# TEST REPORT

**Report Number:** R14720543-E1

| | | |
|---|---|---|
| **Applicant** | : | Samsung Electronics Co., Ltd.<br>129 Samsung-Ro, Yeongtong-Gu<br>Suwon-Si, Gyeonggi-Do, 16677, Korea |
| **Model** | : | SM-X710 |
| **FCC ID** | : | A3LSMX710 |
| **IC** | : | 649E-SMX710 |
| **EUT Description** | : | BT/BLE Tablet + DTS/UNII a/b/g/n/ac/ax and WPT |
| **Test Standard(s)** | : | FCC 47 CFR PART 15 SUBPART C, E: 2023<br>ISED RSS-247 ISSUE 2: 2020<br>ISED RSS-GEN ISSUE 5 + A1 + A2: 2021 |

**Date Of Issue:**

2023-05-18

**Prepared by:**
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ACCREDITED
CERT #0751.06

# REVISION HISTORY

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V1 | 2023-05-18 | Initial Issue | Charles Moody |



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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Samsung Electronics Co., Ltd.
129 Samsung-Ro Yeongtong-Gu
Suwon-Si, Gyeonggi-Do, 16677, Korea

**EUT DESCRIPTION:** BT/BLE Tablet + DTS/UNII a/b/g/n/ac/ax and WPT

**MODEL:** SM-X710

**SERIAL NUMBER:** R32W2005ASM

**SAMPLE RECEIPT DATE:** 2023-03-24

**DATE TESTED:** 2023-04-27 TO 2023-05-04

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| 47 CFR Part 15 Subpart C, E: 2023 | Complies |
| ISED RSS-247 Issue 2: 2020 | Complies |
| ISED RSS-GEN Issue 5 + A1 + A2: 2021 | Complies |

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by a2La, NIST, or any agency of the U.S. government.

Approved & Released For
UL LLC By:

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UL LLC

Prepared By:

Charles Moody
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Consumer, Medical, and IT Segment
UL LLC

# 2. TEST RESULTS SUMMARY

This report contains data provided by the applicant which can impact the validity of results. UL LLC is only responsible for the validity of results after the integration of the data provided by the customer.

| FCC Clause | ISED Clause | Requirement | Result | Comment |
|---|---|---|---|---|
| See Comment | | Duty Cycle | Reporting purposes only | ANSI C63.10 Section 11.6. |
| - | RSS-GEN 6.7 | 99% OBW | Not Performed | Radiated spot checks performed to justify data reuse. |
| 15.247 (a) (2) | RSS-247 5.2 (a) | 6dB BW | | |
| 15.247 (b) (3) | RSS-247 5.4 (d) | Output Power | | |
| 15.247 (e) | RSS-247 5.2 (b) | PSD | | |
| 15.247 (d) | RSS-247 5.5 | Conducted Spurious Emissions | | |
| 15.207 | RSS-Gen 8.8 | AC Mains Conducted Emissions | | |
| 15.209, 15.205 | RSS-GEN 8.9, 8.10 | Radiated Emissions | See Comment | Radiated spot checks performed on worst-case channels only to justify data reuse. |

# 3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC 47 CFR Part 2, FCC 47 CFR Part 15, ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, RSS-GEN Issue 5 + A1 + A2, and RSS-247 Issue 2

# 4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, certification # 0751.06, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

| | Address | ISED CABID | ISED Company Number | FCC Registration |
|---|---|---|---|---|
| ☐ | Building:<br>12 Laboratory Dr<br>RTP, NC 27709, U.S.A | US0067 | 2180C | 825374 |
| ☒ | Building:<br>2800 Perimeter Park Dr. Suite B<br>Morrisville, NC 27560, U.S.A | | 27265 | |

# 5. DECISION RULES AND MEASUREMENT UNCERTAINTY

## 5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

## 5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

## 5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER | $U_{Lab}$ |
|---|---|
| All emissions, radiated | 6 dB |

Uncertainty figures are valid to a confidence level of 95%.

## 5.4. SAMPLE CALCULATION

**RADIATED EMISSIONS**

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m



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# 6. EQUIPMENT UNDER TEST

## 6.1. DESCRIPTION OF EUT

The EUT is a BT/BLE Tablet + DTS/UNII a/b/g/n/ac/ax and WPT.

## 6.2. WORST-CASE CONFIGURATION AND MODE

Band edge and radiated emissions between 1GHz and 18 GHz were performed with the EUT set to transmit at the worst-case channels and data rates based on the reports of an electrically identical model (see section 7 for data reuse information).

The antenna of the EUT was investigated in three orthogonal orientations X/Y/Z. See the table below for WC Orientations.

| Technology | Orientation |
|---|---|
| 2.4 WLAN | Y |
| 5 WLAN | X |
| 6 WLAN | Y |

The Worst-Case scenarios for 1-18GHz are as follows:

| Technology | Test Type | Frequency (MHz) | Mode | Data Rate | Chain |
|---|---|---|---|---|---|
| 2.4 WLAN (DTS) | Band Edge | 2417 | HE20 242T/RU61 | MCS0 | MIMO |
| | RSE | 2412 | 11g | 6Mbps | MIMO |
| 5 WLAN (UNII) | 5.2 Band Edge | 5190 | HE40 484T/RU65 | MCS0 | MIMO |
| | 5.3 Band Edge | 5290 | 11ac VHT80 | MCS0 | MIMO |
| | 5.6 Band Edge | 5500 | HE20 242T/RU61 | MCS0 | MIMO |
| | 5.8 Band Edge | 5885 | HE20 106T/RU54 | MCS0 | MIMO |
| | RSE | 5500 | HE20 106T/RU53 | MCS0 | MIMO |
| 6 WLAN (UNII) | Band Edge | 5955 | HE20 26T/RU0 | MCS0 | MIMO |
| | RSE | 6145 | HE80 996T/RU67 | MCS0 | MIMO |

## 6.3. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| Support Equipment List | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Serial Number** | **FCC ID** |
| AC Adapter | Samsung | EP-TA800 | R37TCCJ49LASEA | - |

**I/O CABLES**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| **Cable No.** | **Port** | **# of Identical Ports** | **Connector Type** | **Cable Type** | **Cable Length (m)** | **Remarks** |
| 1 | Charging | 1 | USB C to USB A | Shielded | <3m | Used to charge the device |

**TEST SETUP**

The EUT is configured to the desired settings prior to testing, using the built-in application on the EUT.

**SETUP DIAGRAMS**

Refer to R14720543-EP1 for setup diagrams.

# 7. REUSE OF TEST DATA

## 7.1. INTRODUCTION

According to the manufacturer, FCC ID: A3LSMX710 and FCC ID: A3LSMX716B unlicensed radios (WLAN) are electrically identical. The FCC ID: A3LSMX716B test data shall remain representative of FCC ID: A3LSMX710 so, FCC ID: A3LSMX710 leverages test data from FCC ID: A3LSMX716B.

The applicant takes full responsibility that the test data as referenced in this section represents compliance for this FCC ID.

## 7.2. DEVICES DIFFERENCES

Difference between A3LSMX710 and A3LSMX716B:

Samsung Electronics Co., Ltd. hereby declares that the hardware of WLAN 2.4GHz, WLAN 5GHz, WLAN 6GHz, and Bluetooth is identical among A3LSMX716B and A3LSMX710. The hardware changes between the models are related to the cellular radio. The output power for Bluetooth is different between the two models. Therefore, the following WLAN reports for A3LSMX716B may be used to represent A3LSMX710.

## 7.3. REFERENCE DETAIL

| Equipment Class | Reference FCC ID | Report Title/Section |
|---|---|---|
| DTS (WLAN) | A3LSMX716B | R14720550-E1a FCC ISED DTS 802.11 non-ax WLAN REPORT - FINAL / All sections<br>R14720550-E1b FCC ISED DTS 802.11ax WLAN REPORT - FINAL / All sections |
| NII (WLAN) | A3LSMX716B | R14720550-E2a FCC ISED 5.2-5.9GHz WLAN WLAN REPORT - FINAL / All sections<br>R14720550-E3 FCC ISED 6GHz WLAN WLAN REPORT - FINAL / All sections |
| 6CD (WLAN) | A3LSMX716B | R14720550-E3 all sections<br>Note: Contention Based Protocol testing performed on A3LSMX710 |

## 7.4. SPOT CHECK VERIFICATION RESULTS SUMMARY

Spot check verification has been done on device A3LSMX710 for radiated spurious. The data from the application has been verified through appropriate spot checks to demonstrate compliance for this device as shown in the summary.

| A3LSMX710 SPOT CHECK RESULTS | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Technology | Test Item | Channel | Measured Frequency (MHz) | A3LSMX716B | | A3LSMX710 | | Delta (dB) <+3dB | |
| | | | | PK Reading (dBuV/m) | AV Reading (dBuV/m) | PK Reading (dBuV/m) | AV Reading (dBuV/m) | PK | AV |
| 2.4GHz WLAN (HE20) | RBE | 2 | 2390 | 71.18 | 46.51 | 70.58 | 46.75 | -0.60 | 0.24 |
| 2.4GHz WLAN (11g) | RSE | 1 | 1948 | 51.58 | 38.32 | 45.59 | 33.39 | -5.99 | -4.93 |
| | | | | | | | | | |
| 5GHz WLAN (HE40) | RBE | 38 | 5140 | 71.74 | 47.19 | 61.32 | 40.14 | -10.42 | -7.05 |
| 5GHz WLAN (11ac VHT80) | RBE | 58 | 5350 | 63.61 | 50.62 | 66.07 | 51.58 | 2.46 | 0.96 |
| 5GHz WLAN (HE20) | RBE | 100 | 5470 | 65.91 | 39.50 | 65.89 | 38.69 | -0.02 | -0.81 |
| | RSE | 100 | 7692 | 52.29 | 40.18 | 53.18 | 42.41 | 0.89 | 2.23 |
| | RBE | 177 | 5895 | 4.78 (EIRP) | -8.24 (EIRP) | 2.88 (EIRP) | -11.00 (EIRP) | -1.90 | -2.76 |
| | | | | | | | | | |
| 6GHz WLAN (HE20) | RBE | 1 | 5925 | -38.6 (EIRP) | -49.16 (EIRP) | -37.79 (EIRP) | -48.76 (EIRP) | 0.81 | 0.4 |
| 6GHz (HE80) | RSE | 39 | 8193 | 53.25 | 49.4 | 51.13 | 47.28 | -2.12 | -2.12 |

# 8. TEST AND MEASUREMENT EQUIPMENT

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 2)

| Equip. ID | Description | Manufacturer/Brand | Model Number | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| | **1-18 GHz** | | | | |
| 88761 | Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz | ETS Lindgren | 3117 | 2022-09-13 | 2023-09-13 |
| | **Gain-Loss Chains** | | | | |
| 91977 | Gain-loss string: 1-18GHz | Various | Various | 2022-05-10 | 2023-05-31 |
| | **Receiver & Software** | | | | |
| 197955 | Spectrum Analyzer | Rohde & Schwarz | ESW44 | 2023-04-10 | 2024-04-10 |
| SOFTEMI | EMI Software | UL | Version 9.5 (18 Oct 2021) | | |
| | **Additional Equipment used** | | | | |
| 200540 | Environmental Meter | Fisher Scientific | 15-077-963 s/n 181474409 | 2022-10-05 | 2023-10-05 |

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 4)

| Equip. ID | Description | Manufacturer/Brand | Model Number | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| | **1-18 GHz** | | | | |
| 86408 | Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz | ETS Lindgren | 3117 | 2022-05-24 | 2023-05-24 |
| | **Gain-Loss Chains** | | | | |
| 207640 | Gain-loss string: 1-18GHz | Various | Various | 2022-05-20 | 2023-05-31 |
| | **Receiver & Software** | | | | |
| 206496 | Spectrum Analyzer | Rohde & Schwarz | ESW44 | 2023-03-24 | 2024-03-24 |
| SOFTEMI | EMI Software | UL | Version 9.5 (18 Oct 2021) | | |
| | **Additional Equipment used** | | | | |
| 21642 | Environmental Meter | Fisher Scientific | 15-077-963 (s/n 210701692) | 2021-08-16 | 2023-08-16 |


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# 9. ON TIME AND DUTY CYCLE

**LIMITS**

None; for reporting purposes only.

**PROCEDURE**

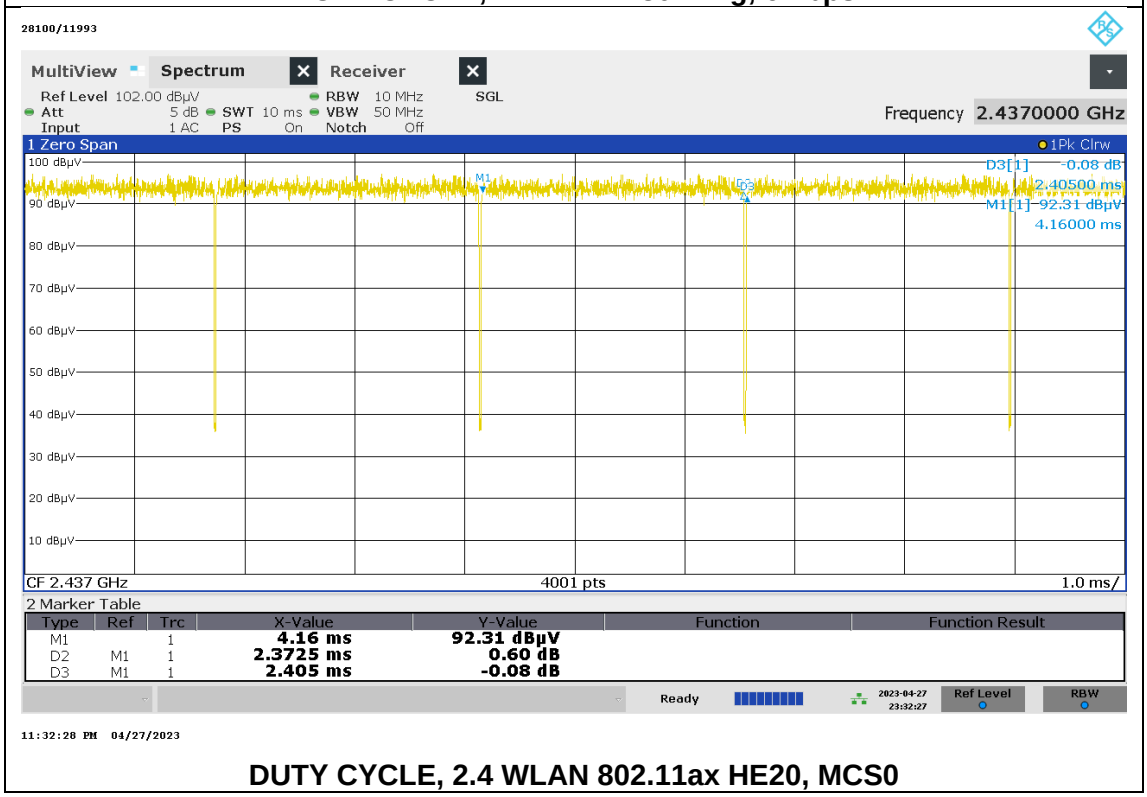
KDB 558074 D01 Zero-Span Spectrum Analyzer Method.
KDB 789033 Zero-Span Spectrum Analyzer Method.

**ON TIME AND DUTY CYCLE RESULTS**

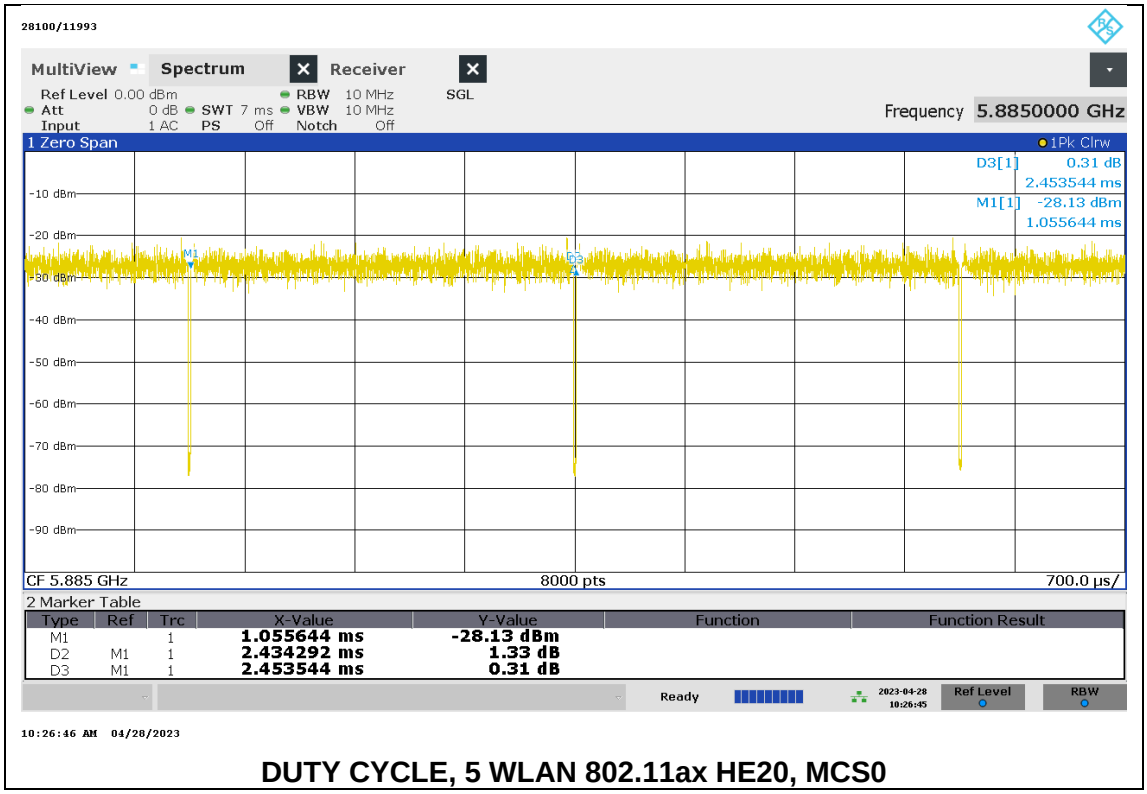
| Mode | ON Time B (msec) | Period (msec) | Duty Cycle x (linear) | Duty Cycle (%) | Duty Cycle Correction Factor (dB) | 1/B Minimum VBW (kHz) |
|---|---|---|---|---|---|---|
| **2.4 WLAN DTS** | | | | | | |
| 802.11g 6Mbps | 1.4525 | 1.5700 | 0.925 | 92.52% | 0.68 | 0.688 |
| 802.11ax HE20 | 2.3725 | 2.4050 | 0.986 | 98.65% | 0.00 | 0.010 |
| | | | | | | |
| **5 WLAN UNII** | | | | | | |
| 802.11ax HE20 | 2.4343 | 2.4535 | 0.992 | 99.22% | 0.00 | 0.010 |
| 802.11ax HE40 | 2.3725 | 2.4125 | 0.983 | 98.34% | 0.00 | 0.010 |
| 802.11ac VHT80 | 3.6043 | 3.7363 | 0.965 | 96.47% | 0.31 | 0.277 |
| | | | | | | |
| **6WLAN UNII** | | | | | | |
| 802.11ax HE20 | 2.5943 | 2.6131 | 0.993 | 99.28% | 0.00 | 0.010 |
| 802.11ax HE80 | 2.4175 | 2.4357 | 0.992 | 99.25% | 0.00 | 0.010 |

DUTY CYCLE PLOTS

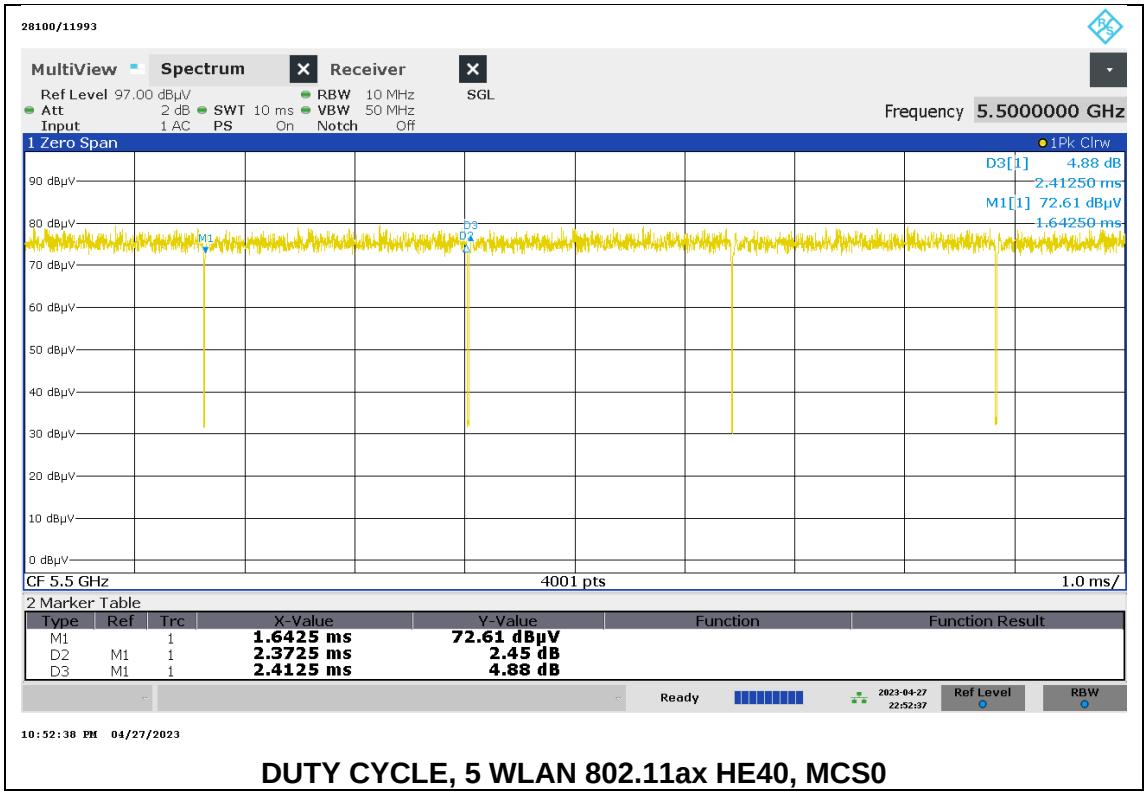

**DUTY CYCLE, 2.4 WLAN 802.11g, 6Mbps**



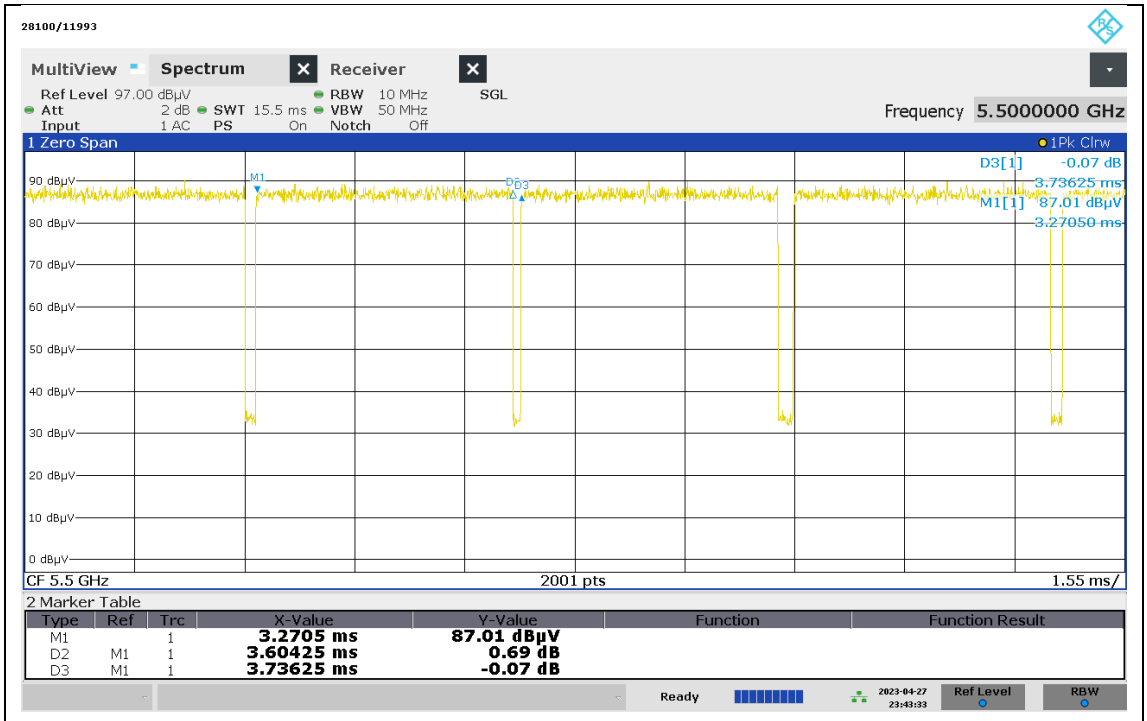

**DUTY CYCLE, 2.4 WLAN 802.11ax HE20, MCS0**



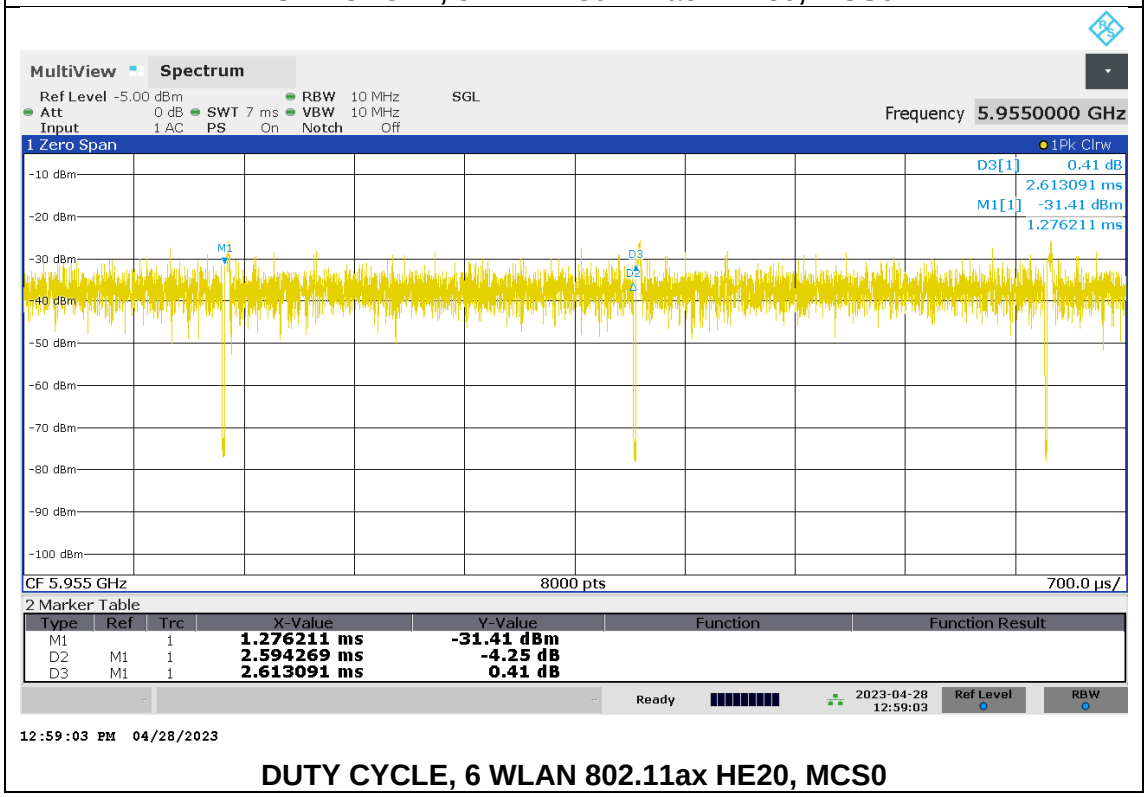

**DUTY CYCLE, 5 WLAN 802.11ax HE20, MCS0**



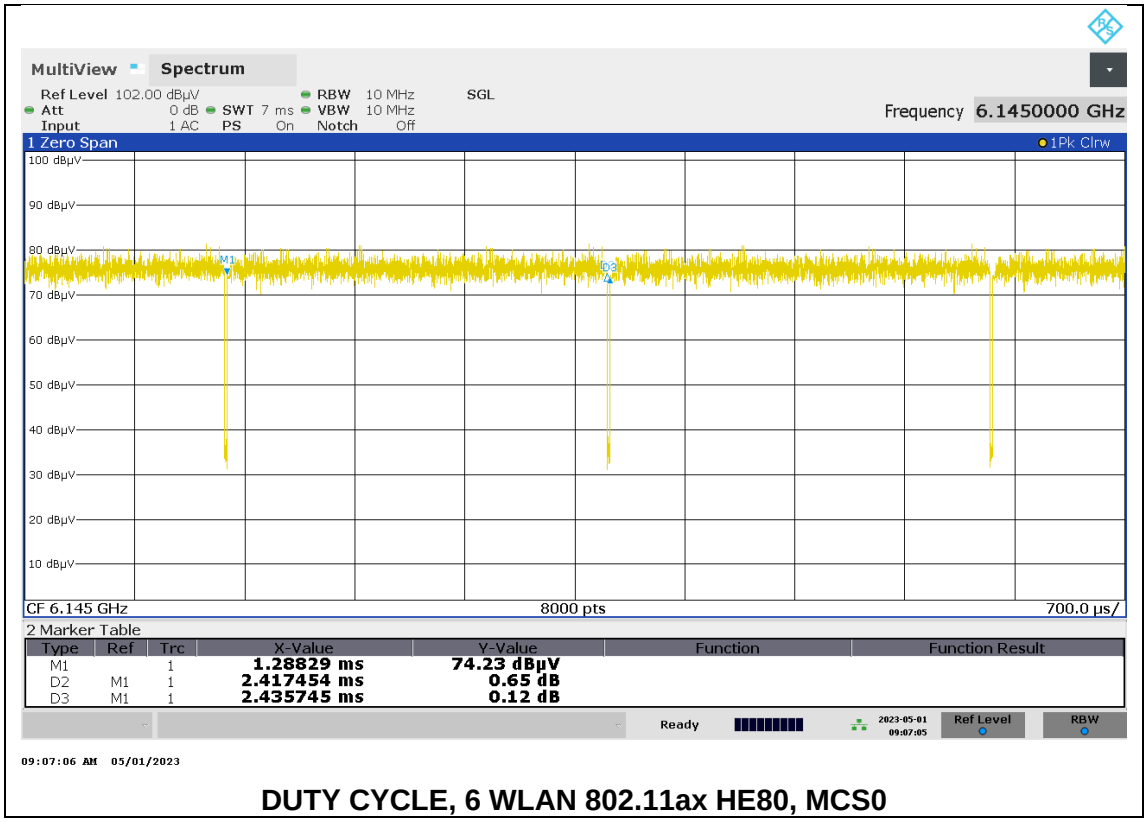

**DUTY CYCLE, 5 WLAN 802.11ax HE40, MCS0**




**DUTY CYCLE, 5 WLAN 802.11ac VHT80, MCS0**




**DUTY CYCLE, 6 WLAN 802.11ax HE20, MCS0**




**DUTY CYCLE, 6 WLAN 802.11ax HE80, MCS0**

# 10. SPOT CHECK DATA

**LIMITS**

FCC §15.205 and §15.209

| Frequency Range (MHz) | Field Strength Limit (uV/m) at 3 m | Field Strength Limit (dBuV/m) at 3 m |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) @ 300 m | - |
| 0.490-1.705 | 24000/F(kHz) @ 30 m | - |
| 1.705 - 30 | 30 @ 30m | - |
| 30 - 88 | 100 | 40 |
| 88 - 216 | 150 | 43.5 |
| 216 - 960 | 200 | 46 |
| Above 960 | 500 | 54 |

**TEST PROCEDURE**

The EUT is placed on a non-conducting table 1.5 m above the ground plane for measurement above 1GHz and at 80 cm above the ground plane for measurements below 1 GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and linear voltage average detection for WLAN measurements.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to worst case mode.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.



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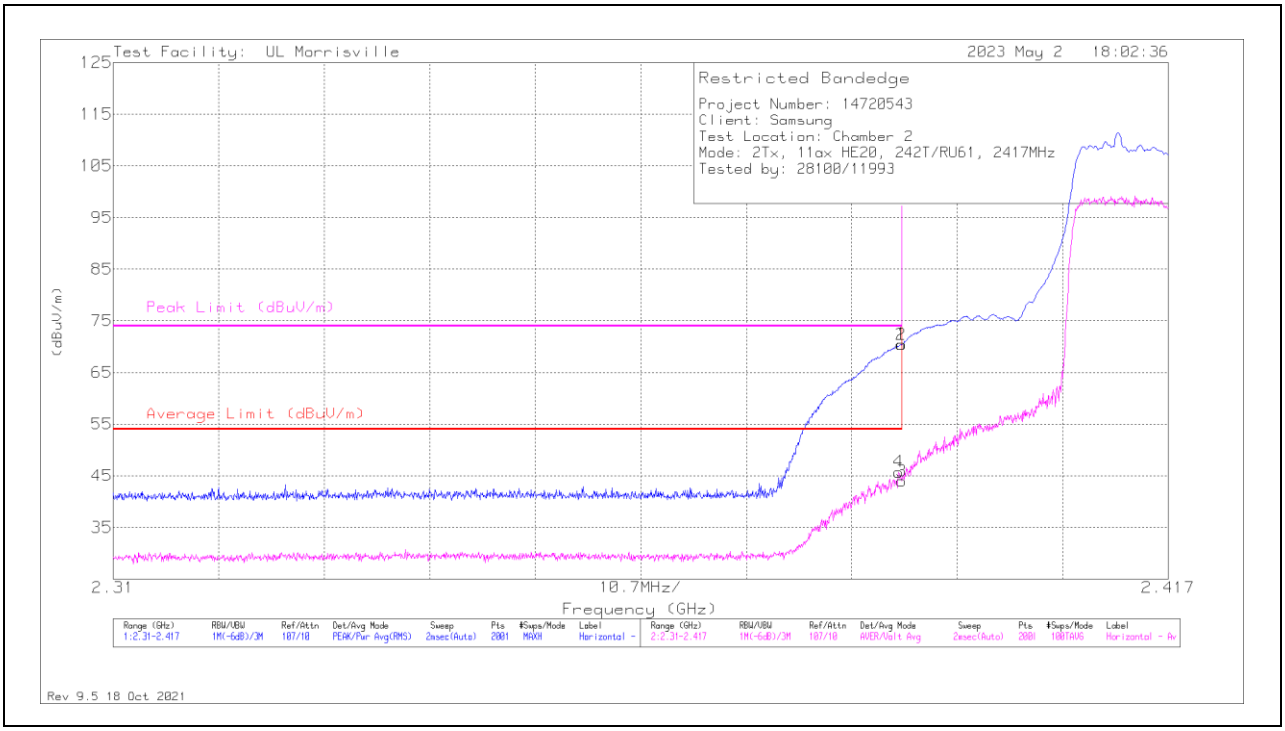
## 10.1. 2.4GHz WLAN

### BANDEDGE (LOW CHANNEL – 2TX, 802.11ax HE20 242T/RU61)

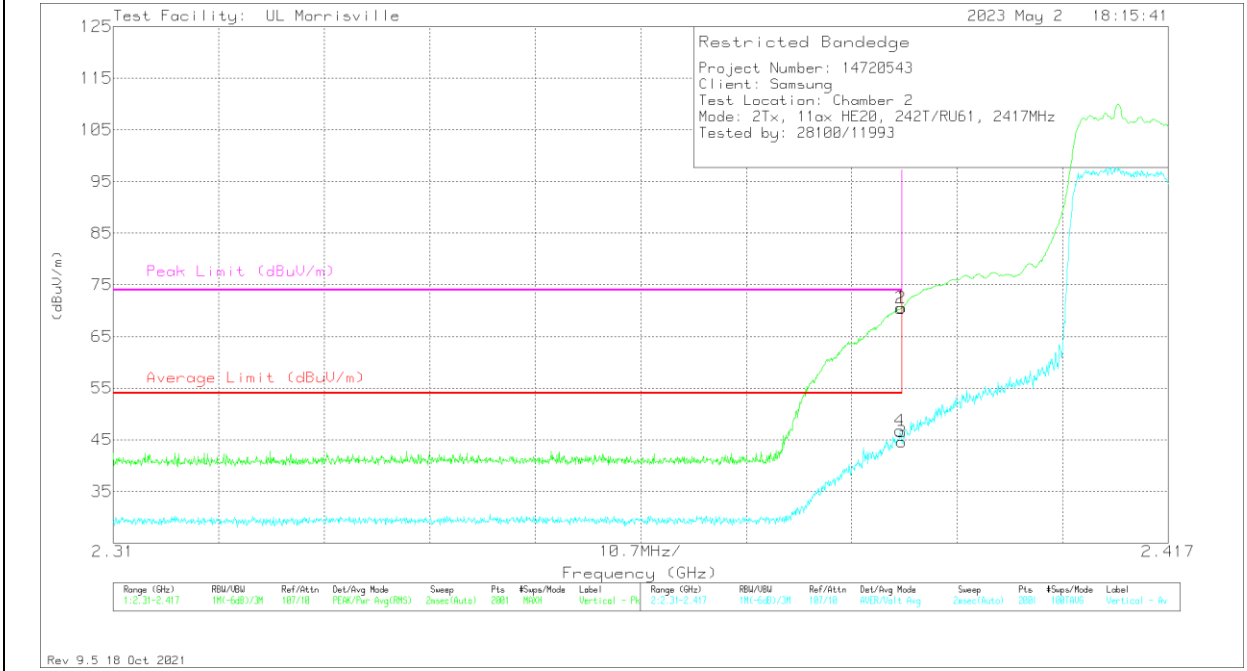
### HORIZONTAL RESULT




| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 88761 (dB/m) | Gain/Loss (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * ** 2.38998 | 62.44 | Pk | 31.8 | -23.8 | 70.44 | - | - | 74 | -3.56 | 149 | 247 | H |
| 2 | * ** 2.38993 | 62.42 | Pk | 31.8 | -23.8 | 70.42 | - | - | 74 | -3.58 | 149 | 247 | H |
| 3 | * ** 2.38998 | 35.96 | ADV | 31.8 | -23.8 | 43.96 | 54 | -10.04 | - | - | 149 | 247 | H |
| 4 | * ** 2.38966 | 37.74 | ADV | 31.8 | -23.8 | 45.74 | 54 | -8.26 | - | - | 149 | 247 | H |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

## VERTICAL RESULT

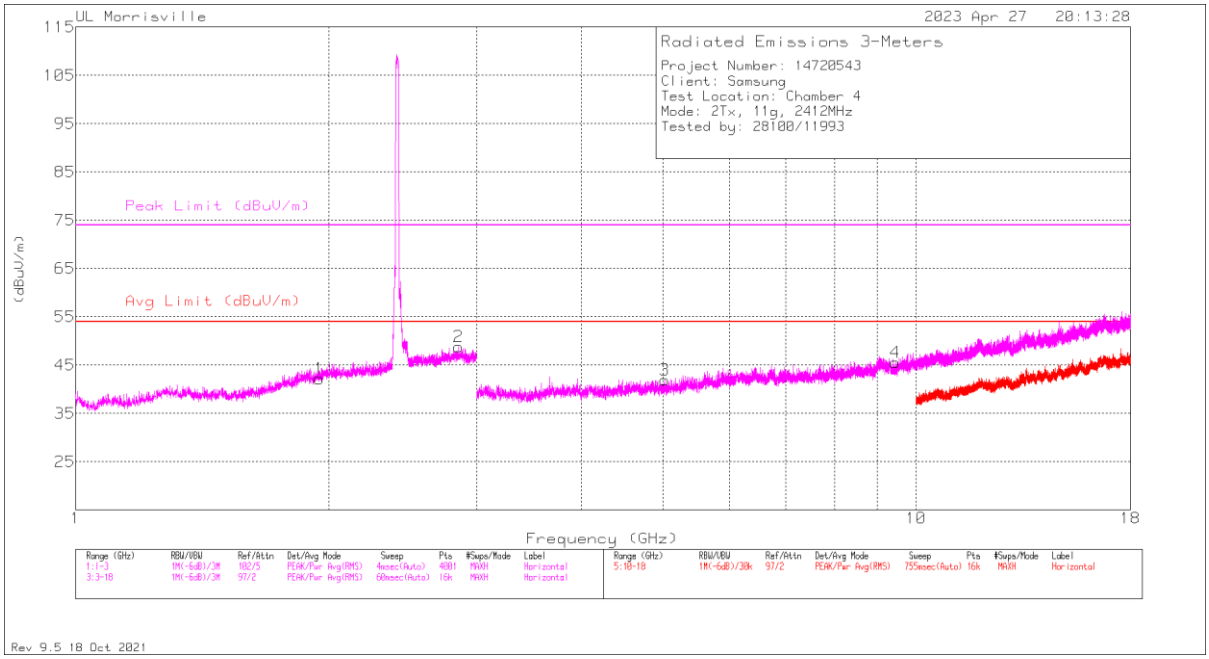



| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 88761 (dB/m) | Gain/Loss (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * ** 2.38998 | 62.58 | Pk | 31.8 | -23.8 | 70.58 | - | - | 74 | -3.42 | 126 | 113 | V |
| 2 | * ** 2.38988 | 62.49 | Pk | 31.8 | -23.8 | 70.49 | - | - | 74 | -3.51 | 126 | 113 | V |
| 3 | * ** 2.38998 | 36.58 | ADV | 31.8 | -23.8 | 44.58 | 54 | -9.42 | - | - | 126 | 113 | V |
| 4 | * ** 2.38977 | 38.75 | ADV | 31.8 | -23.8 | 46.75 | 54 | -7.25 | - | - | 126 | 113 | V |

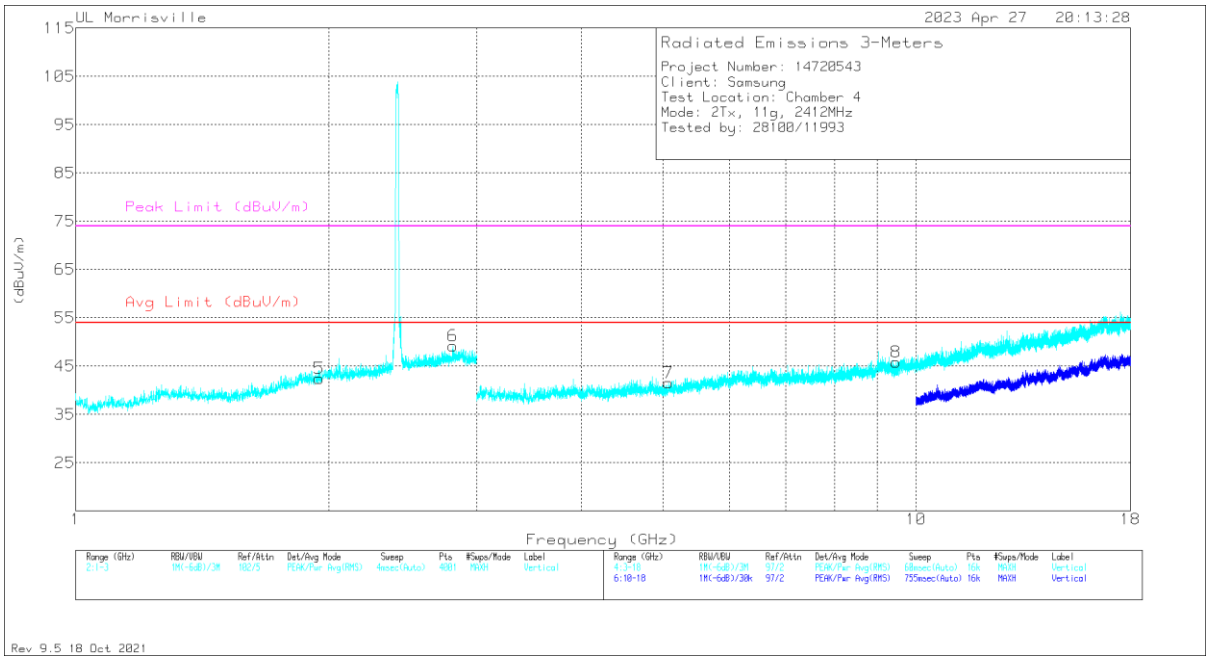
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

## HARMONICS AND SPURIOUS EMISSIONS

### LOW CHANNEL 2TX, 802.11g, 6Mbps




**HORIZONTAL**




**VERTICAL**

## RADIATED EMISSIONS

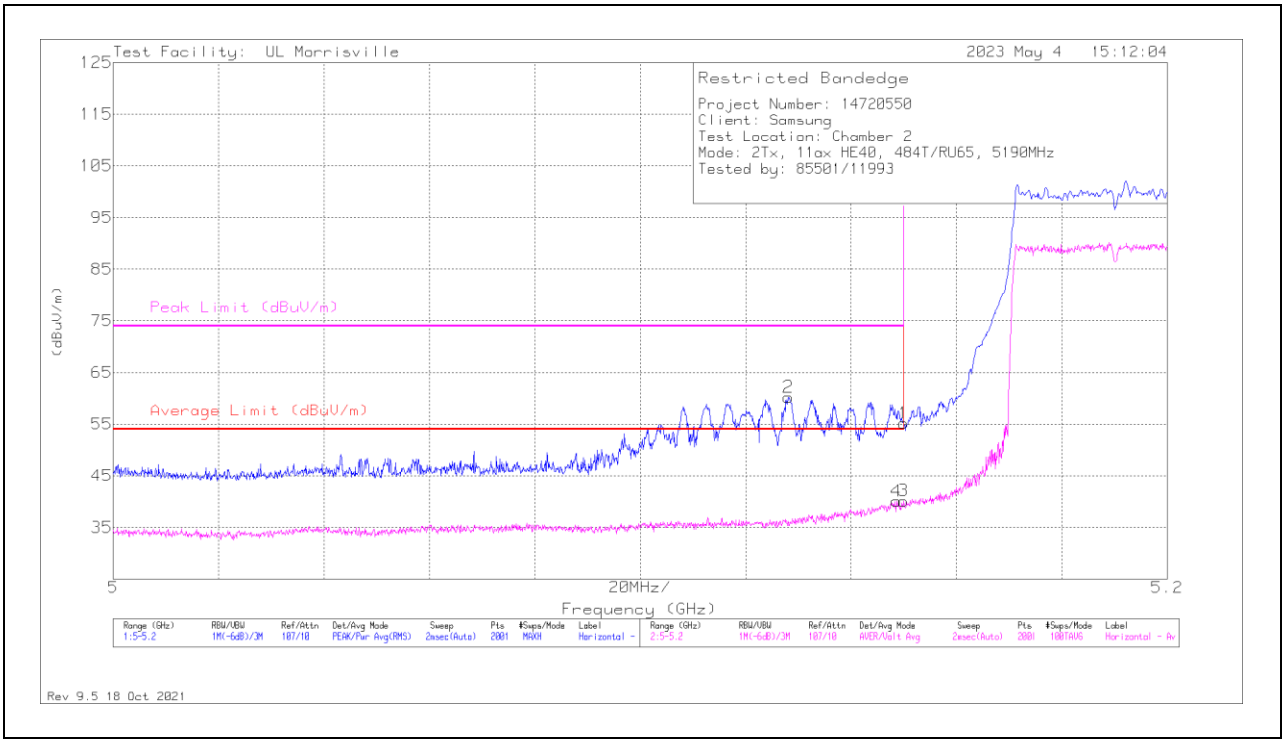
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 86408 (dB/m) | Gain/Loss (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ** 1.94934 | 28.59 | PK2 | 31.3 | -14.3 | 0 | 45.59 | - | - | 74 | -28.41 | 283 | 141 | H |
| | ** 1.94951 | 15.71 | ADV | 31.3 | -14.3 | .68 | 33.39 | 54 | -20.61 | - | - | 283 | 141 | H |
| 2 | * ** 2.85312 | 29.32 | PK2 | 32.6 | -12.8 | 0 | 49.12 | - | - | 74 | -24.88 | 322 | 147 | H |
| | * ** 2.85396 | 16.78 | ADV | 32.6 | -12.8 | .68 | 37.26 | 54 | -16.74 | - | - | 322 | 147 | H |
| 5 | ** 1.95012 | 27.88 | PK2 | 31.3 | -14.3 | 0 | 44.88 | - | - | 74 | -29.12 | 43 | 226 | V |
| | ** 1.94998 | 15.7 | ADV | 31.3 | -14.3 | .68 | 33.38 | 54 | -20.62 | - | - | 43 | 226 | V |
| 6 | * ** 2.81407 | 28.93 | PK2 | 32.6 | -12.6 | 0 | 48.93 | - | - | 74 | -25.07 | 79 | 297 | V |
| | * ** 2.81288 | 16.66 | ADV | 32.6 | -12.6 | .68 | 37.34 | 54 | -16.66 | - | - | 79 | 297 | V |
| 3 | * ** 5.02406 | 40.23 | Pk | 34 | -32.3 | 0 | 41.93 | 54 | -12.07 | 74 | -32.07 | 0-360 | 100 | H |
| 4 | * ** 9.44625 | 35.03 | Pk | 36.5 | -26 | 0 | 45.53 | 54 | -8.47 | 74 | -28.47 | 0-360 | 100 | H |
| 7 | * ** 5.0775 | 39.75 | Pk | 34.1 | -32.3 | 0 | 41.55 | 54 | -12.45 | 74 | -32.45 | 0-360 | 200 | V |
| 8 | * ** 9.47156 | 35.36 | Pk | 36.5 | -26 | 0 | 45.86 | 54 | -8.14 | 74 | -28.14 | 0-360 | 200 | V |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
PK2 - Maximum Peak
ADV - Linear Voltage Average

## 10.2. 5GHz WLAN

### BANDEDGE (5.2 BAND LOW CHANNEL – 2TX, 802.11ax HE40, 484T/RU65)

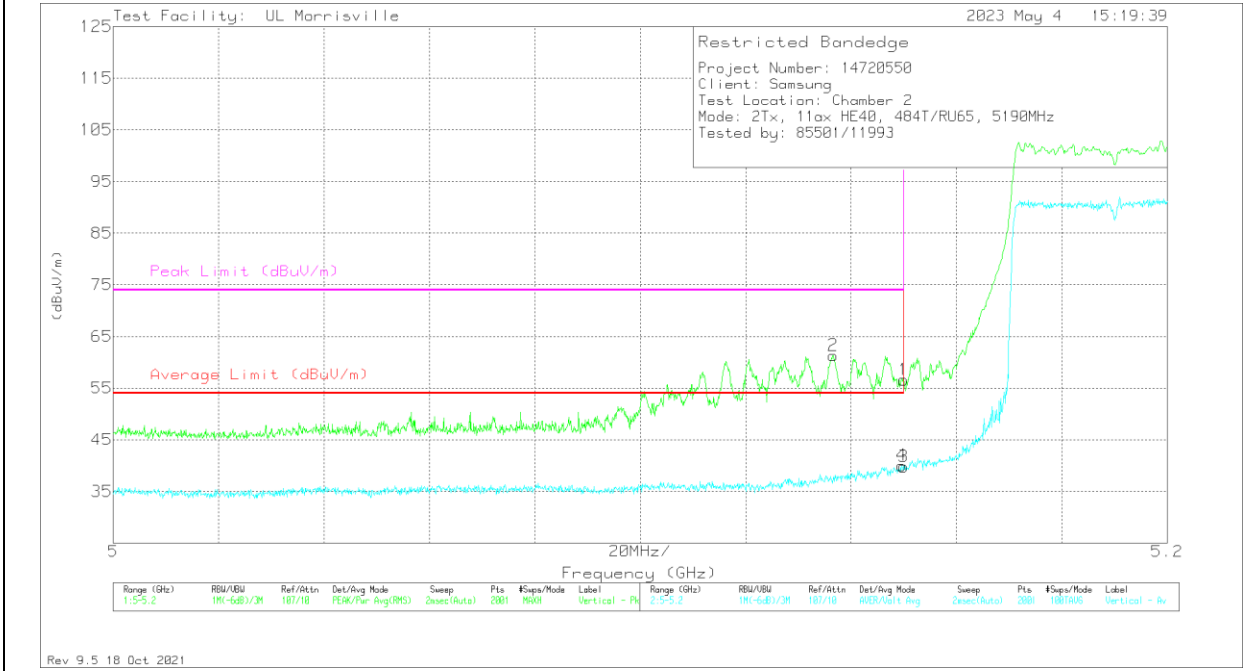
### HORIZONTAL RESULT




| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 88761 (dB/m) | Gain/Loss (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * ** 5.15 | 43.67 | Pk | 34.1 | -22.6 | 55.17 | - | - | 74 | -18.83 | 331 | 111 | H |
| 2 | * ** 5.1281 | 48.59 | Pk | 34.1 | -22.5 | 60.19 | - | - | 74 | -13.81 | 331 | 111 | H |
| 3 | * ** 5.15 | 28.64 | ADV | 34.1 | -22.6 | 40.14 | 54 | -13.86 | - | - | 331 | 111 | H |
| 4 | * ** 5.1486 | 28.59 | ADV | 34.1 | -22.6 | 40.09 | 54 | -13.91 | - | - | 331 | 111 | H |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

## VERTICAL RESULT

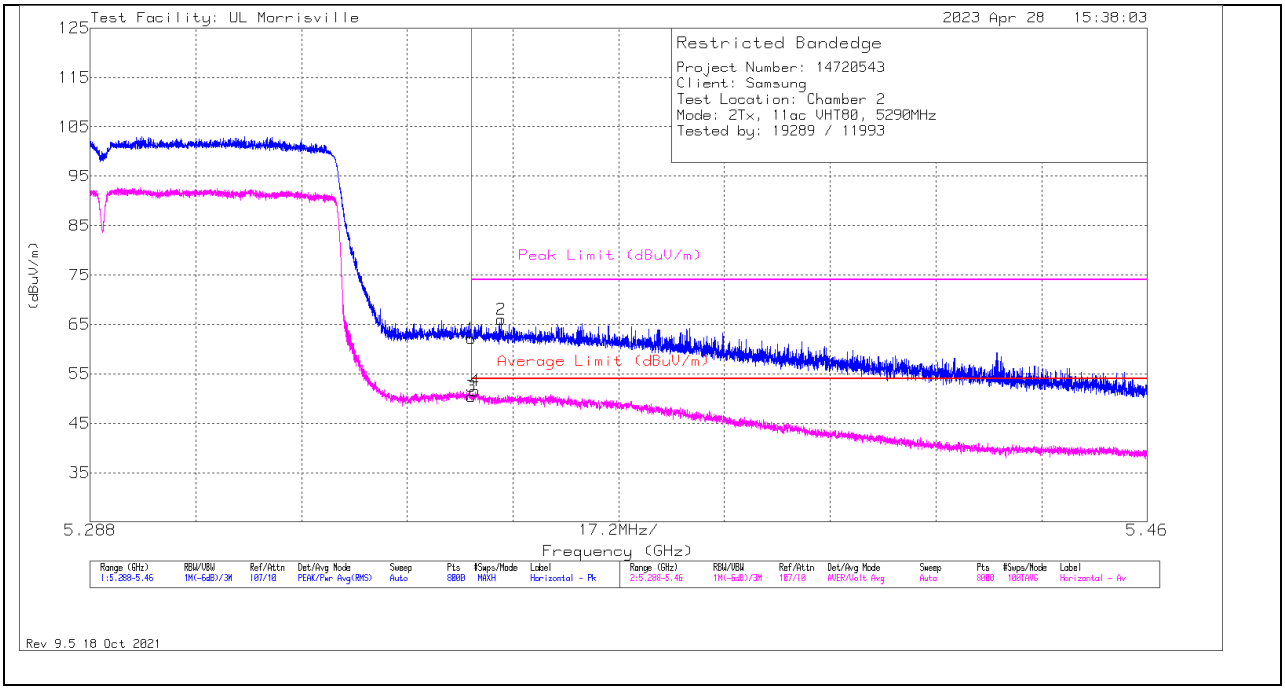



| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 88761 (dB/m) | Gain/Loss (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * ** 5.15 | 45.12 | Pk | 34.1 | -22.6 | 56.62 | - | - | 74 | -17.38 | 230 | 246 | V |
| 2 | * ** 5.1366 | 49.52 | Pk | 34.1 | -22.3 | 61.32 | - | - | 74 | -12.68 | 230 | 246 | V |
| 3 | * ** 5.15 | 28.3 | ADV | 34.1 | -22.6 | 39.8 | 54 | -14.2 | - | - | 230 | 245 | V |
| 4 | * ** 5.1496 | 28.52 | ADV | 34.1 | -22.6 | 40.02 | 54 | -13.98 | - | - | 230 | 245 | V |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

## BANDEDGE (5.3 BAND HIGH CHANNEL – 2TX, 802.11ac VHT80)

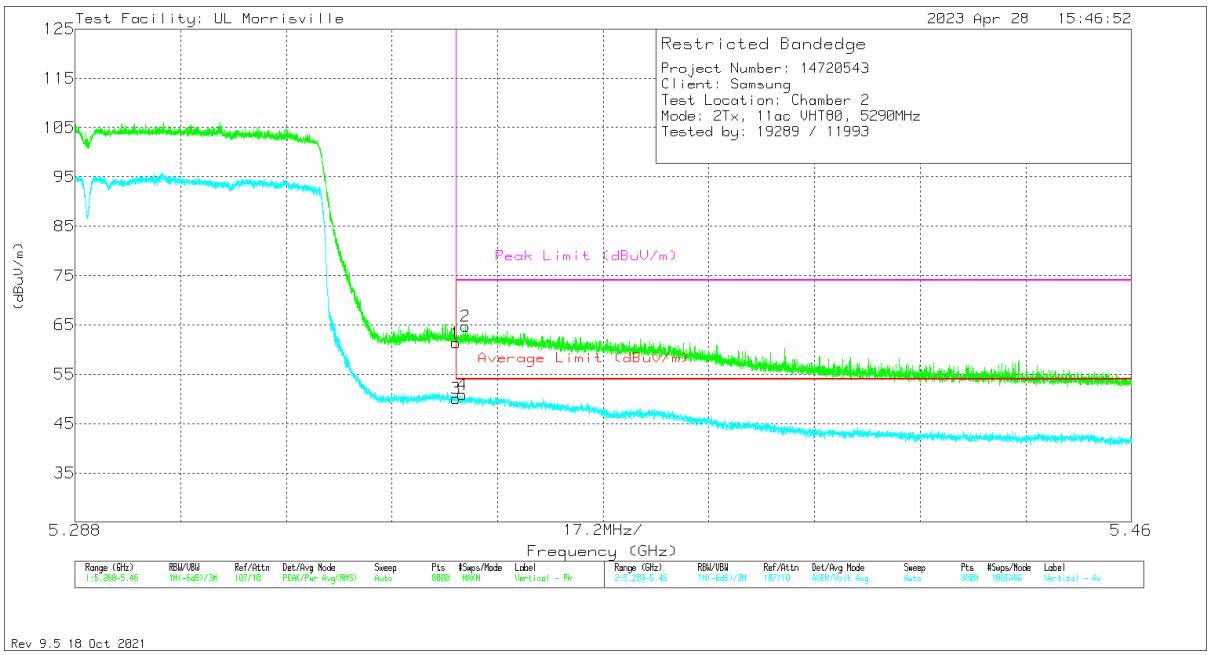
### HORIZONTAL RESULT




| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 88761 (dB/m) | Gain/Loss (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * ** 5.35001 | 50.58 | Pk | 34.3 | -22.7 | 0 | 62.18 | - | - | 74 | -11.82 | 264 | 176 | H |
| 3 | * ** 5.35001 | 38.58 | ADV | 34.3 | -22.7 | .31 | 50.49 | 54 | -3.51 | - | - | 264 | 176 | V |
| 4 | * ** 5.35062 | 39.67 | ADV | 34.3 | -22.7 | .31 | 51.58 | 54 | -2.42 | - | - | 264 | 176 | V |
| 2 | * ** 5.3549 | 54.57 | Pk | 34.3 | -22.8 | 0 | 66.07 | - | - | 74 | -7.93 | 264 | 176 | H |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

## VERTICAL RESULT

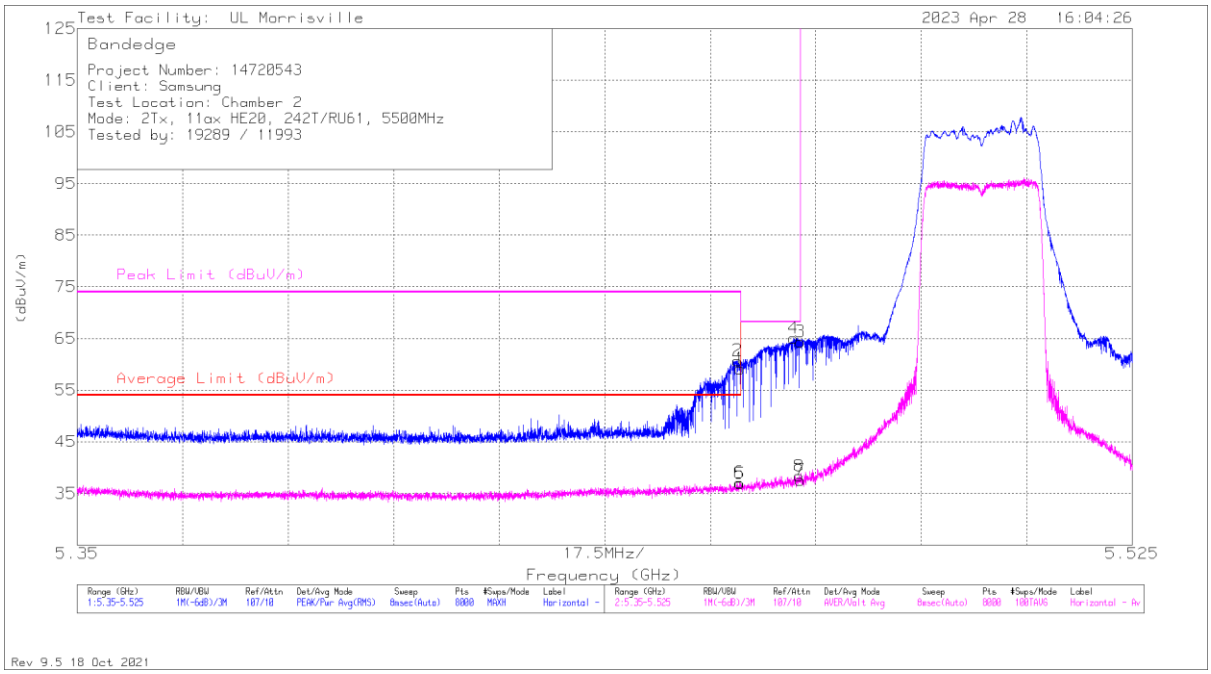



| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 88761 (dB/m) | Gain/Loss (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * ** 5.35001 | 49.73 | Pk | 34.3 | -22.7 | 0 | 61.33 | - | - | 74 | -12.67 | 199 | 237 | V |
| 3 | * ** 5.35001 | 38.18 | ADV | 34.3 | -22.7 | .31 | 50.09 | 54 | -3.91 | - | - | 199 | 237 | V |
| 4 | * ** 5.35107 | 38.96 | ADV | 34.3 | -22.7 | .31 | 50.87 | 54 | -3.13 | - | - | 199 | 237 | V |
| 2 | * ** 5.35158 | 53.14 | Pk | 34.3 | -22.7 | 0 | 64.74 | - | - | 74 | -9.26 | 199 | 237 | V |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

## BANDEDGE (5.6 BAND LOW CHANNEL – 2TX, 802.11ax HE20 242T/RU61)

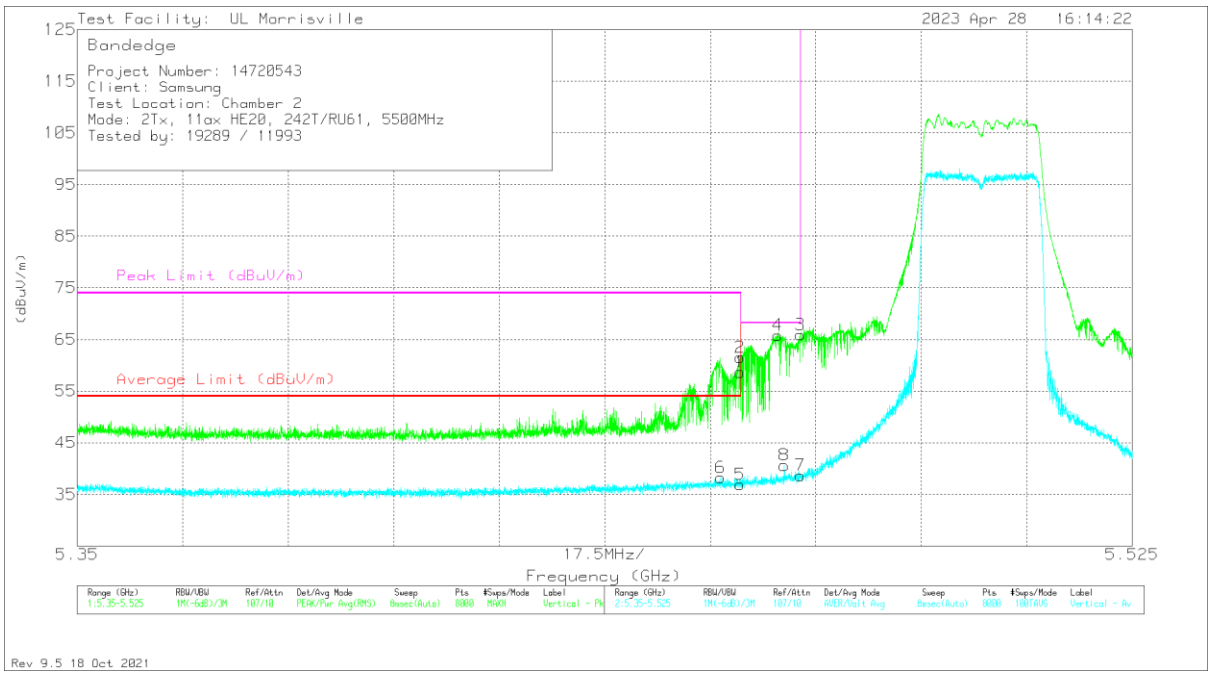
### HORIZONTAL RESULT




| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 88761 (dB/m) | Gain/Loss (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * ** 5.45998 | 47.96 | Pk | 34.5 | -23.3 | 59.16 | - | - | 74 | -14.84 | 224 | 232 | H |
| 2 | * ** 5.45957 | 49.5 | Pk | 34.5 | -23.3 | 60.7 | - | - | 74 | -13.3 | 224 | 232 | H |
| 5 | * ** 5.45998 | 25.72 | ADV | 34.5 | -23.3 | 36.92 | 54 | -17.08 | - | - | 224 | 232 | H |
| 6 | * ** 5.45987 | 25.87 | ADV | 34.5 | -23.3 | 37.07 | 54 | -16.93 | - | - | 224 | 232 | H |
| 4 | 5.4688 | 54.13 | Pk | 34.5 | -23.6 | 65.03 | - | - | 68.2 | -3.17 | 224 | 232 | H |
| 8 | 5.46978 | 27.47 | ADV | 34.5 | -23.6 | 38.37 | - | - | - | - | 224 | 232 | H |
| 3 | 5.46998 | 53.47 | Pk | 34.5 | -23.6 | 64.37 | - | - | 68.2 | -3.83 | 224 | 232 | H |
| 7 | 5.46998 | 26.7 | ADV | 34.5 | -23.6 | 37.6 | - | - | - | - | 224 | 232 | H |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

## VERTICAL RESULT

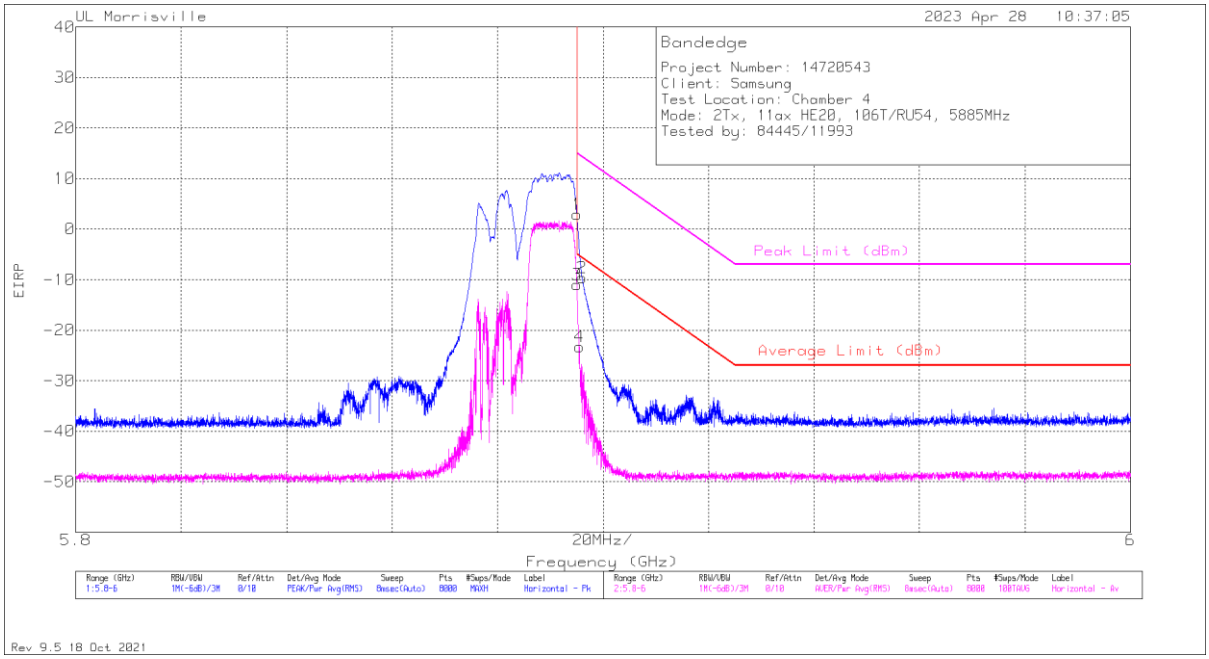



| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 88761 (dB/m) | Gain/Loss (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * ** 5.45998 | 47.48 | Pk | 34.5 | -23.3 | 58.68 | - | - | 74 | -15.32 | 205 | 284 | V |
| 2 | * ** 5.45994 | 50.31 | Pk | 34.5 | -23.3 | 61.51 | - | - | 74 | -12.49 | 205 | 284 | V |
| 5 | * ** 5.45998 | 25.72 | ADV | 34.5 | -23.3 | 36.92 | 54 | -17.08 | - | - | 205 | 284 | V |
| 6 | * ** 5.45674 | 27.04 | ADV | 34.5 | -23.3 | 38.24 | 54 | -15.76 | - | - | 205 | 284 | V |
| 4 | 5.46622 | 54.81 | Pk | 34.5 | -23.5 | 65.81 | - | - | 68.2 | -2.39 | 205 | 284 | V |
| 8 | 5.46729 | 29.64 | ADV | 34.5 | -23.5 | 40.64 | - | - | - | - | 205 | 284 | V |
| 3 | 5.46998 | 54.99 | Pk | 34.5 | -23.6 | 65.89 | - | - | 68.2 | -2.31 | 205 | 284 | V |
| 7 | 5.46998 | 27.79 | ADV | 34.5 | -23.6 | 38.69 | - | - | - | - | 205 | 284 | V |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
ADV - Linear Voltage Average

## BANDEDGE (5.8 BAND HIGH CHANNEL – 2TX, 802.11ax HE20 106T/RU54)

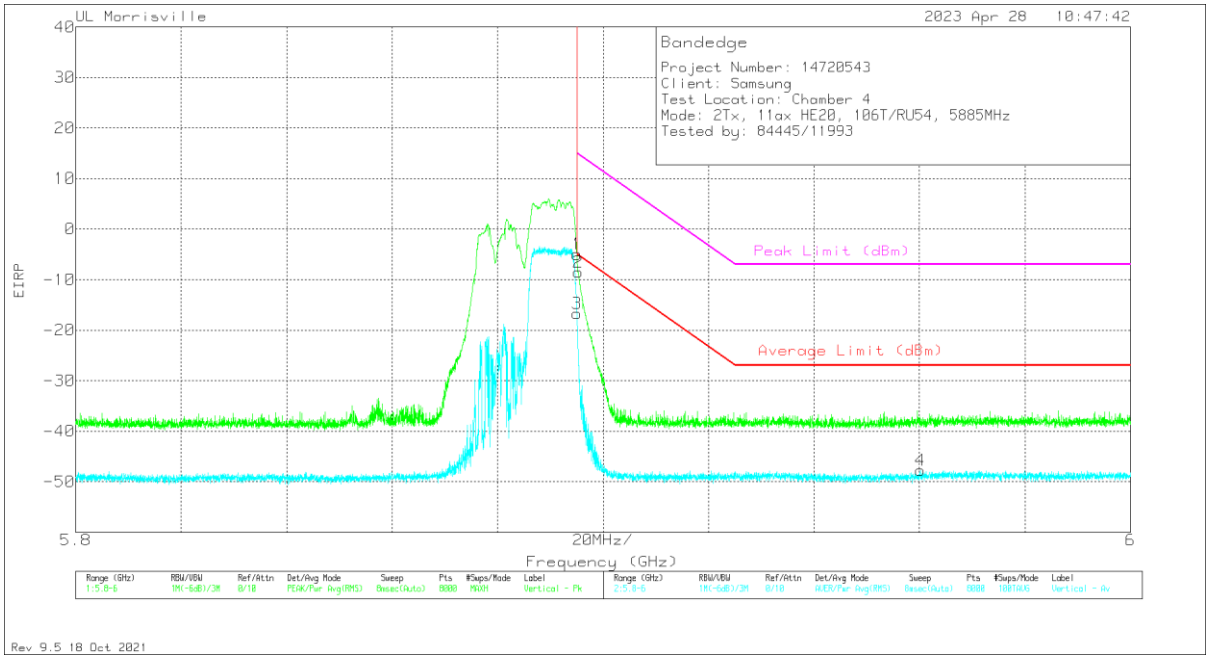
### HORIZONTAL RESULT




| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | 86408 (dB/m) | Gain/Loss (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Average Limit (dBm) | RMS Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.89501 | -34.92 | Pk | 35.1 | -9.1 | 11.8 | 2.88 | 14.99 | -12.11 | - | - | 94 | 118 | H |
| 2 | 5.89601 | -47.47 | Pk | 35.1 | -9.1 | 11.8 | -9.67 | 14.26 | -23.93 | - | - | 94 | 118 | H |
| 3 | 5.89501 | -48.8 | RMS | 35.1 | -9.1 | 11.8 | -11 | - | - | -5.01 | -5.99 | 94 | 118 | H |
| 4 | 5.89551 | -61.04 | RMS | 35.1 | -9.1 | 11.8 | -23.24 | - | - | -5.38 | -17.86 | 94 | 118 | H |

Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT

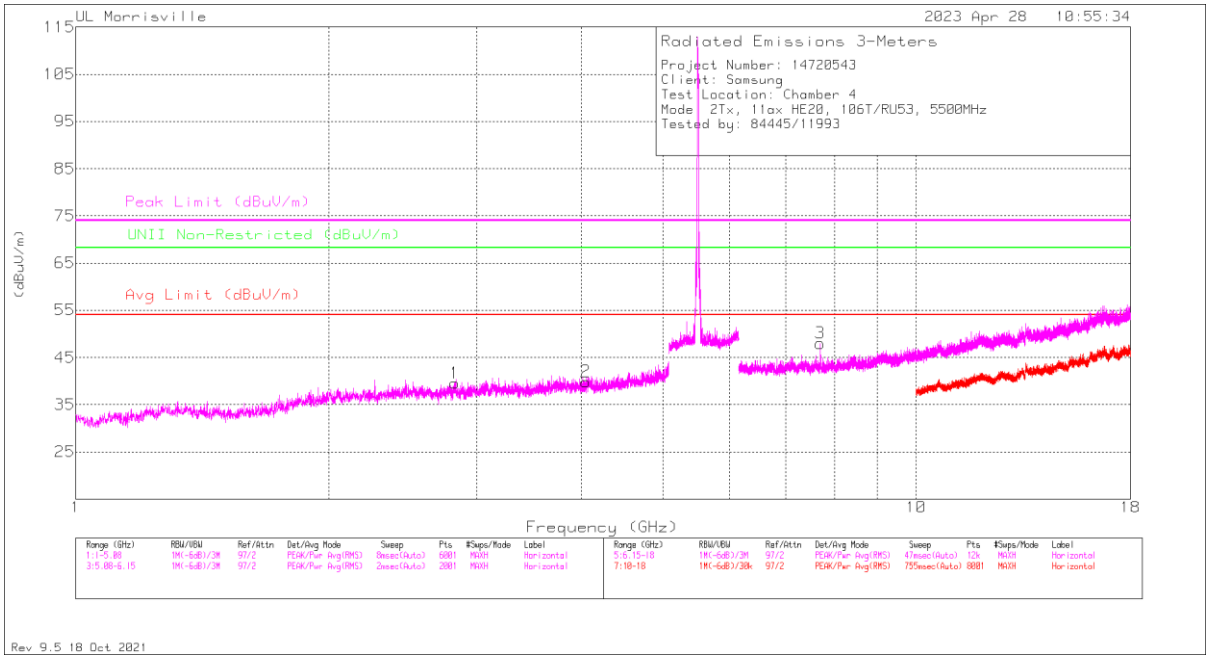



| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | 86408 (dB/m) | Gain/Loss (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Peak Limit (dBm) | PK Margin (dB) | Average Limit (dBm) | RMS Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.89501 | -42.77 | Pk | 35.1 | -9.1 | 11.8 | -4.97 | 14.99 | -19.96 | - | - | 356 | 281 | V |
| 2 | 5.89526 | -46.36 | Pk | 35.1 | -9.1 | 11.8 | -8.56 | 14.81 | -23.37 | - | - | 356 | 281 | V |
| 3 | 5.89501 | -54.5 | RMS | 35.1 | -9.1 | 11.8 | -16.7 | - | - | -5.01 | -11.69 | 356 | 281 | V |
| 4 | 5.96014 | -85.56 | RMS | 35.1 | -9.1 | 11.8 | -47.76 | - | - | -27 | -20.76 | 356 | 281 | V |

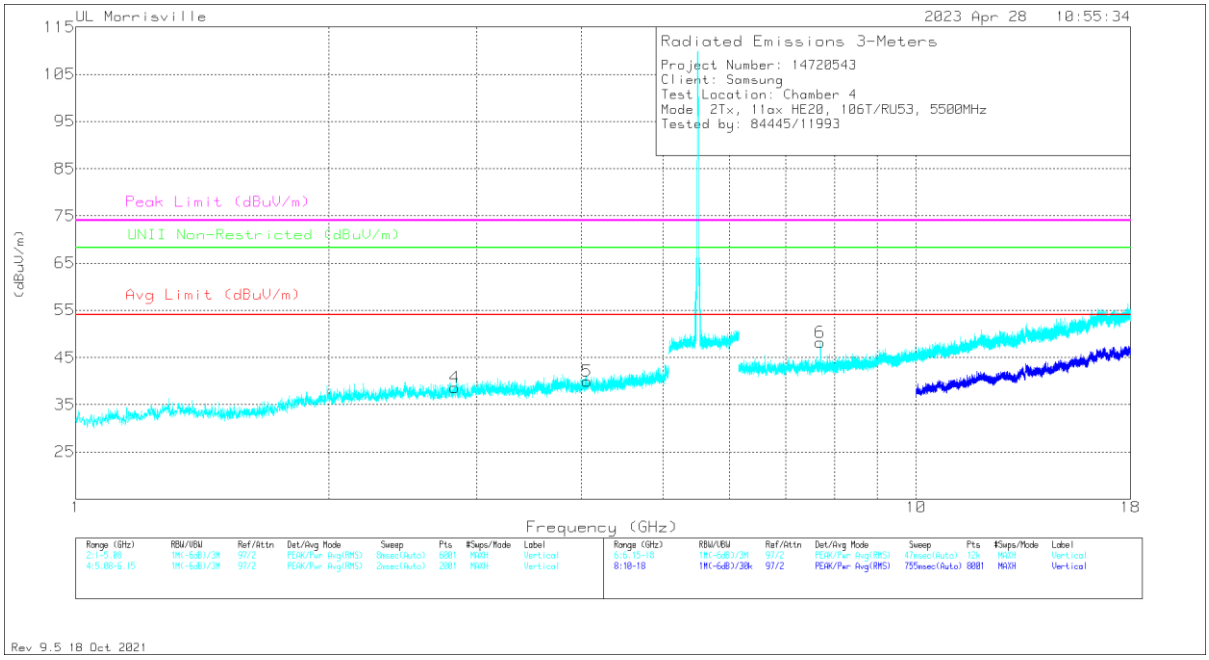
Pk - Peak detector
RMS - RMS detection

## HARMONICS AND SPURIOUS EMISSIONS

### 5.6 BAND LOW CHANNEL 2TX, 802.11ax HE20 106T/RU53




**HORIZONTAL**




**VERTICAL**

**RADIATED EMISSIONS**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 86408 (dB/m) | Gain/Loss (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * ** 2.82376 | 42.22 | Pk | 32.6 | -35.3 | 39.52 | 54 | -14.48 | 74 | -34.48 | - | - | 0-360 | 100 | H |
| 2 | * ** 4.04504 | 39.29 | Pk | 33.4 | -32.8 | 39.89 | 54 | -14.11 | 74 | -34.11 | - | - | 0-360 | 100 | H |
| 4 | * ** 2.82512 | 41.29 | Pk | 32.6 | -35.3 | 38.59 | 54 | -15.41 | 74 | -35.41 | - | - | 0-360 | 200 | V |
| 5 | * ** 4.05796 | 39.32 | Pk | 33.4 | -32.8 | 39.92 | 54 | -14.08 | 74 | -34.08 | - | - | 0-360 | 200 | V |
| 3 | * ** 7.69412 | 43.37 | PK2 | 35.7 | -27.9 | 51.17 | - | - | 74 | -22.83 | - | - | 323 | 132 | H |
|  | * ** 7.69347 | 32.42 | ADV | 35.7 | -27.9 | 40.22 | 54 | -13.78 | - | - | - | - | 323 | 132 | H |
| 6 | * ** 7.692 | 45.38 | PK2 | 35.7 | -27.9 | 53.18 | - | - | 74 | -20.82 | - | - | 187 | 217 | V |
|  | * ** 7.69372 | 34.61 | ADV | 35.7 | -27.9 | 42.41 | 54 | -11.59 | - | - | - | - | 187 | 217 | V |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
PK2 - Maximum Peak
ADV - Linear Voltage Average



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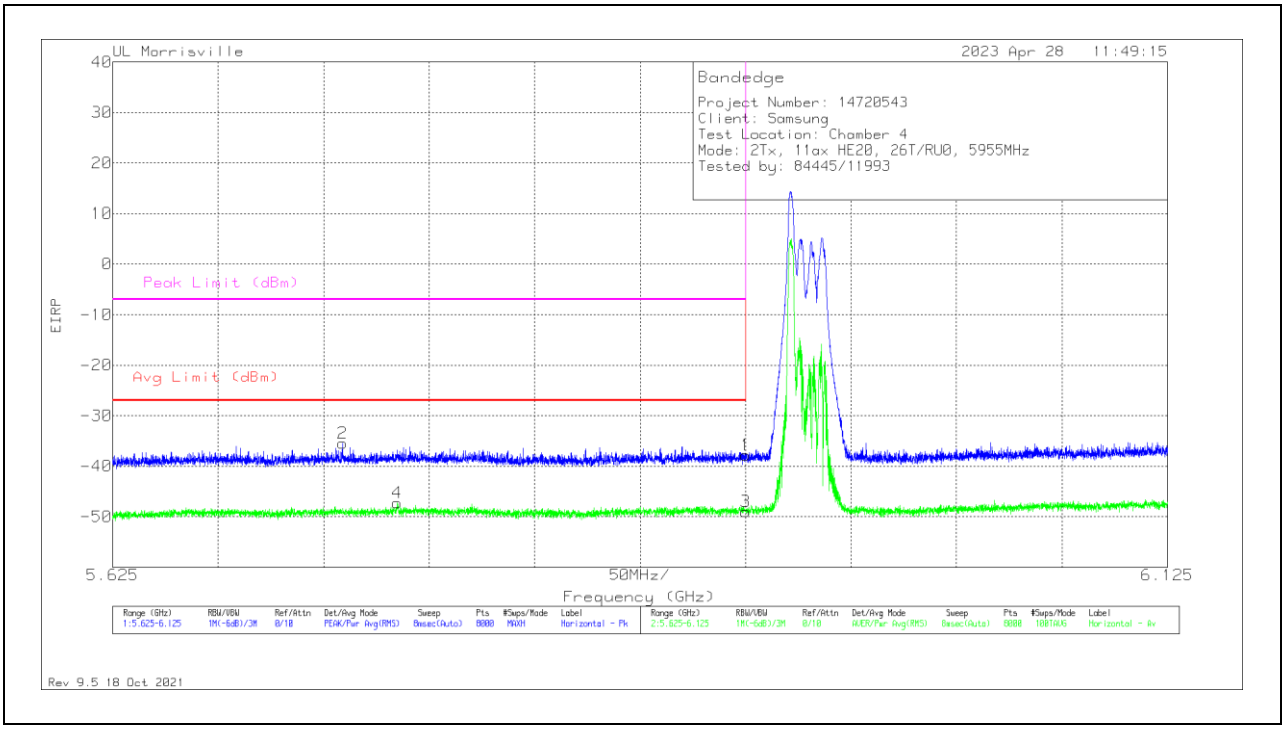
## 10.3. 6GHz WLAN

### BANDEDGE (LOW CHANNEL – 2TX, 802.11ax HE20 26T/RU0)

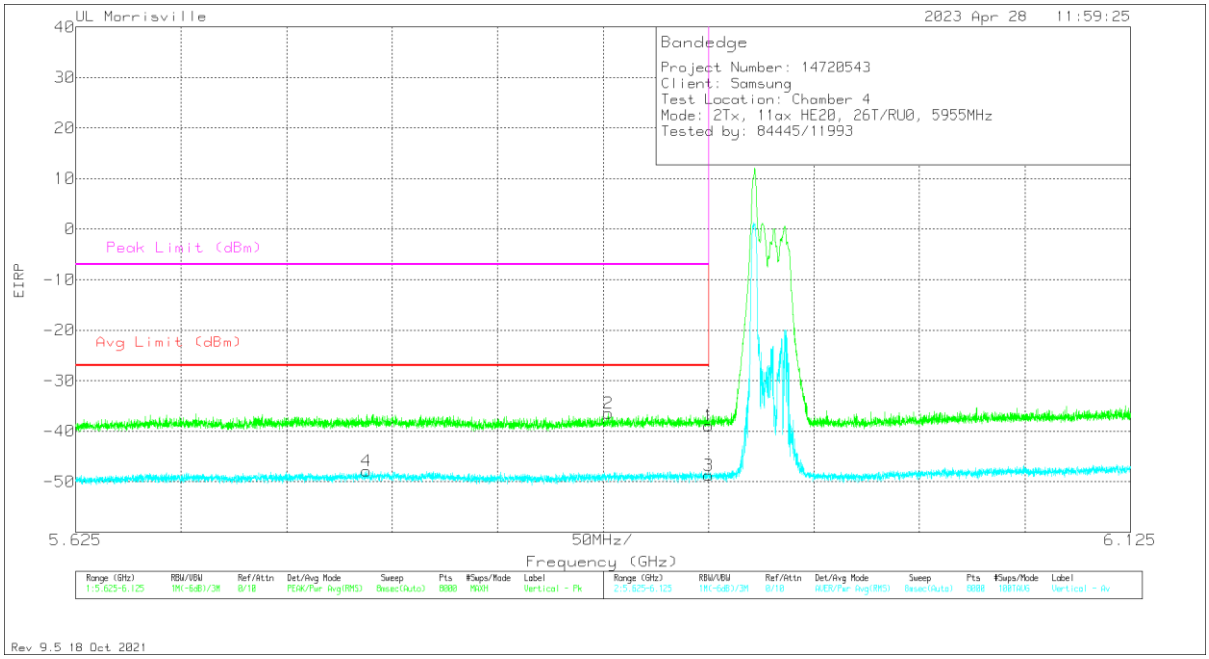
### HORIZONTAL RESULT




| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | 86408 (dB/m) | Gain/Loss (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Avg Limit (dBm) | RMS Margin (dB) | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.92498 | -75.79 | Pk | 35.1 | -8.9 | 11.8 | -37.79 | - | - | -7 | -30.79 | 137 | 230 | H |
| 2 | 5.73389 | -72.99 | Pk | 34.8 | -9.1 | 11.8 | -35.49 | - | - | -7 | -28.49 | 137 | 230 | H |
| 3 | 5.92498 | -86.96 | RMS | 35.1 | -8.9 | 11.8 | -48.96 | -27 | -21.96 | - | - | 137 | 230 | H |
| 4 | 5.75995 | -84.65 | RMS | 34.8 | -9.2 | 11.8 | -47.25 | -27 | -20.25 | - | - | 137 | 230 | H |

Pk - Peak detector
RMS - RMS detection

## VERTICAL RESULT

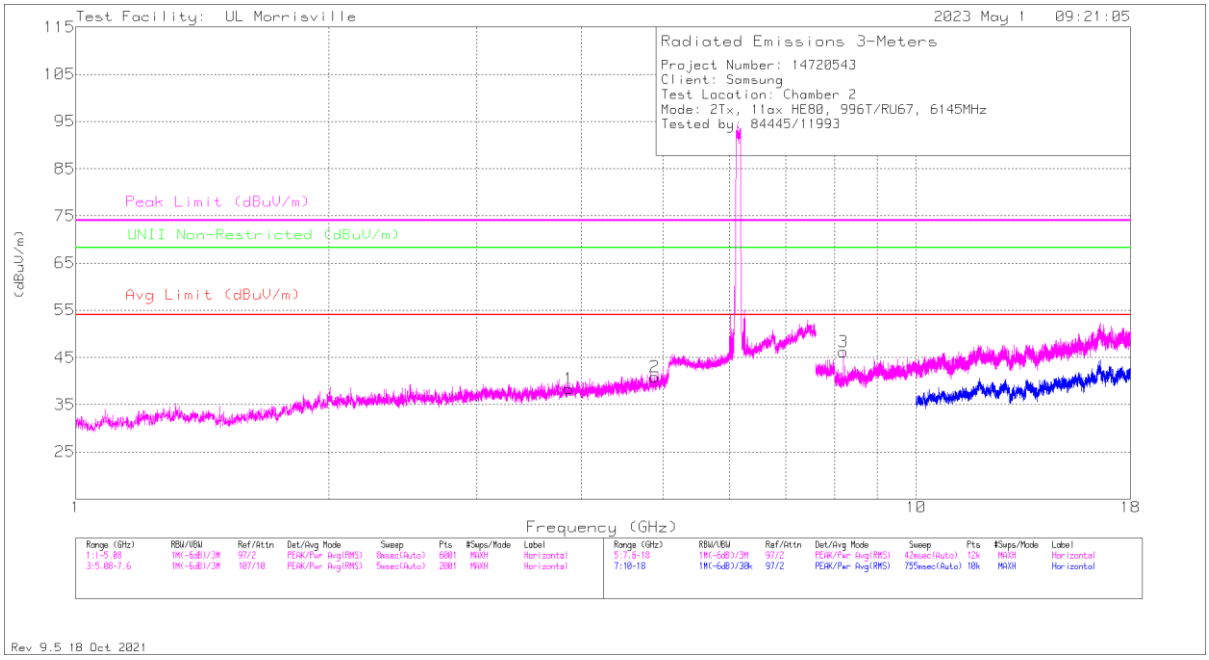



| Marker | Frequency (GHz) | Meter Reading (dBm) | Det | 86408 (dB/m) | Gain/Loss (dB) | Conversion Factor (dB) | Corrected Reading EIRP | Avg Limit (dBm) | RMS Margin (dB) | Peak Limit (dBm) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5.92498 | -76.88 | Pk | 35.1 | -8.9 | 11.8 | -38.88 | - | - | -7 | -31.88 | 129 | 107 | V |
| 2 | 5.87759 | -74.28 | Pk | 35 | -9 | 11.8 | -36.48 | - | - | -7 | -29.48 | 129 | 107 | V |
| 3 | 5.92498 | -86.76 | RMS | 35.1 | -8.9 | 11.8 | -48.76 | -27 | -21.76 | - | - | 129 | 107 | V |
| 4 | 5.76277 | -85.4 | RMS | 34.8 | -9.1 | 11.8 | -47.9 | -27 | -20.9 | - | - | 129 | 107 | V |

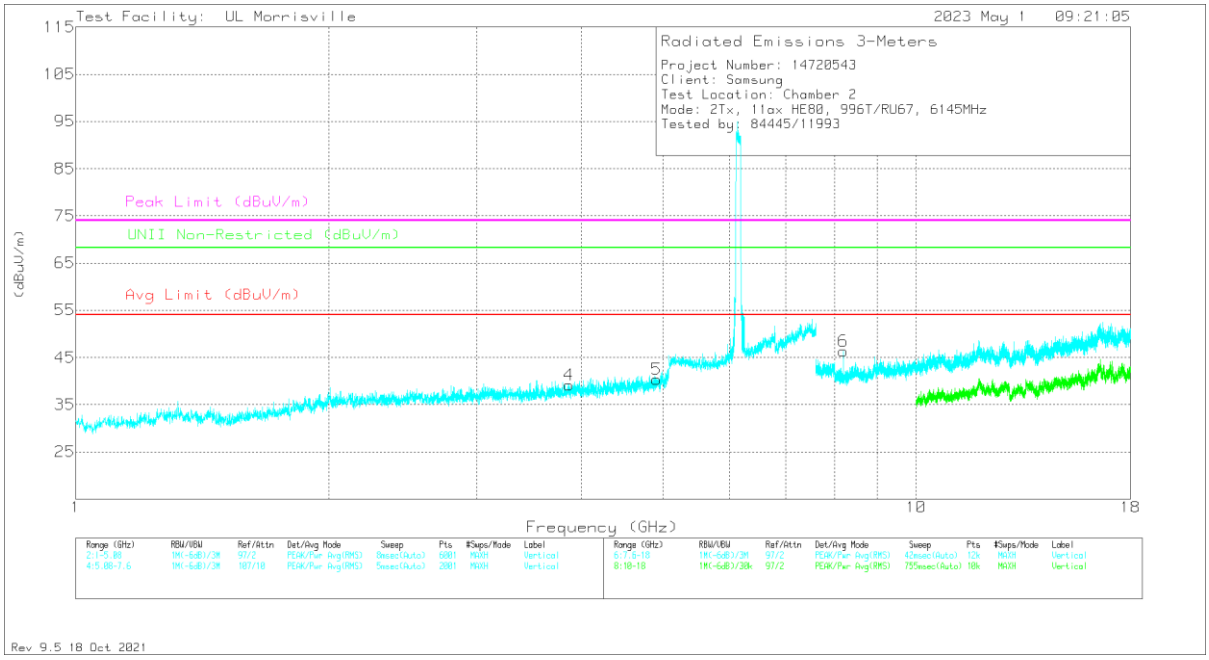
Pk - Peak detector
RMS - RMS detection

## HARMONICS AND SPURIOUS EMISSIONS

### MID CHANNEL 2TX, 802.11ax HE80 996T/RU67




**HORIZONTAL**




**VERTICAL**

**RADIATED EMISSIONS**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 88761 (dB/m) | Gain/Loss (dB) | Filter (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | UNII Non-Restricted (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * ** 3.86008 | 36.99 | Pk | 33.4 | -32 | 0 | 38.39 | 54 | -15.61 | 74 | -35.61 | - | - | 0-360 | 200 | H |
| 2 | * ** 4.88756 | 36.94 | Pk | 34 | -30.1 | 0 | 40.84 | 54 | -13.16 | 74 | -33.16 | - | - | 0-360 | 200 | H |
| 4 | * ** 3.86552 | 37.81 | Pk | 33.4 | -32.1 | 0 | 39.11 | 54 | -14.89 | 74 | -34.89 | - | - | 0-360 | 200 | V |
| 5 | * ** 4.91612 | 35.96 | Pk | 34 | -29.6 | 0 | 40.36 | 54 | -13.64 | 74 | -33.64 | - | - | 0-360 | 101 | V |
| 3 | * ** 8.19337 | 41.73 | PK-U | 35.7 | -27.2 | .9 | 51.13 | - | - | 74 | -22.87 | - | - | 111 | 118 | H |
| | * ** 8.19331 | 37.88 | ADV | 35.7 | -27.2 | .9 | 47.28 | 54 | -6.72 | - | - | - | - | 111 | 118 | H |
| 6 | * ** 8.19336 | 41.44 | PK-U | 35.7 | -27.2 | .9 | 50.84 | - | - | 74 | -23.16 | - | - | 212 | 199 | V |
| | * ** 8.19332 | 36.74 | ADV | 35.7 | -27.2 | .9 | 46.14 | 54 | -7.86 | - | - | - | - | 212 | 199 | V |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
** - indicates frequency in Taiwan NCC LP0002 Restricted Band
Pk - Peak detector
PK-U - Maximum Peak
ADV - Linear Voltage Average



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# 11. SETUP PHOTOS

Refer to R14720543-EP1 for setup photos.

## END OF REPORT



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