# FCC TEST REPORT

## FCC ID: 2BFFE-DT-UNITBASE-A

| | | |
|---|---|---|
| **Report No.** | : | SSP24030102-1E |
| **Applicant** | : | IDQ Science and Technology (Hengqin, Guangdong) Co. Ltd. |
| **Product Name** | : | USB Base Station |
| **Model Name** | : | DT-UNIT-BASE-A |
| **Test Standard** | : | FCC Part 15.249 |
| **Date of Issue** | : | 2024-04-08 |
| **Prepared By** | | Shenzhen CCUT Quality Technology Co., Ltd. |

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This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen CCUT Quality Technology Co., Ltd.

## Test Report Basic Information

| | |
|---|---|
| **Applicant**.....: | IDQ Science and Technology (Hengqin, Guangdong) Co. Ltd. |
| Address of Applicant.....: | 7 # Building, No.1889, Huandao East Road, Hengqin District, Zhuhai, Guangdong, China |
| **Manufacturer**.....: | Shenzhen Greedar Technology Co., Ltd |
| Address of Manufacturer.....: | Room406, B Block, Donghe industrial Building No#6, Yuehe Street, Yantian District, Shenzhen, Guangdong |
| **Product Name**.....: | USB Base Station |
| **Brand Name**.....: | - |
| **Main Model**.....: | DT-UNIT-BASE-A |
| **Series Models**.....: | - |
| **Test Standard**.....: | FCC Part 15 Subpart C<br>ANSI C63.4-2014<br>ANSI C63.10-2013 |
| **Date of Test** .....: | 2024-03-14 to 2024-03-25 |
| **Test Result**.....: | PASS |
| **Tested By** .....: | Walker Wu (Walker Wu) |
| **Reviewed By**.....: | Lieber Ouyang (Lieber Ouyang) |
| **Authorized Signatory**.....: | Lahm Peng (Lahm Peng) |

Shenzhen CCUT Quality Technology Co., Ltd. APPROVED

Note : This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen CCUT Quality Technology Co., Ltd.. All test data presented in this test report is only applicable to presented test sample.

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# Revision History

| Revision | Issue Date | Description | Revised By |
|---|---|---|---|
| V1.0 | 2024-04-08 | Initial Release | Lahm Peng |
| | | | |
| | | | |
| | | | |
| | | | |

# 1. General Information

## 1.1 Product Information

| | |
|---|---|
| Product Name: | USB Base Station |
| Trade Name: | - |
| Main Model: | DT-UNIT-BASE-A |
| Series Models: | - |
| Rated Voltage: | DC 5V |
| Battery: | - |
| Hardware Version: | V1.0 |
| Software Version: | V1.0 |
| Note 1: The test data is gathered from a production sample, provided by the manufacturer. | |

| **Wireless Specification** | |
|---|---|
| Wireless Standard: | 2.4GHz RF |
| Operating Frequency: | 2405MHz ~2480MHz |
| Max. Field Strength: | 92.8dBuV/m |
| Quantity of Channel: | 16 |
| Channel Separation: | 3MHz |
| Modulation: | GFSK |
| Antenna Gain: | 1dBi |
| Type of Antenna: | AN1003 Multilayer Chip Antenna |
| Type of Device: | ☒ Portable Device ☐ Mobile Device ☐ Modular Device |

## 1.2 Test Setup Information

| List of Test Modes | | |
|---|---|---|
| Test Mode | Description | Remark |
| TM1 | Transmitting | 2405/2440/2480MHz |

| List and Details of Auxiliary Cable | | | |
|---|---|---|---|
| Description | Length (cm) | Shielded/Unshielded | With/Without Ferrite |
| - | - | - | - |
| - | - | - | - |

| List and Details of Auxiliary Equipment | | | |
|---|---|---|---|
| Description | Manufacturer | Model | Serial Number |
| Notebook | Lenovo | ThlnkPad E15 Gen 2 | SPPOP39975 |
| - | - | - | - |

| List of Channels | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. of Channel | Frequency (MHz) | No. of Channel | Frequency (MHz) | No. of Channel | Frequency (MHz) | No. of Channel | Frequency (MHz) |
| 01 | 2405 | 05 | 2425 | 09 | 2445 | 13 | 2465 |
| 02 | 2410 | 06 | 2430 | 10 | 2450 | 14 | 2470 |
| 03 | 2415 | 07 | 2435 | 11 | 2455 | 15 | 2475 |
| 04 | 2420 | 08 | 2440 | 12 | 2460 | 16 | 2480 |

## 1.3 Compliance Standards

| Compliance Standards | |
|---|---|
| FCC Part 15 Subpart C | FEDERAL COMMUNICATIONS COMMISSION, RADIO FREQUENCY DEVICES, Intentional Radiators |
| All measurements contained in this report were conducted with all above standards | |
| According to standards for test methodology | |
| FCC Part 15 Subpart C | FEDERAL COMMUNICATIONS COMMISSION, RADIO FREQUENCY DEVICES, Intentional Radiators |
| ANSI C63.4-2014 | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. |
| ANSI C63.10-2013 | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices |
| Maintenance of compliance is the responsibility of the manufacturer or applicant. Any modification of the product, which result is lowering the emission, should be checked to ensure compliance has been maintained. | |

## 1.4 Test Facilities

| | |
|---|---|
| Laboratory Name: | **Shenzhen CCUT Quality Technology Co., Ltd.**<br>1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen, Guangdong, China |
| CNAS Laboratory No.: | L18863 |
| A2LA Certificate No.: | 6893.01 |
| FCC Registration No: | 583813 |
| ISED Registration No.: | CN0164 |
| All measurement facilities used to collect the measurement data are located at 1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen, Guangdong, China. | |

## 1.5 List of Measurement Instruments

| Description | Manufacturer | Model | Serial Number | Cal. Date | Due. Date |
|---|---|---|---|---|---|
| **Conducted Emissions** | | | | | |
| AMN | ROHDE&SCHWARZ | ENV216 | 101097 | 2023-10-21 | 2024-10-20 |
| EMI Test Receiver | ROHDE&SCHWARZ | ESPI | 100242 | 2023-07-31 | 2024-07-30 |
| **Radiated Emissions** | | | | | |
| EMI Test Receiver | ROHDE&SCHWARZ | ESPI | 100154 | 2023-07-31 | 2024-07-30 |
| Spectrum Analyzer | KEYSIGHT | N9020A | MY48030972 | 2023-07-31 | 2024-07-30 |
| Spectrum Analyzer | ROHDE&SCHWARZ | FSV40-N | 101692 | 2023-07-31 | 2024-07-30 |
| Amplifier | SCHWARZBECK | BBV 9743B | 00251 | 2023-07-31 | 2024-07-30 |
| Amplifier | HUABO | YXL0518-2.5-45 | -- | 2023-07-31 | 2024-07-30 |
| Amplifier | COM-MW | DLAN-18G-4G-02 | 10229104 | 2023-07-31 | 2024-07-30 |
| Loop Antenna | DAZE | ZN30900C | 21104 | 2023-08-07 | 2024-08-06 |
| Broadband Antenna | SCHWARZBECK | VULB 9168 | 01320 | 2023-08-07 | 2024-08-06 |
| Horn Antenna | SCHWARZBECK | BBHA 9120D | 02553 | 2023-08-07 | 2024-08-06 |
| Horn Antenna | COM-MW | ZLB7-18-40G-950 | 12221225 | 2023-08-07 | 2024-08-06 |
| **Conducted RF Testing** | | | | | |
| RF Test System | MWRFTest | MW100-RFCB | 220418SQS-37 | 2023-07-31 | 2024-07-30 |
| Spectrum Analyzer | KEYSIGHT | N9020A | ATO-90521 | 2023-07-31 | 2024-07-30 |

## 1.6 Measurement Uncertainty

| Test Item | Conditions | Uncertainty |
|---|---|---|
| Conducted Emissions | 9kHz ~ 30MHz | ±1.64 dB |
| Radiated Emissions | 9kHz ~ 30MHz | ±2.88 dB |
| | 30MHz ~ 1GHz | ±3.32 dB |
| | 1GHz ~ 18GHz | ±3.50 dB |
| | 18GHz ~ 40GHz | ±3.66 dB |
| Occupied Bandwidth | 9kHz ~ 26GHz | ±4.0 % |

# 2. Summary of Test Results

| FCC Rule | Description of Test Item | Result |
|---|---|---|
| FCC Part 15.203 | Antenna Requirement | Passed |
| FCC Part 15.207 | Conducted Emissions | Passed |
| FCC Part 15.209, 15.249(a)&(d) | Radiated Emissions | Passed |
| FCC Part 15.249(d) | Band-edge Emissions | Passed |
| FCC Part 15.215(c) | Occupied Bandwidth | Passed |
| Passed: The EUT complies with the essential requirements in the standard<br>Failed: The EUT does not comply with the essential requirements in the standard<br>N/A: Not applicable | | |

# 3. Antenna Requirement

## 3.1 Standard and Limit

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

## 3.2 Test Result

This product has an AN1003 Multilayer Chip antenna, fulfill the requirement of this section.

# 4. Conducted Emissions

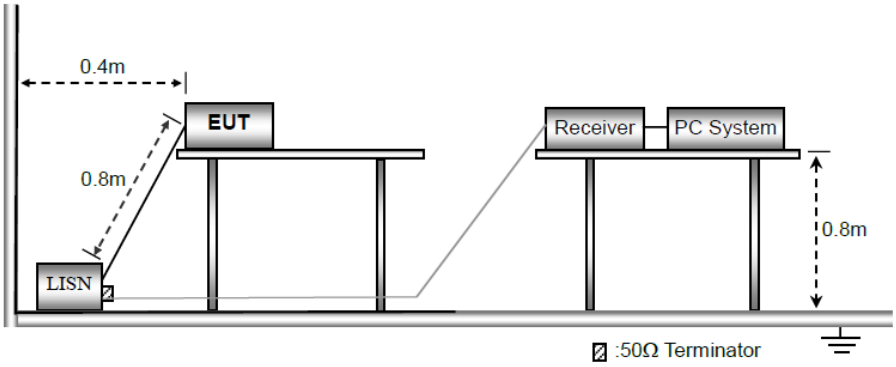
## 4.1 Standard and Limit

According to the rule FCC Part 15.207, Conducted emissions limit, the limit for a wireless device as below:

| Frequency of Emission (MHz) | Conducted emissions (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 | 56 to 46 |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |
| Note 1: Decreases with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz<br>Note 2: The lower limit applies at the band edges | | |

## 4.2 Test Procedure

Test is conducting under the description of ANSI C63.10 - 2013 section 6.2.




Test Setup Block Diagram

a) The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

b) The following is the setting of the receiver
Attenuation: 10dB
Start Frequency: 0.15MHz
Stop Frequency: 30MHz
IF Bandwidth: 9kHz

c) The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

d) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
e) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

f) LISN is at least 80 cm from nearest part of EUT chassis.

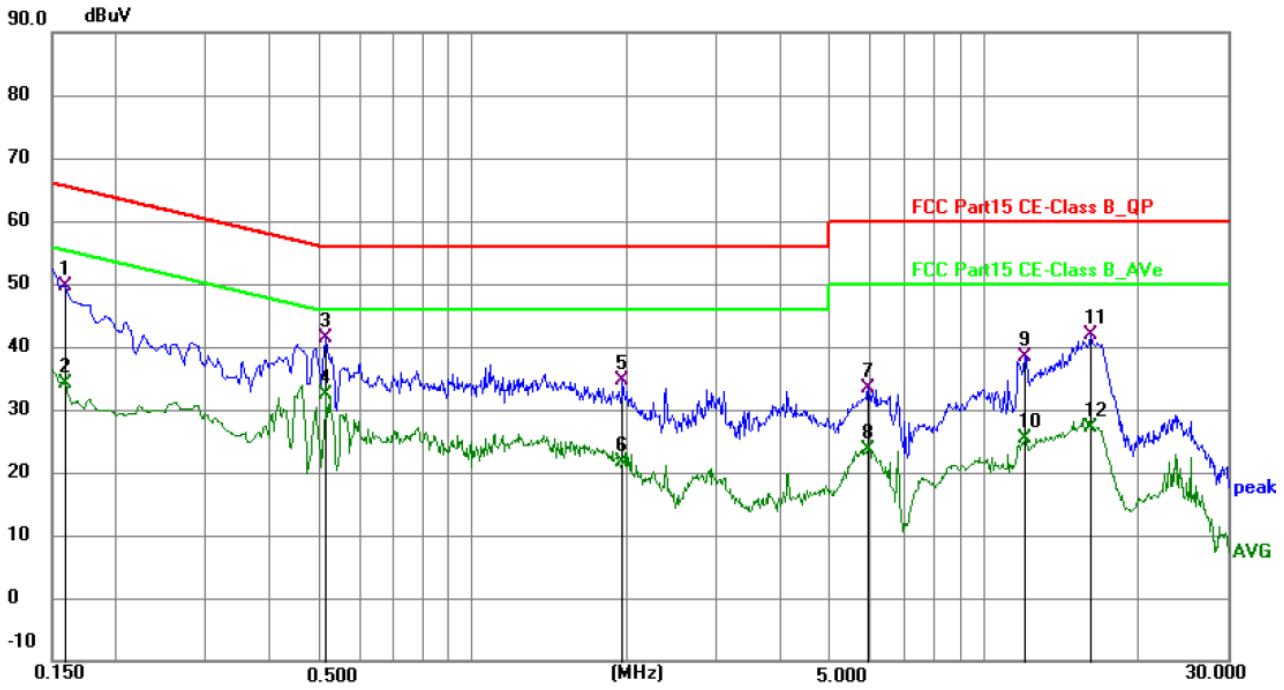
g) For the actual test configuration, please refer to the related Item - photographs of the test setup.

## 4.3 Test Data and Results

All of the 2.4G RF modes have been tested, the EUT complied with the FCC Part 15.207 standard limit for a wireless device, and with the worst case 2.4G RF_2405MHz as below:

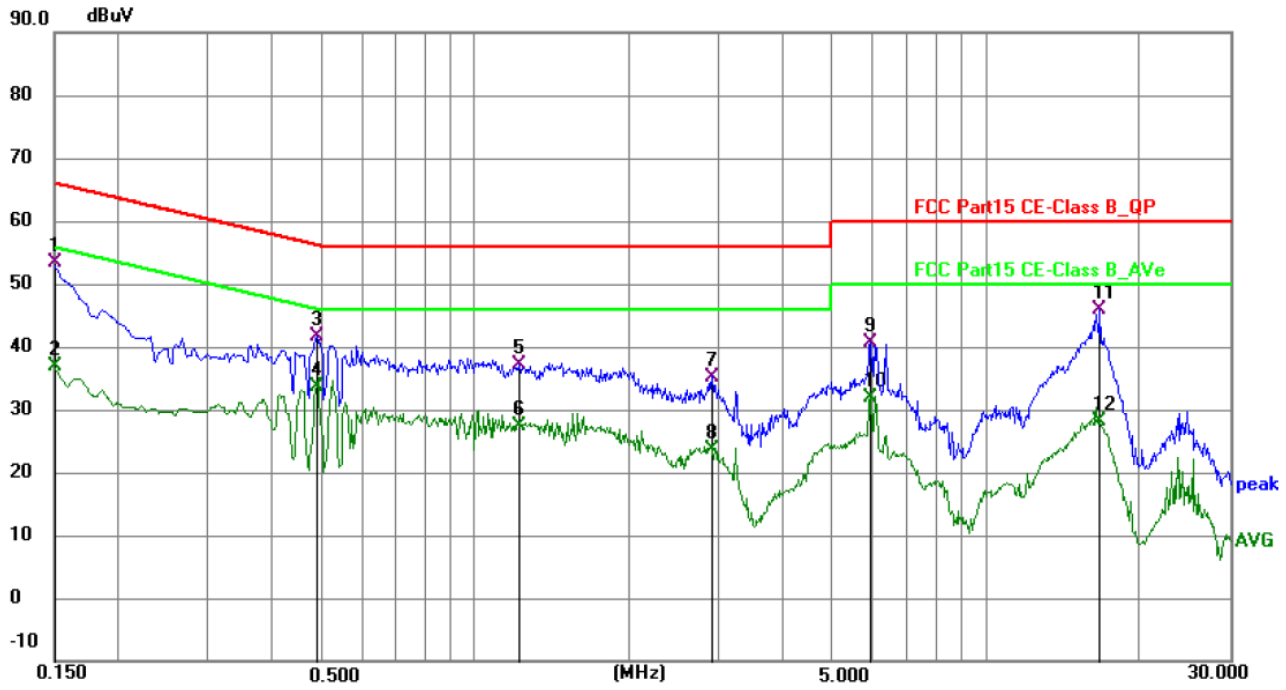
Remark: Level = Reading + Factor, Margin = Level – Limit

| Test Plots and Data of Conducted Emissions | |
|---|---|
| Tested Mode: | TM1 |
| Test Voltage: | AC 120V/60Hz |
| Test Power Line: | Neutral |
| Remark: | |




| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.1590 | 40.07 | 9.55 | 49.62 | 65.52 | -15.90 | QP | P | |
| 2 | 0.1590 | 24.50 | 9.55 | 34.05 | 55.52 | -21.47 | AVG | P | |
| 3 | 0.5144 | 31.51 | 9.96 | 41.47 | 56.00 | -14.53 | QP | P | |
| 4 * | 0.5144 | 22.32 | 9.96 | 32.28 | 46.00 | -13.72 | AVG | P | |
| 5 | 1.9680 | 24.68 | 10.02 | 34.70 | 56.00 | -21.30 | QP | P | |
| 6 | 1.9680 | 11.69 | 10.02 | 21.71 | 46.00 | -24.29 | AVG | P | |
| 7 | 5.9370 | 23.24 | 10.14 | 33.38 | 60.00 | -26.62 | QP | P | |
| 8 | 5.9370 | 13.48 | 10.14 | 23.62 | 50.00 | -26.38 | AVG | P | |
| 9 | 12.0525 | 28.23 | 10.17 | 38.40 | 60.00 | -21.60 | QP | P | |
| 10 | 12.0525 | 15.28 | 10.17 | 25.45 | 50.00 | -24.55 | AVG | P | |
| 11 | 16.1970 | 31.85 | 10.14 | 41.99 | 60.00 | -18.01 | QP | P | |
| 12 | 16.1970 | 16.95 | 10.14 | 27.09 | 50.00 | -22.91 | AVG | P | |

| Test Plots and Data of Conducted Emissions | |
|---|---|
| Tested Mode: | TM1 |
| Test Voltage: | AC 120V/60Hz |
| Test Power Line: | Live |
| Remark: | |




| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.1500 | 43.86 | 9.47 | 53.33 | 66.00 | -12.67 | QP | P | |
| 2 | 0.1500 | 27.42 | 9.47 | 36.89 | 56.00 | -19.11 | AVG | P | |
| 3 | 0.4875 | 31.55 | 9.97 | 41.52 | 56.21 | -14.69 | QP | P | |
| 4 * | 0.4875 | 23.76 | 9.97 | 33.73 | 46.21 | -12.48 | AVG | P | |
| 5 | 1.2210 | 27.01 | 10.02 | 37.03 | 56.00 | -18.97 | QP | P | |
| 6 | 1.2210 | 17.41 | 10.02 | 27.43 | 46.00 | -18.57 | AVG | P | |
| 7 | 2.9085 | 25.19 | 10.06 | 35.25 | 56.00 | -20.75 | QP | P | |
| 8 | 2.9085 | 13.59 | 10.06 | 23.65 | 46.00 | -22.35 | AVG | P | |
| 9 | 5.9415 | 30.54 | 10.16 | 40.70 | 60.00 | -19.30 | QP | P | |
| 10 | 5.9415 | 21.63 | 10.16 | 31.79 | 50.00 | -18.21 | AVG | P | |
| 11 | 16.6965 | 35.55 | 10.35 | 45.90 | 60.00 | -14.10 | QP | P | |
| 12 | 16.6965 | 17.68 | 10.35 | 28.03 | 50.00 | -21.97 | AVG | P | |

# 5. Radiated Emissions

## 5.1 Standard and Limit

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental frequency | Field strength of fundamental (milli-volts/meter) | Field strength of Harmonics (micro-volts/meter) |
|---|---|---|
| 902-928 MHz | 50 | 500 |
| 2400-2483.5 MHz | 50 | 500 |
| 5725-5875 MHz | 50 | 500 |
| 24.0-24.25 GHz | 250 | 2500 |

According to §15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

According to the rule FCC Part 15.209, Radiated emission limit for a wireless device as below:

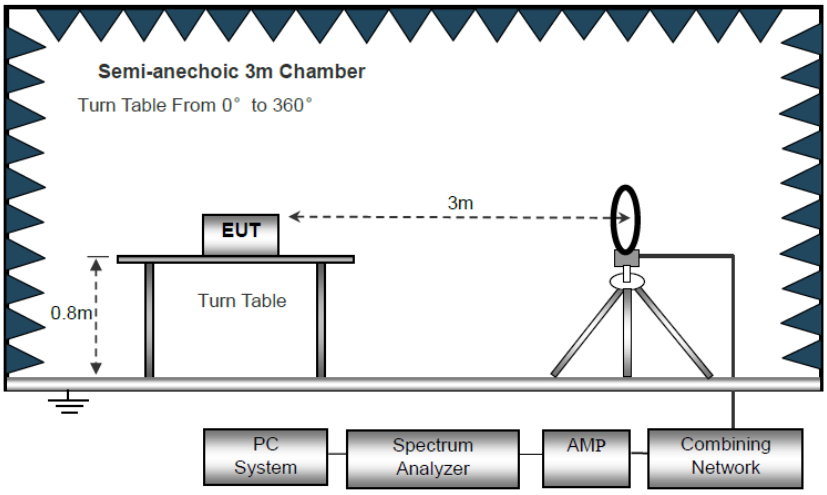
| Frequency of emission (MHz) | Radiated emissions (3m) |
|---|---|
| | Quasi-peak (dBuV/m) |
| 30-88 | 40 |
| 88-216 | 43.5 |
| 216-960 | 46 |
| Above 960 | 54 |
| Note: The more stringent limit applies at transition frequencies. | |

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

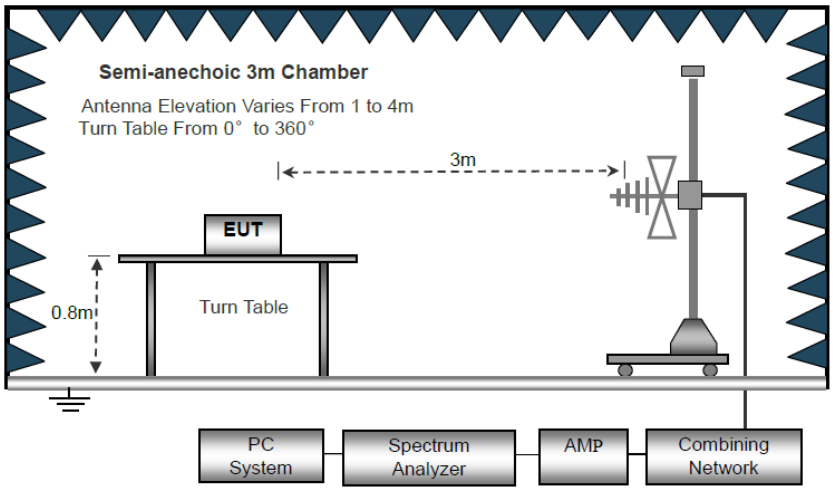
*Note: Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.*

## 5.2 Test Procedure

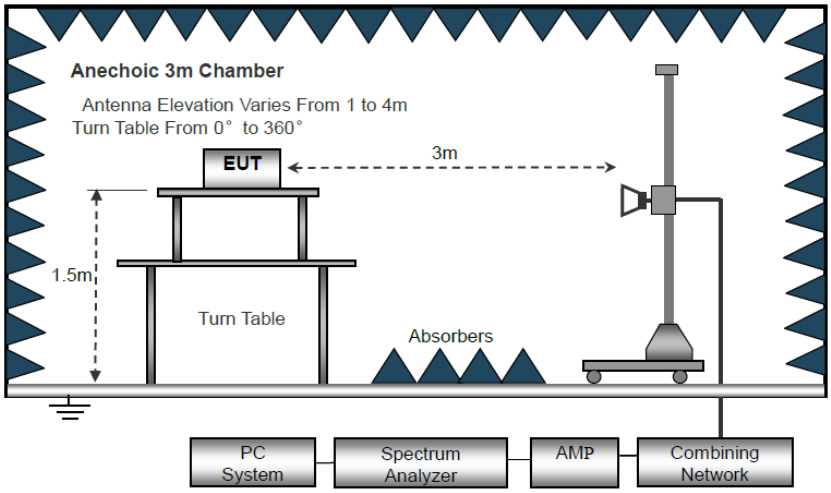
Test is conducting under the description of ANSI C63.10 - 2013 section 6.3 to 6.6.




Block Diagram of Radiated Emission Below 30MHz




Block Diagram of Radiated Emission From 30MHz to 1GHz




Block Diagram of Radiated Emission Above 1GHz

a) The EUT is placed on a turntable, which is 0.8m above ground plane for test frequency range blew 1GHz, and 1.5m above ground plane for test frequency range above 1GHz.

b) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.

c) Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured
RBW = 1 MHz for f ≥ 1GHz, 100 kHz for f < 1 GHz, 10kHz for f < 30MHz
VBW ≥ RBW, Sweep = auto
Detector function = peak
Trace = max hold

d) Follow the guidelines in ANSI C63.4-2014 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

e) The peak level, once corrected, must comply with the limit specified in Section 15.209. Set the RBW = 1MHz, VBW = 10Hz, Detector = PK for AV value, while maintaining all of the other instrument settings.

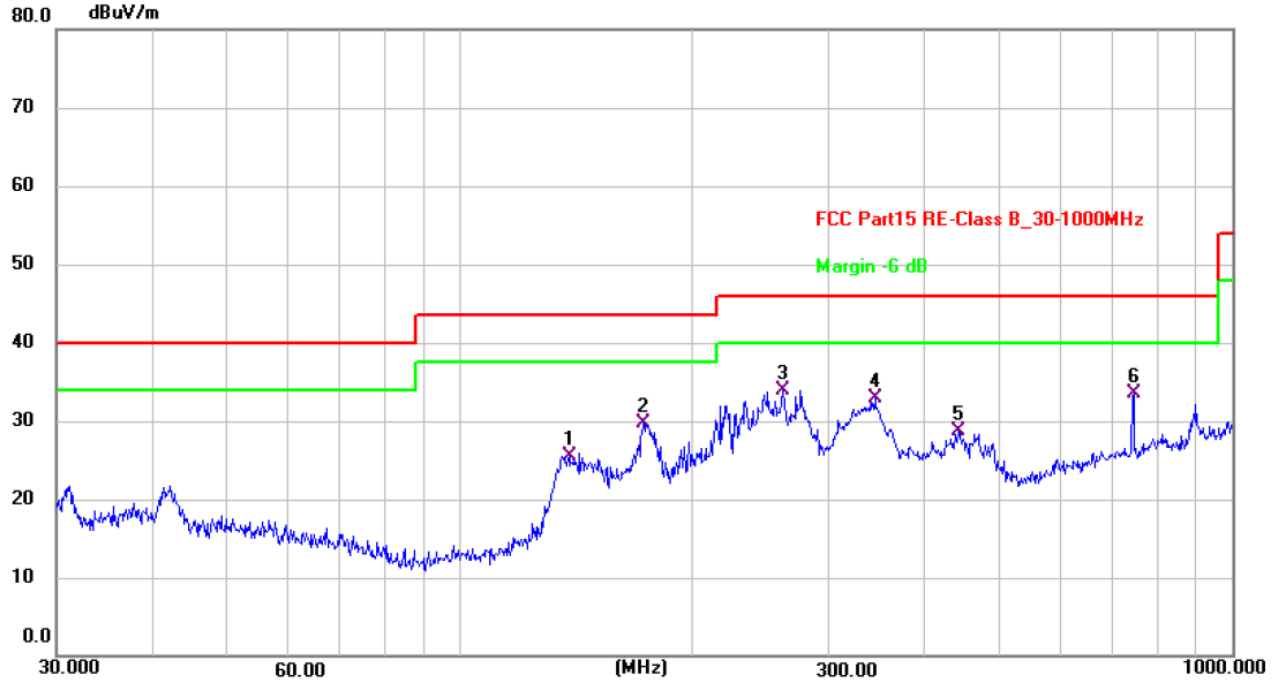
f) For the actual test configuration, please refer to the related item - EUT test photos.

## 5.3 Test Data and Results

All of the 2.4G RF modes have been tested, the EUT complied with the FCC Part 15.249 standard limit for a wireless device, and with the worst case 2.4G RF_2405MHz as below:

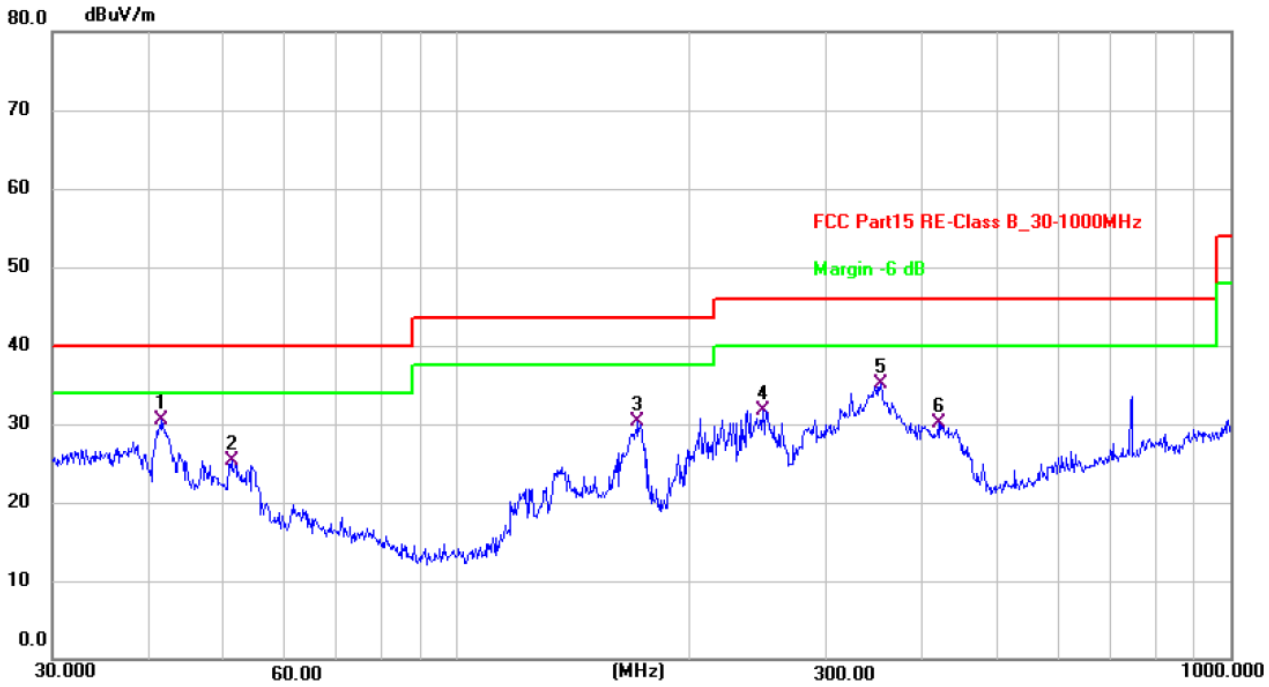
Remark: Level = Reading + Factor, Margin = Level - Limit

| Radiated Emission Test Data (30MHz to 1GHz) | |
|---|---|
| Tested Mode: | TM1 |
| Test Antenna Polarization: | Horizontal |
| Remark: | |




| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 138.3873 | 34.95 | -9.39 | 25.56 | 43.50 | -17.94 | QP | 100 | 256 | P | |
| 2 | 172.5987 | 39.51 | -9.88 | 29.63 | 43.50 | -13.87 | QP | 100 | 75 | P | |
| 3 * | 261.9750 | 43.47 | -9.51 | 33.96 | 46.00 | -12.04 | QP | 100 | 238 | P | |
| 4 | 344.3854 | 40.52 | -7.65 | 32.87 | 46.00 | -13.13 | QP | 100 | 44 | P | |
| 5 | 441.7425 | 33.95 | -5.16 | 28.79 | 46.00 | -17.21 | QP | 100 | 333 | P | |
| 6 | 744.8660 | 32.85 | 0.73 | 33.58 | 46.00 | -12.42 | QP | 100 | 146 | P | |

| Radiated Emission Test Data (30MHz to 1GHz) | |
|---|---|
| Tested Mode: | TM1 |
| Test Antenna Polarization: | Vertical |
| Remark: | |




| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Height (cm) | Azimuth (deg.) | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 * | 41.5670 | 38.91 | -8.38 | 30.53 | 40.00 | -9.47 | QP | 100 | 257 | P | |
| 2 | 51.1210 | 34.05 | -8.81 | 25.24 | 40.00 | -14.76 | QP | 100 | 360 | P | |
| 3 | 171.3925 | 40.00 | -9.74 | 30.26 | 43.50 | -13.24 | QP | 100 | 336 | P | |
| 4 | 248.5520 | 41.44 | -9.77 | 31.67 | 46.00 | -14.33 | QP | 100 | 212 | P | |
| 5 | 352.9433 | 42.49 | -7.44 | 35.05 | 46.00 | -10.95 | QP | 100 | 55 | P | |
| 6 | 419.1080 | 35.69 | -5.67 | 30.02 | 46.00 | -15.98 | QP | 100 | 145 | P | |

| Radiated Emission Test Data (Above 1GHz) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency | Reading | Correct | Result | Limit | Margin | Polar | Detector |
| MHz | dBuV/m | dB/m | dBuV/m | dBuV/m | dB | H/V | PK/AV |
| Lowest Channel (2405MHz) | | | | | | | |
| 2405 | 113.60 | -20.88 | 92.8 | 114 | -21.2 | H | PK |
| 2405 | 92.77 | -20.88 | 71.88 | 94 | -22.12 | H | AV |
| 4810 | 76.98 | -14.72 | 62.26 | 74 | -11.74 | H | PK |
| 4810 | 61.18 | -14.72 | 46.46 | 54 | -7.54 | H | AV |
| 7215 | 64.09 | -8.41 | 55.68 | 74 | -18.32 | H | PK |
| 7215 | 46.56 | -8.41 | 38.15 | 54 | -15.85 | H | AV |
| 2405 | 109.31 | -20.89 | 89.45 | 114 | -25.58 | V | PK |
| 2405 | 89.57 | -20.89 | 69.86 | 94 | -25.32 | V | AV |
| 4810 | 74.88 | -14.72 | 60.16 | 74 | -13.84 | V | PK |
| 4810 | 57.91 | -14.72 | 43.19 | 54 | -10.81 | V | AV |
| 7215 | 62.29 | -8.41 | 53.88 | 74 | -20.12 | V | PK |
| 7215 | 47.89 | -8.41 | 39.48 | 54 | -14.52 | V | AV |
| Middle Channel (2440MHz) | | | | | | | |
| 2440 | 112.13 | -20.6 | 91.43 | 114 | -22.57 | H | PK |
| 2440 | 94.74 | -20.6 | 74.04 | 94 | -19.96 | H | AV |
| 4880 | 74.28 | -14.64 | 59.64 | 74 | -14.36 | H | PK |
| 4880 | 59.64 | -14.64 | 45 | 54 | -9 | H | AV |
| 7320 | 65.02 | -8.28 | 56.74 | 74 | -17.26 | H | PK |
| 7320 | 49.07 | -8.28 | 40.79 | 54 | -13.21 | H | AV |
| 2440 | 107.62 | -20.6 | 87.70 | 114 | -27.08 | V | PK |
| 2440 | 88.75 | -20.6 | 68.05 | 94 | -25.95 | V | AV |
| 4880 | 78.26 | -14.64 | 63.62 | 74 | -10.38 | V | PK |
| 4880 | 59.77 | -14.64 | 45.13 | 54 | -8.87 | V | AV |
| 7320 | 63.01 | -8.28 | 54.73 | 74 | -19.27 | V | PK |
| 7320 | 50.01 | -8.28 | 41.73 | 54 | -12.27 | V | AV |

| Radiated Emission Test Data (Above 1GHz) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency | Reading | Correct | Result | Limit | Margin | Polar | Detector |
| MHz | dBuV/m | dB/m | dBuV/m | dBuV/m | dB | H/V | PK/AV |
| Highest Channel (2480MHz) | | | | | | | |
| 2480 | 111.13 | -20.55 | 90.58 | 114 | -23.42 | H | PK |
| 2480 | 91.35 | -20.55 | 70.8 | 94 | -23.2 | H | AV |
| 4960 | 78.58 | -14.53 | 64.05 | 74 | -9.95 | H | PK |
| 4960 | 60.89 | -14.53 | 46.36 | 54 | -7.64 | H | AV |
| 7440 | 65.06 | -8.13 | 56.93 | 74 | -17.07 | H | PK |
| 7440 | 48.91 | -8.13 | 40.78 | 54 | -13.22 | H | AV |
| 2480 | 105.77 | -20.55 | 85.22 | 114 | -28.78 | V | PK |
| 2480 | 87.68 | -20.55 | 67.13 | 94 | -26.87 | V | AV |
| 4960 | 78.18 | -14.53 | 63.65 | 74 | -10.35 | V | PK |
| 4960 | 57.73 | -14.53 | 43.2 | 54 | -10.8 | V | AV |
| 7440 | 64.47 | -8.13 | 56.34 | 74 | -17.66 | V | PK |
| 7440 | 47.05 | -8.13 | 38.92 | 54 | -15.08 | V | AV |

*Note 1: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

*Note 2: Testing is carried out with frequency rang 9kHz to the tenth harmonics. The measurements greater than 20dB below the limit from 9kHz to 30MHz.*

Other emissions are attenuated 20dB below the limits from 9kHz to 30MHz, so it does not recorded in report.

18GHz-26GHz not recorded for no spurious point have a margin of less than 6 dB with respect to the limits.

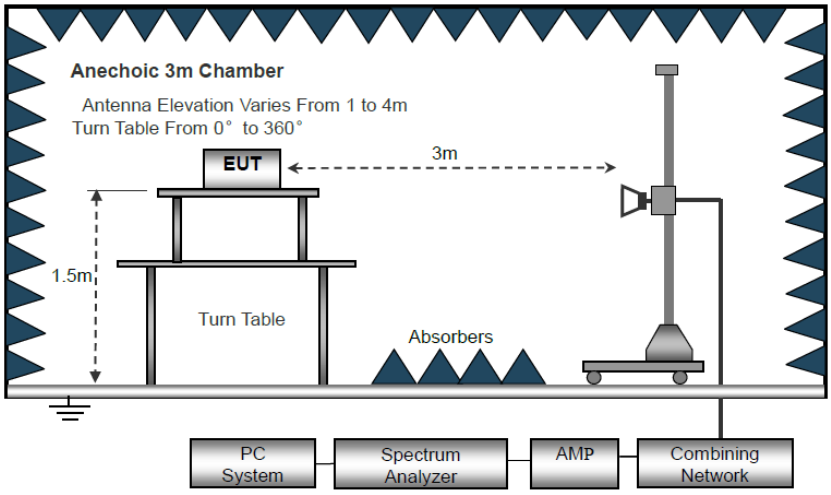
# 6. Band-edge Emissions

## 6.1 Standard and Limit

According to §15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

## 6.2 Test Procedure

Test is conducting under the description of ANSI C63.10 - 2013 section 6.3 to 6.6 and section 6.10.




Test Setup Block Diagram

As the radiated emissions testing, set the Lowest and Highest Transmitting Channel, observed the outside band of 2310MHz to 2400MHz and 2483.5MHz to 2500MHz, than mark the higher-level emission for comparing with the FCC rules.

## 6.3 Test Data and Results

Based on all tested data, the EUT complied with the FCC Part 15.249 standard limit, and with the worst case as below:

| Test Mode | Frequency | Limit | Result |
|---|---|---|---|
| | MHz | dBuV/dBc | |
| Lowest | 2310.00 | <54 dBuV | Pass |
| | 2390.00 | <54 dBuV | Pass |
| Highest | 2483.50 | <54 dBuV | Pass |
| | 2500.00 | <54 dBuV | Pass |

| Radiated Emission Test Data (Band edge emissions) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency | Reading | Correct | Result | Limit | Margin | Polar | Detector |
| MHz | dBuV/m | dB/m | dBuV/m | dBuV/m | dB | H/V | PK/AV |
| Lowest Channel GFSK (2405MHz) | | | | | | | |
| 2310 | 69.31 | -21.34 | 47.97 | 74 | -26.03 | H | PK |
| 2310 | 51.98 | -21.34 | 30.64 | 54 | -23.36 | H | AV |
| 2390 | 64.07 | -20.96 | 43.11 | 74 | -30.89 | H | PK |
| 2390 | 50.52 | -20.96 | 29.56 | 54 | -24.44 | H | AV |
| 2400 | 72.41 | -20.91 | 51.5 | 74 | -22.5 | H | PK |
| 2400 | 55.6 | -20.91 | 34.69 | 54 | -19.31 | H | AV |
| 2310 | 64.29 | -21.34 | 42.95 | 74 | -31.05 | V | PK |
| 2310 | 49.92 | -21.34 | 28.58 | 54 | -25.42 | V | AV |
| 2390 | 68.26 | -20.96 | 47.3 | 74 | -26.7 | V | PK |
| 2390 | 51.64 | -20.96 | 30.68 | 54 | -23.32 | V | AV |
| 2400 | 72.07 | -20.91 | 51.16 | 74 | -22.84 | V | PK |
| 2400 | 53.14 | -20.91 | 32.23 | 54 | -21.77 | V | AV |
| Highest Channel GFSK (2480MHz) | | | | | | | |
| 2483.50 | 68.95 | -20.51 | 48.44 | 74 | -25.56 | H | PK |
| 2483.50 | 50.19 | -20.51 | 29.68 | 54 | -24.32 | H | AV |
| 2500 | 65.34 | -20.43 | 44.91 | 74 | -29.09 | H | PK |
| 2500 | 50.37 | -20.43 | 29.94 | 54 | -24.06 | H | AV |
| 2483.50 | 65.67 | -20.51 | 45.16 | 74 | -28.84 | V | PK |
| 2483.50 | 50.27 | -20.51 | 29.76 | 54 | -24.24 | V | AV |
| 2500 | 66.53 | -20.43 | 46.1 | 74 | -27.9 | V | PK |
| 2500 | 50.92 | -20.43 | 30.49 | 54 | -23.51 | V | AV |

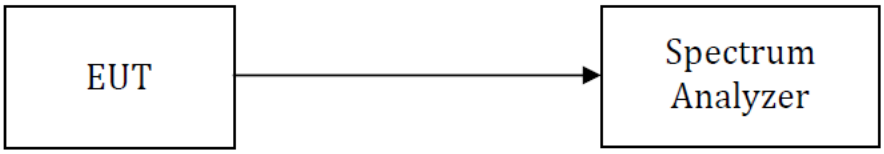
# 7. Occupied Bandwidth

## 7.1 Standard and Limit

According to 15.215 (c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

## 7.2 Test Procedure

According to the ANSI 63.10-2013, section 6.9, the emission bandwidth test method as follows.
1) Remove the antenna from the EUT and connect to the spectrum analyzer via a low loss RF cable.
2) Set the spectrum analyzer to any one measured frequency within its operating range.
3) Set RBW = 20kHz, VBW = 62kHz, Sweep = Auto.
4) Set a reference level on the measuring instrument equal to the highest peak value.
5) Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
6) Repeat the above procedures until all frequencies measured were complete.
All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 20dB down and 99% bandwidth of the emission.



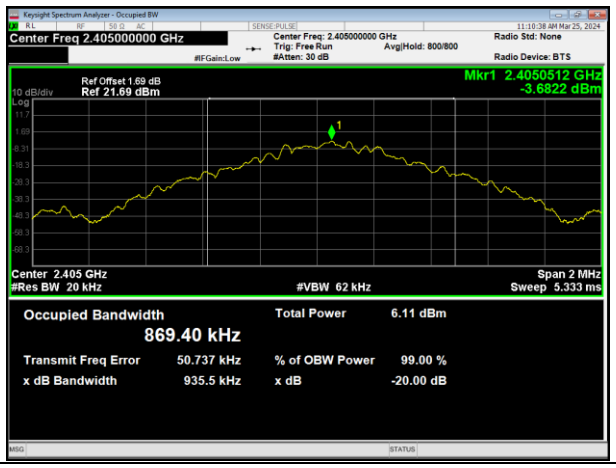

Test Setup Block Diagram

## 7.3 Test Data and Results

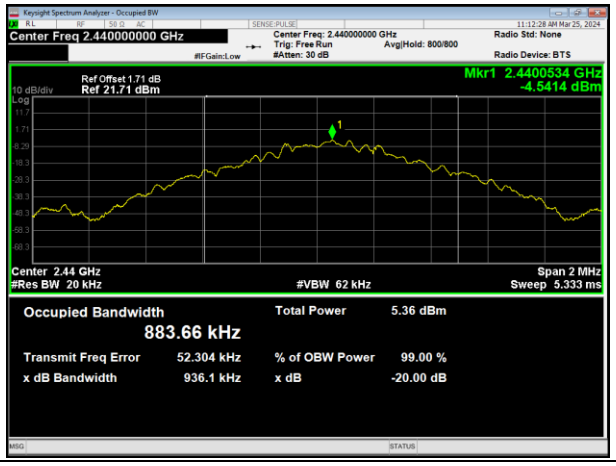
| Test Channel | Test Frequency | 20dB Bandwidth (MHz) | 99% Bandwidth (MHz) |
|---|---|---|---|
| Lowest Channel | 2405MHz | 0.9355 | 0.86940 |
| Middle Channel | 2440MHz | 0.9361 | 0.88366 |
| Highest Channel | 2480MHz | 0.9371 | 0.88580 |

Test Plots of Occupied Bandwidth

2405MHz




2440MHz




2480MHz

******* END OF REPORT *******