

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

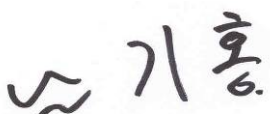
Test Report No. : OT-202-RWD-045
AGR No. : A202A-189
Applicant : Samsung Electronics Co Ltd
Address : 19 Chapin Rd., Building D, Pine Brook, New Jersey, 07058, United States
Manufacturer : Samsung Electronics Co Ltd
Address : Maetan dong 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do 16677, Korea
Type of Equipment : SMART CONTROL
FCC ID. : A3LRMCWPT1AP1
Model Name : RMCWPT1AP1
Serial number : N/A
Total page of Report : 32 pages (including this page)
Date of Incoming : February 10, 2020
Date of issue : February 24, 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 / General Manager
 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.....	7
3. GENERAL INFORMATION.....	8
3.1 PRODUCT DESCRIPTION.....	8
3.2 ALTERNATIVE TYPE(S)/MODEL(S); ALSO COVERED BY THIS TEST REPORT.....	8
4. EUT MODIFICATIONS.....	8
5. SYSTEM TEST CONFIGURATION.....	9
5.1 JUSTIFICATION.....	9
5.2 PERIPHERAL EQUIPMENT	9
5.3 MODE OF OPERATION DURING THE TEST	9
6. PRELIMINARY TEST	12
6.1 AC POWER LINE CONDUCTED EMISSIONS TESTS.....	12
6.2 GENERAL RADIATED EMISSIONS TESTS	12
7. MINIMUM 6 DB BANDWIDTH.....	13
7.1 OPERATING ENVIRONMENT	13
7.2 TEST SET-UP	13
7.3 TEST EQUIPMENT USED.....	13
7.4 TEST DATA.....	14
8. MAXIMUM PEAK OUTPUT POWER.....	16
8.1 OPERATING ENVIRONMENT	16
8.2 TEST SET-UP	16
8.3 TEST EQUIPMENT USED.....	16
8.4 TEST DATA.....	17
9. 100 KHZ BANDWIDTH OUTSIDE THE FREQUENCY BAND.....	19
9.1 OPERATING ENVIRONMENT	19
9.2 TEST SET-UP FOR CONDUCTED MEASUREMENT	19

9.3 TEST SET-UP FOR RADIATED MEASUREMENT	19
9.4 TEST EQUIPMENT USED	19
9.5 TEST DATA FOR CONDUCTED EMISSION	20
9.6 TEST DATA FOR RADIATED EMISSION	25
9.6.1 Radiated Emission which fall in the Restricted Band	25
9.6.2 Spurious & Harmonic Radiated Emission	26
10. PEAK POWER SPECTRAL DENSITY	27
10.1 OPERATING ENVIRONMENT	27
10.2 TEST SET-UP	27
10.3 TEST EQUIPMENT USED	27
10.4 TEST DATA	28
11. RADIATED EMISSION TEST	30
11.1 OPERATING ENVIRONMENT	30
11.2 TEST SET-UP	30
11.3 TEST EQUIPMENT USED	30
11.4 TEST DATA FOR 30 MHZ ~ 1 GHZ (BLUETOOTH LE MODE)	31
11.5 TEST DATA FOR BELOW 30 MHZ	32
11.6 TEST DATA FOR ABOVE 1 GHZ	32

Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-202-RWD-045	February 24, 2020	Initial Release	All

1. VERIFICATION OF COMPLIANCE

Applicant : Samsung Electronics Co Ltd
 Address : 19 Chapin Rd., Building D, Pine Brook, New Jersey, 07058, United States
 Contact Person : minhyung, cho / Senior Engineer
 Telephone No. : +82-31-277-2688
 FCC ID : A3LRMCWPT1AP1
 Model Name : RMCWPT1AP1
 Brand Name : 
 Serial Number : N/A
 Date : February 24, 2020

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	SMART CONTROL
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	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 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

Laboratory Qualification	Registration No.	Mark
IECEE CBTL	TL189	
KOLAS	KT085	
RRA	KR0013	
FCC	KR0013	
Industry Canada (IC)	IC 3736A	
TUV SUD	ROK1015C	
TUV Rheinland	UA 50269464 UA 50269476 UA 50269480	
VCCI	C-14617 R-4112 T-11842 G-10666	
Hyundai Kia	ES96200-00	
Korean Register of Shipping	PCT25650-TL001	

3. GENERAL INFORMATION

3.1 Product Description

The Samsung Electronics Co Ltd, Model RMCWPT1AP1 (referred to as the EUT in this report) is a SMART CONTROL. The product specification described herein was obtained from product data sheet or user's manual.

Device Type	SMART CONTROL
Temperature Range	0 °C ~ 50 °C
Operating Frequency	2 402 MHz ~ 2 480 MHz
RF Output Power	7.54 dBm
Number of Channel	40 Channel
Modulation Type	GFSK (Bluetooth LE)
Antenna Type	Chip Antenna
Antenna Gain	0.97 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)	32.768 kHz, 32 MHz
RATED SUPPLY VOLTAGE	DC 3.0 V

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	Samsung Electronics Co Ltd	TM2095	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
RMCWPT1API	Samsung Electronics Co Ltd	SMART CONTROL(EUT)	-
19SC DEBUG BOARD	N/A	Jig Board	EUT / Notebook PC
Ideapad 100	LENOVO	Notebook PC	Jig Board
PA-1450-55LR	Liteon	AC Adapter	Notebook PC

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.

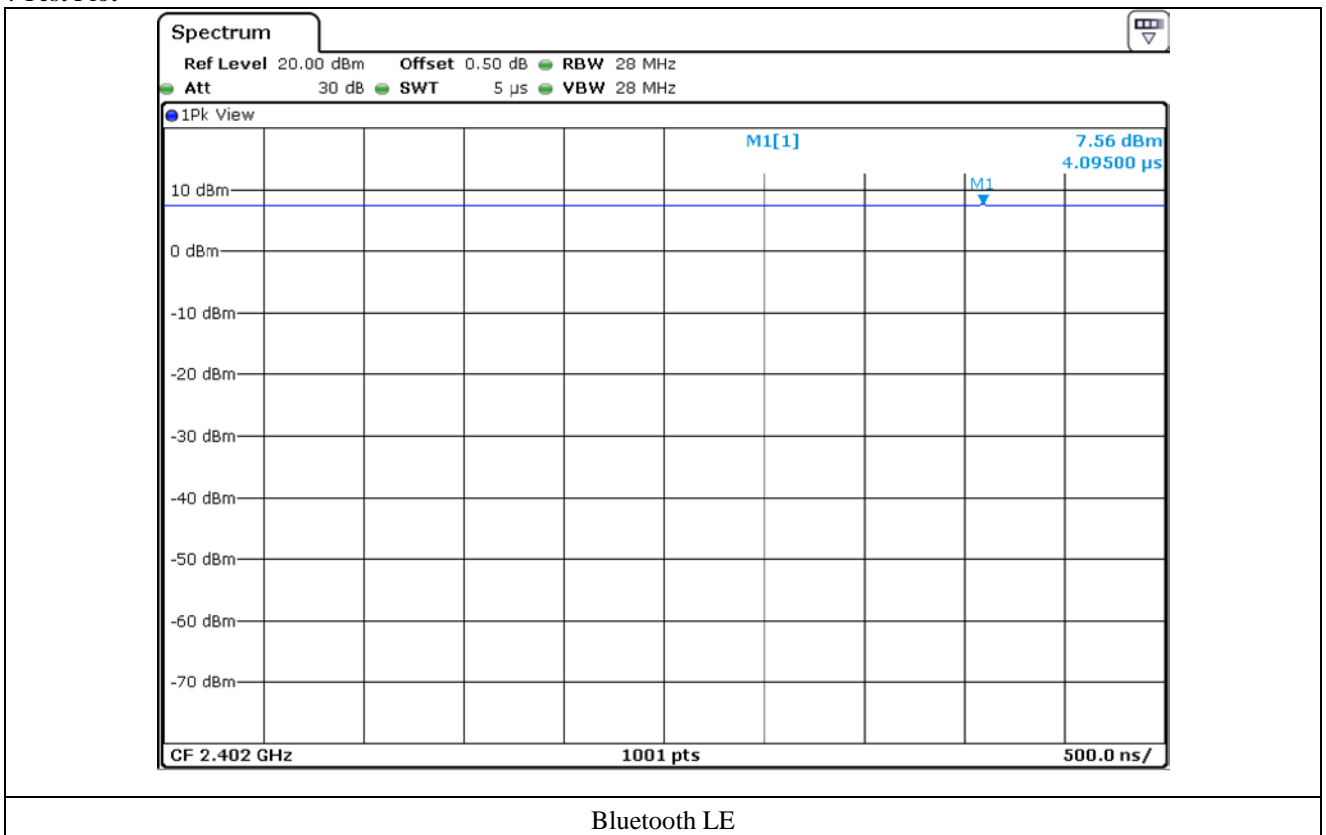
- Duty Cycle

Mode	Tx On Time [ms]	Tx Off Time [ms]	Duty Cycle [%]
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



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 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 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)
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

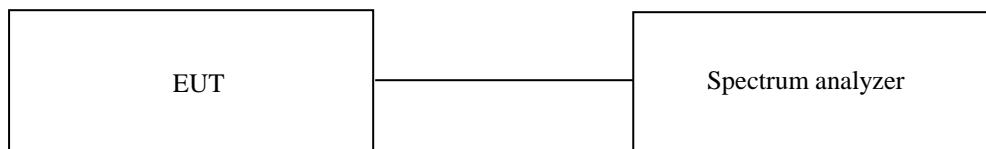
7. MINIMUM 6 dB BANDWIDTH

7.1 Operating environment

Temperature : 25 °C
 Relative humidity : 46 % 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	Jul. 24, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

7.4 Test data

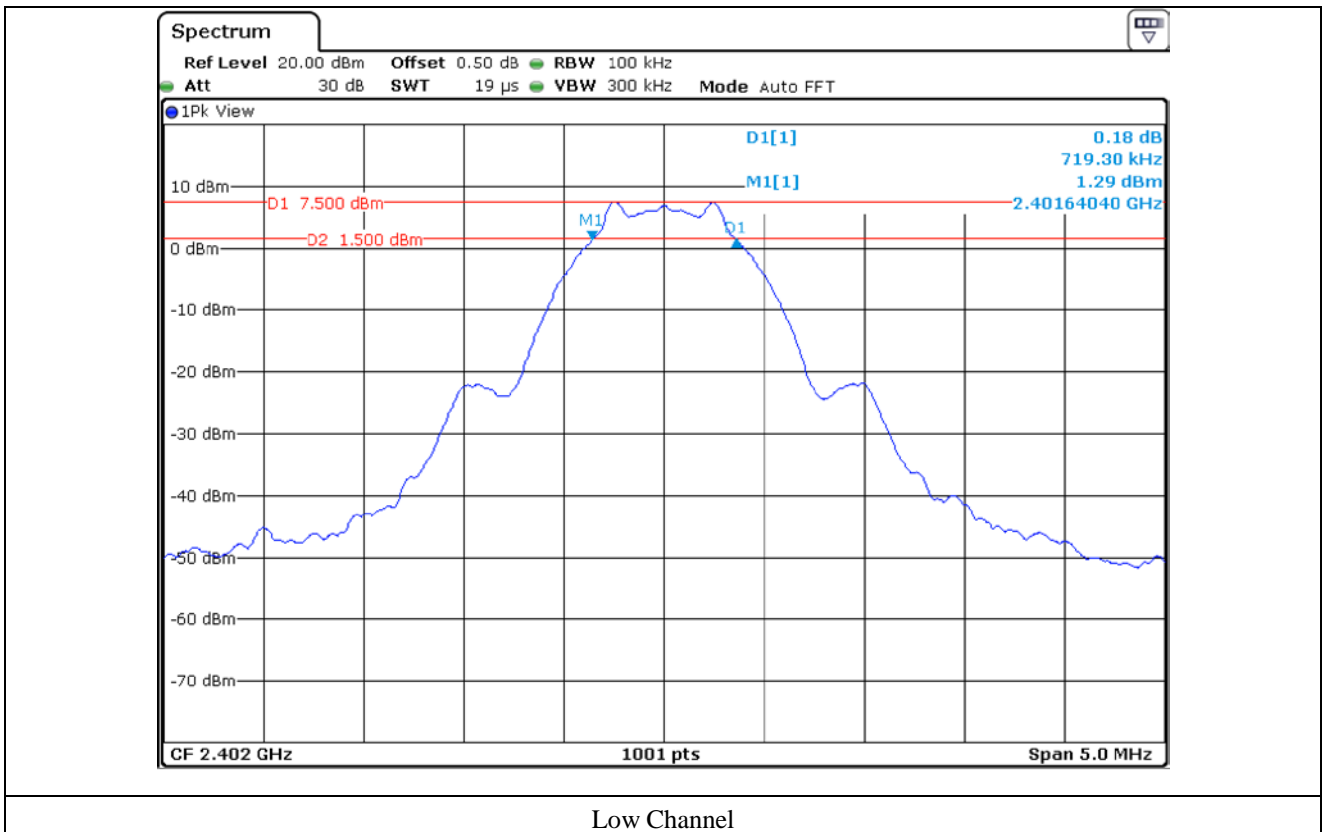
- Test Date : February 10, 2020 ~ February 18, 2020
- Test Result : Pass

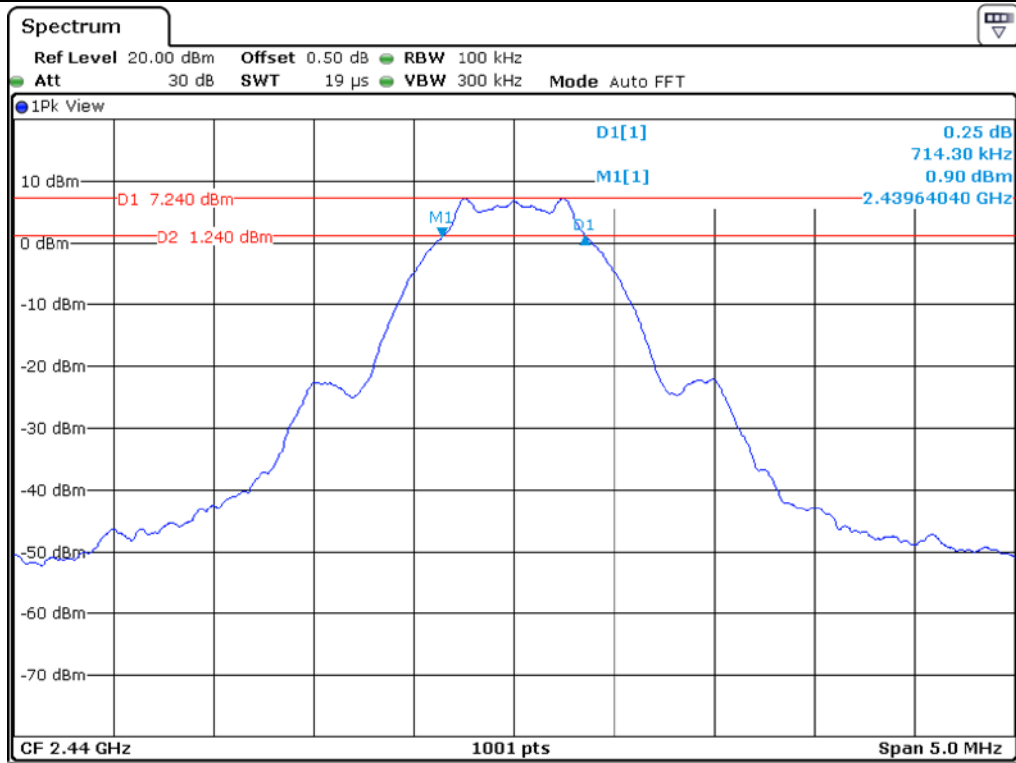
CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	2 402.00	719.30	500.00	219.30
Middle	2 440.00	714.30	500.00	214.30
High	2 480.00	724.30	500.00	224.30

Remark. Margin = Measured Value - Limit

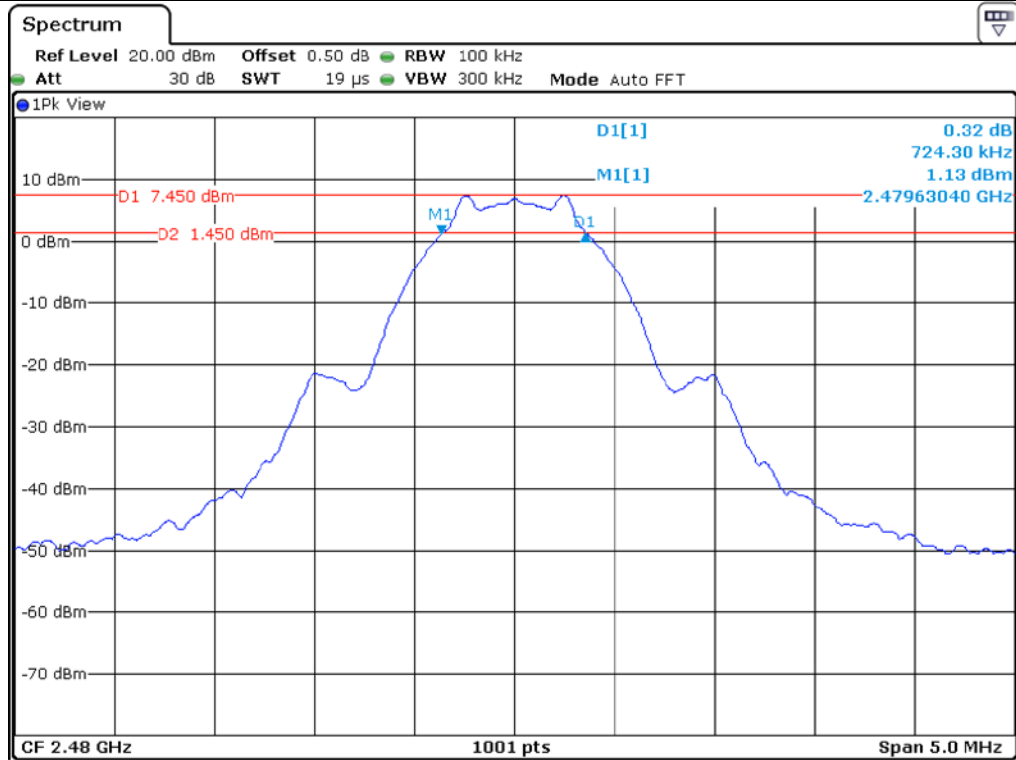


Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

8. MAXIMUM PEAK OUTPUT POWER

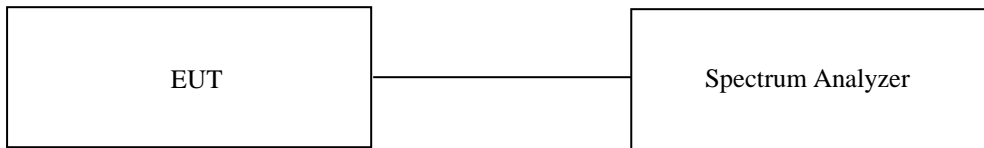
8.1 Operating environment

Temperature : 25 °C
 Relative humidity : 46 % 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 \geq 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.
■ - FSV30	Rohde & Schwarz	Signal Analyzer	101372	Jul. 24, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

8.4 Test data

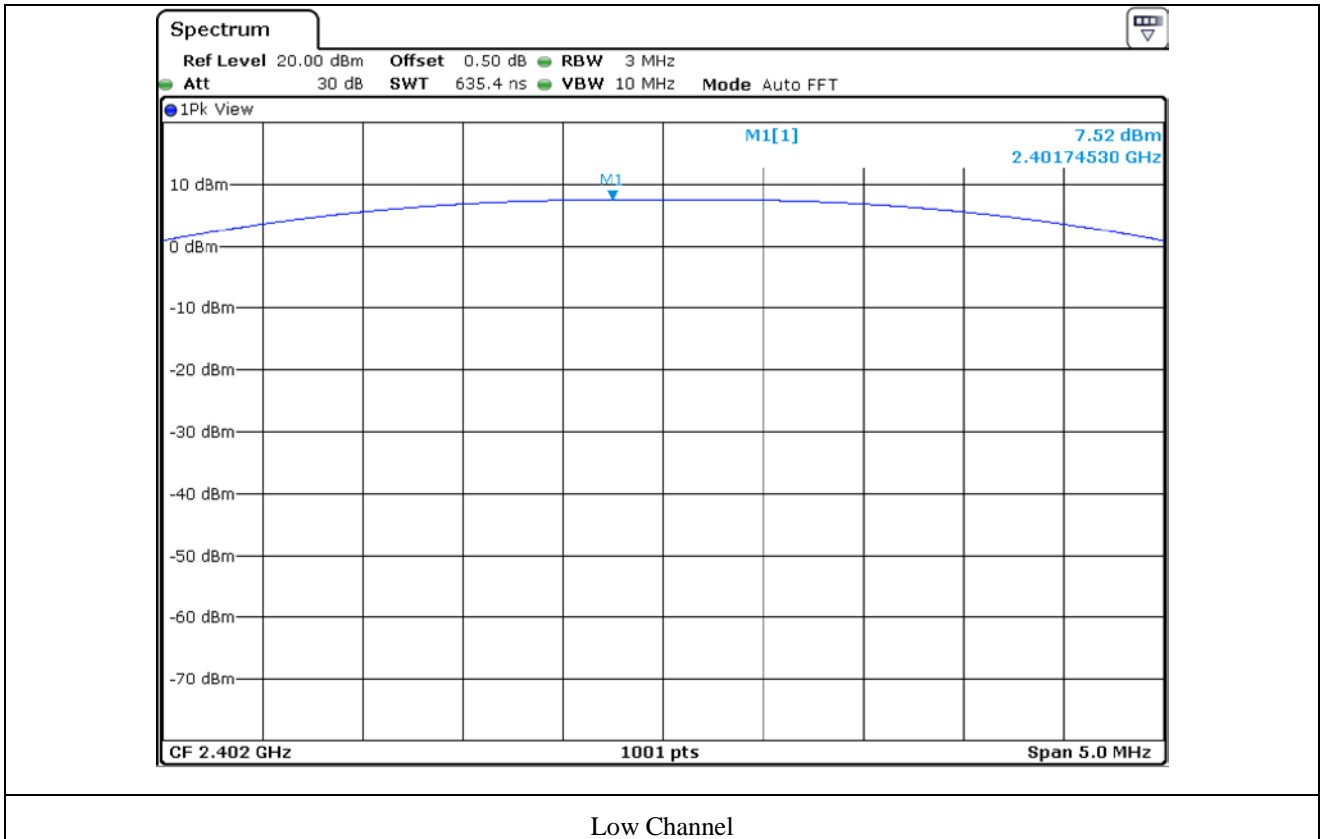
- Test Date : February 10, 2020 ~ February 18, 2020

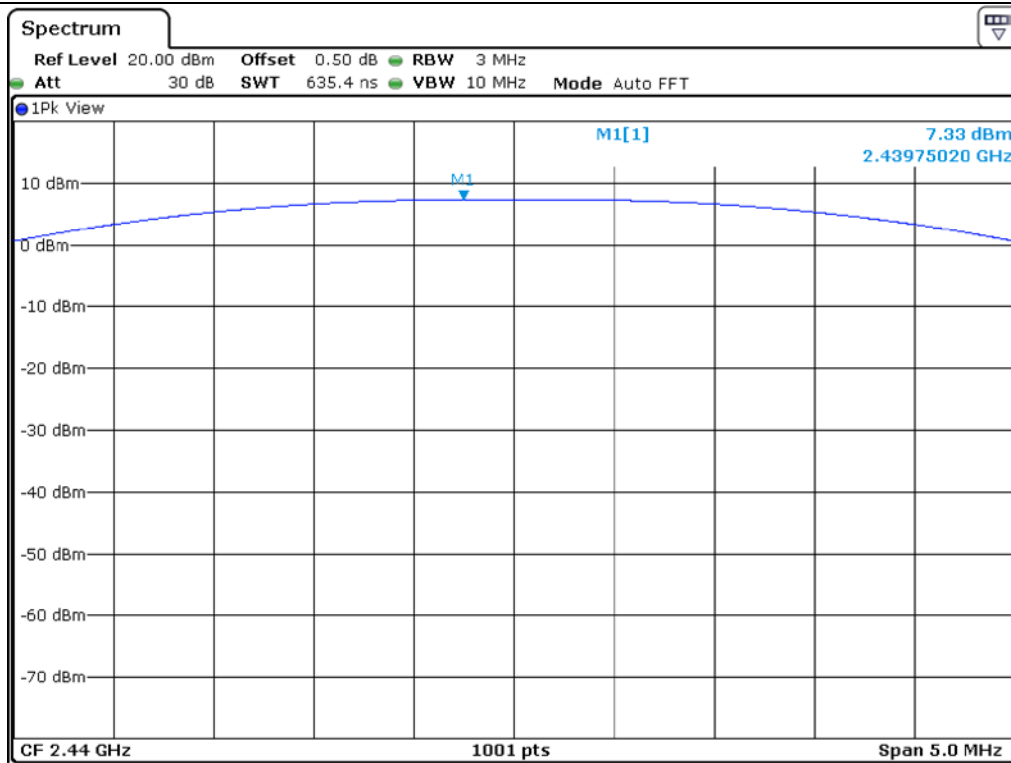
- Test Result : Pass

CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 402.00	7.52	30.00	22.48
MIDDLE	2 440.00	7.33	30.00	22.67
HIGH	2 480.00	7.54	30.00	22.46

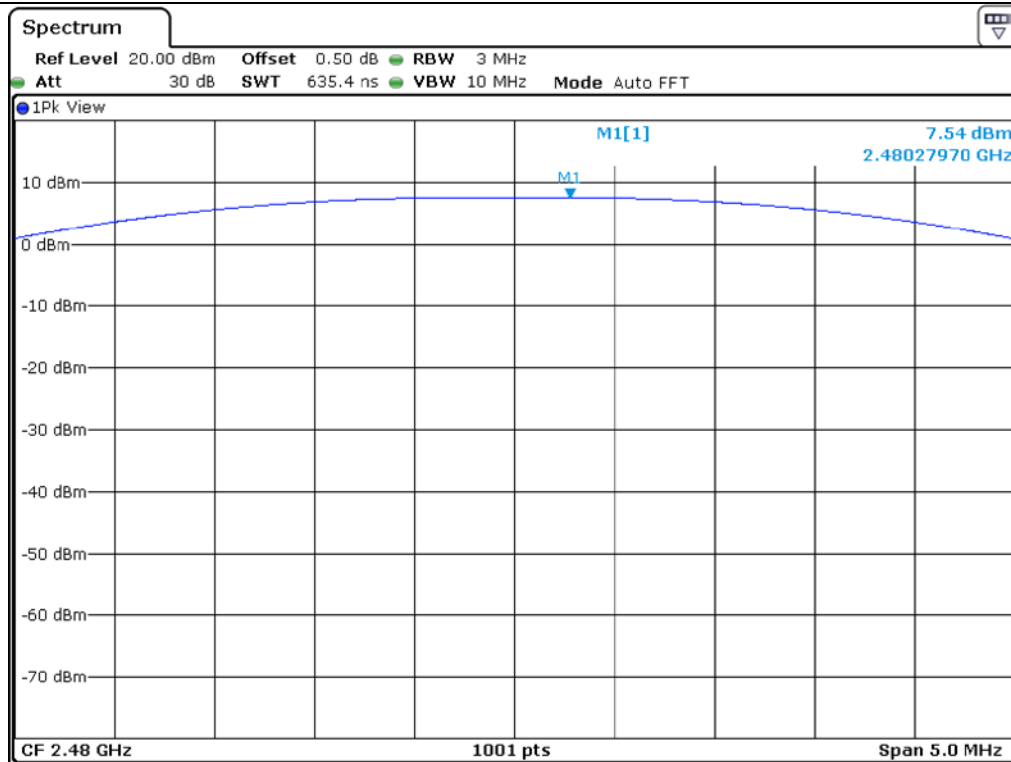
Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

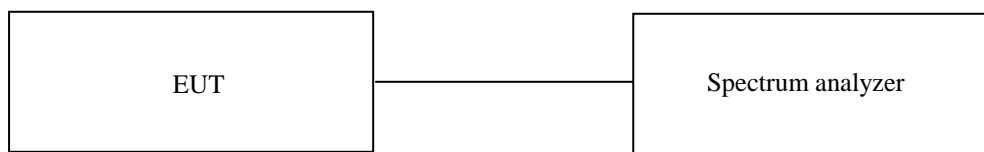
9. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

9.1 Operating environment

Temperature : 25 °C
 Relative humidity : 46 % 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 10 m semi anechoic chamber. The EUT was placed on turntable approximately 1.5 m above the ground plane.

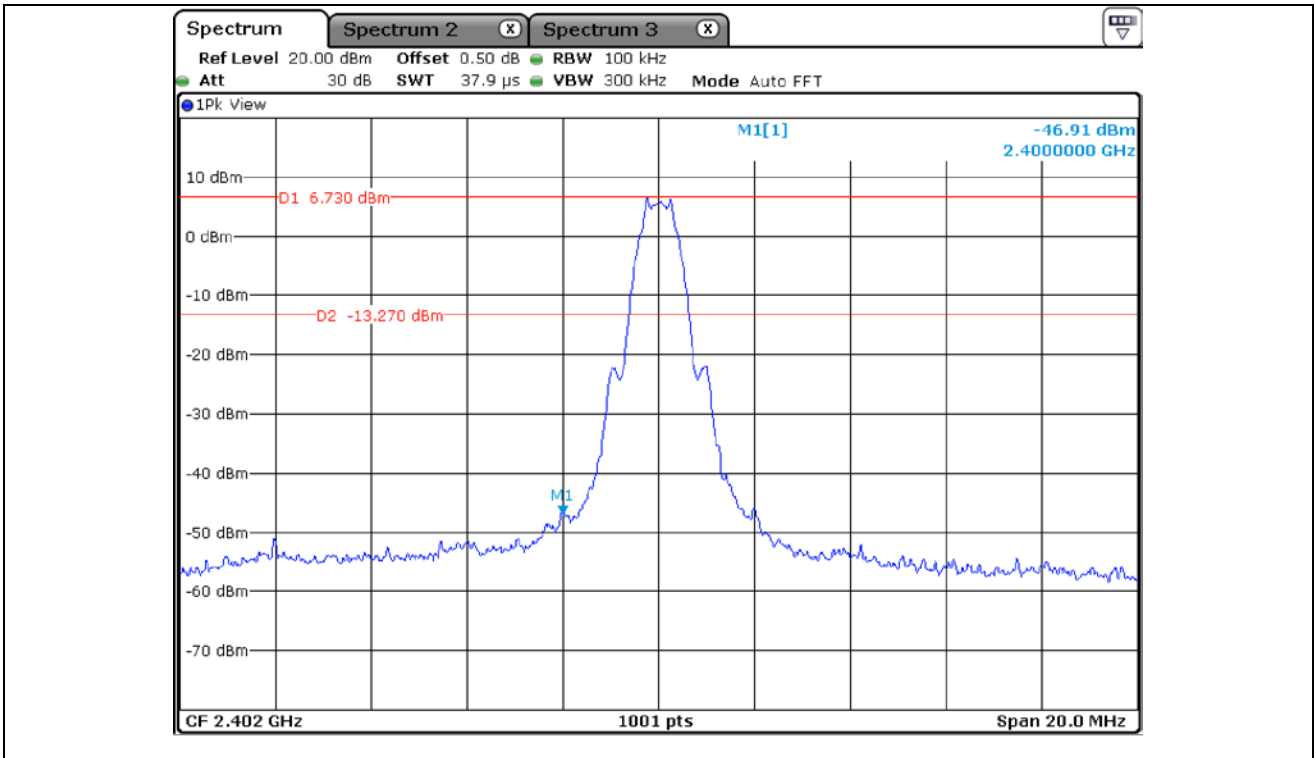
The frequency spectrum from 30 MHz to 26.5 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal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

9.4 Test equipment used

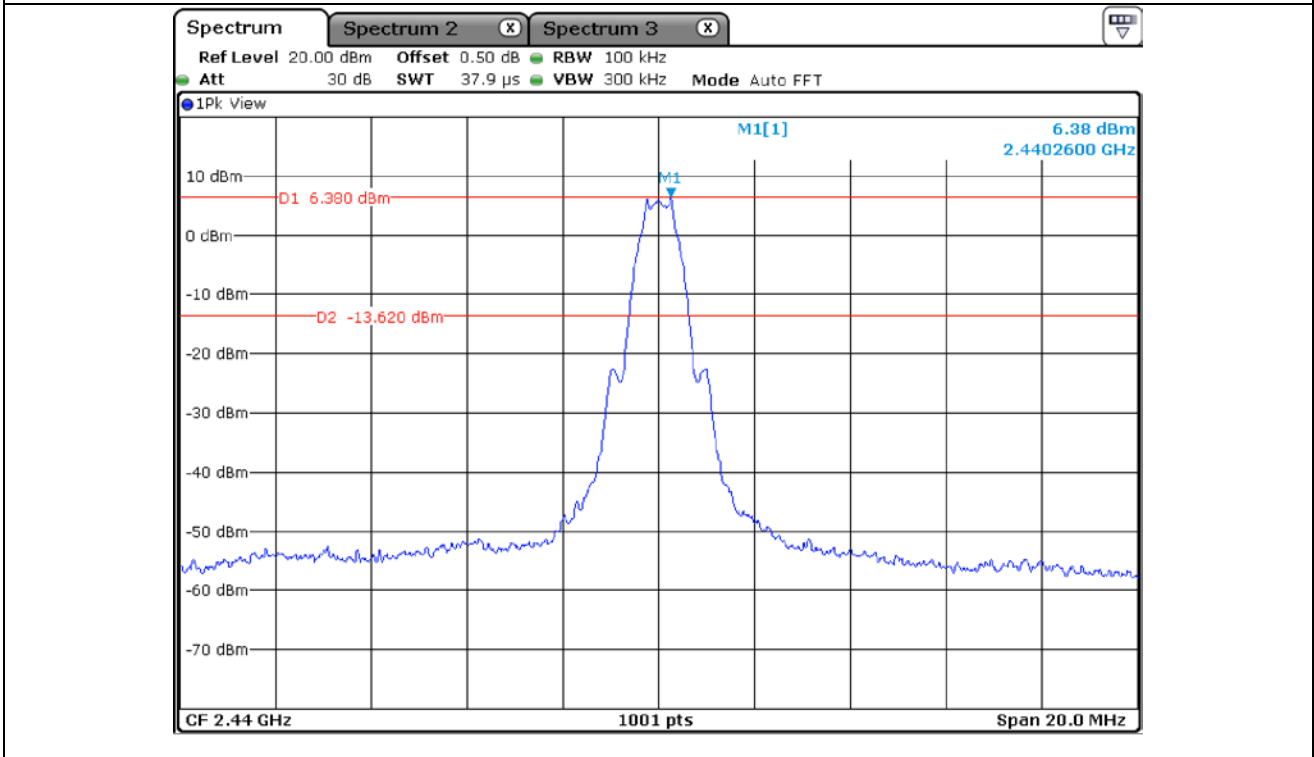
Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - FSV30	Rohde & Schwarz	Signal Analyzer	101372	Jul. 24, 2019 (1Y)
■ - ESW	Rohde & Schwarz	EMI Test Receiver	101851	Aug. 07, 2019 (1Y)
■ - 310N	Sonoma Instrument	Pre-Amplifier	312544	Mar. 18, 2019 (1Y)
- BBV 9718B	Schwarzbeck	Amplifier	009	Mar. 20, 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)
■ - BBHA9120D	Schwarzbeck	Horn Antenna	9120D-1366	Jul. 16, 2019 (1Y)
■ - BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170179	Jan. 20, 2020 (1Y)
■ - VAMP9243	Schwarzbeck	ROD ANTENNA	VAMP9243	Mar. 14, 2019 (2Y)

All test equipment used is calibrated on a regular basis.

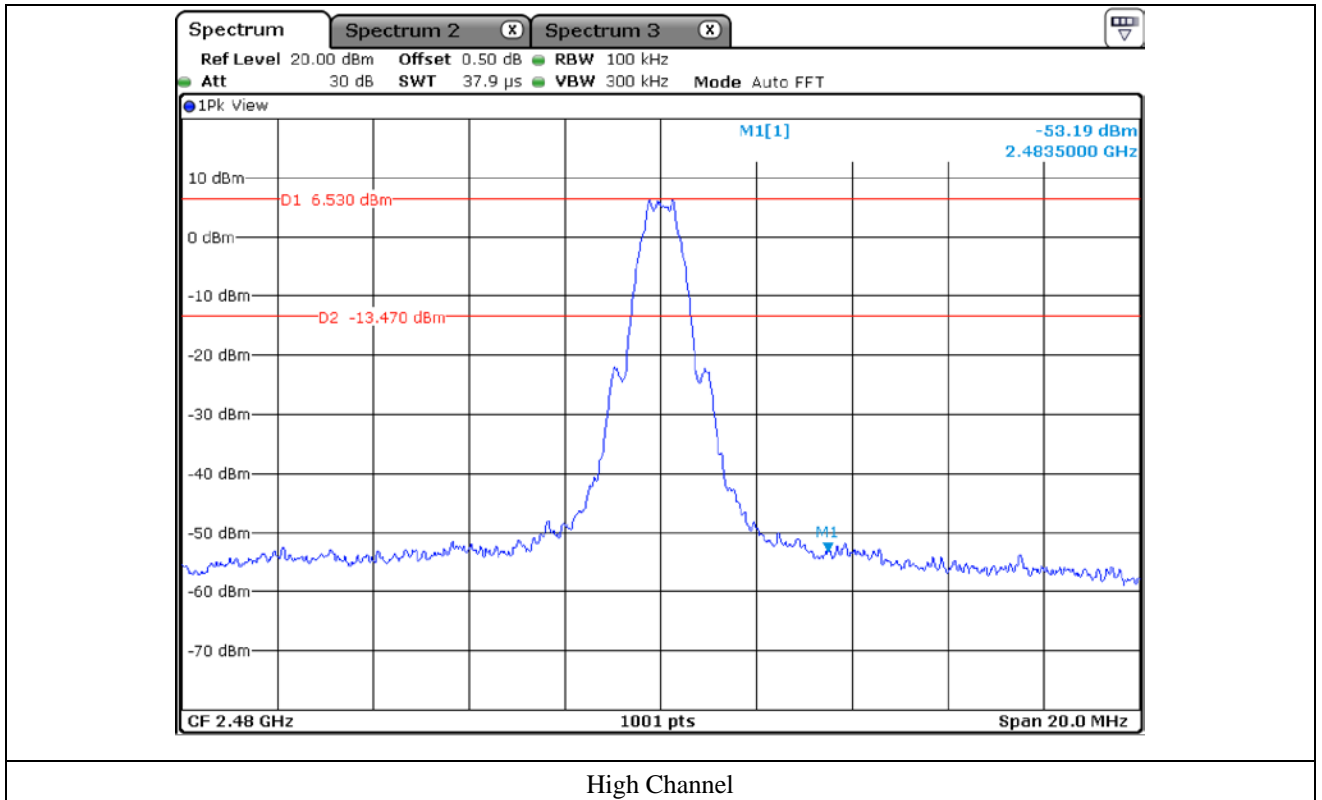
9.5 Test data for conducted emission



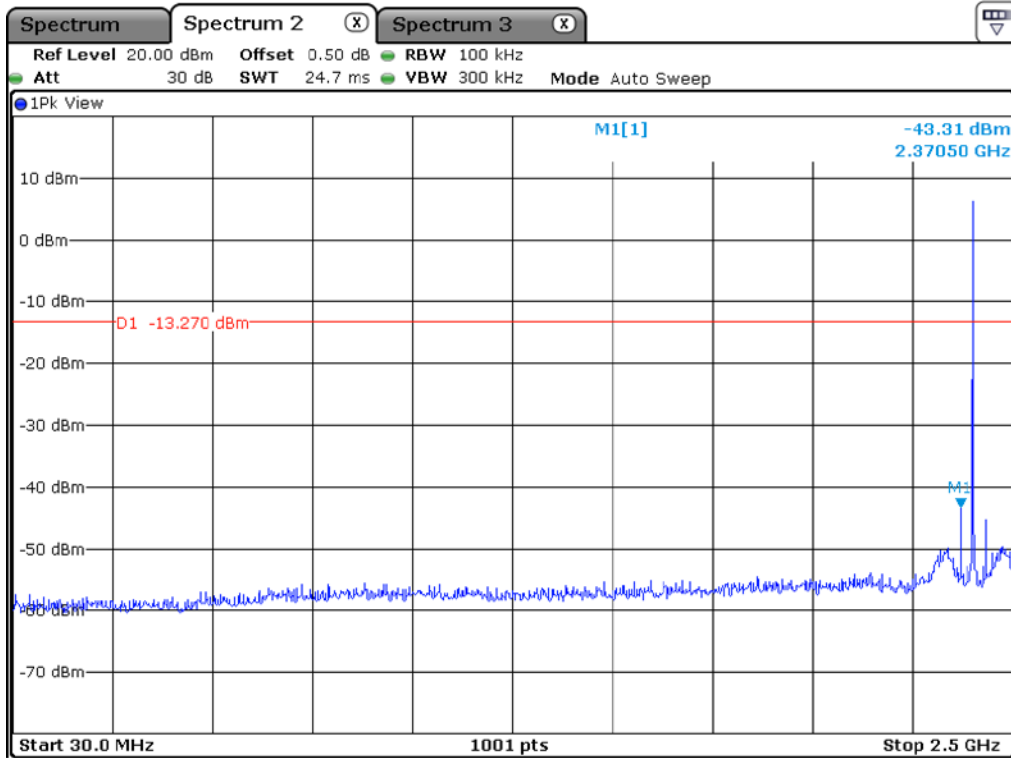
Low Channel



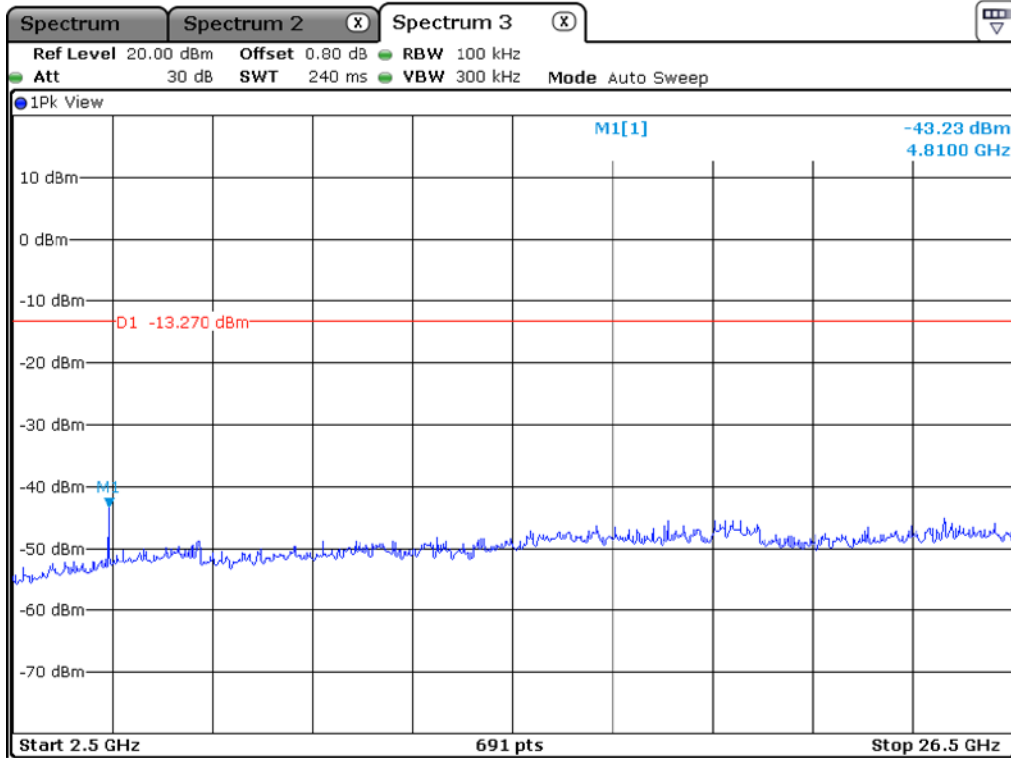
Middle Channel



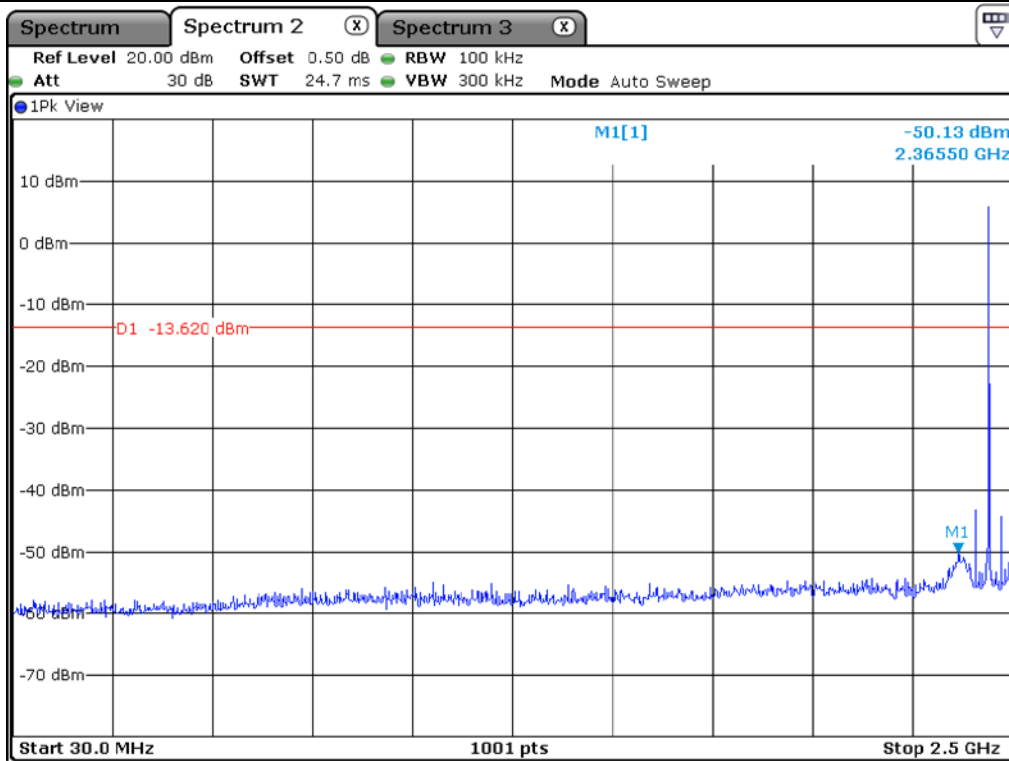
High Channel



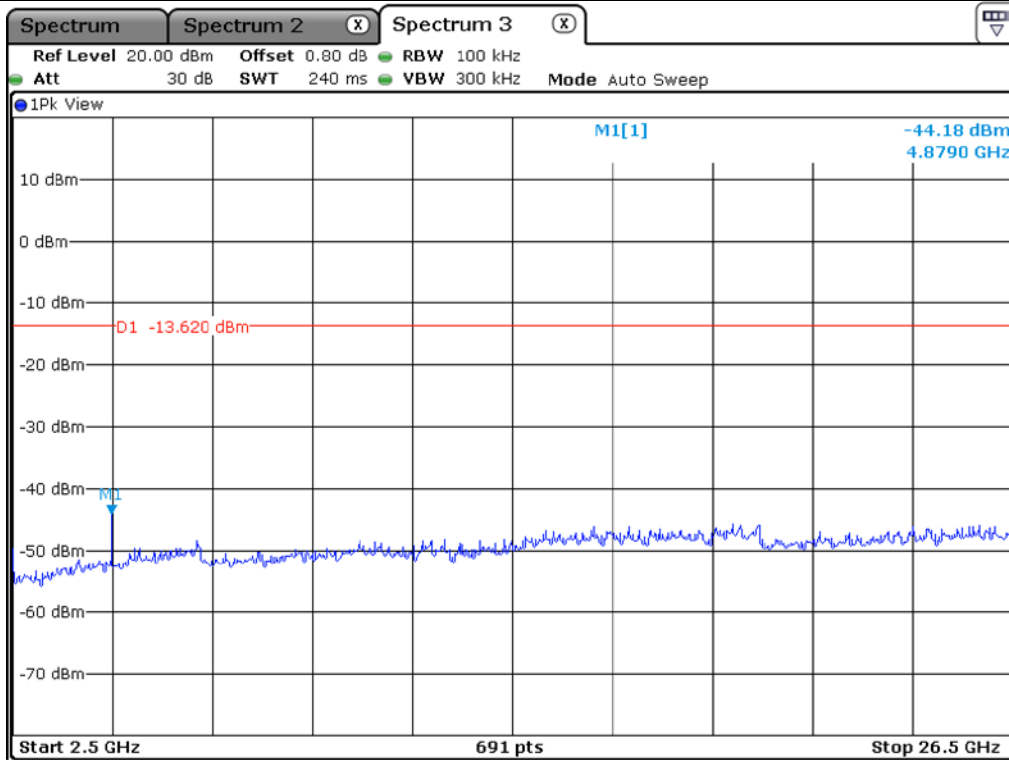
Low Channel



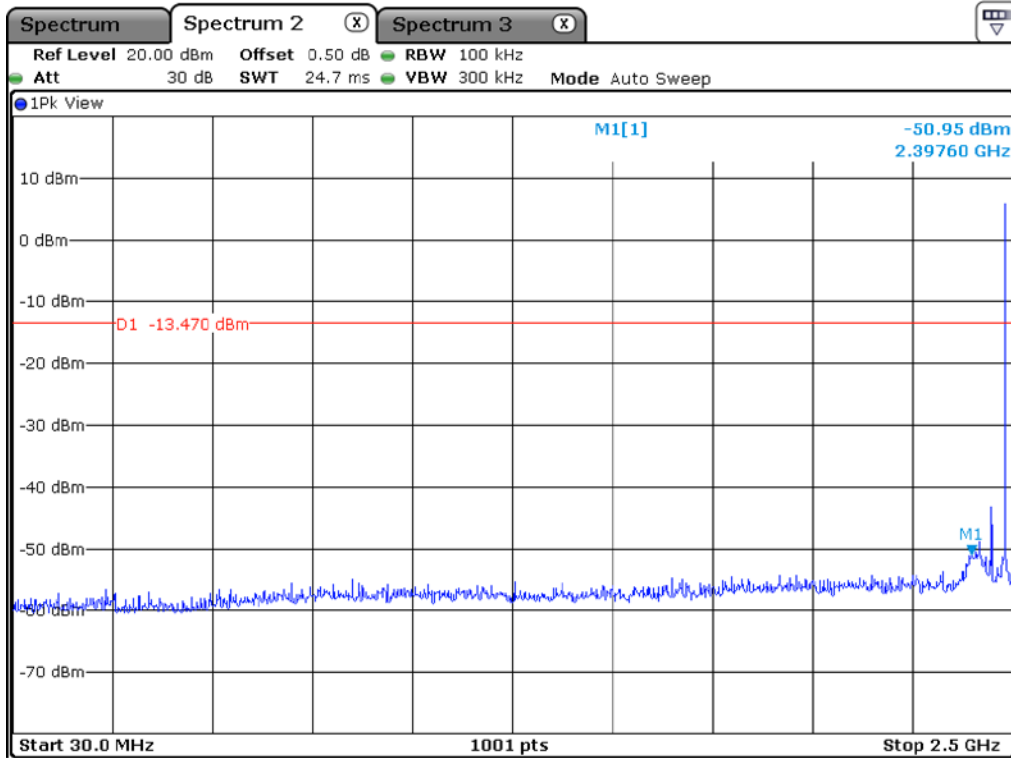
Low Channel



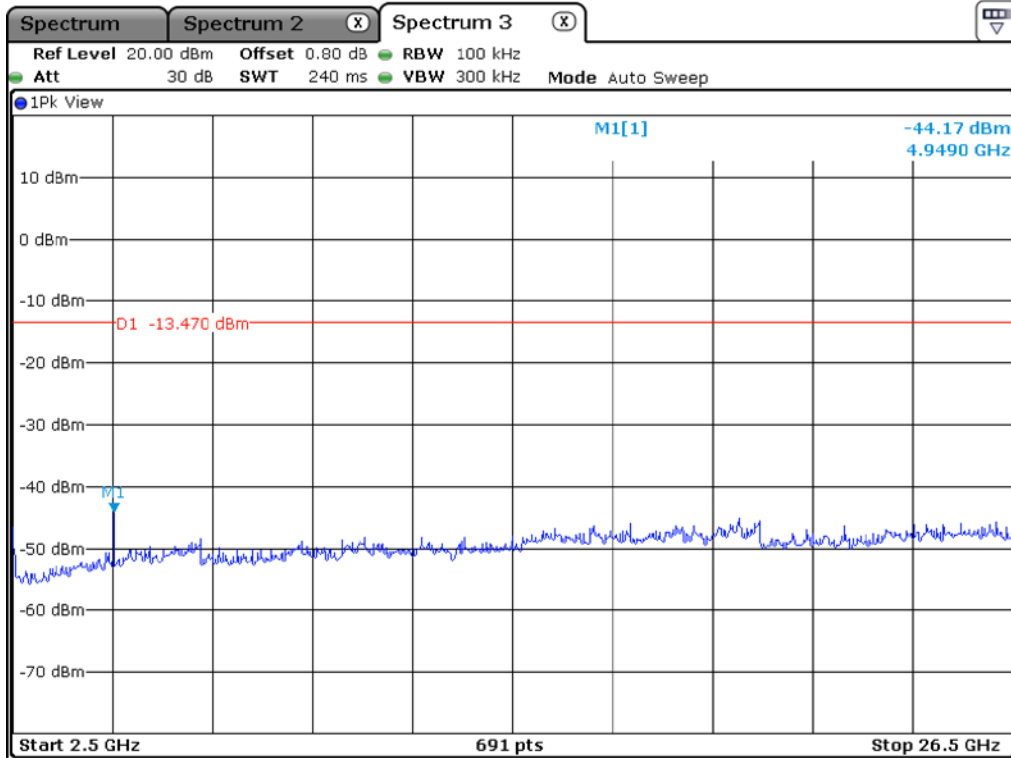
Middle Channel



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 : February 10, 2020 ~ February 18, 2020
- 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)
Test Data for Low Channel								
2 389.560	20.48	Peak	H	26.94	9.20	56.62	74.00	17.38
2 369.980	13.04	Average	H			49.18	54.00	4.82
2 370.140	19.12	Peak	V			55.26	74.00	18.74
2 369.980	13.08	Average	V			49.22	54.00	4.78
Test Data for High Channel								
2 486.459	18.28	Peak	H	27.47	9.49	55.24	74.00	18.76
2 483.508	4.13	Average	H			41.09	54.00	12.91
2 484.613	15.89	Peak	V			52.85	74.00	21.15
2 483.508	5.68	Average	V			42.64	54.00	11.36

Tabulated test data for Restricted Band

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

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

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss}$$



Tested by: Hyung-Kwon, Oh / Assistant Manager

9.6.2 Spurious & Harmonic Radiated Emission

- Test Date : February 10, 2020 ~ February 18, 2020
- 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 (GHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel								
4 804.00	16.41	Peak	H	28.84	10.31	55.56	74.00	18.44
	4.71	Average	H			43.86	54.00	10.14
	16.38	Peak	V			55.53	74.00	18.47
	4.66	Average	V			43.81	54.00	10.19
Test Data for Middle Channel								
4 880.00	16.40	Peak	H	28.01	10.43	54.84	74.00	19.16
	4.80	Average	H			43.24	54.00	10.76
	16.33	Peak	V			54.77	74.00	19.23
	4.70	Average	V			43.14	54.00	10.86
Test Data for High Channel								
4 960.00	16.35	Peak	H	29.15	10.81	56.31	74.00	17.69
	4.63	Average	H			44.59	54.00	9.41
	16.33	Peak	V			56.29	74.00	17.71
	4.58	Average	V			44.54	54.00	9.46

Tabulated test data for Restricted Band

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

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

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss}$$



Tested by: Hyung-Kwon, Oh / Assistant Manager

10. PEAK POWER SPECTRAL DENSITY

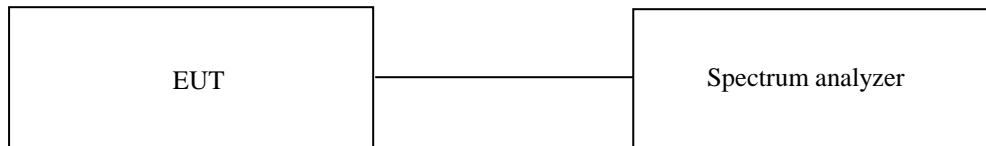
10.1 Operating environment

Temperature : 25 °C
 Relative humidity : 46 % 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 $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$, the video bandwidth is set to 3 times the resolution bandwidth.



10.3 Test equipment used

Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - FSV30	Rohde & Schwarz	Signal Analyzer	101372	Jul. 24, 2019 (1Y)

All test equipment used is calibrated on a regular basis.

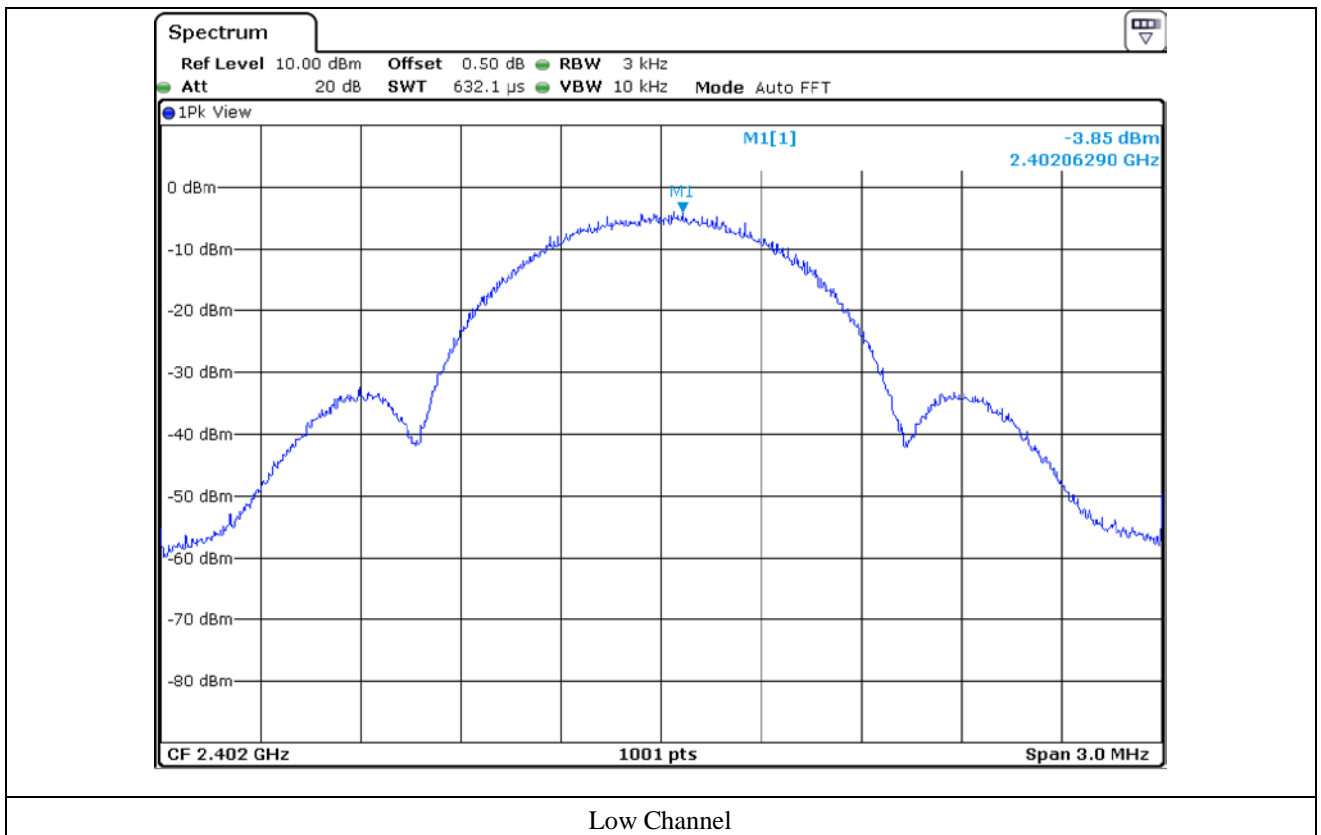
10.4 Test data

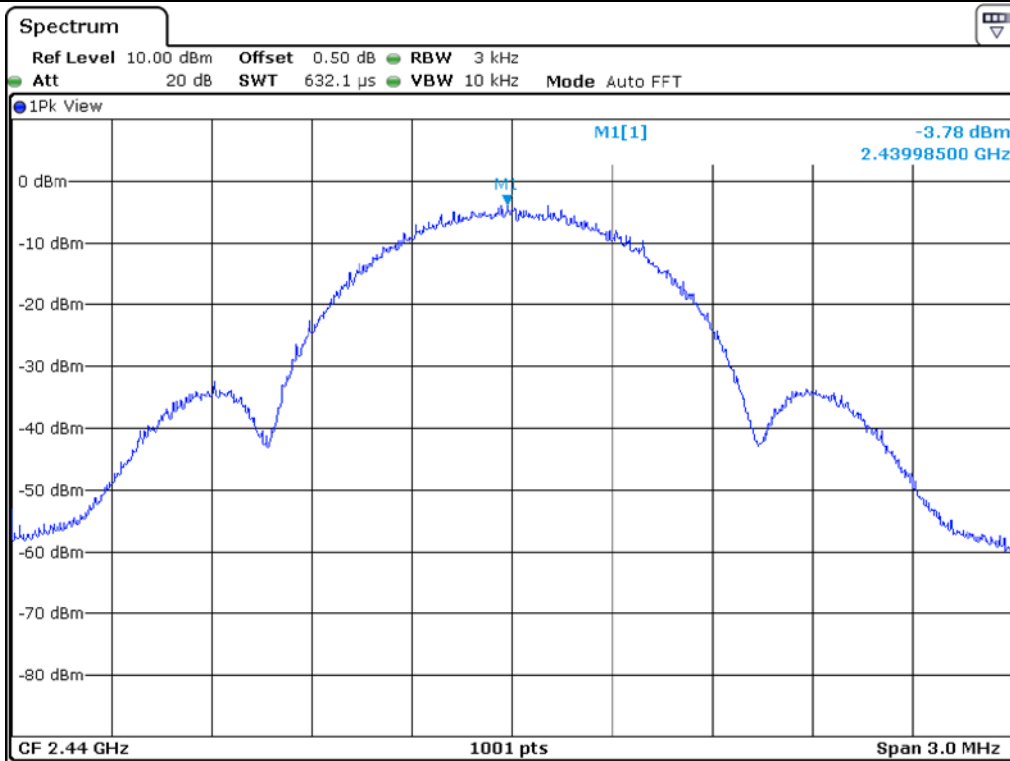
- Test Date : February 10, 2020 ~ February 18, 2020
- Test Result : Pass
- Operating Condition : Continuous transmitting mode

CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 402.00	-3.85	8.00	11.85
Middle	2 440.00	-3.78	8.00	11.78
High	2 480.00	-3.61	8.00	11.61

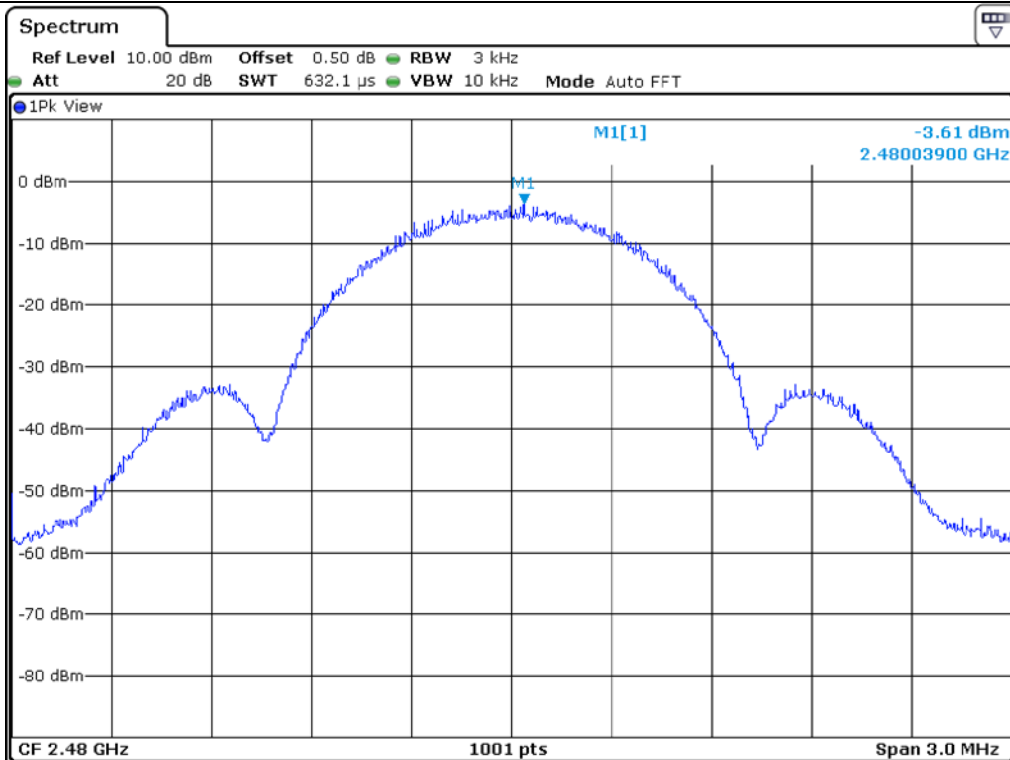
Remark. Margin = Limit – Measured value

Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

11. RADIATED EMISSION TEST

11.1 Operating environment

Temperature : 25 °C
 Relative humidity : 46 % 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

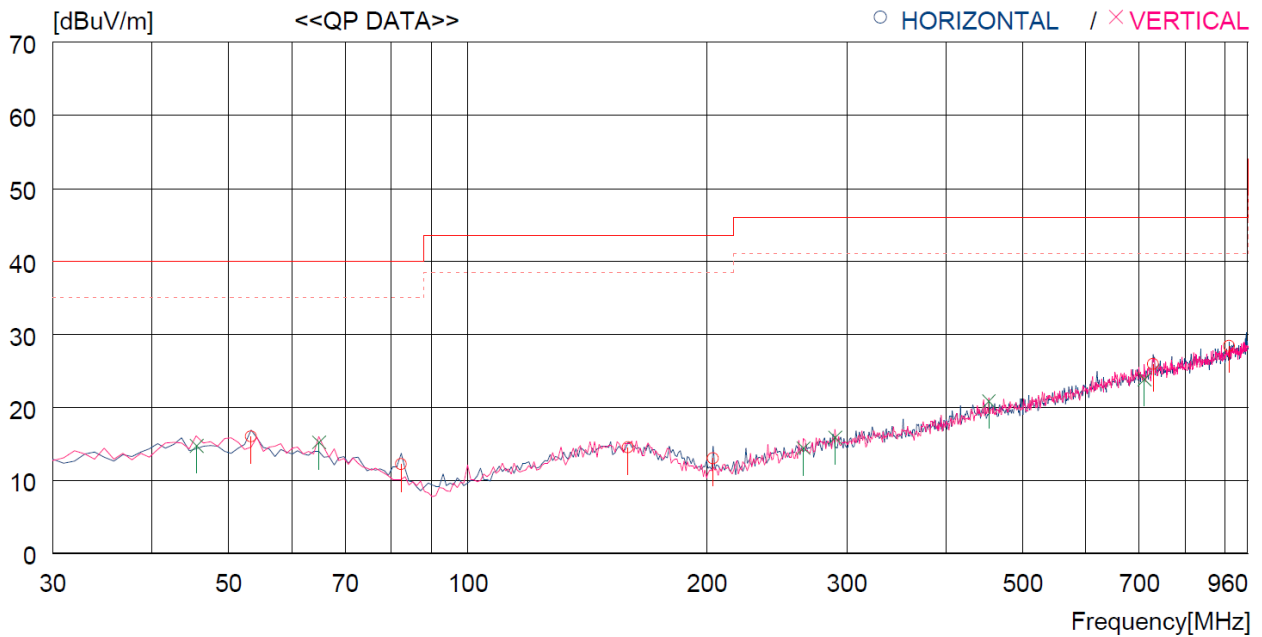
Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ - FSV30	Rohde & Schwarz	Signal Analyzer	101372	Jul. 24, 2019 (1Y)
■ - ESW	Rohde & Schwarz	EMI Test Receiver	101851	Aug. 07, 2019 (1Y)
■ - 310N	Sonoma Instrument	Pre-Amplifier	312544	Mar. 18, 2019 (1Y)
■ - BBV 9718B	Schwarzbeck	Amplifier	009	Mar. 20, 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)
■ - BBHA9120D	Schwarzbeck	Horn Antenna	9120D-1366	Jul. 16, 2019 (1Y)
■ - BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170179	Jan. 20, 2020 (1Y)
■ - VAMP9243	Schwarzbeck	ROD ANTENNA	VAMP9243	Mar. 14, 2019 (2Y)

All test equipment used is calibrated on a regular basis.

11.4 Test data for 30 MHz ~ 1 GHz (Bluetooth LE Mode)

Humidity Level : 46 % R.H. Temperature: 25 °C
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247
 Result : PASSED

EUT : SMART CONTROL Date: February 10, 2020 ~ February 18, 2020
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
 Test channel : 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	53.280	27.7	19.6	1.8	33.1	16.0	40.0	24.0	200	254
2	82.380	28.5	14.7	2.0	33.0	12.2	40.0	27.8	300	0
3	159.010	25.4	19.1	3.0	33.0	14.5	43.5	29.0	200	162
4	203.630	26.9	15.8	3.3	33.0	13.0	43.5	30.5	300	90
5	729.364	25.7	27.2	6.2	33.2	25.9	46.0	20.1	400	313
6	909.779	24.5	29.1	7.1	32.3	28.4	46.0	17.6	100	248
----- Vertical -----										
7	45.520	26.8	19.5	1.5	33.1	14.7	40.0	25.3	100	359
8	64.920	28.0	18.4	1.9	33.1	15.2	40.0	24.8	400	160
9	264.740	25.5	18.1	3.8	33.0	14.4	46.0	31.6	100	19
10	289.960	25.9	19.1	3.9	33.0	15.9	46.0	30.1	200	66
11	452.921	26.0	23.0	4.9	33.1	20.8	46.0	25.2	100	359
12	710.935	23.9	27.0	6.2	33.3	23.8	46.0	22.2	300	359

[Signature]
Tested by: Hyung-Kwon, Oh / Assistant Manager

11.5 Test data for Below 30 MHz

- . Test Date : February 10, 2020 ~ February 18, 2020
- . 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 (dB μ V)	Ant. Pol. (H/V)	Ant. Height (m)	Angle ($^{\circ}$)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
Measurements are 20 dB below these limits, the measurements are not reported.									

11.6 Test data for above 1 GHz

- . Test Date : February 10, 2020 ~ February 18, 2020
- . 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 ($^{\circ}$)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dB μ V/m)	Limits (dB μ V/m)	Margin (dB)
Measurements are 20 dB below these limits, the measurements are not reported.									



Tested by: Hyung-Kwon, Oh / Assistant Manager