

# TEST REPORT

**Report Number.:** 14093504-E2V2

**Applicant :** SONOS INC.  
614 CHAPALA ST.  
SANTA BARBARA, CA, 93101, U.S.A.

**Model :** S39

**Brand :** SONOS

**FCC ID :** SBVRM039

**IC :** 5373A-RM039

**EUT Description :** 802.11 a/b/g/n/ac/ax 2x2 Client Device with BT and BLE

**Test Standard(s) :** FCC 47 CFR PART 15 SUBPART C  
ISED RSS-247 ISSUE 2  
ISED RSS-GEN ISSUE 5 + A1 + A2

**Date Of Issue:**

2022-10-03

**Prepared by:**

UL VERIFICATION SERVICES

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## REPORT REVISION HISTORY

| Rev. | Issue Date | Revisions           | Revised By |
|------|------------|---------------------|------------|
| V1   | 2022-09-20 | Initial Issue       | ---        |
| V2   | 2022-10-03 | Updated Section 6.3 | K.Kedida   |

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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Sonos Inc.  
614 Chapala St.  
Santa Barbara, CA, 93101, U.S.A.

**EUT DESCRIPTION:** 802.11 a/b/g/n/ac/ax 2x2 Client Device with BT and BLE

**MODEL:** S39

**BRAND:** SONOS

**SERIAL NUMBER:** Radiated Sample: A100 2207CP F0-F6-C1-A0-0D-80:1 and  
A100 2207CP F0-F6-C1-A0-0D-CC:9  
Conducted Sample: 7885B

**SAMPLE RECEIPT DATE:** 2022-07-25

**DATE TESTED:** 2022-07-25 to 08-23

| APPLICABLE STANDARDS           |              |
|--------------------------------|--------------|
| STANDARD                       | TEST RESULTS |
| CFR 47 Part 15 Subpart C       | Complies     |
| ISED RSS-247 Issue 2           | Complies     |
| ISED RSS-GEN Issue 5 + A1 + A2 | Complies     |

UL Verification Services Inc. 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 Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For  
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UL Verification Services Inc.

## 2. TEST RESULTS SUMMARY

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

Below is a list of the data provided by the customer:

1. Antenna gain and type (see section 6.3)

| 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                      | Reporting purposes only | ANSI C63.10 Section 6.9.3.           |
| 15.247 (a) (2) | RSS-247 5.2 (a)   | 6dB BW                       | Compliant               | None.                                |
| 15.247 (b) (3) | RSS-247 5.4 (d)   | Output Power                 | Compliant               | None.                                |
| See Comment    |                   | Average power                | Reporting purposes only | Per ANSI C63.10, Section 11.9.2.3.2. |
| 15.247 (e)     | RSS-247 5.2 (b)   | PSD                          | Compliant               | None.                                |
| 15.247 (d)     | RSS-247 5.5       | Conducted Spurious Emissions | Compliant               | None.                                |
| 15.209, 15.205 | RSS-GEN 8.9, 8.10 | Radiated Emissions           | Compliant               | None.                                |
| 15.207         | RSS-Gen 8.8       | AC Mains Conducted Emissions | Compliant               | None.                                |

### 3. 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, KDB 414788 D01 Radiated Test Site v01r01, RSS-GEN Issue 5 + A1 + A2, and RSS-247 Issue 2.

### 4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, Certificate Number #0751.05, 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 |
|-------------------------------------|---|------------|---------------------|------------------|
| <input checked="" type="checkbox"/> | Building 1:<br>47173 Benicia Street<br>Fremont, CA 94538, U.S.A | US0104     | 2324A               | 208313           |
| <input type="checkbox"/>            | Building 2:<br>47266 Benicia Street<br>Fremont, CA 94538, U.S.A | US0104     | 22541               | 208313           |
| <input checked="" type="checkbox"/> | Building 4:<br>47658 Kato Rd<br>Fremont, CA 94538, U.S.A        | US0104     | 2324B               | 208313           |



## 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 <sub>Lab</sub> |
|---|------------------|
| Worst Case Conducted Disturbance, 9KHz to 0.15 MHz  | 3.78 dB          |
| Worst Case Conducted Disturbance, 0.15 to 30 MHz    | 3.40 dB          |
| Worst Case Radiated Disturbance, 9KHz to 30 MHz     | 2.87 dB          |
| Worst Case Radiated Disturbance, 30 to 1000 MHz     | 6.01 dB          |
| Worst Case Radiated Disturbance, 1000 to 18000 MHz  | 4.73 dB          |
| Worst Case Radiated Disturbance, 18000 to 26000 MHz | 4.51 dB          |
| Worst Case Radiated Disturbance, 26000 to 40000 MHz | 5.29 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:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

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

#### MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

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

$$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$$

## 6. EQUIPMENT UNDER TEST

### 6.1. EUT DESCRIPTION

The EUT is an 802.11 a/b/g/n/ac/ax 2x2 Client Device with BT and BLE.

This report covers BLE radio.

### 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           | BLE (1Mbps) | 12.42              | 17.46             |

### 6.3. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna gain and type, as provided by the manufacturer are as follows:

The radio utilizes a PCB antenna, with a maximum gain of 1.2 dBi.

### 6.4. SOFTWARE AND FIRMWARE

The EUT software used during testing was 70.1-29190-diag.

The test utility software used during testing was GUI\_V8.

### 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 can only be setup in desktop orientation; therefore, all radiated testing was performed with the EUT in desktop orientation.

The worst-case data rate was determined to be as follow, based on input from the manufacturer of the radio.

BLE: 1 Mbps.

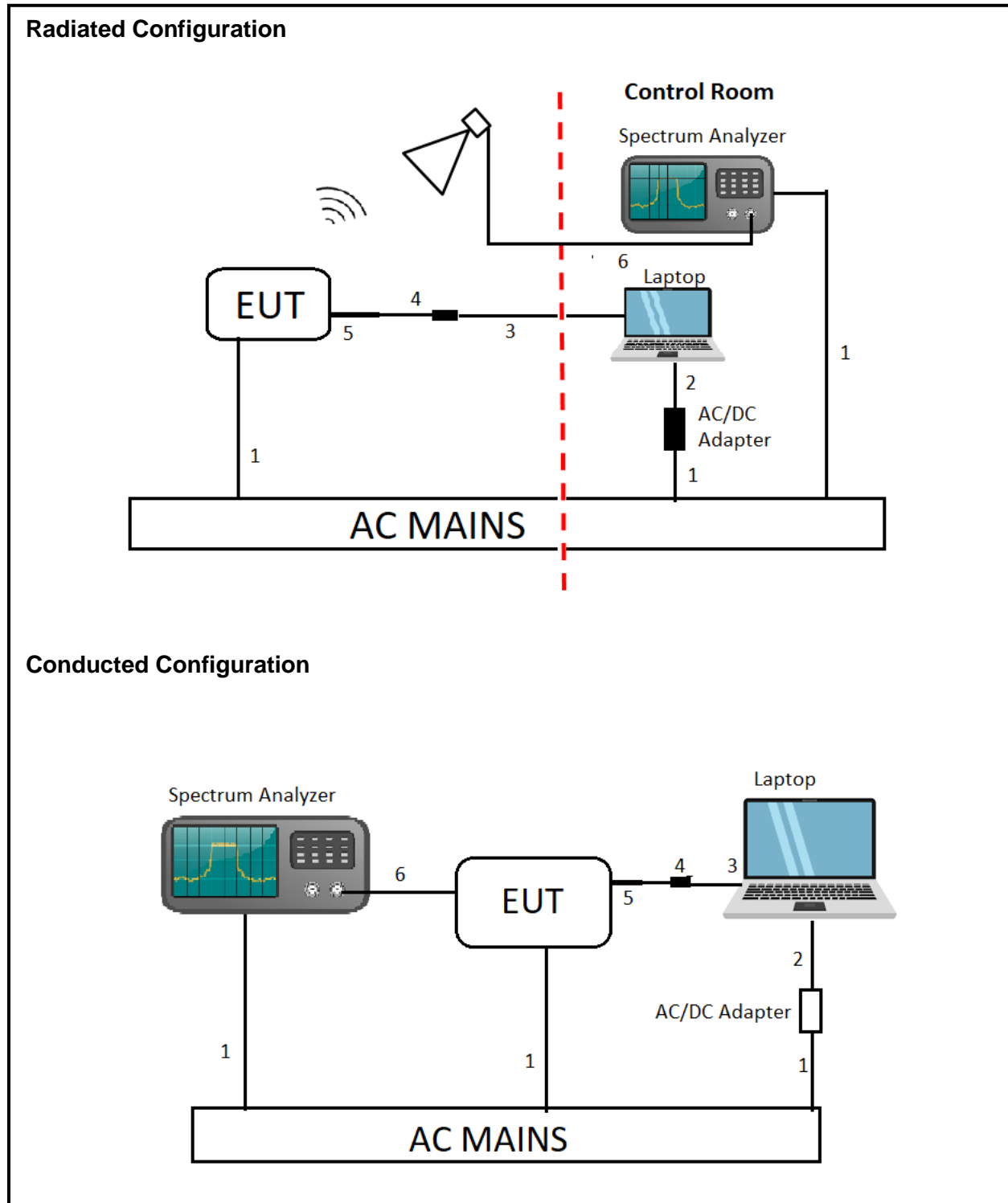
## 6.6. DESCRIPTION OF TEST SETUP

| SUPPORT TEST EQUIPMENT        |               |                      |                        |             |                  |   |
|-------------------------------|---------------|----------------------|------------------------|-------------|------------------|---|
| Description                   | Manufacturer  | Model                | Serial Number          | FCC ID/ DoC |                  |   |
| Laptop                        | Lenovo        | T460s                | PC0JMBF8               | Doc         |                  |   |
| Laptop AC/DC Adapter          | Lenovo        | ADLX90NLC2A          | 11S45N0247Z1ZSHH448JEY | Doc         |                  |   |
| USB-A to Ethernet Adapter     | Plugable      | USB2-E100            | 8CAE4CE46AFA           | Doc         |                  |   |
| USB-C to USB-A Female Adapter | Amazon Basics | L6LUC160-CS-R        | N/A                    | Doc         |                  |   |
| I/O CABLES (CONDUCTED TEST)   |               |                      |                        |             |                  |   |
| Cable No.                     | Port          | # of Identical Ports | Connector Type         | Cable Type  | Cable Length (m) | Remarks   |
| 1                             | AC            | 3                    | AC                     | Un-shielded | 1.25             | AC Mains to EUT/Spectrum Analyzer/AC/DC Adapter |
| 2                             | DC            | 1                    | DC                     | Un-shielded | 1                | AC/DC Adapter to Laptop                         |
| 3                             | Ethernet      | 1                    | RJ45                   | Un-shielded | 1.5              | Laptop to USB Ethernet Adapter                  |
| 4                             | USB-A         | 1                    | USB-A                  | Shielded    | 0.05             | USB Ethernet Adapter to USB                     |
| 5                             | USB-C         | 1                    | USB-C                  | Shielded    | 0.05             | EUT to USB-C/USB-A Female Adapter               |
| 6                             | SMA Cable     | 1                    | SMA                    | Un-Shielded | 0.1              | EUT to Spectrum Analyzer                        |
| I/O CABLES (RADIATED TEST)    |               |                      |                        |             |                  |   |
| Cable No.                     | Port          | # of Identical Ports | Connector Type         | Cable Type  | Cable Length (m) | Remarks   |
| 1                             | AC            | 3                    | AC                     | Un-shielded | 1.25             | AC Mains to EUT/Spectrum Analyzer/AC/DC Adapter |
| 2                             | DC            | 1                    | DC                     | Un-shielded | 1                | AC/DC Adapter to Laptop                         |
| 3                             | Ethernet      | 1                    | RJ45                   | Un-shielded | 10               | Laptop to USB Ethernet Adapter                  |
| 4                             | USB-A         | 1                    | USB-A                  | Shielded    | 0.05             | USB Ethernet Adapter to USB                     |
| 5                             | USB-C         | 1                    | USB-C                  | Shielded    | 0.05             | EUT to USB-C/USB-A Female Adapter               |
| 6                             | SMA Cable     | 1                    | SMA                    | Un-Shielded | 10               | EUT to Horn Antenna                             |

### TEST SETUP

The EUT is a stand-alone unit, and the radio is exercised remotely by Sonos Compliance GUI test utility software via ethernet.

**SETUP DIAGRAM**



## 7. MEASUREMENT METHOD

On Time and Duty Cycle: ANSI C63.10 Section 11.6.

6 dB BW: ANSI C63.10 Subclause -11.8.1 RBW  $\geq$  DTS BW

Occupied BW (99%): ANSI C63.10-2013 Section 6.9.3

Output Power: ANSI C63.10 Subclause -11.9.1.3 Method PKPM1 Peak-reading power meter

Output Power: ANSI C63.10 Subclause -11.9.2.3.2 Method AVGPM-G (Measurement using a gated RF average-reading power meter)

PSD: ANSI C63.10 Subclause -11.10.2 Method PKPSD (peak PSD)

Radiated emissions non-restricted frequency bands: ANSI C63.10 Subclause -11.11

Radiated emissions restricted frequency bands: ANSI C63.10 Subclause -11.12.1

Conducted emissions in restricted frequency bands: ANSI C63.10 Subclause -11.12.2

Band-edge: ANSI C63.10 Section 6.10

AC Power Line Conducted Emissions: ANSI C63.10-2013, Section 6.2.

Radiated Spurious Emissions Below 30MHz: ANSI C63.10-2013 Section 6.4

## 8. TEST AND MEASUREMENT EQUIPMENT

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

| TEST EQUIPMENT LIST                                |                                    |                              |                     |            |            |
|--|------------------------------------|------------------------------|---------------------|------------|------------|
| Description  | Manufacturer                       | Model                        | ID Num              | Cal Due    | Last Cal   |
| Antenna, Broadband Hybrid, 30MHz to 3GHz           | Sunol Sciences Corp.               | JB3                          | 171862              | 2022-09-28 | 2021-09-28 |
| Amplifier, 10KHz to 1GHz, 32dB                     | SONOMA INSTRUMENT                  | 310N                         | 29654               | 2023-04-24 | 2022-04-24 |
| Antenna, Horn 1-18GHz                              | ETS-Lindgren (Cedar Park, Texas)   | 3117                         | 80402               | 2023-07-05 | 2022-07-05 |
| Amplifier, 100MHz-18GHz                            | AMPLICAL                           | AMP0.1G18-47-20              | 185686              | 2023-04-19 | 2022-04-19 |
| EMI TEST RECEIVER, with B8 option                  | Rohde & Schwarz                    | ESW44                        | 169937              | 2023-02-20 | 2022-02-20 |
| EMI TEST RECEIVER                                  | Rohde & Schwarz                    | ESW44                        | 169927              | 2023-02-13 | 2022-02-13 |
| Antenna, Horn 18 to 26.5GHz                        | ARA                                | MWH-1826/B                   | 81138               | 2022-10-13 | 2021-10-13 |
| Amplifier 18-26.5GHz, +5Vdc, 60dB min              | AMPLICAL                           | AMP18G26.5-60                | 215705              | 2023-02-26 | 2022-02-26 |
| Antenna, Passive Loop 30Hz - 1MHz                  | ELECTRO METRICS                    | EM-6871                      | 219909              | 2023-05-10 | 2022-05-10 |
| Antenna, Passive Loop 100KHz - 30MHz               | ELECTRO METRICS                    | EM-6872                      | 219911              | 2023-05-10 | 2022-05-10 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz               | Agilent Technologies               | N9030A                       | 80396               | 2023-01-02 | 2022-01-02 |
| Power Meter, P-series single channel               | Keysight Technologies Inc          | N1911A                       | T1268               | 2023-02-03 | 2022-02-03 |
| Power Sensor, P - series, 50MHz to 18GHz, Wideband | Keysight Technologies Inc          | N1921A                       | 90419               | 2023-03-02 | 2022-03-02 |
| AC Line Conducted                                  |                                    |                              |                     |            |            |
| LISN   | Fischer Custom Communications, Inc | FCC-LISN-50/250-25-2-01-480V | 175765              | 2023-01-25 | 2022-01-25 |
| EMI TEST RECEIVER                                  | Rohde & Schwarz                    | ESR                          | 93091               | 2023-02-21 | 2022-02-21 |
| Transient Limiter                                  | Com-Power                          | LIT-930                      | 127455              | 2023-02-02 | 2022-02-02 |
| UL TEST SOFTWARE LIST                              |                                    |                              |                     |            |            |
| Radiated Software                                  | UL                                 | UL EMC                       | Ver 2022-07-06      |            |            |
| Antenna Port Software                              | UL                                 | UL RF                        | Ver 2022.5.31       |            |            |
| AC Line Conducted Software                         | UL                                 | UL EMC                       | Rev 9.5, 2022-02-17 |            |            |

\*Test performed before calibration expired.

## 9. ANTENNA PORT TEST RESULTS

### 9.1. ON TIME AND DUTY CYCLE

#### LIMITS

None; for reporting purposes only.

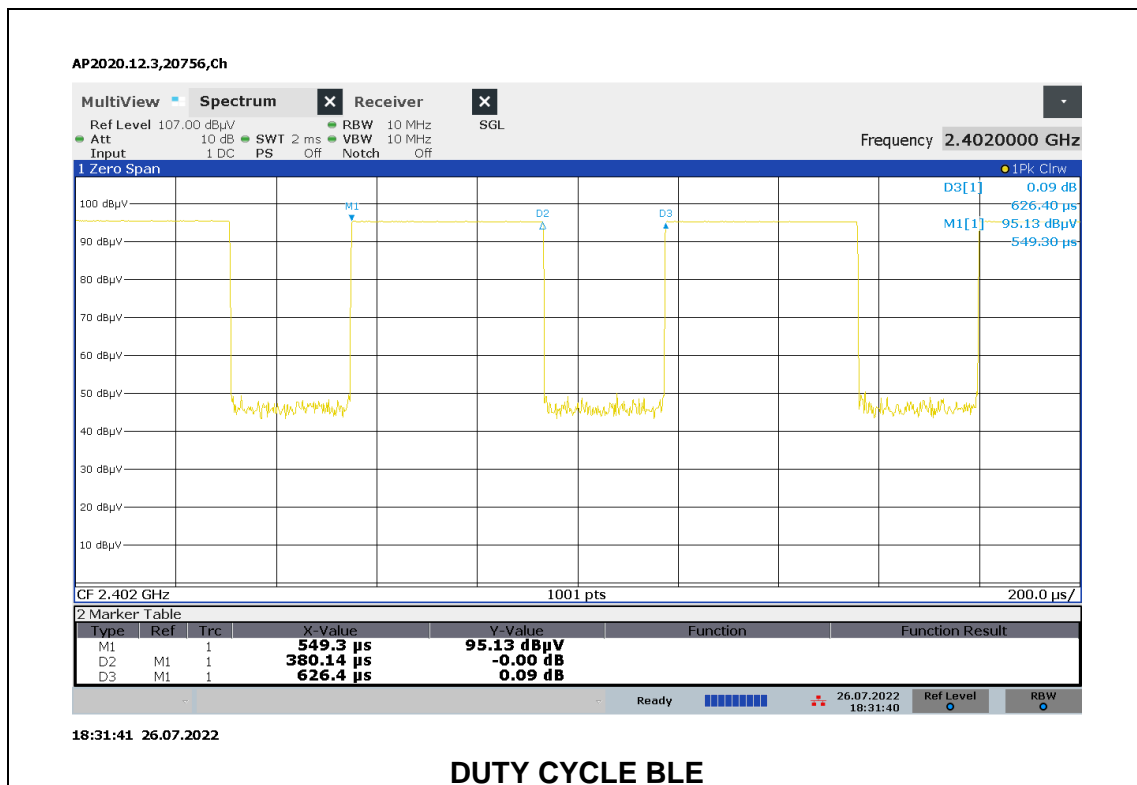
#### PROCEDURE

KDB 558074 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/B<br>Minimum VBW<br>(kHz) |
|-------------|------------------------|------------------|-----------------------------|----------------------|---|-----------------------------|
| BLE (1Mbps) | 0.380                  | 0.626            | 0.607                       | 60.69                | 2.17                                    | 2.631                       |

#### DUTY CYCLE PLOTS



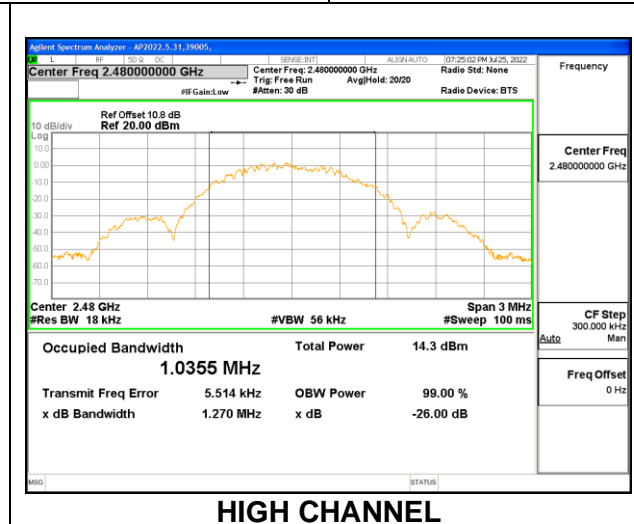
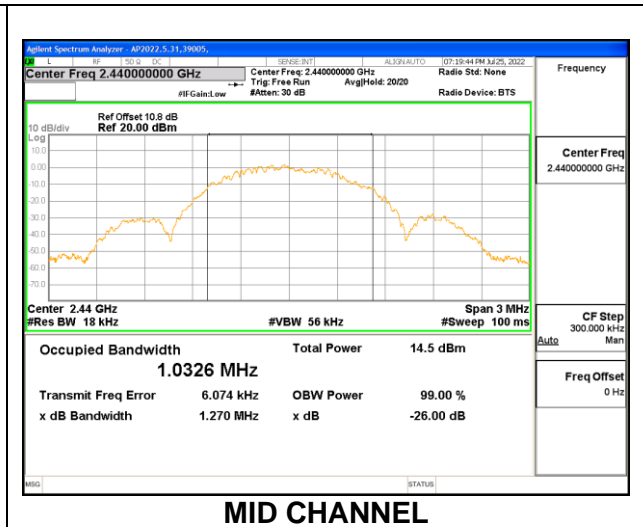
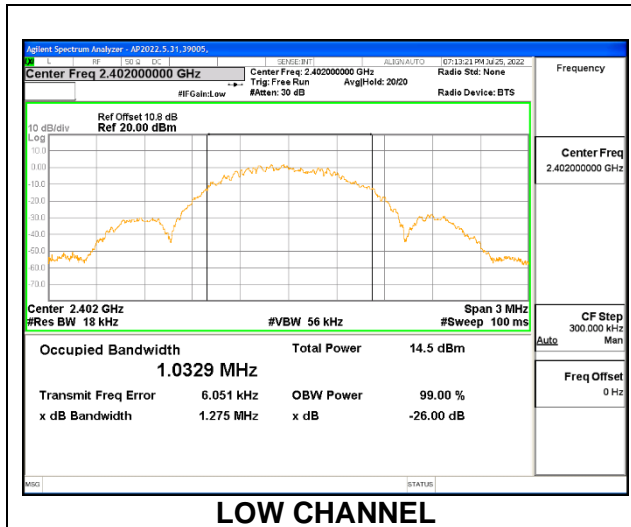
## 9.2. 99% BANDWIDTH

### LIMITS

None; for reporting purposes only.

### RESULTS

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low     | 2402            | 1.0329              |
| Middle  | 2440            | 1.0326              |
| High    | 2480            | 1.0355              |





### 9.3. 6 dB BANDWIDTH

#### LIMITS

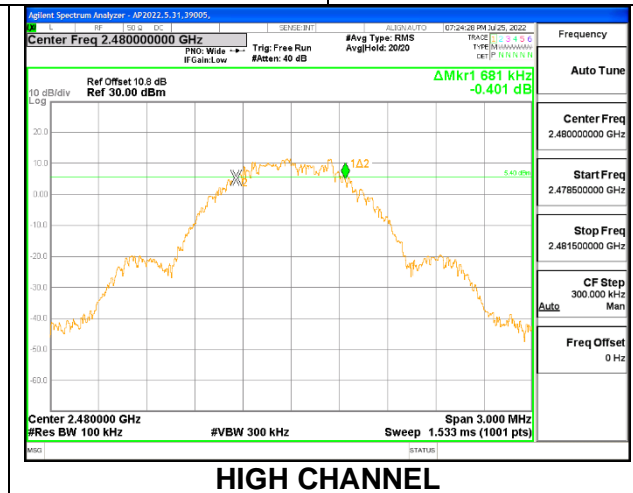
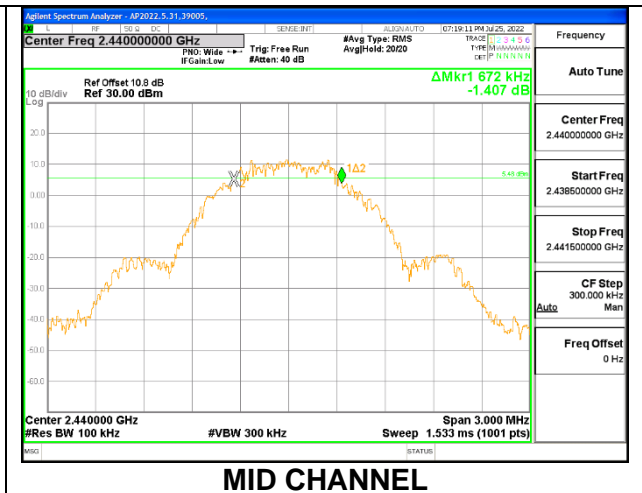
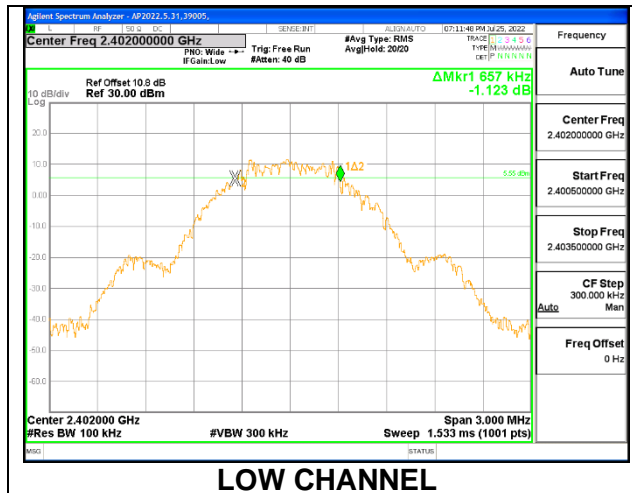
FCC §15.247 (a) (2)

RSS-247 5.2 (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

#### RESULTS

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|----------------------|---------------------|
| Low     | 2402            | 0.657                | 0.5                 |
| Middle  | 2440            | 0.672                | 0.5                 |
| High    | 2480            | 0.681                | 0.5                 |



## 9.4. OUTPUT POWER

### LIMITS

FCC §15.247 (b) (3)

RSS-247 5.4 (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

### TEST PROCEDURE

The transmitter output is connected to a power meter.

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband power sensor. Peak output power was read directly from power meter.

### RESULTS

|                   |            |
|-------------------|------------|
| <b>Tested By:</b> | RA39005    |
| <b>Date:</b>      | 2022-07-28 |

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Peak Power<br/>Reading<br/>(dBm)</b> | <b>Limit<br/>(dBm)</b> | <b>Margin<br/>(dB)</b> |
|----------------|----------------------------|---|------------------------|------------------------|
| Low            | 2402                       | 12.42                                   | 30                     | -17.58                 |
| Middle         | 2440                       | 12.38                                   | 30                     | -17.62                 |
| High           | 2480                       | 12.13                                   | 30                     | -17.87                 |

## 9.5. AVERAGE POWER

### LIMITS

None; for reporting purposes only.

### TEST PROCEDURE

The transmitter output is connected to a power meter.

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband power sensor. Gated average output power was read directly from power meter.

### RESULTS

|                   |            |
|-------------------|------------|
| <b>Tested By:</b> | RA39005    |
| <b>Date:</b>      | 2022-07-28 |

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>AV power<br/>(dBm)</b> |
|----------------|----------------------------|---------------------------|
| Low            | 2402                       | 12.24                     |
| Middle         | 2440                       | 12.11                     |
| High           | 2480                       | 12.05                     |

## 9.6. POWER SPECTRAL DENSITY

### LIMITS

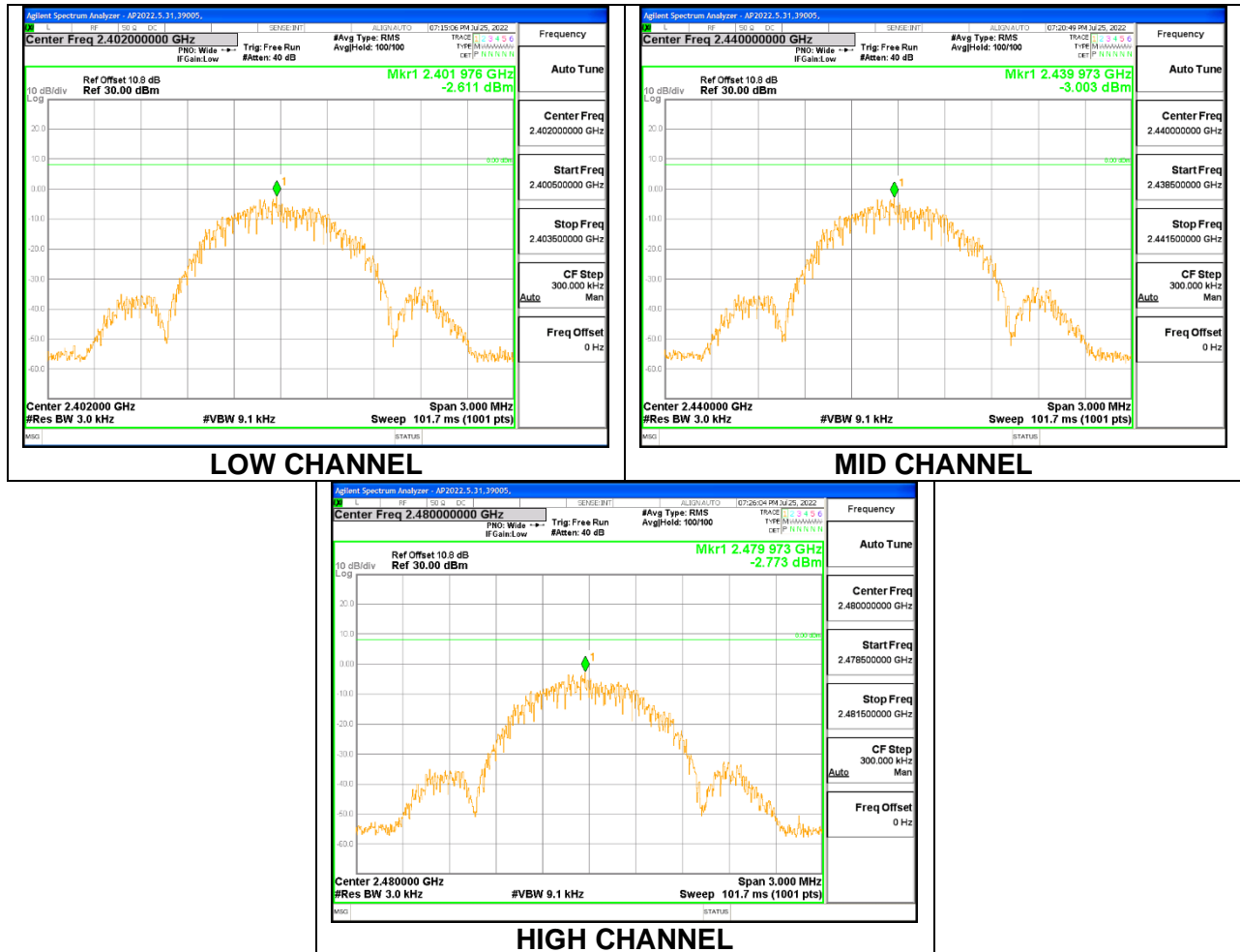
FCC §15.247 (e)

RSS-247 (5.2) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### RESULTS

| Channel | Frequency (MHz) | PSD (dBm/3kHz) | Limit (dBm/3kHz) | Margin (dB) |
|---------|-----------------|----------------|------------------|-------------|
| Low     | 2402            | -2.611         | 8                | -10.61      |
| Middle  | 2440            | -3.003         | 8                | -11.00      |
| High    | 2480            | -2.773         | 8                | -10.77      |



## **9.7. CONDUCTED SPURIOUS EMISSIONS**

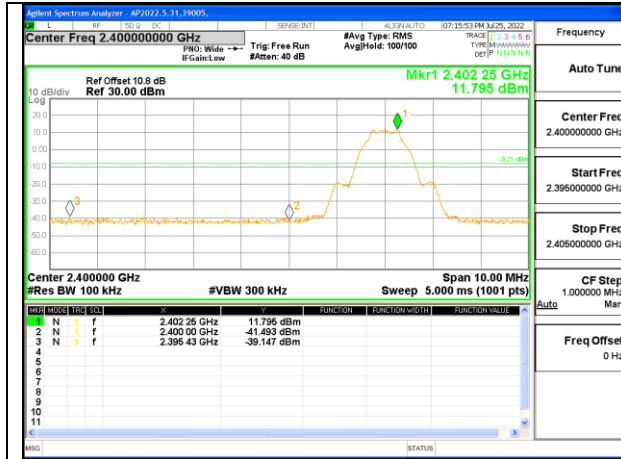
### **LIMITS**

FCC §15.247 (d)

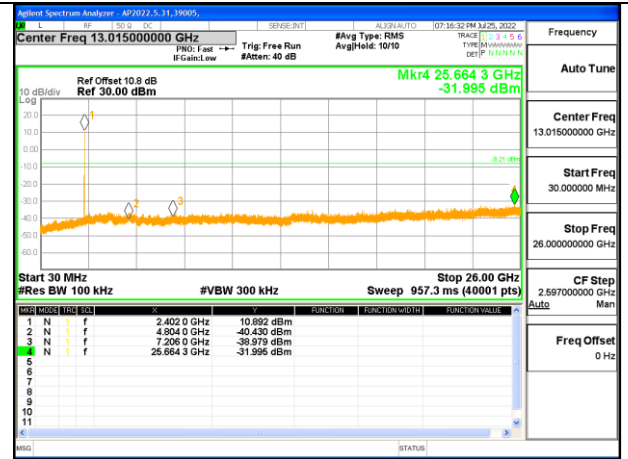
RSS-247 5.5

Output power was measured based on the use of a peak measurement; therefore, the required attenuation is 20 dB.

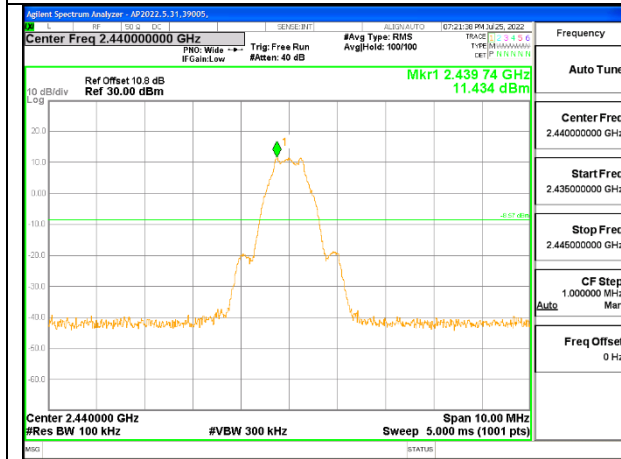
### **RESULTS**



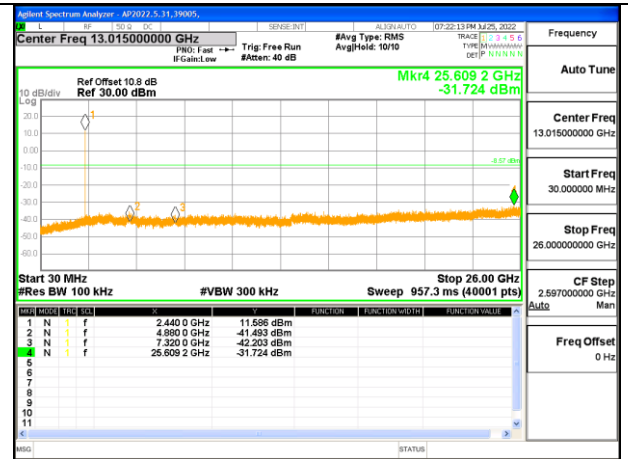
**LOW CHANNEL BANDEDGE**



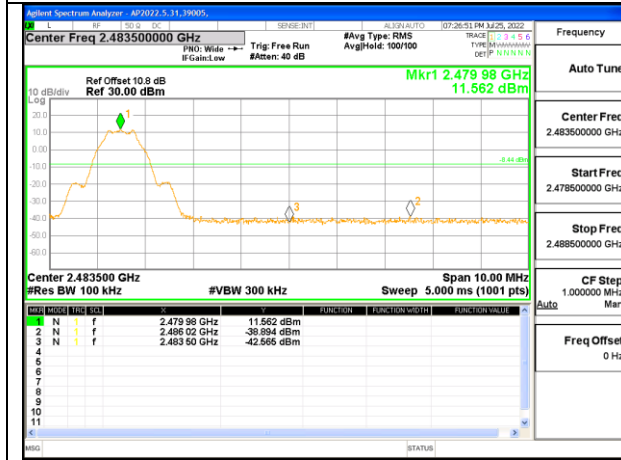
**OUT-OF-BAND LOW CHANNEL**



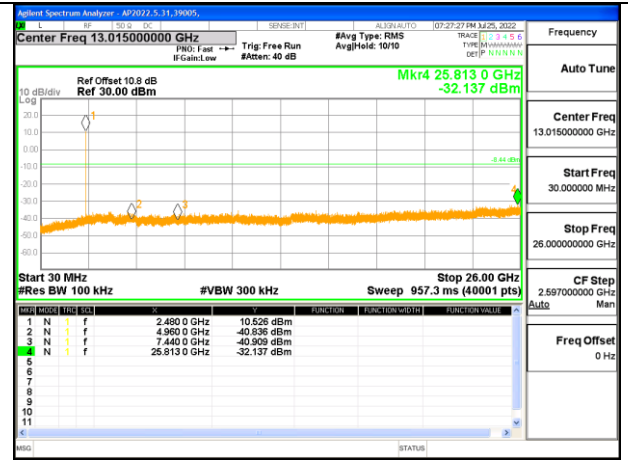
**IN-BAND REFERENCE LEVEL**



**OUT-OF-BAND MID CHANNEL**



**HIGH CHANNEL BANDEDGE**



**OUT-OF-BAND HIGH CHANNEL**

## 10. RADIATED TEST RESULTS

### 10.1. LIMITS AND PROCEDURE

#### 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 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. 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 as applicable for average measurements.

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.

2D antenna use - For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.

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.

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

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

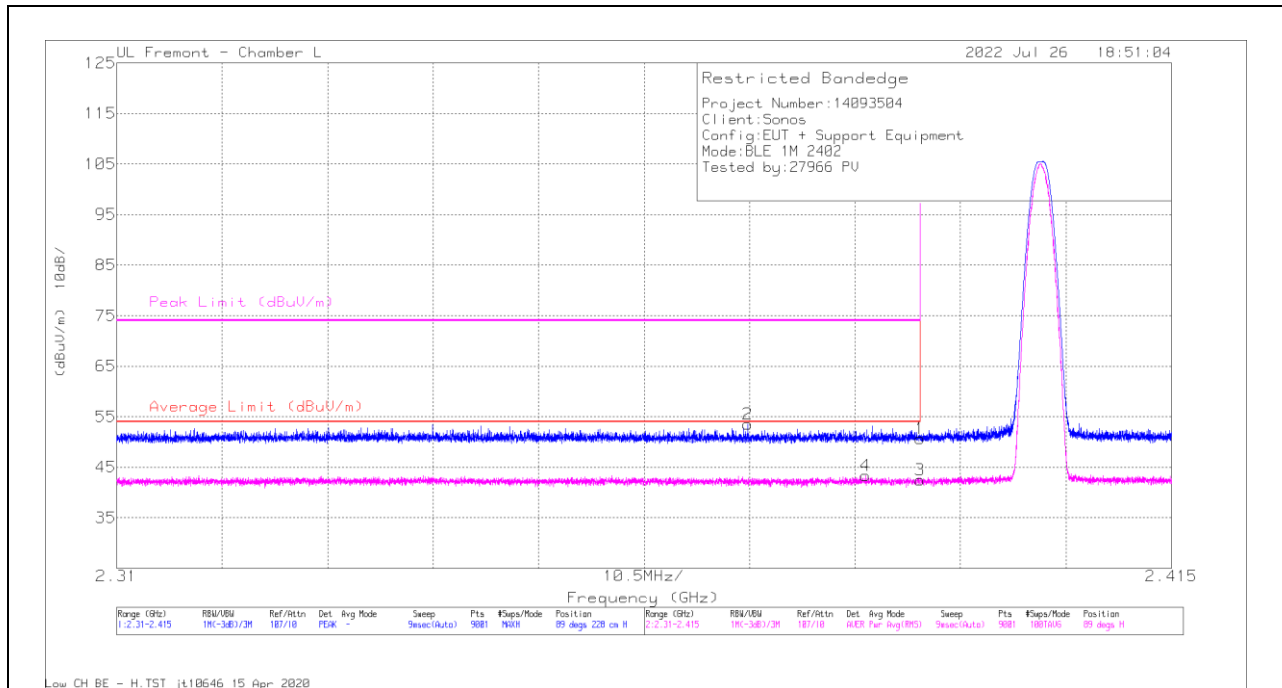
**Note:** The limits in CFR 47, Part 15, Subpart C, paragraph 15.209(a), are identical to those in RSS-Gen section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table), using the free space impedance of 377 Ohms. For example, the measurement at frequency X kHz resulted in a level of Y dBuV/m, which is equivalent to  $Y - 51.5 = Z$  dBuA/m, which has the same margin, W dB, to the corresponding RSS-Gen Table 6 limit as it has to 15.209(a) limit.



## 10.2. TRANSMITTER ABOVE 1 GHz

### BANDEDGE (LOW CHANNEL)

#### HORIZONTAL RESULT



#### Trace Markers

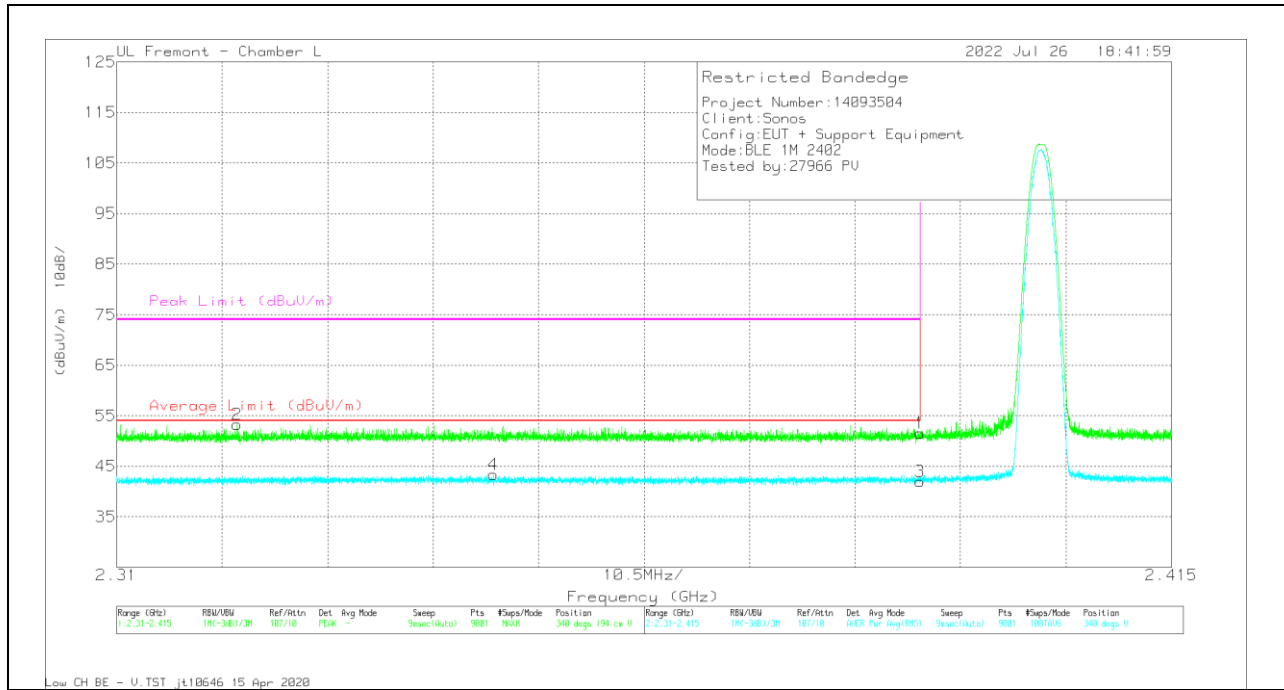
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 80707 ACF (dB) | Amp/Cbl/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|------------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.39          | 38.88                | Pk  | 31.9           | -20.1            | 0            | 50.68                      | -                      | -           | 74                  | -23.32         | 89             | 228         | H        |
| 2      | * 2.37285       | 41.71                | Pk  | 31.9           | -20.1            | 0            | 53.51                      | -                      | -           | 74                  | -20.49         | 89             | 228         | H        |
| 3      | * 2.39          | 28.49                | RMS | 31.9           | -20.1            | 2.17         | 42.46                      | 54                     | -11.54      | -                   | -              | 89             | 228         | H        |
| 4      | * 2.38454       | 29.36                | RMS | 31.9           | -20.1            | 2.17         | 43.33                      | 54                     | -10.67      | -                   | -              | 89             | 228         | H        |

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

Pk - Peak detector

RMS - RMS detection

### VERTICAL RESULT



### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 80707 ACF (dB) | Amp/Cbl/Pad (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      | * 2.39          | 39.69                | Pk  | 31.9           | -20.1            | 0            | 51.49                      | -                      | -           | 74                  | -22.51         | 340            | 194         | V        |
| 2      | * 2.321994      | 41.55                | Pk  | 32             | -20.3            | 0            | 53.25                      | -                      | -           | 74                  | -20.75         | 340            | 194         | V        |
| 3      | * 2.39          | 27.98                | RMS | 31.9           | -20.1            | 2.17         | 41.95                      | 54                     | -12.05      | -                   | -              | 340            | 194         | V        |
| 4      | * 2.347498      | 29.34                | RMS | 32             | -20.2            | 2.17         | 43.31                      | 54                     | -10.69      | -                   | -              | 340            | 194         | V        |

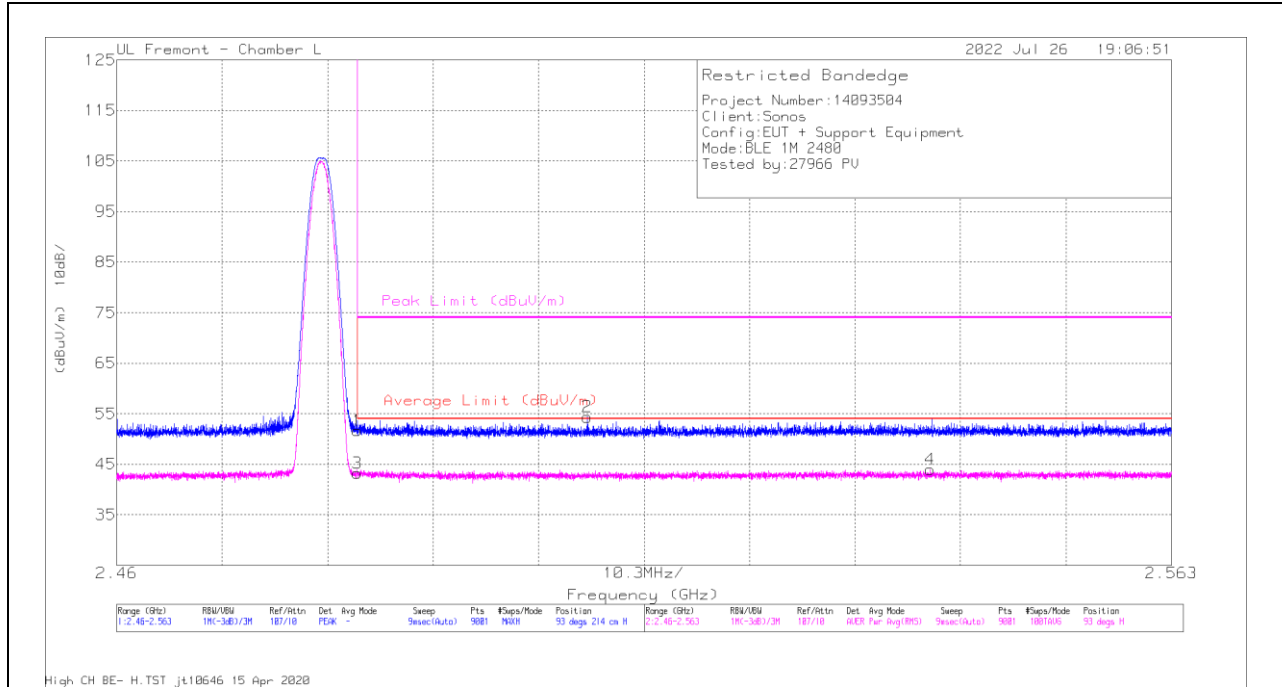
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

### BANDEDGE (HIGH CHANNEL)

### HORIZONTAL RESULT



### Trace Markers

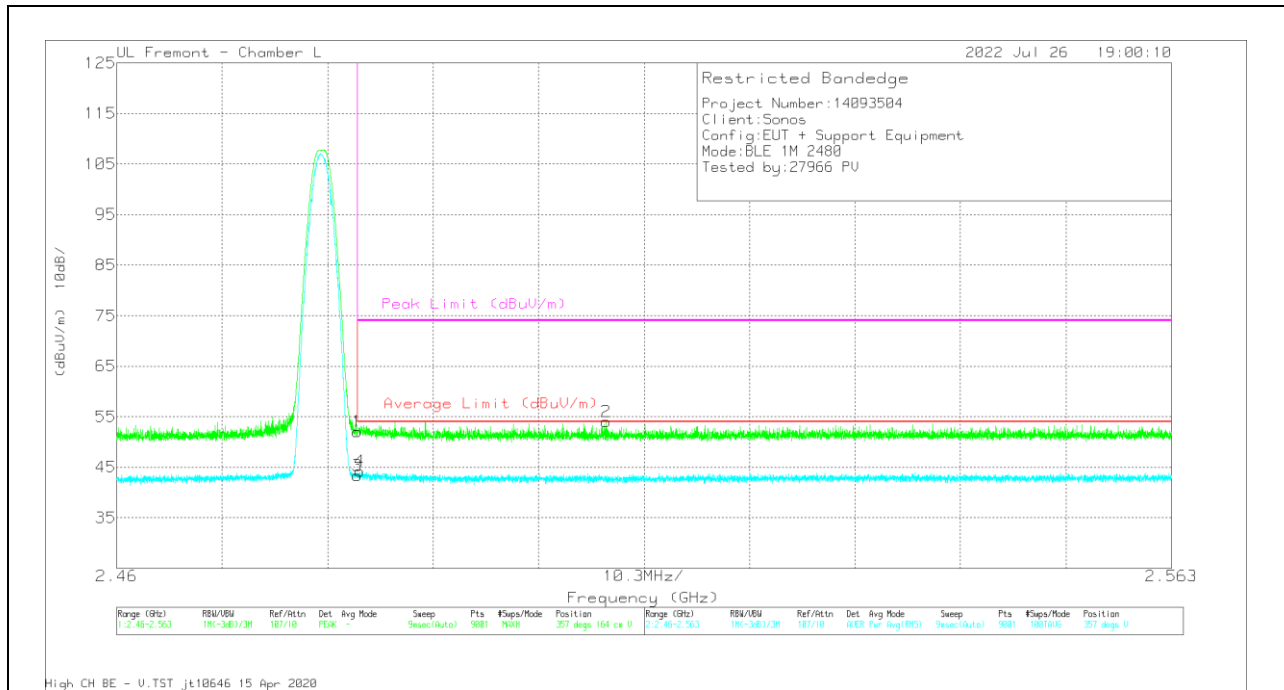
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 80707 ACF (dB) | Amp/Cbl/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|------------------|--------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.4835        | 39.39                | Pk  | 32.2           | -19.9            | 0            | 51.69                      | -                      | -           | 74                  | -22.31         | 93             | 214         | H        |
| 2      | 2.505982        | 42.03                | Pk  | 32.2           | -19.9            | 0            | 54.33                      | -                      | -           | 74                  | -19.67         | 93             | 214         | H        |
| 3      | * 2.4835        | 28.73                | RMS | 32.2           | -19.9            | 2.17         | 43.2                       | 54                     | -10.8       | -                   | -              | 93             | 214         | H        |
| 4      | 2.539456        | 29.3                 | RMS | 32.4           | -19.9            | 2.17         | 43.97                      | 54                     | -10.03      | -                   | -              | 93             | 214         | H        |

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

Pk - Peak detector

RMS - RMS detection

### VERTICAL RESULT



### Trace Markers

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | 80707 ACF (dB) | Amp/Cbl/Pad (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      | * 2.4835        | 39.73                | Pk  | 32.2           | -19.9            | 0            | 52.03                      | -                      | -           | 74                  | -21.97         | 357            | 164         | V        |
| 2      | 2.507813        | 41.67                | Pk  | 32.2           | -19.9            | 0            | 53.97                      | -                      | -           | 74                  | -20.03         | 357            | 164         | V        |
| 3      | * 2.4835        | 28.9                 | RMS | 32.2           | -19.9            | 2.17         | 43.37                      | 54                     | -10.63      | -                   | -              | 357            | 164         | V        |
| 4      | * 2.483712      | 29.69                | RMS | 32.2           | -19.9            | 2.17         | 44.16                      | 54                     | -9.84       | -                   | -              | 357            | 164         | V        |

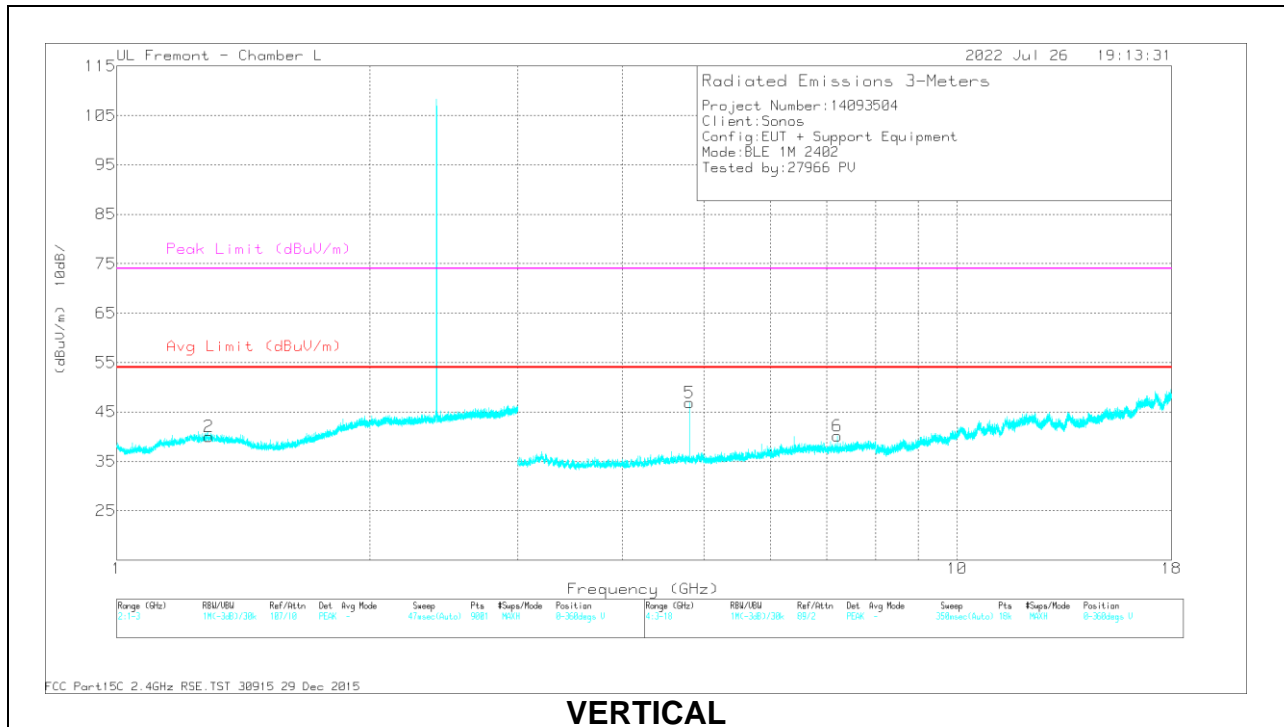
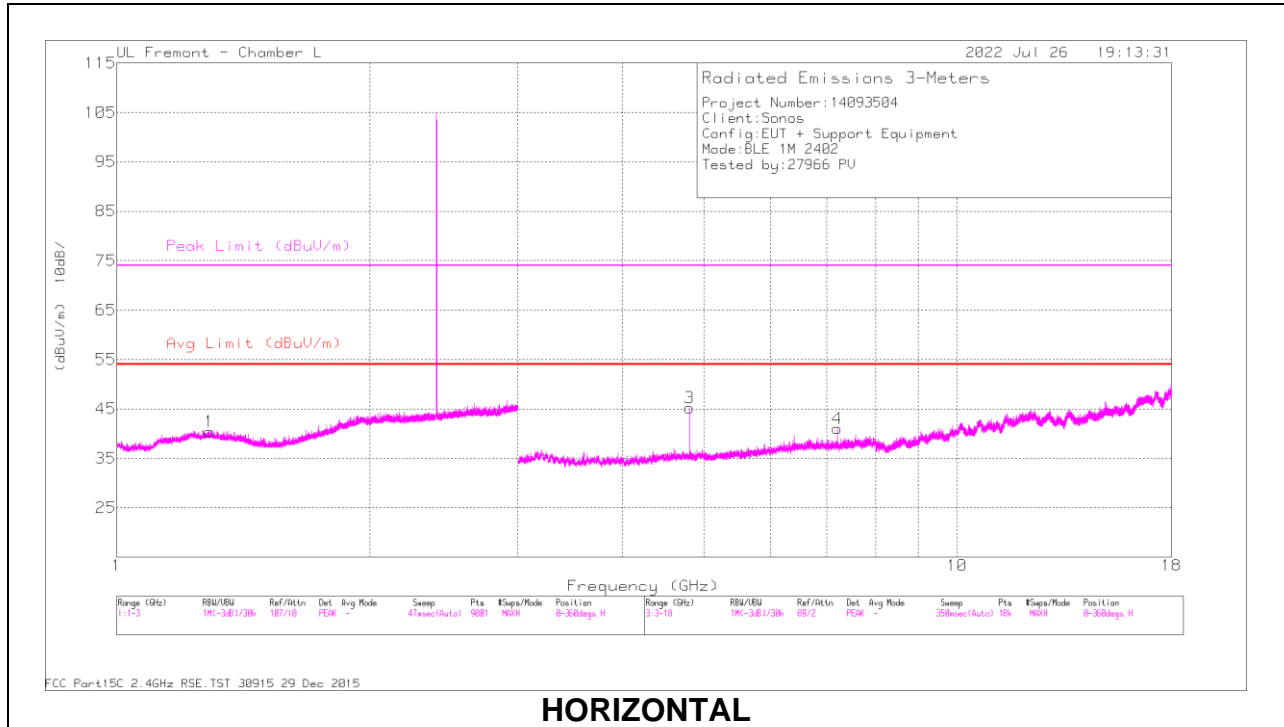
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

# HARMONICS AND SPURIOUS EMISSIONS

## LOW CHANNEL RESULTS



**RADIATED EMISSIONS**

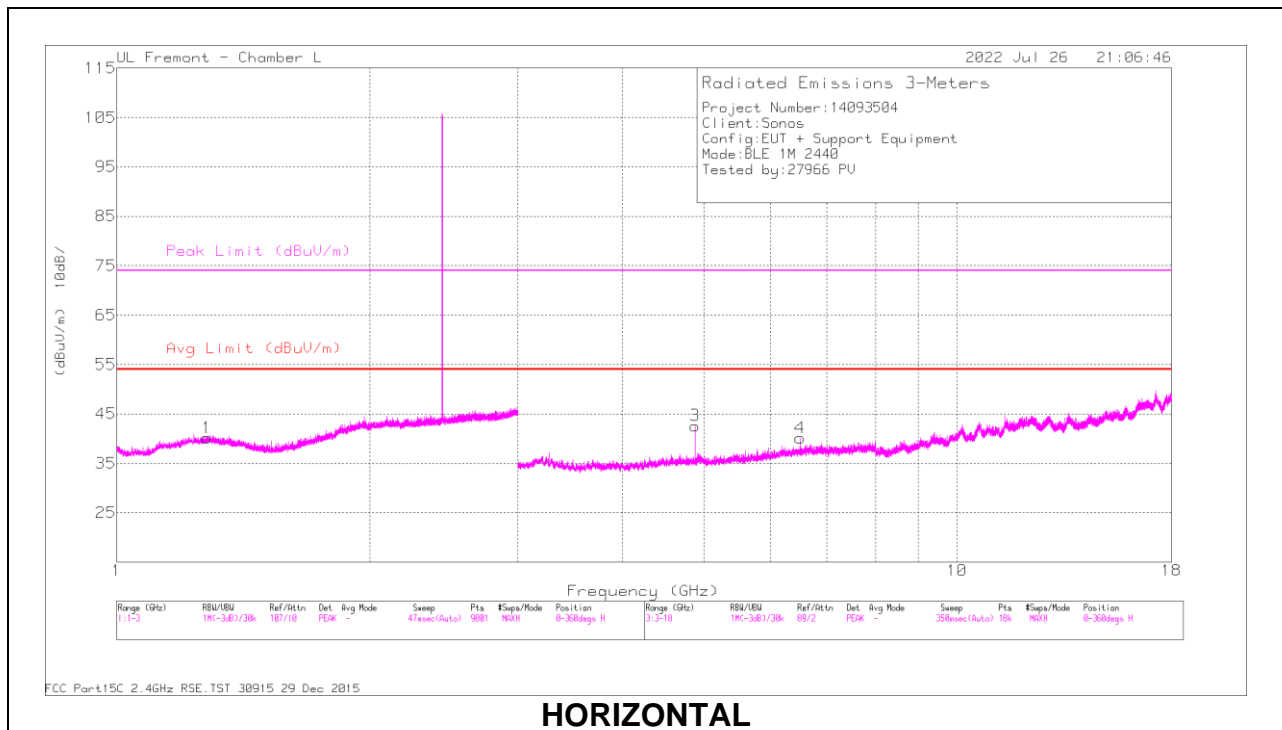
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | 80707 ACF (dB) | Amp/Cbl/Pad (dB) | DC Corr (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|------|----------------|------------------|--------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 1.289964      | 43.58                | PK2  | 30             | -23.3            | 0            | 50.28                      | -                  | -           | 74                  | -23.72         | 205            | 101         | H        |
|        | * 1.288797      | 31.87                | MAv1 | 30             | -23.2            | 2.17         | 40.84                      | 54                 | -13.16      | -                   | -              | 205            | 101         | H        |
| 2      | * 1.28753       | 44.05                | PK2  | 30             | -23.2            | 0            | 50.85                      | -                  | -           | 74                  | -23.15         | 241            | 104         | V        |
|        | * 1.285329      | 31.97                | MAv1 | 30             | -23.2            | 2.17         | 40.94                      | 54                 | -13.06      | -                   | -              | 241            | 104         | V        |
| 3      | * 4.803662      | 43.5                 | PK2  | 34.1           | -26.5            | 0            | 51.1                       | -                  | -           | 74                  | -22.9          | 127            | 104         | H        |
|        | * 4.803842      | 34.74                | MAv1 | 34.1           | -26.5            | 2.17         | 44.51                      | 54                 | -9.49       | -                   | -              | 127            | 104         | H        |
| 4      | 7.205271        | 37.42                | PK2  | 35.9           | -23              | 0            | 50.32                      | -                  | -           | -                   | -              | 315            | 101         | H        |
| 5      | * 4.804456      | 44.63                | PK2  | 34.1           | -26.5            | 0            | 52.23                      | -                  | -           | 74                  | -21.77         | 65             | 103         | V        |
|        | * 4.80374       | 36.86                | MAv1 | 34.1           | -26.5            | 2.17         | 46.63                      | 54                 | -7.37       | -                   | -              | 65             | 103         | V        |
| 6      | 7.205052        | 36.23                | PK2  | 35.9           | -23              | 0            | 49.13                      | -                  | -           | -                   | -              | 339            | 102         | V        |

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

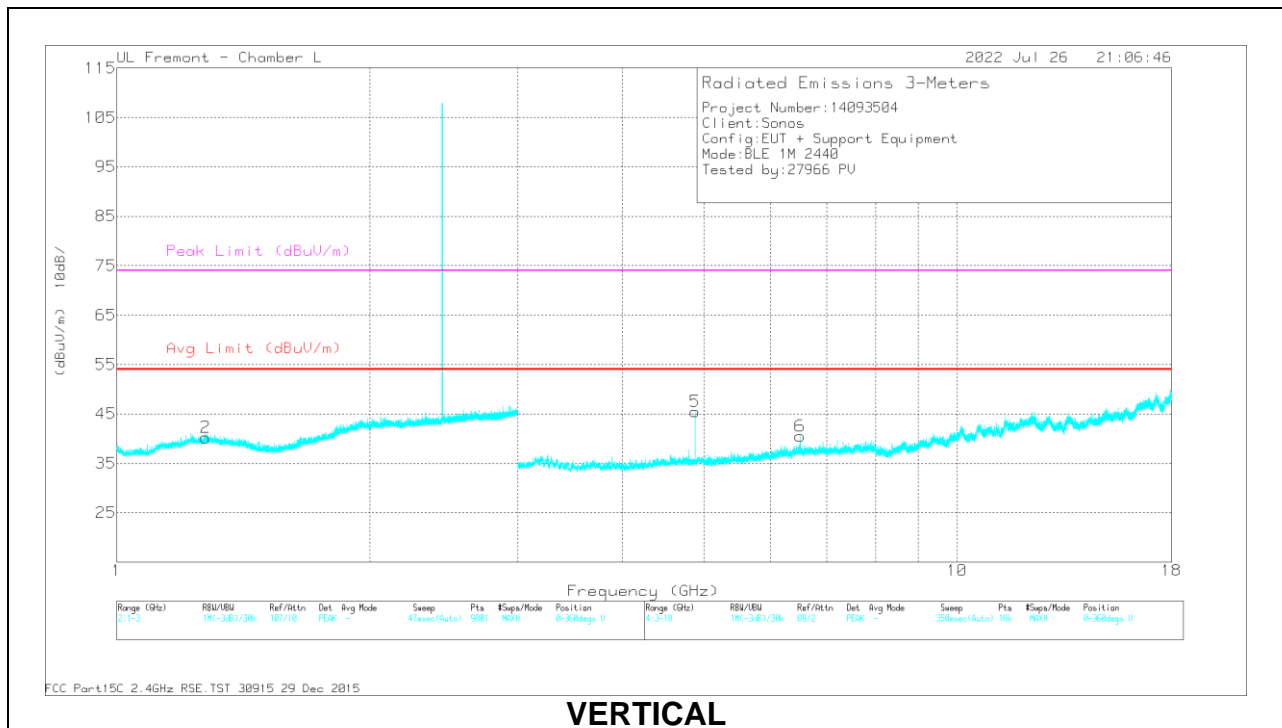
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

### MID CHANNEL RESULTS



**HORIZONTAL**



**VERTICAL**

**RADIATED EMISSIONS**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | 80707 ACF (dB) | Amp/Cbl/Pad (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      | * 1.277865      | 44.13                | PK2  | 30             | -23.2            | 0            | 50.93                      | -                  | -           | 74                  | -23.07         | 272            | 214         | H        |
|        | * 1.280774      | 31.62                | MAv1 | 30.1           | -23.3            | 2.17         | 40.59                      | 54                 | -13.41      | -                   | -              | 272            | 214         | H        |
| 2      | * 1.275237      | 43.05                | PK2  | 30             | -23.2            | 0            | 49.85                      | -                  | -           | 74                  | -24.15         | 331            | 231         | V        |
|        | * 1.276647      | 31.37                | MAv1 | 30             | -23.2            | 2.17         | 40.34                      | 54                 | -13.66      | -                   | -              | 331            | 231         | V        |
| 3      | * 4.879624      | 41.87                | PK2  | 34.2           | -26.4            | 0            | 49.67                      | -                  | -           | 74                  | -24.33         | 208            | 102         | H        |
|        | * 4.879855      | 32.7                 | MAv1 | 34.2           | -26.4            | 2.17         | 42.67                      | 54                 | -11.33      | -                   | -              | 208            | 102         | H        |
| 4      | 6.507037        | 37.05                | PK2  | 36             | -24.1            | 0            | 48.95                      | -                  | -           | -                   | -              | 32             | 101         | H        |
| 5      | * 4.879434      | 43.39                | PK2  | 34.2           | -26.4            | 0            | 51.19                      | -                  | -           | 74                  | -22.81         | 60             | 102         | V        |
|        | * 4.879842      | 34.83                | MAv1 | 34.2           | -26.4            | 2.17         | 44.8                       | 54                 | -9.2        | -                   | -              | 60             | 102         | V        |
| 6      | 6.506881        | 36.81                | PK2  | 36             | -24.1            | 0            | 48.71                      | -                  | -           | -                   | -              | 243            | 102         | V        |

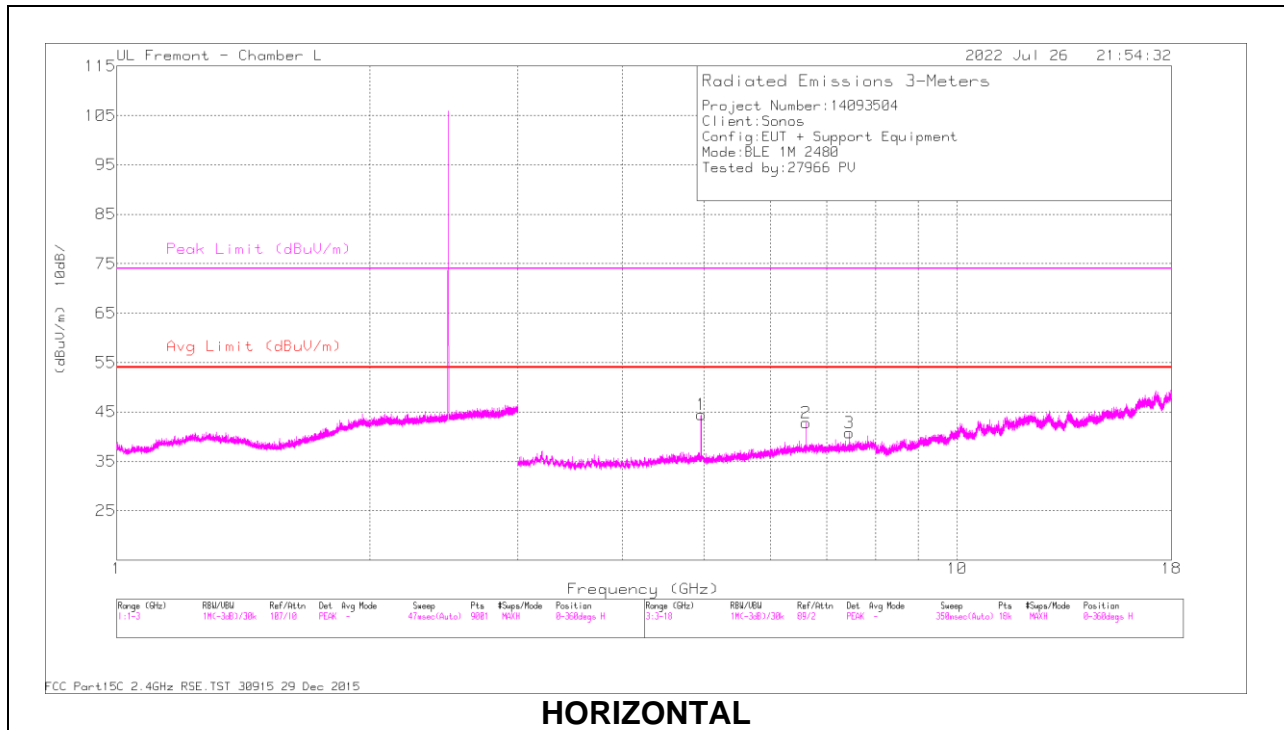
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

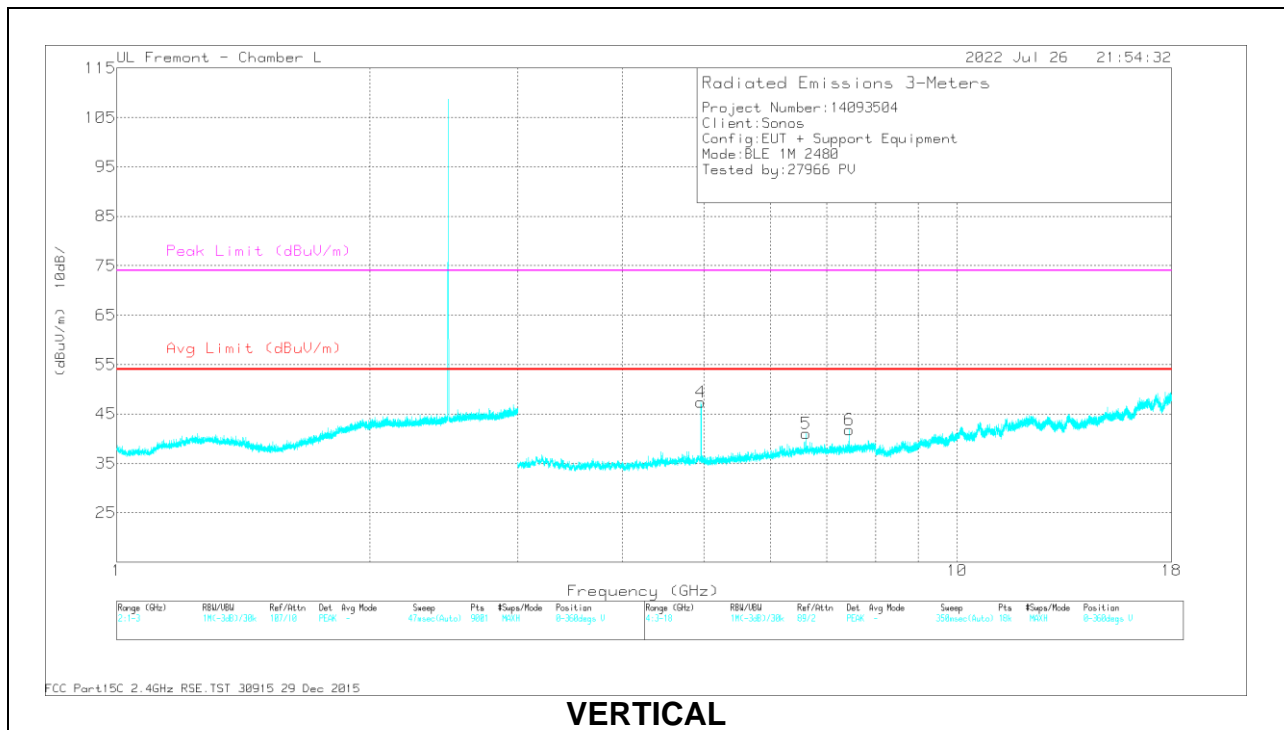
MAv1 - KDB558074 Option 1 Maximum RMS Average



### HIGH CHANNEL RESULTS



**HORIZONTAL**



**VERTICAL**

**RADIATED EMISSIONS**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | 80707 ACF (dB) | Amp/Cbl/Fitr (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      | * 4.960553      | 42.53                | PK2  | 34.2           | -25.4             | 0            | 51.33                      | -                  | -           | 74                  | -22.67         | 210            | 101         | H        |
|        | * 4.95993       | 34.33                | MAv1 | 34.2           | -25.4             | 2.17         | 45.3                       | 54                 | -8.7        | -                   | -              | 210            | 101         | H        |
| 2      | 6.613246        | 37.52                | PK2  | 36             | -23.7             | 0            | 49.82                      | -                  | -           | -                   | -              | 126            | 101         | H        |
| 3      | * 7.439299      | 36.98                | PK2  | 35.9           | -22.5             | 0            | 50.38                      | -                  | -           | 74                  | -23.62         | 104            | 102         | H        |
|        | * 7.440502      | 26.04                | MAv1 | 35.9           | -22.5             | 2.17         | 41.61                      | 54                 | -12.39      | -                   | -              | 104            | 102         | H        |
| 4      | * 4.960339      | 43.01                | PK2  | 34.2           | -25.4             | 0            | 51.81                      | -                  | -           | 74                  | -22.19         | 63             | 101         | V        |
|        | * 4.959956      | 35.04                | MAv1 | 34.2           | -25.4             | 2.17         | 46.01                      | 54                 | -7.99       | -                   | -              | 63             | 101         | V        |
| 5      | 6.613           | 37.12                | PK2  | 36             | -23.7             | 0            | 49.42                      | -                  | -           | -                   | -              | 296            | 107         | V        |
| 6      | * 7.439459      | 37.36                | PK2  | 35.9           | -22.5             | 0            | 50.76                      | -                  | -           | 74                  | -23.24         | 61             | 101         | V        |
|        | * 7.439531      | 27.49                | MAv1 | 35.9           | -22.5             | 2.17         | 43.06                      | 54                 | -10.94      | -                   | -              | 61             | 101         | V        |

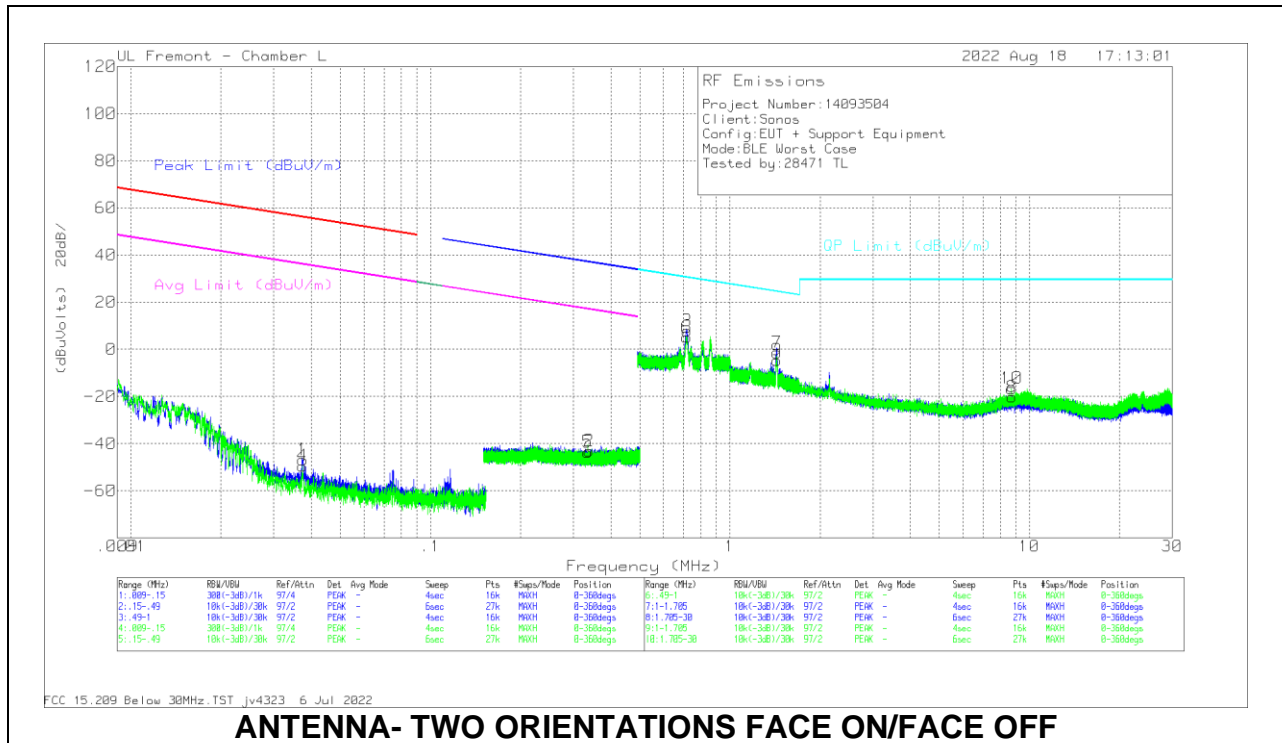
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

### 10.3. WORST CASE BELOW 30MHz

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



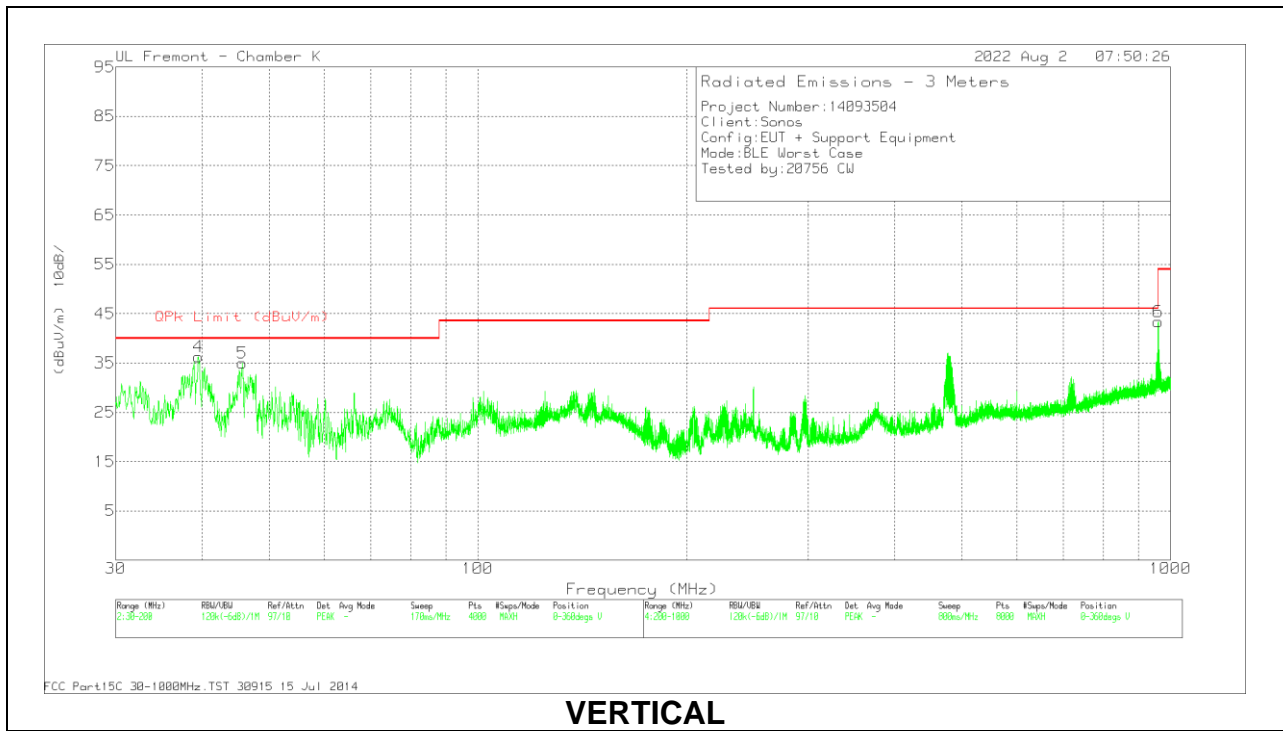
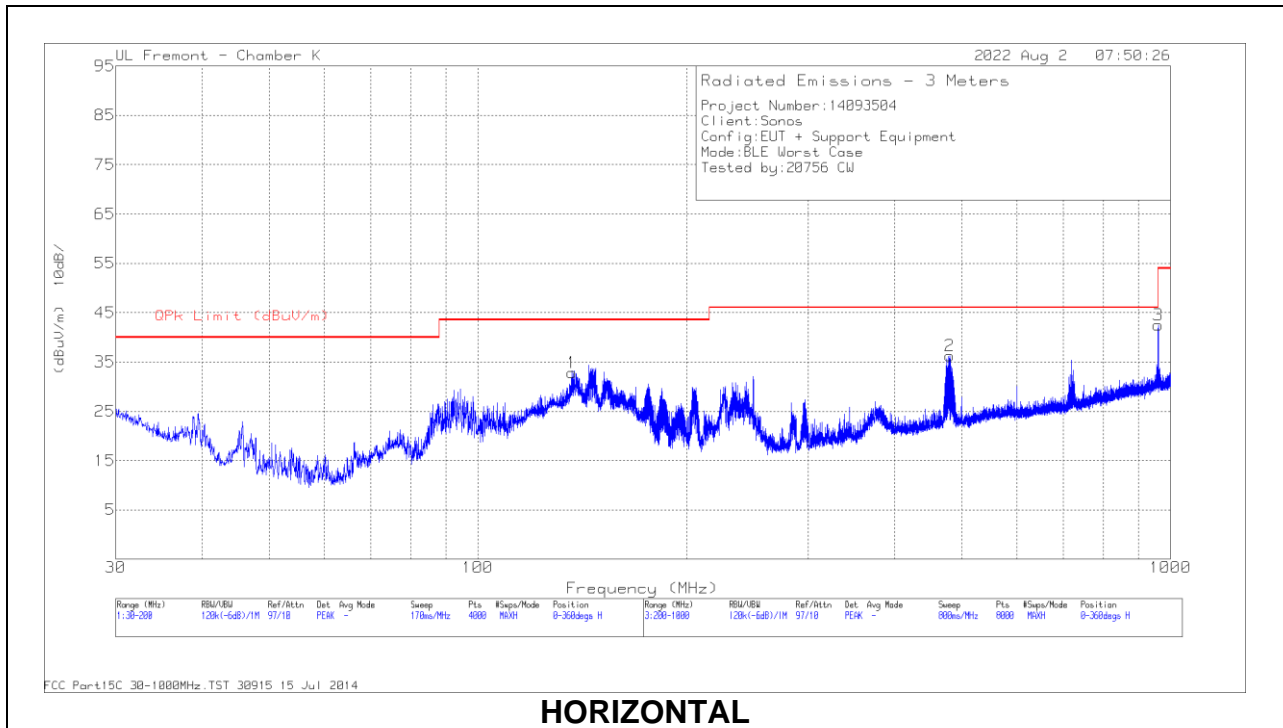
#### Below 30MHz Data

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | Loop Antenna E(ACF) | Amp/Cbl (dB) | Dist Corr 300m | Corrected Reading (dBuVolts) | Peak Limit (dBuV/m) | Margin (dB) | Avg Limit (dBuV/m) | Margin (dB) | QP Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | Margin (dB) | Avg Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) |
|--------|-----------------|----------------------|-----|---------------------|--------------|----------------|------------------------------|---------------------|-------------|--------------------|-------------|-------------------|-------------|---------------------|-------------|--------------------|-------------|----------------|
| 1      | .0375           | 7.5                  | Pk  | 57.4                | -31.7        | -80            | -46.8                        | 56.11               | -102.91     | 36.11              | -82.91      | -                 | -           | -                   | -           | -                  | -           | 0-360          |
| 2      | .3388           | 12.68                | Pk  | 56.2                | -32          | -80            | -43.12                       | -                   | -           | -                  | -           | -                 | -           | 37.01               | -80.13      | 17.01              | -60.13      | 0-360          |
| 4      | .0374           | 4.88                 | Pk  | 57.4                | -31.7        | -80            | -49.42                       | 56.13               | -105.55     | 36.13              | -85.55      | -                 | -           | -                   | -           | -                  | -           | 0-360          |
| 5      | .3352           | 12.19                | Pk  | 56.2                | -32          | -80            | -43.61                       | -                   | -           | -                  | -           | -                 | -           | 37.1                | -80.71      | 17.1               | -60.71      | 0-360          |
| 3      | .7192           | 23.56                | Pk  | 56.2                | -31.9        | -40            | 7.86                         | -                   | -           | -                  | -           | 30.48             | -22.62      | -                   | -           | -                  | -           | 0-360          |
| 6      | .7176           | 20.9                 | Pk  | 56.2                | -31.9        | -40            | 5.2                          | -                   | -           | -                  | -           | 30.5              | -25.3       | -                   | -           | -                  | -           | 0-360          |
| 7      | 1.4355          | 26.96                | Pk  | 44.6                | -31.9        | -40            | -1.34                        | -                   | -           | -                  | -           | 24.49             | -25.83      | -                   | -           | -                  | -           | 0-360          |
| 8      | 8.735           | 16.81                | Pk  | 34.6                | -31.6        | -40            | -20.19                       | -                   | -           | -                  | -           | 29.5              | -49.69      | -                   | -           | -                  | -           | 0-360          |
| 9      | 1.4352          | 22.71                | Pk  | 44.6                | -31.9        | -40            | -4.59                        | -                   | -           | -                  | -           | 24.49             | -29.08      | -                   | -           | -                  | -           | 0-360          |
| 10     | 8.7224          | 20.4                 | Pk  | 34.6                | -31.6        | -40            | -16.6                        | -                   | -           | -                  | -           | 29.5              | -46.1       | -                   | -           | -                  | -           | 0-360          |

Pk - Peak detector

### 10.4. WORST CASE BELOW 1 GHz

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



**Below 1GHz Data**

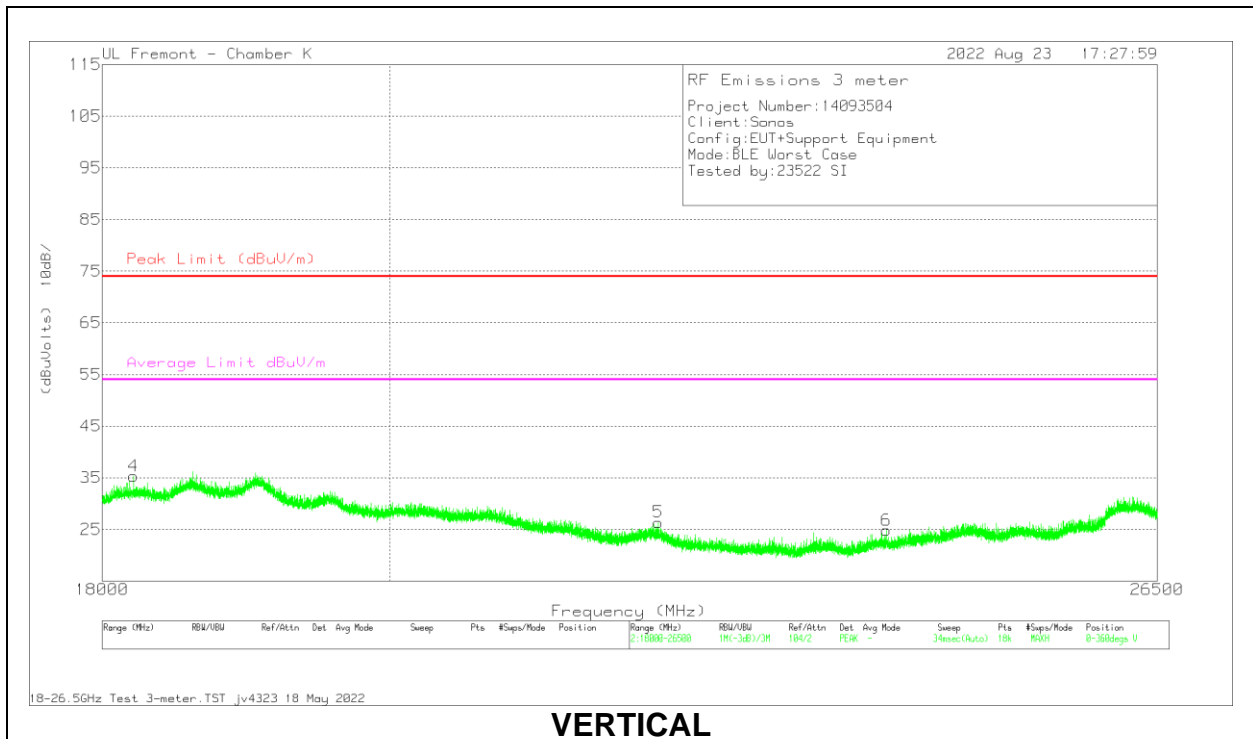
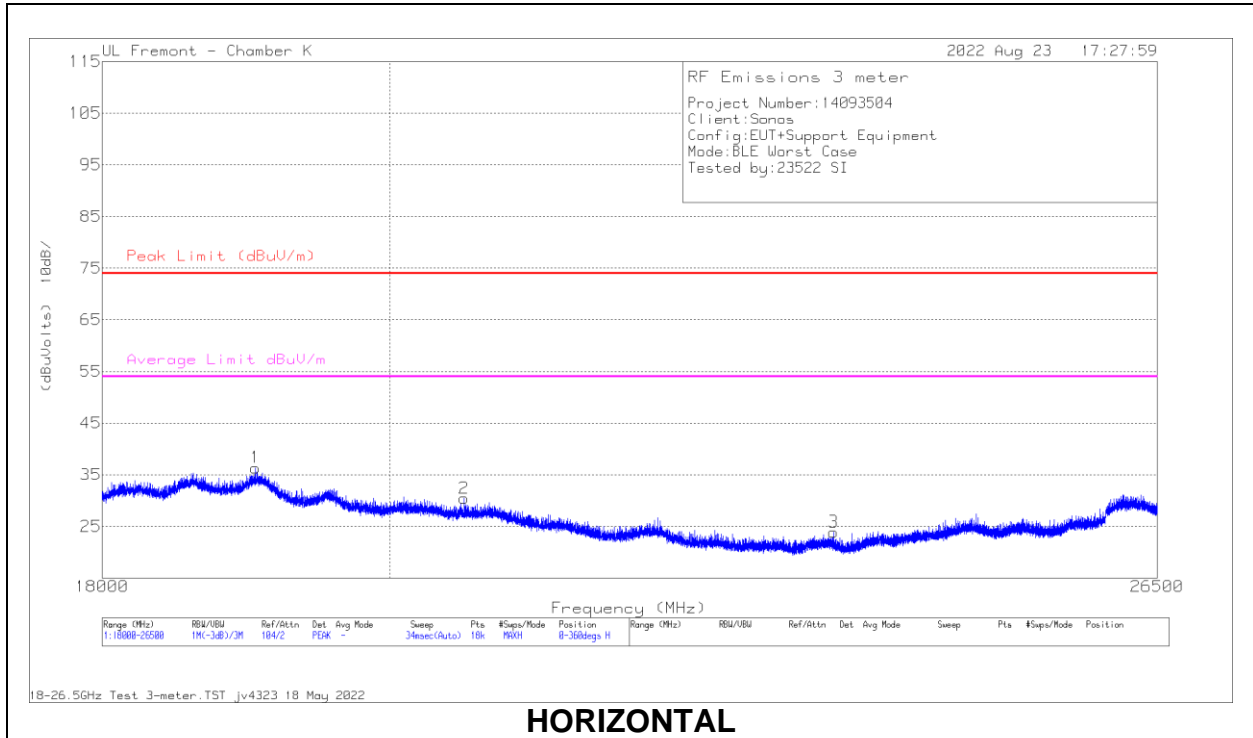
| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | 82258 ACF (dB) | Amp/Cbl (dB) | Corrected Reading (dBuV/m) | QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|--------------|----------------------------|--------------------|-------------|----------------|-------------|----------|
| 1      | * 136.618       | 43.83                | Pk  | 19.7           | -30.7        | 32.83                      | 43.52              | -10.69      | 0-360          | 197         | H        |
| 4      | 39.4788         | 44.72                | Qp  | 20.5           | -31.4        | 33.82                      | 40                 | -6.18       | 358            | 104         | V        |
| 5      | 45.7321         | 48.81                | Qp  | 16.2           | -31.3        | 33.71                      | 40                 | -6.29       | 42             | 97          | V        |
| 2      | 480.736         | 41.32                | Pk  | 23.9           | -29          | 36.22                      | 46.02              | -9.8        | 0-360          | 199         | H        |
| 3      | * 960.008       | 39.48                | Qp  | 29.4           | -26.3        | 42.58                      | 53.97              | -11.39      | 355            | 98          | H        |
| 6      | * 960.009       | 39.76                | Qp  | 29.4           | -26.3        | 42.86                      | 53.97              | -11.11      | 67             | 99          | V        |

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

Pk - Peak detector

Qp - Quasi-Peak detector

### 10.5. WORST CASE 18-26 GHz



**18 – 26GHz DATA**

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | 81138 AF (dB/m) | 215705 amp/cbl (dB) | Cables (dB) | Corrected Reading (dBuVolts) | Peak Limit (dBuV/m) | PK Margin (dB) | Average Limit dBuV/m | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|-----------------|---------------------|-------------|------------------------------|---------------------|----------------|----------------------|-------------|----------------|-------------|----------|
| 1      | * 19038.416     | 46.35                | Pk  | 32.6            | -60.7               | 18.1        | 36.35                        | 74                  | -37.65         | 54                   | -17.65      | 0-360          | 100         | H        |
| 2      | * 20553.777     | 38.33                | Pk  | 33.1            | -59.7               | 18.7        | 30.43                        | 74                  | -43.57         | 54                   | -23.57      | 0-360          | 200         | H        |
| 3      | 23533.497       | 31.19                | Pk  | 33.9            | -61.2               | 20          | 23.89                        | 74                  | -50.11         | 54                   | -30.11      | 0-360          | 100         | H        |
| 4      | * 18207.305     | 46.12                | Pk  | 32.4            | -60.9               | 17.7        | 35.32                        | 74                  | -38.68         | 54                   | -18.68      | 0-360          | 200         | V        |
| 5      | * 22068.193     | 34.47                | Pk  | 33.4            | -60.8               | 19.3        | 26.37                        | 74                  | -47.63         | 54                   | -27.63      | 0-360          | 200         | V        |
| 6      | * 23996.275     | 31.93                | Pk  | 33.9            | -61.2               | 20.2        | 24.83                        | 74                  | -49.17         | 54                   | -29.17      | 0-360          | 200         | V        |

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

## 11. 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        |

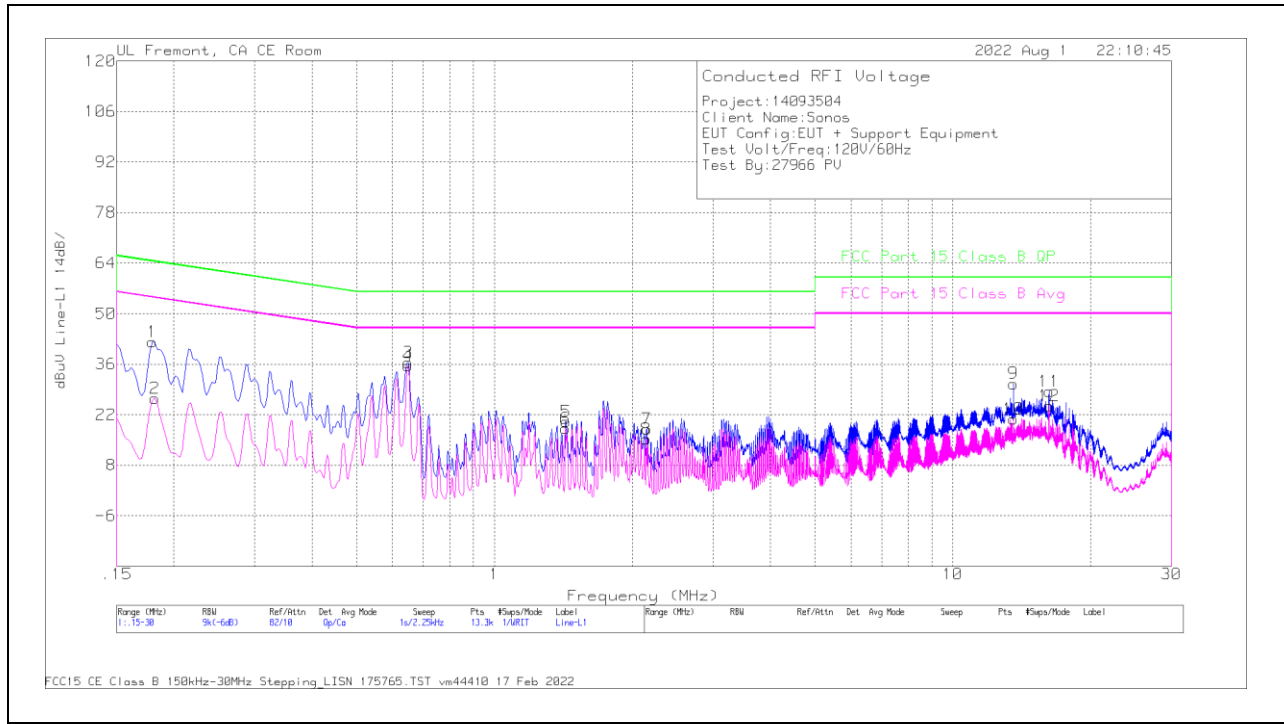
\*Decreases with the logarithm of the frequency.

### RESULTS



# 11.1. AC POWER LINE

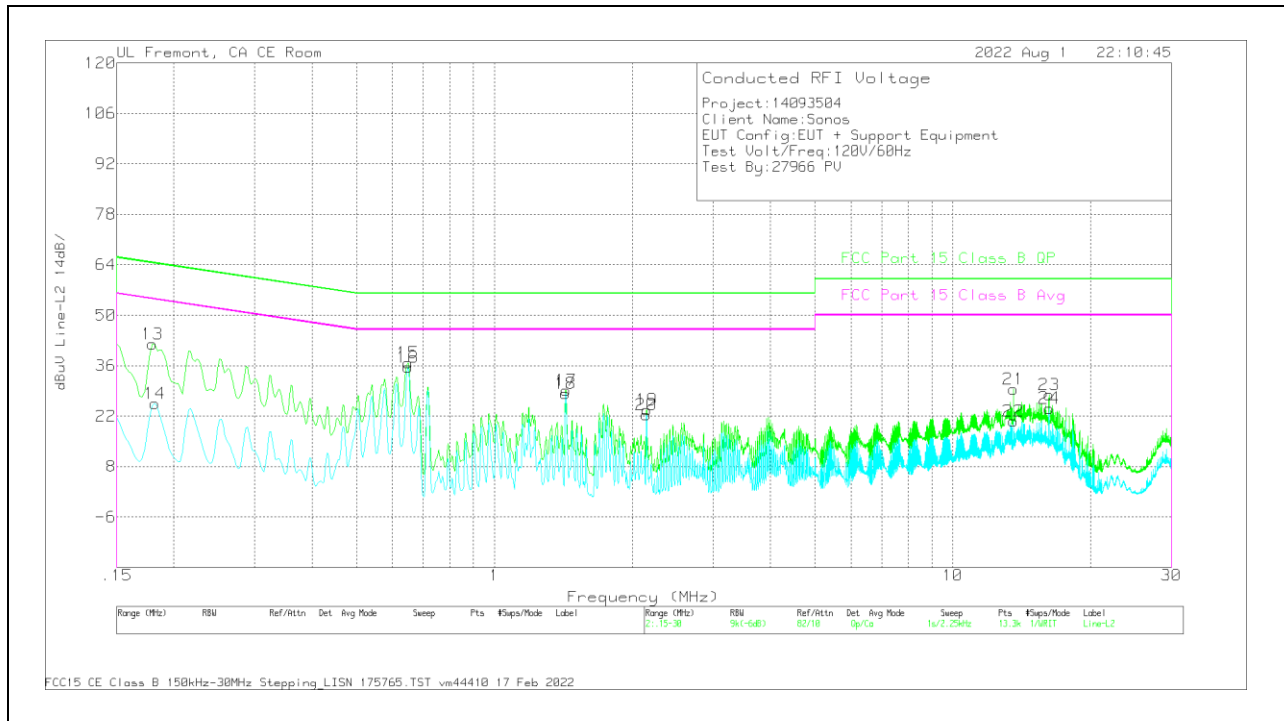
## LINE 1 RESULTS



| Range 1: Line-L1 .15 - 30MHz |                 |                      |     |                |                       |                                |                        |                        |                |                         |                       |
|------------------------------|-----------------|----------------------|-----|----------------|-----------------------|--------------------------------|------------------------|------------------------|----------------|-------------------------|-----------------------|
| Marker                       | Frequency (MHz) | Meter Reading (dBuV) | Det | 175765 LISN L1 | C1&C3 cable path loss | 207996 Limiter with short cabl | Corrected Reading dBuV | FCC Part 15 Class B QP | QP Margin (dB) | FCC Part 15 Class B Avg | Av(CISPR)M argin (dB) |
| 2                            | .1815           | 17.07                | Ca  | .1             | 0                     | 9.4                            | 26.57                  | -                      | -              | 54.42                   | -27.85                |
| 4                            | .6473           | 26.11                | Ca  | 0              | .1                    | 9.3                            | 35.51                  | -                      | -              | 46                      | -10.49                |
| 6                            | 1.4303          | 8.76                 | Ca  | 0              | .1                    | 9.3                            | 18.16                  | -                      | -              | 46                      | -27.84                |
| 8                            | 2.1458          | 5.9                  | Ca  | 0              | .1                    | 9.3                            | 15.3                   | -                      | -              | 46                      | -30.7                 |
| 10                           | 13.56           | 11.23                | Ca  | .1             | .2                    | 9.3                            | 20.83                  | -                      | -              | 50                      | -29.17                |
| 12                           | 16.2285         | 14.9                 | Ca  | .1             | .2                    | 9.3                            | 24.5                   | -                      | -              | 50                      | -25.5                 |
| 1                            | .1793           | 32.69                | Qp  | .1             | 0                     | 9.4                            | 42.19                  | 64.52                  | -22.33         | -                       | -                     |
| 3                            | .6473           | 27.11                | Qp  | 0              | .1                    | 9.3                            | 36.51                  | 56                     | -19.49         | -                       | -                     |
| 5                            | 1.4325          | 10.75                | Qp  | 0              | .1                    | 9.3                            | 20.15                  | 56                     | -35.85         | -                       | -                     |
| 7                            | 2.148           | 8.56                 | Qp  | 0              | .1                    | 9.3                            | 17.96                  | 56                     | -38.04         | -                       | -                     |
| 9                            | 13.56           | 21.02                | Qp  | .1             | .2                    | 9.3                            | 30.62                  | 60                     | -29.38         | -                       | -                     |
| 11                           | 16.2285         | 18.87                | Qp  | .1             | .2                    | 9.3                            | 28.47                  | 60                     | -31.53         | -                       | -                     |

Qp - Quasi-Peak detector  
 Ca - CISPR average detection

### LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | 175765 LISN L2 | C2&C3 cable path loss | 207996 Limiter with short cabl | Corrected Reading dBuV | FCC Part 15 Class B QP | QP Margin (dB) | FCC Part 15 Class B Avg | Av(CISPR)M argin (dB) |
|--------|-----------------|----------------------|-----|----------------|-----------------------|--------------------------------|------------------------|------------------------|----------------|-------------------------|-----------------------|
| 14     | .1815           | 16.06                | Ca  | .1             | 0                     | 9.4                            | 25.56                  | -                      | -              | 54.42                   | -28.86                |
| 16     | .6473           | 26.16                | Ca  | 0              | .1                    | 9.3                            | 35.56                  | -                      | -              | 46                      | -10.44                |
| 18     | 1.4303          | 18.94                | Ca  | 0              | .1                    | 9.3                            | 28.34                  | -                      | -              | 46                      | -17.66                |
| 20     | 2.1458          | 12.93                | Ca  | 0              | .1                    | 9.3                            | 22.33                  | -                      | -              | 46                      | -23.67                |
| 22     | 13.56           | 11.04                | Ca  | .1             | .2                    | 9.3                            | 20.64                  | -                      | -              | 50                      | -29.36                |
| 24     | 16.2285         | 14.58                | Ca  | .1             | .2                    | 9.3                            | 24.18                  | -                      | -              | 50                      | -25.82                |
| 13     | .1793           | 32.57                | Qp  | .1             | 0                     | 9.4                            | 42.07                  | 64.52                  | -22.45         | -                       | -                     |
| 15     | .6473           | 27.33                | Qp  | 0              | .1                    | 9.3                            | 36.73                  | 56                     | -19.27         | -                       | -                     |
| 17     | 1.4325          | 19.81                | Qp  | 0              | .1                    | 9.3                            | 29.21                  | 56                     | -26.79         | -                       | -                     |
| 19     | 2.148           | 14.35                | Qp  | 0              | .1                    | 9.3                            | 23.75                  | 56                     | -32.25         | -                       | -                     |
| 21     | 13.56           | 19.84                | Qp  | .1             | .2                    | 9.3                            | 29.44                  | 60                     | -30.56         | -                       | -                     |
| 23     | 16.2285         | 18.33                | Qp  | .1             | .2                    | 9.3                            | 27.93                  | 60                     | -32.07         | -                       | -                     |

Qp - Quasi-Peak detector  
 Ca - CISPR average detection