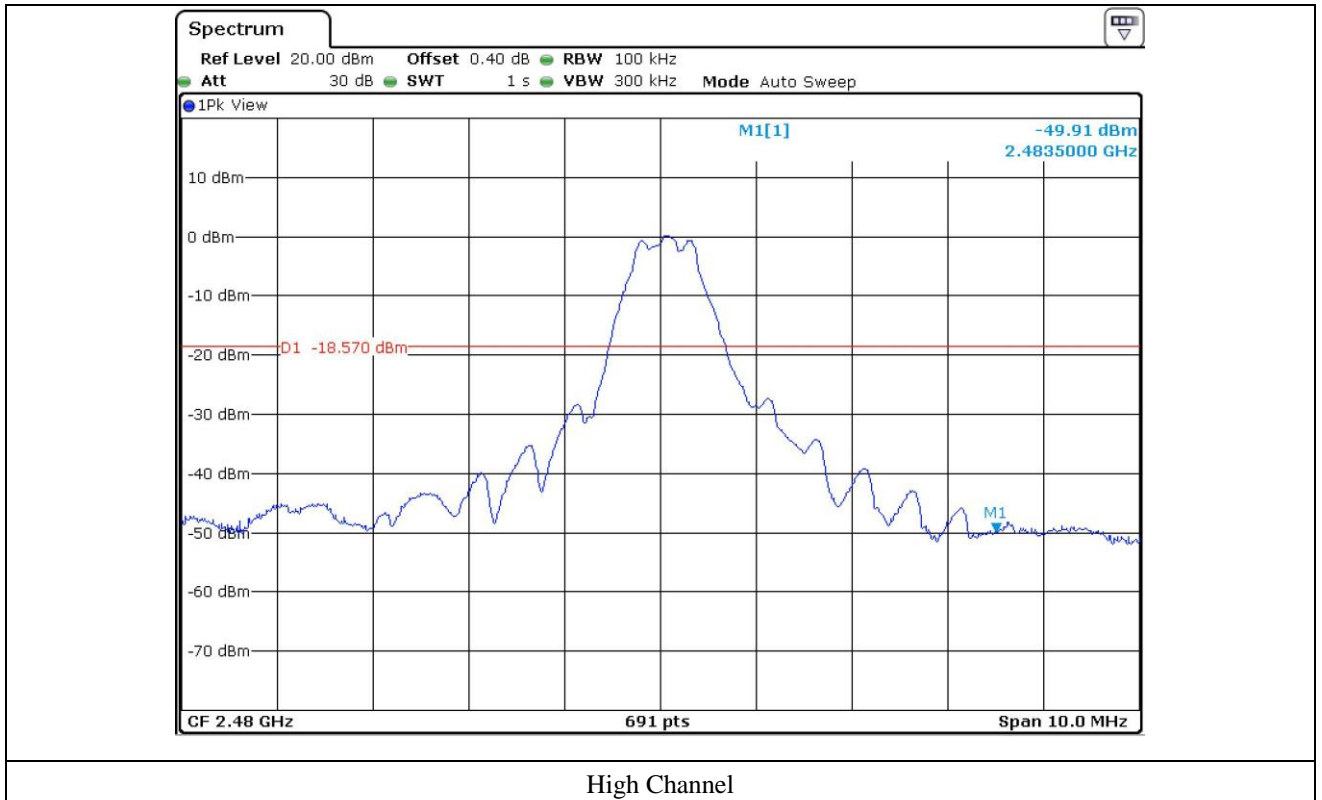
9.5 Test data for conducted emission



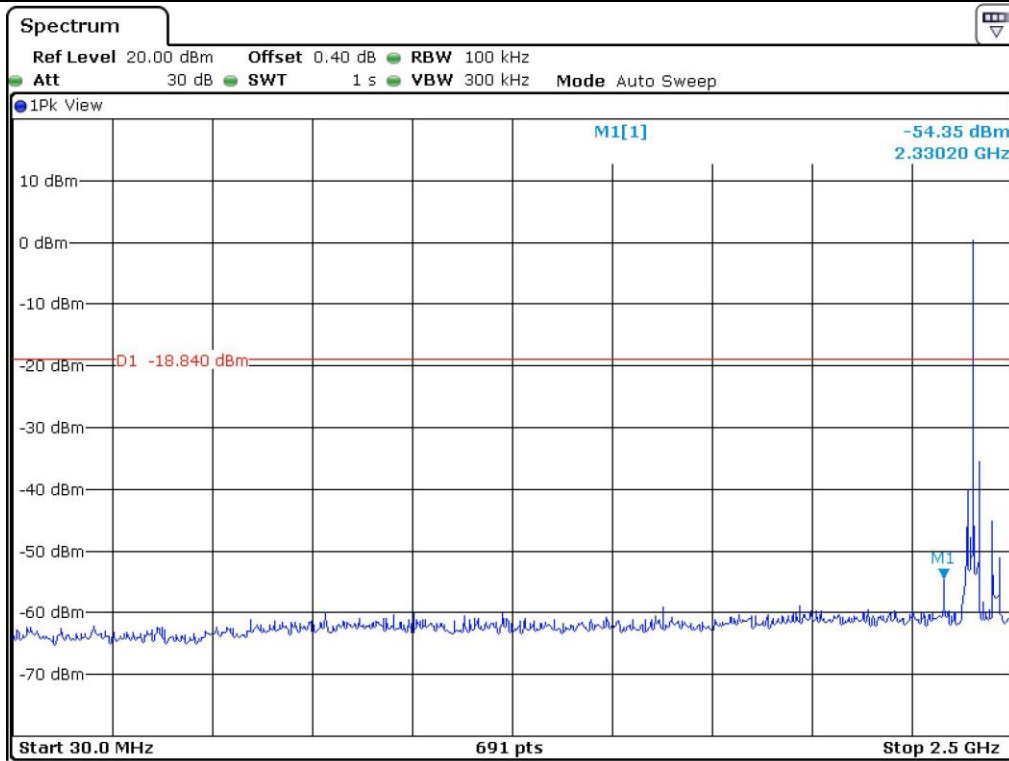
Low Channel



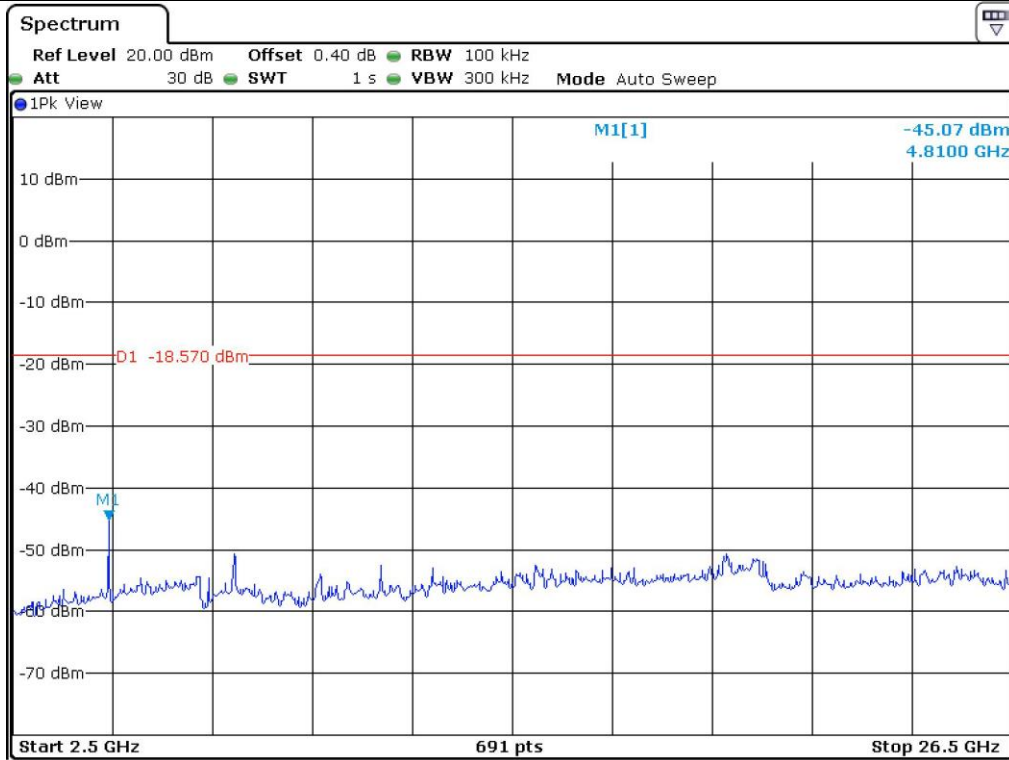
Middle Channel



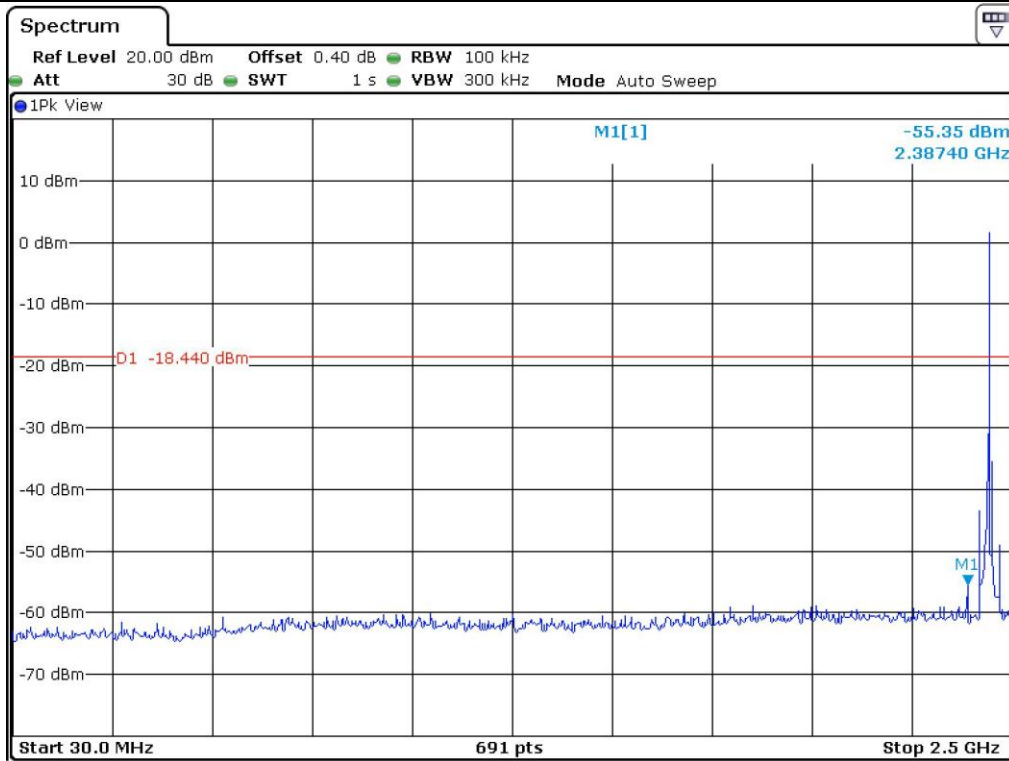
High Channel



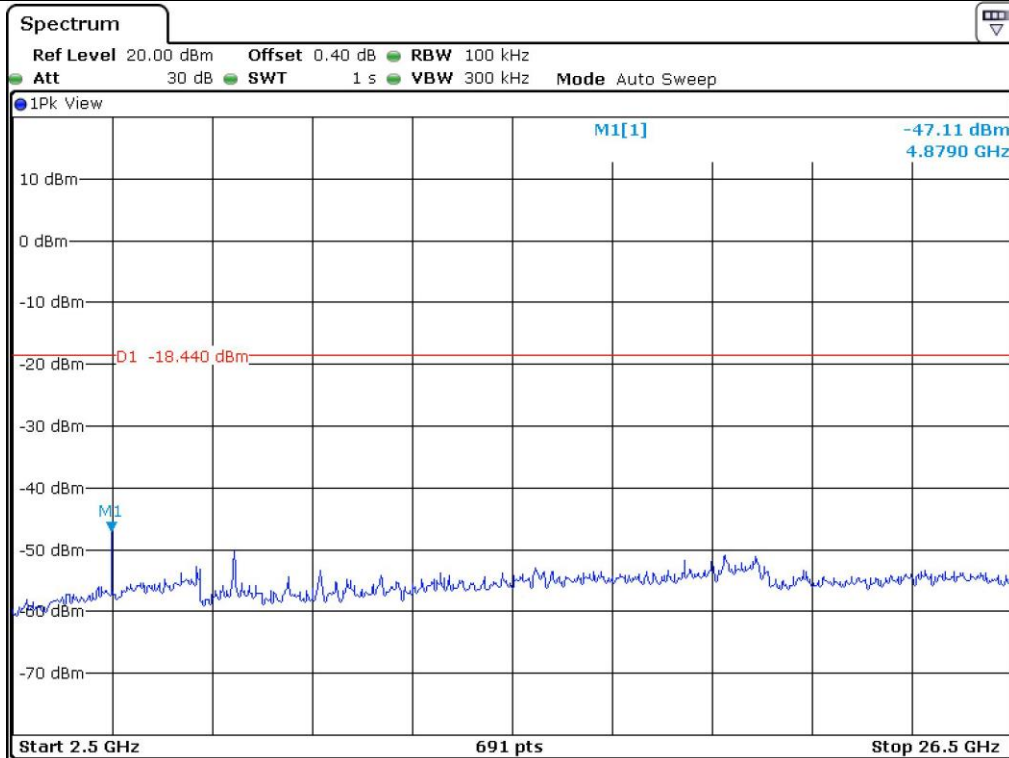
Low Channel



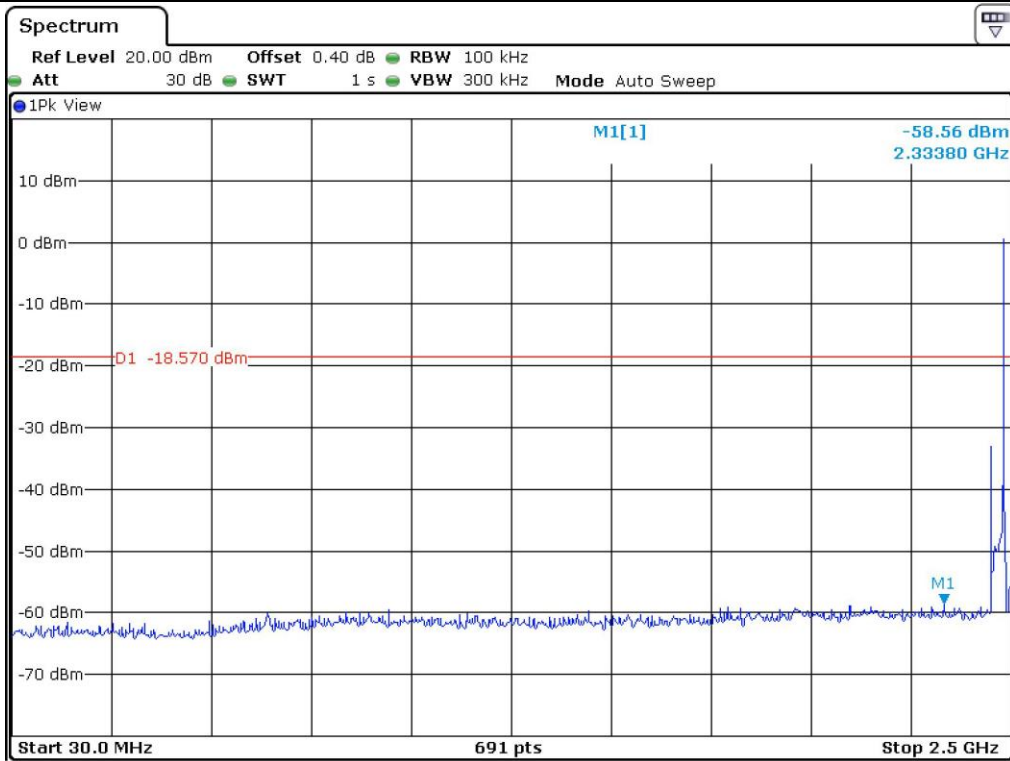
Low Channel



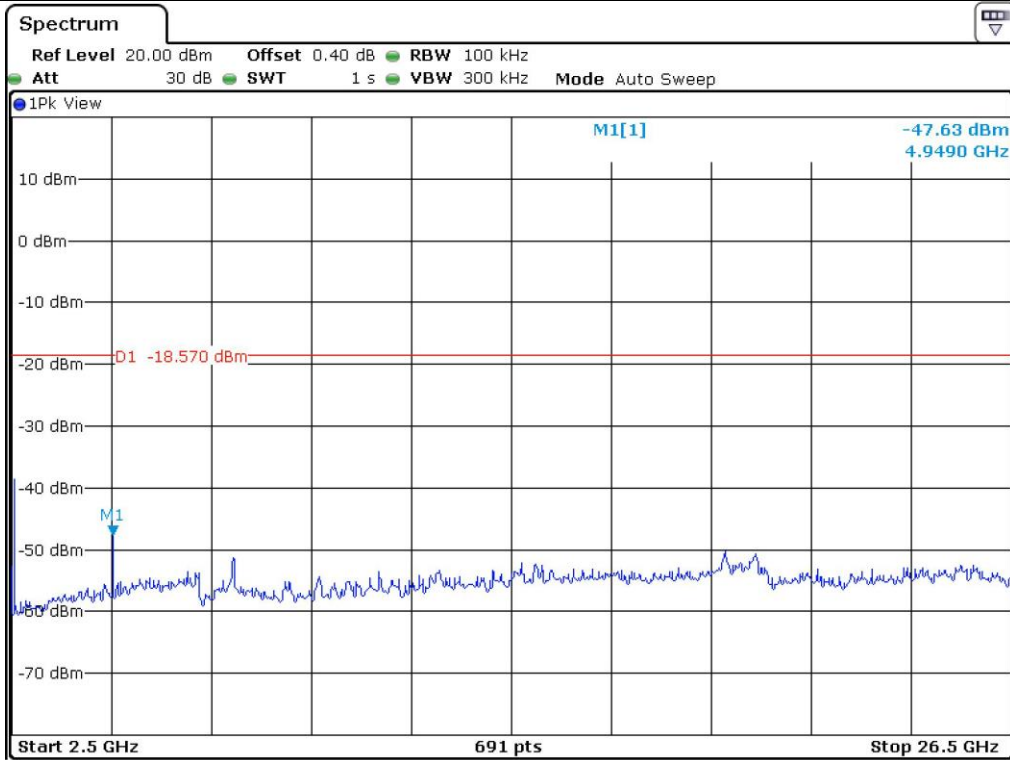
Middle Channel



Middle Channel



High Channel



High Channel

9.6 Test data for radiated emission

9.6.1 Radiated Emission which fall in the Restricted Band

- Test Date : January 22, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Measurement distance : 3 m
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel									
2 381.36	48.25	Peak	H	27.10	7.50	43.00	39.85	74.00	34.15
	35.15	Average	H				26.75	54.00	27.25
2 368.21	48.07	Peak	V				39.67	74.00	34.33
	35.19	Average	V				26.79	54.00	27.21
Test Data for High Channel									
2 491.68	47.95	Peak	H	27.10	7.50	43.00	39.55	74.00	34.45
	34.53	Average	H				26.13	54.00	27.87
2 487.44	48.03	Peak	V				39.63	74.00	34.37
	34.89	Average	V				26.49	54.00	27.51

Tabulated test data for Restricted Band

Remark: “H”: Horizontal, “V”: Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Pre-Amplifier Gain}$$



Tested by: hyung-kwon, Oh / Engineer

9.6.2 Spurious & Harmonic Radiated Emission

- Test Date : January 22, 2015
- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
100 kHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 26.5 GHz
- Measurement distance : 3 m
- Result : PASSED

Frequency (GHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Amp Gain	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel									
2 402.00	76.21	Peak	H	27.00	7.50	42.80	67.91	-	-
	79.19	Peak	V				70.89	-	-
4 804.00	48.10	Peak	H	30.60	11.10	42.50	47.30	74.00	26.70
	35.51	Average	H				34.71	54.00	19.29
	48.20	Peak	V				47.40	74.00	26.60
	35.42	Average	V				34.62	54.00	19.38
Test Data for Middle Channel									
2 440.00	76.44	Peak	H	27.20	7.60	42.80	68.44	-	-
	77.51	Peak	V				69.51	-	-
4 880.00	48.04	Peak	H	30.70	11.20	42.50	47.44	74.00	26.56
	35.22	Average	H				34.62	54.00	19.38
	48.28	Peak	V				47.68	74.00	26.32
	35.39	Average	V				34.79	54.00	19.21

Test Data for High Channel									
2 480.00	78.04	Peak	H	27.40	7.70	42.90	70.24	-	-
	76.95	Peak	V				69.15	-	-
4 960.00	48.35	Peak	H	30.80	11.30	42.50	47.95	74.00	26.05
	35.63	Average	H				35.23	54.00	18.77
	48.20	Peak	V				47.80	74.00	26.20
	35.30	Average	V				34.90	54.00	19.10

Tabulated test data for Restricted Band

Remark: “H”: Horizontal, “V”: Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Pre-Amplifier Gain}$$



Tested by: hyung-kwon, Oh / Engineer

10. PEAK POWER SPECTRAL DENSITY

10.1 Operating environment

Temperature : 21.6 °C
 Relative humidity : 43.0 % R.H.

10.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 3 kHz, the video bandwidth is set to 3 times the resolution bandwidth.



10.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ - FSV30	Rohde & Schwarz	Signal Analyzer	101372	Apr. 28, 2014(1Y)

All test equipment used is calibrated on a regular basis.

10.4 Test data

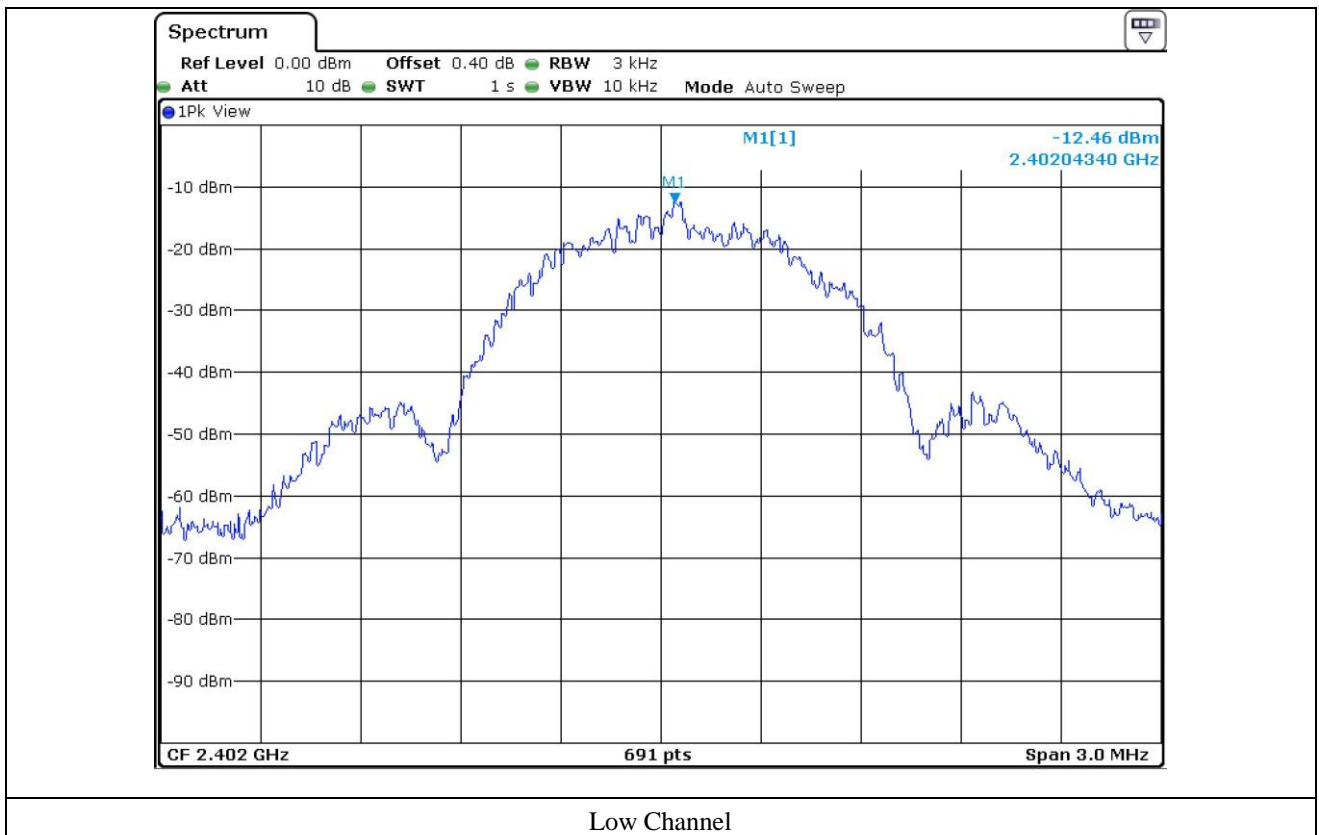
- Test Date : December 30, 2014
- Test Result : Pass
- Operating Condition : Continuous transmitting mode

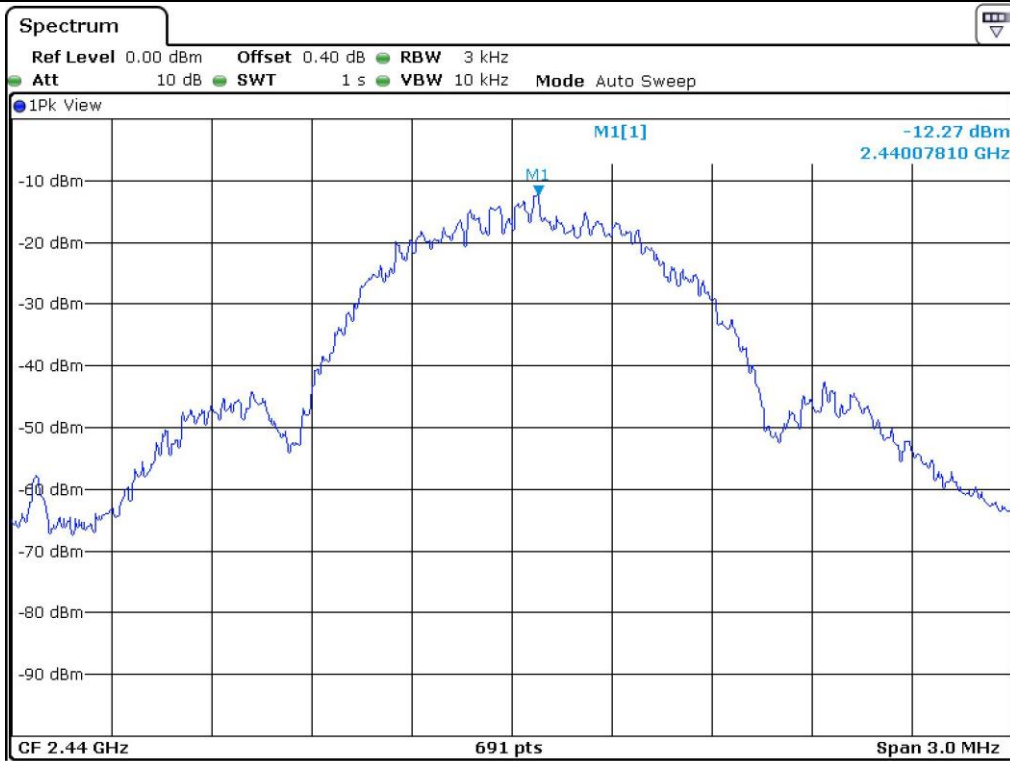
CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 402	-12.46	8.00	20.46
Middle	2 440	-12.27	8.00	20.27
High	2 480	-12.94	8.00	20.94

Remark. Margin = Limit – Measured value

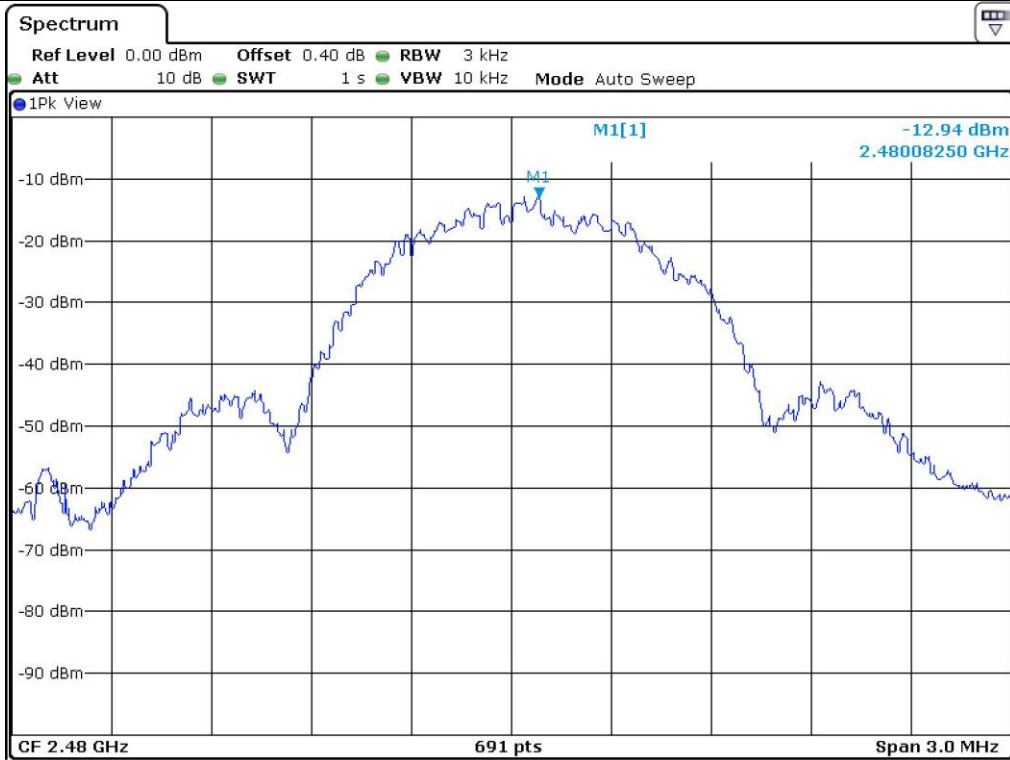


Tested by: hyung-kwon, Oh / Engineer





Middle Channel



High Channel

11. RADIATED EMISSION TEST

11.1 Operating environment

Temperature : 21.6 °C
 Relative humidity : 43.0 % R.H.

11.2 Test set-up

The radiated emissions measurements were on the 3 m, open-field test site. The EUT and other support equipment were placed on a non-conductive turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

The frequency spectrum from 30 MHz to 26.5 GHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

11.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
□ - ESCI	Rohde & Schwarz	EMI Test Receiver	101012	Nov. 03, 2014(1Y)
■ - ESU	Rohde & Schwarz	EMI Test Receiver	100261	Apr. 29, 2014(1Y)
□ - 8564E	HP	Spectrum Analyzer	3650A00756	Apr. 28, 2014(1Y)
□ - FSP	Rohde & Schwarz	Spectrum Analyzer	100017	Oct. 08, 2014(1Y)
■ - 310N	Sonoma Instrument	AMPLIFIER	312544	Apr. 28, 2014(1Y)
■ - FSV30	Rohde & Schwarz	Signal Analyzer	101372	Apr. 28, 2014(1Y)
■ - SCU-18	Rohde & Schwarz	PRE-AMPLIFIER	10041	Nov. 25, 2014(1Y)
■ - MA240	HD GmbH	Antenna Master	N/A	N/A
■ - HD100	HD GmbH	Position Controller	N/A	N/A
■ - DS420S	HD GmbH	Turn Table	N/A	N/A
■ - HFH2-Z2	Rohde & Schwarz	Loop Antenna	879 285/26	Dec. 09, 2014(2Y)
■ - VULB9163	Schwarzbeck	TRILOG Broadband Antenna	9163-255	May 02, 2014(2Y)
■ - BBHA9120D	Schwarzbeck	Horn Antenna	BBHA9120D295	Sep. 05, 2013(2Y)
■ - BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Sep. 05, 2013(2Y)
■ - 83051A	Agilent	Microwave System Preamplifier	3950M00201	Apr. 30, 2014(1Y)

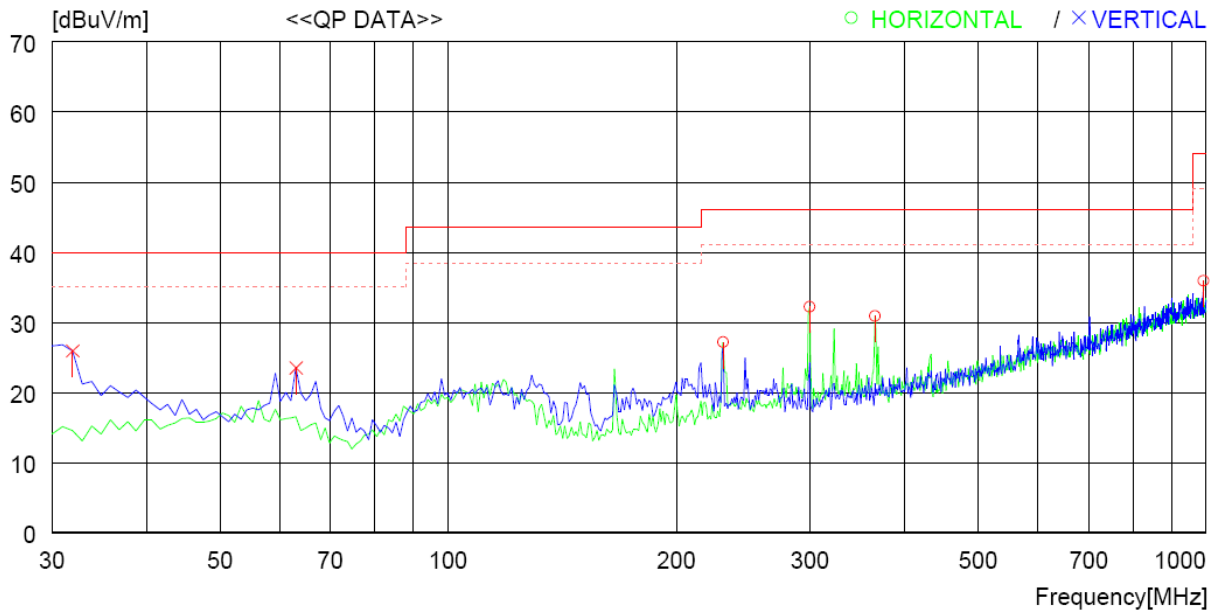
All test equipment used is calibrated on a regular basis.

11.4 Test data for Charging Mode

11.4.1 Test data for 30 MHz ~ 1 GHz

Humidity Level : 43.0 % R.H. Temperature: 21.6 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247
 Result : PASSED

EUT : Activity Tracker Date: December 29, 2014
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)



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	230.790	38.3	11.8	9.9	32.9	27.1	46.0	18.9	100	0
2	299.660	41.0	13.6	10.5	32.9	32.2	46.0	13.8	100	0
3	365.620	37.7	15.1	11.1	33.0	30.9	46.0	15.1	100	0
4	992.226	29.3	22.6	15.7	31.7	35.9	54.0	18.1	400	0
----- Vertical -----										
5	31.940	40.2	11.7	7.0	33.0	25.9	40.0	14.1	100	0
6	62.980	36.9	12.2	7.5	33.1	23.5	40.0	16.5	100	0

[Signature]
Tested by: hyung-kwon, Oh / Engineer

11.4.2 Test data for Below 30 MHz

- Test Date : December 29, 2014
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Charging Mode

Frequency (MHz)	Reading (dB μ V)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
It was not observed any emissions from the EUT.									

11.4.3 Test data for above 1 GHz

- Test Date : December 29, 2014
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 26.5 GHz
- Measurement distance : 3 m
- Operating mode : Charging Mode

Frequency (MHz)	Reading (dB μ V)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: hyung-kwon, Oh / Engineer

11.5 Test data for Transmitting Mode

11.5.1 Test data for 30 MHz ~ 1 GHz

Humidity Level : 43.0 % R.H. Temperature: 21.6 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

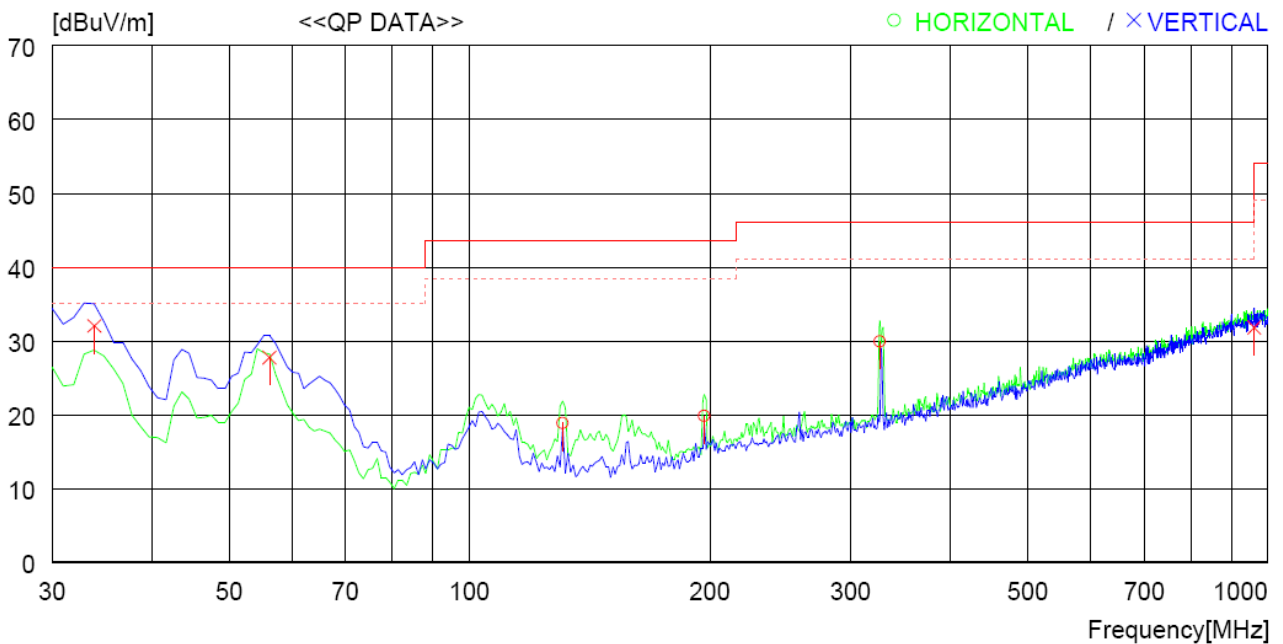
Result : PASSED

EUT : Activity Tracker

Date: December 29, 2014

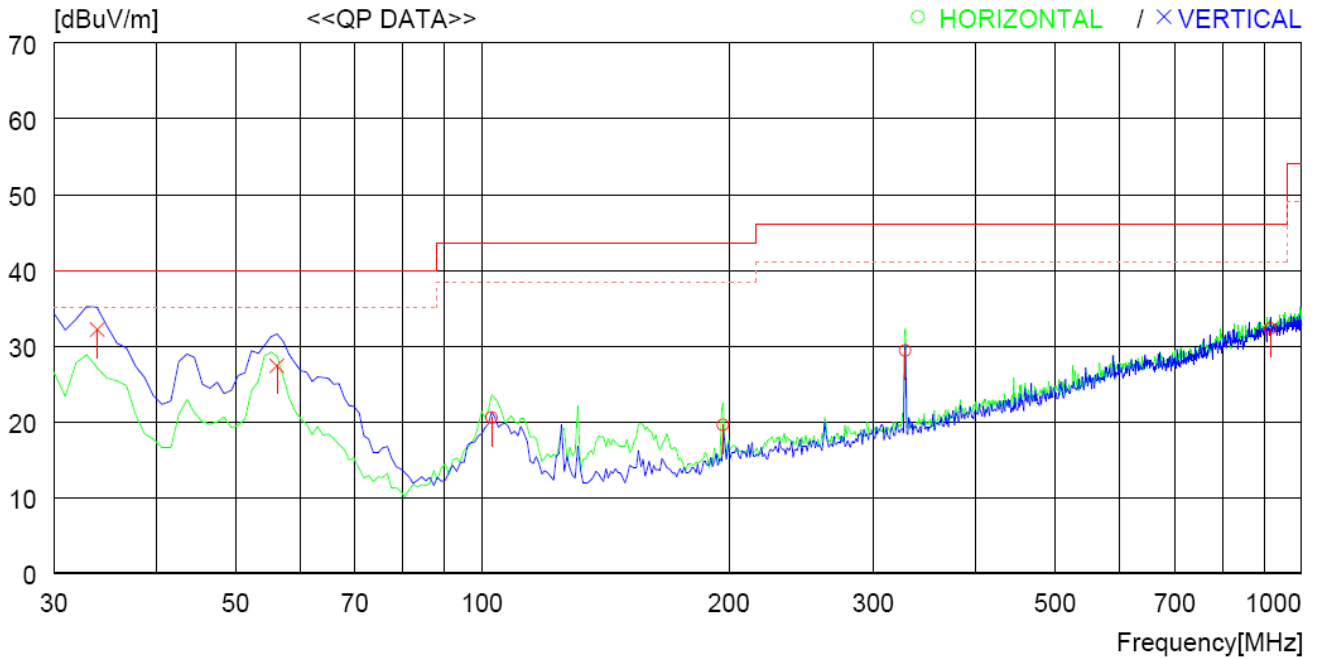
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

Operating condition : Low Channel



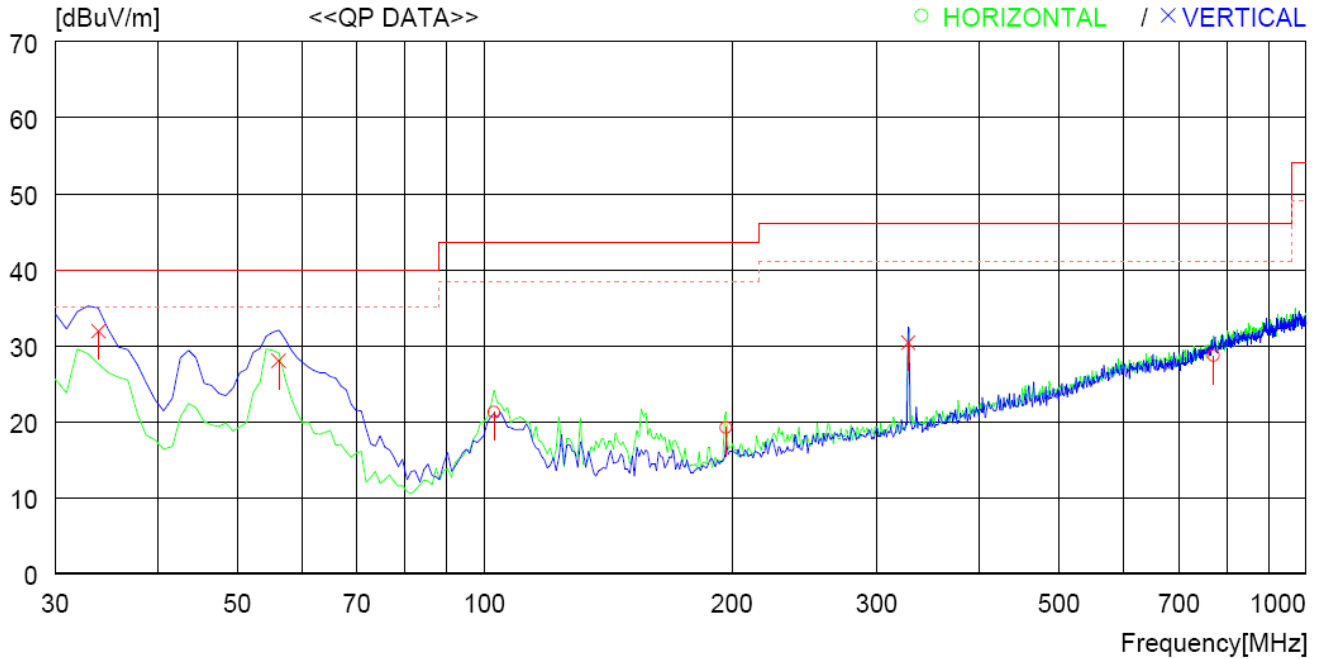
No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	130.880	34.2	8.9	8.7	33.0	18.8	43.5	24.7	200	0
2	196.840	32.1	11.0	9.6	32.9	19.8	43.5	23.7	200	0
3	326.820	38.1	13.9	10.8	32.9	29.9	46.0	16.1	300	359
----- Vertical -----										
4	33.880	46.5	11.4	7.1	33.0	32.0	40.0	8.0	300	320
5	56.190	40.1	13.4	7.3	33.1	27.7	40.0	12.3	300	216
6	961.187	26.1	22.1	15.5	31.9	31.8	54.0	22.2	400	278

Operating condition : Middle Channel



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	102.750	33.8	11.5	8.3	33.1	20.5	43.5	23.0	300	166
2	196.840	31.8	11.0	9.6	32.9	19.5	43.5	24.0	200	0
3	328.760	37.5	13.9	10.8	32.9	29.3	46.0	16.7	300	180
4	917.538	27.5	21.9	15.2	32.3	32.3	46.0	13.7	200	341
----- Vertical -----										
5	33.880	46.6	11.4	7.1	33.0	32.1	40.0	7.9	300	180
6	56.190	39.8	13.4	7.3	33.1	27.4	40.0	12.6	300	180

Operating condition : High Channel



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	102.750	34.5	11.5	8.3	33.1	21.2	43.5	22.3	300	194
2	196.840	31.5	11.0	9.6	32.9	19.2	43.5	24.3	200	359
3	772.043	27.1	20.2	14.4	33.1	28.6	46.0	17.4	100	194
----- Vertical -----										
4	33.880	46.4	11.4	7.1	33.0	31.9	40.0	8.1	289	0
5	56.190	40.4	13.4	7.3	33.1	28.0	40.0	12.0	289	0
6	327.790	38.6	13.9	10.8	32.9	30.4	46.0	15.6	289	0

Tested by: hyung-kwon, Oh / Engineer

11.5.2 Test data for Below 30 MHz

- Test Date : December 29, 2014
- Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- Frequency range : 9 kHz ~ 30 MHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									

11.5.3 Test data for above 1 GHz

- Test Date : December 29, 2014
- Resolution bandwidth : 1 MHz for Peak and Average Mode
- Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode
- Frequency range : 1 GHz ~ 26.5 GHz
- Measurement distance : 3 m
- Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
It was not observed any emissions from the EUT.									



Tested by: hyung-kwon, Oh / Engineer

15. CONDUCTED EMISSION TEST

15.1 Operating environment

Temperature : 21.6 °C
 Relative humidity : 43.0 % R.H.

15.2 Test set-up

The EUT was placed on a wooden table, 0.8 m height above the floor. Power was fed to the EUT through a 50 Ω / 50 μH + 5 Ω Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

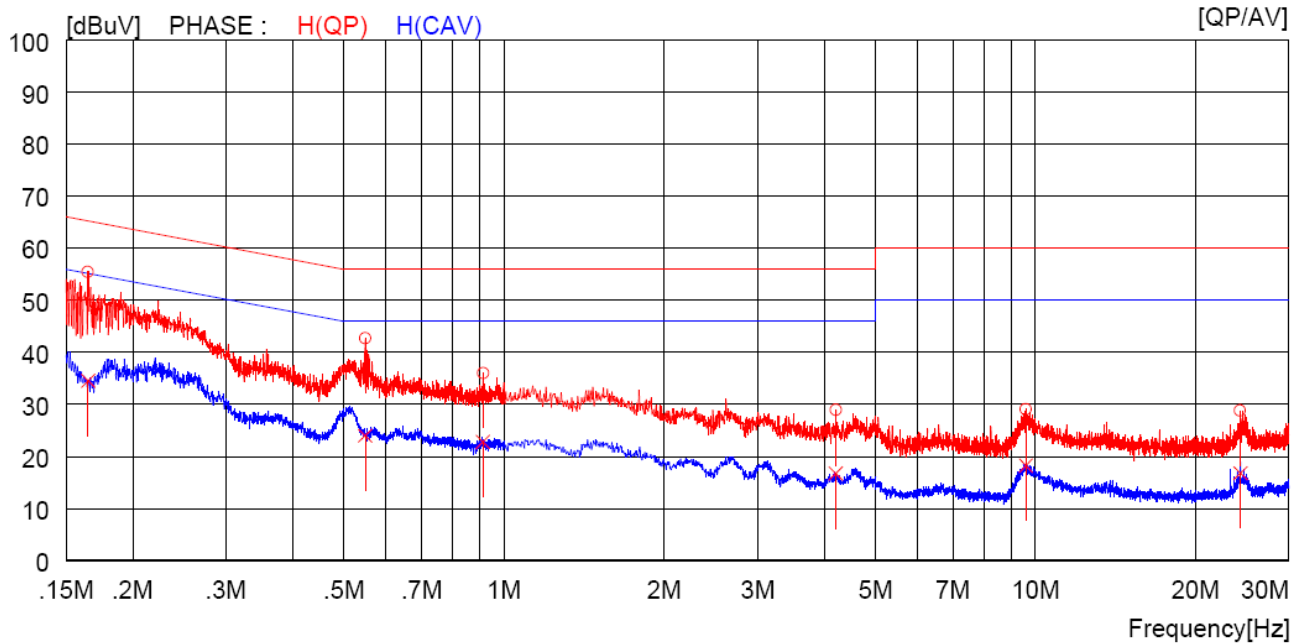
15.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ - ESPI	Rohde & Schwarz	EMI Test Receiver	101278	Nov. 03, 2014 (1Y)
□ - ESHS10	Rohde & Schwarz	EMI Test Receiver	834467/007	Jul. 15, 2014 (1Y)
□ - NSLK8128	Schwarzbeck	AMN	8128-216	Apr. 11, 2014 (1Y)
■ - NSLK8126	Schwarzbeck	AMN	8126-404	Jul. 11, 2014 (1Y)
□ - 3825/2	EMCO	AMN	9109-1869	Apr. 29, 2014 (1Y)
■ -- 3825/2	EMCO	AMN	9109-1867	Apr. 29, 2014 (1Y)

All test equipment used is calibrated on a regular basis.

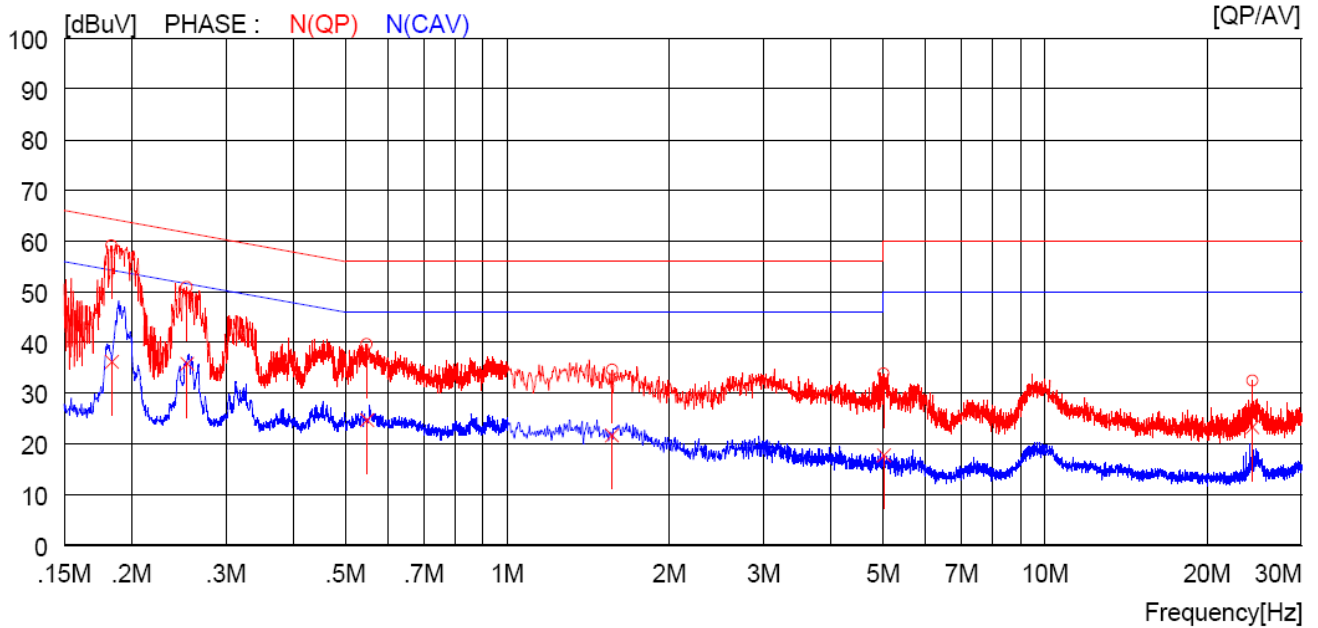
15.4 Test data for Charging Mode

- Test Date : December 29, 2014
- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Tested Line : HOT LINE



NO	FREQ [MHz]	READING		C. FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.16500	45.4	----	10.0	55.4	----	65.2	----	9.8	----	H (QP)
2	0.54800	32.7	----	10.0	42.7	----	56.0	----	13.3	----	H (QP)
3	0.91400	26.0	----	10.0	36.0	----	56.0	----	20.0	----	H (QP)
4	4.21200	18.8	----	10.1	28.9	----	56.0	----	27.1	----	H (QP)
5	9.60000	18.8	----	10.2	29.0	----	60.0	----	31.0	----	H (QP)
6	24.30000	18.1	----	10.7	28.8	----	60.0	----	31.2	----	H (QP)
7	0.16500	----	24.5	10.0	----	34.5	----	55.2	----	20.7	H (CAV)
8	0.54800	----	14.0	10.0	----	24.0	----	46.0	----	22.0	H (CAV)
9	0.91400	----	12.8	10.0	----	22.8	----	46.0	----	23.2	H (CAV)
10	4.21200	----	6.6	10.1	----	16.7	----	46.0	----	29.3	H (CAV)
11	9.60000	----	8.1	10.2	----	18.3	----	50.0	----	31.7	H (CAV)
12	24.30000	----	6.1	10.7	----	16.8	----	50.0	----	33.2	H (CAV)

- Tested Line : NEUTRAL LINE



NO	FREQ [MHz]	READING		C. FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.18400	49.1	----	10.0	59.1	----	64.3	----	5.2	----	N(QP)
2	0.25400	40.9	----	10.0	50.9	----	61.6	----	10.7	----	N(QP)
3	0.54900	29.7	----	10.0	39.7	----	56.0	----	16.3	----	N(QP)
4	1.56800	24.6	----	10.0	34.6	----	56.0	----	21.4	----	N(QP)
5	5.02000	23.7	----	10.1	33.8	----	60.0	----	26.2	----	N(QP)
6	24.33000	21.8	----	10.7	32.5	----	60.0	----	27.5	----	N(QP)
7	0.18400	----	26.2	10.0	----	36.2	----	54.3	----	18.1	N(CAV)
8	0.25400	----	25.8	10.0	----	35.8	----	51.6	----	15.8	N(CAV)
9	0.54900	----	14.7	10.0	----	24.7	----	46.0	----	21.3	N(CAV)
10	1.56800	----	11.6	10.0	----	21.6	----	46.0	----	24.4	N(CAV)
11	5.02000	----	7.7	10.1	----	17.8	----	50.0	----	32.2	N(CAV)
12	24.33000	----	12.6	10.7	----	23.3	----	50.0	----	26.7	N(CAV)

Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

Tested by: hyung-kwon, Oh / Engineer