

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

Test Report No. : W156R-D020

AGR No. : A155A-147

Applicant : Remote Solution Co., Ltd.

Address : 92, Chogokri, Nammyun, Kimchon city, Kyungbuk, Korea, 740-871

Manufacturer : Remote Solution Co., Ltd.

Address : 92, Chogokri, Nammyun, Kimchon city, Kyungbuk, Korea, 740-871

Type of Equipment : Smart Home Sensor

FCC ID. : TX4SH05A

Model Name : SH05A

Multiple Model Name : SH05B, SH05C, SH05D, SH05E, SH05F, SH05G, SH05H, SH05I, SH05J, SH05K,
SH05L, SH05M, SH05N, SH05O, SH05P, SH05Q, SH05R, SH05S, SH05T, SH05U,
SH05V, SH05W, SH05X, SH05Y, SH05Z

Serial number : N/A

Total page of Report : 33 pages (including this page)

Date of Incoming : June 05, 2015

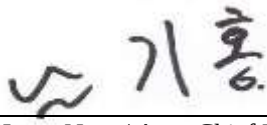
Date of issue : June 17, 2015

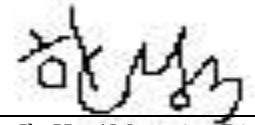
SUMMARY

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 / Asst, Chief Engineer
ONETECH Corp.

Approved by: 
Sung-Ik, Han/ Managing Director
ONETECH Corp.

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Revision History

Issued Report No.	Issued Date	Revisions	Effect Section
W156R-D020	June 17, 2015	Initial Issue	All

1. VERIFICATION OF COMPLIANCE

Applicant : Remote Solution Co., Ltd.
 Address : 92, Chogokri, Nammyun, Kimchon city, Kyungbuk, Korea, 740-871
 Contact Person : Byung-Cheol, Kim / Manager
 Telephone No. : +82-54-420-4517
 FCC ID : TX4SH05A
 Model Name : SH05A
 Brand Name : Smart Home Sensor
 Serial Number : N/A
 Date : June 17, 2015

EQUIPMENT CLASS	<i>DTS – DIGITAL TRNSMISSION SYSTEM</i>
E.U.T. DESCRIPTION	Smart Home Sensor
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10:2013
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	N/A (See Note)
15.203	Antenna Requirement	Met requirement / PASS

Note: This test is not performed because the EUT is operated by DC battery.

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 section 2.1.

2.5 Test Methodology

Radiated testing was performed according to the procedures in ANSI C63.10: 2013 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 Remote Solution Co., Ltd., Model SH05A (referred to as the EUT in this report) is a Smart Home Sensor. Product specification information described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Portable Device
FREQUENCY RANGE	2 405 MHz ~ 2 475 MHz
Channel Number	15
MAX. RF OUTPUT POWER	19.40 dBm
NUMBER OF LAYER	4 Layers
ANTENNA TYPE	PCB Antenna
ANTENNA GAIN	0.28 dBi
MODULATION METHOD	GFSK
USED RF CHIP	Marker: GreenPeak Technologies Model Name: GP490
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	16 MHz
POWER REQUIREMENT	DC 3.0 V
EXTERNAL CONNECTOR	-

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

-. The following lists consist of the added model and their differences.

Model Name	Differences	Tested
SH05A	Basic Model	☒
SH05B, SH05C, SH05D, SH05E, SH05F, SH05G, SH05H, SH05I, SH05J, SH05K, SH05L, SH05M, SH05N, SH05O, SH05P, SH05Q, SH05R, SH05S, SH05T, SH05U, SH05V, SH05W, SH05X, SH05Y, SH05Z	The model is identical to basic model except for the model name only.	☐

Note: 1. Applicant consigns only basic model to test. Therefore this test report just guarantees the units, which have been tested.

2. The Applicant/manufacture is responsible for the compliance of all variants.

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	Remote Solution Co., Ltd.	SH051BF-0402A MOTION_V1.6	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
SH05A	Remote Solution Co., Ltd.	Smart Home Sensor (EUT)	-

5.3 Mode of operation during the test

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

-. The EUT was set at Low Channel (2 405 MHz), Middle Channel (2 440 MHz), and High Channel (2 475 MHz).

To get a maximum radiated emission levels from the EUT

5.4 Configuration of Test System

Line Conducted Test: It is not need to test this requirement, because the EUT shall be operated by DC battery.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 m 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 PCB 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)
It is not need to test this requirement, because the power of the EUT is supplied by battery.	

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)
Transmitting Mode	X

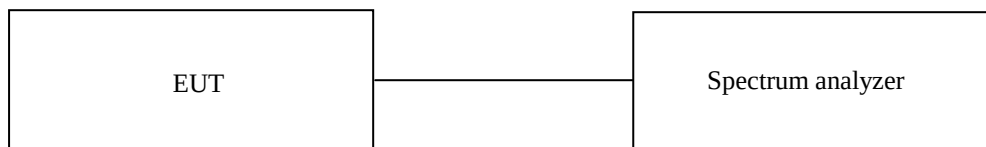
7. MINIMUM 6 dB BANDWIDTH

7.1 Operating environment

Temperature : 24.2 °C
Relative humidity : 45 % 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.
■ -	FSV30	Rohde & Schwarz	Signal Analyzer	101372	Apr. 29, 2015(1Y)

All test equipment used is calibrated on a regular basis.

7.4 Test data

-. Test Date : June 11, 2015

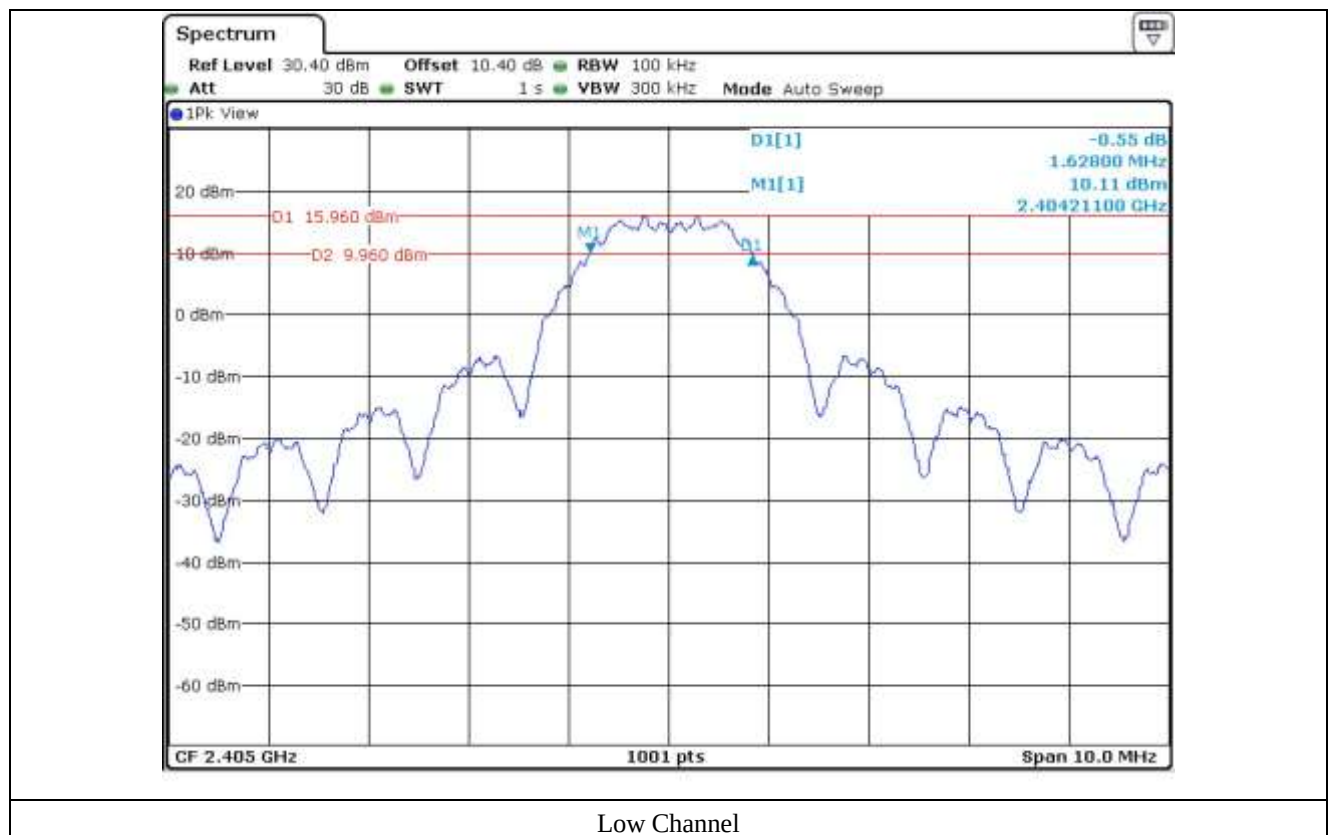
-. Test Result : Pass

CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (MHz)	LIMIT (MHz)	MARGIN (MHz)
Low	2 405	1.63	0.50	1.13
Middle	2 440	1.60	0.50	1.10
High	2 475	1.59	0.50	1.09

Remark. Margin = Measured Value - Limit



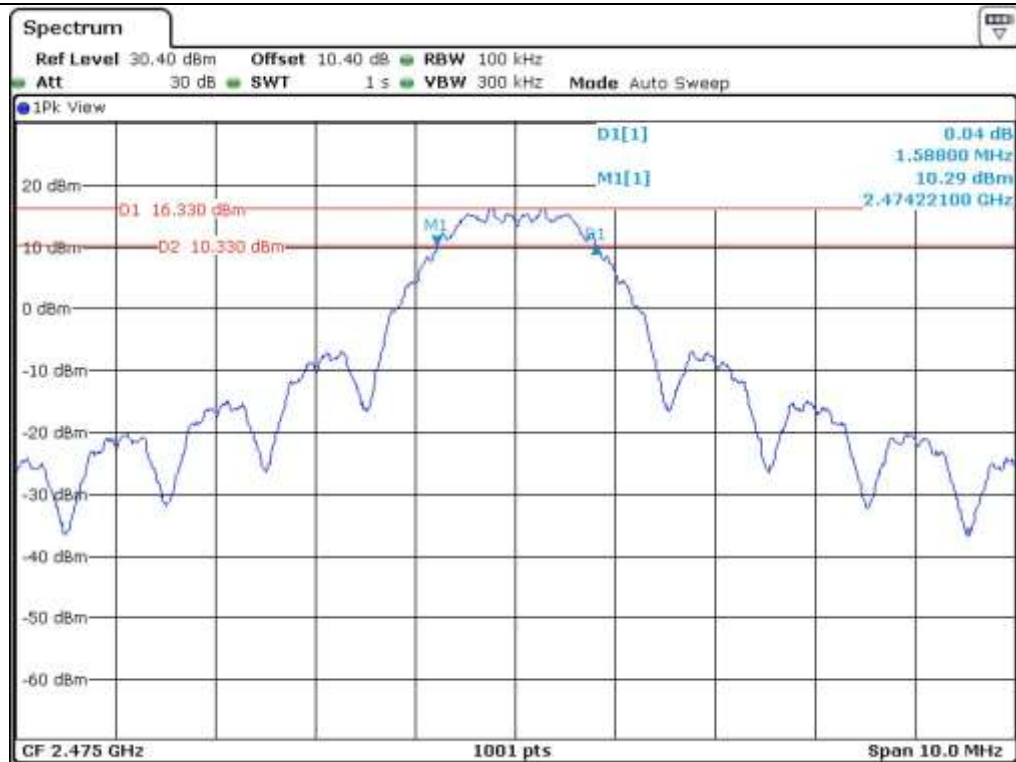
Tested by: Hyung-Kwon, Oh / Engineer



Low Channel



Middle Channel



High Channel

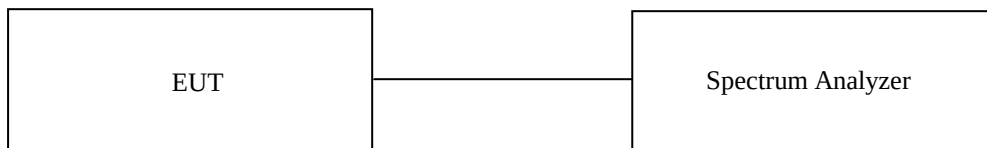
8. MAXIMUM PEAK OUTPUT POWER

8.1 Operating environment

Temperature : 24.2 °C
Relative humidity : 45 % R.H.

8.2 Test set-up

The maximum peak output power was measured with the spectrum analyzer connected to the antenna output of the EUT.
The EUT was operating in transmit mode at the appropriate center frequency.



8.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - FSV30	Rohde & Schwarz	Signal Analyzer	101372	Apr. 29, 2015(1Y)

All test equipment used is calibrated on a regular basis.

8.4 Test data

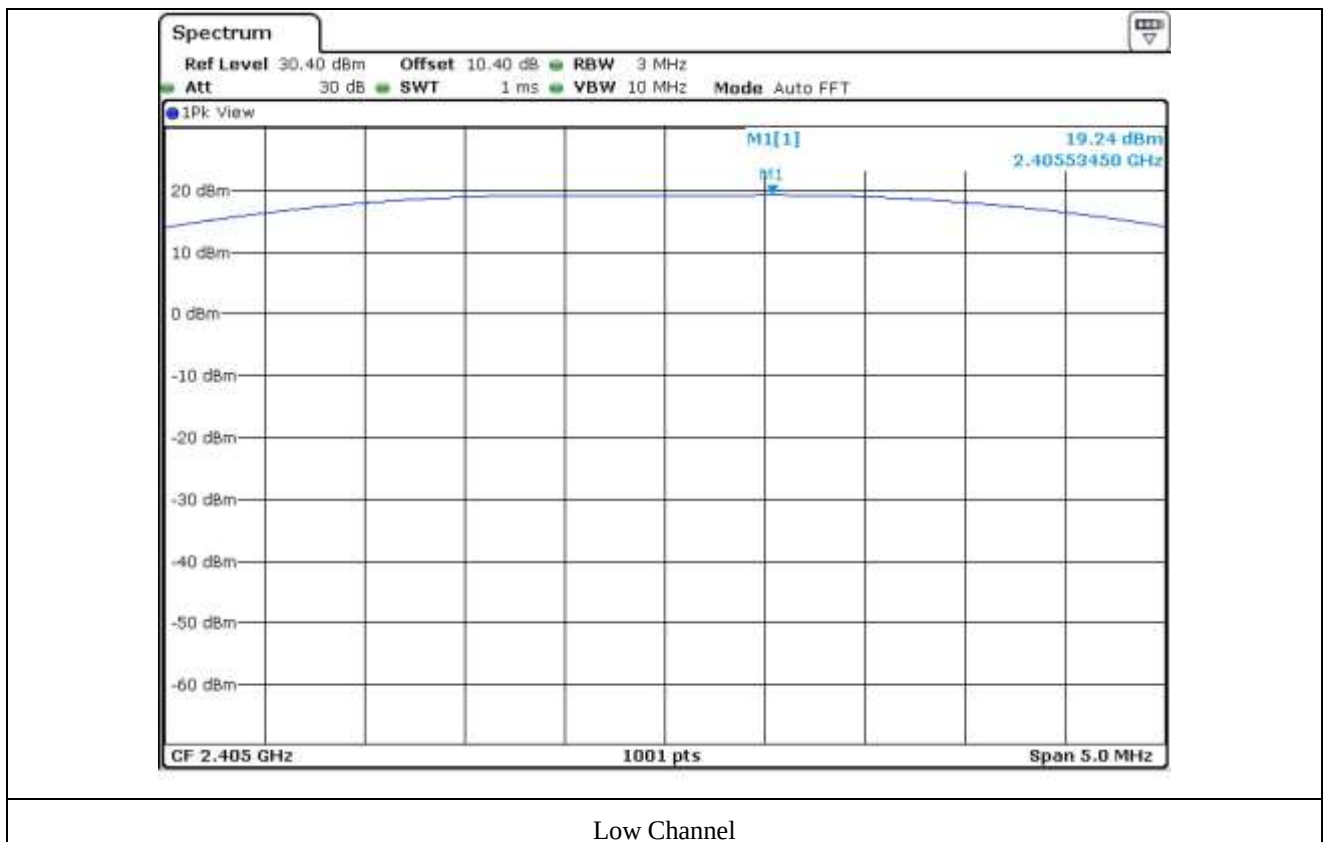
-. Test Date : June 12, 2015

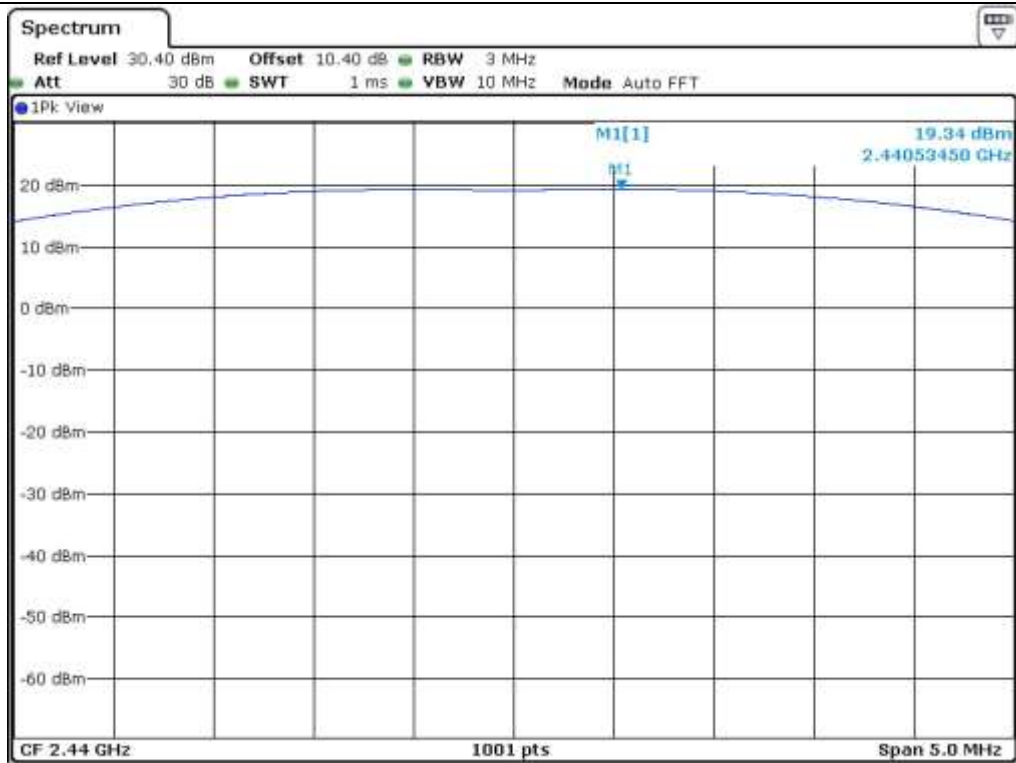
-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	DTS (MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 405	1.63	19.24	30.00	10.76
MIDDLE	2 440	1.60	19.34	30.00	10.66
HIGH	2 475	1.59	19.40	30.00	10.60

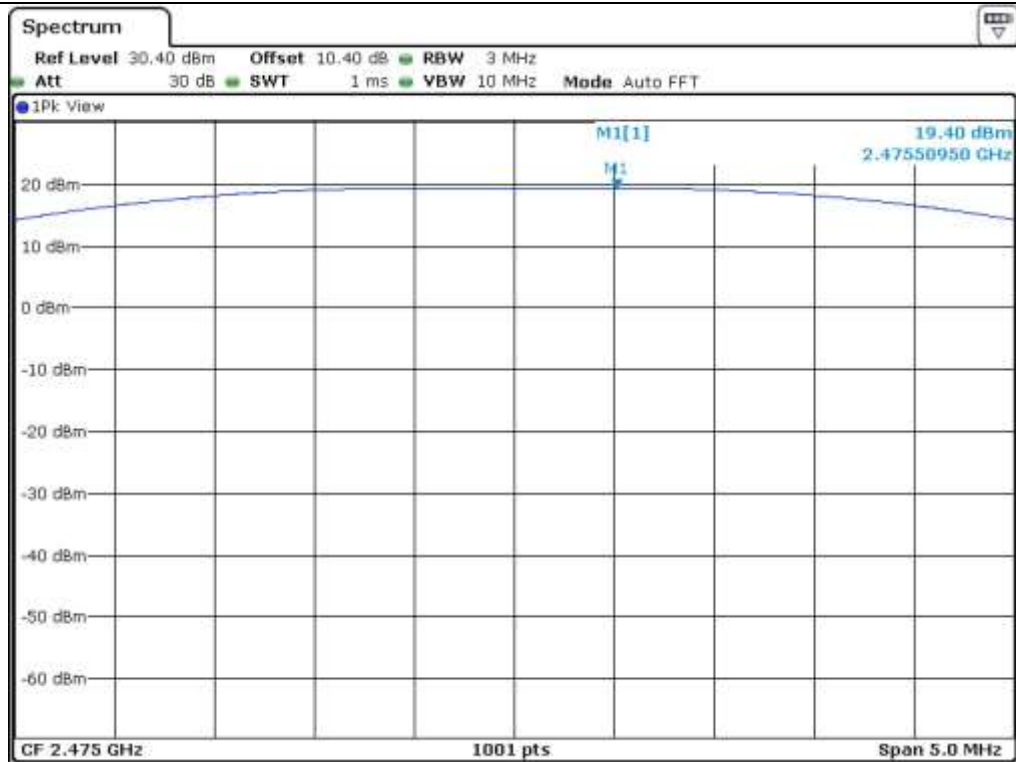
Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

Tested by: Hyung-Kwon, Oh / Engineer





Middle Channel



High Channel

9. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

9.1 Operating environment

Temperature : 25 °C
Relative humidity : 45 % 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 semi anechoic chamber. The EUT was placed on turntable approximately 1.5 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, 2015(1Y)
□ -	8564E	HP	Spectrum Analyzer	3650A00756	Apr. 28, 2015(1Y)
□ -	FSP	Rohde & Schwarz	Spectrum Analyzer	100017	Oct. 08, 2014(1Y)
■ -	310N	Sonoma Instrument	AMPLIFIER	312544	Apr. 29, 2015(1Y)
■ -	FSV30	Rohde & Schwarz	Signal Analyzer	101372	Apr. 28, 2015(1Y)
■ -	SCU-18	Rohde & Schwarz	PRE-AMPLIFIER	10041	Nov. 25, 2014(1Y)
■ -	83051A	Agilent	Microwave System Preamplifier	3950M00201	Apr. 30, 2015(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	Apr. 30, 2015(2Y)
■ -	83051A	Agilent	Microwave System Preamplifier	3950M00201	Apr. 30, 2015(2Y)

All test equipment used is calibrated on a regular basis.

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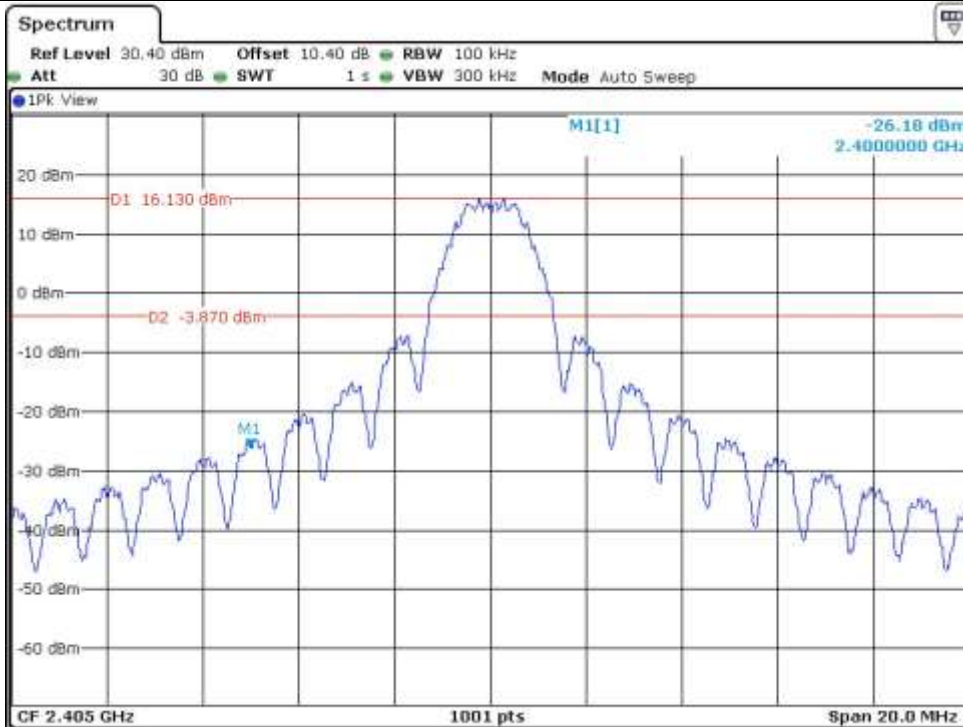
EMC-003 (Rev.3)

HEAD OFFICE : 301-14 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

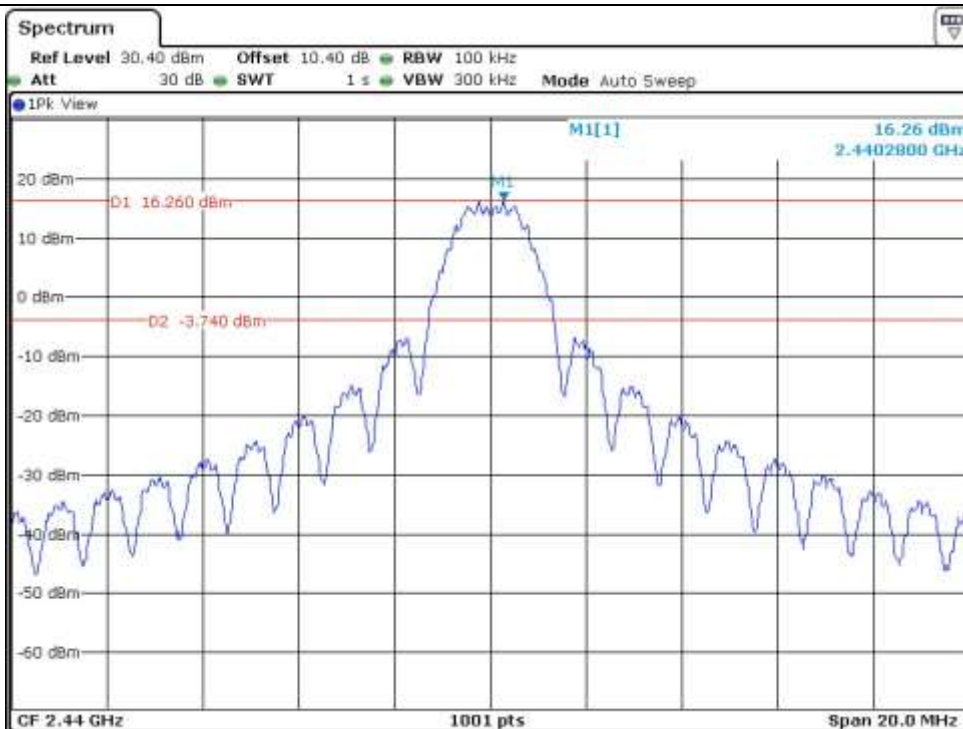
EMC Testing Div. : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea (TEL: 82-31-765-8289, FAX: 82-31-766-2904)

9.5 Test data for conducted emission

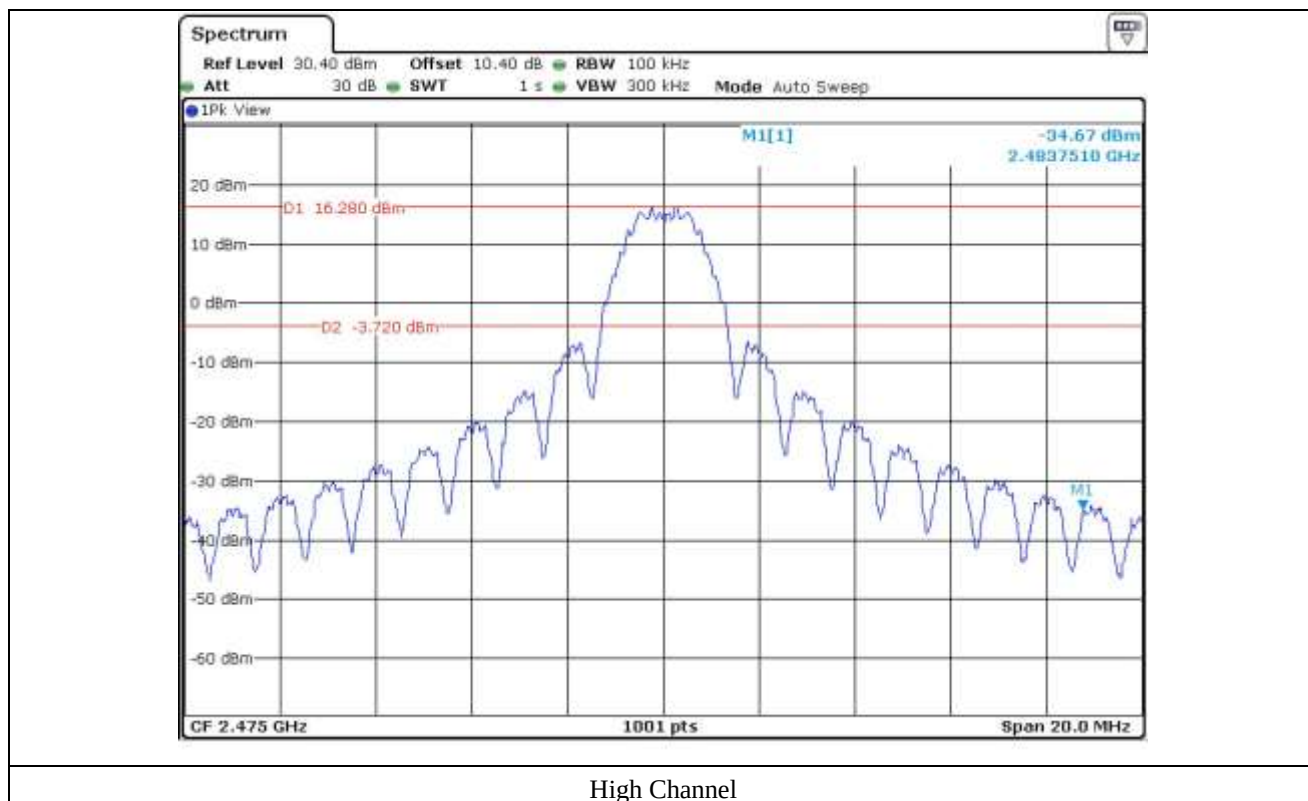
9.5.1 Test data

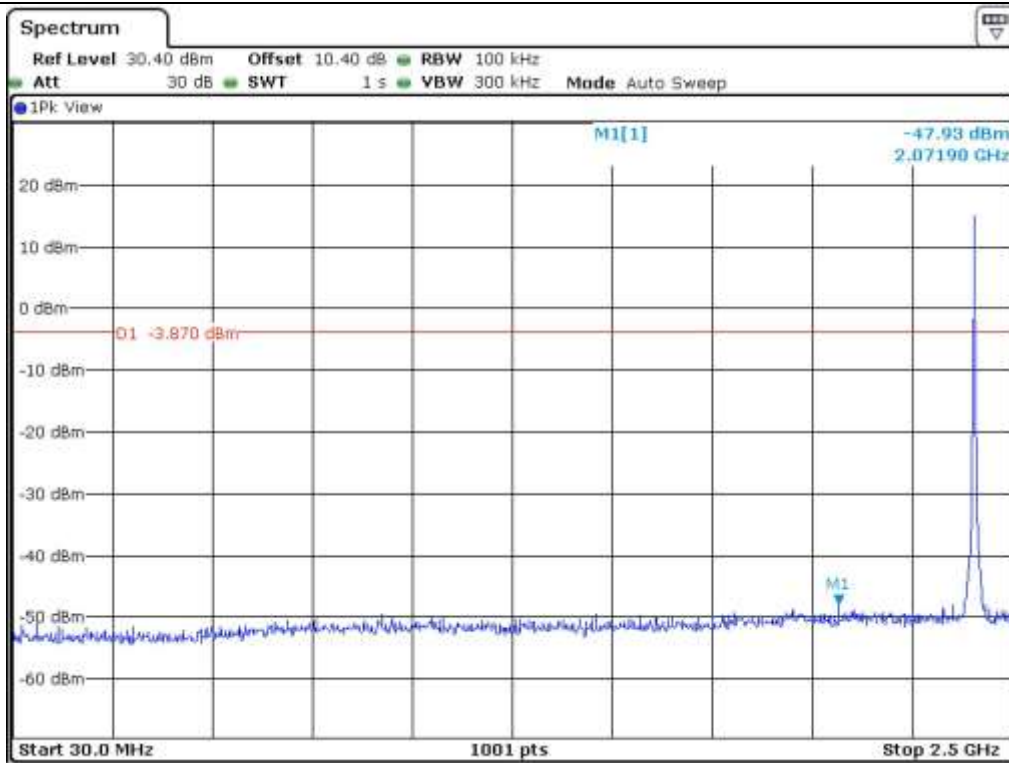


Low Channel

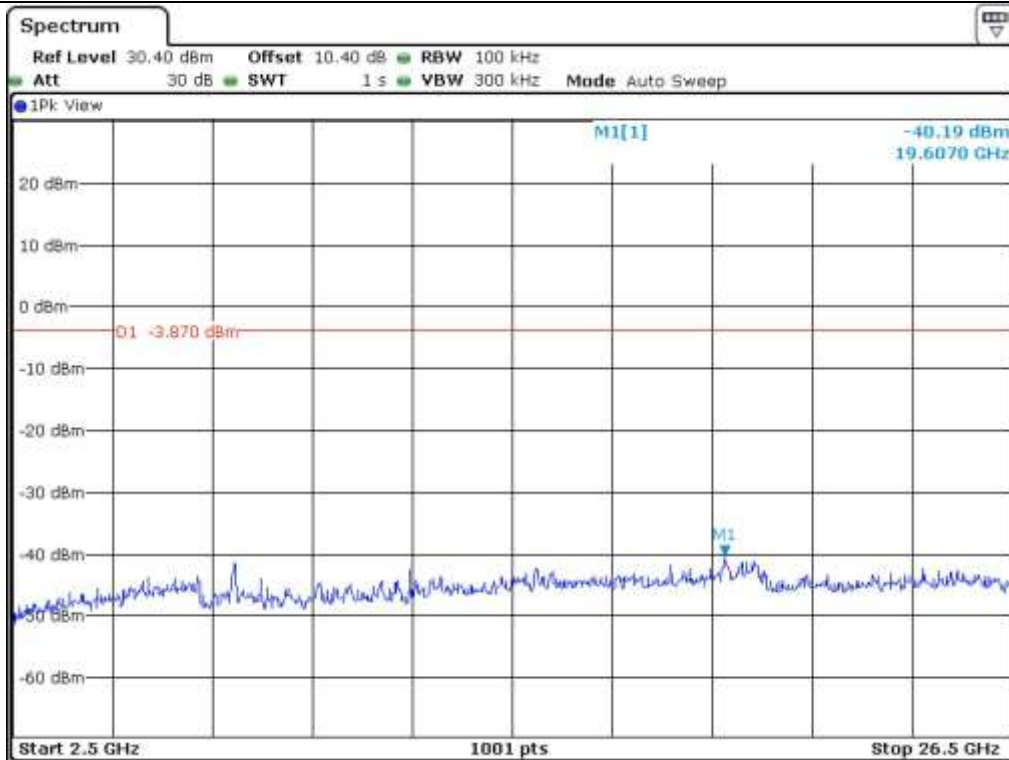


Middle Channel

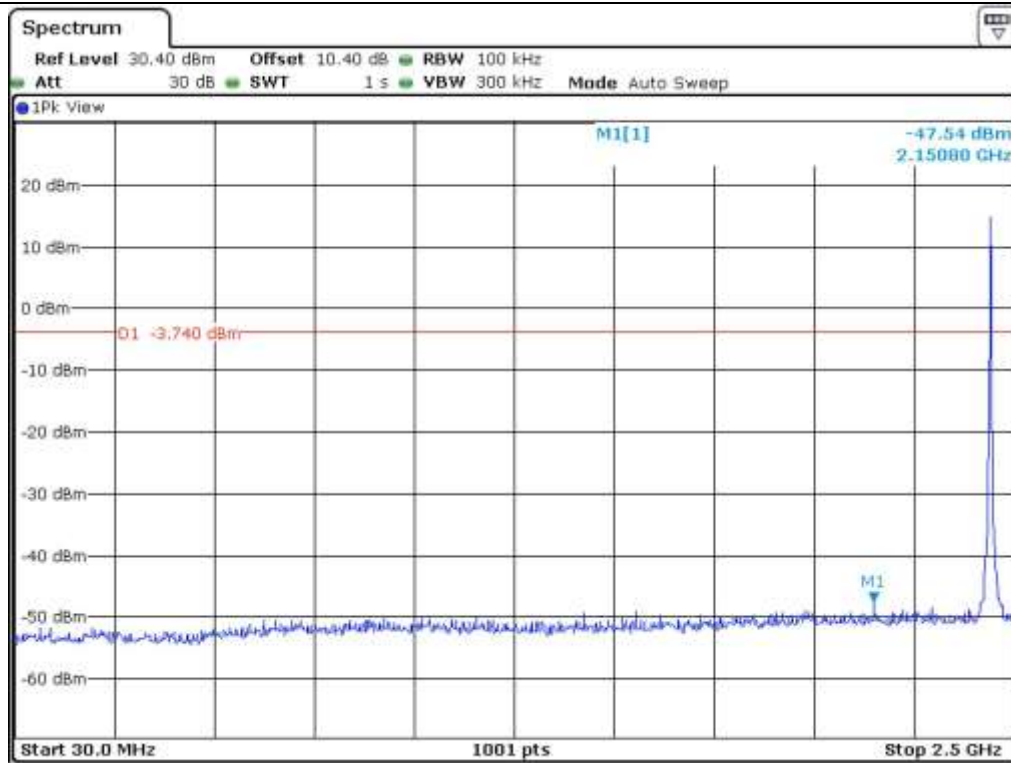




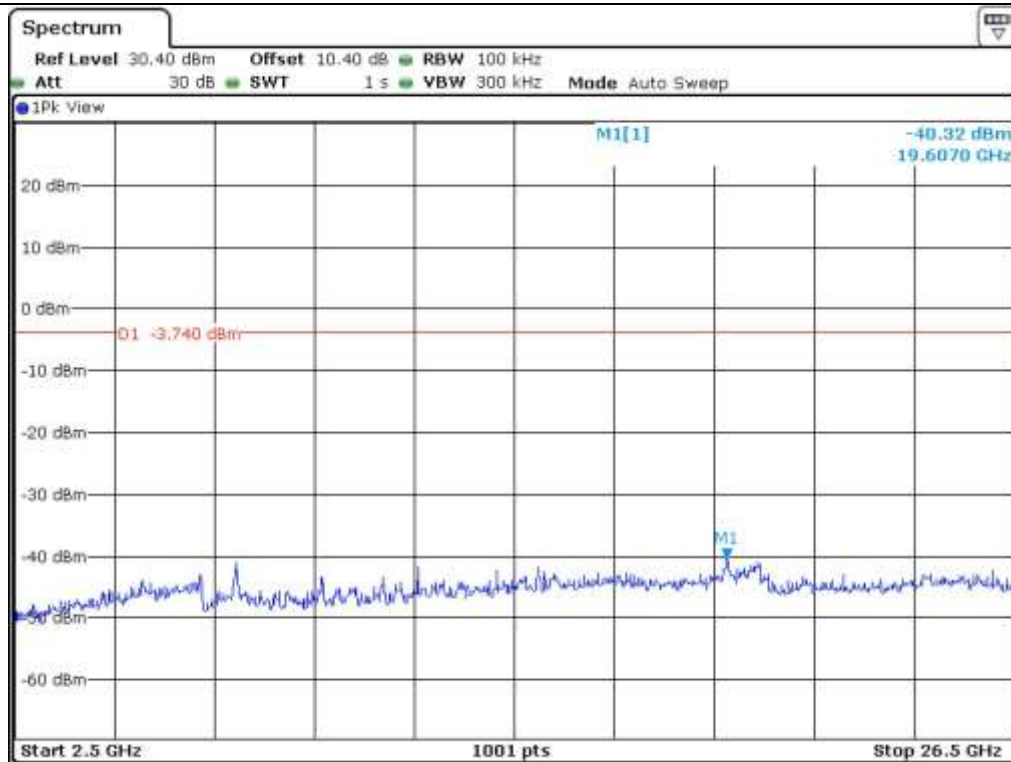
Low Channel



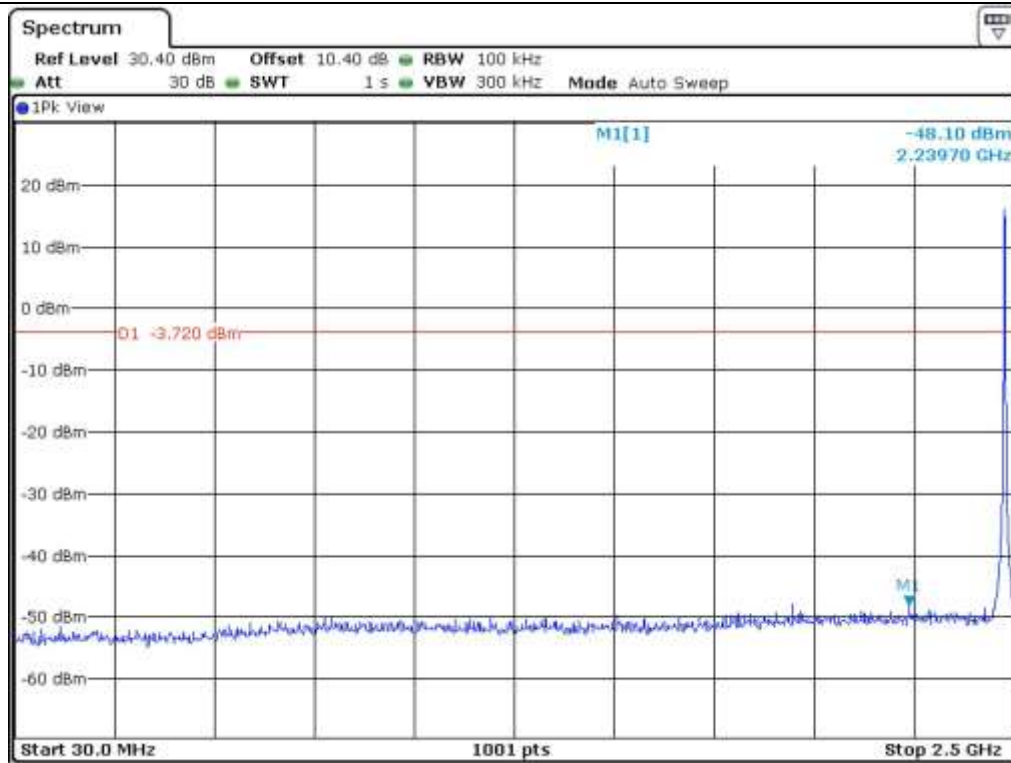
Low Channel



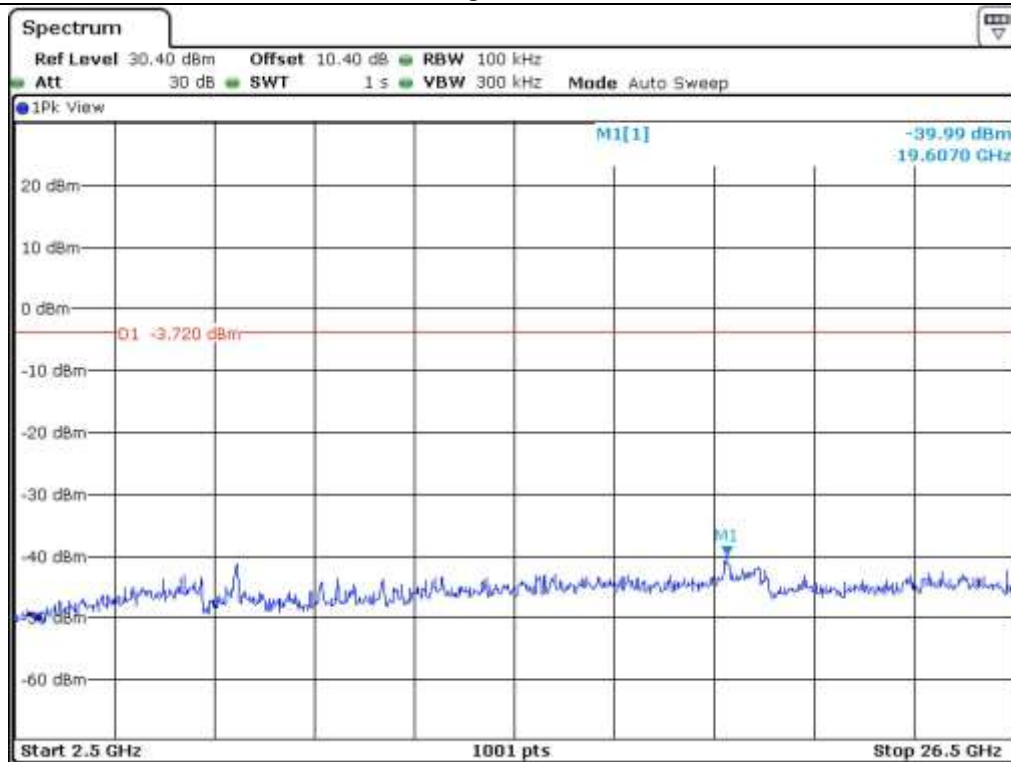
Middle Channel



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 : June 16, 2015
- . Resolution bandwidth : 100 kHz for Peak and Average Mode at 30 MHz ~ 1 GHz
1 MHz for Peak and Average Mode at above 1 GHz
- . Video bandwidth : 100 kHz for Peak and Average Mode at 30 MHz ~ 1 GHz
1 MHz for Peak and 10 Hz for Average Mode at above 1 GHz
- . Frequency range : 30 MHz ~ 26.5 GHz
- . 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									
2 390.00	50.78	Peak	H	27.20	7.10	43.10	41.98	74.00	32.02
	40.59	Average	H				31.79	54.00	22.21
2 390.00	51.01	Peak	V				42.21	74.00	31.79
	41.62	Average	V				32.82	54.00	21.18
Test Data for Low Channel									
2 400.00	61.72	Peak	H	27.20	7.10	43.10	52.92	74.00	21.08
	50.97	Average	H				42.17	54.00	11.83
	60.82	Peak	V				52.02	74.00	21.98
	50.01	Average	V				41.21	54.00	12.79
Test Data for High Channel									
2 483.50	59.28	Peak	H	27.40	7.10	43.10	50.68	74.00	23.32
	49.63	Average	H				41.03	54.00	12.97
2 483.50	58.94	Peak	V				50.34	74.00	23.66
	49.97	Average	V				41.37	54.00	12.63

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss – Pre-Amplifier Gain

Tested by: Hyung-Kwon, Oh / Engineer

9.6.2 Spurious & Harmonic Radiated Emission

- Test Date : June 16, 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									
2 405.00	107.81	Peak	H	27.20	7.10	43.10	99.01	113.98	14.97
	99.14	Average	H				90.34	93.98	3.64
	107.19	Peak	V				98.39	113.98	15.59
	99.32	Average	V				90.52	93.98	3.46
4 810.00	54.87	Peak	H	31.10	9.60	42.40	53.17	73.98	20.81
	45.12	Average	H				43.42	53.98	10.56
	54.69	Peak	V				52.99	73.98	20.99
	45.38	Average	V				43.68	53.98	10.30
Test Data for Middle Channel									
2 440.00	106.57	Peak	H	27.30	7.10	43.10	97.87	113.98	16.11
	98.36	Average	H				89.66	93.98	4.32
	106.34	Peak	V				97.64	113.98	16.34
	98.44	Average	V				89.74	93.98	4.24
4 880.00	54.69	Peak	H	31.30	9.80	42.40	53.39	73.98	20.59
	44.92	Average	H				43.62	53.98	10.36
	54.51	Peak	V				53.21	73.98	20.77
	45.07	Average	V				43.77	53.98	10.21

Test Data for High Channel									
2 475.00	106.82	Peak	H	27.30	7.10	43.10	98.12	113.98	15.86
	98.78	Average	H				90.08	93.98	3.90
	106.34	Peak	V				97.64	113.98	16.34
	98.42	Average	V				89.72	93.98	4.26
4 950.00	54.30	Peak	H	31.30	9.90	42.30	53.20	73.98	20.78
	44.57	Average	H				43.47	53.98	10.51
	54.26	Peak	V				53.16	73.98	20.82
	44.49	Average	V				43.39	53.98	10.59

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

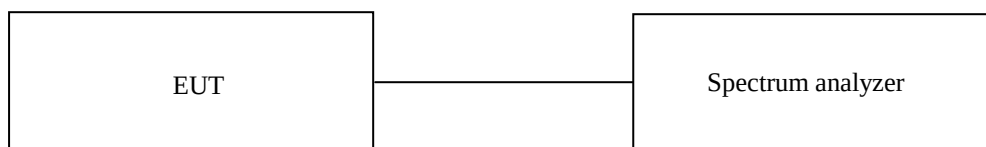
10 PEAK POWER SPECTRUL DENSITY

10.1 Operating environment

Temperature : 24.2 °C
Relative humidity : 45 % 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. The maximum level form the EUT in 3 kHz bandwidth was measured with above condition.



10.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	FSV30	Rohde & Schwarz	Signal Analyzer	101372	Apr. 29, 2015(1Y)

All test equipment used is calibrated on a regular basis.

10.4 Test data

-. Test Date : June 15, 2015

-. Test Result : Pass

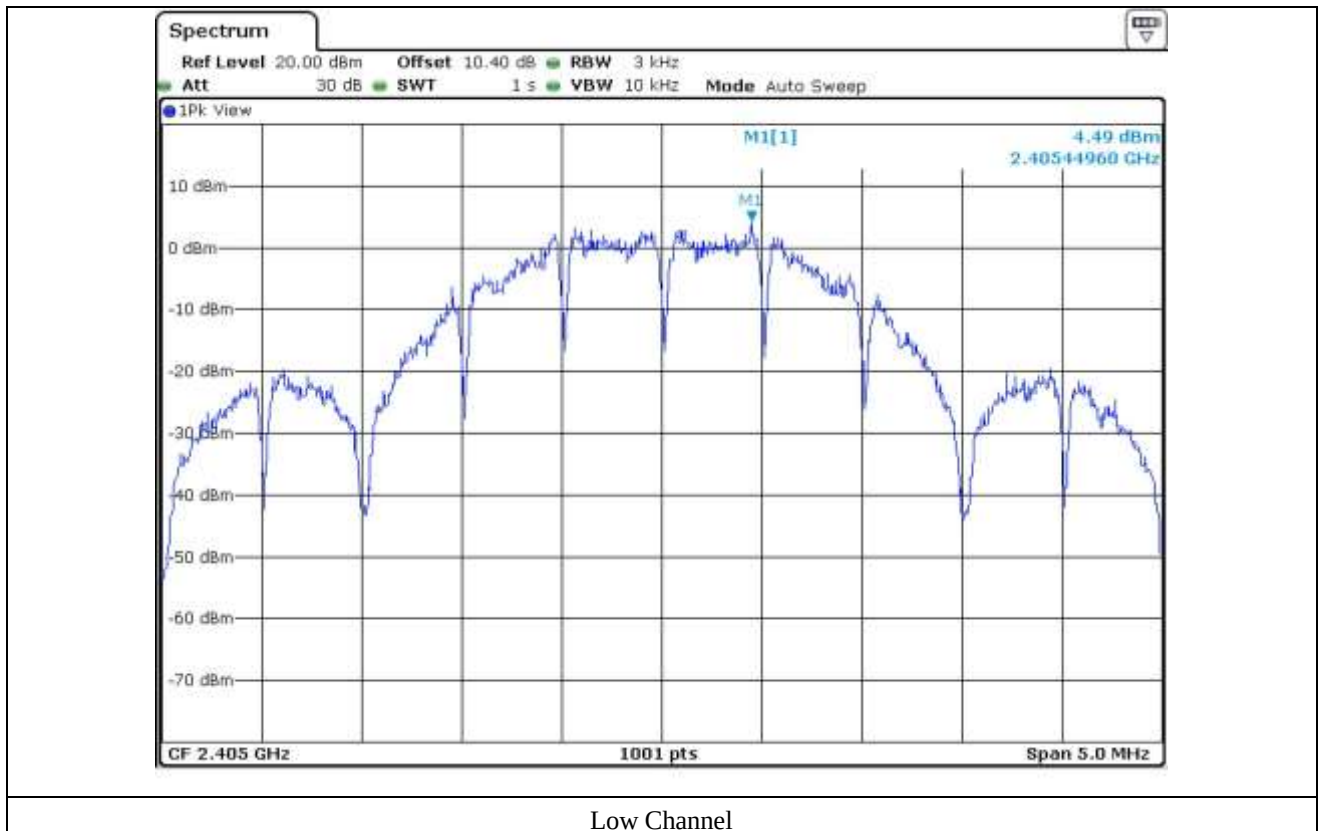
-. Operating Condition : Continuous transmitting mode

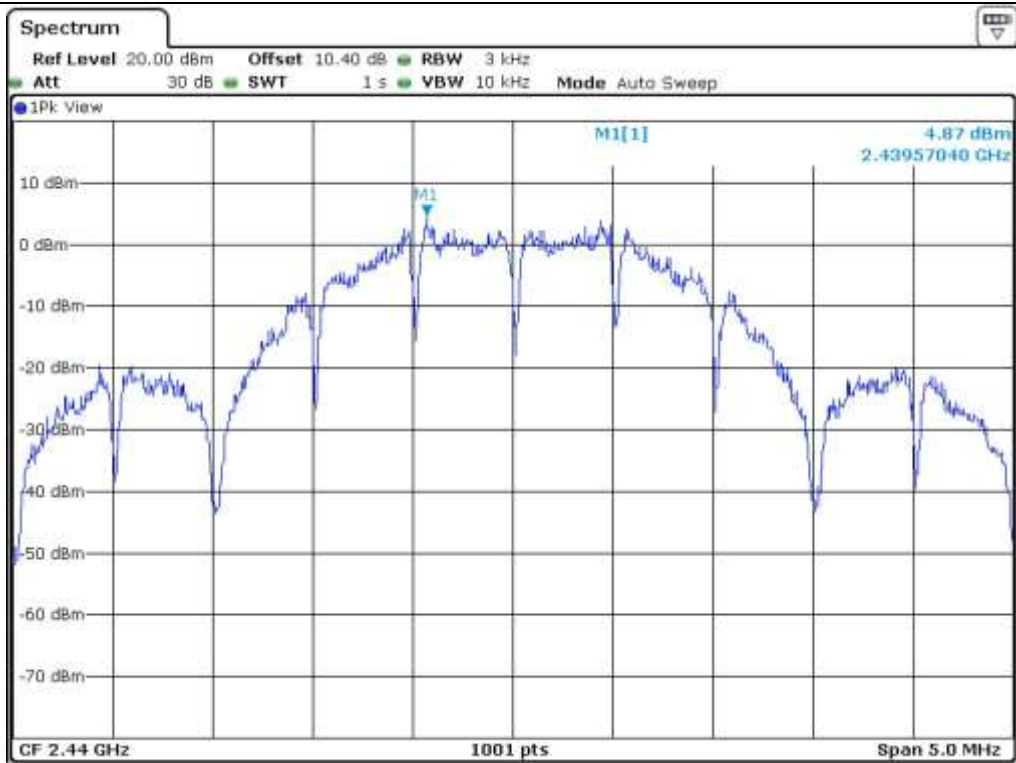
CHANNEL	FREQUENCY(MHz)	MEASURED VLAUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 405	4.49	8.00	3.51
Middle	2 440	4.87	8.00	3.13
High	2 475	4.26	8.00	3.74

Remark. Margin = Limit – Measured value

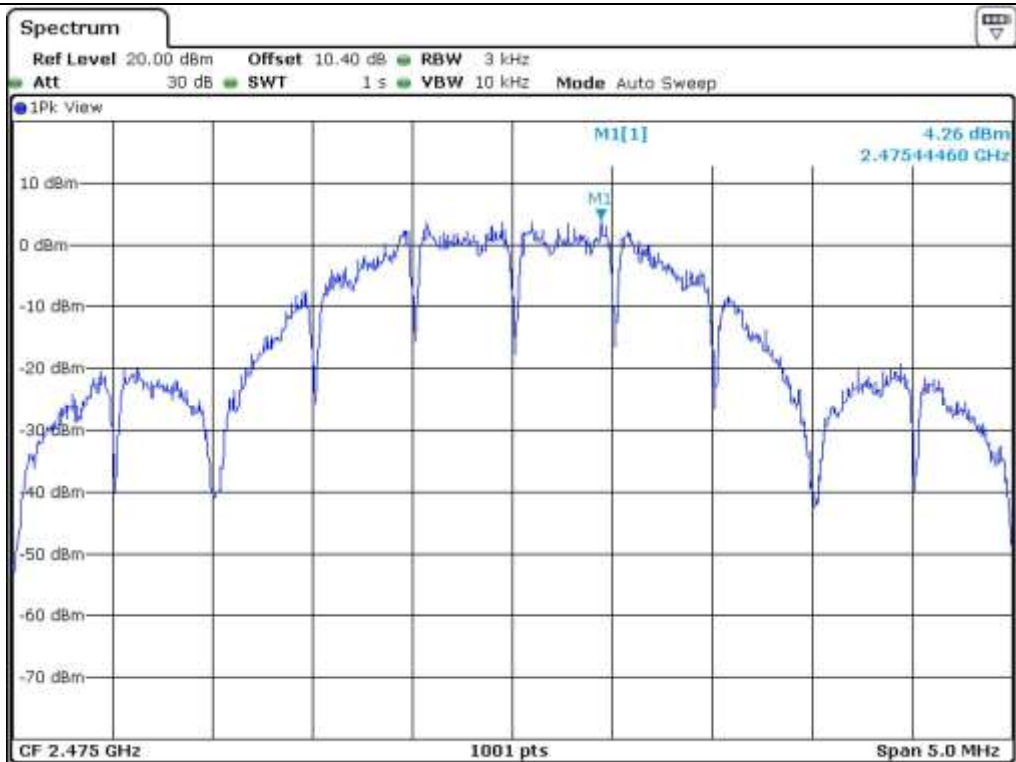


Tested by: Hyung-Kwon, Oh / Engineer





Middle Channel



High Channel

11. RADIATED EMISSION TEST

11.1 Operating environment

Temperature : 24.2 °C
Relative humidity : 45 % R.H.

11.2 Test set-up

The radiated emissions measurements were performed on the 3 m semi anechoic chamber. 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 9 kHz 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 and 4.0 meters 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, 2015(1Y)
□ - 8564E	HP	Spectrum Analyzer	3650A00756	Apr. 28, 2015(1Y)
□ - FSP	Rohde & Schwarz	Spectrum Analyzer	100017	Oct. 08, 2014(1Y)
■ - 310N	Sonoma Instrument	AMPLIFIER	312544	Apr. 29, 2015(1Y)
■ - FSV30	Rohde & Schwarz	Signal Analyzer	101372	Apr. 28, 2015(1Y)
■ - 83051A	Agilent	Microwave System Preamplifier	3950M00201	Apr. 30, 2015(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	Apr. 30, 2015(2Y)
■ - 83051A	Agilent	Microwave System Preamplifier	3950M00201	Apr. 30, 2015(2Y)

All test equipment used is calibrated on a regular basis.

11.4 Test data

11.4.1 Test data for Below 30 MHz

- . Test Date : June 15, 2015
- . 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.									

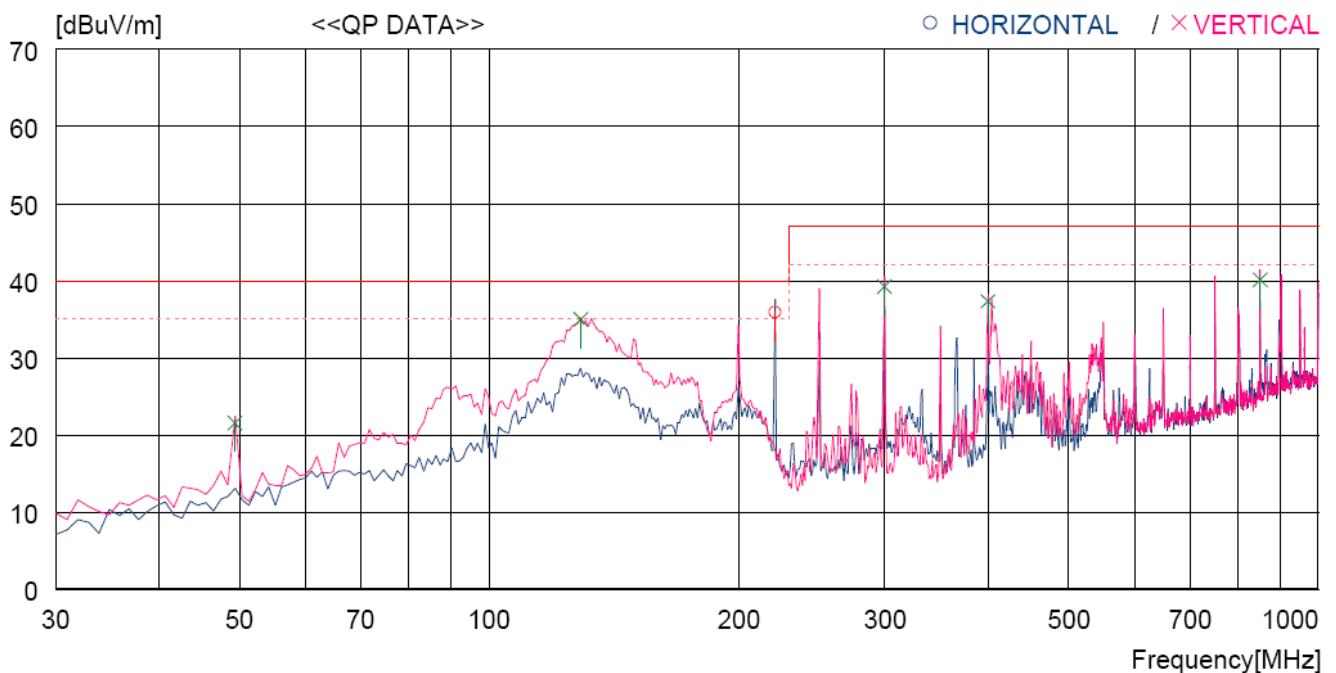


Tested by: Hyung-Kwon, Oh / Engineer

11.4.2 Test data for 30 MHz ~ 1 000 MHz

-. Test Date : June 15, 2015
 -. Resolution bandwidth : 120 kHz
 -. Frequency range : 30 MHz ~ 1 000 MHz
 -. Measurement distance : 3 m
 -. Operating mode : Transmitting mode

Operating condition : Low Channel

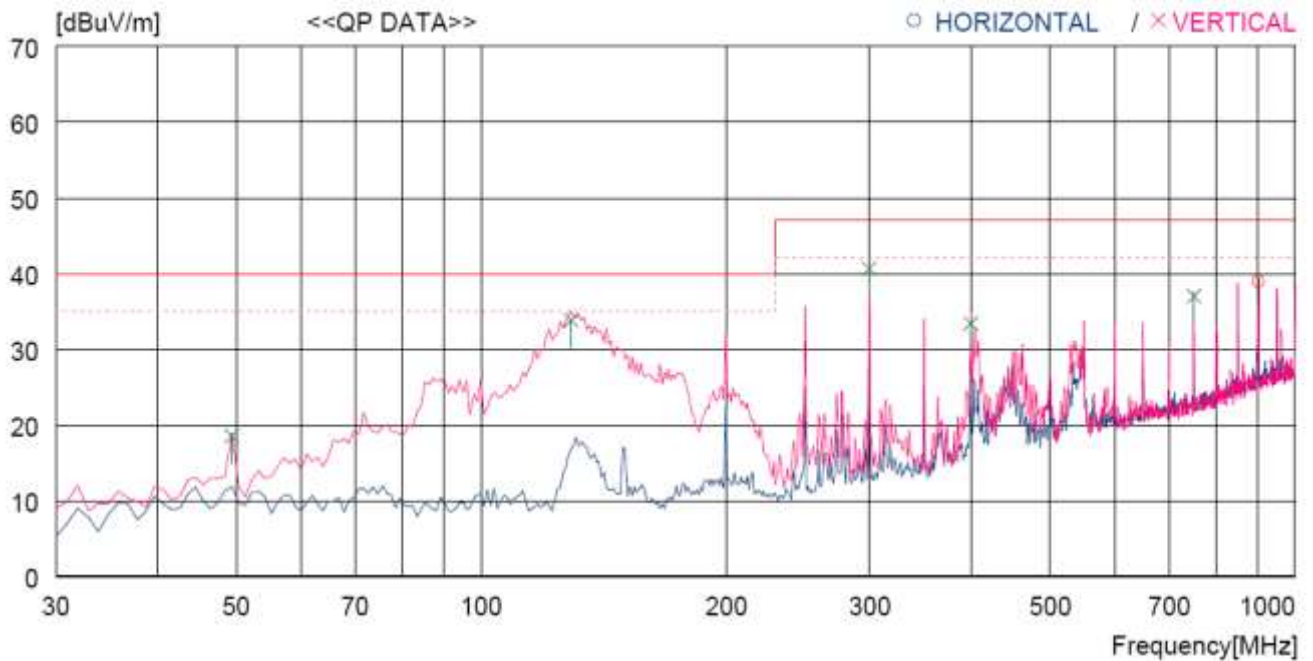


No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	221.090	53.0	11.5	4.3	32.9	35.9	40.0	4.1	199	0
----- Vertical -----										
2	49.400	38.8	13.7	2.0	33.0	21.5	40.0	18.5	100	61
3	128.940	55.4	9.3	3.3	33.0	35.0	40.0	5.0	100	31
4	299.660	53.4	13.6	5.1	32.9	39.2	47.0	7.8	100	353
5	399.570	48.5	15.9	5.9	33.0	37.3	47.0	9.7	100	31
6	850.610	42.3	21.6	8.9	32.7	40.1	47.0	6.9	100	158

Remark: Margin (dB) = Limit – Result and Result = Reading Quasi- Peak + Antenna Factor + Loss – Gain

Loss and Gain in above table means Cable Loss and Pre-amplifier gain.

Operating condition : Middle Channel

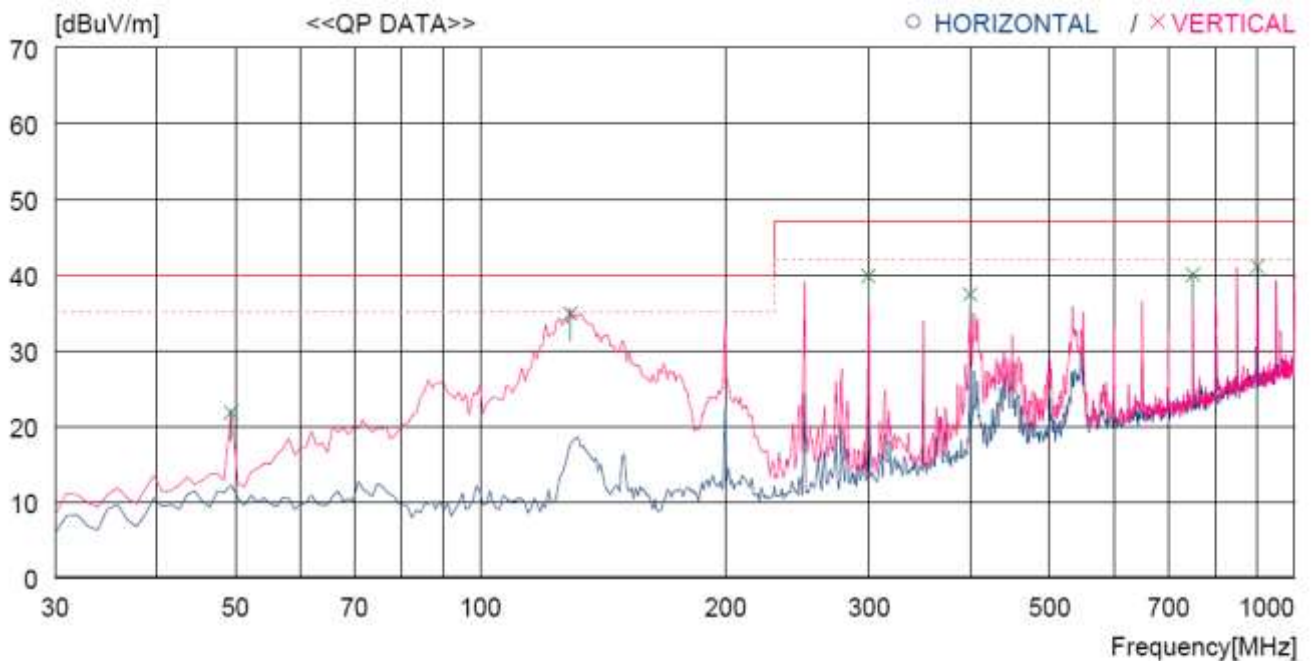


No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	901.049	39.8	22.3	9.2	32.4	38.9	47.0	8.1	100	74
----- Vertical -----										
2	49.400	35.8	13.7	2.0	33.0	18.5	40.0	21.5	100	250
3	128.940	54.2	9.3	3.3	33.0	33.8	40.0	6.2	100	258
4	299.660	54.8	13.6	5.1	32.9	40.6	47.0	6.4	100	358
5	399.570	44.6	15.9	5.9	33.0	33.4	47.0	13.6	100	250
6	750.703	41.5	20.3	8.3	33.1	37.0	47.0	10.0	100	250

Remark: Margin (dB) = Limit – Result and Result = Reading Quasi- Peak + Antenna Factor + Loss – Gain

Loss and Gain in above table means Cable Loss and Pre-amplifier gain.

Operating condition : High Channel



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA TABLE	
	[MHz]	QP	FACTOR							
		[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Vertical -----										
1	49.400	39.1	13.7	2.0	33.0	21.8	40.0	18.2	100	8
2	128.940	55.3	9.3	3.3	33.0	34.9	40.0	5.1	100	299
3	299.660	54.0	13.6	5.1	32.9	39.8	47.0	7.2	100	358
4	399.570	48.6	15.9	5.9	33.0	37.4	47.0	9.6	100	26
5	750.703	44.5	20.3	8.3	33.1	40.0	47.0	7.0	100	8
6	901.049	42.0	22.3	9.2	32.4	41.1	47.0	5.9	100	8

Remark: Margin (dB) = Limit – Result and Result = Reading Quasi- Peak + Antenna Factor + Loss – Gain

Loss and Gain in above table means Cable Loss and Pre-amplifier gain.

Tested by: Hyung-Kwon, Oh / Engineer

11.4.3 Test data for above 1 GHz

- . Test Date : June 15, 2015
- . 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 (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