# FCC/IC Test Report

**For:**
Lucid USA, Inc.

**Host Model:** P21-K2C000
**Module Model:** JODY-W354-00A

**Host Product Description:**
UCC (Unified Cockpit Controller)

**FCC ID:** 2AXZJ-K2B100
**IC:** 27970-K2B100

**Applied Rules and Standards:**
47 CFR Part 15.247
RSS-247 Issue 3 & RSS-Gen Issue 5

**REPORT #:** EMC_LUCID_019_24001_15_247

**DATE:** 2024-09-30

**A2LA Accredited**

**IC recognized # 3462B**

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## 1 Assessment

The following device was evaluated against the applicable criteria specified in FCC rules Parts 15.247 of Title 47 of the Code of Federal Regulations and the relevant ISED Canada standard RSS-247.

No deviations were ascertained.

| Company | Description | Host Model # | Module Model # |
|---|---|---|---|
| Lucid USA, Inc. | UCC (Unified Cockpit Controller) | P21-K2C000 | JODY-W354-00A |

**Responsible for the Report:**

| Date | Section | Name | Signature |
|---|---|---|---|
| 2024-09-30 | Compliance | Art Thammanavarat (Senior EMC Engineer) | Art Thammanavarat Digitally signed by: Art Thammanavarat DN: CN = Art Thammanavarat email = art.thammanavarat@cetecom.com C = AD Date: 2024.09.30 13:08:15 -07'00' |

# 2 Administrative Data

## 2.1 Identification of the Testing Laboratory Issuing the EMC Test Report

| | |
|---|---|
| **Company Name:** | CETECOM Inc. |
| **Department:** | Compliance |
| **Street Address:** | 411 Dixon Landing Road |
| **City/Zip Code** | Milpitas, CA 95035 |
| **Country** | USA |
| **Telephone:** | +1 (408) 586 6200 |
| **Fax:** | +1 (408) 586 6299 |
| **EMC Lab Manager:** | Alvin, Ilarina |
| **Responsible Project Leader:** | Akanksha Baskaran |

## 2.2 Identification of the Client

| | |
|---|---|
| **Client Firm/Name:** | Lucid USA, Inc. |
| **Street Address:** | 7373 Gateway Blvd |
| **City/Zip Code** | Newark, California, 94560 |
| **Country** | USA |

## 2.3 Identification of the Manufacturer

| | |
|---|---|
| **Manufacturer's Name:** | Same as Client |
| **Manufacturers Address:** | |
| **City/Zip Code** | |
| **Country** | |

# 3 Equipment Under Test (EUT)

## 3.1 EUT Specifications

| | |
|---|---|
| **Host Model No** | P21-K2C000 |
| **HW Version** | 01 |
| **SW Version** | 491 |
| **Contains FCC ID :** | 2AXZJ-K2B100 |
| **Contains IC:** | 27970-K2B100 |
| **Product Description** | UCC (Unified Cockpit Controller) |
| **Radio Module** | **Wi-Fi & Bluetooth Modules**<br>**Model Name** : Ublox<br>**Model Number :** JODY-W354-00A<br>**Wireless Technologies**<br>**Wi-Fi 5GHz :** 802.11a/ac<br>**Bluetooth :** BDR/DER, BLE |
| **Frequency Range, # of channels** | Bluetooth Basic/EDR: Nominal band: 2400 MHz – 2483.5 MHz; 79 channels<br>Bluetooth Low Energy: Nominal band: 2400 MHz – 2483.5 MHz; 40 channels |
| **Modes of Operation** | Bluetooth Basic/EDR: GFSK, π /4 DQPSK, 8DPSK<br>Bluetooth Low Energy: GFSK |
| **Antenna Gain as declared** | 3.8 dBi |
| **Max. Peak Output Power** | Bluetooth: +11.2 dBm<br>BLE: +6.0 dBm |
| **Rated Operating Voltage Range** | 9V to 16V DCs |
| **Operating Temperature Range** | -40 ºC to 85 ºC |
| **Other Radios in the device** | UNII-1 / UNII-3 |
| **Sample Revision** | ■Production Unit; ☐Pre-Production |

### 3.2 EUT Sample details

| EUT # | Host Model # | HW Version | SW Version | Notes/Comments |
|---|---|---|---|---|
| 1 | P21-K2C000 | 01 | 491 | N/A |

### 3.3 Support Equipment (SE) details

| SE # | Type | Model | Manufacturer | Serial Number |
|---|---|---|---|---|
| 1 | Media Converter | 100/1000Base-T1 | Technica Engineering | 1402240122420140 |
| 2 | Center Console Monitor | P11-NAT6ST-01 | LUCID | 2213800007 |
| 3 | Dash Monitor | P11-NASBST-07 | LUCID | 2218900006 |
| 4 | USB Drive – 32GB | CRUZER 32 GB | San DISK | SDCZ36-032G |
| 5 | Video Camera | P11-G160WW-C | Continental | RVS231LD10-0001 |
| 6 | Dual A2B Audio Generator | A2BFRTX2 | Flexmedia XM | 0090 |
| 7 | Gigabit Ethernet Fiber Media Converter | ET91000SFP2 | Startech.com | 2821010161 |

### 3.4 Test Sample Configuration

| EUT Set-up # | Combination of AE used for test set up | Comments |
|---|---|---|
| 1 | EUT#1+(SE#1+2+3+4+5+6+7) | Powered by 12 VDC Car battery |

### 3.5 Mode of Operation details

| Mode of Operation | Description |
|---|---|
| Bluetooth BR | The radio of the EUT was configured to a fixed channel transmission with highest possible duty cycle using confidential test software and scripts provided by the applicant. |
| Bluetooth LE | The radio of the EUT was configured to a fixed channel transmission with highest possible duty cycle using confidential test software and scripts provided by the applicant. |

### 3.6 Justification for Worst Case Mode of Operation

During the testing process, the EUT was tested with transmitter sets on mid channels, in BDR & BLE mode. For radiated measurements, all data in this report shows the worst case between horizontal and vertical antenna polarizations.

## 4 Subject of Investigation

The objective of the measurements done by CETECOM Inc. was to assess the performance of the EUT according to the relevant requirements specified in FCC rules Part 15.247 of Title 47 of the Code of Federal Regulations and Radio Standard Specification RSS-247 of ISED Canada.

This test report is to support a request for the FCC ID: 2AXZJ-K2B100 and IC: 27970-K2B100.

## 5 Measurement Results Summary

| Test Specification | Test Case | Temperature and Voltage Conditions | Mode | Pass | NA | NP | Result |
|---|---|---|---|---|---|---|---|
| §15.247(a)(1)<br>RSS-247 5.2(a) | Emission Bandwidth | Nominal | BRD/BLE | ☐ | ☐ | ■ | See Note 4 |
| §15.247(e)<br>RSS-247 5.2(b) | Power Spectral Density | Nominal | BRD/BLE | ☐ | ☐ | ■ | See Note 5 |
| §15.247(b)(1)<br>RSS-247 5.4(d) | Maximum Conducted Output Power and EIRP | Nominal | BRD/BLE | ■ | ☐ | ☐ | See Note 3,6 |
| §15.247(d)<br>RSS-247 5.5 | Band edge compliance Unrestricted Band Edges | Nominal | BRD/BLE | ☐ | ☐ | ■ | See Note 7 |
| §15.247; 15.209; 15.205<br>RSS-Gen 8.9; 8.10 | Band edge compliance Restricted Band Edges | Nominal | BRD/BLE | ☐ | ☐ | ■ | See Note 7 |
| §15.247(d); §15.209<br>RSS-Gen 6.13 | TX Spurious emissions-Radiated | Nominal | BRD/BLE | ■ | ☐ | ☐ | Complies |
| §15.207(a)<br>RSS Gen 8.8 | AC Conducted Emissions | Nominal | BRD/BLE | ☐ | ■ | ☐ | See Note 1,2 |

**Note 1:** NA= Not Applicable
**Note 2:** This device does not connect to AC mains network
**Note 3**: Power verification testing was conducted only on middle channel.
**Note 4**: Leveraged from report # MDE_UBLOX_2220_FCC_01, Section 5.2 &5.3 (FCC ID: XPYJODYW374, IC: 8595A-JODYW374)
**Note 5**: Leveraged from report # MDE_UBLOX_2220_FCC_01, Section 5.9 (FCC ID: XPYJODYW374, IC: 8595A-JODYW374)
**Note 6**: Leveraged from report # MDE_UBLOX_2220_FCC_01, Section 5.4 (FCC ID: XPYJODYW374, IC: 8595A-JODYW374)
**Note 7**: Leveraged from report # MDE_UBLOX_2220_FCC_01, Section 5.8 (FCC ID: XPYJODYW374, IC: 8595A-JODYW374)

# 6 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus, with 95% confidence interval (in dB delta to result), based on a coverage factor k=2.

Radiated measurement

| Measurement System | | EMC 1 | EMC 2 |
|---|---|---|---|
| Conducted emissions (mains port) | 150 kHz – 30 MHz | 2.47 dB | N/A |
| Radiated emissions | 9 kHz – 30 MHz | 2.68 dB | 2.53 dB |
| | 30 – 100 MHz | 4.21 dB | 3.85 dB |
| | 100 MHz – 1 GHz | 5.51 dB | 5.24 dB |
| | 1 – 6 GHz | 5.0 dB | 4.88 dB |
| | 6 – 18 GHz | 4.76 dB | 4.58 dB |
| | 18 – 40 GHz | 4.65 dB | 4.61 dB |

RF conducted measurement ±0.5 dB

According to TR 102 273 a multiplicative propagation of error is assumed for RF measurement systems. For this reason the RMS method is applied to dB values and not to linear values as appropriate for additive propagation of error. Also used: http://physics.nist.gov/cuu/Uncertainty/typeb.html. The above calculated uncertainties apply to direct application of the Substitution method. The Substitution method is always used when the EUT comes closer than 3dB to the limit.

## 6.1 Environmental Conditions During Testing:

The following environmental conditions were maintained during the course of testing:

- Ambient Temperature: 20-25°C
- Relative humidity: 40-60%

## 6.2 Dates of Testing:

2024-07-26 – 2024-08-06

## 6.3 Decision Rule:

Cetecom advanced follows ILAC G8:2019 chapter 4.2.1 (Simple Acceptance Rule).

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3. The measurement uncertainty is mentioned in this test report, See chapter 9, but is not taken into account – neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong.

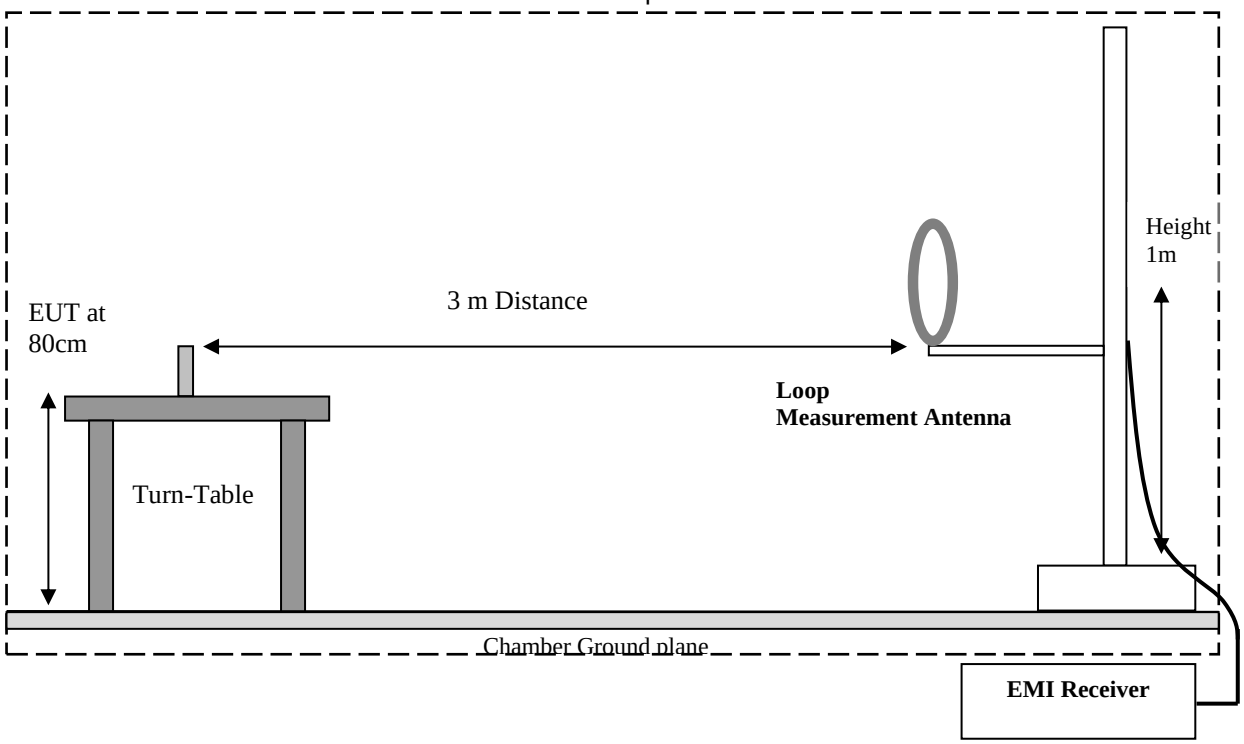
# 7 Measurement Procedures

## 7.1 Radiated Measurement

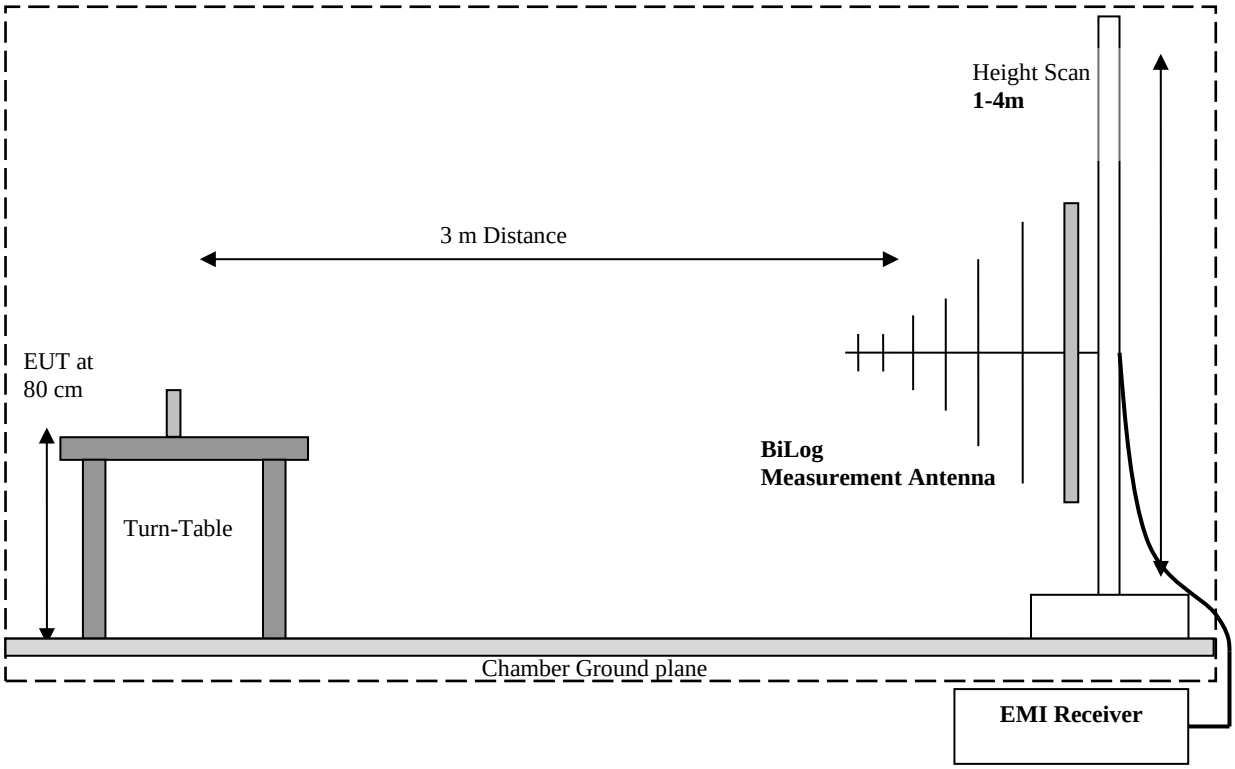
The radiated measurement is performed according to ANSI C63.10 (2013)

- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to cover the 3 orthogonal axis of the EUT. A max peak detector is utilized during the exploratory measurement. The Test-SW creates an overall maximum trace for all 12 sweeps and saves the settings for each point of this trace. The maximum trace is part of the test report.
- The 10 highest emissions are selected with an automatic algorithm of EMC32 searching for peaks in the noise floor and ensuring that broadband signals are not selected multiple times.
- The maxima are then put through the final measurement and again maximized in a 90deg range of the turntable, fine search in frequency domain and height scan between 1m and 4m.
- The above procedure is repeated for all possible ways of power supply to EUT and for all supported modulations.
- In case there are no emissions above noise floor level only the maximum trace is reported as described above.
- The results are split up into up to 4 frequency ranges due to antenna bandwidth restrictions. A magnetic loop is used from 9 kHz to 30 MHz, a Biconilog antenna is used from 30 MHz to 1 GHz, and two different horn antennas are used to cover frequencies up to 40 GHz.

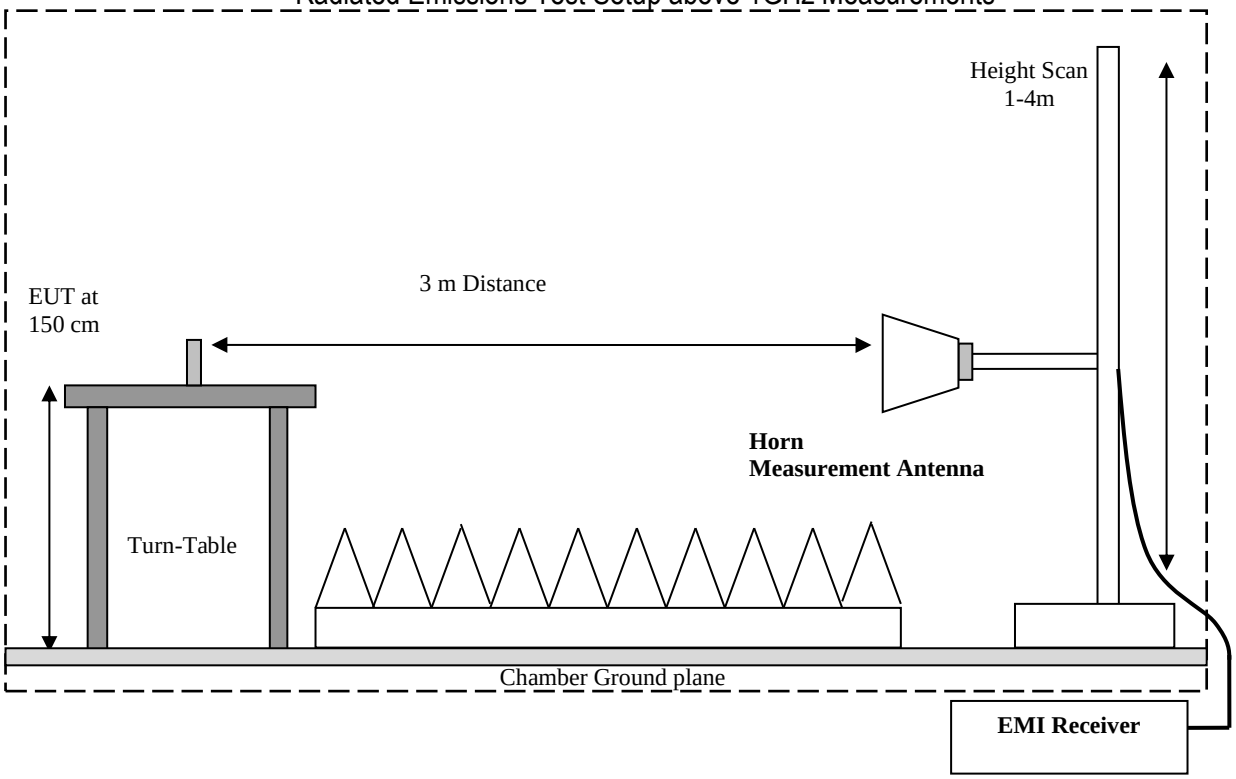
Radiated Emissions Test Setup below 30MHz Measurements



Radiated Emissions Test Setup 30MHz-1GHz Measurements




Radiated Emissions Test Setup above 1GHz Measurements



### 7.1.1 Sample Calculations for Field Strength Measurements

Field Strength is calculated from the Spectrum Analyzer/ Receiver readings, taking into account the following parameters:

1. Measured reading in dBµV
2. Cable Loss between the receiving antenna and SA in dB and
3. Antenna Factor in dB/m

All radiated measurement plots in this report are taken from a test SW that calculates the Field Strength based on the following equation:

FS (dBµV/m) = Measured Value on SA (dBµV)+ Cable Loss (dB)+ Antenna Factor (dB/m)

Example:

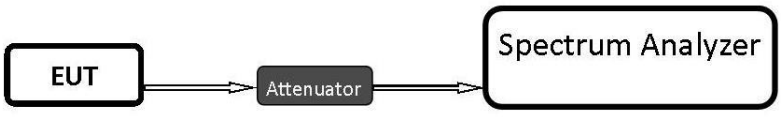
| Frequency (MHz) | Measured SA (dBµV) | Cable Loss (dB) | Antenna Factor Correction (dB) | Field Strength Result (dBµV/m) |
|---|---|---|---|---|
| 1000 | 80.5 | 3.5 | 14 | 98.0 |

## 7.2 Power Line Conducted Measurement Procedure

AC Power Line conducted emissions measurements performed according to: ANSI C63.4 (2014)

## 7.3 RF Conducted Measurement Procedure

Testing procedures are based on 558074 D01 15.247 Meas Guidance v05r02 – "GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES" - April 2, 2019, by the Federal Communications Commission, Office of Engineering and Technology, Laboratory Division.




- Connect the equipment as shown in the above diagram.
- Adjust the settings of the SA (Rohde-Schwarz Spectrum Analyzer) to connect the EUT at the required mode of test.
- Measurements are to be performed with the EUT set to the low, middle and high channels and for worst case modulation schemes.

# 8 Test Result Data

## 8.1 Maximum Peak Conducted Output Power

### 8.1.1 Measurement according to FCC 558074 D01 15.247 Meas Guidance v05r02 and ANSI C63.11.9

**Spectrum Analyzer settings:**

- RBW ≥ DTS bandwidth
- VBW ≥ 3 x RBW
- Span ≥ 3 x RBW
- Sweep = Auto couple
- Detector function = Peak
- Trace = Max hold
- Use peak marker function to determine the peak amplitude level

### 8.1.2 Limits:

**Maximum Peak Output Power:**

- FCC §15.247 (b)(1): 1 W
- IC RSS-247: 1 W

### 8.1.3 Test conditions and setup:

| Ambient Temperature | EUT Set-Up # | EUT operating mode | Power Input | Antenna Gain |
|---|---|---|---|---|
| 22° C | 1 | GFSK continuous fixed channel | 12 VDC | 3.8 dBi |

## 8.2 Conducted Power Verification Results:

| EUT operating mode #1 | | | |
|---|---|---|---|
| **Plot #** | **Operating Mode** | **Channel #** | **Power Measurement (dBm)** |
| 1 | Bluetooth BR | Mid | 11.2 |
| 2 | Bluetooth LE | Mid | 6.0 |

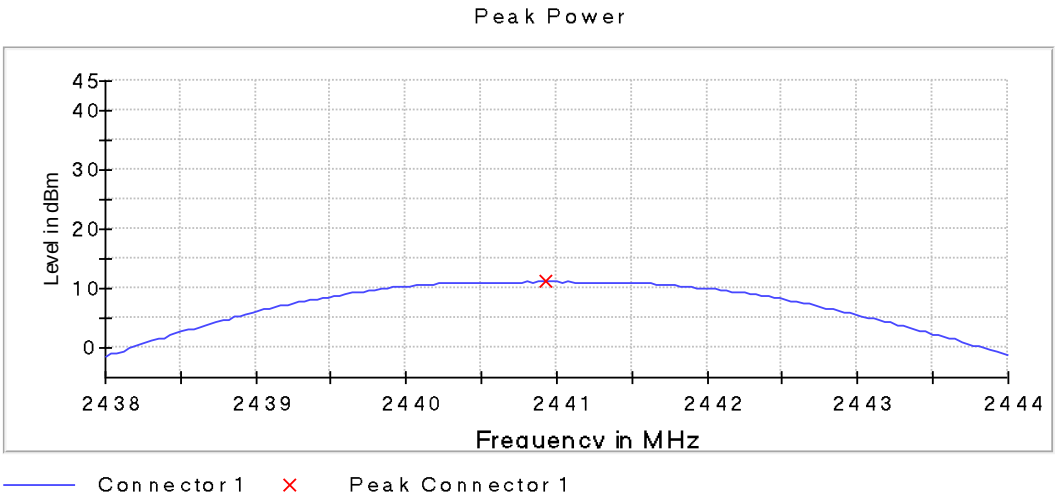
### 8.2.1 Measurement Plots:

**Plot #1 Power Verification**

**Mode:** BDR | **Channel:** Mid

**Result**

| DUT Frequency (MHz) | Peak Power (dBm) | Limit Max (dBm) | Result |
|---|---|---|---|
| 2441.000000 | 11.2 | 21.0 | PASS |

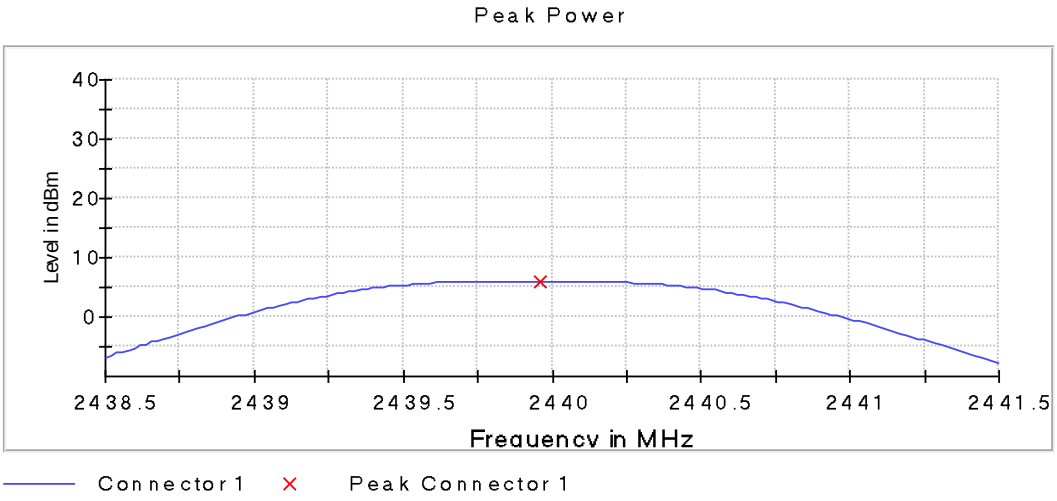



**Plot #2 Power Verification**

**Mode:** BLE | **Channel:** Mid

**Result**

| DUT Frequency (MHz) | Peak Power (dBm) | Limit Max (dBm) | Result |
|---|---|---|---|
| 2440.000000 | 6.0 | 30.0 | PASS |



## 8.3 Radiated Transmitter Spurious Emissions and Restricted Bands

### 8.3.1 Measurement according to ANSI C63.10 (2013)

**Spectrum Analyzer Settings:**

- Frequency = 9 KHz – 30 MHz
- RBW = 9 KHz
- Detector: Peak

- Frequency = 30 MHz – 1 GHz
- Detector = Peak / Quasi-Peak
- RBW= 120 KHz (<1GHz)

- Frequency > 1 GHz
- Detector = Peak / Average
- RBW = 1 MHz

- Radiated spurious emissions shall be measured for the transmit frequencies, transmit power, and data rate for the lowest, middle and highest channel in each frequency band of operation and for the highest gain antenna for each antenna type, and using the appropriate parameters and test requirements.
- The highest (or worst-case) data rate shall be recorded for each measurement.
- For testing at distance other than the specified in the standard, the limit conversion is calculated by using 40 dB/decade extrapolation factor as follow: Conversion factor (CF) = 40 log (D/d) = 40 log (300m / 3m) = 80dB

### 8.3.2 Limits:

FCC §15.247

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

FCC §15.209

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

| Frequency of emission (MHz) | Field strength (µV/m) | Measurement Distance (m) | Field strength @ 3m (dBµV/m) |
|---|---|---|---|
| 0.009–0.490 | 2400/F(kHz) / --------- | 300 | - |
| 0.490–1.705 | 24000/F(kHz) / -------- | 30 | - |
| 1.705–30.0 | 30 / (29.5) | 30 | - |
| 30–88 | 100 | 3 | 40 dBµV/m |
| 88–216 | 150 | 3 | 43.5 dBµV/m |
| 216–960 | 200 | 3 | 46 dBµV/m |
| Above 960 | 500 | 3 | 54 dBµV/m |

FCC §15.205

- Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090-0.110 | 16.42-16.423 | 399.9-410 | 4.5-5.15 |
| [1]0.495-0.505 | 16.69475-16.69525 | 608-614 | 5.35-5.46 |
| 2.1735-2.1905 | 16.80425-16.80475 | 960-1240 | 7.25-7.75 |
| 4.125-4.128 | 25.5-25.67 | 1300-1427 | 8.025-8.5 |
| 4.17725-4.17775 | 37.5-38.25 | 1435-1626.5 | 9.0-9.2 |
| 4.20725-4.20775 | 73-74.6 | 1645.5-1646.5 | 9.3-9.5 |
| 6.215-6.218 | 74.8-75.2 | 1660-1710 | 10.6-12.7 |
| 6.26775-6.26825 | 108-121.94 | 1718.8-1722.2 | 13.25-13.4 |
| 6.31175-6.31225 | 123-138 | 2200-2300 | 14.47-14.5 |
| 8.291-8.294 | 149.9-150.05 | 2310-2390 | 15.35-16.2 |
| 8.362-8.366 | 156.52475-156.52525 | 2483.5-2500 | 17.7-21.4 |
| 8.37625-8.38675 | 156.7-156.9 | 2690-2900 | 22.01-23.12 |
| 8.41425-8.41475 | 162.0125-167.17 | 3260-3267 | 23.6-24.0 |
| 12.29-12.293 | 167.72-173.2 | 3332-3339 | 31.2-31.8 |
| 12.51975-12.52025 | 240-285 | 3345.8-3358 | 36.43-36.5 |
| 12.57675-12.57725 | 322-335.4 | 3600-4400 | Above 38.6 |
| 13.36-13.41 | | | |

- Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
  *PEAK LIMIT= 74 dBµV/m
  *AVG. LIMIT= 54 dBµV/m

### 8.3.3 Test conditions and setup:

| Ambient Temperature | EUT Set-Up # | EUT operating mode | Power Input |
|---|---|---|---|
| 20.9° C | 1 | BDR/BLE | 12 VDC |

### 8.3.4 Measurement result:

| EUT operating mode 1 | | | | | |
|---|---|---|---|---|---|
| **Plot #** | **Operating Mode** | **Channel #** | **Scan Frequency** | **Limit** | **Result** |
| 1-5 | Bluetooth BDR | Mid | 9 kHz – 26 GHz | See section 8.3.2 | Pass |
| 6-11 | Bluetooth LE | Mid | 9 kHz – 26 GHz | See section 8.3.2 | Pass |

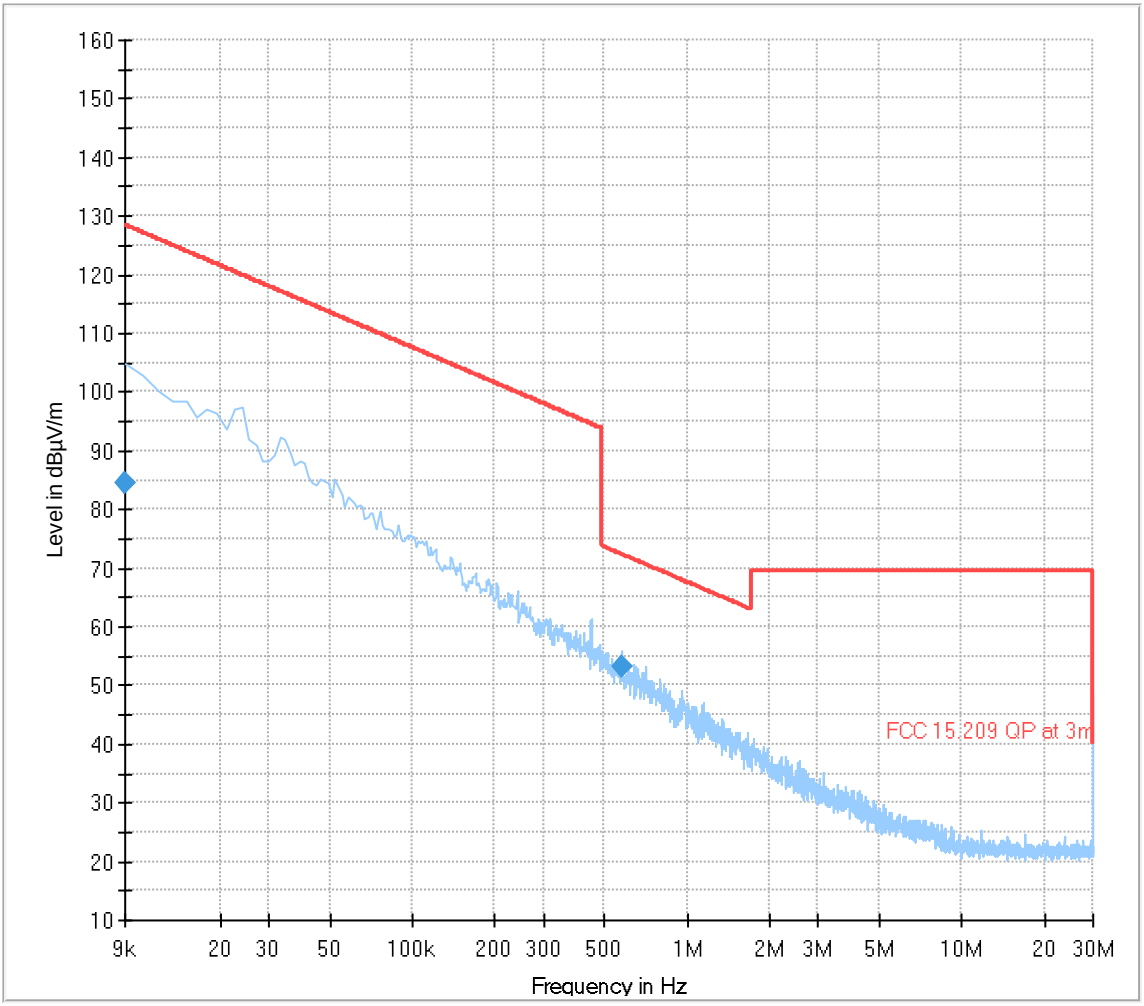
### 8.3.5 Measurement Plots:

**Plot # 1 Radiated Emissions: 9 KHz – 30 MHz**

| Tx Frequency: 2440 MHz | BDR / GFSK |
|---|---|

## Final_Result

| Frequency (MHz) | QuasiPeak (dBµV/m) | DET 2 (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.009 | 84.50 | --- | 128.50 | 44.00 | 500.0 | 0.2 | 120.0 | V | 315.0 | 59.9 |
| 0.576 | 53.15 | --- | 72.40 | 19.25 | 500.0 | 9.0 | 120.0 | H | 19.0 | 23.7 |

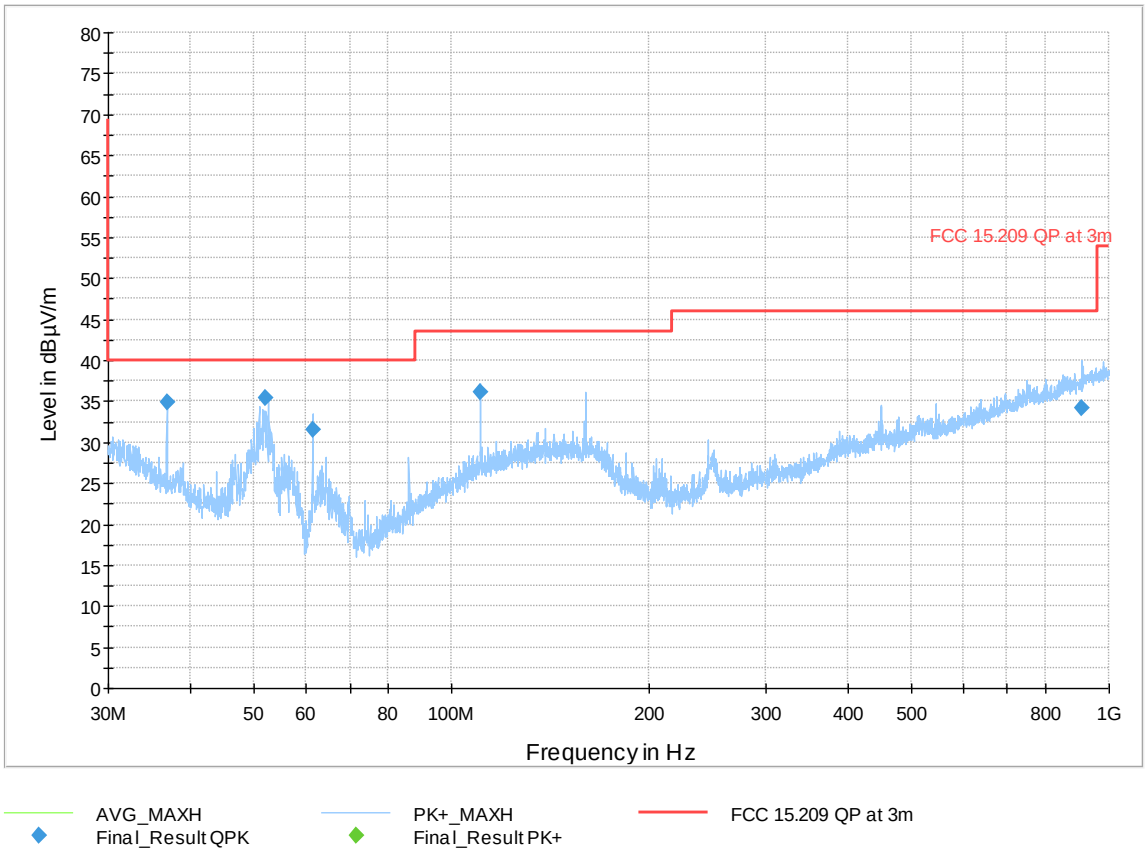


## Plot # 2 Radiated Emissions: 30 MHz – 1 GHz

| Tx Frequency: 2440 MHz | BDR / GFSK |
|---|---|

## Final_Result

| Frequency (MHz) | QuasiPeak (dBµV/m) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) | Sig Path (dB) | Preamp (dB) | Trd Corr. (dB/m) | Raw Rec (dBµV) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36.864 | 34.879 | --- | 40.00 | 5.12 | 500.0 | 120.000 | 100.0 | V | 176.0 | 20.6 | 0.7 | 0.0 | 19.8 | 14.3 |
| 52.146 | 35.428 | --- | 40.00 | 4.57 | 500.0 | 120.000 | 100.0 | V | 323.0 | 14.6 | 0.9 | 0.0 | 13.7 | 20.8 |
| 61.485 | 31.585 | --- | 40.00 | 8.42 | 500.0 | 120.000 | 100.0 | V | 187.0 | 14.0 | 0.9 | 0.0 | 13.0 | 17.6 |
| 110.608 | 36.063 | --- | 43.50 | 7.44 | 500.0 | 120.000 | 100.0 | V | 320.0 | 23.9 | 1.2 | 0.0 | 22.8 | 12.1 |
| 908.758 | 34.234 | --- | 46.02 | 11.79 | 500.0 | 120.000 | 282.0 | V | 247.0 | 31.9 | 3.2 | 0.0 | 28.7 | 2.3 |

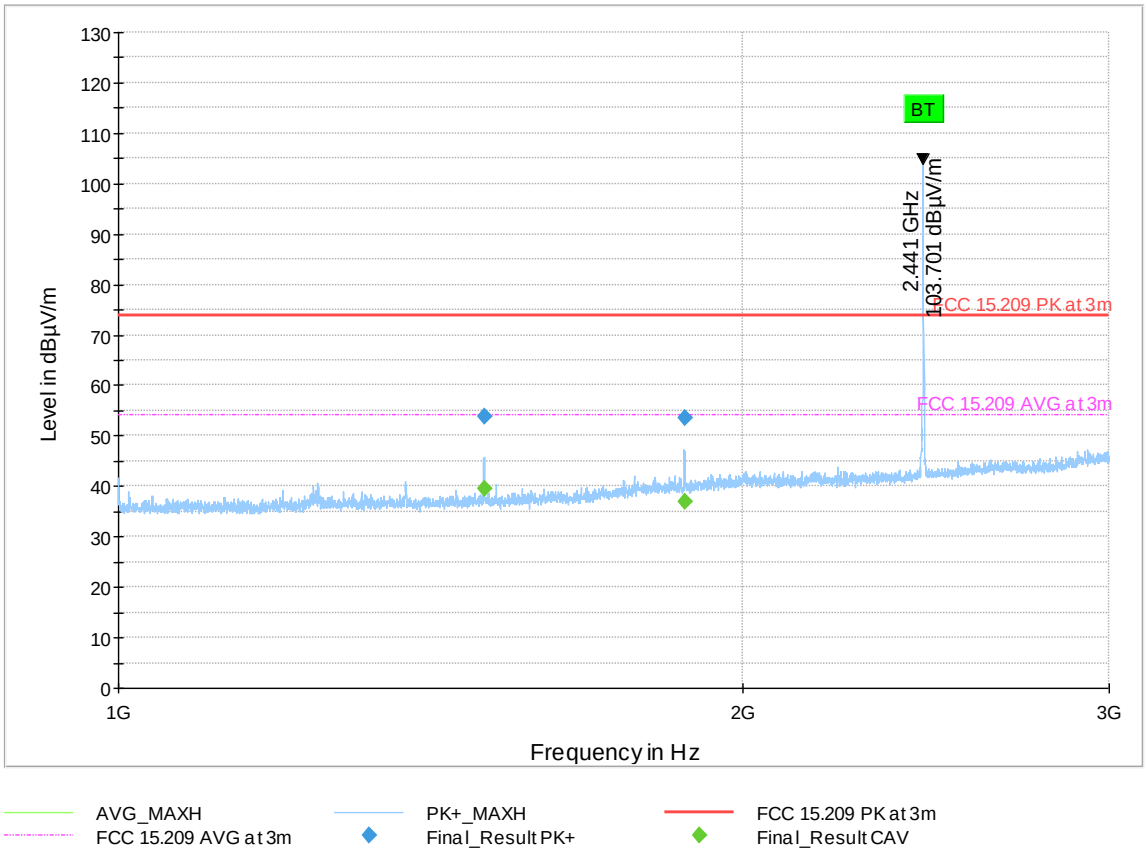


## Plot # 3 Radiated Emissions: 1 – 3 GHz

| Tx Frequency: 2440 MHz | BDR / GFSK |
|---|---|

## Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) | Sig Path (dB) | Preamp (dB) | Trd Corr. (dB/m) | Raw Rec (dBµV) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1500.098 | --- | 39.514 | 53.98 | 14.47 | 500.0 | 1000.000 | 167.0 | H | 300.0 | 29.8 | 4.6 | 0.0 | 25.2 | 9.7 |
| 1500.098 | 53.888 | --- | 73.98 | 20.09 | 500.0 | 1000.000 | 167.0 | H | 300.0 | 29.8 | 4.6 | 0.0 | 25.2 | 24.1 |
| 1873.791 | --- | 36.860 | 53.98 | 17.12 | 500.0 | 1000.000 | 329.0 | V | 170.0 | 31.9 | 5.1 | 0.0 | 26.8 | 4.9 |
| 1873.791 | 53.453 | --- | 73.98 | 20.53 | 500.0 | 1000.000 | 329.0 | V | 170.0 | 31.9 | 5.1 | 0.0 | 26.8 | 21.5 |

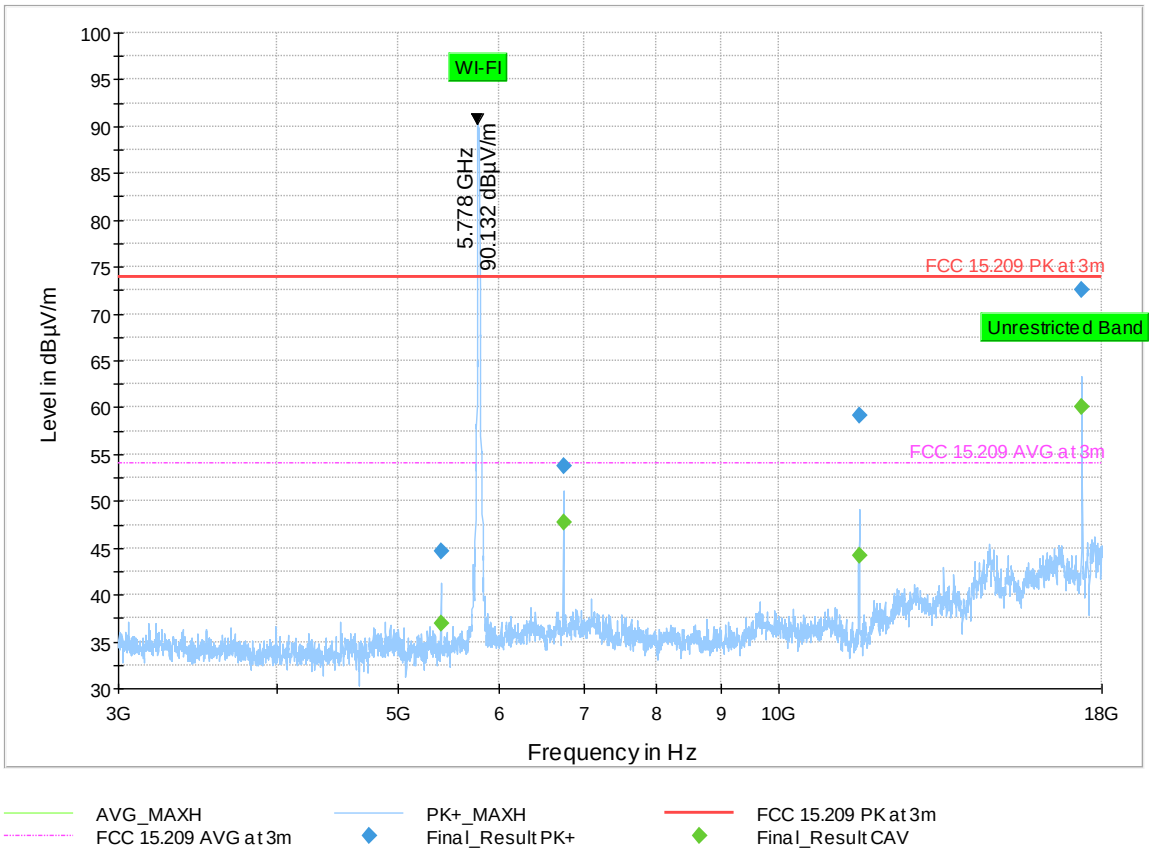


## Plot # 4 Radiated Emissions: 3 – 18 GHz

| Tx Frequency: 2440 MHz | BDR / GFSK |
|---|---|

## Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) | Sig Path (dB) | Preamp (dB) | Trd Corr. (dB/m) | Raw Rec (dBµV) | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5399.750 | --- | 36.939 | 53.98 | 17.04 | 500.0 | 1000.000 | 100.0 | V | 192.0 | -3.4 | 7.6 | -45.7 | 34.7 | 40.3 | |
| 5399.750 | 44.637 | --- | 73.98 | 29.34 | 500.0 | 1000.000 | 100.0 | V | 192.0 | -3.4 | 7.6 | -45.7 | 34.7 | 48.0 | |
| 6749.750 | --- | 47.673 | 53.98 | 6.31 | 500.0 | 1000.000 | 100.0 | V | 187.0 | -1.8 | 8.4 | -46.2 | 36.1 | 49.4 | |
| 6749.750 | 53.678 | --- | 73.98 | 20.30 | 500.0 | 1000.000 | 100.0 | V | 187.0 | -1.8 | 8.4 | -46.2 | 36.1 | 55.4 | |
| 11564.000 | --- | 44.219 | 53.98 | 9.76 | 500.0 | 1000.000 | 378.0 | H | 45.0 | 2.3 | 11.0 | -46.8 | 38.0 | 42.0 | |
| 11564.000 | 59.113 | --- | 73.98 | 14.87 | 500.0 | 1000.000 | 378.0 | H | 45.0 | 2.3 | 11.0 | -46.8 | 38.0 | 56.9 | |
| 17356.500 | --- | 60.027 | 53.98 | -6.05 | 500.0 | 1000.000 | 377.0 | H | 45.0 | 12.2 | 14.8 | -43.9 | 41.3 | 47.9 | Unrestricte |
| 17356.500 | 72.541 | --- | 73.98 | 1.44 | 500.0 | 1000.000 | 377.0 | H | 45.0 | 12.2 | 14.8 | -43.9 | 41.3 | 60.4 | |

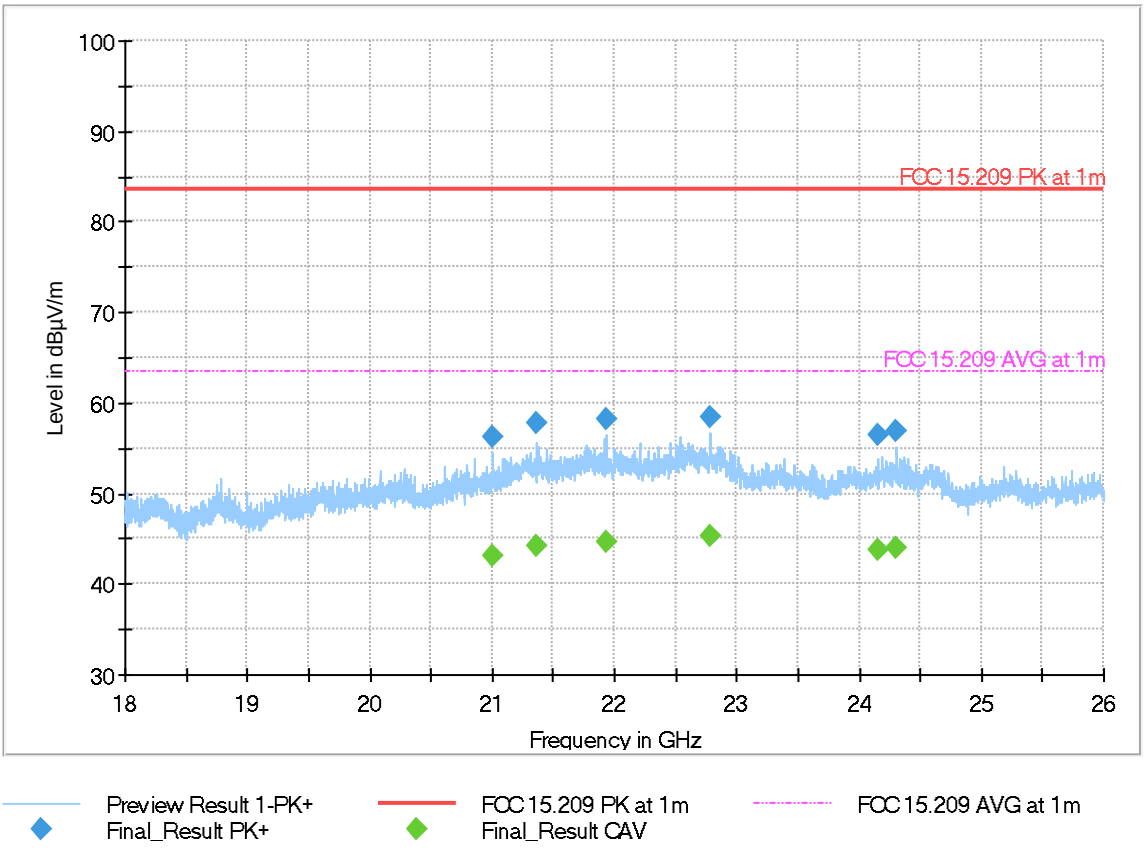


## Plot # 5 Radiated Emissions: 18 – 26 GHz

| Tx Frequency: 2440 MHz | BDR / GFSK |
|---|---|

## Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 21008.500 | 56.21 | --- | 83.50 | 27.29 | 500.0 | 1000.0 | 140.0 | V | 118.0 | 17.9 |
| 21008.500 | --- | 43.03 | 63.50 | 20.47 | 500.0 | 1000.0 | 140.0 | V | 118.0 | 17.9 |
| 21358.500 | 57.79 | --- | 83.50 | 25.71 | 500.0 | 1000.0 | 140.0 | H | 183.0 | 18.2 |
| 21358.500 | --- | 44.27 | 63.50 | 19.23 | 500.0 | 1000.0 | 140.0 | H | 183.0 | 18.2 |
| 21942.250 | --- | 44.70 | 63.50 | 18.80 | 500.0 | 1000.0 | 140.0 | V | 87.0 | 18.8 |
| 21942.250 | 58.11 | --- | 83.50 | 25.39 | 500.0 | 1000.0 | 140.0 | V | 87.0 | 18.8 |
| 22780.500 | --- | 45.42 | 63.50 | 18.08 | 500.0 | 1000.0 | 140.0 | H | 156.0 | 20.0 |
| 22780.500 | 58.44 | --- | 83.50 | 25.06 | 500.0 | 1000.0 | 140.0 | H | 156.0 | 20.0 |
| 24150.750 | 56.55 | --- | 83.50 | 26.95 | 500.0 | 1000.0 | 140.0 | H | 108.0 | 18.3 |
| 24150.750 | --- | 43.73 | 63.50 | 19.77 | 500.0 | 1000.0 | 140.0 | H | 108.0 | 18.3 |
| 24308.000 | 57.00 | --- | 83.50 | 26.50 | 500.0 | 1000.0 | 140.0 | H | 69.0 | 18.1 |
| 24308.000 | --- | 43.92 | 63.50 | 19.58 | 500.0 | 1000.0 | 140.0 | H | 69.0 | 18.1 |

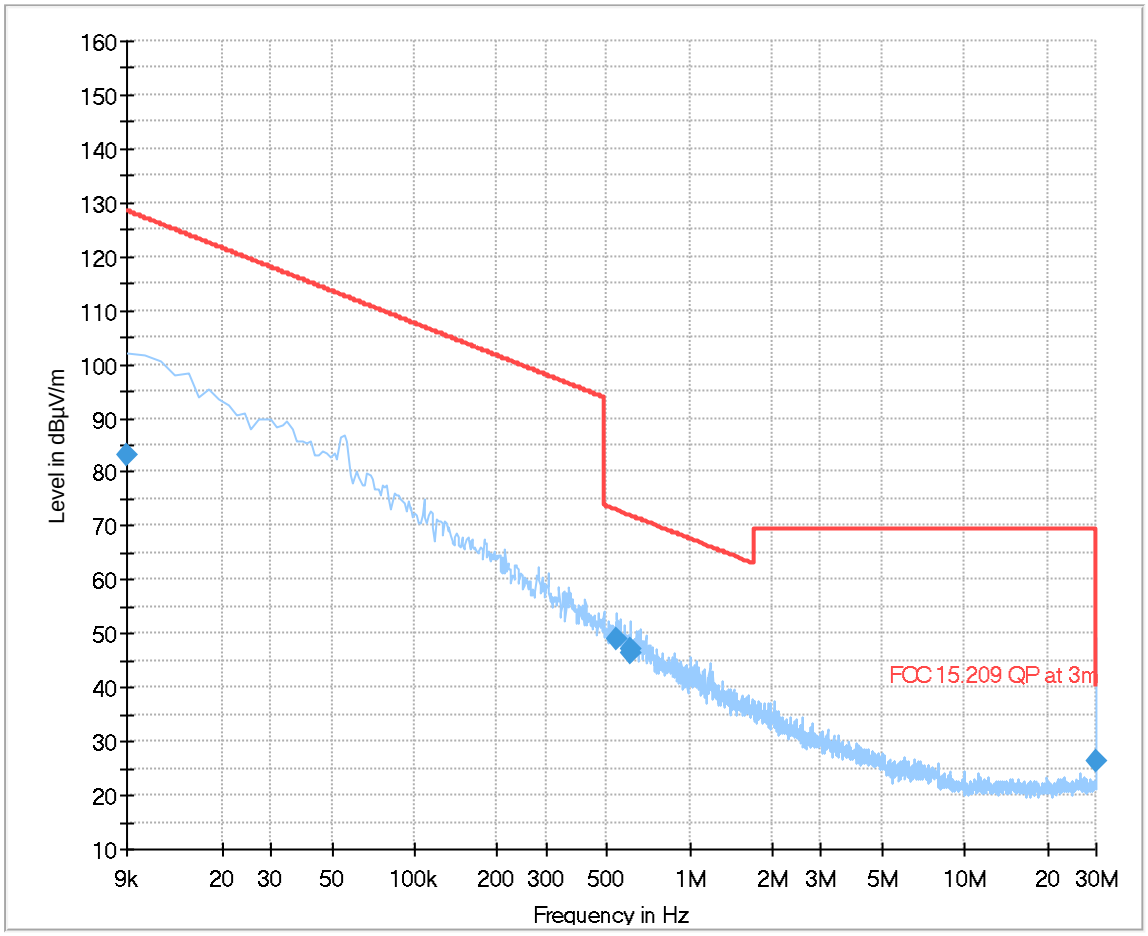


## Plot # 6 Radiated Emissions: 9 KHz – 30 MHz

**Tx Frequency: 2440 MHz** | **BLE = 1MB**

## Final_Result

| Frequency (MHz) | QuasiPeak (dBµV/m) | DET 2 (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.009 | 83.15 | --- | 128.50 | 45.35 | 500.0 | 0.2 | 120.0 | V | 352.0 | 59.9 |
| 0.544 | 48.95 | --- | 72.89 | 23.94 | 500.0 | 9.0 | 120.0 | V | 33.0 | 24.2 |
| 0.610 | 46.52 | --- | 71.90 | 25.38 | 500.0 | 9.0 | 120.0 | V | -44.0 | 23.3 |
| 0.612 | 47.04 | --- | 71.88 | 24.84 | 500.0 | 9.0 | 120.0 | V | 45.0 | 23.2 |
| 30.000 | 26.44 | --- | 40.00 | 43.06 | 500.0 | 9.0 | 120.0 | H | 150.0 | 23.8 |

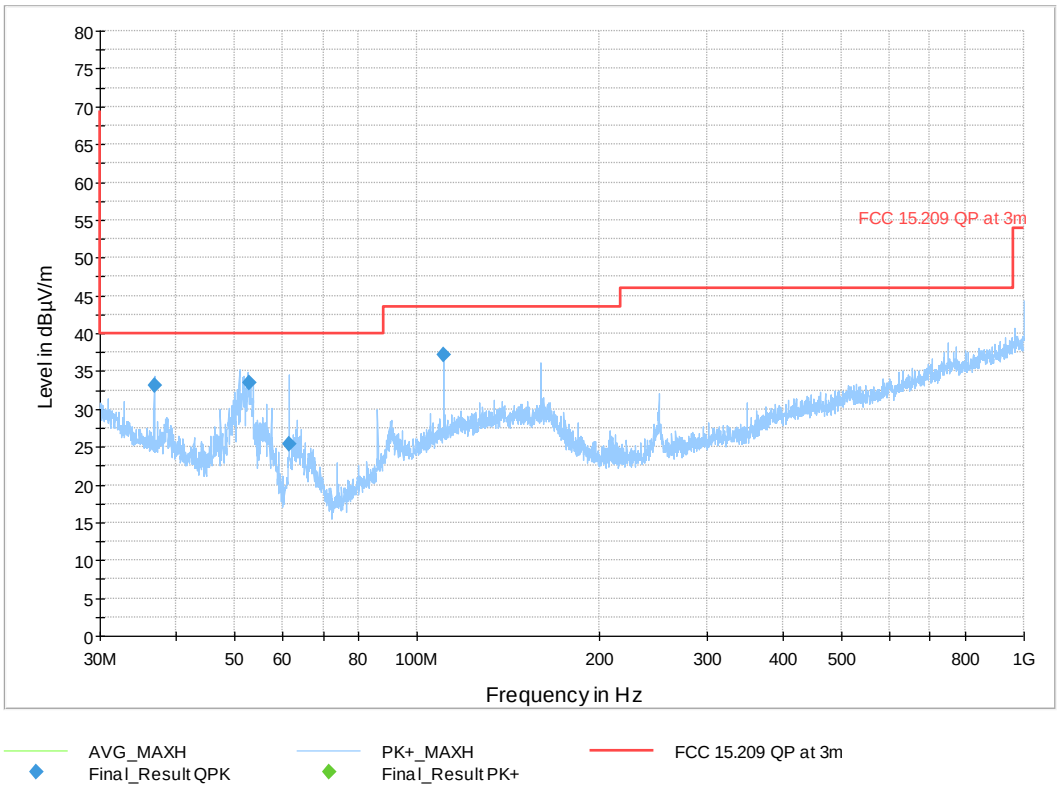


## Plot # 7 Radiated Emissions: 30 MHz – 1 GHz

| Tx Frequency: 2440 MHz | BLE = 1MB |
|---|---|

## Final_Result

| Frequency (MHz) | QuasiPeak (dBµV/m) | MaxPeak (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) | Sig Path (dB) | Preamp (dB) | Trd Corr. (dB/m) | Raw Rec (dBµV) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36.869 | 33.062 | --- | 40.00 | 6.94 | 500.0 | 120.000 | 100.0 | V | 132.0 | 20.6 | 0.7 | 0.0 | 19.8 | 12.5 |
| 52.780 | 33.510 | --- | 40.00 | 6.49 | 500.0 | 120.000 | 100.0 | V | 354.0 | 14.3 | 0.9 | 0.0 | 13.4 | 19.2 |
| 61.358 | 25.431 | --- | 40.00 | 14.57 | 500.0 | 120.000 | 126.0 | V | 176.0 | 13.9 | 0.9 | 0.0 | 13.0 | 11.5 |
| 110.604 | 37.191 | --- | 43.50 | 6.31 | 500.0 | 120.000 | 100.0 | V | 312.0 | 23.9 | 1.2 | 0.0 | 22.8 | 13.2 |

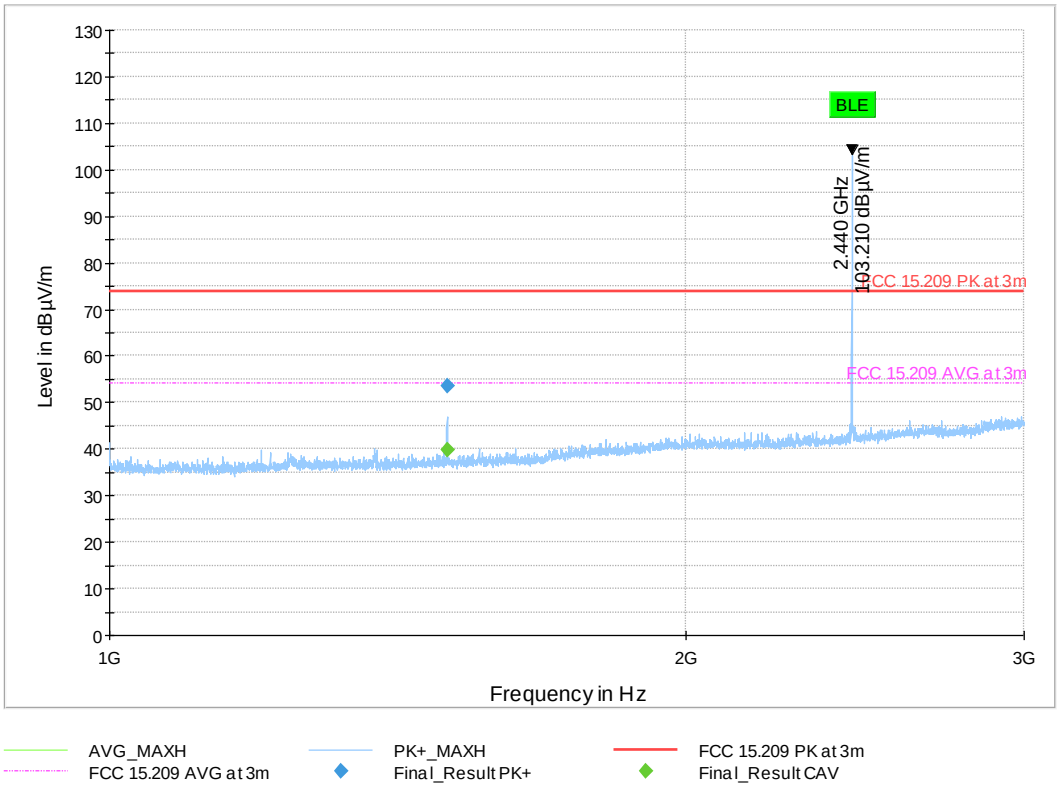


## Plot # 8 Radiated Emissions: 1 – 3 GHz

| Tx Frequency: 2440 MHz | BLE = 1MB |
|---|---|

## Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) | Sig Path (dB) | Preamp (dB) | Trd Corr. (dB/m) | Raw Rec (dBµV) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1500.233 | --- | 39.707 | 53.98 | 14.27 | 500.0 | 1000.000 | 192.0 | H | 298.0 | 29.8 | 4.6 | 0.0 | 25.2 | 9.9 |
| 1500.233 | 53.655 | --- | 73.98 | 20.32 | 500.0 | 1000.000 | 192.0 | H | 298.0 | 29.8 | 4.6 | 0.0 | 25.2 | 23.8 |

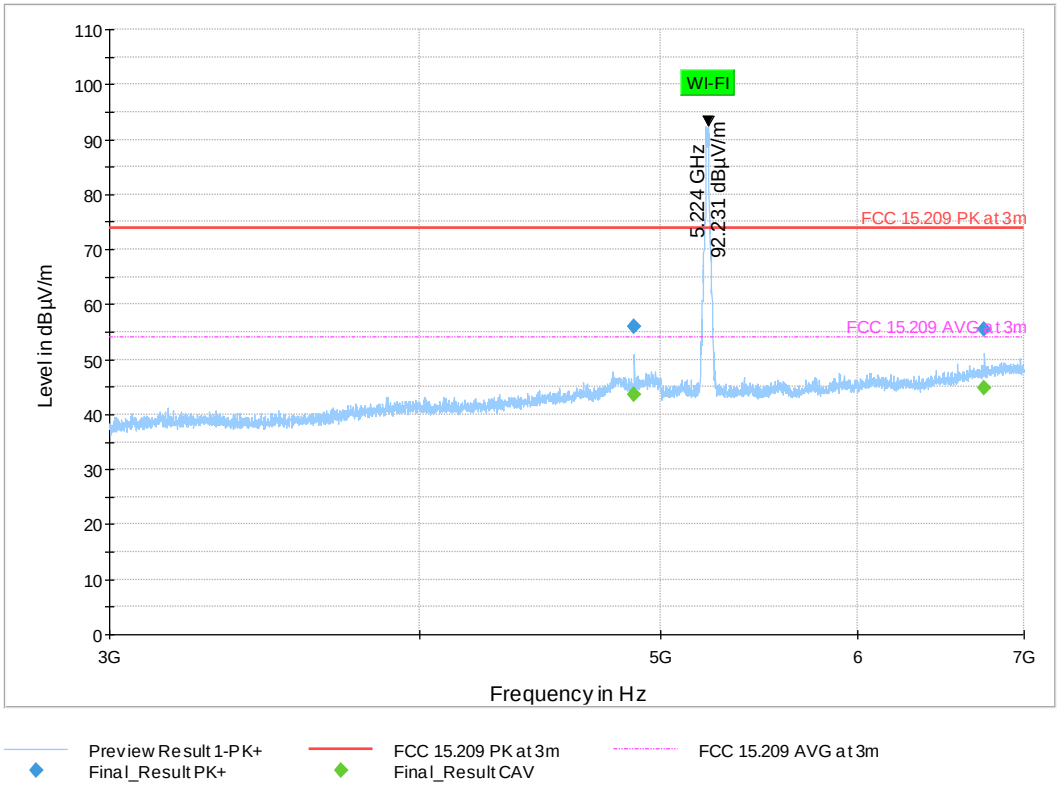


## Plot # 9 Radiated Emissions: 3 – 7 GHz

| Tx Frequency: 2440 MHz | BLE = 1MB |
|---|---|

## Final_Result

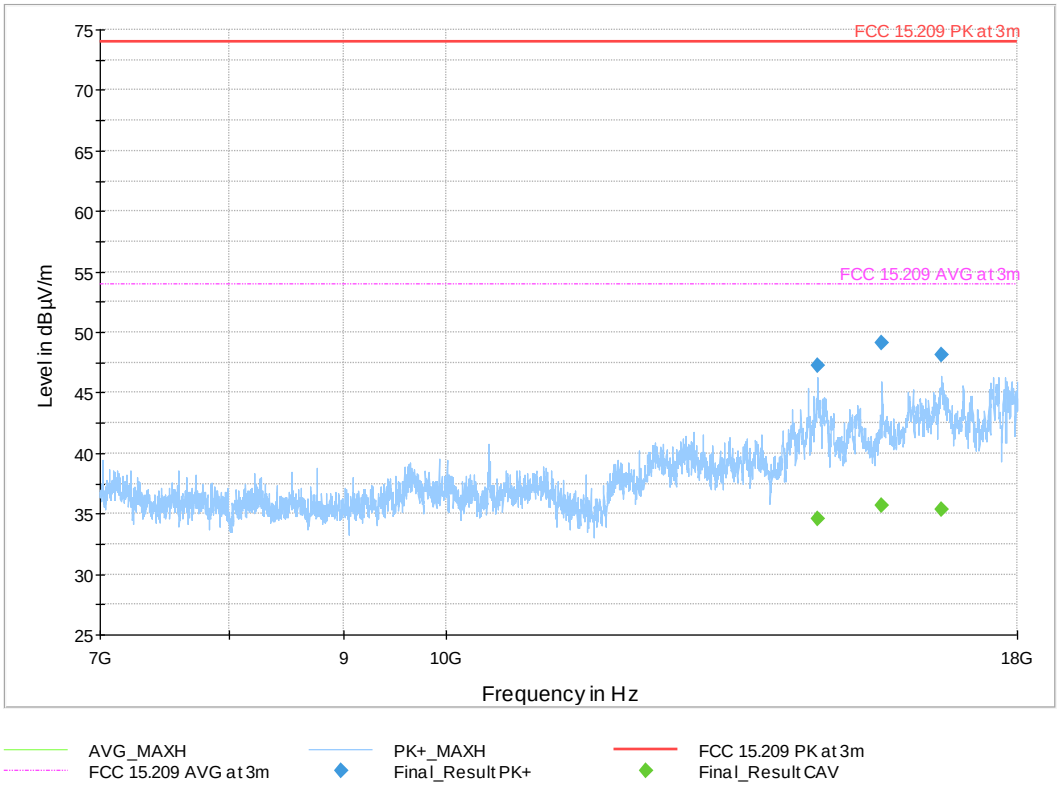
| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) | Sig Path (dB) | Preamp (dB) | Trd Corr. (dB/m) | Raw Rec (dBµV) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4879.375 | --- | 43.698 | 53.98 | 10.28 | 500.0 | 1000.000 | 107.0 | V | 276.0 | 13.4 | -19.7 | 0.0 | 33.1 | 30.3 |
| 4879.375 | 55.960 | --- | 73.98 | 18.02 | 500.0 | 1000.000 | 107.0 | V | 276.0 | 13.4 | -19.7 | 0.0 | 33.1 | 42.5 |
| 6749.875 | --- | 44.924 | 53.98 | 9.06 | 500.0 | 1000.000 | 133.0 | H | 257.0 | 16.3 | -18.6 | 0.0 | 34.9 | 28.6 |
| 6749.875 | 55.506 | --- | 73.98 | 18.47 | 500.0 | 1000.000 | 133.0 | H | 257.0 | 16.3 | -18.6 | 0.0 | 34.9 | 39.2 |



| Plot # 10 Radiated Emissions: 7 – 18 GHz | |
|---|---|
| Tx Frequency: 2440 MHz | BLE = 1MB |

## Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) | Sig Path (dB) | Preamp (dB) | Trd Corr. (dB/m) | Raw Rec (dBµV) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14653.433 | --- | 34.582 | 53.98 | 19.40 | 500.0 | 1000.000 | 368.0 | H | 231.0 | 10.1 | 13.9 | -45.0 | 41.2 | 24.5 |
| 14653.433 | 47.262 | --- | 73.98 | 26.72 | 500.0 | 1000.000 | 368.0 | H | 231.0 | 10.1 | 13.9 | -45.0 | 41.2 | 37.2 |
| 15661.033 | --- | 35.639 | 53.98 | 18.34 | 500.0 | 1000.000 | 151.0 | V | 315.0 | 9.9 | 13.1 | -44.1 | 40.9 | 25.7 |
| 15661.033 | 49.170 | --- | 73.98 | 24.81 | 500.0 | 1000.000 | 151.0 | V | 315.0 | 9.9 | 13.1 | -44.1 | 40.9 | 39.2 |
| 16640.583 | --- | 35.353 | 53.98 | 18.63 | 500.0 | 1000.000 | 400.0 | H | 32.0 | 13.9 | 15.2 | -42.5 | 41.2 | 21.5 |
| 16640.583 | 48.142 | --- | 73.98 | 25.84 | 500.0 | 1000.000 | 400.0 | H | 32.0 | 13.9 | 15.2 | -42.5 | 41.2 | 34.2 |

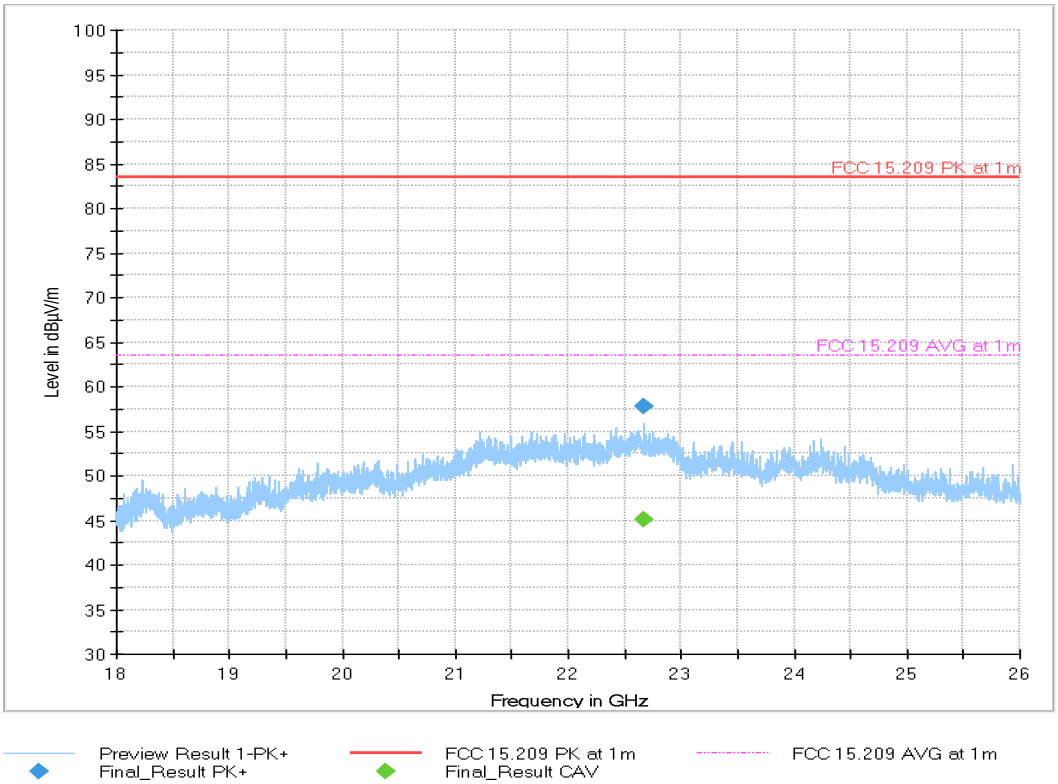


## Plot # 11 Radiated Emissions: 18 – 26 GHz

**Tx Frequency: 2440 MHz** | **BLE = 1MB**

### Final_Result

| Frequency (MHz) | MaxPeak (dBµV/m) | CAverage (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Height (cm) | Pol | Azimuth (deg) | Corr. (dB/m) |
|---|---|---|---|---|---|---|---|---|---|---|
| 22675.250 | --- | 45.10 | 63.50 | 18.40 | 500.0 | 1000.0 | 140.0 | H | 17.0 | 19.9 |
| 22675.250 | 57.79 | --- | 83.50 | 25.71 | 500.0 | 1000.0 | 140.0 | H | 17.0 | 19.9 |



## 9 Test setup photos

Setup photos are included in supporting file name: “EMC_LUCID_019_24001_Setup_Photos.pdf”

## 10 Test Equipment And Ancillaries Used For Testing

| Equipment Type | Manufacturer | Model | Serial # | Calibration Cycle | Last Calibration Date |
|---|---|---|---|---|---|
| BILOG ANTENNA | A.H. SYSTEMS | BiLA2G | 569 | 3 YEARS | 10/30/2023 |
| HORN ANTENNA | EMCO | 3115 | 00035111 | 3 YEARS | 10/26/2023 |
| HORN ANTENNA | ETS LINDGREN | 3117-PA | 00167061 | 3 YEARS | 9/25/2023 |
| HORN ANTENNA | ETS LINDGREN | 3116C-PA | 00166821 | 3 YEARS | 10/26/2023 |
| ESW.EMI TEST RECEIVER | ROHDE & SCHWARZ | ESW44 | 101715 | 3 YEARS | 10/24/2023 |
| DIGITAL THERMOMETER | Control Company | 4410,90080-03 | 230712972 | 3 YEARS | 10/18/2023 |
| Software | EMC32 | Version 10.50.40 | - | - | - |

**Note:** Equipment used meets the measurement uncertainty requirements as required per applicable standards for 95% confidence levels.
Calibration due dates, unless defined specifically, falls on the last day of the month. Items indicated “N/A” for cal status either do not specifically require calibration or is internally characterized before use.

## 11 History

| Date | Report Name | Changes to report | Report prepared by |
|---|---|---|---|
| 2024-09-30 | EMC_LUCID_019_24001_15_247 | Initial Version | Art Thammanavarat |
| | | | |

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