| | | | | |
|---|---|---|---|---|
| **Prüfbericht-Nr.:** *Test report no.*: | **CN241RMT 002** | **Auftrags-Nr.:** *Order no.*: | **168455276** | Seite 1 von 28 *Page 1 of 28* |
| **Kunden-Referenz-Nr.:** *Client reference no.*: | N/A | **Auftragsdatum:** *Order date:* | 2023-12-05 | |
| **Auftraggeber:** *Client*: | **BLUEANT WIRELESS** Suite 6,861 Doncaster RD.Doncaster East,Victoria 3109 Australia. | | | |
| **Prüfgegenstand:** *Test item*: | Bluetooth speaker | | | |
| **Bezeichnung / Typ-Nr.:** *Identification / Type no.*: | X3D MAX (Trademark: BlueAnt) | | | |
| **Auftrags-Inhalt:** *Order content*: | Test Report | | | |
| **Prüfgrundlage:** *Test specification*: | CFR47 FCC Part 15: Subpart C Section 15.247<br>RSS-247 Issue 3 August 2023<br>RSS-Gen Issue 5 February 2021 | | | |

| | | |
|---|---|---|
| **Wareneingangsdatum:** *Date of sample receipt*: | 2023-12-11 | Please refer to Photo Document |
| **Prüfmuster-Nr.:** *Test sample no:* | A003618183-001~016 | |
| **Prüfzeitraum:** *Testing period*: | 2023-12-20 - 2024-01-05 | |
| **Ort der Prüfung:** *Place of testing*: | TÜV Rheinland (Shenzhen) Co., Ltd. | |
| **Prüflaboratorium:** *Testing laboratory:* | TÜV Rheinland (Shenzhen) Co., Ltd. | |
| **Prüfergebnis*:** *Test result**: | Pass | |

| | | | |
|---|---|---|---|
| **geprüft von:** tested by: | X Jonathan Li<br>Signed by: Jonathan Li | **genehmigt von:** *authorized by*: | X Bell Hu<br>Signed by: Bell Hu |
| **Datum:** *Date:* 2024-04-15 | | **Ausstellungsdatum:** *Issue date:* 2024-04-15 | |
| **Stellung** / Position: | Sachverständige(r)/Expert | **Stellung** / Position: | Sachverständige(r)/Expert |

**Sonstiges /** *Other*: FCC ID: VHFBLUEANTX3DM
IC: 7252A-X3DMAX, HVIN: X3D MAX

**Zustand des Prüfgegenstandes bei Anlieferung:** *Condition of the test item at delivery*: Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

| | | | | |
|---|---|---|---|---|
| * Legende: | P(ass) = entspricht o.g. Prüfgrundlage(n) | F(ail) = entspricht nicht o.g. Prüfgrundlage(n) | N/A = nicht anwendbar | N/T = nicht getestet |
| ** Legend:* | *P(ass) = passed a.m. test specification(s)* | *F(ail) = failed a.m. test specification(s)* | *N/A = not applicable* | *N/T = not tested* |





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Mail: service-gc@tuv.com · Web: www.tuv.com

## Anmerkungen
*Remarks*

| | |
|---|---|
| **1** | Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben.<br>Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.<br><br>*The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.*<br>*Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.* |
| **2** | Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben.<br><br>*As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged.* |
| **3** | Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben.<br>Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.<br><br>*Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report.*<br>*Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.* |
| **4** | Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.<br><br>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the “Zero Guard Band Rule” and “Simple Acceptance” in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019. |

# *Test Summary*

**5.1.1 ANTENNA REQUIREMENT**
*RESULT: Pass*

**5.1.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER**
*RESULT: Pass*

**5.1.3 CONDUCTED POWER SPECTRAL DENSITY**
*RESULT: Pass*

**5.1.4 6DB BANDWIDTH**
*RESULT: Pass*

**5.1.5 99% BANDWIDTH**
*RESULT: Pass*

**5.1.6 20DB BANDWIDTH**
*RESULT: Pass*

**5.1.7 CARRIER FREQUENCY SEPARATION**
*RESULT: Pass*

**5.1.8 NUMBER OF HOPPING FREQUENCY**
*RESULT: Pass*

**5.1.9 TIME OF OCCUPANCY**
*RESULT: Pass*

**5.1.10 CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHZ BANDWIDTH**
*RESULT: Pass*

**5.1.11 RADIATED SPURIOUS EMISSION**
*RESULT: Pass*

**5.1.12 CONDUCTED EMISSION ON AC MAINS**
*RESULT: Pass*

# *Contents*

# 1 General Remarks

## 1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Test Results of Bluetooth BR & EDR

Appendix B: Test Results of Bluetooth LE & Conducted Emission

Appendix C: Photographs of the Test Set-up

# 2 Test Sites

## 2.1 Test Facilities

**TÜV Rheinland (Shenzhen) Co., Ltd.**
No. 362 Huanguan Road Middle, Longhua District, 518110, Shenzhen, P. R. China.

FCC Accreditation Designation No.: 694916
ISED wireless device testing laboratory: 25069

## 2.2 List of Test and Measurement Instruments

**Table 1: List of Test and Measurement Equipment**

| **Radio Spectrum Testing (TS8997)** | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model** | **Serial No.** | **Cal. Date** | **Cal. until** |
| Signal Analyzer | R&S | FSV 40 | 101441 | 2023-07-26 | 2024-07-25 |
| OSP | R&S | OSP 150 | 101017 | 2023-11-14 | 2024-11-13 |
| Control PC | DELL | OptiPlex 7050 | FTJZ9P2 | N/A | N/A |
| Test Software | R&S | WMS32 (V11.00.00) | N/A | N/A | N/A |
| Power Meter | R&S | NRP2 | 107105 | 2023-11-14 | 2024-11-13 |
| Wideband Power Sensor | R&S | NRP-Z81 | 105677 | 2023-07-26 | 2024-07-25 |
| Shielding Room 8# | Albatross | SR8 | APC17151-SR8 | 2021-06-22 | 2024-06-22 |
| **Unwanted Emission Testing (TS9975)** | | | | | |
| **Equipment** | **Manufacturer** | **Model** | **Serial No.** | **Cal. Date** | **Cal. until** |
| EMI Test Receiver | R&S | ESR 7 | 102021 | 2023-07-26 | 2024-07-25 |
| Signal Analyzer | R&S | FSV 40 | 101439 | 2023-07-26 | 2024-07-25 |
| System Controller Interface | R&S | SCI-100 | S10010038 | N/A | N/A |
| Filterbank | R&S | Wlan | 100759 | 2023-07-26 | 2024-07-25 |
| OSP | R&S | OSP 120 | 102040 | N/A | N/A |
| Pre-amplifier | R&S | SCU08F1 | 08320031 | 2023-07-26 | 2024-07-25 |
| Amplifier | R&S | SCU-18F | 180070 | 2023-07-26 | 2024-07-25 |
| Amplifier | R&S | SCU40A | 100475 | 2023-07-26 | 2024-07-25 |
| Trilog Broadband Antenna (30 MHz - 7 GHz) | Schwarzbeck | VULB 9162 | 193 | 2022-08-07 | 2024-08-06 |
| Double-Ridged Antenna (1 -18 GHz) | ETS-LINDGREN | 3117 | 00218717 | 2022-08-07 | 2024-08-06 |
| Wideband Ridged Horn Antenna (18-40 GHz) | Steatite | QMS-00880 | 19067 | 2022-08-28 | 2024-08-27 |
| Active Loop Antenna | Schwarzbeck | FMZB 1513 | 302 | 2022-08-07 | 2024-08-06 |
| Test software | R&S | EMC32 (V10.60.10) | N/A | N/A | N/A |

| | | | | | |
|---|---|---|---|---|---|
| Control PC | Dell | OptiPlex 7050 | 36NV9P2 | N/A | N/A |
| 3m Semi-Anechoic Chamber | Albatross | SAC-3m | APC17151-SAC | 2021-06-22 | 2024-06-22 |

| **Conducted Emission** | | | | |
|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Cal. Until** |
| EMI Test Receiver | R&S | ESR3 | 102680 | 2024-02-23 |
| Artificial Mains Network | R&S | ENV216 | 101445 | 2024-02-23 |
| Artificial Mains Network | R&S | ENV432 | 101546 | 2024-02-23 |
| EMC32 test software | R&S | EMC32(Ver.10.50.00) | N/A | N/A |

## 2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

## 2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

## 2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

**Table 2: Measurement Uncertainty**

| Parameter | Uncertainty (k=2) |
|---|---|
| RF output power, conducted | ± 0.99 dB |
| Occupied Channel Bandwidth | ± 2.08 % |
| RF power density, conducted | ± 0.99 dB |
| Unwanted Emissions, conducted | ± 0.89 dB |
| All emissions, radiated | ±4.17 dB |
| Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz) | ± 3.70 dB / ± 3.30 dB |

## 2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B & C of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

## 2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at No. 362 Huanguan Road Middle, Longhua District, 518110, Shenzhen, P. R. China. is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

# 3 General Product Information

## 3.1 Product Function and Intended Use

The product is a Bluetooth speaker, which supports Bluetooth dual mode wireless technology.

For details refer to the User Manual, Technical Description and Circuit Diagram.

## 3.2 Ratings and System Details

**Table 3: Technical Specification of EUT**

| General Information of EUT | Value |
|---|---|
| Kind of Equipment: | Bluetooth speaker |
| Type Designation: | X3D MAX |
| Trademark: | BlueAnt |
| FCC ID: | VHFBLUEANTX3DM |
| IC: | 7252A-X3DMAX |
| HVIN: | X3D MAX |
| Operating Voltage: | DC 5V@2A input via USB port,<br>or DC 7.4V via internal rechargeable lithium battery |
| Testing Voltage: | Fully charged battery |
| Operating Temperature Range: | -10°C ~ +50 °C |
| **Technical Specification of Bluetooth (dual mode)** | |
| Operating Frequency: | 2402 MHz to 2480 MHz |
| Type of Modulation: | GFSK, π/4-DQPSK, 8DPSK |
| Channel Number: | BR & EDR mode:79 channels, Low Energy mode:40 channels |
| Channel Separation: | BR & EDR mode:1MHz, Low Energy mode:2MHz |
| Data Rate: | BR & EDR mode:( 1Mbps, 2Mbps, 3Mbps)<br>Low Energy mode: (1Mbps, 2Mbps) |
| Antenna Type: | PCB Layout Antenna |
| Antenna Gain: | 1.0 dBi (Provided by the Client) |

**Table 4: RF Channel and Frequency of Bluetooth BR & EDR**

| RF Channel | Frequency (MHz) | RF Channel | Frequency (MHz) | RF Channel | Frequency (MHz) | RF Channel | Frequency (MHz) |
|---|---|---|---|---|---|---|---|
| **0** | **2402.00** | 20 | 2422.00 | 40 | 2442.00 | 60 | 2462.00 |
| 1 | 2403.00 | 21 | 2423.00 | 41 | 2443.00 | 61 | 2463.00 |
| 2 | 2404.00 | 22 | 2424.00 | 42 | 2444.00 | 62 | 2464.00 |
| 3 | 2405.00 | 23 | 2425.00 | 43 | 2445.00 | 63 | 2465.00 |
| 4 | 2406.00 | 24 | 2426.00 | 44 | 2446.00 | 64 | 2466.00 |
| 5 | 2407.00 | 25 | 2427.00 | 45 | 2447.00 | 65 | 2467.00 |
| 6 | 2408.00 | 26 | 2428.00 | 46 | 2448.00 | 66 | 2468.00 |
| 7 | 2409.00 | 27 | 2429.00 | 47 | 2449.00 | 67 | 2469.00 |
| 8 | 2410.00 | 28 | 2430.00 | 48 | 2450.00 | 68 | 2470.00 |
| 9 | 2411.00 | 29 | 2431.00 | 49 | 2451.00 | 69 | 2471.00 |
| 10 | 2412.00 | 30 | 2432.00 | 50 | 2452.00 | 70 | 2472.00 |
| 11 | 2413.00 | 31 | 2433.00 | 51 | 2453.00 | 71 | 2473.00 |
| 12 | 2414.00 | 32 | 2434.00 | 52 | 2454.00 | 72 | 2474.00 |
| 13 | 2415.00 | 33 | 2435.00 | 53 | 2455.00 | 73 | 2475.00 |
| 14 | 2416.00 | 34 | 2436.00 | 54 | 2456.00 | 74 | 2476.00 |
| 15 | 2417.00 | 35 | 2437.00 | 55 | 2457.00 | 75 | 2477.00 |
| 16 | 2418.00 | 36 | 2438.00 | 56 | 2458.00 | 76 | 2478.00 |
| 17 | 2419.00 | 37 | 2439.00 | 57 | 2459.00 | 77 | 2479.00 |
| 18 | 2420.00 | 38 | 2440.00 | 58 | 2460.00 | 78 | **2480.00** |
| 19 | 2421.00 | 39 | **2441.00** | 59 | 2461.00 | | |

Test frequencies are lowest channel: 2402 MHz, middle channel: 2441 MHz and highest channel: 2480 MHz for Bluetooth BR & EDR

**Table 5: RF Channel and Frequency of Bluetooth LE**

| RF Channel | Frequency (MHz) | RF Channel | Frequency (MHz) | RF Channel | Frequency (MHz) | RF Channel | Frequency (MHz) |
|---|---|---|---|---|---|---|---|
| **0** | **2402** | 10 | 2422 | 20 | 2442 | 30 | 2462 |
| 1 | 2404 | 11 | 2424 | 21 | 2444 | 31 | 2464 |
| 2 | 2406 | 12 | 2426 | 22 | 2446 | 32 | 2466 |
| 3 | 2408 | 13 | 2428 | 23 | 2448 | 33 | 2468 |
| 4 | 2410 | 14 | 2430 | 24 | 2450 | 34 | 2470 |
| 5 | 2412 | 15 | 2432 | 25 | 2452 | 35 | 2472 |
| 6 | 2414 | 16 | 2434 | 26 | 2454 | 36 | 2474 |
| 7 | 2416 | 17 | 2436 | 27 | 2456 | 37 | 2476 |
| 8 | 2418 | 18 | 2438 | 28 | 2458 | 38 | 2478 |
| 9 | 2420 | **19** | **2440** | 29 | 2460 | **39** | **2480** |

Test frequencies are lowest channel: 2402 MHz, middle channel: 2440 MHz and highest channel: 2480 MHz for Bluetooth LE

## 3.3 Independent Operation Modes

The basic operation modes are:

A. On, Bluetooth transmitting mode (BR & EDR mode)
    1) Low Channel
    2) Middle Channel
    3) High Channel

B. On, Bluetooth transmitting mode (BLE)
    1) Low Channel
    2) Middle Channel
    3) High Channel

C. On, Transmitting on Hopping channel

D. On, Normal Working with BT

E. Off

## 3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

## 3.5 Submitted Documents

- Application Form
- ID Label and Location Info
- User Manual
- Operation Description

# 4 Test Set-up and Operation Modes

## 4.1 Principle of Configuration Selection

**Radio Spectrum:** The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

## 4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.1, all tests were performed on model X3D MAX in this report.

## 4.3 Special Accessories and Auxiliary Equipment

**Table 6: List of Accessories and Auxiliary Equipment**

| Description | Manufacturer | Model | S/N | Rating |
|---|---|---|---|---|
| Laptop | Lenovo | T480 | PF-16A6N8 | -- |
| AC/DC Adapter | Shenzhen chuangfuyuan Electronic Co Ltd. | X3D-MAX-FAST | -- | Input: 100-240V～,50/60Hz,0.6A Max. Output:5.0V 3.0A,9.0V 3.0A,12.0V 3.0A,15.0V 3.0A, 20V 2.25APPS:3.3~11V 4.05A |

## 4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

# 4.5 Test Setup Diagram

**Diagram of Measurement Configuration for Radiation Test (Below 1GHz)**

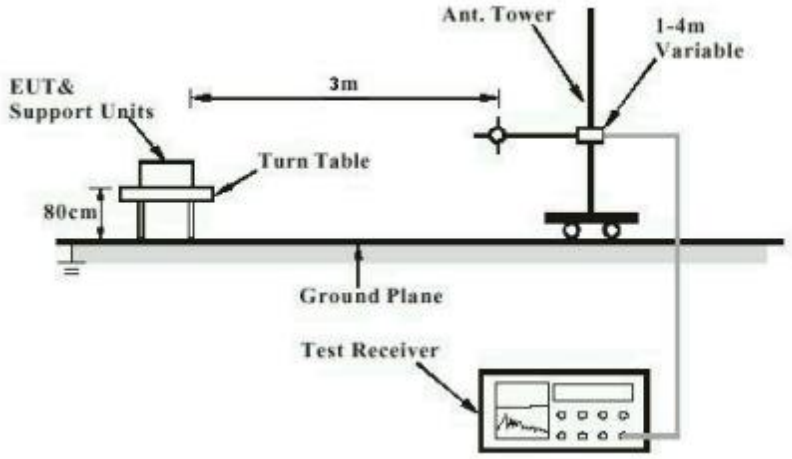



**Diagram of Measurement Configuration for Radiation Test (Above 1GHz)**

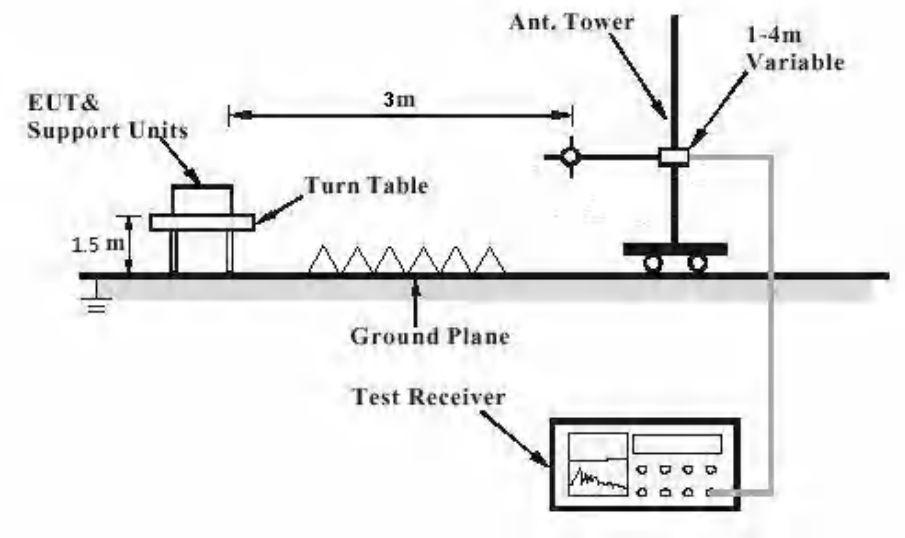


**Diagram of Measurement Configuration for Mains Conduction Measurement**

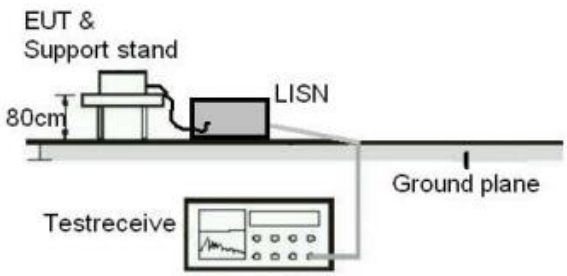
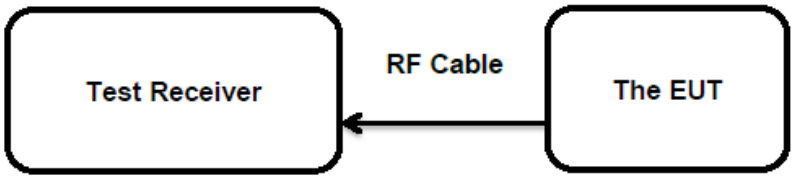



**Diagram of Measurement Configuration for Conducted Transmitter Measurement**



# 5 Test Results

## 5.1 Transmitter Requirement & Test Suites

### 5.1.1 Antenna Requirement

**RESULT:** **Pass**

**Test Specification**

Test standard : FCC Part 15.247(b)(4) and Part 15.203
RSS-Gen Clause 6.8

According to the manufacturer declared, the EUT has a PCB Layout Antenna, the directional gain of antenna is 1 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement.

Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

## 5.1.2 Maximum Peak Conducted Output Power

**RESULT:** **Pass**

**Test Specification**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(b)(1)&(3)<br>RSS-247 Clause 5.4(b)&(d) |
| Basic standard | : | ANSI C63.10: 2013 |
| Limits | : | FHSS < 0.125 Watts, DSSS < 1.0 Watts |
| Kind of test site | : | Shielded Room |

**Test Setup**

| | | |
|---|---|---|
| Date of testing | : | 2024-01-05 |
| Input voltage | : | Fully charged battery |
| Operation mode | : | A, B |
| Test channel | : | Low / Middle / High |
| Ambient temperature | : | 25.1 ℃ |
| Relative humidity | : | 50 % |
| Atmospheric pressure | : | 101 kPa |

For details refer to following test result.

**Table 7: Test Result of Maximum Peak Conducted Output Power, Bluetooth BR & EDR**

| Test Mode | Test Channel (MHz) | Measured Peak Power | | Limit (W) |
|---|---|---|---|---|
| | | (dBm) | (W) | |
| GFSK (BR) | 2402.0 | 1.00 | 0.0013 | < 0.125 |
| | 2441.0 | -2.40 | 0.0006 | |
| | 2480.0 | -3.50 | 0.0004 | |
| **Maximum Measured Value** | | **1.00** | **0.0013** | |
| **Test Mode** | **Test Channel (MHz)** | **Measured Peak Power** | | **Limit (W)** |
| | | **(dBm)** | **(W)** | |
| 8DPSK (EDR) | 2402.0 | 0.90 | 0.0012 | < 0.125 |
| | 2441.0 | -2.50 | 0.0006 | |
| | 2480.0 | -3.50 | 0.0004 | |
| **Maximum Measured Value** | | **0.90** | **0.0012** | |
| Max. e.i.r.p=1.00dBm+1dBi=2.00dBm, which is less than 36dBm=4W. | | | | |

**Table 8: Test Result of Maximum Peak Conducted Output Power, Bluetooth LE**

| Test Mode | Test Channel (MHz) | Measured Peak Power | | Limit (W) |
|---|---|---|---|---|
| | | (dBm) | (W) | |
| Bluetooth LE (1 Mbps) | 2402 | 2.70 | 0.0019 | < 1.0 |
| | 2440 | -2.30 | 0.0006 | |
| | 2480 | -3.40 | 0.0005 | |
| **Max. Measured Value** | | **2.70** | **0.0019** | |
| Max. e.i.r.p=2.70dBm+1dBi=3.70dBm, which is less than 36dBm=4W. | | | | |

Note:
1) The cable loss is taken into account in results.
2) Antenna gain(G): 1 dBi

## 5.1.3 Conducted Power Spectral Density

**RESULT:** **Pass**

**Test Specification**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(e)<br>RSS-247 Clause 5.2(b) |
| Basic standard | : | ANSI C63.10: 2013 |
| Limits | : | < 8 dBm / 3kHz |
| Kind of test site | : | Shielded Room |

**Test Setup**

| | | |
|---|---|---|
| Date of testing | : | 2024-01-05 |
| Input voltage | : | Fully charged battery |
| Operation mode | : | B |
| Test channel | : | Low / Middle / High |
| Ambient temperature | : | 25.1 ℃ |
| Relative humidity | : | 50 % |
| Atmospheric pressure | : | 101 kPa |

For the measurement records, refer to the appendix B.

## 5.1.4 6dB Bandwidth

**RESULT:** **Pass**

**Test Specification**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(a)(2)<br>RSS-247 Clause 5.2(a) |
| Basic standard | : | ANSI C63.10: 2013 |
| Limits | : | > 500 KHz |
| Kind of test site | : | Shielded Room |

**Test Setup**

| | | |
|---|---|---|
| Date of testing | : | 2024-01-05 |
| Input voltage | : | Fully charged battery |
| Operation mode | : | B |
| Test channel | : | Low / Middle / High |
| Ambient temperature | : | 25.1 ℃ |
| Relative humidity | : | 50 % |
| Atmospheric pressure | : | 101 kPa |

For the measurement records, refer to the appendix B.

## 5.1.5 99% Bandwidth

**RESULT:** **Pass**

**Test Specification**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(a)<br>RSS-Gen Clause 6.7 |
| Basic standard | : | ANSI C63.10: 2013 |
| Kind of test site | : | Shielded Room |

**Test Setup**

| | | |
|---|---|---|
| Date of testing | : | 2024-01-05 |
| Input voltage | : | Fully charged battery |
| Operation mode | : | A, B |
| Test channel | : | Low / Middle / High |
| Ambient temperature | : | 25.1 ℃ |
| Relative humidity | : | 50 % |
| Atmospheric pressure | : | 101 kPa |

For the measurement records, refer to the appendix A & B.

## 5.1.6 20dB Bandwidth

**RESULT:** **Pass**

**Test Specification**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(a)(1)<br>RSS-247 Clause 5.1(a) |
| Basic standard | : | ANSI C63.10: 2013 |
| Kind of test site | : | Shielded Room |

**Test Setup**

| | | |
|---|---|---|
| Date of testing | : | 2024-01-05 |
| Input voltage | : | Fully charged battery |
| Operation mode | : | A |
| Test channel | : | Low / Middle / High |
| Ambient temperature | : | 25.1 ℃ |
| Relative humidity | : | 50 % |
| Atmospheric pressure | : | 101 kPa |

For the measurement records, refer to the appendix A.

## 5.1.7 Carrier Frequency Separation

**RESULT:** **Pass**

**Test Specification**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(a)(1)<br>RSS-247 Clause 5.1(b) |
| Basic standard | : | ANSI C63.10: 2013 |
| Limits | : | ≥ 25kHz or 2/3 of 20dB bandwidth, whichever is greater |
| Kind of test site | : | Shielded Room |

**Test Setup**

| | | |
|---|---|---|
| Date of testing | : | 2024-01-05 |
| Input voltage | : | Fully charged battery |
| Operation mode | : | C |
| Test channel | : | Low / Middle / High |
| Ambient temperature | : | 25.1 ℃ |
| Relative humidity | : | 50 % |
| Atmospheric pressure | : | 101 kPa |

For the measurement records, refer to the appendix A.

## 5.1.8 Number of Hopping Frequency

**RESULT:** **Pass**

**Test Specification**

| | | |
|---|---|---|
| Test standard | : | FCC part 15.247(a)(1)(iii)<br>RSS-247 Clause 5.1(d) |
| Basic standard | : | ANSI C63.10: 2013 |
| Limits | : | ≥ 15 non-overlapping channels |
| Kind of test site | : | Shielded Room |

**Test Setup**

| | | |
|---|---|---|
| Date of testing | : | 2024-01-05 |
| Input voltage | : | Fully charged battery |
| Operation mode | : | C |
| Ambient temperature | : | 25.1 ℃ |
| Relative humidity | : | 50 % |
| Atmospheric pressure | : | 101 kPa |

For the measurement records, refer to the appendix A.

## 5.1.9 Time of Occupancy

**RESULT:** **Pass**

**Test Specification**

| | | |
|---|---|---|
| Test standard | : | FCC part 15.247(a)(1)(iii)<br>RSS-247 Clause 5.1(d) |
| Basic standard | : | ANSI C63.10: 2013 |
| Limits | : | < 0.4s |
| Kind of test site | : | Shielded Room |

**Test Setup**

| | | |
|---|---|---|
| Date of testing | : | 2024-01-05 |
| Input voltage | : | Fully charged battery |
| Operation mode | : | C |
| Test channel | : | Low / Middle / High |
| Ambient temperature | : | 25.1 ℃ |
| Relative humidity | : | 50 % |
| Atmospheric pressure | : | 101 kPa |

For the measurement records, refer to the appendix A.

## 5.1.10 Conducted Spurious Emissions Measured in 100 kHz Bandwidth

**RESULT:** **Pass**

**Test Specification**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(d)<br>RSS-247 Clause 5.5 |
| Basic standard | : | ANSI C63.10: 2013 |
| Limits | : | 20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power);<br>In addition, radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified in 15.209(a) |
| Kind of test site | : | Shielded Room |

**Test Setup**

| | | |
|---|---|---|
| Date of testing | : | 2024-01-05 |
| Input voltage | : | Fully charged battery |
| Operation mode | : | A, B |
| Test channel | : | Low / Middle / High |
| Ambient temperature | : | 25.1 ℃ |
| Relative humidity | : | 50 % |
| Atmospheric pressure | : | 101 kPa |

Test results of 100kHz Bandwidth of Frequency Band Edge by Conducted method refer to test plots, and compliance is achieved as well.

For the measurement records, refer to the appendix A & B.

## 5.1.11 Radiated Spurious Emission

**RESULT:** **Pass**

**Test Specification**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.247(d) & FCC Part 15.205<br>RSS-247 Clause 3.3 |
| Basic standard | : | ANSI C63.10: 2013 |
| Limits | : | Refer to 15.209(a) of FCC part 15.247(d)<br>RSS-Gen Section 8.9 & 8.10 |
| Kind of test site | : | 3m Semi-anechoic Chamber |

**Test Setup**

| | | |
|---|---|---|
| Date of testing | : | 2024-01-03 to 2024-01-04 |
| Input voltage | : | Fully charged battery |
| Operation mode | : | A, B |
| Test channel | : | Low / Middle / High |
| Ambient temperature | : | Refer to test result |
| Relative humidity | : | Refer to test result |
| Atmospheric pressure | : | 101 kPa |

Remark:
Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix A & B.

## 5.1.12 Conducted Emission on AC Mains

**RESULT:** **Pass**

**Test Specification**

| | | |
|---|---|---|
| Test standard | : | FCC Part 15.207(a)<br>RSS-Gen Section 8.8 |
| Basic standard | : | ANSI C63.10: 2013 |
| Frequency range | : | 0.15 – 30MHz |
| Classification | : | Class B |
| Limits | : | FCC Part 15.207(a)<br>RSS-Gen Table 4 |
| Kind of test site | : | Shielded Room |

**Test Setup**

| | | |
|---|---|---|
| Date of testing | : | 2023-12-20 |
| Input voltage | : | AC 120V, 60Hz or Built-in battery |
| Operation mode | : | D |
| Earthing | : | Not connected |
| Ambient temperature | : | 24.3 ℃ |
| Relative humidity | : | 51.2 % |
| Atmospheric pressure | : | 101 kPa |

For the measurement records, refer to the appendix B.

# 6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix C.

# 7 List of Tables

# Appendix A: Test Results of Bluetooth BR & EDR

# Appendix A.1: Test Results of 99% Bandwidth

## BR mode (GFSK)

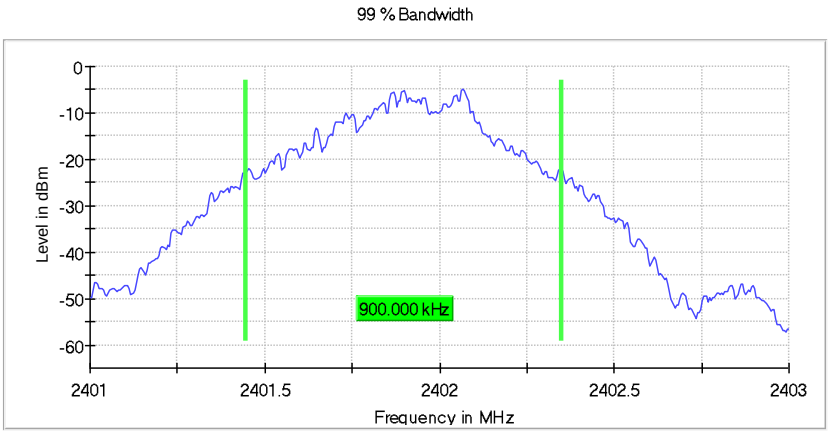
### Occupied Channel Bandwidth 99% (2402 MHz; 10.000 dBm; 1 MHz; Test Mode)

#### 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2402.000000 | 0.900000 | --- | --- | 2401.447500 | 2402.347500 |

**(continuation of the "99 % Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Result |
|---|---|
| 2402.000000 | PASS |




#### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.40100 GHz | 2.40100 GHz |
| Stop Frequency | 2.40300 GHz | 2.40300 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 500 | 500 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.30 dB | 0.30 dB |
| Run | 4 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.15 dB | 0.30 dB |

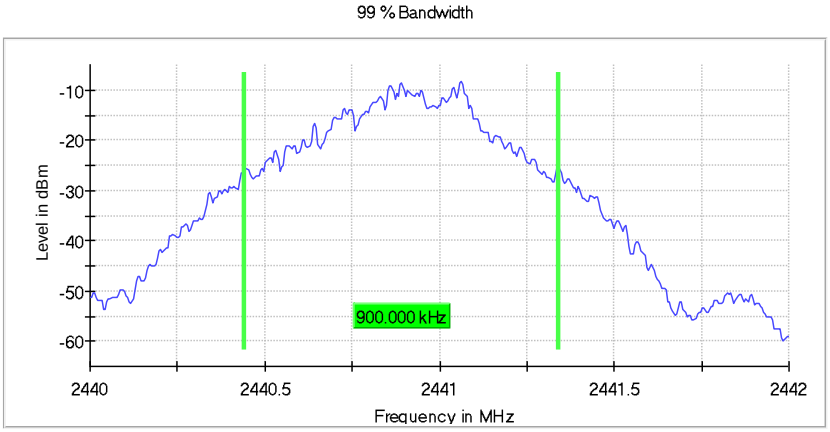
## Occupied Channel Bandwidth 99% (2441 MHz; 10.000 dBm; 1 MHz; Test Mode)

### 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2441.000000 | 0.900000 | --- | --- | 2440.442500 | 2441.342500 |

**(continuation of the "99 % Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Result |
|---|---|
| 2441.000000 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.44000 GHz | 2.44000 GHz |
| Stop Frequency | 2.44200 GHz | 2.44200 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 500 | 500 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.30 dB | 0.30 dB |
| Run | 5 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.20 dB | 0.30 dB |

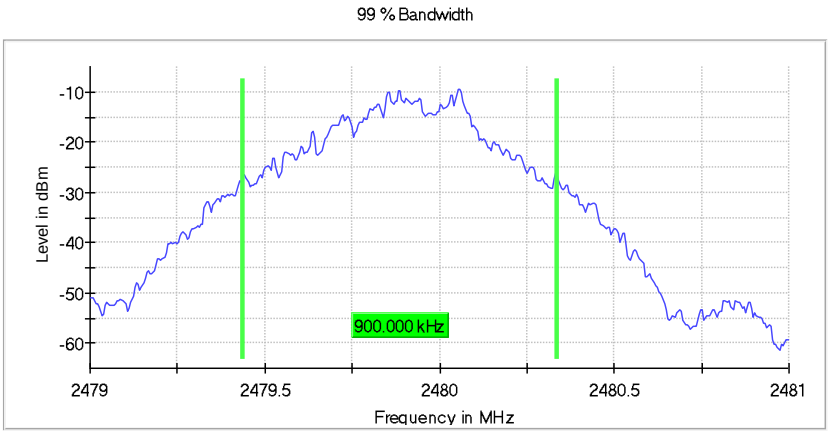
## Occupied Channel Bandwidth 99% (2480 MHz; 10.000 dBm; 1 MHz; Test Mode)

### 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2480.000000 | 0.900000 | --- | --- | 2479.437500 | 2480.337500 |

**(continuation of the "99 % Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Result |
|---|---|
| 2480.000000 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.47900 GHz | 2.47900 GHz |
| Stop Frequency | 2.48100 GHz | 2.48100 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 500 | 500 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.30 dB | 0.30 dB |
| Run | 5 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.10 dB | 0.30 dB |

## EDR mode (8DPSK)

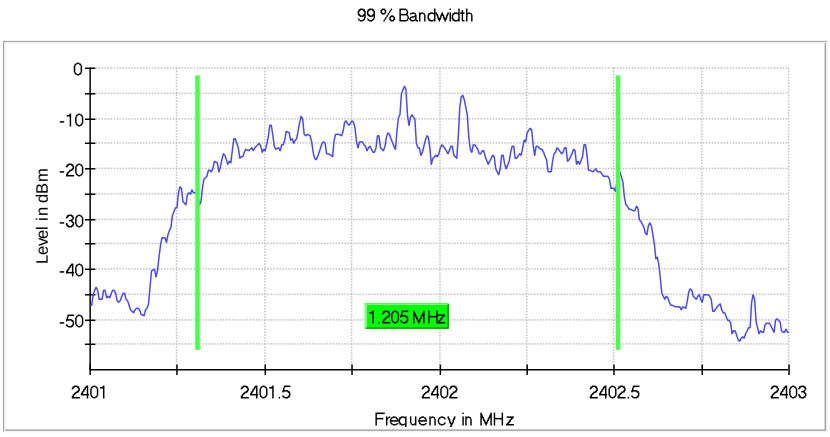
## Occupied Channel Bandwidth 99% (2402 MHz; 10.000 dBm; 1 MHz; Test Mode)

### 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2402.000000 | 1.205000 | --- | --- | 2401.307500 | 2402.512500 |

**(continuation of the "99 % Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Result |
|---|---|
| 2402.000000 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.40100 GHz | 2.40100 GHz |
| Stop Frequency | 2.40300 GHz | 2.40300 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 500 | 500 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.30 dB | 0.30 dB |
| Run | 5 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.09 dB | 0.30 dB |

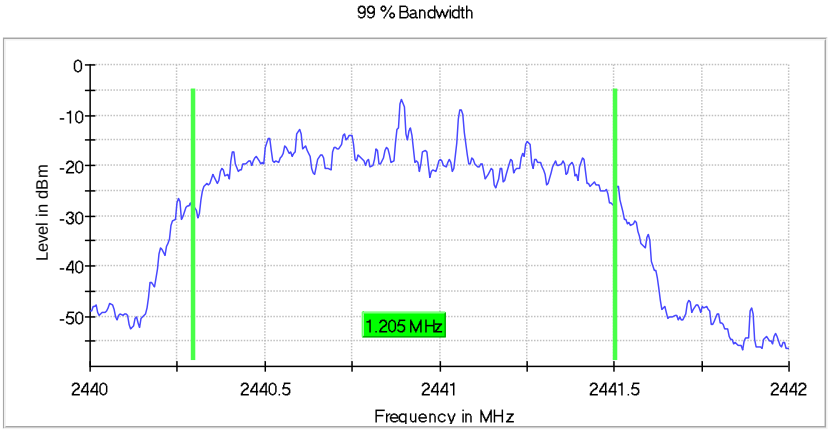
## Occupied Channel Bandwidth 99% (2441 MHz; 10.000 dBm; 1 MHz; Test Mode)

### 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2441.000000 | 1.205000 | --- | --- | 2440.297500 | 2441.502500 |

**(continuation of the "99 % Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Result |
|---|---|
| 2441.000000 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.44000 GHz | 2.44000 GHz |
| Stop Frequency | 2.44200 GHz | 2.44200 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 500 | 500 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.30 dB | 0.30 dB |
| Run | 5 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.17 dB | 0.30 dB |

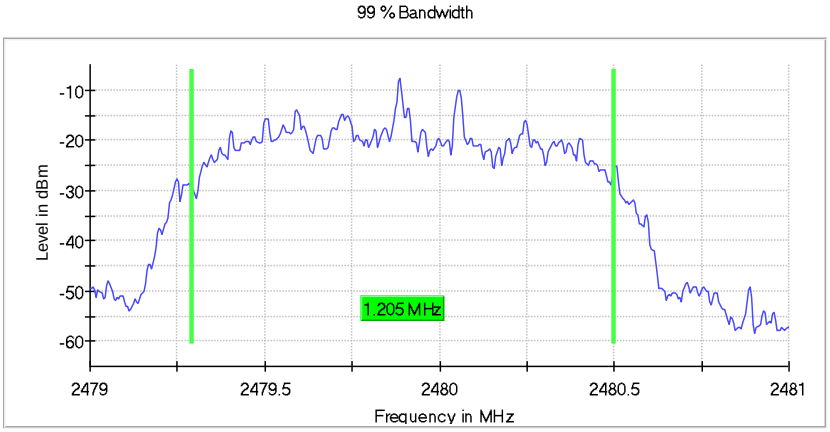
## Occupied Channel Bandwidth 99% (2480 MHz; 10.000 dBm; 1 MHz; Test Mode)

### 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2480.000000 | 1.205000 | --- | --- | 2479.292500 | 2480.497500 |

**(continuation of the "99 % Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Result |
|---|---|
| 2480.000000 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.47900 GHz | 2.47900 GHz |
| Stop Frequency | 2.48100 GHz | 2.48100 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 500 | 500 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.30 dB | 0.30 dB |
| Run | 5 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.14 dB | 0.30 dB |

# Appendix A.2: Test Results of 20dB Bandwidth

## BR mode (GFSK)

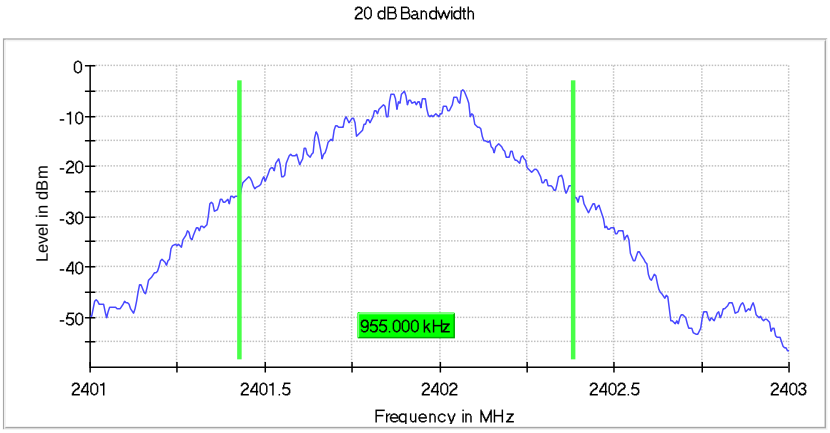
### Emission Bandwidth 20 dB (2402 MHz; 10.000 dBm; 1 MHz; Test Mode)

### 20 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2402.000000 | 0.955000 | --- | --- | 2401.427500 | 2402.382500 |

**(continuation of the "20 dB Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---|---|---|
| 2402.000000 | -4.9 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.40100 GHz | 2.40100 GHz |
| Stop Frequency | 2.40300 GHz | 2.40300 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | 0.000 dBm | 0.000 dBm |
| Attenuation | 20.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 200 | 200 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 11 / max. 150 | max. 150 |
| Stable | 5 / 5 | 5 |
| Max Stable Difference | 0.07 dB | 0.50 dB |

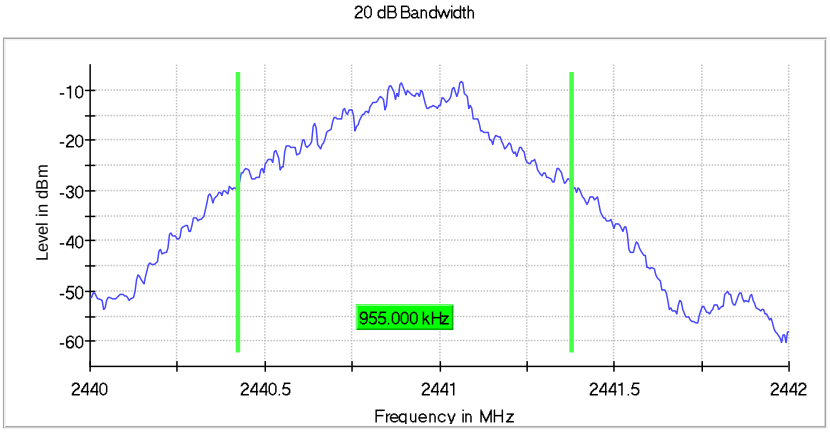
## Emission Bandwidth 20 dB (2441 MHz; 10.000 dBm; 1 MHz; Test Mode)

### 20 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2441.000000 | 0.955000 | --- | --- | 2440.422500 | 2441.377500 |

**(continuation of the "20 dB Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---|---|---|
| 2441.000000 | -8.4 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.44000 GHz | 2.44000 GHz |
| Stop Frequency | 2.44200 GHz | 2.44200 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 200 | 200 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 8 / max. 150 | max. 150 |
| Stable | 5 / 5 | 5 |
| Max Stable Difference | 0.09 dB | 0.50 dB |

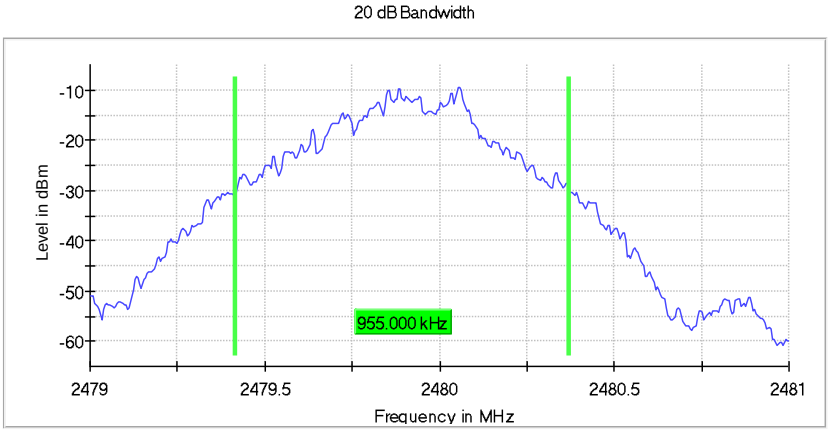
## Emission Bandwidth 20 dB (2480 MHz; 10.000 dBm; 1 MHz; Test Mode)

### 20 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2480.000000 | 0.955000 | --- | --- | 2479.417500 | 2480.372500 |

**(continuation of the "20 dB Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---|---|---|
| 2480.000000 | -9.4 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.47900 GHz | 2.47900 GHz |
| Stop Frequency | 2.48100 GHz | 2.48100 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 200 | 200 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 8 / max. 150 | max. 150 |
| Stable | 5 / 5 | 5 |
| Max Stable Difference | 0.07 dB | 0.50 dB |

## EDR mode (8DPSK)

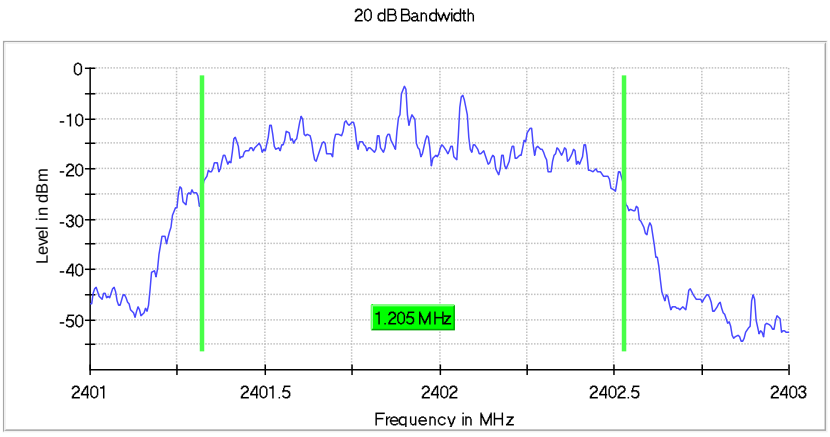
## Emission Bandwidth 20 dB (2402 MHz; 10.000 dBm; 1 MHz; Test Mode)

### 20 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2402.000000 | 1.205000 | --- | --- | 2401.322500 | 2402.527500 |

**(continuation of the "20 dB Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---|---|---|
| 2402.000000 | -3.5 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.40100 GHz | 2.40100 GHz |
| Stop Frequency | 2.40300 GHz | 2.40300 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | 0.000 dBm | 0.000 dBm |
| Attenuation | 20.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 200 | 200 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 7 / max. 150 | max. 150 |
| Stable | 5 / 5 | 5 |
| Max Stable Difference | 0.02 dB | 0.50 dB |

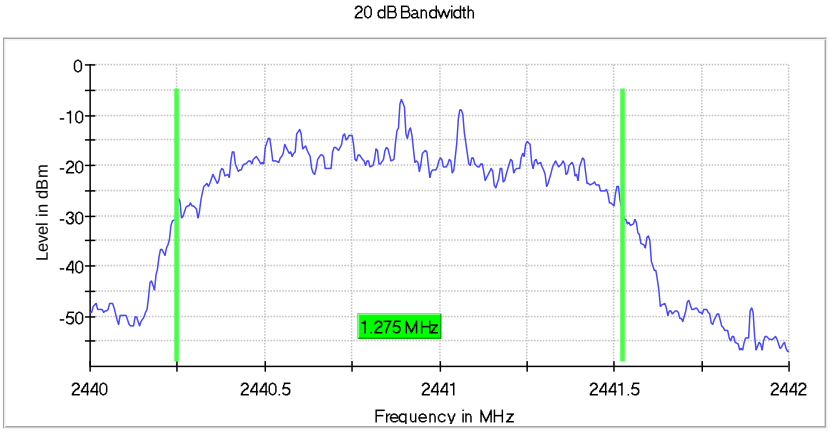
## Emission Bandwidth 20 dB (2441 MHz; 10.000 dBm; 1 MHz; Test Mode)

### 20 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2441.000000 | 1.275000 | --- | --- | 2440.247500 | 2441.522500 |

**(continuation of the "20 dB Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---|---|---|
| 2441.000000 | -6.8 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.44000 GHz | 2.44000 GHz |
| Stop Frequency | 2.44200 GHz | 2.44200 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 200 | 200 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 9 / max. 150 | max. 150 |
| Stable | 5 / 5 | 5 |
| Max Stable Difference | 0.06 dB | 0.50 dB |

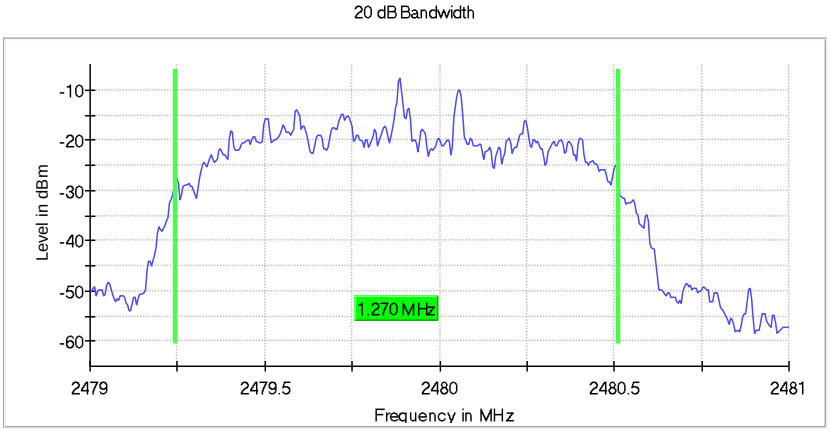
## Emission Bandwidth 20 dB (2480 MHz; 10.000 dBm; 1 MHz; Test Mode)

### 20 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2480.000000 | 1.270000 | --- | --- | 2479.242500 | 2480.512500 |

**(continuation of the "20 dB Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---|---|---|
| 2480.000000 | -7.8 | PASS |



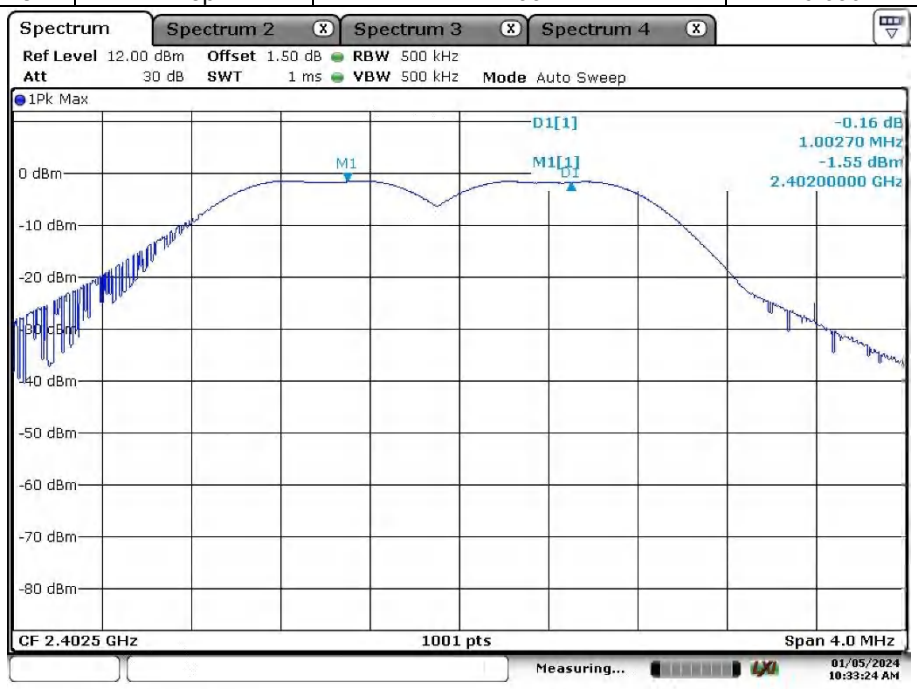

### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.47900 GHz | 2.47900 GHz |
| Stop Frequency | 2.48100 GHz | 2.48100 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 200 | 200 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 9 / max. 150 | max. 150 |
| Stable | 5 / 5 | 5 |
| Max Stable Difference | 0.04 dB | 0.50 dB |

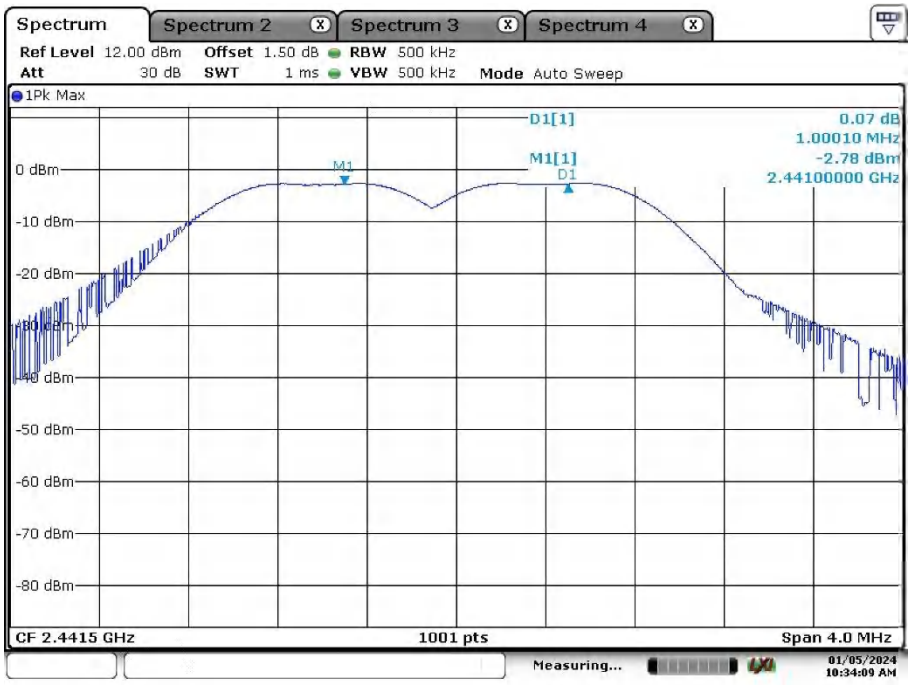
## Appendix A.3: Test Results of Carrier Frequency Separation

### BR mode (GFSK)

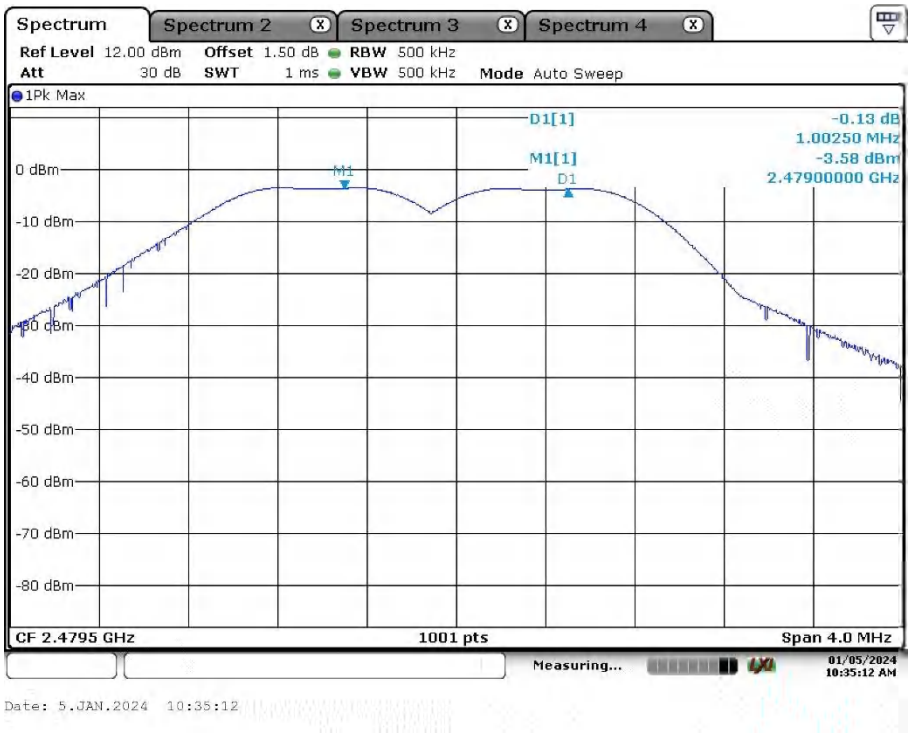
| TestMode | Channel | Result[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|
| DH5-low channel | Hop | 1.00 | ≥0.636 | PASS |
| DH5-middel channel | Hop | 1.00 | ≥0.636 | PASS |
| DH5-high channel | Hop | 1.00 | ≥0.636 | PASS |




Date: 5.JAN.2024 10:33:24

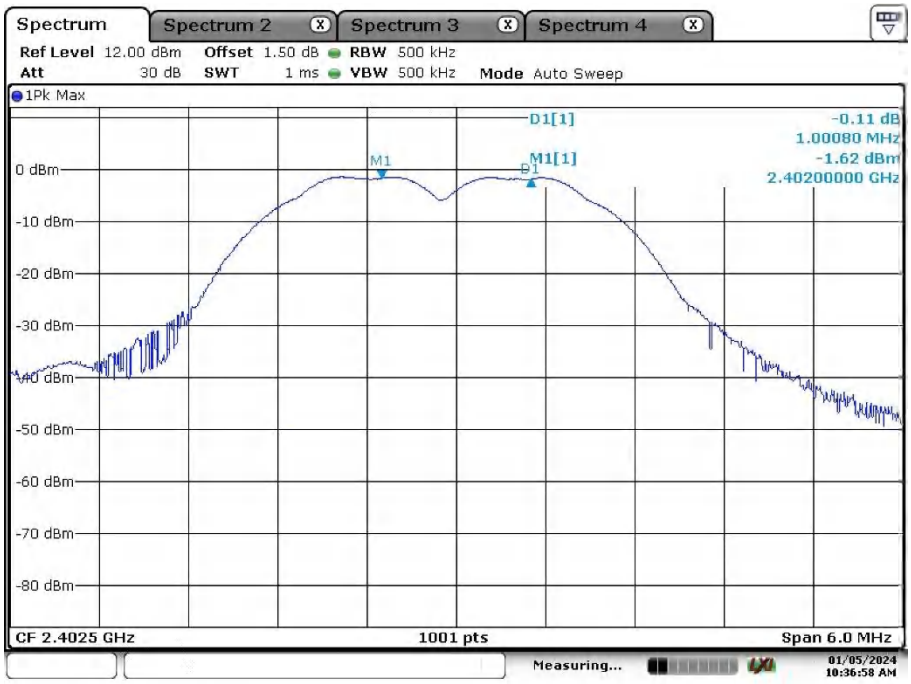


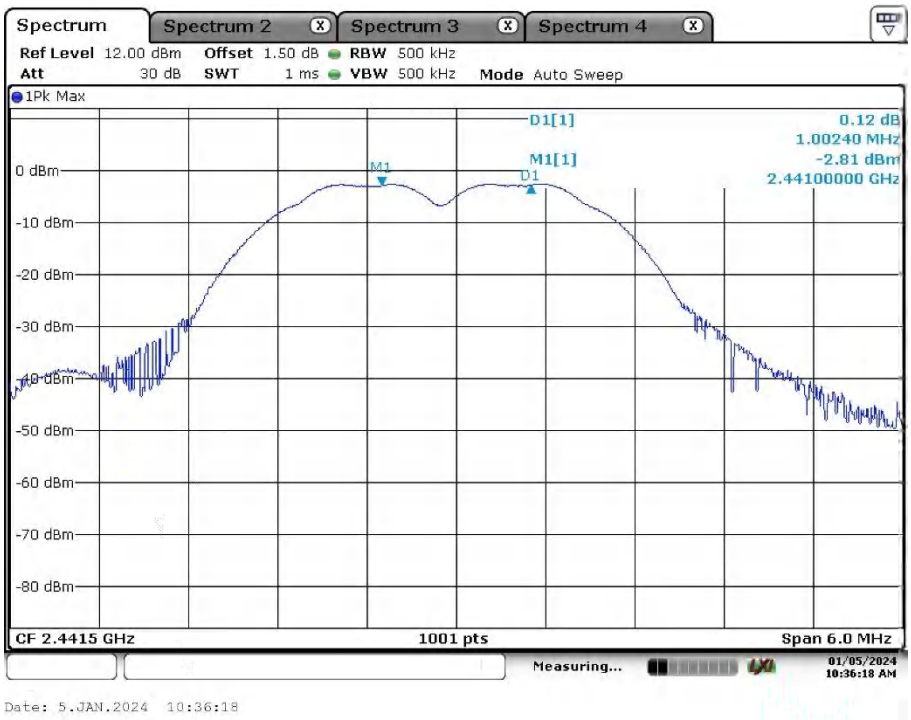

Date: 5.JAN.2024 10:34:09

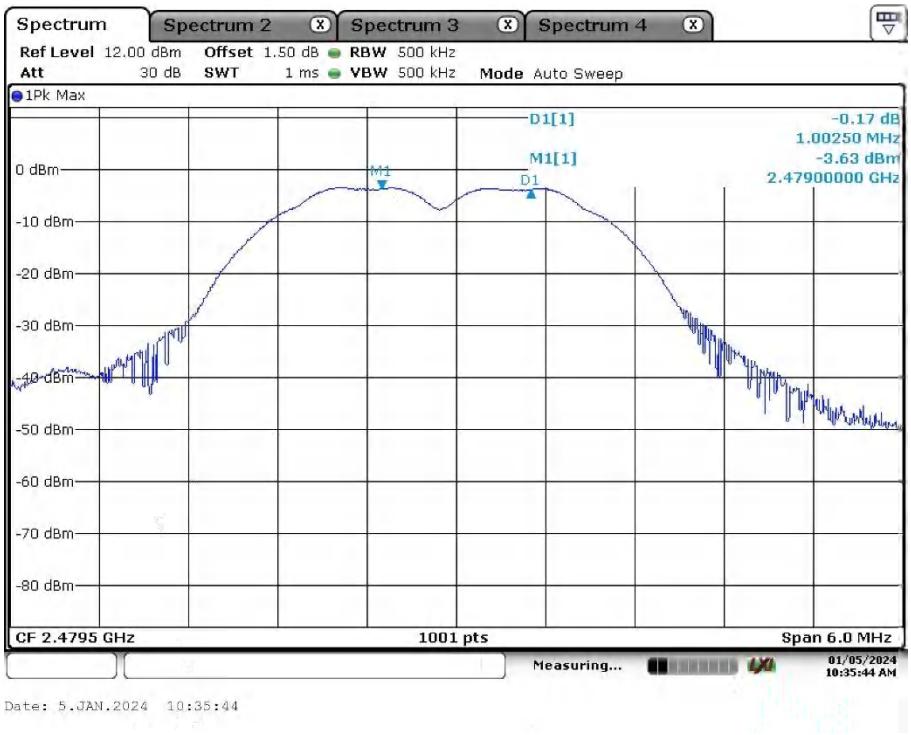

Spectrum
Spectrum 2
Spectrum 3
Spectrum 4
Ref Level 12.00 dBm Offset 1.50 dB RBW 500 kHz
Att 30 dB SWT 1 ms VBW 500 kHz Mode Auto Sweep
1Pk Max
D1[1] -0.13 dB
1.00250 MHz
M1[1] -3.58 dBm
2.47900000 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.4795 GHz
1001 pts
Span 4.0 MHz
Measuring...
01/05/2024
10:35:12 AM
Date: 5.JAN.2024 10:35:12

**EDR mode (8DPSK)**

| TestMode | Channel | Result[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|
| 3DH5-low channel | Hop | 1.00 | ≥0.803 | PASS |
| 3DH5-middel channel | Hop | 1.00 | ≥0.850 | PASS |
| 3DH5-high channel | Hop | 1.00 | ≥0.847 | PASS |




Spectrum
Spectrum 2
Spectrum 3
Spectrum 4
Ref Level 12.00 dBm Offset 1.50 dB RBW 500 kHz
Att 30 dB SWT 1 ms VBW 500 kHz Mode Auto Sweep
1Pk Max
D1[1] -0.17 dB
1.00250 MHz
M1[1] -3.63 dBm
2.47900000 GHz
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.4795 GHz
1001 pts
Span 6.0 MHz
Measuring...
01/05/2024
10:35:44 AM
Date: 5.JAN.2024 10:35:44

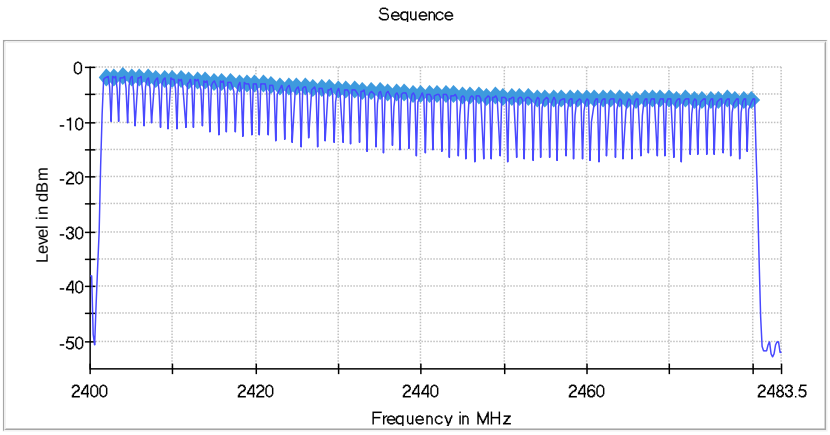
# Appendix A.4: Test Results of Number of Hopping Frequency

## BR mode (GFSK)

### Hopping Frequencies (frequency independent; 10.000 dBm; 1 MHz)

### Channels

| Channels | Limit Min | Limit Max | Result |
|---|---|---|---|
| 79 | 15 | --- | PASS |




### Measurement

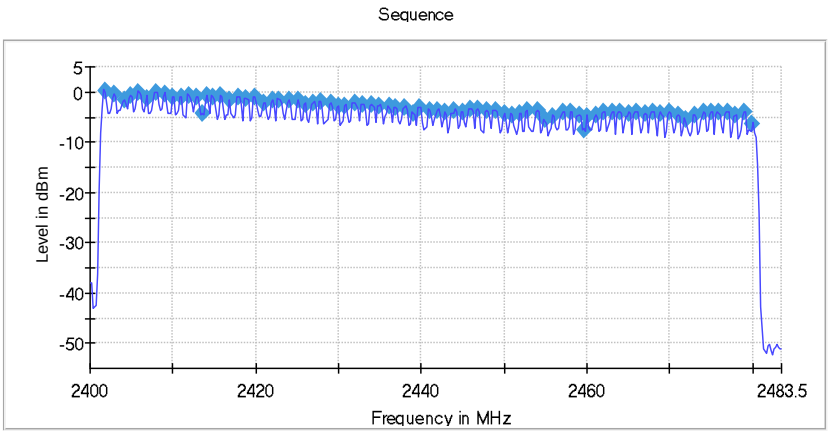
| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.40000 GHz | 2.40000 GHz |
| Stop Frequency | 2.48350 GHz | 2.48350 GHz |
| Span | 83.500 MHz | 83.500 MHz |
| RBW | 200.000 kHz | <= 299.000 kHz |
| VBW | 200.000 kHz | >= 200.000 kHz |
| SweepPoints | 418 | ~ 418 |
| Sweeptime | 1.060 ms | AUTO |
| Reference Level | 0.000 dBm | 0.000 dBm |
| Attenuation | 20.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 100 | 100 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | Sweep | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 60 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.00 dB | 0.50 dB |

## EDR mode (8DPSK)

## Hopping Frequencies (frequency independent; 10.000 dBm; 1 MHz)

### Channels

| Channels | Limit Min | Limit Max | Result |
|---|---|---|---|
| 81 | 15 | --- | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.40000 GHz | 2.40000 GHz |
| Stop Frequency | 2.48350 GHz | 2.48350 GHz |
| Span | 83.500 MHz | 83.500 MHz |
| RBW | 200.000 kHz | <= 299.000 kHz |
| VBW | 200.000 kHz | >= 200.000 kHz |
| SweepPoints | 418 | ~ 418 |
| Sweeptime | 1.060 ms | AUTO |
| Reference Level | 0.000 dBm | 0.000 dBm |
| Attenuation | 20.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 100 | 100 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | Sweep | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 109 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.07 dB | 0.50 dB |

# Appendix A.5: Test Results of Time of Occupancy

## BR mode (GFSK-DH5)

### Time of Channel Occupancy (2441 MHz; 10.000 dBm; 1 MHz)

### Result

| DUT Frequency (MHz) | Result | Number of Hops | Average time of occupancy (ms) | Threshold (dBm) |
|---|---|---|---|---|
| 2441.000000 | PASS | 314 | 120.320 | -10.0 |

### Periode

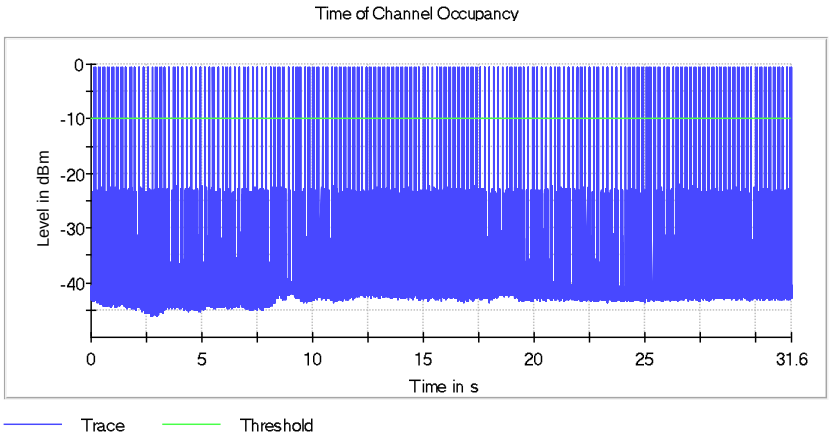
| Min (ms) | Max (ms) | Mean (ms) |
|---|---|---|
| 5.000 | 198.750 | 100.313 |

### Transmit Time per Hop

| Min (ms) | Max (ms) | Limit Max for Max (ms) | Limit Min for Max (ms) | Mean (ms) |
|---|---|---|---|---|
| 0.35 | 0.78 | 400.000 | 0.000 | 0.382 |

### DwellTime

| Min (ms) | Max (ms) | Mean (ms) |
|---|---|---|
| 0.37 | 1.640 | 0.401 |



## Time of Channel Occupancy(2) (2441 MHz; 10.000 dBm; 1 MHz)

### Result

| DUT Frequency (MHz) | Result | Number of Hops | Average time of occupancy (ms) | Threshold (dBm) |
|---|---|---|---|---|
| 2441.000000 | PASS | 175 | 290.100 | -10.0 |

### Periode

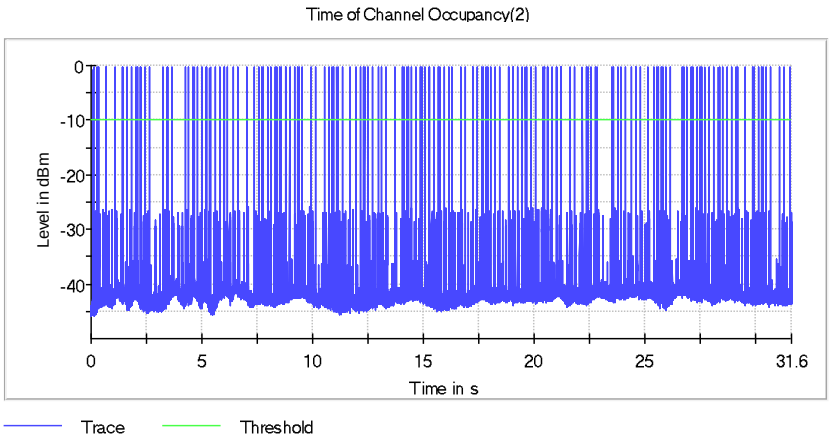
| Min (ms) | Max (ms) | Mean (ms) |
|---|---|---|
| 10.000 | 687.510 | 178.954 |

### Transmit Time per Hop

| Min (ms) | Max (ms) | Limit Max for Max (ms) | Limit Min for Max (ms) | Mean (ms) |
|---|---|---|---|---|
| 1.640 | 1.650 | 400.000 | 0.000 | 1.648 |

### DwellTime

| Min (ms) | Max (ms) | Mean (ms) |
|---|---|---|
| 1.650 | 1.660 | 1.653 |



## Time of Channel Occupancy(3) (2441 MHz; 10.000 dBm; 1 MHz)

### Result

| DUT Frequency (MHz) | Result | Number of Hops | Average time of occupancy (ms) | Threshold (dBm) |
|---|---|---|---|---|
| 2441.000000 | PASS | 109 | 317.250 | -10.0 |

### Periode

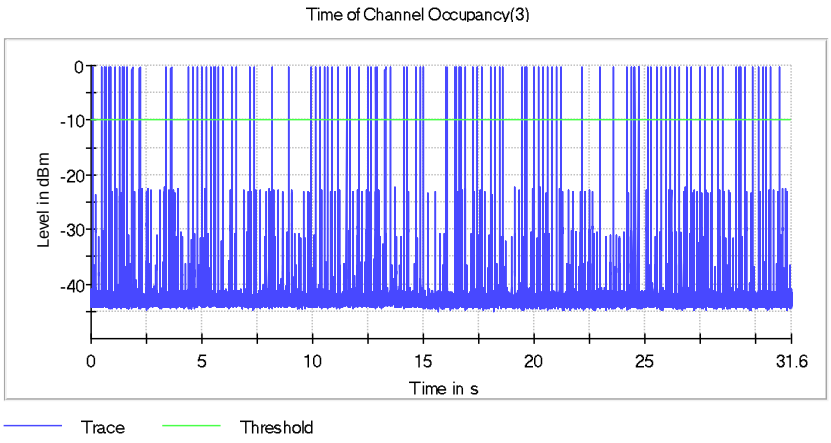
| Min (ms) | Max (ms) | Mean (ms) |
|---|---|---|
| 33.750 | 1188.770 | 283.372 |

### Transmit Time per Hop

| Min (ms) | Max (ms) | Limit Max for Max (ms) | Limit Min for Max (ms) | Mean (ms) |
|---|---|---|---|---|
| 2.870 | 2.900 | 400.000 | 0.000 | 2.884 |

### DwellTime

| Min (ms) | Max (ms) | Mean (ms) |
|---|---|---|
| 2.880 | 2.910 | 2.888 |



## EDR mode (8DPSK-3DH5)

### Time of Channel Occupancy (2441 MHz; 10.000 dBm; 1 MHz)

### Result

| DUT Frequency (MHz) | Result | Number of Hops | Average time of occupancy (ms) | Threshold (dBm) |
|---|---|---|---|---|
| 2441.000000 | PASS | 314 | 81.630 | -10.0 |

### Periode

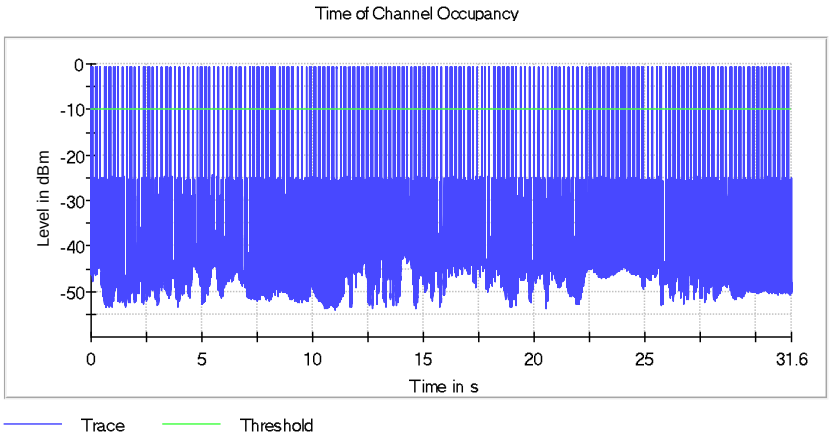
| Min (ms) | Max (ms) | Mean (ms) |
|---|---|---|
| 5.000 | 198.750 | 100.285 |

### Transmit Time per Hop

| Min (ms) | Max (ms) | Limit Max for Max (ms) | Limit Min for Max (ms) | Mean (ms) |
|---|---|---|---|---|
| 0.18 | 0.56 | 400.000 | 0.000 | 0.259 |

### DwellTime

| Min (ms) | Max (ms) | Mean (ms) |
|---|---|---|
| 0.22 | 1.650 | 0.398 |



## Time of Channel Occupancy(2) (2441 MHz; 10.000 dBm; 1 MHz)

### Result

| DUT Frequency (MHz) | Result | Number of Hops | Average time of occupancy (ms) | Threshold (dBm) |
|---|---|---|---|---|
| 2441.000000 | PASS | 175 | 154.370 | -10.0 |

### Periode

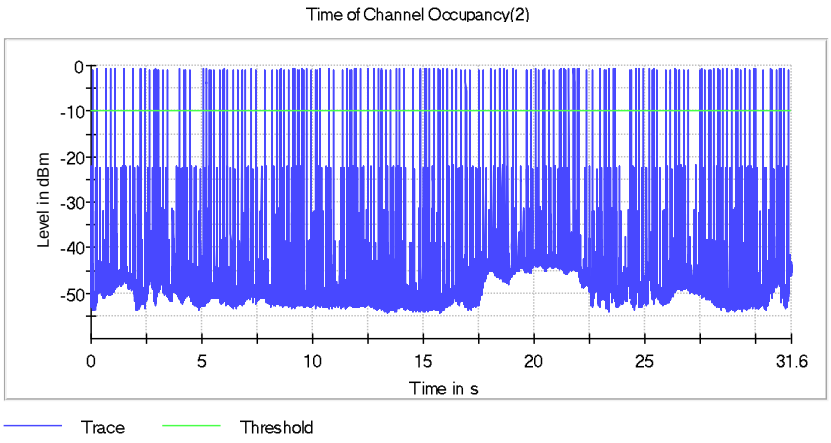
| Min (ms) | Max (ms) | Mean (ms) |
|---|---|---|
| 10.000 | 687.510 | 179.356 |

### Transmit Time per Hop

| Min (ms) | Max (ms) | Limit Max for Max (ms) | Limit Min for Max (ms) | Mean (ms) |
|---|---|---|---|---|
| 0.71 | 1.000 | 400.000 | 0.000 | 0.877 |

### DwellTime

| Min (ms) | Max (ms) | Mean (ms) |
|---|---|---|
| 1.640 | 1.650 | 1.645 |



## Time of Channel Occupancy(3) (2441 MHz; 10.000 dBm; 1 MHz)

### Result

| DUT Frequency (MHz) | Result | Number of Hops | Average time of occupancy (ms) | Threshold (dBm) |
|---|---|---|---|---|
| 2441.000000 | PASS | 110 | 236.020 | -10.0 |

### Periode

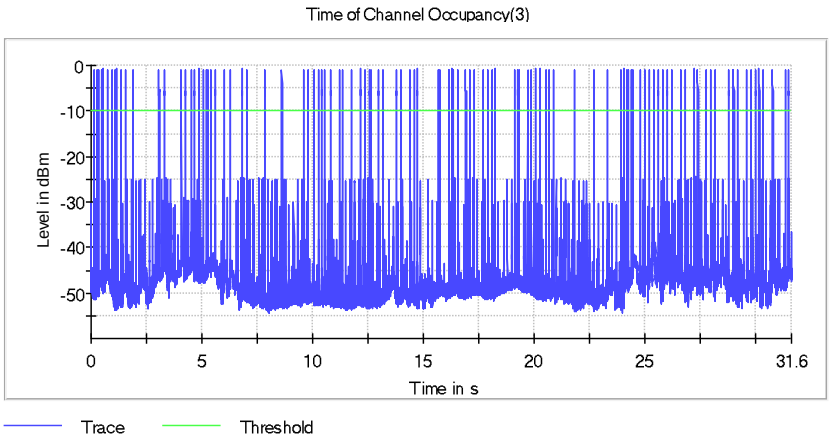
| Min (ms) | Max (ms) | Mean (ms) |
|---|---|---|
| 33.750 | 1188.770 | 285.865 |

### Transmit Time per Hop

| Min (ms) | Max (ms) | Limit Max for Max (ms) | Limit Min for Max (ms) | Mean (ms) |
|---|---|---|---|---|
| 1.970 | 2.260 | 400.000 | 0.000 | 2.126 |

### DwellTime

| Min (ms) | Max (ms) | Mean (ms) |
|---|---|---|
| 2.880 | 2.900 | 2.893 |

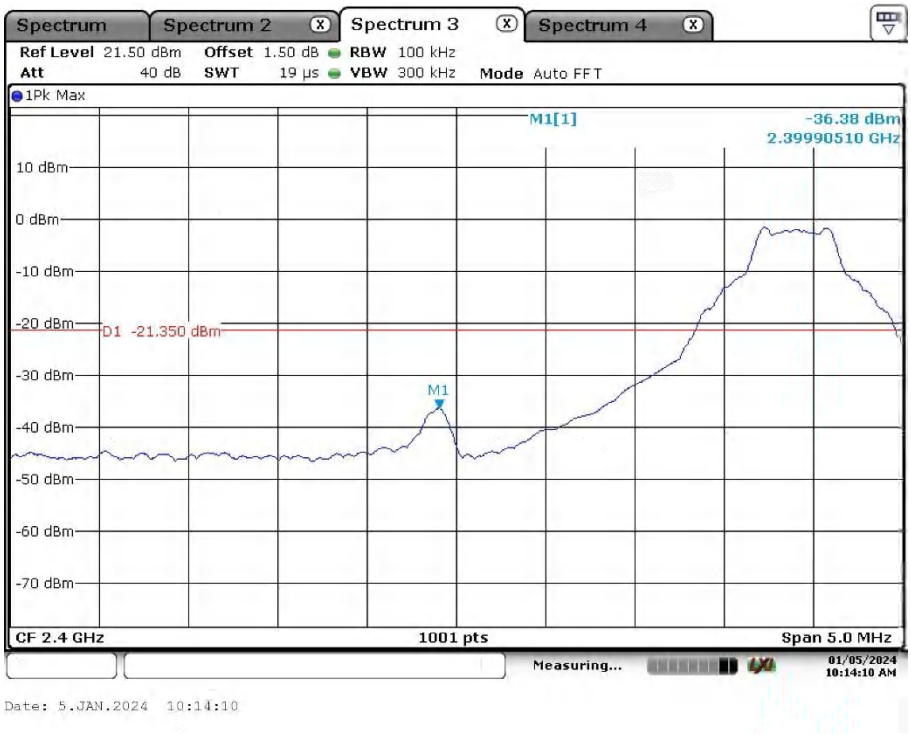


## Appendix A.6: Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

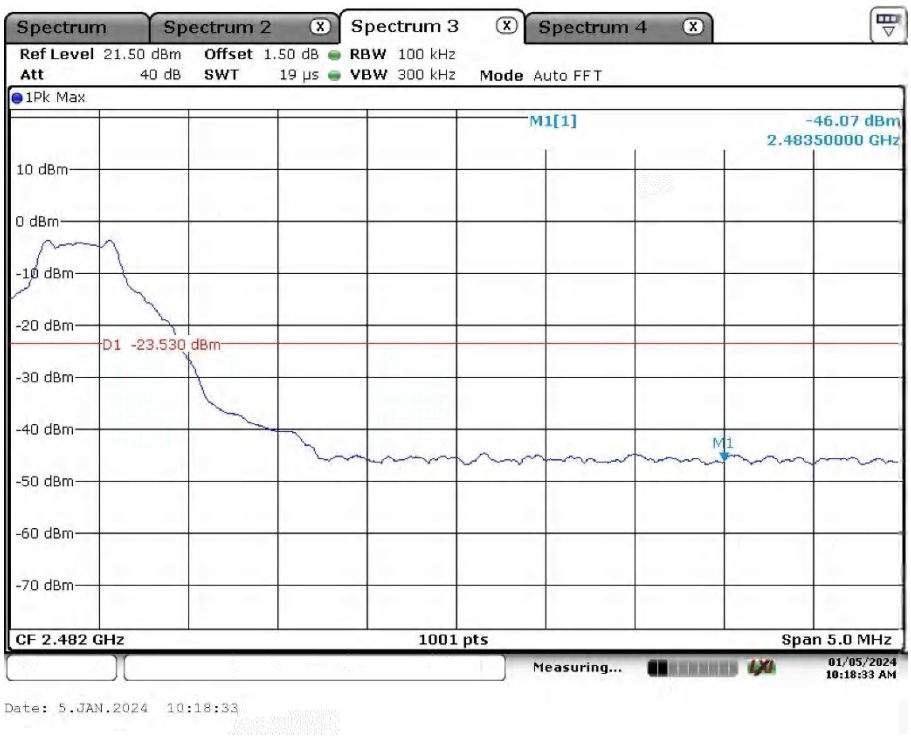
### BR mode (GFSK)

Fixed mode, Band Edge

Low Channel

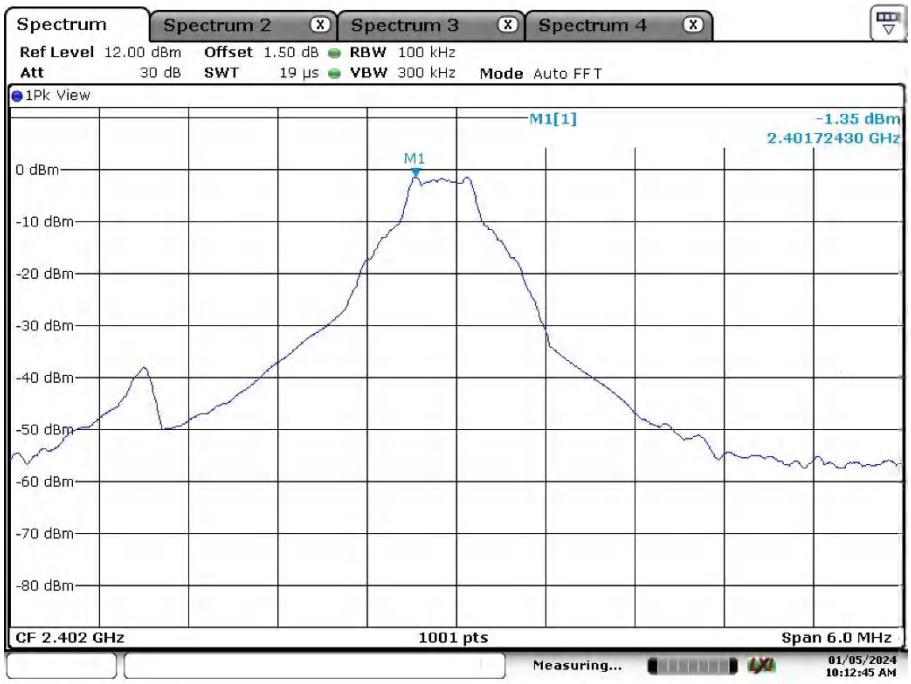


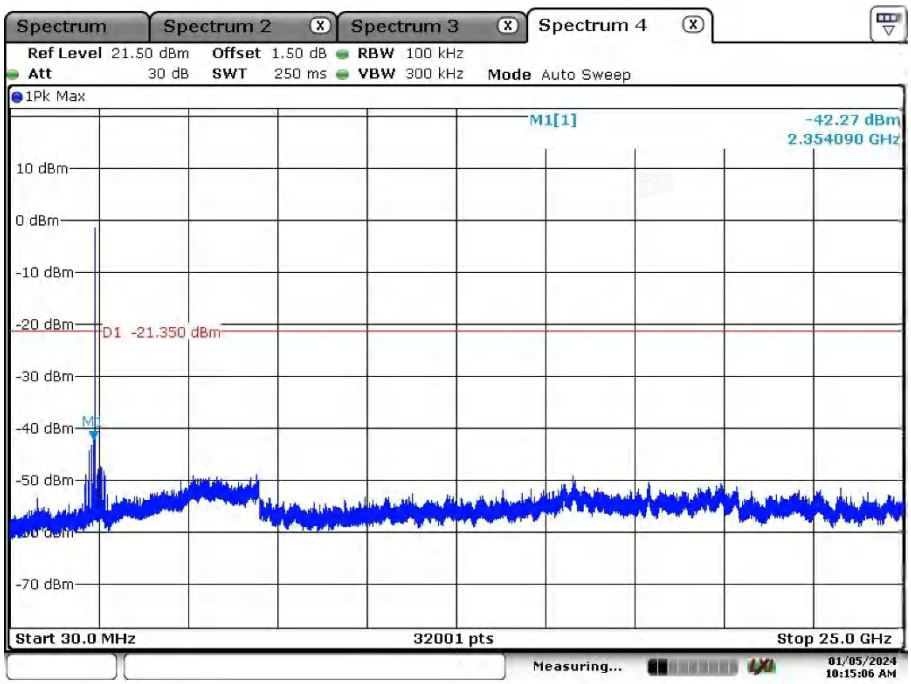

High Channel



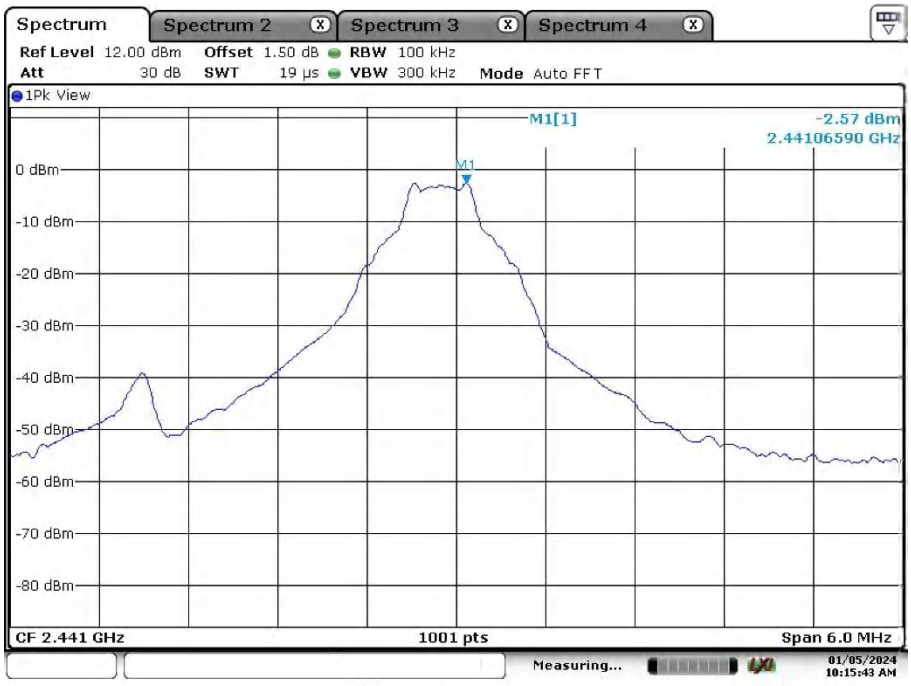
Fixed mode, Conducted Spurious Emission

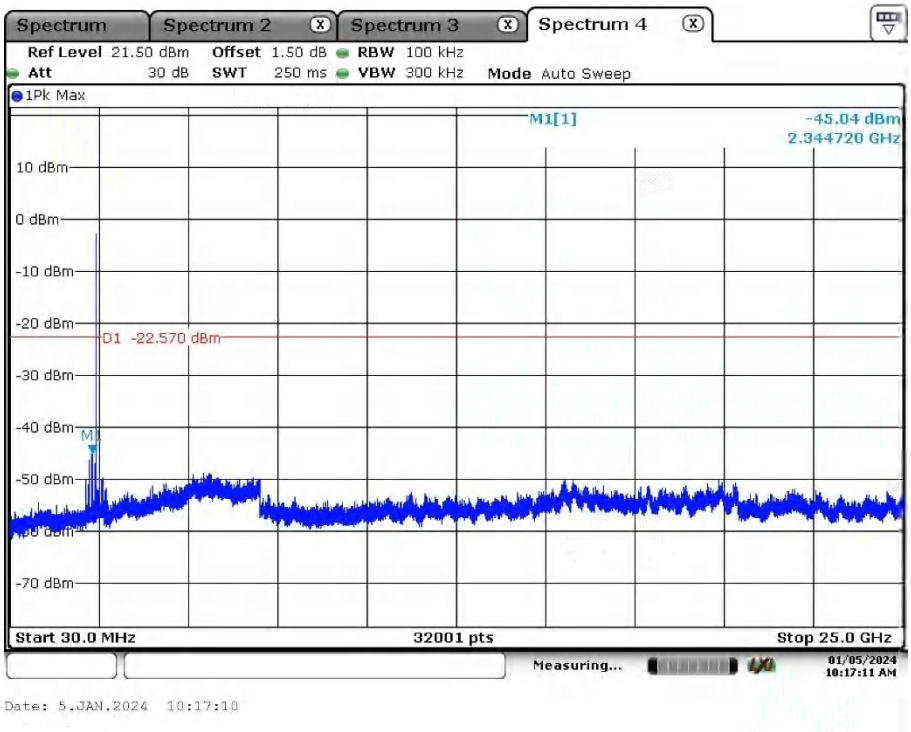
Low Channel



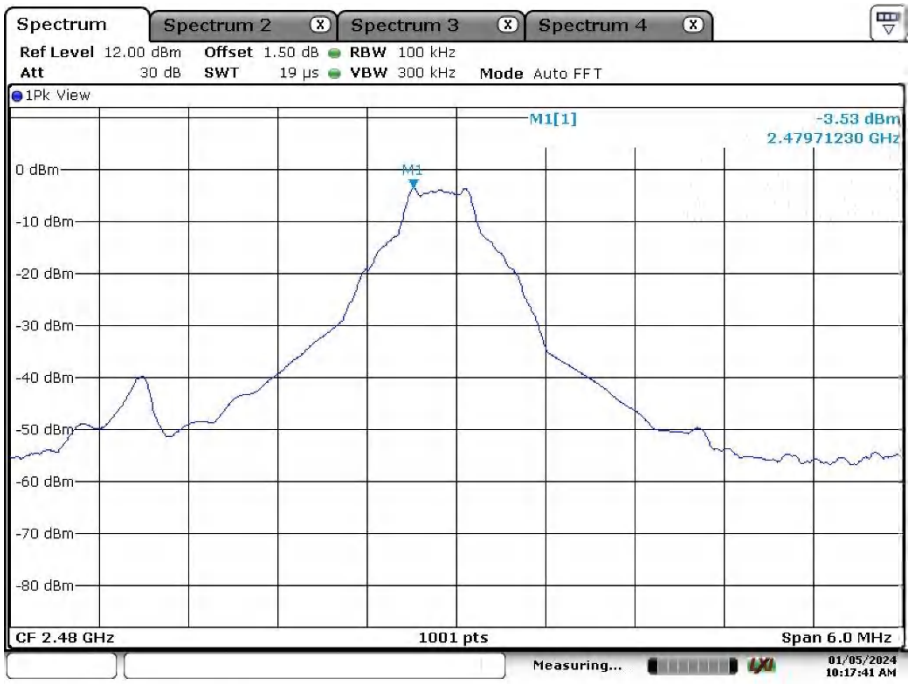



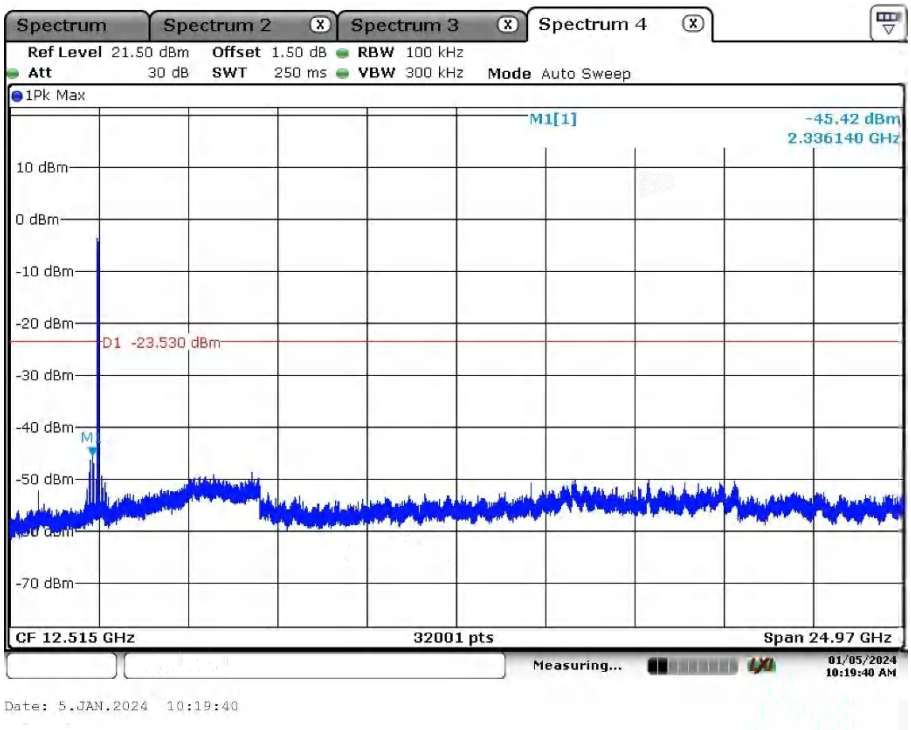
Middle Channel



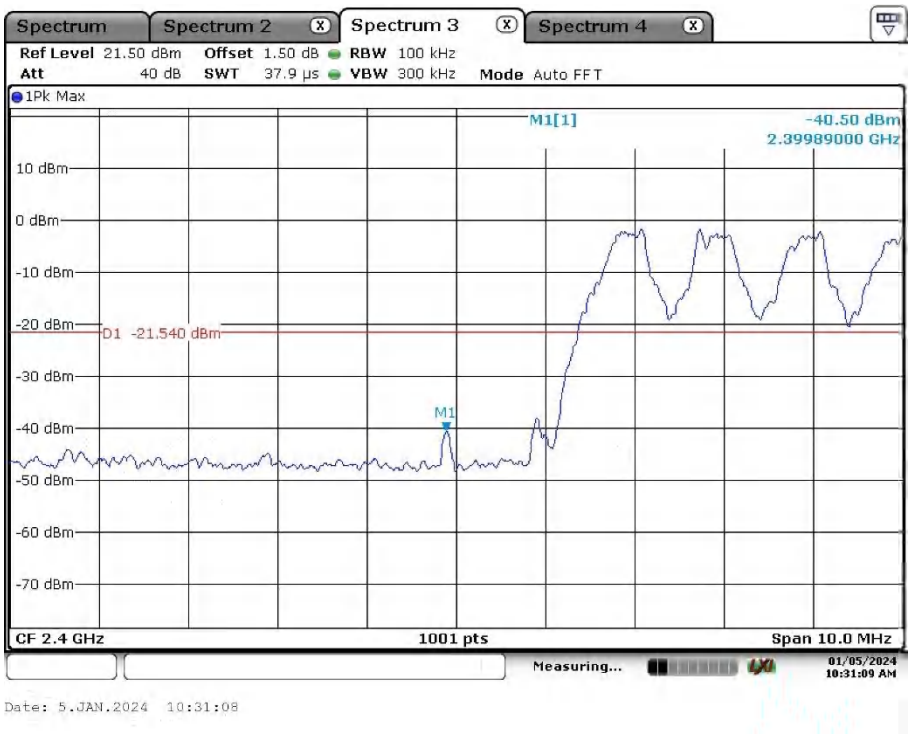
High Channel



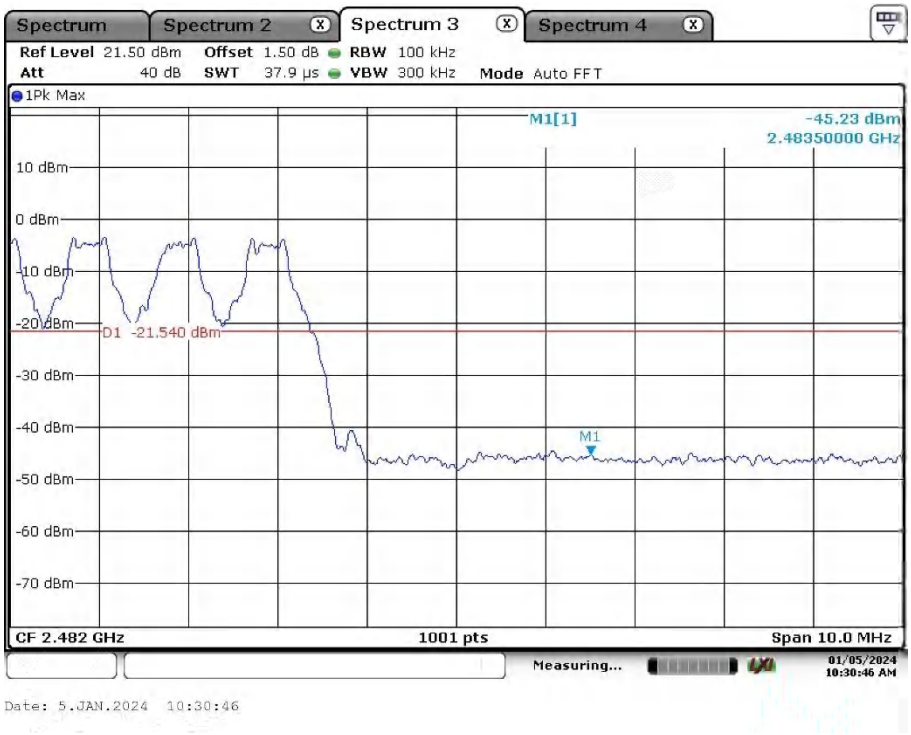



Hopping Mode, Band Edge

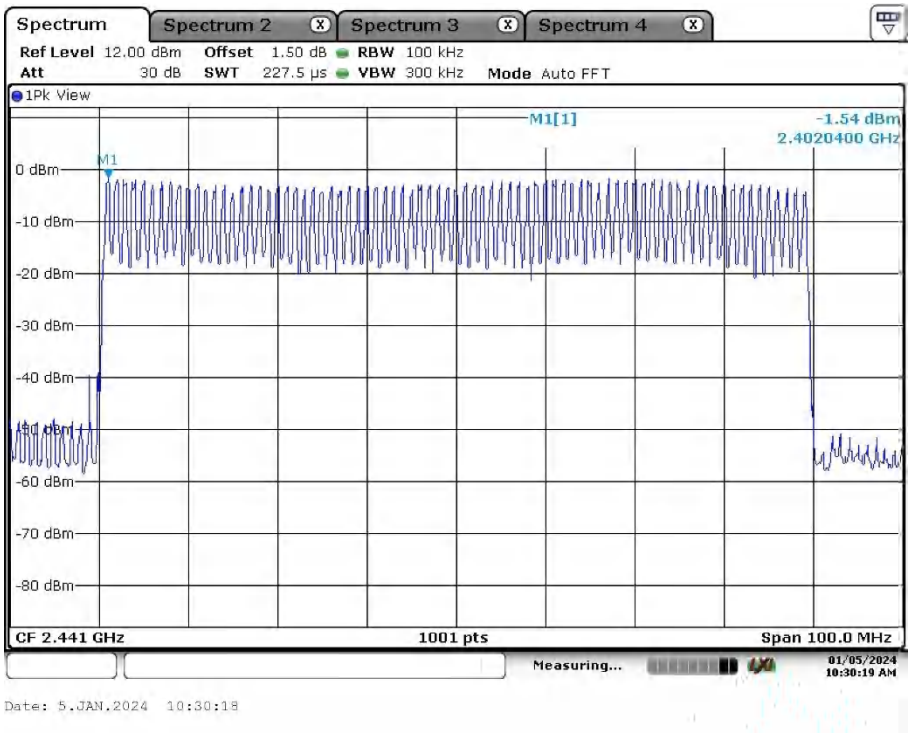
Low Channel

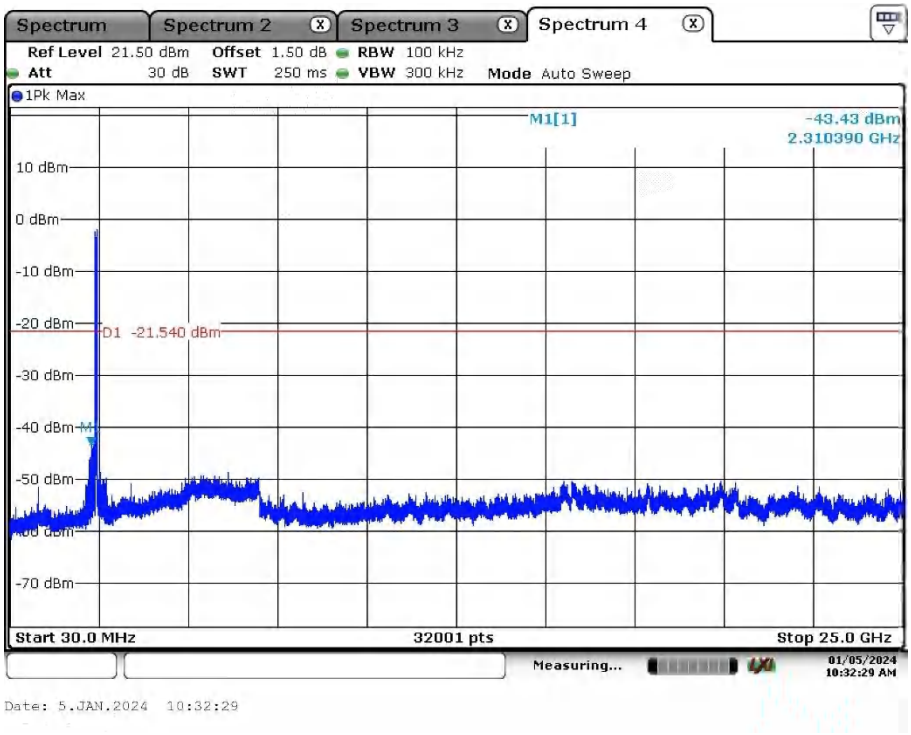



High Channel



Hopping Mode, Conducted Spurious Emission

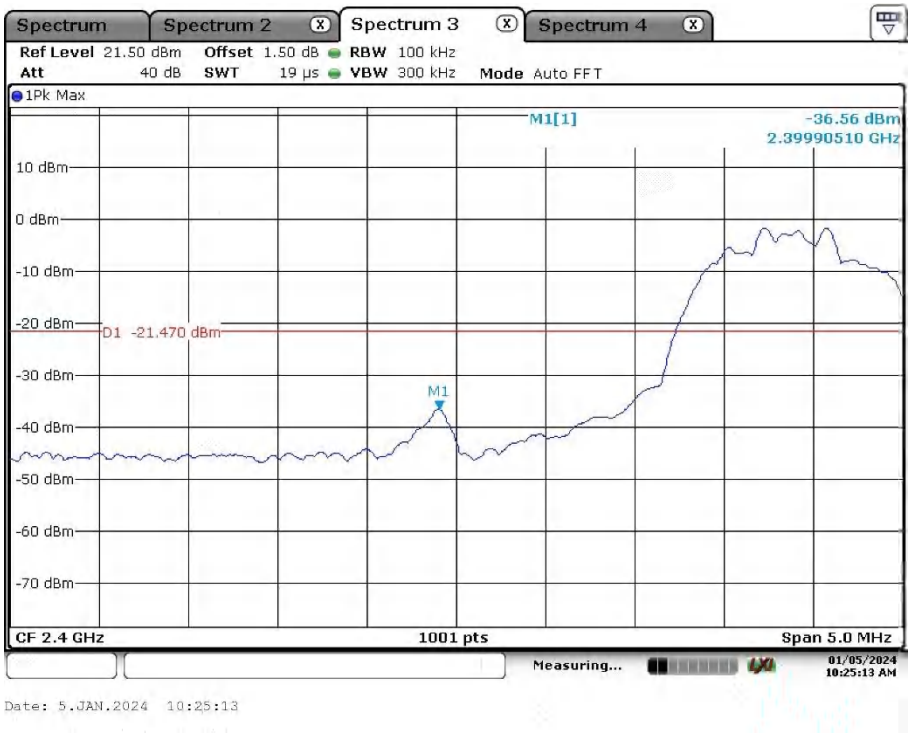


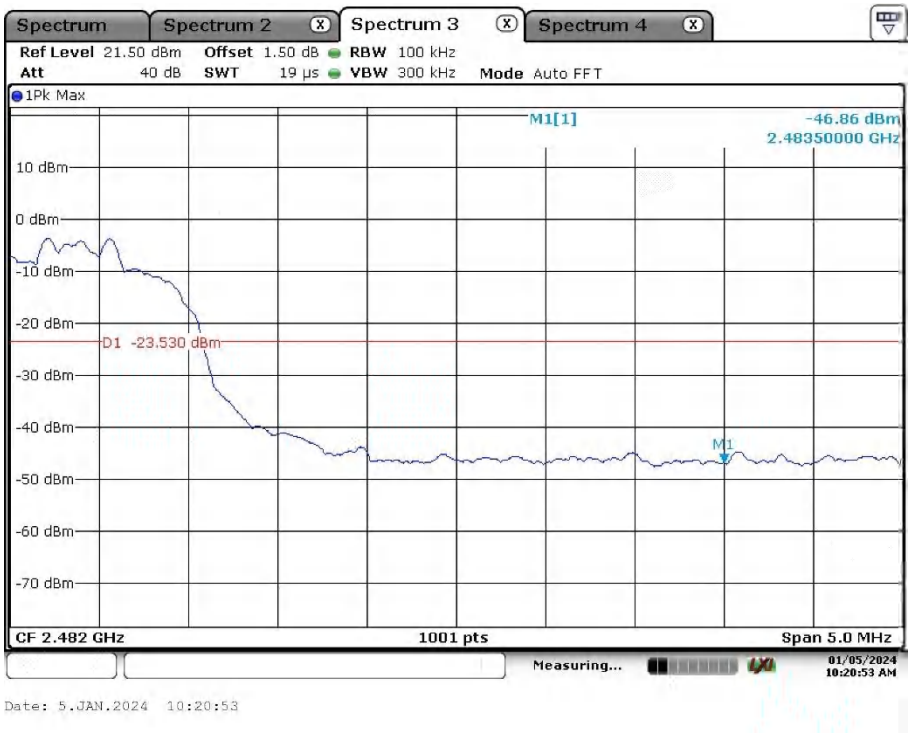
**EDR mode (8DPSK)**

Fixed mode, Band Edge

Low Channel

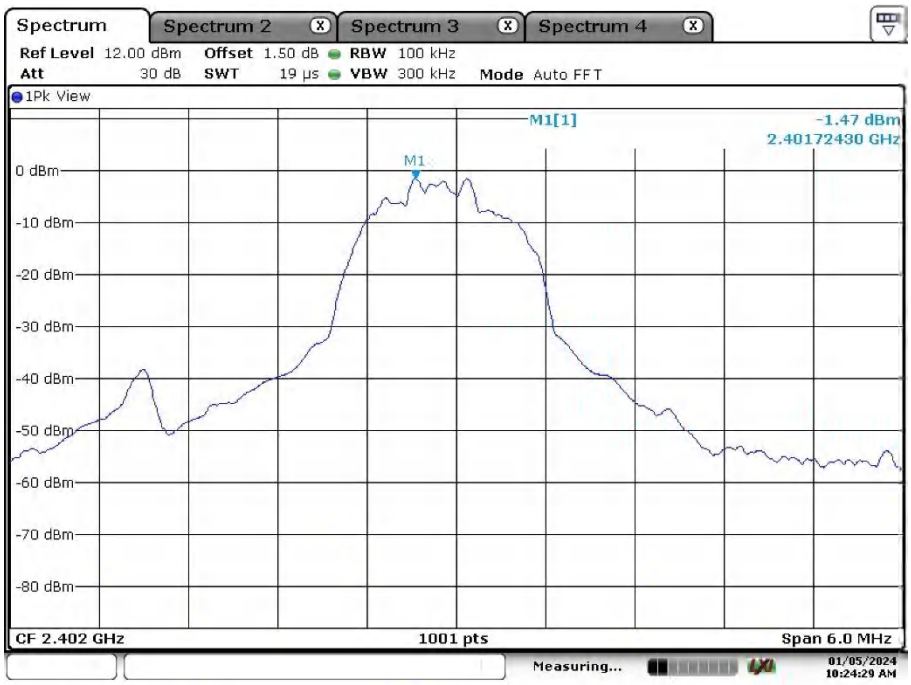


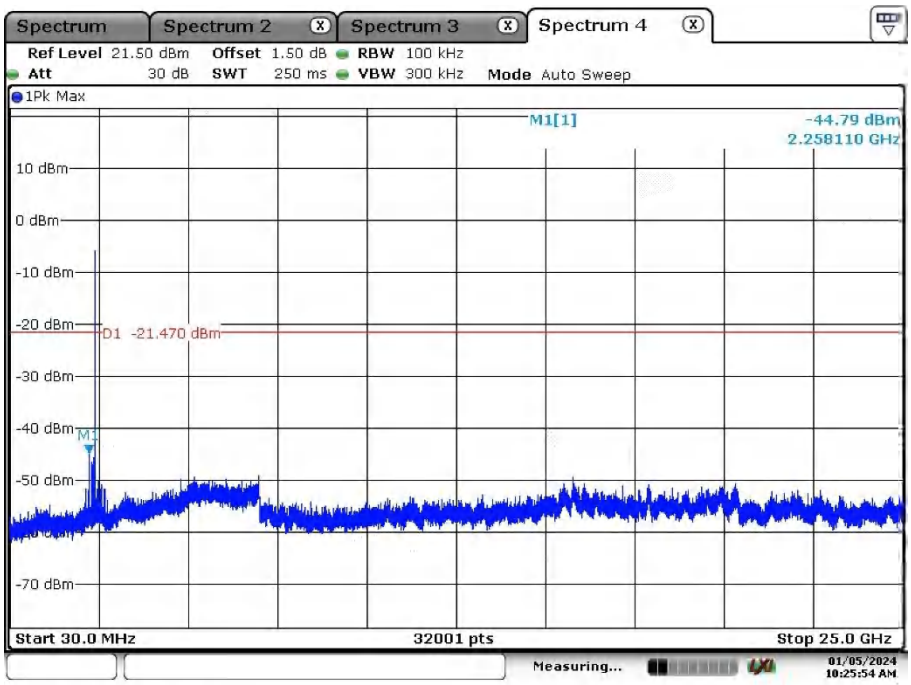

High Channel



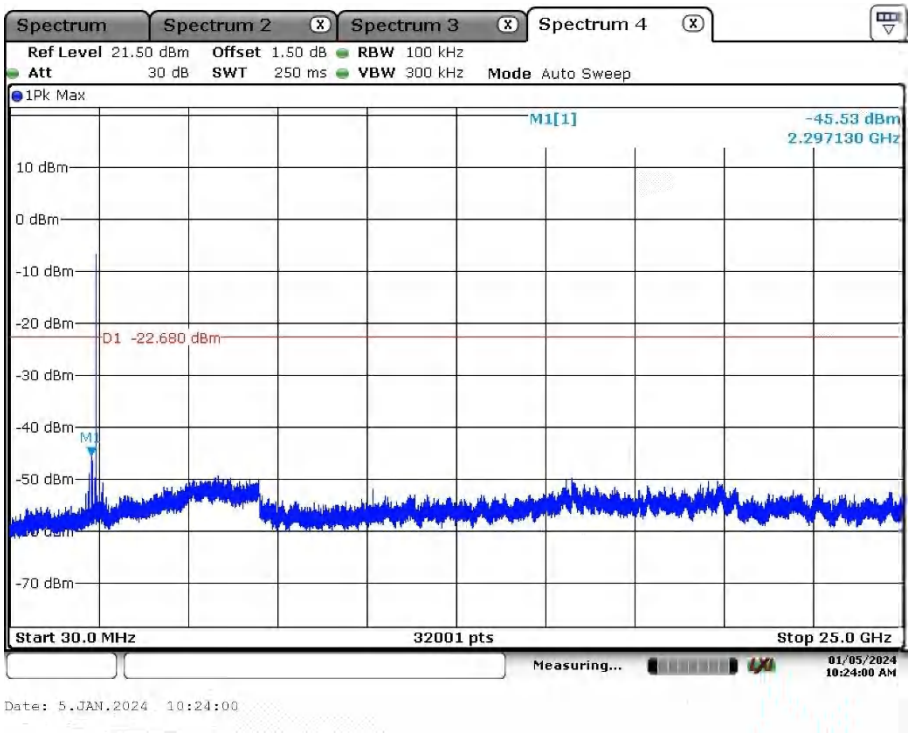
Fixed mode, Conducted Spurious Emission

Low Channel

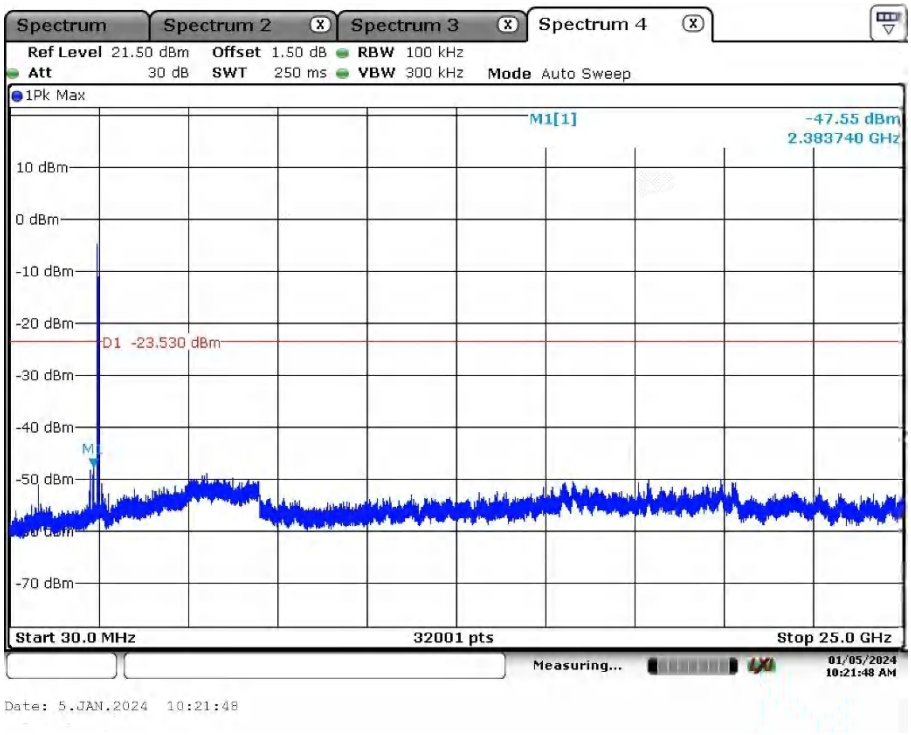


Middle Channel

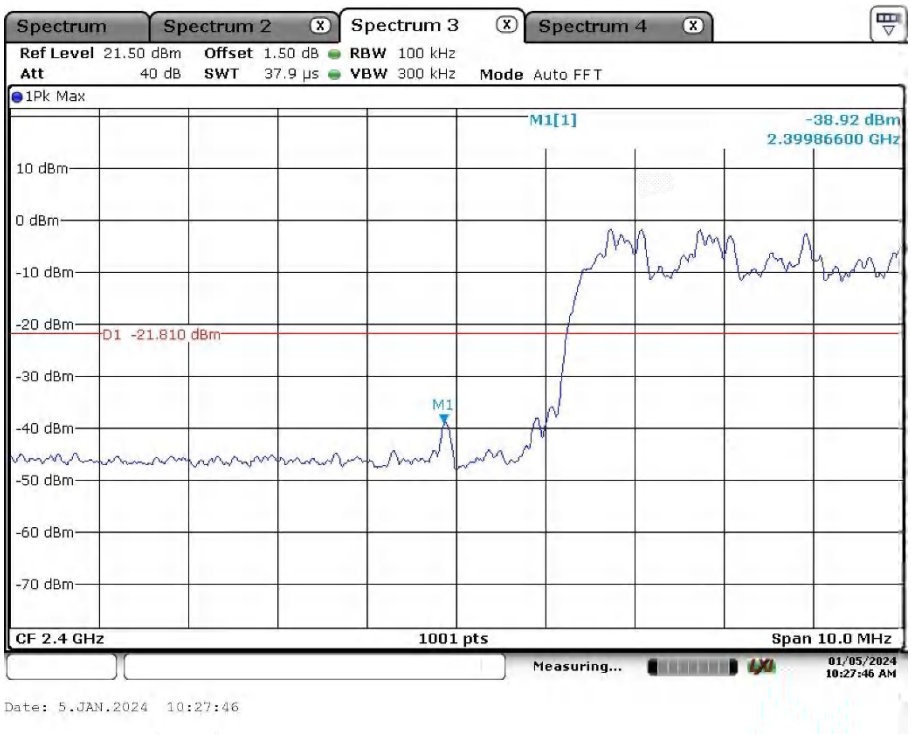



High Channel

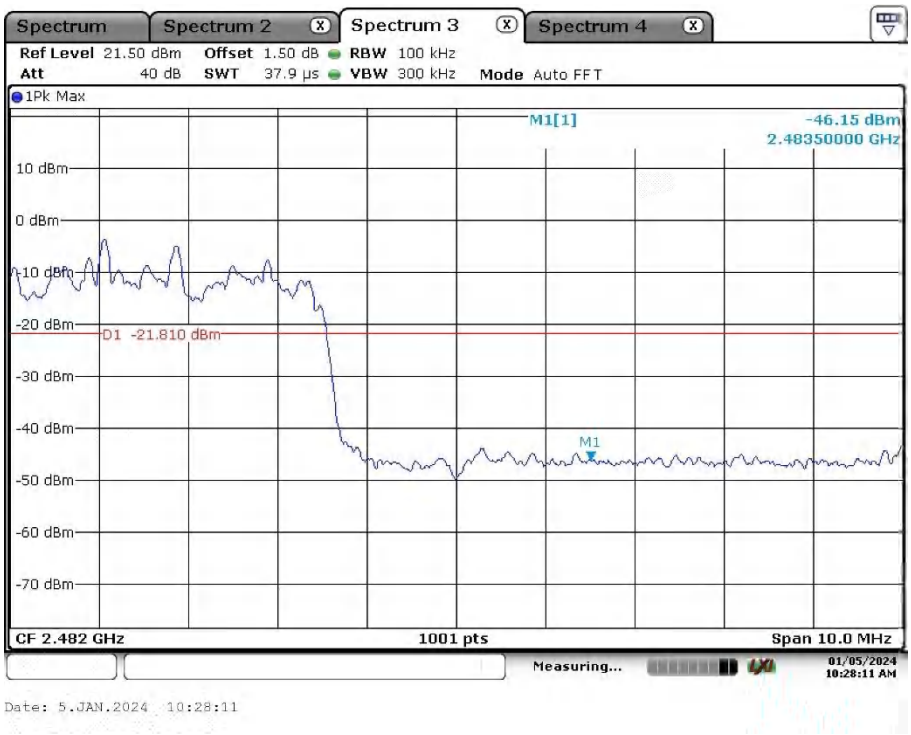



Hopping Mode, Band Edge

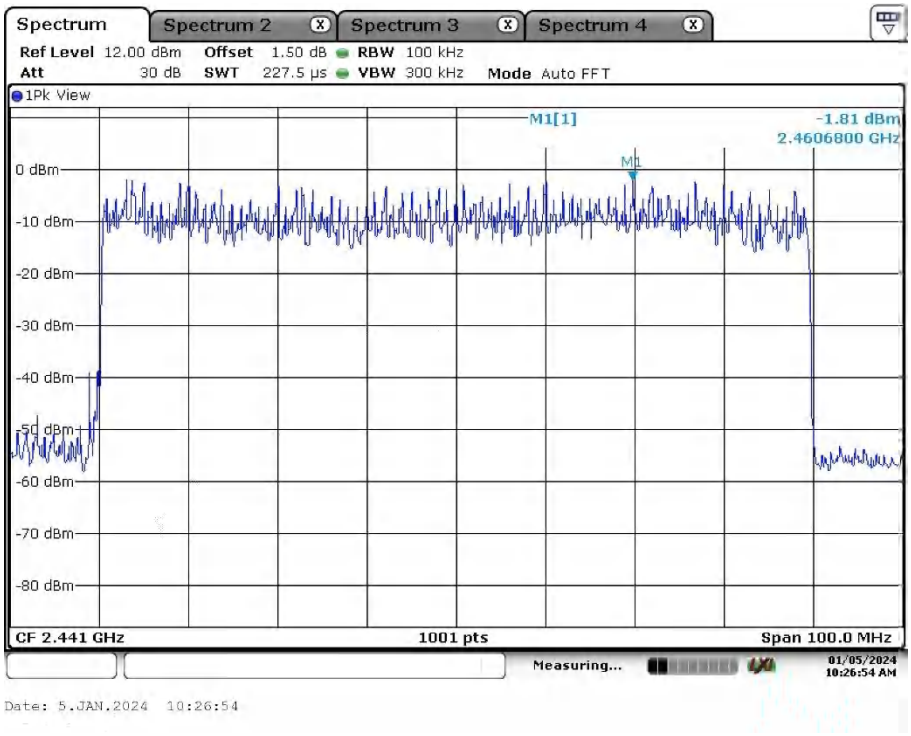
Low Channel

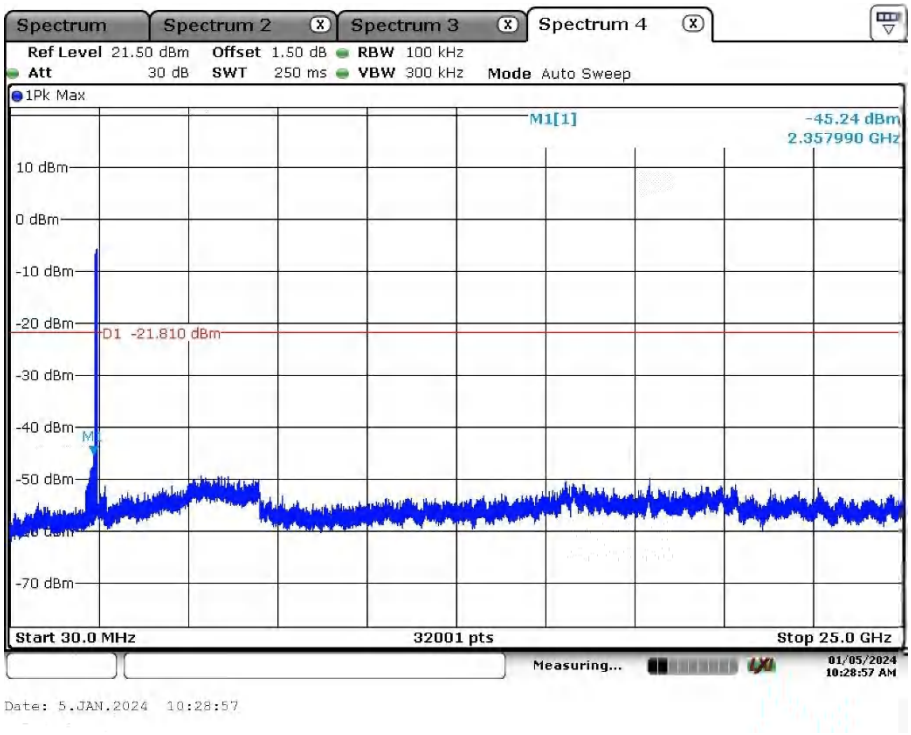



High Channel



Hopping Mode, Conducted Spurious Emission



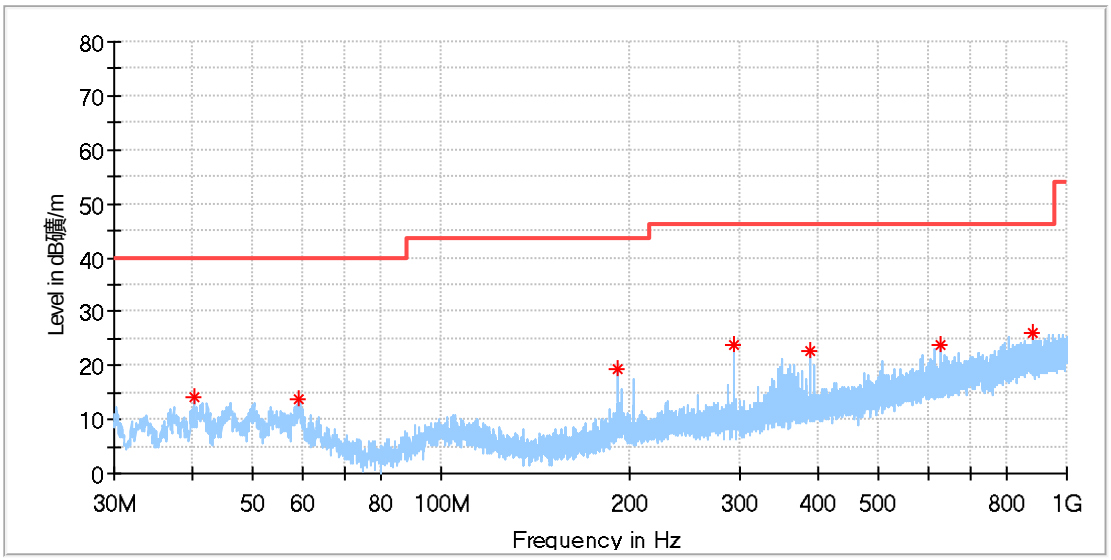
## Appendix A.7: Test Results of Radiated Spurious Emissions

Note:
1) This testing was carried out on different modulations, but only the worst case was presented in this report.
2) Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

**30MHz - 1GHz**

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_Mid channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

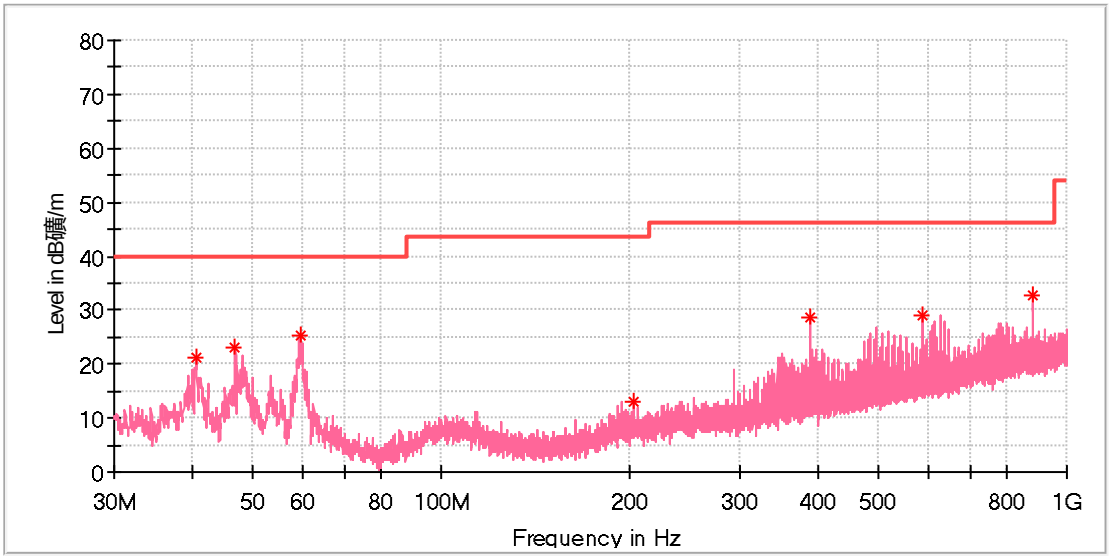
| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 40.222308 | 14.01 | 40.00 | 25.99 | 100.0 | H | 334.0 | -20.4 |
| 59.211923 | 13.89 | 40.00 | 26.11 | 100.0 | H | 354.0 | -19.2 |
| 191.915385 | 19.16 | 43.50 | 24.34 | 100.0 | H | 23.0 | -19.7 |
| 293.504231 | 23.84 | 46.00 | 22.16 | 100.0 | H | 0.0 | -16.8 |
| 389.571539 | 22.72 | 46.00 | 23.28 | 100.0 | H | 190.0 | -14.3 |
| 626.550000 | 23.89 | 46.00 | 22.11 | 100.0 | H | 0.0 | -9.8 |
| 880.615385 | 26.03 | 46.00 | 19.97 | 100.0 | H | 166.0 | -5.6 |

# Final_Result

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_Mid channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 40.595385 | 21.31 | 40.00 | 18.69 | 100.0 | V | 347.0 | -20.3 |
| 46.863077 | 23.13 | 40.00 | 16.87 | 100.0 | V | 202.0 | -18.9 |
| 59.696923 | 25.16 | 40.00 | 14.84 | 100.0 | V | 62.0 | -19.3 |
| 203.182308 | 13.04 | 43.50 | 30.46 | 100.0 | V | 97.0 | -19.3 |
| 389.608846 | 28.53 | 46.00 | 17.47 | 100.0 | V | 123.0 | -14.3 |
| 587.078462 | 29.10 | 46.00 | 16.90 | 100.0 | V | 310.0 | -10.5 |
| 880.578077 | 32.80 | 46.00 | 13.20 | 100.0 | V | 131.0 | -5.6 |

# Final_Result

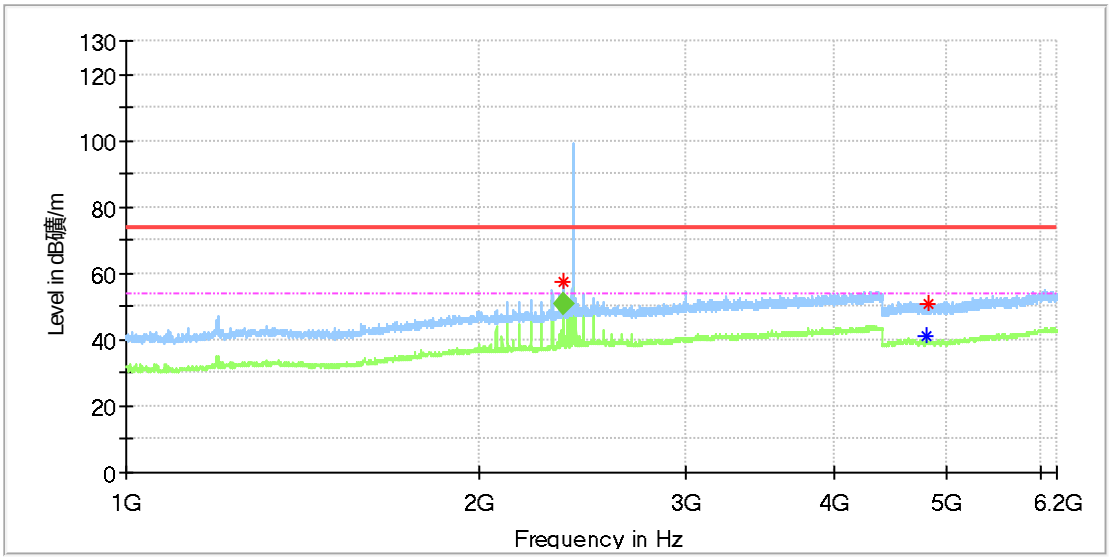
| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

**1GHz - 18GHz**

Note: The highest waveform in the figure is Bluetooth Fundamental.

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_Low channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

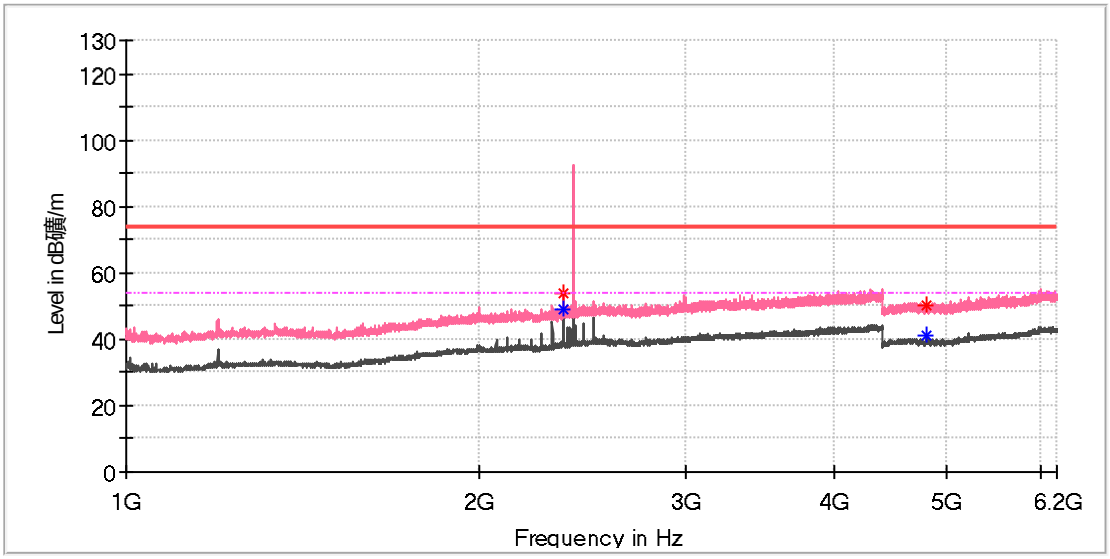
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2354.000000 | 57.46 | --- | 74.00 | 16.54 | 150.0 | H | 184.0 | 6.9 |
| 4804.000000 | --- | 40.84 | 54.00 | 13.16 | 150.0 | H | 316.0 | 11.8 |
| 4825.500000 | 50.89 | --- | 74.00 | 23.11 | 150.0 | H | 50.0 | 11.8 |

# Final_Result

| Frequency (MHz) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 2353.964706 | 50.88 | 54.00 | 3.12 | 145.0 | H | 182.0 | 6.9 |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_Low channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

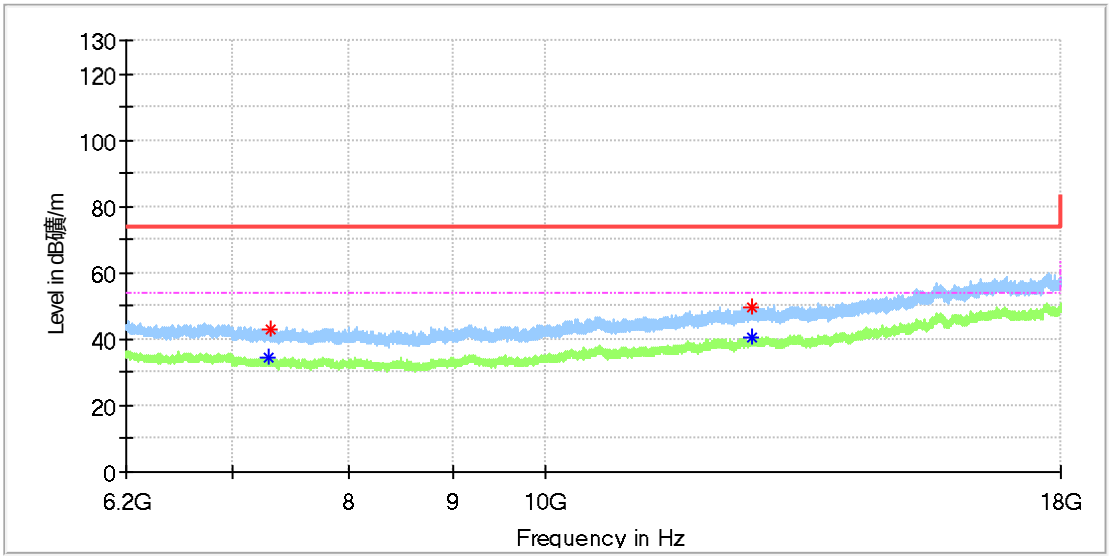
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2354.000000 | 53.94 | --- | 74.00 | 20.06 | 150.0 | V | 262.0 | 6.9 |
| 2354.000000 | --- | 49.16 | 54.00 | 4.84 | 150.0 | V | 262.0 | 6.9 |
| 4802.000000 | 50.24 | --- | 74.00 | 23.76 | 150.0 | V | 12.0 | 11.8 |
| 4803.500000 | --- | 41.06 | 54.00 | 12.94 | 150.0 | V | 342.0 | 11.8 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_Low channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

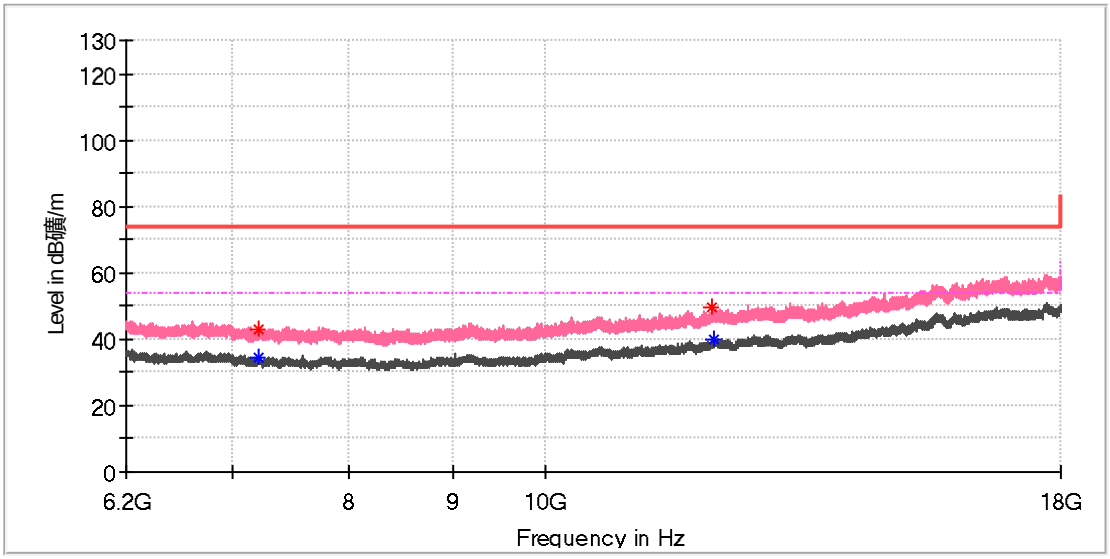
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 7301.333333 | --- | 34.32 | 54.00 | 19.68 | 150.0 | H | 0.0 | 8.3 |
| 7301.825000 | 42.93 | --- | 74.00 | 31.07 | 150.0 | H | 296.0 | 8.3 |
| 12651.650000 | --- | 40.59 | 54.00 | 13.41 | 150.0 | H | 149.0 | 15.0 |
| 12670.333333 | 49.70 | --- | 74.00 | 24.30 | 150.0 | H | 331.0 | 15.1 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_Low channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

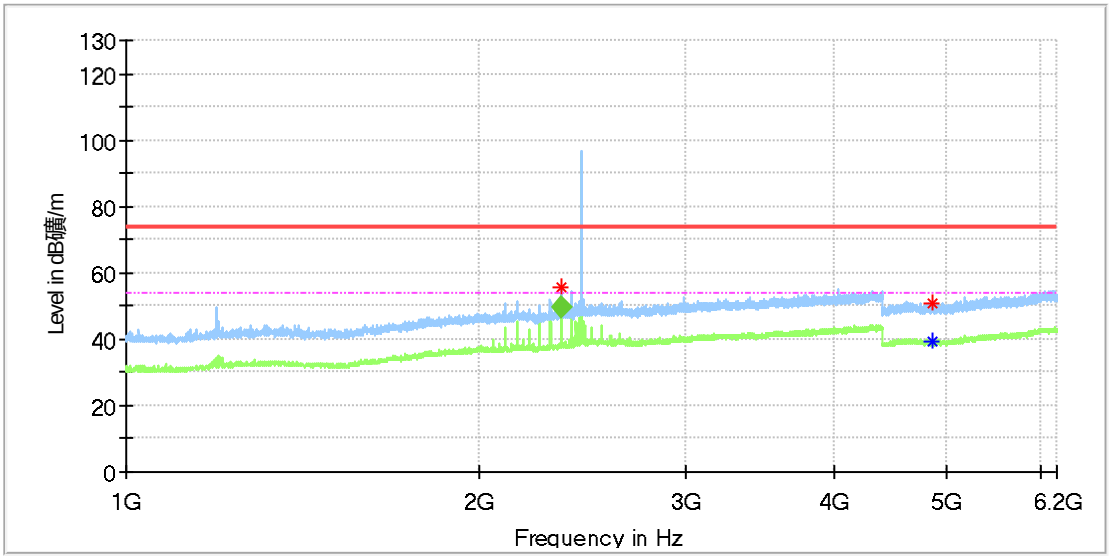
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 7212.833333 | 43.08 | --- | 74.00 | 30.92 | 150.0 | V | 146.0 | 8.7 |
| 7212.833333 | --- | 34.23 | 54.00 | 19.77 | 150.0 | V | 146.0 | 8.7 |
| 12092.625000 | 49.72 | --- | 74.00 | 24.28 | 150.0 | V | 39.0 | 14.1 |
| 12113.766667 | --- | 40.01 | 54.00 | 13.99 | 150.0 | V | 146.0 | 14.2 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_Mid channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

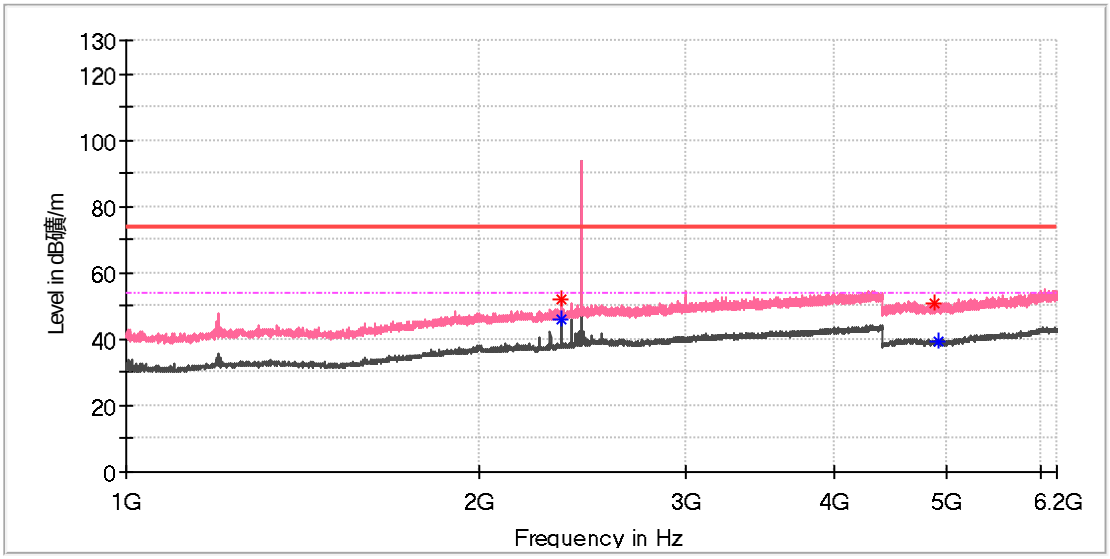
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2345.000000 | 55.64 | --- | 74.00 | 18.36 | 150.0 | H | 229.0 | 6.9 |
| 4858.500000 | 50.98 | --- | 74.00 | 23.02 | 150.0 | H | 210.0 | 11.8 |
| 4862.000000 | --- | 39.48 | 54.00 | 14.52 | 150.0 | H | 18.0 | 11.8 |

# Final_Result

| Frequency (MHz) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 2344.866177 | 49.49 | 54.00 | 4.51 | 145.0 | H | 227.0 | 6.9 |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_Mid channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

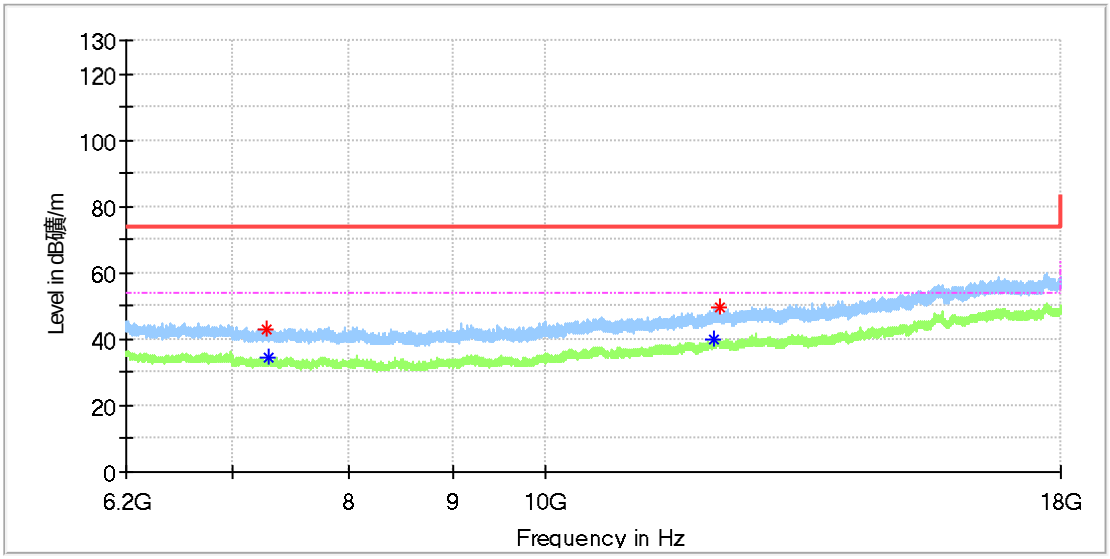
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2345.000000 | 51.78 | --- | 74.00 | 22.22 | 150.0 | V | 245.0 | 6.9 |
| 2345.000000 | --- | 46.20 | 54.00 | 7.80 | 150.0 | V | 245.0 | 6.9 |
| 4871.000000 | 50.64 | --- | 74.00 | 23.36 | 150.0 | V | 16.0 | 11.8 |
| 4907.500000 | --- | 39.58 | 54.00 | 14.42 | 150.0 | V | 53.0 | 11.8 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_Mid channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

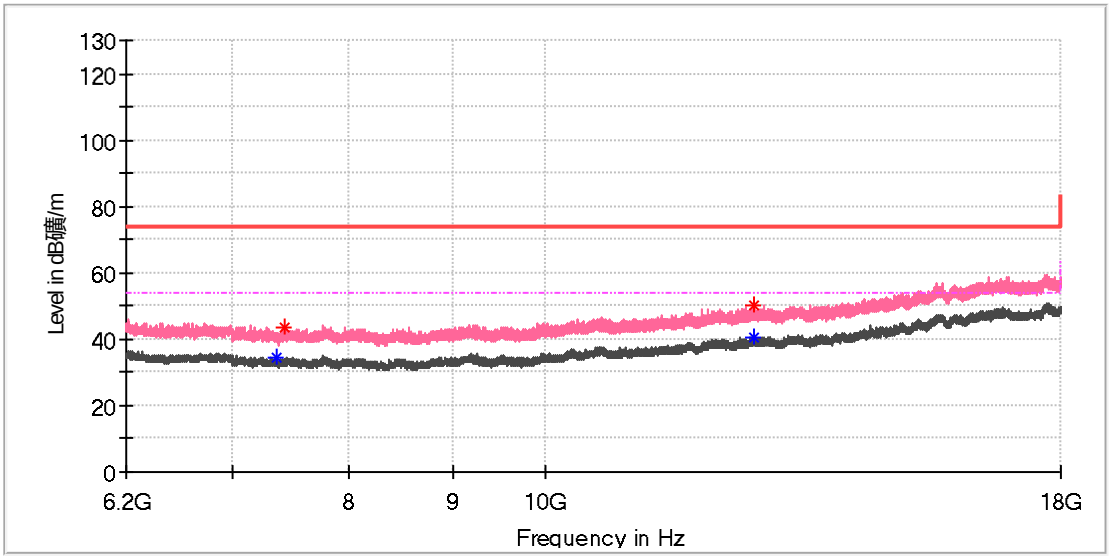
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 7283.141667 | 42.95 | --- | 74.00 | 31.05 | 150.0 | H | 100.0 | 8.4 |
| 7289.041667 | --- | 34.26 | 54.00 | 19.74 | 150.0 | H | 76.0 | 8.4 |
| 12121.141667 | --- | 39.93 | 54.00 | 14.07 | 150.0 | H | 277.0 | 14.3 |
| 12202.758333 | 49.69 | --- | 74.00 | 24.31 | 150.0 | H | 15.0 | 14.7 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_Mid channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

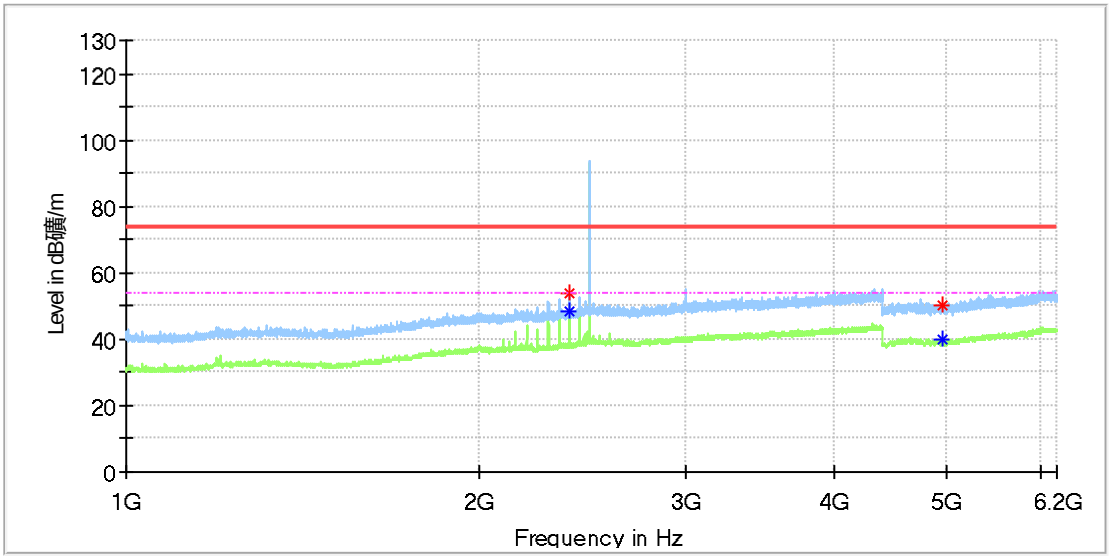
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 7359.350000 | --- | 34.52 | 54.00 | 19.48 | 150.0 | V | 303.0 | 8.1 |
| 7425.725000 | 43.63 | --- | 74.00 | 30.37 | 150.0 | V | 70.0 | 8.4 |
| 12686.066667 | --- | 40.40 | 54.00 | 13.60 | 150.0 | V | 317.0 | 15.1 |
| 12699.341667 | 50.20 | --- | 74.00 | 23.80 | 150.0 | V | 56.0 | 15.1 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_High channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

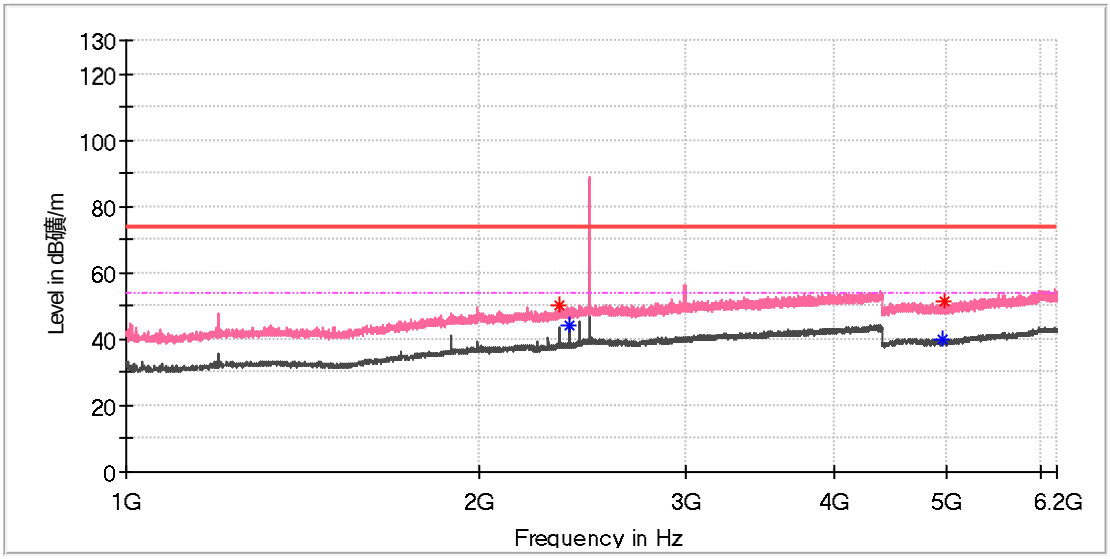
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2384.000000 | --- | 48.52 | 54.00 | 5.48 | 150.0 | H | 143.0 | 7.0 |
| 2384.000000 | 53.52 | --- | 74.00 | 20.48 | 150.0 | H | 143.0 | 7.0 |
| 4958.500000 | --- | 39.68 | 54.00 | 14.32 | 150.0 | H | 326.0 | 11.8 |
| 4964.500000 | 50.24 | --- | 74.00 | 23.76 | 150.0 | H | 209.0 | 11.8 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_High channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

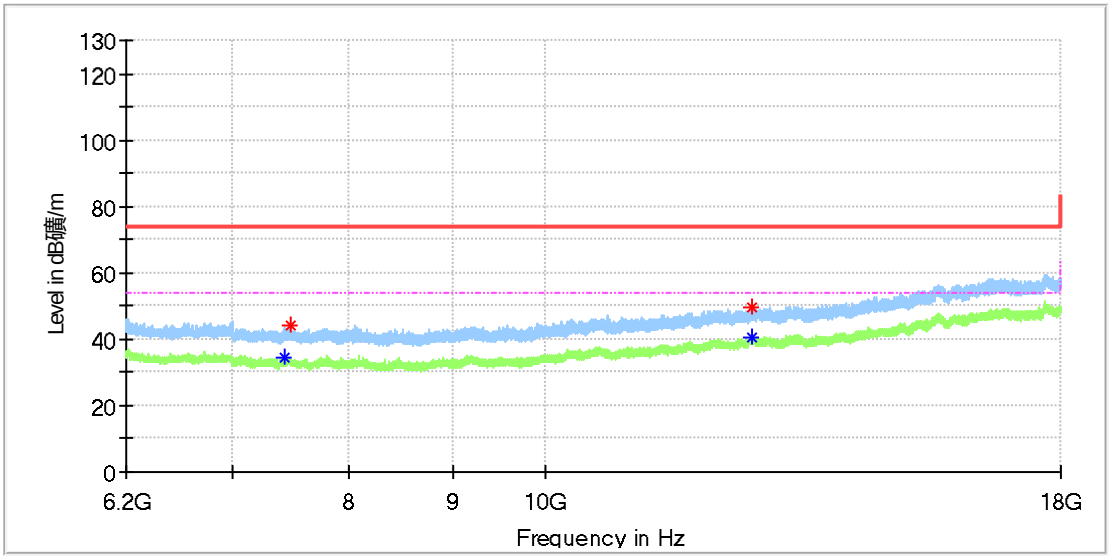
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2336.000000 | 50.07 | --- | 74.00 | 23.93 | 150.0 | V | 271.0 | 6.8 |
| 2384.000000 | --- | 44.03 | 54.00 | 9.97 | 150.0 | V | 110.0 | 7.0 |
| 4959.500000 | --- | 40.06 | 54.00 | 13.94 | 150.0 | V | 328.0 | 11.8 |
| 4970.500000 | 51.48 | --- | 74.00 | 22.52 | 150.0 | V | 270.0 | 11.8 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_High channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

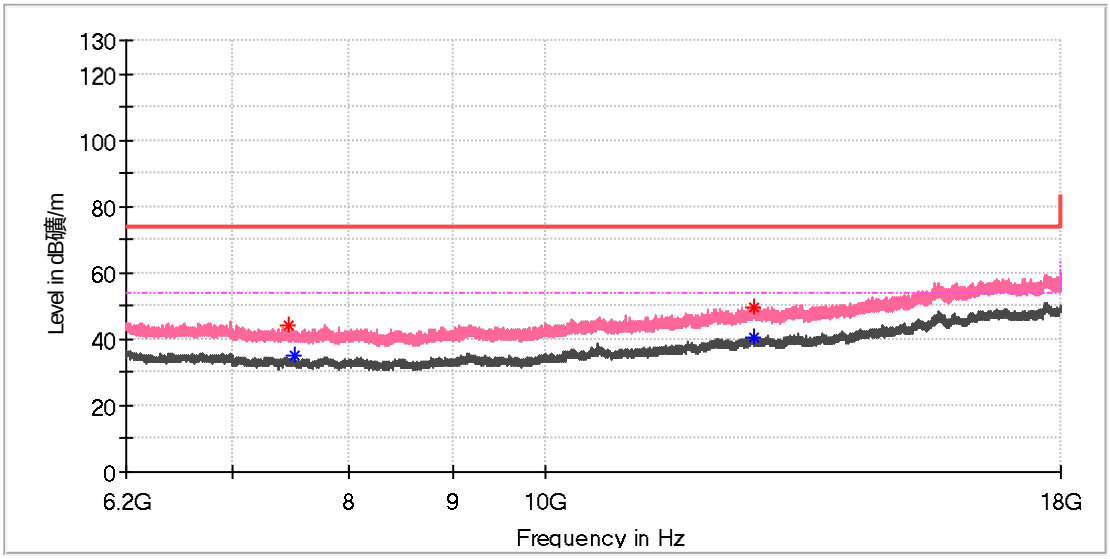
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 7432.608333 | --- | 34.42 | 54.00 | 19.58 | 150.0 | H | 122.0 | 8.4 |
| 7475.383333 | 43.95 | --- | 74.00 | 30.05 | 150.0 | H | 19.0 | 8.6 |
| 12651.650000 | 49.64 | --- | 74.00 | 24.36 | 150.0 | H | 265.0 | 15.0 |
| 12651.650000 | --- | 40.28 | 54.00 | 13.72 | 150.0 | H | 265.0 | 15.0 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_High channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 7453.750000 | 43.91 | --- | 74.00 | 30.09 | 150.0 | V | 0.0 | 8.5 |
| 7511.275000 | --- | 35.09 | 54.00 | 18.91 | 150.0 | V | 0.0 | 8.7 |
| 12675.741667 | 49.62 | --- | 74.00 | 24.38 | 150.0 | V | 8.0 | 15.1 |
| 12692.458333 | --- | 40.77 | 54.00 | 13.23 | 150.0 | V | 8.0 | 15.1 |

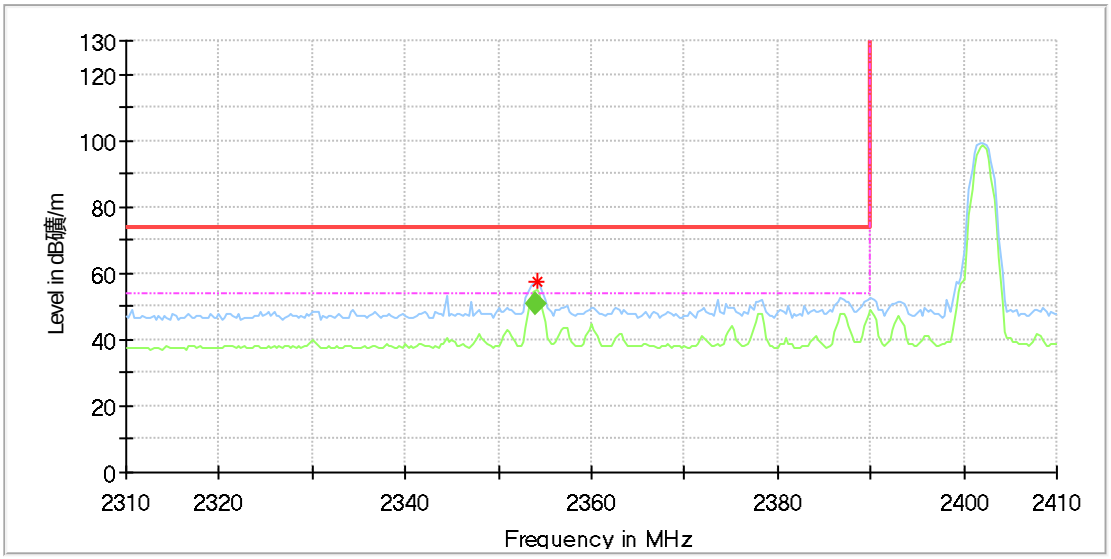
# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

## Appendix A.8: Test Results of Radiated Emissions in Restricted Bands

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_Low channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

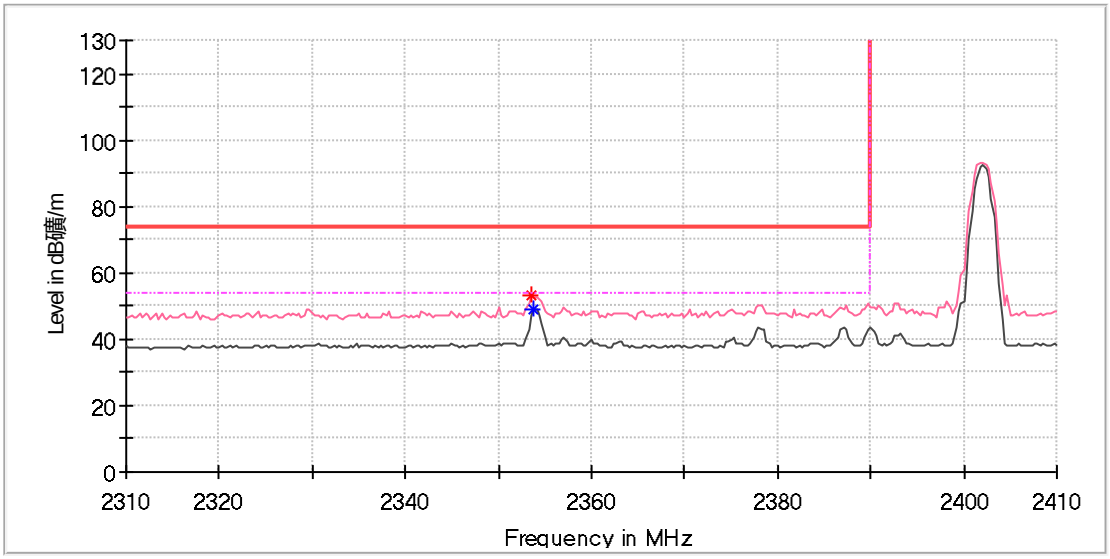
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2354.117647 | 57.22 | --- | 74.00 | 16.78 | 150.0 | H | 229.0 | 6.9 |

# Final_Result

| Frequency (MHz) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 2353.961029 | 50.98 | 54.00 | 3.02 | 145.0 | H | 227.0 | 6.9 |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_Low channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

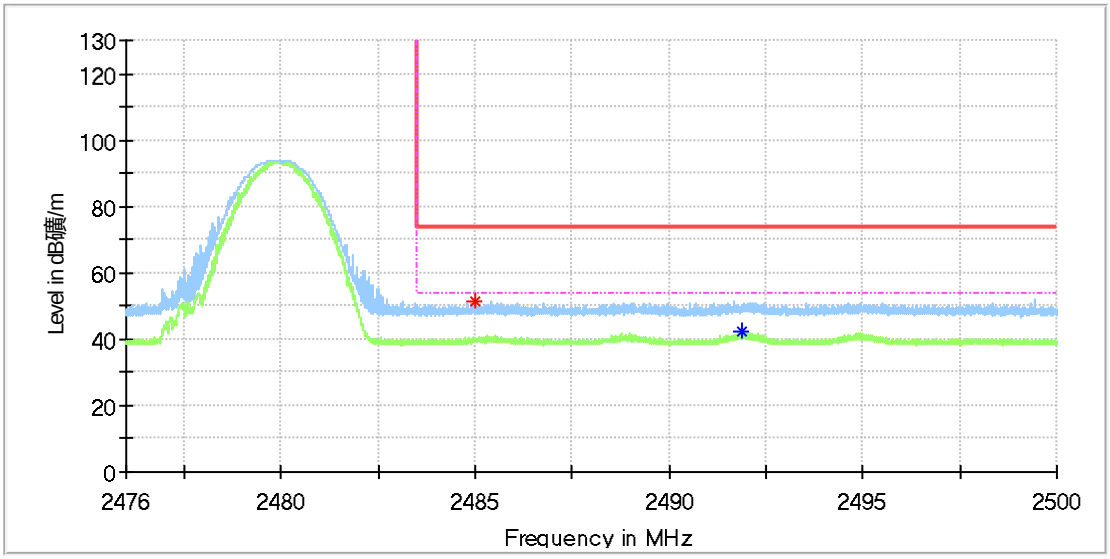
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2353.529412 | 53.43 | --- | 74.00 | 20.57 | 150.0 | V | 182.0 | 6.9 |
| 2353.823529 | --- | 49.24 | 54.00 | 4.76 | 150.0 | V | 182.0 | 6.9 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_High channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

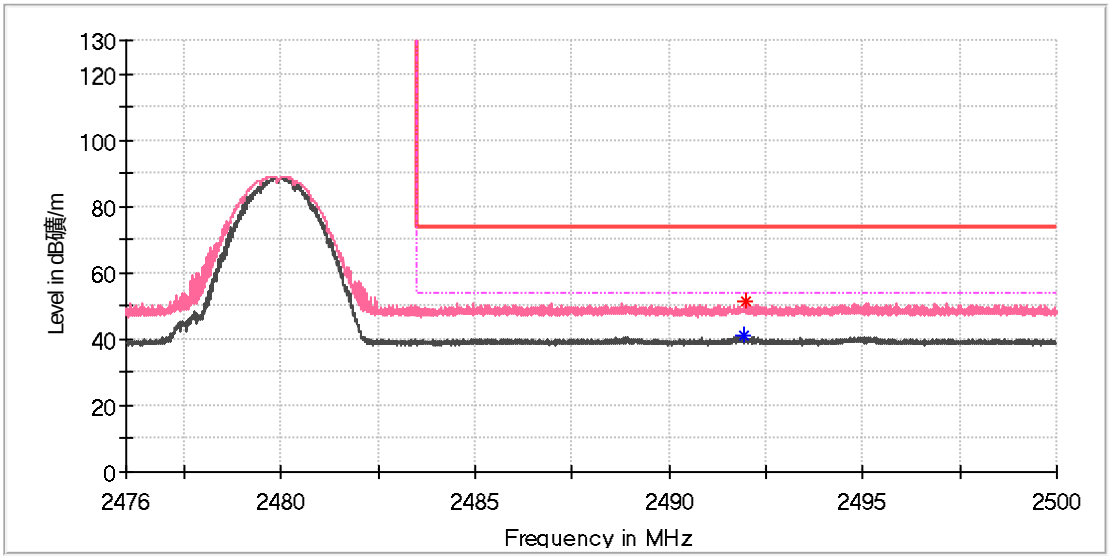
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2484.985882 | 51.50 | --- | 74.00 | 22.50 | 150.0 | H | 145.0 | 7.4 |
| 2491.875294 | --- | 42.22 | 54.00 | 11.78 | 150.0 | H | 145.0 | 7.4 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BR_DH5_High channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2491.910588 | --- | 41.19 | 54.00 | 12.81 | 150.0 | V | 359.0 | 7.4 |
| 2491.988235 | 51.30 | --- | 74.00 | 22.70 | 150.0 | V | 254.0 | 7.4 |

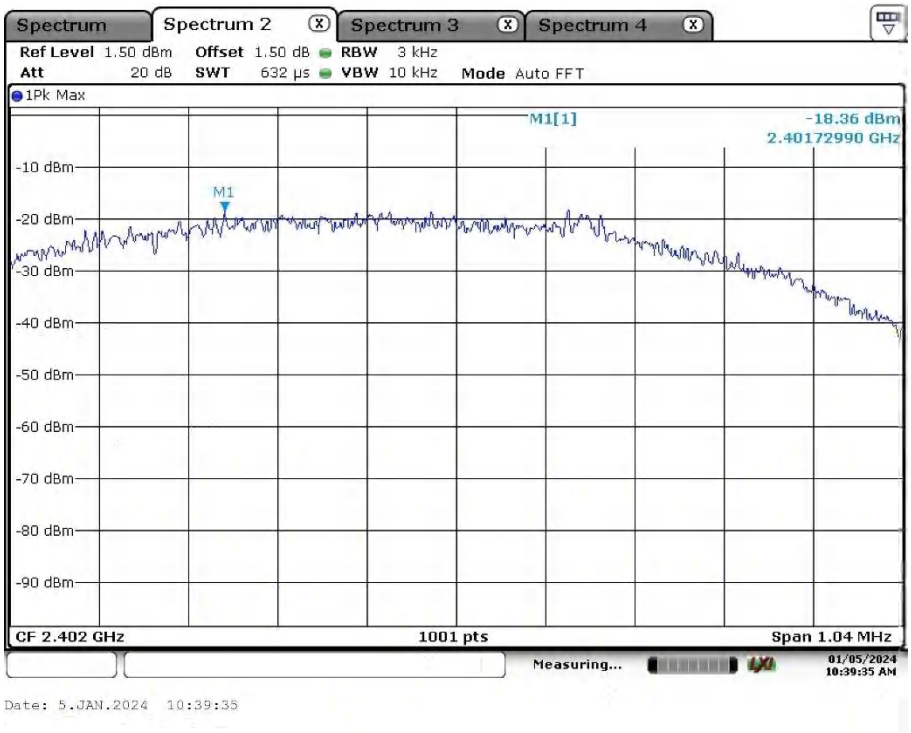
# Final_Result

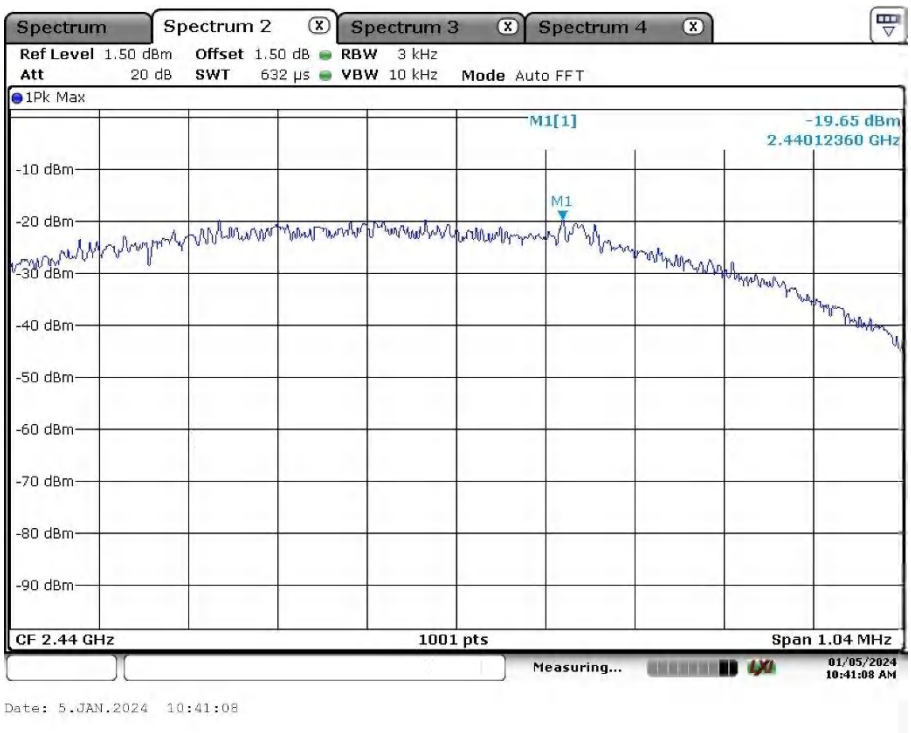
| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

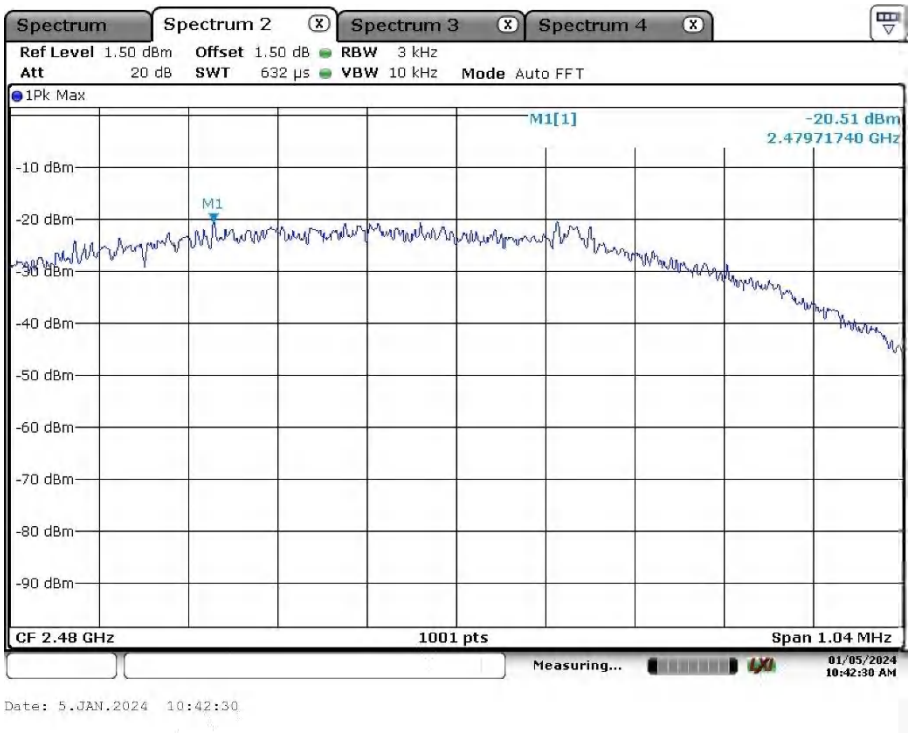
# Appendix B: Test Results of Bluetooth LE & Conducted Emission

## Appendix B.1: Test Results of Conducted Power Spectral Density

| TestMode | Antenna | Channel | Result[dBm/3-100kHz] | Limit[dBm/3kHz] | Verdict |
|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | -18.36 | ≤8.00 | PASS |
| | | 2440 | -19.65 | ≤8.00 | PASS |
| | | 2480 | -20.51 | ≤8.00 | PASS |




Spectrum
Spectrum 2
Spectrum 3
Spectrum 4
Ref Level 1.50 dBm
Offset 1.50 dB
RBW 3 kHz
Att 20 dB
SWT 632 µs
VBW 10 kHz
Mode Auto FFT
1Pk Max
M1[1]
-20.51 dBm
2.47971740 GHz
M1
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
CF 2.48 GHz
1001 pts
Span 1.04 MHz
Measuring...
01/05/2024
10:42:30 AM
Date: 5.JAN.2024 10:42:30

# Appendix B.2: Test Results of 6dB Bandwidth

### Minimum Emission Bandwidth 6 dB (2402 MHz; 20.000 dBm; 1 MHz)

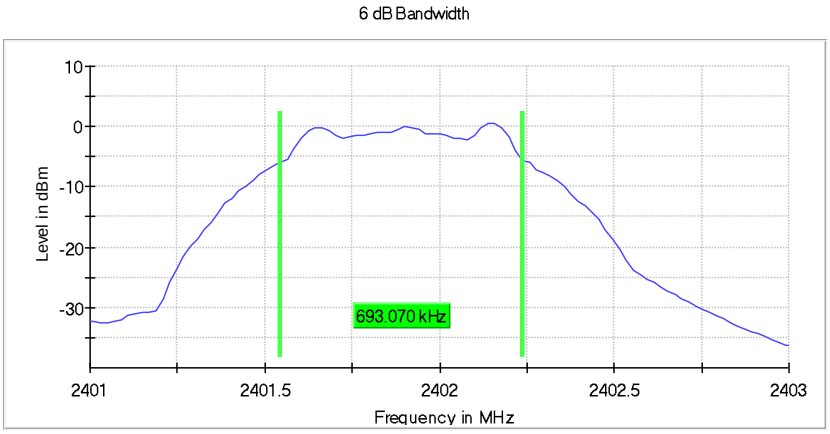
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

### 6 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2402.000000 | 0.693070 | 0.500000 | --- | 2401.544554 | 2402.237624 |

**(continuation of the "6 dB Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---|---|---|
| 2402.000000 | 0.5 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.40100 GHz | 2.40100 GHz |
| Stop Frequency | 2.40300 GHz | 2.40300 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 100.000 kHz | ~ 100.000 kHz |
| VBW | 300.000 kHz | ~ 300.000 kHz |
| SweepPoints | 101 | ~ 40 |
| Sweeptime | 18.938 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 100 | 100 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 12 / max. 150 | max. 150 |
| Stable | 5 / 5 | 5 |
| Max Stable Difference | 0.00 dB | 0.50 dB |

## Minimum Emission Bandwidth 6 dB (2440 MHz; 20.000 dBm; 1 MHz)

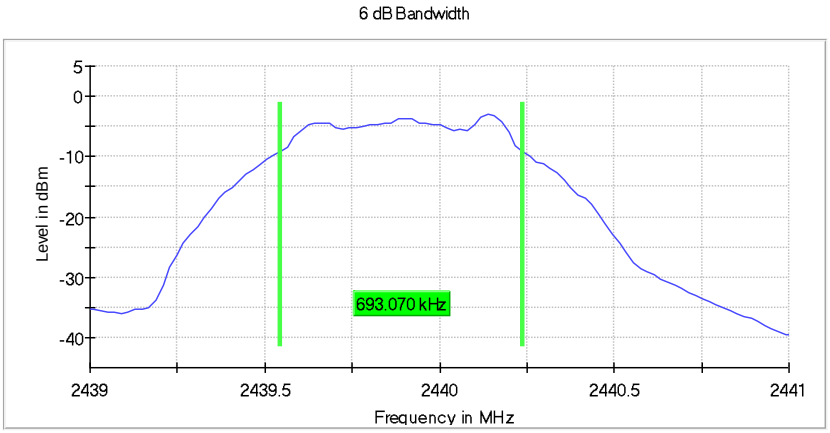
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

### 6 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2440.000000 | 0.693070 | 0.500000 | --- | 2439.544554 | 2440.237624 |

**(continuation of the "6 dB Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---|---|---|
| 2440.000000 | -3.0 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.43900 GHz | 2.43900 GHz |
| Stop Frequency | 2.44100 GHz | 2.44100 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 100.000 kHz | ~ 100.000 kHz |
| VBW | 300.000 kHz | ~ 300.000 kHz |
| SweepPoints | 101 | ~ 40 |
| Sweeptime | 18.938 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 100 | 100 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 9 / max. 150 | max. 150 |
| Stable | 5 / 5 | 5 |
| Max Stable Difference | 0.15 dB | 0.50 dB |

## Minimum Emission Bandwidth 6 dB (2480 MHz; 20.000 dBm; 1 MHz)

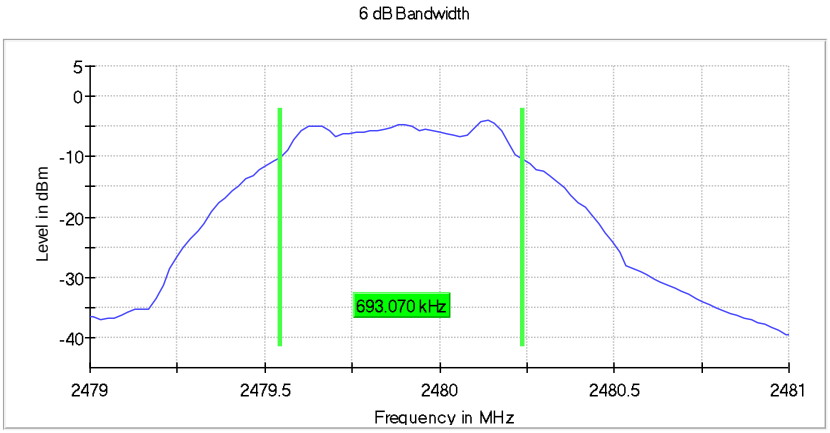
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

### 6 dB Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2480.000000 | 0.693070 | 0.500000 | --- | 2479.544554 | 2480.237624 |

**(continuation of the "6 dB Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Max Level (dBm) | Result |
|---|---|---|
| 2480.000000 | -4.0 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.47900 GHz | 2.47900 GHz |
| Stop Frequency | 2.48100 GHz | 2.48100 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 100.000 kHz | ~ 100.000 kHz |
| VBW | 300.000 kHz | ~ 300.000 kHz |
| SweepPoints | 101 | ~ 40 |
| Sweeptime | 18.938 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 100 | 100 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.50 dB | 0.50 dB |
| Run | 13 / max. 150 | max. 150 |
| Stable | 5 / 5 | 5 |
| Max Stable Difference | 0.05 dB | 0.50 dB |

# Appendix B.3: Test Results of 99% Bandwidth

## Occupied Channel Bandwidth 99% (2402 MHz; 20.000 dBm; 1 MHz)

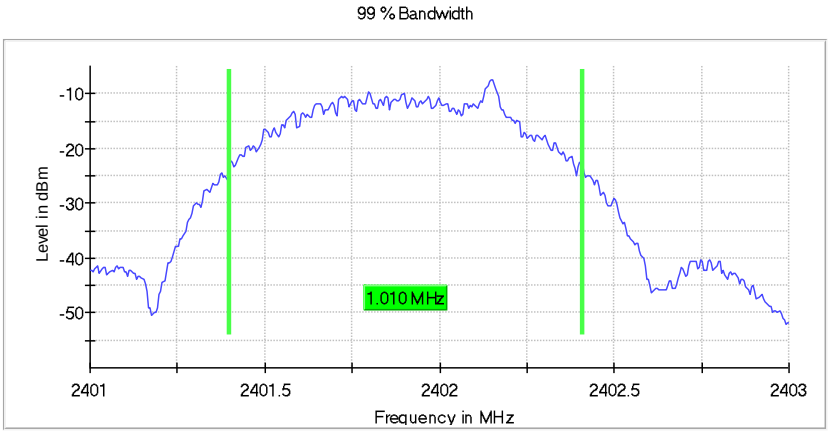
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

### 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2402.000000 | 1.010000 | --- | --- | 2401.397500 | 2402.407500 |

**(continuation of the "99 % Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Result |
|---|---|
| 2402.000000 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.40100 GHz | 2.40100 GHz |
| Stop Frequency | 2.40300 GHz | 2.40300 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 100 | 100 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.30 dB | 0.30 dB |
| Run | 9 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.22 dB | 0.30 dB |

## Occupied Channel Bandwidth 99% (2440 MHz; 20.000 dBm; 1 MHz)

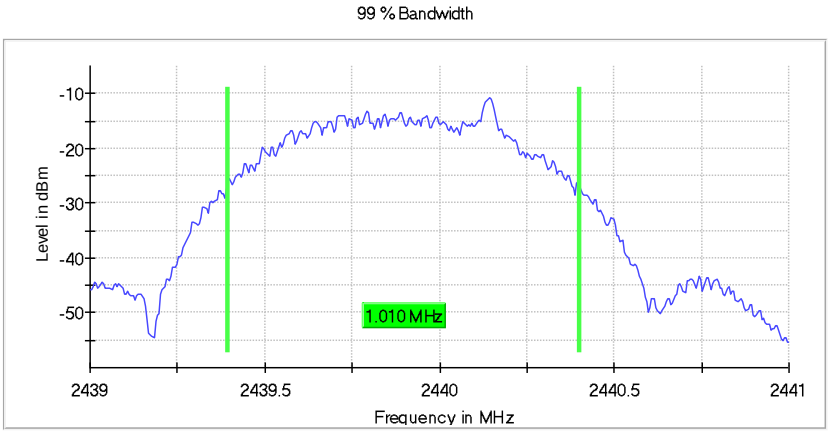
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

### 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2440.000000 | 1.010000 | --- | --- | 2439.392500 | 2440.402500 |

**(continuation of the "99 % Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Result |
|---|---|
| 2440.000000 | PASS |




### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.43900 GHz | 2.43900 GHz |
| Stop Frequency | 2.44100 GHz | 2.44100 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 100 | 100 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.30 dB | 0.30 dB |
| Run | 6 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.10 dB | 0.30 dB |

## Occupied Channel Bandwidth 99% (2480 MHz; 20.000 dBm; 1 MHz)

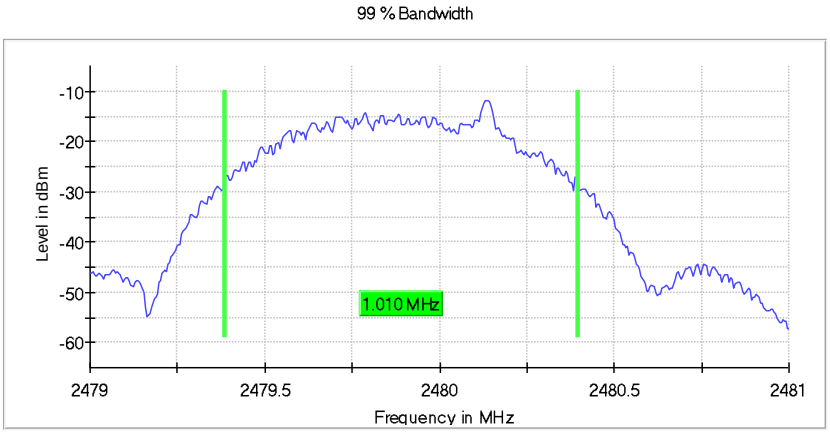
Test according to FCC title 47 part 15 §15.247(a), KDB 558074 D01 DTS Meas Guidance v04 and ANSI C63.10-2013

### 99 % Bandwidth

| DUT Frequency (MHz) | Bandwidth (MHz) | Limit Min (MHz) | Limit Max (MHz) | Band Edge Left (MHz) | Band Edge Right (MHz) |
|---|---|---|---|---|---|
| 2480.000000 | 1.010000 | --- | --- | 2479.387500 | 2480.397500 |

**(continuation of the "99 % Bandwidth" table from column 6 ...)**

| DUT Frequency (MHz) | Result |
|---|---|
| 2480.000000 | PASS |



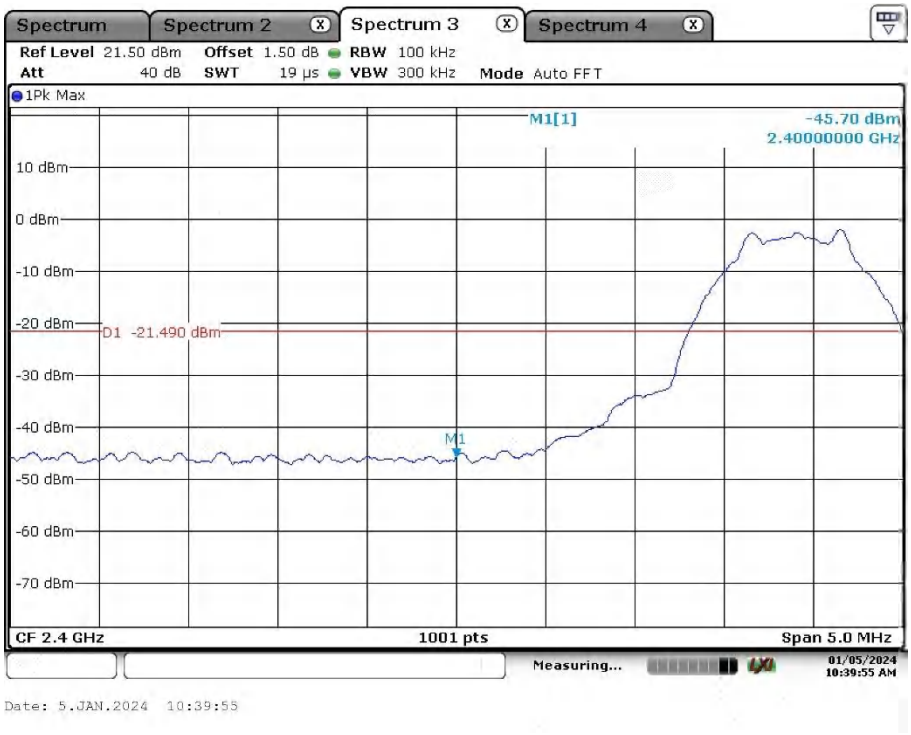

### Measurement

| Setting | Instrument Value | Target Value |
|---|---|---|
| Start Frequency | 2.47900 GHz | 2.47900 GHz |
| Stop Frequency | 2.48100 GHz | 2.48100 GHz |
| Span | 2.000 MHz | 2.000 MHz |
| RBW | 10.000 kHz | >= 10.000 kHz |
| VBW | 30.000 kHz | >= 30.000 kHz |
| SweepPoints | 400 | ~ 400 |
| Sweeptime | 189.648 µs | AUTO |
| Reference Level | -10.000 dBm | -10.000 dBm |
| Attenuation | 10.000 dB | AUTO |
| Detector | MaxPeak | MaxPeak |
| SweepCount | 100 | 100 |
| Filter | 3 dB | 3 dB |
| Trace Mode | Max Hold | Max Hold |
| Sweeptype | FFT | AUTO |
| Preamp | off | off |
| Stablemode | Trace | Trace |
| Stablevalue | 0.30 dB | 0.30 dB |
| Run | 5 / max. 150 | max. 150 |
| Stable | 3 / 3 | 3 |
| Max Stable Difference | 0.13 dB | 0.30 dB |

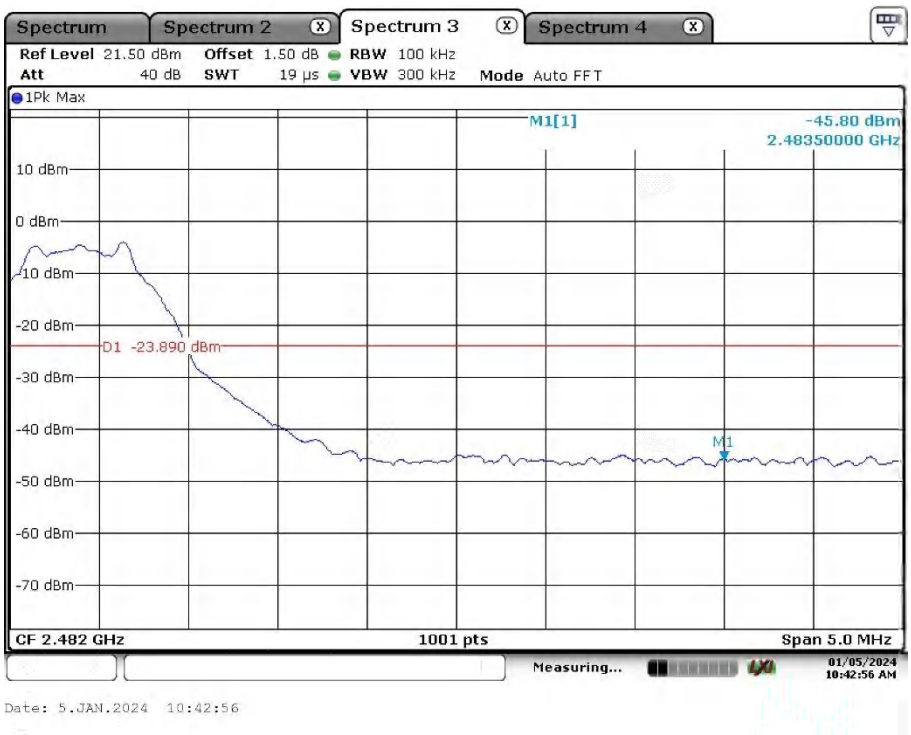
## Appendix B.4: Test Results of Conducted Spurious Emissions Measured in 100 kHz Bandwidth

### Band Edge

Low Channel:

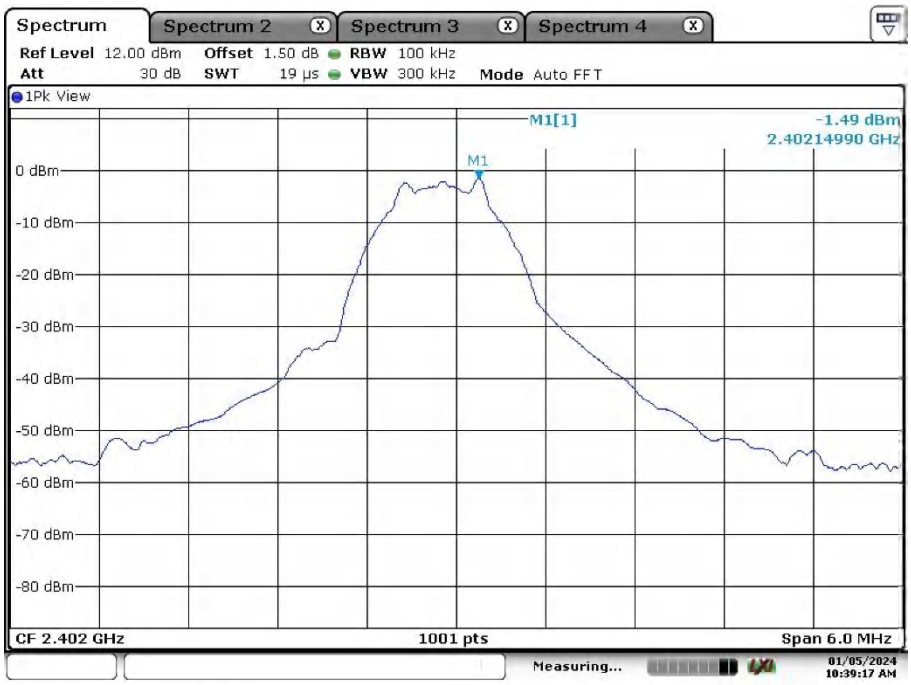


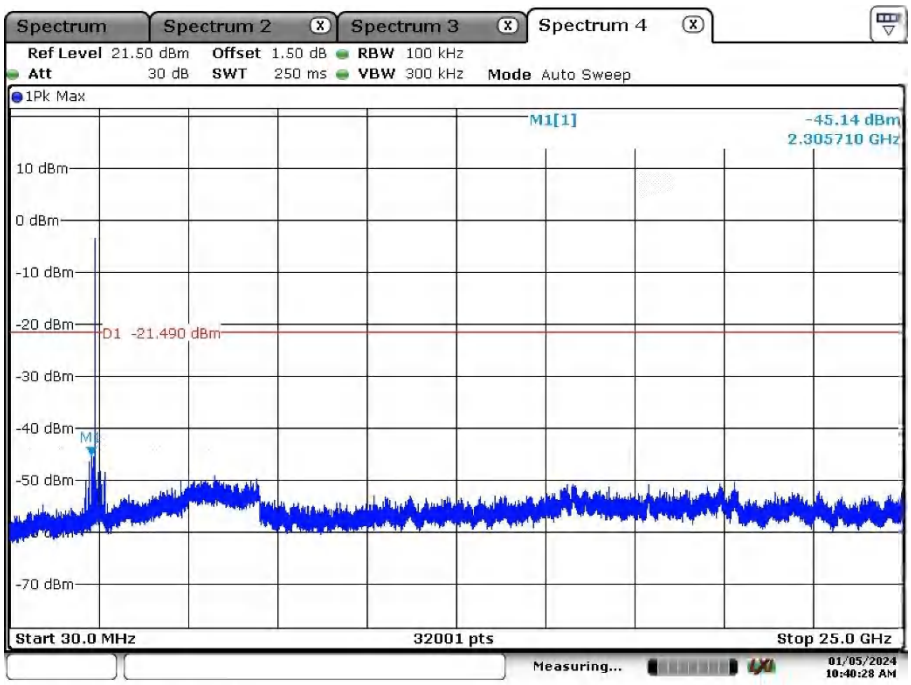

High Channel:



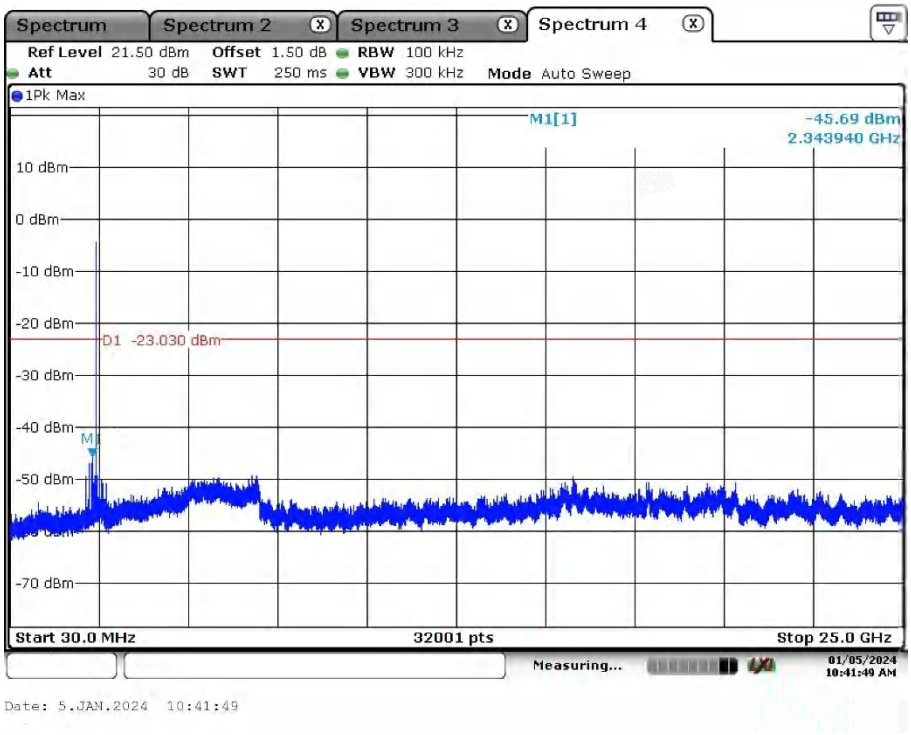
**Conducted Spurious Emission**

Low Channel:

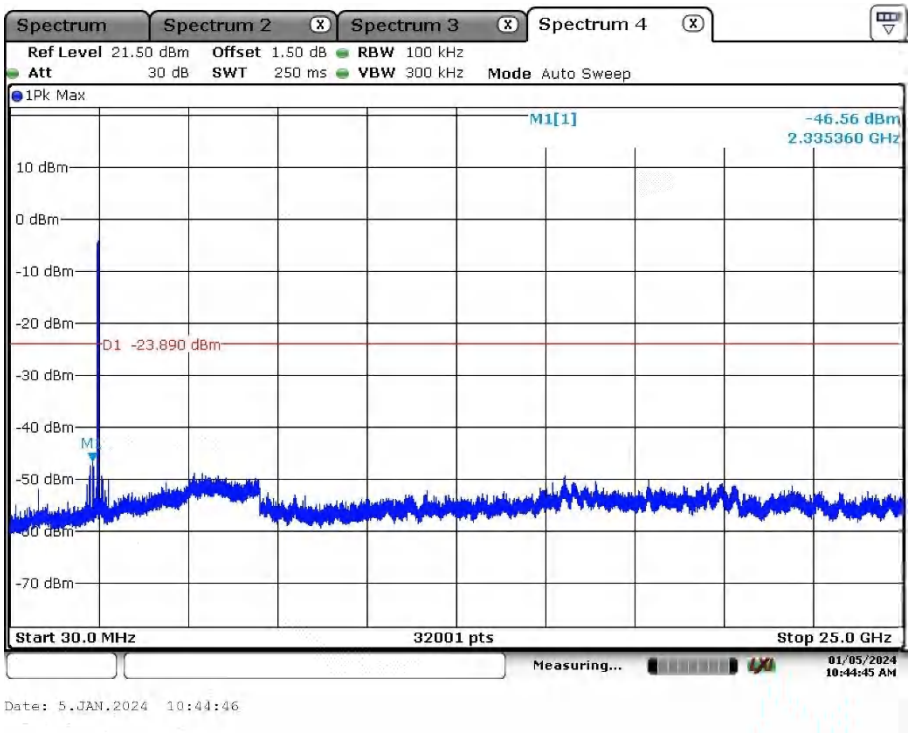


Middle Channel:

High Channel:

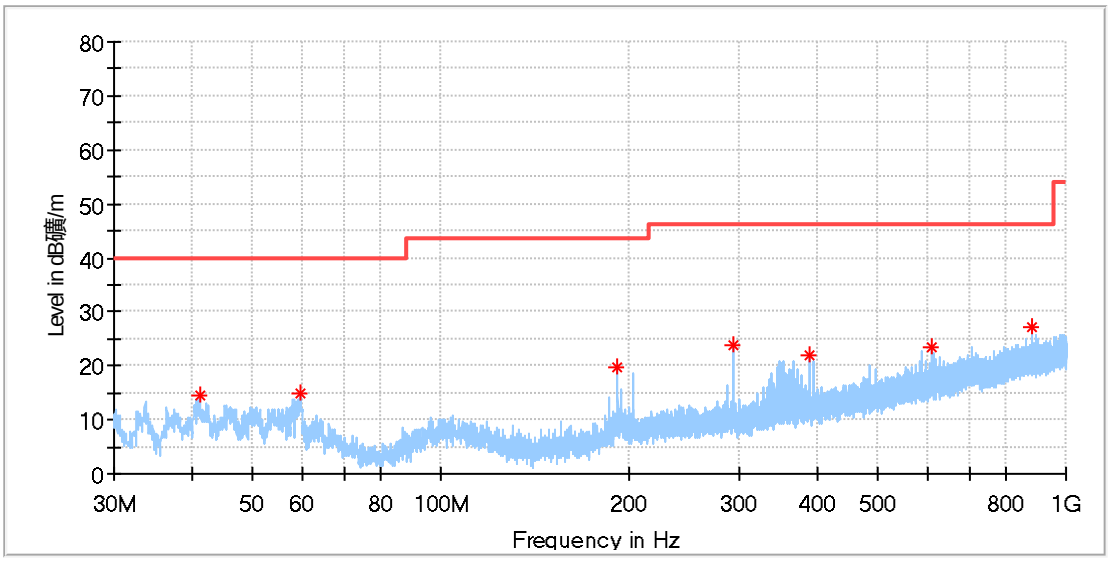
## Appendix B.5: Test Results of Radiated Spurious Emissions

Note:
1) This testing was carried out on different modulations, but only the worst case was presented in this report.
2) Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

**30 MHz to 1GHz**

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_Mid channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

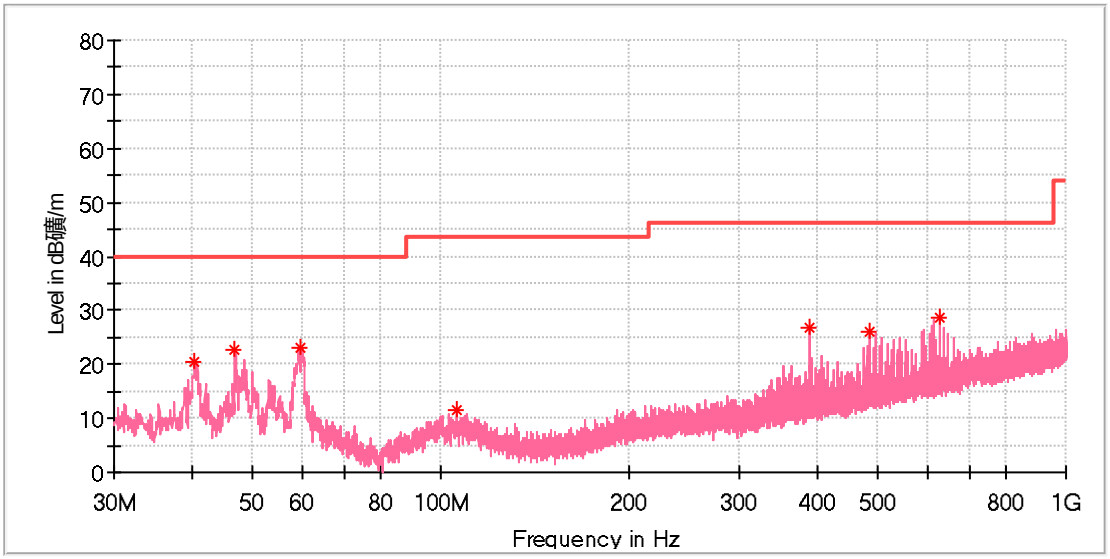
| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 41.117692 | 14.44 | 40.00 | 25.56 | 100.0 | H | 156.0 | -20.1 |
| 59.510385 | 14.87 | 40.00 | 25.13 | 100.0 | H | 104.0 | -19.2 |
| 191.915385 | 19.84 | 43.50 | 23.66 | 100.0 | H | 212.0 | -19.7 |
| 293.504231 | 23.97 | 46.00 | 22.03 | 100.0 | H | 172.0 | -16.8 |
| 389.608846 | 21.89 | 46.00 | 24.11 | 100.0 | H | 195.0 | -14.3 |
| 609.612308 | 23.37 | 46.00 | 22.63 | 100.0 | H | 222.0 | -10.0 |
| 880.578077 | 27.27 | 46.00 | 18.73 | 100.0 | H | 195.0 | -5.6 |

# Final_Result

| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_Mid channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 40.296923 | 20.51 | 40.00 | 19.49 | 100.0 | V | 107.0 | -20.3 |
| 46.863077 | 22.76 | 40.00 | 17.24 | 100.0 | V | 242.0 | -18.9 |
| 59.659615 | 23.13 | 40.00 | 16.87 | 100.0 | V | 17.0 | -19.3 |
| 106.219615 | 11.42 | 43.50 | 32.08 | 100.0 | V | 10.0 | -19.2 |
| 389.646154 | 26.80 | 46.00 | 19.20 | 100.0 | V | 326.0 | -14.3 |
| 485.415000 | 26.23 | 46.00 | 19.77 | 100.0 | V | 344.0 | -12.4 |
| 626.587308 | 28.81 | 46.00 | 17.19 | 100.0 | V | 308.0 | -9.8 |

# Final_Result

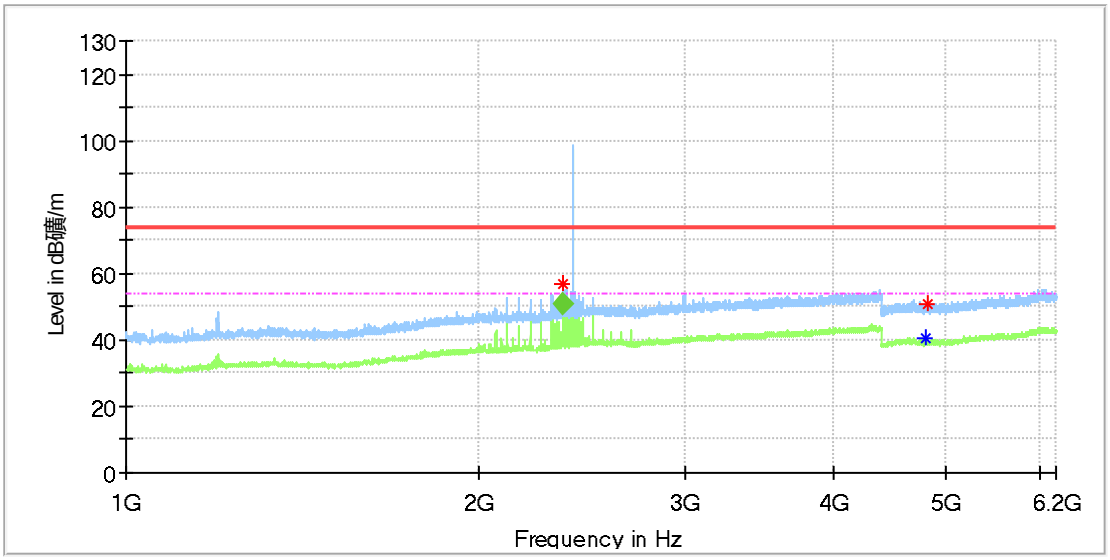
| Frequency (MHz) | QuasiPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

**1GHz-18GHz**

Note: The highest waveform in the figure is Bluetooth Fundamental.

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_Low channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

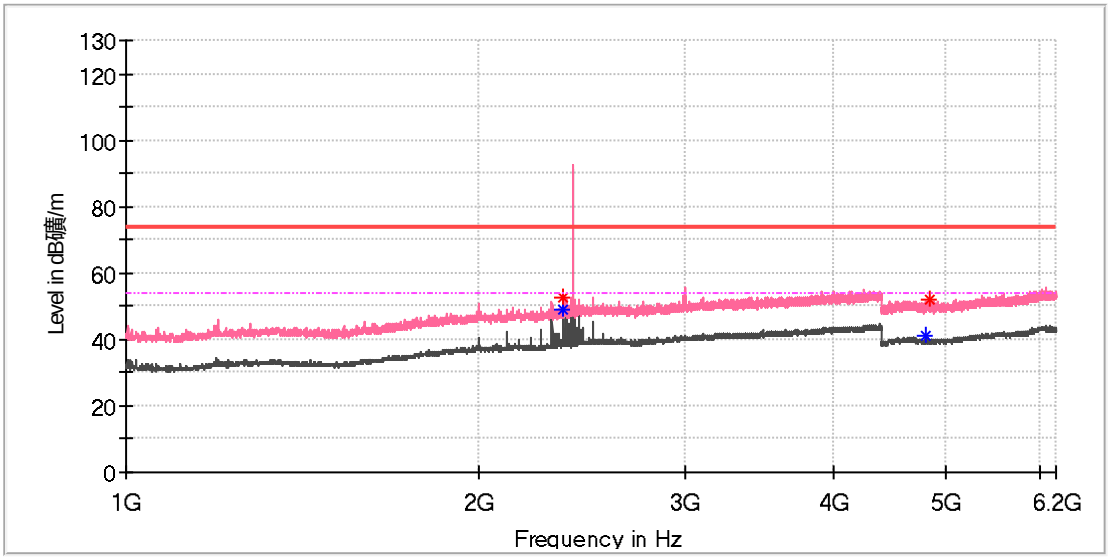
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2354.000000 | 56.78 | --- | 74.00 | 17.22 | 150.0 | H | 230.0 | 6.9 |
| 4804.000000 | --- | 40.45 | 54.00 | 13.55 | 150.0 | H | 353.0 | 11.8 |
| 4812.500000 | 51.00 | --- | 74.00 | 23.00 | 150.0 | H | 199.0 | 11.8 |

# Final_Result

| Frequency (MHz) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 2353.850000 | 50.76 | 54.00 | 3.24 | 145.0 | H | 229.0 | 6.9 |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_Low channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

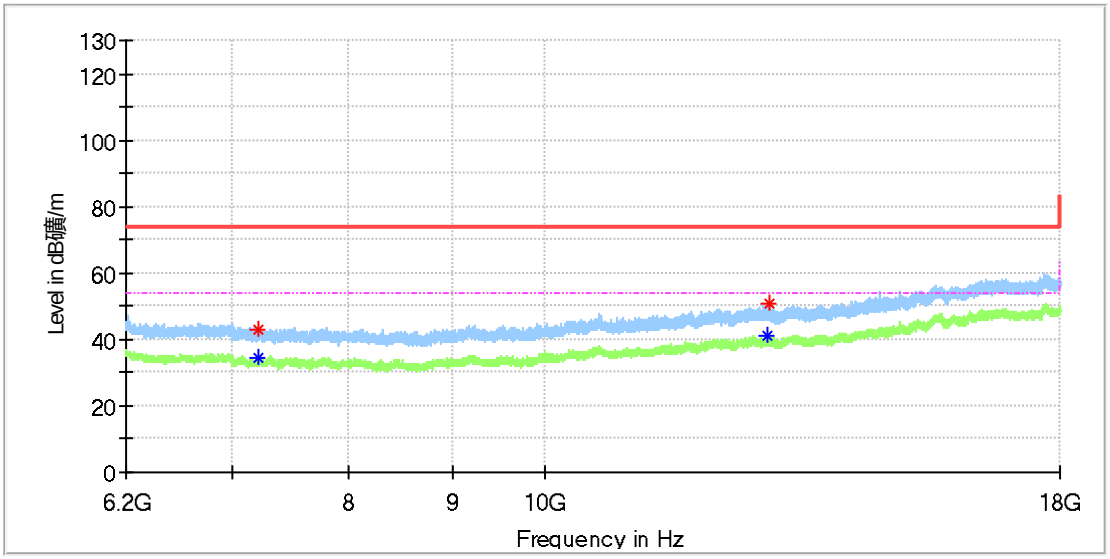
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2354.000000 | 52.69 | --- | 74.00 | 21.31 | 150.0 | V | 183.0 | 6.9 |
| 2354.000000 | --- | 48.71 | 54.00 | 5.29 | 150.0 | V | 183.0 | 6.9 |
| 4804.000000 | --- | 40.88 | 54.00 | 13.12 | 150.0 | V | 117.0 | 11.8 |
| 4840.500000 | 52.01 | --- | 74.00 | 21.99 | 150.0 | V | 275.0 | 11.8 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_Low channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

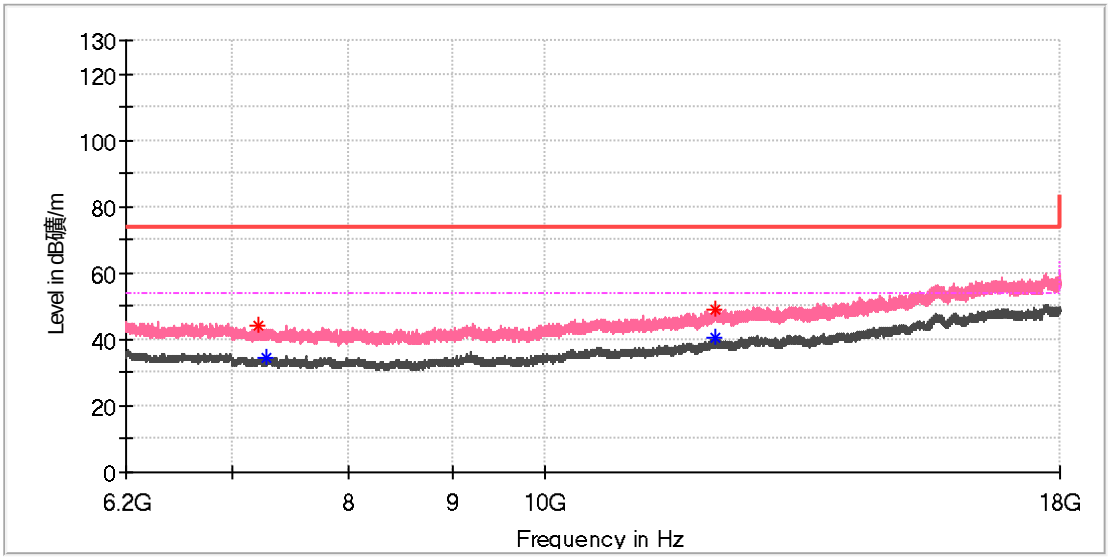
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 7215.291667 | --- | 34.70 | 54.00 | 19.30 | 150.0 | H | 227.0 | 8.7 |
| 7216.275000 | 42.98 | --- | 74.00 | 31.02 | 150.0 | H | 0.0 | 8.7 |
| 12898.466667 | --- | 40.96 | 54.00 | 13.04 | 150.0 | H | 108.0 | 15.5 |
| 12923.050000 | 51.01 | --- | 74.00 | 22.99 | 150.0 | H | 0.0 | 15.6 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_Low channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

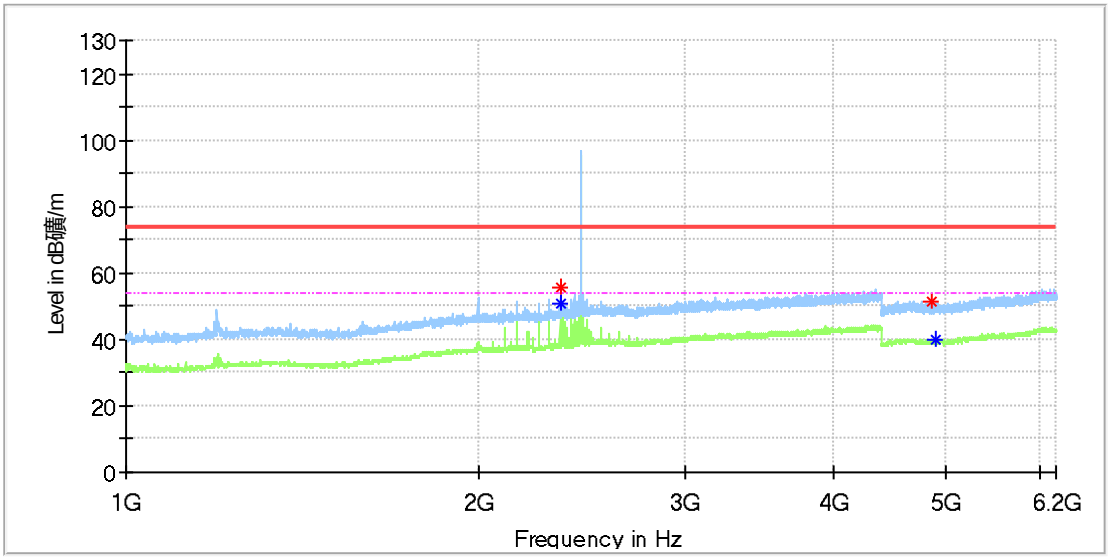
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 7213.816667 | 44.38 | --- | 74.00 | 29.62 | 150.0 | V | 292.0 | 8.7 |
| 7279.700000 | --- | 34.70 | 54.00 | 19.30 | 150.0 | V | 329.0 | 8.4 |
| 12135.400000 | 48.90 | --- | 74.00 | 25.10 | 150.0 | V | 329.0 | 14.3 |
| 12154.083333 | --- | 40.25 | 54.00 | 13.75 | 150.0 | V | 183.0 | 14.4 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_Mid channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

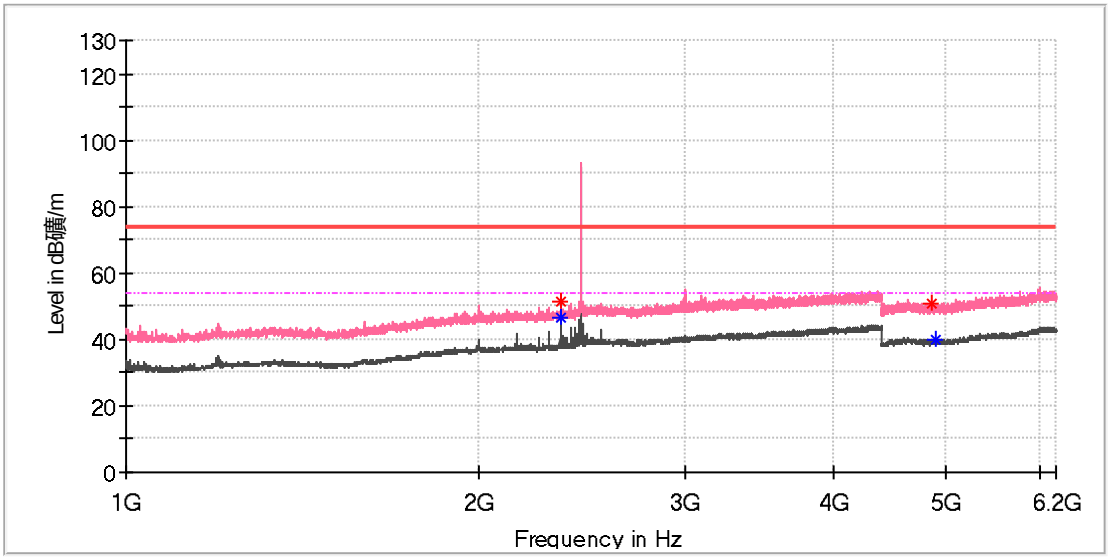
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2343.500000 | --- | 50.76 | 54.00 | 3.24 | 150.0 | H | 189.0 | 6.9 |
| 2344.000000 | 55.49 | --- | 74.00 | 18.51 | 150.0 | H | 183.0 | 6.9 |
| 4860.000000 | 51.26 | --- | 74.00 | 22.74 | 150.0 | H | 252.0 | 11.8 |
| 4897.500000 | --- | 39.88 | 54.00 | 14.12 | 150.0 | H | 303.0 | 11.8 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_Mid channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

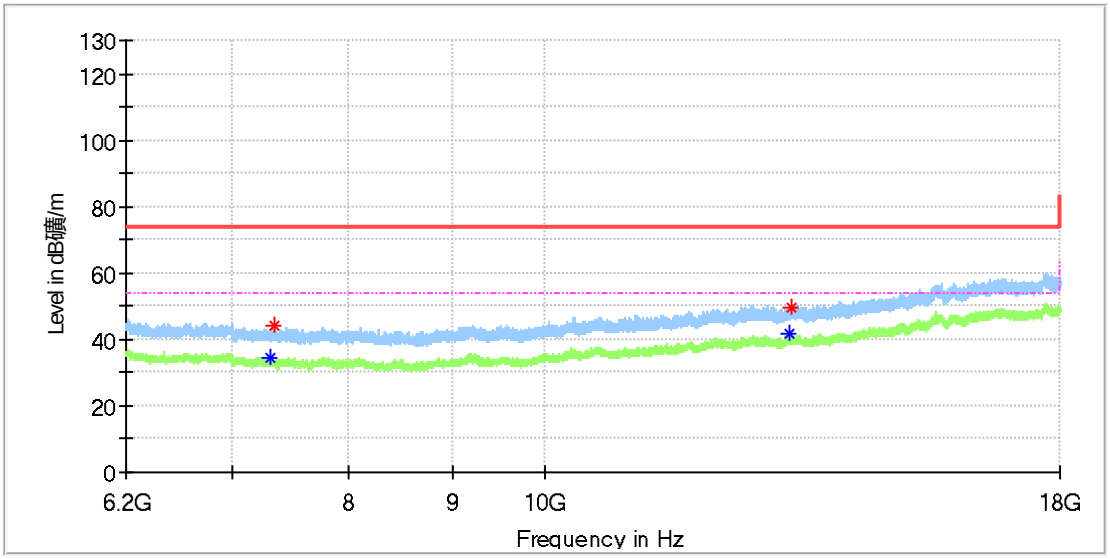
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2344.000000 | --- | 46.58 | 54.00 | 7.42 | 150.0 | V | 246.0 | 6.9 |
| 2344.000000 | 51.31 | --- | 74.00 | 22.69 | 150.0 | V | 246.0 | 6.9 |
| 4861.000000 | 50.75 | --- | 74.00 | 23.25 | 150.0 | V | 179.0 | 11.8 |
| 4900.000000 | --- | 39.82 | 54.00 | 14.18 | 150.0 | V | 235.0 | 11.8 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_Mid channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

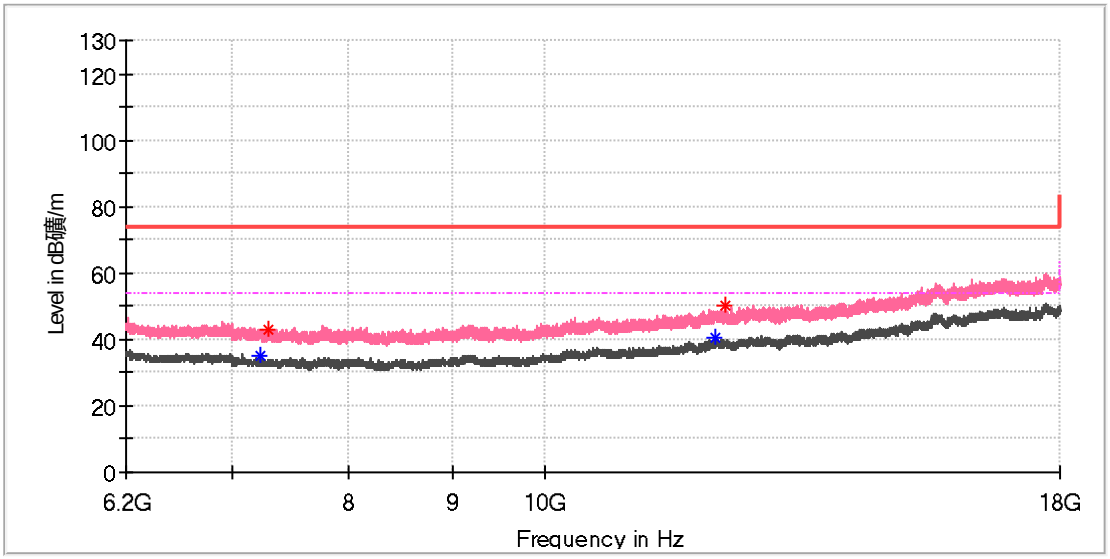
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 7305.758333 | --- | 34.36 | 54.00 | 19.64 | 150.0 | H | 185.0 | 8.3 |
| 7339.191667 | 43.87 | --- | 74.00 | 30.13 | 150.0 | H | 93.0 | 8.1 |
| 13227.883333 | --- | 41.47 | 54.00 | 12.53 | 150.0 | H | 1.0 | 15.5 |
| 13235.750000 | 49.79 | --- | 74.00 | 24.21 | 150.0 | H | 150.0 | 15.5 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_Mid channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

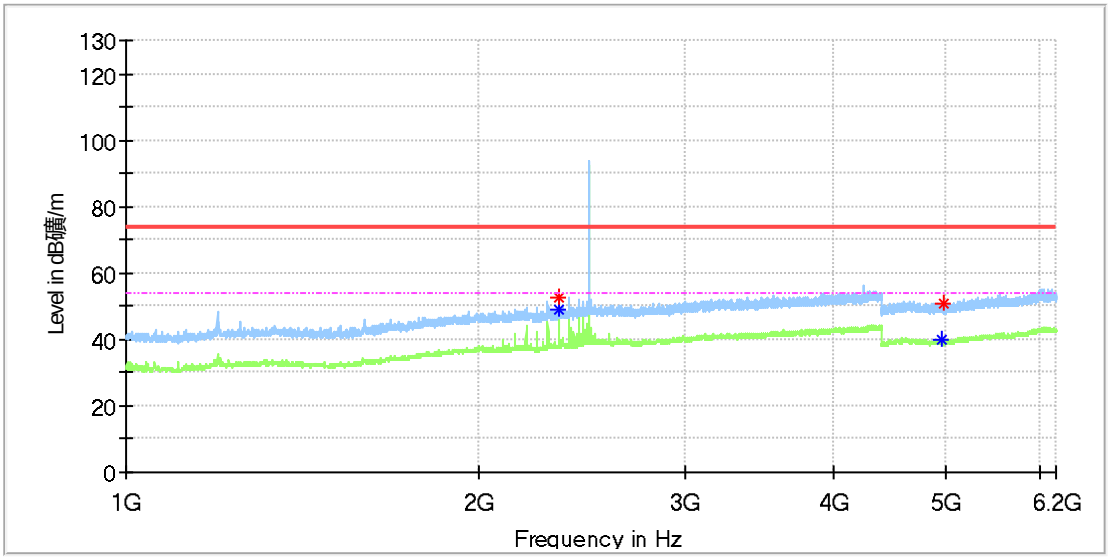
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 7224.633333 | --- | 35.29 | 54.00 | 18.71 | 150.0 | V | 244.0 | 8.7 |
| 7287.075000 | 42.80 | --- | 74.00 | 31.20 | 150.0 | V | 258.0 | 8.4 |
| 12158.016667 | --- | 40.39 | 54.00 | 13.61 | 150.0 | V | 258.0 | 14.5 |
| 12298.633333 | 50.04 | --- | 74.00 | 23.96 | 150.0 | V | 292.0 | 14.9 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_High channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

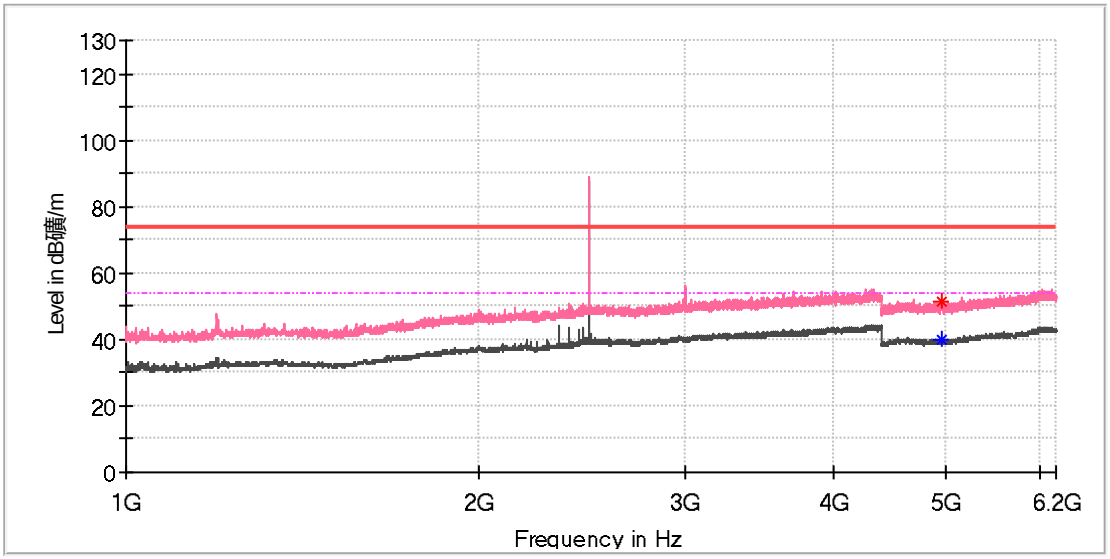
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2336.000000 | 52.86 | --- | 74.00 | 21.14 | 150.0 | H | 50.0 | 6.8 |
| 2336.000000 | --- | 48.85 | 54.00 | 5.15 | 150.0 | H | 50.0 | 6.8 |
| 4960.000000 | --- | 39.95 | 54.00 | 14.05 | 150.0 | H | 319.0 | 11.8 |
| 4968.000000 | 50.75 | --- | 74.00 | 23.25 | 150.0 | H | 353.0 | 11.8 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_High channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

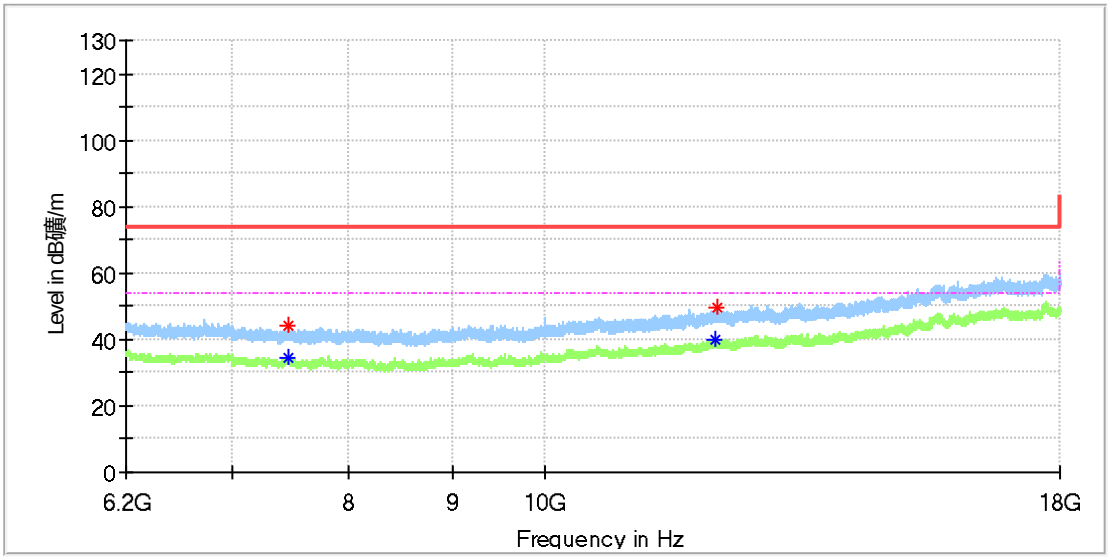
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 4946.000000 | --- | 39.81 | 54.00 | 14.19 | 150.0 | V | 238.0 | 11.8 |
| 4963.000000 | 51.25 | --- | 74.00 | 22.75 | 150.0 | V | 221.0 | 11.8 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_High channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

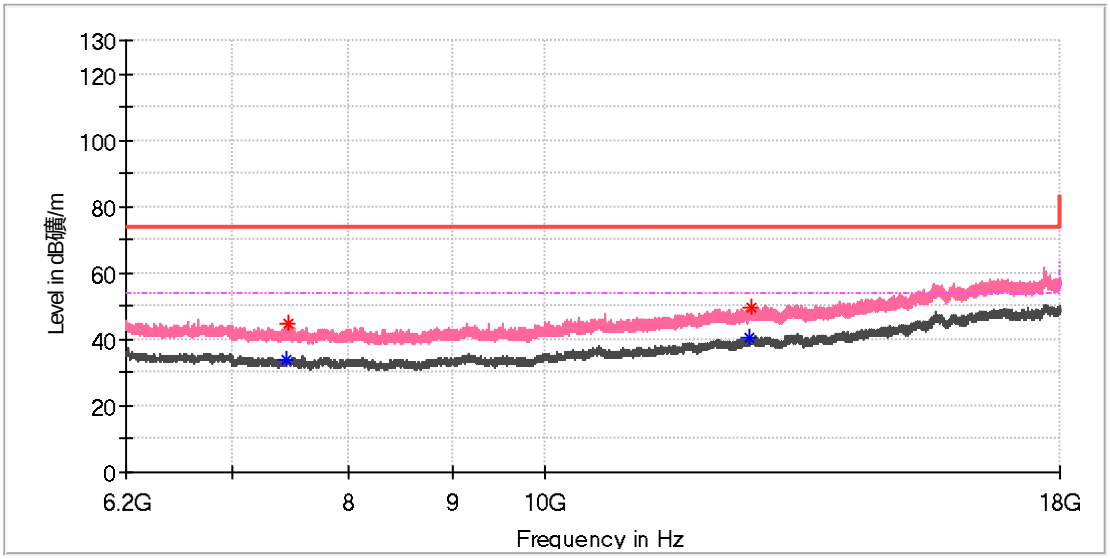
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 7454.241667 | --- | 34.33 | 54.00 | 19.67 | 150.0 | H | 276.0 | 8.5 |
| 7459.650000 | 43.92 | --- | 74.00 | 30.08 | 150.0 | H | 0.0 | 8.5 |
| 12156.050000 | --- | 39.67 | 54.00 | 14.33 | 150.0 | H | 356.0 | 14.4 |
| 12174.733333 | 49.31 | --- | 74.00 | 24.69 | 150.0 | H | 0.0 | 14.5 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_High channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 7445.883333 | --- | 34.12 | 54.00 | 19.88 | 150.0 | V | 64.0 | 8.5 |
| 7466.041667 | 44.48 | --- | 74.00 | 29.52 | 150.0 | V | 156.0 | 8.6 |
| 12640.833333 | --- | 40.81 | 54.00 | 13.19 | 150.0 | V | 206.0 | 15.0 |
| 12642.800000 | 49.59 | --- | 74.00 | 24.41 | 150.0 | V | 76.0 | 15.0 |

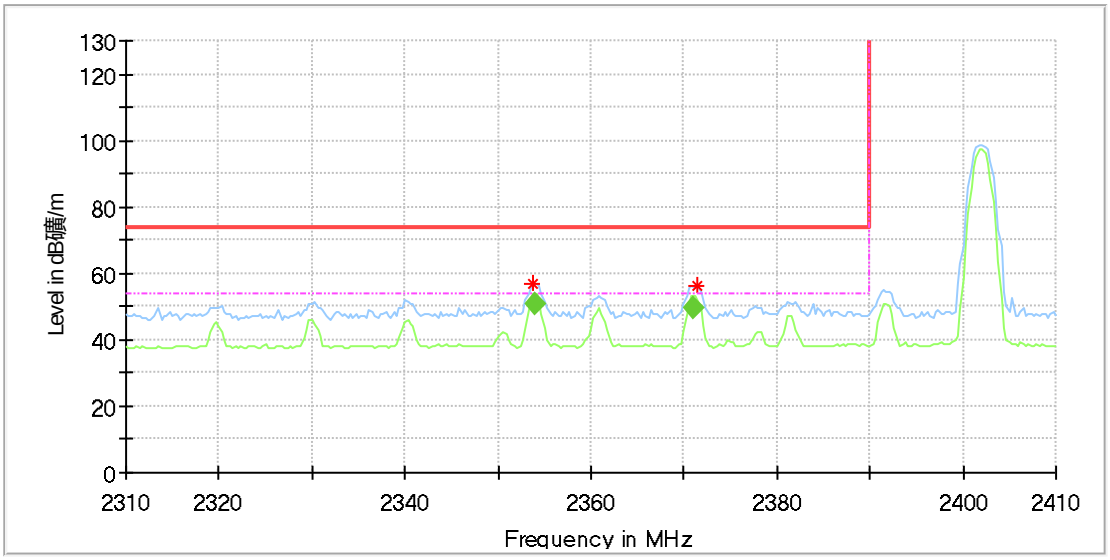
# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

## Appendix B.6: Test Results of Radiated Emissions in Restricted Bands

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_Low channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

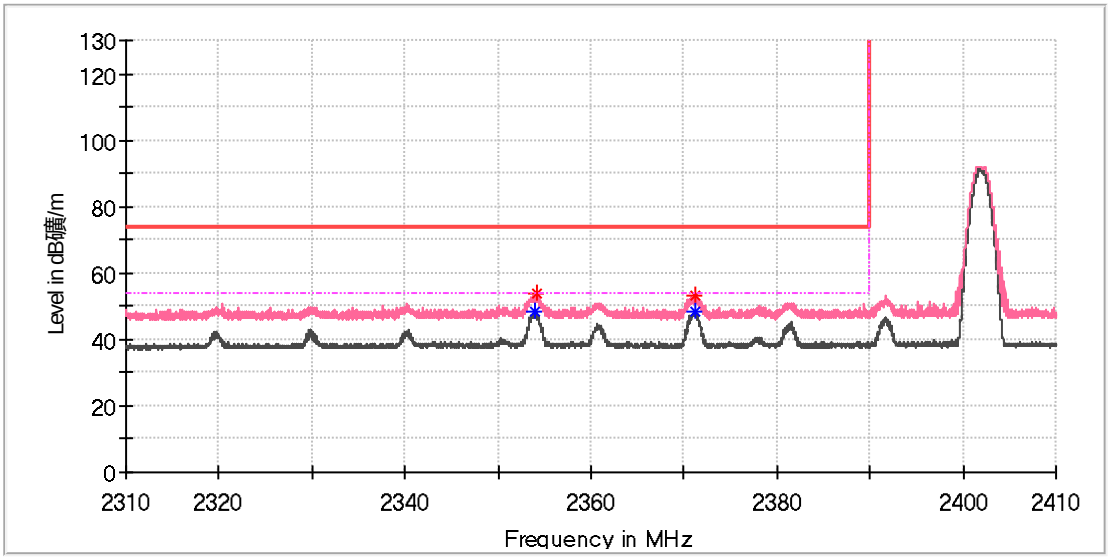
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2353.823529 | 56.82 | --- | 74.00 | 17.18 | 150.0 | H | 226.0 | 6.9 |
| 2371.470588 | 56.17 | --- | 74.00 | 17.83 | 150.0 | H | 226.0 | 6.9 |

# Final_Result

| Frequency (MHz) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| 2353.893235 | 50.49 | 54.00 | 3.51 | 145.0 | H | 224.0 | 6.9 |
| 2371.061177 | 49.79 | 54.00 | 4.21 | 145.0 | H | 224.0 | 6.9 |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_Low channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

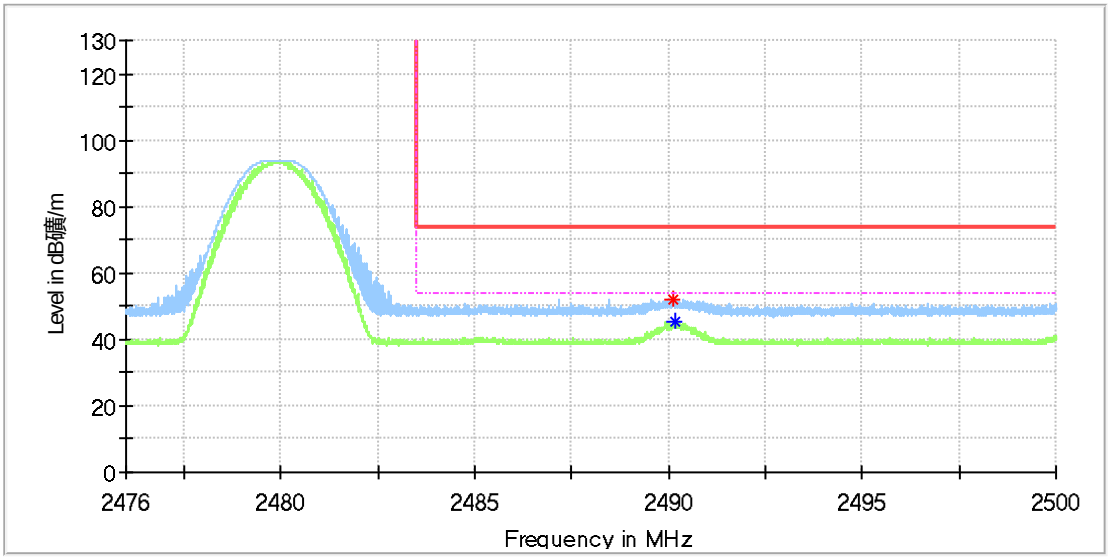
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2353.985294 | --- | 48.35 | 54.00 | 5.65 | 150.0 | V | 181.0 | 6.9 |
| 2354.220588 | 53.57 | --- | 74.00 | 20.43 | 150.0 | V | 238.0 | 6.9 |
| 2371.147059 | 52.94 | --- | 74.00 | 21.06 | 150.0 | V | 231.0 | 6.9 |
| 2371.250000 | --- | 48.24 | 54.00 | 5.76 | 150.0 | V | 246.0 | 6.9 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_High channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

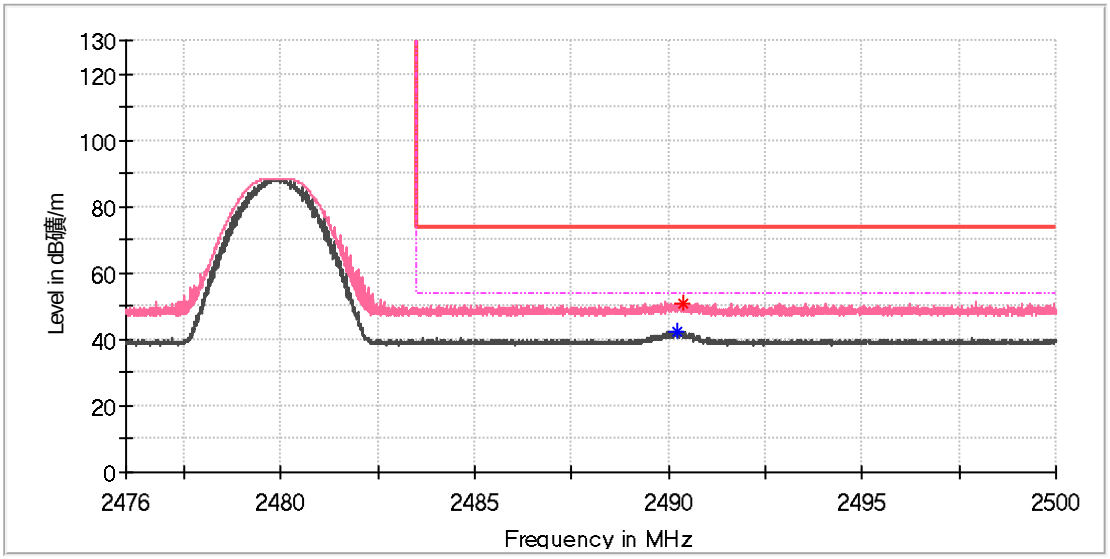
| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2490.110588 | 52.06 | --- | 74.00 | 21.94 | 150.0 | H | 137.0 | 7.4 |
| 2490.152941 | --- | 45.14 | 54.00 | 8.86 | 150.0 | H | 144.0 | 7.4 |

# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Model: | X3D MAX |
| Test Mode: | BLE 1M_High channel |
| Order No/Sample No: | 168455276/A003618183-013 |
| Test Voltage: | Battery |
| Remark: | Temp 22 Humi:52% |
| Test Standard: | FCC 15.247 |
| Tested By: | Kei Zhang |
| Reviewed By: | Terry Yin |




# Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV/m) | Average (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|
| 2490.212941 | --- | 42.59 | 54.00 | 11.41 | 150.0 | V | 243.0 | 7.4 |
| 2490.371765 | 50.84 | --- | 74.00 | 23.16 | 150.0 | V | 252.0 | 7.4 |

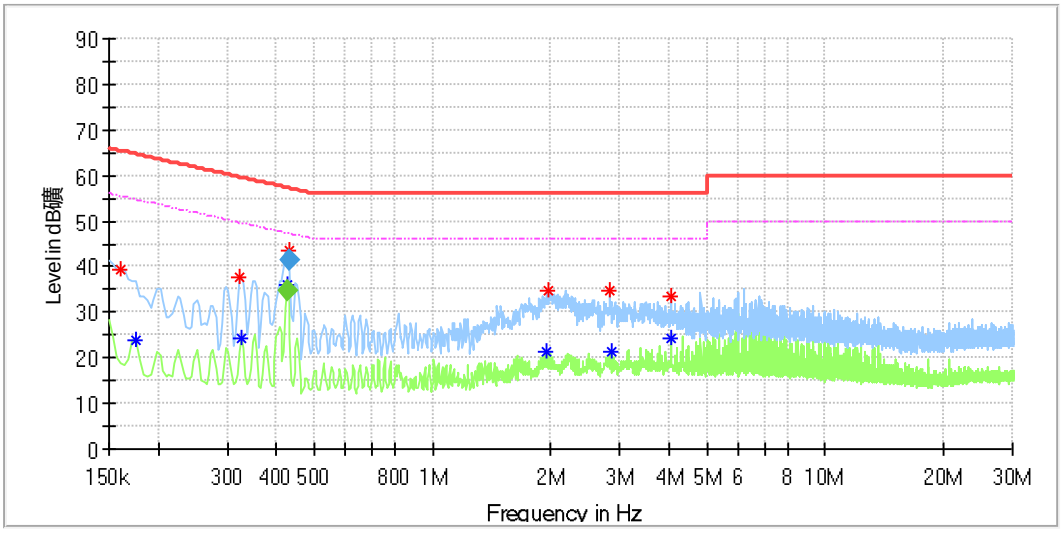
# Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|
| --- | --- | --- | --- | --- | | --- | --- |

## Appendix B.7: Test Results of Conducted Emission on AC Mains

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Order Number: | 168455276 100 |
| Model: | X3D MAX |
| Test Mode: | Normal Working with BT |
| Test Voltage: | AC 120V/60Hz |
| Test Standard: | FCC Part 15.207 |
| Test By:/Review By: | Guangshen Cen / Gary Chen |
| Tem./Hum./Pressure: | 24.3°C/51.2%/101kPa |
| Remark: | SR2 |




# Critical_Freqs

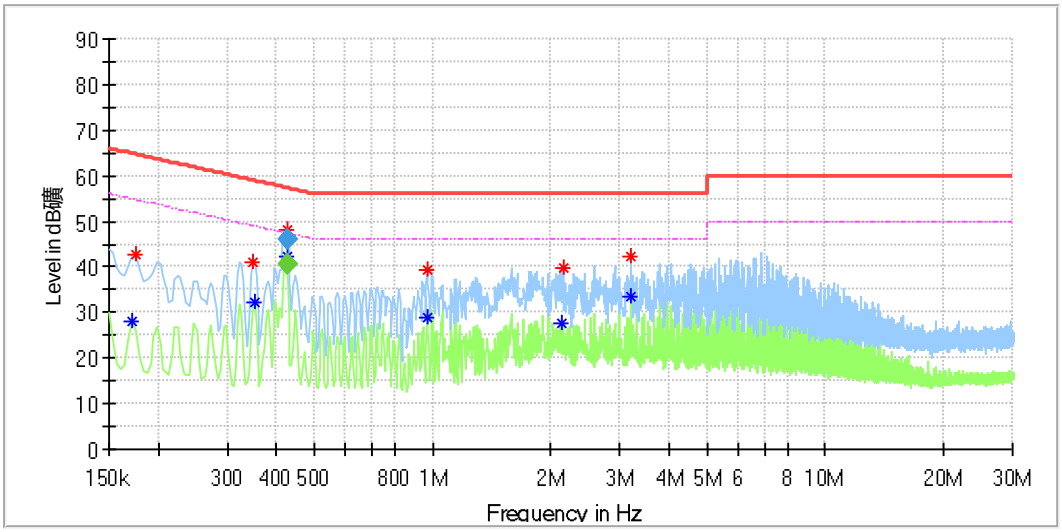
| Frequency (MHz) | MaxPeak (dBµV) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|
| 0.161194 | 39.36 | --- | 65.40 | 26.04 | L1 | 9.9 |
| 0.176119 | --- | 24.05 | 54.67 | 30.62 | L1 | 9.9 |
| 0.321638 | 37.55 | --- | 59.66 | 22.11 | L1 | 9.9 |
| 0.325369 | --- | 24.24 | 49.57 | 25.32 | L1 | 9.9 |
| 0.425612 | --- | 35.83 | 47.33 | 11.50 | L1 | 9.9 |
| 0.429612 | 43.45 | --- | 57.33 | 13.88 | L1 | 9.9 |
| 1.941000 | --- | 21.53 | 46.00 | 24.47 | L1 | 10.1 |
| 1.967119 | 34.59 | --- | 56.00 | 21.41 | L1 | 10.1 |
| 2.817844 | 34.79 | --- | 56.00 | 21.21 | L1 | 10.2 |
| 2.851425 | --- | 21.31 | 46.00 | 24.69 | L1 | 10.2 |
| 4.056619 | --- | 24.40 | 46.00 | 21.60 | L1 | 10.2 |
| 4.056619 | 33.61 | --- | 56.00 | 22.39 | L1 | 10.2 |

# Final_Result

| Frequency (MHz) | QuasiPeak (dBµV) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 0.425612 | --- | 34.66 | 47.34 | 12.68 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.429612 | 41.29 | --- | 57.26 | 15.97 | 1000.0 | 9.000 | L1 | 9.9 |

# EUT Information

| | |
|---|---|
| EUT Name: | Bluetooth speaker |
| Order Number: | 168455276 100 |
| Model: | X3D MAX |
| Test Mode: | Normal Working with BT |
| Test Voltage: | AC 120V/60Hz |
| Test Standard: | FCC Part 15.207 |
| Test By:/Review By: | Guangshen Cen / Gary Chen |
| Tem./Hum./Pressure: | 24.3°C/51.2%/101kPa |
| Remark: | SR2 |




# Critical_Freqs

| Frequency (MHz) | MaxPeak (dBµV) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|
| 0.172388 | --- | 28.16 | 54.85 | 26.69 | N | 9.8 |
| 0.176119 | 42.53 | --- | 64.67 | 22.14 | N | 9.8 |
| 0.347756 | 41.05 | --- | 59.02 | 17.96 | N | 9.8 |
| 0.351488 | --- | 32.30 | 48.93 | 16.63 | N | 9.8 |
| 0.425612 | 47.96 | --- | 57.33 | 9.37 | N | 9.8 |
| 0.426881 | --- | 42.33 | 47.40 | 5.07 | N | 9.8 |
| 0.967144 | 39.40 | --- | 56.00 | 16.60 | N | 9.8 |
| 0.970875 | --- | 28.90 | 46.00 | 17.10 | N | 9.8 |
| 2.142488 | --- | 27.80 | 46.00 | 18.20 | N | 9.9 |
| 2.146219 | 39.57 | --- | 56.00 | 16.43 | N | 9.9 |
| 3.202163 | --- | 33.59 | 46.00 | 12.41 | N | 9.9 |
| 3.202163 | 42.07 | --- | 56.00 | 13.93 | N | 9.9 |

# Final_Result

| Frequency (MHz) | QuasiPeak (dBµV) | Average (dBµV) | Limit (dBµV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 0.425612 | 45.92 | --- | 57.34 | 11.42 | 1000.0 | 9.000 | N | 9.8 |
| 0.426881 | --- | 40.49 | 47.31 | 6.82 | 1000.0 | 9.000 | N | 9.8 |