



# **CERTIFICATION TEST REPORT**

**Report Number. :** R12663786-E5

**Applicant :** Ideal Industries Lighting LLC, DBA CREE Lighting  
4401 Silicon Drive  
Durham, NC 27703, USA

**Model :** WIM-CMB-OEM

**FCC ID :** 2ACQ6-WMB

**IC :** 11481A-WMB

**EUT Description :** Wireless Integration Module with Bluetooth

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

**Date Of Issue:**  
2019-07-17

**Prepared by:**  
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## REPORT REVISION HISTORY

| Ver. | Issue Date | Revisions                             | Revised By      |
|------|------------|---------------------------------------|-----------------|
| 1    | 2019-06-28 | Initial Issue                         | Brian T. Kiewra |
| 2    | 2019-07-17 | Updated applicant name and FCC/IC IDs | Niklas Haydon   |

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** Ideal Industries Lighting LLC, DBA CREE Lighting  
4401 Silicon Drive  
Durham, NC 27703, USA

**EUT DESCRIPTION:** 802.15.4/BLE radio module

**MODEL:** WIM-CMB-OEM

**SERIAL NUMBER:** Radiated: WRC-2, JN251C78092, JN251C78096  
Conducted: JN251C78093, JN251C78096 (LC)

**DATE TESTED:** 2019-06-21 to 2019-06-26

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

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

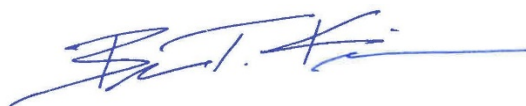
**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of 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.

Approved & Released  
For UL LLC By:



Jeffrey Moser  
Operations Leader  
UL – Consumer Technology Division

Prepared By:



Brian T. Kiewra  
Project Engineer  
UL – Consumer Technology Division

## 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, 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, NC 27709, USA and 2800 Perimeter Park Dr., Suite B, Morrisville, NC 27560, 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 Suite Perimeter Park Dr.                     |
|------------------------------------|---------------------------------------------------|
| ISED Site Code: 2180C              |                                                   |
| <input type="checkbox"/> Chamber A | <input type="checkbox"/> Chamber North            |
| <input type="checkbox"/> Chamber C | <input checked="" type="checkbox"/> Chamber South |

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

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. 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.

### 4.2. 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.  
 $36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$

### 4.3. 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                    |
| Occupied Channel Bandwidth          | 2.00%                       |
| RF output power, conducted          | 1.3 dB (PK)<br>0.45 dB (AV) |
| RF output power, radiated (SAC)     | 4.52 dB                     |
| Power Spectral Density, conducted   | 2.47 dB                     |
| 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%.

## 5. EQUIPMENT UNDER TEST

### 5.1. EUT DESCRIPTION

The EUT is a 802.15.4/BLE radio module. This report covers BLE.

### 5.2. 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  | 3.28               | 2.13              |

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The BLE radio utilize a Johanson 2450AT18B100 antenna, with a maximum gain of 0.5 dBi.

### 5.4. SOFTWARE AND FIRMWARE

The Firmware used for Bluetooth on the EUT during testing is common F/W for all Bluetooth channels - UART commands based "radio\_test\_pca10040.hex", Rev 0

### 5.5. 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 fundamental of the EUT was investigated in three orthogonal orientations X,Y,Z, it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

All testing done at power setting of 3dBm, except for power. Power will be set to 3dBm for 2402-2478MHz. 2480MHz will be set to 0dbm.



## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| Support Equipment List |                     |           |                |        |
|------------------------|---------------------|-----------|----------------|--------|
| Description            | Manufacturer        | Model     | Serial Number  | FCC ID |
| DC power supply        | Circuit Specialists | CSI3005X5 | Non-Serialized | NA     |

### I/O CABLES

| I/O Cable List |      |                      |                |            |                  |                          |
|----------------|------|----------------------|----------------|------------|------------------|--------------------------|
| Cable No.      | Port | # of Identical Ports | Connector Type | Cable Type | Cable Length (m) | Remarks                  |
| 1              | DC   | 1                    | Terminal       | Unshielded | <3m              | Provides DC power to EUT |

### SETUP DIAGRAMS

Refer to UL Document R12663786-EP5

## 6. MEASUREMENT METHOD

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

6 dB BW: ANSI C63.10 Subclause 11.8.1

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

Output Power: ANSI C63.10 Subclause 11.9.1.3 (PKPM1)

PSD: ANSI C63.10 Subclause 11.10.2 (Peak PSD)

Out-of-band emissions in non-restricted bands: ANSI C63.10-2013 Section 11.11 & 6.10.4

Out-of-band emissions in restricted bands: ANSI C63.10-2013 Section 11.12.1 & 6.10.5

General Radiated Emissions: ANSI C63.10:2013 Sections 6.3 – 6.6

## 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)

| Equipment ID                     | Description                                       | Manufacturer         | Model Number | Last Cal.  | Next Cal.  |
|----------------------------------|---------------------------------------------------|----------------------|--------------|------------|------------|
| <b>0.009-30MHz (Loop Ant.)</b>   |                                                   |                      |              |            |            |
| AT0079                           | Active Loop Antenna                               | ETS-Lindgren         | 6502         | 2019-01-24 | 2020-01-31 |
| <b>30-1000 MHz</b>               |                                                   |                      |              |            |            |
| AT0074                           | Hybrid Broadband Antenna                          | Sunol Sciences Corp. | JB3          | 2018-07-24 | 2019-07-24 |
| <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-SAC01                          | Gain-loss string: 0.009-30MHz                     | Various              | Various      | 2019-05-02 | 2020-05-02 |
| S-SAC02                          | Gain-loss string: 25-1000MHz                      | Various              | Various      | 2019-05-02 | 2020-05-02 |
| 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       | 2019-05-15 | 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 |
| 76022                            | DC Regulated Power Supply                         | Circuit Specialists  | CSI3005X5    | N/A        | N/A        |

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 181562858         | Environmental Meter                           | Fisher Scientific   | 14-650-118                  | 2018-09-04 | 2020-09-04 |
| LISN003               | LISN, 50-ohm/50-uH, 2-conductor, 25A          | Fischer Custom      | FCC-LISN-50-25-2-01-550V    | 2018-08-21 | 2019-08-21 |
| 75141<br>(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 |
| PS214                 | AC Power Source                               | Elgar               | CW2501M<br>(s/n 1523A02396) | NA         | NA         |
| SOFTEMI               | EMI Software                                  | UL                  | Version 9.5                 | NA         | NA         |
| 76021                 | DC Regulated Power Supply                     | Circuit Specialists | CSI3005X5                   | N/A        | N/A        |

Test Equipment Used - Wireless Conducted Measurement Equipment

| Equipment ID           | Description                              | Manufacturer          | Model Number     | Last Cal.  | Next Cal   |
|------------------------|------------------------------------------|-----------------------|------------------|------------|------------|
| 72822<br>(PRE0100902)  | Spectrum Analyzer                        | Agilent Technologies  | E4446A           | 2018-11-19 | 2019-11-19 |
| PWM002<br>(PRE0137346) | RF Power Meter                           | Keysight Technologies | N1911A           | 2018-07-30 | 2019-07-30 |
| PWS002<br>(PRE0126443) | Peak and Avg Power Sensor, 50MHz to 6GHz | Keysight Technologies | E9323A           | 2018-07-30 | 2019-07-30 |
| 76023<br>(EC0225)      | Temp/Humid Chamber                       | Cincinnati Sub-Zero   | ZPH-8-3.5-SCT/AC | 2019-06-14 | 2020-06-14 |
| SN 181474341           | Environmental Meter                      | Fisher Scientific     | 15-077-963       | 2018-07-27 | 2020-07-27 |
| 76021                  | DC Regulated Power Supply                | Circuit Specialists   | CSI3005X5        | N/A        | N/A        |

## 8. ANTENNA PORT TEST RESULTS

### 8.1. ON TIME AND DUTY CYCLE

#### LIMITS

None; for reporting purposes only.

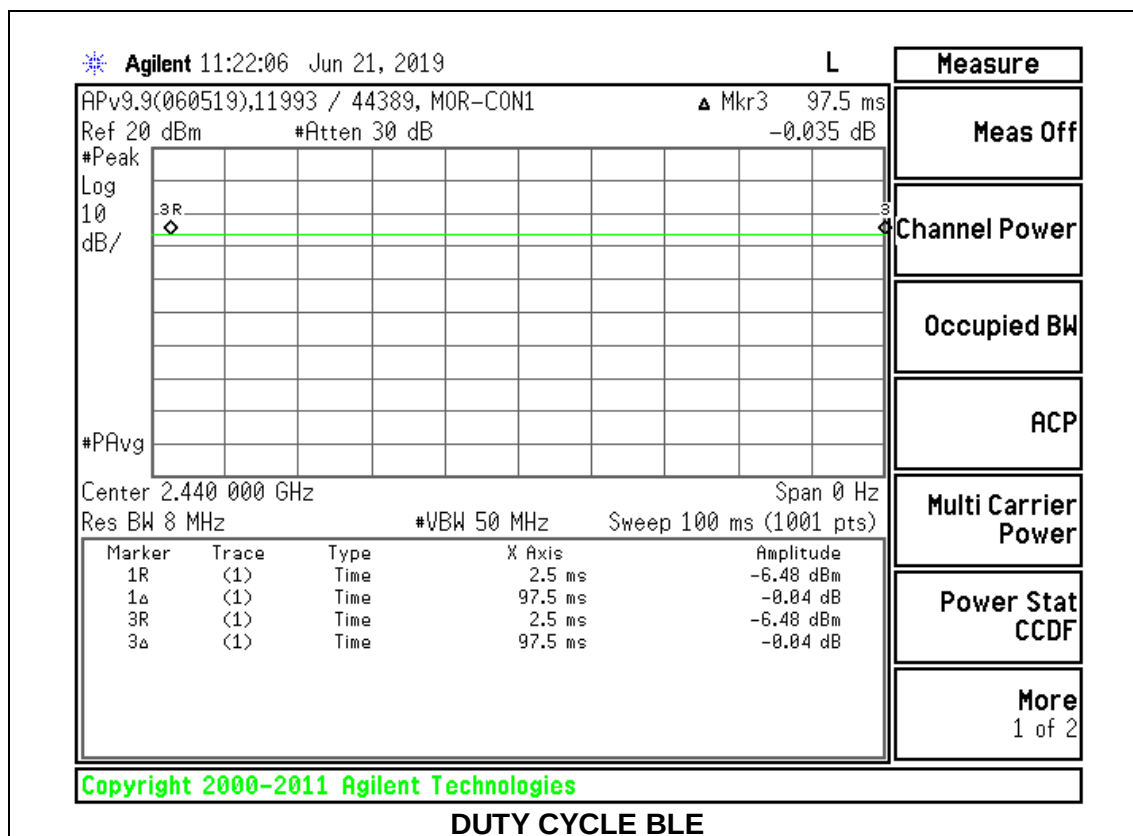
#### PROCEDURE

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) |
|--------------------|------------------------|------------------|-----------------------------|----------------------|-----------------------------------------|-----------------------------|
| <b>2.4GHz Band</b> |                        |                  |                             |                      |                                         |                             |
| BLE                | 97.500                 | 97.500           | 1.000                       | 100.00%              | 0.00                                    | 0.010                       |

#### DUTY CYCLE PLOTS

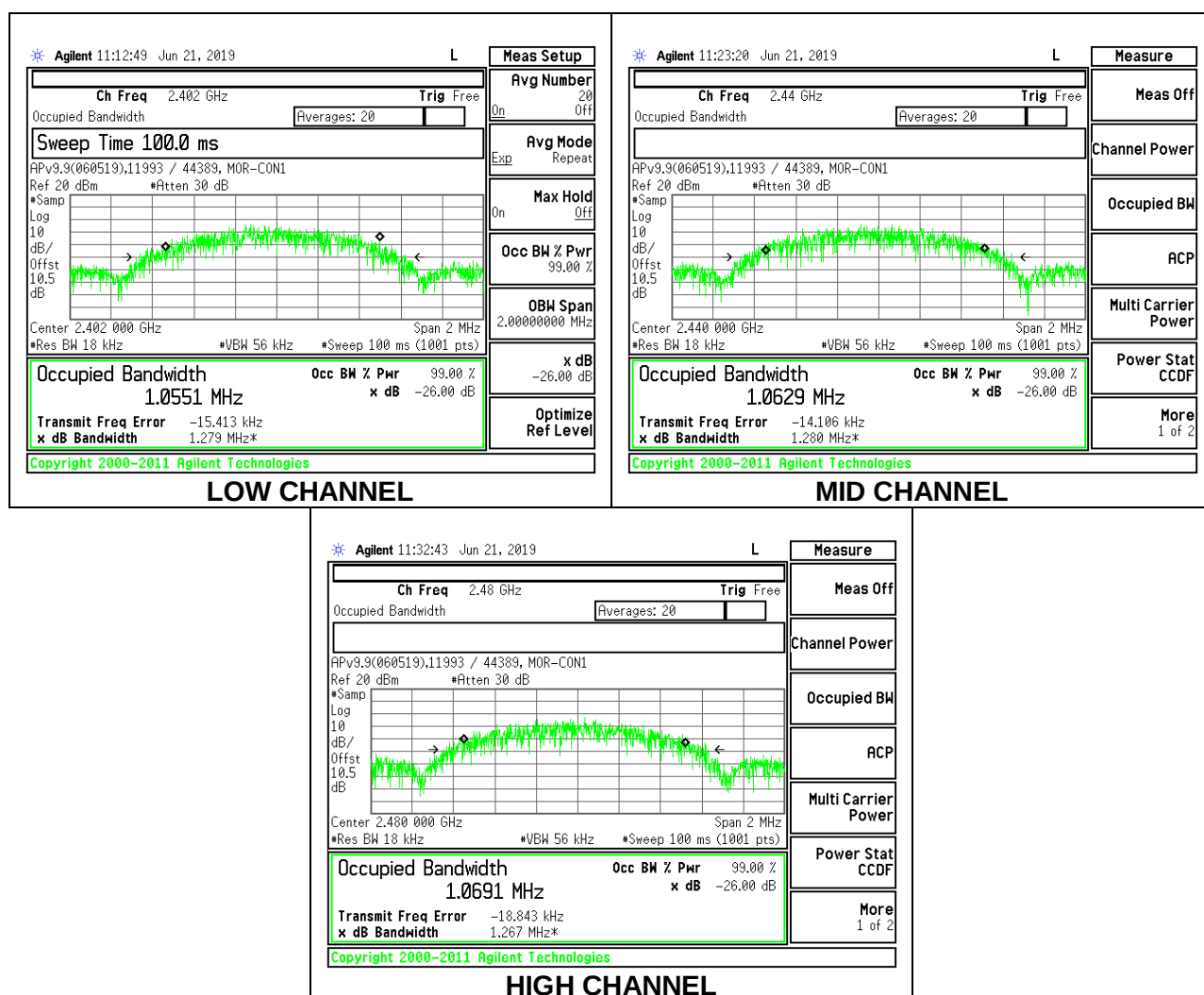


## 8.2. 99% BANDWIDTH

### LIMITS

None; for reporting purposes only.

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---------|-----------------|---------------------|
| Low     | 2402            | 1.0551              |
| Middle  | 2440            | 1.0629              |
| High    | 2480            | 1.0691              |



Note - All testing done at power setting of 3dBm, except for power. Power will be set to 3dBm for 2402-2478MHz. 2480MHz will be set to 0dbm.

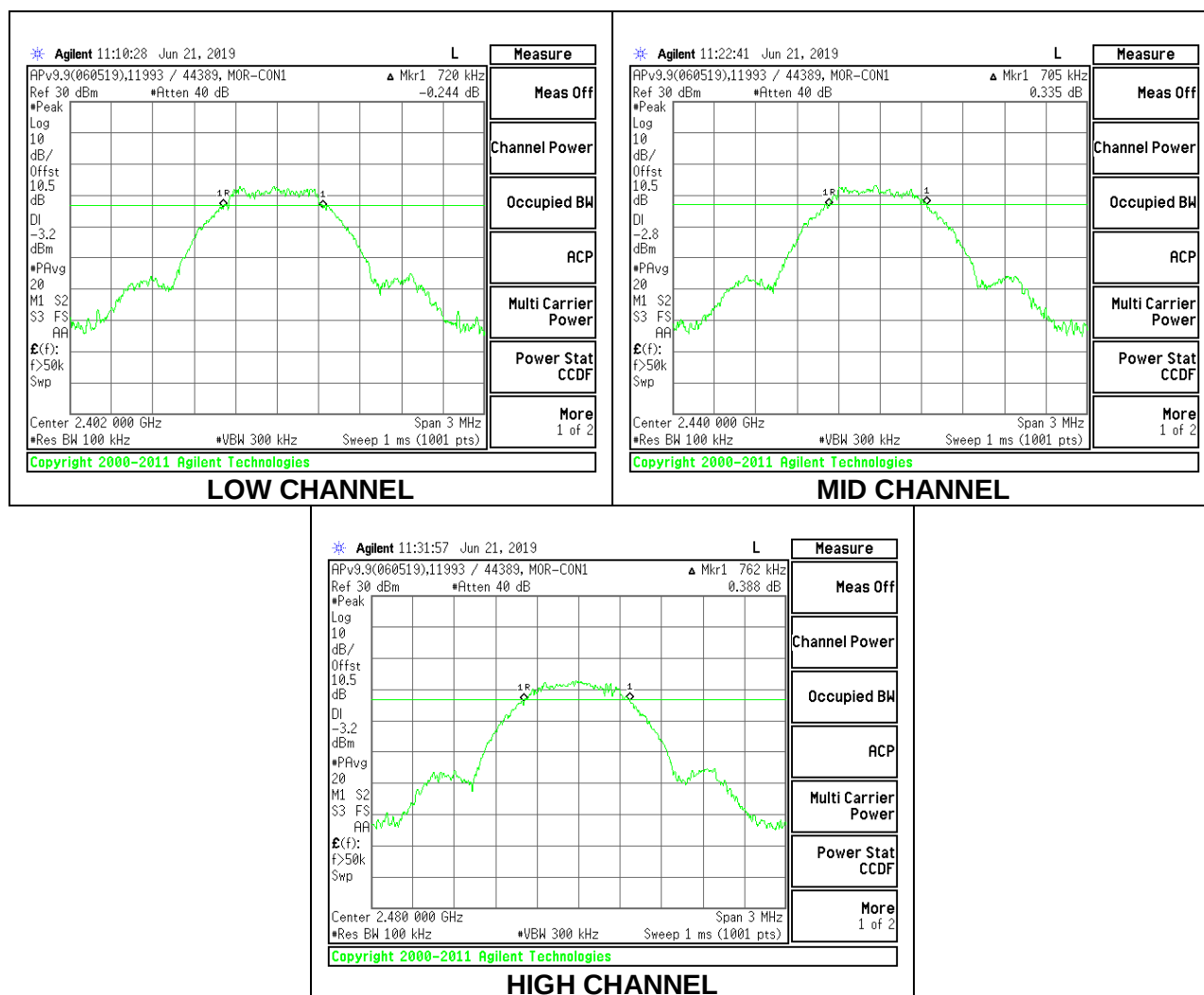
### 8.3. 6 dB BANDWIDTH

#### LIMITS

FCC §15.247 (a) (2)  
RSS-247 5.2 (a)

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

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---------|-----------------|----------------------|---------------------|
| Low     | 2402            | 0.720                | 0.5                 |
| Middle  | 2440            | 0.705                | 0.5                 |
| High    | 2480            | 0.762                | 0.5                 |



Note - All testing done at power setting of 3dBm, except for power. Power will be set to 3dBm for 2402-2478MHz. 2480MHz will be set to 0dbm.

## 8.4. 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 cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for a peak reading of power.

|                   |             |
|-------------------|-------------|
| <b>Tested By:</b> | 11993/44389 |
| <b>Date:</b>      | 2019-06-26  |

| <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                       | 2.88                                    | 30                     | -27.12                 |
| Middle         | 2440                       | 2.99                                    | 30                     | -27.01                 |
| High           | 2478                       | 3.28                                    | 30                     | -26.72                 |
| High           | 2480                       | 0.99                                    | 30                     | -29.01                 |



## 8.5. AVERAGE POWER

### LIMITS

None; for reporting purposes only.

### TEST PROCEDURE

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for a gated average reading of power.

|                   |             |
|-------------------|-------------|
| <b>Tested By:</b> | 11993/44389 |
| <b>Date:</b>      | 2019-06-26  |

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>AV power<br/>(dBm)</b> |
|----------------|----------------------------|---------------------------|
| Low            | 2402                       | 2.68                      |
| Middle         | 2440                       | 2.77                      |
| High           | 2478                       | 3.09                      |
| High           | 2480                       | 0.67                      |

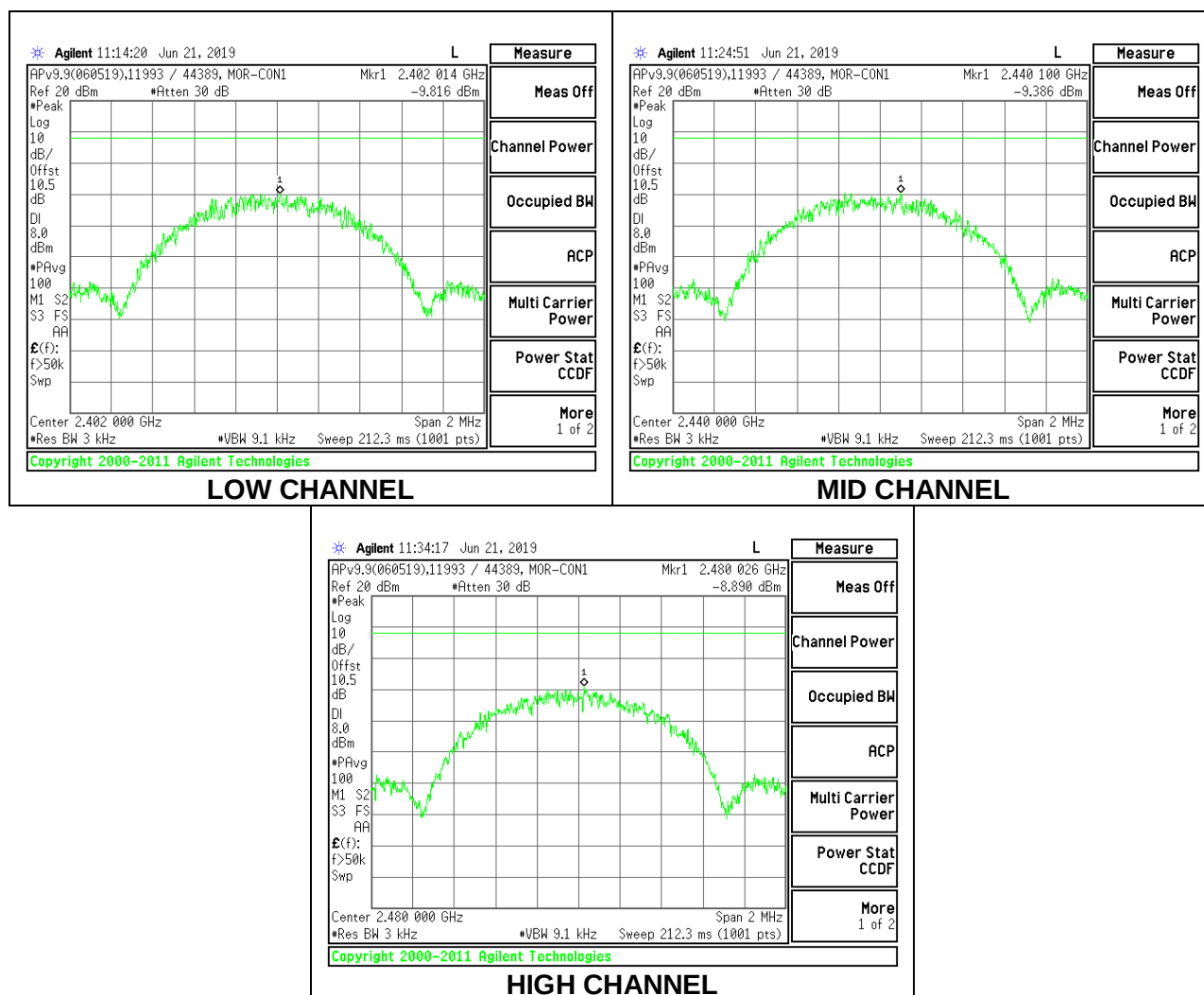
## 8.6. POWER SPECTRAL DENSITY

### 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.

| Channel | Frequency (MHz) | PSD (dBm/3kHz) | Limit (dBm/3kHz) | Margin (dB) |
|---------|-----------------|----------------|------------------|-------------|
| Low     | 2402            | -9.816         | 8                | -17.82      |
| Middle  | 2440            | -9.386         | 8                | -17.39      |
| High    | 2480            | -8.890         | 8                | -16.89      |



Note - All testing done at power setting of 3dBm, except for power. Power will be set to 3dBm for 2402-2478MHz. 2480MHz will be set to 0dbm.

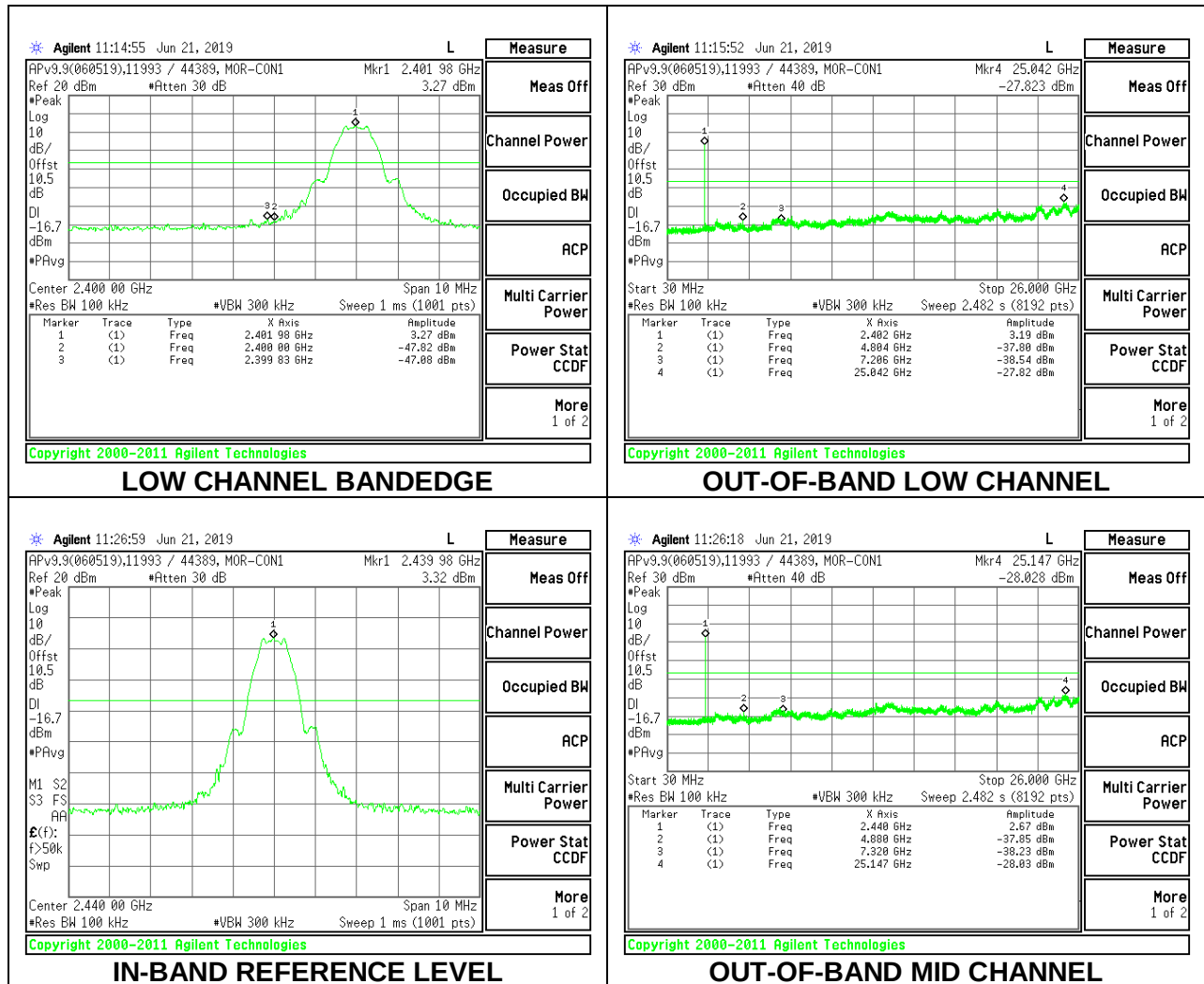
## 8.7. CONDUCTED SPURIOUS EMISSIONS

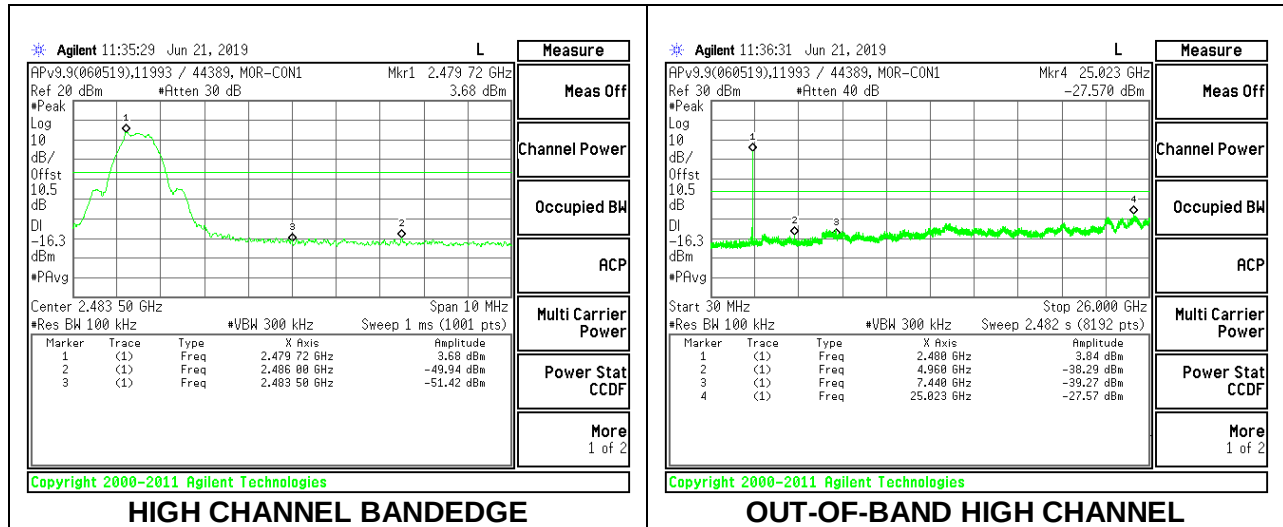
### LIMITS

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.





Note - All testing done at power setting of 3dBm, except for power. Power will be set to 3dBm for 2402-2478MHz. 2480MHz will be set to 0dbm.

## 9. RADIATED TEST RESULTS

### 9.1. 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. In this case RMS averaging was used.

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 and PSD 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.

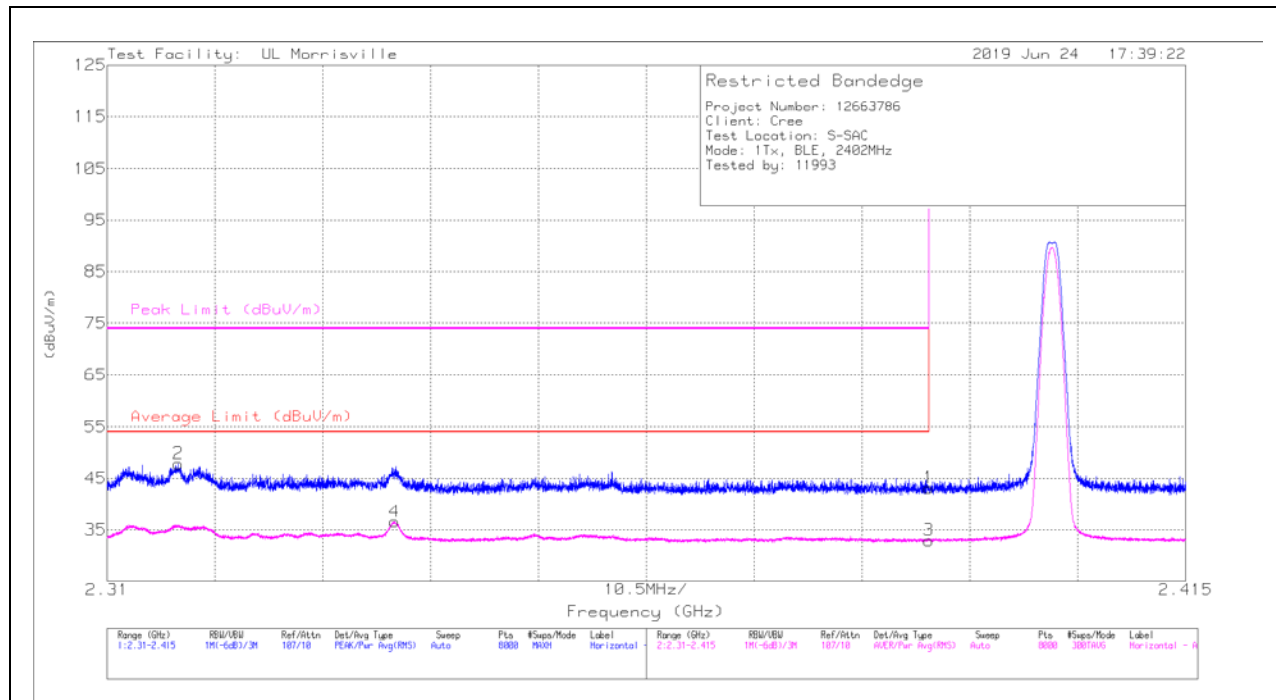
OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Note - All testing done at power setting of 3dBm, except for power. Power will be set to 3dBm for 2402-2478MHz. 2480MHz will be set to 0dbm.

## 9.2. TRANSMITTER ABOVE 1 GHz

### BANDEDGE (LOW CHANNEL)

#### HORIZONTAL RESULT



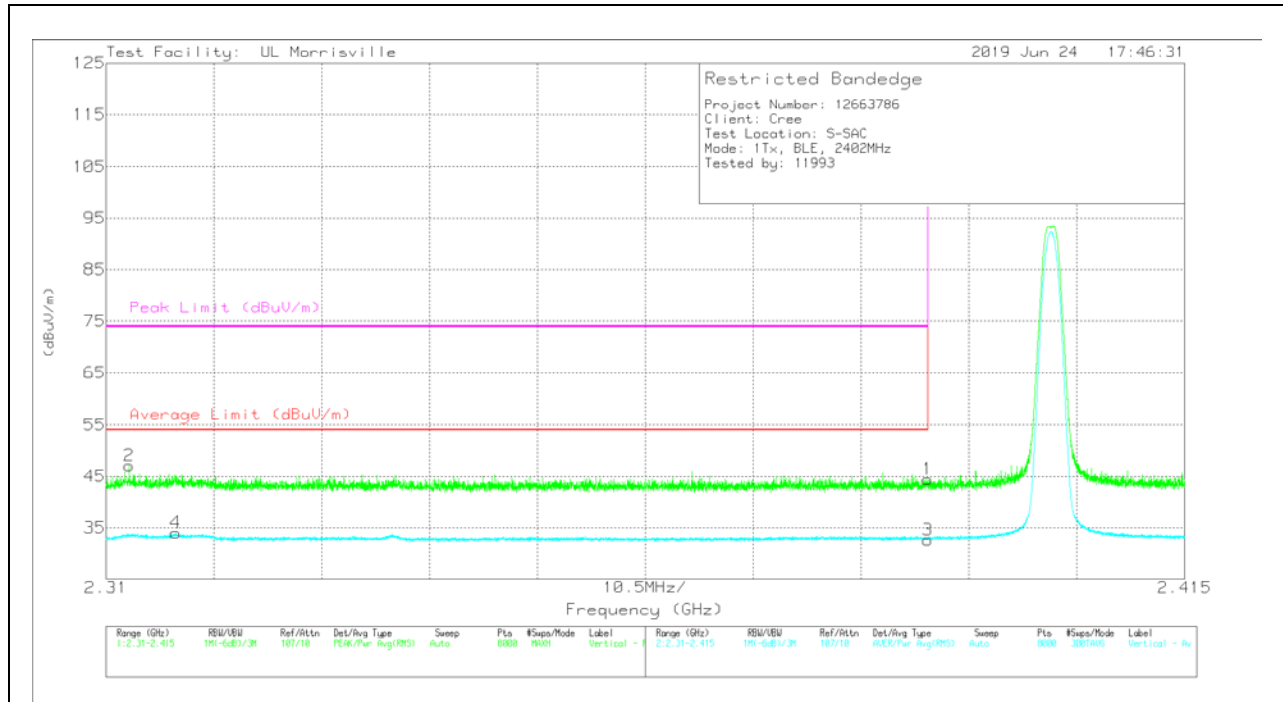
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AT0072 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|---------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.39          | 35.23                | Pk  | 31.9          | -24                    | 43.13                      | -                      | -           | 74                  | -30.87         | 2              | 112         | H        |
| 2      | * 2.31692       | 39.8                 | Pk  | 31.7          | -23.7                  | 47.8                       | -                      | -           | 74                  | -26.2          | 2              | 112         | H        |
| 3      | * 2.39          | 25.05                | RMS | 31.9          | -24                    | 32.95                      | 54                     | -21.05      | -                   | -              | 2              | 112         | H        |
| 4      | * 2.33797       | 28.64                | RMS | 31.6          | -23.7                  | 36.54                      | 54                     | -17.46      | -                   | -              | 2              | 112         | H        |

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

Pk - Peak detector

RMS - RMS detection

## 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          | 36.55                | Pk  | 31.9          | -24                    | 44.45                      | -                      | -           | 74                  | -29.55         | 214            | 353         | V        |
| 2      | * 2.31222       | 39.03                | Pk  | 31.7          | -23.7                  | 47.03                      | -                      | -           | 74                  | -26.97         | 214            | 353         | V        |
| 3      | * 2.39          | 24.73                | RMS | 31.9          | -24                    | 32.63                      | 54                     | -21.37      | -                   | -              | 214            | 353         | V        |
| 4      | * 2.31677       | 26.04                | RMS | 31.7          | -23.7                  | 34.04                      | 54                     | -19.96      | -                   | -              | 214            | 353         | V        |

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

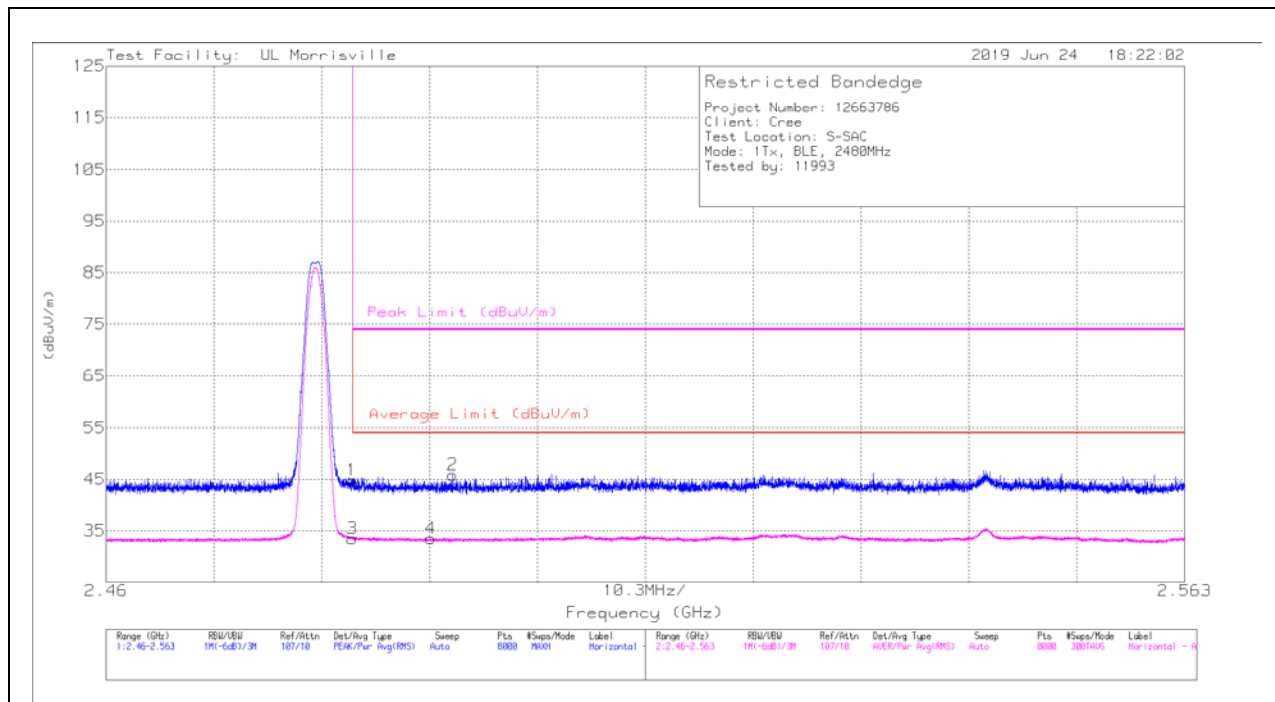
Pk - Peak detector

RMS - RMS detection



## BANDEDGE (HIGH CHANNEL)

### HORIZONTAL RESULT



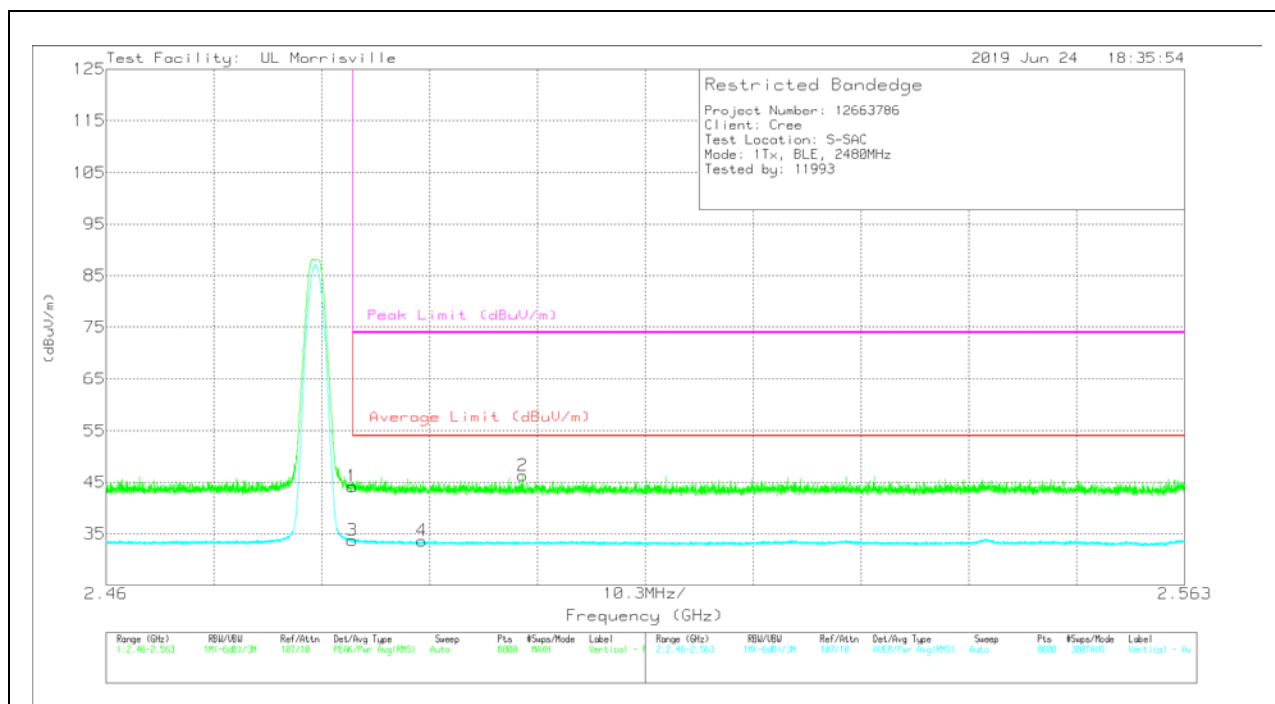
| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AT0072 (dB/m) | Amp/Cbl/Filtr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|---------------|------------------------|----------------------------|------------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 1      | * 2.4835        | 36.99                | Pk  | 32.3          | -24.5                  | 44.79                      | -                      | -           | 74                  | -29.21         | 21             | 349         | H        |
| 2      | * 2.49312       | 38.03                | Pk  | 32.3          | -24.5                  | 45.83                      | -                      | -           | 74                  | -28.17         | 21             | 349         | H        |
| 3      | * 2.4835        | 25.69                | RMS | 32.3          | -24.5                  | 33.49                      | 54                     | -20.51      | -                   | -              | 21             | 349         | H        |
| 4      | * 2.49102       | 25.68                | RMS | 32.3          | -24.5                  | 33.48                      | 54                     | -20.52      | -                   | -              | 21             | 349         | H        |

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

Pk - Peak detector

RMS - RMS detection

## 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        | 36.43                | Pk  | 32.3          | -24.5                  | 44.23                      | -                      | -           | 74                  | -29.77         | 108            | 227         | V        |
| 2      | * 2.49979       | 38.58                | Pk  | 32.3          | -24.6                  | 46.28                      | -                      | -           | 74                  | -27.72         | 108            | 227         | V        |
| 3      | * 2.4835        | 25.98                | RMS | 32.3          | -24.5                  | 33.78                      | 54                     | -20.22      | -                   | -              | 108            | 227         | V        |
| 4      | * 2.49017       | 25.86                | RMS | 32.3          | -24.5                  | 33.66                      | 54                     | -20.34      | -                   | -              | 108            | 227         | V        |

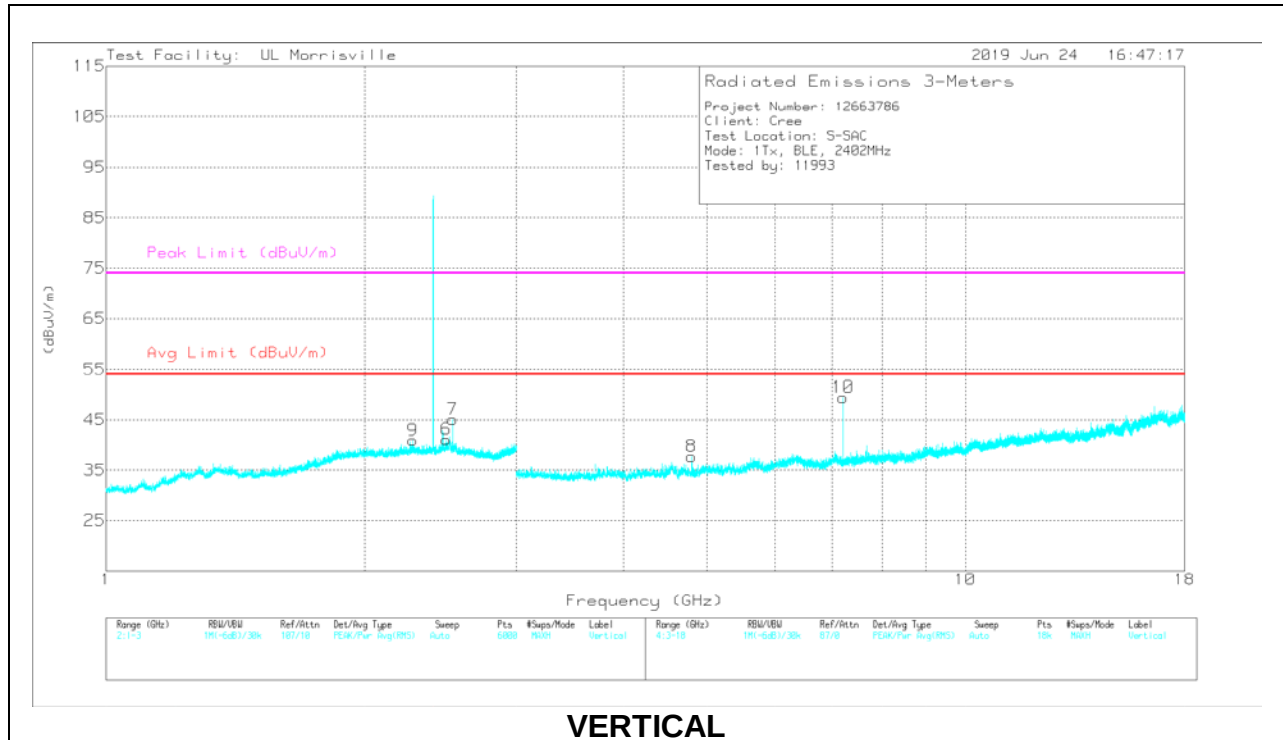
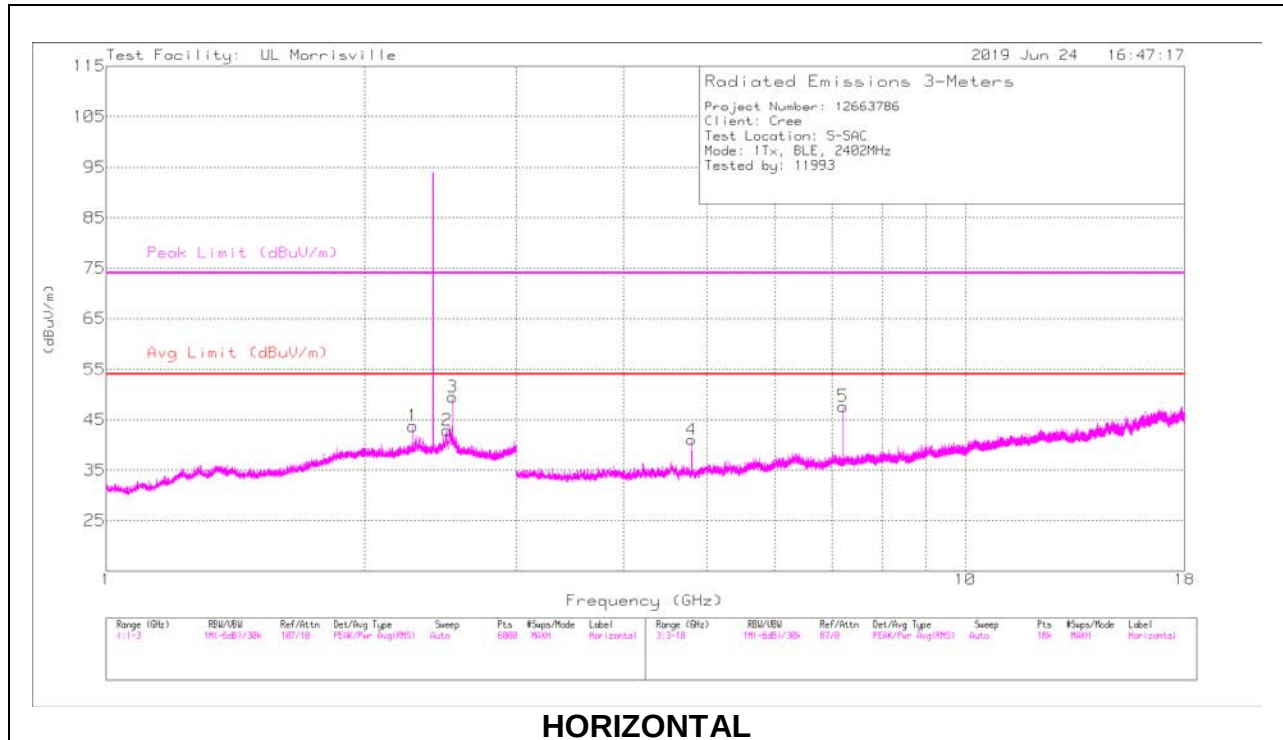
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

## HARMONICS AND SPURIOUS EMISSIONS

### LOW CHANNEL RESULTS



## RADIATED EMISSIONS

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det  | 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 |
|--------|-----------------|----------------------|------|---------------|------------------------|----------------------------|--------------------|-------------|---------------------|----------------|----------------|-------------|----------|
| 2      | * 2.27423       | 41.93                | PK2  | 31.8          | -23.5                  | 50.23                      | -                  | -           | 74                  | -23.77         | 14             | 202         | H        |
|        | * 2.27398       | 32.72                | MAv1 | 31.8          | -23.5                  | 41.02                      | 54                 | -12.98      | -                   | -              | 14             | 202         | H        |
| 3      | * 2.49173       | 43.13                | PK2  | 32.3          | -24.5                  | 50.93                      | -                  | -           | 74                  | -23.07         | 290            | 202         | H        |
|        | * 2.4917        | 31.77                | MAv1 | 32.3          | -24.5                  | 39.57                      | 54                 | -14.43      | -                   | -              | 290            | 202         | H        |
| 6      | * 2.48738       | 41.36                | PK2  | 32.3          | -24.5                  | 49.16                      | -                  | -           | 74                  | -24.84         | 229            | 101         | V        |
|        | * 2.48728       | 28.28                | MAv1 | 32.3          | -24.5                  | 36.08                      | 54                 | -17.92      | -                   | -              | 229            | 101         | V        |
| 9      | * 2.2743        | 39.5                 | PK2  | 31.8          | -23.5                  | 47.8                       | -                  | -           | 74                  | -26.2          | 201            | 288         | V        |
|        | * 2.27394       | 29.62                | MAv1 | 31.8          | -23.5                  | 37.92                      | 54                 | -16.08      | -                   | -              | 201            | 288         | V        |
| 4      | * 4.8044        | 43.48                | PK2  | 34.2          | -31                    | 46.68                      | -                  | -           | 74                  | -27.32         | 296            | 187         | H        |
|        | * 4.80434       | 34.84                | MAv1 | 34.2          | -31                    | 38.04                      | 54                 | -15.96      | -                   | -              | 296            | 187         | H        |
| 8      | * 4.80451       | 42.31                | PK2  | 34.2          | -31                    | 45.51                      | -                  | -           | 74                  | -28.49         | 121            | 105         | V        |
|        | * 4.80431       | 33.09                | MAv1 | 34.2          | -31                    | 36.29                      | 54                 | -17.71      | -                   | -              | 121            | 105         | V        |
| 7      | 2.52992         | 37.5                 | Pk   | 32.4          | -24.8                  | 45.1                       | -                  | -           | -                   | -              | 0-360          | 199         | V        |
| 3      | 2.53026         | 41.84                | Pk   | 32.4          | -24.8                  | 49.44                      | -                  | -           | -                   | -              | 0-360          | 199         | H        |
| 10     | 7.2044          | 41.69                | Pk   | 35.7          | -28                    | 49.39                      | -                  | -           | -                   | -              | 0-360          | 101         | V        |
| 5      | 7.20607         | 39.93                | Pk   | 35.7          | -28                    | 47.63                      | -                  | -           | -                   | -              | 0-360          | 101         | H        |

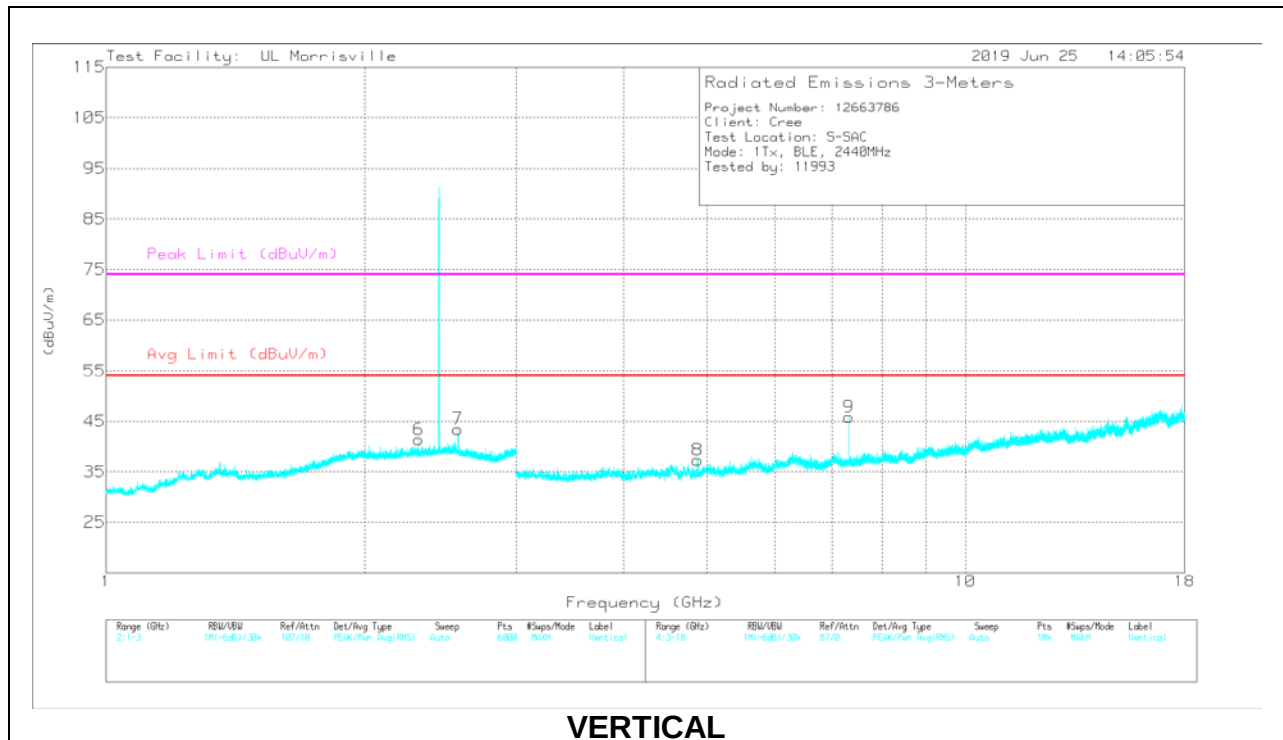
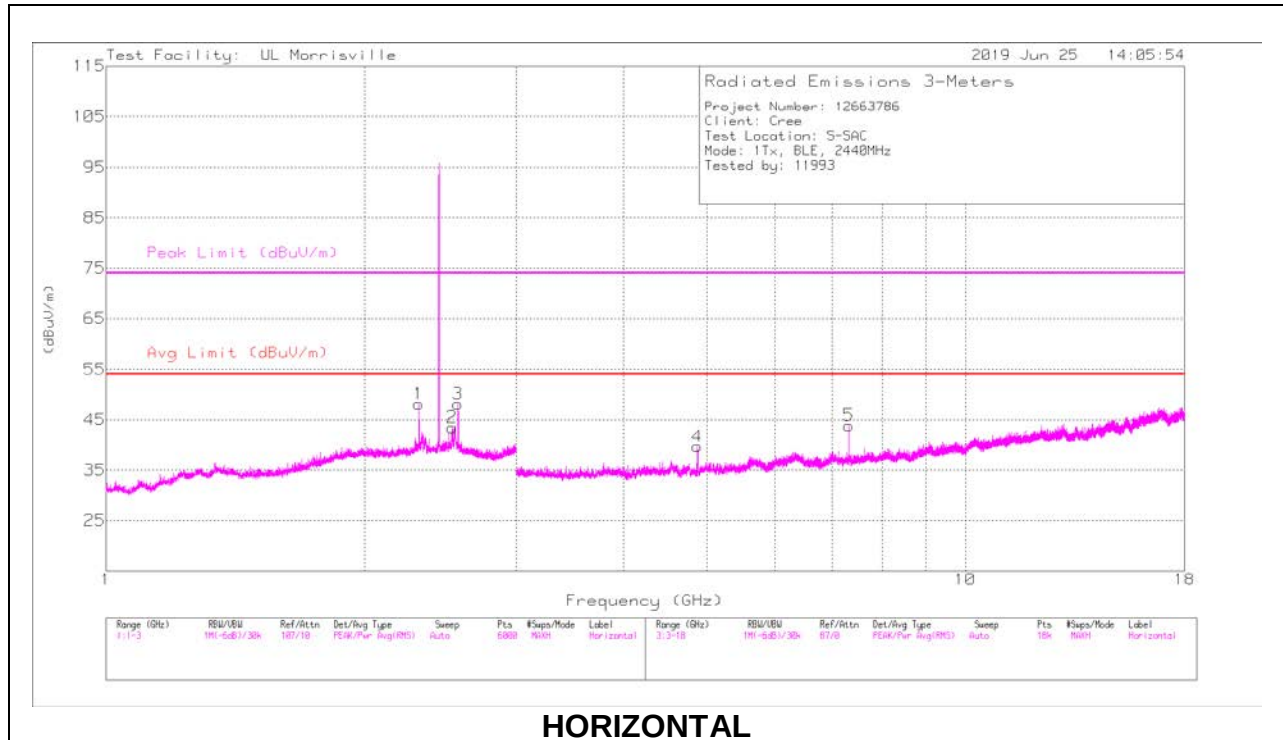
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - Maximum Peak

MAv1 - Maximum RMS Average

Pk - Peak detector

## MID 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      | * 2.31217       | 45.01                | PK2  | 31.7          | -23.7                  | 53.01                      | -                  | -           | 74                  | -20.99         | 354            | 106         | H        |
|        | * 2.31201       | 37.63                | MAv1 | 31.7          | -23.7                  | 45.63                      | 54                 | -8.37       | -                   | -              | 354            | 106         | H        |
| 6      | * 2.31199       | 41.74                | PK2  | 31.7          | -23.7                  | 49.74                      | -                  | -           | 74                  | -24.26         | 273            | 393         | V        |
|        | * 2.31196       | 32.79                | MAv1 | 31.7          | -23.7                  | 40.79                      | 54                 | -13.21      | -                   | -              | 273            | 393         | V        |
| 4      | * 4.8796        | 43.17                | PK2  | 34            | -30.6                  | 46.57                      | -                  | -           | 74                  | -27.43         | 146            | 205         | H        |
|        | * 4.87958       | 32.74                | MAv1 | 34            | -30.6                  | 36.14                      | 54                 | -17.86      | -                   | -              | 146            | 205         | H        |
| 5      | * 7.31923       | 42.24                | PK2  | 35.7          | -27.5                  | 50.44                      | -                  | -           | 74                  | -23.56         | 73             | 109         | H        |
|        | * 7.31925       | 34.69                | MAv1 | 35.7          | -27.5                  | 42.89                      | 54                 | -11.11      | -                   | -              | 73             | 109         | H        |
| 8      | * 4.8794        | 41.17                | PK2  | 34            | -30.6                  | 44.57                      | -                  | -           | 74                  | -29.43         | 337            | 197         | V        |
|        | * 4.87966       | 30.47                | MAv1 | 34            | -30.6                  | 33.87                      | 54                 | -20.13      | -                   | -              | 337            | 197         | V        |
| 9      | * 7.31925       | 41.98                | PK2  | 35.7          | -27.5                  | 50.18                      | -                  | -           | 74                  | -23.82         | 120            | 103         | V        |
|        | * 7.31928       | 34.72                | MAv1 | 35.7          | -27.5                  | 42.92                      | 54                 | -11.08      | -                   | -              | 120            | 103         | V        |
| 2      | 2.52526         | 35.79                | Pk   | 32.4          | -24.7                  | 43.49                      | -                  | -           | -                   | -              | 0-360          | 101         | H        |
| 7      | 2.56793         | 36.19                | Pk   | 32.3          | -25                    | 43.49                      | -                  | -           | -                   | -              | 0-360          | 199         | V        |
| 3      | 2.56826         | 40.81                | Pk   | 32.3          | -25                    | 48.11                      | -                  | -           | -                   | -              | 0-360          | 101         | H        |

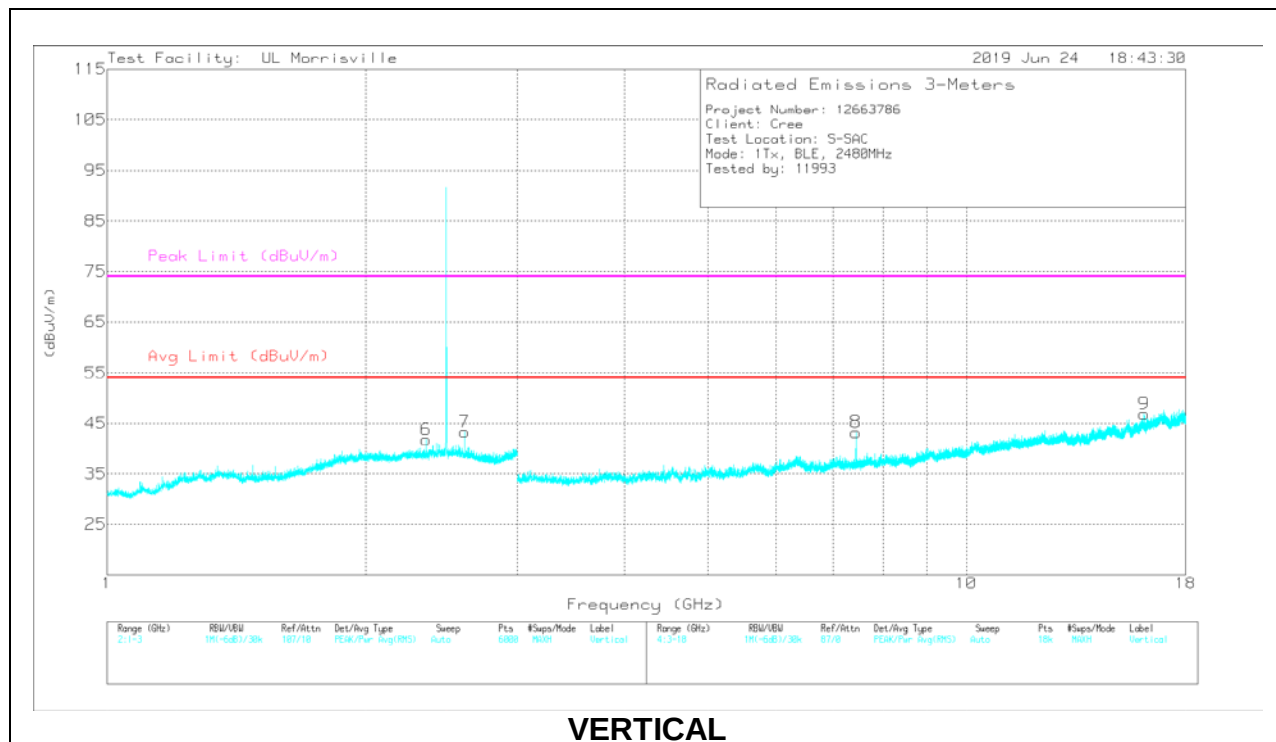
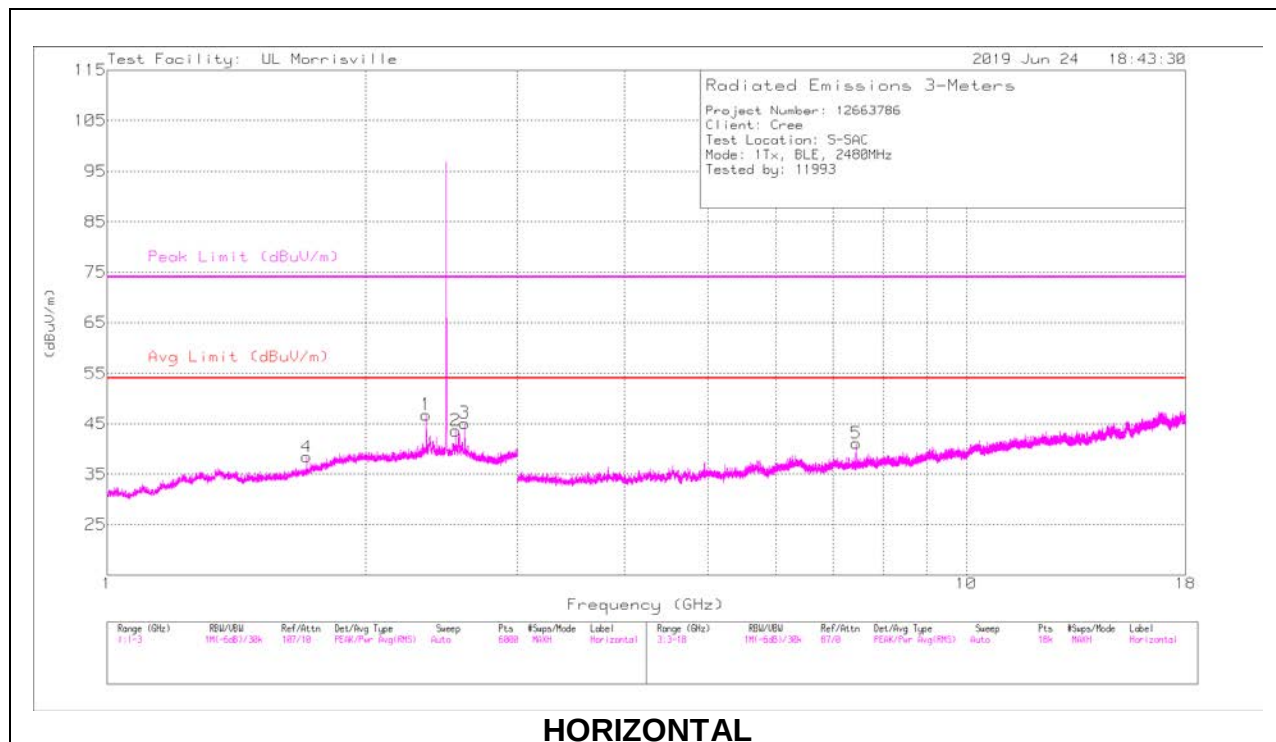
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - Maximum Peak

MAv1 - Maximum RMS Average

Pk - Peak detector

## 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      | * 2.35181       | 44.61                | PK2  | 31.7          | -23.8                  | 52.51                      | -                  | -           | 74                  | -21.49         | 350            | 104         | H        |
|        | * 2.35199       | 37.13                | MAv1 | 31.7          | -23.8                  | 45.03                      | 54                 | -8.97       | -                   | -              | 350            | 104         | H        |
| 4      | * 1.70704       | 36.04                | PK2  | 29            | -22.1                  | 42.94                      | -                  | -           | 74                  | -31.06         | 22             | 200         | H        |
|        | * 1.70619       | 23.73                | MAv1 | 28.9          | -22.1                  | 30.53                      | 54                 | -23.47      | -                   | -              | 22             | 200         | H        |
| 6      | * 2.35201       | 41.69                | PK2  | 31.7          | -23.8                  | 49.59                      | -                  | -           | 74                  | -24.41         | 187            | 387         | V        |
|        | * 2.35198       | 32.72                | MAv1 | 31.7          | -23.8                  | 40.62                      | 54                 | -13.38      | -                   | -              | 187            | 387         | V        |
| 5      | * 7.4392        | 39.36                | PK2  | 35.8          | -27.8                  | 47.36                      | -                  | -           | 74                  | -26.64         | 91             | 101         | H        |
|        | * 7.44059       | 30.14                | MAv1 | 35.8          | -27.8                  | 38.14                      | 54                 | -15.86      | -                   | -              | 91             | 101         | H        |
| 8      | * 7.44073       | 41.03                | PK2  | 35.8          | -27.8                  | 49.03                      | -                  | -           | 74                  | -24.97         | 123            | 104         | V        |
|        | * 7.44066       | 33.28                | MAv1 | 35.8          | -27.8                  | 41.28                      | 54                 | -12.72      | -                   | -              | 123            | 104         | V        |
| 9      | * 16.10618      | 35.24                | PK2  | 40.9          | -23.6                  | 52.54                      | -                  | -           | 74                  | -21.46         | 317            | 354         | V        |
|        | * 16.10653      | 22.99                | MAv1 | 40.9          | -23.6                  | 40.29                      | 54                 | -13.71      | -                   | -              | 317            | 354         | V        |
| 2      | 2.54392         | 36.05                | Pk   | 32.4          | -24.8                  | 43.65                      | -                  | -           | -                   | -              | 0-360          | 199         | H        |
| 3      | 2.60794         | 37.94                | Pk   | 32.4          | -25.2                  | 45.14                      | -                  | -           | -                   | -              | 0-360          | 101         | H        |
| 7      | 2.60794         | 36.12                | Pk   | 32.4          | -25.2                  | 43.32                      | -                  | -           | -                   | -              | 0-360          | 101         | V        |

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

PK2 - Maximum Peak

MAv1 - Maximum RMS Average

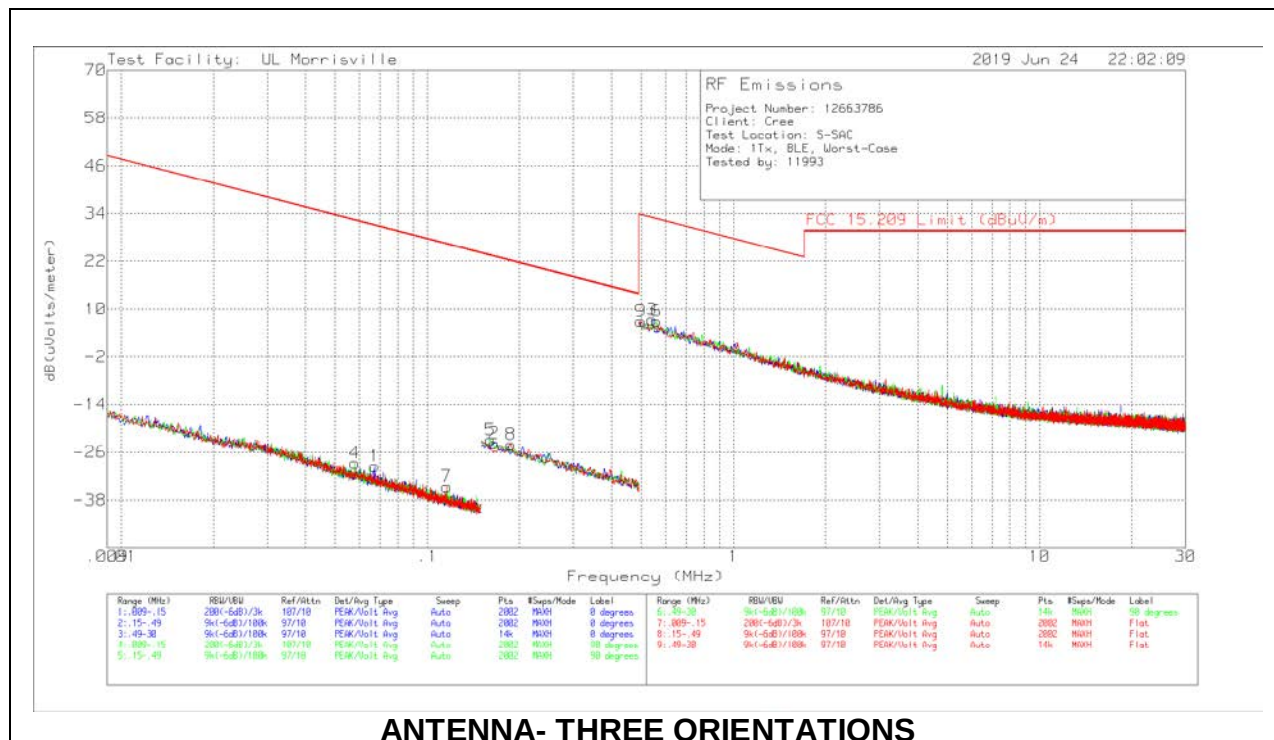
Pk - Peak detector



### 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\*Log (test distance / specification distance).



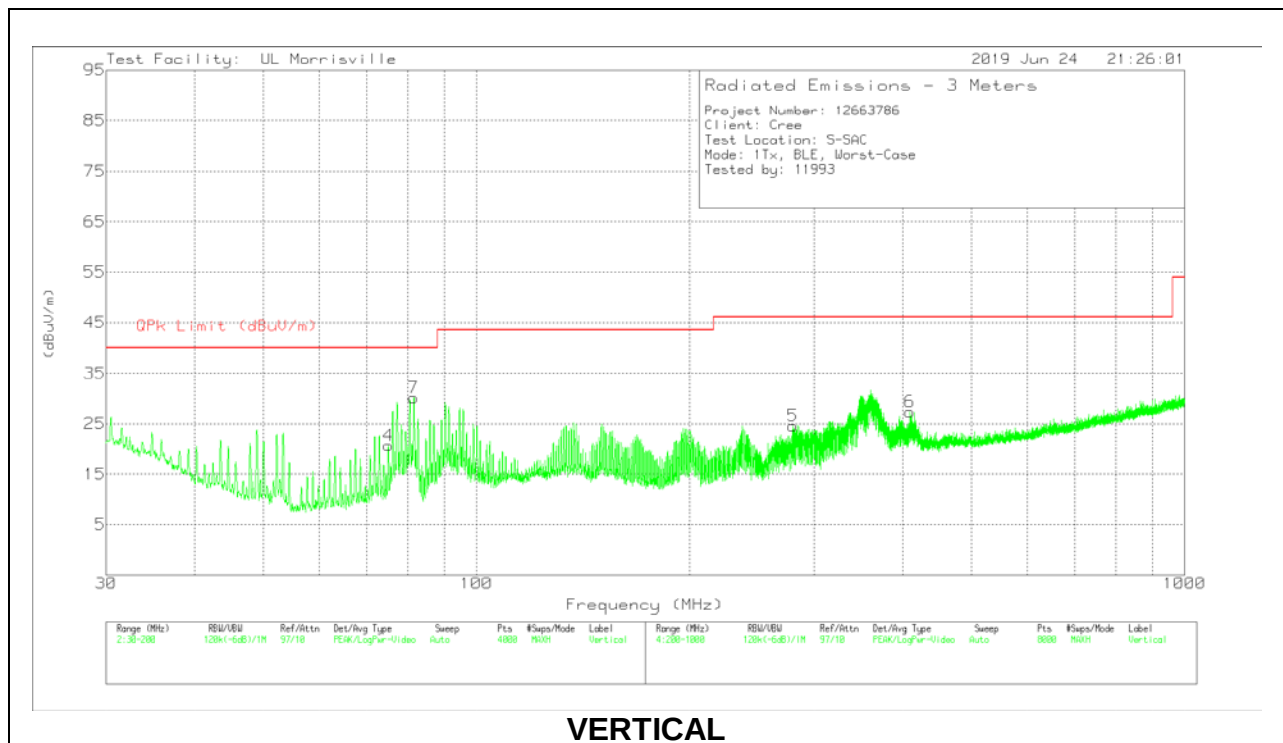
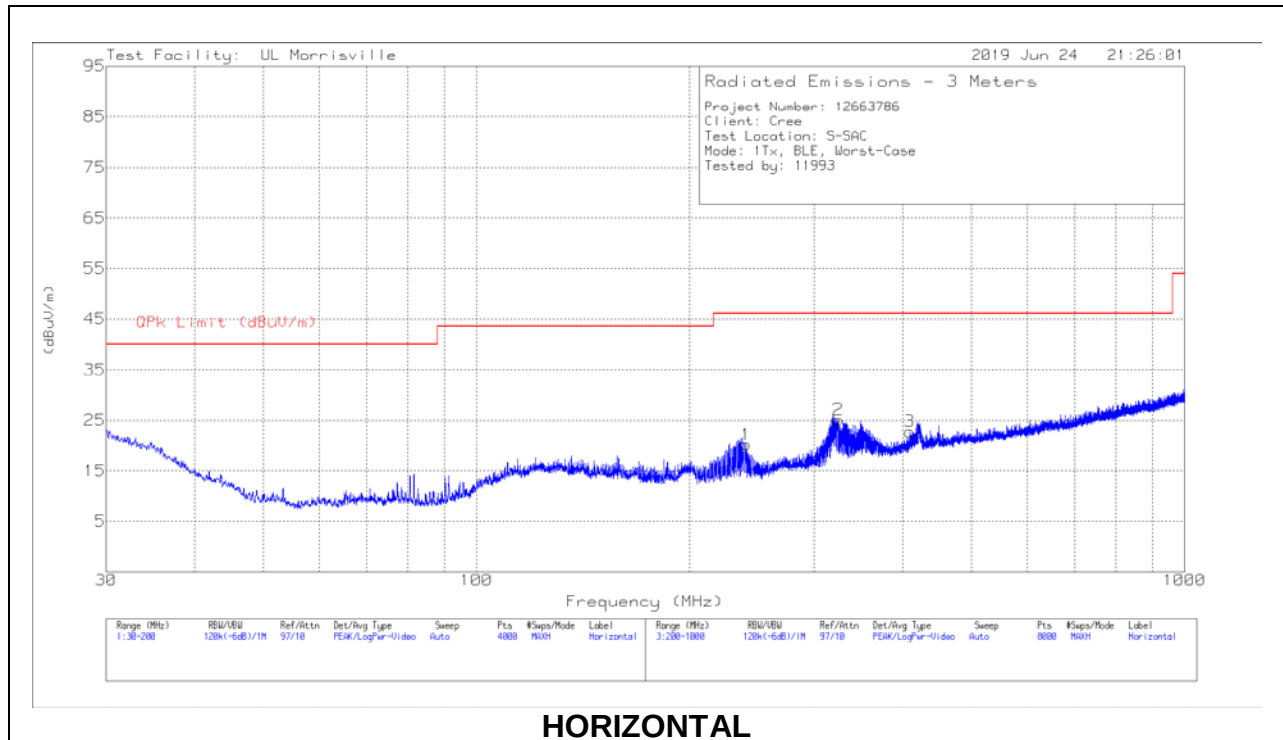
ANTENNA- THREE ORIENTATIONS

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | AT0079 AF (dB/m) | Cbl (dB) | Dist. Corr. Factor (dB) | Corrected Reading dB(uV/m) | FCC 15.209 QP Limit (dBuV/m) | FCC 15.209 AV Limit (dBuV/m) | FCC 15.209 PK Limit (dBuV/m) | Worst-Case Margin (dB) | Azimuth (Degs) | Antenna Face |
|--------|-----------------|----------------------|-----|------------------|----------|-------------------------|----------------------------|------------------------------|------------------------------|------------------------------|------------------------|----------------|--------------|
| 4      | .05793          | 39.61                | Pk  | 11.5             | .1       | -80                     | -28.79                     | -                            | 32.35                        | 52.35                        | -61.14                 | 0-360          | Off          |
| 1      | .06724          | 39.05                | Pk  | 11.3             | .1       | -80                     | -29.55                     | -                            | 31.05                        | 51.05                        | -60.6                  | 0-360          | On           |
| 7      | .11547          | 34.48                | Pk  | 10.8             | .1       | -80                     | -34.62                     | -                            | 26.35                        | 46.35                        | -60.97                 | 0-360          | Flat         |
| 5      | .16029          | 46.34                | Pk  | 10.7             | .1       | -80                     | -22.86                     | -                            | 23.51                        | 43.51                        | -46.37                 | 0-360          | Off          |
| 2      | .16547          | 45.43                | Pk  | 10.7             | .1       | -80                     | -23.77                     | -                            | 23.23                        | 43.23                        | -47                    | 0-360          | On           |
| 8      | .18723          | 45.13                | Pk  | 10.7             | .1       | -80                     | -24.07                     | -                            | 22.16                        | 42.16                        | -46.23                 | 0-360          | Flat         |
| 9      | .49843          | 36.01                | Pk  | 10.8             | .1       | -40                     | 6.91                       | 33.65                        | -                            | -                            | -26.74                 | 0-360          | Flat         |
| 3      | .5427           | 36.36                | Pk  | 10.8             | .1       | -40                     | 7.26                       | 32.91                        | -                            | -                            | -25.65                 | 0-360          | On           |
| 6      | .56062          | 36.02                | Pk  | 10.8             | .1       | -40                     | 6.92                       | 32.63                        | -                            | -                            | -25.71                 | 0-360          | Off          |

Pk - Peak detector

## 9.4. WORST CASE BELOW 1 GHZ

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

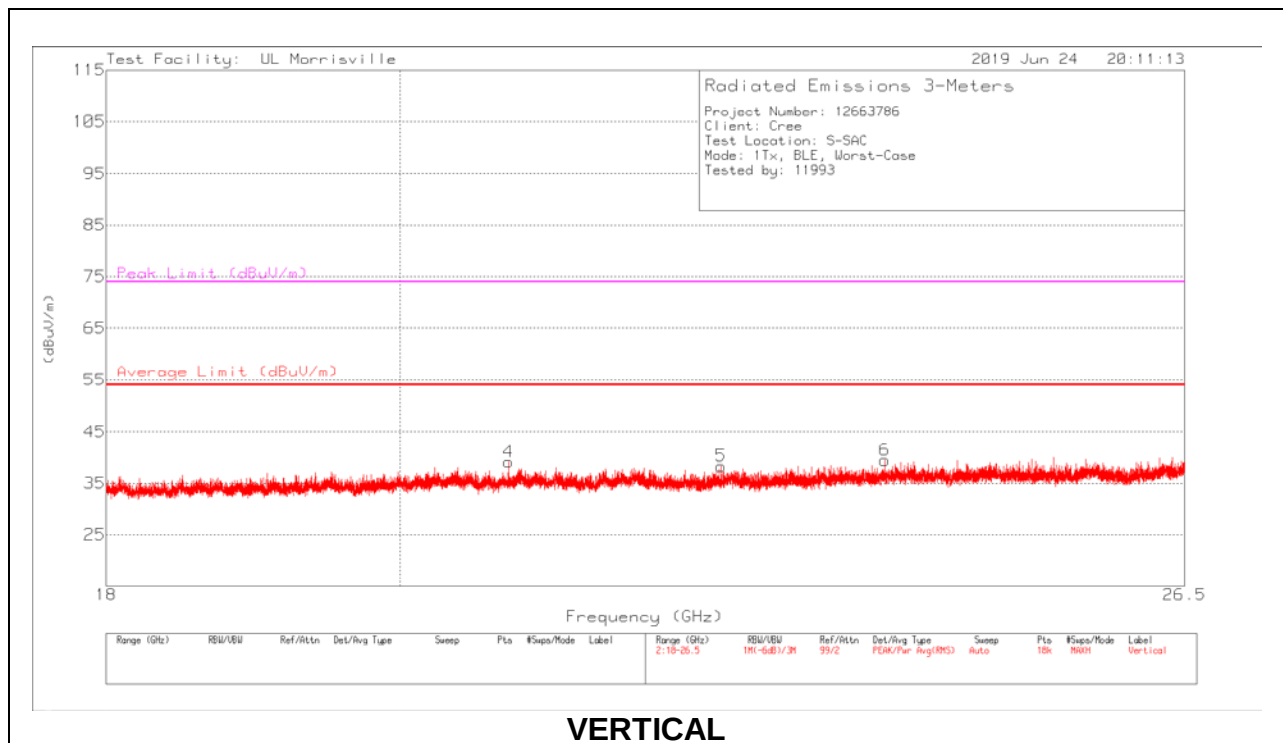
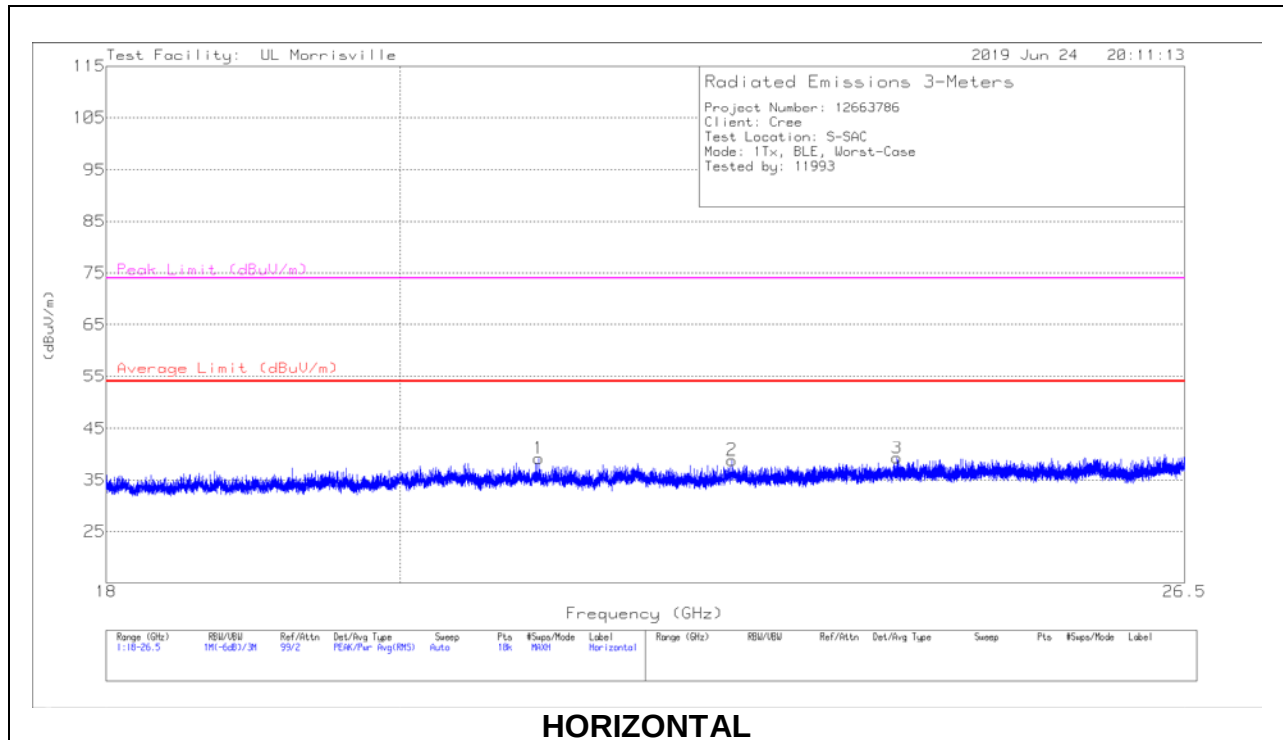


| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | AT0074 AF (dB/m) | Cbl/Amp | Corrected Reading (dBuV/m) | QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|------------------|---------|----------------------------|--------------------|-------------|----------------|-------------|----------|
| 4      | * 75.1042       | 39.48                | Pk  | 12.4             | -31.2   | 20.68                      | 40                 | -19.32      | 0-360          | 102         | V        |
| 1      | * 240.4053      | 33.89                | Pk  | 16.3             | -30     | 20.19                      | 46.02              | -25.83      | 0-360          | 299         | H        |
| 2      | * 324.2161      | 35.76                | Pk  | 18.7             | -29.4   | 25.06                      | 46.02              | -20.96      | 0-360          | 102         | H        |
| 3      | * 409.0272      | 31.27                | Pk  | 20.7             | -29.2   | 22.77                      | 46.02              | -23.25      | 0-360          | 198         | H        |
| 5      | * 279.6103      | 36.47                | Pk  | 17.9             | -29.8   | 24.57                      | 46.02              | -21.45      | 0-360          | 101         | V        |
| 6      | * 409.1272      | 35.81                | Pk  | 20.7             | -29.2   | 27.31                      | 46.02              | -18.71      | 0-360          | 101         | V        |
| 7      | 81.5658         | 49.43                | Pk  | 11.9             | -31.2   | 30.13                      | 40                 | -9.87       | 0-360          | 102         | V        |

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

## 9.5. WORST CASE 18-26 GHZ

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



| 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      | * 21.0205       | 44.06                | Pk  | 33.2             | -38.1        | 39.16                      | 54                     | -14.84      | 74                  | -34.84      | 0-360          | 249         | H        |
| 2      | * 22.52744      | 43.29                | Pk  | 33.5             | -38          | 38.79                      | 54                     | -15.21      | 74                  | -35.21      | 0-360          | 199         | H        |
| 3      | * 23.90452      | 42.5                 | Pk  | 34               | -37.3        | 39.2                       | 54                     | -14.8       | 74                  | -34.8       | 0-360          | 299         | H        |
| 4      | * 20.79335      | 44.3                 | Pk  | 33               | -38.2        | 39.1                       | 54                     | -14.9       | 74                  | -34.9       | 0-360          | 299         | V        |
| 5      | * 22.44055      | 42.81                | Pk  | 33.5             | -38          | 38.31                      | 54                     | -15.69      | 74                  | -35.69      | 0-360          | 201         | V        |
| 6      | * 23.79732      | 42.73                | Pk  | 34               | -37.3        | 39.43                      | 54                     | -14.57      | 74                  | -34.57      | 0-360          | 299         | V        |

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

## 10. AC POWER LINE CONDUCTED EMISSIONS

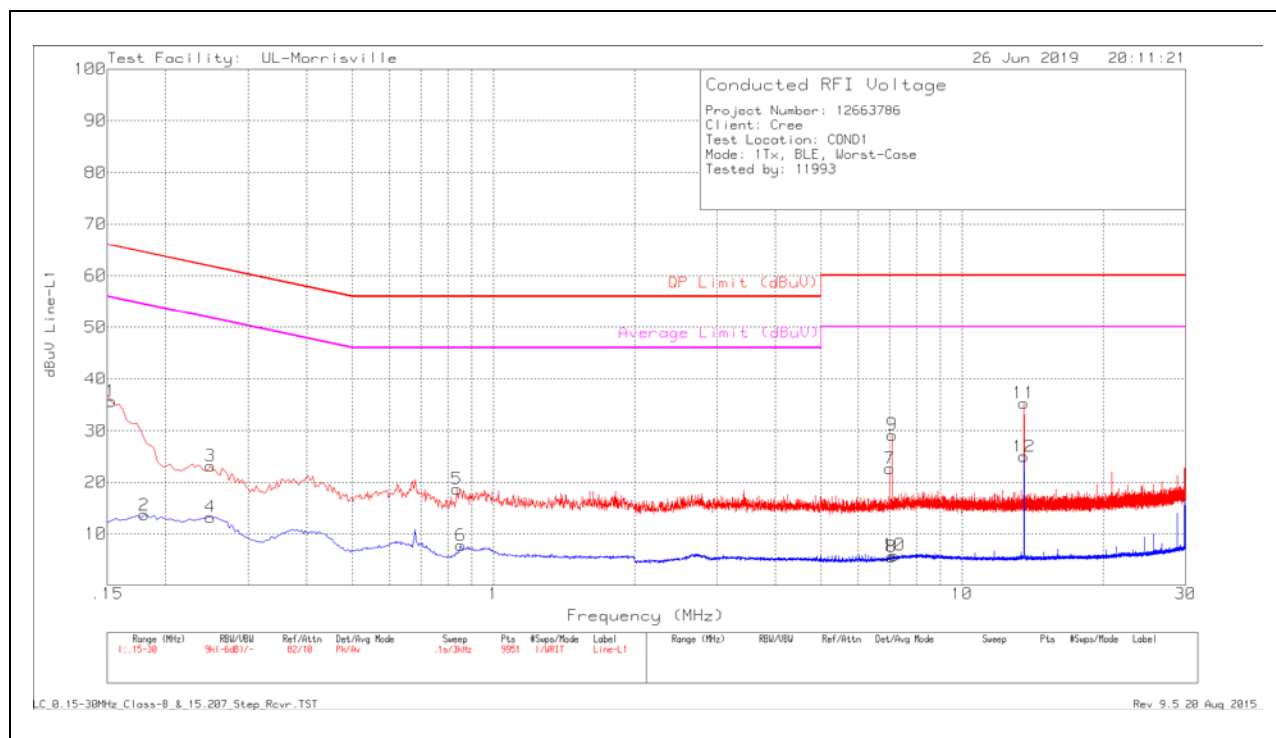
### LIMITS

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.

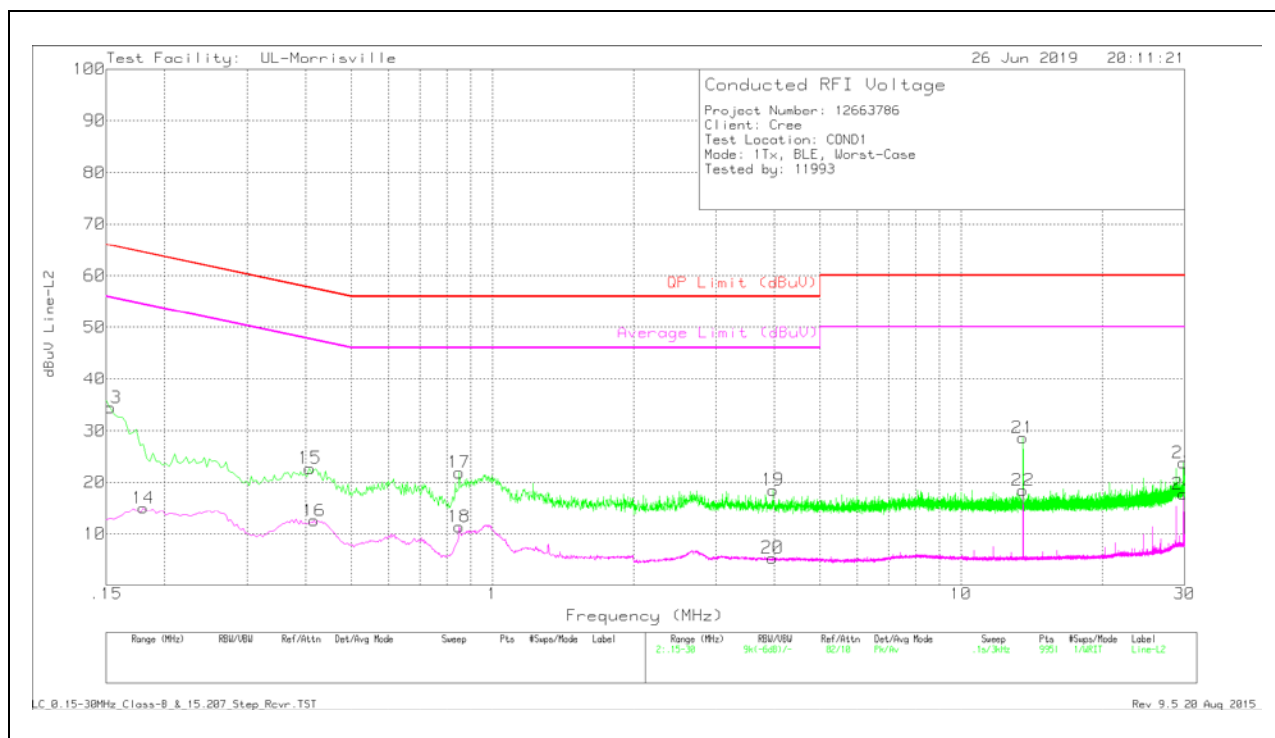
## LINE 1 RESULTS



| 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                            | .153            | 25.43                | Pk  | .2            | 10               | 35.63                  | 65.84           | -30.21      | -                    | -           |
| 2                            | .18             | 3.45                 | Av  | .2            | 10               | 13.65                  | -               | -           | 54.49                | -40.84      |
| 3                            | .249            | 13.01                | Pk  | .1            | 10               | 23.11                  | 61.79           | -38.68      | -                    | -           |
| 4                            | .249            | 3.14                 | Av  | .1            | 10               | 13.24                  | -               | -           | 51.79                | -38.55      |
| 5                            | .837            | 8.7                  | Pk  | 0             | 10               | 18.7                   | 56              | -37.3       | -                    | -           |
| 6                            | .852            | -2.21                | Av  | 0             | 10               | 7.79                   | -               | -           | 46                   | -38.21      |
| 7                            | 7.008           | 12.31                | Pk  | .1            | 10.2             | 22.61                  | 60              | -37.39      | -                    | -           |
| 8                            | 7.071           | -4.78                | Av  | .1            | 10.2             | 5.52                   | -               | -           | 50                   | -44.48      |
| 9                            | 7.101           | 18.9                 | Pk  | .1            | 10.2             | 29.2                   | 60              | -30.8       | -                    | -           |
| 10                           | 7.164           | -4.44                | Av  | .1            | 10.2             | 5.86                   | -               | -           | 50                   | -44.14      |
| 11                           | 13.56           | 24.79                | Pk  | .1            | 10.4             | 35.29                  | 60              | -24.71      | -                    | -           |
| 12                           | 13.56           | 14.5                 | Av  | .1            | 10.4             | 25                     | -               | -           | 50                   | -25         |

Av - Average  
Pk - Peak 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                           | .153            | 24.22                | Pk  | .2            | 10               | 34.42                  | 65.84           | -31.42      | -                    | -           |
| 14                           | .18             | 4.79                 | Av  | .2            | 10               | 14.99                  | -               | -           | 54.49                | -39.5       |
| 15                           | .408            | 12.59                | Pk  | .1            | 10               | 22.69                  | 57.69           | -35         | -                    | -           |
| 16                           | .417            | 2.46                 | Av  | .1            | 10               | 12.56                  | -               | -           | 47.51                | -34.95      |
| 17                           | .849            | 11.85                | Pk  | 0             | 10               | 21.85                  | 56              | -34.15      | -                    | -           |
| 18                           | .849            | 1.38                 | Av  | 0             | 10               | 11.38                  | -               | -           | 46                   | -34.62      |
| 19                           | 3.969           | 8.41                 | Pk  | 0             | 10.1             | 18.51                  | 56              | -37.49      | -                    | -           |
| 20                           | 3.957           | -4.75                | Av  | 0             | 10.1             | 5.35                   | -               | -           | 46                   | -40.65      |
| 21                           | 13.56           | 18.12                | Pk  | .1            | 10.4             | 28.62                  | 60              | -31.38      | -                    | -           |
| 22                           | 13.563          | 7.95                 | Av  | .1            | 10.4             | 18.45                  | -               | -           | 50                   | -31.55      |
| 23                           | 29.841          | 12.61                | Pk  | .3            | 10.8             | 23.71                  | 60              | -36.29      | -                    | -           |
| 24                           | 29.841          | 6.59                 | Av  | .3            | 10.8             | 17.69                  | -               | -           | 50                   | -32.31      |

Av - Average  
Pk - Peak detector



## **11. SETUP PHOTOS**

Refer to UL Document R12663786-EP5

**END OF TEST REPORT**