# FCC RADIO TEST REPORT

| | | |
|---|---|---|
| FCC ID | : | Q87- 03458 |
| Equipment | : | Dual-Band 802.11ax Wireless Router |
| Brand Name | : | LINKSYS |
| Model Name | : | MR9600, EA9350 |
| Applicant | : | Linksys LLC<br>121 Theory Drive, Irvine, CA 92617, USA |
| Standard | : | 47 CFR FCC Part 15.247 |

The product was received on Apr. 30, 2019, and testing was started from Apr. 30, 2019 and completed on Aug. 28, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.
The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Cliff Chang

*SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory*
*No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)*

# Table of Contents

**Appendix H. Test Photos**

**Appendix I. Photographs of EUT**

# History of this test report

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| FR962635AC | 01 | Initial issue of report | Sep. 12, 2019 |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|---|---|---|---|---|
| 1.1.2 | 15.203 | Antenna Requirement | PASS | - |
| 3.1 | 15.207 | AC Power-line Conducted Emissions | PASS | - |
| 3.2 | 15.247(a) | 20dB Bandwidth | PASS | - |
| 3.2 | 15.247(a) | Carrier Frequency Separation | PASS | - |
| 3.3 | 15.247(b) | Maximum Conducted Output Power | PASS | - |
| 3.4 | 15.247(a) | Number of Hopping Frequencies and Hopping Band edge | PASS | - |
| 3.5 | 15.247(a) | Time of Occupancy (Dwell Time) | PASS | - |
| 3.6 | 15.247(d) | Emissions in Non-restricted Frequency Bands | PASS | - |
| 3.7 | 15.247(d) | Emissions in Restricted Frequency Bands | PASS | - |

| **Declaration of Conformity:** |
|---|
| The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. |
| **Comments and Explanations:** |
| The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification. |

**Reviewed by: Sam Chen**
**Report Producer: Sandy Chuang**

# 1 General Description

## 1.1 Information

### 1.1.1 RF General Information

| Frequency Range (MHz) | Bluetooth Version | Ch. Frequency (MHz) | Channel Number |
|---|---|---|---|
| 2400-2483.5 | BR / EDR | 2402-2480 | 0-78 [79] |

| Band | Mode | BWch (MHz) | Nant |
|---|---|---|---|
| 2.4-2.4835GHz | BT-BR(1Mbps) | 1 | 1TX |
| 2.4-2.4835GHz | BT-EDR(2Mbps) | 1 | 1TX |
| 2.4-2.4835GHz | BT-EDR(3Mbps) | 1 | 1TX |

Note:
- Bluetooth BR uses a GFSK (1Mbps).
- Bluetooth EDR uses a combination of π/4-DQPSK (2Mbps) and 8DPSK (3Mbps).
- Bluetooth BR/EDR uses as a system using FHSS modulation.
- BWch is the nominal channel bandwidth.
- Nss-Min is the minimum number of spatial streams.
- Nant is the number of outputs. e.g., 2(2, 3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

### 1.1.2 Antenna Information

| Ant. | Port | | Brand | Model Name | Antenna Type | Connector | Gain (dBi) | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2.4GHz | 5GHz | | | | | 2.4GHz | 5GHz | Bluetooth |
| 1 | 1 | 2 | ARISTOTLE | RFA-52-F100-2-L | Dipole | I-PEX | 2.88 | 2.05 | - |
| 2 | 2 | 3 | ARISTOTLE | RFA-52-F100-3-R | Dipole | I-PEX | 2.23 | 2.12 | - |
| 3 | 3 | 1 | ARISTOTLE | RFA-52-F100-1L | Dipole | I-PEX | 2.27 | 2.28 | - |
| 4 | 4 | 4 | ARISTOTLE | RFA-52-F100-4-R | Dipole | I-PEX | 2.00 | 2.08 | - |
| 5 | 1 | - | N/A | N/A | Printed | N/A | - | - | 3.57 |

Note 1: The above information was declared by manufacturer.
Note 2: The product has beamforming function for n/VHT/ax in 2.4GHz and the gain is 5.26dBi and n/ac/ax in 5GHz and the gain is 4.78dBi.

**For 2.4GHz function:**
**For IEEE 802.11b/g/n/VHT/ax (4TX/4RX):**
Port 1, Port 2, Pot 3 and Port 4 can be used as transmitting/receiving antenna.
Port 1, Port 2, Pot 3 and Port 4 could transmit/receive simultaneously.

**For 5GHz function:**
**For IEEE 802.11a/n/ac/ax (4TX/4RX):**
Port 1, Port 2, Pot 3 and Port 4 can be used as transmitting/receiving antenna.
Port 1, Port 2, Pot 3 and Port 4 could transmit/receive simultaneously.

**For Bluetooth function:**

Only Port 1 can be used as transmitting/receiving antenna.

### 1.1.3 Mode Test Duty Cycle

| Mode | DC | DCF(dB) | T(s) | VBW(Hz) ≥ 1/T |
|---|---|---|---|---|
| BT-BR(1Mbps) | 0.771 | 1.13 | 2.9m | 1k |
| BT-EDR(2Mbps) | 0.777 | 1.1 | 2.9m | 1k |
| BT-EDR(3Mbps) | 0.757 | 1.21 | 2.85m | 1k |

Note:
- DC is Duty Cycle.
- DCF is Duty Cycle Factor.

### 1.1.4 EUT Operational Condition

| | |
|---|---|
| **EUT Power Type** | From Power Adapter |
| **Test Software Version** | 17.10.77.12(r774095 WL TEST) |

### 1.1.5 Table for Multiple Listing

The EUT has two model names which are identical to each other in all aspects except for the following table:

| Model Name | Description |
|---|---|
| MR9600 | All the models are identical; different models serve as marketing strategy. |
| EA9350 | |

From the above models, model: MR9600 was selected as representative model for the test and its data was recorded in this report.

## 1.2 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15
- FCC KDB 558074 D01 v05r02
- FCC KDB 414788 D01 v01r01

## 1.3 Testing Location Information

| Testing Location | | | |
|---|---|---|---|
| ☐ | HWA YA | ADD : | No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) |
| | | TEL : | 886-3-327-3456 FAX : 886-3-327-0973 |
| ☒ | JHUBEI | ADD : | No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. |
| | | TEL : | 886-3-656-9065 FAX : 886-3-656-9085 |

| Test Condition | Test Site No. | Test Engineer | Test Environment | Test Date |
|---|---|---|---|---|
| RF Conducted | TH01-CB | DK Chang | 24.6-26.5℃ / 63-65% | May 09, 2019~ Aug. 17, 2019 |
| Radiated (Below 1GHz) | 03CH06-CB | Cola Fan | 25.3-26.6℃ / 60-66% | Apr. 30, 2019~ Aug. 28, 2019 |
| Radiated (Above 1GHz) | 03CH06-CB | Cola Fan | 29.7-30.5℃ / 67-69% | Apr. 30, 2019~ Aug. 28, 2019 |
| AC Conduction | CO01-CB | Max Lin | 23~24℃ / 59~60 % | Aug . 28, 2019 |

Test site Designation No. TW0006 with FCC.
Test site registered number IC 4086B with Industry Canada.

## 1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

| Test Items | Uncertainty | Remark |
|---|---|---|
| Conducted Emission (150kHz ~ 30MHz) | 2.0 dB | Confidence levels of 95% |
| Radiated Emission (30MHz ~ 1,000MHz) | 4.3 dB | Confidence levels of 95% |
| Radiated Emission (1GHz ~ 18GHz) | 4.3 dB | Confidence levels of 95% |
| Radiated Emission (18GHz ~ 40GHz) | 5.1 dB | Confidence levels of 95% |
| Conducted Emission | 2.4 dB | Confidence levels of 95% |
| Output Power Measurement | 1.5 dB | Confidence levels of 95% |
| Bandwidth Measurement | 2% | Confidence levels of 95% |

# 2 Test Configuration of EUT

## 2.1 Test Channel Mode

| Mode | PowerSetting |
|---|---|
| BT-BR(1Mbps) | - |
| 2402MHz | 4 |
| 2440MHz | a |
| 2480MHz | 8 |
| BT-EDR(2Mbps) | - |
| 2402MHz | a |
| 2440MHz | a |
| 2480MHz | a |
| BT-EDR(3Mbps) | - |
| 2402MHz | 8 |
| 2440MHz | a |
| 2480MHz | 9 |

## 2.2 The Worst Case Measurement Configuration

| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| **Tests Item** | AC power-line conducted emissions |
| **Condition** | AC power-line conducted measurement for line and neutral |
| **Operating Mode** | CTX |
| 1 | 2.4GHz + Adapter 1 |
| 2 | 5GHz + Adapter 1 |
| 3 | Bluetooth BR/EDR + Adapter 1 |
| 4 | Bluetooth LE + Adapter 1 |
| Mode 1 has been evaluated to be the worst case among Mode 1~4, thus measurement for Mode 5 ~ 7 will follow this same test mode. | |
| 5 | 2.4GHz + Adapter 2 |
| 6 | 2.4GHz + Adapter 3 |
| 7 | 2.4GHz + Adapter 4 + power cord |
| For operating mode 1 is the worst case and it was record in this test report. | |

| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| **Tests Item** | 20dB Bandwidth<br>Carrier Frequency Separation<br>Maximum Conducted Output Power<br>Number of Hopping Frequencies<br>Hopping Bandedge<br>Time of Occupancy (Dwell Time)<br>Emissions in Non-restricted Frequency Bands |
| **Test Condition** | Conducted measurement at transmit chains |

| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| **Tests Item** | Emissions in Restricted Frequency Bands |
| **Test Condition** | Radiated measurement<br>If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type. |
| **Operating Mode < 1GHz** | CTX |
| 1 | 2.4GHz + Adapter 1 |
| 2 | 5GHz + Adapter 1 |
| 3 | Bluetooth BR/EDR + Adapter 1 |
| 4 | Bluetooth LE + Adapter 1 |
| Mode 4 has been evaluated to be the worst case among Mode 1~4, thus measurement for Mode 5 ~ 7 will follow this same test mode. | |
| 5 | Bluetooth LE + Adapter 2 |
| 6 | Bluetooth LE + Adapter 3 |
| 7 | Bluetooth LE + Adapter 4 + power cord |
| For operating mode 4 is the worst case and it was record in this test report. | |
| **Operating Mode > 1GHz** | CTX |

| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| **Tests Item** | Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation |
| **Operating Mode** | |
| 1 | Bluetooth+WLAN 2.4GHz+WLAN 5GHz |
| Refer to Sporton Test Report No.: FA962635 for Co-location RF Exposure Evaluation. | |

Note: The EUT can only be used at Z axis position

## 2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

## 2.4 Accessories

| Accessories | | | | |
|---|---|---|---|---|
| **Equipment Name** | **Brand Name** | **Model Name** | **Rating** | **DC power Line** |
| Adapter 1 | Ktec | KSAS0501200400HU | Input: 100-240V~50/60Hz 1.2A<br>Output: 12V, 4.0A | - |
| Adapter 2 | Ktec | KSAS0501200400M2 | Input: 100-240V~50/60Hz 1.2A<br>Output: 12V, 4.0A | Non-Shielded, 1.3m |
| Adapter 3 | LEI | MU48AY120400-A1 | Input: 100-240V~50/60Hz 1.5A<br>Output: 12V, 4A | - |
| Adapter 4 | APD | DA-48T12 | Input: 100-240V~50/60Hz 1.4A Max<br>Output: 12V, 4A | Non-Shielded, 1.3m |
| **Others** | | | | |
| Power cord*2: Non-Shielded, 1m (Use for Adapter 2 and Adapter 4) | | | | |
| RJ-45 cable*1: Non-Shielded, 1m | | | | |

## 2.5 Support Equipment

**For AC Conduction:**

| Support Equipment | | | | |
|---|---|---|---|---|
| **No.** | **Equipment** | **Brand Name** | **Model Name** | **FCC ID** |
| A | Notebook | DELL | E6430 | N/A |
| B | Flash disk3.0 | Transcend | JetFlash-700 | N/A |
| C | Flash disk3.0 | Transcend | JetFlash-700 | N/A |

**For Radiated (below 1GHz):**

| Support Equipment | | | | |
|---|---|---|---|---|
| **No.** | **Equipment** | **Brand Name** | **Model Name** | **FCC ID** |
| A | Notebook | DELL | E4300 | N/A |

**For Radiated (above 1GHz):**

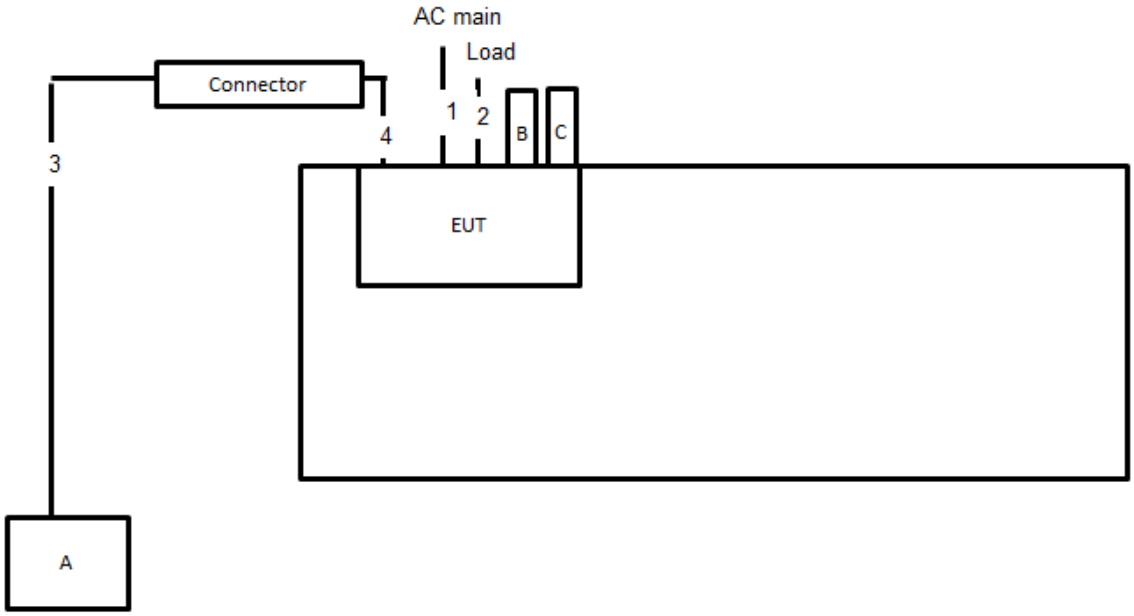
| Support Equipment | | | | |
|---|---|---|---|---|
| **No.** | **Equipment** | **Brand Name** | **Model Name** | **FCC ID** |
| A | Notebook | DELL | E4300 | N/A |

**For RF Conducted:**

| Support Equipment | | | | |
|---|---|---|---|---|
| **No.** | **Equipment** | **Brand Name** | **Model Name** | **FCC ID** |
| A | Notebook | DELL | E4300 | N/A |

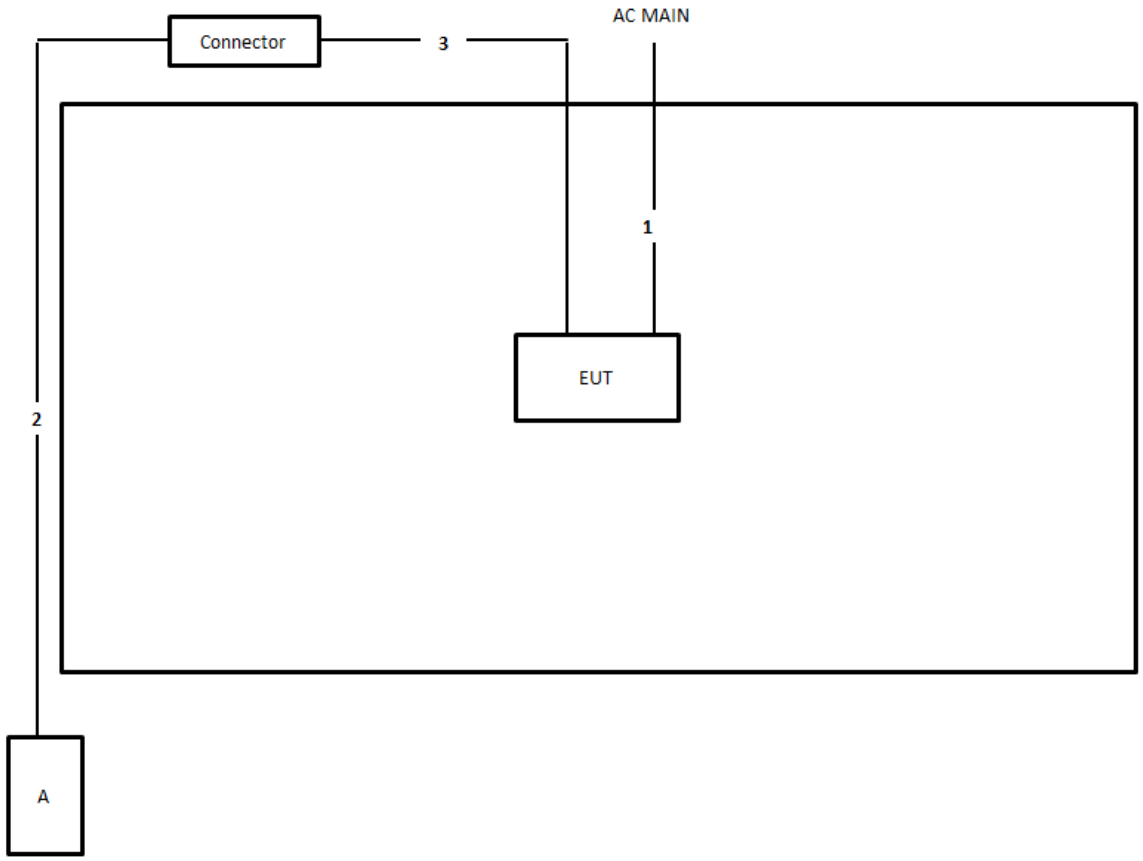
## 2.6 Test Setup Diagram

**Test Setup Diagram – AC Line Conducted Emission Test**



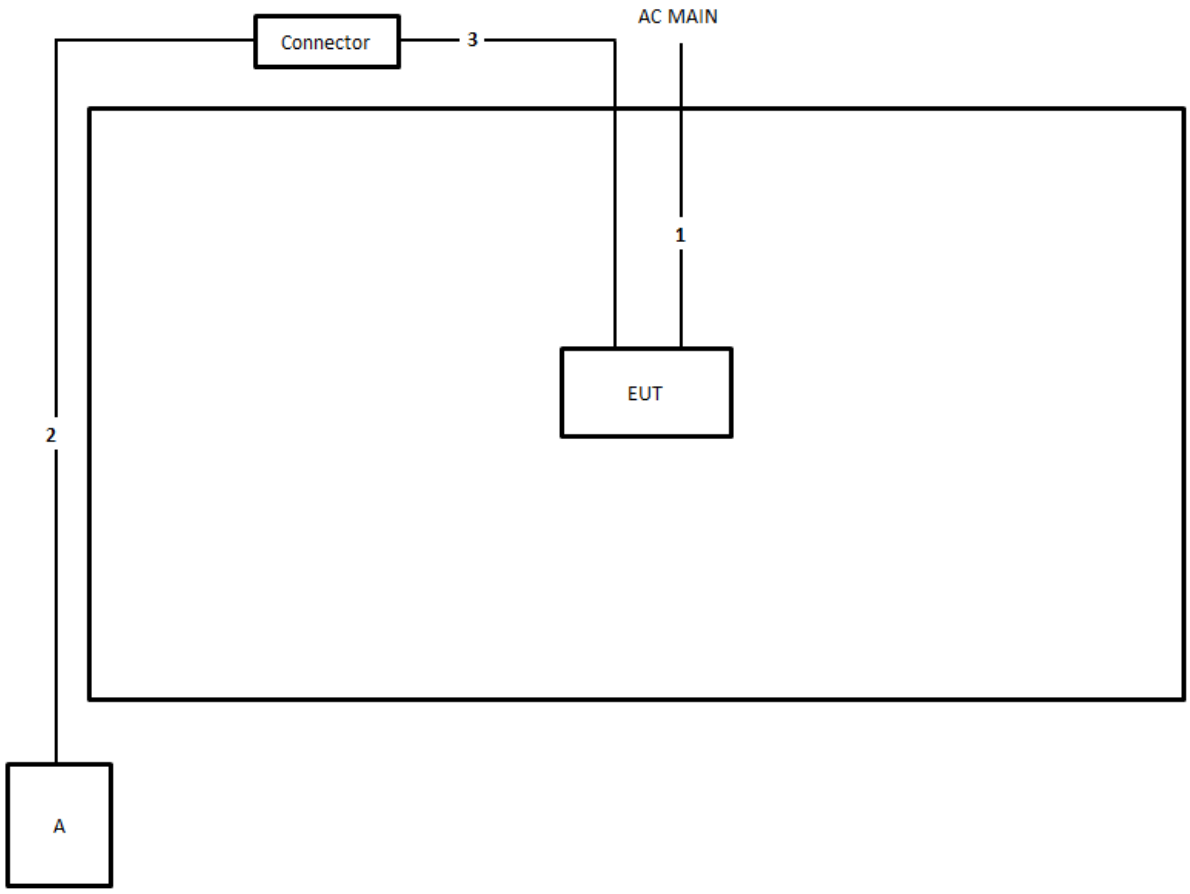

| Item | Connection | Shielded | Length |
|---|---|---|---|
| 1 | Power cable | No | 1.5m |
| 2 | RJ-45 cable*4 | No | 1.5m |
| 3 | RJ-45 cable | No | 10m |
| 4 | RJ-45 cable | No | 1m |

**Test Setup Diagram - Radiated Test < 1GHz**




| Item | Connection | Shielded | Length |
|---|---|---|---|
| 1 | Power cable | No | 1.5m |
| 2 | RJ-45 cable | No | 10m |
| 3 | RJ-45 cable | No | 1m |

**Test Setup Diagram - Radiated Test > 1GHz**




| Item | Connection | Shielded | Length |
|---|---|---|---|
| 1 | Power cable | No | 1.5m |
| 2 | RJ-45 cable | No | 10m |
| 3 | RJ-45 cable | No | 1m |

# 3 Transmitter Test Result

## 3.1 AC Power-line Conducted Emissions

### 3.1.1 AC Power-line Conducted Emissions Limit

| AC Power-line Conducted Emissions Limit | | |
|---|---|---|
| **Frequency Emission (MHz)** | **Quasi-Peak** | **Average** |
| 0.15-0.5 | 66 - 56 * | 56 - 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |
| Note 1: * Decreases with the logarithm of the frequency. | | |

### 3.1.2 Measuring Instruments

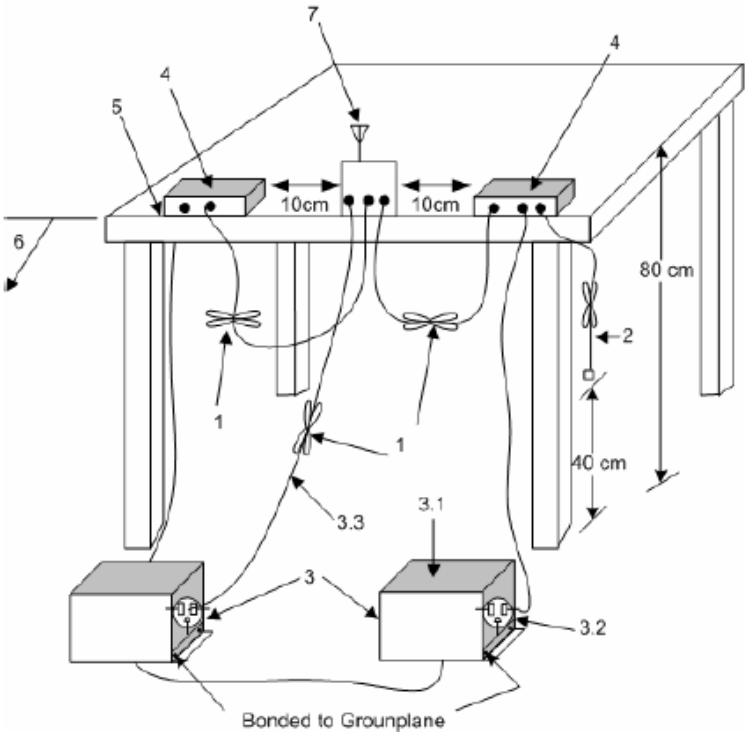
Refer a test equipment and calibration data table in this test report.

### 3.1.3 Test Procedures

| Test Method |
|---|
| ▪ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions. |

### 3.1.4 Test Setup

**AC Power-line Conducted Emissions**




1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.
2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
3.1—All other equipment powered from additional LISN(s).
3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
3.3—LISN at least 80 cm from nearest part of EUT chassis.
4—Non-EUT components of EUT system being tested.
5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

### 3.1.5 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

# 3.2 20dB Bandwidth and Carrier Frequency Separation

## 3.2.1 20dB Bandwidth and Carrier Frequency Separation Limit

| 20dB Bandwidth and Carrier Frequency Separation Limit for Frequency Hopping Systems |
|---|
| ▪ 902-928 MHz Band: |
| ▪ N ≥50 and ChS ≥ MAX (20 dB bandwidth, 25 kHz); 20 dB bandwidth≤ 250 kHz. |
| ▪ 50 >N≥25 and ChS ≥ MAX (20 dB bandwidth, 25 kHz); 20 dB bandwidth>250 kHz. |
| ▪ 2400-2483.5 MHz Band: |
| ▪ N ≥75 and ChS ≥ MAX (20 dB bandwidth, 25 kHz). |
| ▪ 75>N ≥ 15 and ChS ≥ MAX (20 dB bandwidth 2/3,25 kHz). |
| ▪ 5725-5850 MHz Band: |
| ▪ N ≥ 75 and ChS ≥ MAX (20 dB bandwidth, 25 kHz); 20 dB bandwidth≤ 1 MHz. |
| **N:**Number of Hopping Frequencies; **ChS**: Hopping Channel Separation |

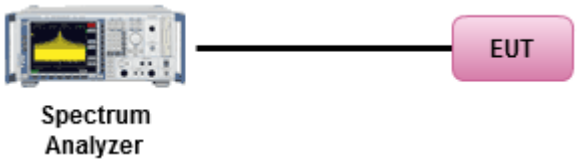
## 3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

## 3.2.3 Test Procedures

| Test Method |
|---|
| ▪ Refer as ANSI C63.10-2013, clause 6.9.1 for 20 dB bandwidth measurement. |
| ▪ Refer as ANSI C63.10-2013, clause 7.8.2 for carrier frequency separation measurement. |

## 3.2.4 Test Setup

| 20dB Bandwidth and Carrier Frequency Separation |
|---|
|  |



## 3.2.5 Test Result of 20dB Bandwidth

Refer as Appendix B

## 3.2.6 Test Result of Carrier Frequency Separation

Refer as Appendix B

# 3.3 Maximum Conducted Output Power

## 3.3.1 Maximum Conducted Output Power Limit

| Maximum Conducted Output Power Limit |
|---|
| ▪ 902-928 MHz Band: |
| ▪ N ≥50; Power 30dBm; EIRP 36dBm |
| ▪ 50 >N≥ 25; Power 24dBm; EIRP 30dBm |
| ▪ 2400-2483.5 MHz Band: |
| ▪ N ≥ 75; Power 30dBm; EIRP 36dBm |
| ▪ 75 >N ≥ 15; Power 21dBm; EIRP 27dBm |
| ▪ 5725-5850 MHz Band: |
| ▪ N ≥ 75; Power 30dBm; EIRP 36dBm |
| **N:**Number of Hopping Frequencies |

## 3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

## 3.3.3 Test Procedures

| Test Method |
|---|
| ▪ Refer as ANSI C63.10-2013, clause 7.8.5 for output power measurement. |

## 3.3.4 Test Setup

| Maximum Conducted Output Power (Peak Power Meter) |
|---|
|  |



## 3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

# 3.4 Number of Hopping Frequencies and Hopping Bandedge

## 3.4.1 Number of Hopping Frequencies Limit

| Number of Hopping Frequencies Limit |
|---|
| ▪ 902-928 MHz Band: |
| ▪ N ≥50 and ChS ≥ MAX (20 dB bandwidth, 25 kHz); 20 dB bandwidth≤ 250 kHz. |
| ▪ 50 >N≥ 25 and ChS ≥ MAX (20 dB bandwidth, 25 kHz); 20 dB bandwidth>250 kHz. |
| ▪ 2400-2483.5 MHz Band: |
| ▪ N ≥ 75 and ChS ≥ MAX (20 dB bandwidth, 25 kHz). |
| ▪ 75 >N ≥ 15 and ChS ≥ MAX (20 dB bandwidth 2/3,25 kHz). |
| ▪ 5725-5850 MHz Band: |
| ▪ N ≥ 75 and ChS ≥ MAX (20 dB bandwidth, 25 kHz); 20 dB bandwidth≤ 1 MHz. |
| **N:**Number of Hopping Frequencies; **ChS** : Hopping Channel Separation |

## 3.4.2 Hopping Bandedge Limit

Refer clause 3.6.1 and clause 3.7.1

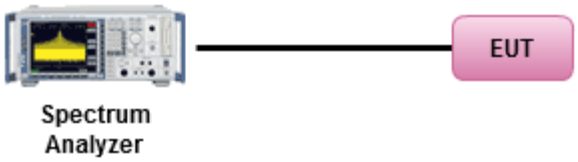
## 3.4.3 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

## 3.4.4 Test Procedures

| Test Method |
|---|
| ▪ Refer as ANSI C63.10-2013, clause 7.8.3 for number of hopping frequencies measurement. |
| ▪ Refer as ANSI C63.10-2013, clause 7.8.6 for hopping frequencies Bandedge measurement. |

## 3.4.5 Test Setup

| Number of Hopping Frequencies and Hopping Frequencies Bandedge |
|---|
|  |

## 3.4.6 Test Result of Number of Hopping Frequencies

Refer as Appendix D

## 3.4.7 Test Result of Number of Hopping Frequencies Bandedge

Refer as Appendix D

# 3.5 Time of Occupancy (Dwell Time)

## 3.5.1 Time of Occupancy (Dwell Time) Limit

| 20dB Bandwidth and Carrier Frequency Separation Limit for Frequency Hopping Systems |
|---|
| ▪ 902-928 MHz Band: |
| ▪ N ≥50; 0.4s in 20s period |
| ▪ 50 >N≥ 25; 0.4s in 10s period |
| ▪ 2400-2483.5 MHz Band: |
| ▪ N ≥ 75; 0.4s in N x 0.4 period |
| ▪ 75 >N ≥ 15; 0.4s in N x 0.4 period |
| ▪ 5725-5850 MHz Band: |
| ▪ N ≥ 75; 0.4s in 30s period |
| **N:**Number of Hopping Frequencies |

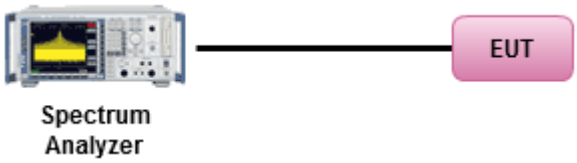
## 3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

## 3.5.3 Test Procedures

| Test Method |
|---|
| ▪ Refer as ANSI C63.10-2013, clause 7.8.4 for dwell time measurement. |
| ▪ Bluetooth ACL packets can be 1, 3, or 5 time slots. Following as dwell time. Operate DH5 at maximum dwell time and maximum duty cycle. |
| ▪ The DH5 packet can cover up to 5 time slots. Operate DH5 at maximum dwell time and maximum duty cycle. A maximum length packet has duration of 5 time slots. The hopping rate is 1600 hops/second so the maximum dwell time is 5/1600 seconds, or 3.125ms.DH5 Packet permit maximum 1600/ 79 / 6 = 3.37 hops per second in each channel. |

## 3.5.4 Test Setup

| Time of Occupancy (Dwell Time) |
|---|
|  |

## 3.5.5 Test Result of Time of Occupancy (Dwell Time)

Refer as Appendix E

# 3.6 Emissions in Non-restricted Frequency Bands

## 3.6.1 Emissions in Non-restricted Frequency Bands Limit

| Un-restricted Band Emissions Limit | |
|---|---|
| **RF output power procedure** | **Limit (dBc)** |
| Peak output power procedure | 20 |
| Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level. | |

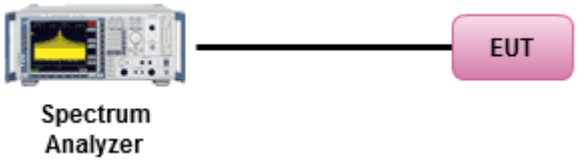
## 3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

## 3.6.3 Test Procedures

| Test Method |
|---|
| ▪ Refer as ANSI C63.10-2013, clause 7.8.8 for unwanted emissions into non-restricted bands. |

## 3.6.4 Test Setup

| Emissions in Non-restricted Frequency Bands |
|---|
|   |

## 3.6.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix F

# 3.7 Emissions in Restricted Frequency Bands

## 3.7.1 Emissions in Restricted Frequency Bands Limit

| Restricted Band Emissions Limit | | | |
|---|---|---|---|
| **Frequency Range (MHz)** | **Field Strength (uV/m)** | **Field Strength (dBuV/m)** | **Measure Distance (m)** |
| 0.009~0.490 | 2400/F(kHz) | 48.5 - 13.8 | 300 |
| 0.490~1.705 | 24000/F(kHz) | 33.8 - 23 | 30 |
| 1.705~30.0 | 30 | 29 | 30 |
| 30~88 | 100 | 40 | 3 |
| 88~216 | 150 | 43.5 | 3 |
| 216~960 | 200 | 46 | 3 |
| Above 960 | 500 | 54 | 3 |

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB / decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

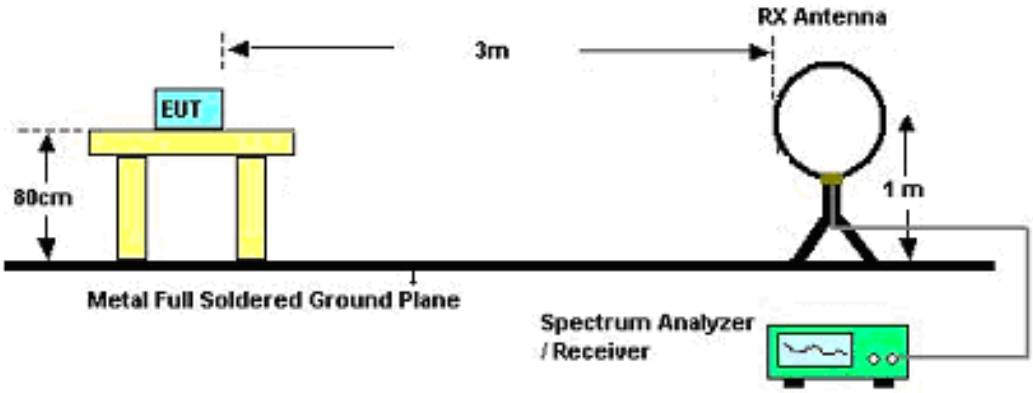
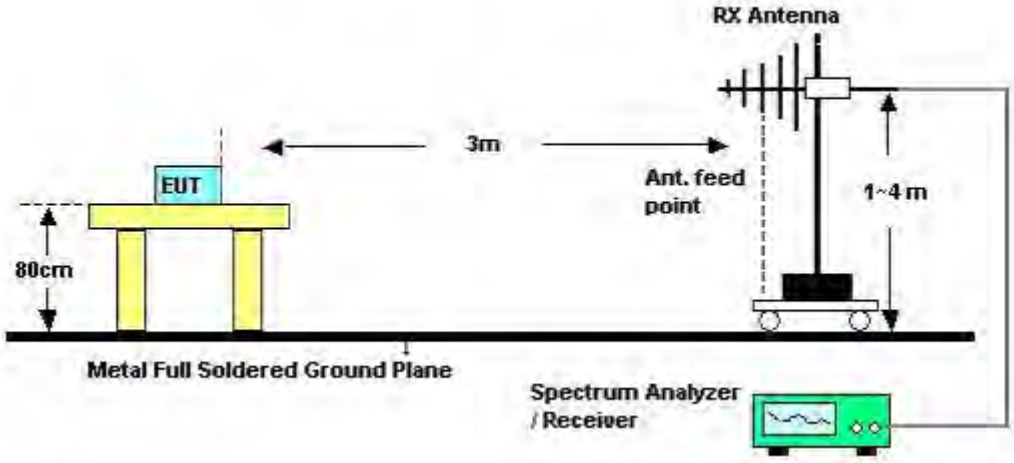
## 3.7.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

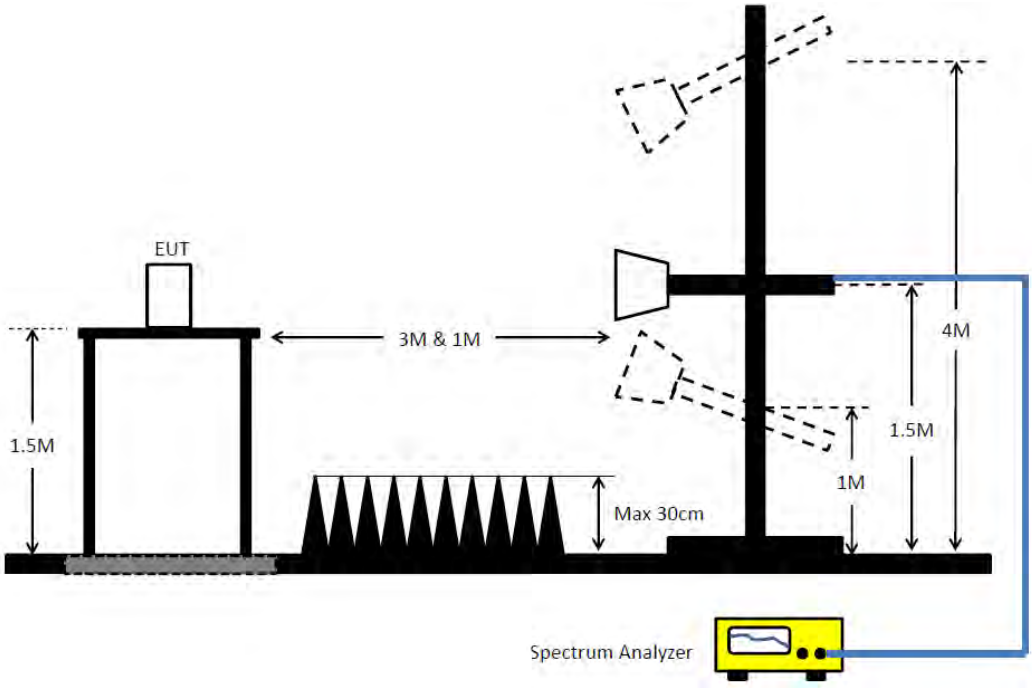
## 3.7.3 Test Procedures

| Test Method | |
|---|---|
| ▪ The average emission levels shall be measured in [hopping duty factor]. | |
| ▪ Refer as ANSI C63.10; clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band. | |
| ▪ For the transmitter unwanted emissions shall be measured using following options below: | |
| | ▪ Refer as ANSI C63.10, clause 4.1.4.2.1 QP value. |
| | ▪ Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak. |
| | ▪ Refer as ANSI C63.10, clause 4.1.4.2.4 average value of hopping pulsed emissions. |

### 3.7.4 Test Setup

| Emissions in Restricted Frequency Bands |
|---|
| 9kHz ~30MHz |
|  |
| 30MHz~1GHz |
|  |

**Above 1GHz**




### 3.7.5 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

### 3.7.6 Emissions in Restricted Frequency Bands (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.
All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.
The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.

### 3.7.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix G

# 4 Test Equipment and Calibration Data

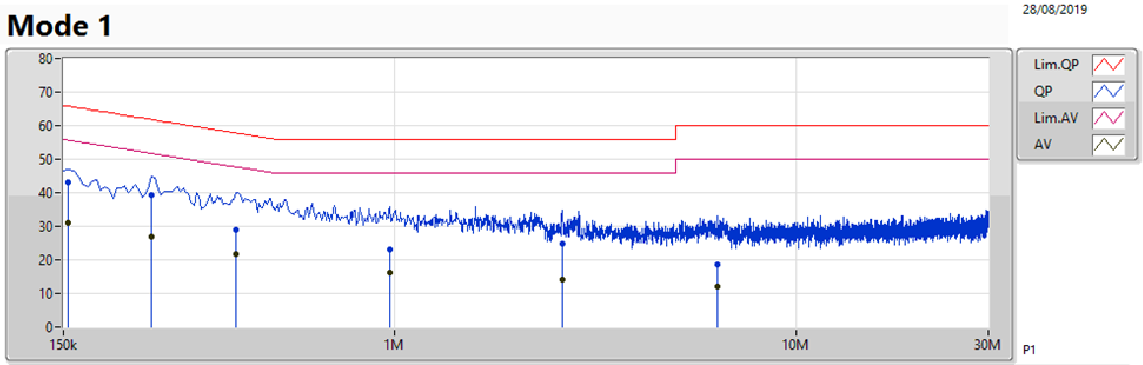
| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Calibration Due Date | Remark |
|---|---|---|---|---|---|---|---|
| EMI Receiver | Agilent | N9038A | My52260123 | 9kHz ~ 8.45GHz | Jan. 28, 2019 | Jan. 29, 2020 | Conduction (CO01-CB) |
| LISN | F.C.C. | FCC-LISN-50-16-2 | 04083 | 150kHz ~ 100MHz | Dec. 24, 2018 | Dec. 23, 2019 | Conduction (CO01-CB) |
| LISN | Schwarzbeck | NSLK 8127 | 8127647 | 9kHz ~ 30MHz | Jan. 11, 2019 | Jan. 10, 2020 | Conduction (CO01-CB) |
| COND Cable | Woken | Cable | Low cable-CO01 | 9kHz ~ 30MHz | May 21, 2019 | May 20, 2020 | Conduction (CO01-CB) |
| Software | Audix | E3 | 6.120210n | - | N.C.R. | N.C.R. | Conduction (CO01-CB) |
| Loop Antenna | Teseq | HLA 6120 | 24155 | 9kHz - 30 MHz | Mar. 29, 2019 | Mar. 28, 2020 | Radiation (03CH06-CB) |
| Bilog Antenna with 6 dB attenuator | TESEQ & EMCI | CBL6112D & N-6-06 | 37878 & AT-N0606 | 20MHz ~ 2GHz | Aug. 04, 2018 | Aug. 03, 2019 | Radiation (03CH06-CB) |
| Bilog Antenna with 6 dB attenuator | TESEQ & Woken | CBL6112D N-6-06-06 | 37880 & AT-N0609 | 20MHz ~ 2GHz | Aug. 27, 2018 | Aug. 26, 2019 | Radiation (03CH06-CB) |
| Horn Antenna | EMCO | 3115 | 00075790 | 750MHz ~ 18GHz | Nov. 13, 2018 | Nov. 12, 2019 | Radiation (03CH06-CB) |
| Horn Antenna | SCHWARZBECK | BBHA9120D | 9120D-1292 | 1GHz~18GHz | Jul. 17, 2019 | Jul. 16, 2020 | Radiation (03CH06-CB) |
| Horn Antenna | Schwarzbeck | BBHA 9170 | BBHA9170252 | 15GHz ~ 40GHz | Jun. 28, 2018 | Jun. 27, 2019 | Radiation (03CH06-CB) |
| Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA9170507 | 15GHz ~ 40GHz | Jun. 12, 2019 | Jun. 11, 2020 | Radiation (03CH06-CB) |
| Pre-Amplifier | EMCI | EMC330N | 980332 | 20MHz ~ 3GHz | May 02, 2018 | May 01, 2019 | Radiation (03CH06-CB) |
| Pre-Amplifier | EMCI | EMC330N | 980332 | 20MHz ~ 3GHz | May 01, 2019 | Apr. 30, 2020 | Radiation (03CH06-CB) |
| Pre-Amplifier | Agilent | 8449B | 3008A02310 | 1GHz ~ 26.5GHz | Jan. 08, 2019 | Jan. 07, 2020 | Radiation (03CH06-CB) |
| Pre-Amplifier | MITEQ | TTA1840-35-HG | 1864479 | 18GHz ~ 40GHz | Jul. 04, 2018 | Jul. 03, 2019 | Radiation (03CH06-CB) |
| Pre-Amplifier | MITEQ | TTA1840-35-HG | 1864479 | 18GHz ~ 40GHz | Jul. 03, 2019 | Jul. 02, 2020 | Radiation (03CH06-CB) |
| Spectrum analyzer | R&S | FSP40 | 100080 | 9kHz~40GHz | Oct. 03, 2018 | Oct. 02, 2019 | Radiation (03CH06-CB) |
| EMI Test Receiver | R&S | ESCS | 100359 | 9kHz ~ 2.75GHz | Jul. 03, 2018 | Jul. 02, 2019 | Radiation (03CH06-CB) |
| EMI Test Receiver | R&S | ESCS | 826547/017 | 9kHz ~ 2.75GHz | May 15, 2019 | May 14, 2020 | Radiation (03CH06-CB) |
| RF Cable-low | HUBER+SUHNER | RG402 | Low Cable-05+24 | 30MHz~1GHz | Oct. 08, 2018 | Oct. 07, 2019 | Radiation (03CH06-CB) |
| RF Cable-high | HUBER+SUHNER | RG402 | High Cable-05 | 1GHz~18GHz | Oct. 08, 2018 | Oct. 07, 2019 | Radiation (03CH06-CB) |

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Calibration Due Date | Remark |
|---|---|---|---|---|---|---|---|
| RF Cable-high | HUBER+SUHNER | RG402 | High Cable-05+24 | 1GHz~18GHz | Oct. 08, 2018 | Oct. 07, 2019 | Radiation (03CH06-CB) |
| RF Cable-high | Woken | RG402 | High Cable-40G#1 | 18GHz ~ 40 GHz | Jul. 27, 2018 | Jul. 26, 2019 | Radiation (03CH06-CB) |
| RF Cable-high | Woken | RG402 | High Cable-40G#1 | 18GHz ~ 40 GHz | Jul. 24, 2019 | Jul. 23, 2020 | Radiation (03CH06-CB) |
| RF Cable-high | Woken | RG402 | High Cable-40G#2 | 18GHz ~ 40 GHz | Jul. 27, 2018 | Jul. 26, 2019 | Radiation (03CH06-CB) |
| RF Cable-high | Woken | RG402 | High Cable-40G#2 | 18GHz ~ 40 GHz | Jul. 24, 2019 | Jul. 23, 2020 | Radiation (03CH06-CB) |
| Spectrum analyzer | R&S | FSV40 | 100979 | 9kHz~40GHz | Feb. 25, 2019 | Feb. 24, 2020 | Conducted (TH01-CB) |
| RF Cable-high | Woken | RG402 | High Cable-06 | 1 GHz – 26.5 GHz | Oct. 08, 2018 | Oct. 07, 2019 | Conducted (TH01-CB) |
| RF Cable-high | Woken | RG402 | High Cable-07 | 1 GHz –26.5 GHz | Oct. 08, 2018 | Oct. 07, 2019 | Conducted (TH01-CB) |
| RF Cable-high | Woken | RG402 | High Cable-08 | 1 GHz –26.5 GHz | Oct. 08, 2018 | Oct. 07, 2019 | Conducted (TH01-CB) |
| RF Cable-high | Woken | RG402 | High Cable-09 | 1 GHz –26.5 GHz | Oct. 08, 2018 | Oct. 07, 2019 | Conducted (TH01-CB) |
| RF Cable-high | Woken | RG402 | High Cable-10 | 1 GHz –26.5 GHz | Oct. 08, 2018 | Oct. 07, 2019 | Conducted (TH01-CB) |
| RF Cable-high | Woken | RG402 | High Cable-28 | 1 GHz –26.5 GHz | Nov. 19, 2018 | Nov. 18, 2019 | Conducted (TH01-CB) |
| Power Sensor | Agilent | E9327A | US40442088 | 50MHz~18GHz | Jan. 15, 2019 | Jan. 14, 2020 | Conducted (TH01-CB) |
| Power Meter | Agilent | E4416A | GB41291199 | 50MHz~18GHz | Jan. 15, 2019 | Jan. 14, 2020 | Conducted (TH01-CB) |

Note: Calibration Interval of instruments listed above is one year.

NCR means Non-Calibration required.

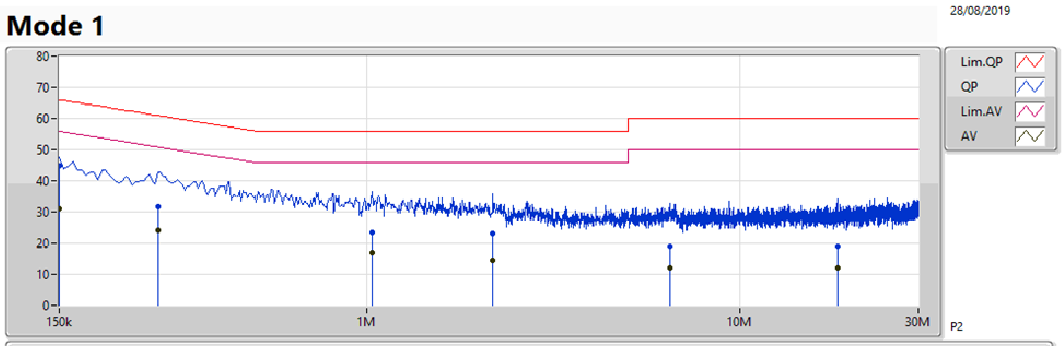
| AC Power-line Conducted Emissions Result | | | |
|---|---|---|---|
| **Operating Mode** | 1 | **Power Phase** | Line |
| **Operating Function** | CTX | | |




| Type | Freq | Level | Limit | Margin | Factor | Condition | Comment | Raw | AF | CL | AT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV) | (dBuV) | (dB) | (dB) | | | (dBuV) | (dB) | (dB) | (dB) |
| QP | 154.5k | 43.11 | 65.75 | -22.64 | 9.90 | Line | - | 33.21 | 0.05 | 0.06 | 9.79 |
| AV | 154.5k | 30.94 | 55.75 | -24.81 | 9.90 | Line | - | 21.04 | 0.05 | 0.06 | 9.79 |
| QP | 249k | 39.26 | 61.79 | -22.53 | 9.92 | Line | "Worst" | 29.34 | 0.06 | 0.06 | 9.80 |
| AV | 249k | 26.76 | 51.79 | -25.03 | 9.92 | Line | - | 16.84 | 0.06 | 0.06 | 9.80 |
| QP | 402k | 28.82 | 57.82 | -29.00 | 9.93 | Line | - | 18.89 | 0.06 | 0.06 | 9.81 |
| AV | 402k | 21.86 | 47.82 | -25.96 | 9.93 | Line | - | 11.93 | 0.06 | 0.06 | 9.81 |
| QP | 973.5k | 22.94 | 56.00 | -33.06 | 9.98 | Line | - | 12.96 | 0.07 | 0.09 | 9.82 |
| AV | 973.5k | 16.15 | 46.00 | -29.85 | 9.98 | Line | - | 6.17 | 0.07 | 0.09 | 9.82 |
| QP | 2.607M | 24.75 | 56.00 | -31.25 | 10.06 | Line | - | 14.69 | 0.10 | 0.14 | 9.82 |
| AV | 2.607M | 14.26 | 46.00 | -31.74 | 10.06 | Line | - | 4.20 | 0.10 | 0.14 | 9.82 |
| QP | 6.36M | 18.79 | 60.00 | -41.21 | 10.24 | Line | - | 8.55 | 0.17 | 0.20 | 9.87 |
| AV | 6.36M | 12.13 | 50.00 | -37.87 | 10.24 | Line | - | 1.89 | 0.17 | 0.20 | 9.87 |

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

| AC Power-line Conducted Emissions Result | | | |
|---|---|---|---|
| **Operating Mode** | 1 | **Power Phase** | Neutral |
| **Operating Function** | CTX | | |




| Type | Freq | Level | Limit | Margin | Factor | Condition | Comment | Raw | AF | CL | AT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV) | (dBuV) | (dB) | (dB) | | | (dBuV) | (dB) | (dB) | (dB) |
| QP | 150k | 44.70 | 66.00 | -21.30 | 9.89 | Neutral | "Worst" | 34.81 | 0.04 | 0.06 | 9.79 |
| AV | 150k | 30.99 | 56.00 | -25.01 | 9.89 | Neutral | - | 21.10 | 0.04 | 0.06 | 9.79 |
| QP | 276k | 31.83 | 60.93 | -29.10 | 9.90 | Neutral | - | 21.93 | 0.04 | 0.06 | 9.80 |
| AV | 276k | 24.28 | 50.93 | -26.65 | 9.90 | Neutral | - | 14.38 | 0.04 | 0.06 | 9.80 |
| QP | 1.032M | 23.44 | 56.00 | -32.56 | 9.97 | Neutral | - | 13.47 | 0.06 | 0.09 | 9.82 |
| AV | 1.032M | 16.77 | 46.00 | -29.23 | 9.97 | Neutral | - | 6.80 | 0.06 | 0.09 | 9.82 |
| QP | 2.171M | 22.96 | 56.00 | -33.04 | 10.03 | Neutral | - | 12.93 | 0.07 | 0.13 | 9.83 |
| AV | 2.171M | 14.49 | 46.00 | -31.51 | 10.03 | Neutral | - | 4.46 | 0.07 | 0.13 | 9.83 |
| QP | 6.464M | 18.88 | 60.00 | -41.12 | 10.22 | Neutral | - | 8.66 | 0.15 | 0.20 | 9.87 |
| AV | 6.464M | 12.15 | 50.00 | -37.85 | 10.22 | Neutral | - | 1.93 | 0.15 | 0.20 | 9.87 |
| QP | 18.2M | 18.85 | 60.00 | -41.15 | 10.45 | Neutral | - | 8.40 | 0.24 | 0.24 | 9.97 |
| AV | 18.2M | 12.12 | 50.00 | -37.88 | 10.45 | Neutral | - | 1.67 | 0.24 | 0.24 | 9.97 |

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

## Summary

| Mode | Max-N dB (Hz) | Max-OBW (Hz) | ITU-Code | Min-N dB (Hz) | Min-OBW (Hz) |
|---|---|---|---|---|---|
| 2.4-2.4835GHz | - | - | - | - | - |
| BT-BR(1Mbps) | 920k | 890.805k | 891KF1D | 920k | 887.056k |
| BT-EDR(2Mbps) | 1.338M | 1.232M | 1M23G1D | 1.335M | 1.224M |
| BT-EDR(3Mbps) | 1.323M | 1.223M | 1M22G1D | 1.31M | 1.219M |

**Max-N dB** = Maximum 20dB down bandwidth; **Max-OBW** = Maximum 99% occupied bandwidth;
**Min-N dB** = Minimum 20dB down bandwidth; **Min-OBW** = Minimum 99% occupied bandwidth;

## Result

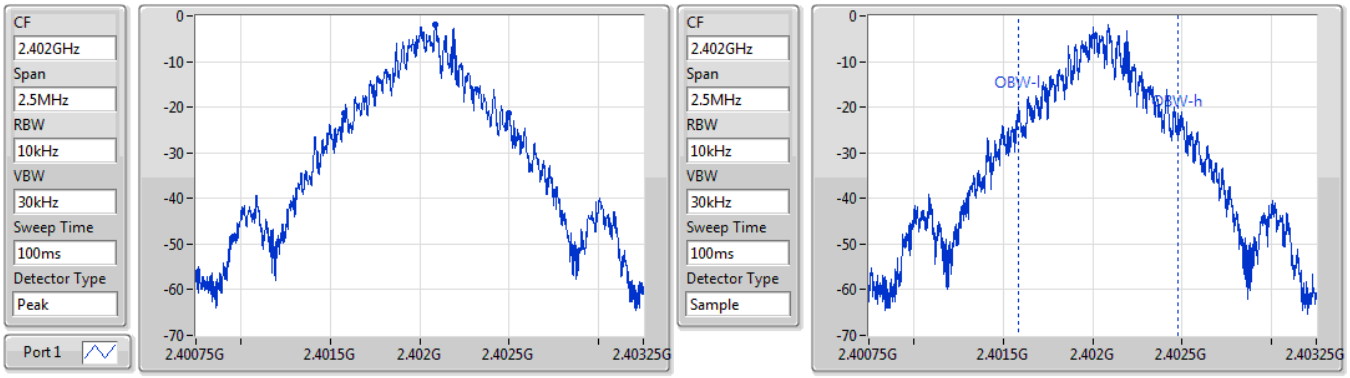
| Mode | Result | Limit (Hz) | Port 1-N dB (Hz) | Port 1-OBW (Hz) |
|---|---|---|---|---|
| BT-BR(1Mbps) | - | - | - | - |
| 2402MHz | Pass | Inf | 920k | 889.555k |
| 2440MHz | Pass | Inf | 920k | 890.805k |
| 2480MHz | Pass | Inf | 920k | 887.056k |
| BT-EDR(2Mbps) | - | - | - | - |
| 2402MHz | Pass | Inf | 1.338M | 1.224M |
| 2440MHz | Pass | Inf | 1.335M | 1.232M |
| 2480MHz | Pass | Inf | 1.336M | 1.224M |
| BT-EDR(3Mbps) | - | - | - | - |
| 2402MHz | Pass | Inf | 1.318M | 1.223M |
| 2440MHz | Pass | Inf | 1.323M | 1.219M |
| 2480MHz | Pass | Inf | 1.31M | 1.221M |

**Port X-N dB** = Port **X** 20dB down bandwidth; **Port X-OBW** = Port **X** 99% occupied bandwidth;

## BT-BR(1Mbps) EBW

### 2402MHz

17/08/2019

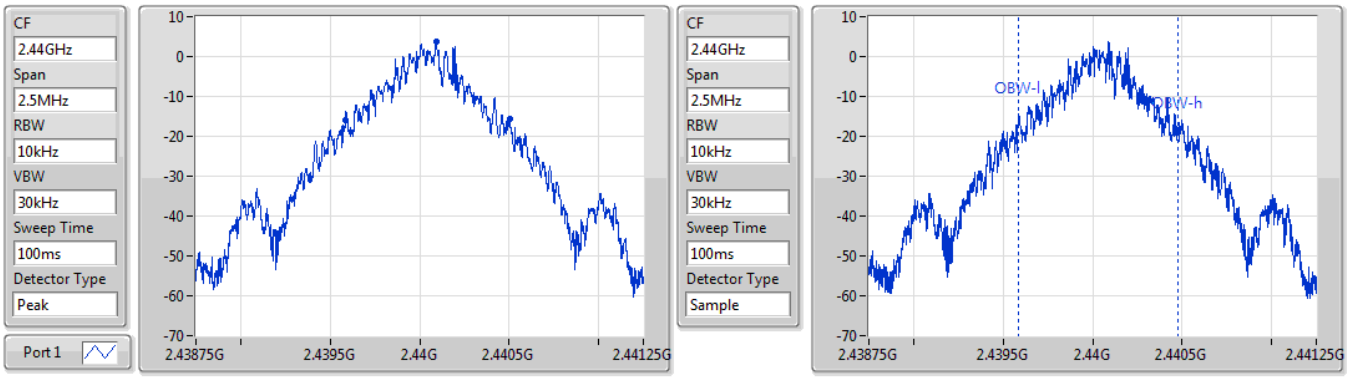



| 20dB(Hz) | Fl-20dB(Hz) | Fh-20dB(Hz) | OBW(Hz) | Fl-OBW(Hz) | Fh-OBW(Hz) | Limit(Hz) | Port |
|---|---|---|---|---|---|---|---|
| 920k | 2.401581G | 2.402501G | 889.555k | 2.401588G | 2.402477G | Inf | 1 |

## BT-BR(1Mbps) EBW

### 2440MHz

17/08/2019



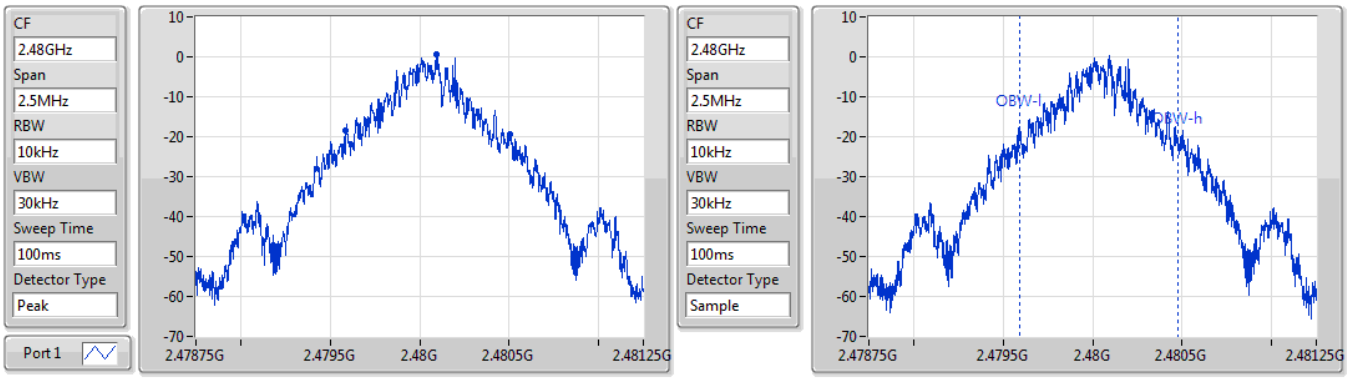

| 20dB(Hz) | Fl-20dB(Hz) | Fh-20dB(Hz) | OBW(Hz) | Fl-OBW(Hz) | Fh-OBW(Hz) | Limit(Hz) | Port |
|---|---|---|---|---|---|---|---|
| 920k | 2.439584G | 2.440504G | 890.805k | 2.439589G | 2.44048G | Inf | 1 |

## BT-BR(1Mbps)

## EBW

## 2480MHz

17/08/2019



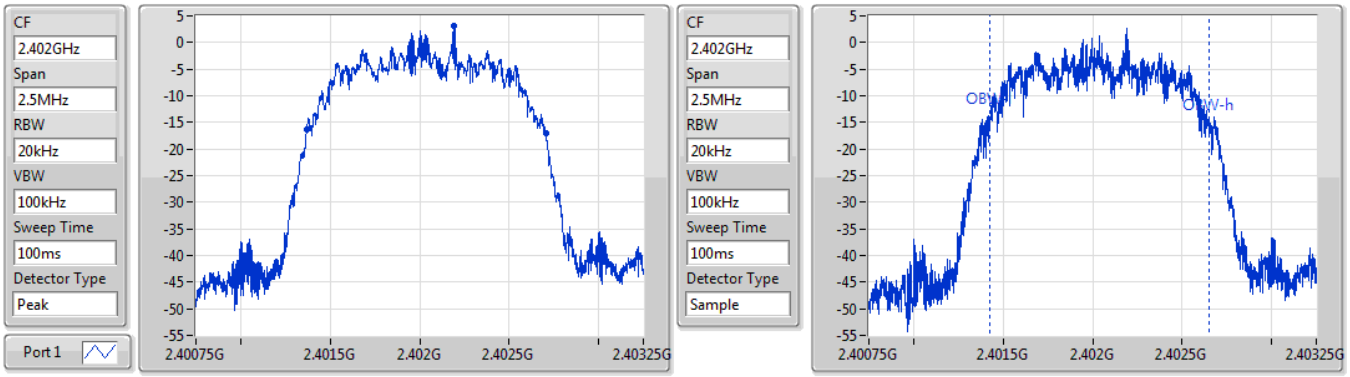

| 20dB(Hz) | Fl-20dB(Hz) | Fh-20dB(Hz) | OBW(Hz) | Fl-OBW(Hz) | Fh-OBW(Hz) | Limit(Hz) | Port |
|---|---|---|---|---|---|---|---|
| 920k | 2.479588G | 2.480508G | 887.056k | 2.479591G | 2.480479G | Inf | 1 |

## BT-EDR(2Mbps)

## EBW

## 2402MHz

17/08/2019

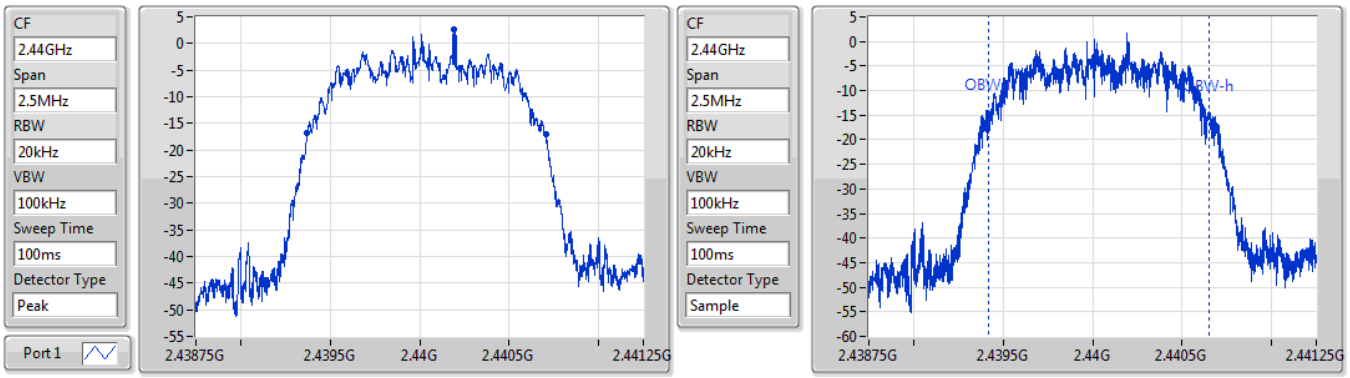



| 20dB(Hz) | Fl-20dB(Hz) | Fh-20dB(Hz) | OBW(Hz) | Fl-OBW(Hz) | Fh-OBW(Hz) | Limit(Hz) | Port |
|---|---|---|---|---|---|---|---|
| 1.338M | 2.401369G | 2.402706G | 1.224M | 2.401424G | 2.402648G | Inf | 1 |

## BT-EDR(2Mbps) EBW

### 2440MHz

17/08/2019

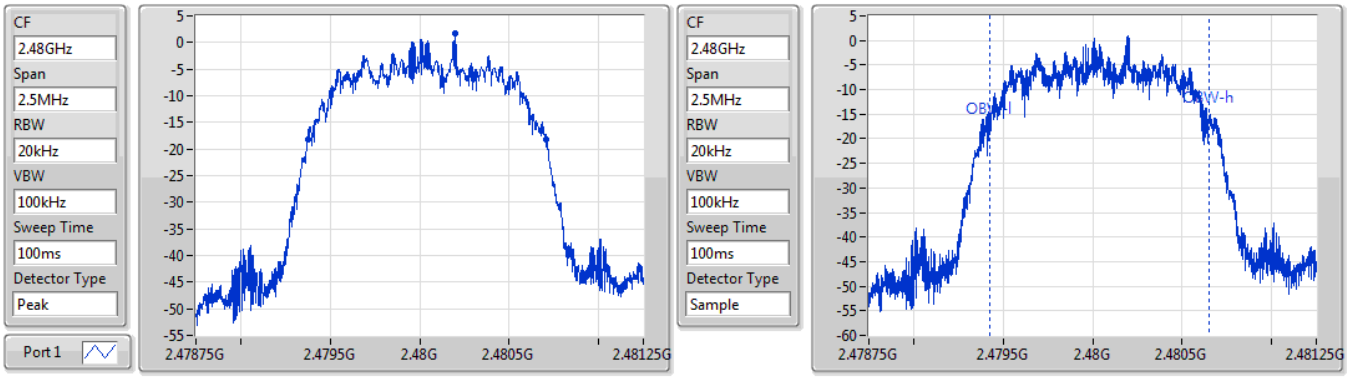



| 20dB(Hz) | Fl-20dB(Hz) | Fh-20dB(Hz) | OBW(Hz) | Fl-OBW(Hz) | Fh-OBW(Hz) | Limit(Hz) | Port |
|---|---|---|---|---|---|---|---|
| 1.335M | 2.439371G | 2.440706G | 1.232M | 2.439418G | 2.44065G | Inf | 1 |

## BT-EDR(2Mbps) EBW

### 2480MHz

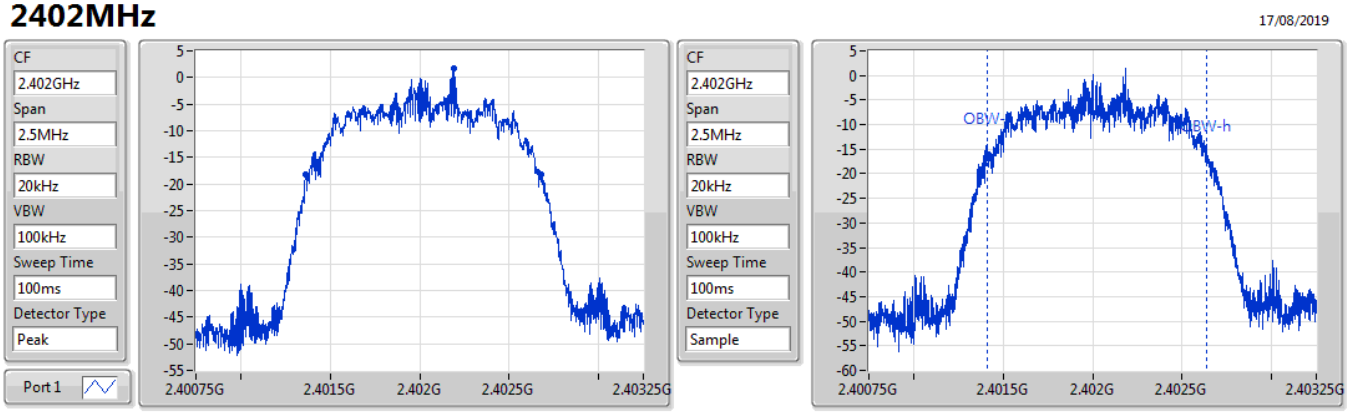
17/08/2019




| 20dB(Hz) | Fl-20dB(Hz) | Fh-20dB(Hz) | OBW(Hz) | Fl-OBW(Hz) | Fh-OBW(Hz) | Limit(Hz) | Port |
|---|---|---|---|---|---|---|---|
| 1.336M | 2.479374G | 2.48071G | 1.224M | 2.479428G | 2.480652G | Inf | 1 |

## BT-EDR(3Mbps) EBW

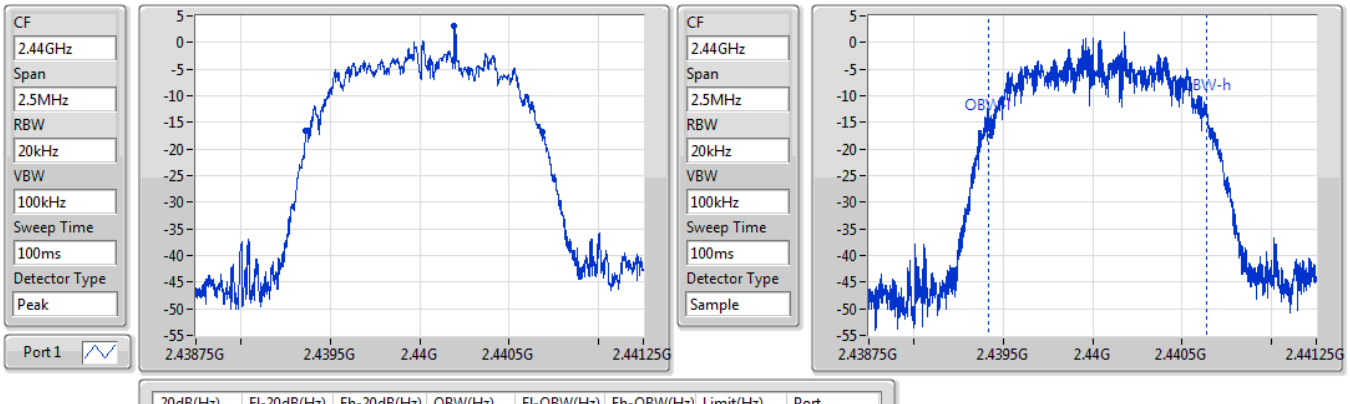
### 2402MHz




| 20dB(Hz) | Fl-20dB(Hz) | Fh-20dB(Hz) | OBW(Hz) | Fl-OBW(Hz) | Fh-OBW(Hz) | Limit(Hz) | Port |
|---|---|---|---|---|---|---|---|
| 1.318M | 2.401364G | 2.402681G | 1.223M | 2.401414G | 2.402637G | Inf | 1 |

## BT-EDR(3Mbps) EBW

### 2440MHz

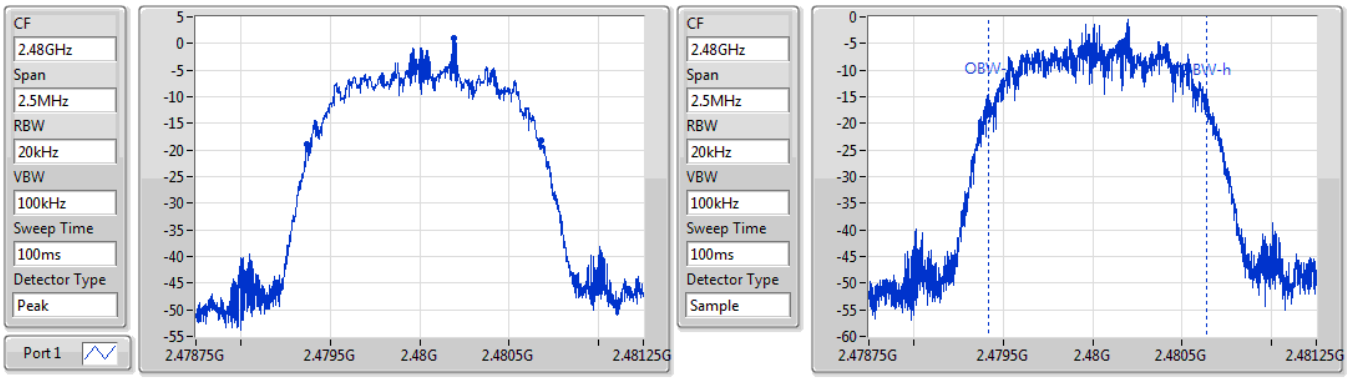



| 20dB(Hz) | Fl-20dB(Hz) | Fh-20dB(Hz) | OBW(Hz) | Fl-OBW(Hz) | Fh-OBW(Hz) | Limit(Hz) | Port |
|---|---|---|---|---|---|---|---|
| 1.323M | 2.439365G | 2.440688G | 1.219M | 2.439419G | 2.440638G | Inf | 1 |

**BT-EDR(3Mbps)** **EBW**

**2480MHz**

17/08/2019




| 20dB(Hz) | Fl-20dB(Hz) | Fh-20dB(Hz) | OBW(Hz) | Fl-OBW(Hz) | Fh-OBW(Hz) | Limit(Hz) | Port |
|---|---|---|---|---|---|---|---|
| 1.31M | 2.479369G | 2.480679G | 1.221M | 2.479419G | 2.48064G | Inf | 1 |

**Summary**

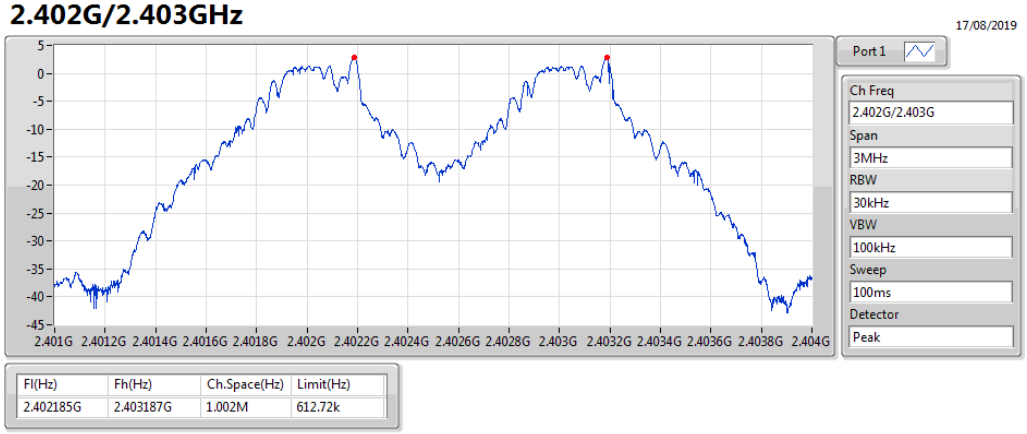
| Mode | Max-Space (Hz) | Min-Space (Hz) |
|---|---|---|
| 2.4-2.4835GHz | - | - |
| BT-BR(1Mbps) | 1.002M | 997.5k |
| BT-EDR(2Mbps) | 1.0035M | 997.5k |
| BT-EDR(3Mbps) | 999k | 997.5k |

**Result**

| Mode | Result | Fl (Hz) | Fh (Hz) | Ch.Space (Hz) | Limit (Hz) |
|---|---|---|---|---|---|
| BT-BR(1Mbps) | - | - | - | - | - |
| 2402MHz | Pass | 2.402185G | 2.403187G | 1.002M | 612.72k |
| 2440MHz | Pass | 2.440188G | 2.44119G | 1.002M | 612.72k |
| 2480MHz | Pass | 2.479194G | 2.480192G | 997.5k | 612.72k |
| BT-EDR(2Mbps) | - | - | - | - | - |
| 2402MHz | Pass | 2.402193G | 2.40319G | 997.5k | 891.108k |
| 2440MHz | Pass | 2.440194G | 2.441198G | 1.0035M | 889.11k |
| 2480MHz | Pass | 2.479196G | 2.480199G | 1.0035M | 889.776k |
| BT-EDR(3Mbps) | - | - | - | - | - |
| 2402MHz | Pass | 2.402187G | 2.403186G | 999k | 877.788k |
| 2440MHz | Pass | 2.44019G | 2.441189G | 999k | 881.118k |
| 2480MHz | Pass | 2.479193G | 2.48019G | 997.5k | 872.46k |

**BT-BR(1Mbps)** **Channel Separation**

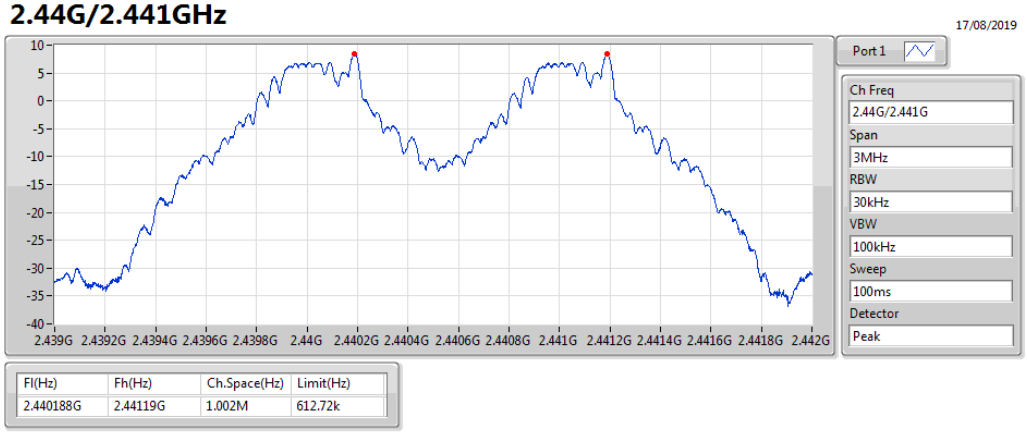
**2.402G/2.403GHz**




| Fl(Hz) | Fh(Hz) | Ch.Space(Hz) | Limit(Hz) |
|---|---|---|---|
| 2.402185G | 2.403187G | 1.002M | 612.72k |

**BT-BR(1Mbps)** **Channel Separation**

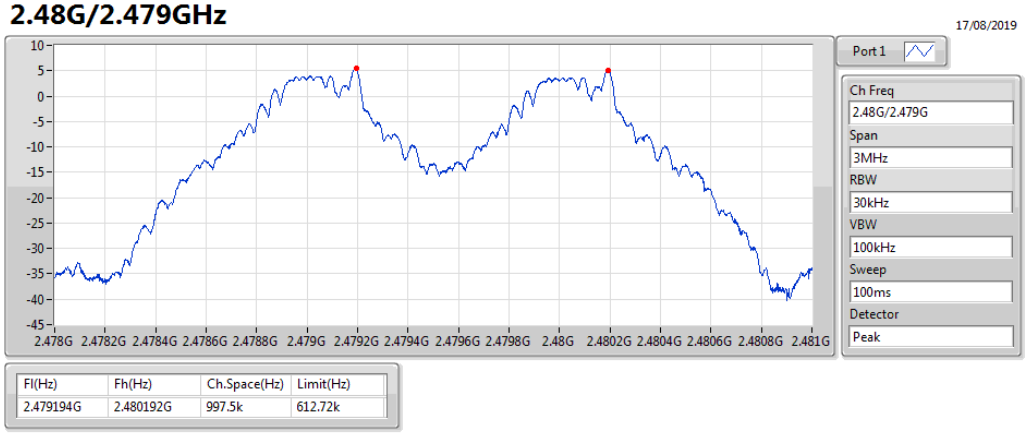
**2.44G/2.441GHz**




| Fl(Hz) | Fh(Hz) | Ch.Space(Hz) | Limit(Hz) |
|---|---|---|---|
| 2.440188G | 2.44119G | 1.002M | 612.72k |

**BT-BR(1Mbps)** **Channel Separation**

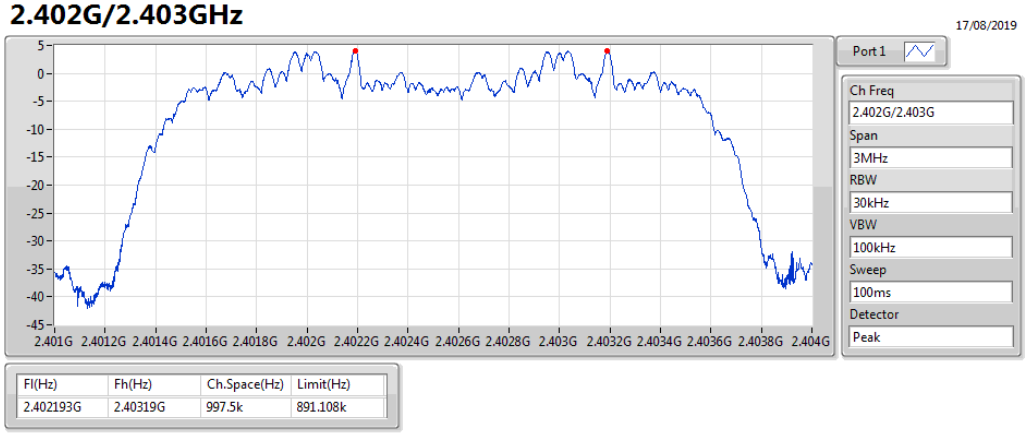
**2.48G/2.479GHz**




| Fl(Hz) | Fh(Hz) | Ch.Space(Hz) | Limit(Hz) |
|---|---|---|---|
| 2.479194G | 2.480192G | 997.5k | 612.72k |

**BT-EDR(2Mbps)** **Channel Separation**

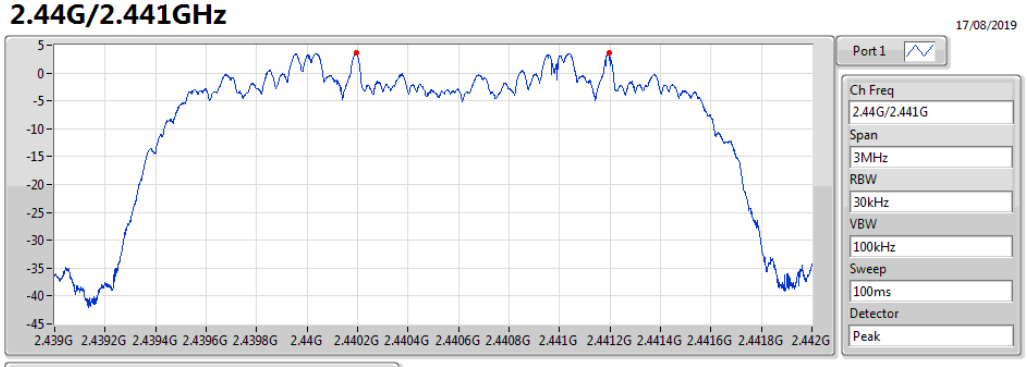
**2.402G/2.403GHz**




| Fl(Hz) | Fh(Hz) | Ch.Space(Hz) | Limit(Hz) |
|---|---|---|---|
| 2.402193G | 2.40319G | 997.5k | 891.108k |

**BT-EDR(2Mbps)** **Channel Separation**

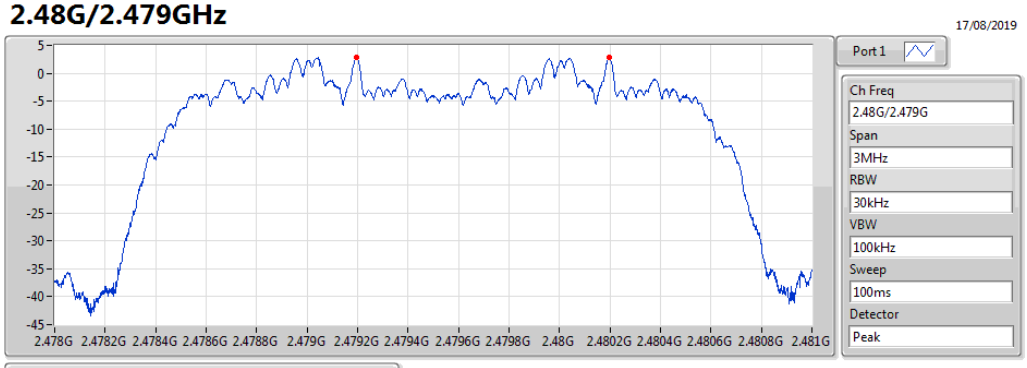
**2.44G/2.441GHz**




| Fl(Hz) | Fh(Hz) | Ch.Space(Hz) | Limit(Hz) |
|---|---|---|---|
| 2.440194G | 2.441198G | 1.0035M | 889.11k |

**BT-EDR(2Mbps)** **Channel Separation**

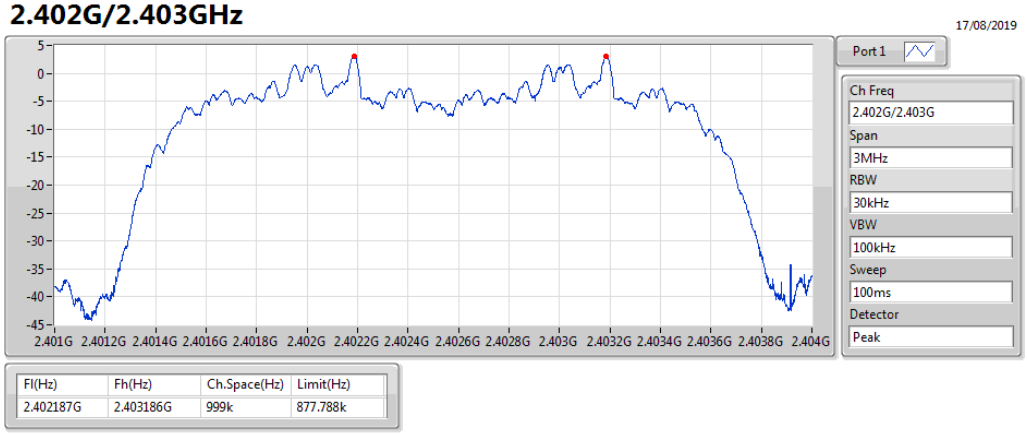
**2.48G/2.479GHz**




| Fl(Hz) | Fh(Hz) | Ch.Space(Hz) | Limit(Hz) |
|---|---|---|---|
| 2.479196G | 2.480199G | 1.0035M | 889.776k |

**BT-EDR(3Mbps)** **Channel Separation**

**2.402G/2.403GHz**




| Fl(Hz) | Fh(Hz) | Ch.Space(Hz) | Limit(Hz) |
|---|---|---|---|
| 2.402187G | 2.403186G | 999k | 877.788k |

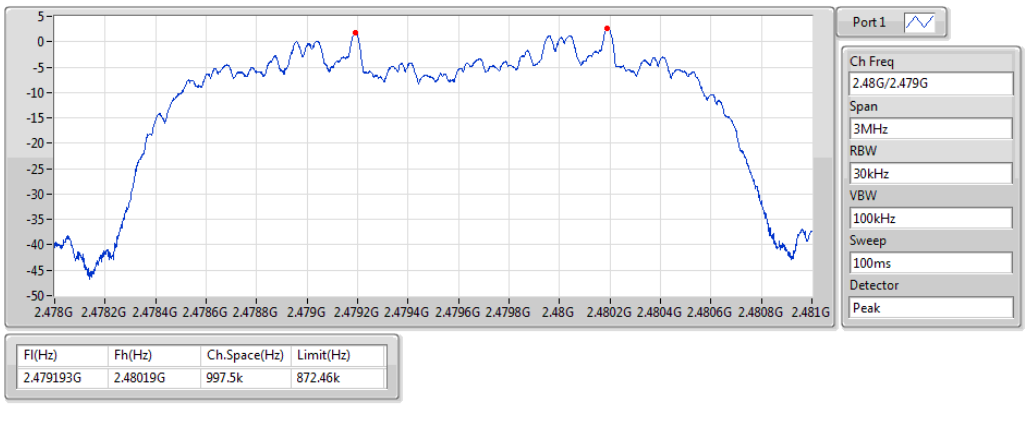
**BT-EDR(3Mbps)** **Channel Separation**

**2.44G/2.441GHz**


| Fl(Hz) | Fh(Hz) | Ch.Space(Hz) | Limit(Hz) |
|---|---|---|---|
| 2.44019G | 2.441189G | 999k | 881.118k |

**BT-EDR(3Mbps)** **Channel Separation**

**2.48G/2.479GHz**




| Fl(Hz) | Fh(Hz) | Ch.Space(Hz) | Limit(Hz) |
|---|---|---|---|
| 2.479193G | 2.48019G | 997.5k | 872.46k |

**Summary**

| Mode | Power (dBm) | Power (W) |
|---|---|---|
| 2.4-2.4835GHz | - | - |
| BT-BR(1Mbps) | 9.81 | 0.00957 |
| BT-EDR(2Mbps) | 7.19 | 0.00524 |
| BT-EDR(3Mbps) | 6.75 | 0.00473 |

## Result

| Mode | Result | Gain (dBi) | Power (dBm) | Power Limit (dBm) |
|---|---|---|---|---|
| BT-BR(1Mbps) | - | - | - | - |
| 2402MHz | Pass | 3.57 | 4.24 | 21.00 |
| 2440MHz | Pass | 3.57 | 9.81 | 21.00 |
| 2480MHz | Pass | 3.57 | 6.56 | 21.00 |
| BT-EDR(2Mbps) | - | - | - | - |
| 2402MHz | Pass | 3.57 | 7.19 | 21.00 |
| 2440MHz | Pass | 3.57 | 6.72 | 21.00 |
| 2480MHz | Pass | 3.57 | 5.97 | 21.00 |
| BT-EDR(3Mbps) | - | - | - | - |
| 2402MHz | Pass | 3.57 | 5.17 | 21.00 |
| 2440MHz | Pass | 3.57 | 6.75 | 21.00 |
| 2480MHz | Pass | 3.57 | 4.51 | 21.00 |

**DG** = Directional Gain; **Port X** = Port X output power

**Summary**

| Mode | Power (dBm) | Power (W) |
|---|---|---|
| 2.4-2.4835GHz | - | - |
| BT-BR(1Mbps) | 9.75 | 0.00944 |
| BT-EDR(2Mbps) | 9.32 | 0.00855 |
| BT-EDR(3Mbps) | 9.37 | 0.00865 |

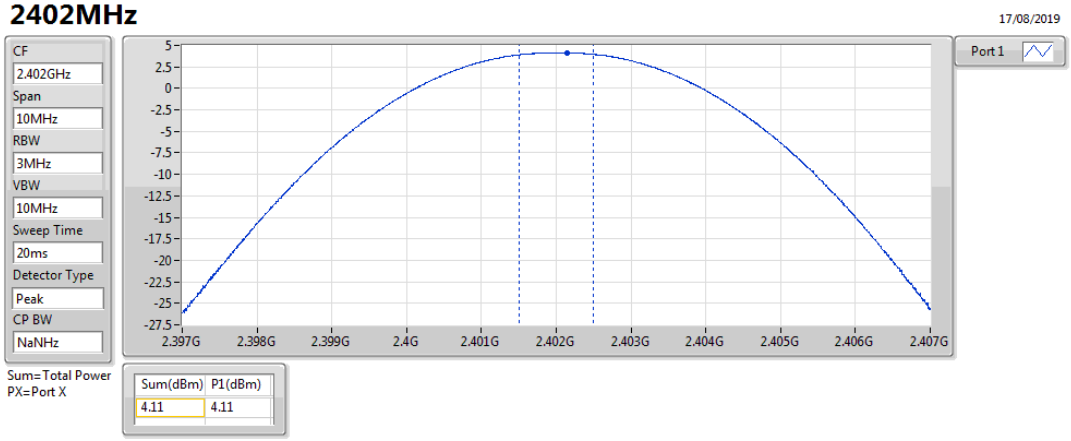
**Result**

| Mode | Result | Gain (dBi) | Power (dBm) | Power Limit (dBm) |
|---|---|---|---|---|
| BT-BR(1Mbps) | - | - | - | - |
| 2402MHz | Pass | 3.57 | 4.11 | 21.00 |
| 2440MHz | Pass | 3.57 | 9.75 | 21.00 |
| 2480MHz | Pass | 3.57 | 6.53 | 21.00 |
| BT-EDR(2Mbps) | - | - | - | - |
| 2402MHz | Pass | 3.57 | 9.32 | 21.00 |
| 2440MHz | Pass | 3.57 | 8.90 | 21.00 |
| 2480MHz | Pass | 3.57 | 8.06 | 21.00 |
| BT-EDR(3Mbps) | - | - | - | - |
| 2402MHz | Pass | 3.57 | 7.70 | 21.00 |
| 2440MHz | Pass | 3.57 | 9.37 | 21.00 |
| 2480MHz | Pass | 3.57 | 7.19 | 21.00 |

**DG** = Directional Gain; **Port X** = Port X output power

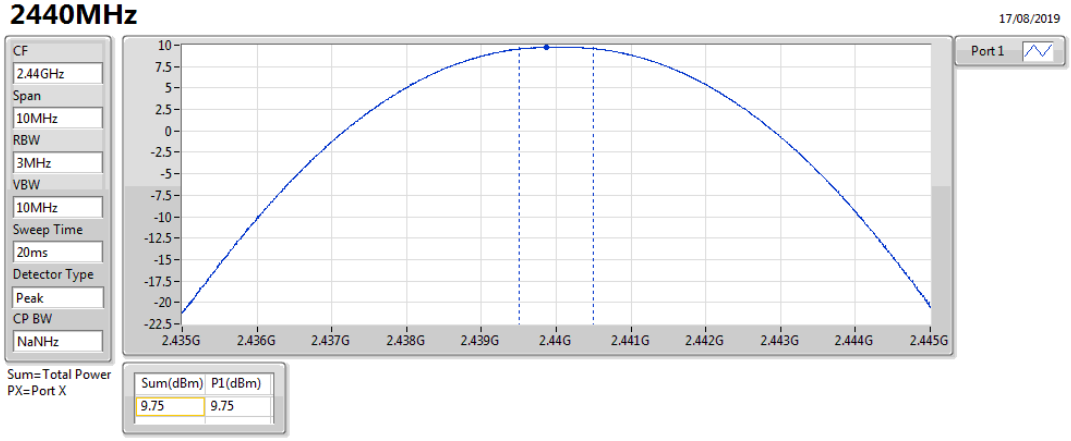
**BT-BR(1Mbps)** **PK Power**

**2402MHz**



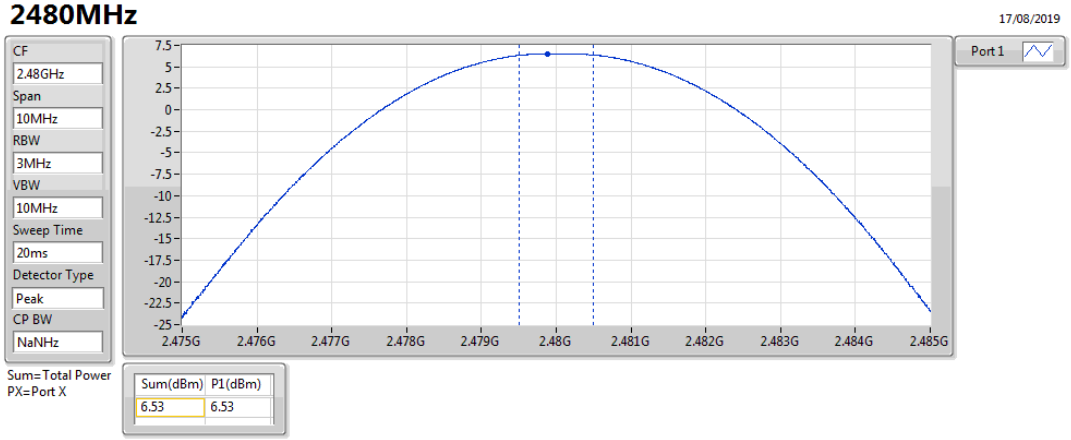

**BT-BR(1Mbps)** **PK Power**

**2440MHz**



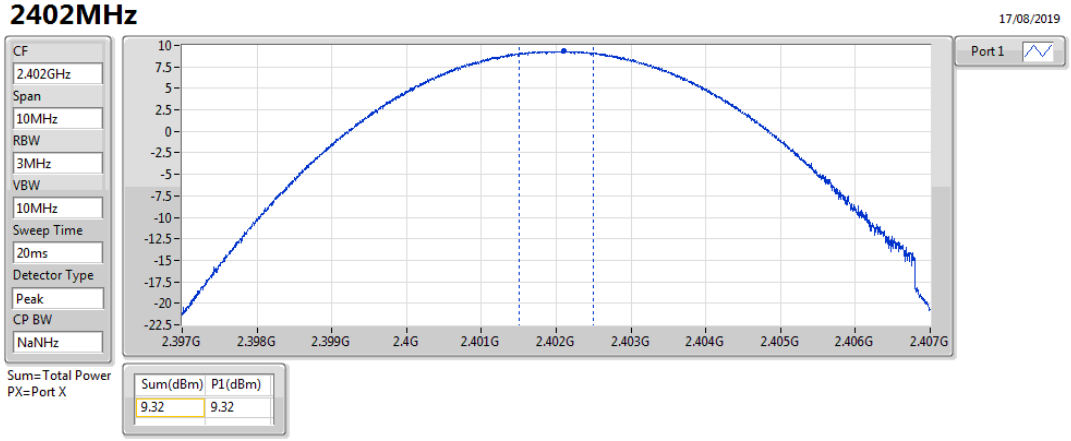

**BT-BR(1Mbps)** **PK Power**

**2480MHz**



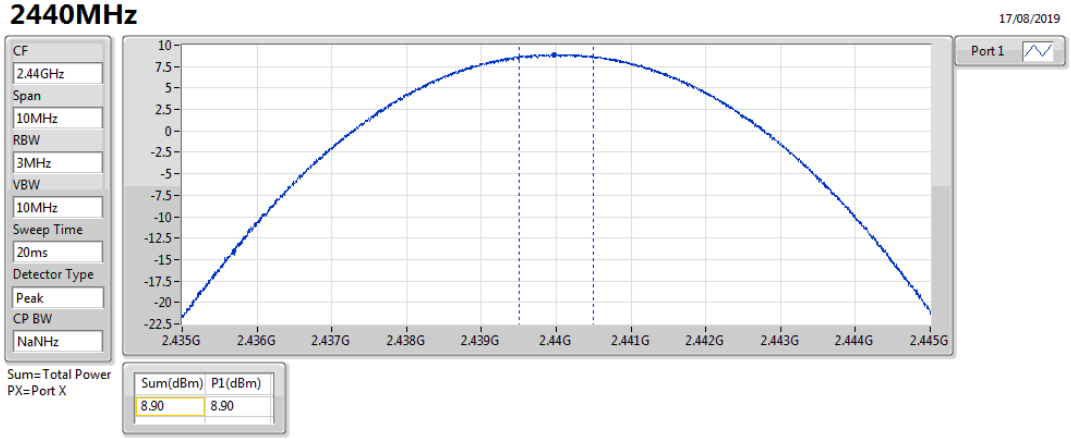
**BT-EDR(2Mbps)** **PK Power**

**2402MHz**



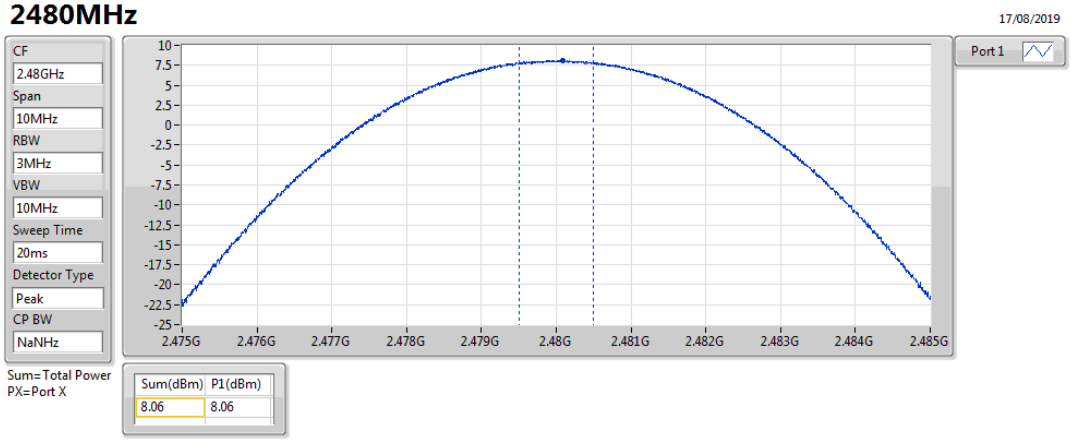

**BT-EDR(2Mbps)** **PK Power**

**2440MHz**



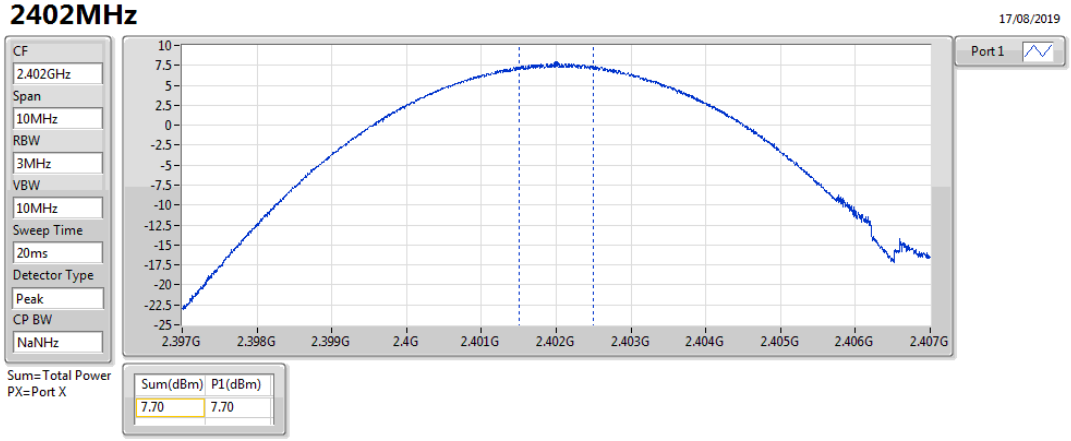

**BT-EDR(2Mbps)** **PK Power**

**2480MHz**



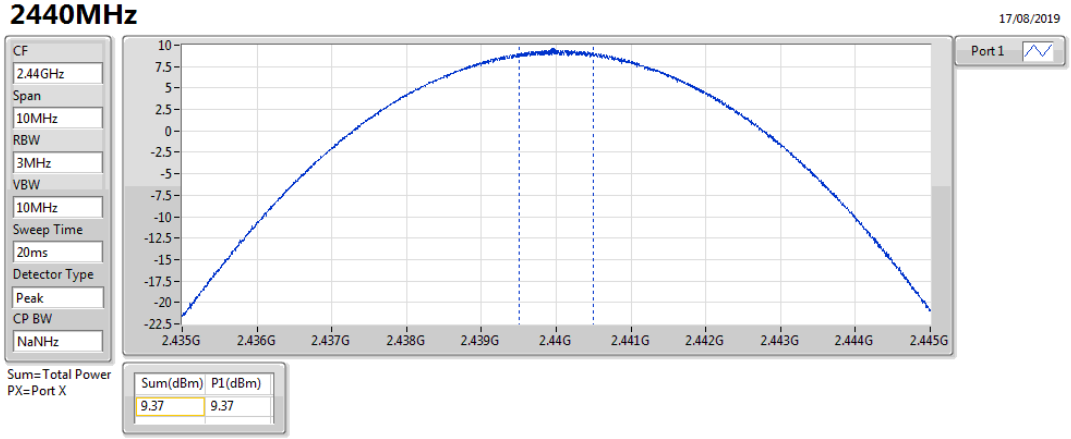
**BT-EDR(3Mbps)** **PK Power**

**2402MHz**



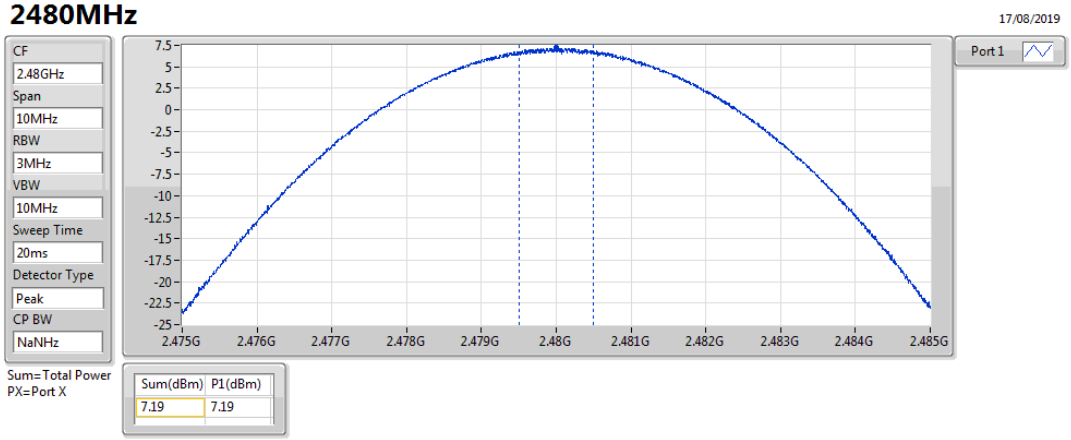

**BT-EDR(3Mbps)** **PK Power**

**2440MHz**




**BT-EDR(3Mbps)** **PK Power**

**2480MHz**



**Summary**

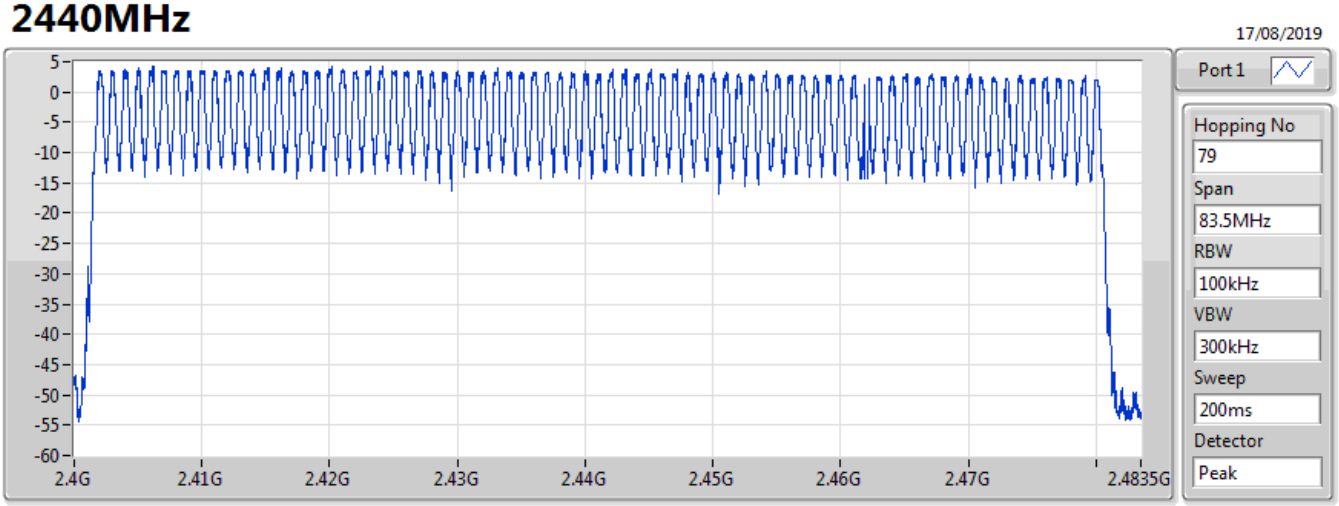
| Mode | Max-Hop No |
|---|---|
| 2.4-2.4835GHz | - |
| BT-BR(1Mbps) | 79 |
| BT-EDR(2Mbps) | 79 |
| BT-EDR(3Mbps) | 79 |

**Result**

| Mode | Result | Hopping No | Limit |
|---|---|---|---|
| BT-BR(1Mbps) | - | - | - |
| 2440MHz | Pass | 79 | 15 |
| BT-EDR(2Mbps) | - | - | - |
| 2440MHz | Pass | 79 | 15 |
| BT-EDR(3Mbps) | - | - | - |
| 2440MHz | Pass | 79 | 15 |

**BT-BR(1Mbps)** **Hopping Ch**

**2440MHz**

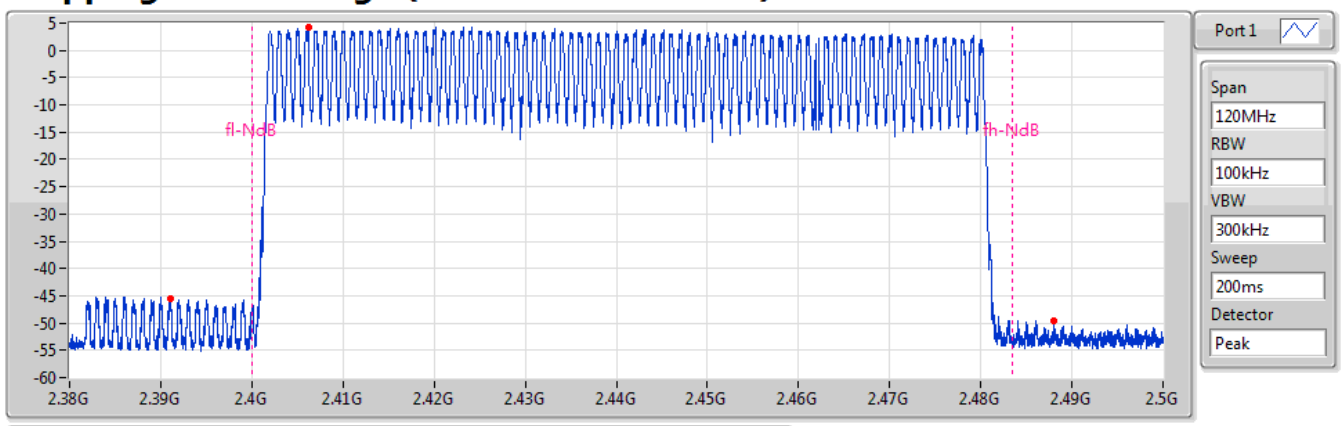



| Hopping No | Limit |
|---|---|
| 79 | 15 |

**BT-BR(1Mbps)**

**2440MHz**

**Hopping Ch Bandedge (Non-restricted Band)**

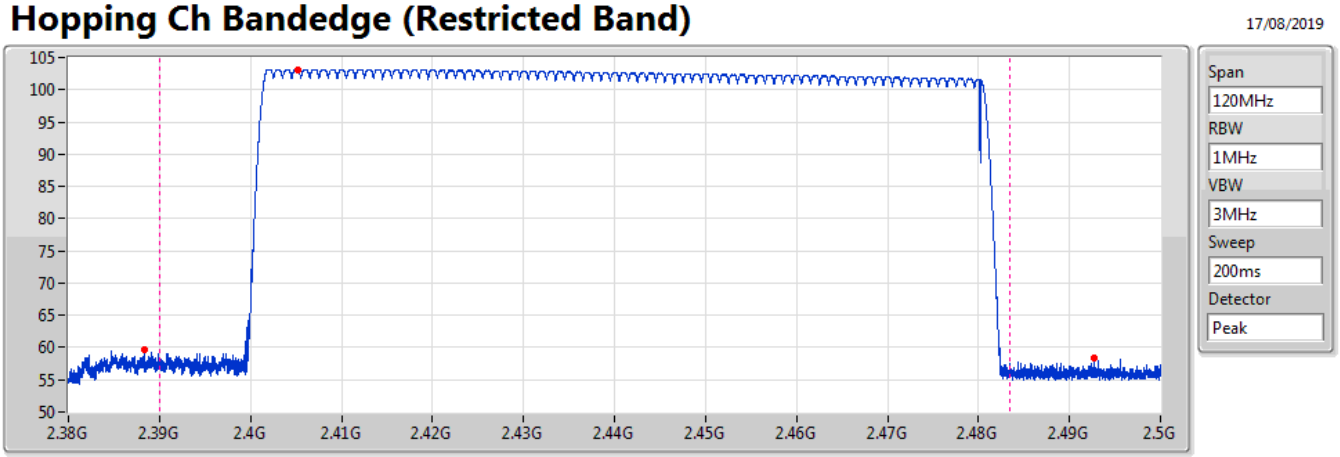



| Limit(dBm) | Ref(Hz) | Ref(dBm) | BE-l(Hz) | BE-l(dBm) | BE-h(Hz) | BE-h(dBm) |
|---|---|---|---|---|---|---|
| -15.8 | 2.406175G | 4.2 | 2.391055G | -45.55 | 2.488075G | -49.55 |

## BT-BR(1Mbps)

## 2440MHz

## Hopping Ch Bandedge (Restricted Band)

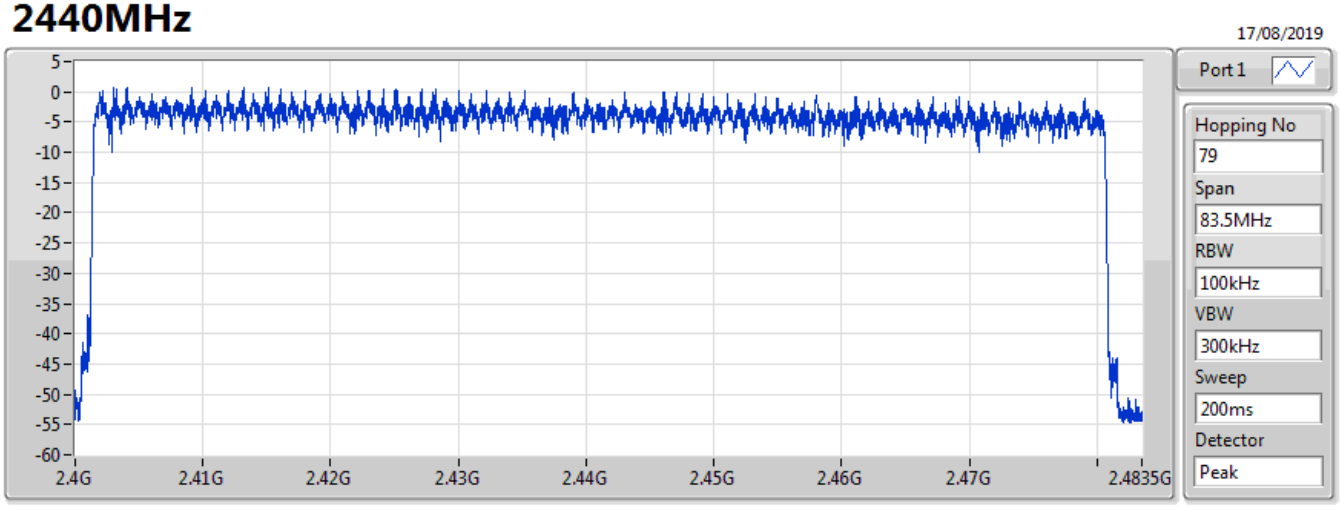



| Ref(Hz) | Ref(dBuV/m) | BE-l(Hz) | PK(dBuV/m) | AV(dBuV/m) | BE-h(Hz) | PK(dBuV/m) | AV(dBuV/m) | LimPK(dBuV/ | LimAV(dBuV/ | Tx On(ms) | DCF(dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.405215G | 103.1 | 2.3884G | 59.65 | 29.55 | 2.49268G | 58.34 | 28.24 | 74 | 54 | 3.125 | -30.1 |

## BT-EDR(2Mbps)

## 2440MHz

## Hopping Ch

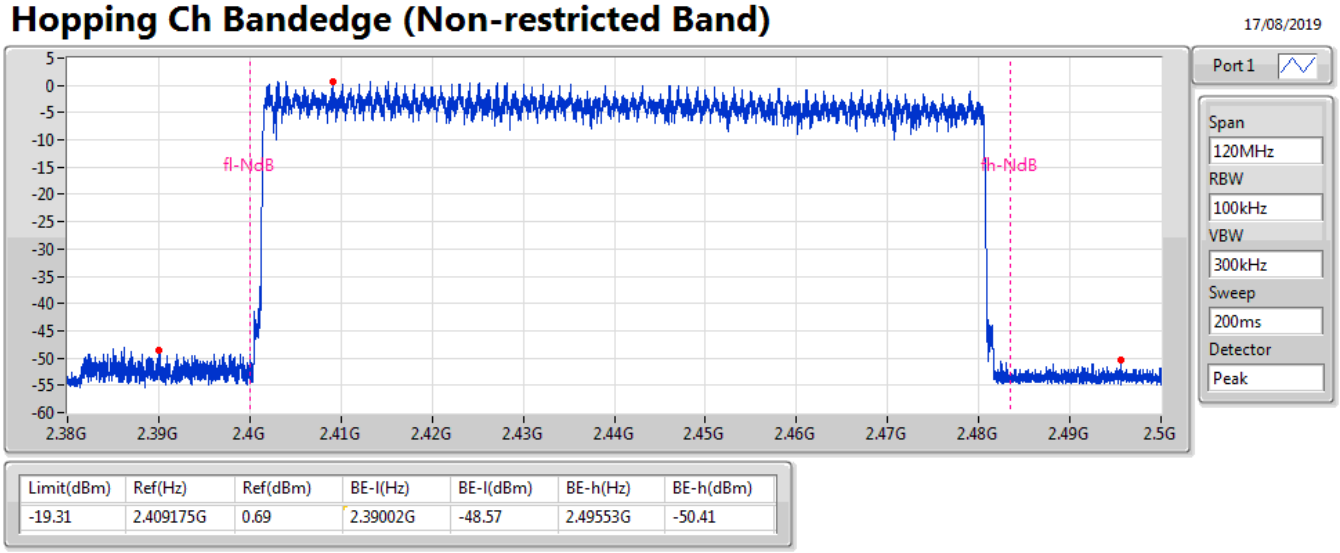



| Hopping No | Limit |
|---|---|
| 79 | 15 |

## BT-EDR(2Mbps)

## 2440MHz

## Hopping Ch Bandedge (Non-restricted Band)

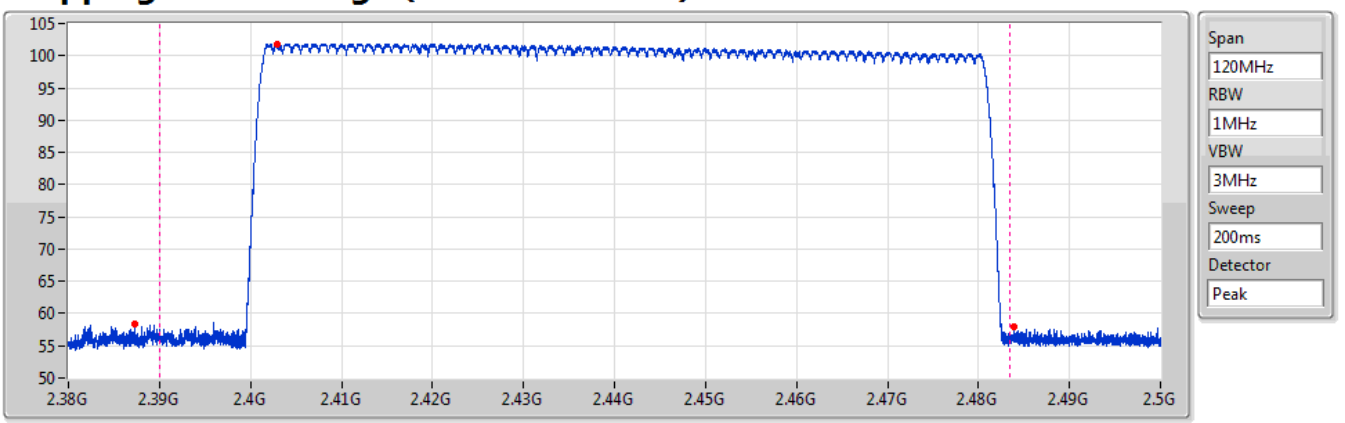



| Limit(dBm) | Ref(Hz) | Ref(dBm) | BE-l(Hz) | BE-l(dBm) | BE-h(Hz) | BE-h(dBm) |
|---|---|---|---|---|---|---|
| -19.31 | 2.409175G | 0.69 | 2.39002G | -48.57 | 2.49553G | -50.41 |

## BT-EDR(2Mbps)

## 2440MHz

## Hopping Ch Bandedge (Restricted Band)

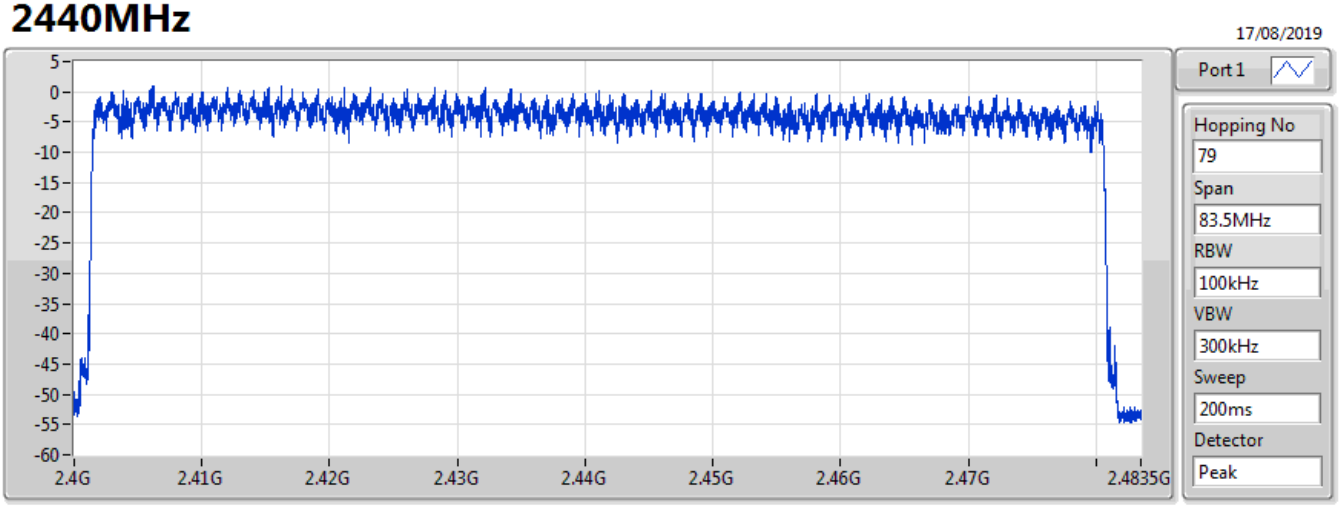



| Ref(Hz) | Ref(dBuV/m) | BE-l(Hz) | PK(dBuV/m) | AV(dBuV/m) | BE-h(Hz) | PK(dBuV/m) | AV(dBuV/m) | LimPK(dBuV/ | LimAV(dBuV/ | Tx On(ms) | DCF(dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.40289G | 101.85 | 2.387275G | 58.29 | 28.19 | 2.48392G | 57.96 | 27.86 | 74 | 54 | 3.125 | -30.1 |

## BT-EDR(3Mbps)

## 2440MHz

## Hopping Ch

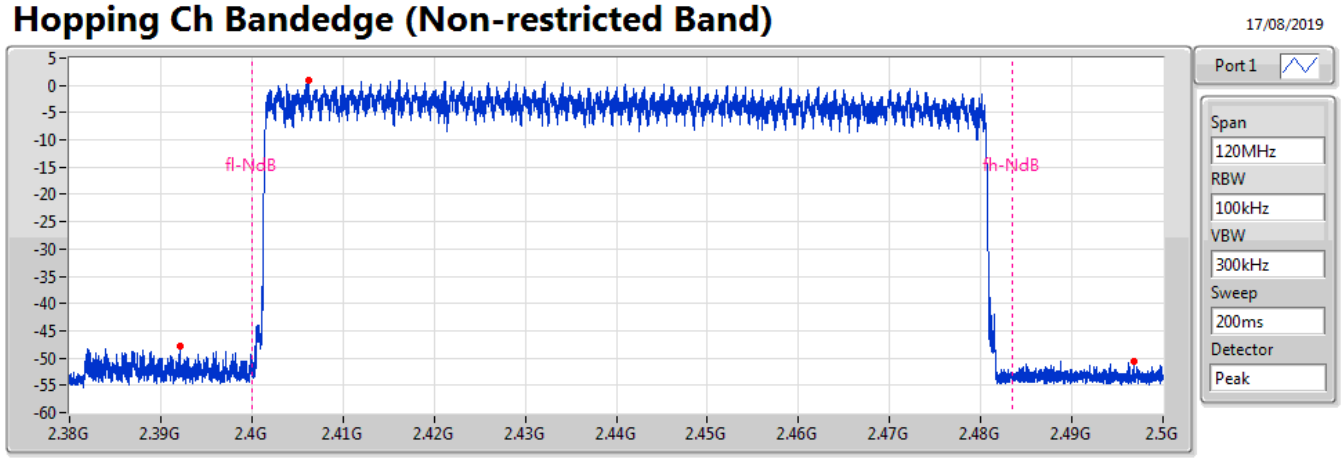



| Hopping No | Limit |
|---|---|
| 79 | 15 |

## BT-EDR(3Mbps)

## 2440MHz

## Hopping Ch Bandedge (Non-restricted Band)

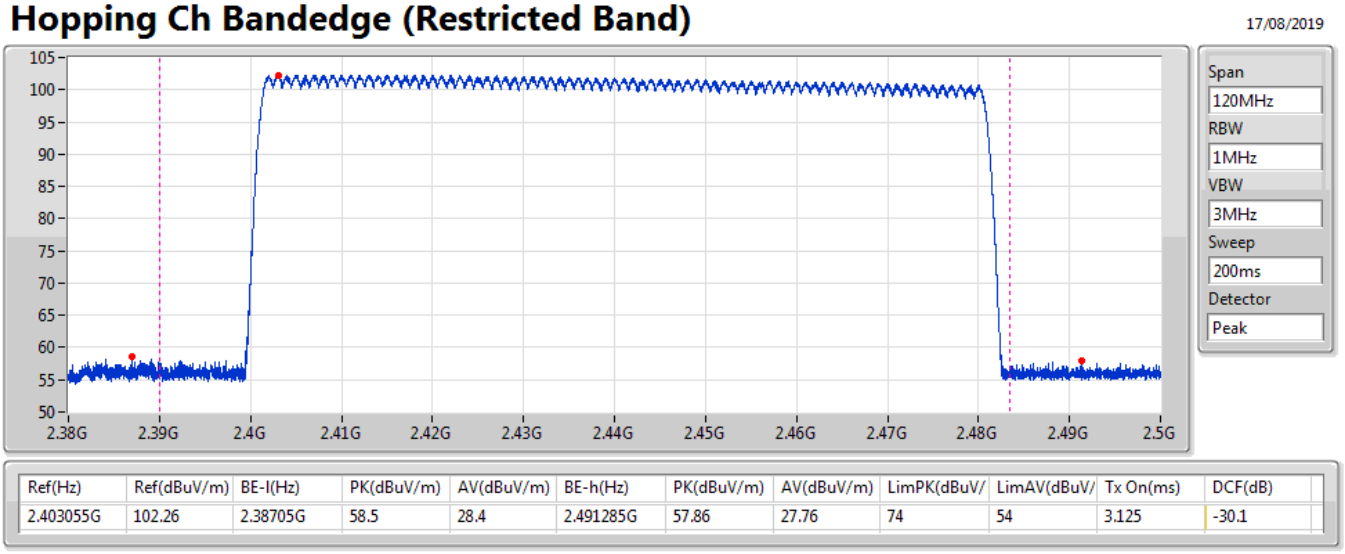



| Limit(dBm) | Ref(Hz) | Ref(dBm) | BE-l(Hz) | BE-l(dBm) | BE-h(Hz) | BE-h(dBm) |
|---|---|---|---|---|---|---|
| -19.12 | 2.406175G | 0.88 | 2.392165G | -47.7 | 2.49676G | -50.56 |

**BT-EDR(3Mbps)**

**2440MHz**

**Hopping Ch Bandedge (Restricted Band)**




| Ref(Hz) | Ref(dBuV/m) | BE-l(Hz) | PK(dBuV/m) | AV(dBuV/m) | BE-h(Hz) | PK(dBuV/m) | AV(dBuV/m) | LimPK(dBuV/ | LimAV(dBuV/ | Tx On(ms) | DCF(dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.403055G | 102.26 | 2.38705G | 58.5 | 28.4 | 2.491285G | 57.86 | 27.76 | 74 | 54 | 3.125 | -30.1 |

**Summary**

| Mode | Max-Dwell (s) |
|---|---|
| 2.4-2.4835GHz | - |
| BT-BR(1Mbps) | 309.2466m |
| BT-EDR(2Mbps) | 309.5664m |
| BT-EDR(3Mbps) | 303.81m |

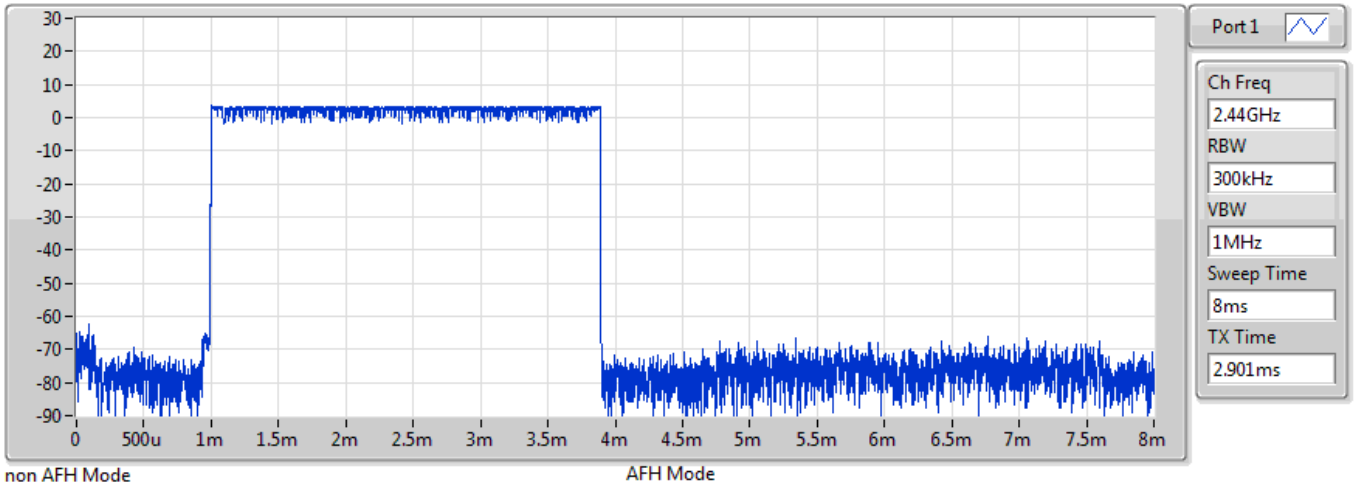
**Result**

| Mode | Result | Period (s) | Dwell (s) | Limit (s) | Tx On (s) |
|---|---|---|---|---|---|
| BT-BR(1Mbps) | - | - | - | - | - |
| 2440MHz | Pass | 31.6 | 309.2466m | 400m | 2.901m |
| BT-EDR(2Mbps) | - | - | - | - | - |
| 2440MHz | Pass | 31.6 | 309.5664m | 400m | 2.904m |
| BT-EDR(3Mbps) | - | - | - | - | - |
| 2440MHz | Pass | 31.6 | 303.81m | 400m | 2.85m |

## BT-BR(1Mbps) Dwell

### 2440MHz

17/08/2019




non AFH Mode

| Period(s) | Dwell(s) | Limit(s) | Tx On(s) |
|---|---|---|---|
| 31.6 | 309.2466m | 400m | 2.901m |

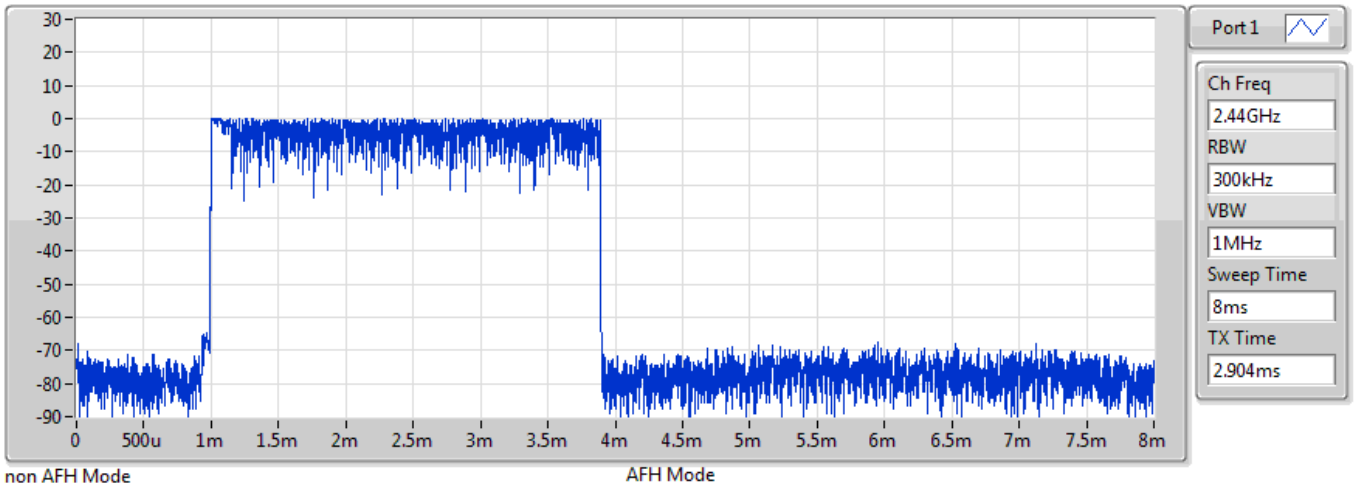
AFH Mode

| Period(s) | Dwell(s) | Limit(s) | Tx On(s) |
|---|---|---|---|
| 0 | 154.6233m | 400m | 2.901m |

## BT-EDR(2Mbps) Dwell

### 2440MHz

17/08/2019




non AFH Mode

| Period(s) | Dwell(s) | Limit(s) | Tx On(s) |
|---|---|---|---|
| 31.6 | 309.5664m | 400m | 2.904m |

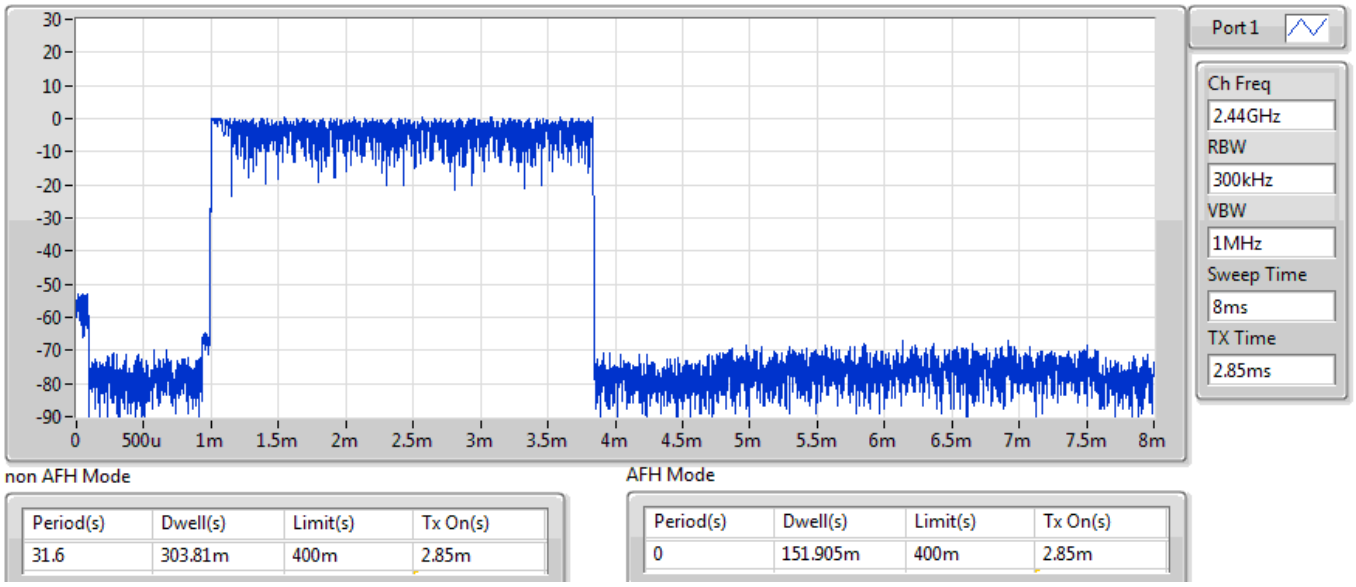
AFH Mode

| Period(s) | Dwell(s) | Limit(s) | Tx On(s) |
|---|---|---|---|
| 0 | 154.7832m | 400m | 2.904m |

**BT-EDR(3Mbps)** **Dwell**

**2440MHz**

17/08/2019




non AFH Mode

| Period(s) | Dwell(s) | Limit(s) | Tx On(s) |
|---|---|---|---|
| 31.6 | 303.81m | 400m | 2.85m |

AFH Mode

| Period(s) | Dwell(s) | Limit(s) | Tx On(s) |
|---|---|---|---|
| 0 | 151.905m | 400m | 2.85m |

## Summary

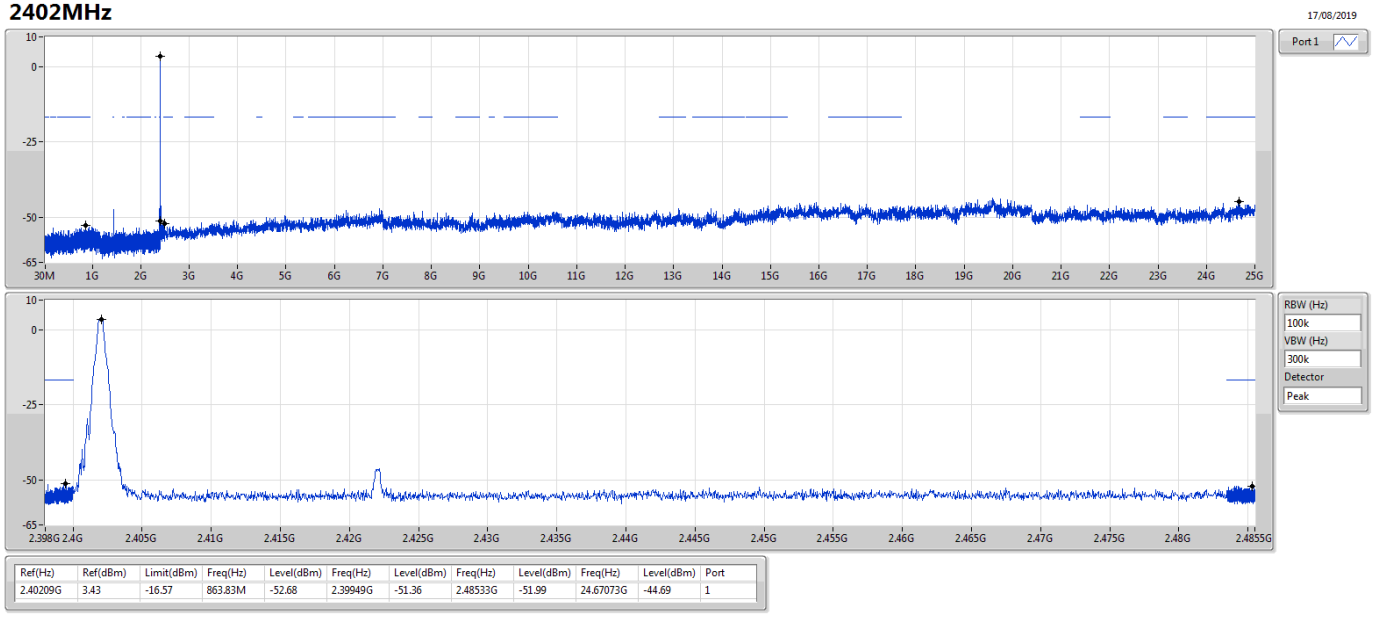
| Mode | Result | Ref (Hz) | Ref (dBm) | Limit (dBm) | Freq (Hz) | Level (dBm) | Freq (Hz) | Level (dBm) | Freq (Hz) | Level (dBm) | Freq (Hz) | Level (dBm) | Port |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.4-2.4835GHz | - | - | - | - | - | - | - | - | - | - | - | - | - |
| BT-BR(1Mbps) | Pass | 2.40209G | 3.43 | -16.57 | 863.83M | -52.68 | 2.39949G | -51.36 | 2.48533G | -51.99 | 24.67073G | -44.69 | 1 |
| BT-EDR(2Mbps) | Pass | 2.47999G | 4.69 | -15.31 | 884.85M | -52.84 | 2.39954G | -52.54 | 2.4836G | -51.53 | 24.37241G | -44.43 | 1 |
| BT-EDR(3Mbps) | Pass | 2.48003G | 3.86 | -16.14 | 921.55M | -53.41 | 2.39903G | -52.37 | 2.48353G | -51.77 | 16.53173G | -44.54 | 1 |

## Result

| Mode | Result | Ref (Hz) | Ref (dBm) | Limit (dBm) | Freq (Hz) | Level (dBm) | Freq (Hz) | Level (dBm) | Freq (Hz) | Level (dBm) | Freq (Hz) | Level (dBm) | Port |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BT-BR(1Mbps) | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2402MHz | Pass | 2.40209G | 3.43 | -16.57 | 863.83M | -52.68 | 2.39949G | -51.36 | 2.48533G | -51.99 | 24.67073G | -44.69 | 1 |
| 2440MHz | Pass | 2.44G | 9.22 | -10.78 | 2.03333G | -52.32 | 2.39997G | -50.92 | 2.48438G | -51.91 | 16.86664G | -45.46 | 1 |
| 2480MHz | Pass | 2.48008G | 5.89 | -14.11 | 821.8M | -52.58 | 2.39839G | -52.28 | 2.48455G | -51.88 | 14.84596G | -44.32 | 1 |
| BT-EDR(2Mbps) | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2402MHz | Pass | 2.402G | 6.87 | -13.13 | 749.87M | -52.97 | 2.39982G | -47.22 | 2.48374G | -51.81 | 16.29815G | -44.57 | 1 |
| 2440MHz | Pass | 2.44G | 5.73 | -14.27 | 869.75M | -52.83 | 2.39987G | -52.47 | 2.48488G | -51.82 | 16.96514G | -44.84 | 1 |
| 2480MHz | Pass | 2.47999G | 4.69 | -15.31 | 884.85M | -52.84 | 2.39954G | -52.54 | 2.4836G | -51.53 | 24.37241G | -44.43 | 1 |
| BT-EDR(3Mbps) | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2402MHz | Pass | 2.40217G | 4.67 | -15.33 | 754.02M | -53.25 | 2.39959G | -50.07 | 2.48425G | -51.19 | 21.77761G | -44.03 | 1 |
| 2440MHz | Pass | 2.43995G | 5.67 | -14.33 | 945.82M | -53.23 | 2.39986G | -51.48 | 2.48443G | -51.65 | 16.54862G | -45.12 | 1 |
| 2480MHz | Pass | 2.48003G | 3.86 | -16.14 | 921.55M | -53.41 | 2.39903G | -52.37 | 2.48353G | -51.77 | 16.53173G | -44.54 | 1 |

**BT-BR(1Mbps)** **CSE NdB**

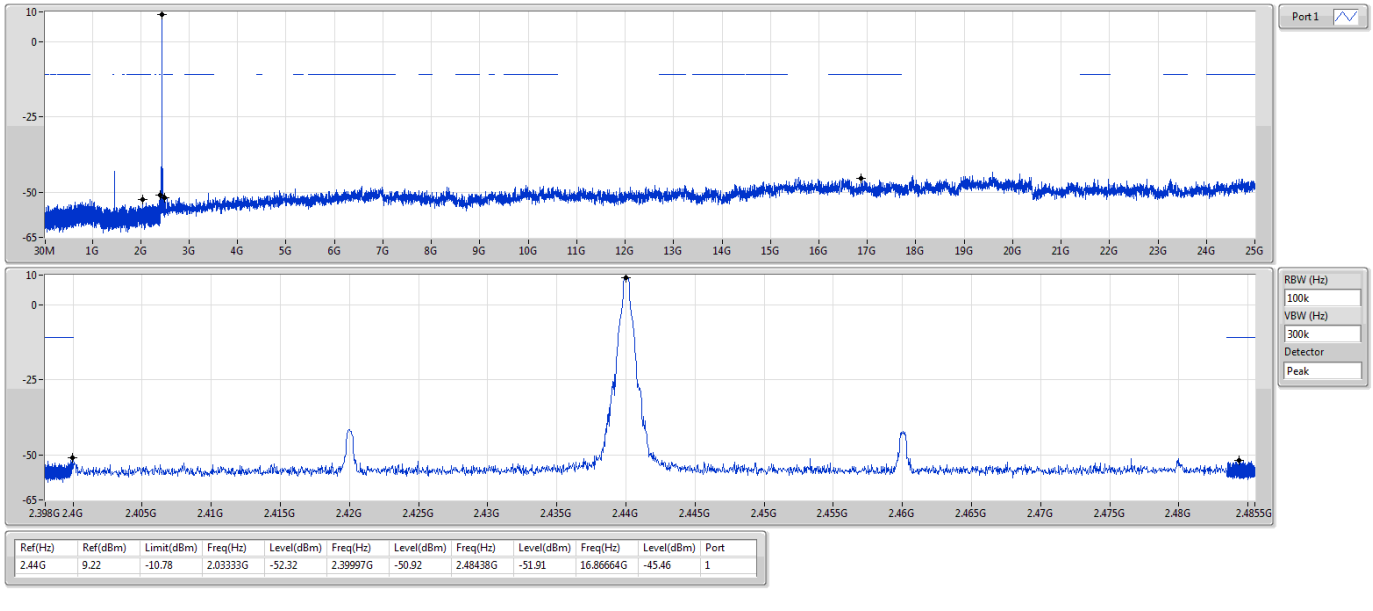
**2402MHz**




| Ref(Hz) | Ref(dBm) | Limit(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Port |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.40209G | 3.43 | -16.57 | 863.83M | -52.68 | 2.39949G | -51.36 | 2.48533G | -51.99 | 24.67073G | -44.69 | 1 |

**BT-BR(1Mbps)** **CSE NdB**

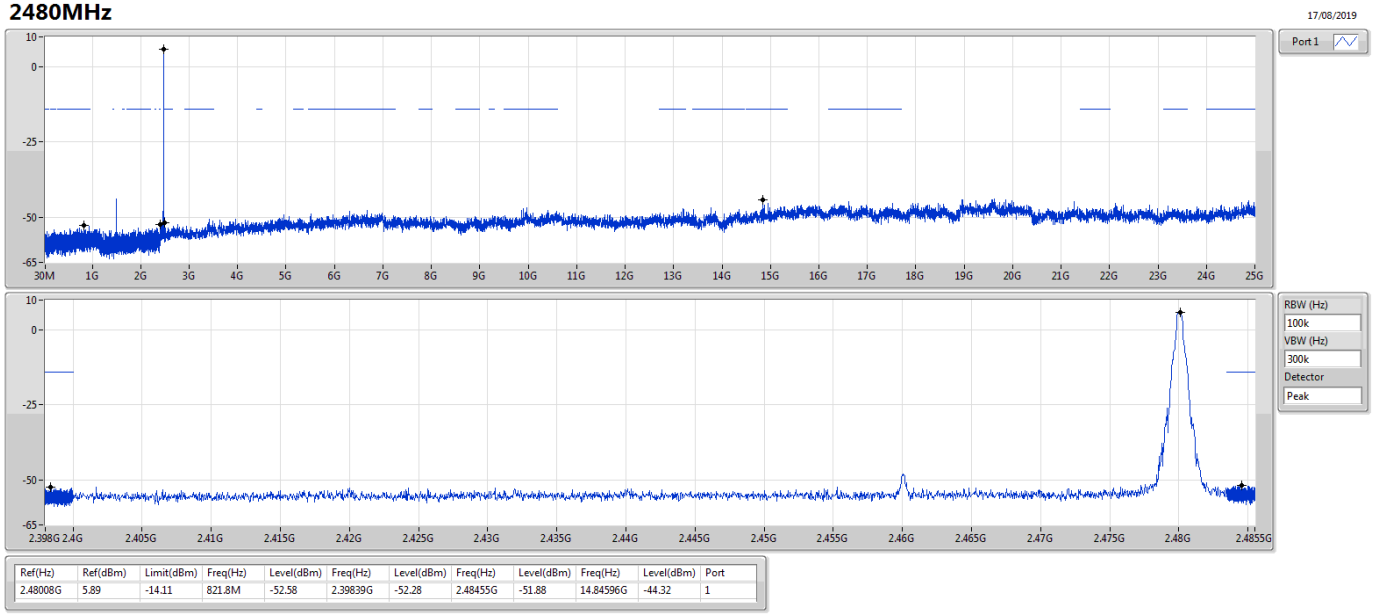
**2440MHz**




| Ref(Hz) | Ref(dBm) | Limit(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Port |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.44G | 9.22 | -10.78 | 2.03333G | -52.32 | 2.39997G | -50.92 | 2.48438G | -51.91 | 16.86664G | -45.46 | 1 |

**BT-BR(1Mbps)** **CSE NdB**

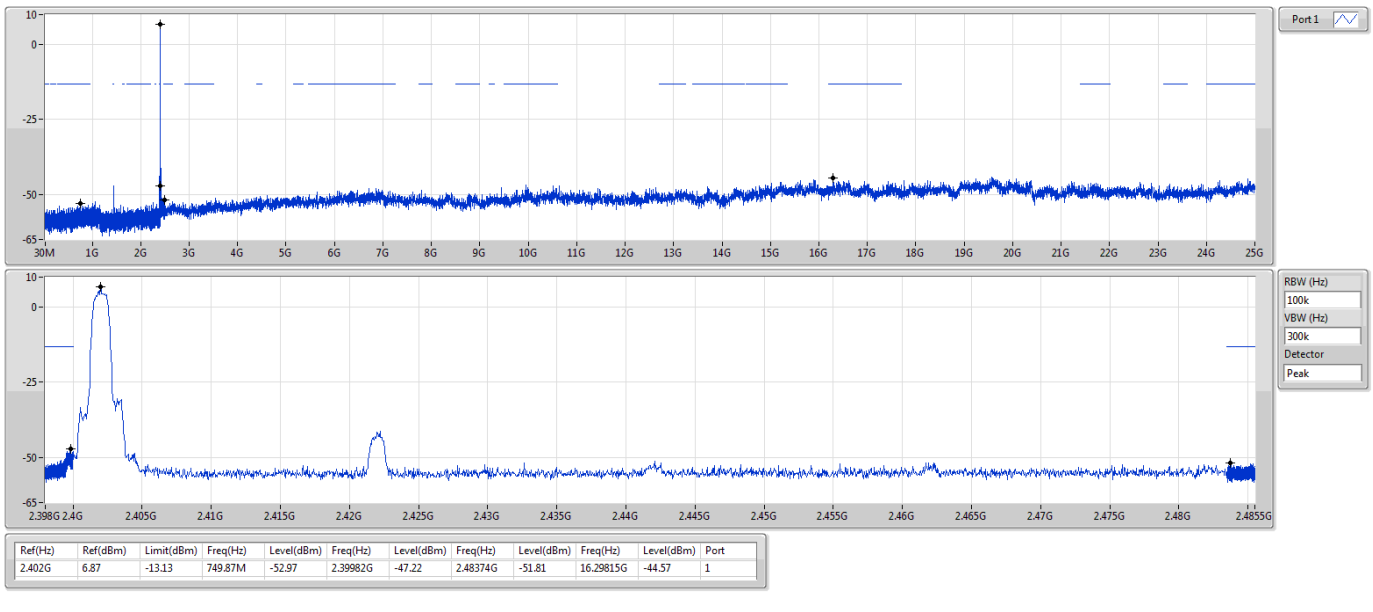
**2480MHz**




| Ref(Hz) | Ref(dBm) | Limit(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Port |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.48008G | 5.89 | -14.11 | 821.8M | -52.58 | 2.39839G | -52.28 | 2.48455G | -51.88 | 14.84596G | -44.32 | 1 |

**BT-EDR(2Mbps)** **CSE NdB**

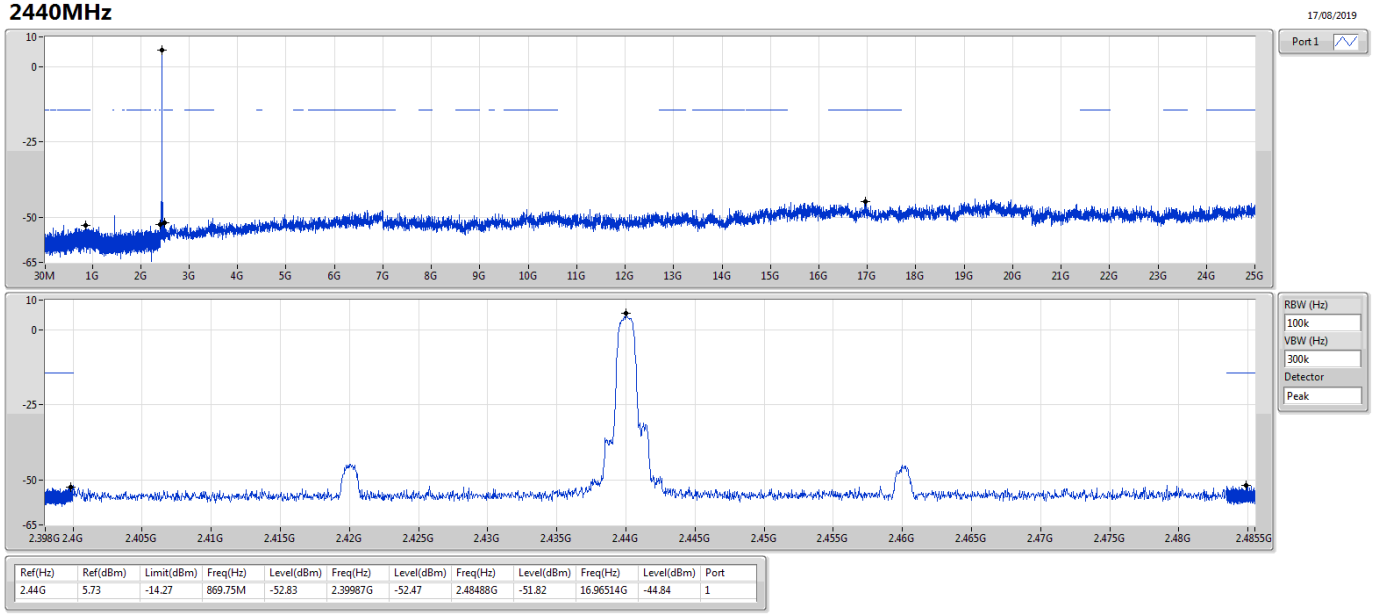
**2402MHz**




| Ref(Hz) | Ref(dBm) | Limit(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Port |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.402G | 6.87 | -13.13 | 749.87M | -52.97 | 2.39982G | -47.22 | 2.48374G | -51.81 | 16.29815G | -44.57 | 1 |

**BT-EDR(2Mbps)** **CSE NdB**

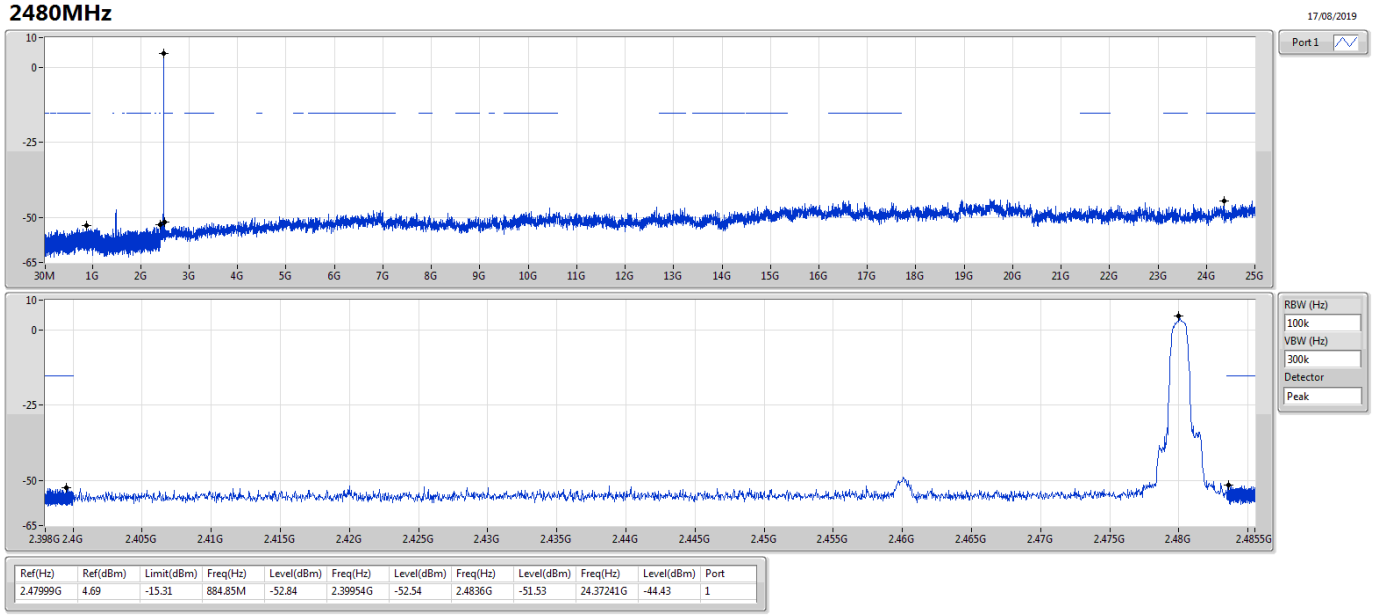
**2440MHz**




| Ref(Hz) | Ref(dBm) | Limit(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Port |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.44G | 5.73 | -14.27 | 869.75M | -52.83 | 2.39987G | -52.47 | 2.48488G | -51.82 | 16.96514G | -44.84 | 1 |

**BT-EDR(2Mbps)** **CSE NdB**

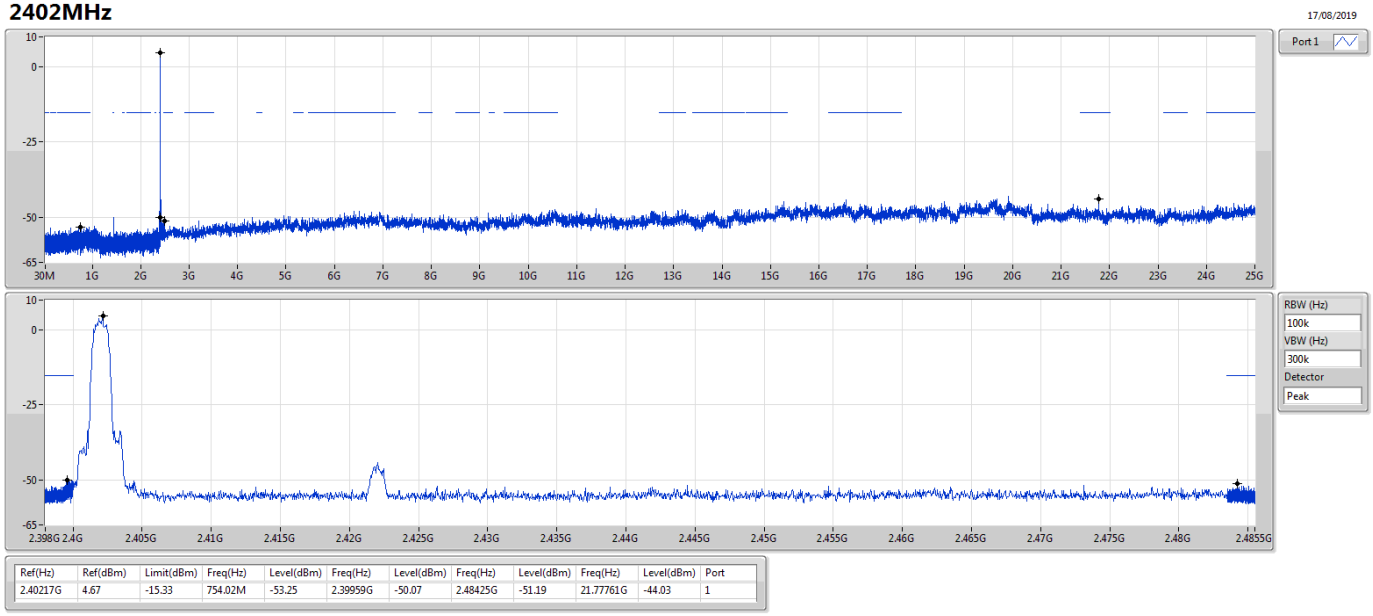
**2480MHz**




| Ref(Hz) | Ref(dBm) | Limit(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Port |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.47999G | 4.69 | -15.31 | 884.85M | -52.84 | 2.39954G | -52.54 | 2.4836G | -51.53 | 24.37241G | -44.43 | 1 |

**BT-EDR(3Mbps)** **CSE NdB**

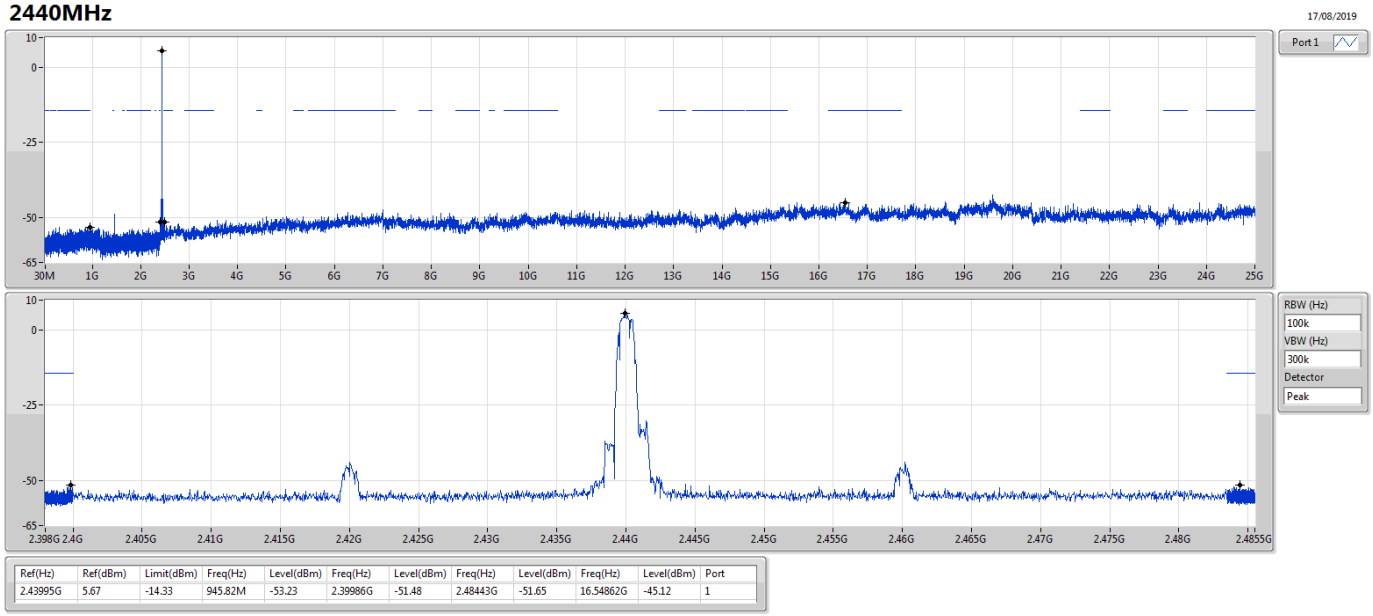
**2402MHz**




| Ref(Hz) | Ref(dBm) | Limit(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Port |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.40217G | 4.67 | -15.33 | 754.02M | -53.25 | 2.39959G | -50.07 | 2.48425G | -51.19 | 21.77761G | -44.03 | 1 |

**BT-EDR(3Mbps)** **CSE NdB**

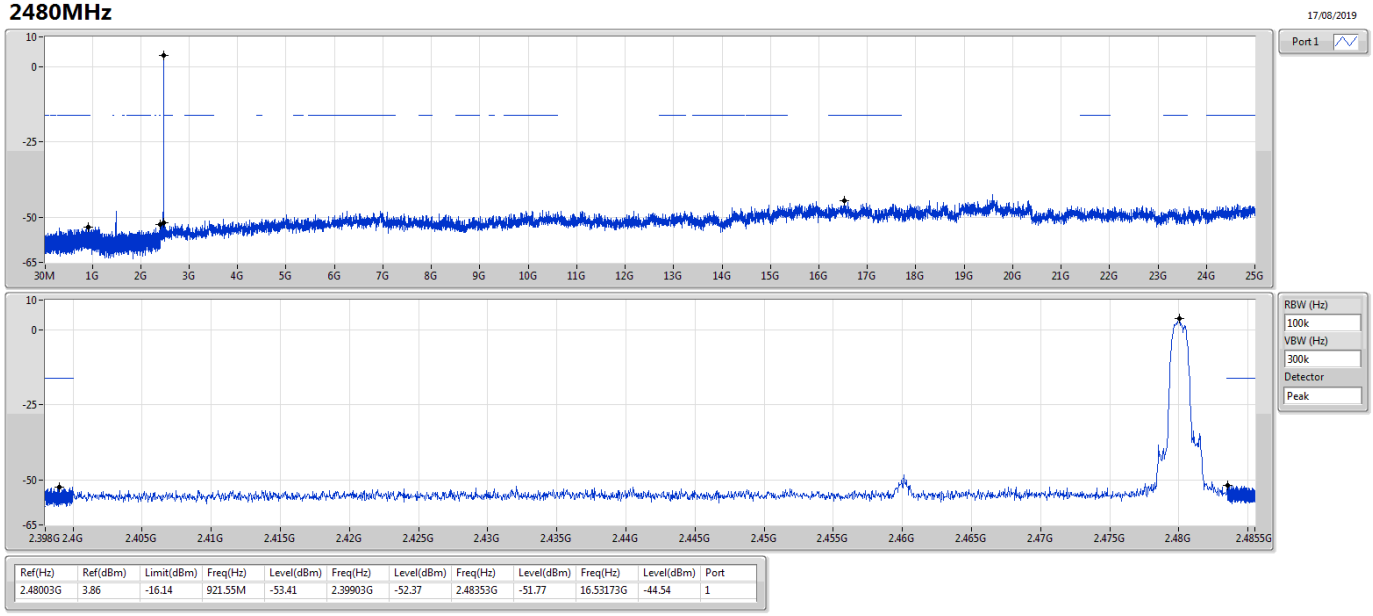
**2440MHz**




| Ref(Hz) | Ref(dBm) | Limit(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Port |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.43995G | 5.67 | -14.33 | 945.82M | -53.23 | 2.39986G | -51.48 | 2.48443G | -51.65 | 16.54862G | -45.12 | 1 |

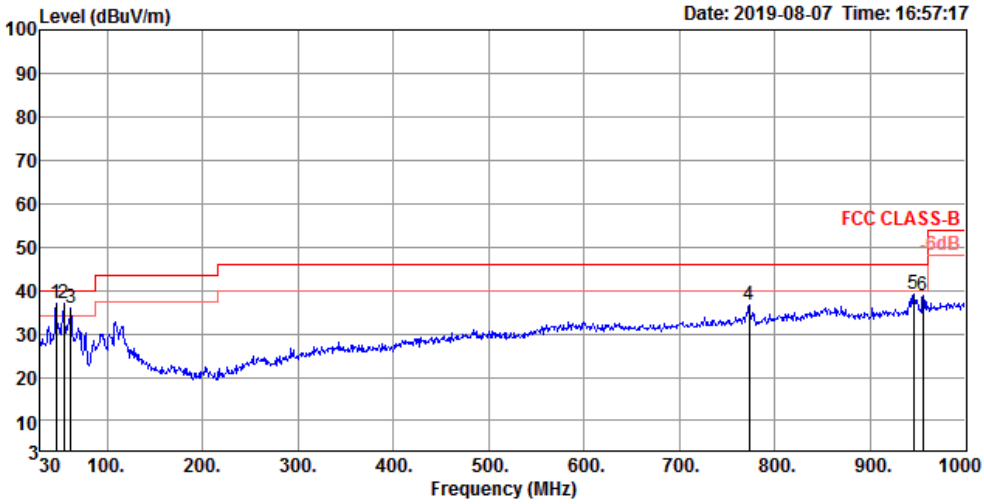
**BT-EDR(3Mbps)** **CSE NdB**

**2480MHz**




| Ref(Hz) | Ref(dBm) | Limit(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Freq(Hz) | Level(dBm) | Port |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.48003G | 3.86 | -16.14 | 921.55M | -53.41 | 2.39903G | -52.37 | 2.48353G | -51.77 | 16.53173G | -44.54 | 1 |

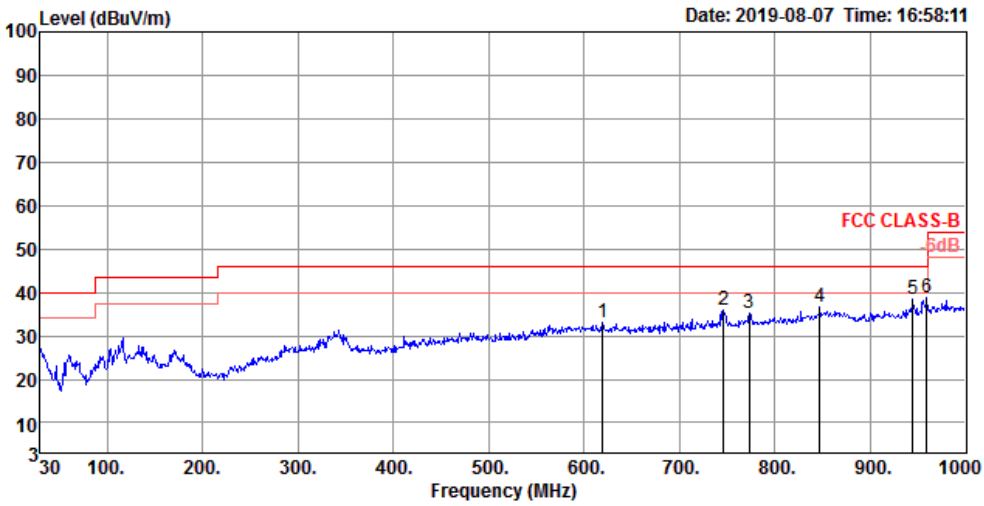
| RSE below 1GHz Result | | | |
|---|---|---|---|
| **Operating Mode** | 4 | **Polarization** | Vertical |
| **Operating Function** | CTX | | |




| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 46.49 | 36.85 | 40.00 | -3.15 | 52.88 | 1.27 | 15.40 | 32.70 | 125 | 267 | Peak | VERTICAL |
| 2 | 54.25 | 36.93 | 40.00 | -3.07 | 55.48 | 1.37 | 12.73 | 32.65 | 150 | 356 | Peak | VERTICAL |
| 3 | 62.01 | 35.87 | 40.00 | -4.13 | 54.85 | 1.46 | 12.05 | 32.49 | 200 | 354 | Peak | VERTICAL |
| 4 | 773.02 | 36.73 | 46.00 | -9.27 | 37.83 | 5.55 | 25.54 | 32.19 | 300 | 268 | Peak | VERTICAL |
| 5 | 945.68 | 39.11 | 46.00 | -6.89 | 37.88 | 6.24 | 26.42 | 31.43 | 300 | 61 | Peak | VERTICAL |
| 6 | 955.38 | 38.71 | 46.00 | -7.29 | 37.24 | 6.28 | 26.52 | 31.33 | 100 | 184 | Peak | VERTICAL |

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

| RSE below 1GHz Result | | | |
|---|---|---|---|
| **Operating Mode** | 4 | **Polarization** | Horizontal |
| **Operating Function** | CTX | | |




| | Freq | Level | Limit Line | Over Limit | Read Level | Cable Loss | Antenna Factor | Preamp Factor | A/Pos | T/Pos | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV/m | dBuV/m | dB | dBuV | dB | dB/m | dB | cm | deg | | |
| 1 | 619.76 | 33.05 | 46.00 | -12.95 | 35.96 | 4.94 | 24.50 | 32.35 | 300 | 87 | Peak | HORIZONTAL |
| 2 | 745.86 | 36.04 | 46.00 | -9.96 | 37.36 | 5.45 | 25.33 | 32.10 | 125 | 283 | Peak | HORIZONTAL |
| 3 | 773.02 | 35.35 | 46.00 | -10.65 | 36.45 | 5.55 | 25.54 | 32.19 | 150 | 8 | Peak | HORIZONTAL |
| 4 | 846.74 | 36.57 | 46.00 | -9.43 | 36.49 | 5.84 | 25.99 | 31.75 | 200 | 164 | Peak | HORIZONTAL |
| 5 | 944.71 | 38.41 | 46.00 | -7.59 | 37.19 | 6.24 | 26.41 | 31.43 | 100 | 356 | Peak | HORIZONTAL |
| 6 | 959.26 | 38.89 | 46.00 | -7.11 | 37.32 | 6.30 | 26.56 | 31.29 | 100 | 215 | Peak | HORIZONTAL |

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

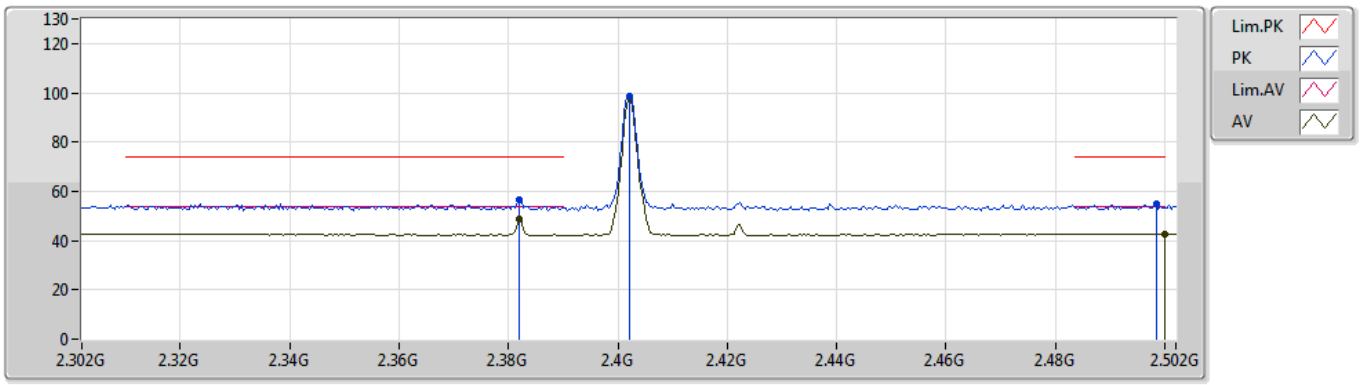
## Summary

| Mode | Result | Type | Freq (Hz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Factor (dB) | Dist (m) | Condition | Azimuth (°) | Height (m) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.4-2.4835GHz | - | - | - | - | - | - | - | - | - | - | - | - |
| BT-BR(1Mbps) | Pass | AV | 2.4835G | 52.97 | 54.00 | -1.03 | 30.05 | 3 | Horizontal | 39 | 1.04 | - |

## BT-BR(1Mbps)

## 2402MHz_TX

15/08/2019



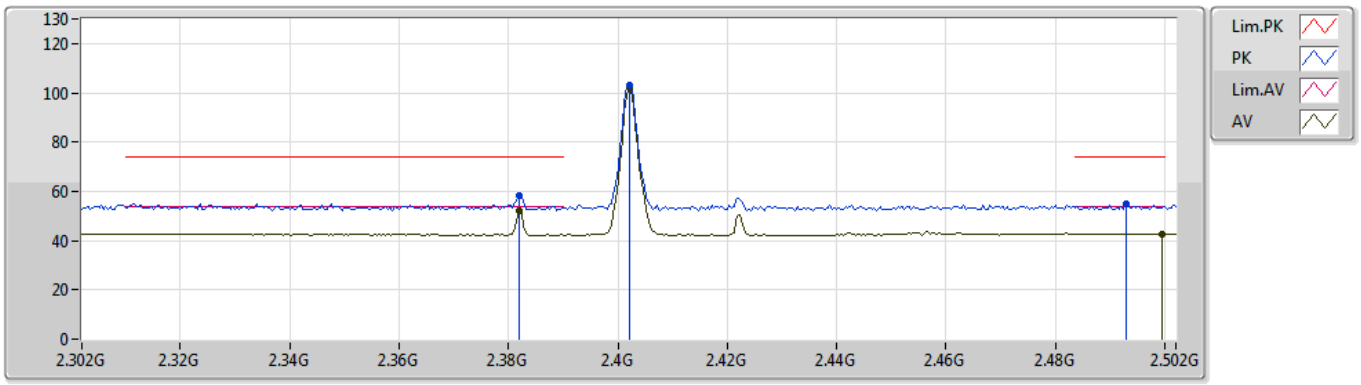

EUT Z_1TX
Setting 4
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 2.382G | 56.33 | 74.00 | -17.67 | 29.85 | 3 | Vertical | 58 | 1.24 | - | 26.48 |
| AV | 2.382G | 48.62 | 54.00 | -5.38 | 29.85 | 3 | Vertical | 58 | 1.24 | - | 18.77 |
| PK | 2.402G | 98.77 | Inf | -Inf | 29.84 | 3 | Vertical | 58 | 1.24 | - | 68.93 |
| AV | 2.402G | 97.91 | Inf | -Inf | 29.84 | 3 | Vertical | 58 | 1.24 | - | 68.07 |
| PK | 2.4984G | 54.74 | 74.00 | -19.26 | 30.09 | 3 | Vertical | 58 | 1.24 | - | 24.65 |
| AV | 2.5G | 42.61 | 54.00 | -11.39 | 30.09 | 3 | Vertical | 58 | 1.24 | - | 12.52 |

## BT-BR(1Mbps)

15/08/2019

## 2402MHz_TX



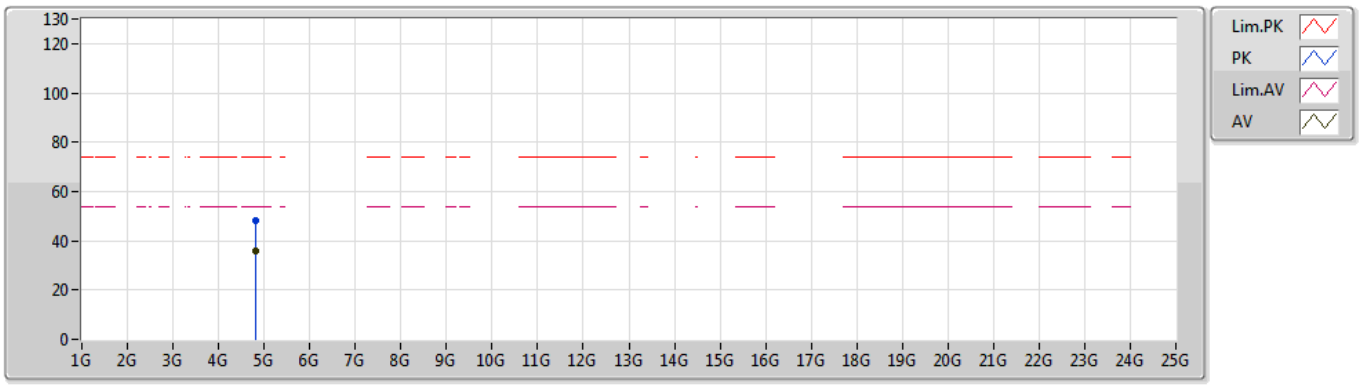

EUT Z_1TX
Setting 4
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 2.382G | 58.36 | 74.00 | -15.64 | 29.85 | 3 | Horizontal | 311 | 1.00 | - | 28.51 |
| AV | 2.382G | 52.19 | 54.00 | -1.81 | 29.85 | 3 | Horizontal | 311 | 1.00 | - | 22.34 |
| PK | 2.402G | 102.88 | Inf | -Inf | 29.84 | 3 | Horizontal | 311 | 1.00 | - | 73.04 |
| AV | 2.402G | 101.96 | Inf | -Inf | 29.84 | 3 | Horizontal | 311 | 1.00 | - | 72.12 |
| PK | 2.4928G | 54.89 | 74.00 | -19.11 | 30.08 | 3 | Horizontal | 311 | 1.00 | - | 24.81 |
| AV | 2.4996G | 42.77 | 54.00 | -11.23 | 30.09 | 3 | Horizontal | 311 | 1.00 | - | 12.68 |

## BT-BR(1Mbps)

## 2402MHz_TX

15/08/2019



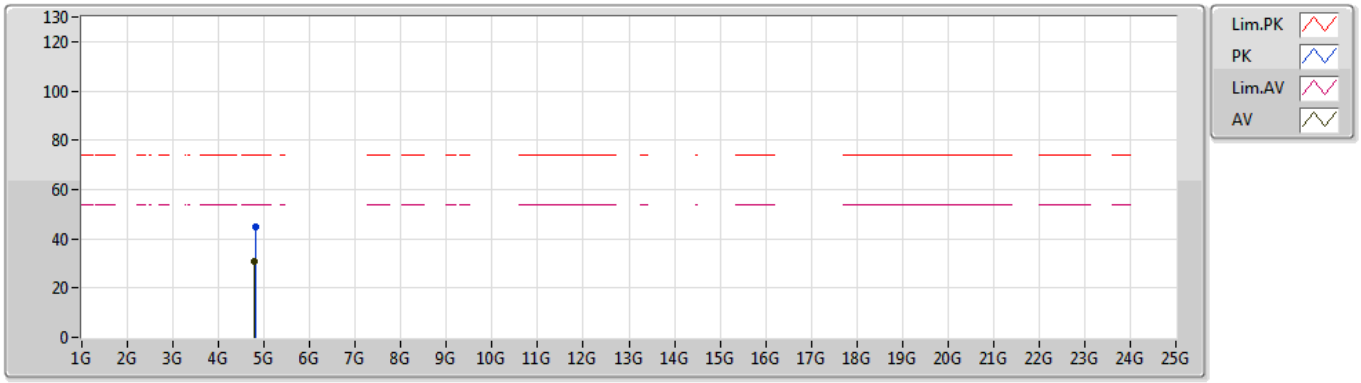

EUT Z_1TX
Setting 4
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 4.79914G | 48.14 | 74.00 | -25.86 | 2.89 | 3 | Vertical | 1 | 1.68 | - | 45.25 |
| AV | 4.81654G | 35.86 | 54.00 | -18.14 | 2.95 | 3 | Vertical | 1 | 1.68 | - | 32.91 |

## BT-BR(1Mbps)

15/08/2019

## 2402MHz_TX



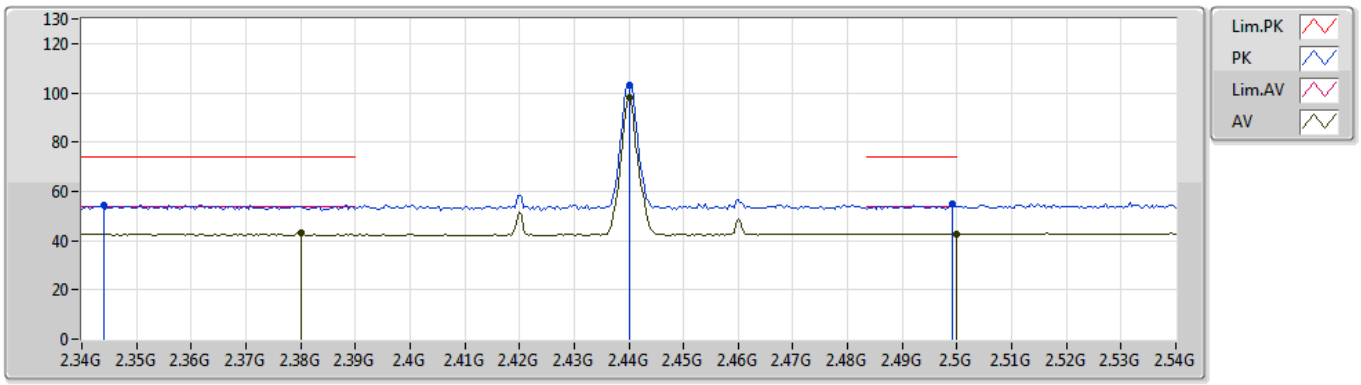

EUT Z_1TX
Setting 4
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 4.80328G | 44.55 | 74.00 | -29.45 | 2.90 | 3 | Horizontal | 346 | 1.04 | - | 41.65 |
| AV | 4.79626G | 30.93 | 54.00 | -23.07 | 2.89 | 3 | Horizontal | 346 | 1.04 | - | 28.04 |

## BT-BR(1Mbps)

## 2440MHz_TX

15/08/2019



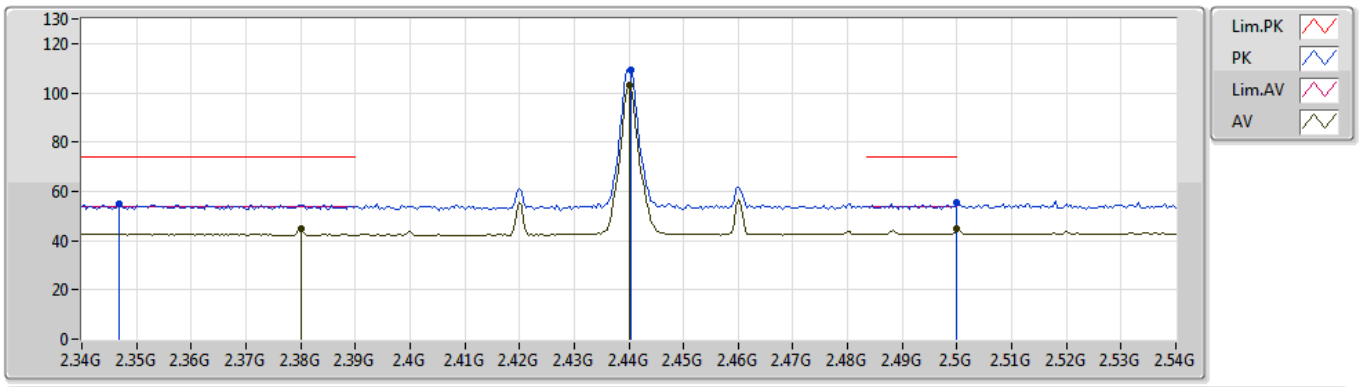

EUT Z_1TX
Setting a
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 2.344G | 54.49 | 74.00 | -19.51 | 29.87 | 3 | Vertical | 54 | 1.02 | - | 24.62 |
| AV | 2.38G | 43.41 | 54.00 | -10.59 | 29.85 | 3 | Vertical | 54 | 1.02 | - | 13.56 |
| PK | 2.44G | 103.38 | Inf | -Inf | 29.94 | 3 | Vertical | 54 | 1.02 | - | 73.44 |
| AV | 2.44G | 97.86 | Inf | -Inf | 29.94 | 3 | Vertical | 54 | 1.02 | - | 67.92 |
| PK | 2.4992G | 54.98 | 74.00 | -19.02 | 30.09 | 3 | Vertical | 54 | 1.02 | - | 24.89 |
| AV | 2.5G | 42.71 | 54.00 | -11.29 | 30.09 | 3 | Vertical | 54 | 1.02 | - | 12.62 |

## BT-BR(1Mbps)

## 2440MHz_TX

15/08/2019



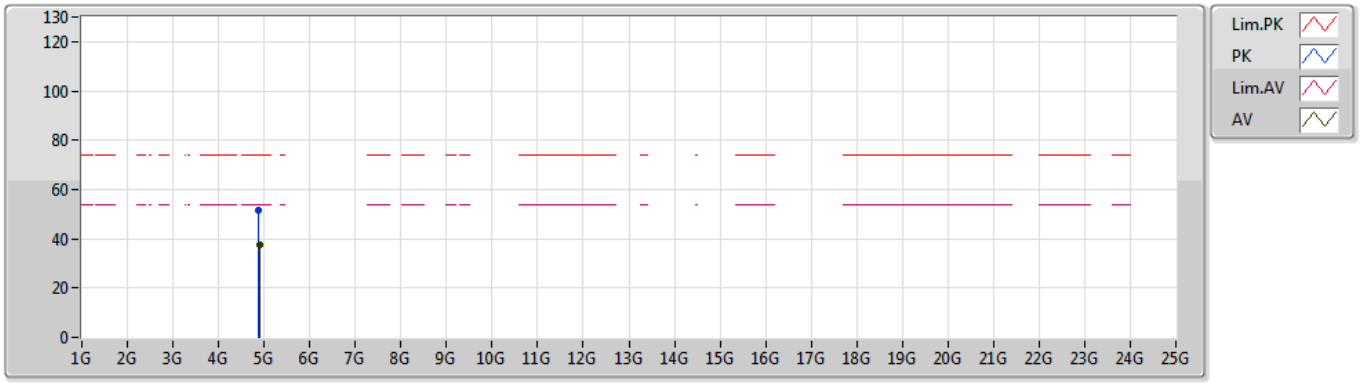

EUT Z_1TX
Setting a
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 2.3468G | 54.92 | 74.00 | -19.08 | 29.86 | 3 | Horizontal | 46 | 1.10 | - | 25.06 |
| AV | 2.38G | 44.55 | 54.00 | -9.45 | 29.85 | 3 | Horizontal | 46 | 1.10 | - | 14.70 |
| PK | 2.4404G | 109.45 | Inf | -Inf | 29.94 | 3 | Horizontal | 46 | 1.10 | - | 79.51 |
| AV | 2.44G | 103.37 | Inf | -Inf | 29.94 | 3 | Horizontal | 46 | 1.10 | - | 73.43 |
| PK | 2.5G | 55.71 | 74.00 | -18.29 | 30.09 | 3 | Horizontal | 46 | 1.10 | - | 25.62 |
| AV | 2.5G | 44.85 | 54.00 | -9.15 | 30.09 | 3 | Horizontal | 46 | 1.10 | - | 14.76 |

## BT-BR(1Mbps)

15/08/2019

## 2440MHz_TX



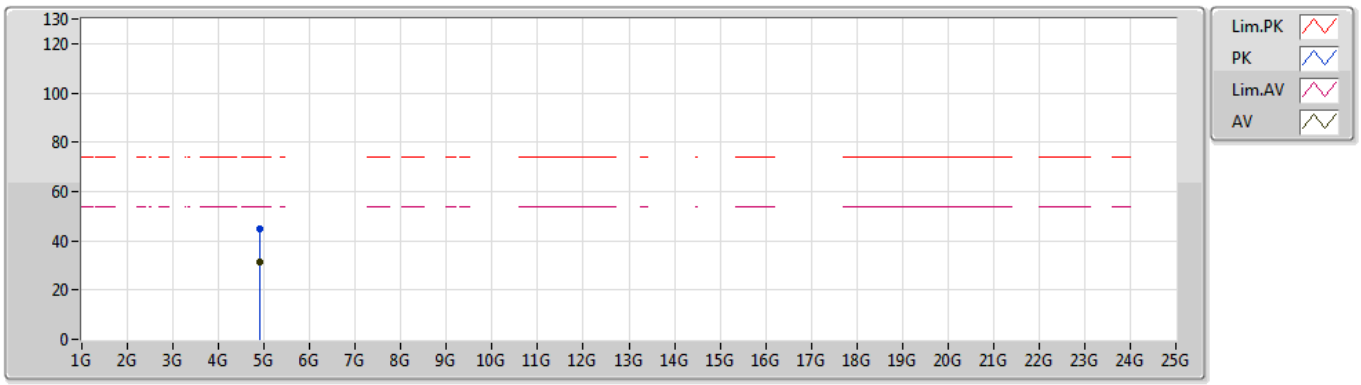

EUT Z_1TX
Setting a
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 4.88684G | 51.34 | 74.00 | -22.66 | 3.15 | 3 | Vertical | 0 | 2.05 | - | 48.19 |
| AV | 4.89044G | 37.65 | 54.00 | -16.35 | 3.17 | 3 | Vertical | 0 | 2.05 | - | 34.48 |

## BT-BR(1Mbps)

15/08/2019

## 2440MHz_TX



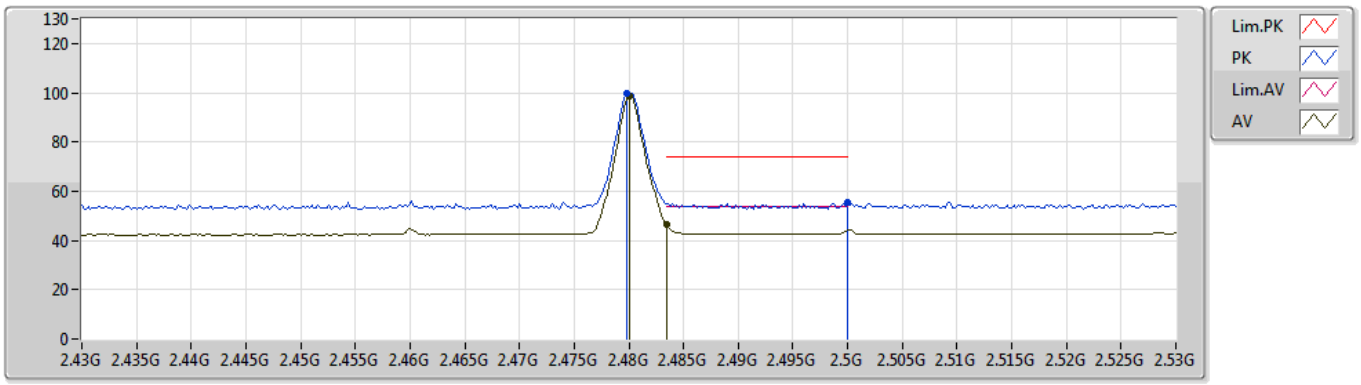

EUT Z_1TX
Setting a
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 4.89086G | 44.62 | 74.00 | -29.38 | 3.17 | 3 | Horizontal | 3 | 1.50 | - | 41.45 |
| AV | 4.88978G | 31.45 | 54.00 | -22.55 | 3.17 | 3 | Horizontal | 3 | 1.50 | - | 28.28 |

## BT-BR(1Mbps)

15/08/2019

## 2480MHz_TX



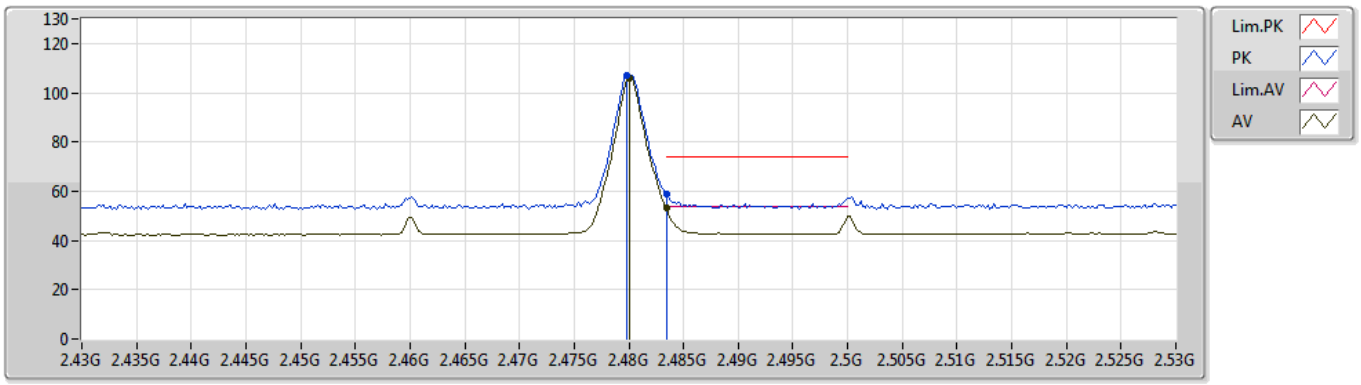

EUT Z_1TX
Setting 8
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 2.4798G | 99.49 | Inf | -Inf | 30.04 | 3 | Vertical | 49 | 1.01 | - | 69.45 |
| AV | 2.48G | 98.60 | Inf | -Inf | 30.04 | 3 | Vertical | 49 | 1.01 | - | 68.56 |
| PK | 2.5G | 55.24 | 74.00 | -18.76 | 30.09 | 3 | Vertical | 49 | 1.01 | - | 25.15 |
| AV | 2.4835G | 46.58 | 54.00 | -7.42 | 30.05 | 3 | Vertical | 49 | 1.01 | - | 16.53 |

## BT-BR(1Mbps)

## 2480MHz_TX

15/08/2019



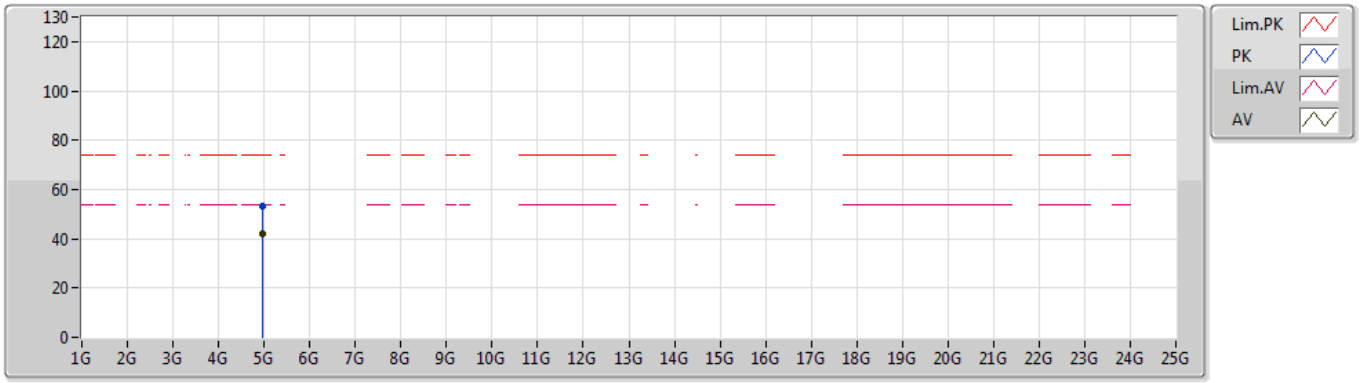

EUT Z_1TX
Setting 8
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 2.4798G | 106.97 | Inf | -Inf | 30.04 | 3 | Horizontal | 39 | 1.04 | - | 76.93 |
| AV | 2.48G | 106.07 | Inf | -Inf | 30.04 | 3 | Horizontal | 39 | 1.04 | - | 76.03 |
| PK | 2.4835G | 58.75 | 74.00 | -15.25 | 30.05 | 3 | Horizontal | 39 | 1.04 | - | 28.70 |
| AV | 2.4835G | 52.97 | 54.00 | -1.03 | 30.05 | 3 | Horizontal | 39 | 1.04 | - | 22.92 |

## BT-BR(1Mbps)

16/08/2019

## 2480MHz_TX



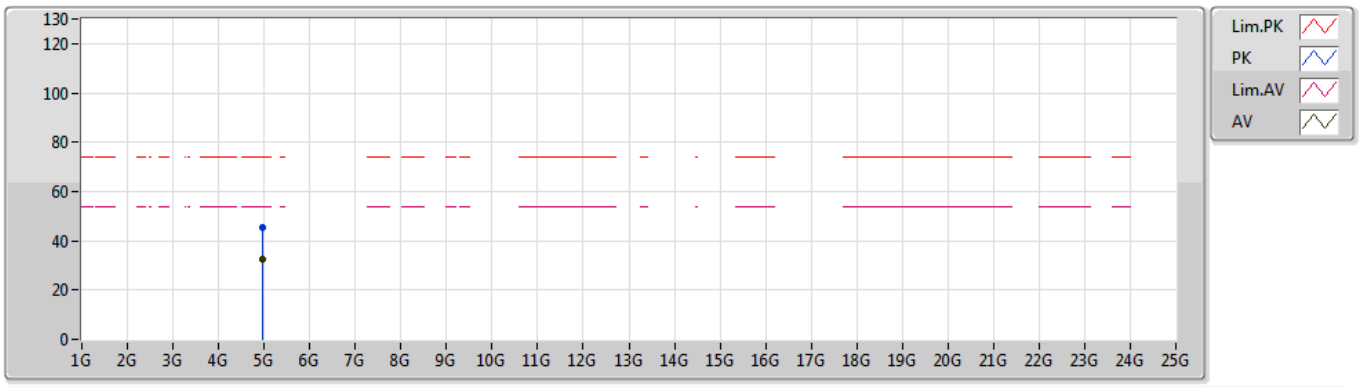

EUT Z_1TX
Setting 8
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 4.9792G | 53.30 | 74.00 | -20.70 | 3.38 | 3 | Vertical | 101 | 1.71 | - | 49.92 |
| AV | 4.9784G | 42.23 | 54.00 | -11.77 | 3.38 | 3 | Vertical | 101 | 1.71 | - | 38.85 |

## BT-BR(1Mbps)

15/08/2019

## 2480MHz_TX



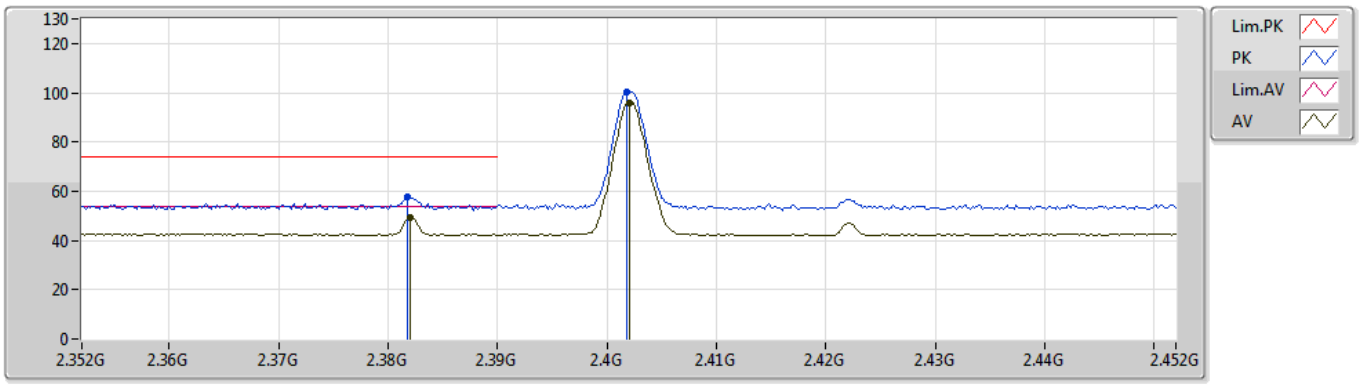

EUT Z_1TX
Setting 8
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 4.97452G | 45.11 | 74.00 | -28.89 | 3.37 | 3 | Horizontal | 243 | 1.24 | - | 41.74 |
| AV | 4.9714G | 32.43 | 54.00 | -21.57 | 3.36 | 3 | Horizontal | 243 | 1.24 | - | 29.07 |

## BT-EDR(3Mbps)

15/08/2019

## 2402MHz_TX



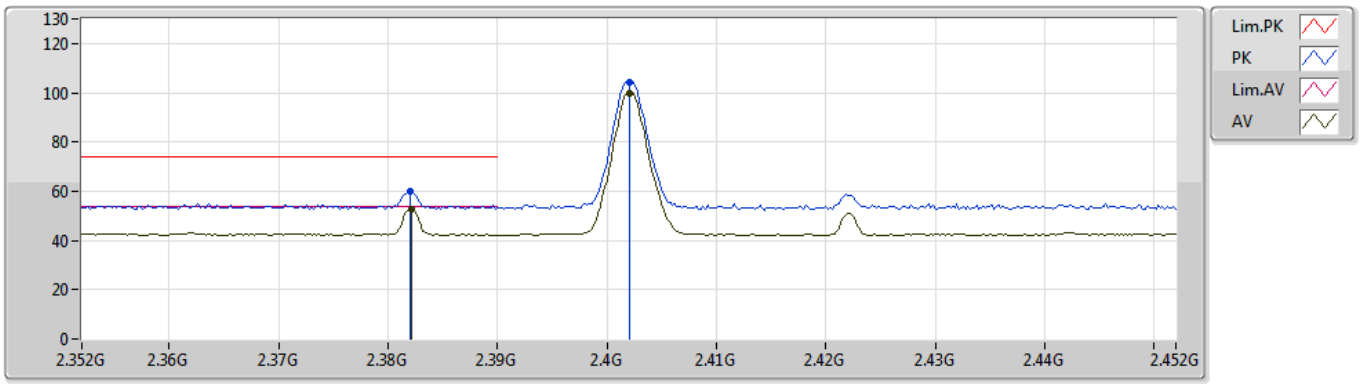

EUT Z_1TX
Setting 8
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 2.3818G | 57.84 | 74.00 | -16.16 | 29.85 | 3 | Vertical | 59 | 1.23 | - | 27.99 |
| AV | 2.382G | 49.08 | 54.00 | -4.92 | 29.85 | 3 | Vertical | 59 | 1.23 | - | 19.23 |
| PK | 2.4018G | 100.14 | Inf | -Inf | 29.84 | 3 | Vertical | 59 | 1.23 | - | 70.30 |
| AV | 2.402G | 95.98 | Inf | -Inf | 29.84 | 3 | Vertical | 59 | 1.23 | - | 66.14 |

## BT-EDR(3Mbps)

15/08/2019

## 2402MHz_TX



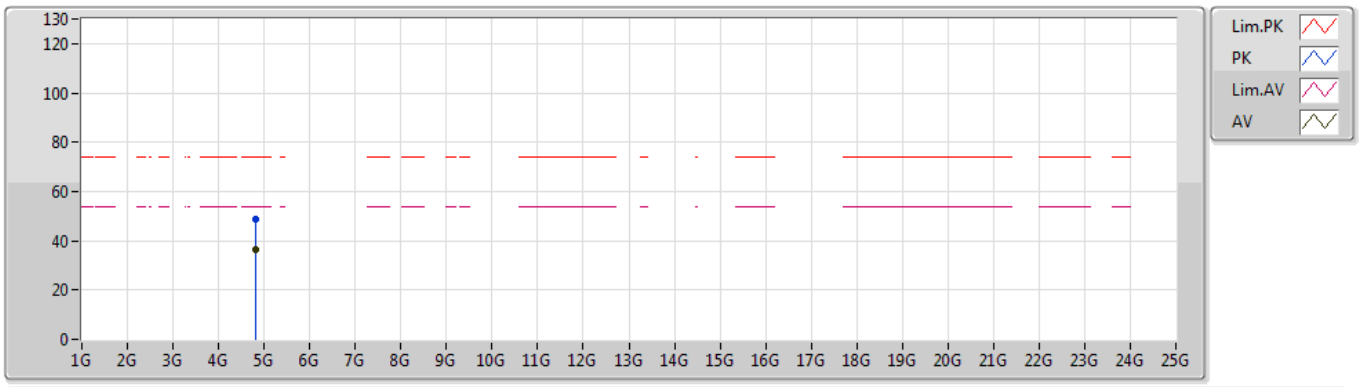

EUT Z_1TX
Setting 8
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 2.382G | 59.90 | 74.00 | -14.10 | 29.85 | 3 | Horizontal | 310 | 1.01 | - | 30.05 |
| AV | 2.3822G | 52.68 | 54.00 | -1.32 | 29.85 | 3 | Horizontal | 310 | 1.01 | - | 22.83 |
| PK | 2.402G | 104.22 | Inf | -Inf | 29.84 | 3 | Horizontal | 310 | 1.01 | - | 74.38 |
| AV | 2.402G | 100.02 | Inf | -Inf | 29.84 | 3 | Horizontal | 310 | 1.01 | - | 70.18 |

## BT-EDR(3Mbps)

16/08/2019

## 2402MHz_TX



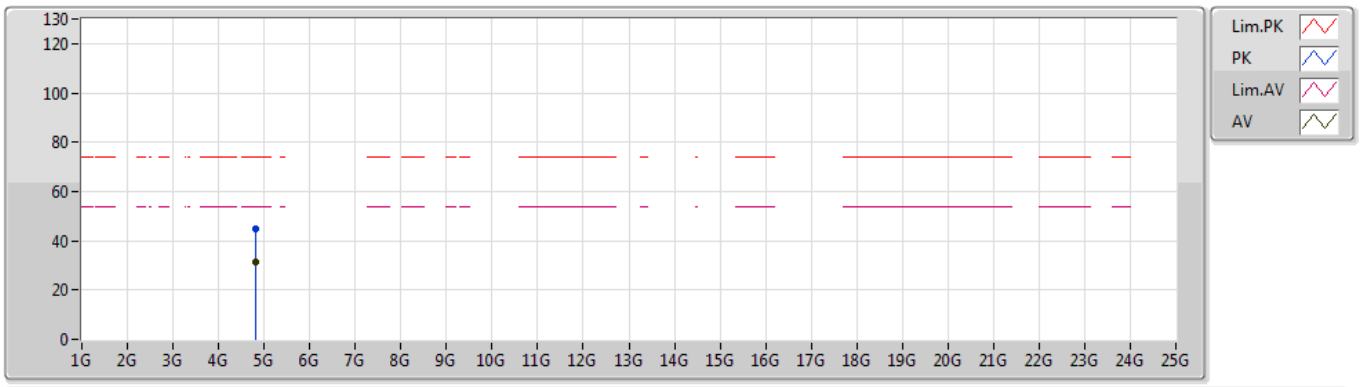

EUT Z_1TX
Setting 8
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 4.8066G | 49.00 | 74.00 | -25.00 | 2.91 | 3 | Vertical | 303 | 2.00 | - | 46.09 |
| AV | 4.8096G | 36.56 | 54.00 | -17.44 | 2.92 | 3 | Vertical | 303 | 2.00 | - | 33.64 |

## BT-EDR(3Mbps)

16/08/2019

## 2402MHz_TX



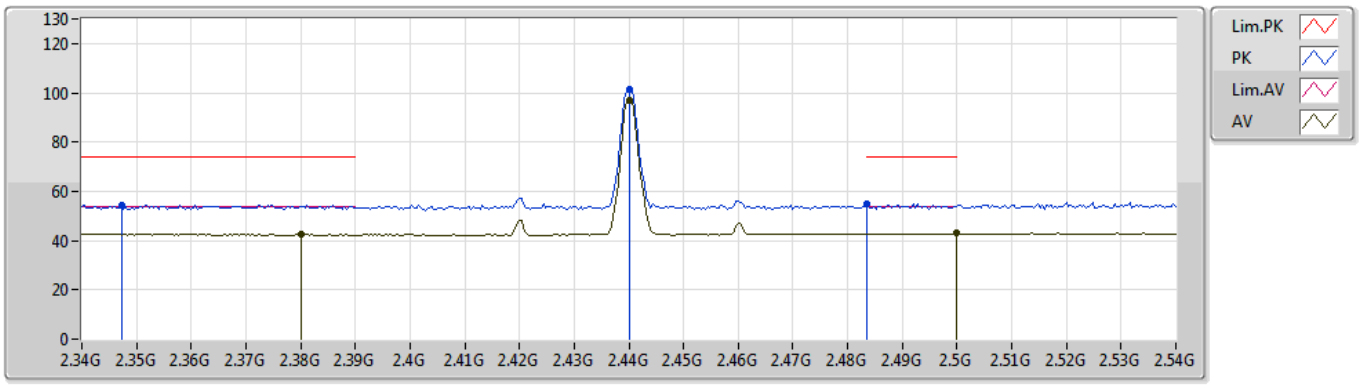

EUT Z_1TX
Setting 8
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 4.8098G | 45.10 | 74.00 | -28.90 | 2.92 | 3 | Horizontal | 310 | 1.50 | - | 42.18 |
| AV | 4.804G | 31.19 | 54.00 | -22.81 | 2.90 | 3 | Horizontal | 310 | 1.50 | - | 28.29 |

## BT-EDR(3Mbps)

15/08/2019

## 2440MHz_TX



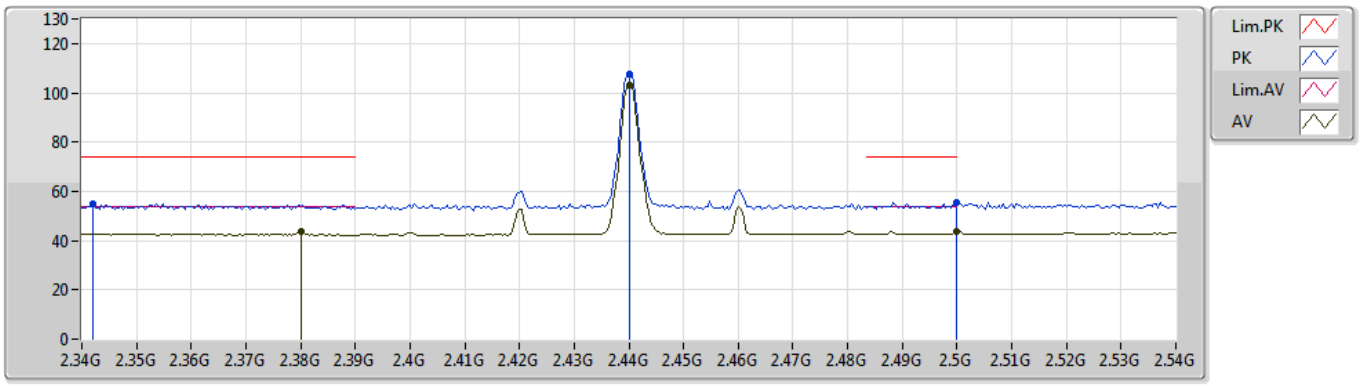

EUT Z_1TX
Setting a
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 2.3472G | 54.62 | 74.00 | -19.38 | 29.86 | 3 | Vertical | 50 | 1.01 | - | 24.76 |
| AV | 2.38G | 42.69 | 54.00 | -11.31 | 29.85 | 3 | Vertical | 50 | 1.01 | - | 12.84 |
| PK | 2.44G | 101.27 | Inf | -Inf | 29.94 | 3 | Vertical | 50 | 1.01 | - | 71.33 |
| AV | 2.44G | 97.17 | Inf | -Inf | 29.94 | 3 | Vertical | 50 | 1.01 | - | 67.23 |
| PK | 2.4835G | 54.87 | 74.00 | -19.13 | 30.05 | 3 | Vertical | 50 | 1.01 | - | 24.82 |
| AV | 2.5G | 42.92 | 54.00 | -11.08 | 30.09 | 3 | Vertical | 50 | 1.01 | - | 12.83 |

## BT-EDR(3Mbps)

15/08/2019

## 2440MHz_TX



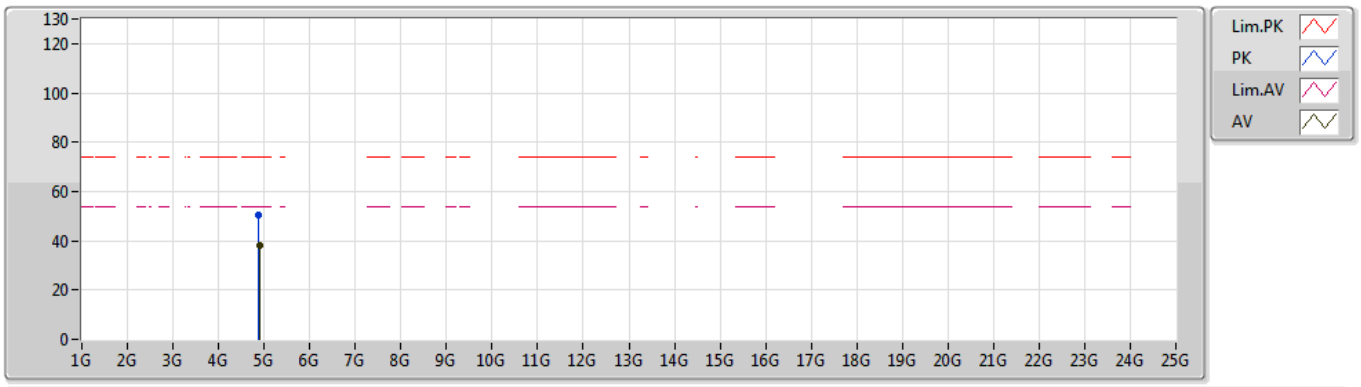

EUT Z_1TX
Setting a
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 2.342G | 54.95 | 74.00 | -19.05 | 29.87 | 3 | Horizontal | 50 | 1.10 | - | 25.08 |
| AV | 2.38G | 43.43 | 54.00 | -10.57 | 29.85 | 3 | Horizontal | 50 | 1.10 | - | 13.58 |
| PK | 2.44G | 107.52 | Inf | -Inf | 29.94 | 3 | Horizontal | 50 | 1.10 | - | 77.58 |
| AV | 2.44G | 103.38 | Inf | -Inf | 29.94 | 3 | Horizontal | 50 | 1.10 | - | 73.44 |
| PK | 2.5G | 55.28 | 74.00 | -18.72 | 30.09 | 3 | Horizontal | 50 | 1.10 | - | 25.19 |
| AV | 2.5G | 43.54 | 54.00 | -10.46 | 30.09 | 3 | Horizontal | 50 | 1.10 | - | 13.45 |

## BT-EDR(3Mbps)

15/08/2019

## 2440MHz_TX



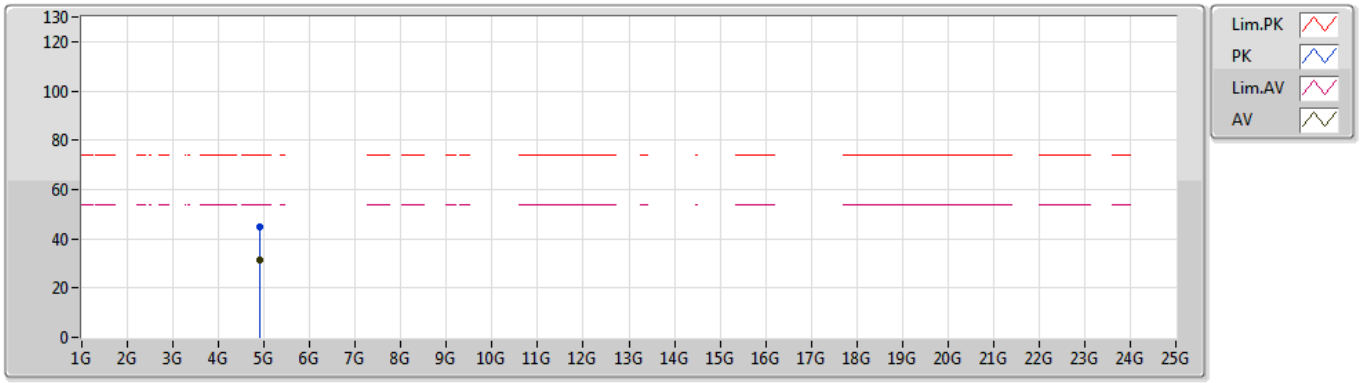

EUT Z_1TX
Setting a
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 4.88666G | 50.42 | 74.00 | -23.58 | 3.15 | 3 | Vertical | 86 | 2.18 | - | 47.27 |
| AV | 4.89392G | 37.86 | 54.00 | -16.14 | 3.18 | 3 | Vertical | 86 | 2.18 | - | 34.68 |

## BT-EDR(3Mbps)

15/08/2019

## 2440MHz_TX



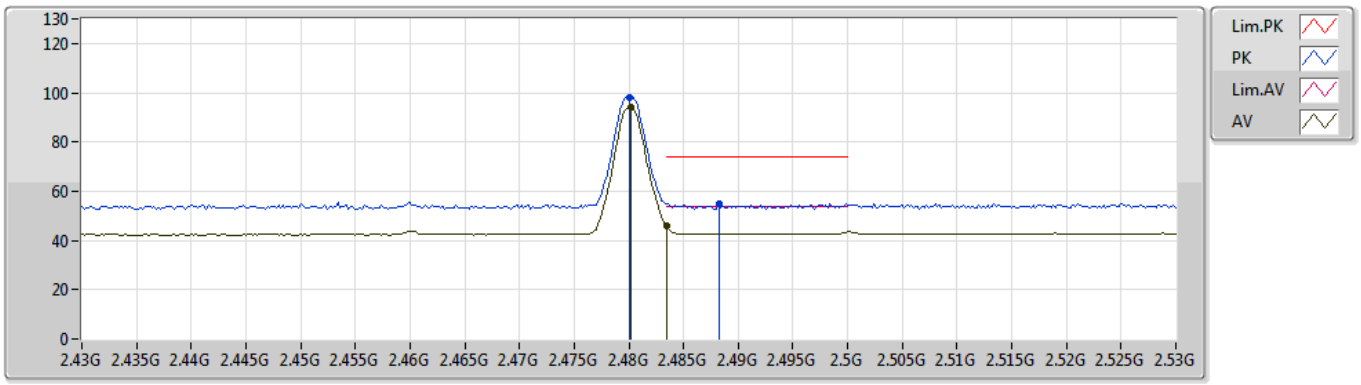

EUT Z_1TX
Setting a
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 4.88936G | 44.73 | 74.00 | -29.27 | 3.17 | 3 | Horizontal | 167 | 1.68 | - | 41.56 |
| AV | 4.89296G | 31.65 | 54.00 | -22.35 | 3.18 | 3 | Horizontal | 167 | 1.68 | - | 28.47 |

## BT-EDR(3Mbps)

15/08/2019

## 2480MHz_TX



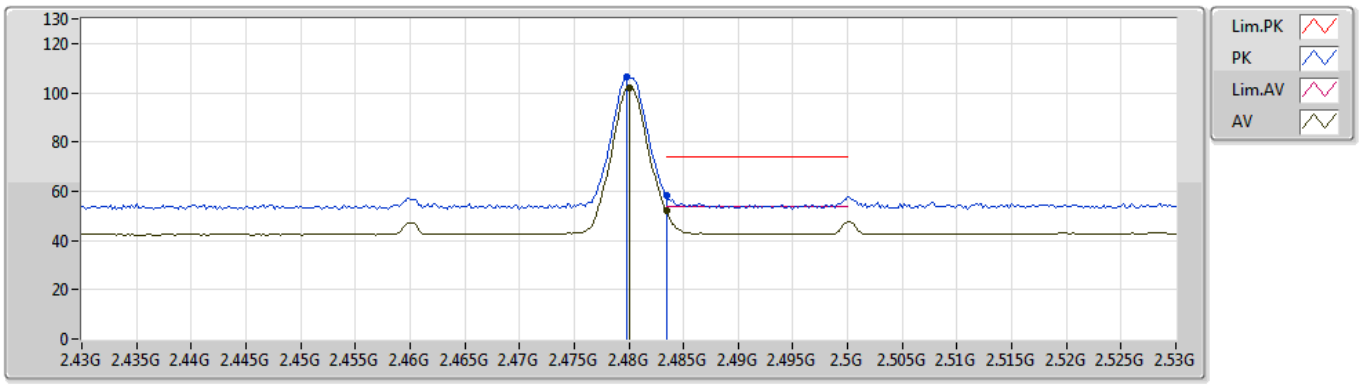

EUT Z_1TX
Setting 9
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 2.48G | 98.26 | Inf | -Inf | 30.04 | 3 | Vertical | 48 | 1.00 | - | 68.22 |
| AV | 2.4802G | 94.12 | Inf | -Inf | 30.04 | 3 | Vertical | 48 | 1.00 | - | 64.08 |
| PK | 2.4882G | 55.17 | 74.00 | -18.83 | 30.06 | 3 | Vertical | 48 | 1.00 | - | 25.11 |
| AV | 2.4835G | 45.71 | 54.00 | -8.29 | 30.05 | 3 | Vertical | 48 | 1.00 | - | 15.66 |

## BT-EDR(3Mbps)

15/08/2019

## 2480MHz_TX



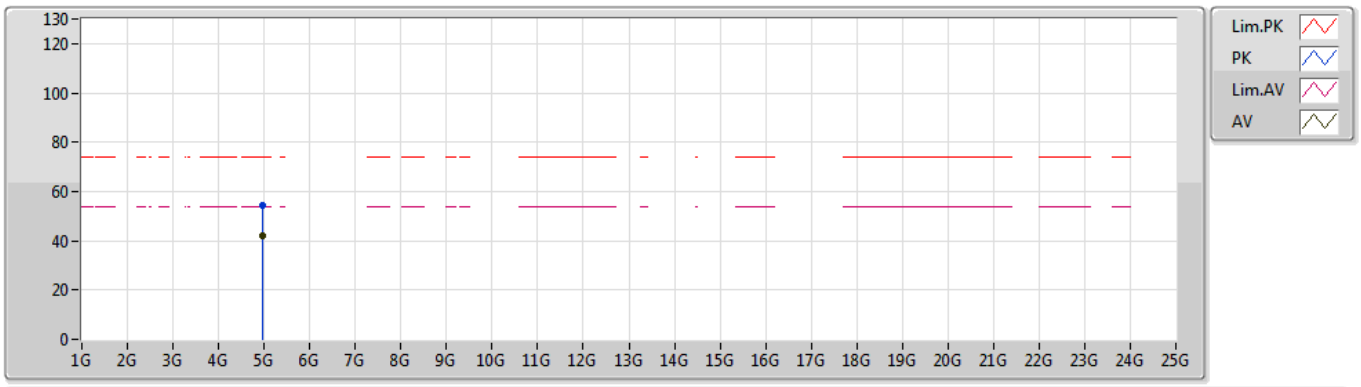

EUT Z_1TX
Setting 9
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 2.4798G | 106.21 | Inf | -Inf | 30.04 | 3 | Horizontal | 42 | 1.05 | - | 76.17 |
| AV | 2.48G | 101.96 | Inf | -Inf | 30.04 | 3 | Horizontal | 42 | 1.05 | - | 71.92 |
| PK | 2.4835G | 58.33 | 74.00 | -15.67 | 30.05 | 3 | Horizontal | 42 | 1.05 | - | 28.28 |
| AV | 2.4835G | 51.95 | 54.00 | -2.05 | 30.05 | 3 | Horizontal | 42 | 1.05 | - | 21.90 |

## BT-EDR(3Mbps)

15/08/2019

## 2480MHz_TX



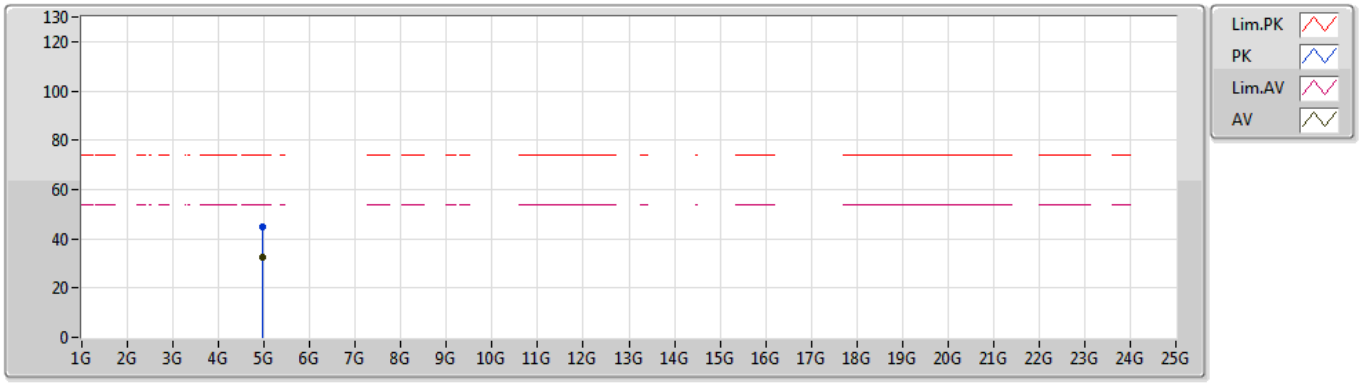

EUT Z_1TX
Setting 9
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 4.9717G | 54.41 | 74.00 | -19.59 | 3.36 | 3 | Vertical | 0 | 1.71 | - | 51.05 |
| AV | 4.96924G | 42.14 | 54.00 | -11.86 | 3.35 | 3 | Vertical | 0 | 1.71 | - | 38.79 |

## BT-EDR(3Mbps)

15/08/2019

## 2480MHz_TX




EUT Z_1TX
Setting 9
04-C-5
FSP

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) |
| PK | 4.96822G | 45.05 | 74.00 | -28.95 | 3.35 | 3 | Horizontal | 59 | 1.33 | - | 41.70 |
| AV | 4.96978G | 32.65 | 54.00 | -21.35 | 3.35 | 3 | Horizontal | 59 | 1.33 | - | 29.30 |