Certificate # 2861.01

# TEST REPORT

Verified Code: 325720

| | | | |
|---|---|---|---|
| **Report No.:** | E202101295124-2 | **Application No.:** | E202101295124 |
| **Client:** | DMAI,Inc. | | |
| **Address:** | 10940 Wilshire Blvd #1100, Los Angeles, CA 90024, USA | | |
| **Sample Description:** | Education tablet,a preschool learning system | | |
| **Model:** | X4C-US21 | | |
| **Test Specification:** | CFR 47, FCC Part 15 Subpart C<br>RADIO FREQUENCY DEVICES: Subpart C—Intentional Radiators | | |
| **Receipt Date:** | 2021-02-20 | | |
| **Test Date:** | 2021-03-04 to 2021-03-24 | | |
| **Issue Date:** | 2021-05-17 | | |
| **Test Result:** | Pass | | |

| **Prepared By:** | **Reviewed By:** | **Approved By:** |
|---|---|---|
| Test Engineer | Technical Manager | Manager |
| Xie Fang | Wu Haoting | GUANGZHOU GRG METROLOGY & TEST CO.,LTD. GRGTEST APPROVED(03) |

**Other Aspects:**

Note: Note

**Abbreviations:** *ok / P = passed; fail / F = failed; n.a. / N = not applicable;*

**The test result in this test report refers exclusively to the presented test sample. This report shall not be reproduced except in full, without the written approval of GRGT.**

# DIRECTIONS OF TEST

1. **This station carries out test task according to the national regulation of verifications which can be traced to National Primary Standards and BIPM.**

2. **The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.**

3. **If there is any objection concerning the test, the client should inform the laboratory within 15 days from the date of receiving the test report.**

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# 1. TEST RESULT SUMMARY

| Technical Requirements | | |
|---|---|---|
| **CFR 47, FCC Part 15 Subpart C (§15.247)<br>KDB 558074 D01 15.247 measurement guidance v05r02** | | |
| **Limit / Severity** | **Item** | **Result** |
| §15.207 | Conducted emission AC power port | Pass |
| §15.247(b)(1) | Conducted output power for FHSS | N/A |
| §15.247(b)(3) | Conducted output power for DTS | Pass |
| §15.247(e) | Power spectral density | Pass |
| §15.247(a)(2) | 6dB bandwidth | Pass |
| §15.247(a)(1) | 20dB Occupied bandwidth | N/A |
| -- | 99% Occupied Bandwidth | N/A |
| §15.247(a)(1) | Carrier frequency separation | N/A |
| §15.247(a)(1)(iii) | Number of hopping frequencies | N/A |
| §15.247(a)(1)(iii) | Dwell Time | N/A |
| §15.247(d) | Spurious RF conducted emissions | Pass |
| §15.247(d) | Band edge | Pass |
| §15.247(d) & §15.209 & §15.205 | Spurious radiated emissions for transmitter | Pass |
| §15.203 | Antenna requirement | Pass |

The EUT has one antenna. The antenna is internal antenna.
The max gain of antenna is 2.8dBi.which accordance 15.203.is considered sufficient to comply with the provisions of this section.

# 2. GENERAL DESCRIPTION OF EUT

## 2.1. APPLICANT

| | |
|---|---|
| Name: | DMAI,Inc. |
| Address: | 10940 Wilshire Blvd #1100, Los Angeles, CA 90024, USA |

## 2.2. MANUFACTURER

| | |
|---|---|
| Name: | DMAI,Inc. |
| Address: | 10940 Wilshire Blvd #1100, Los Angeles, CA 90024, USA |

## 2.3. FACTORY

| | |
|---|---|
| Name : | Shenzhen Valley Ventures Inc |
| Address : | 9F-10F, Block 4, Cloud Park, Xuegang North Road, Bantian Street, Longgang district Shenzhen, 518129, China |

## 2.4. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

| | |
|---|---|
| Equipment: | Education tablet,a preschool learning system |
| Model No.: | X4C-US21 |
| Adding Model: | / |
| Trade Name: | AILA Sit & Play™<br>Animal Island Learning Adventure™<br>DMAI™ |
| FCC ID: | 2AYDJ-X4C-US21 |
| Power Supply: | DC5V power supplied by adapter |
| Adapter Specification: | Model: AS1201A-0502000USU<br>Input: 100-240V~50/60Hz 0.35A Max<br>Output: 5V ⎓ 2000mA |
| Frequency Range: | 2402 ~ 2480MHz |
| Transmit Power: | GFSK for 1Mbps :-3.078dBm<br>GFSK for 2Mbps :-3.516 dBm |
| Modulation type: | GFSK for 1Mbps<br>GFSK for 2Mbps |
| Channel space: | 2MHz |
| Antenna Specification: | FPC antenna 2.8dBi gain (Max.) |
| Temperature Range: | 0℃~40℃ |
| Hardware Version: | MT8168-P71-V1.1 |

| | |
|---|---|
| Software Version: | ys_mssi_t_64_userdebug_10_QP1A.190711.020mp3v4104 test-keys |
| Sample No: | E202101295124-0002 |
| Note: | The adapter have two color of appearance: White,Green. |

## 2.5. TEST OPERATION MODE

| Mode No. | Description of the modes |
|---|---|
| 1 | Bluetooth fixed frequency transmitting (DH5+2DH5+3DH5) |

## 2.6. LOCAL SUPPORTIVE

| Name of Equipment | Manufacturer | Model | Serial Number | Note |
|---|---|---|---|---|
| / | / | / | / | / |
| **Cable** | | | | |
| / | / | / | / | / |

**Test software:**

| Software version | Test level |
|---|---|
| MT6631 software | Default |

# 3. LABORATORY AND ACCREDITATIONS

## 3.1. LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co,. Ltd.


| | | |
|---|---|---|
| Add | : | Address: No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China |
| P.C. | : | 518000 |
| Tel | : | 0755-61180008 |
| Fax | : | 0755-61180008 |


## 3.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to GB/T 27025(ISO/IEC 17025:2017)

| | |
|---|---|
| **USA** | A2LA(Certificate #:2861.01) |

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

| | |
|---|---|
| **Canada** | Industry Canada |
| **USA** | FCC |

Copies of granted accreditation certificates are available for downloading from our web site, http://www.grgtest.com

## 3.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement | | Frequency | Uncertainty |
|---|---|---|---|
| Radiated Emission | Horizontal | 30MHz～1000MHz | 4.30dB |
| | | 1GHz～18GHz | 5.60dB |
| | | 18GHz～26GHz | 3.65dB |
| | | 26GHz～40GHz | 4.00dB |
| | Vertical | 30MHz～1000MHz | 4.30dB |
| | | 1GHz～18GHz | 5.60dB |
| | | 18GHz～26GHz | 3.65dB |
| | | 26GHz～40GHz | 4.00dB |
| Conduction Emission | | 9 kHz ~ 150 kHz | 2.80dB |
| | | 150 kHz ~ 10 MHz | 2.80dB |
| | | 10 MHz ~ 30 MHz | 2.20dB |

This uncertainty represents an expanded uncertainty factor of k=2.

# 4. LIST OF USED TEST EQUIPMENT AT GRGT

| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
|---|---|---|---|---|
| **Conducted Emissions** | | | | |
| EMI TEST RECEIVER | R&S | ESCI | 100783 | 2021-10-08 |
| LISN(EUT) | R&S | ENV216 | 101543 | 2022-03-21 |
| Test S/W | EZ | CCS-3A1-CE | / | / |
| **Radiated Spurious Emission& Restricted bands of operation** | | | | |
| Spectrum Analyzer | Agilent | N9010A | MY52221469 | 2021-05-16 |
| Bilog Antenna | Schwarzbeck | VULB 9163 | 01279 | 2022-02-25 |
| Horn Antenna | Schwarzbeck | BBHA 9120D(1201) | 02143 | 2021-12-27 |
| Board-Band Horn Antenna | Schwarzbeck | BBHA 9170 | BBHA 9170-497 | 2021-11-05 |
| Amplifier | Tonscend | TAP9E6343 | AP20E806065 | 2021-06-28 |
| Amplifier | Tonscend | TAP01018048 | AP20E8060075 | 2021-06-28 |
| Amplifier | Tonscend | TAP184050 | AP20E806071 | 2021-06-15 |
| Test S/W | Tonscend | JS32-RE/2.5.2.4 | | |
| **6 dB Bandwidth** | | | | |
| Spectrum Analyzer | Agilent | N9010A | MY52221469 | 2021-05-16 |
| **Peak/AV Output Power** | | | | |
| Spectrum Analyzer | Agilent | N9010A | MY52221469 | 2021-05-16 |
| **Conducted band edges and Spurious Emission** | | | | |
| Spectrum Analyzer | Agilent | N9010A | MY52221469 | 2021-05-16 |
| **Peak Output Spectral Density Measurement** | | | | |
| Spectrum Analyzer | Agilent | N9010A | MY52221469 | 2021-05-16 |

Note: The calibration interval of the above test instruments is 12 months.

# 5. CONDUCTED EMISSION MEASUREMENT

## 5.1. LIMITS

| Frequency range | Limits (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 150kHz ～ 0.5MHz | 66～56 | 56～46 |
| 0.5 MHz ～ 5 MHz | 56 | 46 |
| 5 MHz ～ 30 MHz | 60 | 50 |

**NOTE:** (1) The lower limit shall apply at the transition frequencies.
(2) The limit decreases in line with the logarithm of the frequency in the range of 150 kHz to 0.5MHz.

## 5.2. TEST PROCEDURES

**Procedure of Preliminary Test**

Test procedures follow ANSI C63.10:2013.

For measurement of the disturbance voltage the equipment under test (EUT) is connected to the power supply mains and any other extended network via one or more artificial network(s). An EUT, whether intended to be grounded or not, and which is to be used on a table is configured as follows:

– Either the bottom or the rear of the EUT shall be at a controlled distance of 40 cm from a reference ground plane. This ground plane is normally the wall or floor of a shielded room. It may also be a grounded metal plane of at least 2 m by 2 m. This is physically accomplished as follows:

1) place the EUT on a table of non-conducting material which is at least 80 cm high. Place the EUT so that it is 40 cm from the wall of the shielded room, or

2) place the EUT on a table of non-conducting material which is 40 cm high so that the bottom of the EUT is 40 cm above the ground plane;

– All other conductive surfaces of the EUT shall be at least 80 cm from the reference ground plane;

– The EUT are placed on the floor that one side of the housings is 40 cm from the vertical reference ground plane and other metallic parts;

– Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 cm to 40 cm long, hanging approximately in the middle between the ground plane and the table.

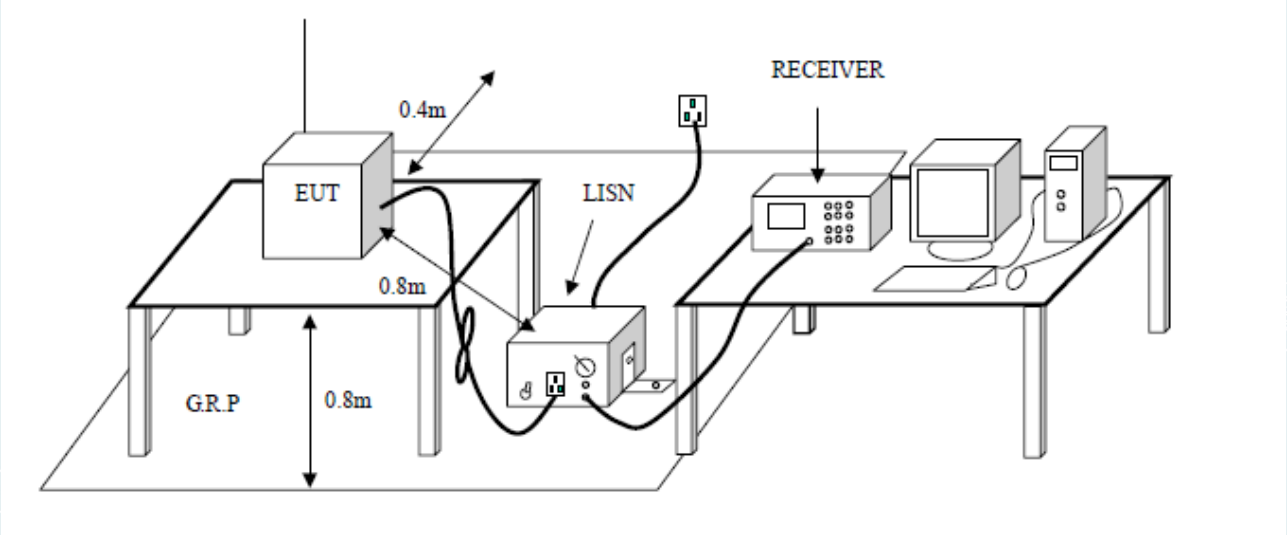
– I/O cables that are connected to a peripheral shall be bundled in the centre. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.

The test mode(s) described in Item 2.4 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.4 producing the highest emission level. The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

**Procedure of Final Test**

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. The test data of the worst-case condition(s) was recorded.

## 5.3. TEST SETUP




## 5.4. DATA SAMPLE

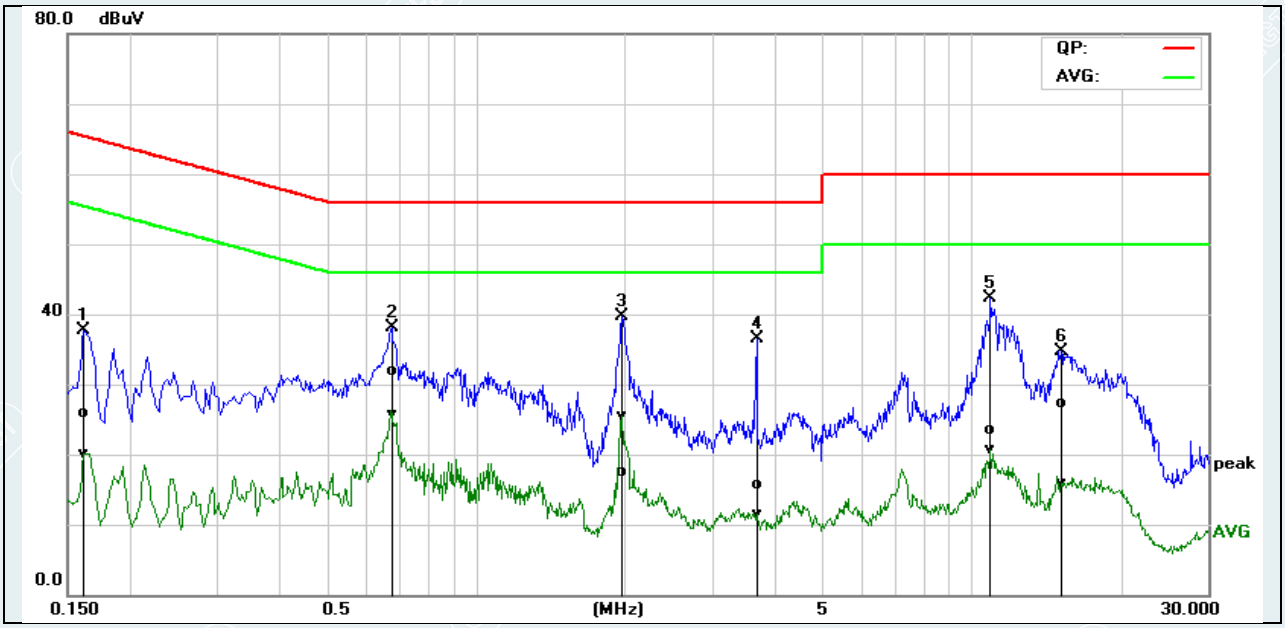
| Frequency (MHz) | QuasiPeak Reading (dBuV) | Average Reading (dBuV) | Correction Factor (dB) | QuasiPeak Result (dBuV) | Average Result (dBuV) | QuasiPeak Limit (dBuV) | Average Limit (dBuV) | QuasiPeak Margin (dB) | Average Margin (dB) | Remark (Pass/Fail) |
|---|---|---|---|---|---|---|---|---|---|---|
| X.XXXX | 32.69 | 25.65 | 11.52 | 44.21 | 37.17 | 65.78 | 55.79 | -21.57 | -18.62 | Pass |

Factor = Insertion loss of LISN + Cable Loss
Result = Quasi-peak Reading/ Average Reading + Factor
Limit =Limit stated in standard
Margin = Result (dBuV) – Limit (dBuV)

## 5.5. TEST RESULTS

| | | | |
|---|---|---|---|
| EUT Name | Education tablet,a preschool learning system | Model | X4C-US21 |
| Environmental Conditions | 24.6℃/54%RH | Test Mode | Mode 1 |
| Power supply | AC120V/60Hz | Tested By | Chen Xiaocong |
| Test Date | 2021-03-15 | Sample No. | E202101295124-0002 |

2402MHz

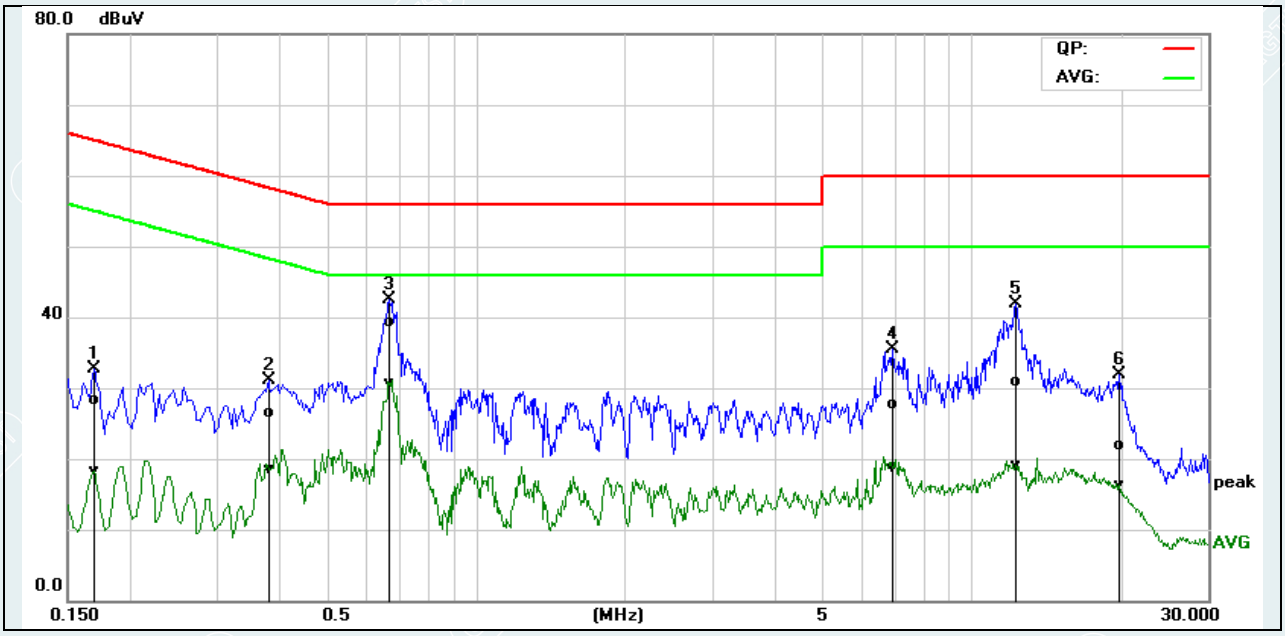



| No. | Frequency | QuasiPeak reading | Average reading | Correction factor | QuasiPeak result | Average result | QuasiPeak limit | Average limit | QuasiPeak margin | Average margin | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | (dBuV) | (dB) | (dBuV) | (dBuV) | (dBuV) | (dBuV) | (dB) | (dB) | |
| 1 | 0.1620 | 16.29 | 10.59 | 9.61 | 25.90 | 20.20 | 65.36 | 55.36 | -39.46 | -35.16 | Pass |
| 2* | 0.6780 | 22.39 | 16.17 | 9.61 | 32.00 | 25.78 | 56.00 | 46.00 | -24.00 | -20.22 | Pass |
| 3 | 1.9740 | 7.88 | 15.89 | 9.62 | 17.50 | 25.51 | 56.00 | 46.00 | -38.50 | -20.49 | Pass |
| 4 | 3.6940 | 6.06 | 1.77 | 9.64 | 15.70 | 11.41 | 56.00 | 46.00 | -40.30 | -34.59 | Pass |
| 5 | 10.9500 | 13.76 | 11.03 | 9.74 | 23.50 | 20.77 | 60.00 | 50.00 | -36.50 | -29.23 | Pass |
| 6 | 15.2220 | 17.52 | 6.10 | 9.78 | 27.30 | 15.88 | 60.00 | 50.00 | -32.70 | -34.12 | Pass |

Note: *L = Live Line*

| | | | |
|---|---|---|---|
| EUT Name | Education tablet,a preschool learning system | Model | X4C-US21 |
| Environmental Conditions | 24.6℃/54%RH | Test Mode | Mode 1 |
| Power supply | AC120V/60Hz | Tested By | Chen Xiaocong |
| Test Date | 2021-03-15 | Sample No. | E202101295124-0002 |

2402MHz




| No. | Frequency | QuasiPeak reading | Average reading | Correction factor | QuasiPeak result | Average result | QuasiPeak limit | Average limit | QuasiPeak margin | Average margin | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | (dBuV) | (dB) | (dBuV) | (dBuV) | (dBuV) | (dBuV) | (dB) | (dB) | |
| 1 | 0.1700 | 18.70 | 8.72 | 9.60 | 28.30 | 18.32 | 64.96 | 54.96 | -36.66 | -36.64 | Pass |
| 2 | 0.3820 | 16.89 | 8.89 | 9.61 | 26.50 | 18.50 | 58.23 | 48.24 | -31.73 | -29.74 | Pass |
| 3* | 0.6700 | 29.69 | 21.04 | 9.61 | 39.30 | 30.65 | 56.00 | 46.00 | -16.70 | -15.35 | Pass |
| 4 | 6.9340 | 18.11 | 8.99 | 9.69 | 27.80 | 18.68 | 60.00 | 50.00 | -32.20 | -31.32 | Pass |
| 5 | 12.3060 | 21.23 | 9.37 | 9.77 | 31.00 | 19.14 | 60.00 | 50.00 | -29.00 | -30.86 | Pass |
| 6 | 19.8900 | 12.06 | 6.37 | 9.84 | 21.90 | 16.21 | 60.00 | 50.00 | -38.10 | -33.79 | Pass |

Note: N = Neutral Line.

# 6. RADIATED SPURIOUS EMISSIONS

## 6.1. LIMITS

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.

| Frequency (MHz) | Quasi-peak(μV/m) | Measurement distance(m) | Quasi-peak(dBμV/m)@distance 3m |
|---|---|---|---|
| 0.009-0.490 | 2400/F(kHz) | 300 | 53.8~88.5 |
| 0.490-1.705 | 24000/F(kHz) | 30 | 43~53.8 |
| 1.705-30.0 | 30 | 30 | 49.5 |
| 30 ~ 88 | 100 | 3 | 40 |
| 88~216 | 150 | 3 | 43.5 |
| 216 ~ 960 | 200 | 3 | 46 |
| Above 960 | 500 | 3 | 54 |

**NOTE**: (1) The lower limit shall apply at the transition frequencies.

## 6.2. TEST PROCEDURES (please refer to measurement standard)

**1) Sequence of testing 9 kHz to 30 MHz**

**Setup:**

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 0.8 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions.

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

**Pre measurement:**

--- The turntable rotates from 0 °to 315 °using 45 °steps.

--- The antenna height is 0.8 meter.

--- At each turntable position the analyzer sweeps with peak detection to find the maximum of all emissions

**Final measurement:**

--- Identified emissions during the pre measurement the software maximizes by rotating the turntable position (0 °to 360 °) and by rotating the elevation axes (0 °to 360 °).

--- The final measurement will be done in the position (turntable and elevation) causing the highest emissions with QPK detector.

--- The final levels, frequency, measuring time, bandwidth, turntable position, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement and the limit will be stored.

**2) Sequence of testing 30 MHz to 1 GHz**

**Setup:**

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a table with 0.8 m height is used, which is placed on the ground plane.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

**Pre measurement:**

--- The turntable rotates from 0 °to 315 °using 45 °steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height changes from 1 to 3 meter.

--- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

**Final measurement:**

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (±45 °) and antenna movement between 1 and 4 meter.

--- The final measurement will be done with QP detector with an EMI receiver.

--- The final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement with marked maximum final measurements and the limit will be stored.

**3) Sequence of testing 1 GHz to 18 GHz**

**Setup:**

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 3 meter.

--- The EUT was set into operation.

**Pre measurement:**

--- The turntable rotates from 0 °to 315 °using 45 °steps.

--- The antenna is polarized vertical and horizontal.

--- The antenna height scan range is 1 meter to 2.5 meter.

--- At each turntable position and antenna polarization the analyzer sweeps with peak detection to find the maximum of all emissions.

**Final measurement:**

--- The final measurement will be performed with minimum the six highest peaks.

--- According to the maximum antenna and turntable positions of premeasurement the software maximize the peaks by changing turntable position (±45°) and antenna movement between 1 and 4 meter. This procedure is repeated for both antenna polarizations.

--- The final measurement will be done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, turntable position, EUT-table position, antenna polarization, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the pre measurement with marked maximum final measurements and the limit will be stored.

**4) Sequence of testing above 18 GHz**
**Setup:**

--- The equipment was set up to simulate a typical usage like described in the user manual or described by manufacturer.

--- If the EUT is a tabletop system, a rotatable table with 1.5 m height is used.

--- If the EUT is a floor standing device, it is placed on the ground plane with insulation between both.

--- Auxiliary equipment and cables were positioned to simulate normal operation conditions

--- The AC power port of the EUT (if available) is connected to a power outlet below the turntable.

--- The measurement distance is 1 meter.

--- The EUT was set into operation.

**Pre measurement:**

--- The antenna is moved spherical over the EUT in different polarisations of the antenna.

**Final measurement:**

--- The final measurement will be performed at the position and antenna orientation for all detected emissions that were found during the premeasurements with Peak and Average detector.
--- The final levels, frequency, measuring time, bandwidth, correction factor, margin to the limit and limit will be recorded. Also a plot with the graph of the premeasurement and the limit will be stored.

NOTE: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (10 log(1/duty cycle)).

## 6.3. TEST SETUP

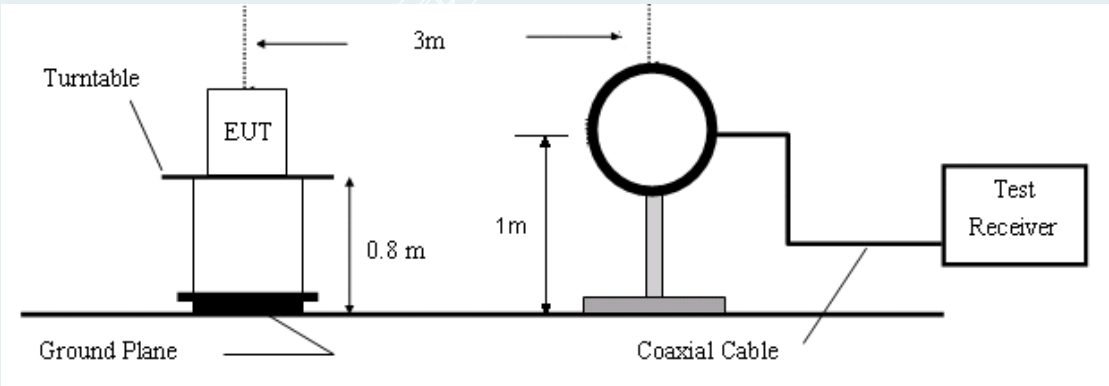



**Figure 1. 9 KHz to 30MHz radiated emissions test configuration**

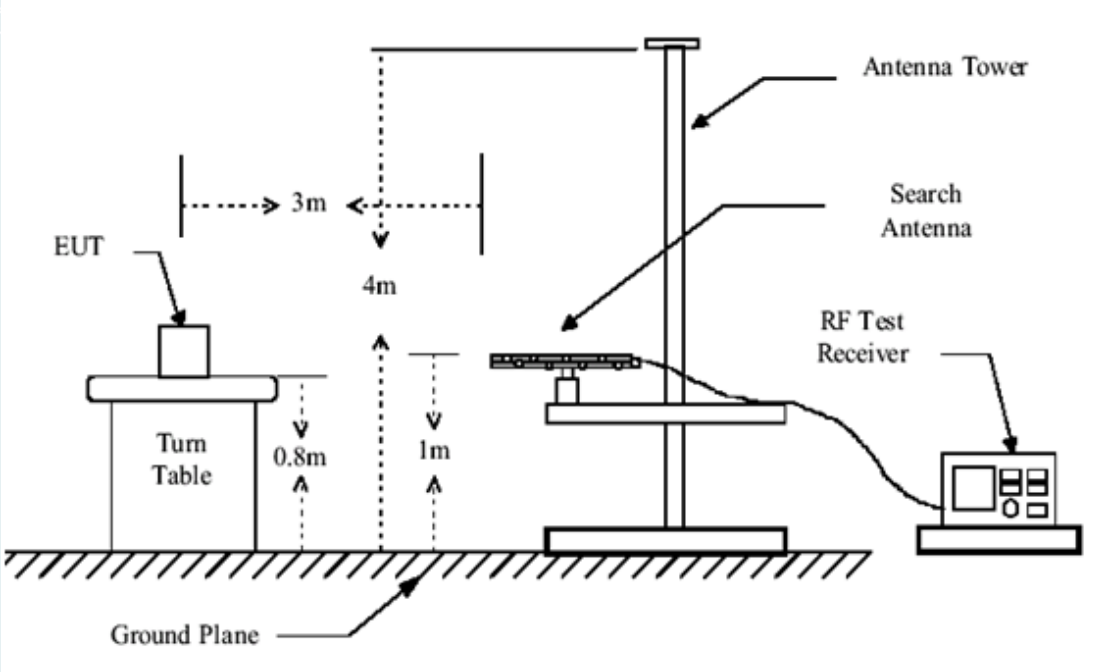



**Figure 2. 30MHz to 1GHz radiated emissions test configuration**

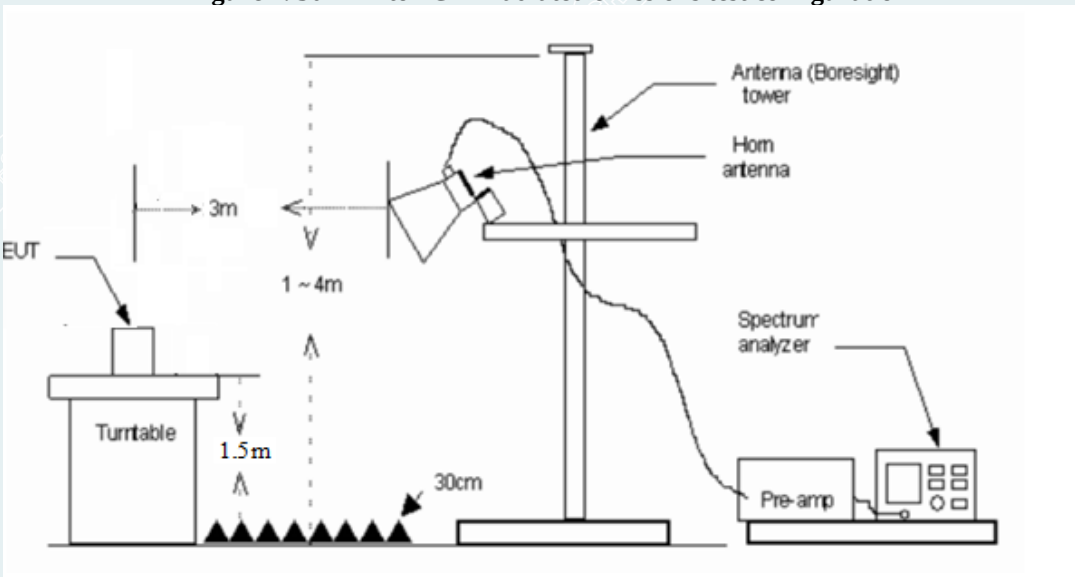



**Figure 3. Above 1GHz radiated emissions test configuration**

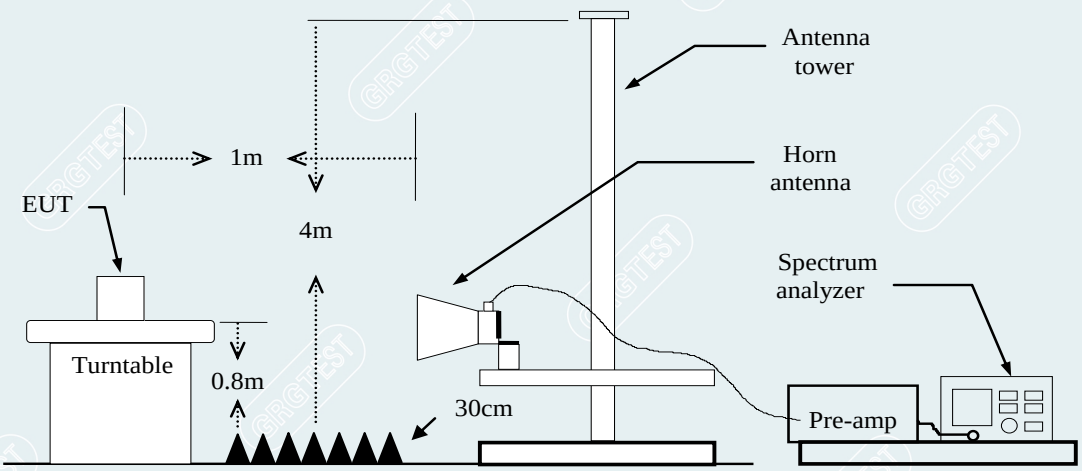



**Figure 4. Above 18GHz radiated emissions test configuration**

## 6.4. DATA SAMPLE

### 30MHz to 1GHz

| No. | Frequency (MHz) | Reading (dBuV/m) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Pole |
|---|---|---|---|---|---|---|---|---|
| xxx | xxx | 37.06 | -15.48 | 21.58 | 40.00 | -18.42 | QP | Vertical |

### Above 1 GHz

| No. | Frequency (MHz) | Reading (dBuV/m) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark | Pole |
|---|---|---|---|---|---|---|---|---|
| xxx | xxx | 65.45 | -11.12 | 54.33 | 74.00 | -19.67 | Peak | Vertical |
| xxx | xxx | 63.00 | -11.12 | 51.88 | 54.00 | -2.12 | AVG | Vertical |

### Above 18 GHz

| No. | Frequency (MHz) | Reading (dBuV/m) | Level (dBuV/m) | Factor (dB) | Limit (dBuV/m) | Margin (dB) | Remark | Pole |
|---|---|---|---|---|---|---|---|---|
| xxx | xxx | 59.22 | 58.58 | -0.64 | 83.54 | 24.96 | peak | Vertical |
| xxx | xxx | 53.01 | 52.37 | -0.64 | 63.54 | 11.17 | AVG | Vertical |

Frequency (MHz) = Emission frequency in MHz

Ant.Pol. (H/V) = Antenna polarization

Reading (dBuV) = Uncorrected Analyzer / Receiver reading

Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain

Result (dBuV/m) = Reading (dBuV) + Correction Factor (dB/m)

Limit (dBuV/m) = Limit stated in standard

Margin (dB) = Remark Result (dBuV/m) – Limit (dBuV/m)

Peak = Peak Reading

QP = Quasi-peak Reading

AVG = Average Reading

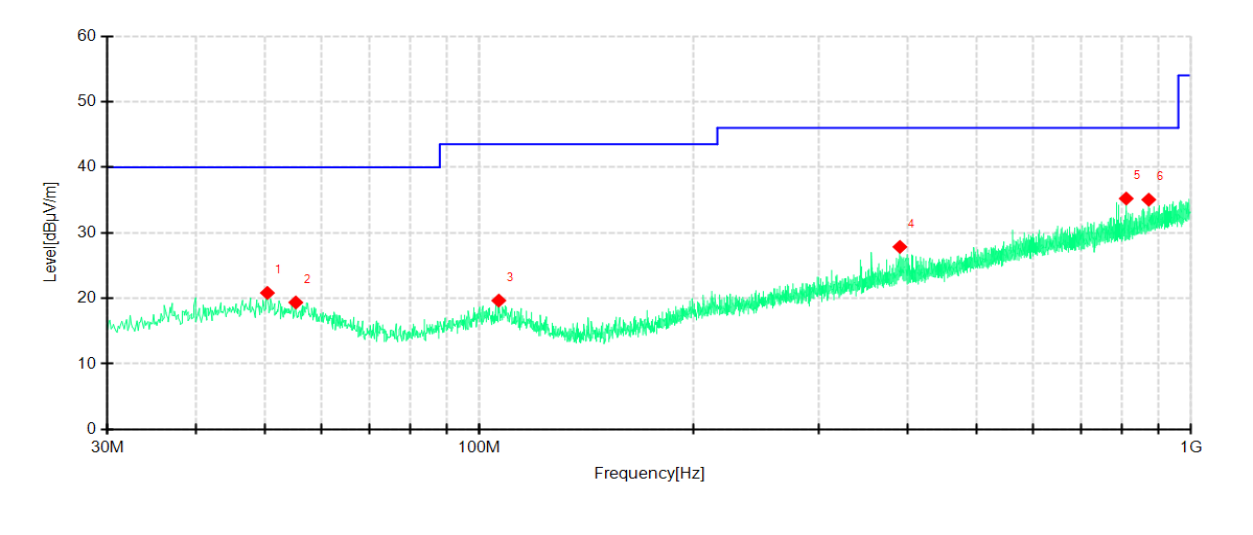
## 6.5. TEST RESULTS

**30MHz to 1GHz**

Recorded the worst case results in this report (1Mbps)

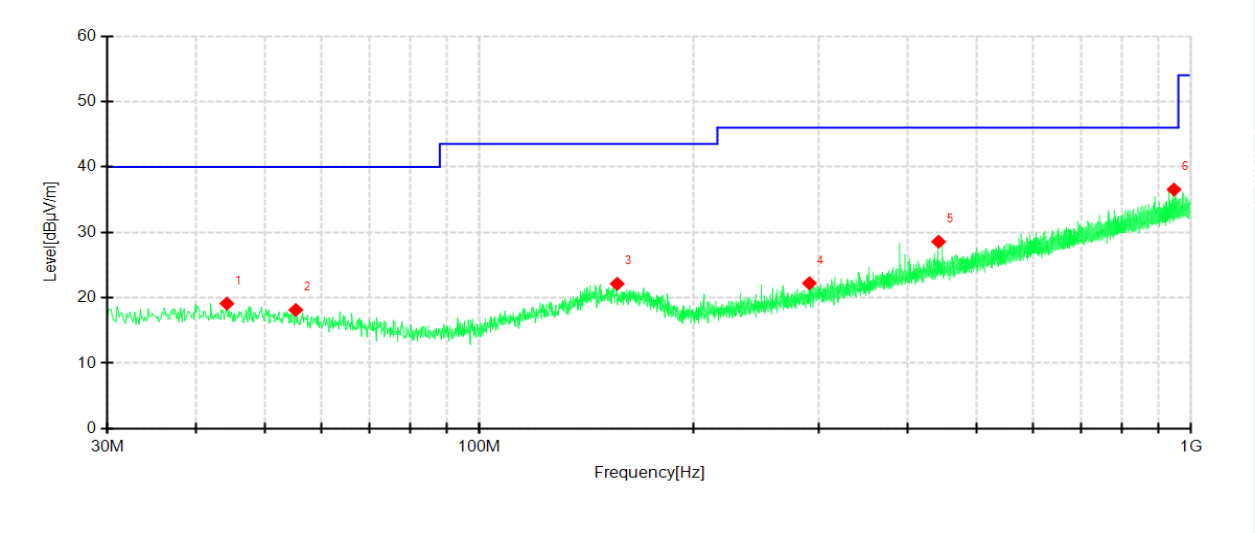
Mode: TX/ 1Mbps

Lowest channel (2402MHz) Date: 2021-03-24



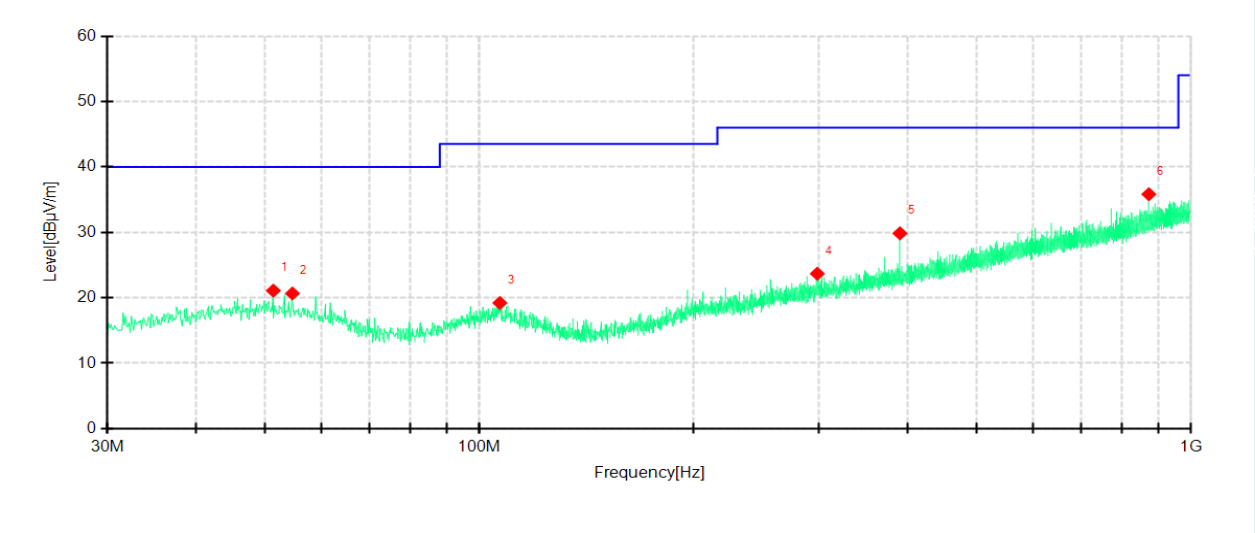

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBµV/m] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [ °] | Polarity |
| 1 | 50.3700 | 48.34 | 20.83 | -27.51 | 40.00 | 19.17 | 100 | 296 | Horizontal |
| 2 | 55.2200 | 47.50 | 19.37 | -28.13 | 40.00 | 20.63 | 200 | 257 | Horizontal |
| 3 | 106.5088 | 48.71 | 19.66 | -29.05 | 43.50 | 23.84 | 100 | 256 | Horizontal |
| 4 | 389.9913 | 51.06 | 27.85 | -23.21 | 46.00 | 18.15 | 100 | 276 | Horizontal |
| 5 | 811.0925 | 51.06 | 35.23 | -15.83 | 46.00 | 10.77 | 100 | 296 | Horizontal |
| 6 | 872.4450 | 49.76 | 35.05 | -14.71 | 46.00 | 10.95 | 100 | 356 | Horizontal |

Mode: TX/ 1Mbps
Lowest channel (2402MHz) Date: 2021-03-24



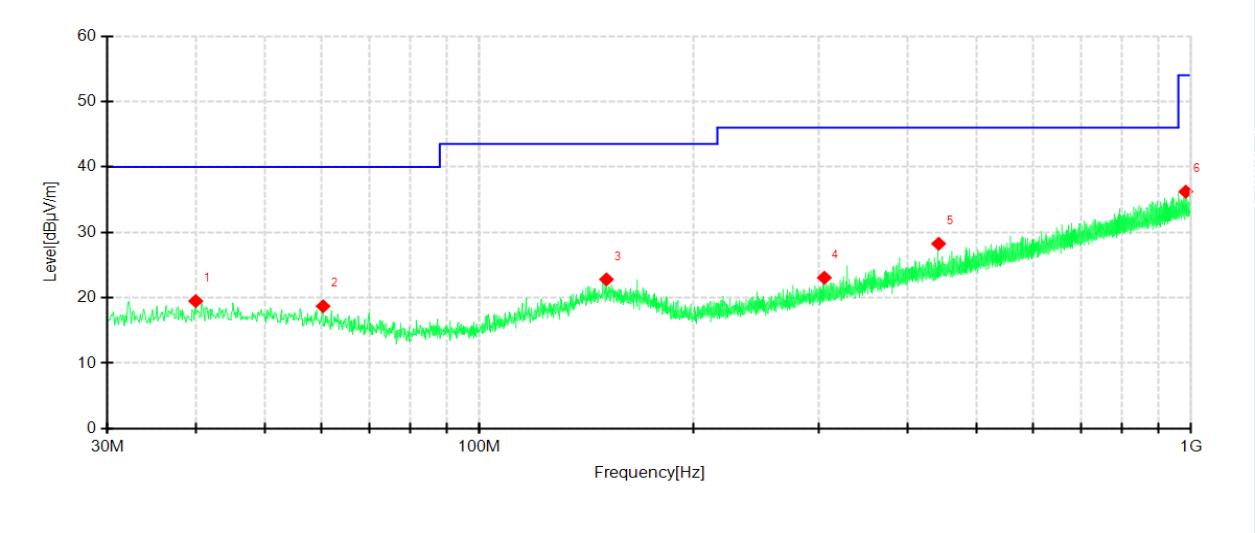

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBµV/m] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 44.1863 | 47.83 | 19.12 | -28.71 | 40.00 | 20.88 | 200 | 360 | Vertical |
| 2 | 55.2200 | 47.43 | 18.14 | -29.29 | 40.00 | 21.86 | 100 | 352 | Vertical |
| 3 | 156.2213 | 48.06 | 22.14 | -25.92 | 43.50 | 21.36 | 200 | 347 | Vertical |
| 4 | 290.9300 | 48.34 | 22.23 | -26.11 | 46.00 | 23.77 | 100 | 129 | Vertical |
| 5 | 442.0075 | 50.64 | 28.57 | -22.07 | 46.00 | 17.43 | 100 | 176 | Vertical |
| 6 | 946.6500 | 49.48 | 36.55 | -12.93 | 46.00 | 9.45 | 100 | 339 | Vertical |

Mode: TX/ 1Mbps
Highest channel (2480MHz) Date: 2021-03-24




| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBµV/m] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 51.3400 | 48.72 | 21.09 | -27.63 | 40.00 | 18.91 | 100 | 268 | Horizontal |
| 2 | 54.6138 | 48.72 | 20.66 | -28.06 | 40.00 | 19.34 | 100 | 155 | Horizontal |
| 3 | 106.8725 | 48.26 | 19.21 | -29.05 | 43.50 | 24.29 | 100 | 195 | Horizontal |
| 4 | 298.4475 | 48.90 | 23.68 | -25.22 | 46.00 | 22.32 | 200 | 324 | Horizontal |
| 5 | 389.9913 | 53.06 | 29.85 | -23.21 | 46.00 | 16.15 | 100 | 229 | Horizontal |
| 6 | 872.5663 | 50.54 | 35.83 | -14.71 | 46.00 | 10.17 | 100 | 357 | Horizontal |

Mode: TX/ 1Mbps
Highest channel (2480MHz) Date: 2021-03-24




| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBµV/m] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 39.9425 | 48.10 | 19.50 | -28.60 | 40.00 | 20.50 | 100 | 208 | Vertical |
| 2 | 60.3125 | 48.42 | 18.71 | -29.71 | 40.00 | 21.29 | 100 | 83 | Vertical |
| 3 | 150.8863 | 48.55 | 22.82 | -25.73 | 43.50 | 20.68 | 100 | 122 | Vertical |
| 4 | 305.3588 | 48.84 | 23.07 | -25.77 | 46.00 | 22.93 | 100 | 281 | Vertical |
| 5 | 442.0075 | 50.33 | 28.26 | -22.07 | 46.00 | 17.74 | 100 | 176 | Vertical |
| 6 | 983.5100 | 48.70 | 36.22 | -12.48 | 54.00 | 17.78 | 100 | 10 | Vertical |

**Remark:**

1 No emission found between lowest internal used/generated frequency to 30MHz.

2 Data of measurement within this frequency range in the table above the reading of PK detector are more 6dB than QP limit, therefore it's unnecessary to performed QP scan.

3 The IF bandwidth of Receiver between 30MHz to 1GHz was 120 kHz.

**Above 1GHz:**
According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.

Mode: TX/ 1Mbps
Lowest channel (2402MHz) Date: 2021-03-18

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 1300.0000 | 62.78 | 38.71 | -24.07 | 74.00 | 35.29 | 100 | 105 | Horizontal |
| 2 | 1560.2500 | 59.58 | 36.54 | -23.04 | 74.00 | 37.46 | 100 | 105 | Horizontal |
| 3 | 3958.5000 | 54.08 | 38.81 | -15.27 | 74.00 | 35.19 | 100 | 163 | Horizontal |
| 4 | 5195.2500 | 51.68 | 40.72 | -10.96 | 74.00 | 33.28 | 100 | 255 | Horizontal |
| 5 | 7150.5000 | 49.94 | 45.25 | -4.69 | 74.00 | 28.75 | 200 | 55 | Horizontal |
| 6 | 8980.5000 | 48.33 | 47.11 | -1.22 | 74.00 | 26.89 | 200 | 255 | Horizontal |

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 1248.0000 | 61.71 | 37.44 | -24.27 | 74.00 | 36.56 | 200 | 105 | Vertical |
| 2 | 1300.0000 | 62.61 | 38.54 | -24.07 | 74.00 | 35.46 | 100 | 105 | Vertical |
| 3 | 3255.0000 | 56.28 | 38.84 | -17.44 | 74.00 | 35.16 | 200 | 0 | Vertical |
| 4 | 5093.2500 | 51.92 | 41.13 | -10.79 | 74.00 | 32.87 | 200 | 255 | Vertical |
| 5 | 7271.2500 | 51.06 | 45.71 | -5.35 | 74.00 | 28.29 | 100 | 255 | Vertical |
| 6 | 7974.7500 | 50.04 | 46.89 | -3.15 | 74.00 | 27.11 | 200 | 255 | Vertical |

Mode: TX/ 1Mbps
Middle channel (2440MHz) Date: 2021-03-18

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 1300.0000 | 62.21 | 38.14 | -24.07 | 74.00 | 35.86 | 100 | 105 | Horizontal |
| 2 | 2967.7500 | 56.52 | 37.82 | -18.70 | 74.00 | 36.18 | 100 | 282 | Horizontal |
| 3 | 3499.5000 | 54.84 | 38.57 | -16.27 | 74.00 | 35.43 | 100 | 183 | Horizontal |
| 4 | 5198.2500 | 52.39 | 41.43 | -10.96 | 74.00 | 32.57 | 100 | 110 | Horizontal |
| 5 | 6164.2500 | 51.10 | 43.04 | -8.06 | 74.00 | 30.96 | 100 | 246 | Horizontal |
| 6 | 7269.0000 | 51.35 | 46.03 | -5.32 | 74.00 | 27.97 | 100 | 255 | Horizontal |

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 1300.0000 | 62.95 | 38.88 | -24.07 | 74.00 | 35.12 | 100 | 105 | Vertical |
| 2 | 1351.7500 | 61.09 | 37.22 | -23.87 | 74.00 | 36.78 | 100 | 360 | Vertical |
| 3 | 3868.5000 | 54.75 | 39.15 | -15.60 | 74.00 | 34.85 | 200 | 236 | Vertical |
| 4 | 4865.2500 | 51.06 | 40.38 | -10.68 | 74.00 | 33.62 | 100 | 128 | Vertical |
| 5 | 5308.5000 | 52.41 | 41.96 | -10.45 | 74.00 | 32.04 | 200 | 34 | Vertical |
| 6 | 8178.7500 | 48.86 | 46.08 | -2.78 | 74.00 | 27.92 | 100 | 109 | Vertical |

Mode: TX/ 1Mbps
Highest channel (2480MHz) Date: 2021-03-18

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 1248.0000 | 60.94 | 36.67 | -24.27 | 74.00 | 37.33 | 100 | 105 | Horizontal |
| 2 | 1300.2500 | 62.12 | 38.05 | -24.07 | 74.00 | 35.95 | 100 | 105 | Horizontal |
| 3 | 4706.2500 | 50.76 | 40.20 | -10.56 | 74.00 | 33.80 | 200 | 183 | Horizontal |
| 4 | 5755.5000 | 51.37 | 41.80 | -9.57 | 74.00 | 32.20 | 100 | 255 | Horizontal |
| 5 | 7743.7500 | 49.60 | 46.24 | -3.36 | 74.00 | 27.76 | 100 | 27 | Horizontal |
| 6 | 9391.5000 | 47.30 | 47.53 | 0.23 | 74.00 | 26.47 | 200 | 75 | Horizontal |

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 1300.0000 | 62.61 | 38.54 | -24.07 | 74.00 | 35.46 | 100 | 105 | Vertical |
| 2 | 1762.7500 | 60.01 | 37.57 | -22.44 | 74.00 | 36.43 | 200 | 345 | Vertical |
| 3 | 5000.2500 | 51.70 | 41.06 | -10.64 | 74.00 | 32.94 | 100 | 255 | Vertical |
| 4 | 5687.2500 | 51.29 | 42.06 | -9.23 | 74.00 | 31.94 | 200 | 255 | Vertical |
| 5 | 7148.2500 | 51.35 | 46.61 | -4.74 | 74.00 | 27.39 | 100 | 125 | Vertical |
| 6 | 8184.7500 | 48.95 | 46.21 | -2.74 | 74.00 | 27.79 | 200 | 164 | Vertical |

Mode: TX/ 2Mbps
Lowest channel (2402MHz) Date: 2021-03-18

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 1300.2500 | 62.14 | 38.07 | -24.07 | 74.00 | 35.93 | 100 | 105 | Horizontal |
| 2 | 2866.2500 | 57.11 | 38.23 | -18.88 | 74.00 | 35.77 | 100 | 186 | Horizontal |
| 3 | 3739.5000 | 54.34 | 38.74 | -15.60 | 74.00 | 35.26 | 200 | 20 | Horizontal |
| 4 | 5181.0000 | 52.13 | 41.12 | -11.01 | 74.00 | 32.88 | 100 | 65 | Horizontal |
| 5 | 7169.2500 | 50.07 | 45.45 | -4.62 | 74.00 | 28.55 | 200 | 255 | Horizontal |
| 6 | 9387.7500 | 47.50 | 47.67 | 0.17 | 74.00 | 26.33 | 200 | 47 | Horizontal |

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 1299.7500 | 62.66 | 38.59 | -24.07 | 74.00 | 35.41 | 100 | 359 | Vertical |
| 2 | 2782.0000 | 57.68 | 38.33 | -19.35 | 74.00 | 35.67 | 200 | 149 | Vertical |
| 3 | 4694.2500 | 50.43 | 39.77 | -10.66 | 74.00 | 34.23 | 100 | 73 | Vertical |
| 4 | 5707.5000 | 50.80 | 41.61 | -9.19 | 74.00 | 32.39 | 100 | 255 | Vertical |
| 5 | 7945.5000 | 49.43 | 45.95 | -3.48 | 74.00 | 28.05 | 100 | 1 | Vertical |
| 6 | 8997.0000 | 48.03 | 46.97 | -1.06 | 74.00 | 27.03 | 200 | 103 | Vertical |

Mode: TX/ 2Mbps
Middle channel (2440MHz) Date: 2021-03-18

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 1248.5000 | 60.97 | 36.70 | -24.27 | 74.00 | 37.30 | 100 | 105 | Horizontal |
| 2 | 1300.2500 | 62.70 | 38.63 | -24.07 | 74.00 | 35.37 | 100 | 105 | Horizontal |
| 3 | 3803.2500 | 54.22 | 38.97 | -15.25 | 74.00 | 35.03 | 200 | 255 | Horizontal |
| 4 | 6155.2500 | 51.65 | 43.66 | -7.99 | 74.00 | 30.34 | 200 | 1 | Horizontal |
| 5 | 8072.2500 | 49.11 | 45.78 | -3.33 | 74.00 | 28.22 | 200 | 255 | Horizontal |
| 6 | 9372.7500 | 47.55 | 47.49 | -0.06 | 74.00 | 26.51 | 100 | 255 | Horizontal |

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 1300.0000 | 63.20 | 39.13 | -24.07 | 74.00 | 34.87 | 100 | 105 | Vertical |
| 2 | 1352.2500 | 61.62 | 37.75 | -23.87 | 74.00 | 36.25 | 100 | 105 | Vertical |
| 3 | 3875.2500 | 54.29 | 38.74 | -15.55 | 74.00 | 35.26 | 200 | 127 | Vertical |
| 4 | 4641.0000 | 51.53 | 40.11 | -11.42 | 74.00 | 33.89 | 200 | 255 | Vertical |
| 5 | 7134.7500 | 51.49 | 46.34 | -5.15 | 74.00 | 27.66 | 200 | 255 | Vertical |
| 6 | 7590.7500 | 49.61 | 45.96 | -3.65 | 74.00 | 28.04 | 200 | 61 | Vertical |

Mode: TX/ 2Mbps
Highest channel (2480MHz) Date: 2021-03-18

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [ °] | Polarity |
| 1 | 1248.2500 | 60.62 | 36.35 | -24.27 | 74.00 | 37.65 | 100 | 105 | Horizontal |
| 2 | 1300.2500 | 62.12 | 38.05 | -24.07 | 74.00 | 35.95 | 100 | 105 | Horizontal |
| 3 | 3716.2500 | 54.32 | 38.61 | -15.71 | 74.00 | 35.39 | 100 | 26 | Horizontal |
| 4 | 5085.0000 | 51.97 | 41.10 | -10.87 | 74.00 | 32.90 | 100 | 173 | Horizontal |
| 5 | 7780.5000 | 50.09 | 46.88 | -3.21 | 74.00 | 27.12 | 100 | 118 | Horizontal |
| 6 | 9809.2500 | 46.95 | 47.45 | 0.50 | 74.00 | 26.55 | 100 | 173 | Horizontal |

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [ °] | Polarity |
| 1 | 1300.2500 | 62.10 | 38.03 | -24.07 | 74.00 | 35.97 | 100 | 105 | Vertical |
| 2 | 1819.5000 | 58.88 | 36.82 | -22.06 | 74.00 | 37.18 | 100 | 359 | Vertical |
| 3 | 3910.5000 | 54.29 | 38.99 | -15.30 | 74.00 | 35.01 | 200 | 255 | Vertical |
| 4 | 5097.0000 | 52.43 | 41.67 | -10.76 | 74.00 | 32.33 | 200 | 175 | Vertical |
| 5 | 5687.2500 | 51.87 | 42.64 | -9.23 | 74.00 | 31.36 | 100 | 17 | Vertical |
| 6 | 7977.0000 | 49.44 | 46.31 | -3.13 | 74.00 | 27.69 | 200 | 255 | Vertical |

***Remark:***

1 Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2 Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.
3 Average test would be performed if the peak result were greater than the average limit or as required by the applicant.
4 Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

**Above 18GHz:**

Recorded the worst case results in this report (1Mbps)

Mode: TX/ 1Mbps

Lowest channel (2402MHz) Date: 2021-03-18

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 18320.0250 | 57.44 | 45.88 | -11.56 | 83.50 | 37.62 | 100 | 210 | Horizontal |
| 2 | 19010.6500 | 57.48 | 46.39 | -11.09 | 83.50 | 37.11 | 100 | 121 | Horizontal |
| 3 | 20302.6500 | 56.30 | 45.67 | -10.63 | 83.50 | 37.83 | 100 | 159 | Horizontal |
| 4 | 21579.3500 | 55.85 | 45.91 | -9.94 | 83.50 | 37.59 | 100 | 197 | Horizontal |
| 5 | 23372.8500 | 55.28 | 46.51 | -8.77 | 83.50 | 36.99 | 100 | 335 | Horizontal |
| 6 | 24352.0500 | 54.89 | 46.72 | -8.17 | 83.50 | 36.78 | 100 | 59 | Horizontal |

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 18356.5750 | 57.79 | 46.25 | -11.54 | 83.50 | 37.25 | 100 | 22 | Vertical |
| 2 | 18647.7000 | 58.14 | 46.76 | -11.38 | 83.50 | 36.74 | 100 | 138 | Vertical |
| 3 | 19575.0500 | 57.06 | 46.18 | -10.88 | 83.50 | 37.32 | 100 | 353 | Vertical |
| 4 | 20556.8000 | 56.24 | 45.78 | -10.46 | 83.50 | 37.72 | 100 | 329 | Vertical |
| 5 | 21530.0500 | 56.74 | 46.76 | -9.98 | 83.50 | 36.74 | 100 | 22 | Vertical |
| 6 | 23713.2750 | 55.28 | 46.73 | -8.55 | 83.50 | 36.77 | 100 | 278 | Vertical |

Mode: TX/ 1Mbps

Lowest channel (2480MHz) Date: 2021-03-18

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 18308.9750 | 58.20 | 46.64 | -11.56 | 83.50 | 36.86 | 100 | 88 | Horizontal |
| 2 | 20465.0000 | 56.96 | 46.45 | -10.51 | 83.50 | 37.05 | 100 | 61 | Horizontal |
| 3 | 21675.8250 | 55.99 | 46.06 | -9.93 | 83.50 | 37.44 | 100 | 226 | Horizontal |
| 4 | 22890.9000 | 55.44 | 46.43 | -9.01 | 83.50 | 37.07 | 100 | 290 | Horizontal |
| 5 | 23744.7250 | 55.18 | 46.66 | -8.52 | 83.50 | 36.84 | 100 | 329 | Horizontal |
| 6 | 26425.6250 | 55.06 | 47.58 | -7.48 | 83.50 | 35.92 | 100 | 359 | Horizontal |

| Suspected Data List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Reading [dBμV/m] | Level [dBμV/m] | Factor [dB] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 18431.3750 | 57.85 | 46.34 | -11.51 | 83.50 | 37.16 | 100 | 297 | Vertical |
| 2 | 19489.2000 | 56.70 | 45.77 | -10.93 | 83.50 | 37.73 | 100 | 145 | Vertical |
| 3 | 21218.9500 | 55.99 | 45.73 | -10.26 | 83.50 | 37.77 | 100 | 349 | Vertical |
| 4 | 23267.4500 | 55.19 | 46.38 | -8.81 | 83.50 | 37.12 | 100 | 297 | Vertical |
| 5 | 24408.1500 | 55.14 | 46.98 | -8.16 | 83.50 | 36.52 | 100 | 186 | Vertical |
| 6 | 26497.4500 | 54.82 | 47.29 | -7.53 | 83.50 | 36.21 | 100 | 349 | Vertical |

# 7. 6dB BANDWIDTH

## 7.1. LIMITS

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

## 7.2. TEST PROCEDURES

1) Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer.
2) Set resolution bandwidth (RBW) = 100kHz.Set the video bandwidth (VBW) ≥ 3 x RBW. Detector = Peak. Trace mode = max hold. Sweep = auto couple. Allow the trace to stabilize, record 6dB bandwidth value.
3) Repeat above procedures until all frequencies measured were complete.

## 7.3. TEST SETUP

## 7.4. TEST RESULTS

**For 1Mbps**

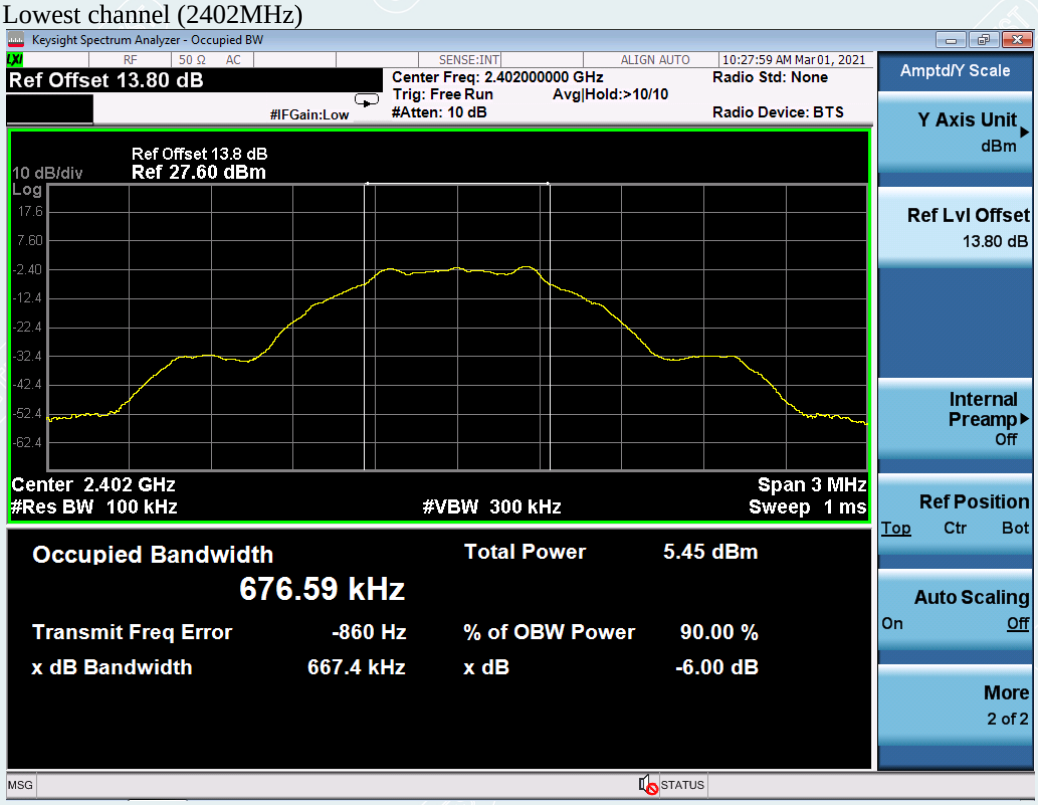
| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Test Result |
|---|---|---|---|---|
| Lowest | 2402 | 667.4 | >500 | PASS |
| Middle | 2440 | 667.8 | | PASS |
| Highest | 2480 | 667.3 | | PASS |

**For 2Mbps**

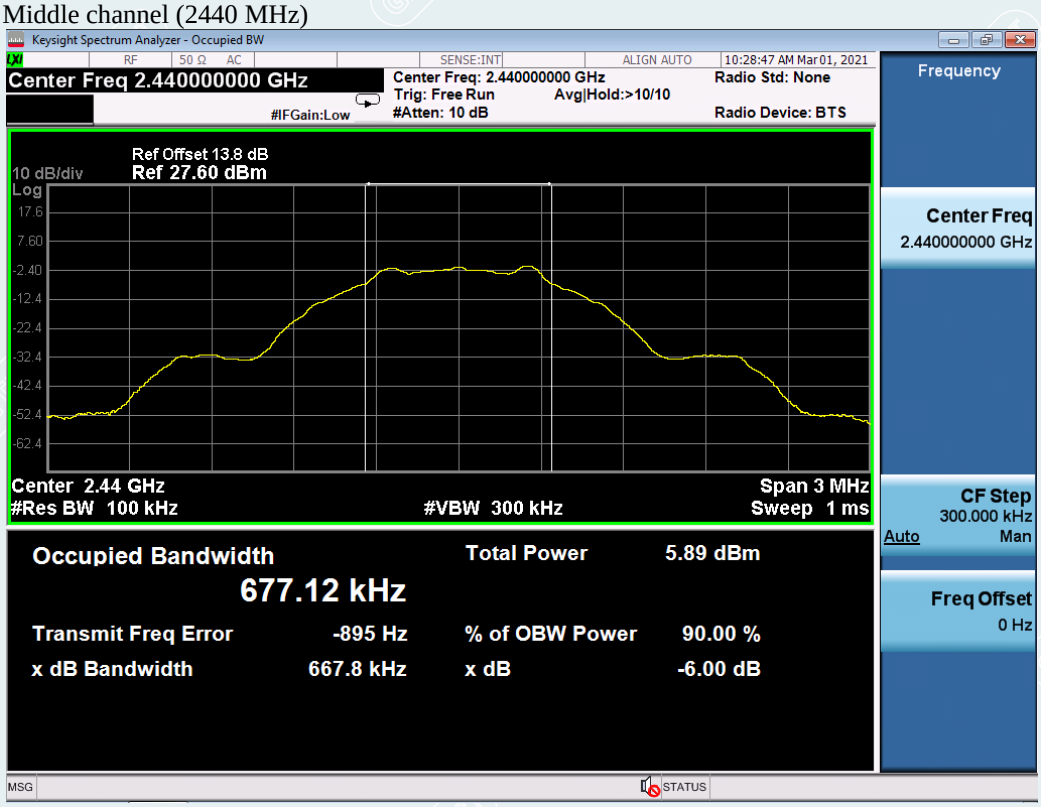
| Channel | Frequency (MHz) | Bandwidth (kHz) | Limit (kHz) | Test Result |
|---|---|---|---|---|
| Lowest | 2402 | 1151.0 | >500 | PASS |
| Middle | 2440 | 1173.0 | | PASS |
| Highest | 2480 | 1165.0 | | PASS |

## For 1Mbps

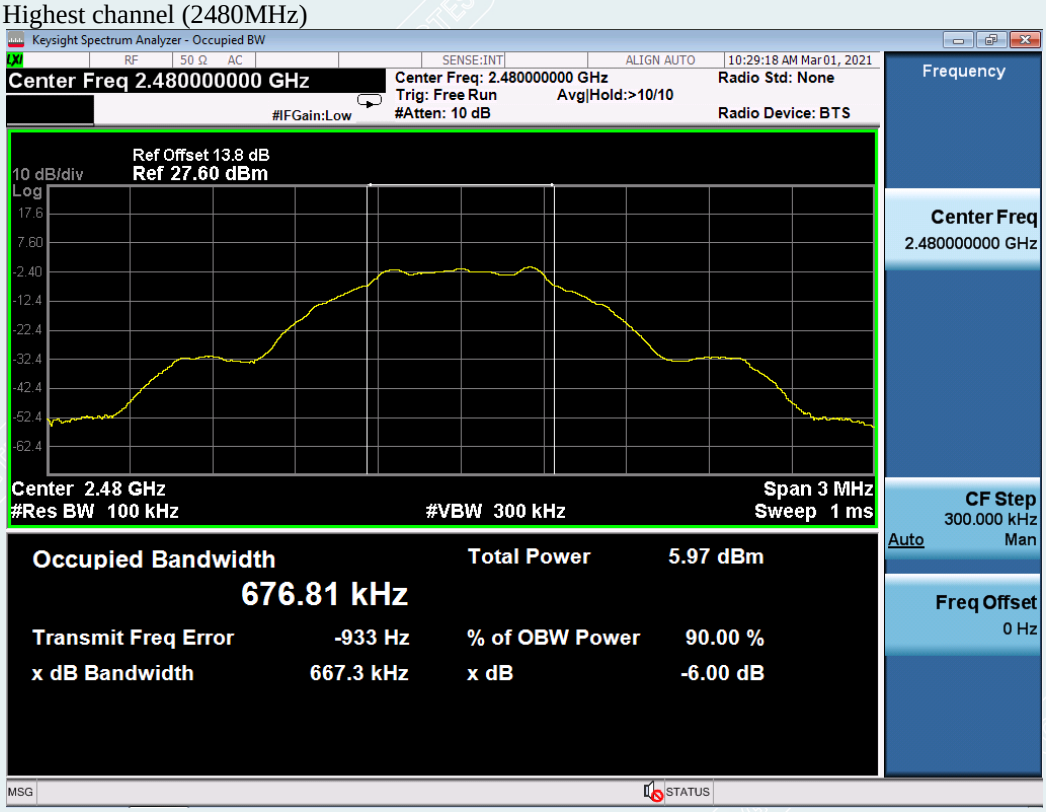
Lowest channel (2402MHz)




Middle channel (2440 MHz)

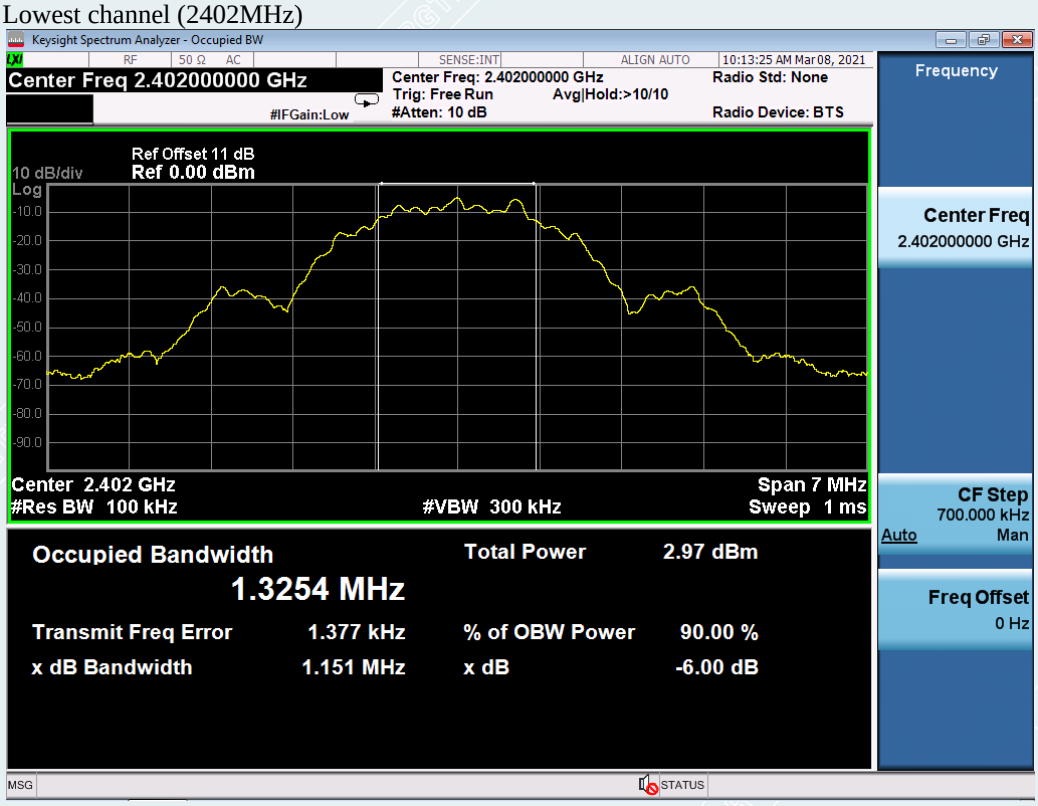


Highest channel (2480MHz)

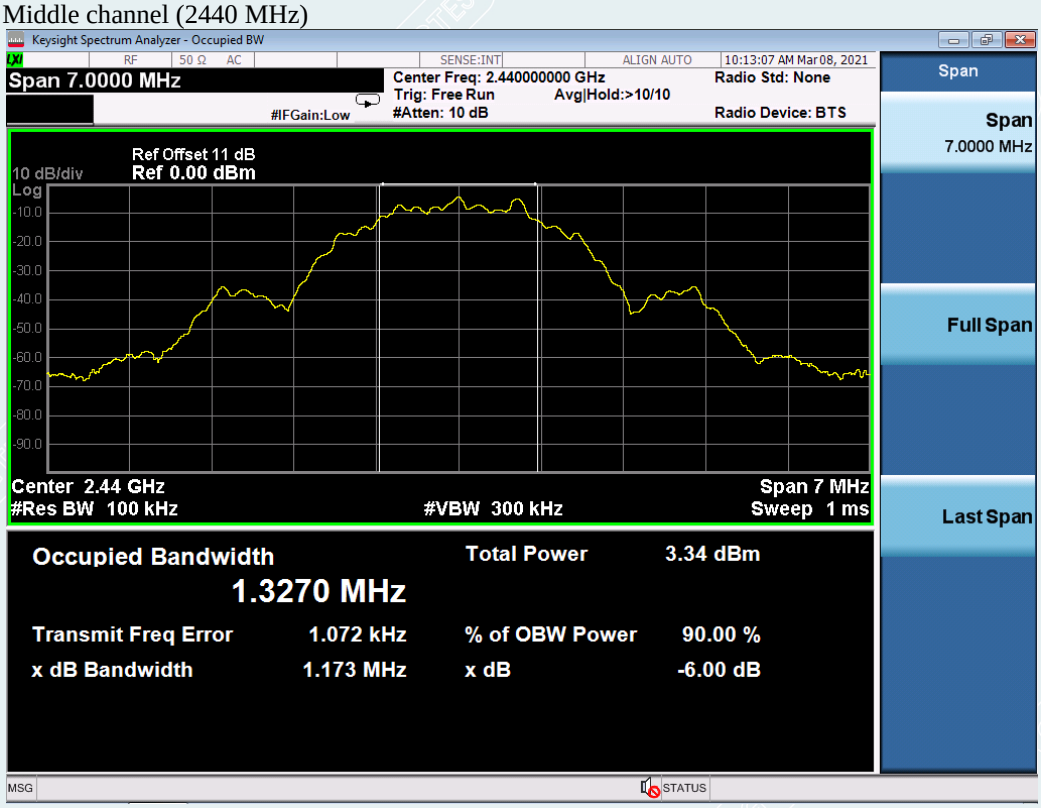



## For 2Mbps

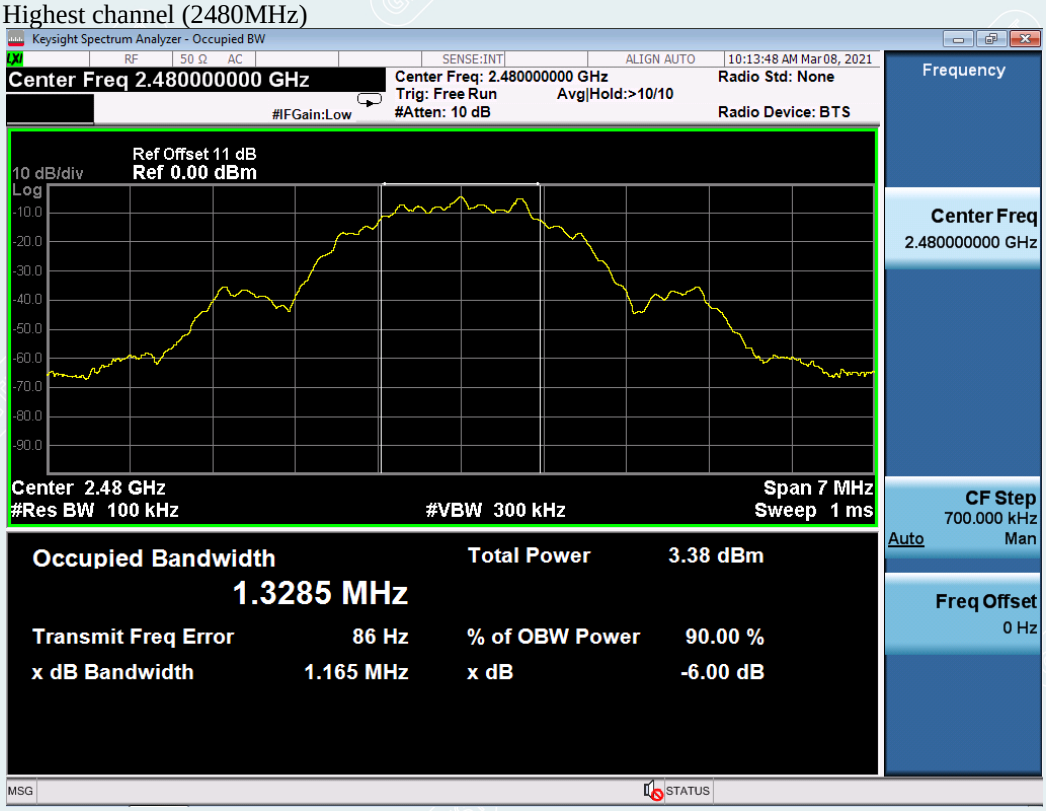
Lowest channel (2402MHz)



Middle channel (2440 MHz)




Highest channel (2480MHz)



# 8. MAXIMUM PEAK OUTPUT POWER

## 8.1.LIMITS

The maximum Peak output power measurement is 1W

## 8.2.TEST PROCEDURES

1) Place the EUT on a bench and set it in transmitting mode.
2) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.

## 8.3.TEST SETUP

## 8.4.TEST RESULTS

**For 1Mbps**

| Channel | Frequency (MHz) | Measured Channel Power (dBm) | Limit | Peak/ Average | Result |
|---|---|---|---|---|---|
| Lowest | 2402 | -3.963 | 1W (30dBm) | Peak | Pass |
| Middle | 2440 | -3.078 | | | Pass |
| Highest | 2480 | -3.438 | | | Pass |

**For 2Mbps**

| Channel | Frequency (MHz) | Measured Channel Power (dBm) | Limit | Peak/ Average | Result |
|---|---|---|---|---|---|
| Lowest | 2402 | -4.021 | 1W (30dBm) | Peak | Pass |
| Middle | 2440 | -3.613 | | | Pass |
| Highest | 2480 | -3.516 | | | Pass |

# 9. POWER SPECTRAL DENSITY

## 9.1. LIMITS

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.

## 9.2. TEST PROCEDURES

1) Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer.
2) Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3) Set the analyzer span to 1.5 times the DTS bandwidth. Set the RBW = 3 kHz. Set the VBW ≥3 RBW. Detector = peak. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
4) Repeat above procedures until all frequencies measured were complete.

## 9.3. TEST SETUP

## 9.4. TEST RESULTS

**For 1Mbps**

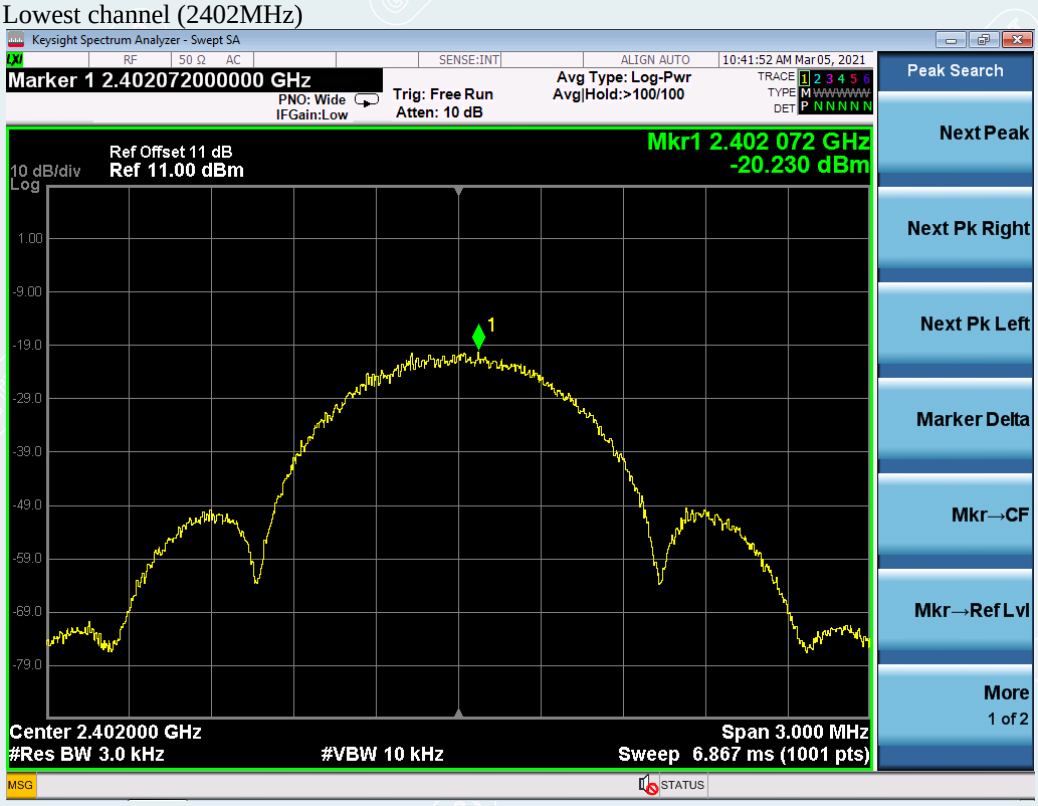
| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm/3kHz) | Test Result |
|---|---|---|---|---|
| Lowest | 2402 | -20.230 | 8 | PASS |
| Middle | 2440 | -19.497 | | PASS |
| Highest | 2480 | -19.915 | | PASS |

**For 2Mbps**

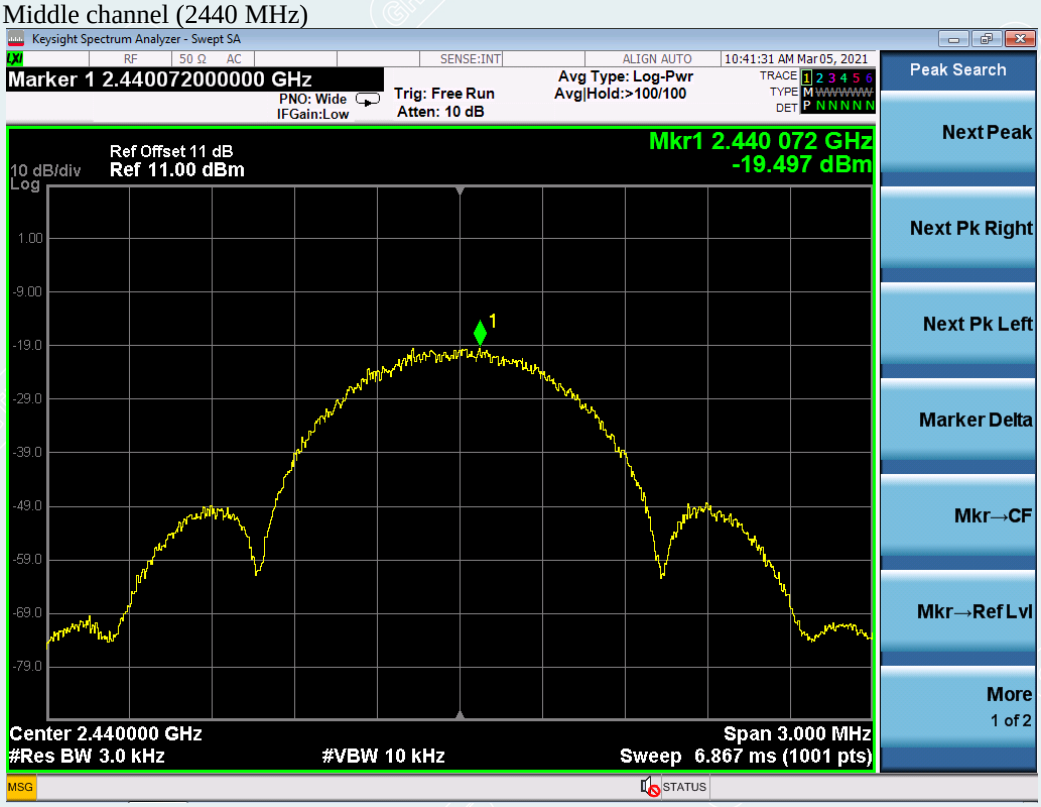
| Channel | Frequency (MHz) | PPSD (dBm) | Limit (dBm/3kHz) | Test Result |
|---|---|---|---|---|
| Lowest | 2402 | -22.590 | 8 | PASS |
| Middle | 2440 | -22.088 | | PASS |
| Highest | 2480 | -22.134 | | PASS |

## For 1Mbps

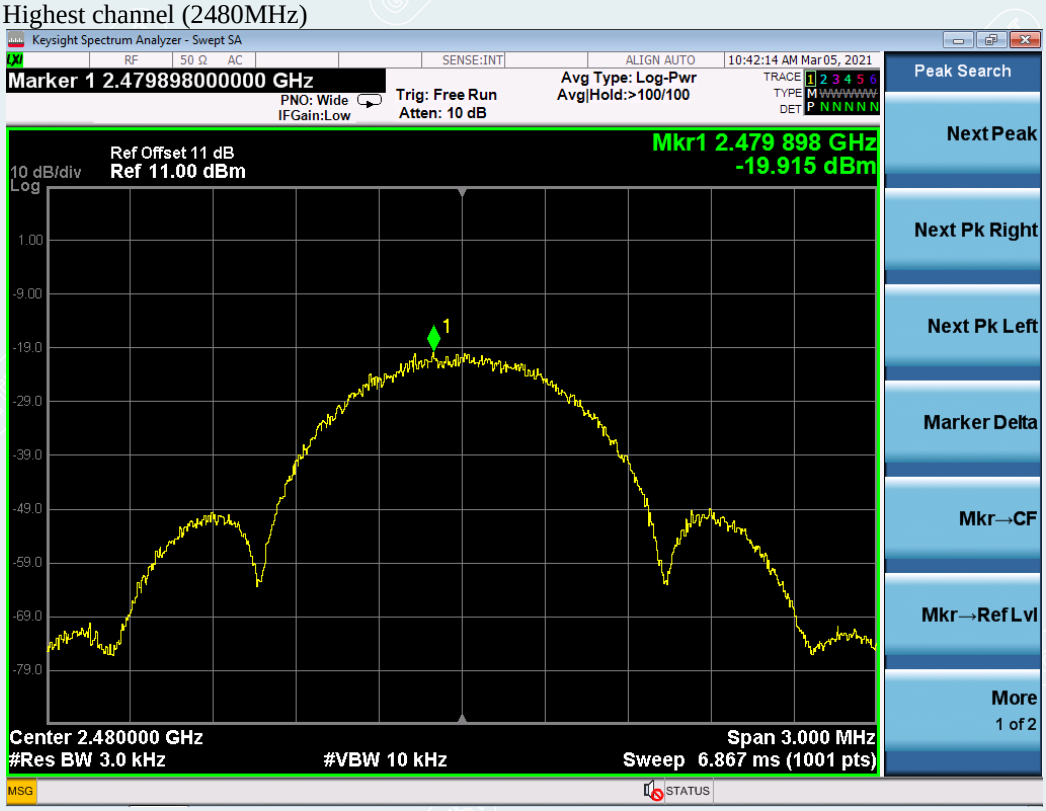
Lowest channel (2402MHz)




Middle channel (2440 MHz)

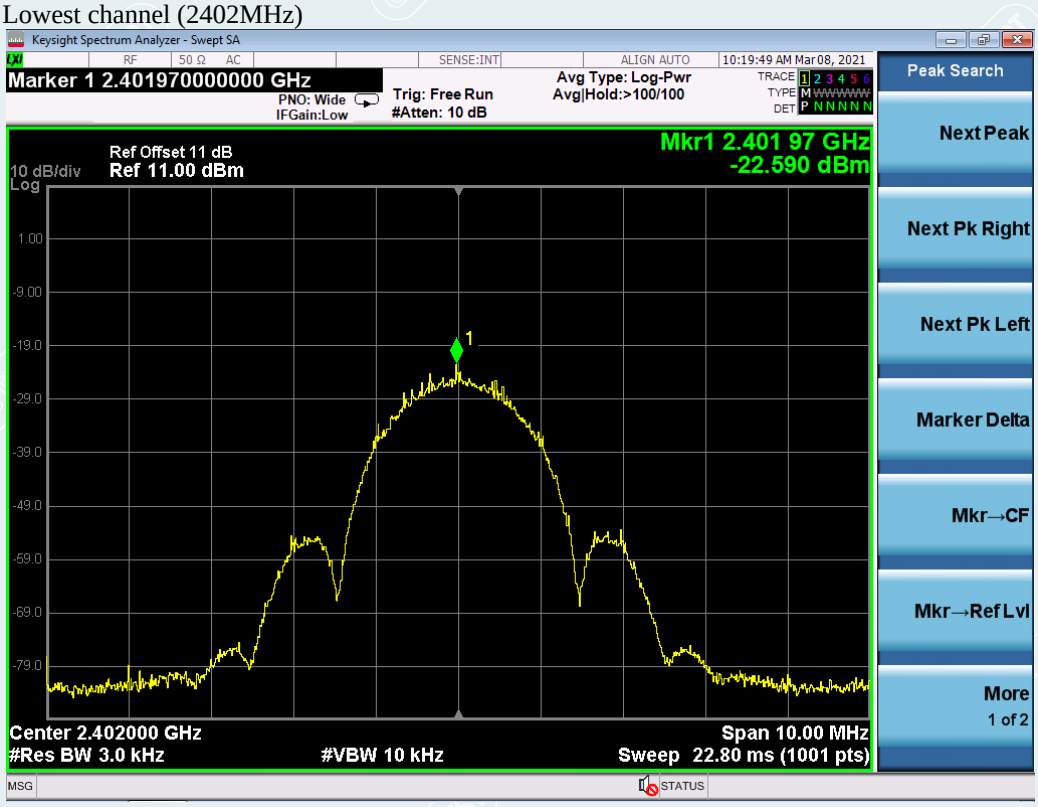


Highest channel (2480MHz)

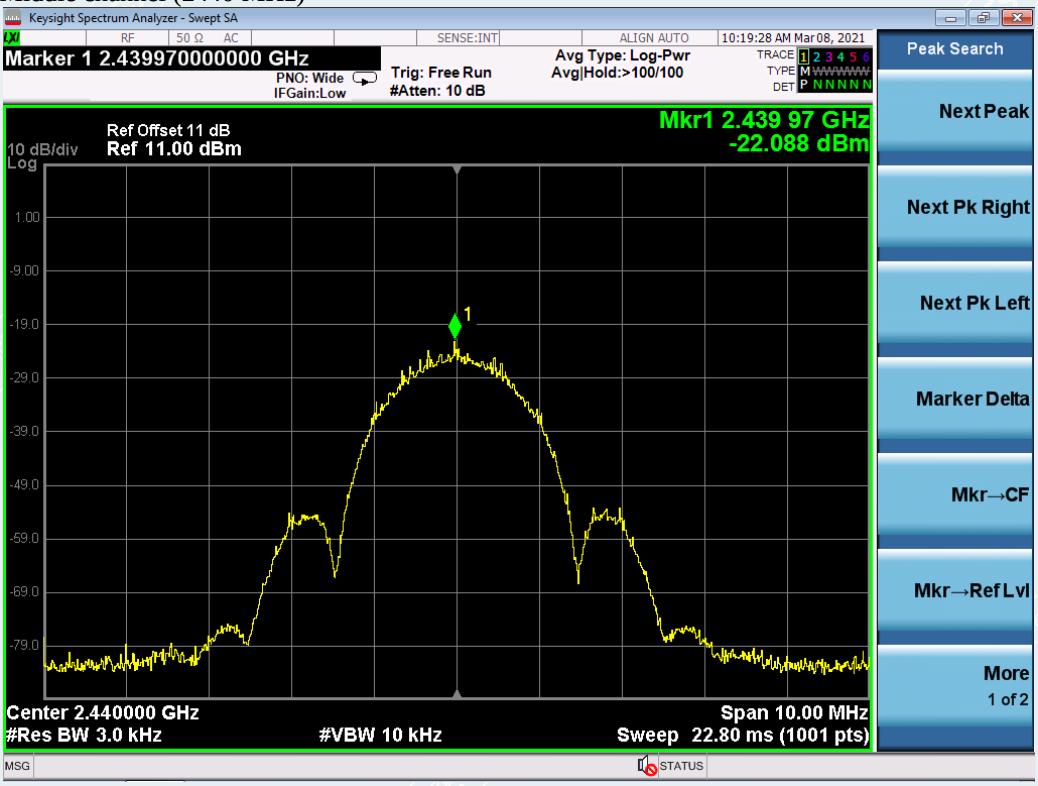



## For 2Mbps

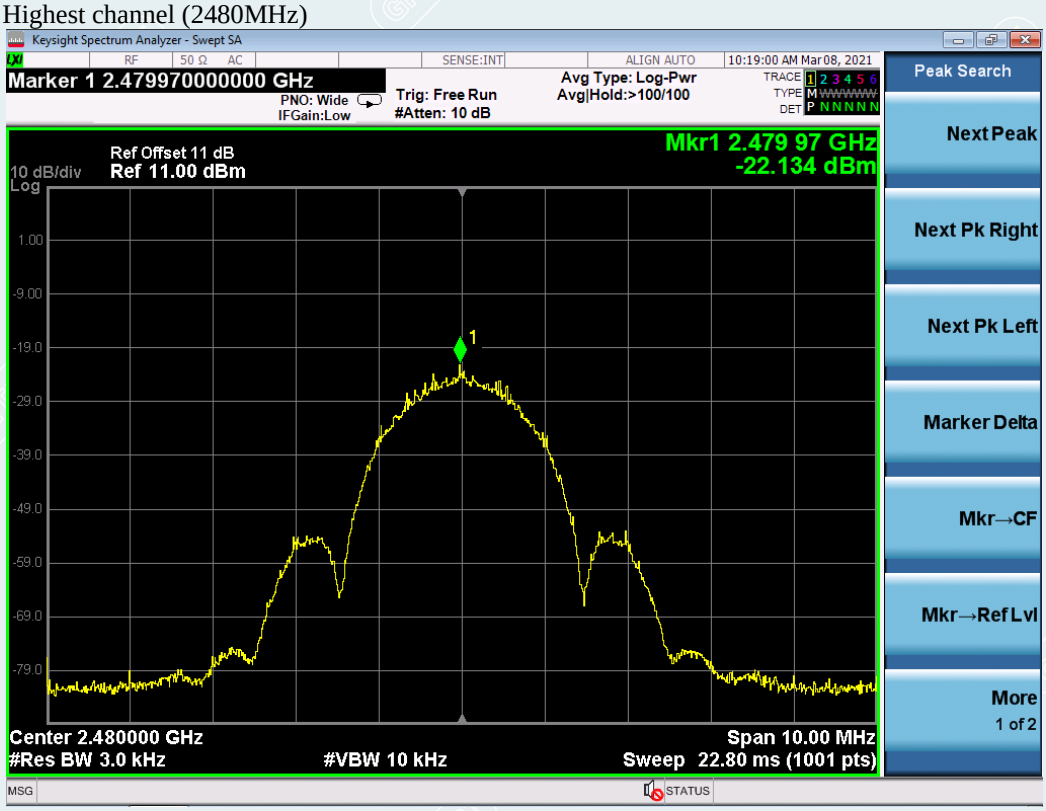
Lowest channel (2402MHz)



Middle channel (2440 MHz)




Highest channel (2480MHz)



# 10. CONDUCTED BAND EDGES AND SPURIOUS EMISSIONS

## 10.1. LIMITS

(d) 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.

## 10.2. TEST PROCEDURES

Test procedures follow KDB 558074 D01 DTS Measurement Guidance v05r02.

Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.

1) Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.
2) Set the spectrum analyzer: RBW =100KHz; VBW =300KHz, Span = 10MHz to 26GHz; Sweep = auto; Detector Function = Peak. Trace = Max, hold.
3) Measure and record the results in the test report.
4) The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
5) Measurements are made over the 9 kHz to 26GHz range with the transmitter set to the lowest, middle, and highest channels. No emission found between lowest internal used/generated frequency to 10MHz，it is only recorded 10MHz to 26GHz.

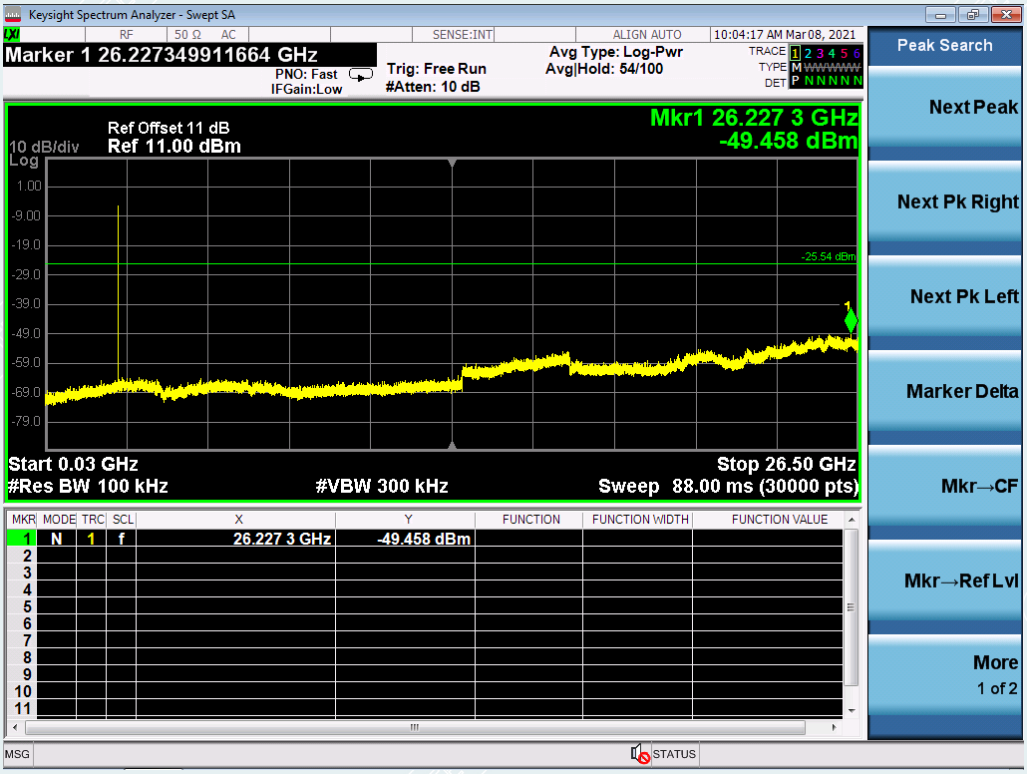
## 10.3. TEST SETUP

# 10.4. TEST RESULTS

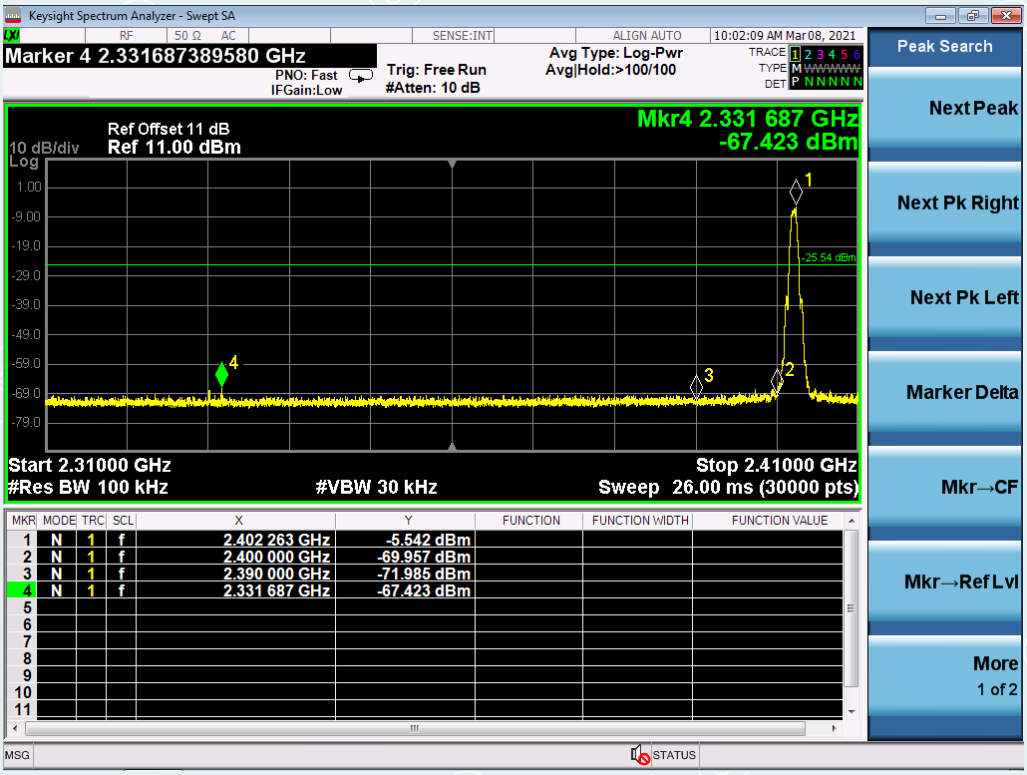
## For 1Mbps

Lowest channel (2402MHz)

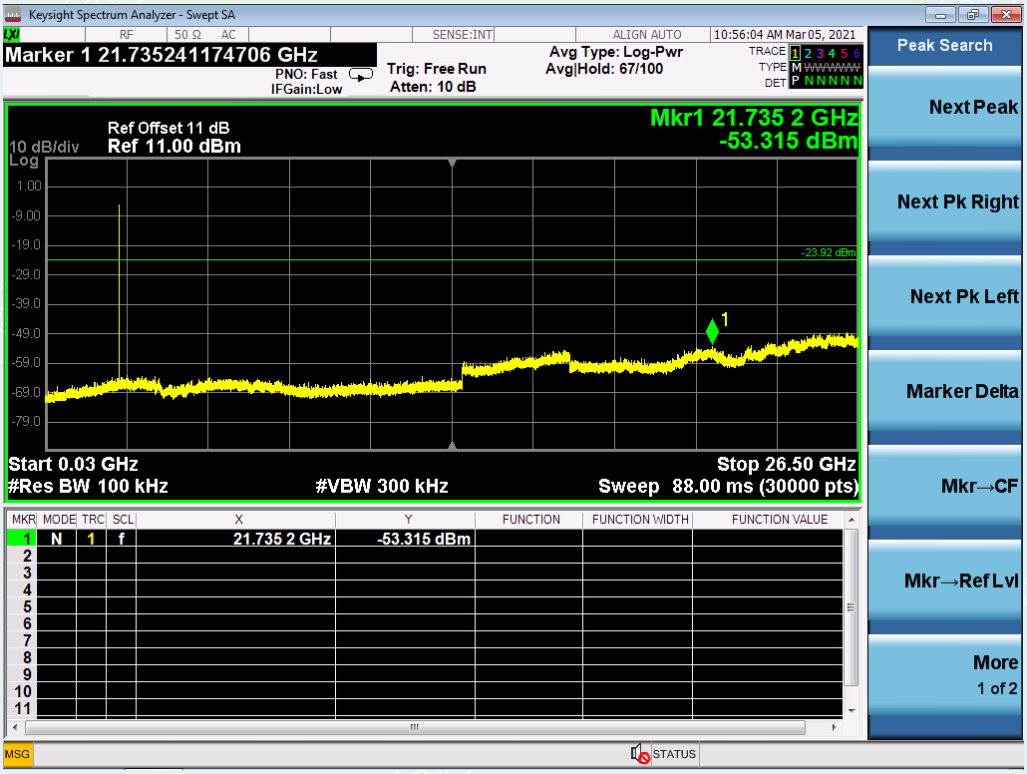
0.03GHz-26.5GHz

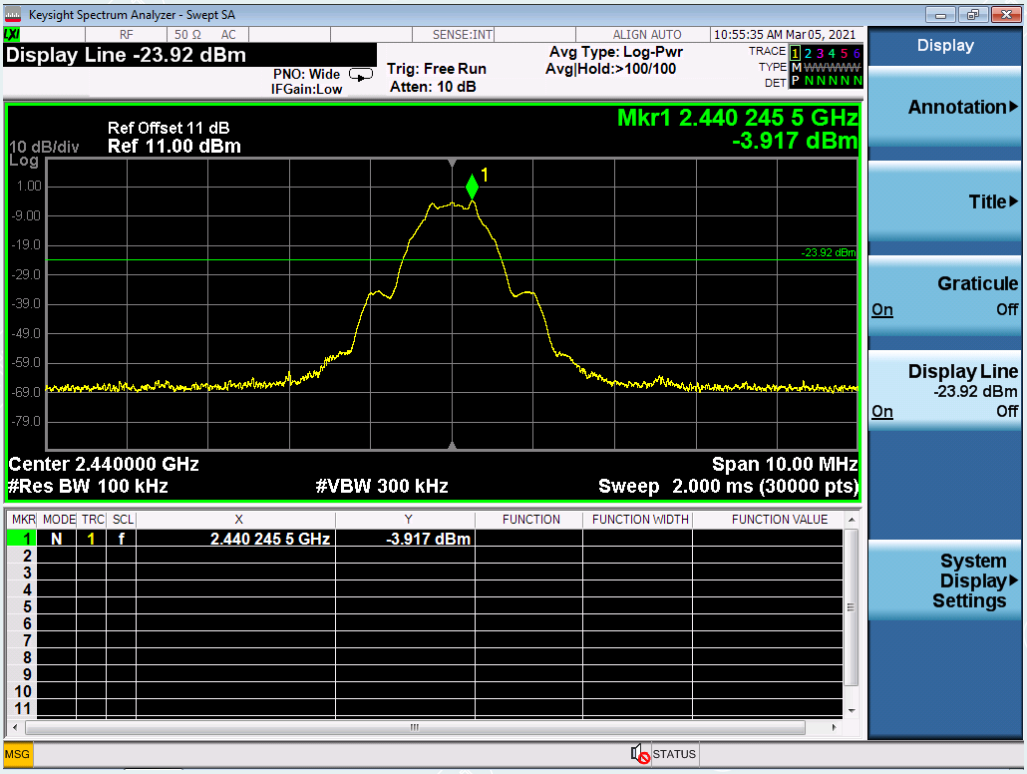



2.31GHz-2.41GHz

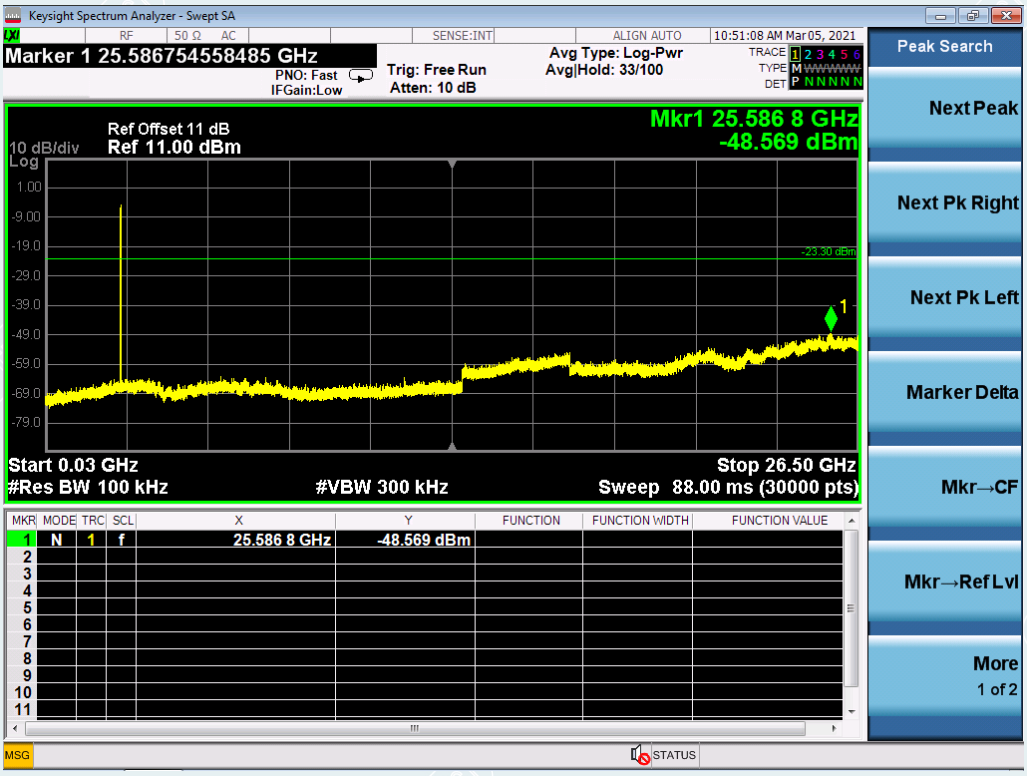


Middle channel (2440 MHz)
0.03GHz-26.5GHz

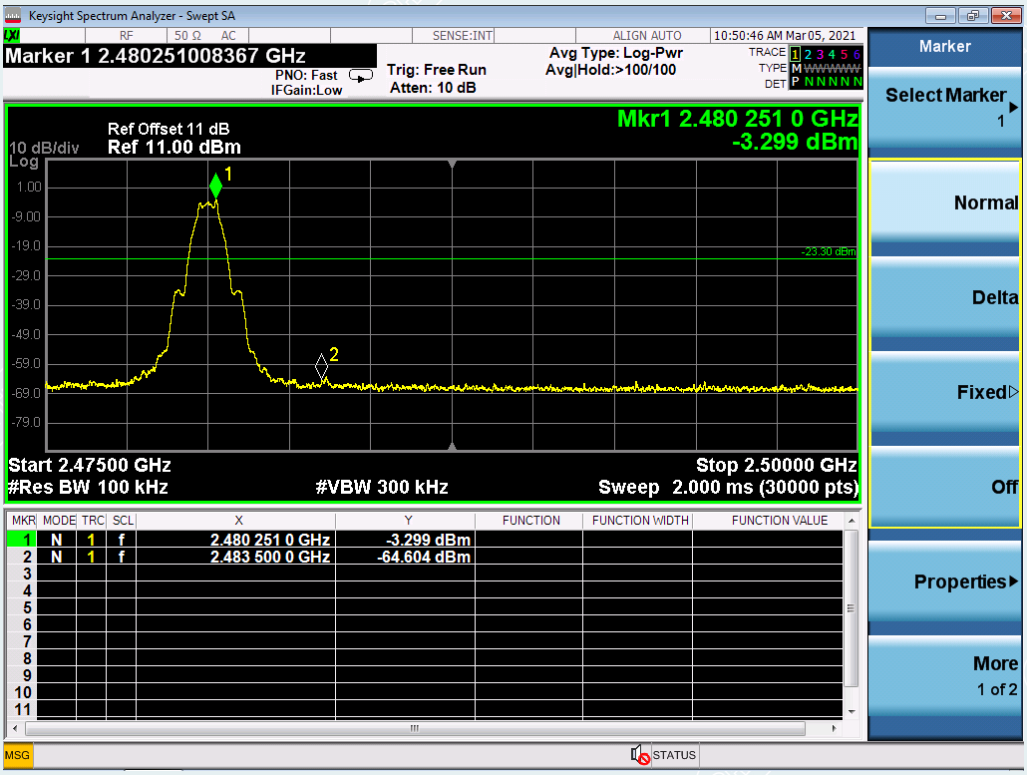


Highest channel (2480MHz)
0.03GHz-26.5GHz



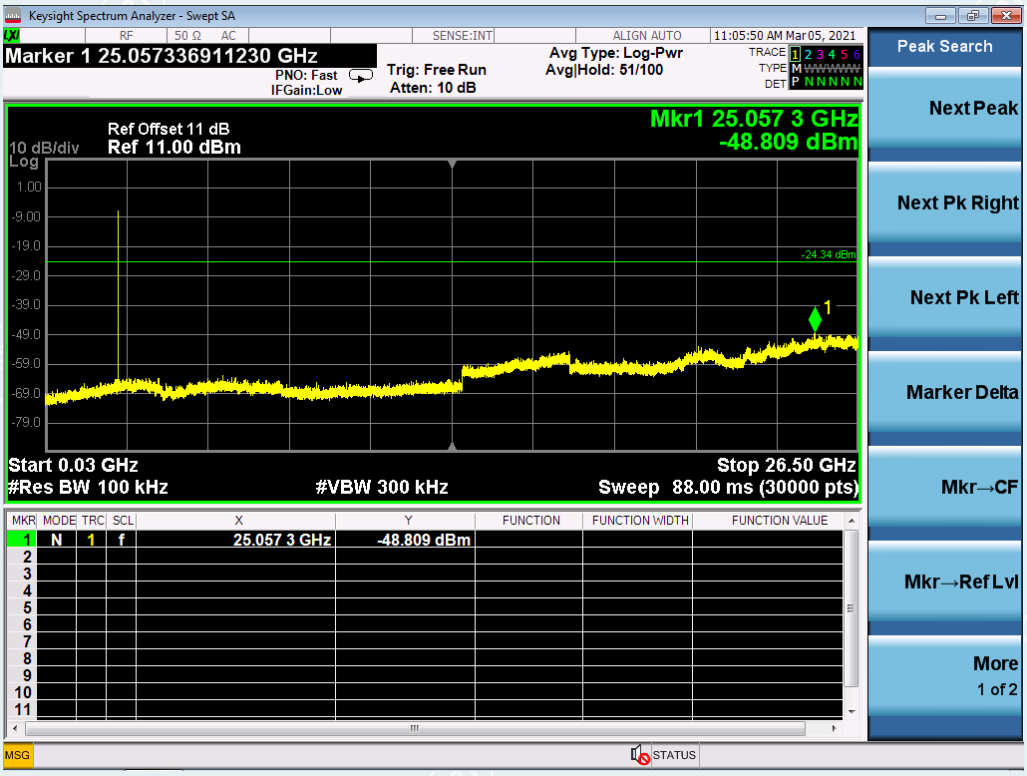

2.475GHz-2.5GHz



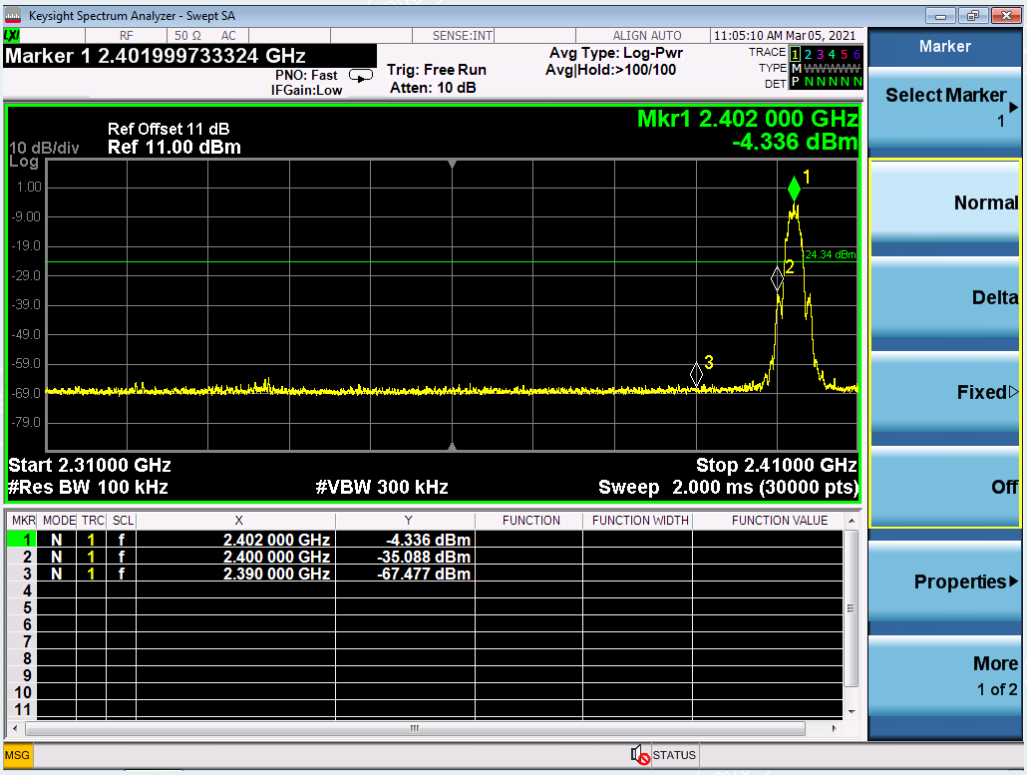
**For 2Mbps**

Lowest channel (2402MHz)

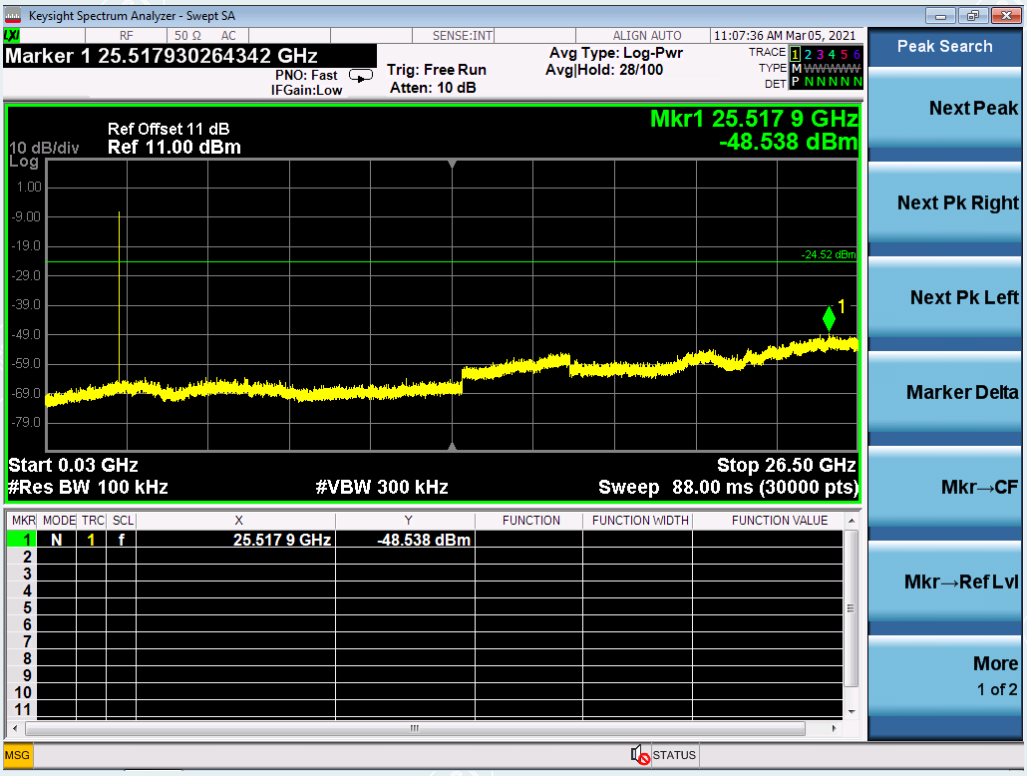
0.03GHz-26.5GHz



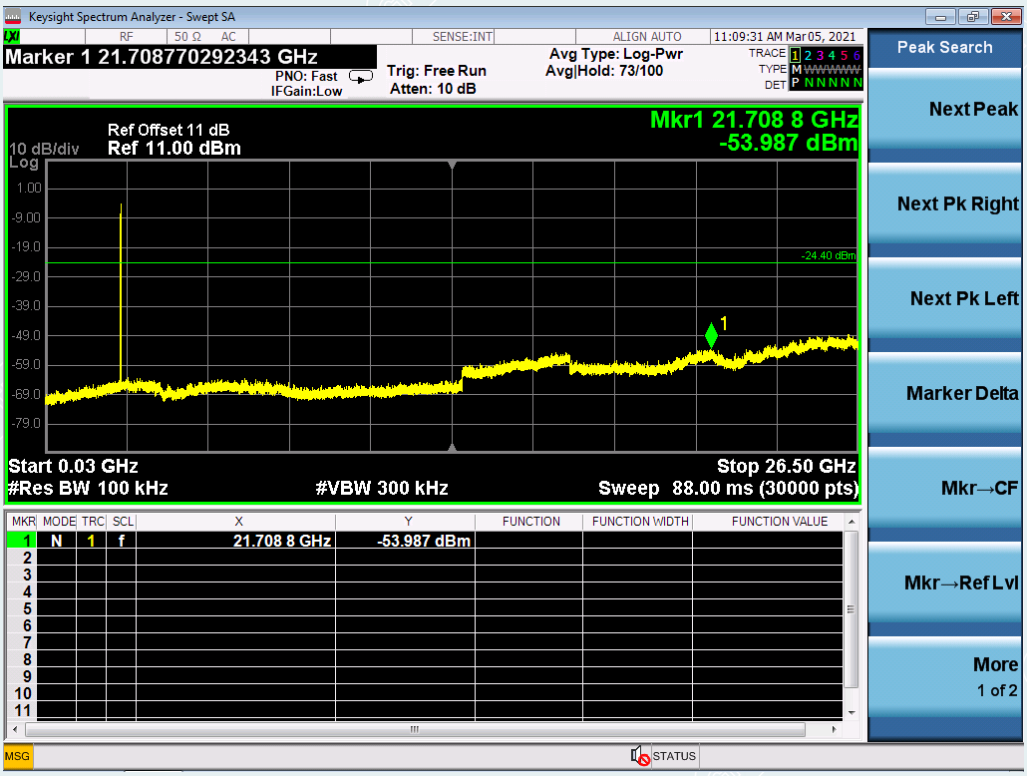

2.31GHz-2.41GHz



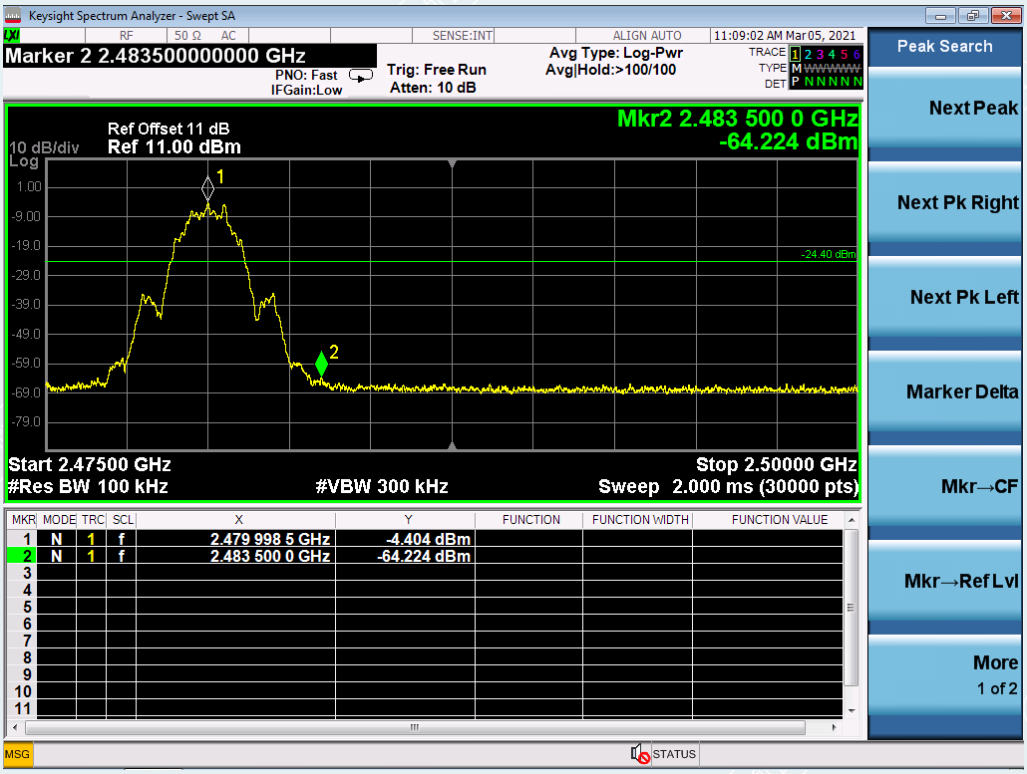
Middle channel (2440 MHz)
0.03GHz-26.5GHz



Highest channel (2480MHz)
0.03GHz-26.5GHz




2.475GHz-2.5GHz



# 11. RESTRICTED BANDS OF OPERATION

## 11.1. LIMITS

Section 15.247(d) 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)).

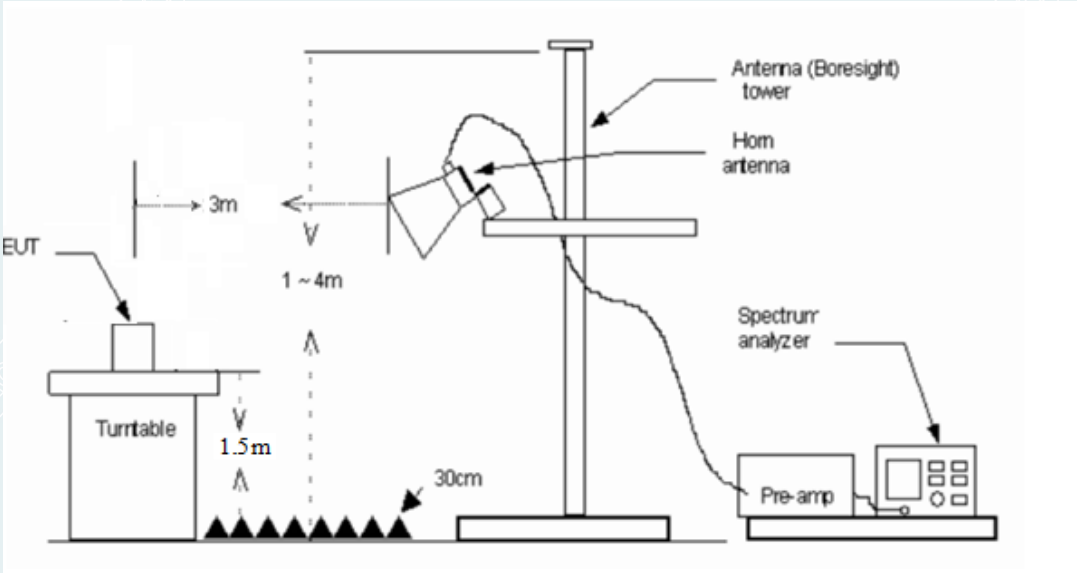
| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| [1]0.495 - 0.505 | 16.69475 - | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.69525 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 16.80425 - | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 16.80475 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 25.5 - 25.67 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 37.5 - 38.25 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 73 - 74.6 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 74.8 - 75.2 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 108 - 121.94 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 123 - 138 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 149.9 - 150.05 | 2655 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 156.52475 - | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 156.52525 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - | 156.7 - 156.9 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.52025 | 162.0125 - 167.17 | 3600 - 4400 | |
| 12.57675 - | 167.72 - 173.2 | | |
| 12.57725 | 240 - 285 | | |
| 13.36 - 13.41 | 322 - 335.4 | | |

## 11.2. TEST PROCEDURES

Test procedures follow KDB 558074 D01 DTS Meas Guidance v03r01.

1) The EUT is placed on a turntable, which is 1.5m above the ground plane.
2) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4) Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   a) PEAK: RBW=1MHz / VBW=1MHz / Sweep=AUTO
   b) AVERAGE: RBW=1MHz / VBW=1/T / Sweep=AUTO
5) Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

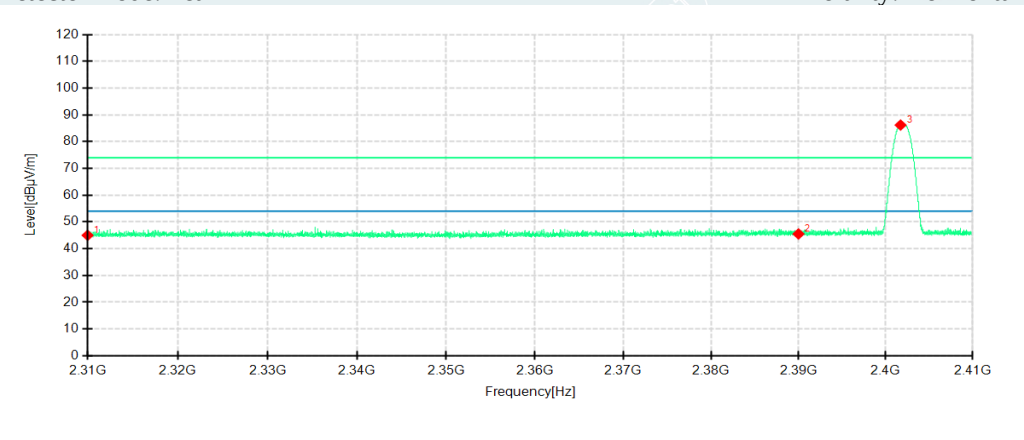
## 11.3. TEST SETUP



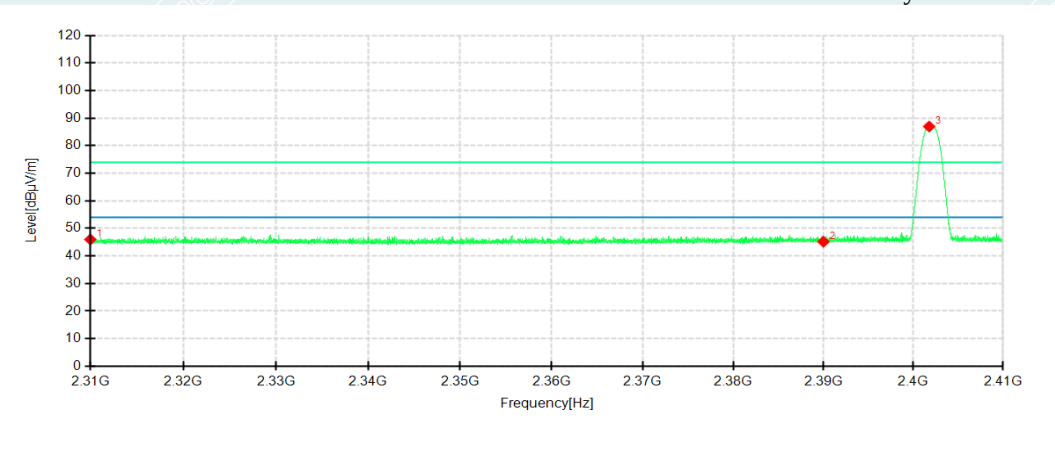
# 11.4. TEST RESULTS

## For 1Mbps

**Lowest Channel**
Channel 2402MHz
Detector mode: Peak Polarity: Horizontal

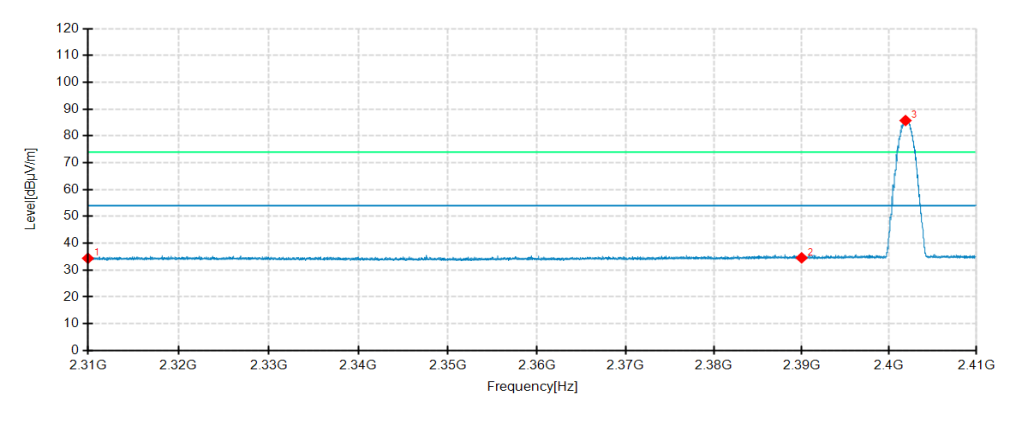



Detector mode: Peak Polarity: Vertical

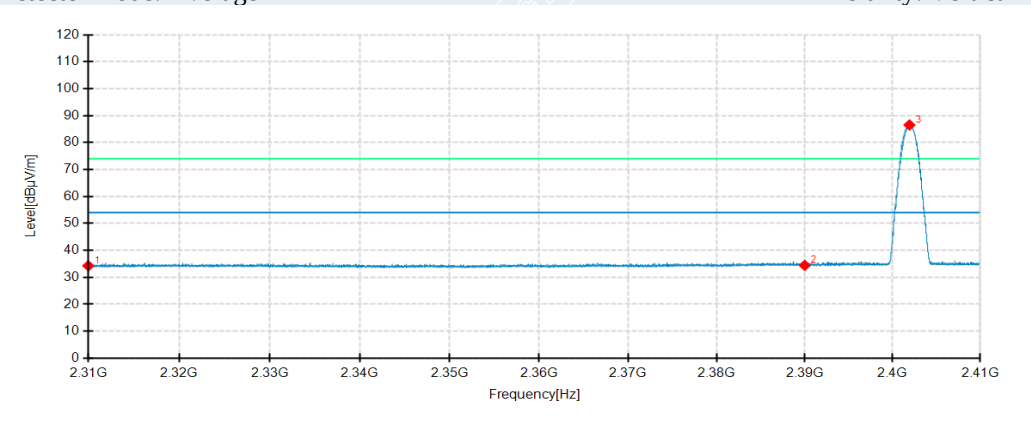



| No. | Frequency MHz | Reading dBµV/m | Level dBµV/m | Factor dB | Limit dBuV/m | Margin dB | Height cm | Angle ° | Pole | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2310.0000 | 42.01 | 45.00 | 2.99 | 74.00 | 29.00 | 200 | 138 | Horizontal | / |
| 2 | 2390.0000 | 42.32 | 45.51 | 3.19 | 74.00 | 28.49 | 200 | 193 | Horizontal | / |
| 3 | 2401.7125 | 82.83 | 86.18 | 3.35 | 74.00 | -12.18 | 100 | 222 | Horizontal | No limit |
| 1 | 2310.0000 | 42.99 | 45.98 | 2.99 | 74.00 | 28.02 | 100 | 351 | Vertical | / |
| 2 | 2390.0000 | 41.99 | 45.18 | 3.19 | 74.00 | 28.82 | 200 | 294 | Vertical | / |
| 3 | 2401.7625 | 83.60 | 86.95 | 3.35 | 74.00 | -12.95 | 200 | 253 | Vertical | No limit |

**Lowest Channel**
Channel 2402MHz
Detector mode: Average Polarity: Horizontal

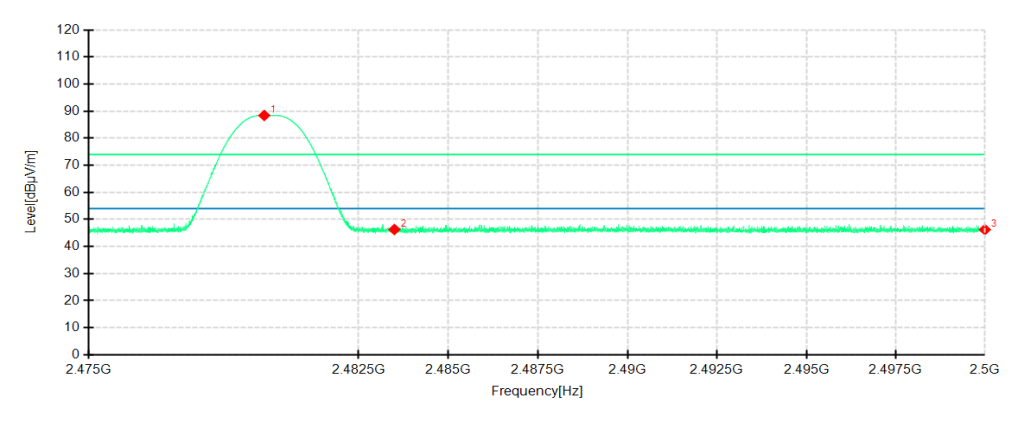



Detector mode: Average Polarity: Vertical

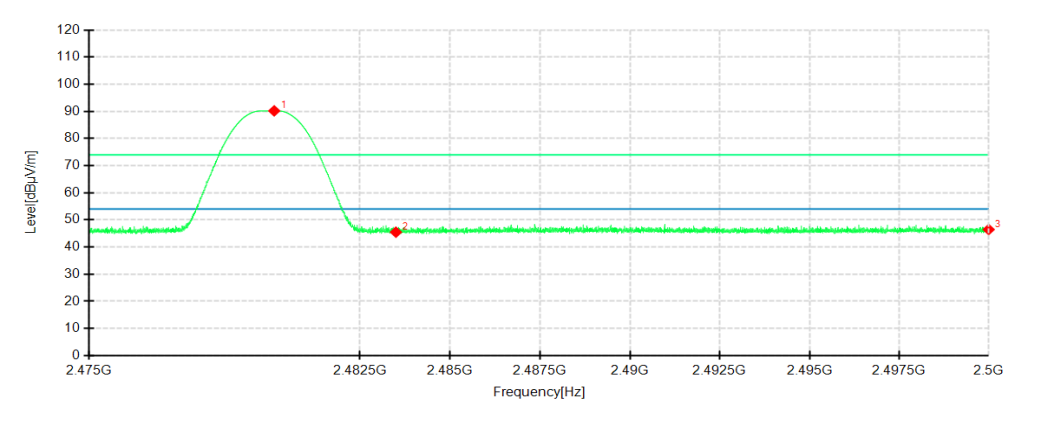



| No. | Frequency MHz | Reading dBµV/m | Level dBµV/m | Factor dB | Limit dBuV/m | Margin dB | Height cm | Angle ° | Pole | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2310.0000 | 31.39 | 34.38 | 2.99 | 54.00 | 19.62 | 200 | 281 | Horizontal | / |
| 2 | 2390.0000 | 31.37 | 34.56 | 3.19 | 54.00 | 19.44 | 100 | 79 | Horizontal | / |
| 3 | 2401.8750 | 82.39 | 85.74 | 3.35 | 54.00 | -31.74 | 100 | 222 | Horizontal | No limit |
| 1 | 2310.0000 | 31.28 | 34.27 | 2.99 | 54.00 | 19.73 | 100 | 18 | Vertical | / |
| 2 | 2390.0000 | 31.25 | 34.44 | 3.19 | 54.00 | 19.56 | 200 | 158 | Vertical | / |
| 3 | 2401.9250 | 83.15 | 86.50 | 3.35 | 54.00 | -32.50 | 200 | 247 | Vertical | No limit |

**Highest Channel**
Channel 2480MHz
Detector mode: Peak Polarity: Horizontal

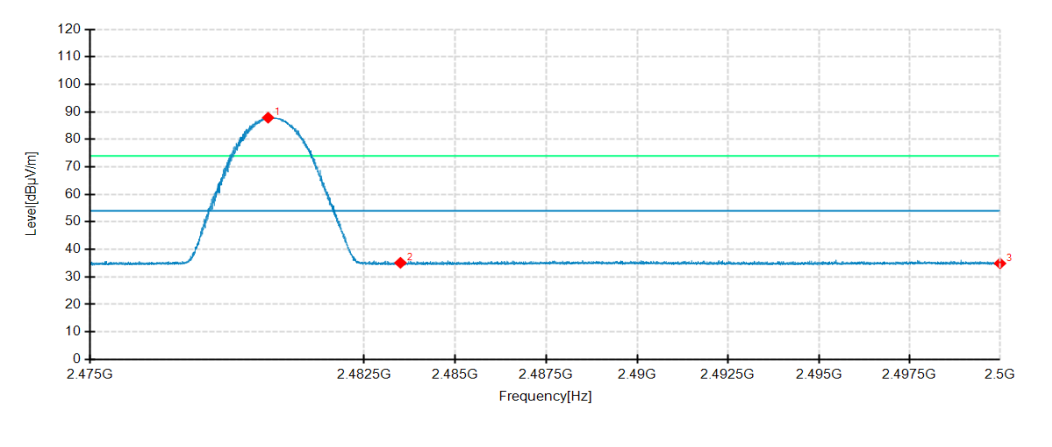



Detector mode: Peak Polarity: Vertical

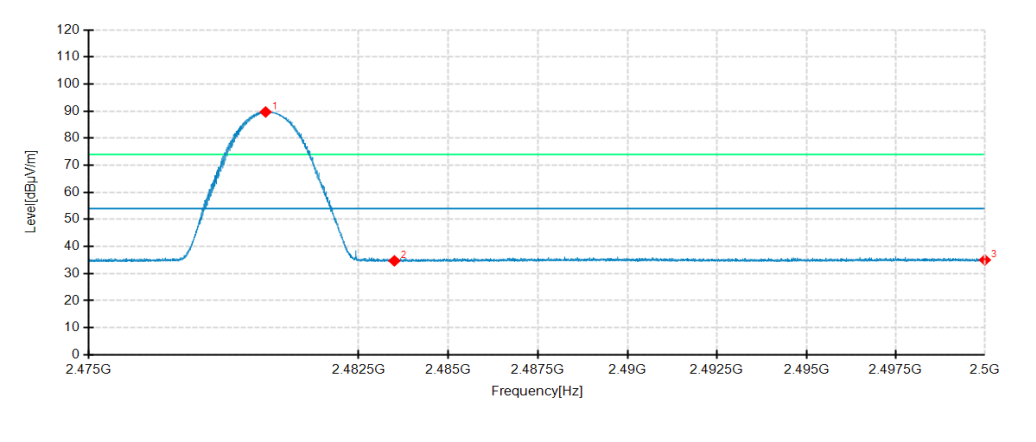



| No. | Frequency MHz | Reading dBµV/m | Level dBµV/m | Factor dB | Limit dBuV/m | Margin dB | Height cm | Angle ° | Pole | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2479.8781 | 84.84 | 88.39 | 3.55 | 74.00 | -14.39 | 100 | 223 | Horizontal | No limit |
| 2 | 2483.5000 | 42.72 | 46.28 | 3.56 | 74.00 | 27.72 | 100 | 24 | Horizontal | / |
| 3 | 2500.0000 | 42.65 | 46.23 | 3.58 | 74.00 | 27.77 | 100 | 277 | Horizontal | |
| 1 | 2480.1250 | 86.63 | 90.18 | 3.55 | 74.00 | -16.18 | 200 | 240 | Vertical | No limit |
| 2 | 2483.5000 | 41.91 | 45.47 | 3.56 | 74.00 | 28.53 | 100 | 114 | Vertical | / |
| 3 | 2500.0000 | 42.87 | 46.45 | 3.58 | 74.00 | 27.55 | 100 | 216 | Vertical | / |

**Highest Channel**
Channel 2480MHz
Detector mode: Average Polarity: Horizontal



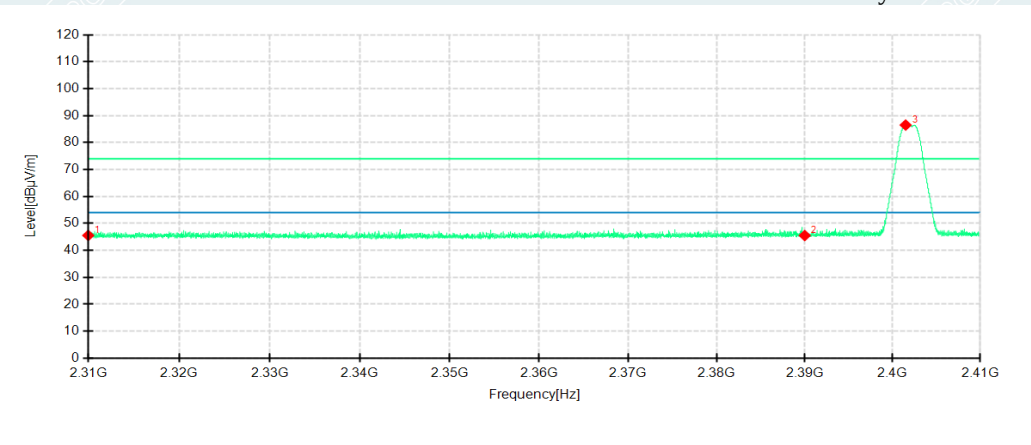

Detector mode: Average Polarity: Vertical



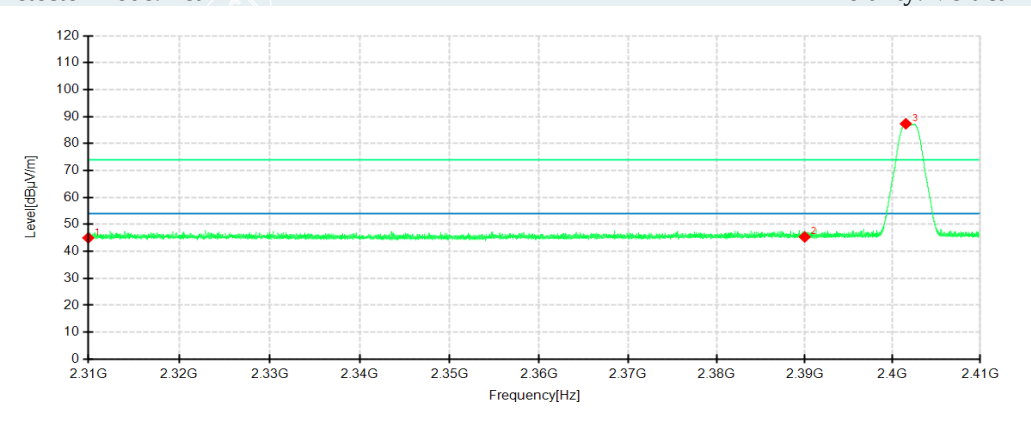

| No. | Frequency MHz | Reading dBµV/m | Level dBµV/m | Factor dB | Limit dBuV/m | Margin dB | Height cm | Angle ° | Pole | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2479.8719 | 84.32 | 87.87 | 3.55 | 54.00 | -33.87 | 100 | 228 | Horizontal | No limit |
| 2 | 2483.5000 | 31.56 | 35.12 | 3.56 | 54.00 | 18.88 | 100 | 79 | Horizontal | / |
| 3 | 2500.0000 | 31.32 | 34.90 | 3.58 | 54.00 | 19.10 | 200 | 0 | Horizontal | / |
| 1 | 2479.9156 | 86.12 | 89.67 | 3.55 | 54.00 | -35.67 | 200 | 246 | Vertical | No limit |
| 2 | 2483.5000 | 31.14 | 34.70 | 3.56 | 54.00 | 19.30 | 100 | 346 | Vertical | / |
| 3 | 2500.0000 | 31.45 | 35.03 | 3.58 | 54.00 | 18.97 | 100 | 161 | Vertical | / |

## For 2Mbps

**Lowest Channel**
Channel 2402MHz
Detector mode: Peak Polarity: Horizontal

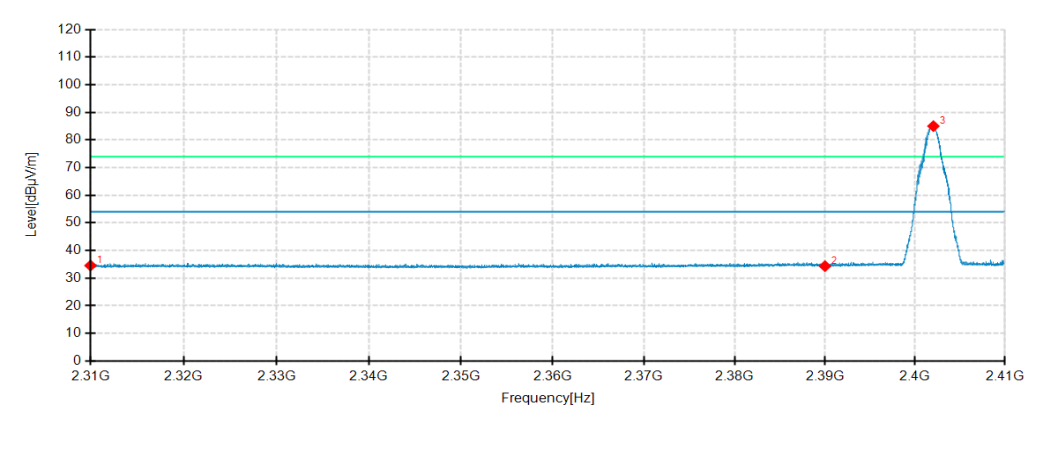



Detector mode: Peak Polarity: Vertical

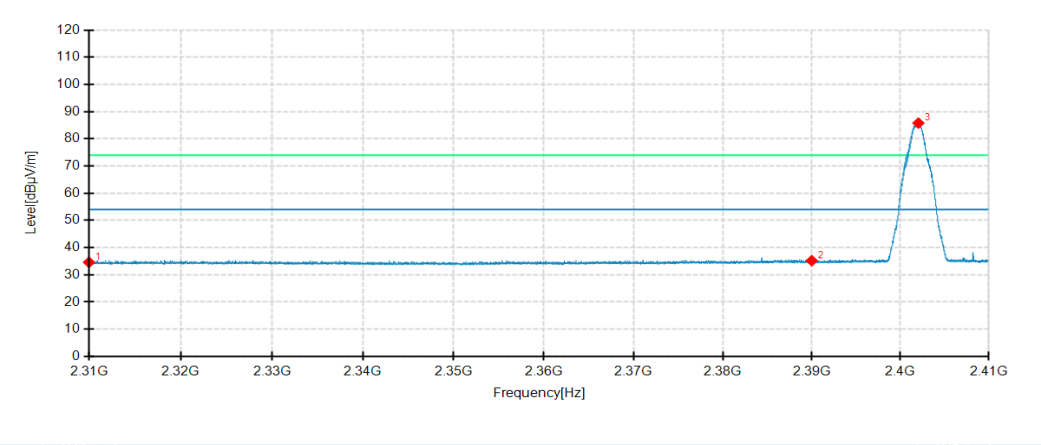



| No. | Frequency MHz | Reading dBµV/m | Level dBµV/m | Factor dB | Limit dBuV/m | Margin dB | Height cm | Angle ° | Pole | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2310.0000 | 42.55 | 45.54 | 2.99 | 74.00 | 28.46 | 200 | 90 | Horizontal | / |
| 2 | 2390.0000 | 42.32 | 45.51 | 3.19 | 74.00 | 28.49 | 100 | 107 | Horizontal | / |
| 3 | 2401.4875 | 83.14 | 86.49 | 3.35 | 74.00 | -12.49 | 100 | 224 | Horizontal | No limit |
| 1 | 2310.0000 | 42.00 | 44.99 | 2.99 | 74.00 | 29.01 | 200 | 184 | Vertical | / |
| 2 | 2390.0000 | 42.16 | 45.35 | 3.19 | 74.00 | 28.65 | 200 | 75 | Vertical | / |
| 3 | 2401.5125 | 83.98 | 87.33 | 3.35 | 74.00 | -13.33 | 200 | 252 | Vertical | No limit |

**Lowest Channel**
Channel 2402MHz
Detector mode: Average Polarity: Horizontal

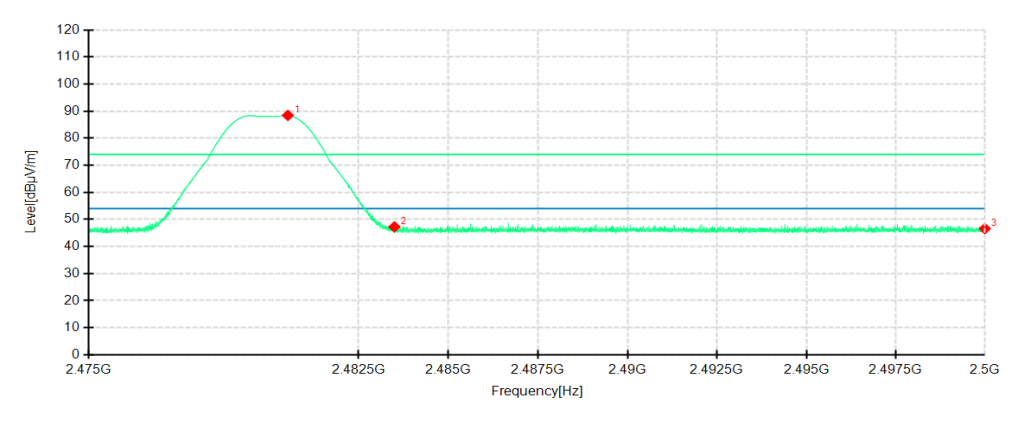



Detector mode: Average Polarity: Vertical

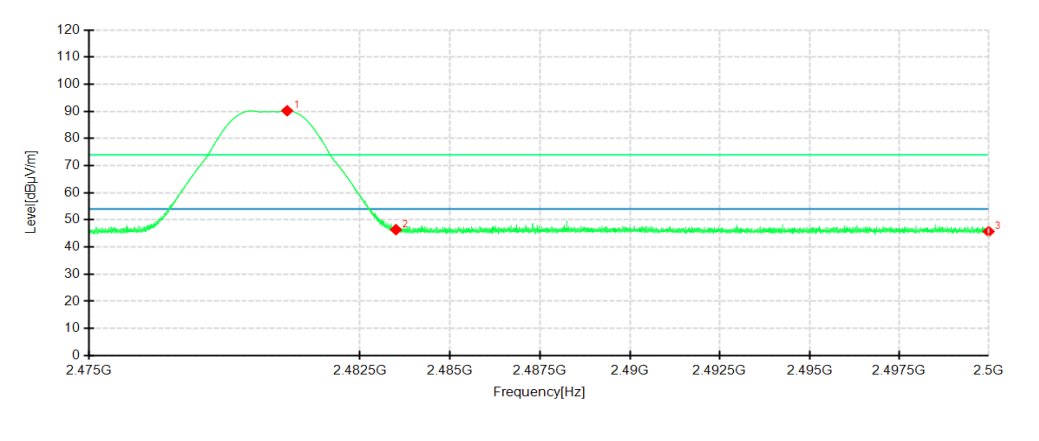



| No. | Frequency MHz | Reading dBµV/m | Level dBµV/m | Factor dB | Limit dBuV/m | Margin dB | Height cm | Angle ° | Pole | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2310.0000 | 31.56 | 34.55 | 2.99 | 54.00 | 19.45 | 200 | 349 | Horizontal | / |
| 2 | 2390.0000 | 31.14 | 34.33 | 3.19 | 54.00 | 19.67 | 100 | 304 | Horizontal | / |
| 3 | 2402.0375 | 81.67 | 85.02 | 3.35 | 54.00 | -31.02 | 100 | 222 | Horizontal | No limit |
| 1 | 2310.0000 | 31.61 | 34.60 | 2.99 | 54.00 | 19.40 | 200 | 69 | Vertical | / |
| 2 | 2390.0000 | 32.00 | 35.19 | 3.19 | 54.00 | 18.81 | 100 | 113 | Vertical | / |
| 3 | 2402.0375 | 82.43 | 85.78 | 3.35 | 54.00 | -31.78 | 200 | 247 | Vertical | No limit |

**Highest Channel**
Channel 2480MHz
Detector mode: Peak Polarity: Horizontal

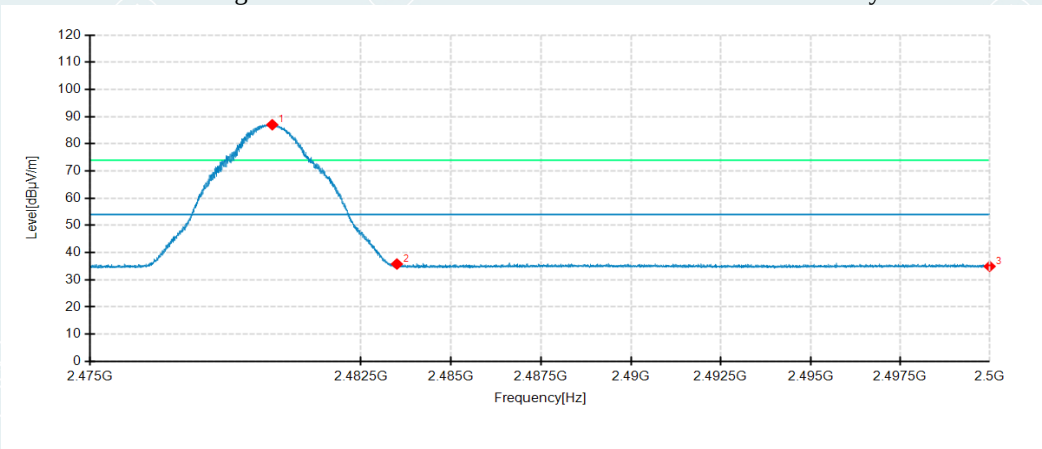



Detector mode: Peak Polarity: Vertical

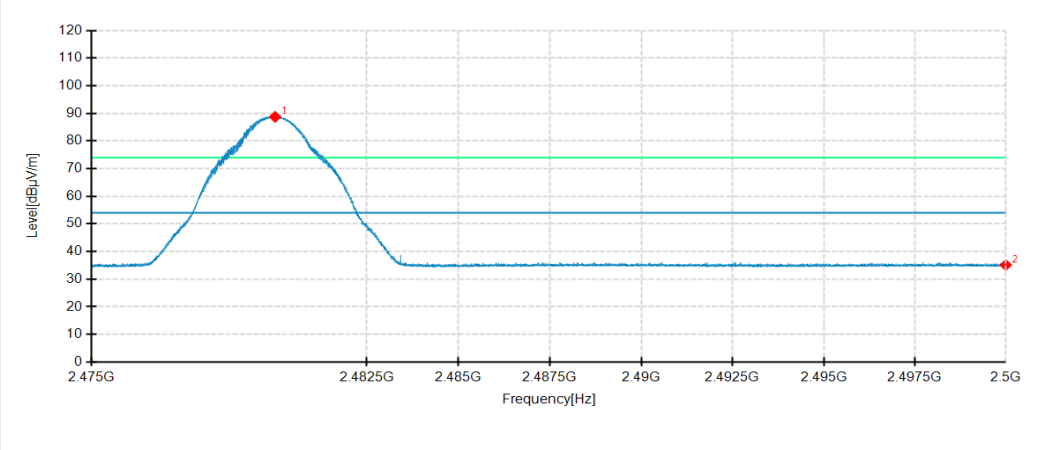



| No. | Frequency MHz | Reading dBµV/m | Level dBµV/m | Factor dB | Limit dBuV/m | Margin dB | Height cm | Angle ° | Pole | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2480.5344 | 84.86 | 88.41 | 3.55 | 74.00 | -14.41 | 100 | 224 | Horizontal | No limit |
| 2 | 2483.5000 | 43.68 | 47.24 | 3.56 | 74.00 | 26.76 | 200 | 349 | Horizontal | / |
| 3 | 2500.0000 | 43.00 | 46.58 | 3.58 | 74.00 | 27.42 | 200 | 1 | Horizontal | / |
| 1 | 2480.4844 | 86.66 | 90.21 | 3.55 | 74.00 | -16.21 | 200 | 240 | Vertical | No limit |
| 2 | 2483.5000 | 42.84 | 46.40 | 3.56 | 74.00 | 27.60 | 200 | 89 | Vertical | / |
| 3 | 2500.0000 | 42.14 | 45.72 | 3.58 | 74.00 | 28.28 | 200 | 247 | Vertical | / |

**Highest Channel**
Channel 2480MHz
Detector mode: Average Polarity: Horizontal




Detector mode: Average Polarity: Vertical




| No. | Frequency MHz | Reading dBµV/m | Level dBµV/m | Factor dB | Limit dBuV/m | Margin dB | Height cm | Angle ° | Pole | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2480.0438 | 83.45 | 87.00 | 3.55 | 54.00 | -33.00 | 100 | 224 | Horizontal | No limit |
| 2 | 2483.5000 | 32.23 | 35.79 | 3.56 | 54.00 | 18.21 | 100 | 217 | Horizontal | / |
| 3 | 2500.0000 | 31.35 | 34.93 | 3.58 | 54.00 | 19.07 | 200 | 301 | Horizontal | / |
| 1 | 2480.0000 | 85.18 | 88.73 | 3.55 | 54.00 | -34.73 | 200 | 239 | Vertical | No limit |
| 2 | 2500.0000 | 31.53 | 35.11 | 3.58 | 54.00 | 18.89 | 200 | 225 | Vertical | / |

Remark: Max field strength in 3m distance. No any other emission which falls in restricted bands can be detected and be reported.

**----------This is the last page of the report. ----------**