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

Test Report No.	**: OT-201-RWD-003**
AGR No.	**: A19DA-017**
Applicant	**: Bloomengine Inc.**
Address	**: 4F #401, 26, Magokjungang 8-ro 1-gil, Gangseo-gu, Seoul, South Korea**
Manufacturer	**: Bloomengine Inc.**
Address	**: 4F #401, 26, Magokjungang 8-ro 1-gil, Gangseo-gu, Seoul, South Korea**
Type of Equipment	**: Smart Indoor Planter**
FCC ID.	**: 2AUU9-B100KHA**
Model Name	**: B100KHA**
Serial number	**: N/A**
Total page of Report	**: 44 pages (including this page)**
Date of Incoming	**: November 25, 2019**
Date of issue	**: January 02, 2020**

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: Tae-Ho, Kim / Senior Manager
ONETECH Corp.

Approved by: Ki-Hong, Nam / Chief Engineer
ONETECH Corp.

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Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-201-RWD-003	January 02, 2020	Initial Release	All

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1. VERIFICATION OF COMPLIANCE

Applicant : Bloomengine Inc.
Address : 4F #401, 26, Magokjungang 8-ro 1-gil, Gangseo-gu, Seoul, South Korea
Manufacturer : Bloomengine Inc.
Address : 4F #401, 26, Magokjungang 8-ro 1-gil, Gangseo-gu, Seoul, South Korea
Contact Person : Seulki Park / CEO
Telephone No. : +82-70-5129-5177
FCC ID : 2AUU9-B100KHA
Model Name : B100KHA
Brand Name : -
Serial Number : N/A
Date : January 02, 2020

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	Smart Indoor Planter
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 558074 D01 15.247 Meas Guidance v05r02
Modifications on the Equipment to Achieve Compliance	None
Final Test was Conducted On	10 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: 2013. 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 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea

-. Site Filing:

VCCI (Voluntary Control Council for Interference) – Registration No. R-4112/ C-14617/ G-10666 / T-1842

IC (Industry Canada) – Registration No. Site# 3736A-3

-. Site Accreditation:

KOLAS (Korea Laboratory Accreditation Scheme) - Accreditation NO. KT085

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) – Designation No. KR0013

3. GENERAL INFORMATION

3.1 Product Description

The Bloomengine Inc., Model B100KHA (referred to as the EUT in this report) is a Smart Indoor Planter. Product specification information described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Smart Indoor Planter
Temperature Range	-10 °C ~ 50 °C
OPERATING FREQUENCY	2 402 MHz ~ 2 480 MHz
MODULATION TYPE	GFSK
RF OUTPUT POWER	-7.78 dBm
ANTENNA TYPE	PCB Antenna
ANTENNA GAIN	-7.71 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	32.768 kHz, 32 MHz
RATED SUPPLY VOLTAGE	AC 120 V

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

-. None

4. EUT MODIFICATIONS

-. None

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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	Bloomengine Inc.	B100KHA REV. MP10	N/A
Sub Board	Bloomengine Inc.	B100KHA CONTROL BRD Rev. MP10	N/A
Power Board	Bloomengine Inc.	B100KHA POWER SUPPLY BRD Rev. MP10	N/A
Sensor Board	Bloomengine Inc.	B100KHA MP10 WATER SENSOR	N/A
FAN	YCCFAN	YDL4010C12	N/A
Water Pump	Qingdao Ahead Electric Co., Ltd	AW100	N/A
DC Adaptor	Dongguan Yinli Electronics Co., Ltd	YLS0241A-K120200	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
B100KHA	Bloomengine Inc.	Smart Indoor Planter(EUT)	-
CC Debugger	Texas Instruments	Jig Board	EUT
HP Pavilion g series	HP	Notebook PC	-
PPP009C	LIE-ON TECHNOLOGY (CHANGZHOU)CO.,LTD.	AC Adapter	-
YLS0241A-K120200	Dongguan Yinli Electronics Co., Ltd	DC Adaptor	-

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.

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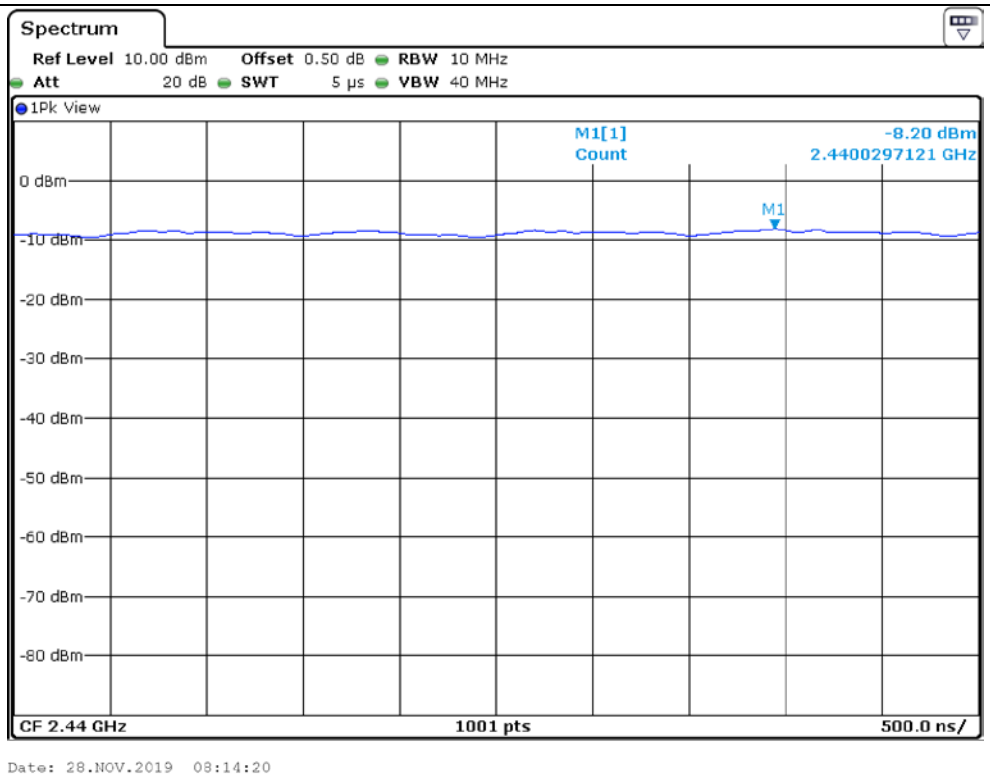
-. Duty Cycle

Mode	Tx On Time [ms]	Tx Off Time [ms]	Duty Cycle [%]	Correction Factor [dB]
Bluetooth LE	-	-	100.00	-

Note – Duty Cycle : (Tx On Time / (Tx On Time + Tx Off Time)) * 100

Correction Factor : 10 * Log(1 / (Duty Cycle / 100))

-. Test Plot



Bluetooth LE

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5.4 Configuration of Test System

Line Conducted Test: The EUT was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions.

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 meter Semi Anechoic Chamber.

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 PCB Antenna on the main board in the EUT, so no consideration of replacement by the user.

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6. PRELIMINARY TEST

6.1 AC Power line Conducted Emissions Tests

During Preliminary Test, the following operating mode was investigated.

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

6.2 General Radiated Emissions Tests

During Preliminary Test, the following operating mode was investigated.

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

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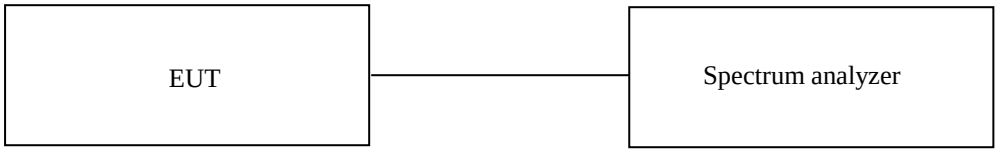
7. MINIMUM 6 dB BANDWIDTH

7.1 Operating environment

Temperature	:	23 °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.
■ -	FSW43	ROHDE & SCHWARZ	Signal & Spectrum Analyzer	104544	Jul. 18, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

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7.4 Test data

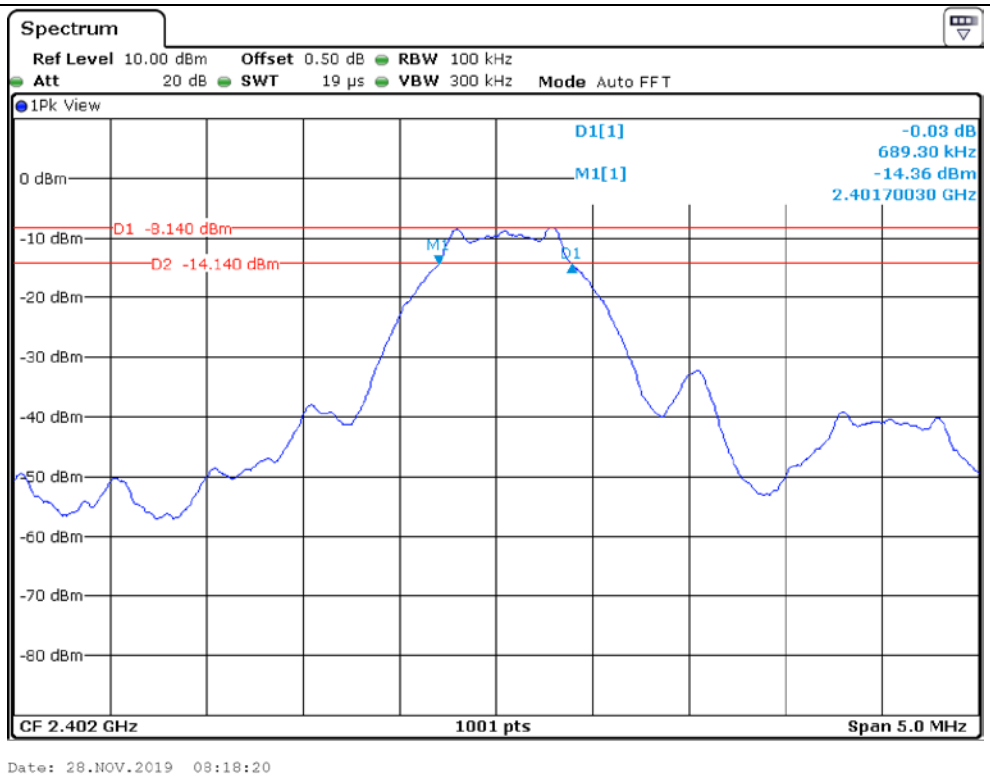
-. Test Date : November 25, 2019 ~ November 28, 2019

-. Test Result : Pass

CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	2 402.00	689.30	500.00	189.30
Middle	2 440.00	679.30	500.00	179.30
High	2 480.00	684.30	500.00	184.30

Remark. Margin = Measured Value - Limit

Tested by: Hyung-Kwon, Oh / Assistant Manager



Low Channel

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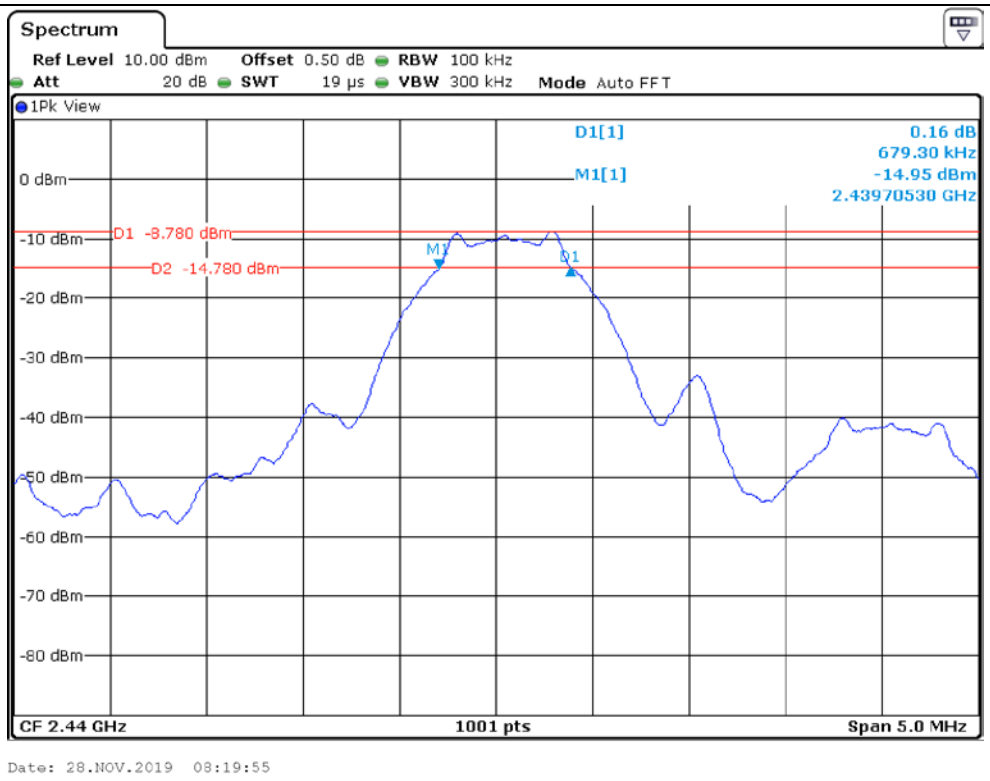
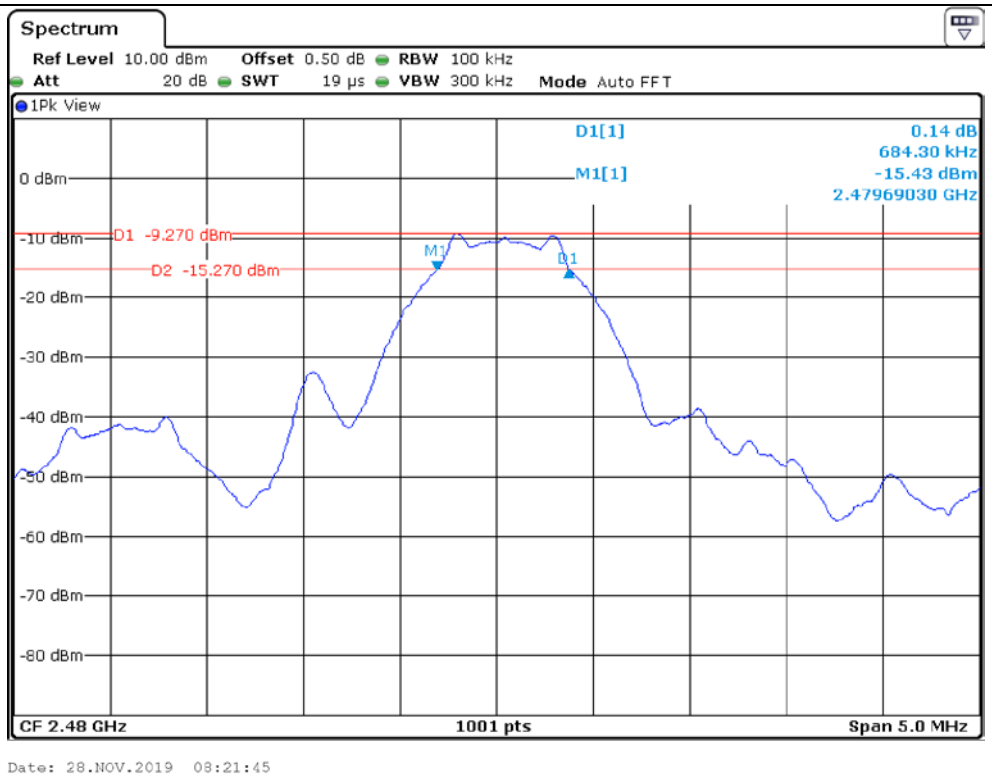


Middle Channel



High Channel

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8. MAXIMUM PEAK OUTPUT POWER

8.1 Operating environment

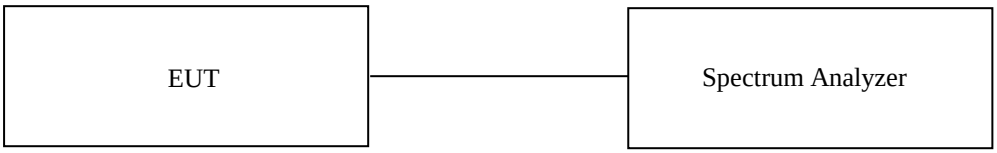
Temperature : 23 °C

Relative humidity : 45 % 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 ≥ DTS Bandwidth, the video bandwidth is set to 3 times the resolution bandwidth.



8.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	FSW43	ROHDE & SCHWARZ	Signal & Spectrum Analyzer	104544	Jul. 18, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

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8.4 Test data

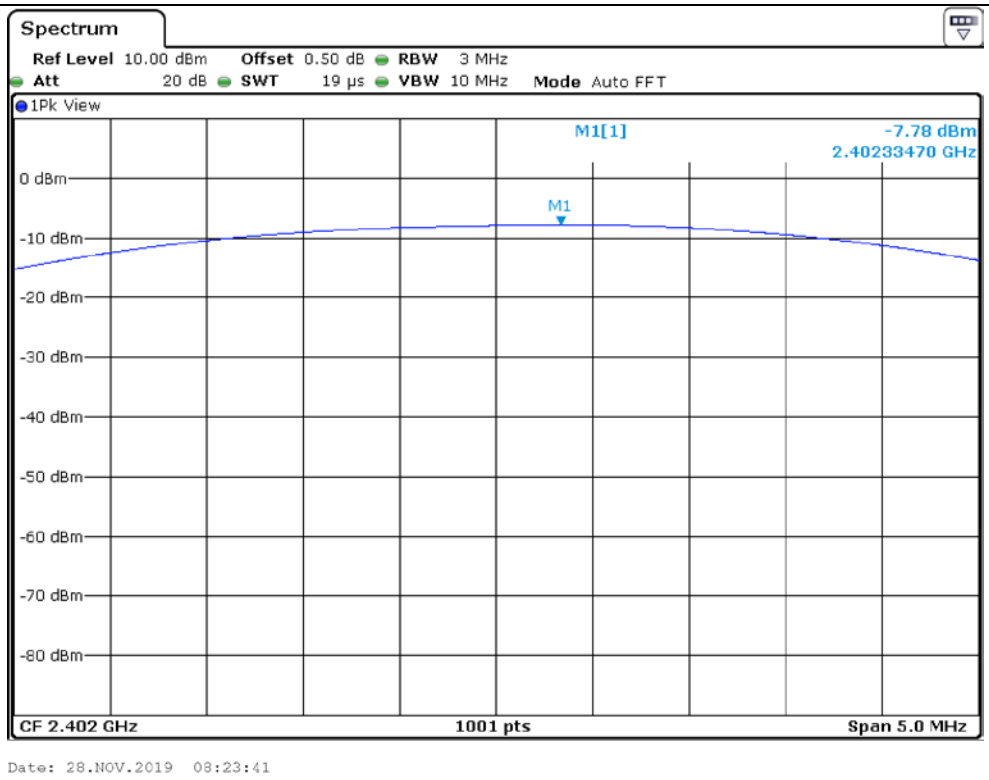
-. Test Date : November 25, 2019 ~ November 28, 2019

-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 402.00	-7.78	30.00	37.78
MIDDLE	2 440.00	-8.39	30.00	38.39
HIGH	2 480.00	-8.64	30.00	38.64

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

Tested by: Hyung-Kwon, Oh / Assistant Manager



Low Channel

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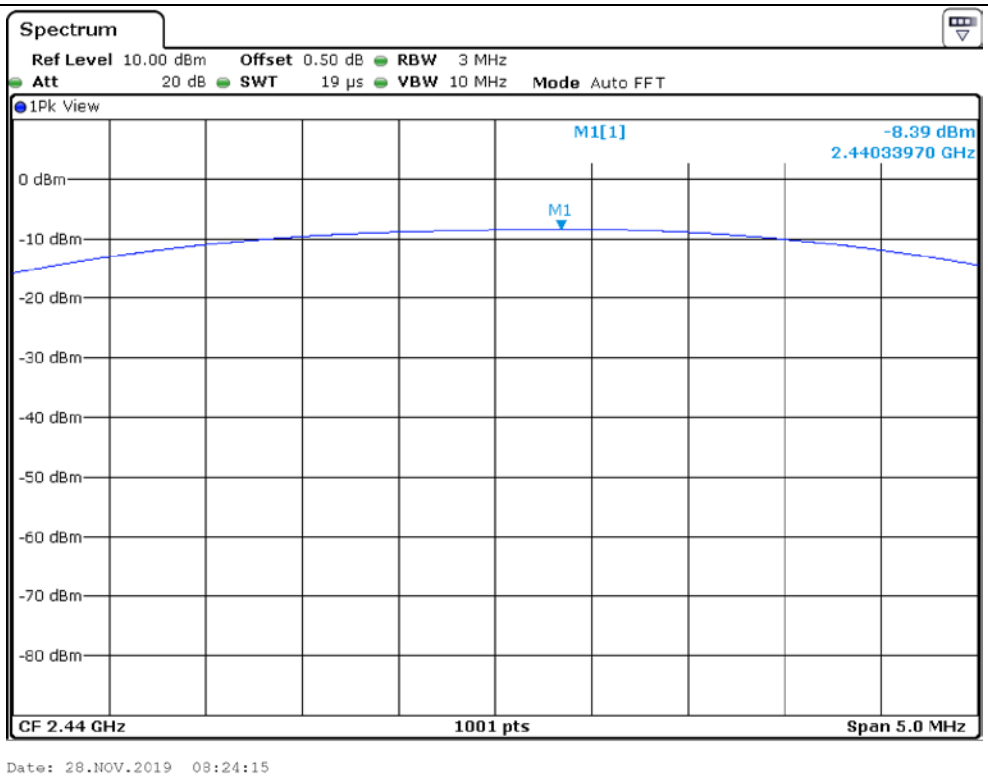
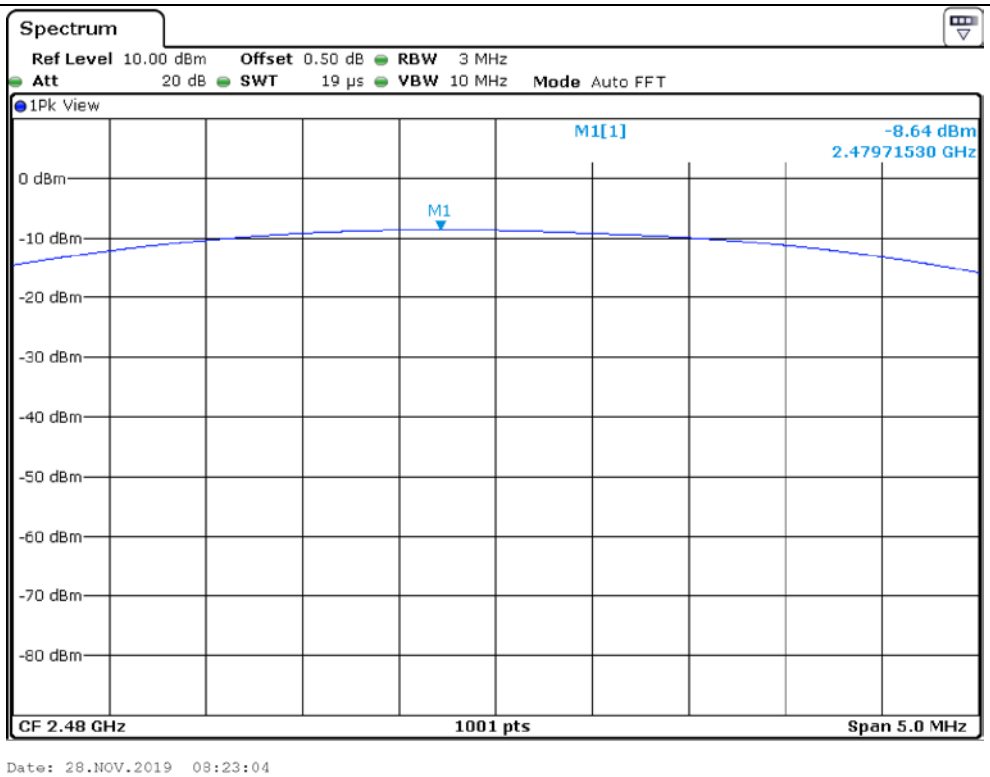


Middle Channel



High Channel

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9. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

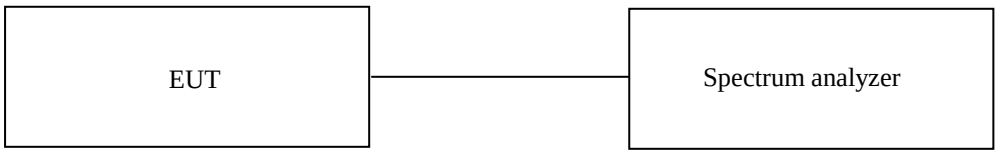
9.1 Operating environment

Temperature : 23 °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 bandwidth is set to 100 kHz, the video bandwidth is set to 3 times the resolution bandwidth 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.
■ -	FSW43	ROHDE & SCHWARZ	Signal & Spectrum Analyzer	104544	Jul. 18, 2019 (1Y)
■ -	ESU	Rohde & Schwarz	EMI Test Receiver	100261	Mar. 28, 2019 (1Y)
■ -	310N	Sonoma Instrument	Pre-Amplifier	312545	Mar. 18, 2019 (1Y)
□ -	BBV9718	Schwarzbeck	Amplifier	310	Mar. 28, 2019 (1Y)
■	SCU40A	Rohde & Schwarz	Signal Conditioning unit	100436	Mar. 11, 2019 (1Y)
■ -	DT3000-3t	Innco System	Turn Table	DT3000/093	N/A
■ -	MA-4000XPET	Innco System	Antenna Master	MA4000/509	N/A
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	777	Apr. 13, 2018 (2Y)
■ -	BBHA 9120D	Schwarzbeck	Horn Antenna	9120D-1366	Jul. 16, 2019 (2Y)
■ -	BBHA 9170	Schwarzbeck	Horn Antenna	BBHA9170179	Jan. 16, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

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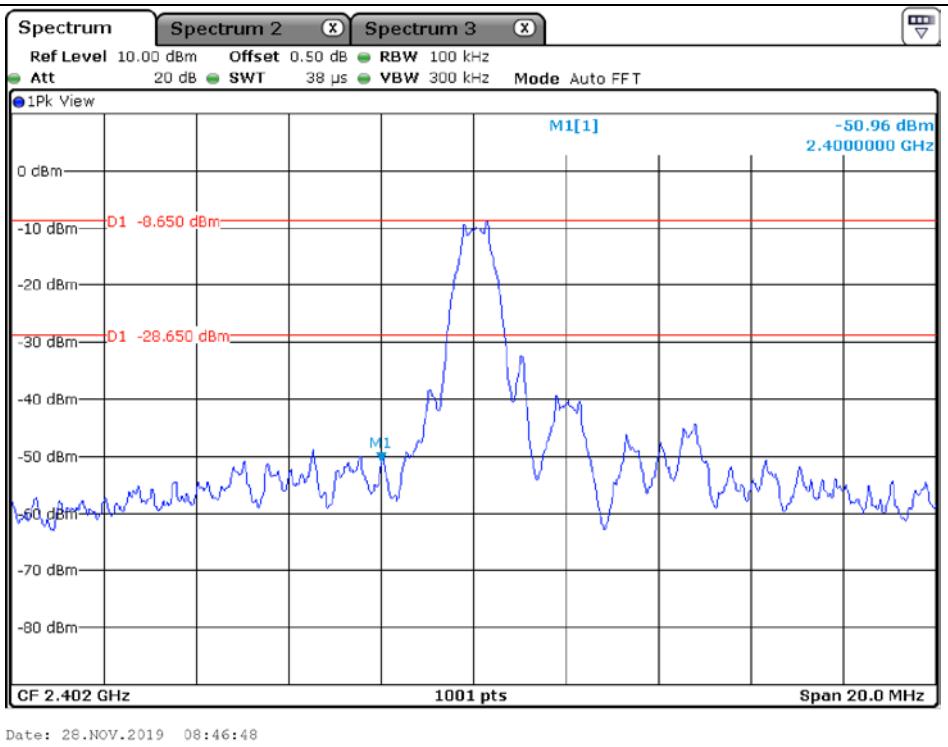
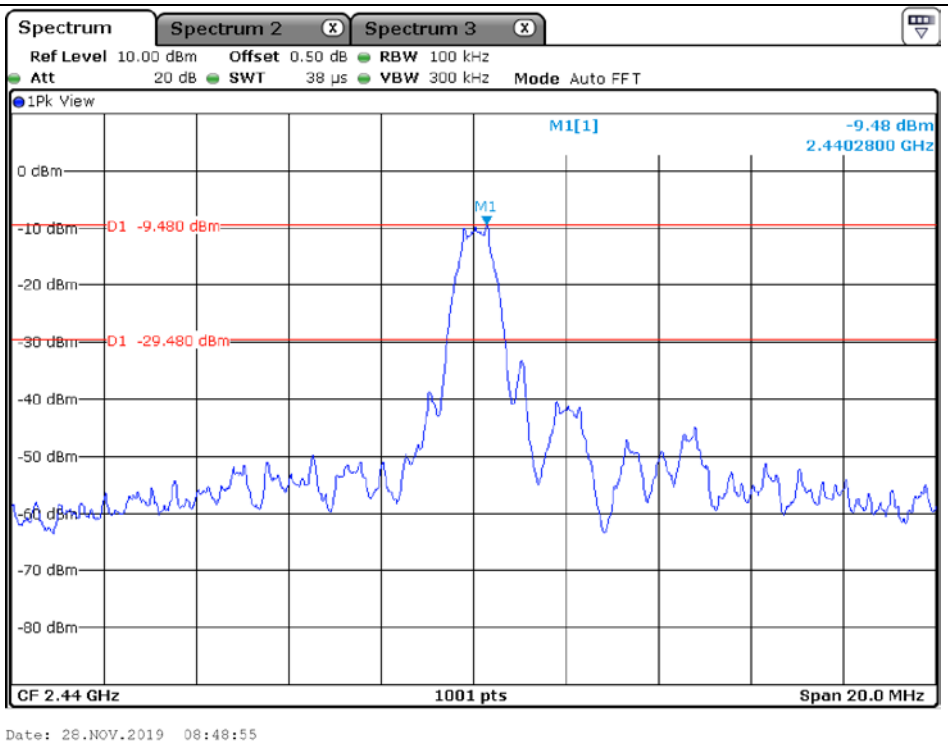
9.5 Test data for conducted emission



Low Channel



Middle Channel

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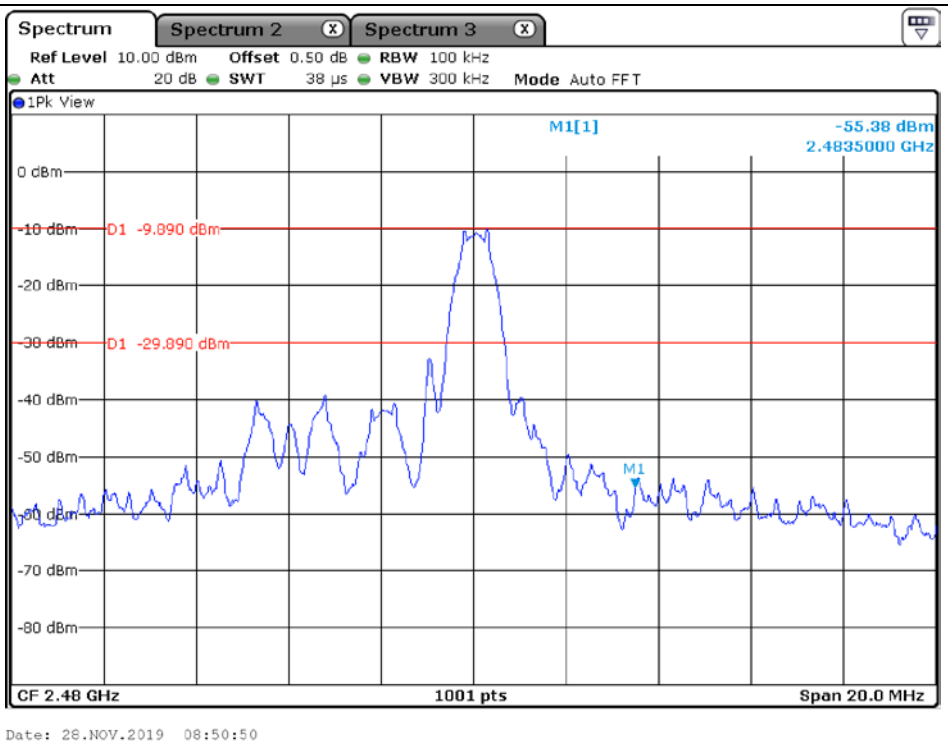
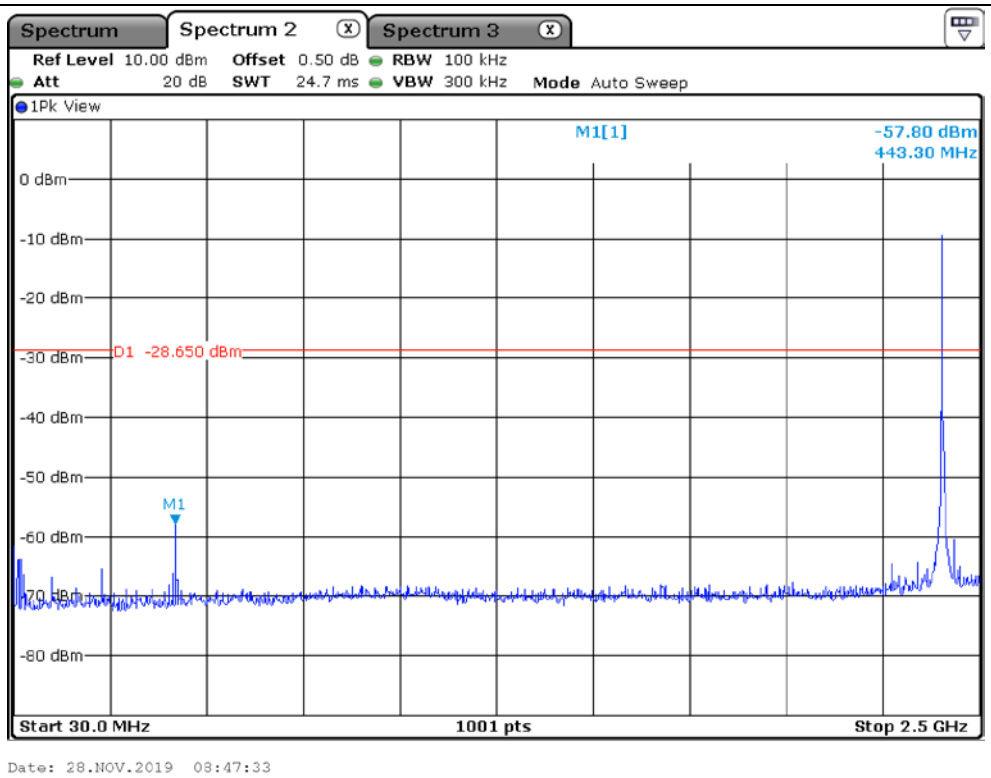
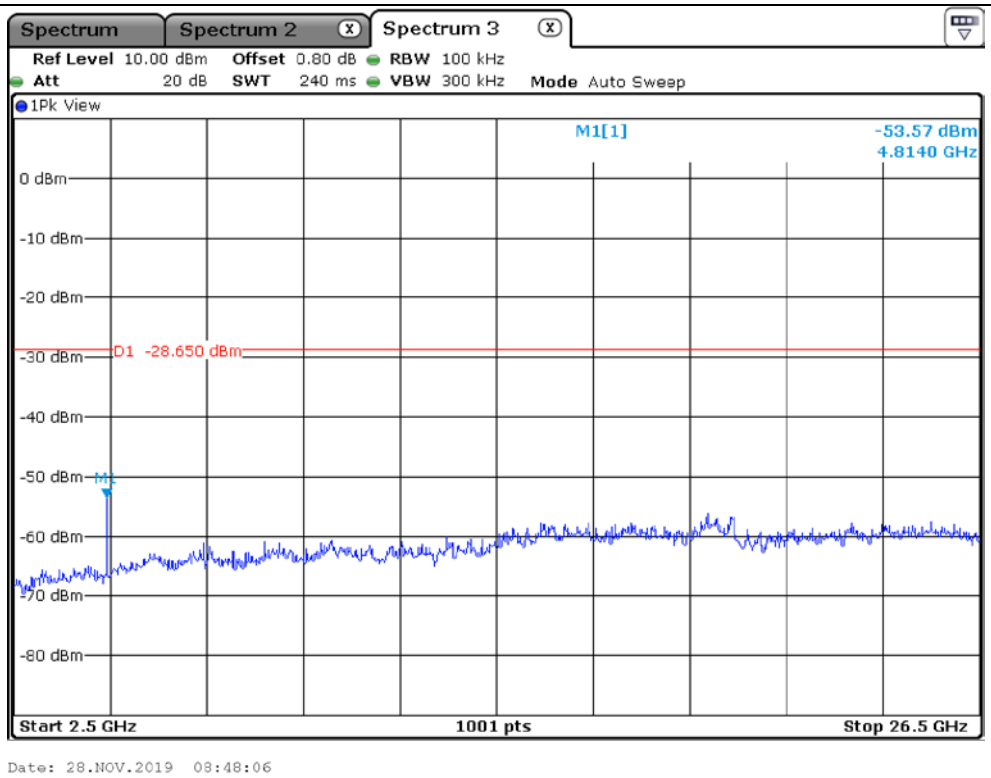


High Channel



Low Channel



Low Channel

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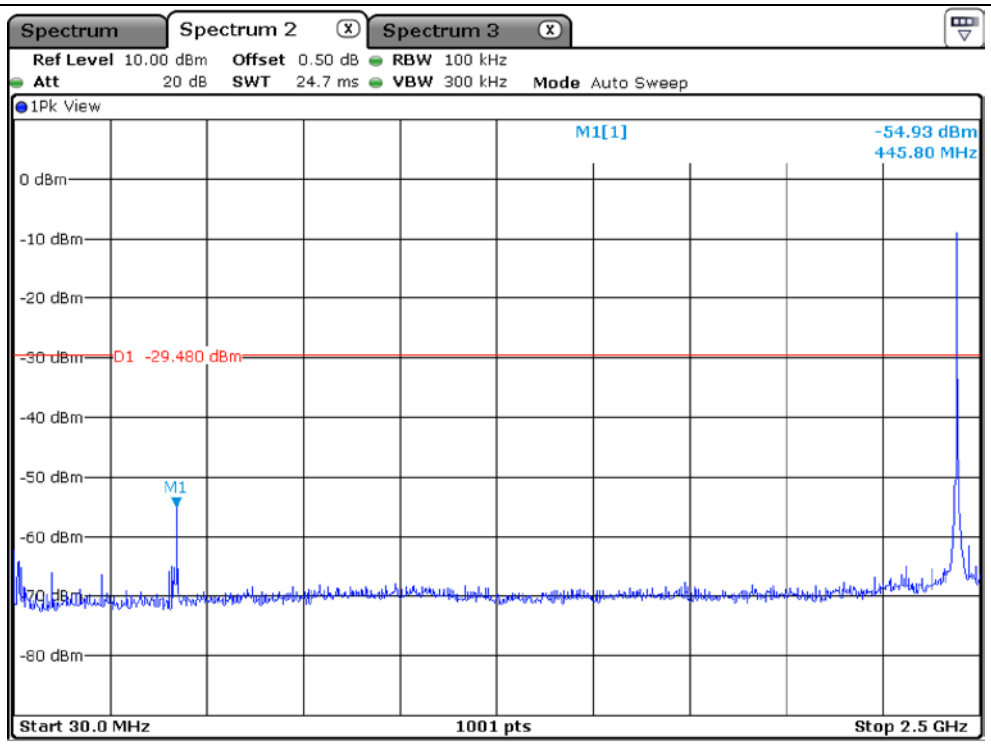
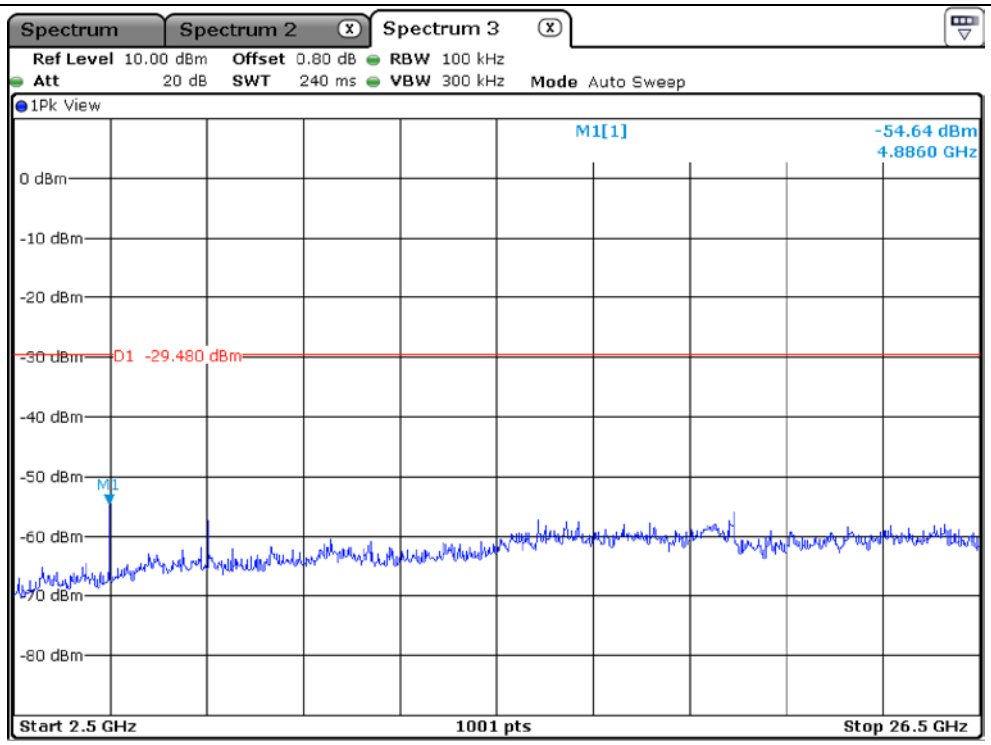


Date: 28.NOV.2019 08:49:34

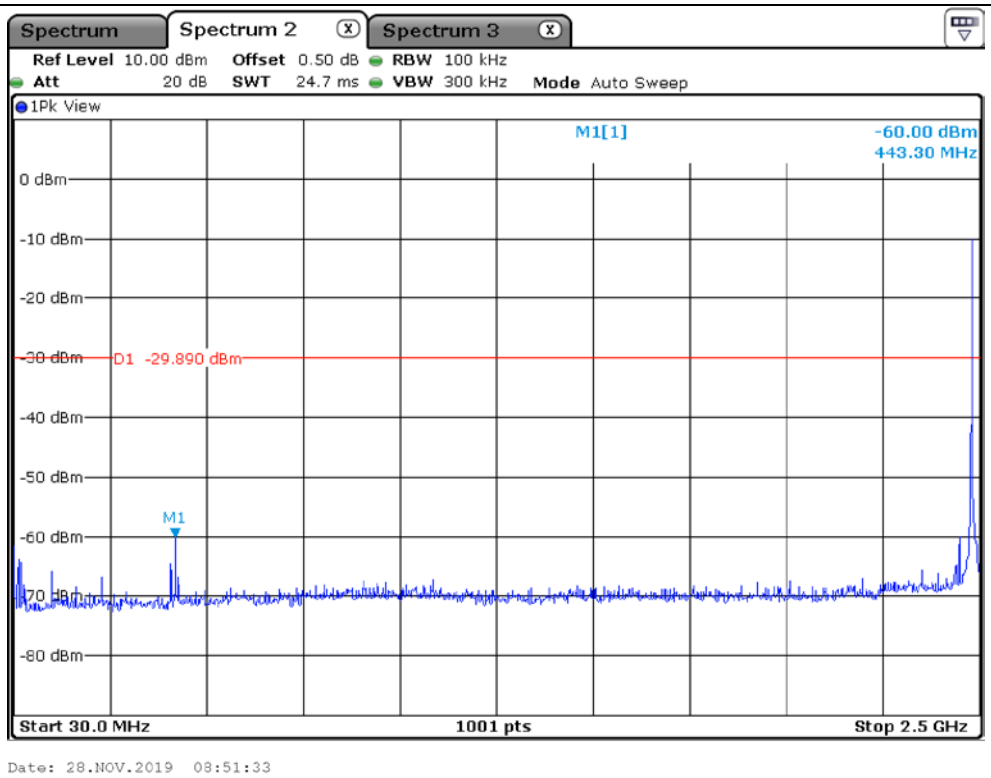
Middle Channel



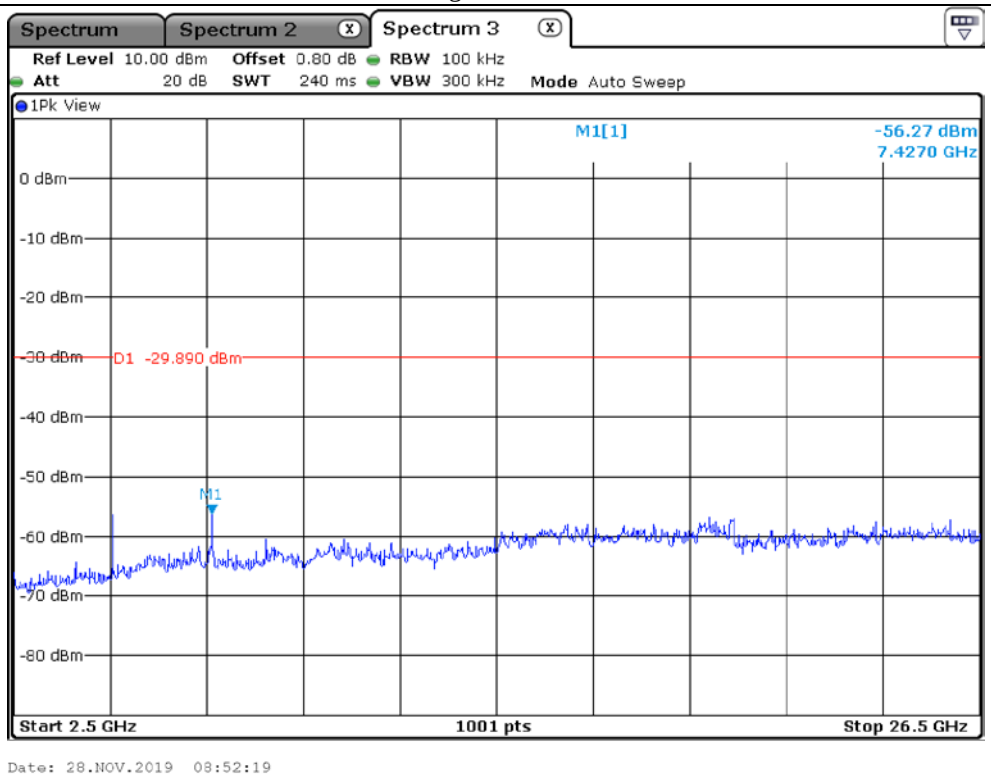
Date: 28.NOV.2019 08:50:05

Middle Channel

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)



High Channel



High Channel

9.6 Test data for radiated emission

9.6.1 Radiated Emission which fall in the Restricted Band

-. Test Date : November 25, 2019 ~ November 28, 2019

-. Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode

-. Video bandwidth : 3 MHz for Peak and Average Mode

-. Measurement distance : 3 m

-. Duty Cycle : 100.00 %

-. Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
2 339.850	17.46	Peak	H	26.90	3.07	47.43	74.00	26.57
2 339.371	6.41	Average	H			36.38	54.00	17.62
2 334.575	16.98	Peak	V			46.95	74.00	27.05
2 340.010	6.21	Average	V			36.18	54.00	17.82
2 483.838	17.37	Peak	H	26.60	3.16	47.13	74.00	26.87
2 483.821	5.49	Average	H			35.25	54.00	18.75
2 488.058	17.46	Peak	V			47.22	74.00	26.78
2 492.607	5.34	Average	V			35.10	54.00	18.90

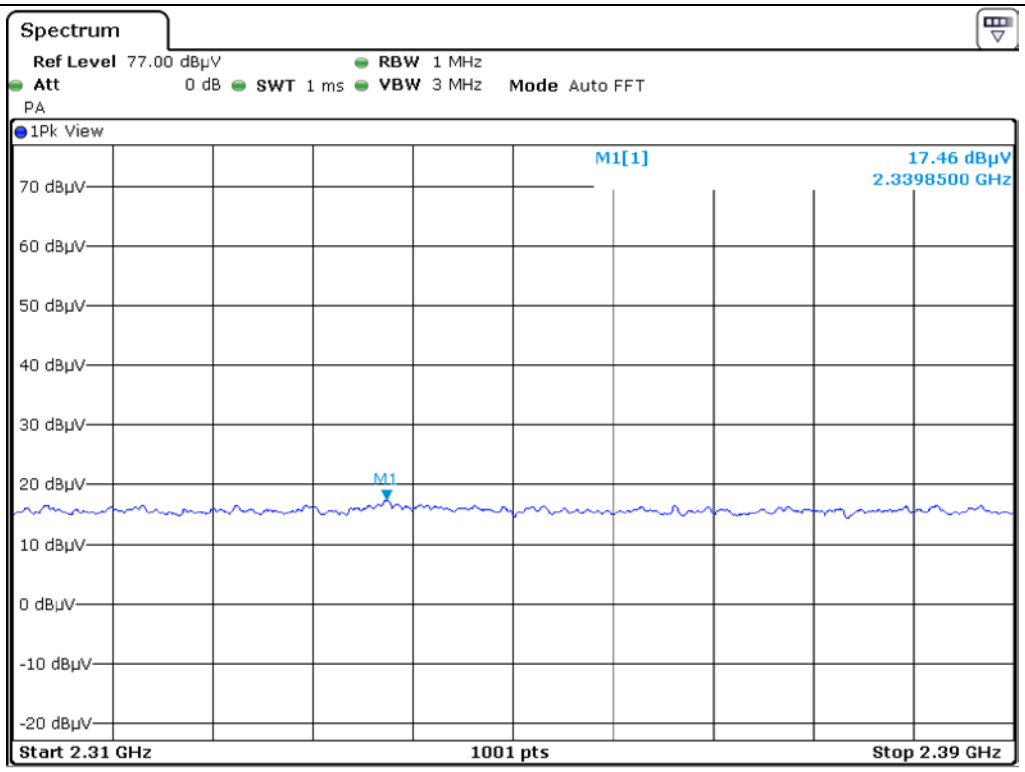
Tabulated test data for Restricted Band

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

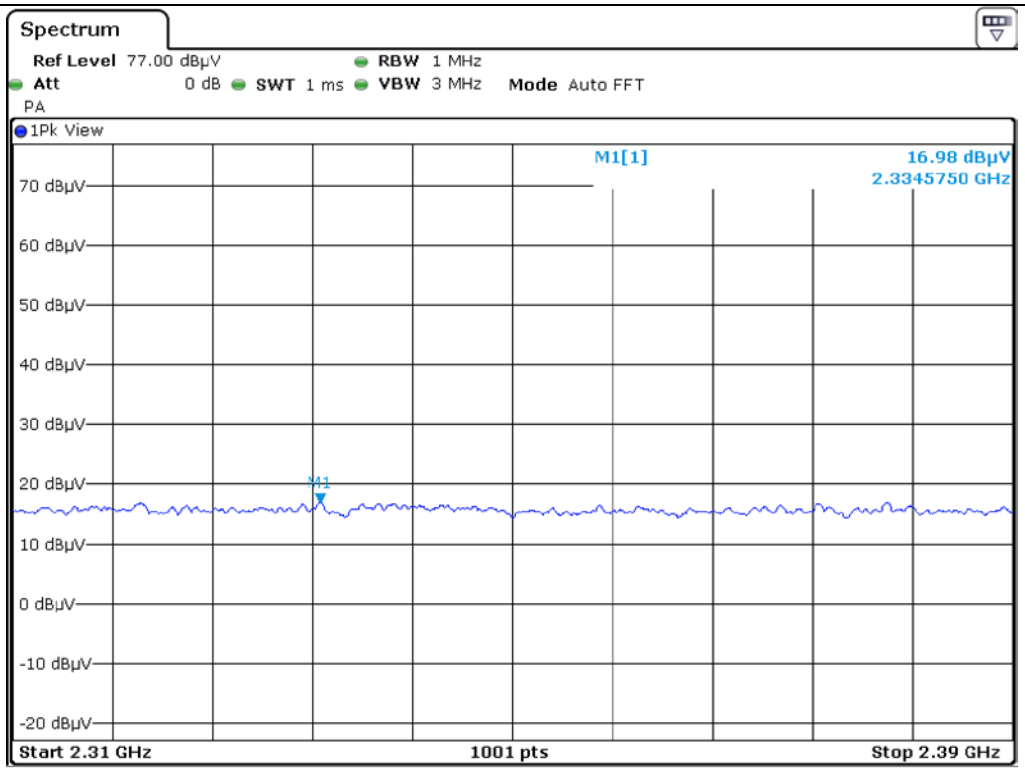
Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss

Tested by: Hyung-Kwon, Oh / Assistant Manager



Low Channel_Peak_H



Low Channel_Peak_V

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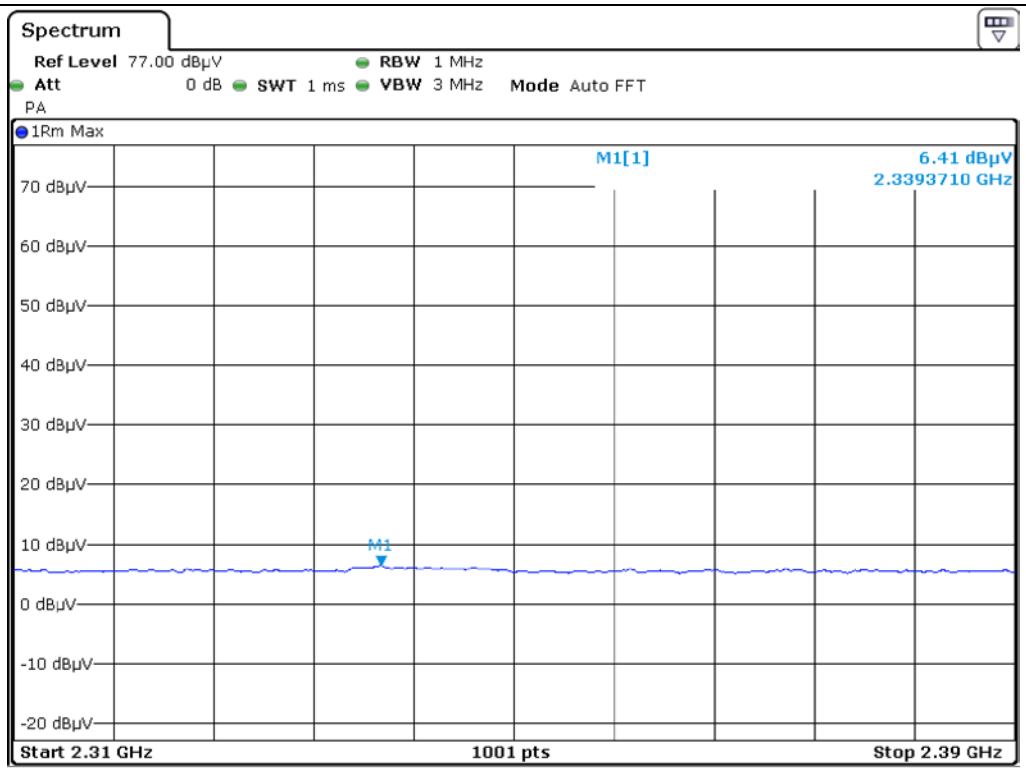
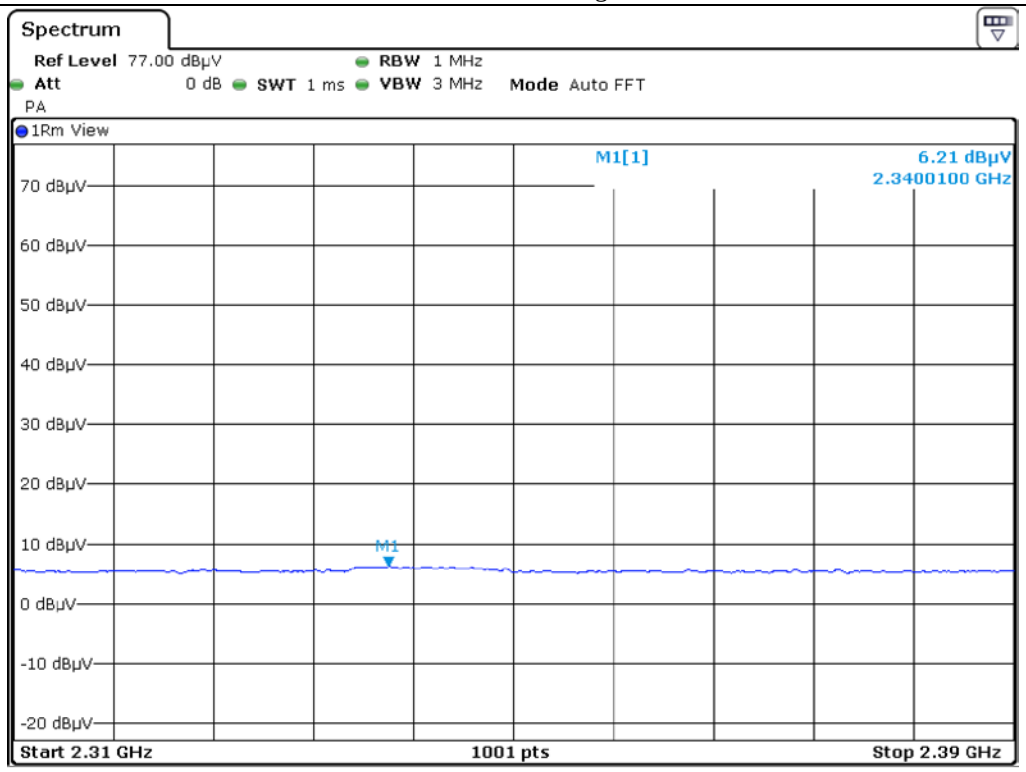
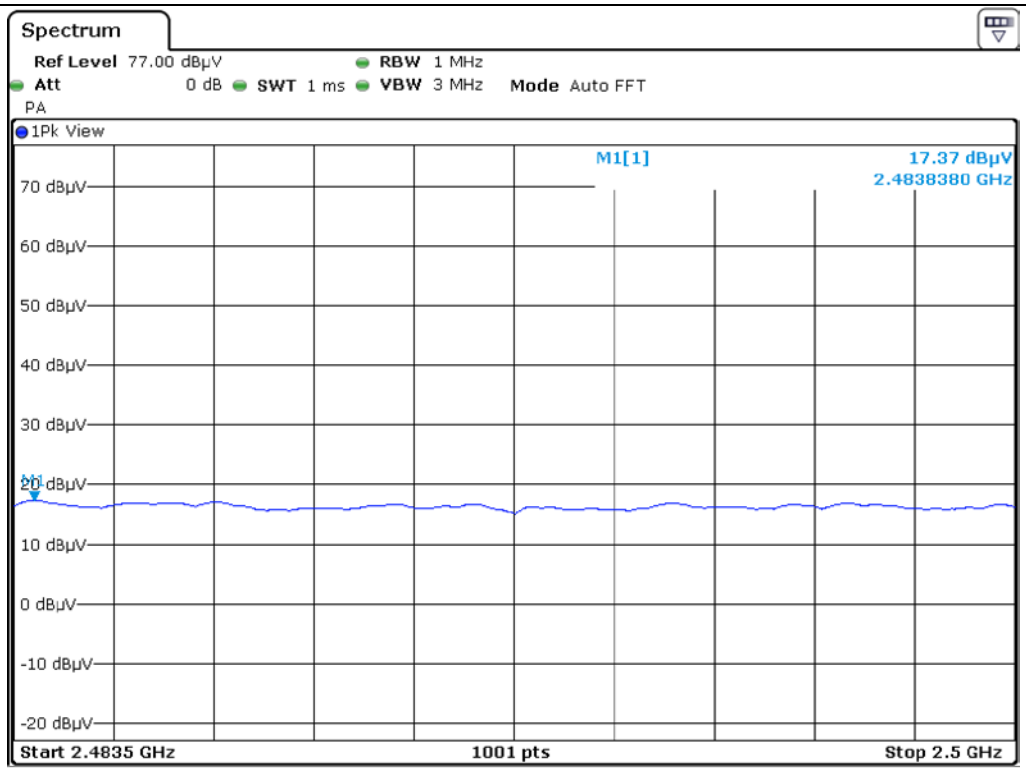


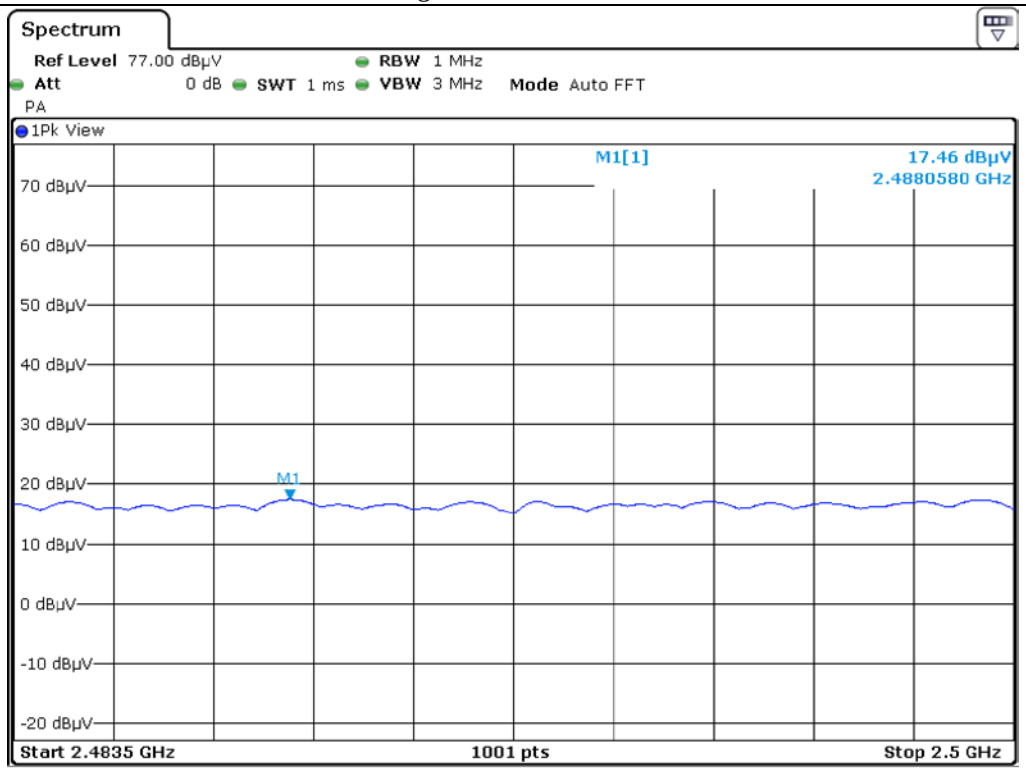
Low Channel_Average_H



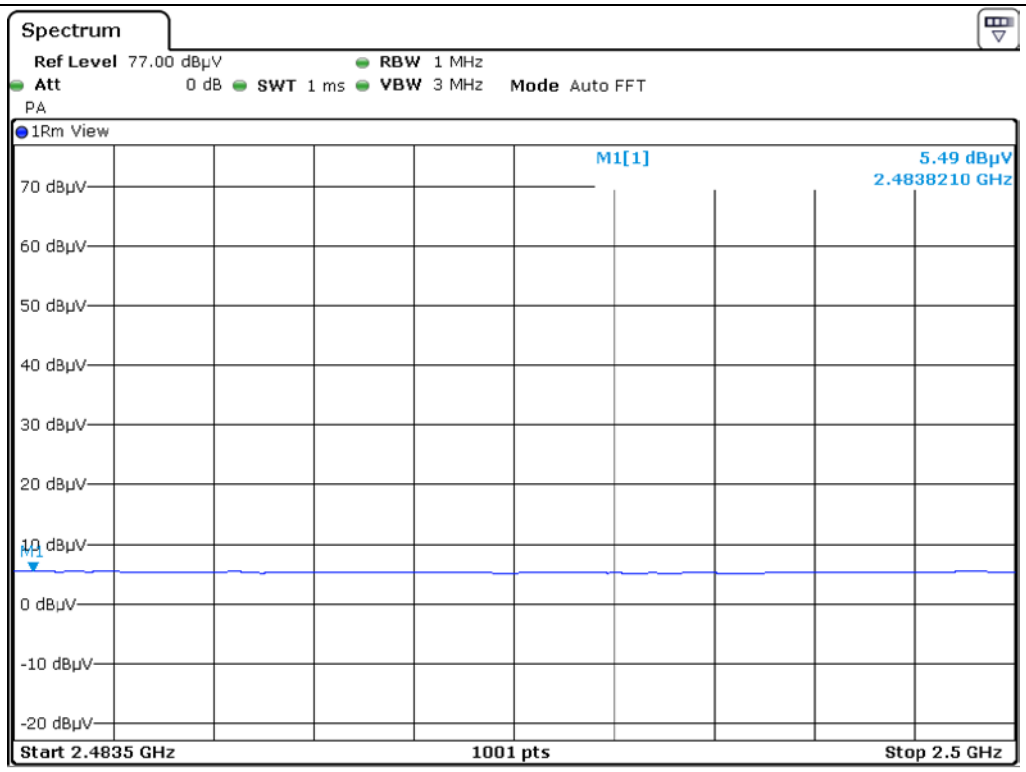
Low Channel_Average_V



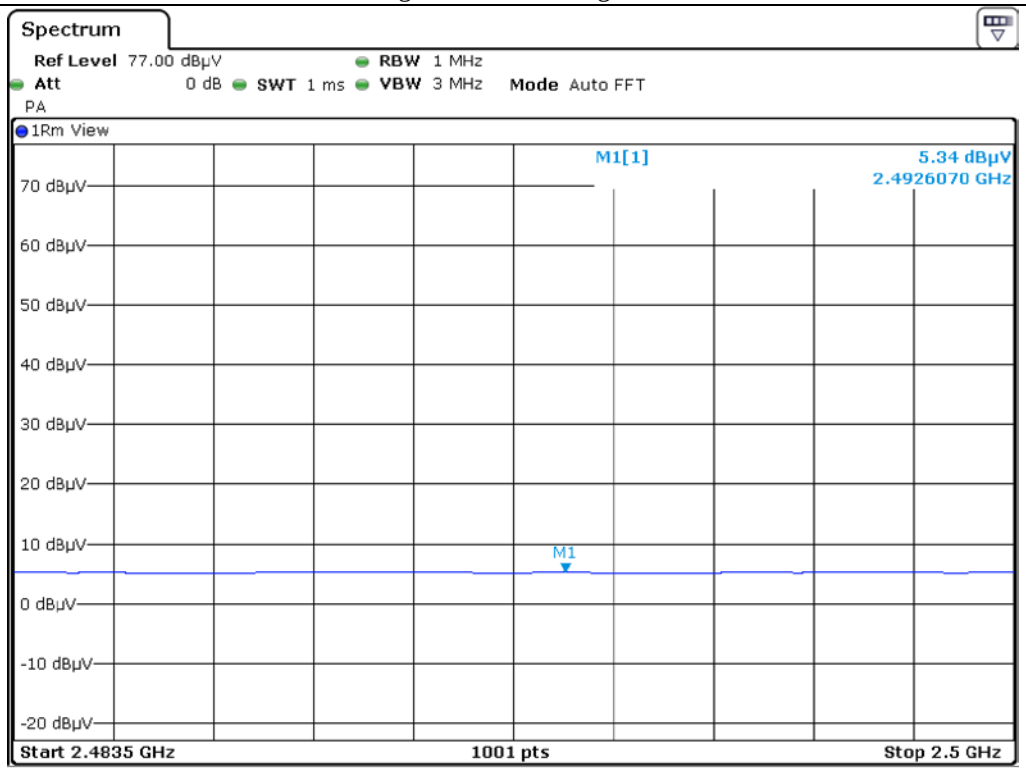
High Channel_Peak_H



High Channel_Peak_V



High Channel_Average_H



High Channel_Average_V

9.6.2 Spurious & Harmonic Radiated Emission

-. Test Date : November 25, 2019 ~ November 28, 2019

-. Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode for the emissions fall in restricted band,
1 MHz and RMS Detector for Average Mode for the emissions fall in restricted band
100 kHz for Peak Mode for the emissions outside restricted band

-. Video bandwidth : 3 MHz for Peak and Average Mode

-. Frequency range : 1 GHz ~ 26.5 GHz

-. Measurement distance : 3 m

-. Duty Cycle : 100.00 %

-. Result : PASSED

Frequency (MHz)	Reading (dBµV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBµV/m)	Limits (dBµV/m)	Margin (dB)
4 804.000	18.44	Peak	H	28.20	4.85	51.49	74.00	22.51
4 804.000	6.89	Average	H			39.94	54.00	14.06
4 804.000	18.36	Peak	V			51.41	74.00	22.59
4 804.000	8.08	Average	V			41.13	54.00	12.87
4 880.000	18.82	Peak	H	28.30	4.91	52.03	74.00	21.97
4 880.000	7.15	Average	H			40.36	54.00	13.64
4 880.000	18.65	Peak	V			51.86	74.00	22.14
4 880.000	8.14	Average	V			41.35	54.00	12.65
4 960.000	18.95	Peak	H	28.60	5.04	52.59	74.00	21.41
4 960.000	7.25	Average	H			40.89	54.00	13.11
4 960.000	19.09	Peak	V			52.73	74.00	21.27
4 960.000	8.40	Average	V			42.04	54.00	11.96

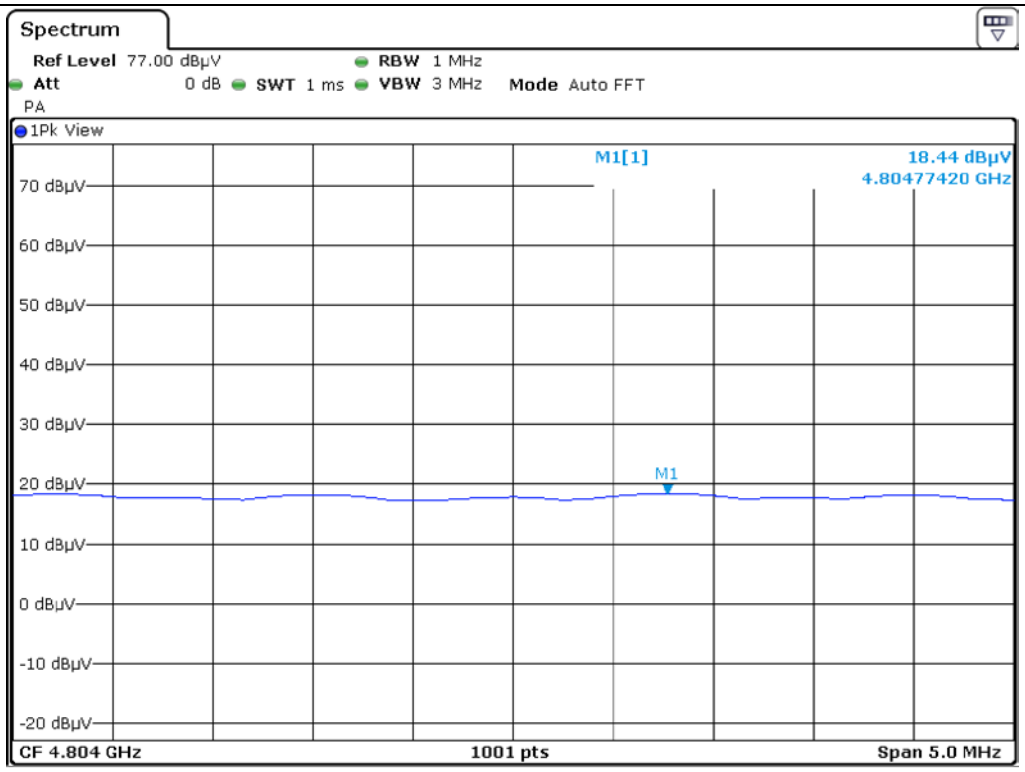
Tabulated test data for Restricted Band

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

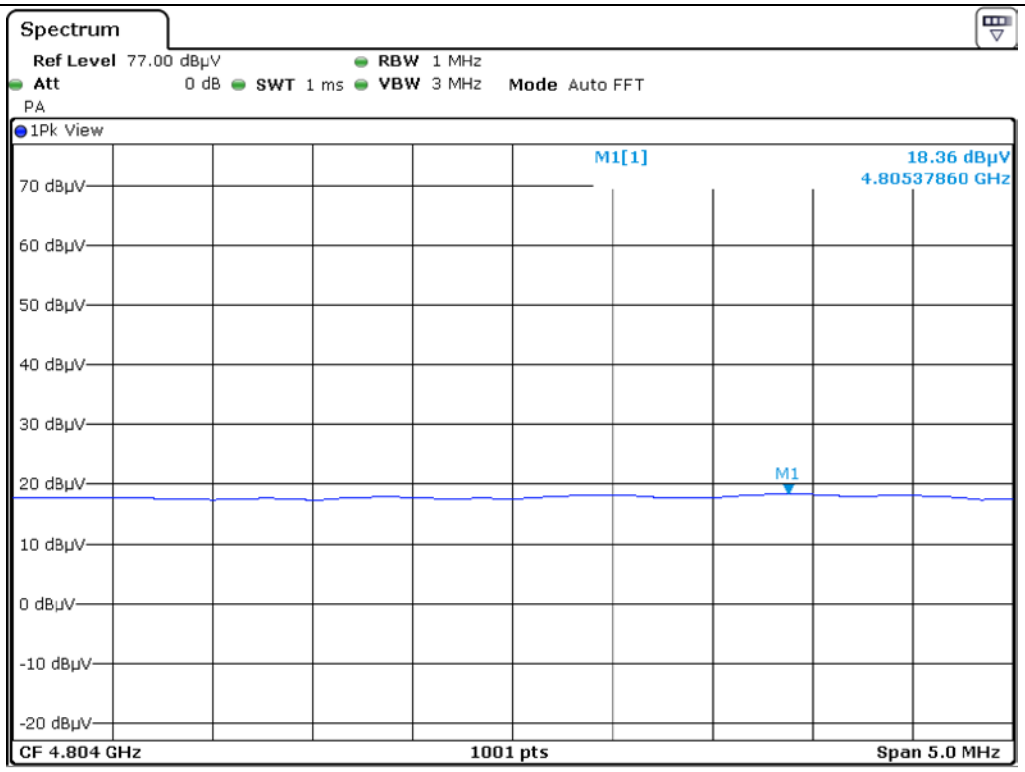
Margin (dB) = Limits (dBµV/m) - Total Level (dBµV/m)

Total Level = Reading + Antenna Factor + Cable Loss

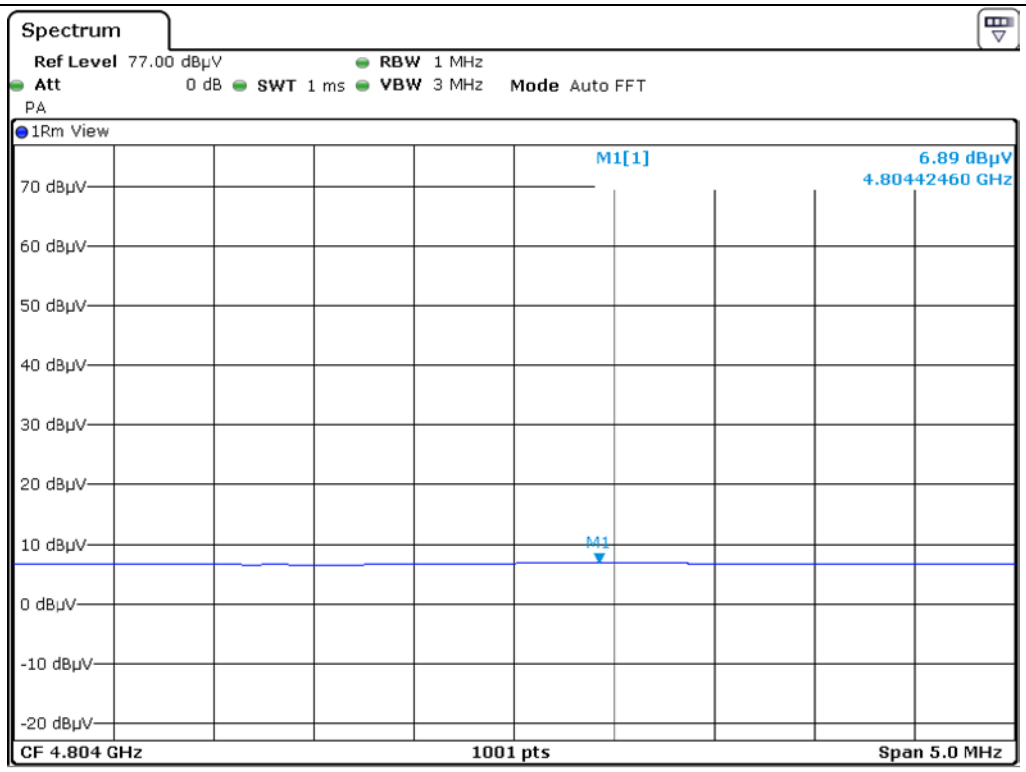
Tested by: Hyung-Kwon, Oh / Assistant Manager



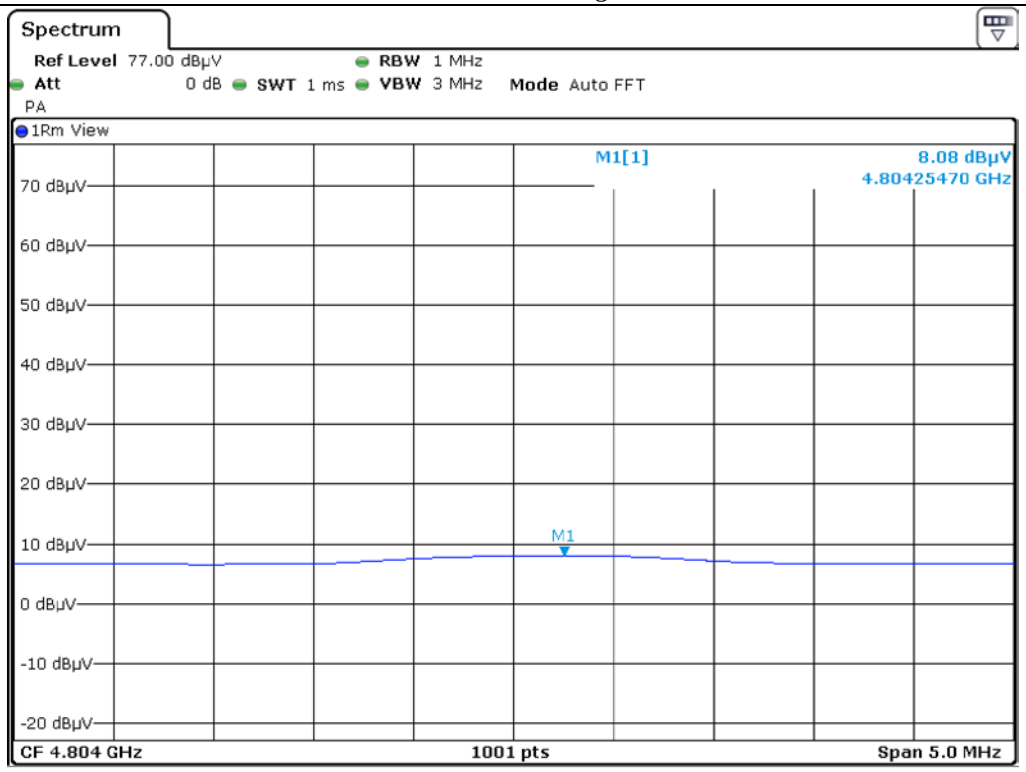
Low Channel_Peak_H



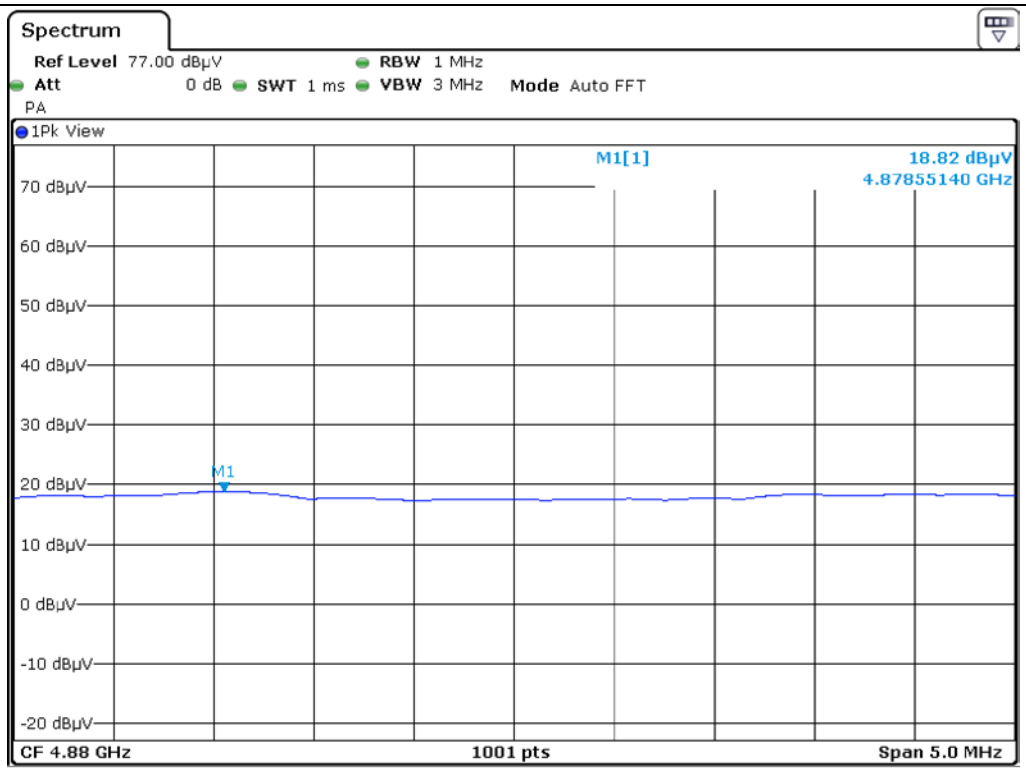
Low Channel_Peak_V



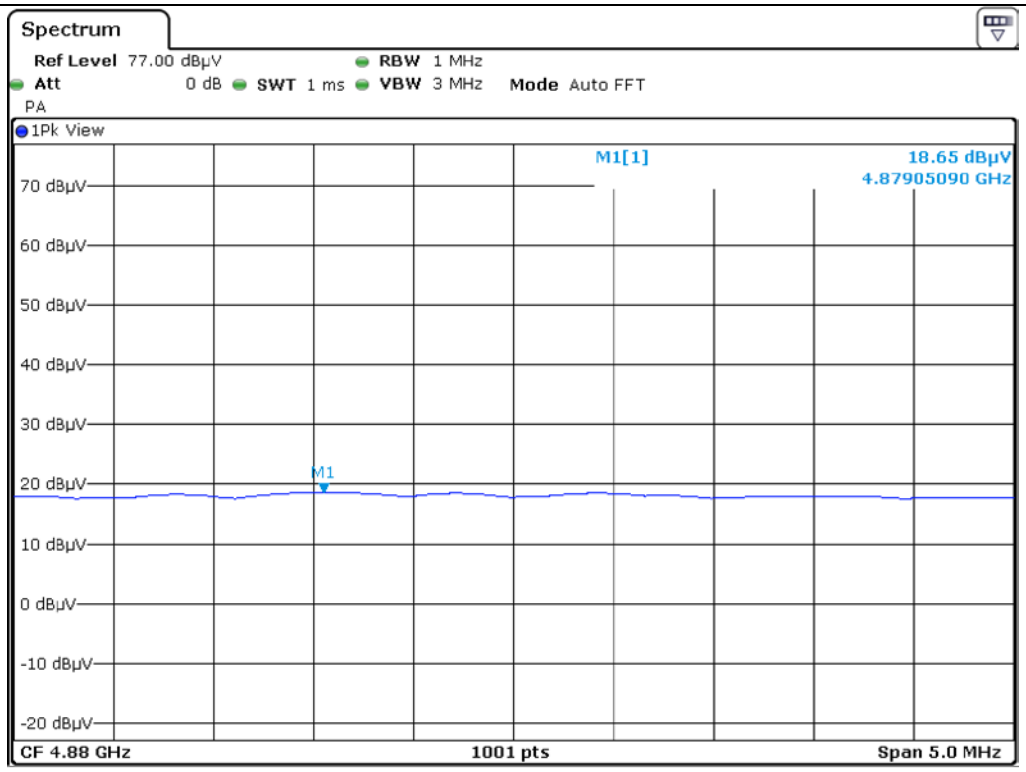
Low Channel_Average_H



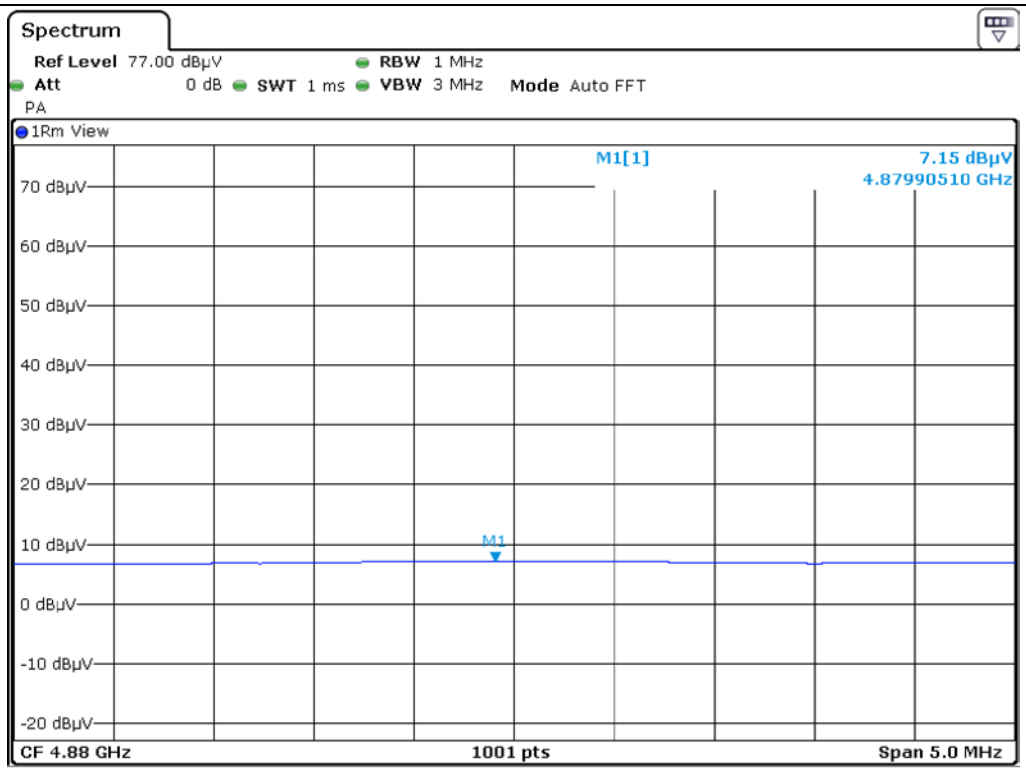
Low Channel_Average_V



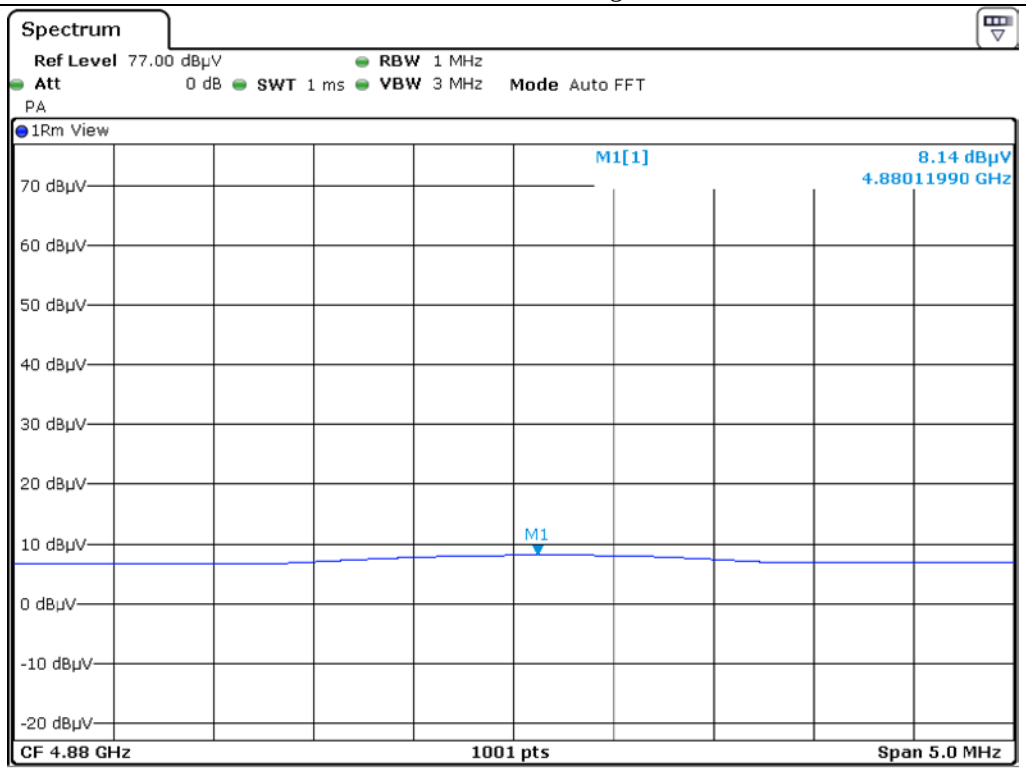
Middle Channel_Peak_H



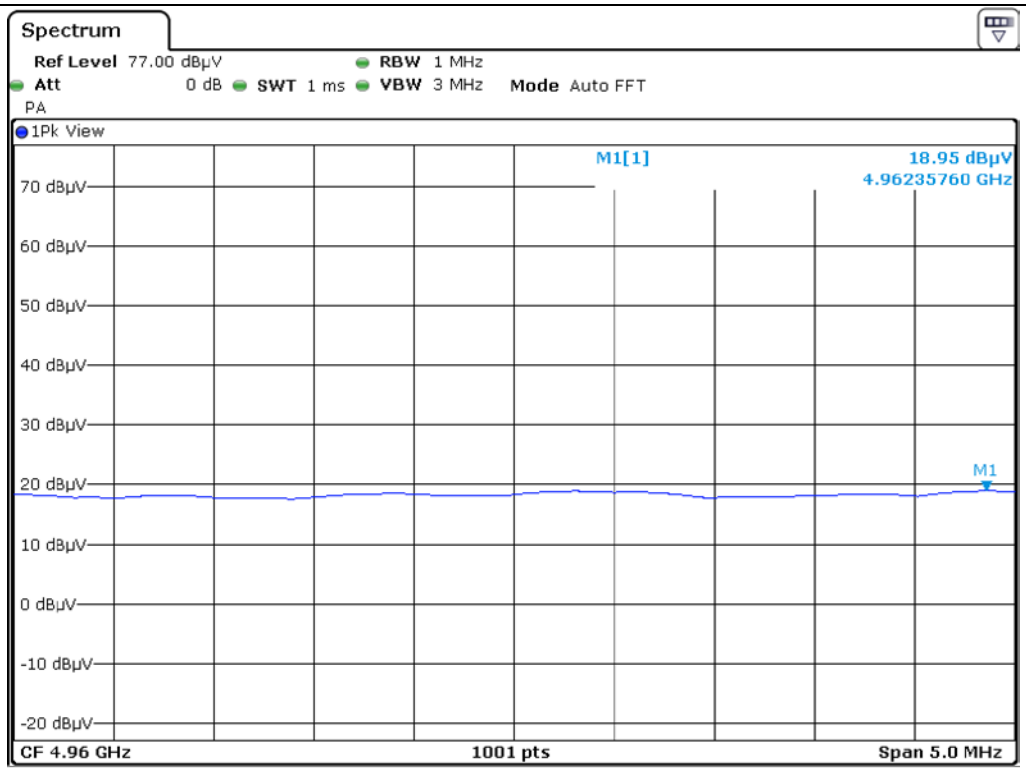
Middle Channel_Peak_V



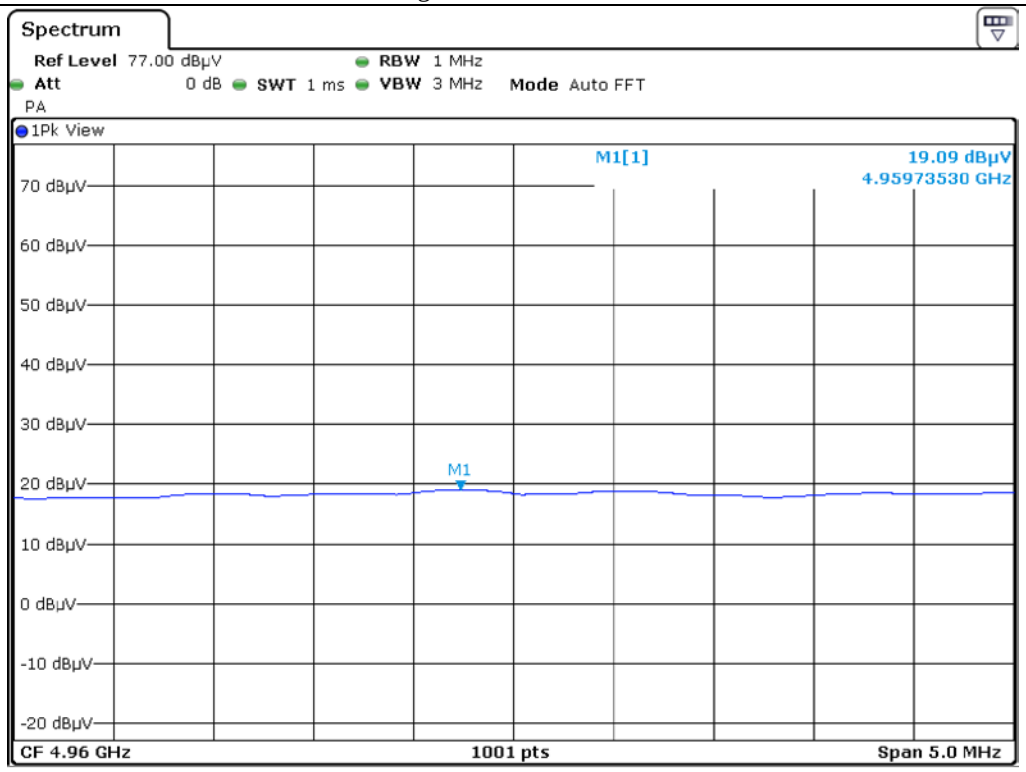
Middle Channel_Average_H



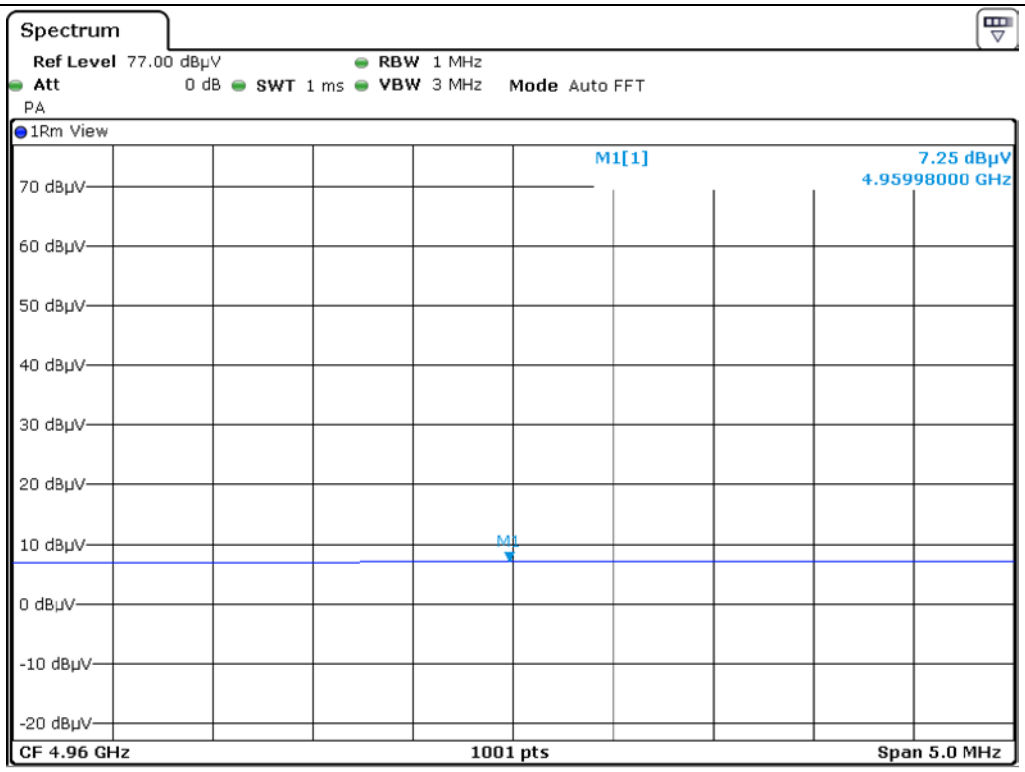
Middle Channel_ Average_V



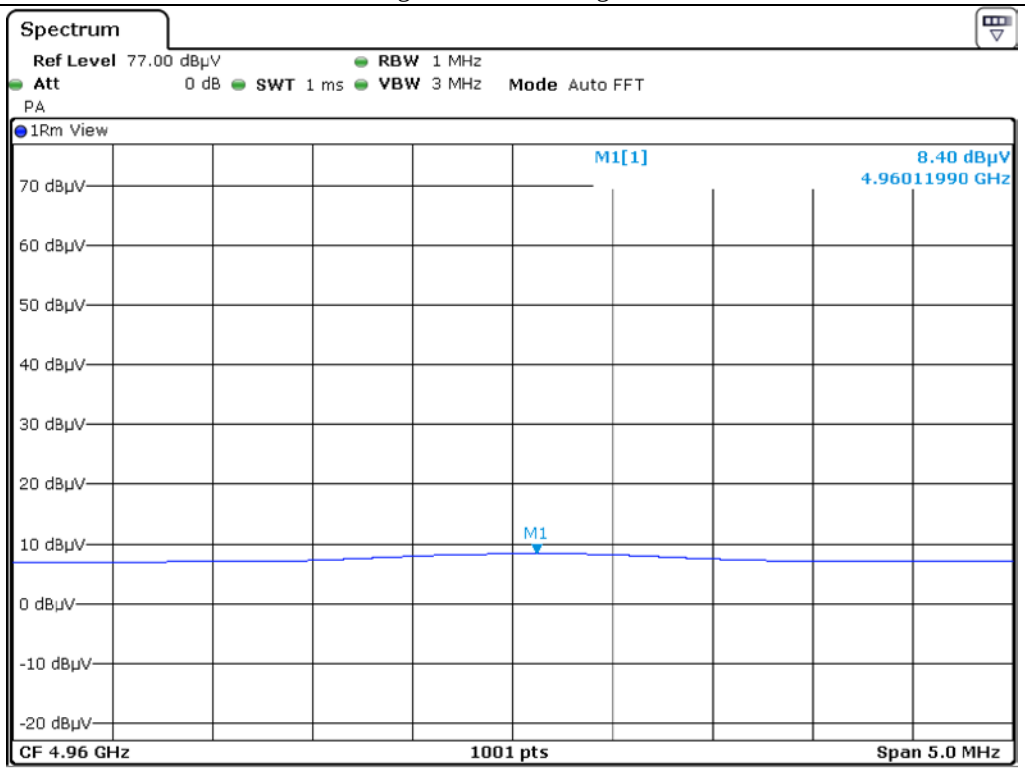
High Channel_Peak_H



High Channel_Peak_V



High Channel_Average_H



High Channel_Average_V

10. PEAK POWER SPECTRAL DENSITY

10.1 Operating environment

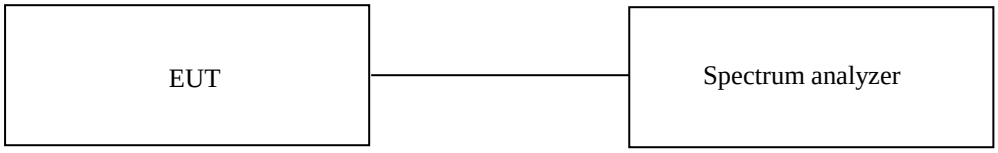
Temperature : 23 °C

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 ≤ RBW ≤100 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.
■ -	FSW43	ROHDE & SCHWARZ	Signal & Spectrum Analyzer	104544	Jul. 18, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

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10.4 Test data

-. Test Date : November 25, 2019 ~ November 28, 2019

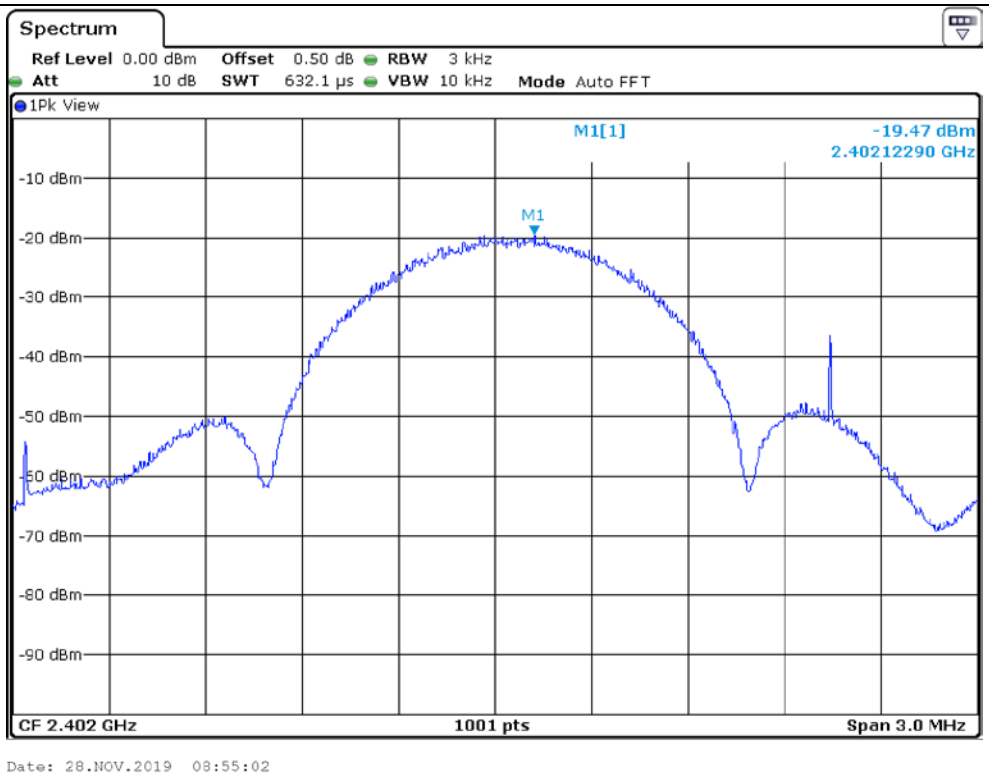
-. Test Result : Pass

-. Operating Condition : Continuous transmitting mode

CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 402.00	-19.47	8.00	27.47
Middle	2 440.00	-20.43	8.00	28.43
High	2 480.00	-20.63	8.00	28.63

Remark. Margin = Limit – Measured value

Tested by: Hyung-Kwon, Oh / Assistant Manager



Low Channel

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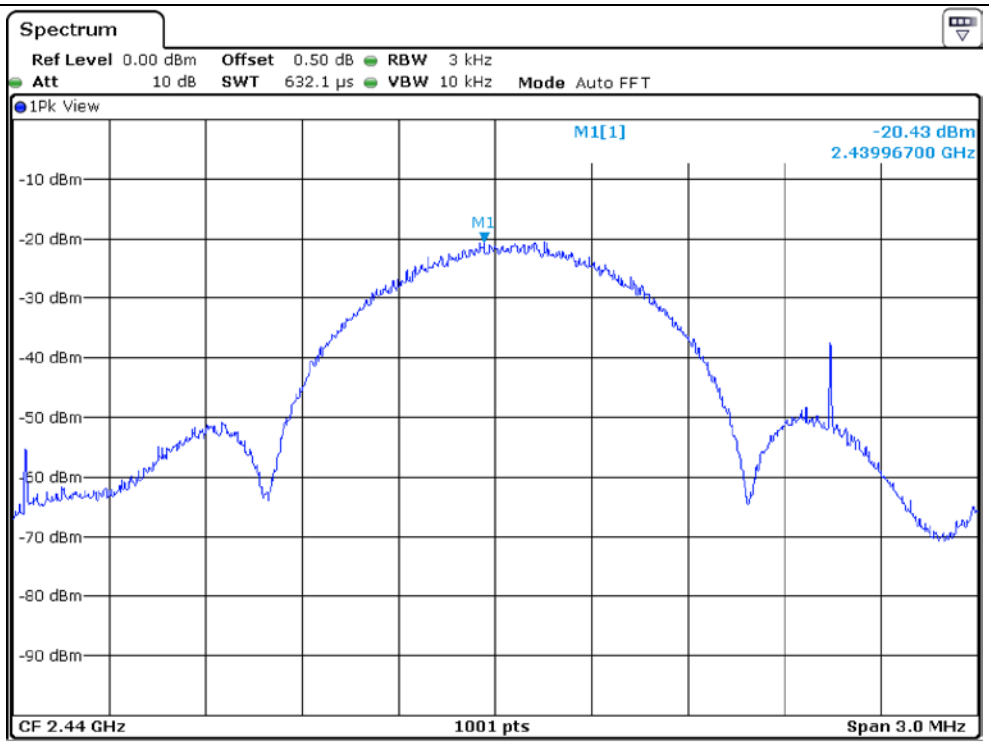
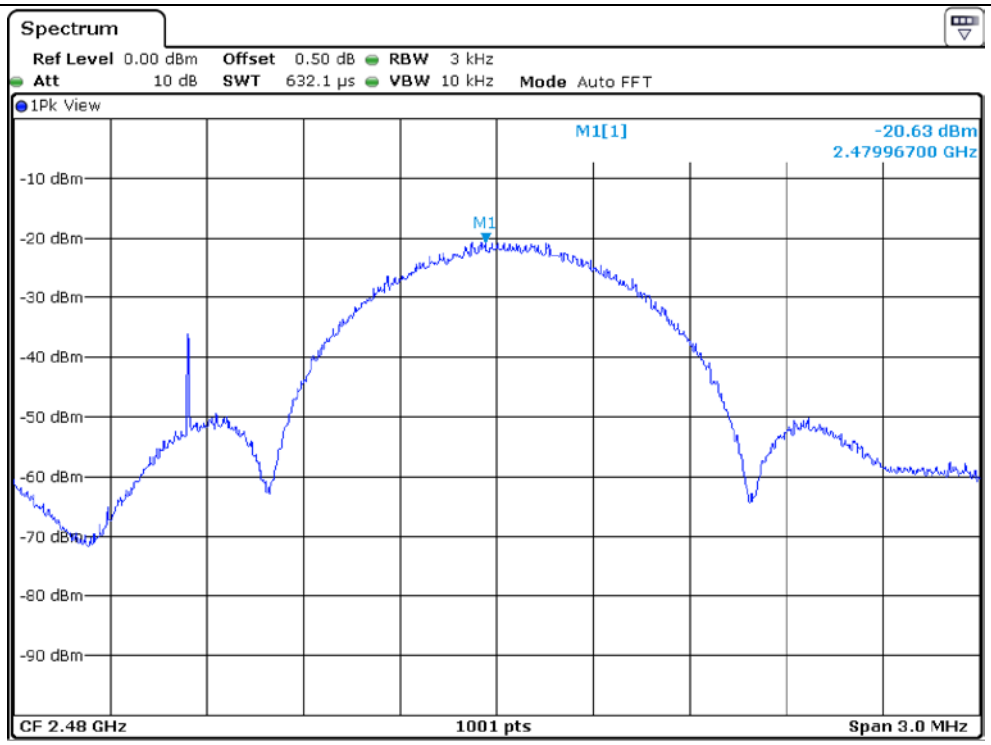


Middle Channel



High Channel

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11. RADIATED EMISSION TEST

11.1 Operating environment

Temperature : 23 °C

Relative humidity : 45 % R.H.

11.2 Test set-up

The radiated emissions measurements were 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 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.
■ -	FSW43	ROHDE & SCHWARZ	Signal & Spectrum Analyzer	104544	Jul. 18, 2019 (1Y)
■ -	ESU	Rohde & Schwarz	EMI Test Receiver	100261	Mar. 28, 2019 (1Y)
■ -	310N	Sonoma Instrument	Pre-Amplifier	312545	Mar. 18, 2019 (1Y)
■ -	BBV9718	Schwarzbeck	Amplifier	310	Mar. 28, 2019 (1Y)
■	DT3000-3t	Innco System	Turn Table	DT3000/093	N/A
■ -	MA-4000XPET	Innco System	Antenna Master	MA4000/509	N/A
■ -	VULB9163	Schwarzbeck	TRILOG Broadband Antenna	777	Apr. 13, 2018 (2Y)
■ -	BBHA 9120D	Schwarzbeck	Horn Antenna	9120D-1366	Jul. 16, 2019 (2Y)
■ -	BBHA 9170	Schwarzbeck	Horn Antenna	BBHA9170179	Jan. 16, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

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11.4 Test data

11.4.1 Test data for 30 MHz ~ 960 MHz

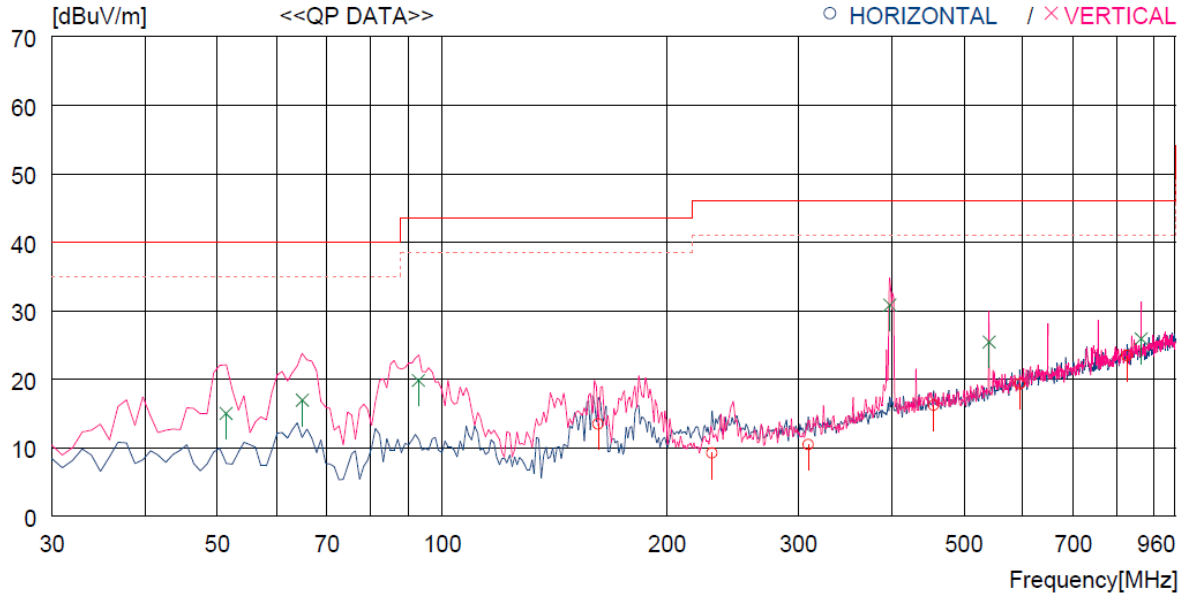
Humidity Level : 45 % R.H. Temperature: 23 °C

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

Result : PASSED

EUT : Smart Indoor Planter Date: November 25, 2019 ~ November 28, 2019

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	161.920	34.4	8.8	3.2	33.0	13.4	43.5	30.1	100	359
2	229.820	26.6	11.9	3.7	33.0	9.2	46.0	36.8	100	244
3	309.360	25.4	13.7	4.4	33.1	10.4	46.0	35.6	100	359
4	455.831	27.7	16.3	5.2	33.1	16.1	46.0	29.9	100	212
5	593.568	27.4	19.3	6.0	33.4	19.3	46.0	26.7	100	359
6	827.331	27.9	21.4	7.1	33.0	23.4	46.0	22.6	100	359
----- Vertical ------										
7	51.340	32.2	14.0	1.9	33.1	15.0	40.0	25.0	100	0
8	64.920	35.5	11.3	3.2	33.1	16.9	40.0	23.1	100	99
9	93.050	38.7	11.6	2.6	33.1	19.8	43.5	23.7	100	0
10	397.630	43.3	15.8	4.9	33.2	30.8	46.0	15.2	100	0
11	540.220	34.9	18.3	5.6	33.4	25.4	46.0	20.6	100	0
12	864.190	29.5	21.9	7.3	32.8	25.9	46.0	20.1	100	0

Tested by: Hyung-Kwon, Oh / Assistant Manager

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11.4.2 Test data for Below 30 MHz

-. Test Date : November 25, 2019 ~ November 28, 2019

-. 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.									

11.4.3 Test data for above 960 MHz

-. Test Date : November 25, 2019 ~ November 28, 2019

-. Resolution bandwidth : 1 MHz for Peak and Average Mode

-. Video bandwidth : 1 MHz for Peak Mode, 10 Hz for Average Mode

-. Frequency range : 960 MHz ~ 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 / Assistant Manager

12. CONDUCTED EMISSION TEST

12.1 Operating environment

Temperature : 23 °C

Relative humidity : 45 % R.H.

12.2 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.

12.3 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal. (Interval)
■ -	ESCI	Rohde & Schwarz	Test Receiver	101012	Oct. 22, 2019 (1Y)
□ -	NSLK8128	Schwarzbeck	AMN	8128-216	Mar. 20, 2019 (1Y)
■ -	NSLK8126	Schwarzbeck	AMN	8126-404	Mar. 19, 2019 (1Y)
□ -	3825/2	EMCO	AMN	9109-1869	Mar. 19, 2019 (1Y)
■ -	3825/2	EMCO	AMN	9109-1867	Mar. 27, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

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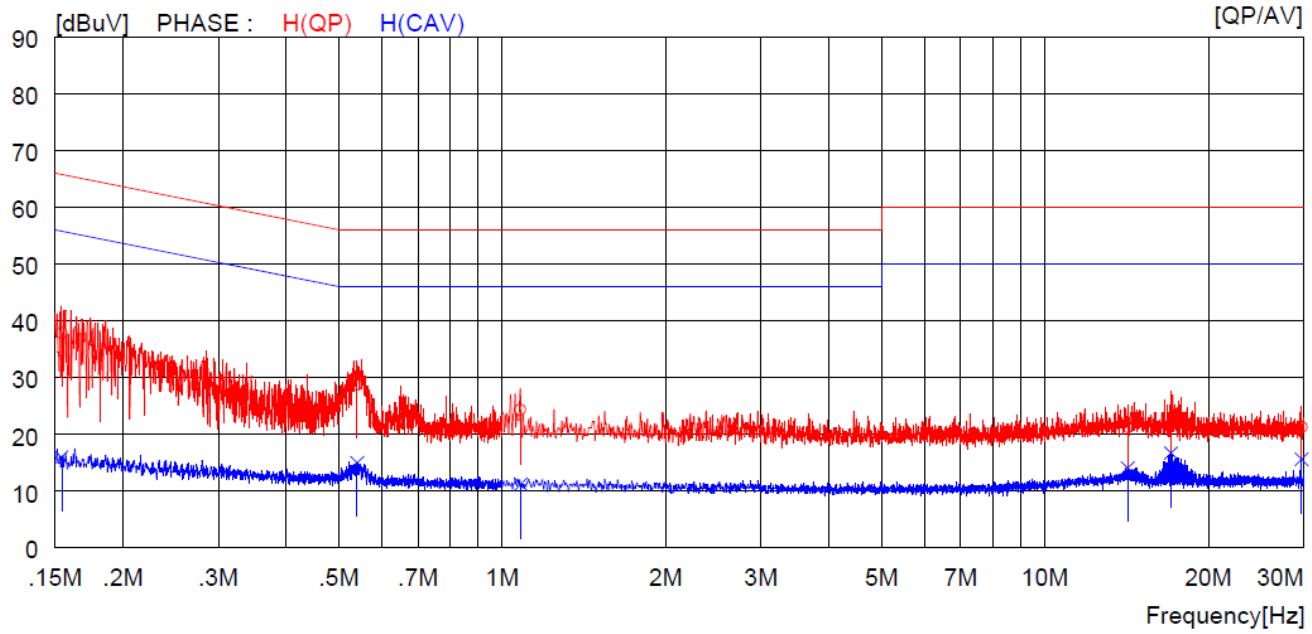
12.4 Test data for Transmitting Mode

-. Test Date : November 25, 2019 ~ November 28, 2019

-. Resolution bandwidth : 9 kHz

-. Frequency range : 0.15 MHz ~ 30 MHz

-. Tested Line : HOT LINE



NO	FREQ [MHz]	READING QP [dBuV]	READING AV [dBuV]	C.FACTOR [dB]	RESULT QP [dBuV]	RESULT AV [dBuV]	LIMIT QP [dBuV]	LIMIT AV [dBuV]	MARGIN QP [dBuV]	MARGIN AV [dBuV]	PHASE
1	0.15400	27.9	----	10.0	37.9	----	65.8	----	27.9	----	H(QP)
2	0.54000	18.8	----	10.0	28.8	----	56.0	----	27.2	----	H(QP)
3	1.08000	14.2	----	10.1	24.3	----	56.0	----	31.7	----	H(QP)
4	14.21000	10.8	----	10.5	21.3	----	60.0	----	38.7	----	H(QP)
5	17.09000	11.0	----	10.6	21.6	----	60.0	----	38.4	----	H(QP)
6	29.75000	10.4	----	10.8	21.2	----	60.0	----	38.8	----	H(QP)
7	0.15400	----	6.0	10.0	----	16.0	----	55.8	----	39.8	H(CAV)
8	0.54000	----	5.0	10.0	----	15.0	----	46.0	----	31.0	H(CAV)
9	1.08000	----	1.1	10.1	----	11.2	----	46.0	----	34.8	H(CAV)
10	14.21000	----	3.6	10.5	----	14.1	----	50.0	----	35.9	H(CAV)
11	17.09000	----	6.1	10.6	----	16.7	----	50.0	----	33.3	H(CAV)
12	29.75000	----	4.8	10.8	----	15.6	----	50.0	----	34.4	H(CAV)

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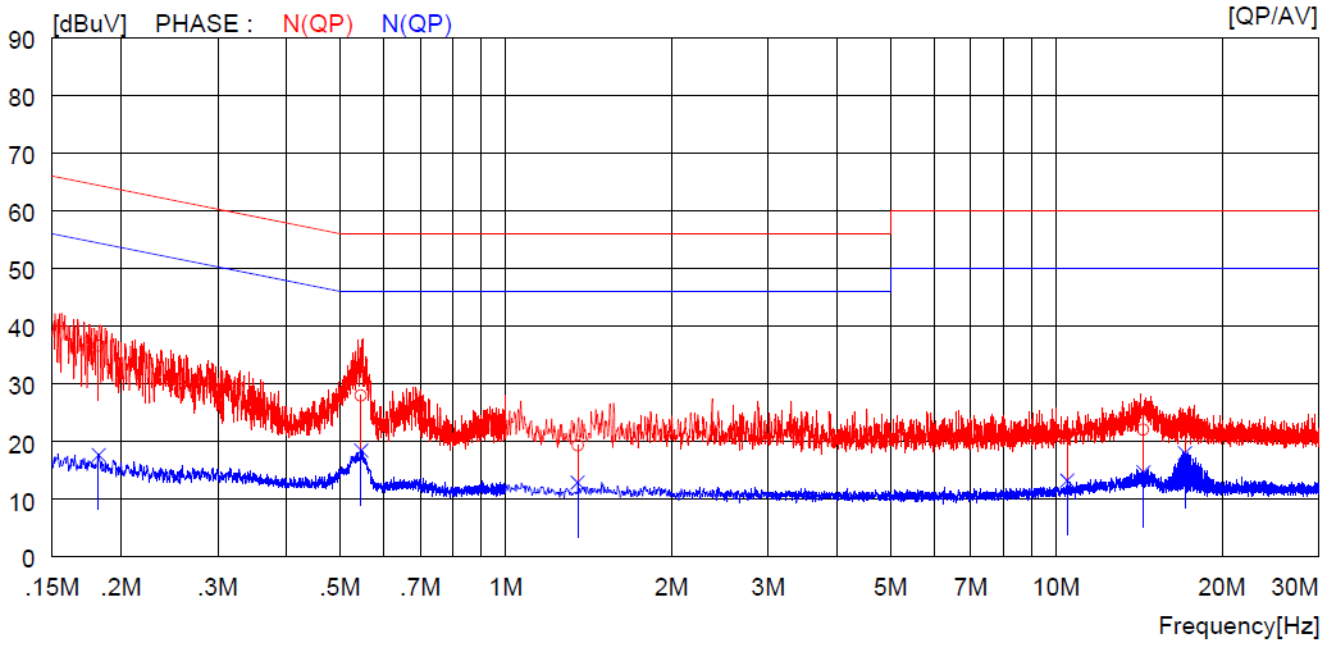
-. Tested Line : NEUTRAL LINE



NO	FREQ [MHz]	READING QP [dBuV]	READING AV [dBuV]	C.FACTOR [dB]	RESULT QP [dBuV]	RESULT AV [dBuV]	LIMIT QP [dBuV]	LIMIT AV [dBuV]	MARGIN QP [dBuV]	MARGIN AV [dBuV]	PHASE
1	0.18200	26.6	----	10.0	36.6	----	64.4	----	27.8	----	N(QP)
2	0.54600	18.0	----	10.0	28.0	----	56.0	----	28.0	----	N(QP)
3	1.35200	9.2	----	10.1	19.3	----	56.0	----	36.7	----	N(QP)
4	10.47000	10.9	----	10.4	21.3	----	60.0	----	38.7	----	N(QP)
5	14.40000	11.6	----	10.5	22.1	----	60.0	----	37.9	----	N(QP)
6	17.15000	12.6	----	10.6	23.2	----	60.0	----	36.8	----	N(QP)
7	0.18200	----	7.7	10.0	----	17.7	----	54.4	----	36.7	N(CAV)
8	0.54600	----	8.5	10.0	----	18.5	----	46.0	----	27.5	N(CAV)
9	1.35200	----	2.8	10.1	----	12.9	----	46.0	----	33.1	N(CAV)
10	10.47000	----	2.8	10.4	----	13.2	----	50.0	----	36.8	N(CAV)
11	14.40000	----	4.2	10.5	----	14.7	----	50.0	----	35.3	N(CAV)
12	17.15000	----	7.4	10.6	----	18.0	----	50.0	----	32.0	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 / Assistant Manager

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