


RADIO PERFORMANCE TEST REPORT

Test Report No. : OT-206-RWD-048
AGR No. : A206A-221
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 : 34 pages (including this page)
Date of Incoming : February 10, 2020
Date of issue : June 22, 2020

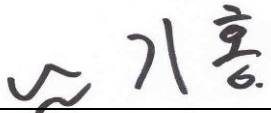
SUMMARY

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.

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Revision History

| Rev. No. | Issue Report No. | Issued Date | Revisions | Section Affected |
|----------|------------------|---------------|--|------------------|
| 0 | OT-206-RWD-048 | June 22, 2020 | Initial Release [Permissive change due to adding Zigbee mode by SW update] | 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 : June 22, 2020

| | |
|--|--|
| EQUIPMENT CLASS | DTS – DIGITAL TRNSMISSION SYSTEM |
| E.U.T. DESCRIPTION | SMART CONTROL |
| THIS REPORT CONCERNS | Class II Permissive Change |
| 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 | 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)

Class II Permissive Change

Following modification(s) is/are made on the product, which was already granted on 02/28/2020

| Changes | Before | After |
|----------------|--------------|-------------------------|
| Operating mode | Bluetooth LE | Bluetooth LE and Zigbee |

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-11842

ISED (Innovation, Science and Economic Development Canada) – Registration No. Site# 3736A-3

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 | Bluetooth LE | 2 402 MHz ~ 2 480 MHz |
| | Zigbee | 2 405 MHz ~ 2 475 MHz |
| RF Output Power | Bluetooth LE | 7.54 dBm |
| | Zigbee | 7.86 dBm |
| Number of Channel | Bluetooth LE | 40 Channel |
| | Zigbee | 3 Channel |
| Modulation Type | Bluetooth LE | GFSK (Bluetooth LE) |
| | Zigbee | O-QPSK (Zigbee) |
| 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 2 405 MHz, 2 440 MHz, and 2 475 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.

- Channel List

| Channel | Frequency[MHz] | Channel | Frequency[MHz] | Channel | Frequency[MHz] |
|---------|----------------|---------|----------------|---------|----------------|
| 11 | 2 405.00 | 18 | 2 440.00 | 25 | 2 475.00 |

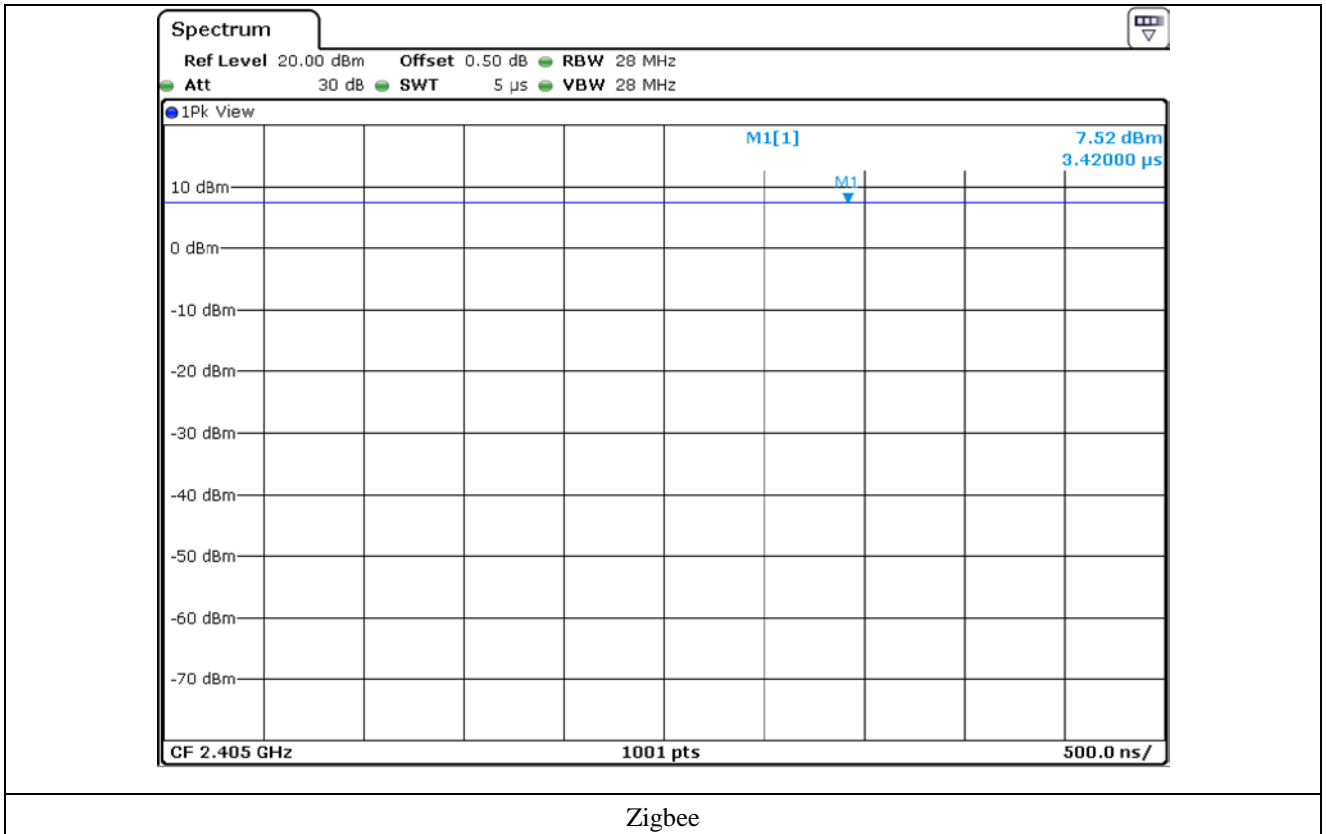
- Duty Cycle

| Mode | Tx On Time [ms] | Tx Off Time [ms] | Duty Cycle [%] |
|--------|-------------------|--------------------|------------------|
| Zigbee | - | - | 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



Zigbee

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 |

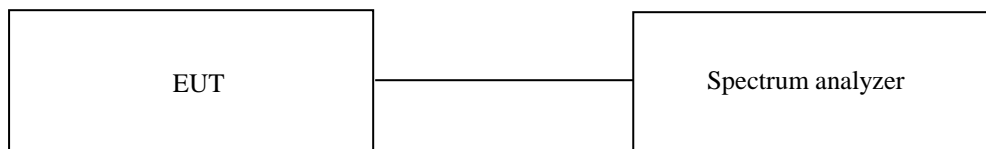
7. MINIMUM 6 dB BANDWIDTH

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.

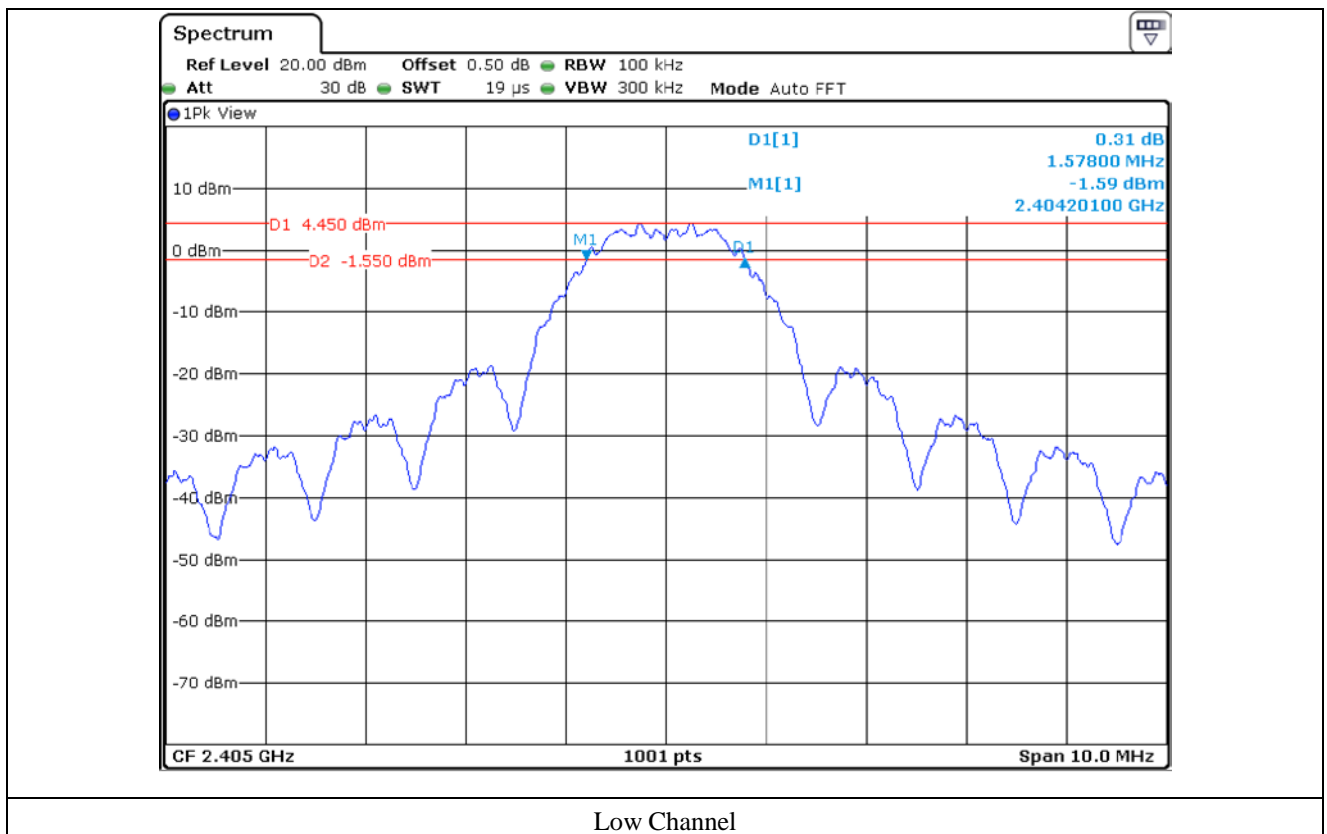
7.4 Test data

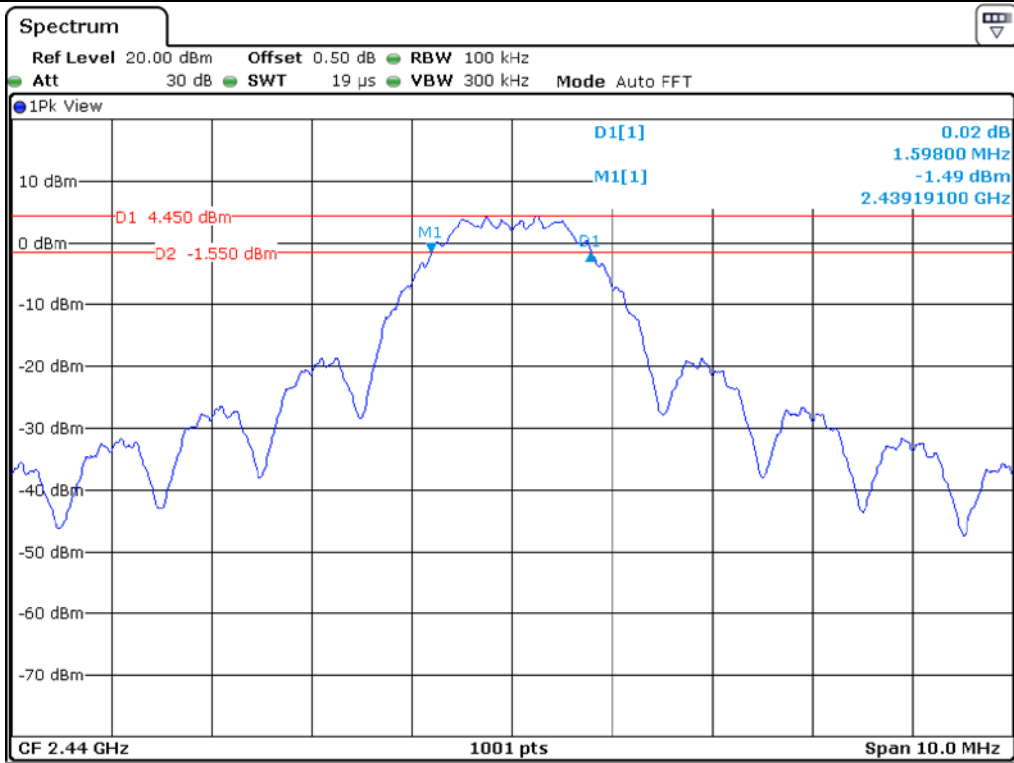
- Test Date : June 16, 2020 ~ June 19, 2020
- Test Result : Pass

| CHANNEL | FREQUENCY(MHz) | MEASURED VALUE (MHz) | LIMIT (MHz) | MARGIN (MHz) |
|---------|----------------|----------------------|-------------|--------------|
| Low | 2 405.00 | 1.58 | 0.50 | 1.08 |
| Middle | 2 440.00 | 1.60 | 0.50 | 1.10 |
| High | 2 475.00 | 1.58 | 0.50 | 1.08 |

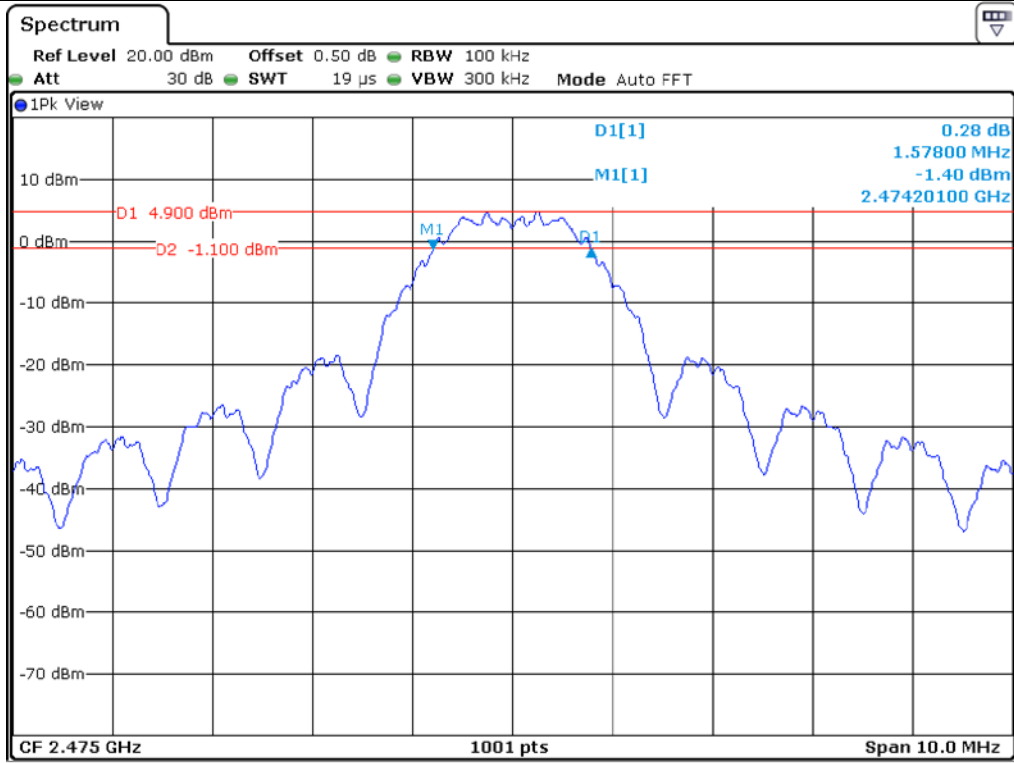
Remark. Margin = Measured Value - Limit

Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

8. MAXIMUM PEAK OUTPUT POWER

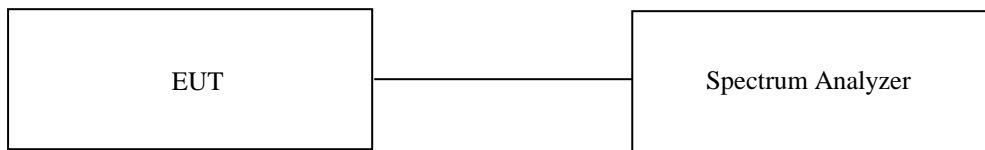
8.1 Operating environment

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

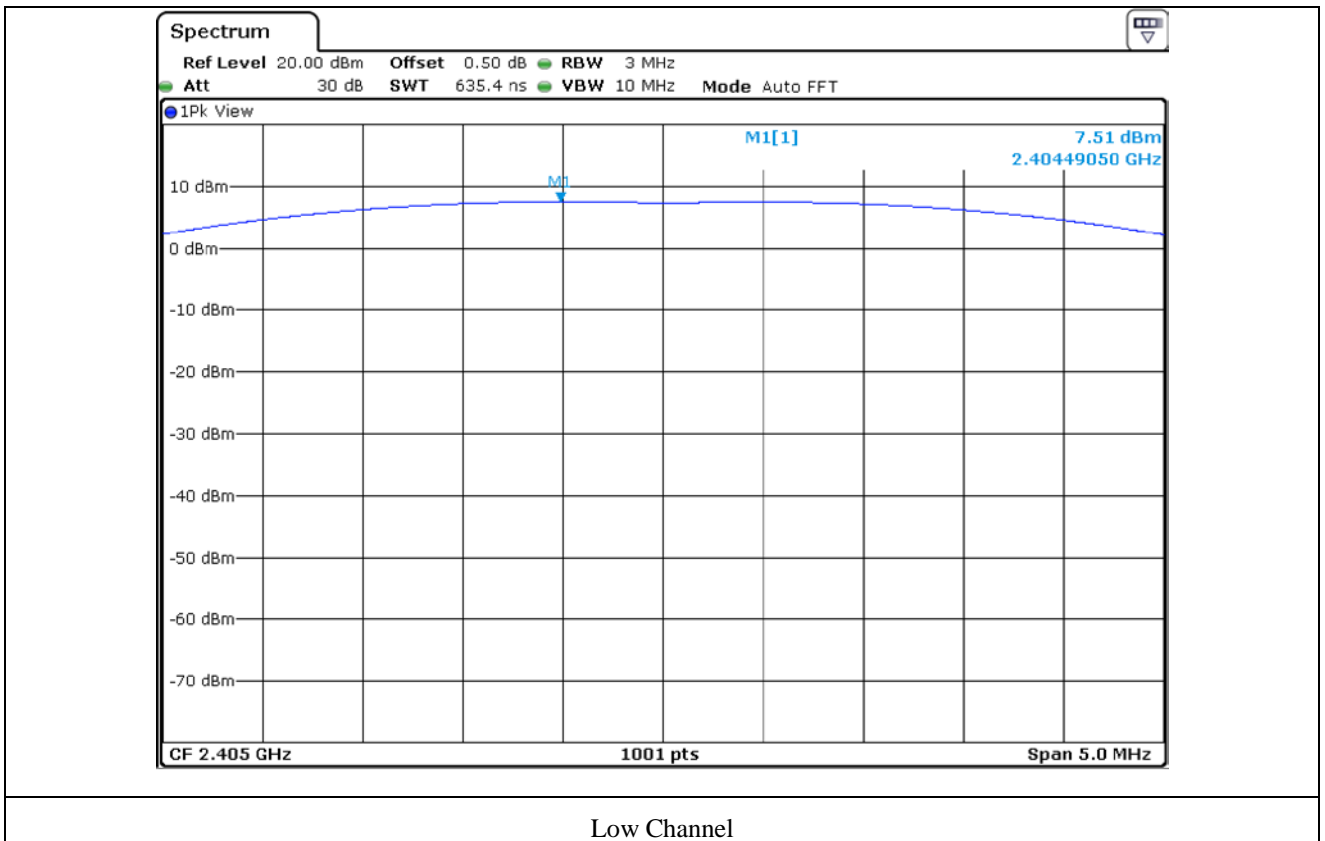
-. Test Date : June 16, 2020 ~ June 19, 2020

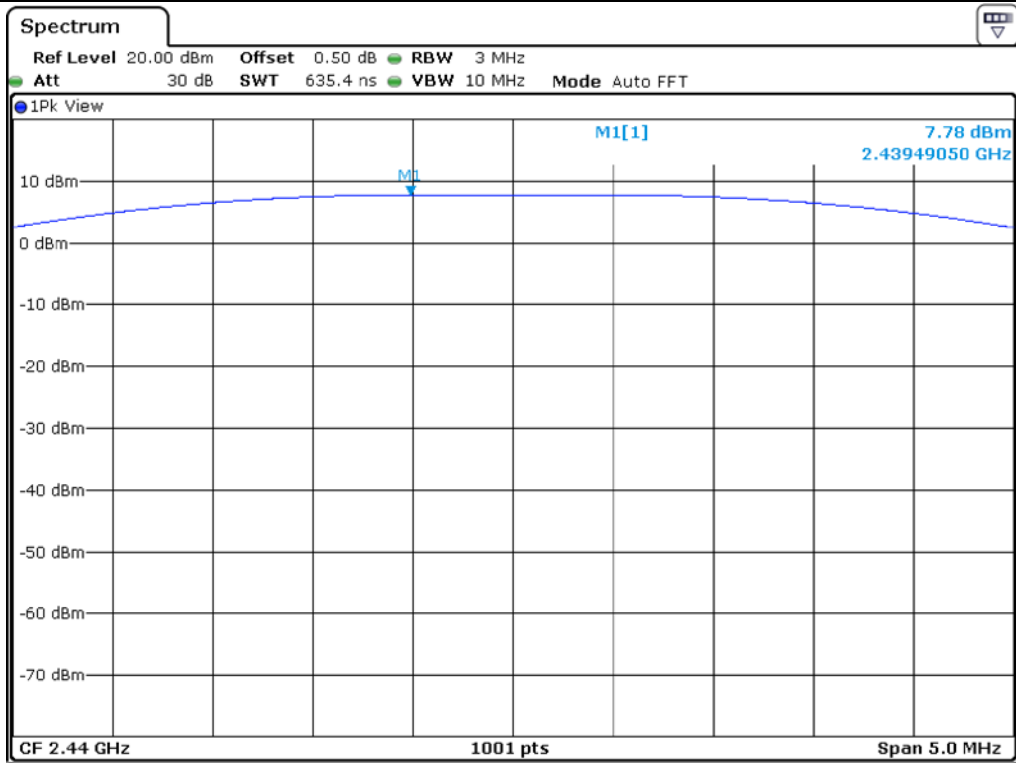
-. Test Result : Pass

| CHANNEL | FREQUENCY (MHz) | MEASURED VALUE (dBm) | LIMIT (dBm) | MARGIN (dB) |
|---------|-----------------|----------------------|-------------|-------------|
| LOW | 2 405.00 | 7.51 | 30.00 | 22.49 |
| MIDDLE | 2 440.00 | 7.78 | 30.00 | 22.22 |
| HIGH | 2 475.00 | 7.86 | 30.00 | 22.14 |

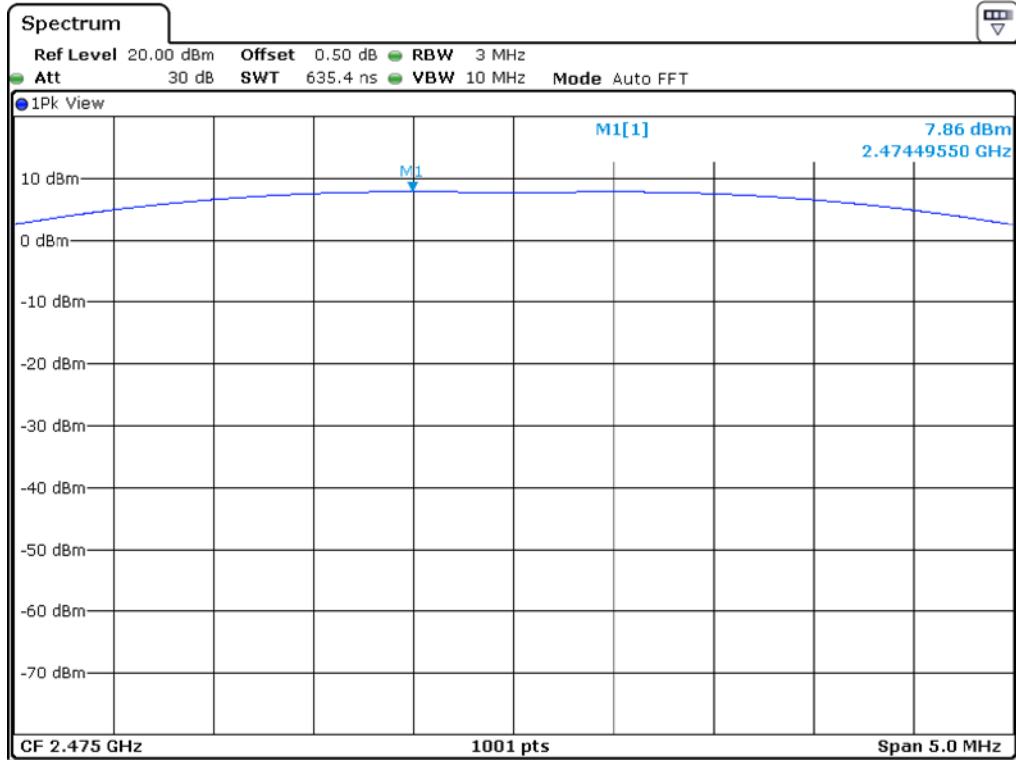
Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

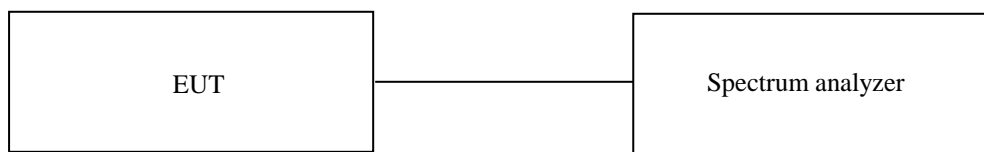
9. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

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.

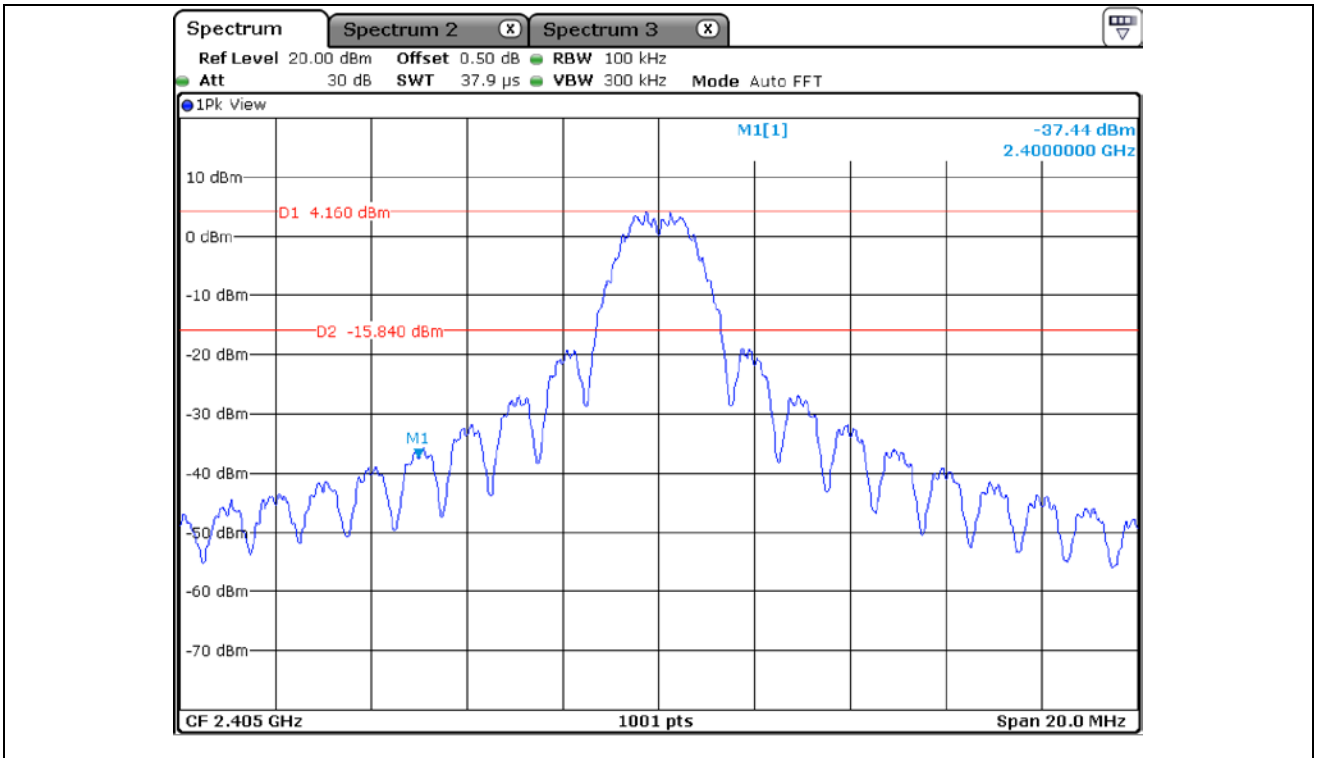
The frequency spectrum from 30 MHz to 26.5 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal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

9.4 Test equipment used

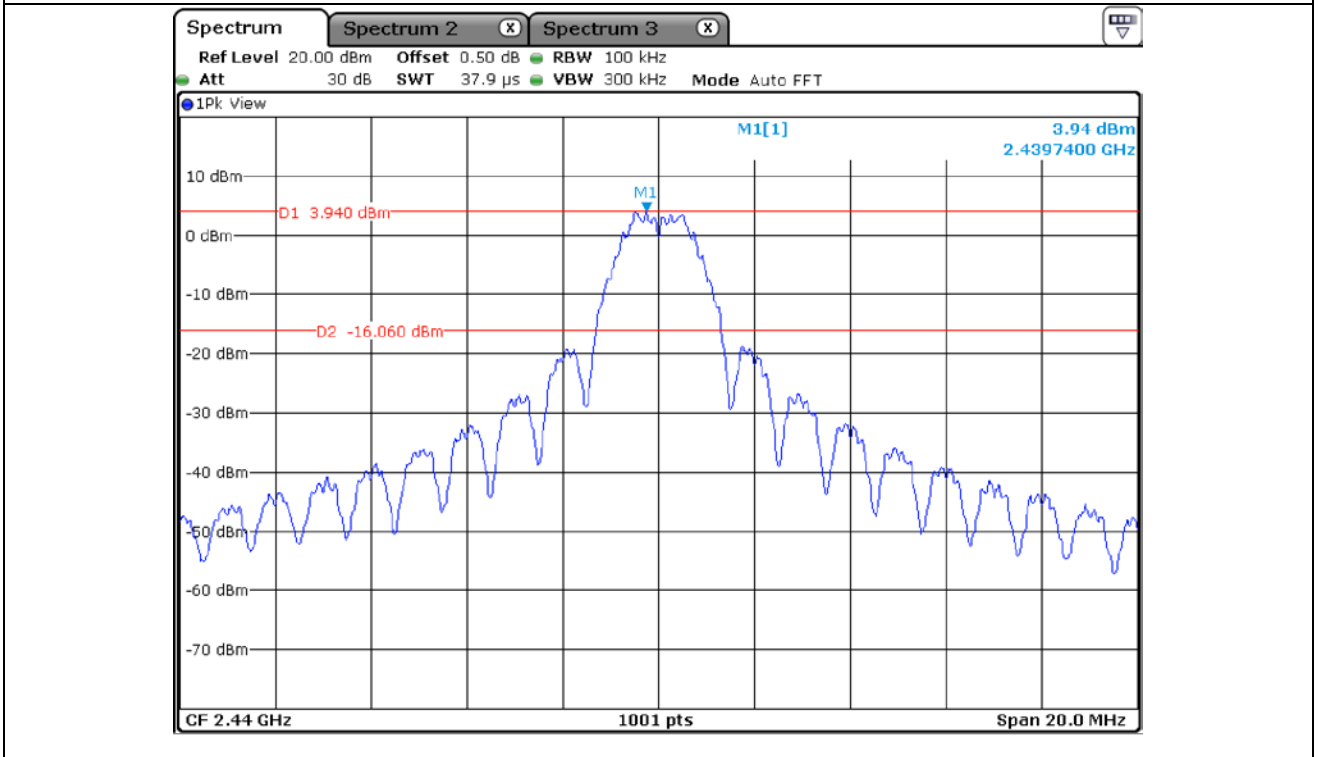
| Model Number | Manufacturer | Description | Serial Number | Last Cal. |
|-----------------|-------------------|--------------------------|---------------|--------------------|
| ■ - FSV30 | Rohde & Schwarz | Signal Analyzer | 101372 | Jul. 24, 2019 (1Y) |
| ■ - ESW | Rohde & Schwarz | EMI Test Receiver | 101851 | Aug. 07, 2019 (1Y) |
| ■ - 310N | Sonoma Instrument | Pre-Amplifier | 312544 | Mar. 16, 2020 (1Y) |
| □ - BBV 9718 B | Schwarzbeck | Broadband Preamplifier | 00009 | Mar. 16, 2020 (1Y) |
| □ - SCU40A | Rohde & Schwarz | Signal Conditioning unit | 100436 | Feb. 20, 2020 (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. 08, 2020 (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.

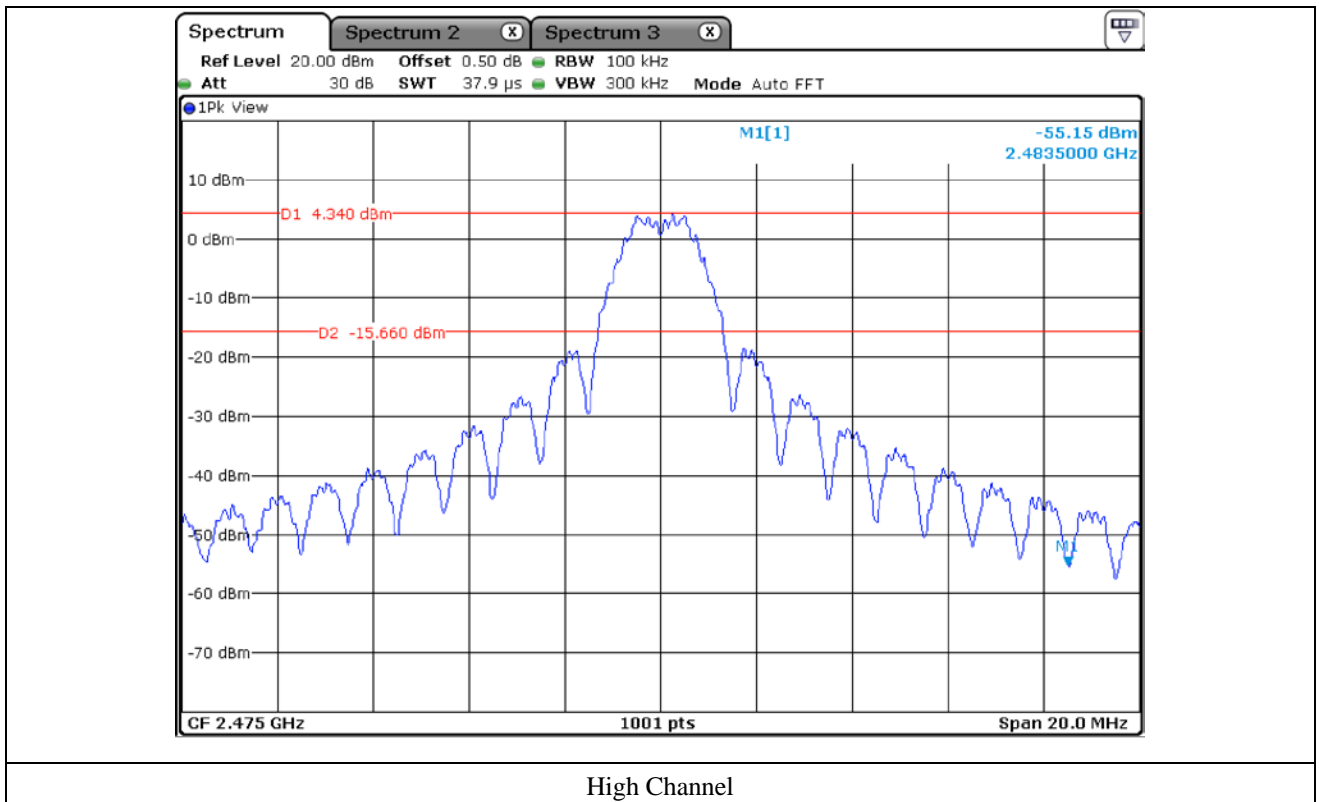
9.5 Test data for conducted emission



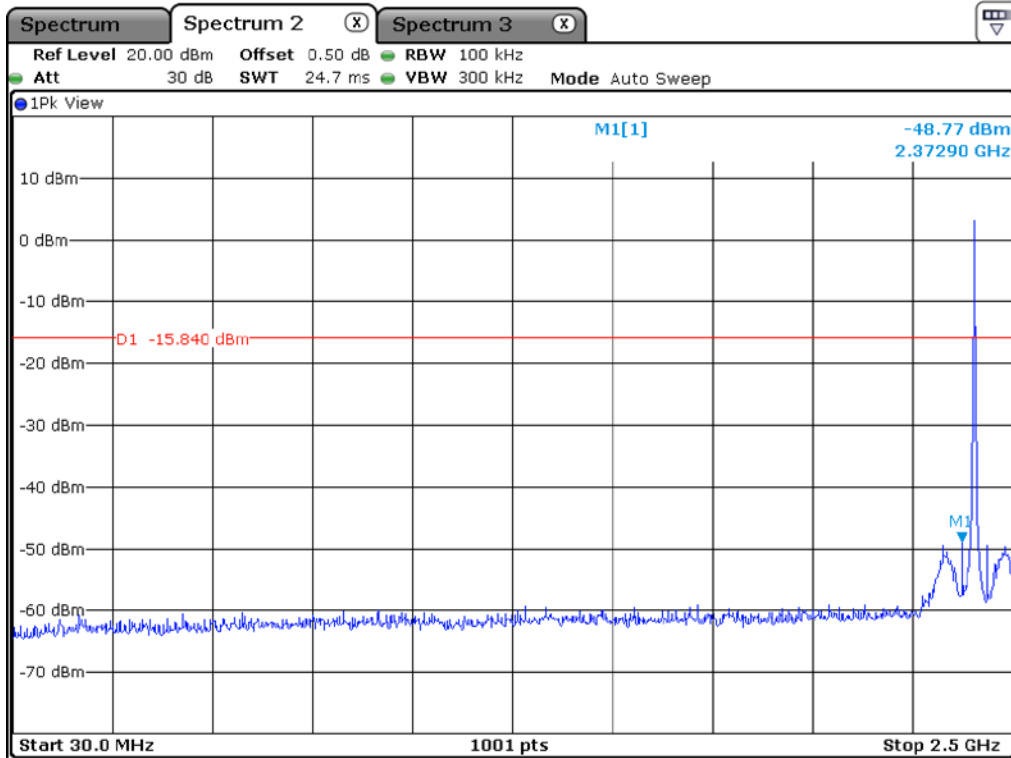
Low Channel



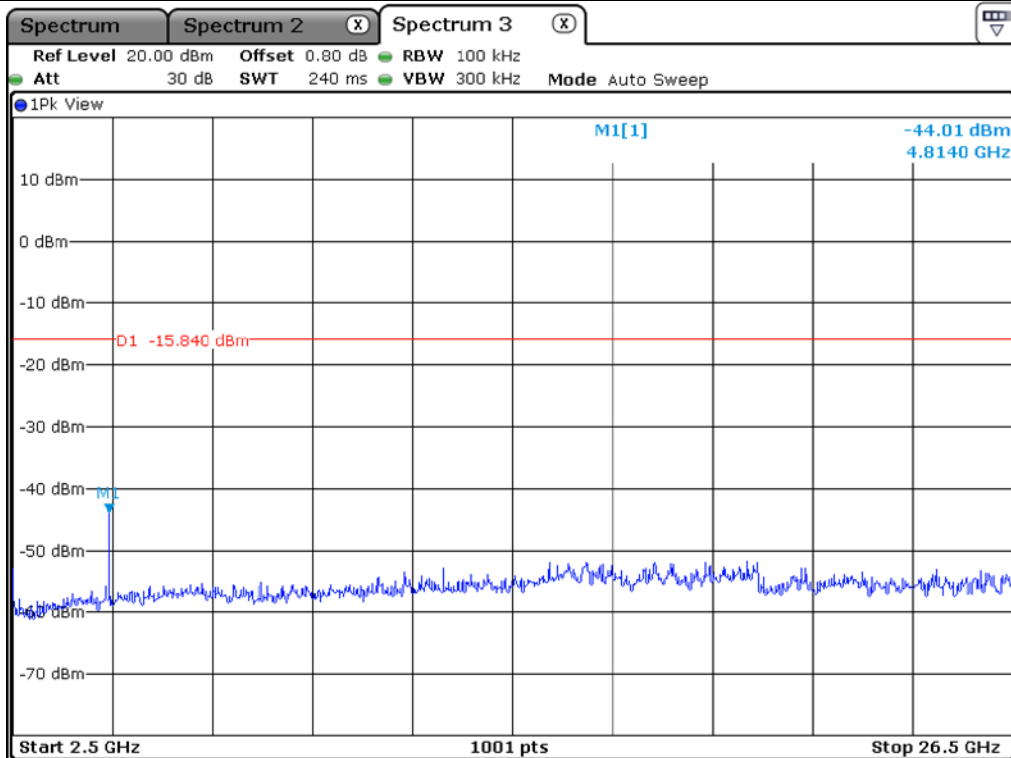
Middle Channel



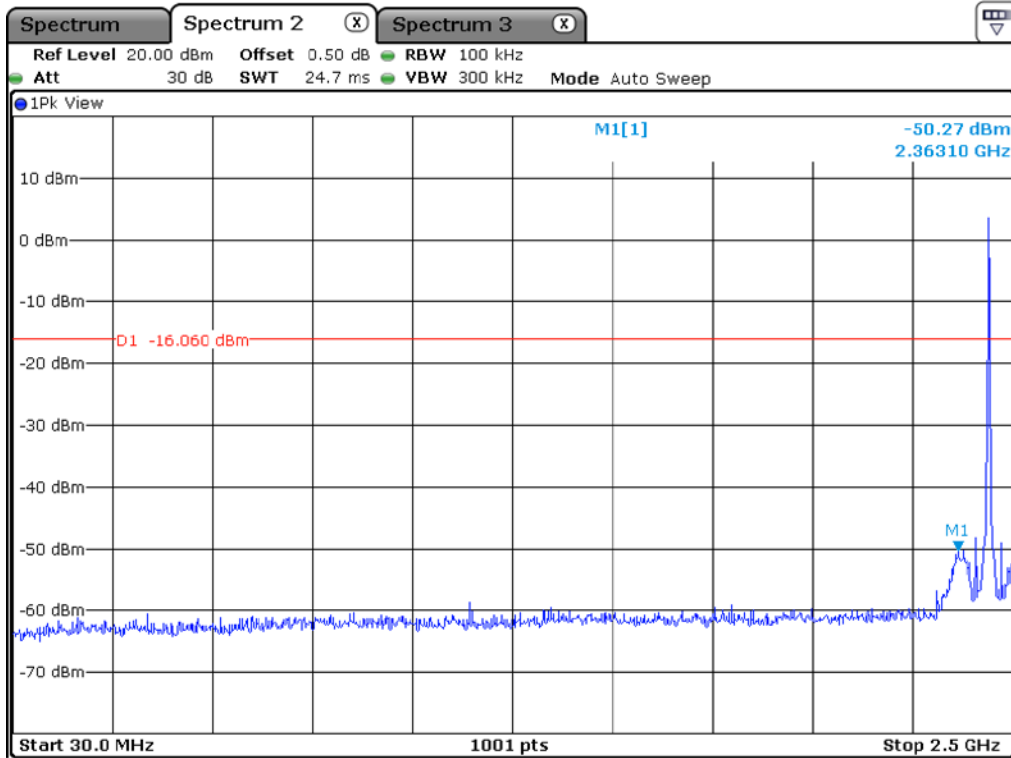
High Channel



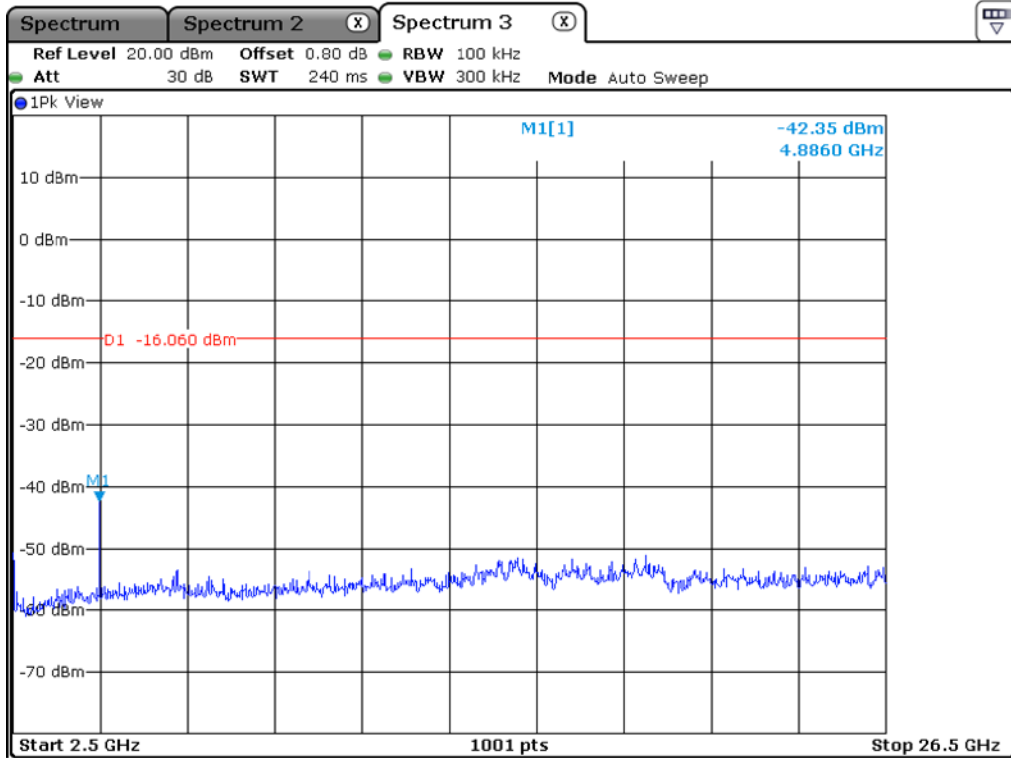
Low Channel



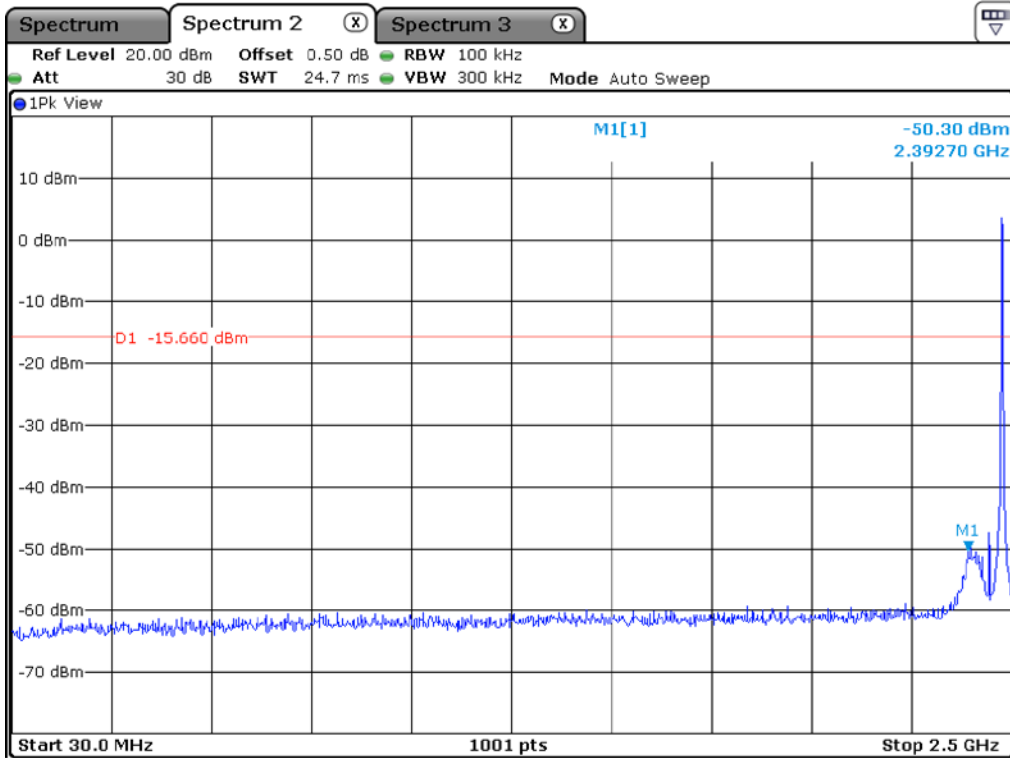
Low Channel



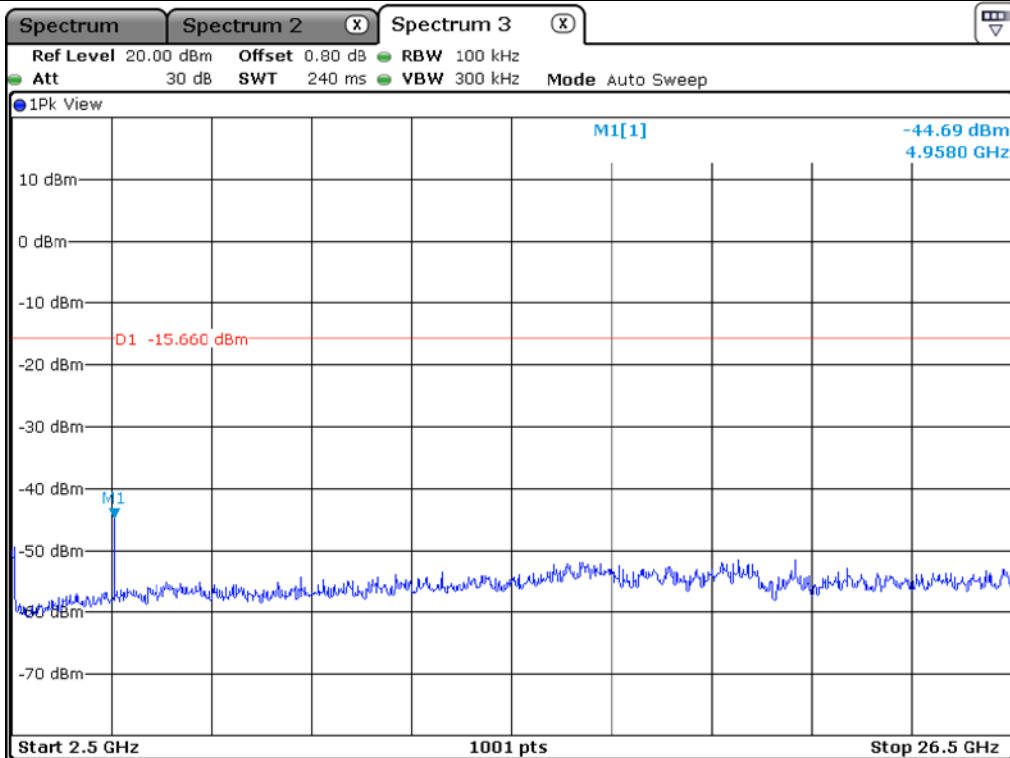
Middle Channel



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 : June 16, 2020 ~ June 19, 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 | | | | | | | | |
| 2 373.497 | 21.43 | Peak | H | 26.90 | 3.07 | 51.40 | 74.00 | 22.60 |
| 2 372.537 | 16.69 | Average | H | 26.90 | 3.07 | 46.66 | 54.00 | 7.34 |
| 2 372.458 | 20.45 | Peak | V | 26.90 | 3.07 | 50.42 | 74.00 | 23.58 |
| 2 373.417 | 17.44 | Average | V | 26.90 | 3.07 | 47.41 | 54.00 | 6.59 |
| Test Data for High Channel | | | | | | | | |
| 2 483.508 | 23.42 | Peak | H | 26.60 | 3.16 | 53.18 | 74.00 | 20.82 |
| 2 483.508 | 17.03 | Average | H | 26.60 | 3.16 | 46.79 | 54.00 | 7.21 |
| 2 484.125 | 23.17 | Peak | V | 26.60 | 3.16 | 52.93 | 74.00 | 21.07 |
| 2 483.508 | 16.82 | Average | V | 26.60 | 3.16 | 46.58 | 54.00 | 7.42 |

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 : June 16, 2020 ~ June 19, 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 (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 | | | | | | | | |
| 4 810.000 | 22.03 | Peak | H | 28.20 | 4.85 | 55.08 | 74.00 | 18.92 |
| 4 810.000 | 9.82 | Average | H | 28.20 | 4.85 | 42.87 | 54.00 | 11.13 |
| 4 810.000 | 21.91 | Peak | V | 28.20 | 4.85 | 54.96 | 74.00 | 19.04 |
| 4 810.000 | 9.60 | Average | V | 28.20 | 4.85 | 42.65 | 54.00 | 11.35 |
| Test Data for Middle Channel | | | | | | | | |
| 4 880.000 | 21.45 | Peak | H | 28.30 | 4.91 | 54.66 | 74.00 | 19.34 |
| 4 880.000 | 9.12 | Average | H | 28.30 | 4.91 | 42.33 | 54.00 | 11.67 |
| 4 880.000 | 21.42 | Peak | V | 28.30 | 4.91 | 54.63 | 74.00 | 19.37 |
| 4 880.000 | 9.06 | Average | V | 28.30 | 4.91 | 42.27 | 54.00 | 11.73 |
| Test Data for High Channel | | | | | | | | |
| 4 950.000 | 22.17 | Peak | H | 28.60 | 5.04 | 55.81 | 74.00 | 18.19 |
| 4 950.000 | 8.86 | Average | H | 28.60 | 5.04 | 42.50 | 54.00 | 11.50 |
| 4 950.000 | 21.32 | Peak | V | 28.60 | 5.04 | 54.96 | 74.00 | 19.04 |
| 4 950.000 | 8.54 | Average | V | 28.60 | 5.04 | 42.18 | 54.00 | 11.82 |

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

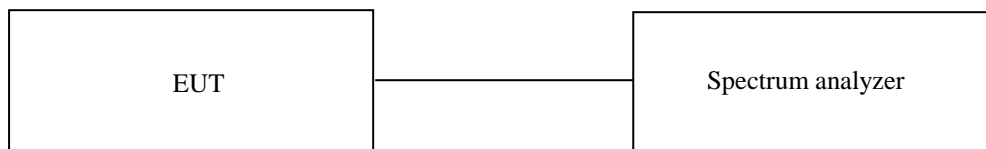
10.1 Operating environment

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

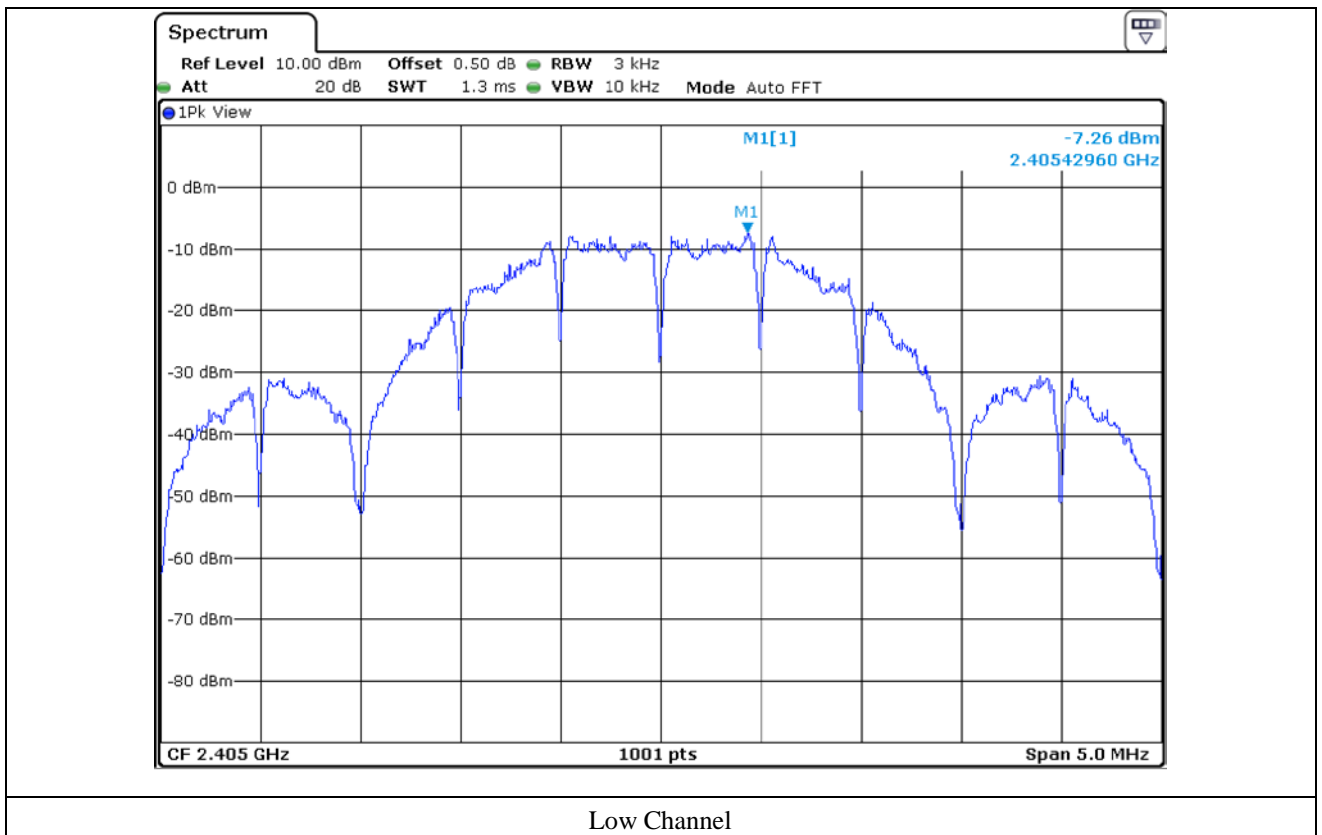
- Test Date : June 16, 2020 ~ June 19, 2020
- Test Result : Pass
- Operating Condition : Continuous transmitting mode

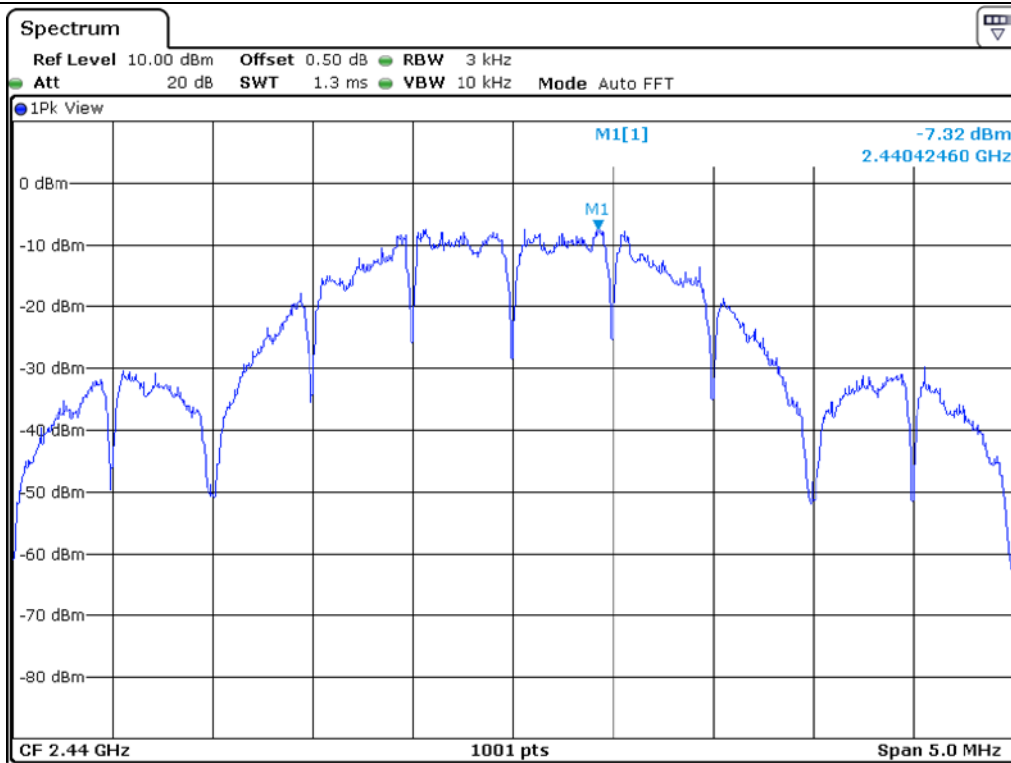
| CHANNEL | FREQUENCY(MHz) | MEASURED VALUE (dBm) | LIMIT (dBm) | MARGIN (dB) |
|---------|----------------|----------------------|-------------|-------------|
| Low | 2 405.00 | -7.26 | 8.00 | 15.26 |
| Middle | 2 440.00 | -7.32 | 8.00 | 15.32 |
| High | 2 475.00 | -7.46 | 8.00 | 15.46 |

Remark. Margin = Limit – Measured value

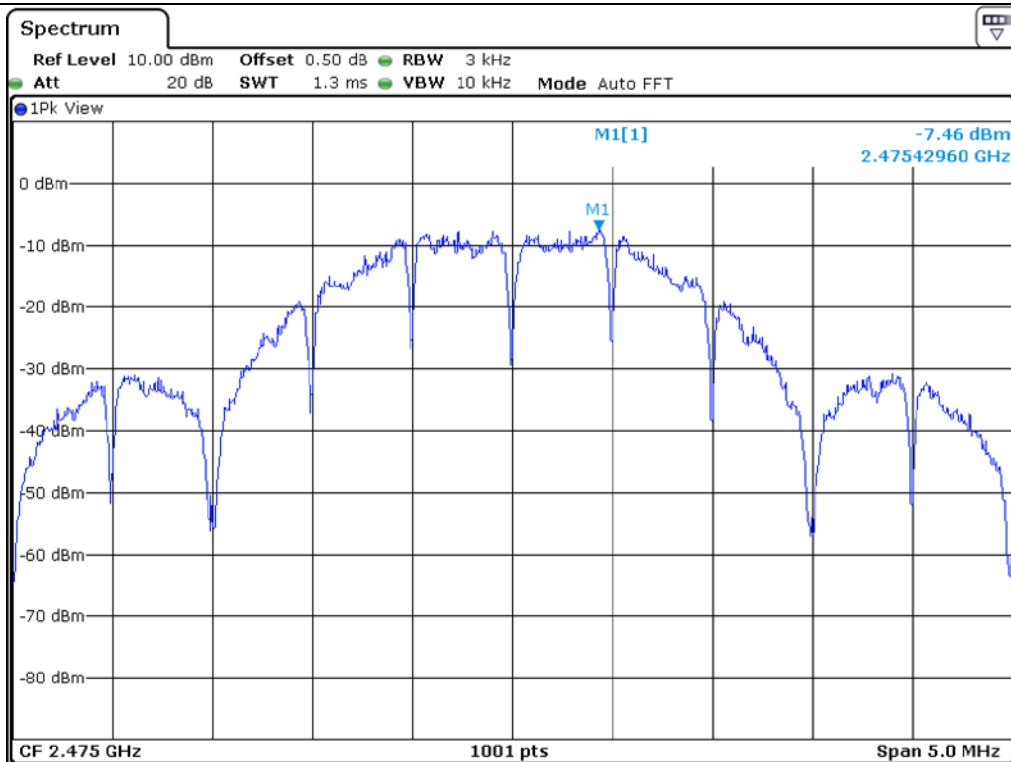


Tested by: Hyung-Kwon, Oh / Assistant Manager





Middle Channel



High Channel

11. RADIATED EMISSION TEST

11.1 Operating environment

Temperature : 25 °C
 Relative humidity : 46 % R.H.

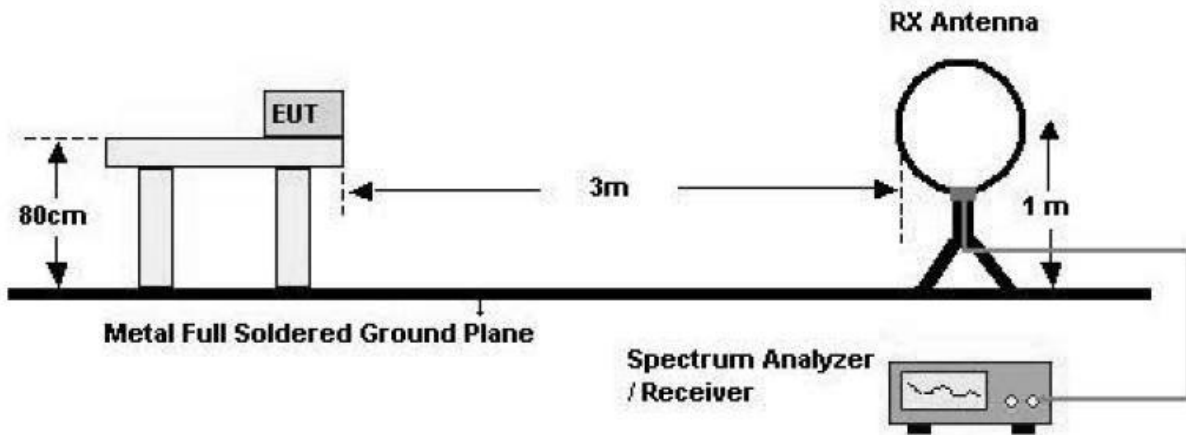
11.2 Test set-up

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.

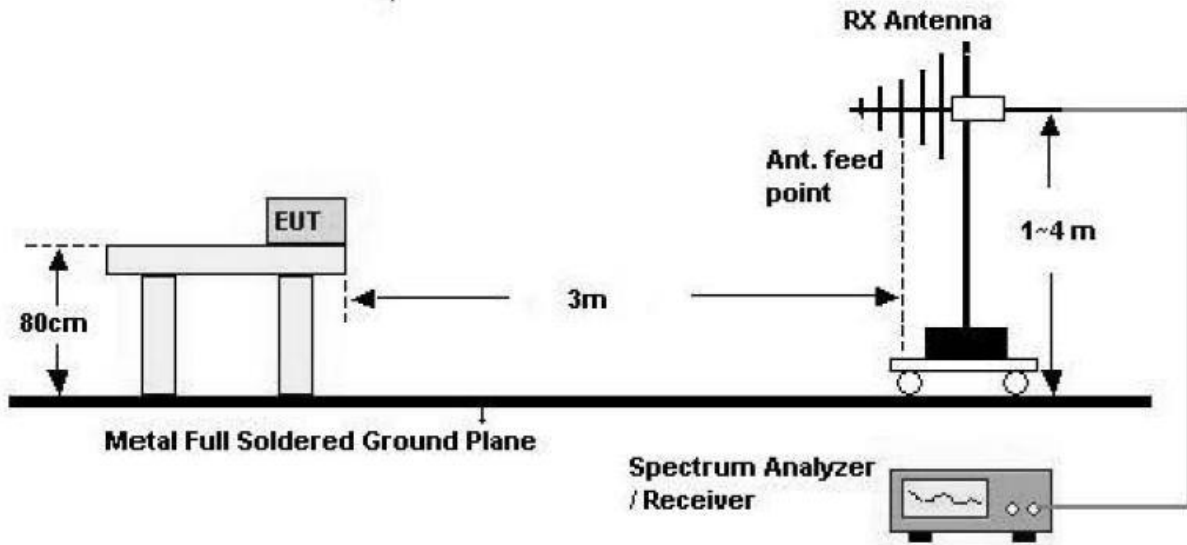
The frequency spectrum from 30 MHz to 26.5 GHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for both horizontal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

- Test Configuration

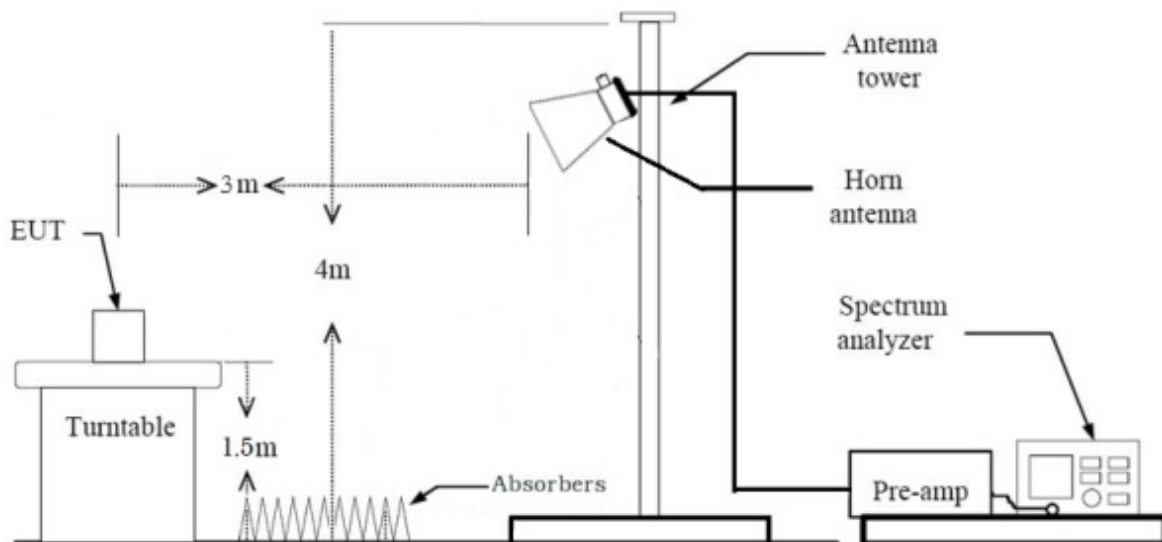
1. Below 30 MHz



2. 30 MHz - 1 GHz



3. Above 1 GHz



11.3 Test equipment used

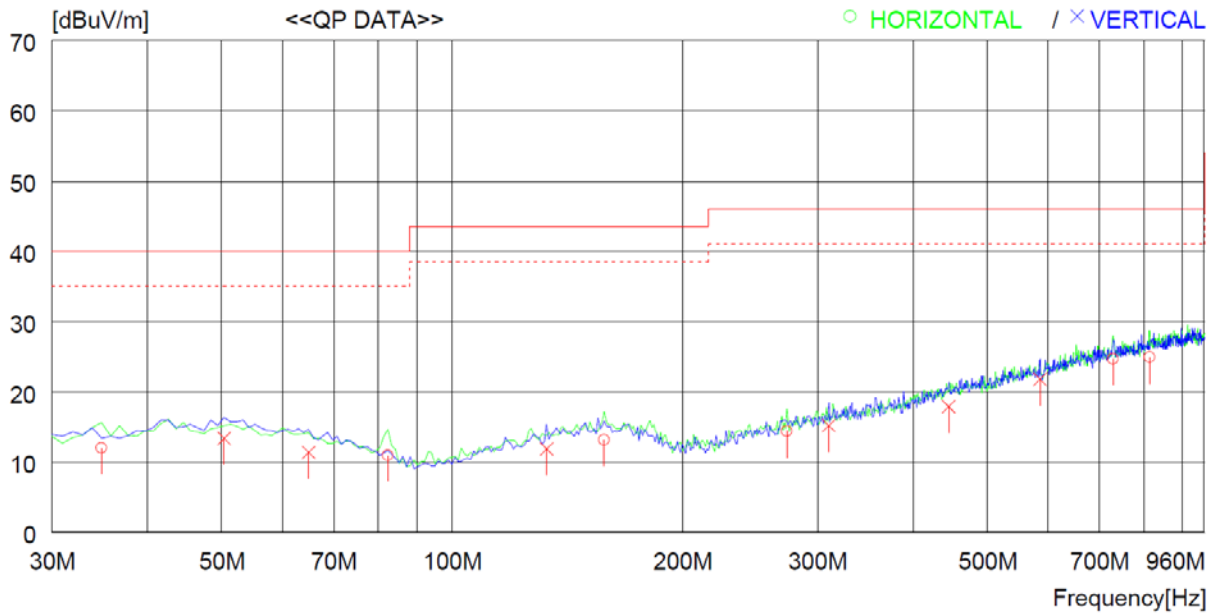
| Model Number | Manufacturer | Description | Serial Number | Last Cal. |
|---------------------|---------------------|--------------------------|----------------------|--------------------|
| ■ - FSV30 | Rohde & Schwarz | Signal Analyzer | 101372 | Jul. 24, 2019 (1Y) |
| ■ - ESW | Rohde & Schwarz | EMI Test Receiver | 101851 | Aug. 07, 2019 (1Y) |
| ■ - 310N | Sonoma Instrument | Pre-Amplifier | 312544 | Mar. 16, 2020 (1Y) |
| ■ - BBV 9718 B | Schwarzbeck | Broadband Preamplifier | 00009 | Mar. 16, 2020 (1Y) |
| ■ - SCU40A | Rohde & Schwarz | Signal Conditioning unit | 100436 | Feb. 20, 2020 (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. 08, 2020 (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

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: June 16, 2020 ~ June 19, 2020
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)
 Operating mode : Transmitting mode



| 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 | 34.850 | 25.1 | 18.1 | 1.3 | 32.5 | 12.0 | 40.0 | 28.0 | 300 | 309 |
| 2 | 82.380 | 26.9 | 14.7 | 1.9 | 32.5 | 11.0 | 40.0 | 29.0 | 300 | 68 |
| 3 | 158.040 | 24.2 | 19.1 | 2.4 | 32.5 | 13.2 | 43.5 | 30.3 | 400 | 0 |
| 4 | 273.470 | 25.0 | 18.6 | 3.2 | 32.4 | 14.4 | 46.0 | 31.6 | 200 | 0 |
| 5 | 729.364 | 24.7 | 27.2 | 5.3 | 32.5 | 24.7 | 46.0 | 21.3 | 300 | 359 |
| 6 | 814.721 | 23.3 | 28.3 | 5.5 | 32.2 | 24.9 | 46.0 | 21.1 | 400 | 3 |
| ----- Vertical ----- | | | | | | | | | | |
| 7 | 50.370 | 24.7 | 19.7 | 1.5 | 32.5 | 13.4 | 40.0 | 26.6 | 200 | 138 |
| 8 | 64.920 | 23.8 | 18.4 | 1.7 | 32.5 | 11.4 | 40.0 | 28.6 | 200 | 324 |
| 9 | 132.820 | 24.4 | 17.8 | 2.2 | 32.5 | 11.9 | 43.5 | 31.6 | 200 | 359 |
| 10 | 310.330 | 24.7 | 19.6 | 3.4 | 32.5 | 15.2 | 46.0 | 30.8 | 400 | 340 |
| 11 | 445.161 | 23.3 | 22.9 | 4.1 | 32.4 | 17.9 | 46.0 | 28.1 | 400 | 30 |
| 12 | 585.808 | 24.5 | 25.3 | 4.6 | 32.6 | 21.8 | 46.0 | 24.2 | 300 | 0 |

Tested by: Hyung-Kwon, Oh / Assistant Manager

11.5 Test data for Below 30 MHz

- . Test Date : June 16, 2020 ~ June 19, 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 (dBμV) | Ant. Pol. (H/V) | Ant. Height (m) | Angle (°) | Ant. Factor (dB/m) | Cable Loss | Emission Level(dBμV/m) | Limits (dBμV/m) | Margin (dB) |
|--|----------------|-----------------|-----------------|-----------|--------------------|------------|------------------------|-----------------|-------------|
| Emission from the EUT more than 20 dB below the limit in each frequency range. | | | | | | | | | |

11.6 Test data for above 1 GHz

- . Test Date : June 16, 2020 ~ June 19, 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 (dBμV) | Ant. Pol. (H/V) | Ant. Height (m) | Angle (°) | Ant. Factor (dB/m) | Cable Loss | Emission Level(dBμV/m) | Limits (dBμV/m) | Margin (dB) |
|--|----------------|-----------------|-----------------|-----------|--------------------|------------|------------------------|-----------------|-------------|
| Emission from the EUT more than 20 dB below the limit in each frequency range. | | | | | | | | | |



Tested by: Hyung-Kwon, Oh / Assistant Manager