



# **CERTIFICATION TEST REPORT**

**Report Number. :** R12922855-E2

**Applicant :** Microsoft Corporation  
One Microsoft Way  
Redmond, WA 98052-6399  
USA

**Model :** 1867

**FCC ID :** C3K1867

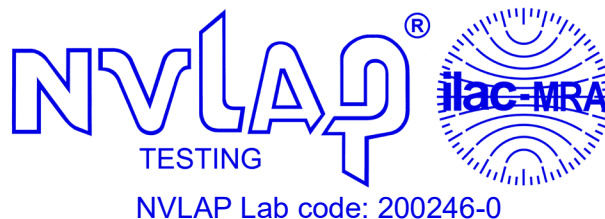
**IC :** 3048A-1867

**EUT Description :** Portable Computing Device

**Test Standard(s) :** FCC 47 CFR PART 15 SUBPART C  
ISED RSS-247 ISSUE 2  
ISED RSS-GEN ISSUE 5

**Date Of Issue:**  
2019-08-29

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## REPORT REVISION HISTORY

| Rev. | Issue Date | Revisions                                                                                        | Revised By      |
|------|------------|--------------------------------------------------------------------------------------------------|-----------------|
| V1   | --         | Initial Issue                                                                                    |                 |
| 2    | 2019-09-06 | Added AC power adaptor to support equipment.<br>Added model similarity explanation to Section 4. | Brian T. Kiewra |

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Microsoft Corporation  
One Microsoft Way  
Redmond, WA 98052-6399  
USA

**EUT DESCRIPTION:** Portable Computing Device

**MODEL:** 1867

**SERIAL NUMBER:** See section 6.4

**DATE TESTED:** 2019-07-18 to 2019-07-22

| APPLICABLE STANDARDS     |              |
|--------------------------|--------------|
| STANDARD                 | TEST RESULTS |
| CFR 47 Part 15 Subpart C | Complies     |
| ISED RSS-247 Issue 2     | Complies     |
| ISED RSS-GEN Issue 5     | 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 NVLAP, NIST, or any agency of the U.S. government.

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## 2. TEST METHODOLOGY

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

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Drive, Research Triangle Park, North Carolina, USA and 2800 Perimeter Park Dr. Suite B, Morrisville, North Carolina, USA. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

| 12 Laboratory Dr.                  | 2800 Perimeter Park Dr. Suite B                   |
|------------------------------------|---------------------------------------------------|
| ISED Site Code: 2180C              |                                                   |
| <input type="checkbox"/> Chamber A | <input checked="" type="checkbox"/> Chamber North |
| <input type="checkbox"/> Chamber C | <input checked="" type="checkbox"/> Chamber South |

The above test sites and facilities are covered under FCC Test Firm Registration # 703469. Chambers above are covered under Industry Canada company address and respective code.

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0

## 4. SCOPE OF REPORT

This test report covers the radiated emissions and AC power line conducted emissions data for model 1867. Antenna port conducted emissions data is leveraged from UL report number R12935938-E2, model 1868 (FCC ID: C3K1868, IC: 3048A-1868).

Models 1867 and 1868 are electrically and RF equivalent as they use the same motherboard, radio module and on-board RF components. Both models share a common WiFi and BT power table. The radio-related firmware and driver versions are the same for the two models. The peak antenna gains are in the antenna gain section of the report. Antenna port conducted emissions measurements are done on model 1868 (FCC ID: C3K1868, IC: 3048A-1868) and the data is leveraged for model 1867 (FCC ID: C3K1867, IC: 3048A-1867). Highest antenna gain across the two models in each band has been considered while doing the conducted emissions measurements. Separate radiated & SAR measurements are done on each model.

## 5. CALIBRATION AND UNCERTAINTY

### 5.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 5.2. 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)  
 $36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$

#### **MAINS CONDUCTED EMISSIONS**

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.  
 $36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$

### 5.3. MEASUREMENT UNCERTAINTY

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

| PARAMETER                           | UNCERTAINTY |
|-------------------------------------|-------------|
| Radio Frequency (Spectrum Analyzer) | 141.2 Hz    |
| Unwanted Emissions, conducted       | 2.50 dB     |
| All emissions, radiated             | 4.88 dB     |
| Temperature                         | 2.26°C      |
| Humidity                            | 6.79%       |
| DC Supply voltages                  | 1.70%       |
| Time                                | 3.39%       |

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

## 6. EQUIPMENT UNDER TEST

### 6.1. EUT DESCRIPTION

The EUT is a Portable Computing Device that contains 802.11 a/ac/ax/b/g/n 20/40/80/160MHz 2x2 dual band and BT/BLE radios.

### 6.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

| Frequency Range (MHz) | Mode           | Output Power (dBm) | Output Power (mW) |
|-----------------------|----------------|--------------------|-------------------|
| 2402 - 2480           | Basic GFSK     | 2.48               | 1.77              |
| 2402 - 2480           | Enhanced DQPSK | 5.14               | 3.27              |
| 2402 - 2480           | Enhanced 8PSK  | 4.86               | 3.06              |

Note: GFSK, DQPSK, 8PSK average Power are all investigated, The GFSK & 8PSK Power are the worst case. Testing is based on these modes to showing compliance. For average power data please refer UL report number R12935938-E2, model 1868 (FCC ID: C3K1868, IC: 3048A-1868).

### 6.3. DESCRIPTION OF AVAILABLE ANTENNAS

| Frequency Range (GHz) | Antenna Type | Peak Gain (dBi) Chain 0 (Right) | Peak Gain (dBi) Chain 1 (Left) |
|-----------------------|--------------|---------------------------------|--------------------------------|
| Model 1867            |              |                                 |                                |
| 2.4 to 2.48           | PIFA         | 0.7                             | 2.6                            |
| 5.15 to 5.25          |              | 4.9                             | 4.4                            |
| 5.25 to 5.35          |              | 6.1                             | 5.0                            |
| 5.47 to 5.72          |              | 7.2                             | 5.5                            |
| 5.725 to 5.85         |              | 9.4                             | 5.6                            |
| Model 1868            |              |                                 |                                |
| 2.4 to 2.48           | PIFA         | 0.4                             | 1.0                            |
| 5.15 to 5.25          |              | 3.6                             | 2.2                            |
| 5.25 to 5.35          |              | 5.2                             | 3.5                            |
| 5.47 to 5.72          |              | 6.4                             | 4.7                            |
| 5.725 to 5.85         |              | 7.8                             | 4.5                            |

The BT radio utilizes Chain 0.

#### 6.4. SOFTWARE AND FIRMWARE

| EUT                        | Serial Number | Radio Test Tool Version | OS Version    | BT Driver Version | WiFi Driver Version | EUT's Power Supply (s/n) |
|----------------------------|---------------|-------------------------|---------------|-------------------|---------------------|--------------------------|
| R-557-1867-FCC-RADIATED-08 | 006438792757  | 11.1916.0-09531         | MTEOS 1.652.0 | 21.0.19157.20088  | 99.0.43.8           | 0D130P028D596            |
| R-557-1867-FCC-RADIATED-09 | 006439692757  | 11.1916.0-09531         | MTEOS 1.652.0 | 21.0.19157.20088  | 99.0.43.8           | 0D130P01H1596            |

#### 6.5. WORST-CASE CONFIGURATION AND MODE

Radiated emissions below 1GHz, above 18GHz, and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

Band edge and radiated emissions between 1GHz and 18GHz were performed with the EUT set to transmit at the highest power on low, middle and high channels.

The EUT has one intended orientations, X; therefore, all final radiated testing was performed with the EUT in X orientation.

Worst-case data rates/packet sizes were:

GFSK mode: DH5  
DQPSK mode: 2-DH5  
8PSK mode: 3-DH5

All radios that can transmit simultaneously have been evaluated for radiated for all possible combinations of transmission and found to be in compliance.

## 6.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| Support Equipment List |              |                 |                                    |        |
|------------------------|--------------|-----------------|------------------------------------|--------|
| Description            | Manufacturer | Model           | Serial Number                      | FCC ID |
| USB Hub                | J5 Create    | JCA374          | AY2A1904000477 /<br>AY6A1903004261 | N/A    |
| Earbuds                | Sony         | MDR-EX14AP      | Non-serialized                     | N/A    |
| USB Flash Drive        | Kingston     | DataTraveler G4 | Non-serialized                     | N/A    |
| AC Power Adaptor       | Microsoft    | 1706            | 0D130P01H1596                      | N/A    |

### I/O CABLES

| I/O Cable List |       |                      |                |            |                  |         |
|----------------|-------|----------------------|----------------|------------|------------------|---------|
| Cable No       | Port  | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1              | Mains | 1                    | 12-pin         | Mains      | <3               | None    |
| 2              | USB-A | 1                    | USB-A          | USB        | <3               | None    |
| 3              | USB-C | 1                    | USB-C          | USB        | <3               | None    |
| 4              | Aux   | 1                    | Aux            | Aux        | <3               | None    |

### TEST SETUP

The test utility software was located on the EUT during the tests and was used to exercised the radios.

### SETUP DIAGRAMS

Please refer to R12922855-EP1 for setup diagrams

## 7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - South Chamber)

| Equip. ID                | Description                                       | Manufacturer      | Model Number | Last Cal.  | Next Cal.  |
|--------------------------|---------------------------------------------------|-------------------|--------------|------------|------------|
|                          | <b>1-18 GHz</b>                                   |                   |              |            |            |
| AT0072                   | Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz | ETS Lindgren      | 3117         | 2019-04-22 | 2020-04-22 |
|                          | <b>18-40 GHz</b>                                  |                   |              |            |            |
| AT0076                   | Horn Antenna, 18-26.5GHz                          | ARA               | MWH-1826/B   | 2018-11-08 | 2019-11-08 |
|                          | <b>Gain-Loss Chains</b>                           |                   |              |            |            |
| S-SAC03                  | Gain-loss string: 1-18GHz                         | Various           | Various      | 2019-03-13 | 2020-03-13 |
| S-SAC04                  | Gain-loss string: 18-40GHz                        | Various           | Various      | 2018-09-30 | 2019-09-30 |
|                          | <b>Receiver &amp; Software</b>                    |                   |              |            |            |
| SA0025                   | Spectrum Analyzer                                 | Agilent           | N9030A       | 2019-02-28 | 2020-02-28 |
| SA0027<br>(18-40GHz RSE) | Spectrum Analyzer                                 | Agilent           | N9030A       | 2019-05-15 | 2020-05-15 |
| SOFTEMI                  | EMI Software                                      | UL                | Version 9.5  | NA         | NA         |
|                          | <b>Additional Equipment used</b>                  |                   |              |            |            |
| s/n 181474409            | Environmental Meter                               | Fisher Scientific | 15-077-963   | 2018-07-27 | 2020-07-27 |

### NOTES:

1. For equipment listed above that was calibrated during the testing period, please note the equipment was used for testing after calibration.
2. For equipment listed above that has a calibration due date during the testing period, the testing was completed before the equipment expiration date.

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - North Chamber)

| Equip. ID     | Description                      | Manufacturer         | Model Number | Last Cal.  | Next Cal.  |
|---------------|----------------------------------|----------------------|--------------|------------|------------|
|               | <b>0.009-30MHz</b>               | <b>(Loop Ant.)</b>   |              |            |            |
| AT0059        | Active Loop Antenna              | ETS-Lindgren         | 6502         | 2018-07-20 | 2019-07-31 |
|               | <b>30-1000 MHz</b>               |                      |              |            |            |
| AT0073        | Hybrid Broadband Antenna         | Sunol Sciences Corp. | JB3          | 2018-08-06 | 2019-08-31 |
|               | <b>Gain-Loss Chains</b>          |                      |              |            |            |
| N-SAC01       | Gain-loss string: 0.009-30MHz    | Various              | Various      | 2019-05-02 | 2020-05-02 |
| N-SAC02       | Gain-loss string: 25-1000MHz     | Various              | Various      | 2019-05-02 | 2020-05-02 |
|               | <b>Receiver &amp; Software</b>   |                      |              |            |            |
| SA0026        | Spectrum Analyzer                | Agilent              | N9030A       | 2019-03-19 | 2020-03-19 |
| SOFTEMI       | EMI Software                     | UL                   | Version 9.5  | NA         | NA         |
|               | <b>Additional Equipment used</b> |                      |              |            |            |
| s/n 181474341 | Environmental Meter              | Fisher Scientific    | 15-077-963   | 2018-07-27 | 2020-07-27 |

**NOTES:**

1. For equipment listed above that was calibrated during the testing period, please note the equipment was used for testing after calibration.
2. For equipment listed above that has a calibration due date during the testing period, the testing was completed before the equipment expiration date.

Test Equipment Used – Line Conducted Emissions Voltage (Morrisville – Conducted 1)

| Equipment ID       | Description                                   | Manufacturer        | Model Number             | Last Cal.  | Next Cal.  |
|--------------------|-----------------------------------------------|---------------------|--------------------------|------------|------------|
| CBL087             | Coax cable, RG223, N-male to BNC-male, 20-ft. | Pasternack          | PE3W06143-240            | 2019-05-29 | 2020-05-29 |
| s/n 161016511      | Environmental Meter                           | Fisher Scientific   | 14-650-118               | 2018-09-04 | 2020-09-04 |
| LISN003            | LISN, 50-ohm/50-uH, 2-conductor, 25A          | Fischer Custom Com. | FCC-LISN-50-25-2-01-550V | 2018-08-21 | 2019-08-21 |
| 75141 (PRE0101521) | EMI Test Receiver 9kHz-7GHz                   | Rohde & Schwarz     | ESCI 7                   | 2018-08-22 | 2019-08-22 |
| TL001              | Transient Limiter, 0.009-30MHz                | Com-Power           | LIT-930A                 | 2019-05-29 | 2020-05-29 |
| PS215              | AC Power Source                               | Elgar               | CW2501M (s/n 1523A02397) | NA         | NA         |
| SOFTEMI            | EMI Software                                  | UL                  | Version 9.5              | NA         | NA         |

**NOTES:**

1. For equipment listed above that was calibrated during the testing period, please note the equipment was used for testing after calibration.
2. For equipment listed above that has a calibration due date during the testing period, the testing was completed before the equipment expiration date.

## **8. MEASUREMENT METHODS**

Radiated Spurious Emissions: ANSI C63.10-2013 Section 6.3 and 6.6

Radiated Band-edge: ANSI C63.10-2013 Section 6.10.5

AC Power-line conducted emissions: ANSI C63.10-2013, Section 6.2.

## 9. RADIATED TEST RESULTS

### LIMITS

FCC §15.205 and §15.209

RSS-GEN, Section 8.9 and 8.10.

| 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 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. 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 below 1 GHz the resolution bandwidth is set to 120 kHz for peak and/or quasi-peak detection measurements in the 30-1000MHz range, 9kHz for peak and/or quasi-peak detection measurements in the 0.15-30MHz range and 200Hz for peak and/or quasi-peak detection measurements in the 9 to 150kHz range. Peak detection is used unless otherwise noted as quasi-peak.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements where T = the on time.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

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.

3D antenna use - For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel).

**KDB 414788 Open Field Site(OFS) and Chamber Correlation Justification**

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

## 9.1. ON TIME AND DUTY CYCLE

### LIMITS

None; for reporting purposes only.

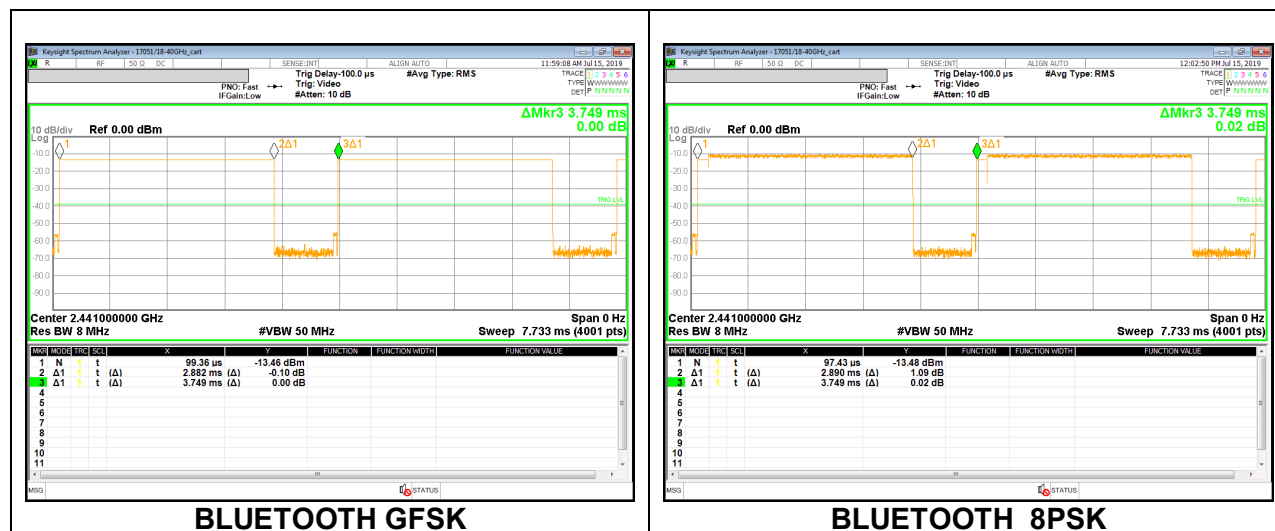
### PROCEDURE

ANSI C63.10, Section 11.6 : Zero-Span Spectrum Analyzer Method.

### ON TIME AND DUTY CYCLE RESULTS

| Mode           | ON Time<br>B<br>(msec) | Period<br>(msec) | Duty Cycle<br>x<br>(linear) | Duty<br>Cycle<br>(%) | Duty Cycle<br>Correction Factor<br>(dB) | 1/T<br>Minimum VBW<br>(kHz) |
|----------------|------------------------|------------------|-----------------------------|----------------------|-----------------------------------------|-----------------------------|
| Bluetooth GFSK | 2.882                  | 3.749            | 0.769                       | 76.9%                | 1.14                                    | 0.347                       |
| Bluetooth 8PSK | 2.890                  | 3.749            | 0.771                       | 77.1%                | 1.13                                    | 0.346                       |

### DUTY CYCLE PLOTS

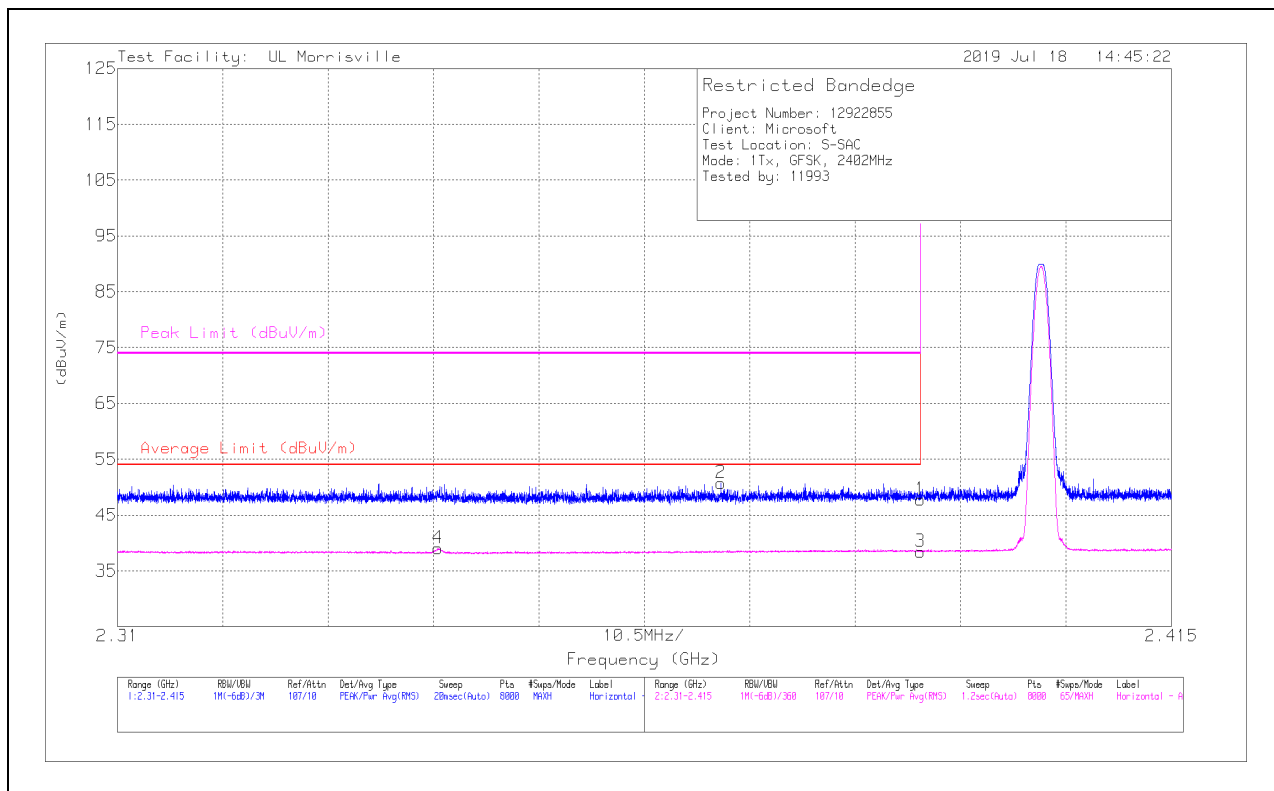


## 9.2. TRANSMITTER ABOVE 1 GHz

### 9.2.1. BLUETOOTH BASIC DATA RATE GFSK MODULATION

#### BANDEDGE (LOW CHANNEL)

#### HORIZONTAL RESULT



| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AT0072 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * ** 2.39       | 39.99                | Pk   | 31.9          | -24.1                  | 47.79                      | -                      | -           | 74                  | -26.21         | 74             | 118         | H        |
| 2      | * ** 2.37012    | 43.14                | Pk   | 31.8          | -24.2                  | 50.74                      | -                      | -           | 74                  | -23.26         | 74             | 118         | H        |
| 3      | * ** 2.39       | 30.64                | V1TR | 31.9          | -24.1                  | 38.44                      | 54                     | -15.56      | -                   | -              | 74             | 118         | H        |
| 4      | * ** 2.34191    | 31.62                | V1TR | 31.6          | -24.2                  | 39.02                      | 54                     | -14.98      | -                   | -              | 74             | 118         | H        |

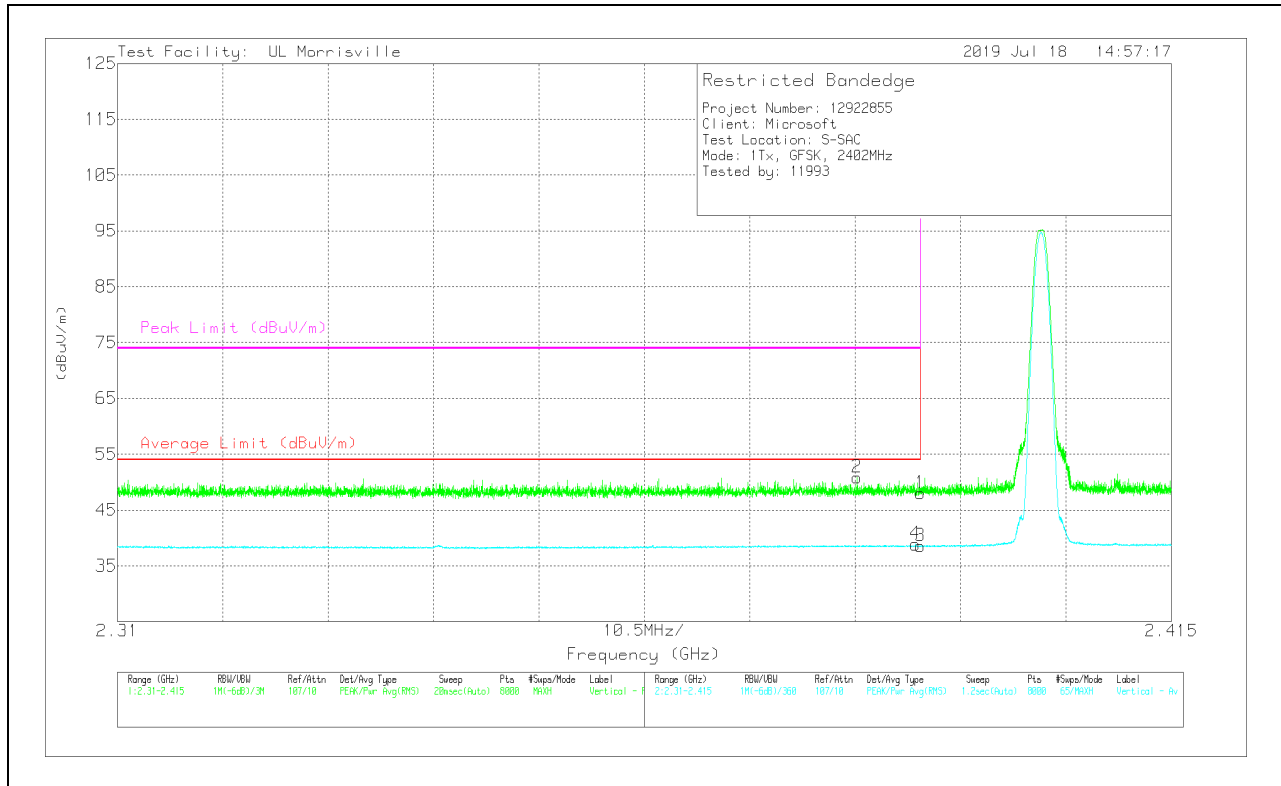
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

\*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TR: VB=1/Ton, Average where: Ton is packet duration

## VERTICAL RESULT



| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AT0072 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * ** 2.39       | 40.23                | Pk   | 31.9          | -24.1                  | 48.03                      | -                      | -           | 74                  | -25.97         | 241            | 377         | V        |
| 2      | * ** 2.38368    | 43.05                | Pk   | 31.9          | -24.1                  | 50.85                      | -                      | -           | 74                  | -23.15         | 241            | 377         | V        |
| 3      | * ** 2.39       | 30.75                | V1TR | 31.9          | -24.1                  | 38.55                      | 54                     | -15.45      | -                   | -              | 241            | 377         | V        |
| 4      | * ** 2.38951    | 31.06                | V1TR | 31.9          | -24.1                  | 38.86                      | 54                     | -15.14      | -                   | -              | 241            | 377         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

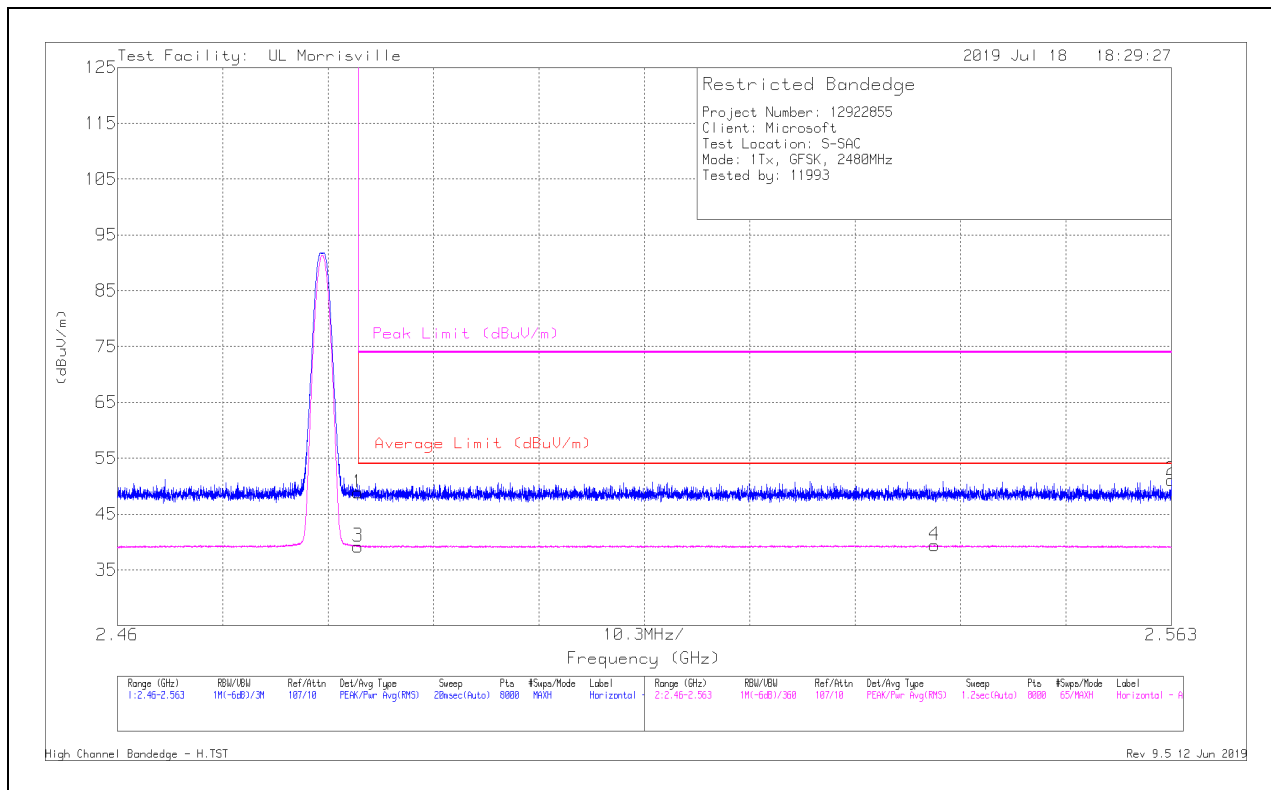
\*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TR: VB=1/Ton, Average where: Ton is packet duration

## BANDEDGE (HIGH CHANNEL)

### HORIZONTAL RESULT



| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AT0072 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * ** 2.4835     | 40.59                | Pk   | 32.3          | -24                    | 48.89                      | -                      | -           | 74                  | -25.11         | 80             | 103         | H        |
| 2      | ** 2.563        | 42.83                | Pk   | 32.3          | -24                    | 51.13                      | -                      | -           | 74                  | -22.87         | 80             | 103         | H        |
| 3      | * ** 2.4835     | 30.91                | V1TR | 32.3          | -24                    | 39.21                      | 54                     | -14.79      | -                   | -              | 80             | 103         | H        |
| 4      | ** 2.53985      | 31.06                | V1TR | 32.4          | -24                    | 39.46                      | 54                     | -14.54      | -                   | -              | 80             | 103         | H        |

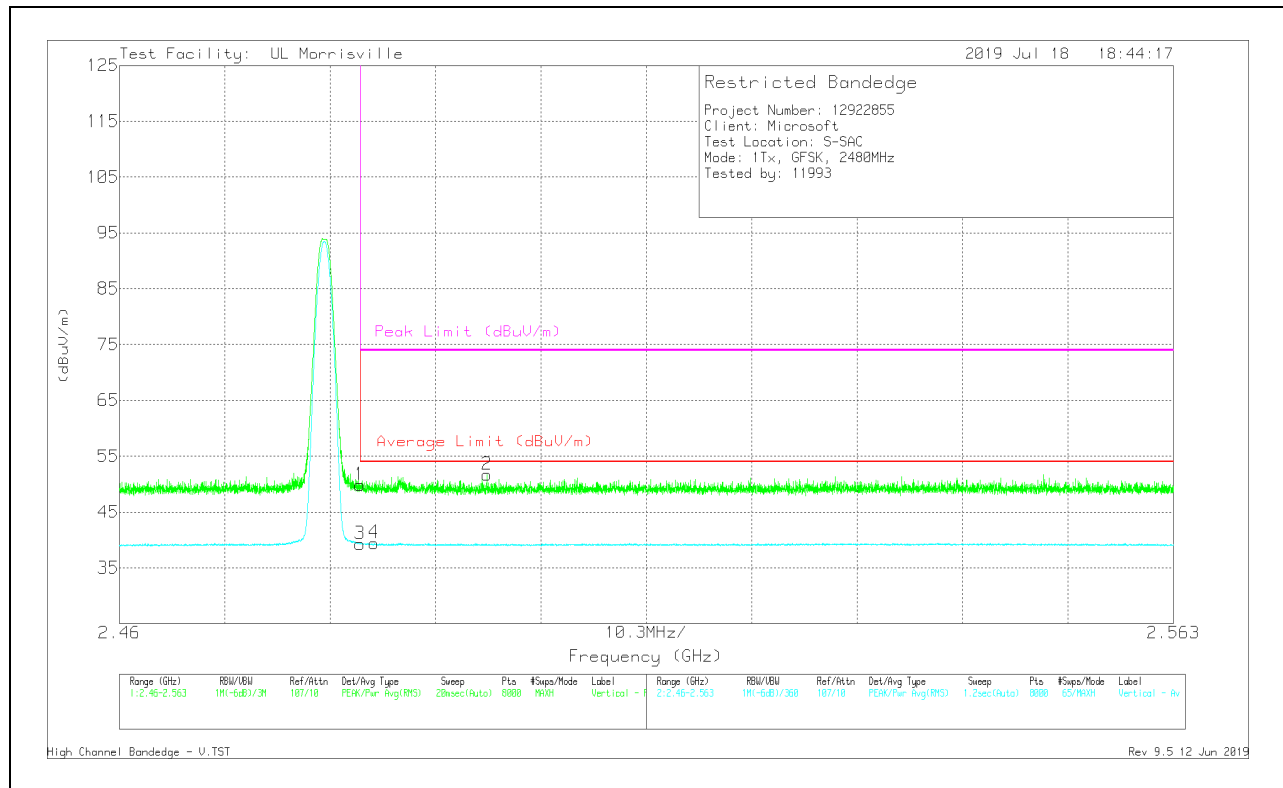
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

\*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TR: VB=1/Ton, Average where: Ton is packet duration

## VERTICAL RESULT



| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AT0072 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | *** 2.4835      | 41.53                | Pk   | 32.3          | -24                    | 49.83                      | -                      | -           | 74                  | -24.17         | 343            | 104         | V        |
| 2      | *** 2.4959      | 43.41                | Pk   | 32.3          | -24                    | 51.71                      | -                      | -           | 74                  | -22.29         | 343            | 104         | V        |
| 3      | *** 2.4835      | 30.96                | V1TR | 32.3          | -24                    | 39.26                      | 54                     | -14.74      | -                   | -              | 343            | 104         | V        |
| 4      | *** 2.48488     | 31.15                | V1TR | 32.3          | -24                    | 39.45                      | 54                     | -14.55      | -                   | -              | 343            | 104         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

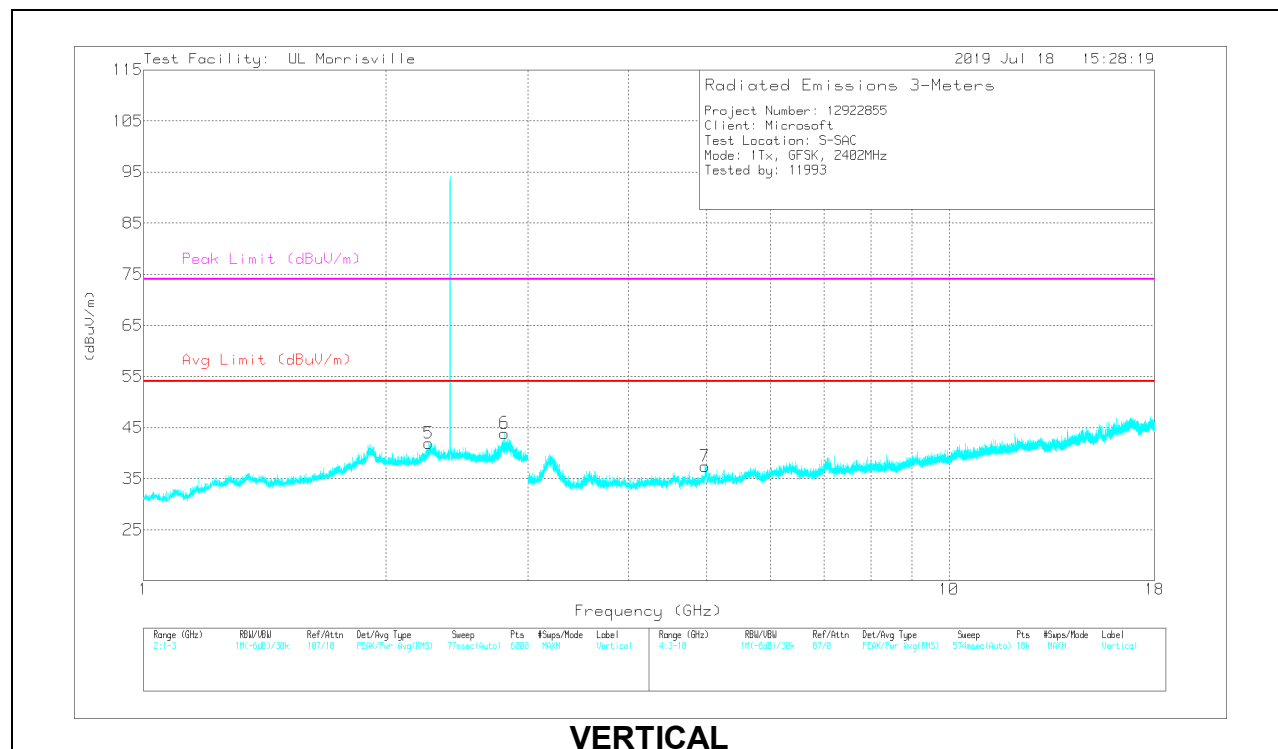
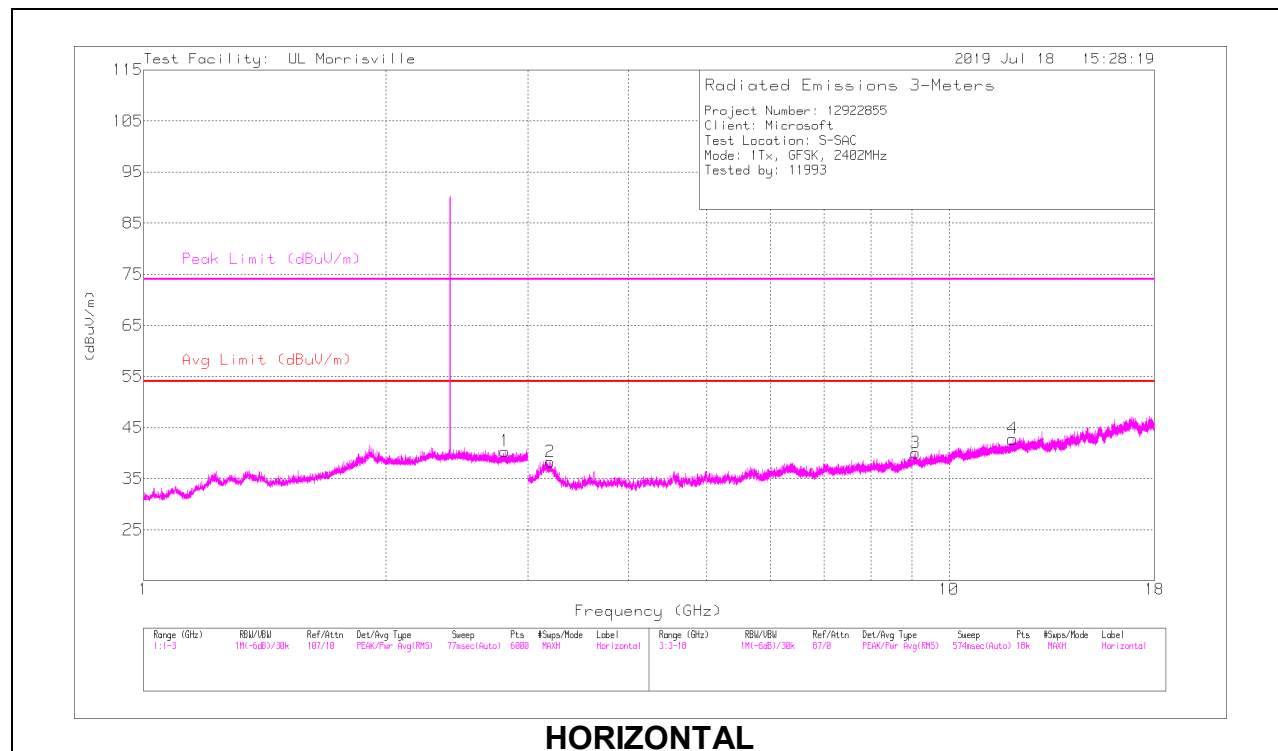
\*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TR: VB=1/Ton, Average where: Ton is packet duration

## HARMONICS AND SPURIOUS EMISSIONS

### LOW CHANNEL RESULTS



## RADIATED EMISSIONS

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AT0072 (dB/m) | Amp/Cbl/Fitr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|-----------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * ** 2.80795    | 39.78                | PK-U | 32.1          | -25.9                 | 45.98                      | -                  | -           | 74                  | -28.02         | 63             | 282         | H        |
|        | * ** 2.80804    | 27.92                | V1TR | 32.1          | -25.9                 | 34.12                      | 54                 | -19.88      | -                   | -              | 63             | 282         | H        |
| 5      | * ** 2.25815    | 40.58                | PK-U | 31.7          | -23.4                 | 48.88                      | -                  | -           | 74                  | -25.12         | 103            | 207         | V        |
|        | * ** 2.25839    | 28.91                | V1TR | 31.7          | -23.4                 | 37.21                      | 54                 | -16.79      | -                   | -              | 103            | 207         | V        |
| 6      | * ** 2.80897    | 45.04                | PK-U | 32.1          | -25.9                 | 51.24                      | -                  | -           | 74                  | -22.76         | 98             | 234         | V        |
|        | * ** 2.80912    | 33.46                | V1TR | 32.1          | -25.9                 | 39.66                      | 54                 | -14.34      | -                   | -              | 98             | 234         | V        |
| 3      | * ** 9.08938    | 35.19                | PK-U | 36.6          | -25.7                 | 46.09                      | -                  | -           | 74                  | -27.91         | 236            | 328         | H        |
|        | * ** 9.08935    | 23.61                | V1TR | 36.6          | -25.7                 | 34.51                      | 54                 | -19.49      | -                   | -              | 236            | 328         | H        |
| 4      | * ** 11.99996   | 33.7                 | PK-U | 38.7          | -23.7                 | 48.7                       | -                  | -           | 74                  | -25.3          | 5              | 217         | H        |
|        | * ** 12.00072   | 22                   | V1TR | 38.7          | -23.7                 | 37                         | 54                 | -17         | -                   | -              | 5              | 217         | H        |
| 7      | * ** 4.97882    | 42.86                | PK-U | 34.1          | -31.1                 | 45.86                      | -                  | -           | 74                  | -28.14         | 305            | 105         | V        |
|        | * ** 4.97905    | 29.3                 | V1TR | 34.1          | -31.1                 | 32.3                       | 54                 | -21.7       | -                   | -              | 305            | 105         | V        |
| 2      | 3.20001         | 37.81                | Pk   | 33.1          | -32.6                 | 38.31                      | -                  | -           | -                   | -              | 0-360          | 199         | H        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

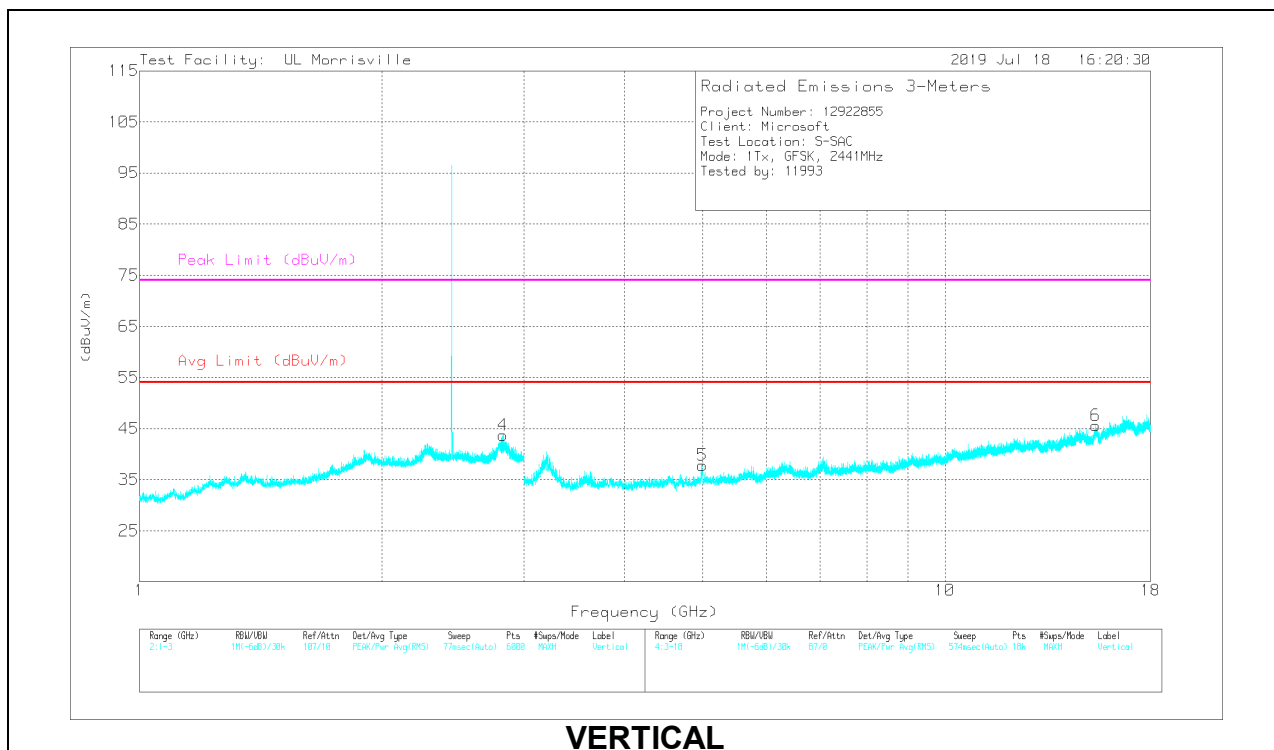
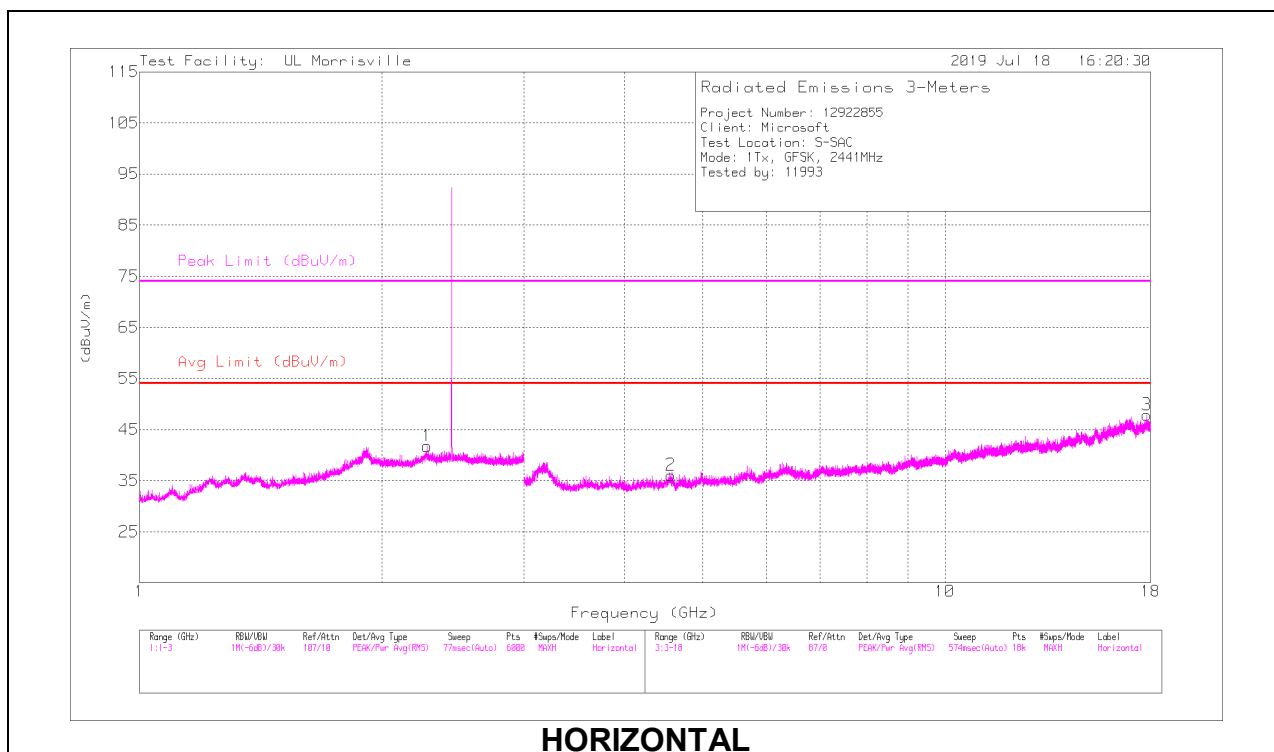
\*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

PK-U: Maximum Peak

V1TR: VB=1/Ton, Average where: Ton is packet duration

Pk - Peak detector

## MID CHANNEL RESULTS



## RADIATED EMISSIONS

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AT0072 (dB/m) | Amp/Cbl/Fitr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|-----------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * ** 2.27449    | 38.92                | PK-U | 31.8          | -23.5                 | 47.22                      | -                  | -           | 74                  | -26.78         | 147            | 106         | H        |
|        | * ** 2.27603    | 27.69                | V1TR | 31.8          | -23.5                 | 35.99                      | 54                 | -18.01      | -                   | -              | 147            | 106         | H        |
| 4      | * ** 2.82576    | 45.18                | PK-U | 32.1          | -25.9                 | 51.38                      | -                  | -           | 74                  | -22.62         | 99             | 216         | V        |
|        | * ** 2.82409    | 33.2                 | V1TR | 32.1          | -25.9                 | 39.4                       | 54                 | -14.6       | -                   | -              | 99             | 216         | V        |
| 2      | * ** 4.56845    | 40.5                 | PK-U | 34.1          | -31.4                 | 43.2                       | -                  | -           | 74                  | -30.8          | 69             | 114         | H        |
|        | * ** 4.56813    | 27.9                 | V1TR | 34.1          | -31.3                 | 30.7                       | 54                 | -23.3       | -                   | -              | 69             | 114         | H        |
| 3      | * ** 17.80722   | 34.12                | PK-U | 41.2          | -20.8                 | 54.52                      | -                  | -           | 74                  | -19.48         | 235            | 247         | H        |
|        | * ** 17.80732   | 22.19                | V1TR | 41.2          | -20.8                 | 42.59                      | 54                 | -11.41      | -                   | -              | 235            | 247         | H        |
| 5      | * ** 4.99909    | 42.81                | PK-U | 34.2          | -31.1                 | 45.91                      | -                  | -           | 74                  | -28.09         | 291            | 108         | V        |
|        | * ** 4.99891    | 29.14                | V1TR | 34.2          | -31.1                 | 32.24                      | 54                 | -21.76      | -                   | -              | 291            | 108         | V        |
| 6      | * ** 15.38935   | 33.68                | PK-U | 39.9          | -21.4                 | 52.18                      | -                  | -           | 74                  | -21.82         | 277            | 259         | V        |
|        | * ** 15.3893    | 21.78                | V1TR | 39.9          | -21.4                 | 40.28                      | 54                 | -13.72      | -                   | -              | 277            | 259         | V        |

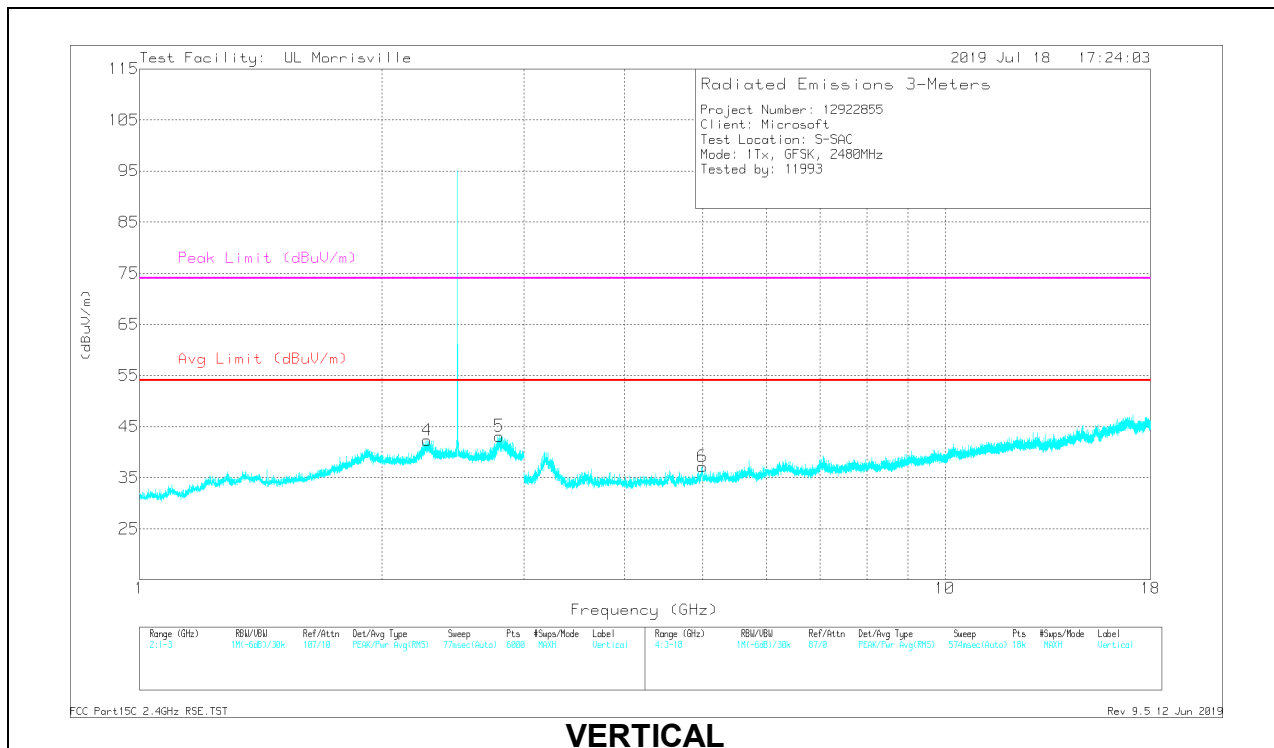
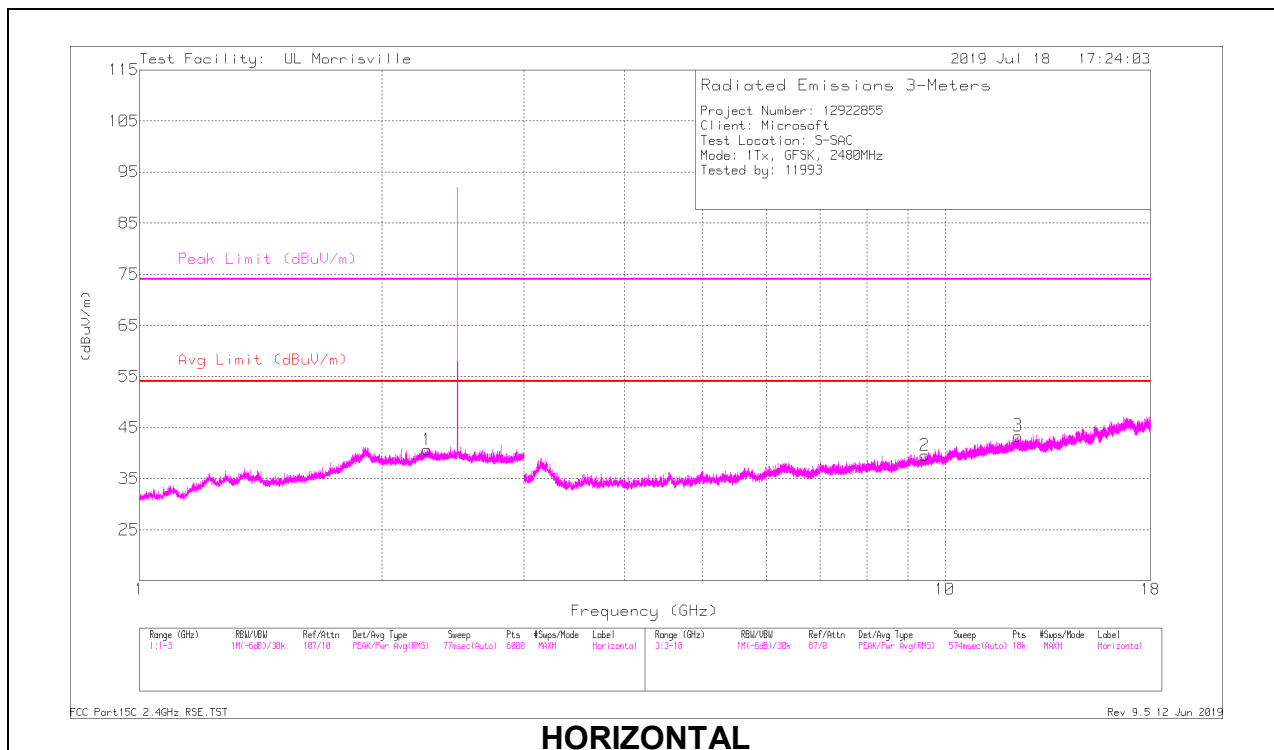
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

\*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

PK-U: Maximum Peak

V1TR: VB=1/Ton, Average where: Ton is packet duration

## HIGH CHANNEL RESULTS



## RADIATED EMISSIONS

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AT0072 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|------------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | *** 2.27778     | 39.55                | PK-U | 31.8          | -23.5                  | 47.85                      | -                  | -           | 74                  | -26.15         | 349            | 147         | H        |
|        | *** 2.27811     | 27.94                | V1TR | 31.8          | -23.5                  | 36.24                      | 54                 | -17.76      | -                   | -              | 349            | 147         | H        |
| 4      | *** 2.27474     | 40.74                | PK-U | 31.8          | -23.5                  | 49.04                      | -                  | -           | 74                  | -24.96         | 92             | 236         | V        |
|        | *** 2.27367     | 29.34                | V1TR | 31.8          | -23.5                  | 37.64                      | 54                 | -16.36      | -                   | -              | 92             | 236         | V        |
| 5      | *** 2.79382     | 44.45                | PK-U | 32.2          | -25.8                  | 50.85                      | -                  | -           | 74                  | -23.15         | 104            | 214         | V        |
|        | *** 2.79383     | 32.6                 | V1TR | 32.2          | -25.8                  | 39                         | 54                 | -15         | -                   | -              | 104            | 214         | V        |
| 2      | *** 9.43504     | 35.57                | PK-U | 37            | -26.2                  | 46.37                      | -                  | -           | 74                  | -27.63         | 337            | 400         | H        |
|        | *** 9.43447     | 23.52                | V1TR | 37            | -26.2                  | 34.32                      | 54                 | -19.68      | -                   | -              | 337            | 400         | H        |
| 3      | *** 12.3244     | 34.28                | PK-U | 38.8          | -23.8                  | 49.28                      | -                  | -           | 74                  | -24.72         | 291            | 345         | H        |
|        | *** 12.32496    | 22.46                | V1TR | 38.8          | -23.8                  | 37.46                      | 54                 | -16.54      | -                   | -              | 291            | 345         | H        |
| 6      | *** 4.99866     | 42.51                | PK-U | 34.2          | -31.1                  | 45.61                      | -                  | -           | 74                  | -28.39         | 291            | 101         | V        |
|        | *** 4.99879     | 28.99                | V1TR | 34.2          | -31.1                  | 32.09                      | 54                 | -21.91      | -                   | -              | 291            | 101         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

\*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

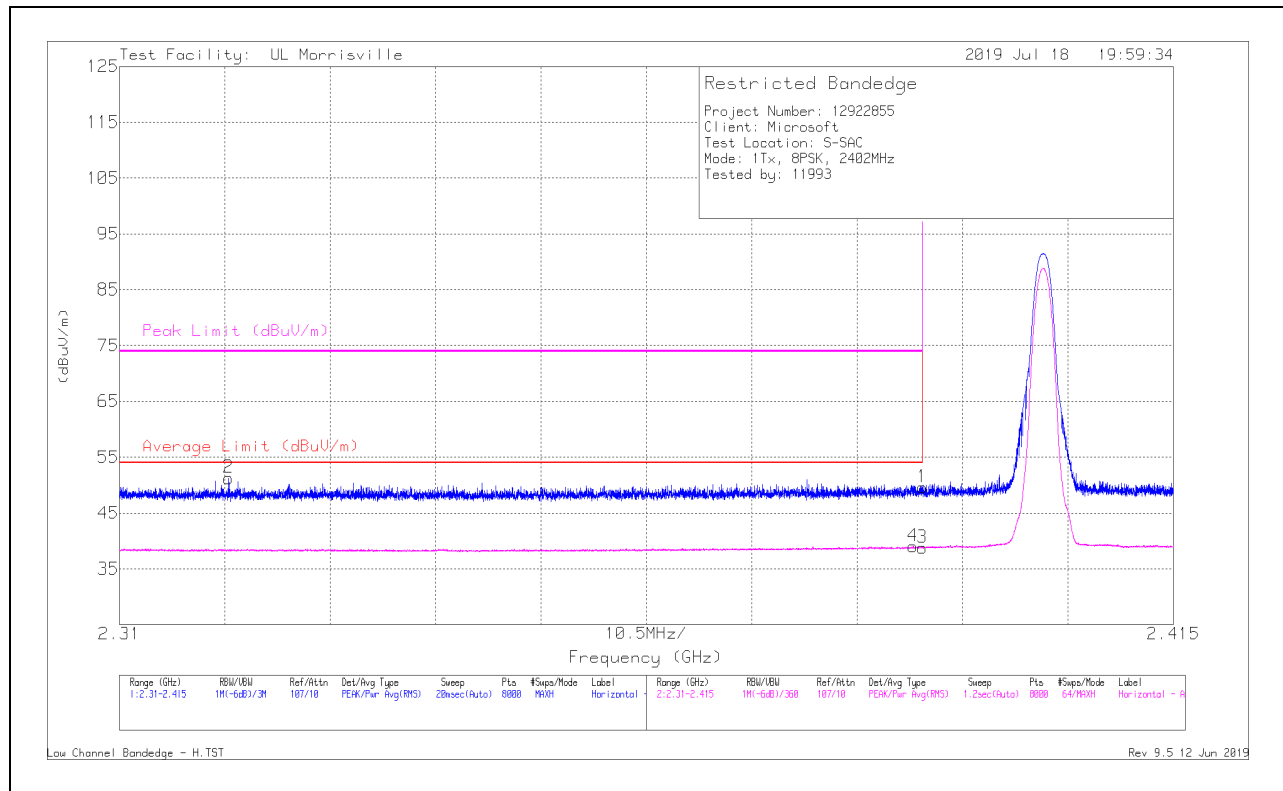
PK-U: Maximum Peak

V1TR: VB=1/Ton, Average where: Ton is packet duration

## 9.2.2. BLUETOOTH ENHANCED DATA RATE 8PSK MODULATION

### BANDEDGE (LOW CHANNEL)

### HORIZONTAL RESULT



| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AT0072 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * ** 2.39       | 41.82                | Pk   | 31.9          | -24.1                  | 49.62                      | -                      | -           | 74                  | -24.38         | 78             | 112         | H        |
| 2      | * ** 2.32087    | 43.77                | Pk   | 31.7          | -24.2                  | 51.27                      | -                      | -           | 74                  | -22.73         | 78             | 112         | H        |
| 3      | * ** 2.39       | 31.02                | V1TR | 31.9          | -24.1                  | 38.82                      | 54                     | -15.18      | -                   | -              | 78             | 112         | H        |
| 4      | * ** 2.38908    | 31.24                | V1TR | 31.9          | -24.1                  | 39.04                      | 54                     | -14.96      | -                   | -              | 78             | 112         | H        |

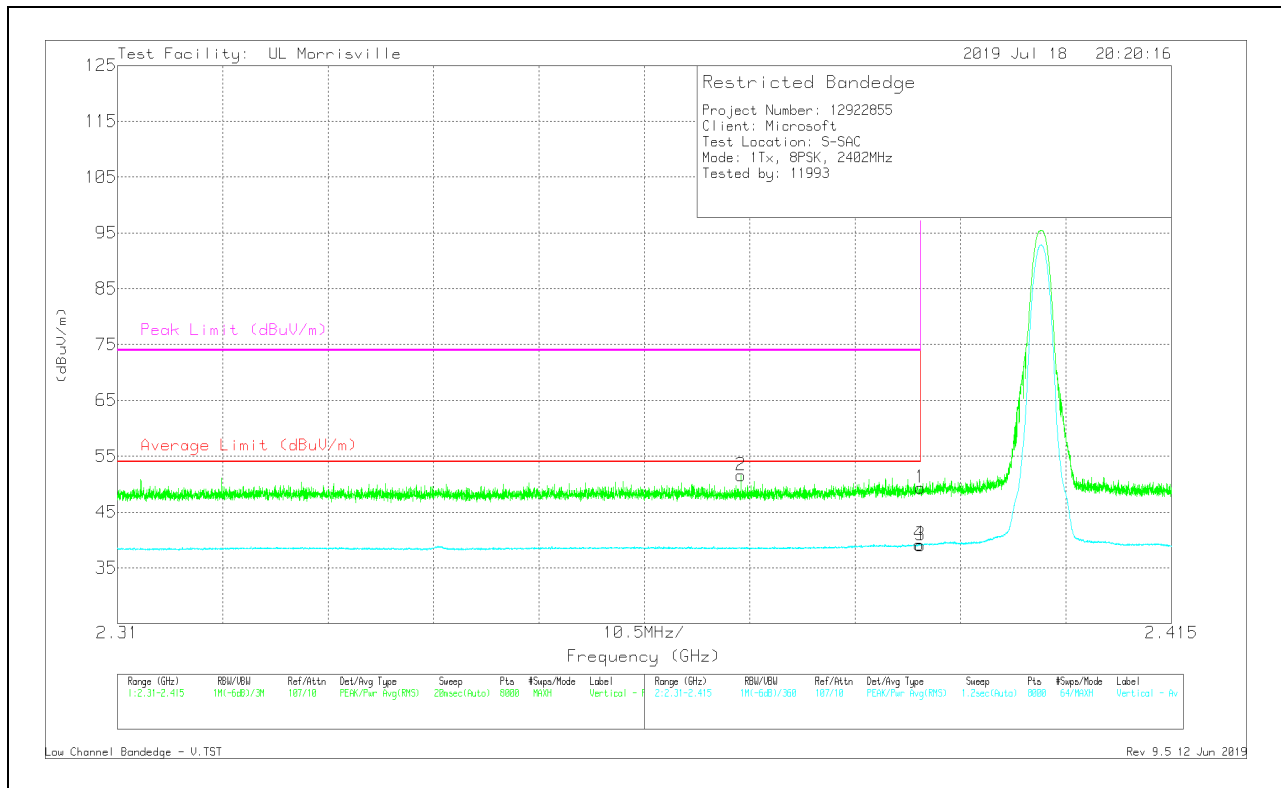
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

\*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TR: VB=1/Ton, Average where: Ton is packet duration

## VERTICAL RESULT



| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AT0072 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * ** 2.39       | 41.54                | Pk   | 31.9          | -24.1                  | 49.34                      | -                      | -           | 74                  | -24.66         | 245            | 342         | V        |
| 2      | * ** 2.37213    | 43.94                | Pk   | 31.8          | -24.2                  | 51.54                      | -                      | -           | 74                  | -22.46         | 245            | 342         | V        |
| 3      | * ** 2.39       | 31.28                | V1TR | 31.9          | -24.1                  | 39.08                      | 54                     | -14.92      | -                   | -              | 245            | 342         | V        |
| 4      | * ** 2.38985    | 31.41                | V1TR | 31.9          | -24.1                  | 39.21                      | 54                     | -14.79      | -                   | -              | 245            | 342         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

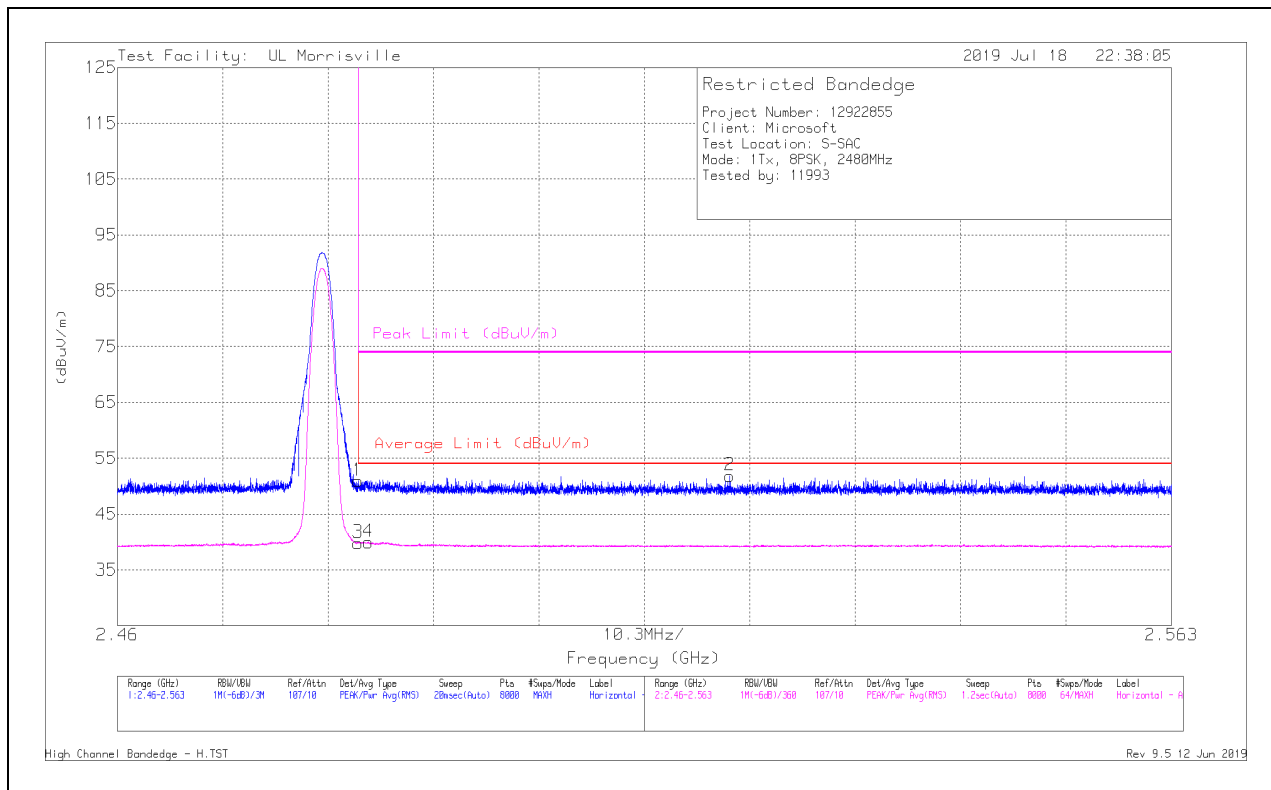
\*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TR: VB=1/Ton, Average where: Ton is packet duration

## BANDEDGE (HIGH CHANNEL)

### HORIZONTAL RESULT



| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AT0072 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * ** 2.4835     | 42.62                | Pk   | 32.3          | -24                    | 50.92                      | -                      | -           | 74                  | -23.08         | 77             | 108         | H        |
| 2      | ** 2.51983      | 43.48                | Pk   | 32.4          | -24                    | 51.88                      | -                      | -           | 74                  | -22.12         | 77             | 108         | H        |
| 3      | * ** 2.4835     | 31.53                | V1TR | 32.3          | -24                    | 39.83                      | 54                     | -14.17      | -                   | -              | 77             | 108         | H        |
| 4      | * ** 2.48449    | 31.67                | V1TR | 32.3          | -24                    | 39.97                      | 54                     | -14.03      | -                   | -              | 77             | 108         | H        |

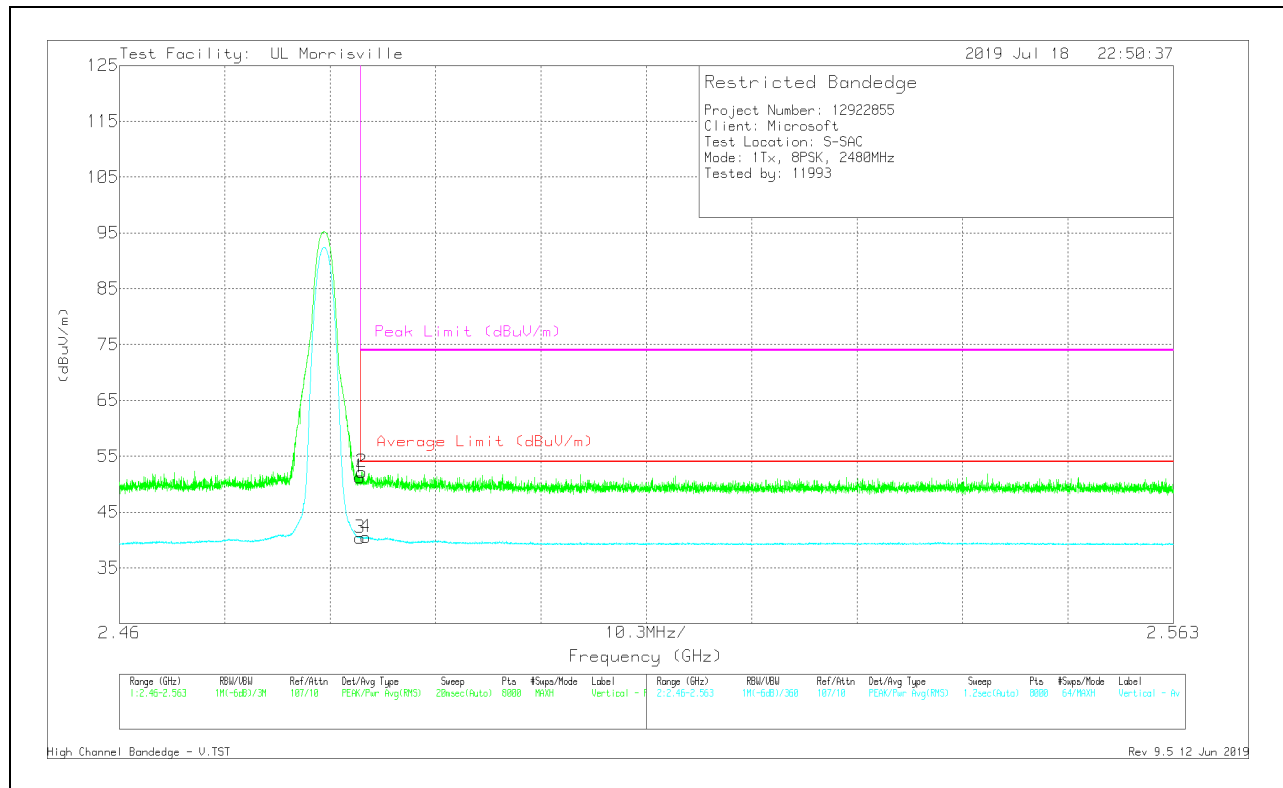
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

\*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TR: VB=1/Ton, Average where: Ton is packet duration

## VERTICAL RESULT



| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AT0072 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * ** 2.4835     | 42.96                | Pk   | 32.3          | -24                    | 51.26                      | -                      | -           | 74                  | -22.74         | 355            | 127         | V        |
| 2      | * ** 2.48368    | 43.9                 | Pk   | 32.3          | -24                    | 52.2                       | -                      | -           | 74                  | -21.8          | 355            | 127         | V        |
| 3      | * ** 2.4835     | 32.11                | V1TR | 32.3          | -24                    | 40.41                      | 54                     | -13.59      | -                   | -              | 355            | 127         | V        |
| 4      | * ** 2.48411    | 32.23                | V1TR | 32.3          | -24                    | 40.53                      | 54                     | -13.47      | -                   | -              | 355            | 127         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

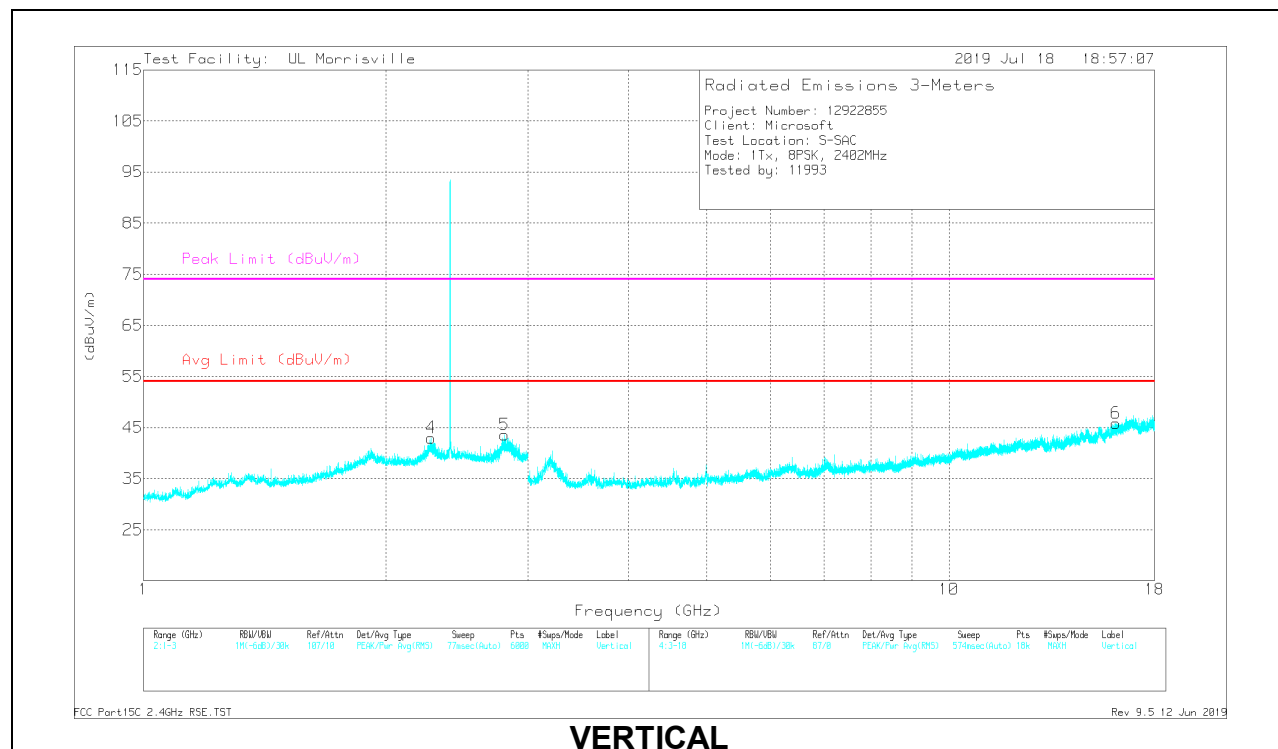
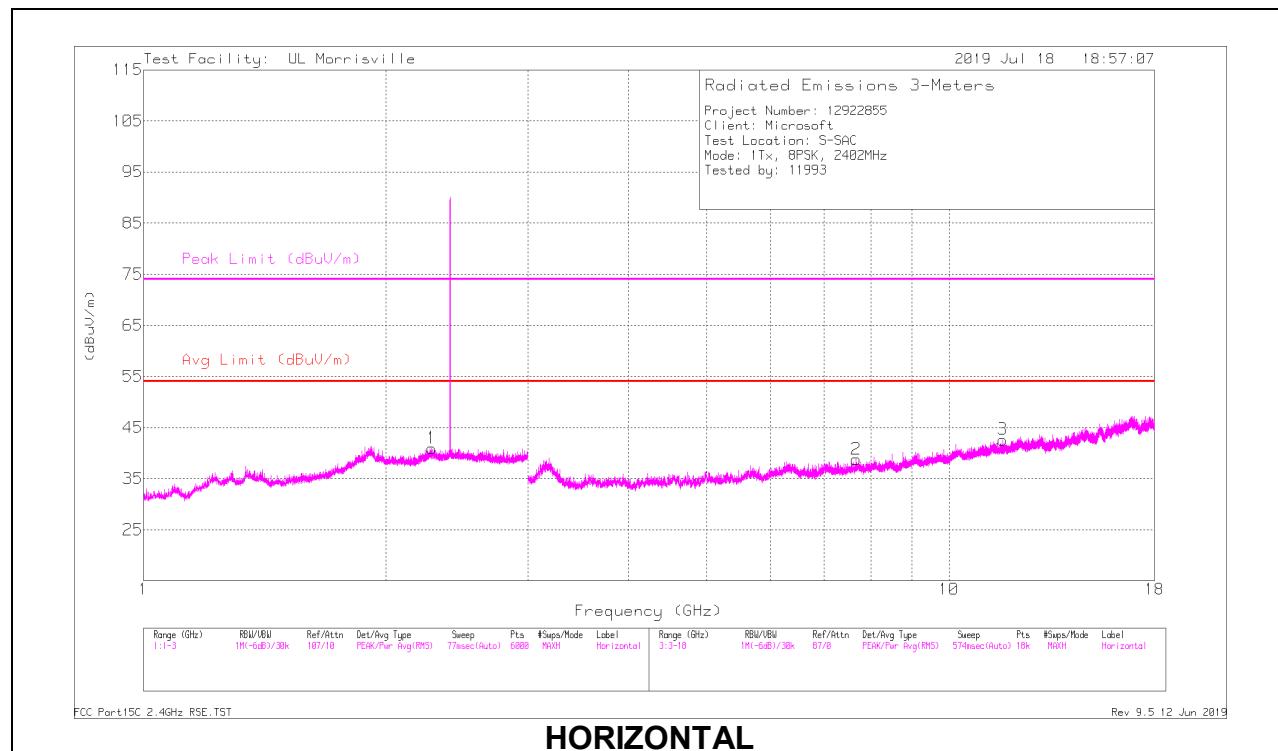
\*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

Pk - Peak detector

V1TR: VB=1/Ton, Average where: Ton is packet duration

## HARMONICS AND SPURIOUS EMISSIONS

### LOW CHANNEL RESULTS



## RADIATED EMISSIONS

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AT0072 (dB/m) | Amp/Cbl/Fitr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|-----------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * ** 2.27687    | 40.09                | PK-U | 31.8          | -23.5                 | 48.39                      | -                  | -           | 74                  | -25.61         | 351            | 146         | H        |
|        | * ** 2.27758    | 27.77                | V1TR | 31.8          | -23.5                 | 36.07                      | 54                 | -17.93      | -                   | -              | 351            | 146         | H        |
| 4      | * ** 2.27487    | 41.02                | PK-U | 31.8          | -23.5                 | 49.32                      | -                  | -           | 74                  | -24.68         | 91             | 261         | V        |
|        | * ** 2.2737     | 29.29                | V1TR | 31.8          | -23.5                 | 37.59                      | 54                 | -16.41      | -                   | -              | 91             | 261         | V        |
| 5      | * ** 2.80717    | 45.34                | PK-U | 32.1          | -25.9                 | 51.54                      | -                  | -           | 74                  | -22.46         | 101            | 212         | V        |
|        | * ** 2.80668    | 33.57                | V1TR | 32.2          | -25.9                 | 39.87                      | 54                 | -14.13      | -                   | -              | 101            | 212         | V        |
| 2      | * ** 7.6722     | 36.46                | PK-U | 35.9          | -27.4                 | 44.96                      | -                  | -           | 74                  | -29.04         | 37             | 136         | H        |
|        | * ** 7.67248    | 24.52                | V1TR | 35.9          | -27.4                 | 33.02                      | 54                 | -20.98      | -                   | -              | 37             | 136         | H        |
| 3      | * ** 11.67174   | 34.66                | PK-U | 38.4          | -24.1                 | 48.96                      | -                  | -           | 74                  | -25.04         | 245            | 216         | H        |
|        | * ** 11.67153   | 22.23                | V1TR | 38.4          | -24.1                 | 36.53                      | 54                 | -17.47      | -                   | -              | 245            | 216         | H        |
| 6      | * ** 16.12894   | 34.25                | PK-U | 40.9          | -23.7                 | 51.45                      | -                  | -           | 74                  | -22.55         | 183            | 162         | V        |
|        | * ** 16.13089   | 23.32                | V1TR | 40.9          | -23.7                 | 40.52                      | 54                 | -13.48      | -                   | -              | 183            | 162         | V        |

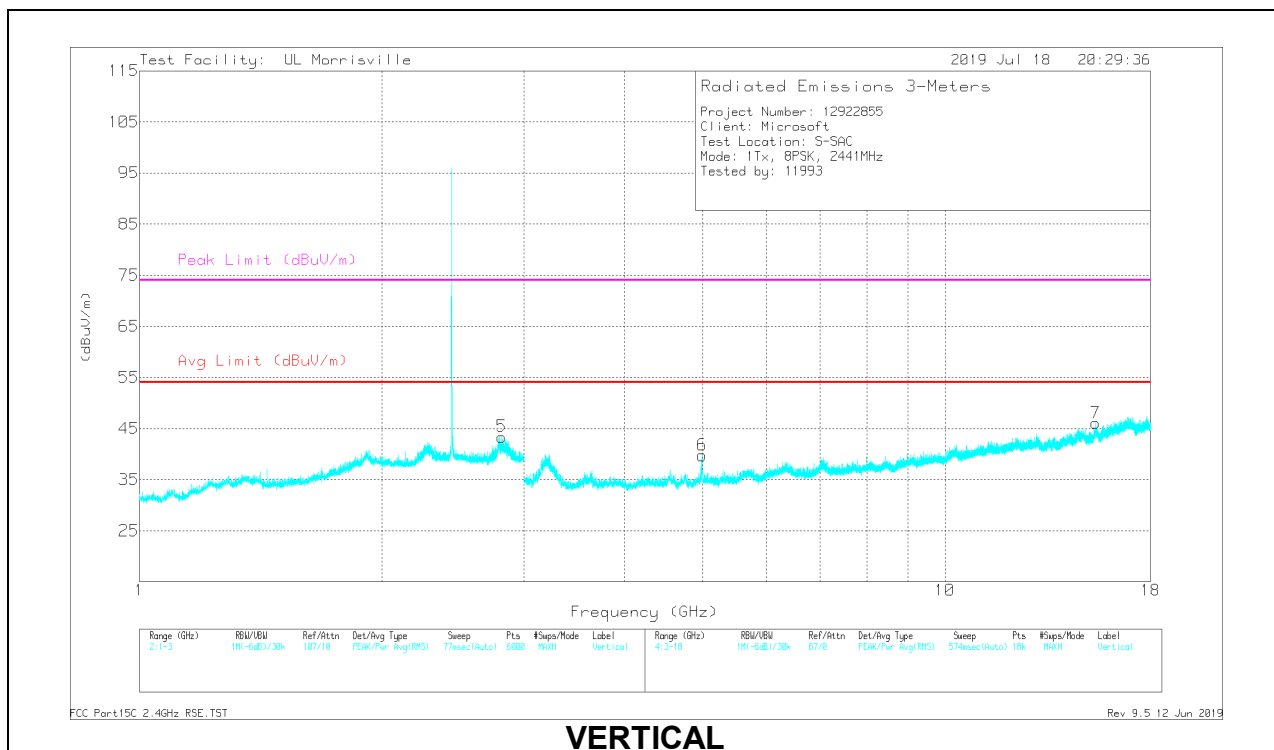
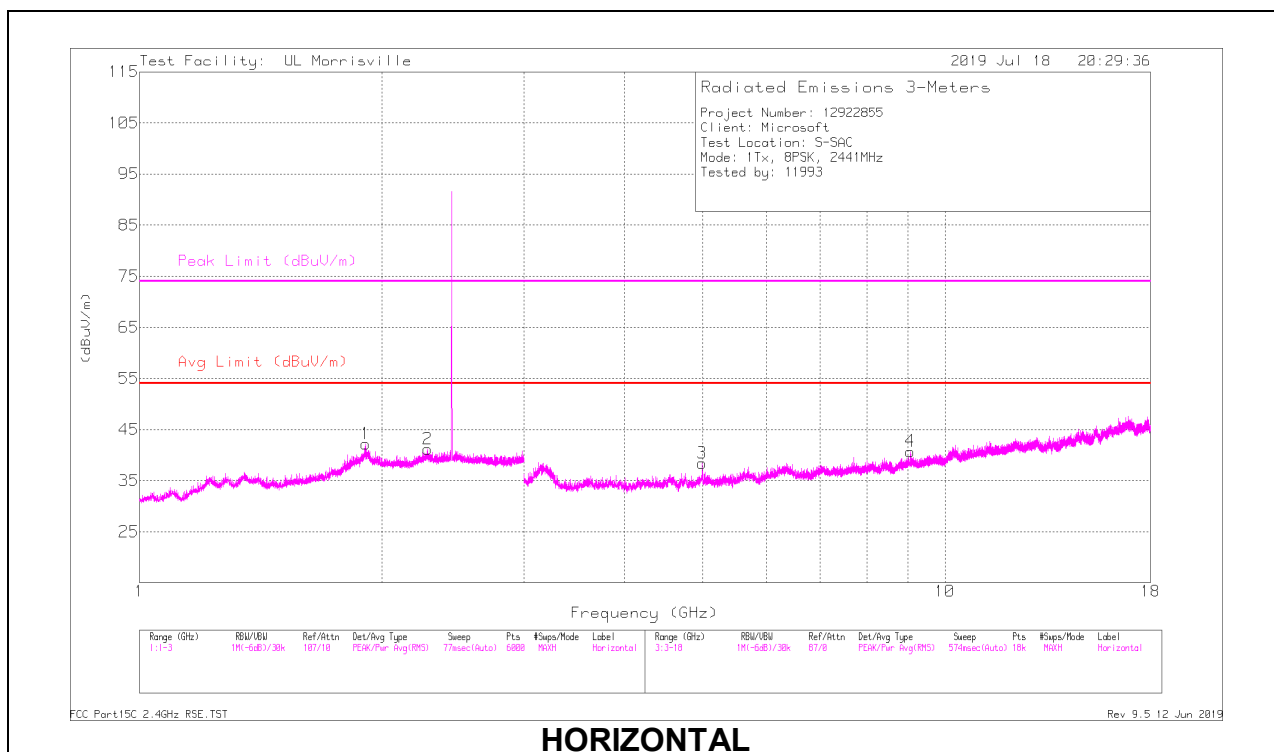
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

\*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

PK-U: Maximum Peak

V1TR: VB=1/Ton, Average where: Ton is packet duration

## MID CHANNEL RESULTS



## RADIATED EMISSIONS

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AT0072 (dB/m) | Amp/Cbl/Fitr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|-----------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | ** 1.90933      | 39.63                | PK-U | 31.1          | -22.4                 | 48.33                      | -                  | -           | 74                  | -25.67         | 360            | 206         | H        |
|        | ** 1.90966      | 27.9                 | V1TR | 31.1          | -22.4                 | 36.6                       | 54                 | -17.4       | -                   | -              | 360            | 206         | H        |
| 2      | *** 2.2776      | 39.77                | PK-U | 31.8          | -23.5                 | 48.07                      | -                  | -           | 74                  | -25.93         | 145            | 109         | H        |
|        | *** 2.27764     | 27.8                 | V1TR | 31.8          | -23.5                 | 36.1                       | 54                 | -17.9       | -                   | -              | 145            | 109         | H        |
| 5      | *** 2.81285     | 45.38                | PK-U | 32.1          | -25.9                 | 51.58                      | -                  | -           | 74                  | -22.42         | 100            | 239         | V        |
|        | *** 2.81263     | 33.63                | V1TR | 32.1          | -25.9                 | 39.83                      | 54                 | -14.17      | -                   | -              | 100            | 239         | V        |
| 3      | *** 4.99844     | 42.54                | PK-U | 34.2          | -31.1                 | 45.64                      | -                  | -           | 74                  | -28.36         | 288            | 142         | H        |
|        | *** 4.99895     | 29.34                | V1TR | 34.2          | -31.1                 | 32.44                      | 54                 | -21.56      | -                   | -              | 288            | 142         | H        |
| 4      | *** 9.06168     | 35.88                | PK-U | 36.6          | -26.3                 | 46.18                      | -                  | -           | 74                  | -27.82         | 311            | 148         | H        |
|        | *** 9.06209     | 24.08                | V1TR | 36.6          | -26.3                 | 34.38                      | 54                 | -19.62      | -                   | -              | 311            | 148         | H        |
| 6      | *** 4.99917     | 43.5                 | PK-U | 34.2          | -31.1                 | 46.6                       | -                  | -           | 74                  | -27.4          | 295            | 101         | V        |
|        | *** 4.99909     | 29.72                | V1TR | 34.2          | -31.1                 | 32.82                      | 54                 | -21.18      | -                   | -              | 295            | 101         | V        |
| 7      | *** 15.38249    | 33.74                | PK-U | 39.9          | -21.6                 | 52.04                      | -                  | -           | 74                  | -21.96         | 303            | 231         | V        |
|        | *** 15.38299    | 22.14                | V1TR | 39.9          | -21.5                 | 40.54                      | 54                 | -13.46      | -                   | -              | 303            | 231         | V        |

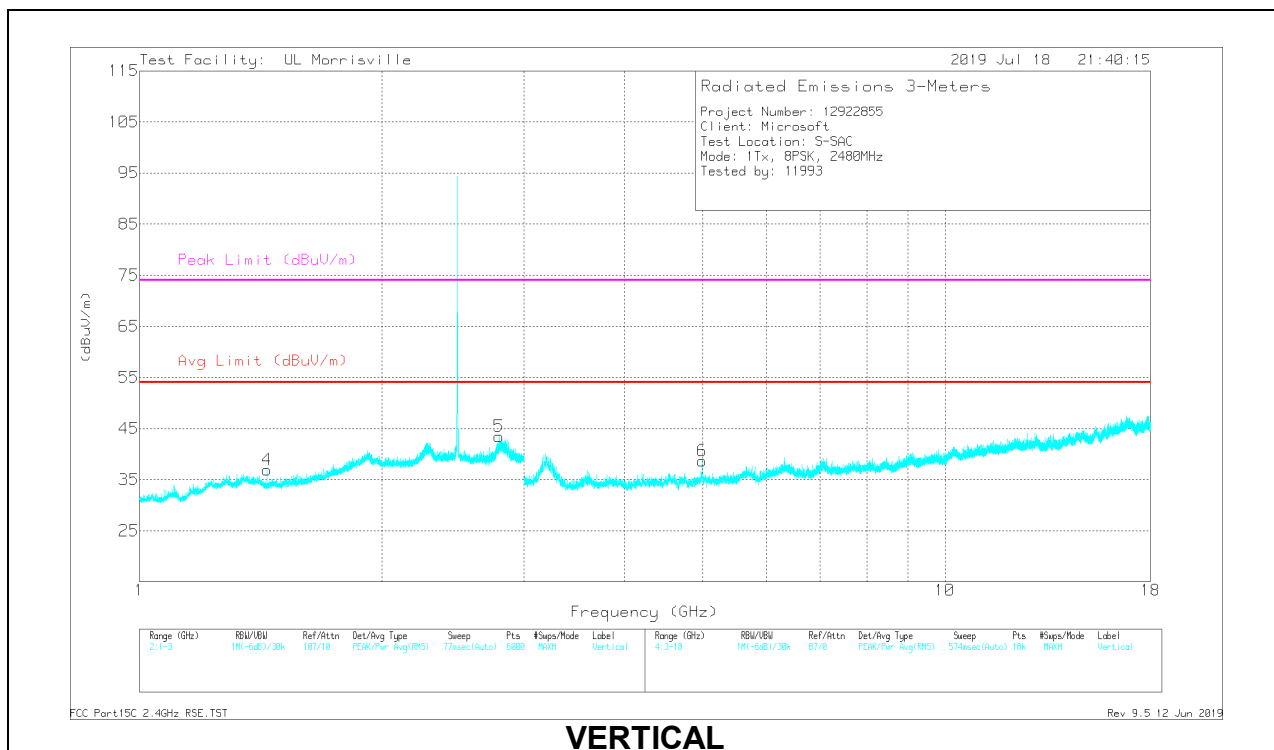
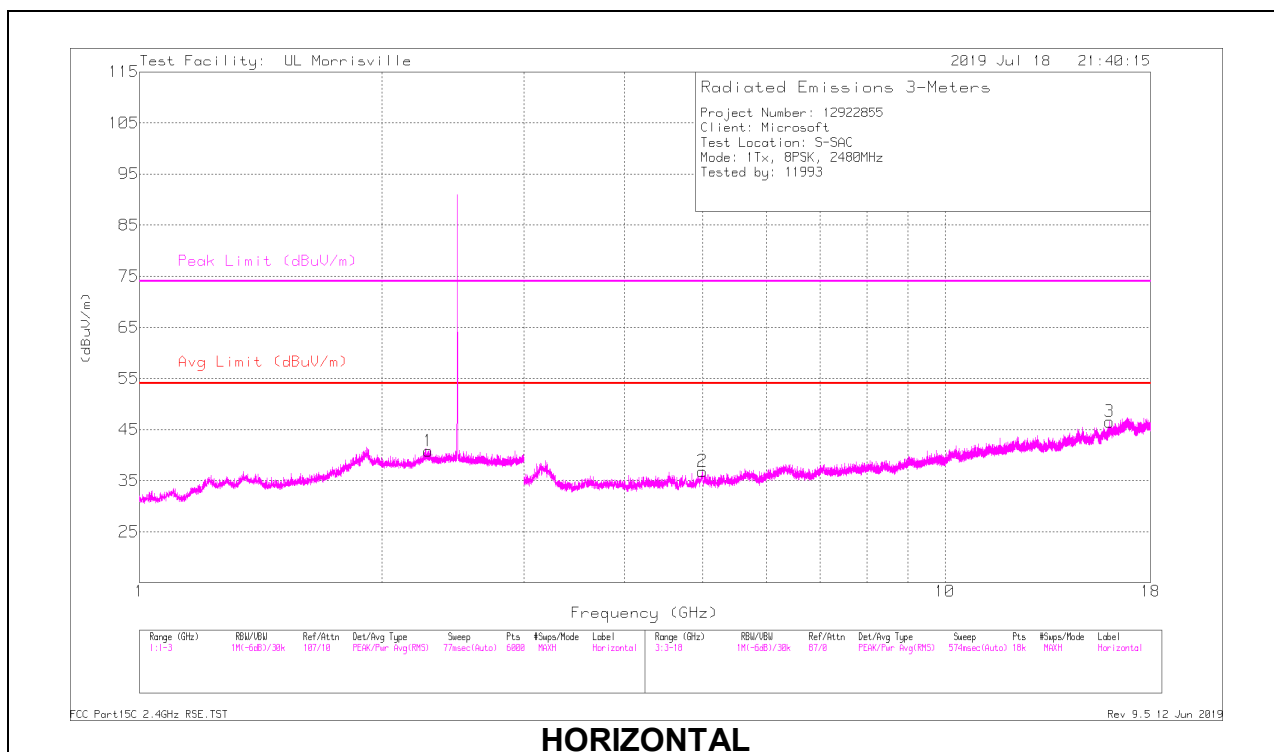
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

\*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

PK-U: Maximum Peak

V1TR: VB=1/Ton, Average where: Ton is packet duration

## HIGH CHANNEL RESULTS



## RADIATED EMISSIONS

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | AT0072 (dB/m) | Amp/Cbl/Fitr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|---------------|-----------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * ** 2.28075    | 38.48                | PK-U | 31.8          | -23.5                 | 46.78                      | -                  | -           | 74                  | -27.22         | 231            | 261         | H        |
|        | * ** 2.28054    | 27.13                | V1TR | 31.8          | -23.5                 | 35.43                      | 54                 | -18.57      | -                   | -              | 231            | 261         | H        |
| 4      | * ** 1.4401     | 37.52                | PK-U | 28.1          | -22.7                 | 42.92                      | -                  | -           | 74                  | -31.08         | 315            | 188         | V        |
|        | * ** 1.44004    | 29.1                 | V1TR | 28.1          | -22.7                 | 34.5                       | 54                 | -19.5       | -                   | -              | 315            | 188         | V        |
| 5      | * ** 2.79443    | 44.74                | PK-U | 32.2          | -25.8                 | 51.14                      | -                  | -           | 74                  | -22.86         | 97             | 234         | V        |
|        | * ** 2.79414    | 33.44                | V1TR | 32.2          | -25.8                 | 39.84                      | 54                 | -14.16      | -                   | -              | 97             | 234         | V        |
| 2      | * ** 4.99895    | 42.66                | PK-U | 34.2          | -31.1                 | 45.76                      | -                  | -           | 74                  | -28.24         | 331            | 118         | H        |
|        | * ** 4.99882    | 29.1                 | V1TR | 34.2          | -31.1                 | 32.2                       | 54                 | -21.8       | -                   | -              | 331            | 118         | H        |
| 3      | * ** 16.0189    | 35.08                | PK-U | 40.7          | -23.5                 | 52.28                      | -                  | -           | 74                  | -21.72         | 6              | 123         | H        |
|        | * ** 16.01933   | 23.69                | V1TR | 40.7          | -23.5                 | 40.89                      | 54                 | -13.11      | -                   | -              | 6              | 123         | H        |
| 6      | * ** 4.99268    | 42.88                | PK-U | 34.1          | -31.1                 | 45.88                      | -                  | -           | 74                  | -28.12         | 300            | 115         | V        |
|        | * ** 4.99243    | 29.37                | V1TR | 34.1          | -31.1                 | 32.37                      | 54                 | -21.63      | -                   | -              | 300            | 115         | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

\*\* - indicates frequency in Taiwan NCC LP0002 Restricted Band

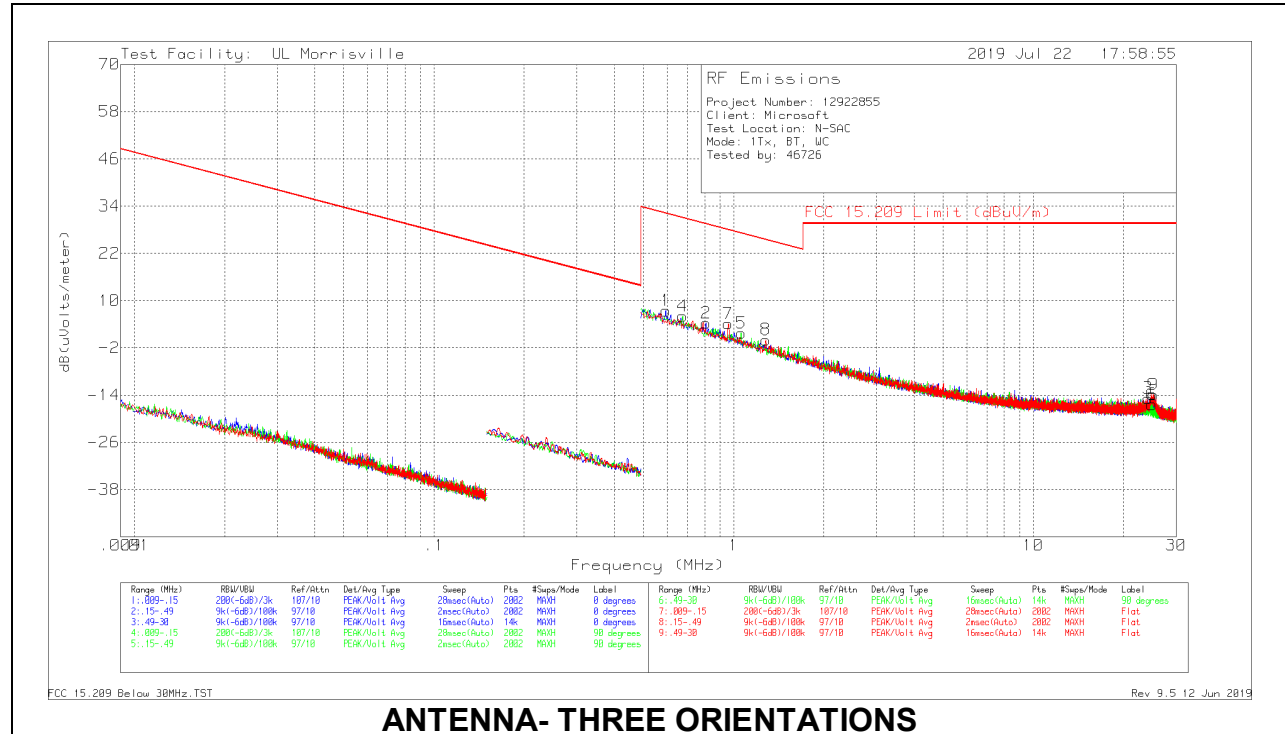
PK-U: Maximum Peak

V1TR: VB=1/Ton, Average where: Ton is packet duration

### 9.3. WORST CASE BELOW 30MHZ

#### SPURIOUS EMISSIONS BELOW 30 MHz (WORST-CASE CONFIGURATION)

Note: All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were  $40 \cdot \log(\text{test distance} / \text{specification distance})$ .



#### ANTENNA- THREE ORIENTATIONS

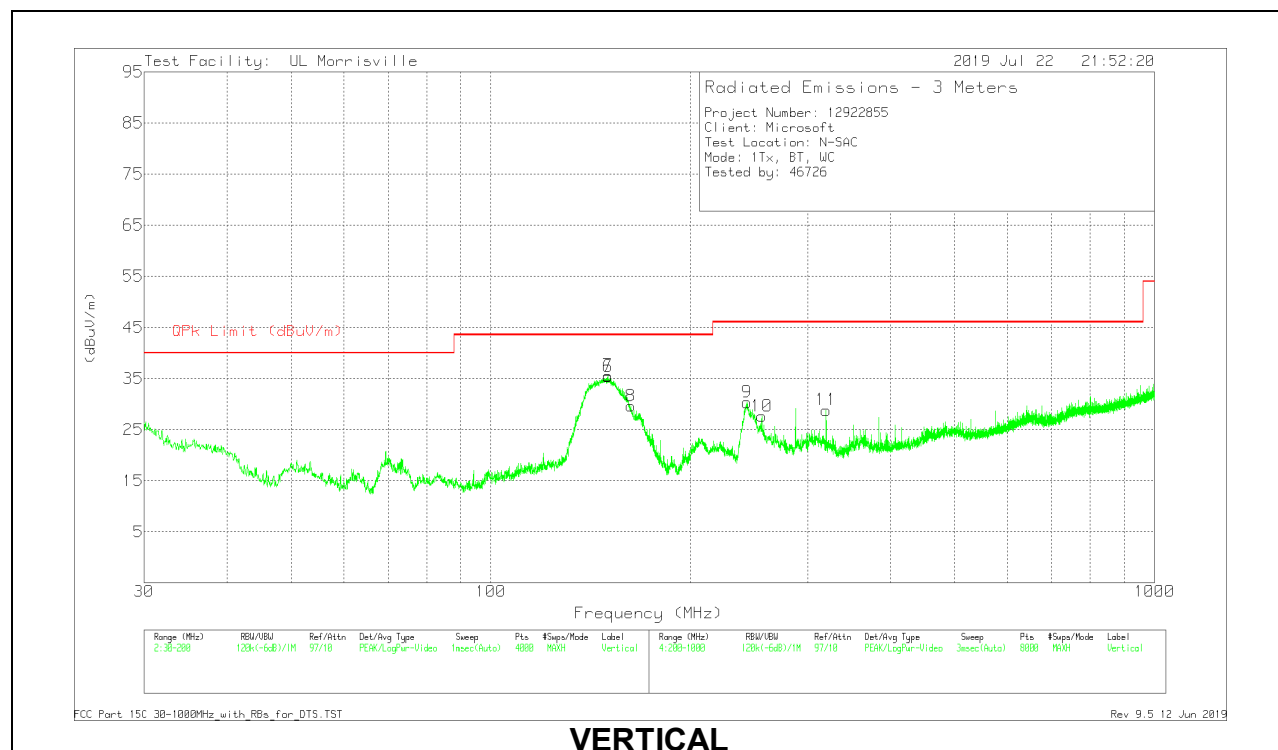
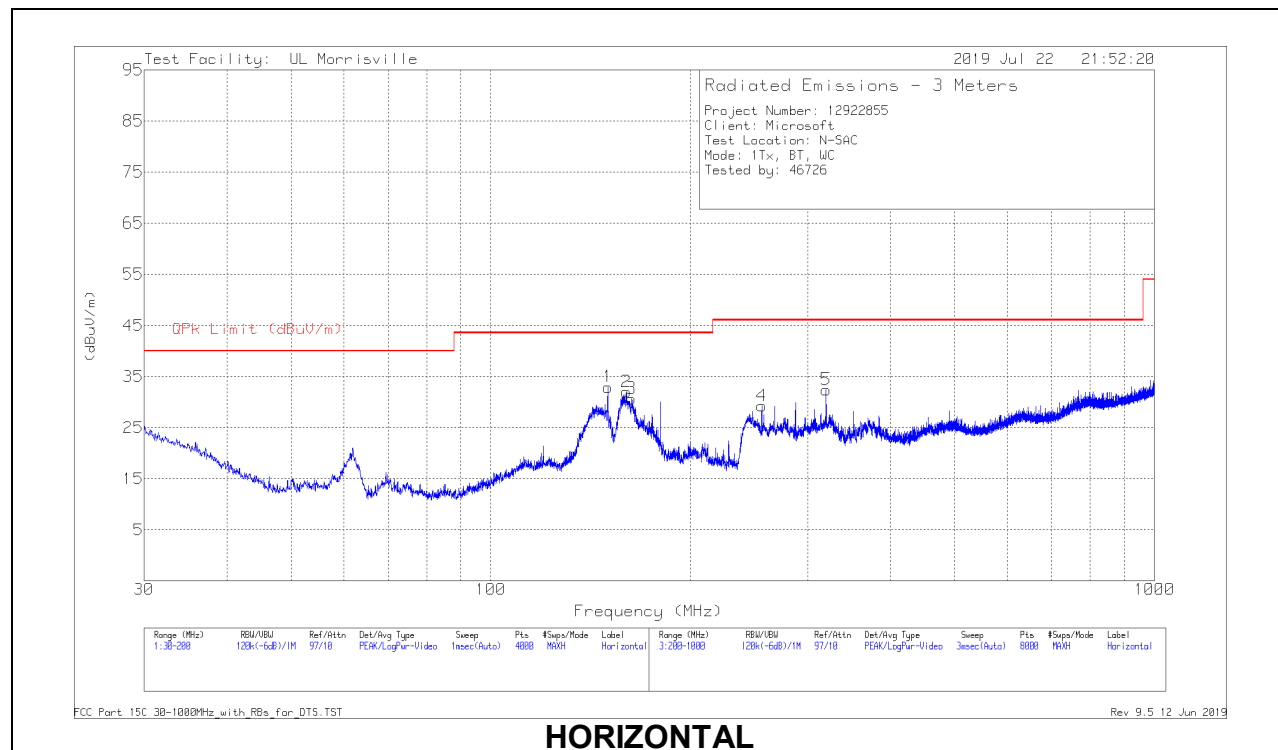
#### Below 30MHz Data

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | AT0059 (dB/m) | Cbl (dB) | Dist. Corr. Factor (dB) | Corrected Reading dB(uVolts/meter) | FCC 15.209 QP/Avg Limit (dBuV/m) | FCC 15.209 Pk Limit (dBuV/m) | Worst-Case Margin (dB) | Azimuth (Degs) |
|--------|-----------------|----------------------|-----|---------------|----------|-------------------------|------------------------------------|----------------------------------|------------------------------|------------------------|----------------|
| 1      | .59329          | 36.92                | Pk  | 10.4          | .1       | -40                     | 7.42                               | 32.14                            | -                            | -24.72                 | 0-360          |
| 4      | .6755           | 35.51                | Pk  | 10.4          | .1       | -40                     | 6.01                               | 31.01                            | -                            | -25                    | 0-360          |
| 2      | .80831          | 33.84                | Pk  | 10.3          | .1       | -40                     | 4.24                               | 29.45                            | -                            | -25.21                 | 0-360          |
| 7      | .96008          | 33.38                | Pk  | 10.5          | .2       | -40                     | 4.08                               | 27.96                            | -                            | -23.88                 | 0-360          |
| 5      | 1.05916         | 30.92                | Pk  | 10.6          | .2       | -40                     | 1.72                               | 27.11                            | -                            | -25.39                 | 0-360          |
| 8      | 1.2805          | 29.25                | Pk  | 10.6          | .2       | -40                     | .05                                | 25.46                            | -                            | -25.41                 | 0-360          |
| 3      | 24.12068        | 14.78                | Pk  | 9.6           | .8       | -40                     | -14.82                             | 29.54                            | -                            | -44.36                 | 0-360          |
| 6      | 24.90064        | 13.52                | Pk  | 9.3           | .8       | -40                     | -16.38                             | 29.54                            | -                            | -45.92                 | 0-360          |
| 9      | 25.13463        | 15.89                | Pk  | 9.3           | .9       | -40                     | -13.91                             | 29.54                            | -                            | -43.45                 | 0-360          |

Pk - Peak detector

## 9.4. WORST CASE BELOW 1 GHz

### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)



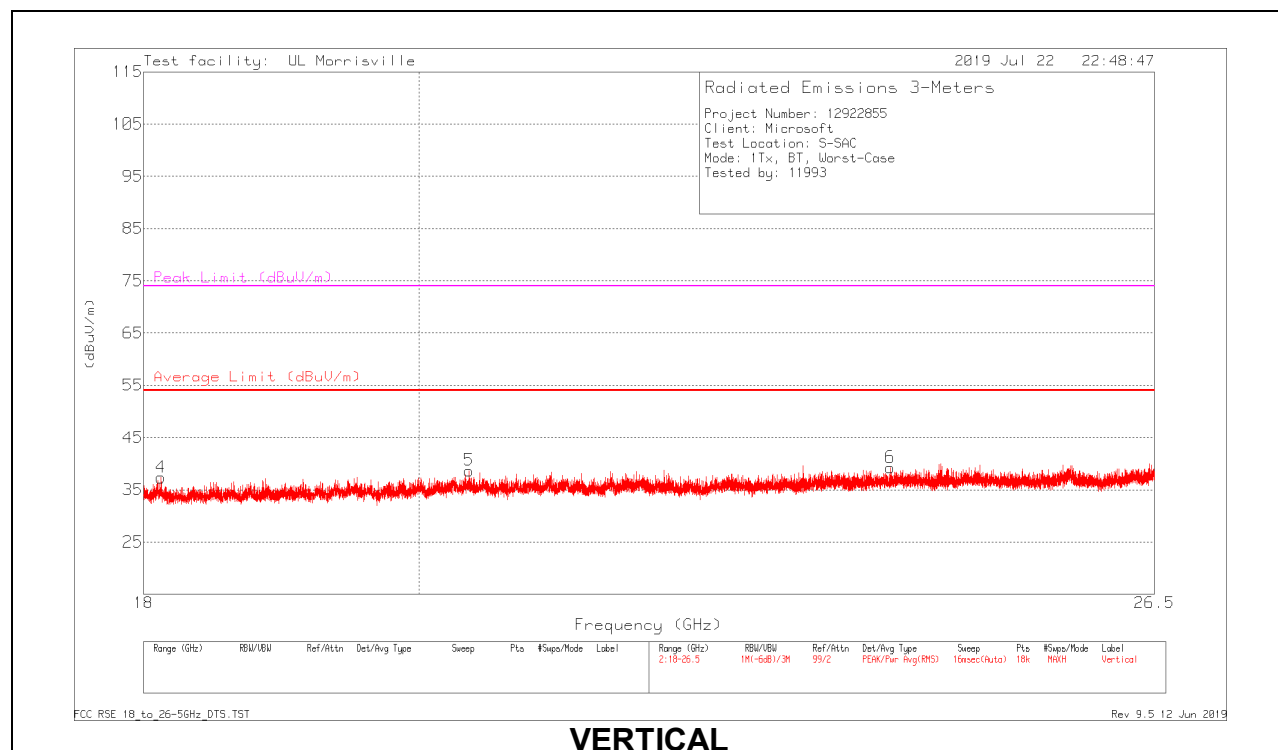
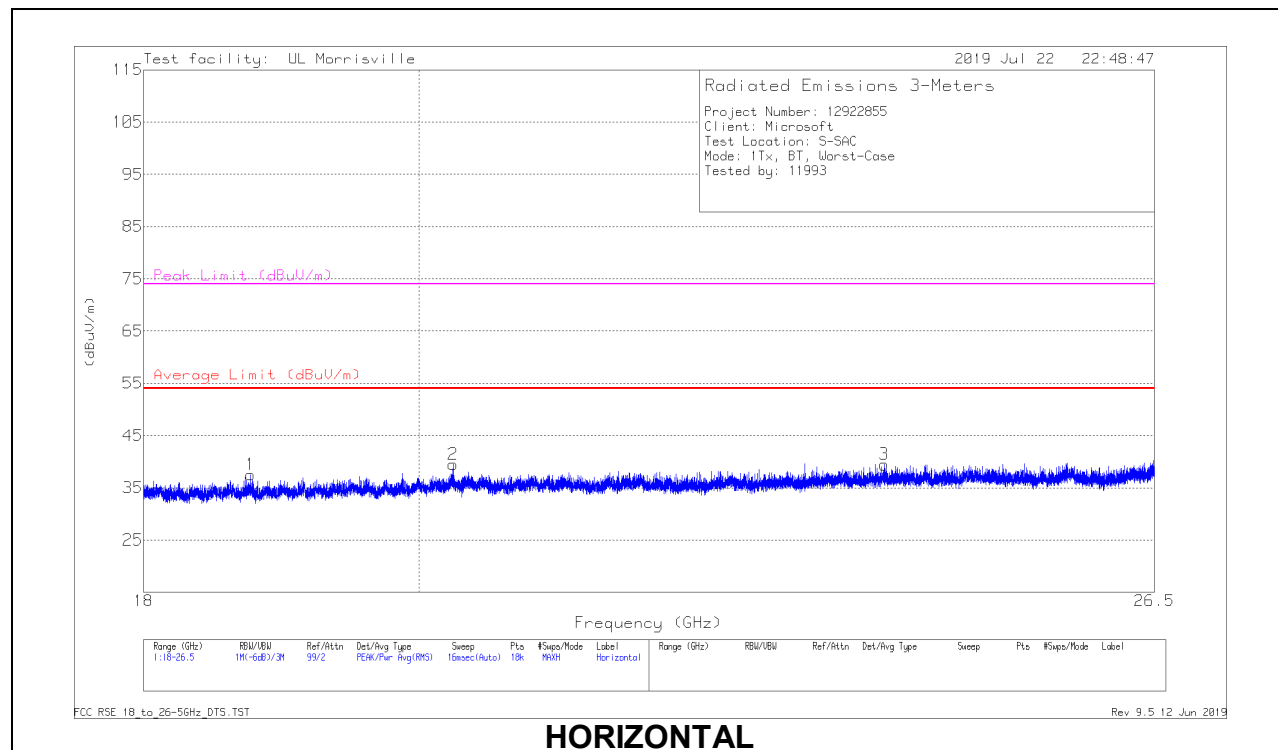
## Below 1GHz Data

| Marker | Frequency (MHz) | Meter Reading (dBUV) | Det | AT0073 ACF (dB/m) | Amp/Cbl (dB) | Corrected Reading (dBUV/m) | QPk Limit (dBUV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|-------------------|--------------|----------------------------|--------------------|-------------|----------------|-------------|----------|
| 1      | * ** 150.0086   | 44.45                | Pk  | 19                | -30.5        | 32.95                      | 43.52              | -10.57      | 0-360          | 199         | H        |
| 3      | * ** 162.9319   | 42.38                | Pk  | 18.7              | -30.4        | 30.68                      | 43.52              | -12.84      | 0-360          | 199         | H        |
| 6      | * ** 150.0086   | 46.91                | Pk  | 19                | -30.5        | 35.41                      | 43.52              | -8.11       | 0-360          | 102         | V        |
| 8      | * ** 162.5068   | 41.36                | Pk  | 18.7              | -30.4        | 29.66                      | 43.52              | -13.86      | 0-360          | 102         | V        |
| 4      | * ** 256.0073   | 40.57                | Pk  | 18.4              | -29.7        | 29.27                      | 46.02              | -16.75      | 0-360          | 102         | H        |
| 9      | * ** 243.0056   | 41.95                | Pk  | 18.2              | -29.8        | 30.35                      | 46.02              | -15.67      | 0-360          | 102         | V        |
| 10     | * ** 256.0073   | 38.95                | Pk  | 18.4              | -29.7        | 27.65                      | 46.02              | -18.37      | 0-360          | 102         | V        |
| 7      | 150.0511        | 47.04                | Pk  | 19                | -30.5        | 35.54                      | 43.52              | -7.98       | 0-360          | 102         | V        |
| 2      | 159.9986        | 43.69                | Pk  | 18.7              | -30.4        | 31.99                      | 43.52              | -11.53      | 0-360          | 199         | H        |
| 5      | 320.0156        | 41.22                | Pk  | 20.6              | -29.4        | 32.42                      | 46.02              | -13.6       | 0-360          | 102         | H        |
| 11     | 320.0156        | 37.63                | Pk  | 20.6              | -29.4        | 28.83                      | 46.02              | -17.19      | 0-360          | 199         | V        |

Pk - Peak detector

## 9.5. WORST CASE 18-26 GHZ

### SPURIOUS EMISSIONS 18-26 GHz (WORST-CASE CONFIGURATION)



## 18 – 26GHz DATA

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AT0076 AF (dB/m) | Cbl/Amp (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|------------------|--------------|----------------------------|------------------------|-------------|---------------------|-------------|----------------|-------------|----------|
| 1      | *** 18.75229    | 43.91                | Pk  | 32.5             | -38.9        | 37.51                      | 54                     | -16.49      | 74                  | -36.49      | 0-360          | 199         | H        |
| 2      | *** 20.26301    | 44.85                | Pk  | 33               | -38.4        | 39.45                      | 54                     | -14.55      | 74                  | -34.55      | 0-360          | 299         | H        |
| 3      | *** 23.89602    | 42.74                | Pk  | 34               | -37.3        | 39.44                      | 54                     | -14.56      | 74                  | -34.56      | 0-360          | 299         | H        |
| 4      | *** 18.12137    | 44.25                | Pk  | 32.4             | -39.3        | 37.35                      | 54                     | -16.65      | 74                  | -36.65      | 0-360          | 299         | V        |
| 5      | *** 20.38816    | 43.88                | Pk  | 33               | -38.2        | 38.68                      | 54                     | -15.32      | 74                  | -35.32      | 0-360          | 201         | V        |
| 6      | *** 23.95269    | 42.49                | Pk  | 34               | -37.2        | 39.29                      | 54                     | -14.71      | 74                  | -34.71      | 0-360          | 299         | V        |

Pk - Peak detector

## 10. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

| Frequency of Emission (MHz) | Conducted Limit (dBuV) |            |
|-----------------------------|------------------------|------------|
|                             | Quasi-peak             | Average    |
| 0.15-0.5                    | 66 to 56 *             | 56 to 46 * |
| 0.5-5                       | 56                     | 46         |
| 5-30                        | 60                     | 50         |

\* Decreases with the logarithm of the frequency.

### TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

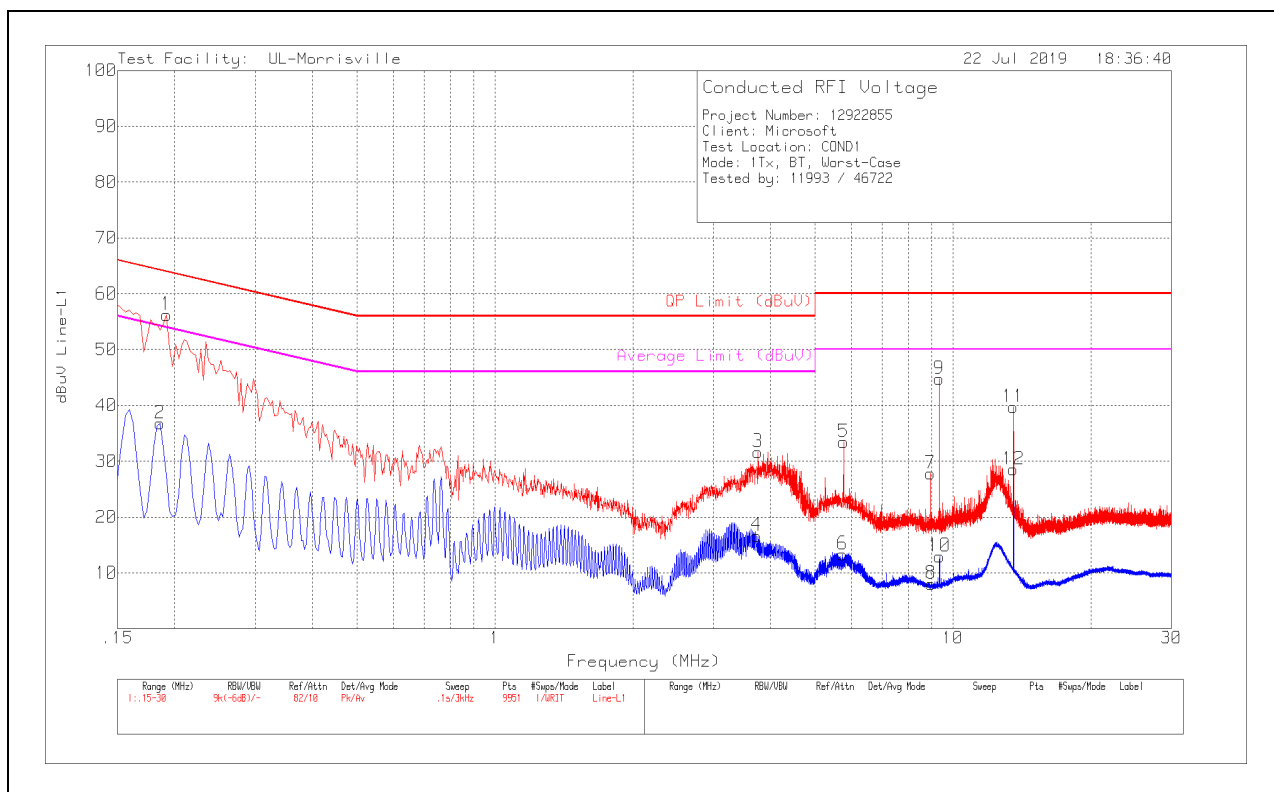
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

### RESULTS

## 10.1.1. AC Power Line Host

### LINE 1 RESULTS

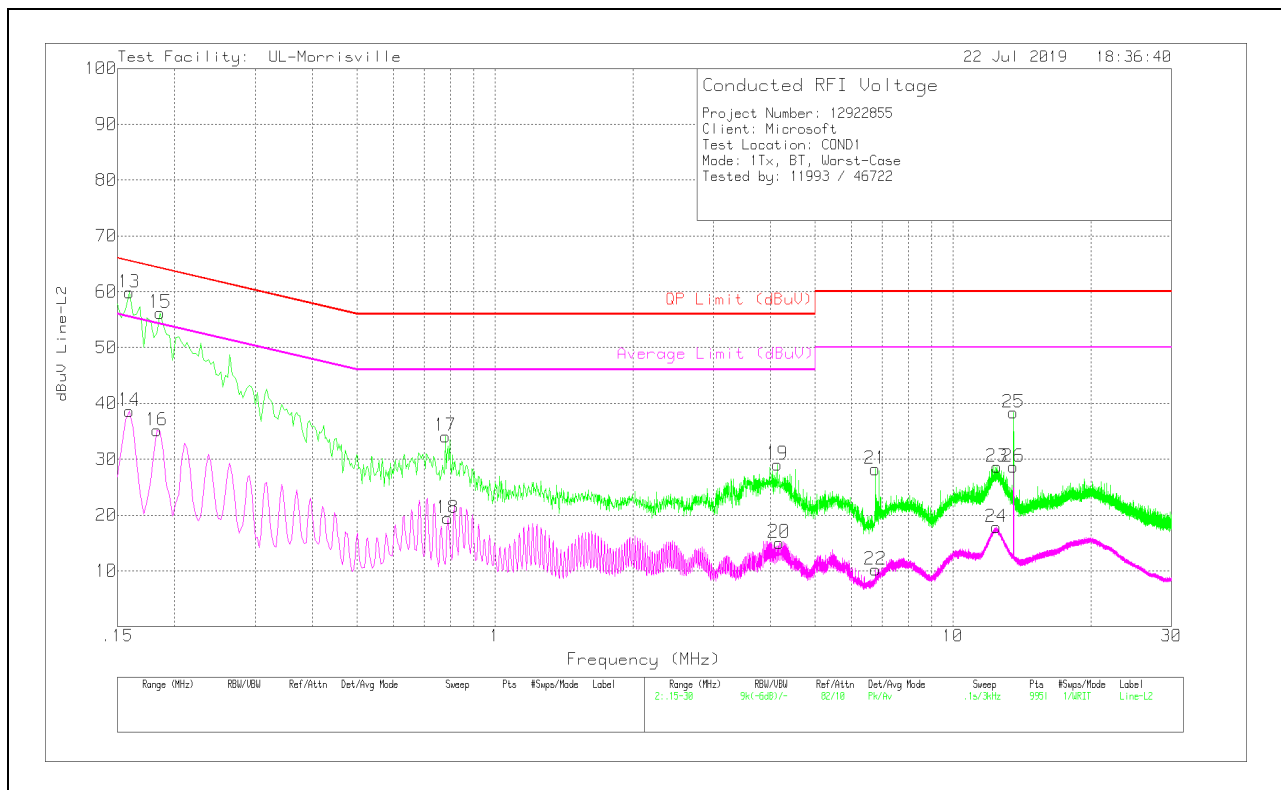


| Range 1: Line-L1 .15 - 30MHz |                 |                      |     |               |                  |                        |                 |             |                      |             |
|------------------------------|-----------------|----------------------|-----|---------------|------------------|------------------------|-----------------|-------------|----------------------|-------------|
| Marker                       | Frequency (MHz) | Meter Reading (dBuV) | Det | LISN VCF (dB) | Cbl/Limiter (dB) | Corrected Reading dBuV | QP Limit (dBuV) | Margin (dB) | Average Limit (dBuV) | Margin (dB) |
| 1                            | .192            | 46.14                | Pk  | .1            | 10               | 56.24                  | 63.95           | -7.71       | -                    | -           |
| 2                            | .186            | 26.57                | Av  | .2            | 10               | 36.77                  | -               | -           | 54.21                | -17.44      |
| 3                            | 3.756           | 21.55                | Pk  | 0             | 10.1             | 31.65                  | 56              | -24.35      | -                    | -           |
| 4                            | 3.729           | 6.57                 | Av  | 0             | 10.1             | 16.67                  | -               | -           | 46                   | -29.33      |
| 5                            | 5.772           | 23.26                | Pk  | 0             | 10.2             | 33.46                  | 60              | -26.54      | -                    | -           |
| 6                            | 5.748           | 3.13                 | Av  | 0             | 10.2             | 13.33                  | -               | -           | 50                   | -36.67      |
| 7                            | 8.937           | 17.41                | Pk  | .1            | 10.3             | 27.81                  | 60              | -32.19      | -                    | -           |
| 8                            | 8.952           | -2.34                | Av  | .1            | 10.3             | 8.06                   | -               | -           | 50                   | -41.94      |
| 9                            | 9.342           | 34.35                | Pk  | .1            | 10.3             | 44.75                  | 60              | -15.25      | -                    | -           |
| 10                           | 9.351           | 2.58                 | Av  | .1            | 10.3             | 12.98                  | -               | -           | 50                   | -37.02      |
| 11                           | 13.56           | 29.23                | Pk  | .1            | 10.4             | 39.73                  | 60              | -20.27      | -                    | -           |
| 12                           | 13.56           | 18.01                | Av  | .1            | 10.4             | 28.51                  | -               | -           | 50                   | -21.49      |

Pk - Peak detector

Av - Average Detector

## LINE 2 RESULTS



| Range 2: Line-L2 .15 - 30MHz |                 |                      |     |               |                  |                        |                 |             |                      |             |
|------------------------------|-----------------|----------------------|-----|---------------|------------------|------------------------|-----------------|-------------|----------------------|-------------|
| Marker                       | Frequency (MHz) | Meter Reading (dBuV) | Det | LISN VCF (dB) | Cbl/Limiter (dB) | Corrected Reading dBuV | QP Limit (dBuV) | Margin (dB) | Average Limit (dBuV) | Margin (dB) |
| 13                           | .15311          | 39.93                | Qp  | .2            | 10               | 50.13                  | 65.83           | -15.7       | -                    | -           |
| 14                           | .15311          | 26.35                | Av  | .2            | 10               | 36.55                  | -               | -           | 55.83                | -19.28      |
| 15                           | .186            | 46.03                | Pk  | .2            | 10               | 56.23                  | 64.21           | -7.98       | -                    | -           |
| 16                           | .183            | 24.94                | Av  | .2            | 10               | 35.14                  | -               | -           | 54.35                | -19.21      |
| 17                           | .78             | 24.13                | Pk  | 0             | 10               | 34.13                  | 56              | -21.87      | -                    | -           |
| 18                           | .789            | 9.45                 | Av  | 0             | 10               | 19.45                  | -               | -           | 46                   | -26.55      |
| 19                           | 4.14            | 18.88                | Pk  | 0             | 10.2             | 29.08                  | 56              | -26.92      | -                    | -           |
| 20                           | 4.173           | 4.86                 | Av  | 0             | 10.2             | 15.06                  | -               | -           | 46                   | -30.94      |
| 21                           | 6.774           | 17.94                | Pk  | .1            | 10.2             | 28.24                  | 60              | -31.76      | -                    | -           |
| 22                           | 6.777           | -11                  | Av  | .1            | 10.2             | 10.19                  | -               | -           | 50                   | -39.81      |
| 23                           | 12.474          | 18.14                | Pk  | .1            | 10.4             | 28.64                  | 60              | -31.36      | -                    | -           |
| 24                           | 12.444          | 7.37                 | Av  | .1            | 10.4             | 17.87                  | -               | -           | 50                   | -32.13      |
| 25                           | 13.56           | 27.85                | Pk  | .1            | 10.4             | 38.35                  | 60              | -21.65      | -                    | -           |
| 26                           | 13.56           | 18.17                | Av  | .1            | 10.4             | 28.67                  | -               | -           | 50                   | -21.33      |

Pk - Peak detector  
Av - Average Detector

## 11. SETUP PHOTOS

Please refer to R12922855-EP1 for setup photos

**END OF TEST REPORT**