

TEST REPORT



한국산업기술시험원
Korea Testing Laboratory

Report No. : 23-068261-03-1b

Page of Pages : (1)/ (36)



1. Client

Name : BASMANtechnology Co.,Ltd

Address : Iteco #660/661, 150, Jojeong-daero, Hanam-si, Gyeonggi-do, Korea

Date of Receipt : 2023. 10. 24.

2. Use of Report : FCC Certification

3. Test Sample

Description : Second Battery

Manufacturer : BASMANtechnology Co.,Ltd

Model Name : BLB-AAA740B

Serial Number : prototype

Remark : -

4. Date of Test : 2023. 11. 01. ~ 2023. 11. 27.

5. Location of Test :

KTL Permanent Test Lab (Address : 87, Digital-ro 26-gil, Guro-gu, Seoul, KOREA)

On Site Testing

6. Test Standard/Method : CFR47, FCC Part 15 Subpart C, ANSI C63.10_2013

7. Test Results : Refer to the attached test results

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4. This report is not related to KS Q ISO/IEC 17025 & KOLAS Accreditation.

| | | | | |
|-------------|-----------------------------------|--|--|--|
| Affirmation | Tested by Name : Kim YoungHyun |  (Signature) | Technical Manager Name : CHO SUNG KYU |  (Signature) |
|-------------|-----------------------------------|--|--|--|

2023. 11. 28.

Korea Testing Laboratory



87, Digital-ro 26-gil, Guro-gu, Seoul, KOREA Tel.+82-2-860-1417 Fax. +82-2-860-1459



한국산업기술시험원
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Revision History

| Report No. | Description | Revised date |
|-----------------|------------------------------------|--------------|
| 23-068261-03-1 | Original release | 2023-11-22 |
| 23-068261-03-1a | Modify FCC ID, typo | 2023-11-23 |
| 23-068261-03-1b | Add tested voltage, CAB identifier | 2023-11-28 |

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1. GENERAL INFORMATIONS

1.1 Testing Laboratory

| | |
|-------------------------|--|
| Testing Place | Korea Testing Labortory (KTL) 87, Digital-ro 26-gil, Guro-gu, Seoul , Korea (08389) |
| FCC registration number | 0033369398 |
| CAB identifier | KR0009 |
| Test Engineer | Kim Younghyun |
| Telephone number | +82 2 860 1417 |
| Facsimile number | +82 2 860 1459 |
| E-mail address | yh21c90@ktl.re.kr |

1.2 Applicant (Client)

| | |
|----------------------|--|
| Name | BASMANtechnology Co.,Ltd |
| Address | Itech #660/661, 150 , Jojeong-daero, Hanam-si, Gyeonggi-do, Korea, 12930 |
| Manufacturer | BASMANtechnology Co.,Ltd |
| Manufacturer Address | Itech #660/661, 150 , Jojeong-daero, Hanam-si, Gyeonggi-do, Korea, 12930 |

1.3 Equipment (EUT)

| | |
|---------------------|-----------------------|
| Name | Second Battery |
| Model Name | BLB-AAA740B |
| FCC ID | 2BDA8-BLB-AAA740B |
| IC Number | N/A |
| Operating Frequency | 2 402 MHz ~ 2 480 MHz |
| Number of channels | 40 |
| Type of Modulation | GFSK |
| Nominal Voltage | 3.7 VDC |
| Tested Voltage | 3.3 VDC |
| Hardware Version | Ver 0.2 |
| Software Version | Ver 0.2 |
| Antenna Designation | Chip Antenna |
| Antenna Gain | 1.0 dBi |
| Serial No. | Prototype |

1.4 Technical specifications

This device contains the following capabilities:

Bluetooth Low Energy, FHSS (GFSK)

| Ch. | Frequency (MHz) |
|-----|-----------------|
| 01 | 2 402 |
| 02 | 2 404 |
| 03 | 2 406 |
| 04 | 2 408 |
| 05 | 2 410 |
| 06 | 2 412 |
| 07 | 2 414 |
| 08 | 2 416 |
| 09 | 2 418 |
| 10 | 2 420 |
| 11 | 2 422 |
| 12 | 2 424 |
| 13 | 2 426 |
| 14 | 2 428 |
| 15 | 2 430 |
| 16 | 2 432 |
| 17 | 2 434 |
| 18 | 2 436 |
| 19 | 2 438 |
| 20 | 2 440 |
| 21 | 2 442 |
| 22 | 2 444 |
| 23 | 2 446 |
| 24 | 2 448 |
| 25 | 2 450 |
| 26 | 2 452 |
| 27 | 2 454 |
| 28 | 2 456 |



| | |
|----|-------|
| 29 | 2 458 |
| 30 | 2 460 |
| 31 | 2 462 |
| 32 | 2 464 |
| 33 | 2 466 |
| 34 | 2 468 |
| 35 | 2 470 |
| 36 | 2 472 |
| 37 | 2 474 |
| 38 | 2 476 |
| 39 | 2 478 |
| 40 | 2 480 |

2. SUMMARY OF TEST RESULTS

| Name of Test | FCC Rules | Test Condition | Test Result |
|-----------------------------------|---------------------------|----------------|-------------|
| 6 dB Bandwidth | 15.247(a)(2) | Conducted | PASS |
| Maximum Peak Output Power | 15.247(b)(3) | | PASS |
| Peak Power Spectral Density | 15.247(e) | | PASS |
| Conducted Spurious Emission | 15.247(d) | | PASS |
| AC Power line Conducted Emissions | 15.207 | Radiated | PASS |
| Radiated Spurious Emissions | 15.205, 15.209 | | PASS |
| Radiated Restricted Band Edge | 15.247(d), 15.205, 15.209 | | PASS |

N/A – Not Applicable

Note 1 : The EUT is powered by DC.

Note 2 : All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.

Note 3 : The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest

Note 4 : All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators

* Modifications required for compliance

No modifications were implemented by KTL.

All results in this report pertain to the un-modified sample provided to KTL.

2.1 Measurement uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10_2013

All measurement uncertainty values are shown with a coverage factor of $k=2$ to indicated a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and thus, can be compared directly to specified limits to determine compliance.

| Parameter | Expanded uncertainty |
|--|--|
| Conducted Frequency | 1 176.02 Hz |
| Conducted Occupied Bandwidth | 3 465.554 Hz |
| Conducted RF power | 1.26 dB |
| Radiated spurious emissions, 9 kHz ~ 30 MHz | 3.8 dB |
| Radiated spurious emissions, 30 MHz ~ 1 GHz | 3.6 dB (Horizontal), 5.4 dB (Vertical) |
| Radiated spurious emissions, 1 GHz ~ 18 GHz | 4.7 dB (Horizontal), 4.8 dB (Vertical) |
| Radiated spurious emissions, 18 GHz ~ 26.5 GHz | 5.0 dB (Horizontal), 5.0 dB (Vertical) |
| Radiated spurious emissions, 26.5 GHz ~ 40 GHz | 5.6 dB (Horizontal), 5.7 dB (Vertical) |
| Conducted emissions | 3.0 dB |



3. TEST RESULTS

3.1 Antenna Requirements

3.1.1 Requirement

EUT must meet the antenna requirement of FCC Rule 15.203

- EUT uses a permanently attached antenna which is considered sufficient to comply with the provisions of this rule.
- EUT uses a unique antenna jack or electrical connector which is considered sufficient to comply with the provisions of this rule.

3.1.2 Attestation

The EUT use permanently attached antennas.

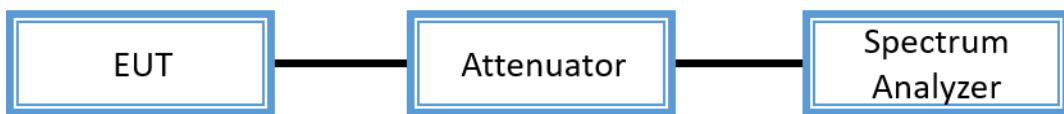
3.2 6 dB Bandwidth

3.2.1 Test Overview and Limit

The bandwidth at 6dB down from the highest in band spectral density is measured a spectrum analyzer connected to the transmitter antenna terminal of the EUT is operating at maximum power and at the appropriate frequencies. All modes of operation were investigated and the worst case configuration results are reported in this section.

The minimum permissible 6dB bandwidth is 500 kHz.

3.2.2 Test Configuration



3.2.3 Test Procedure

ANSI C63.10_2013 – Section 11.8.2
KDB 558074 v05r02 – Section 8.2

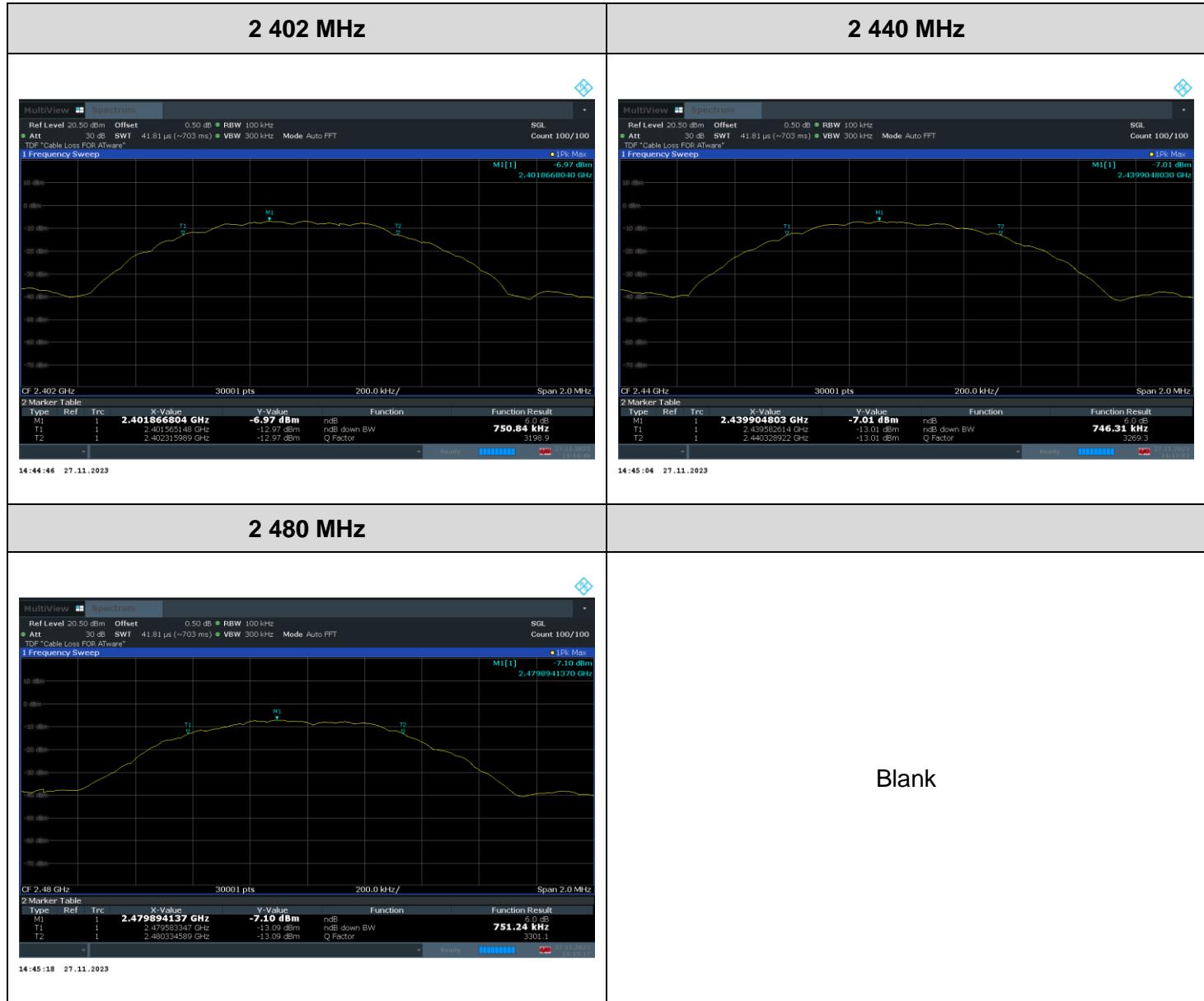
The transmitter output is connected to the Spectrum Analyzer.

1. The signal analyzers' automatic bandwidth measurement capability of the spectrum analyzer was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 100 kHz
3. VBW \geq 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize

3.2.4 Test Results

| Frequency [MHz] | Channel No. | Measured Bandwidth [kHz] | Limit [kHz] |
|--------------------|----------------|--------------------------------|----------------|
| 2 402 | 0 | 750.84 | >500 |
| 2 440 | 19 | 746.31 | |
| 2 480 | 39 | 751.24 | |

3.2.5 Result Plots



3.3 Output Power

3.3.1 Test Overview and Limit

For systems using digital modulation in the 902-928 MHz, 2 400-2 483.5 MHz, and 5 725-5 850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

The maximum permissible conducted output power is 1 Watt.

3.3.2 Test Configuration



3.3.3 Test Procedure

Peak Power (ANSI 63.10_2013 – Section 11.9.1.3)

Measure the peak power of the transmitter.

Average Power (KDB 558074 v05r02 – Section 8.3.2.3, ANSI 63.10_2013 – Section 11.9.2.3)

- 1) Measure the duty cycle.
- 2) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
- 3) Add $10 \log (1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times.



3.3.4 Test Results

| Channels | Frequency [MHz] | Channel No. | Peak Conducted Power | | Limit [mW] |
|----------|--------------------|----------------|----------------------|-------|---------------|
| | | | [dBm] | [mW] | |
| Low | 2 402 | 0 | -4.0 | 0.398 | 1 000 |
| Middle | 2 440 | 19 | -3.6 | 0.437 | 1 000 |
| High | 2 480 | 39 | -3.5 | 0.447 | 1 000 |

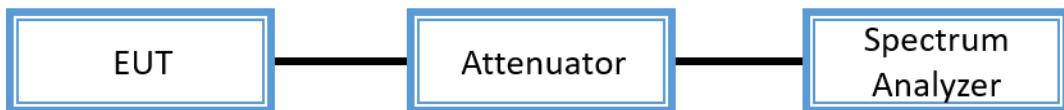
3.4 Power Spectral Density

3.4.1 Test Overview and Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

The maximum permissible power spectral density is 8 dBm in any 3 kHz band.

3.4.2 Test Configuration



3.4.3 Test Procedure

**ANSI C63.10_2023 – Section 11.10.2 Method PKPSD (Peak PSD)
KDB 558074 v05r02 – Section 8.4**

The following procedure shall be used if maximum peak conducted output power was used to determine compliance, and it is optional if the maximum conducted (average) output power was used to determine compliance

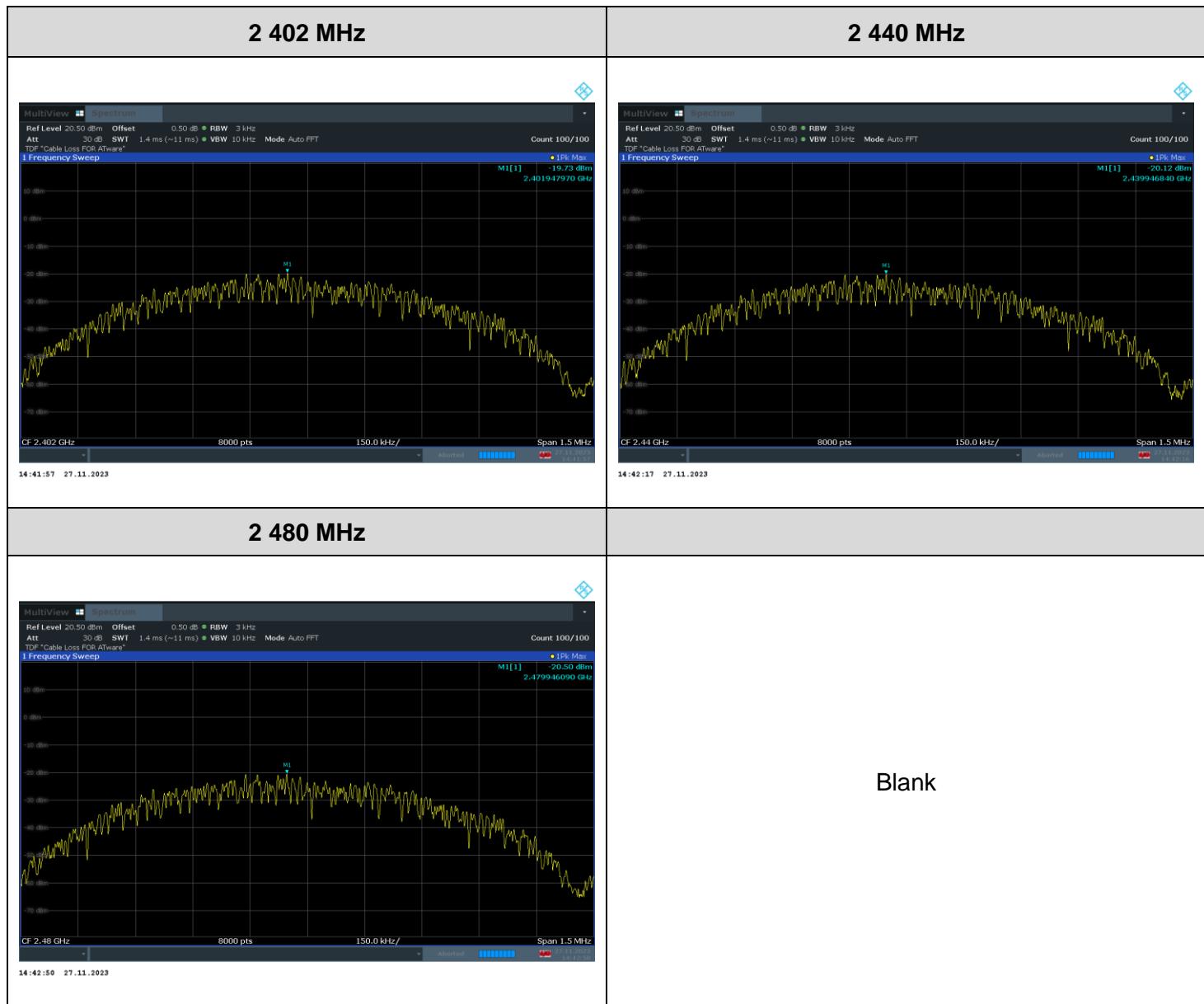
The spectrum analyzer is set to :

- 1) Set analyzer center frequency to DTS channel center frequency.
- 2) Set the span to 1.5 times the DTS bandwidth.
- 3) Set the RBW to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- 4) Set the VBW $\geq [3 \times \text{RBW}]$.
- 5) Detector = peak.
- 6) Sweep time = auto couple.
- 7) Trace mode = max hold.
- 8) Allow trace to fully stabilize.
- 9) Use the peak marker function to determine the maximum amplitude level within the RBW.
- 10) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

3.4.4 Test Results

| Channels | Frequency [MHz] | Channel No. | Test Result | |
|----------|--------------------|----------------|--------------------|----------------------|
| | | | PSD (dBm/3 kHz) | Limit (dBm/3 kHz) |
| Low | 2 402 | 0 | -19.73 | 8.0 |
| Middle | 2 440 | 19 | -20.12 | |
| High | 2 480 | 39 | -20.50 | |

3.4.5 Result Plots



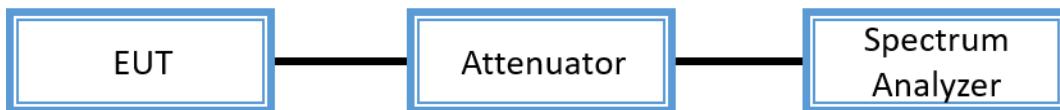
3.5 Conducted Spurious Emissions

3.5.1 Test Overview and Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see 15.205(c)).

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth per the procedure in Section 11.1 of KDB 558074 v05r02.

3.5.2 Test Configuration



3.5.3 Test Procedure

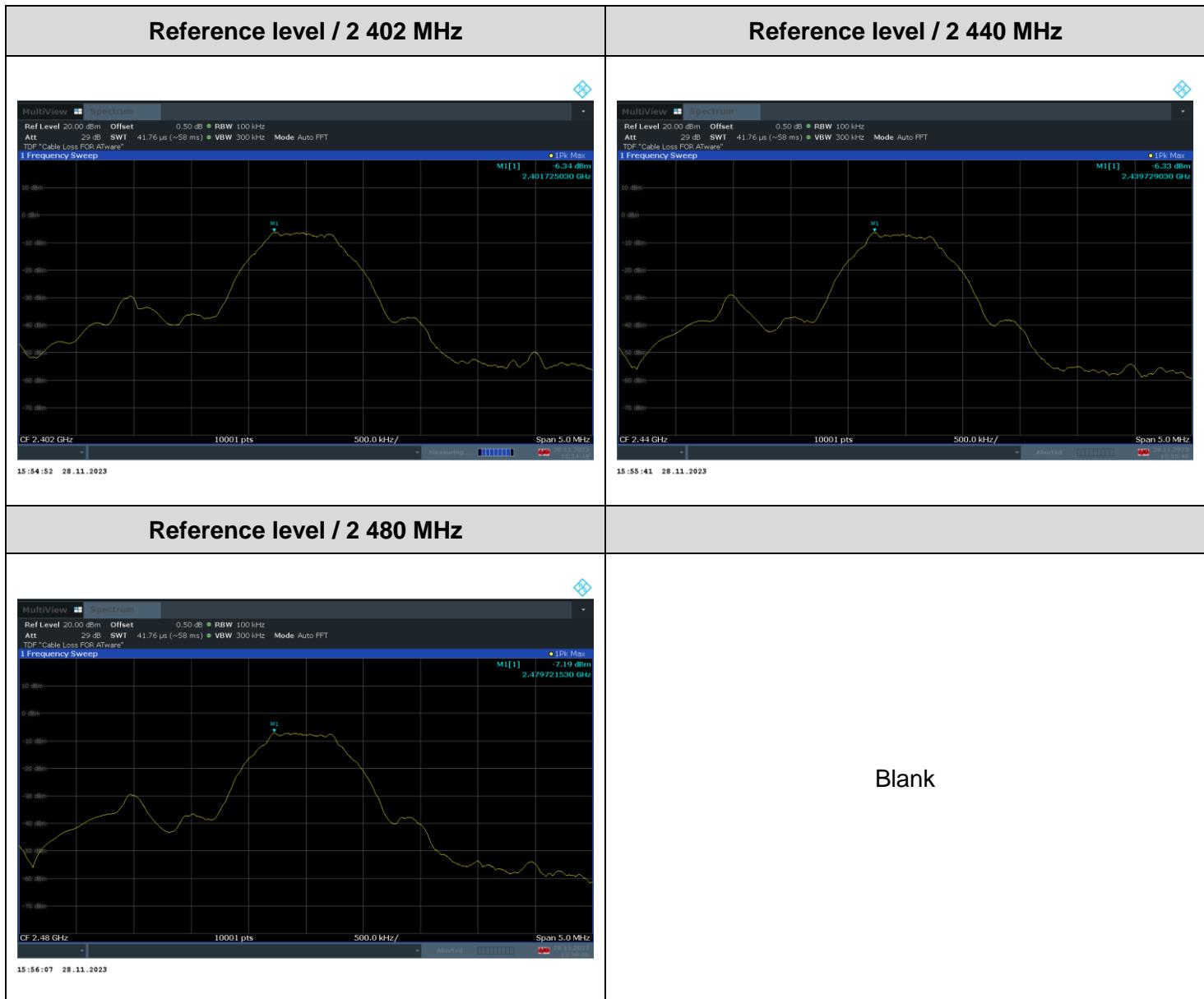
**ANSI C63.10_2013 – Section 11.11
KDB 558074 v05r02 – Section 8.5**

The transmitter output is connected to the spectrum analyzer :

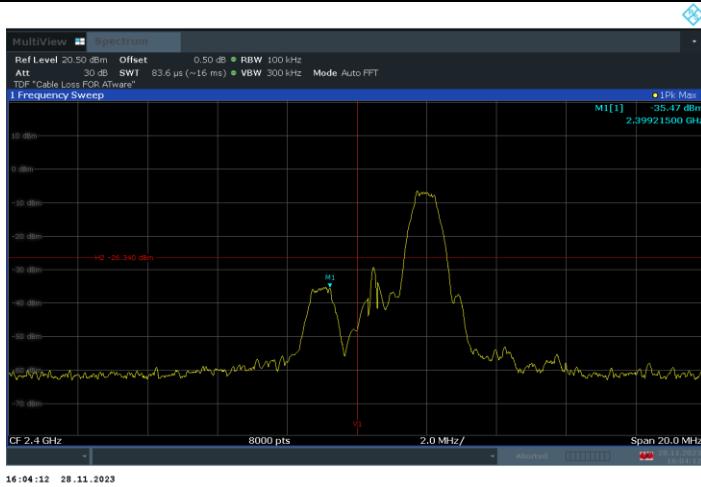
- 1) RBW = 100 kHz
- 2) VBW \geq 3 x RBW
- 3) Set span to encompass the spectrum to be examined
- 4) Detector = Peak
- 5) Trace Mode = max hold
- 6) Sweep time = auto couple
- 7) Ensure that the number of measurement points \geq Span/RBW
- 8) Allow trace to fully stabilize.
- 9) Use peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

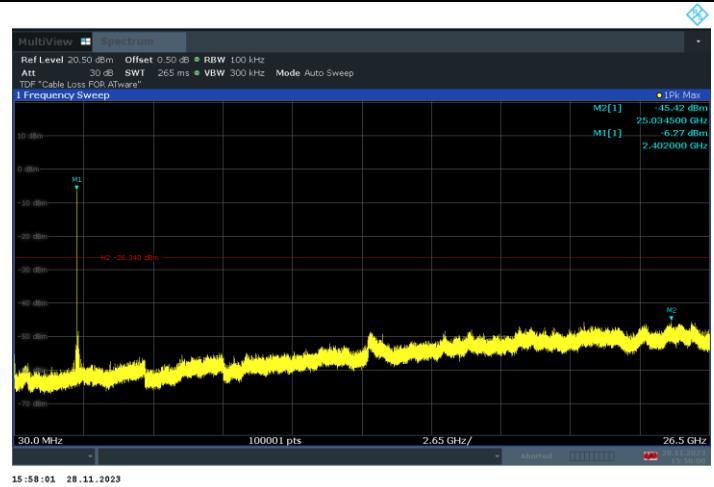
3.5.4 Result Plots



Conducted band-edge / 2 402 MHz



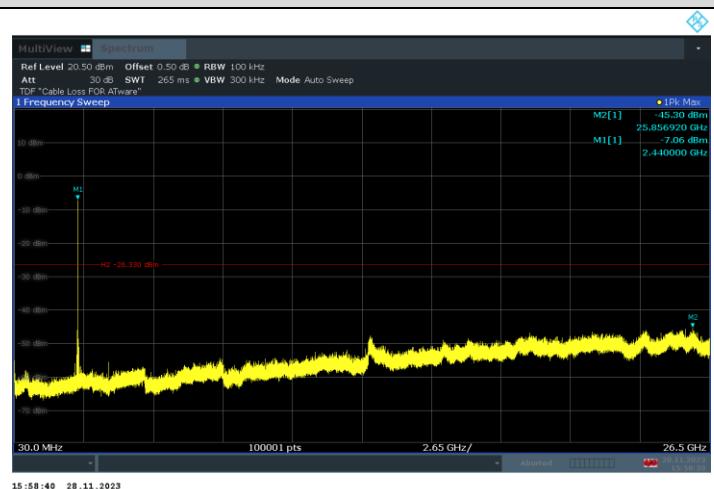
Conducted spurious / 2 402 MHz



Conducted band-edge / 2 440 MHz

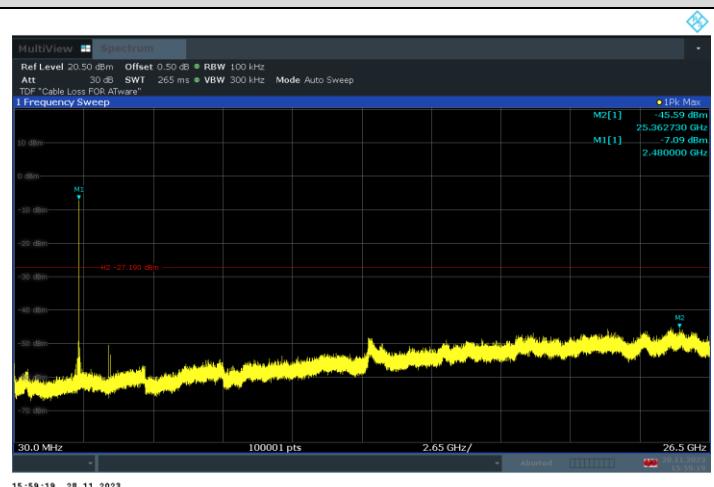
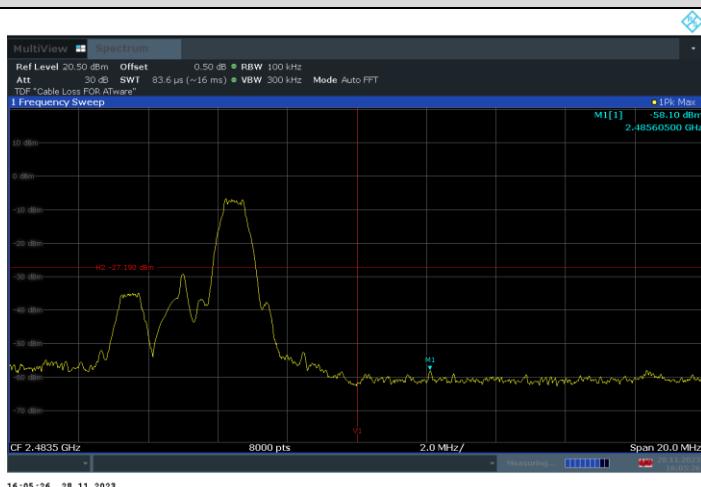
Blank

Conducted spurious / 2 440 MHz



Conducted band-edge / 2 480 MHz

Conducted spurious / 2 480 MHz



3.6 Radiated Measurement

3.6.1 Radiated Spurious Emissions, Band Edge and Restricted bands

Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength (μ V/m) | Measurement Distance (m) |
|-----------------|-----------------------------|--------------------------|
| 0.009 ~ 0.490 | 2 400/F(kHz) | 300 |
| 0.490 ~ 1.705 | 24 000/F(kHz) | 30 |
| 1.705 ~ 30 | 30 | 30 |
| 30 ~ 88 | 100 | 3 |
| 88 ~ 216 | 150 | 3 |
| 216 ~ 960 | 200 | 3 |
| Above 960 | 500 | 3 |

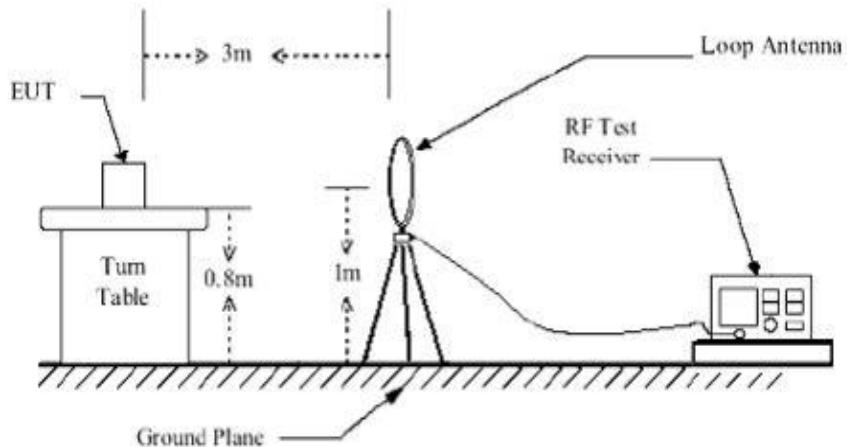
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241.

According to section 15.205(a) and (b), only spurious emissions are permitted in any of the frequency bands listed below:

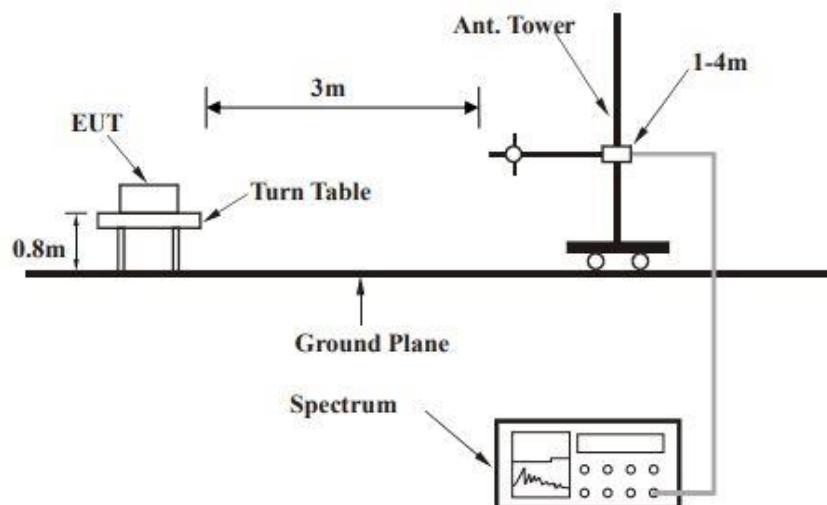
| MHz | MHz | MHz | GHz |
|-----------------------|-------------------------|-------------------|---------------|
| 0.009 – 0.110 | 16.42 – 16.423 | 399.9 – 410 | 4.5 – 5.15 |
| 0.495 – 0.505 | 16.694 75 – 16.695 25 | 608 – 614 | 5.35 – 5.46 |
| 2.173 5 – 2.190 5 | 16.804 25 – 16.804 75 | 960 – 1 240 | 7.25 – 7.75 |
| 4.125 – 4.128 | 25.5 – 25.67 | 1 300 – 1 427 | 8.025 – 8.5 |
| 4.177 25 – 4.177 75 | 37.5 – 38.25 | 1 435 – 1 626.5 | 9.0 – 9.2 |
| 4.207 25 – 4.207 75 | 73 – 74.6 | 1 645.5 – 1 646.5 | 9.3 – 9.5 |
| 6.215 – 6.218 | 74.8 – 75.2 | 1 660 – 1 710 | 10.6 – 12.7 |
| 6.311 75 – 6.312 25 | 108 – 121.94 | 1 718.8 – 1 722.2 | 13.25 – 13.4 |
| 8.291 – 8.294 | 123 – 138 | 2 220 – 2 300 | 14.47 – 14.5 |
| 8.362 – 8.366 | 149.9 – 150.05 | 2 310 – 2 390 | 15.35 – 16.2 |
| 8.376 25 – 8.386 75 | 156.524 75 – 156.525 25 | 2 483.5 – 2 500 | 17.7 – 21.4 |
| 8.414 25 – 8.414 75 | 156.7 – 156.9 | 2 690 – 2 900 | 22.01 – 23.12 |
| 12.29 – 12.293 | 162.012 5 – 167.17 | 3 260 – 3 267 | 23.6 – 24.0 |
| 12.519 75 – 12.520 25 | 167.72 – 173.2 | 3 332 – 3 339 | 31.2 – 31.8 |
| 12.576 75 – 12.577 25 | 240 – 285 | 3 345.8 – 3 358 | 36.43 – 36.5 |
| 13.36 – 13.41 | 322 – 335.4 | 3 600 – 4 400 | Above 38.6 |

3.6.2 Test Configuration

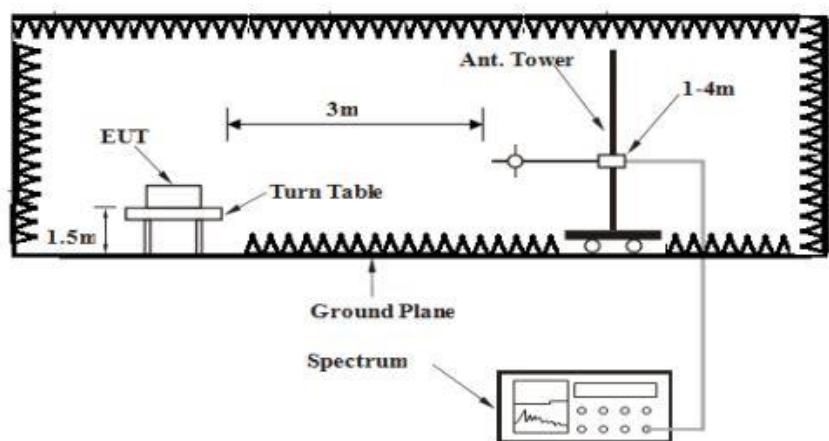
Below 30 MHz



30 MHz ~ 1 GHz



Above 1 GHz



3.6.3 Test Procedure

ANSI C63.10_2013- Section 6.3, 6.4, 6.5, 6.6, 11.12

3.6.3.1 Radiated spurious emissions(Below 30 MHz)

- 1) The EUT was placed on a non-conductive table located on semi-anechoic chamber.
- 2) The loop antenna was placed at a location 3 m from the EUT
- 3) The EUT is placed on a turntable, which is 0.8 m above ground plane.
- 4) We have done x,y,z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
- 5) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 6) Distance Correction Factor(0.009 MHz ~ 0.490 MHz) = $40\log(3 \text{ m}/300 \text{ m}) = -80 \text{ dB}$
Measurement Distance : 3 m
- 7) Distance Correction Factor(0.490 MHz ~ 30 MHz) = $40\log(3 \text{ m}/30 \text{ m}) = -40 \text{ dB}$
Measurement Distance : 3 m
- 8) Spectrum Setting
 - Frequency Range = 9 kHz ~ 30 MHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 200 Hz (Frequency : 9 kHz ~ 150 kHz), 9 kHz (Frequency : 150 kHz ~ 30 MHz)
 - VBW $\geq 3 \times$ RBW
- 9) Total = Measured Value + Antenna Factor + Cable Loss + Distance Factor
- 10) Measurement value only up to 6 maximum emissions noted. Or would be lesser if no specific emissions from the EUT are recorded and considered that's already beyond the background noise floor.

3.6.3.2 Radiated spurious emissions(Below 1 GHz)

- 1) The EUT was placed on a non-conductive table located on semi-anechoic chamber.
- 2) The EUT is placed on a turntable, which is 0.8 m above ground plane.
- 3) The Hybrid antenna was placed at a location 3 m from the EUT, which is varied from 1 m to 4 m to find out the highest emissions.
- 4) We have done x,y,z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 5) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 6) Spectrum Setting
 - <Peak>**
 - Frequency Range = 30 MHz ~ 1 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 100 kHz
 - VBW $\geq 3 \times$ RBW
 - <Quasi-peak>**
 - Frequency Range = 30 MHz ~ 1 GHz
 - Detector = Quasi-Peak
 - Trace = Maxhold
 - RBW = 120 kHz
- 7) Total = Measured Value + Antenna Factor + Cable Loss
- 8) Measurement value only up to 6 maximum emissions noted. Or would be lesser if no specific emissions from the EUT are recorded and considered that's already beyond the background noise floor.

3.6.3.3 Radiated spurious emissions(Above 1 GHz)

- 1) The EUT is placed on a turntable, which is 1.5 m above ground plane.
- 2) We have done x,y,z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 3) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 4) EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
- 5) Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6) Each emissions was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

7) Spectrum Setting

<Peak>

- Frequency Range = 1 GHz ~ 26.5 GHz
- Detector = Peak
- Trace = Maxhold
- RBW = 1 MHz
- VBW \geq 3 x RBW

<Average>

- Duty cycle < 98 %, duty cycle variations are less than $\pm 2 \%$
- Measured Frequency Range : 1 GHz ~ 26.5 GHz
- Detector = RMS
- Averaging type = power
- RBW = 1 MHz
- VBW \geq 3 x RBW
- Sweep time = auto
- Trace = average
- Correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle

- 8) Measurement value only up to 6 maximum emissions noted. Or would be lesser if no specific emissions from the EUT are recorded and considered that's already beyond the background noise floor.

3.6.3.3 Radiated Restricted Band Edge

- 1) The EUT is placed on a turntable, which is 1.5 m above ground plane.
- 2) We have done x,y,z planes in EUT and horizontal and vertical polarization in detecting antenna.
- 3) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 4) EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
- 5) Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6) Each emissions was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

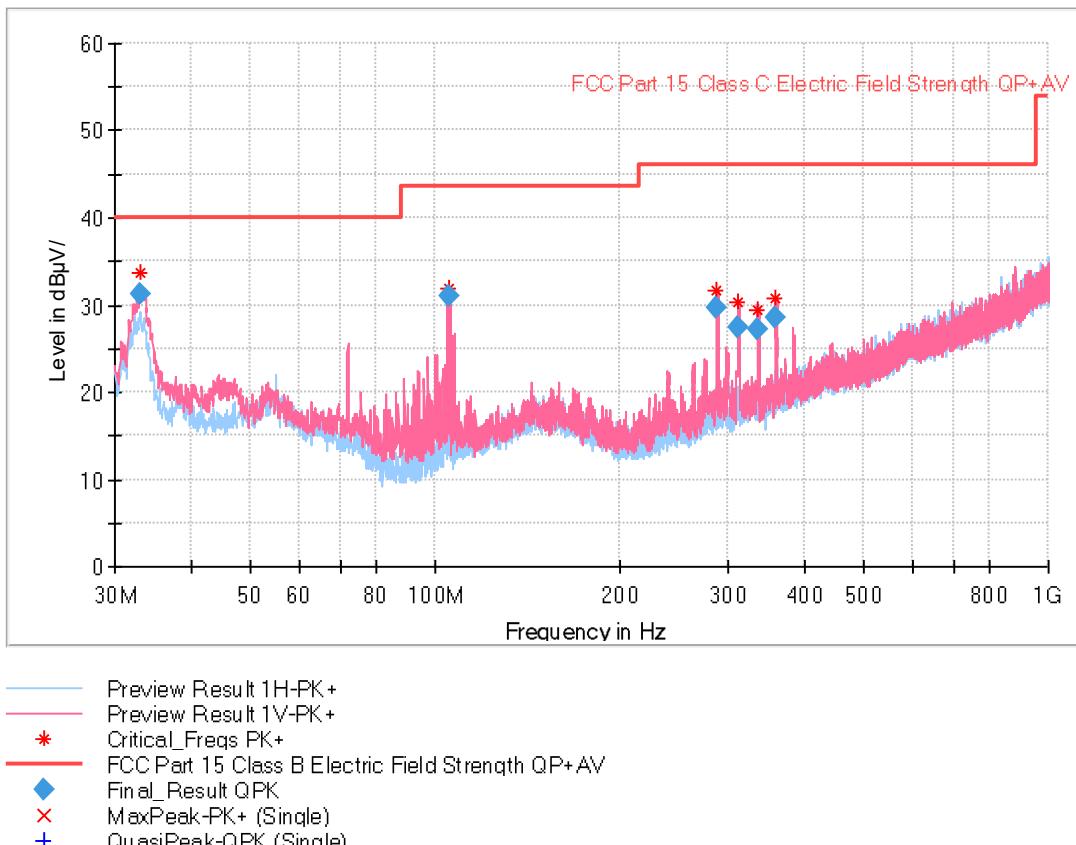
7) Spectrum Setting

- RBW = 1 MHz
- VBW \geq 1 / T
- Detector = peak
- Sweep time = auto
- Trace mode = max hold
- Allow max hold to run for at least [50 (1/D)] traces

3.6.4 Test Results and Plots

Below 1000 MHz

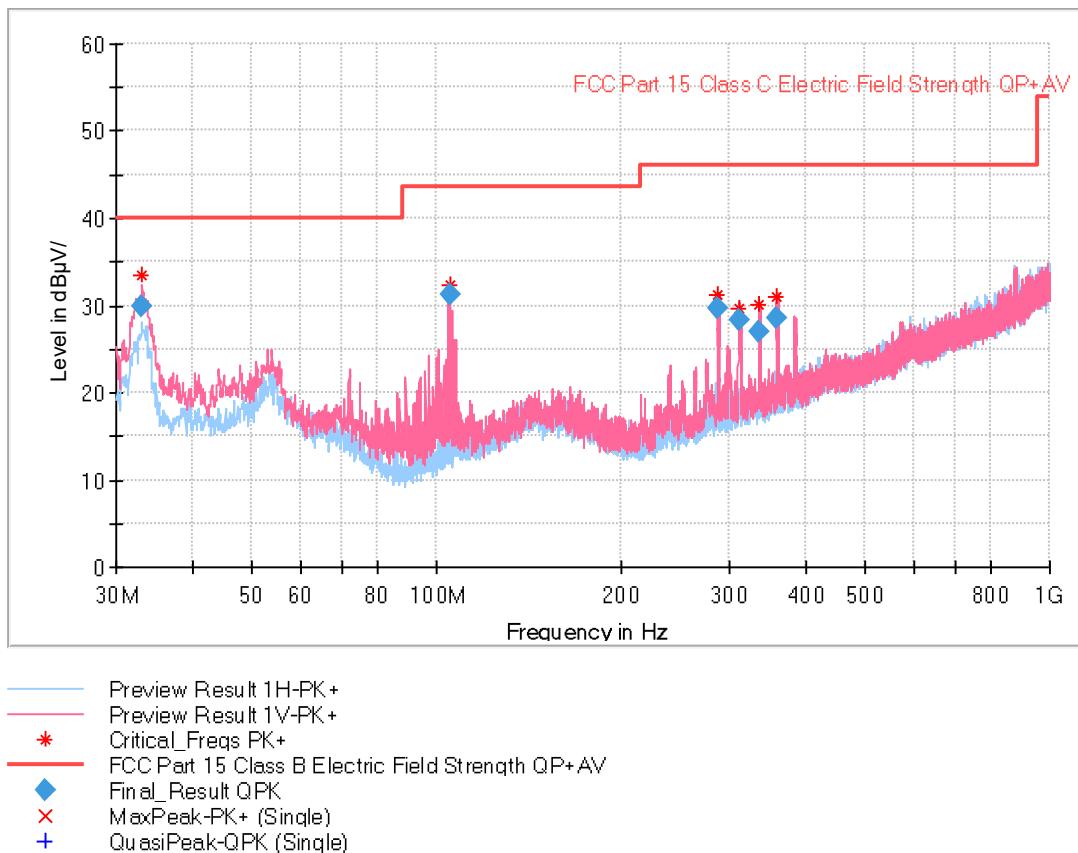
- Low CH (2 402 MHz)



Final Result

| Frequency (MHz) | QuasiPeak (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|--------------------------|----------------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 33.08 | 31.2 | 40.0 | 8.8 | 15 000.0 | 120.0 | 325.0 | V | 300.0 | -13.3 |
| 104.89 | 30.9 | 43.5 | 12.6 | 15 000.0 | 120.0 | 278.0 | V | 254.0 | -15.5 |
| 288.09 | 29.6 | 46.0 | 16.4 | 15 000.0 | 120.0 | 112.0 | V | 27.0 | -10.8 |
| 311.52 | 27.5 | 46.0 | 18.5 | 15 000.0 | 120.0 | 125.0 | V | 333.0 | -10.1 |
| 336.21 | 27.1 | 46.0 | 18.9 | 15 000.0 | 120.0 | 217.0 | V | 290.0 | -9.4 |
| 359.46 | 28.5 | 46.0 | 17.5 | 15 000.0 | 120.0 | 100.0 | V | 333.0 | -8.9 |

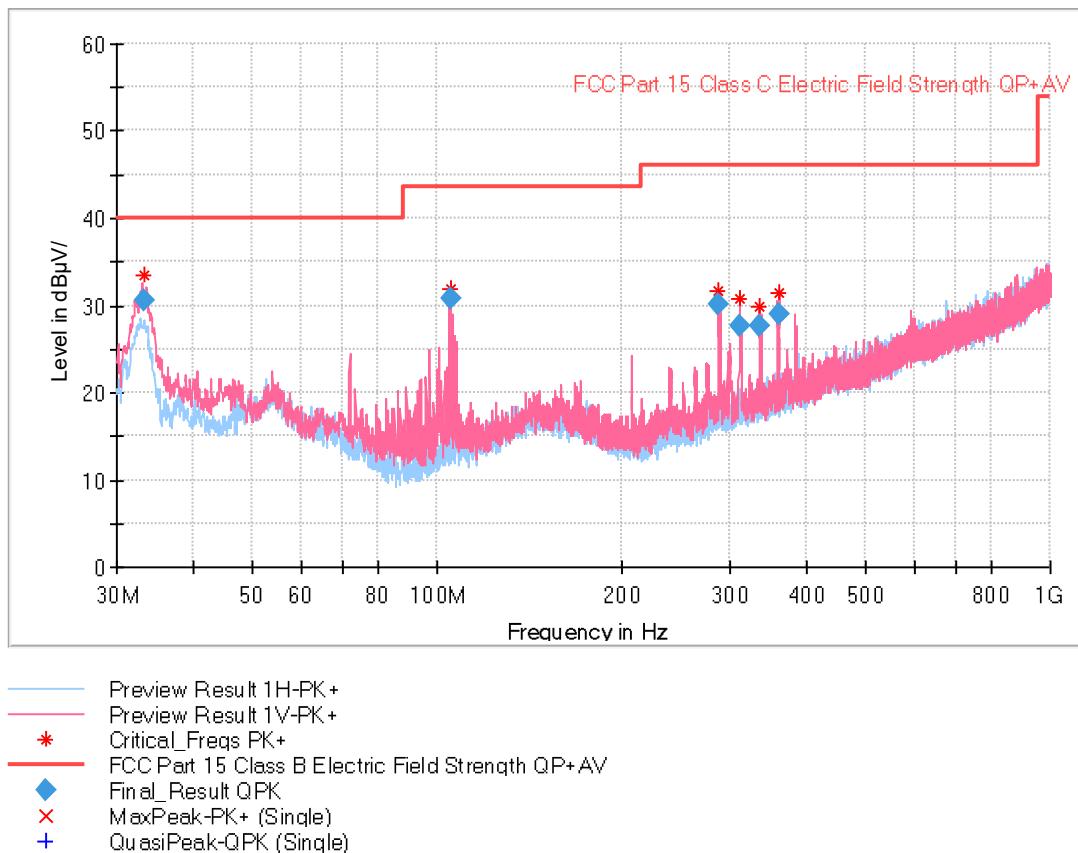
- Middle CH (2 440 MHz)



Final_Result

| Frequency (MHz) | QuasiPeak (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|--------------------------|----------------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 32.97 | 29.8 | 40.0 | 10.2 | 15 000.0 | 120.0 | 97.0 | V | 6.0 | -13.3 |
| 104.88 | 31.3 | 43.5 | 12.2 | 15 000.0 | 120.0 | 225.0 | V | 260.0 | -15.5 |
| 287.54 | 29.7 | 46.0 | 16.3 | 15 000.0 | 120.0 | 97.0 | V | 345.0 | -10.8 |
| 312.63 | 28.4 | 46.0 | 17.6 | 15 000.0 | 120.0 | 117.0 | V | 143.0 | -10.0 |
| 334.97 | 27.0 | 46.0 | 19.0 | 15 000.0 | 120.0 | 97.0 | V | 197.0 | -9.4 |
| 359.34 | 28.5 | 46.0 | 17.5 | 15 000.0 | 120.0 | 97.0 | V | 273.0 | -8.9 |

- High CH (2 480 MHz)



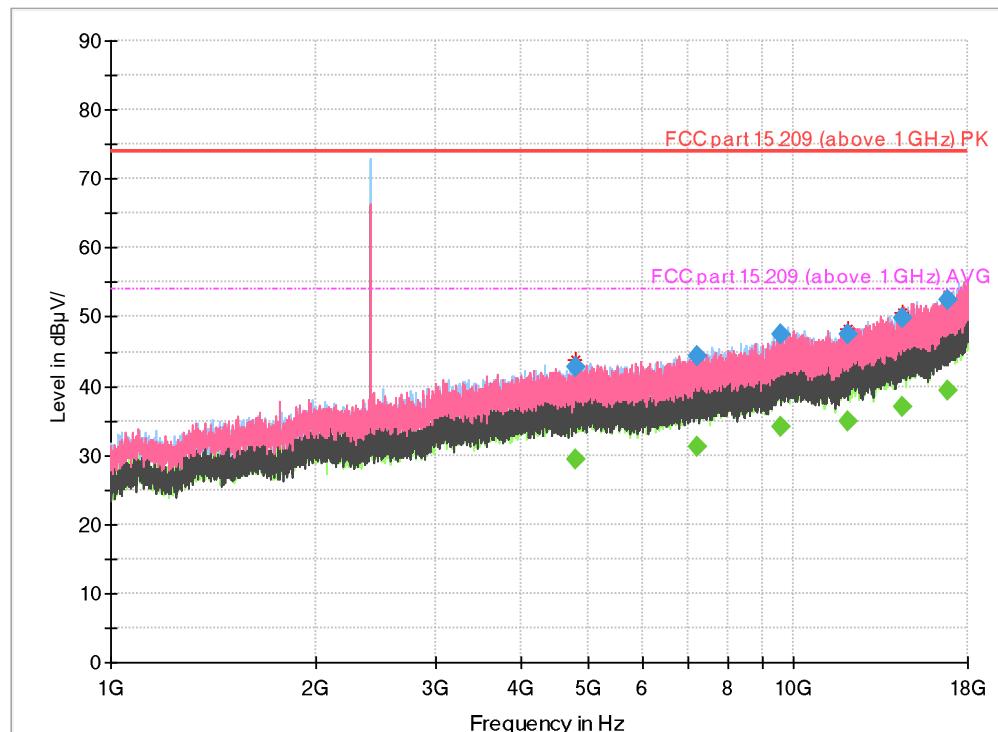
Final_Result

| Frequency (MHz) | QuasiPeak (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|-----------------|--------------------|----------------|-------------|-----------------|-----------------|-------------|-----|---------------|--------------|
| 33.32 | 30.5 | 40.0 | 9.5 | 15 000.0 | 120.0 | 125.0 | V | 47.0 | -13.3 |
| 104.89 | 30.8 | 43.5 | 12.7 | 15 000.0 | 120.0 | 225.0 | V | 177.0 | -15.5 |
| 288.25 | 30.1 | 46.0 | 15.9 | 15 000.0 | 120.0 | 104.0 | V | 294.0 | -10.8 |
| 311.04 | 27.7 | 46.0 | 18.3 | 15 000.0 | 120.0 | 100.0 | V | 154.0 | -10.1 |
| 336.40 | 27.6 | 46.0 | 18.4 | 15 000.0 | 120.0 | 179.0 | V | 84.0 | -9.4 |
| 359.85 | 29.0 | 46.0 | 17.0 | 15 000.0 | 120.0 | 98.0 | V | 1.0 | -8.9 |

1 GHz ~ 18 GHz

- Low CH (2 402 MHz)

Full Spectrum

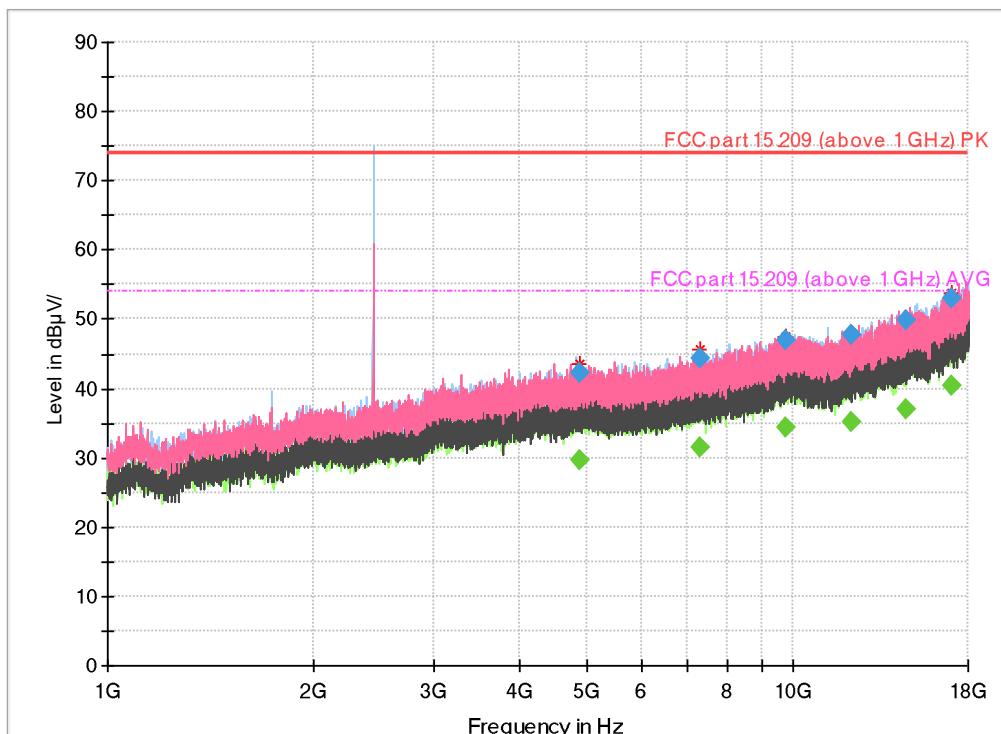


Final Result

| Frequency (MHz) | MaxPeak (dBμV/m) | Average (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Pol | Azimuth (deg) | Corr. (dB/m) | Height (cm) |
|-----------------|------------------|------------------|----------------|-------------|-----------------|-----------------|-----|---------------|--------------|-------------|
| 4804.00 | --- | 29.43 | 54.0 | 24.6 | 15 000 | 1 000.0 | V | 289.0 | 5.9 | 142.0 |
| 4804.00 | 42.78 | --- | 74.0 | 31.2 | 15 000 | 1 000.0 | V | 289.0 | 5.9 | 143.0 |
| 7206.00 | --- | 31.27 | 54.0 | 22.7 | 15 000 | 1 000.0 | H | 289.0 | 8.1 | 142.0 |
| 7206.00 | 44.45 | --- | 74.0 | 29.5 | 15 000 | 1 000.0 | H | 289.0 | 8.1 | 143.0 |
| 9608.00 | --- | 34.21 | 54.0 | 19.8 | 15 000 | 1 000.0 | H | 39.0 | 11.2 | 142.0 |
| 9608.00 | 47.58 | --- | 74.0 | 26.4 | 15 000 | 1 000.0 | H | 39.0 | 11.2 | 143.0 |
| 12010.00 | 47.59 | --- | 74.0 | 26.4 | 15 000 | 1 000.0 | V | 20.0 | 11.2 | 143.0 |
| 12010.00 | --- | 34.89 | 54.0 | 19.1 | 15 000 | 1 000.0 | H | 169.0 | 11.2 | 158.0 |
| 14412.00 | 49.74 | --- | 74.0 | 24.3 | 15 000 | 1 000.0 | V | 49.0 | 14.2 | 145.0 |
| 14412.00 | --- | 37.03 | 54.0 | 17.0 | 15 000 | 1 000.0 | V | 48.0 | 14.2 | 143.0 |
| 16814.00 | --- | 39.33 | 54.0 | 14.7 | 15 000 | 1 000.0 | V | 190.0 | 16.1 | 143.0 |
| 16814.00 | 52.37 | --- | 74.0 | 21.6 | 15 000 | 1 000.0 | H | 269.0 | 16.1 | 148.0 |

- Middle CH (2 440 MHz)

Full Spectrum

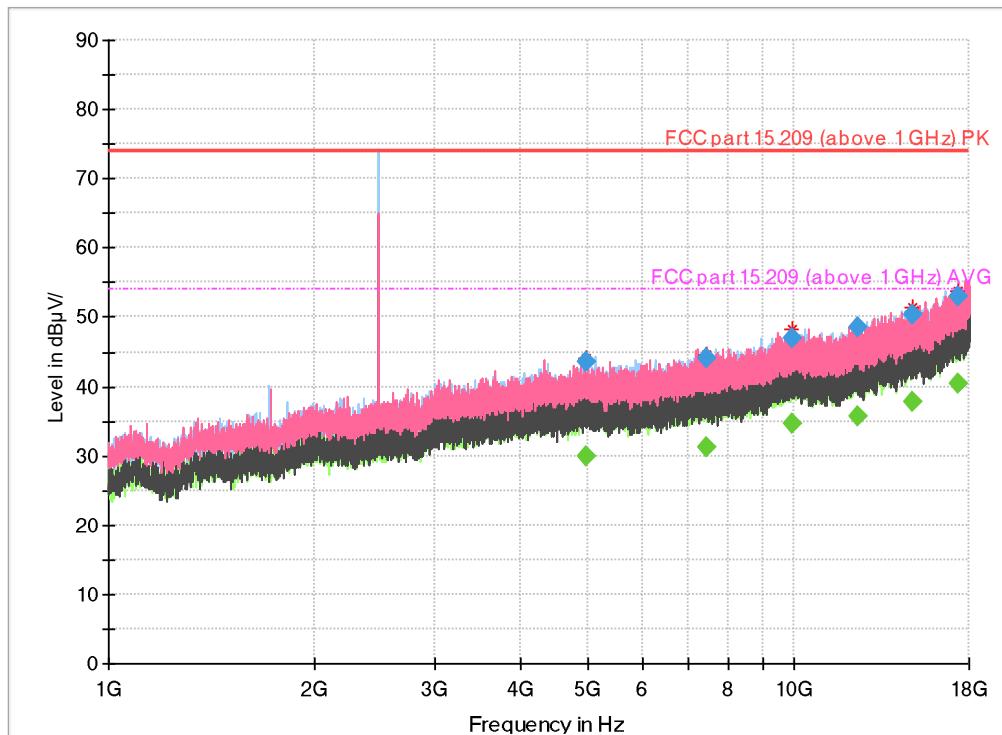


Final_Result

| Frequency (MHz) | MaxPeak (dB μ V/m) | Average (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Pol | Azimuth (deg) | Corr. (dB/m) | Height (cm) |
|-----------------|------------------------|------------------------|----------------------|-------------|-----------------|-----------------|-----|---------------|--------------|-------------|
| 4880.00 | --- | 29.75 | 54.0 | 24.3 | 15 000 | 1 000.0 | V | 81.0 | 6.2 | 143.0 |
| 4880.00 | 42.36 | --- | 74.0 | 31.6 | 15 000 | 1 000.0 | V | 86.0 | 6.2 | 143.0 |
| 7320.00 | --- | 31.58 | 54.0 | 22.4 | 15 000 | 1 000.0 | V | 57.0 | 8.2 | 157.0 |
| 7320.00 | 44.39 | --- | 74.0 | 29.6 | 15 000 | 1 000.0 | V | 57.0 | 8.2 | 157.0 |
| 9760.00 | --- | 34.31 | 54.0 | 19.7 | 15 000 | 1 000.0 | H | 0.0 | 11.3 | 158.0 |
| 9760.00 | 46.98 | --- | 74.0 | 27.0 | 15 000 | 1 000.0 | H | 1.0 | 11.3 | 158.0 |
| 12200.00 | 47.85 | --- | 74.0 | 26.2 | 15 000 | 1 000.0 | V | 22.0 | 11.4 | 145.0 |
| 12200.00 | --- | 35.08 | 54.0 | 18.9 | 15 000 | 1 000.0 | V | 21.0 | 11.4 | 142.0 |
| 14640.00 | 49.81 | --- | 74.0 | 24.2 | 15 000 | 1 000.0 | V | 274.0 | 14.4 | 157.0 |
| 14640.00 | --- | 36.91 | 54.0 | 17.1 | 15 000 | 1 000.0 | H | -1.0 | 14.4 | 142.0 |
| 17080.00 | --- | 40.32 | 54.0 | 13.7 | 15 000 | 1 000.0 | H | 91.0 | 16.5 | 158.0 |
| 17080.00 | 53.08 | --- | 74.0 | 20.9 | 15 000 | 1 000.0 | H | 92.0 | 16.5 | 158.0 |

- High CH (2 480 MHz)

Full Spectrum

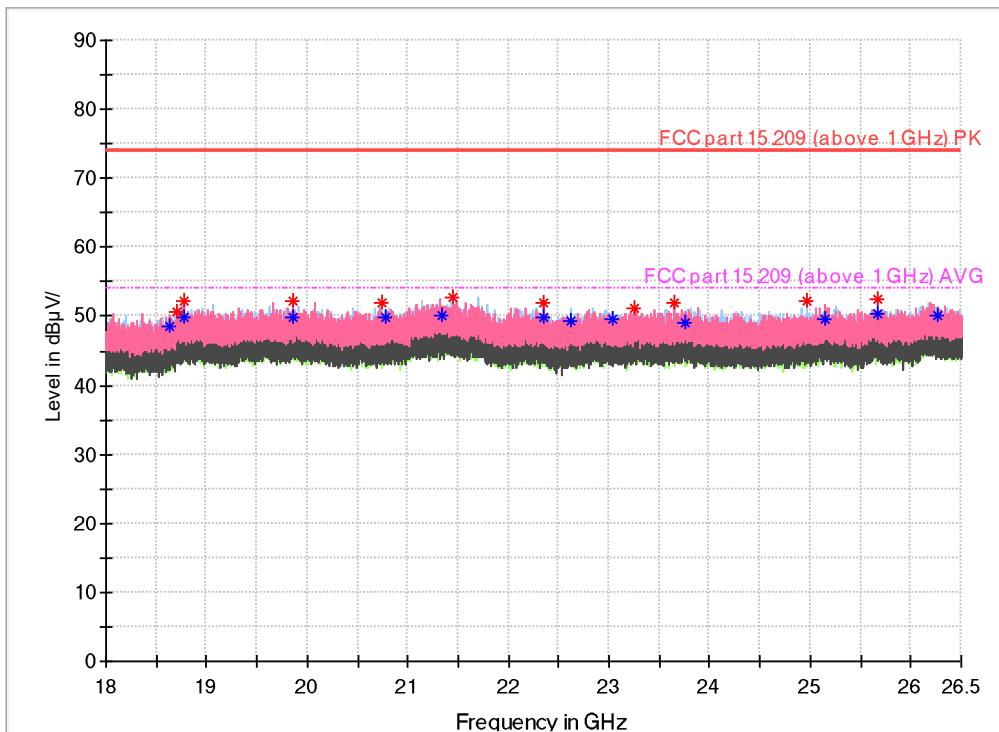


Final_Result

| Frequency (MHz) | MaxPeak (dB μ V/m) | Average (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Pol | Azimuth (deg) | Corr. (dB/m) | Height (cm) |
|-----------------|------------------------|------------------------|----------------------|-------------|-----------------|-----------------|-----|---------------|--------------|-------------|
| 4960.00 | --- | 29.85 | 54.0 | 24.1 | 15 000 | 1 000.0 | V | 72.0 | 6.5 | 142.0 |
| 4960.00 | 43.45 | --- | 74.0 | 30.6 | 15 000 | 1 000.0 | V | 72.0 | 6.5 | 142.0 |
| 7440.00 | --- | 31.19 | 54.0 | 22.8 | 15 000 | 1 000.0 | V | 246.0 | 8.1 | 142.0 |
| 7440.00 | 44.11 | --- | 74.0 | 29.9 | 15 000 | 1 000.0 | V | 246.0 | 8.1 | 158.0 |
| 9920.00 | --- | 34.60 | 54.0 | 19.4 | 15 000 | 1 000.0 | H | 15.0 | 11.4 | 142.0 |
| 9920.00 | 47.06 | --- | 74.0 | 26.9 | 15 000 | 1 000.0 | V | 203.0 | 11.4 | 157.0 |
| 12400.00 | 48.45 | --- | 74.0 | 25.6 | 15 000 | 1 000.0 | H | 71.0 | 11.3 | 158.0 |
| 12400.00 | --- | 35.63 | 54.0 | 18.4 | 15 000 | 1 000.0 | H | 72.0 | 11.3 | 157.0 |
| 14880.00 | 50.51 | --- | 74.0 | 23.5 | 15 000 | 1 000.0 | H | 214.0 | 14.7 | 143.0 |
| 14880.00 | --- | 37.80 | 54.0 | 16.2 | 15 000 | 1 000.0 | H | 214.0 | 14.7 | 158.0 |
| 17360.00 | --- | 40.36 | 54.0 | 13.6 | 15 000 | 1 000.0 | H | 128.0 | 17.1 | 157.0 |
| 17360.00 | 52.94 | --- | 74.0 | 21.1 | 15 000 | 1 000.0 | H | 128.0 | 17.1 | 158.0 |

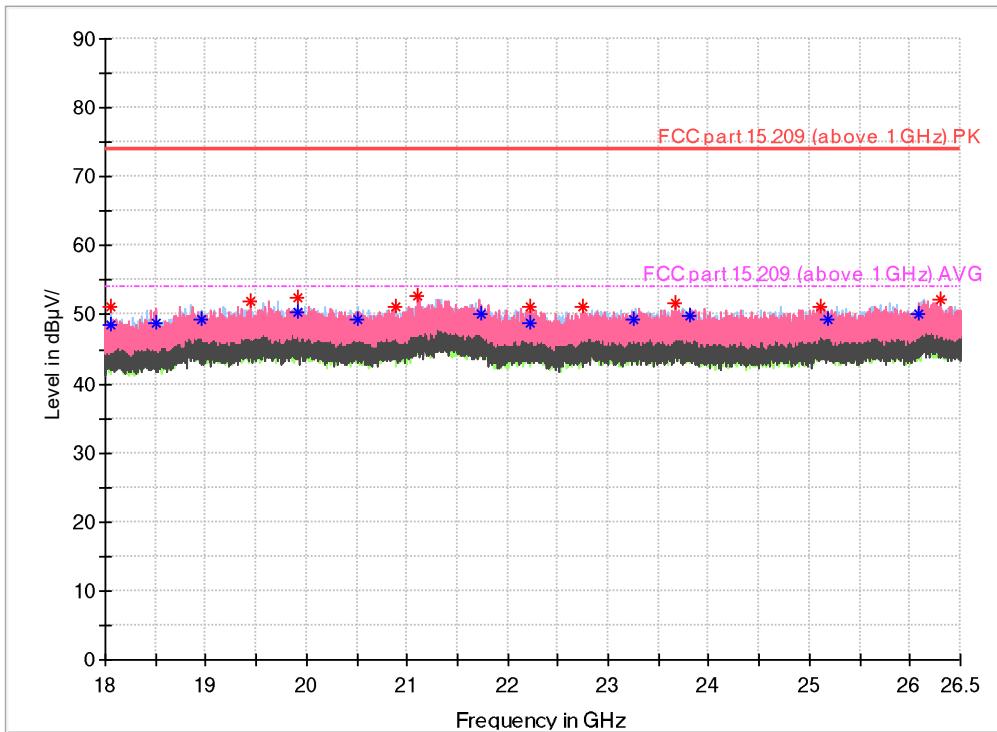
18 GHz ~ 26.5 GHz
- Low CH (2 402 MHz)

Full Spectrum



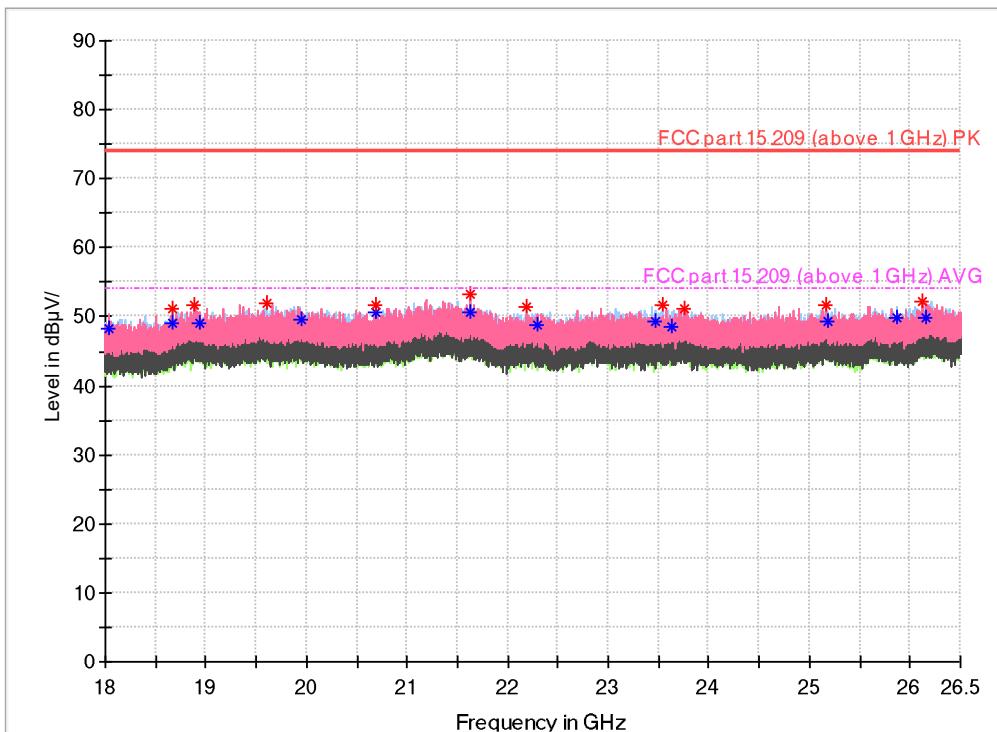
- Middle CH (2.440 MHz)

Full Spectrum



- High CH (2 480 MHz)

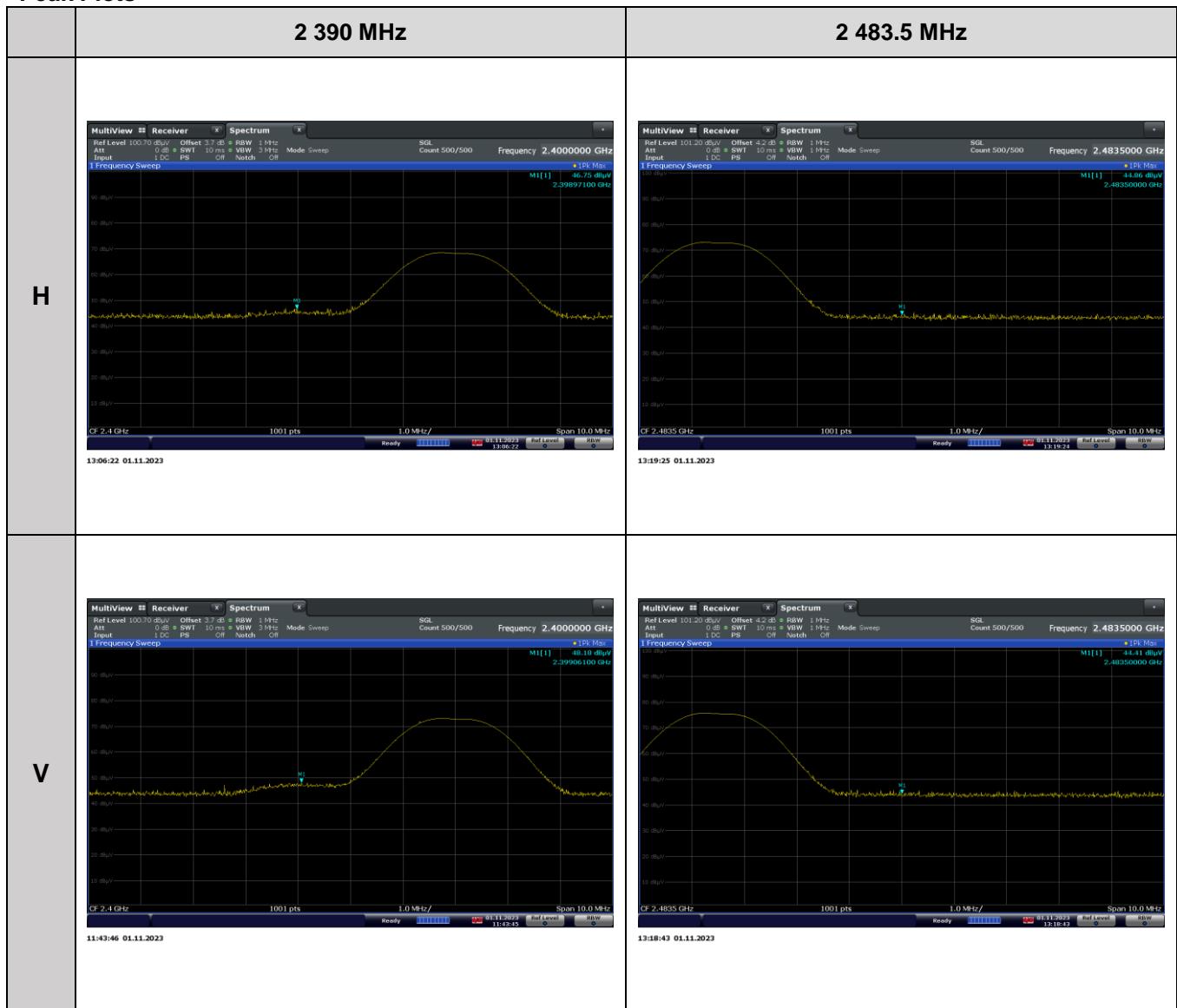
Full Spectrum



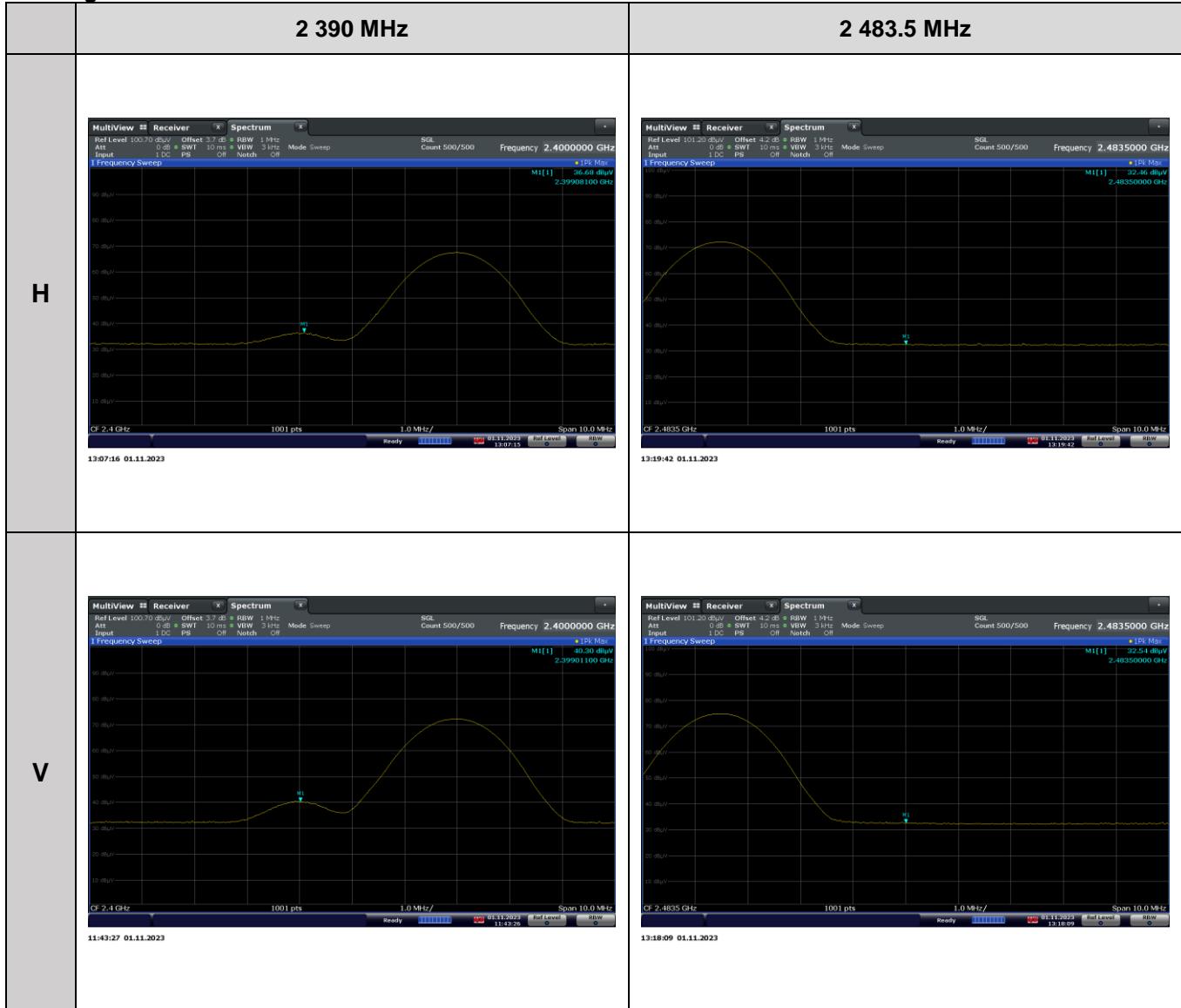
Band-edge and Restricted band

| Frequency (MHz) | Reading (dB μ V/m) | Corr. (dB/m) | Result (dB μ V/m) | Limit (dB μ V/m) | Margin (dB) | Pol | Detector |
|-----------------|------------------------|--------------|-----------------------|----------------------|-------------|-----|----------|
| 2 390.0 | 40.68 | 3.7 | 44.38 | 74.0 | 29.62 | H | Peak |
| 2 390.0 | 29.05 | 3.7 | 32.75 | 54.0 | 21.25 | H | Average |
| 2 390.0 | 40.47 | 3.7 | 44.17 | 74.0 | 29.83 | V | Peak |
| 2 390.0 | 28.97 | 3.7 | 32.67 | 54.0 | 21.33 | V | Average |
| 2 483.5 | 40.66 | 4.2 | 44.86 | 74.0 | 29.14 | H | Peak |
| 2 483.5 | 28.26 | 4.2 | 32.46 | 54.0 | 21.54 | H | Average |
| 2 483.5 | 40.21 | 4.2 | 44.41 | 74.0 | 29.59 | V | Peak |
| 2 483.5 | 28.34 | 4.2 | 32.54 | 54.0 | 21.46 | V | Average |

Peak Plots



Average Plots



3.7 AC Power line Conducted Emissions

3.7.1 Test Limit

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN)

| Frequency Range [MHz] | Limits[dB μ V] | |
|-----------------------|---------------------------|-------------------------|
| | Quasi-peak ^(a) | Average ^(a) |
| 0.15 to 0.50 | 66 to 56 ^(a) | 56 to 46 ^(a) |
| 0.50 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |

(a) Decreases with the logarithm of the frequency

Compliance with this provision shall be based on the measurement of the radio frequency Voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

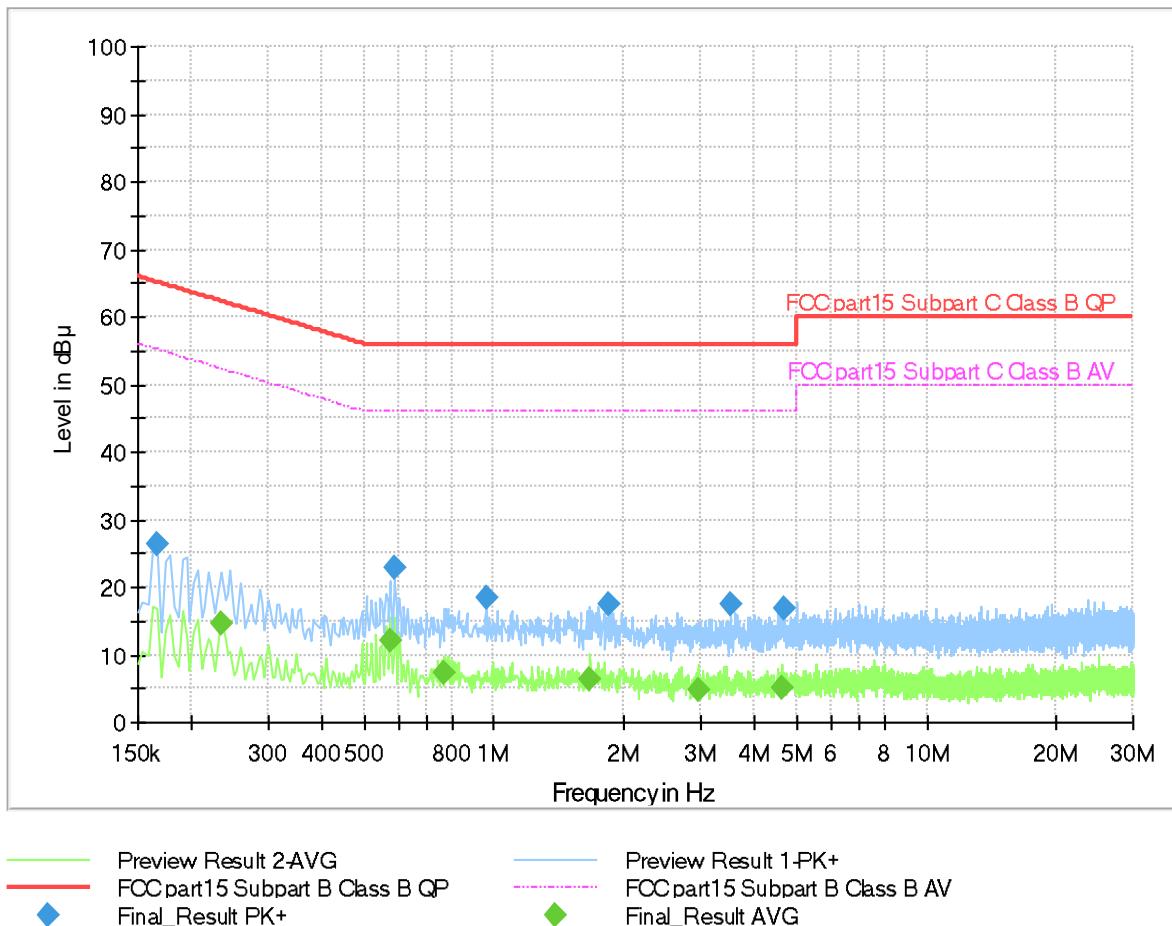
3.7.2 Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

3.7.3 Test Procedure

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below.
4. Detectors : Quasi Peak and Average Detector.

3.7.4 Test Results and Plots



Final_Result

| Frequency (MHz) | MaxPeak (dB μ V) | Average (dB μ V) | Limit (dB μ V) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|-----------------|----------------------|----------------------|--------------------|-------------|-----------------|-----------------|------|------------|
| 0.17 | 26.5 | --- | 65.2 | 38.6 | 3000.0 | 9.0 | N | 9.8 |
| 0.23 | --- | 14.7 | 52.3 | 37.6 | 3000.0 | 9.0 | N | 9.8 |
| 0.57 | --- | 12.2 | 46.0 | 33.8 | 3000.0 | 9.0 | N | 10.0 |
| 0.59 | 22.9 | --- | 56.0 | 33.1 | 3000.0 | 9.0 | N | 10.0 |
| 0.77 | --- | 7.3 | 46.0 | 38.7 | 3000.0 | 9.0 | N | 10.0 |
| 0.96 | 18.3 | --- | 56.0 | 37.7 | 3000.0 | 9.0 | N | 10.1 |
| 1.67 | --- | 6.3 | 46.0 | 39.7 | 3000.0 | 9.0 | N | 10.1 |
| 1.84 | 17.6 | --- | 56.0 | 38.4 | 3000.0 | 9.0 | L1 | 10.3 |
| 2.95 | --- | 4.9 | 46.0 | 41.1 | 3000.0 | 9.0 | N | 10.2 |
| 3.54 | 17.4 | --- | 56.0 | 38.6 | 3000.0 | 9.0 | N | 10.3 |
| 4.65 | --- | 5.1 | 46.0 | 40.9 | 3000.0 | 9.0 | N | 10.3 |
| 4.69 | 16.7 | --- | 56.0 | 39.3 | 3000.0 | 9.0 | L1 | 10.7 |

4. TEST EQUIPMENT

| Equipment | Manufacturer | Model | S/N | Cal Date | Due Date |
|----------------------------|---------------|--------------|---------------------------|--------------|--------------|
| Spectrum Analyzer | Rohde&Schwarz | FSW43 | 104368 | 2023-01-20 | 2024-01-20 |
| Spectrum Analyzer | Rohde&Schwarz | FSW85 | 101350 | 2023-01-20 | 2024-01-20 |
| EMI Test Receiver | Rohde&Schwarz | ESW26 | 101387 | 2023-01-27 | 2024-01-27 |
| Broadband Antenna | Schwarzbeck | VULB9168 | 01359 | 2023-01-12 | 2024-01-12 |
| Horn Antenna | Rohde&Schwarz | HF907 | 103033 | 2023-01-17 | 2024-01-17 |
| DOUBLE RIDGED HORN ANTENNA | ETS-Lindgren | 3116 | 2664 | 2023-01-05 | 2024-01-05 |
| RF Amplifier | SONOMA | 310N | 186358 | 2023-01-20 | 2024-01-20 |
| Amplifier | Keysight | 83017A | MY57280133 | 2023-01-20 | 2024-01-20 |
| Pre Amplifier | INSJOY | BLNA-1826 | 27886 | 2023-03-20 | 2024-03-20 |
| Antenna Mast | INNCO | MA4640-XP-ET | MA4640/648/43220 418/P | Not required | Not required |
| Antenna Controller | INNCO | CO3000 | 103033 | Not required | Not required |
| Software | Rohde&Schwarz | EMC32 | - | Not required | Not required |
| POWER METER | AGILENT | GB41290751 | E4417A | 2023-01-11 | 2024-01-11 |
| POWER SENSOR | AGILENT | E9323A | US40410259 | 2023-01-11 | 2024-01-11 |
| DC POWER SUPPLY | AGILENT | E3645A | MY40000853 | 2023-01-20 | 2024-01-20 |
| TWO-LINE V-NETWORK | Rohde&Schwarz | ENV216 | 101557 | 2023-01-20 | 2024-01-20 |
| Pulse Limiter | Rohde&Schwarz | ESH3-Z2 | 101185 | 2023-01-20 | 2024-01-20 |
| EMI Test Receiver | Rohde&Schwarz | ESCI | 100273 | 2023-01-20 | 2024-01-20 |
| Active Loop Antenna | Schwarzbeck | FMZB 1519 B | 00118 | 2023-02-04 | 2024-02-04 |

- End of Test Report-