



# **CERTIFICATION TEST REPORT**

**Report Number. :** 13181006-E3V3

**Applicant :** APPLE INC.  
1 APPLE PARK WAY  
CUPERTINO, CA 95014, U.S.A

**Model :** A2140

**FCC ID :** BCGA2140

**IC :** 579C-A2140

**EUT Description :** WIRELESS CHARGER

**Test Standard(s) :** FCC 47 CFR PART 15 SUBPART C  
ISED RSS-216 ISSUE 2

**Date Of Issue:**  
October 03, 2020

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Revision History

| Rev. | Issue Date | Revisions                                | Revised By |
|------|------------|------------------------------------------|------------|
| V1   | 9/23/2020  | Initial Issue                            | Chin Pang  |
| V2   | 9/28/2020  | Updated ICES-001 Limit Tables on Page 16 | T. Chan    |
| V3   | 10/3/2020  | Updated ICES-001 Limit Tables on Page 35 | Chin Pang  |

## TABLE OF CONTENTS

|                                                                                  |           |
|----------------------------------------------------------------------------------|-----------|
| <b>1. ATTESTATION OF TEST RESULTS .....</b>                                      | <b>5</b>  |
| <b>2. TEST METHODOLOGY .....</b>                                                 | <b>6</b>  |
| <b>3. FACILITIES AND ACCREDITATION .....</b>                                     | <b>6</b>  |
| <b>4. DECISION RULES AND MEASUREMENT UNCERTAINTY .....</b>                       | <b>7</b>  |
| 4.1. METROLOGICAL TRACEABILITY .....                                             | 7         |
| 4.2. DECISION RULES.....                                                         | 7         |
| 4.3. MEASUREMENT UNCERTAINTY.....                                                | 7         |
| <b>5. EQUIPMENT UNDER TEST .....</b>                                             | <b>8</b>  |
| 5.1. DESCRIPTION OF EUT .....                                                    | 8         |
| 5.2. MAXIMUM E-FIELD AND H-FIELD STRENGTH .....                                  | 9         |
| 5.3. SOFTWARE AND FIRMWARE.....                                                  | 9         |
| 5.4. WORST-CASE CONFIGURATION AND MODE.....                                      | 9         |
| 5.5. DESCRIPTION OF TEST SETUP.....                                              | 10        |
| <b>6. TEST AND MEASUREMENT EQUIPMENT .....</b>                                   | <b>12</b> |
| <b>7. OCCUPIED BANDWIDTH .....</b>                                               | <b>13</b> |
| 7.1. 360kHz .....                                                                | 14        |
| 7.1.1. CONFIG 2.....                                                             | 14        |
| 7.2. 127kHz .....                                                                | 14        |
| 7.2.1. CONFIG 3.....                                                             | 14        |
| 7.2.2. CONFIG 4.....                                                             | 15        |
| <b>8. RADIATED EMISSION TEST RESULTS.....</b>                                    | <b>16</b> |
| 8.1. LIMITS AND PROCEDURE .....                                                  | 16        |
| 8.2. FCC TX FUNDAMENTAL AND SPURIOUS EMISSIONS FROM 9 kHz TO 30 MHz ..           | 17        |
| 8.2.1. CONFIG 1: STANDBY CONFIGURATION .....                                     | 17        |
| 8.2.2. CONFIG 2: OPERATING WITH iPHONE 15W LOAD.....                             | 18        |
| 8.3. IC / CISPR 11 TX FUNDAMENTAL AND SPURIOUS EMISSIONS FROM 9 kHz TO 30 MHz 19 |           |
| 8.3.1. CONFIG 1: STANDBY CONFIGURATION .....                                     | 19        |
| 8.3.2. CONFIG 2: OPERATING WITH iPHONE @ 15W LOAD .....                          | 20        |
| 8.4. FCC TX SPURIOUS EMISSION 30 TO 1000 MHz FOR 360kHz.....                     | 21        |
| 8.4.1. CONFIG 1: STANDBY .....                                                   | 21        |
| 8.4.2. CONFIG 2: OPERATING WITH iPHONE @ 15W LOAD .....                          | 23        |
| 8.5. IC / CISPR 11 TX SPURIOUS EMISSION 30 TO 1000 MHz .....                     | 25        |
| 8.5.1. CONFIG 1: STANDBY .....                                                   | 25        |
| 8.5.2. CONFIG 2: OPERATING WITH iPHONE @15W LOAD .....                           | 27        |

|        |                                                                                           |    |
|--------|-------------------------------------------------------------------------------------------|----|
| 8.6.   | FCC TX FUNDAMENTAL AND SPURIOUS EMISSIONS FROM 9 kHz TO 30 MHz FOR 127kHz.....            | 29 |
| 8.6.1. | OPERATING WITH iPHONE @ 7.5W LOAD .....                                                   | 29 |
| 8.7.   | FCC TX SPURIOUS EMISSION 30 TO 1000 MHz FOR 127kHz.....                                   | 30 |
| 8.7.1. | OPERATING WITH iPHONE @ 7.5W LOAD .....                                                   | 30 |
| 8.8.   | IC / CISPR 11 TX FUNDAMENTAL AND SPURIOUS EMISSIONS FROM 9 kHz TO 30 MHz FOR 127kHz ..... | 32 |
| 8.8.1. | OPERATING WITH AIRPODS CHARGING CASE @ 1W LOAD .....                                      | 32 |
| 8.9.   | IC / CISPR 11 TX SPURIOUS EMISSION 30 TO 1000 MHz FOR 127kHz.....                         | 33 |
| 8.9.1. | OPERATING WITH AIRPODS CHARGING CASE @1W LOAD.....                                        | 33 |
| 9.     | AC MAINS LINE CONDUCTED EMISSIONS.....                                                    | 35 |
| 9.1.1. | STANDBY MODE .....                                                                        | 36 |
| 9.1.2. | OPERATING MODE WITH iPHONE @ 15W LOAD .....                                               | 38 |
| 10.    | SETUP PHOTOS .....                                                                        | 40 |

## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** APPLE INC.  
1 APPLE PARK WAY  
CUPERTINO, CA 95014, U.S.A

**EUT DESCRIPTION:** WIRELESS CHARGER

**MODEL:** A2140

**SERIAL NUMBER:** DLCD42U106M2

**DATE TESTED:** AUGUST 17, 2020 – SEPTEMBER 04, 2020

| APPLICABLE STANDARDS  |              |
|-----------------------|--------------|
| STANDARD              | TEST RESULTS |
| FCC PART 15 SUBPART C | Complies     |
| ISED RSS-216 Issue 2  | Complies     |
| ISED RSS-GEN Issue 5  | 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 NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For  
UL Verification Services Inc. By:



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UL Verification Services Inc.

Prepared By:



Joe Vang  
Test Engineer  
Consumer Technology Division  
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## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, 414788 D01 Radiated Test Site v01r01, FCC CFR 47 Part 2, and FCC CFR 47 Part 15, RSS-GEN Issue 5 and RSS-216 Issue 2 January 2016.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and 47658 Kato Road, Fremont, California, USA. Line conducted emissions were measured at 47658 Kato RD address. 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.

| 47173 Benicia Street                            | 47266 Benicia Street                                       | 47658 Kato Rd.                                   |
|-------------------------------------------------|------------------------------------------------------------|--------------------------------------------------|
| <input type="checkbox"/> Chamber A (IC:2324B-1) | <input type="checkbox"/> Chamber D (IC:22541-1)            | <input type="checkbox"/> Chamber I (IC: 2324A-5) |
| <input type="checkbox"/> Chamber B (IC:2324B-2) | <input type="checkbox"/> Chamber E (IC:22541-2)            | <input type="checkbox"/> Chamber J (IC: 2324A-6) |
| <input type="checkbox"/> Chamber C (IC:2324B-3) | <input type="checkbox"/> Chamber F (IC:22541-3)            | <input type="checkbox"/> Chamber K (IC: 2324A-1) |
|                                                 | <input checked="" type="checkbox"/> Chamber G (IC:22541-4) | <input type="checkbox"/> Chamber L (IC: 2324A-3) |
|                                                 | <input type="checkbox"/> Chamber H (IC:22541-5)            | <input type="checkbox"/> Chamber M (IC: 2324A-2) |

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0

## 4. DECISION RULES AND MEASUREMENT UNCERTAINTY

### 4.1. 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.

### 4.2. 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.)

### 4.3. 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  | 3.39 dB          |
| Worst Case Conducted Disturbance, 0.15 to 30 MHz    | 3.07 dB          |
| Worst Case Radiated Disturbance, 9KHz to 30 MHz     | 2.52 dB          |
| Worst Case Radiated Disturbance, 30 to 1000 MHz     | 4.88 dB          |
| Worst Case Radiated Disturbance, 1000 to 18000 MHz  | 4.24 dB          |
| Worst Case Radiated Disturbance, 18000 to 26000 MHz | 4.37 dB          |
| Worst Case Radiated Disturbance, 26000 to 40000 MHz | 5.17 dB          |

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

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a magnetic charger which inductively charge other wireless charging devices. The charging function operates at 127.7kHz (Qi) and 360.0kHz. The charger supports charging at 5W, 7.5W and 15W power and NFC tag operation. The charger doesn't have any internal battery.

#### I/O CABLES

| I/O Cable List |      |                      |                |             |                  |                  |
|----------------|------|----------------------|----------------|-------------|------------------|------------------|
| Cable No       | Port | # of identical ports | Connector Type | Cable Type  | Cable Length (m) | Remarks          |
| 1              | DC   | 1                    | USB-C          | Un-shielded | 1                | 30W Power Supply |
| 2              | DC   | 1                    | Magnetic 5 pin | Un-shielded | 3                | 60W Power Supply |
| 3              | USB  | 1                    | Lightening     | Un-shielded | 1                | Communication    |

## 5.2. MAXIMUM E-FIELD AND H-FIELD STRENGTH

The transmitter has maximum peak radiated electric and H-field strength as follows:

| Fundamental Frequency<br>(kHz) | Mode           | E field<br>(300m distance)<br>FCC (dBuV/m) | H field<br>(3m distance)<br>IC (dBuA/m) |
|--------------------------------|----------------|--------------------------------------------|-----------------------------------------|
| 360                            | Operating mode | -13.85                                     | 16.33                                   |
| 127                            | Operating mode | 1.58                                       | 31.02                                   |

## 5.3. SOFTWARE AND FIRMWARE

The firmware version installed in the EUT during testing is v87

## 5.4. WORST-CASE CONFIGURATION AND MODE

The EUT is a dual frequencies magnetic charger enclosed in a plastic case. For the entire radiated emissions test, the EUT was examining on the following configuration.

| Config | Mode                                        | Descriptions                                                                      |
|--------|---------------------------------------------|-----------------------------------------------------------------------------------|
| 1      | Standby mode<br>(Radiated Spurious Only)    | EUT powered by AC/DC adapter via USB-C cable                                      |
| 2      | Operating mode<br>(EUT w/360kHz Fund @15W)  | EUT powered by AC/DC adapter via USB-C cable with iPhone (15W) at charging mode   |
| 3      | Operating mode<br>(EUT w/127kHz Fund @7.5W) | EUT powered by AC/DC adapter via USB-C cable with iPhones (7.5W) at charging mode |
| 4      | Operating mode<br>(EUT w/127kHz Fund @1W)   | EUT powered by AC/DC adapter via USB-C cable with airpod at charging mode         |

EUT was tested as standby and operation modes. For worst case operational mode, EUT was tested with iPhones, with iPhone at 15W has a magnetic alignment and iPhones at 7.5W without magnetic alignment. Device being charged was at a state of 20 – 50% charged.

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.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 300 m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788 D01.

## 5.5. DESCRIPTION OF TEST SETUP

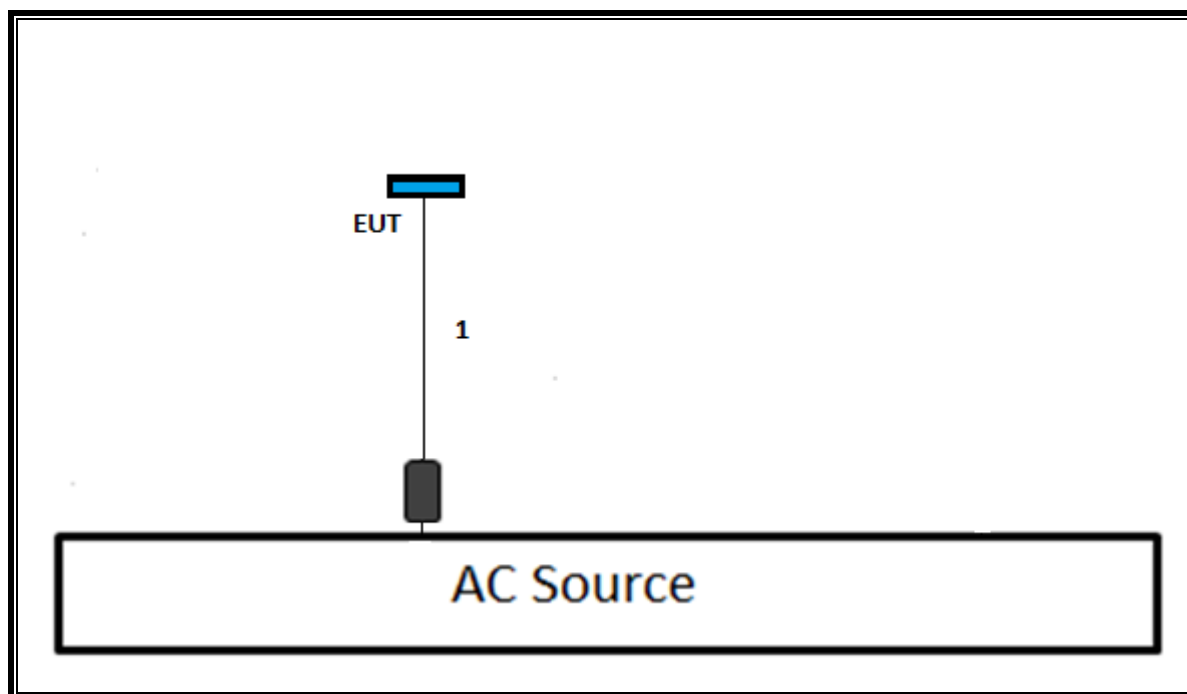
### SUPPORT EQUIPMENT

| Support Equipment List |              |             |                   |        |
|------------------------|--------------|-------------|-------------------|--------|
| Description            | Manufacturer | Model       | Serial Number     | FCC ID |
| AC/DC adapter          | Apple        | A1882       | C4H748200RXH80MAY | N/A    |
| Phone                  | Apple        | iPhone      | N/A               | N/A    |
| Laptop                 | Apple        | MacBook Air | C2QLN093FKYR      | DoC    |
| Laptop Adapter         | Apple        | A1436       | C045196GMGTG6HHAD | DoC    |

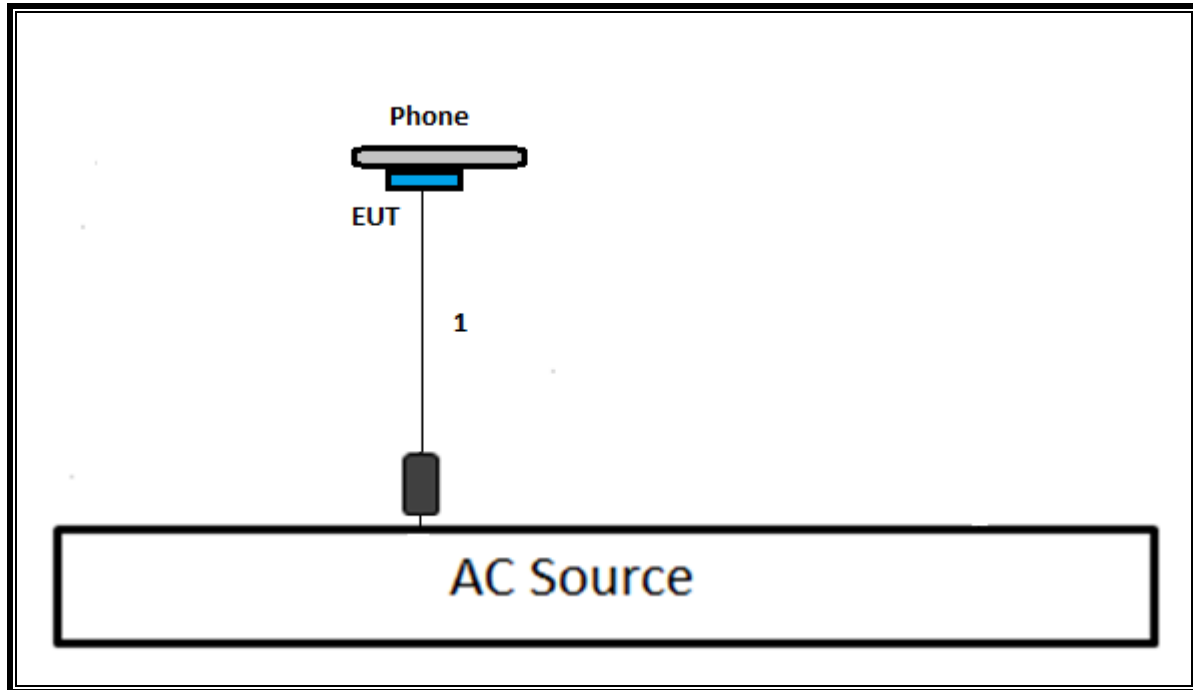
### TEST SETUP

The EUT is directly connected to an AC/DC adapter via USB-C cable and magnetic connect to host phone on top of EUT. Host laptop computer is connected to host phone via USB / lightening cable during the tests. Test software exercised the radio card.

### CONFIGURATION 1: STANDBY MODE



**CONFIGURATION 2 & 3: OPERATING MODE WITH iPhone**



## 6. 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, Active Loop 9KHz to 30MHz                | ETS-Lindgren                    | 6502              | T1616  | 10/28/2020 | 10/28/2019 |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz w/4dB | Sunol Sciences Crop.            | JB1               | T243   | 04/15/2021 | 04/15/2020 |
| Amplifier, 10kHz to 1GHz, 32dB                    | Sonoma Instrument               | 310N              | T173   | 07/22/2021 | 07/22/2020 |
| Sniffer Probes                                    | Electro Metrics                 | EM-6992           | N/A    | N/A        | N/A        |
| Environmental Chamber                             | Cincinnati Sub-Zero             | ZPHS-8-3.5-SCT/WC | T754   | 12/22/2020 | 12/22/2019 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz              | Agilent (Keysight) Technologies | N9030A-544        | T342   | 01/23/2021 | 01/23/2020 |

| AC Line Conducted                     |                               |                         |                            |            |            |
|---------------------------------------|-------------------------------|-------------------------|----------------------------|------------|------------|
| Description                           | Manufacturer                  | Model                   | ID Num                     | Cal Due    | Last Cal   |
| EMI Test Receiver 9kHz-7GHz           | Rohde & Schwarz               | ESR                     | T1436                      | 02/20/2021 | 02/20/2020 |
| Power Cable, Line Conducted Emissions | UL                            | PR1                     | T861                       | 10/27/2020 | 10/27/2019 |
| LISN for Conducted Emissions CISPR-16 | FISCHER CUSTOM COMMUNICATIONS | FCC-LISN-50/250-25-2-01 | PRE0186446                 | 01/23/2021 | 01/23/2020 |
| UL AUTOMATION SOFTWARE                |                               |                         |                            |            |            |
| Radiated Software                     | UL                            | UL EMC                  | Ver 9.5, Mar 6, 2020       |            |            |
| Conducted Software                    | UL                            | UL EMC                  | 2020.2.26                  |            |            |
| AC Line Conducted Software            | UL                            | UL EMC                  | Ver 9.5, February 21, 2020 |            |            |

## 7. OCCUPIED BANDWIDTH

### TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 300Hz. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

Note: Because the measured signal is CW-like, adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

Note that when the EUT was in standby mode the only signal that comes out from the EUT was the intentional charging signal of 326.5kHz. On the other hand, when the EUT was in operational mode there were two signals. One of the intentional charging signal of 326.5kHz and the other one the control signal of 340kHz that controls the communication/charging status between EUT and the client device-the watch.

### EUT SETUP

Configuration 1: N/A due to no intended radiator.

Configuration 2: Charger with iPhone in operating mode, transmitting at 360kHz test.

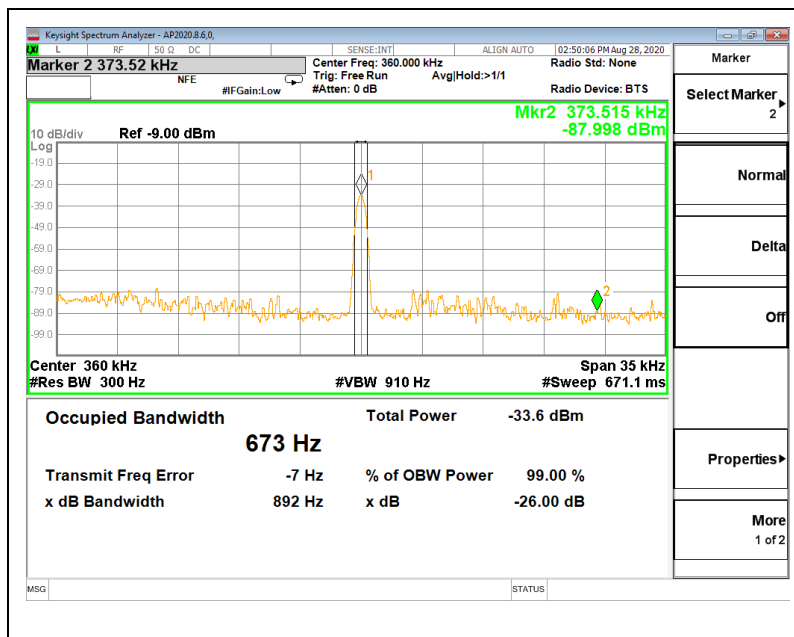
Configuration 3: Charger with iPhone in operating mode, transmitting at 127kHz test.

Configuration 4: Charger with Airpod in operating mode, transmitting at 127kHz test

### RESULTS

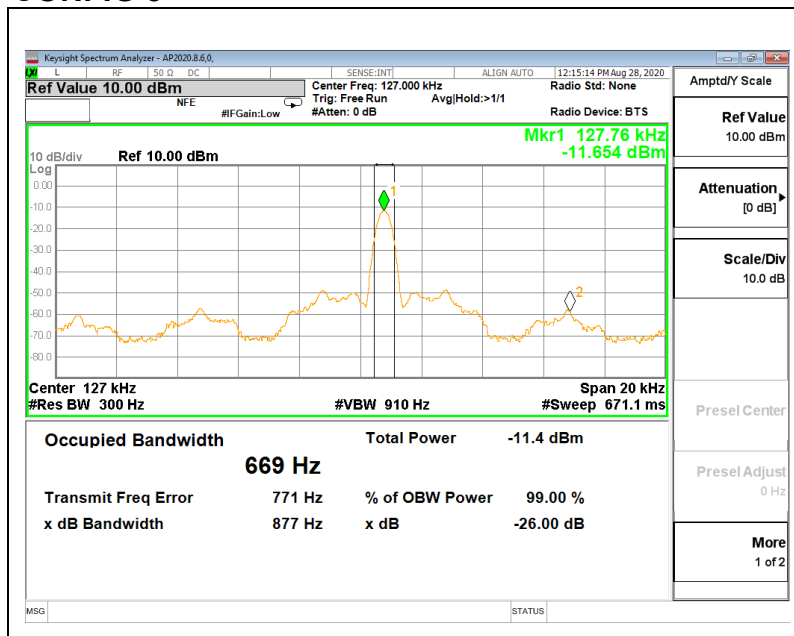
## 7.1. 360kHz

### 7.1.1. CONFIG 2

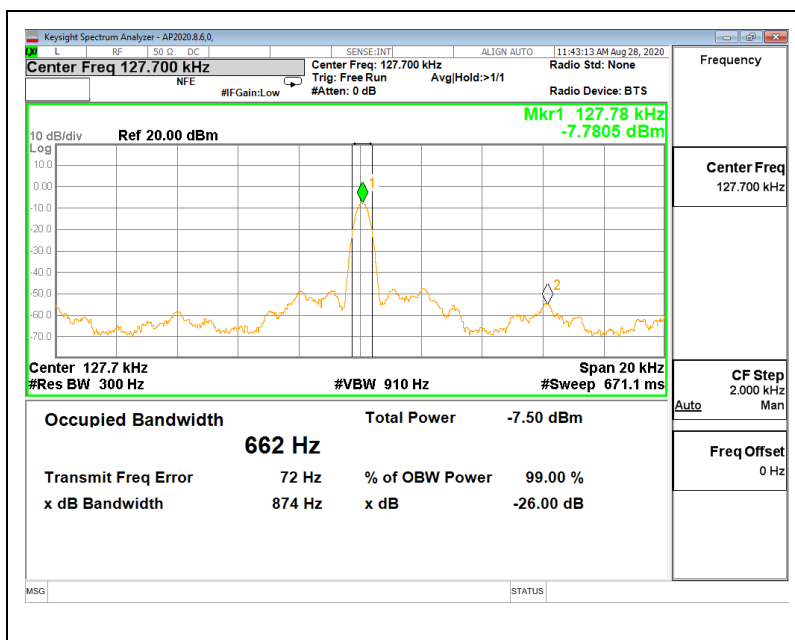


## 7.2. 127kHz

### 7.2.1. CONFIG 3



## 7.2.2. CONFIG 4



## 8. RADIATED EMISSION TEST RESULTS

### 8.1. LIMITS AND PROCEDURE

#### LIMIT

FCC §15.209 (a)

ICES-001 Section 6.2, IC RSS-216 6.2.2, and IC RSS-GEN Sections 8.9 and 8.10.

| Frequency (MHz)                                                | Field Strength (microvolts/meter) | Measurement Distance (m) |
|----------------------------------------------------------------|-----------------------------------|--------------------------|
| 0.009–0.490                                                    | 2400/F(kHz)                       | 300                      |
| 0.490–1.705                                                    | 24000/F(kHz)                      | 30                       |
| 1.705–30.0                                                     | 30                                | 30                       |
| 30–88                                                          | 100                               | 3                        |
| 88 to 216                                                      | 150                               | 3                        |
| 216 to 960                                                     | 200                               | 3                        |
| Above 960 MHz                                                  | 500                               | 3                        |
| Note: The lower limit shall apply at the transition frequency. |                                   |                          |

ICES-001 Issue 5 Table 2 & Table 4:

**Table 2: Magnetic field strength radiated emission limits for induction cooking appliances**

| Frequency range (MHz)                                                           | Quasi-peak, at 3 m distance (dBμA/m) |
|---------------------------------------------------------------------------------|--------------------------------------|
| 0.009 – 0.07                                                                    | 69                                   |
| 0.07 – 0.15                                                                     | 69 to 39 *                           |
| 0.15 – 30                                                                       | 39 to 7 *                            |
| * The limit level in dBμA/m decreases linearly with the logarithm of frequency. |                                      |

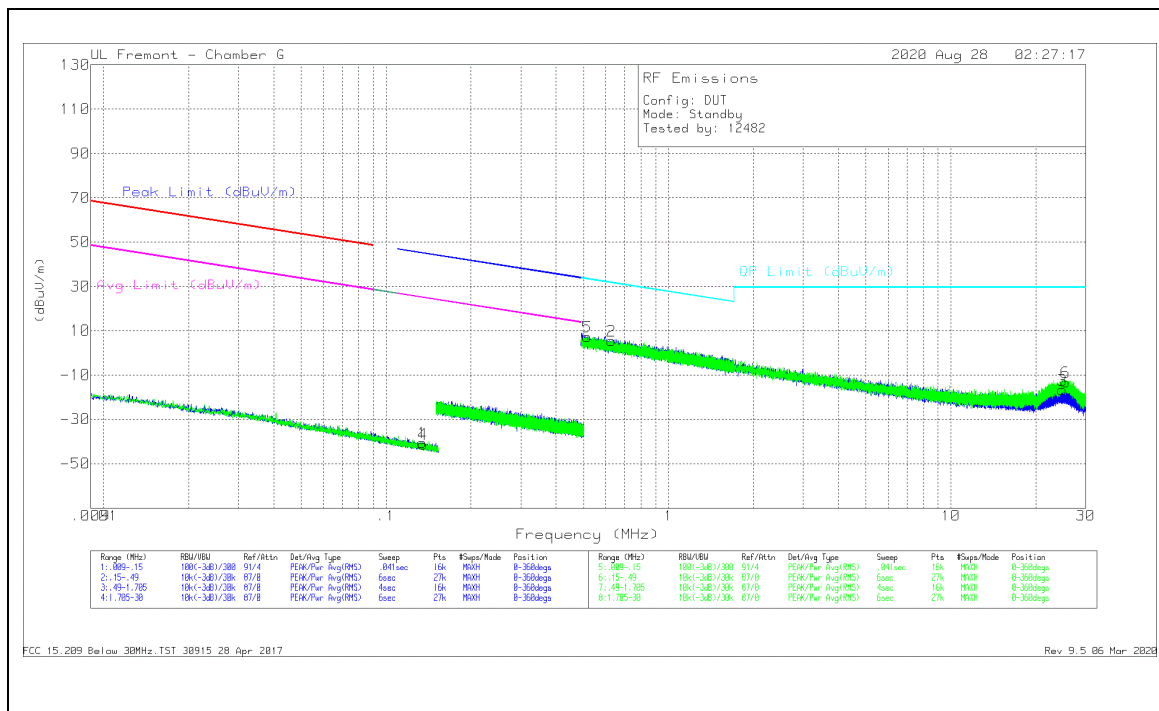
**Table 4: Electric field strength radiated emission limits for induction cooking appliances**

| Frequency range (MHz)                                                                                                                                                                                                                                                         | OATS or SAC *<br>10 m measurement distance<br>Quasi-peak (dBμV/m) | OATS or SAC *<br>3 m measurement distance<br>Quasi-peak (dBμV/m) | FAR *<br>3 m measurement distance<br>Quasi-peak (dBμV/m) |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------|----------------------------------------------------------|
| 30 – 230                                                                                                                                                                                                                                                                      | 30                                                                | 40                                                               | 42 to 35 **                                              |
| 230 – 1000                                                                                                                                                                                                                                                                    | 37                                                                | 47                                                               | 42                                                       |
| <b>Note:</b> The more stringent limit applies at the transition frequency.<br>* OATS = open-area test site, SAC = semi-anechoic chamber, FAR = fully-anechoic room (see CSA CISPR 11:19).<br>** The limit level in dBμV/m decreases linearly with the logarithm of frequency. |                                                                   |                                                                  |                                                          |

#### RESULTS

## 8.2. FCC TX FUNDAMENTAL AND SPURIOUS EMISSIONS FROM 9 kHz TO 30 MHz

### 8.2.1. CONFIG 1: STANDBY CONFIGURATION



## DATA

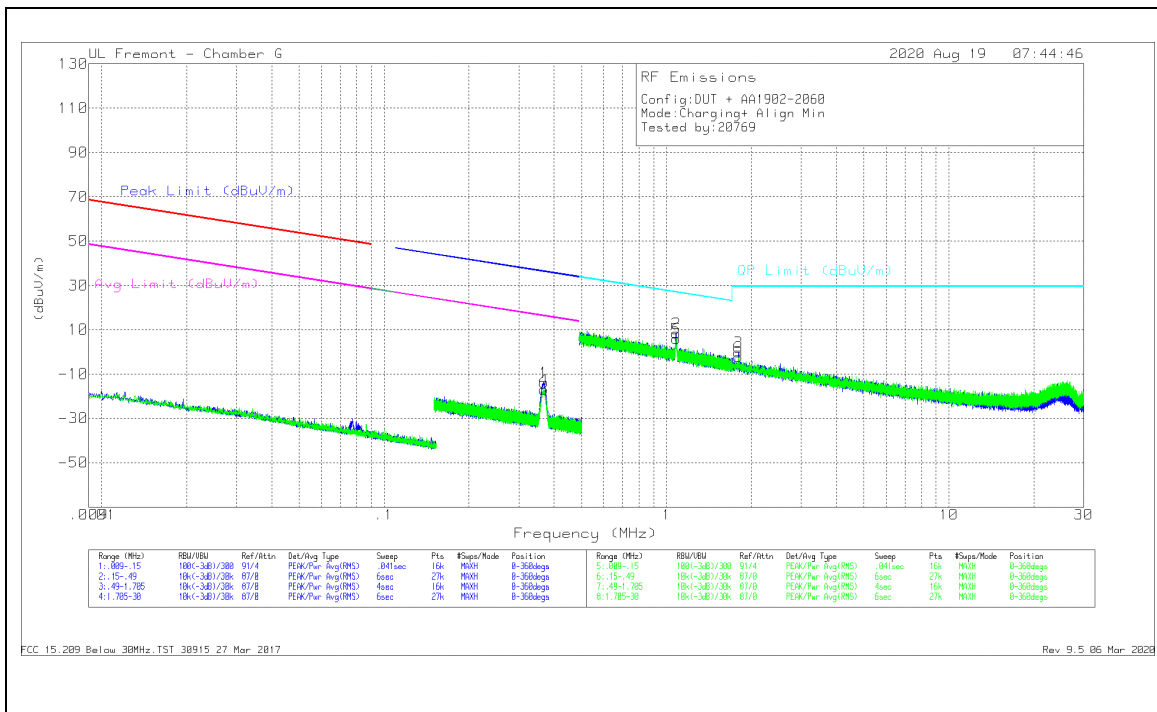
| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | Loop Antenna (dBm) | Cables (dB) | Dist Corr 300m | Corrected Reading (dBuVolts) | Avg Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) |
|--------|-----------------|----------------------|-----|--------------------|-------------|----------------|------------------------------|--------------------|-------------|----------------|
| 1      | .12046          | 20.22                | Av  | 11.2               | .1          | -80            | -48.48                       | 26.01              | -74.49      | 272            |
| 4      | .12239          | 20                   | Av  | 11.2               | .1          | -80            | -48.7                        | 25.87              | -74.57      | 53             |

Av - Average detection

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | Loop Antenna (dBm) | Cables (dB) | Dist Corr 30m | Corrected Reading (dBuVolts) | QP Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) |
|--------|-----------------|----------------------|-----|--------------------|-------------|---------------|------------------------------|-------------------|-------------|----------------|
| 5      | .50691          | 29.61                | Qp  | 11                 | .1          | -40           | .71                          | 33.51             | -32.8       | 76             |
| 2      | .61941          | 28.21                | Qp  | 11                 | .1          | -40           | -.69                         | 31.77             | -32.46      | 206            |
| 3      | 24.8001         | 8.46                 | Qp  | 9.3                | .8          | -40           | -21.44                       | 29.5              | -50.94      | 89             |
| 6      | 25.5034         | 12.05                | Qp  | 9.2                | .8          | -40           | -17.95                       | 29.5              | -47.45      | 130            |

Qp - Quasi-Peak detector

## 8.2.2. CONFIG 2: OPERATING WITH iPhone 15W LOAD



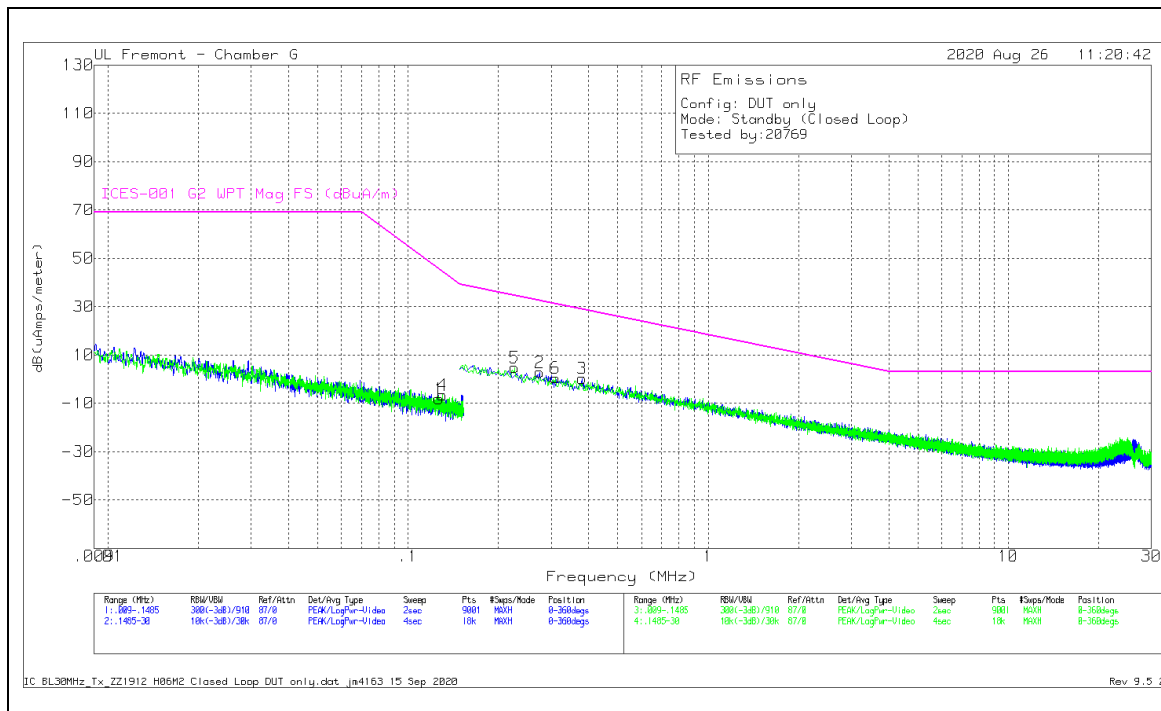
| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | Loop Antenna (dB/m) | Cables (dB) | Dist Corr 300m | Corrected Reading (dBuVolts) | QP Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) |
|--------|-----------------|----------------------|-----|---------------------|-------------|----------------|------------------------------|-------------------|-------------|----------------|
| 4      | 36774           | 51.72                | QP  | 11.1                | .1          | -80            | -17.75                       | 36.3              | -54.05      | 342            |
| 1      | 36798           | 55.06                | QP  | 11.1                | .1          | -80            | -13.85                       | 36.29             | -50.14      | 266            |

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | Loop Antenna (dB/m) | Cables (dB) | Dist Corr 30m | Corrected Reading (dBuVolts) | QP Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) |
|--------|-----------------|----------------------|-----|---------------------|-------------|---------------|------------------------------|-------------------|-------------|----------------|
| 2      | 1.07919         | 32.78                | Qp  | 10.8                | .1          | -40           | 3.68                         | 26.96             | -23.28      | 336            |
| 5      | 1.07971         | 35.6                 | Qp  | 10.8                | .1          | -40           | 6.5                          | 26.96             | -20.46      | 235            |
| 6      | 1.79794         | 23.16                | Qp  | 10.8                | .2          | -40           | -5.84                        | 29.5              | -35.34      | 356            |
| 3      | 1.79958         | 25.51                | Qp  | 10.8                | .2          | -40           | -3.49                        | 29.5              | -32.99      | 275            |

Qp - Quasi-Peak detector

### 8.3. IC / CISPR 11 TX FUNDAMENTAL AND SPURIOUS EMISSIONS FROM 9 kHz TO 30 MHz

#### 8.3.1. CONFIG 1: STANDBY CONFIGURATION

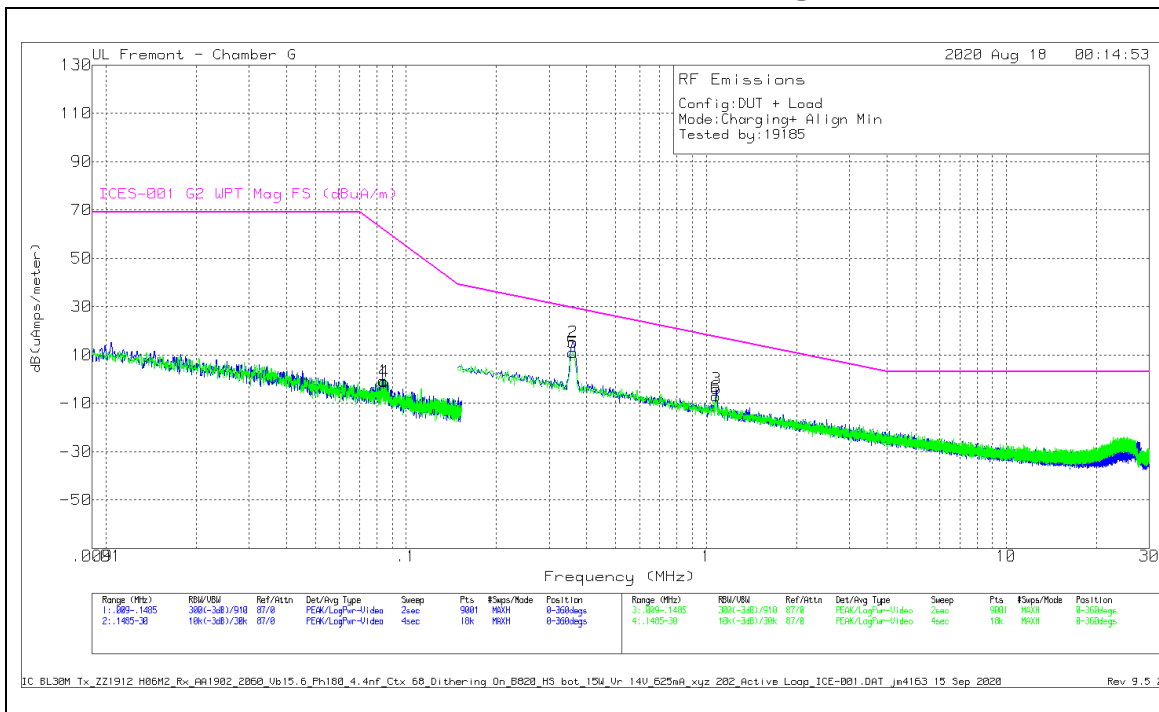


#### DATA

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | Loop Antenna (dB/m) | Cables (dB) | Corrected Reading dB(uAmps/meter) | CISPR11 G2 WPT Mag FS (dBuA/m) | Margin (dB) | Azimuth (Degs) |
|--------|-----------------|----------------------|-----|---------------------|-------------|-----------------------------------|--------------------------------|-------------|----------------|
| 1      | .11066          | 44.43                | Qp  | -40.1               | .1          | 4.43                              | 50.73                          | -46.3       | 18             |
| 4      | .12197          | 43.57                | Qp  | -40.2               | .1          | 3.47                              | 46.85                          | -43.38      | 107            |
| 5      | .21305          | 39.12                | Qp  | -40.4               | .1          | -1.18                             | 35.05                          | -36.23      | 341            |
| 2      | .26546          | 37.43                | Qp  | -40.5               | .1          | -2.97                             | 32.65                          | -35.62      | 101            |
| 6      | .32398          | 35.84                | Qp  | -40.6               | .1          | -4.66                             | 30.47                          | -35.13      | 81             |
| 3      | .38253          | 34.22                | Qp  | -40.6               | .1          | -6.28                             | 28.66                          | -34.94      | 253            |

Qp - Quasi-Peak detector

### 8.3.2. CONFIG 2: OPERATING WITH iPhone @ 15W LOAD



### DATA

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | Loop Antenna (dB/m) | Cables (dB) | Corrected Reading dB(uAmps/meter) | CISPR11 G2 WPT Mag FS (dBuA/m) | Margin (dB) | Azimuth (Degs) |
|--------|-----------------|----------------------|-----|---------------------|-------------|-----------------------------------|--------------------------------|-------------|----------------|
| 1      | .06931          | 47.35                | Qp  | -39.5               | .1          | 7.95                              | 69                             | -61.05      | 224            |
|        | .01703          | 60.37                | Pk  | -35.2               | .1          | 25.27                             | 69                             | -43.73      | 224            |
| 4      | .07328          | 46.97                | Qp  | -39.5               | .1          | 7.57                              | 67.17                          | -59.6       | 112            |
|        | .06729          | 52.93                | Pk  | -39.4               | .1          | 13.63                             | 69                             | -55.37      | 85             |
| 5      | .36003          | 56.57                | Qp  | -40.6               | .1          | 16.07                             | 29.32                          | -13.25      | 249            |
|        | .35911          | 52.95                | Pk  | -40.6               | .1          | 12.45                             | 29.35                          | -16.9       | 154            |
| 2      | .3601           | 52.57                | Qp  | -40.6               | .1          | 12.07                             | 29.32                          | -17.25      | 154            |
|        | .35955          | 56.83                | Pk  | -40.6               | .1          | 16.33                             | 29.33                          | -13         | 249            |
| 6      | 1.07904         | 33.53                | Qp  | -40.2               | .1          | -6.57                             | 17.32                          | -23.89      | 346            |
|        | 1.0791          | 34.97                | Pk  | -40.2               | .1          | -5.13                             | 17.32                          | -22.45      | 346            |
| 3      | 1.08026         | 37.08                | Qp  | -40.2               | .1          | -3.02                             | 17.31                          | -20.33      | 257            |
|        | 1.0806          | 37.93                | Pk  | -40.2               | .1          | -2.17                             | 17.31                          | -19.48      | 257            |

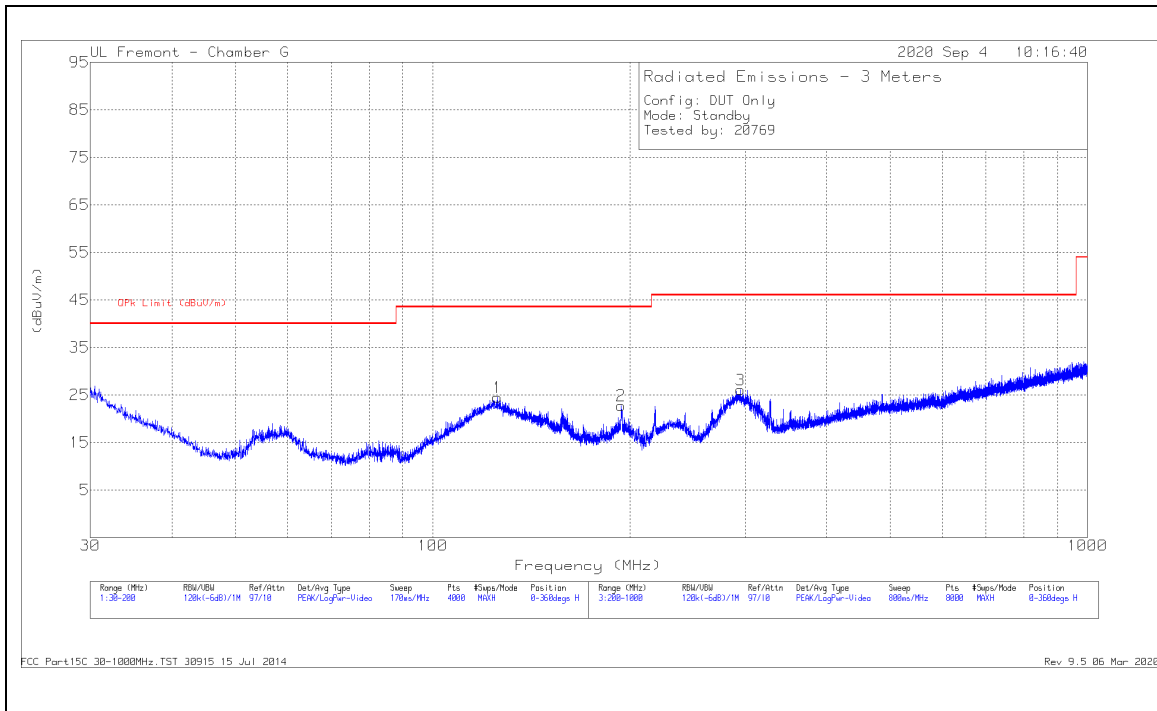
Pk - Peak detector

Qp - Quasi-Peak detector

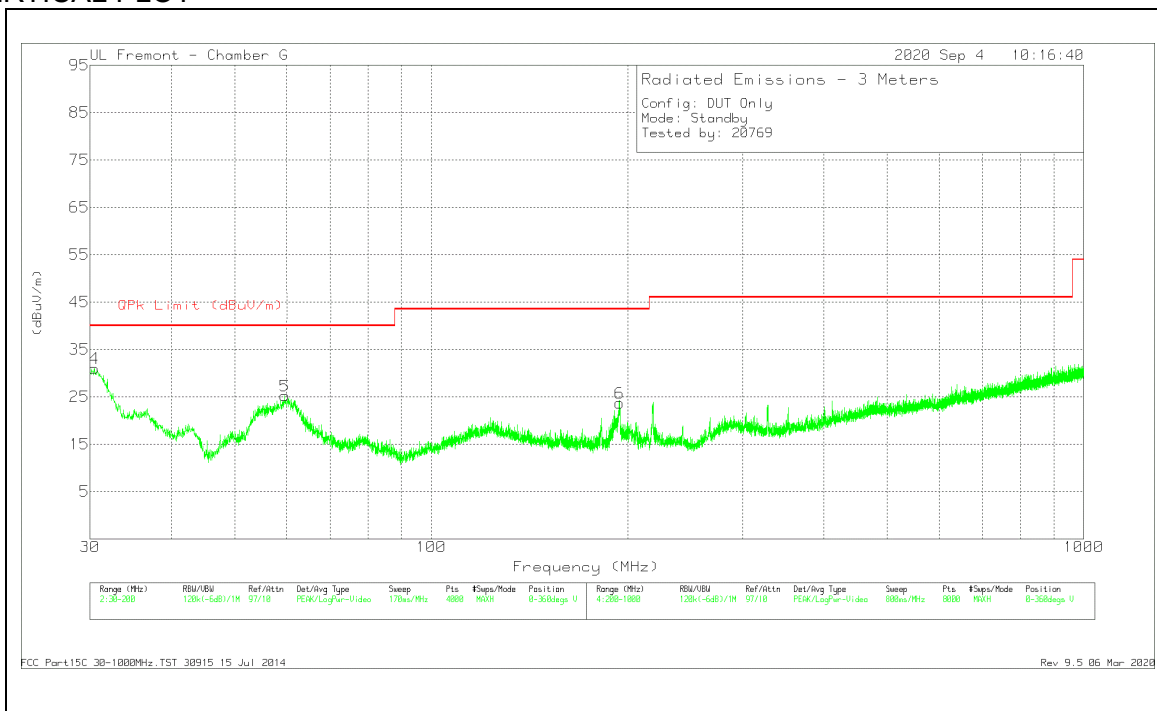
## 8.4. FCC TX SPURIOUS EMISSION 30 TO 1000 MHz FOR 360kHz

### 8.4.1. CONFIG 1: STANDBY

#### HORIZONTAL PLOT



#### VERTICAL PLOT



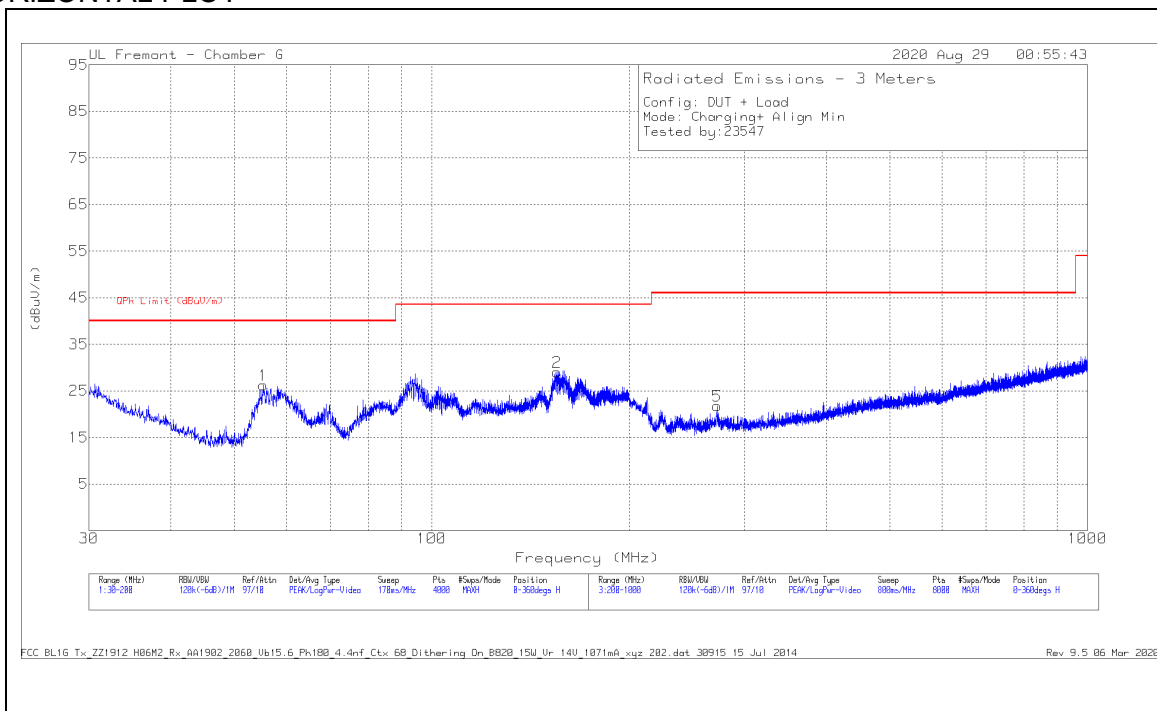
## **DATA**

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | AF T477 (dB/m) | Amp Cbl (dB) | Corrected Reading (dBuV/m) | QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|--------------|----------------------------|--------------------|-------------|----------------|-------------|----------|
| 1      | * 125.1207      | 28.89                | Qp  | 19.8           | -30          | 18.69                      | 43.52              | -24.83      | 11             | 198         | H        |
| 4      | 30.7477         | 29.48                | Qp  | 26.9           | -31          | 25.38                      | 40                 | -14.62      | 195            | 100         | V        |
| 5      | 59.3927         | 37.17                | Qp  | 13.4           | -30.7        | 19.87                      | 40                 | -20.13      | 82             | 100         | V        |
| 6      | 194.0445        | 33.03                | Qp  | 17.6           | -29.5        | 21.13                      | 43.52              | -22.39      | 211            | 100         | V        |
| 2      | 194.5034        | 31.34                | Qp  | 17.7           | -29.5        | 19.54                      | 43.52              | -23.98      | 211            | 137         | H        |
| 3      | 296.0764        | 30.14                | Qp  | 19.4           | -28.9        | 20.64                      | 46.02              | -25.38      | 329            | 107         | H        |

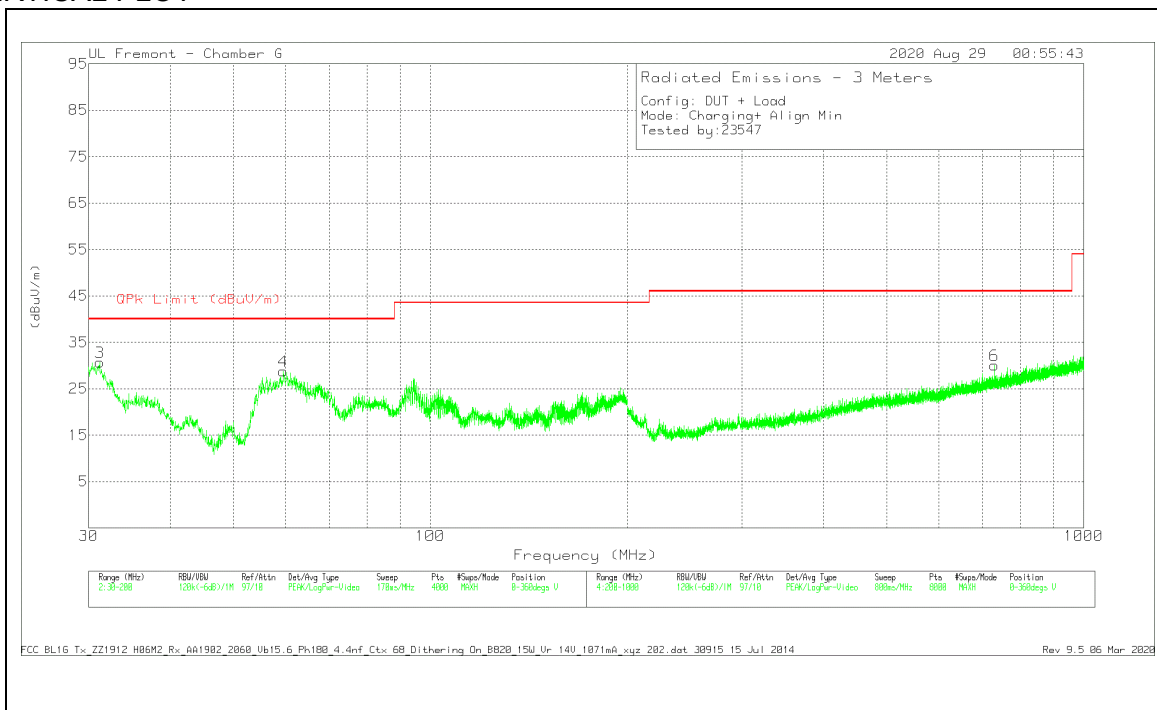
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band  
Qp - Quasi-Peak detector

## 8.4.2. CONFIG 2: OPERATING WITH iPhone @ 15W LOAD

### HORIZONTAL PLOT



### VERTICAL PLOT



## DATA

| Marker | Frequency (MHz) | Meter Reading (dBUV) | Det | AF T477 (dB/m) | Amp Cbl (dB) | Corrected Reading (dBUV/m) | QPk Limit (dBUV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|--------------|----------------------------|--------------------|-------------|----------------|-------------|----------|
| 5      | * 272.1755      | 25.3                 | Qp  | 19.3           | -29.1        | 15.5                       | 46.02              | -30.52      | 159            | 126         | H        |
| 3      | 31.0242         | 29.51                | Qp  | 26.7           | -31          | 25.21                      | 40                 | -14.79      | 227            | 104         | V        |
| 1      | 55.4908         | 37.66                | Qp  | 13.2           | -30.7        | 20.16                      | 40                 | -19.84      | 191            | 392         | H        |
| 4      | 59.7726         | 41.75                | Qp  | 13.5           | -30.7        | 24.55                      | 40                 | -15.45      | 108            | 116         | V        |
| 2      | 155.0297        | 30.9                 | Qp  | 18.3           | -29.9        | 19.3                       | 43.52              | -24.22      | 221            | 131         | H        |
| 6      | 729.5334        | 19.96                | Qp  | 26.7           | -27.3        | 19.36                      | 46.02              | -26.66      | 121            | 202         | V        |

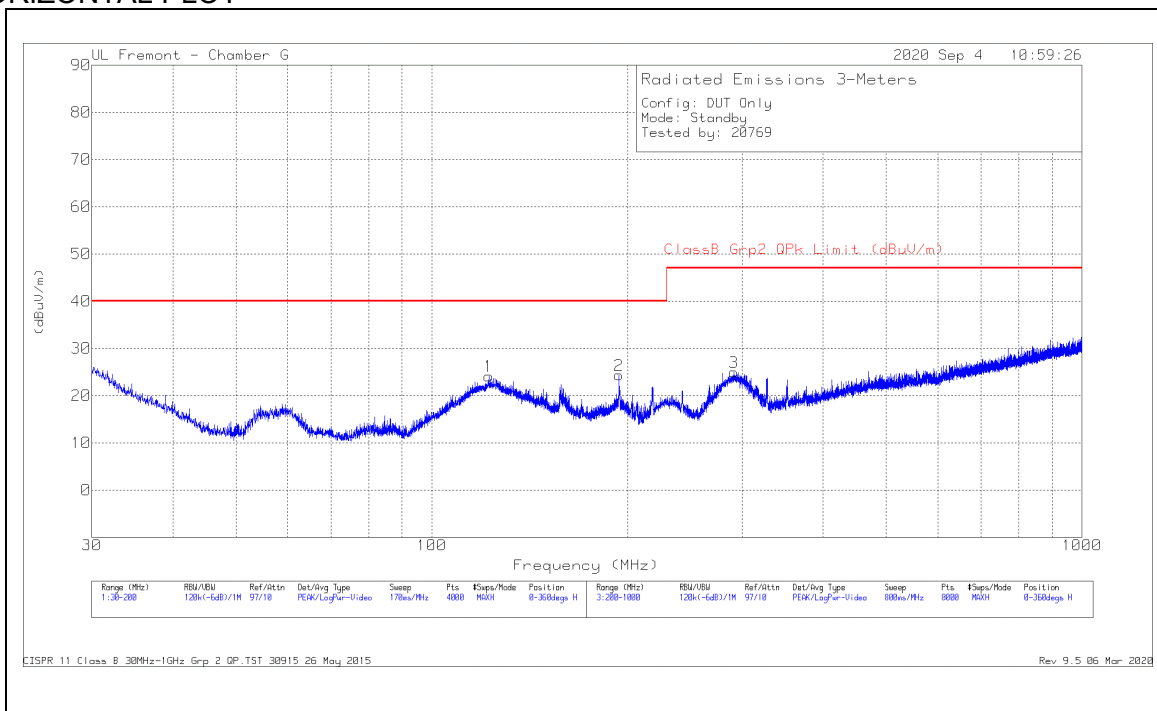
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Qp - Quasi-Peak detector

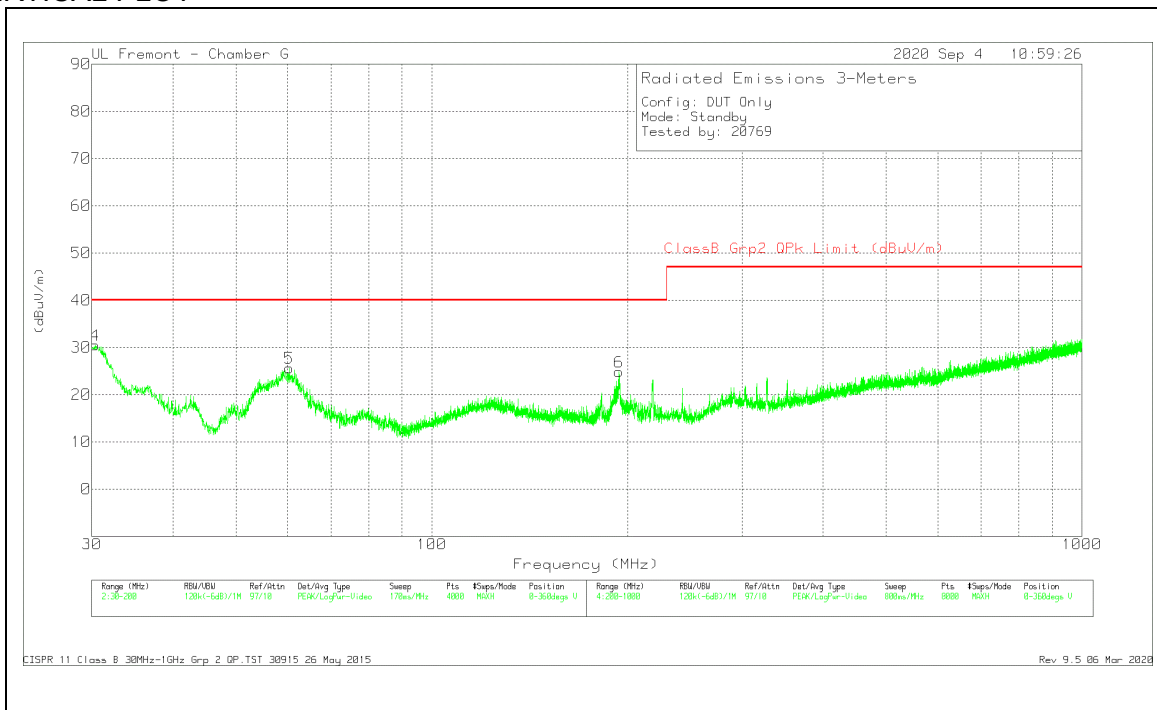
## 8.5. IC / CISPR 11 TX SPURIOUS EMISSION 30 TO 1000 MHz

### 8.5.1. CONFIG 1: STANDBY

#### HORIZONTAL PLOT



#### VERTICAL PLOT



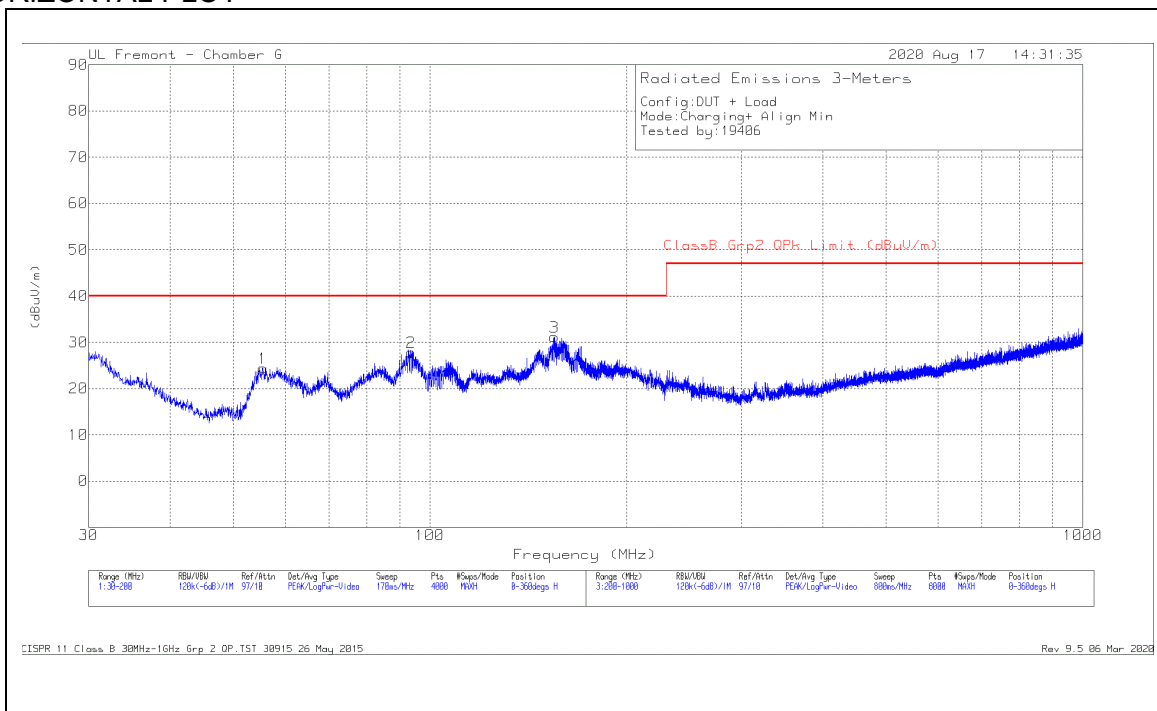
## DATA

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | AF T477 (dB/m) | Amp Cbl (dB) | Correct ed Reading (dBuV/m) | ClassB Grp2 QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|--------------|-----------------------------|--------------------------------|-------------|----------------|-------------|----------|
| 4      | 30.7746         | 29.88                | Qp  | 26.8           | -31          | 25.68                       | 40                             | -14.32      | 329            | 101         | V        |
| 5      | 59.0689         | 36.67                | Qp  | 13.4           | -30.7        | 19.37                       | 40                             | -20.63      | 139            | 124         | V        |
| 1      | 123.9549        | 28.42                | Qp  | 19.8           | -30          | 18.22                       | 40                             | -21.78      | 344            | 216         | H        |
| 2      | 193.9274        | 31.64                | Qp  | 17.6           | -29.5        | 19.74                       | 40                             | -20.26      | 211            | 194         | H        |
| 6      | 193.9765        | 34.01                | Qp  | 17.6           | -29.5        | 22.11                       | 40                             | -17.89      | 182            | 106         | V        |
| 3      | 293.0199        | 29.91                | Qp  | 19.4           | -28.9        | 20.41                       | 47                             | -26.59      | 331            | 100         | H        |

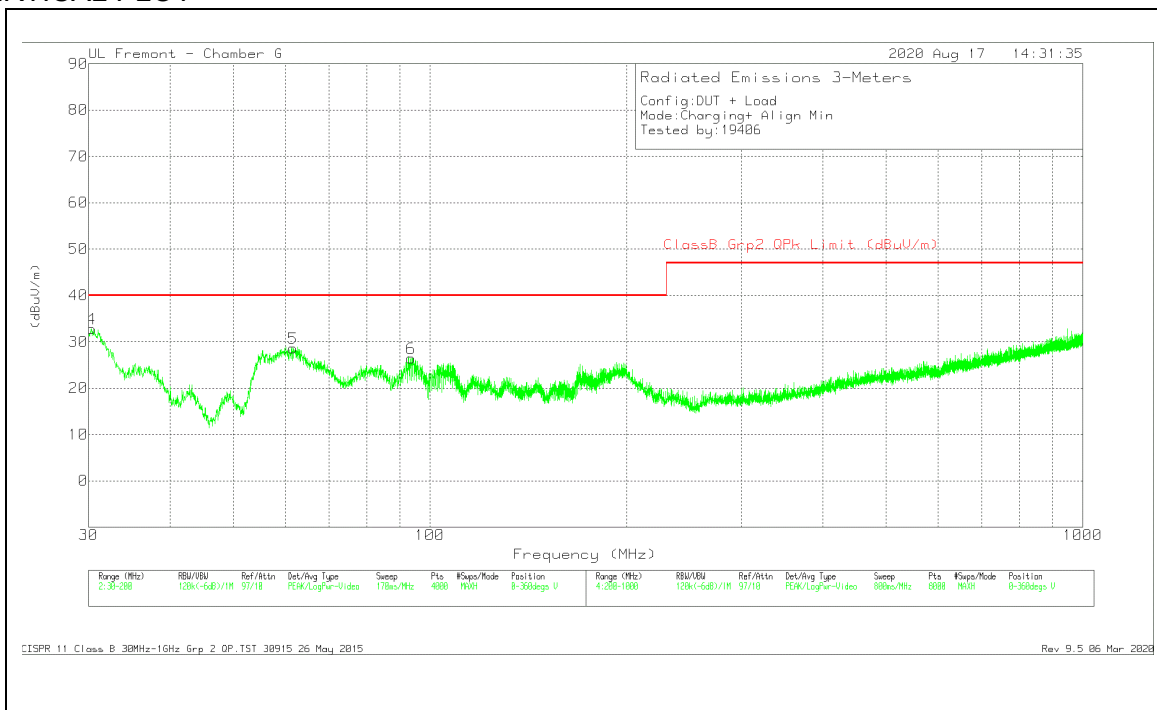
Qp - Quasi-Peak detector

## 8.5.2. CONFIG 2: OPERATING WITH iPhone @15W LOAD

### HORIZONTAL PLOT



### VERTICAL PLOT



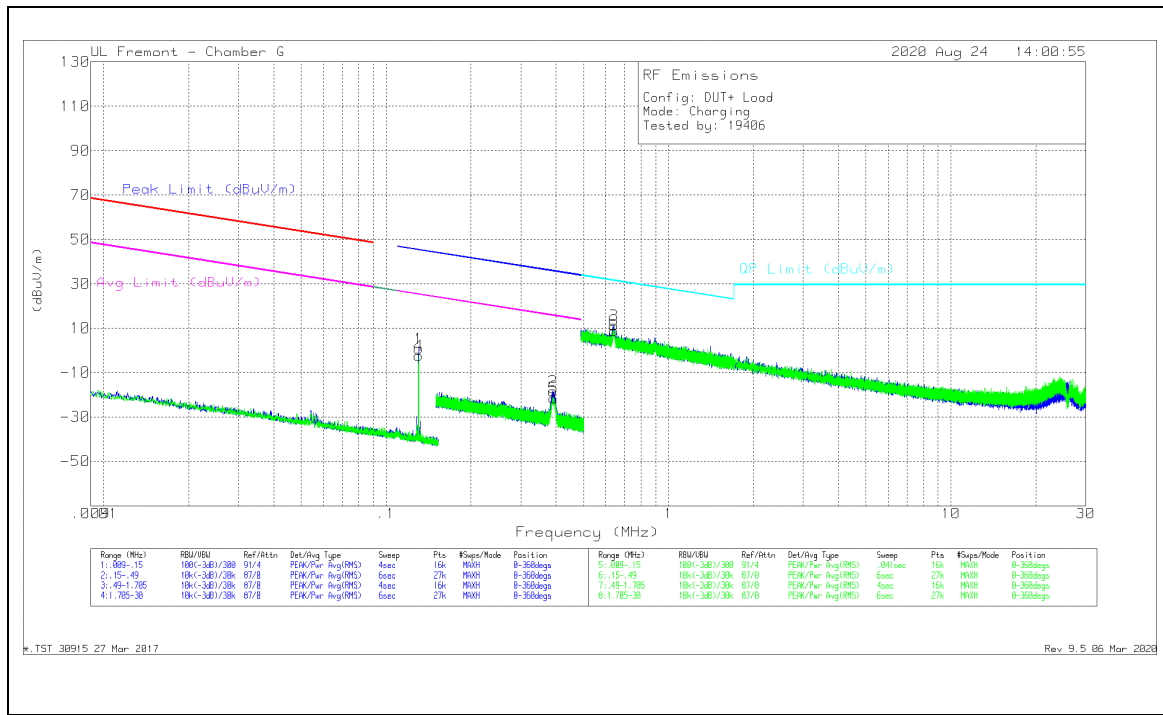
## DATA

| Frequency (MHz) | Meter Reading (dBuV) | Det | AF T477 (dB/m) | Amp Cbl (dB) | Corrected Reading (dBuV/m) | ClassB Grp2 QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|-----------------|----------------------|-----|----------------|--------------|----------------------------|--------------------------------|-------------|----------------|-------------|----------|
| 30.5261         | 32.27                | Qp  | 27             | -31          | 28.27                      | 40                             | -11.73      | 251            | 100         | V        |
| 55.2502         | 36.41                | Qp  | 13.2           | -30.7        | 18.91                      | 40                             | -21.09      | 197            | 384         | H        |
| 61.7151         | 41.46                | Qp  | 13.7           | -30.7        | 24.46                      | 40                             | -15.54      | 109            | 106         | V        |
| 93.2848         | 33.41                | Qp  | 14.5           | -30.4        | 17.51                      | 40                             | -22.49      | 176            | 230         | H        |
| 93.5653         | 28.77                | Qp  | 14.5           | -30.4        | 12.87                      | 40                             | -27.13      | 222            | 100         | V        |
| 155.0693        | 30.78                | Qp  | 18.3           | -29.9        | 19.18                      | 40                             | -20.82      | 247            | 146         | H        |

Qp - Quasi-Peak detector

## 8.6. FCC TX FUNDAMENTAL AND SPURIOUS EMISSIONS FROM 9 kHz TO 30 MHz FOR 127kHz

### 8.6.1. OPERATING WITH iPhone @ 7.5W LOAD



## DATA

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | Loop Antenna (dB/m) | Cables (dB) | Dist Corr 30m | Corrected Reading (dBuVolts) | Peak Limit (dBuV/m) | PK Margin (dB) | Avg Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) |
|--------|-----------------|----------------------|-----|---------------------|-------------|---------------|------------------------------|---------------------|----------------|--------------------|-------------|----------------|
| 1      | .12742          | 69.68                | Av  | 11.8                | .1          | -80           | 1.58                         | -                   | -              | 25.52              | -23.94      | 245            |
|        | .12749          | 66.65                | Pk  | 11.8                | .1          | -80           | -1.45                        | 45.52               | -46.97         | 25.52              | -26.97      | 340            |
| 4      | .12781          | 64.71                | Av  | 11.8                | .1          | -80           | -3.39                        | -                   | -              | 25.49              | -28.88      | 340            |
|        | .12825          | 70.62                | Pk  | 11.8                | .1          | -80           | 2.52                         | 45.46               | -42.94         | 25.46              | -22.94      | 245            |
| 2      | .38258          | 43.38                | Av  | 11                  | .1          | -80           | -25.52                       | -                   | -              | 15.95              | -41.47      | 155            |
|        | .38295          | 47.34                | Av  | 11                  | .1          | -80           | -21.56                       | -                   | -              | 15.95              | -37.51      | 231            |
| 5      | .38302          | 49.66                | Pk  | 11                  | .1          | -80           | -19.24                       | 35.94               | -55.18         | 15.94              | -35.18      | 231            |
|        | .38347          | 47.16                | Pk  | 11                  | .1          | -80           | -21.74                       | 35.93               | -57.67         | 15.93              | -37.67      | 155            |

Pk - Peak detector  
Av - Average detection

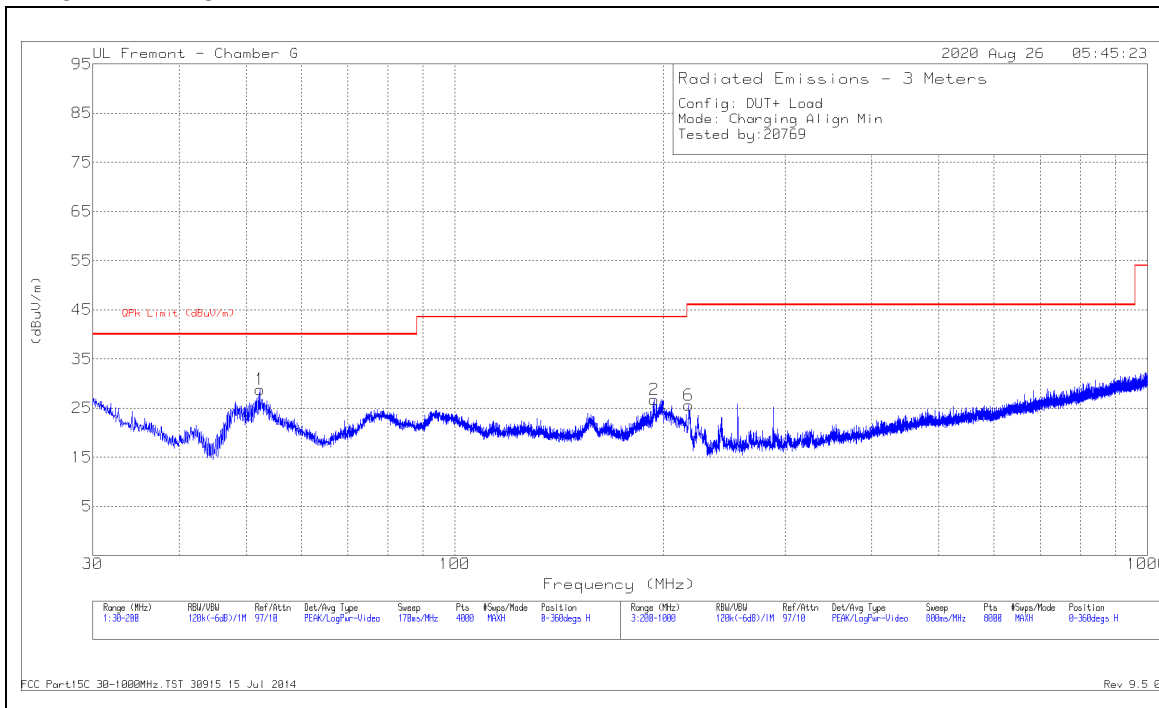
| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | Loop Antenna (dB/m) | Cables (dB) | Dist Corr 30m | Corrected Reading (dBuVolts) | QP Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) |
|--------|-----------------|----------------------|-----|---------------------|-------------|---------------|------------------------------|-------------------|-------------|----------------|
| 3      | .63791          | 38.73                | Qp  | 10.8                | .1          | -40           | 9.63                         | 31.52             | -21.89      | 251            |
| 6      | .63942          | 34.92                | Qp  | 10.8                | .1          | -40           | 5.82                         | 31.49             | -25.67      | 9              |

Qp - Quasi-Peak detector

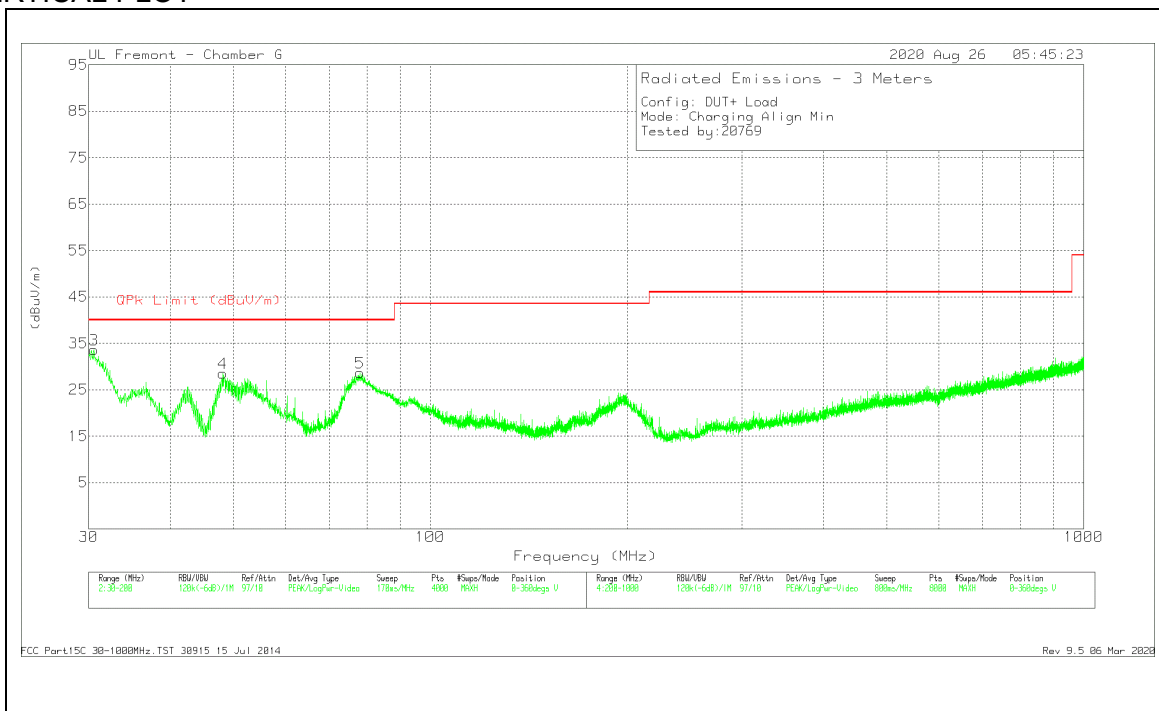
## 8.7. FCC TX SPURIOUS EMISSION 30 TO 1000 MHz FOR 127kHz

### 8.7.1. OPERATING WITH IPHONE @ 7.5W LOAD

#### HORIZONTAL PLOT



#### VERTICAL PLOT



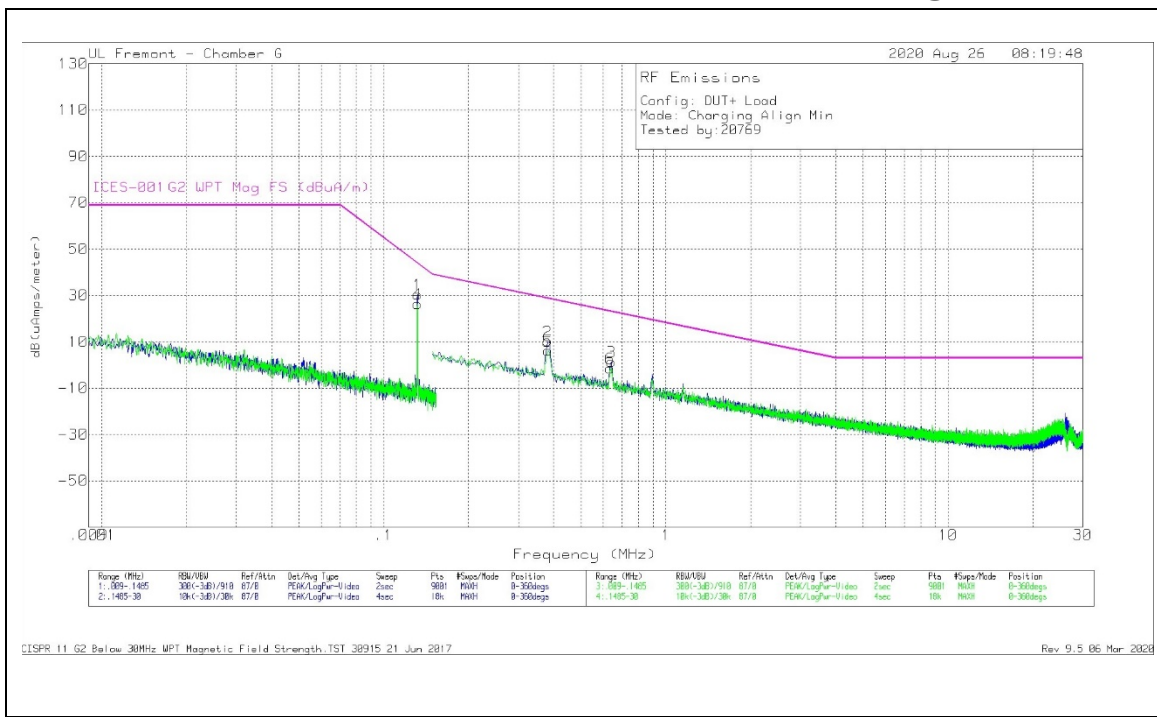
## DATA

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | AF T477 (dB/m) | Amp Cbl (dB) | Corrected Reading (dBuV/m) | QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|--------------|----------------------------|--------------------|-------------|----------------|-------------|----------|
| 3      | 30.4646         | 31.88                | Qp  | 27             | -31          | 27.88                      | 40                 | -12.12      | 241            | 105         | V        |
| 4      | 48.6922         | 41.62                | Qp  | 14.3           | -30.8        | 25.12                      | 40                 | -14.88      | 303            | 101         | V        |
| 1      | 52.6918         | 38.15                | Qp  | 13.3           | -30.8        | 20.65                      | 40                 | -19.35      | 176            | 364         | H        |
| 5      | 77.4174         | 40.85                | Qp  | 13.9           | -30.5        | 24.25                      | 40                 | -15.75      | 80             | 100         | V        |
| 2      | 193.9134        | 34.96                | Qp  | 17.6           | -29.5        | 23.06                      | 43.52              | -20.46      | 83             | 176         | H        |
| 6      | 218.0743        | 38.89                | Qp  | 16.6           | -29.4        | 26.09                      | 46.02              | -19.93      | 67             | 100         | H        |

Qp - Quasi-Peak detector

## 8.8. IC / CISPR 11 TX FUNDAMENTAL AND SPURIOUS EMISSIONS FROM 9 kHz TO 30 MHz FOR 127kHz

### 8.8.1. OPERATING WITH AIRPODS CHARGING CASE @ 1W LOAD



## DATA

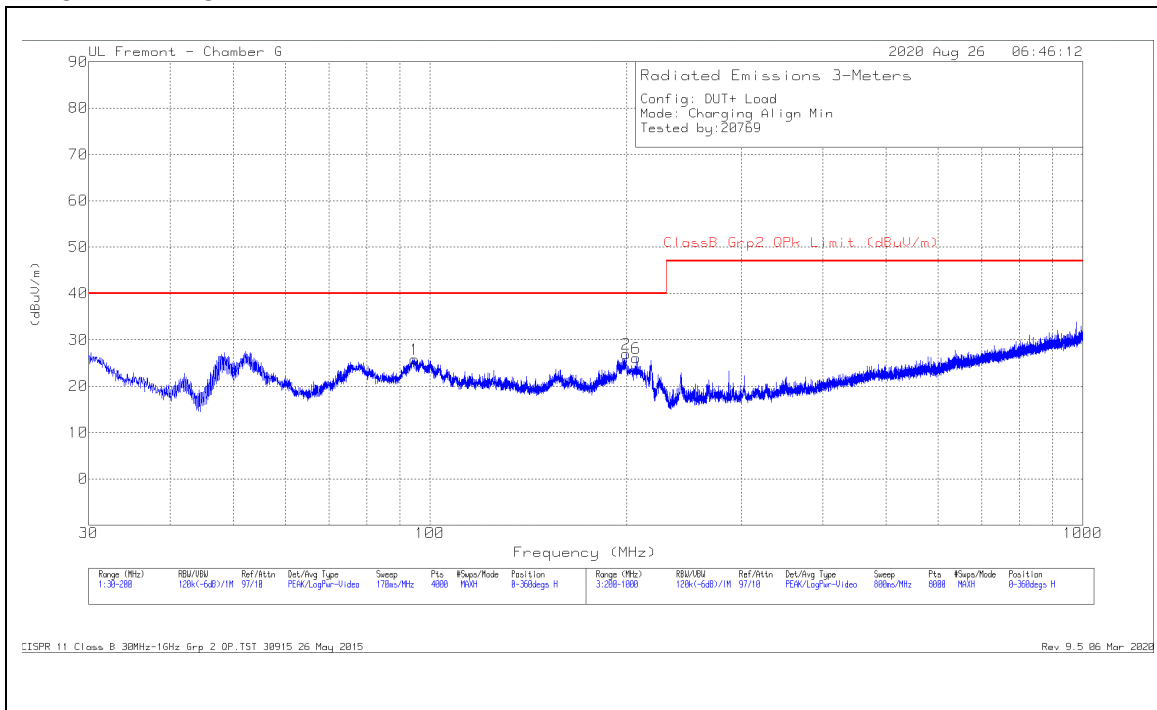
| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | Loop Antenna (dB/m) | Cables (dB) | Corrected Reading dB(uAmps/meter) | CISPR11 G2 WPT Mag FS (dBuA/m) | Margin (dB) | Azimuth (Degs) |
|--------|-----------------|----------------------|-----|---------------------|-------------|-----------------------------------|--------------------------------|-------------|----------------|
| 1      | .12779          | 71.12                | Qp  | -40.2               | .1          | 31.02                             | 44.99                          | -13.97      | 247            |
| 4      | .12812          | 66.79                | Qp  | -40.2               | .1          | 26.69                             | 44.89                          | -18.2       | 329            |
| 2      | .38322          | 50.18                | Qp  | -40.6               | .1          | 9.68                              | 28.64                          | -18.96      | 260            |
| 5      | .38333          | 46.38                | Qp  | -40.6               | .1          | 5.88                              | 28.63                          | -22.75      | 342            |
| 3      | .63776          | 41.28                | Qp  | -40.5               | .1          | .88                               | 23.07                          | -22.19      | 257            |
| 6      | .63915          | 37.78                | Qp  | -40.5               | .1          | -2.62                             | 23.05                          | -25.67      | 157            |

Qp - Quasi-Peak detector

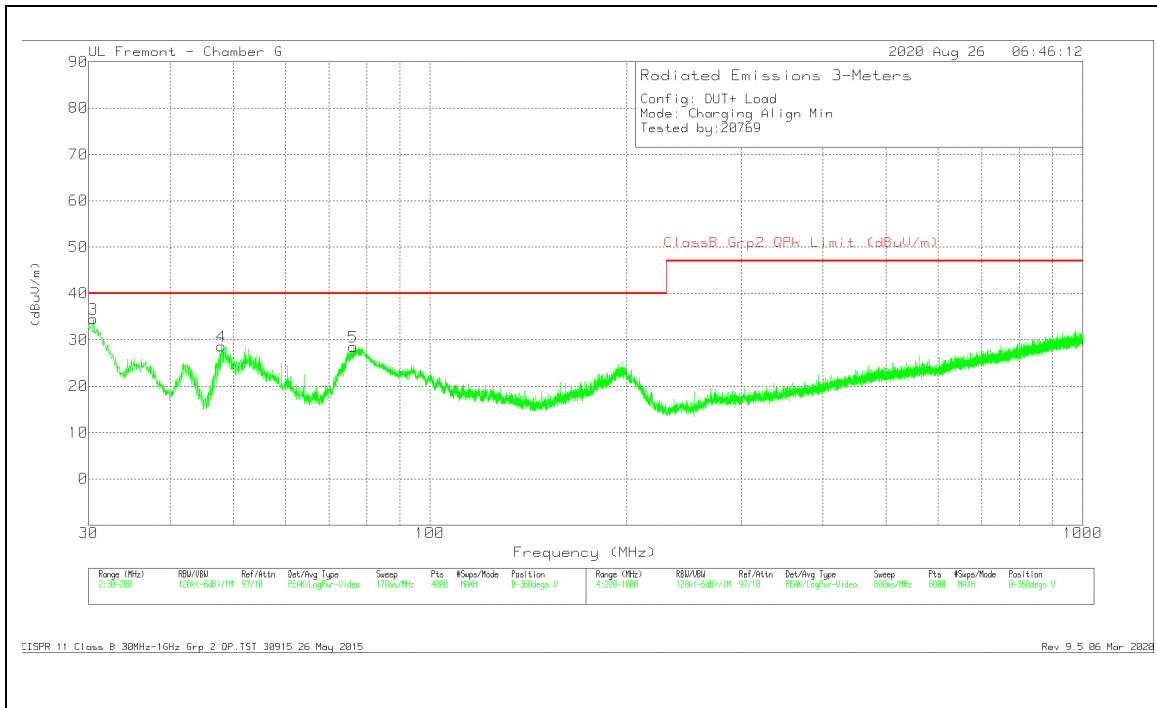
## 8.9. IC / CISPR 11 TX SPURIOUS EMISSION 30 TO 1000 MHz FOR 127kHz

### 8.9.1. OPERATING WITH AIRPODS CHARGING CASE @1W LOAD

#### HORIZONTAL PLOT



#### VERTICAL PLOT



# **DATA**

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | AF T477 (dB/m) | Amp Cbl (dB) | Corrected Reading (dBuV/m) | ClassB Grp2 QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|----------------|--------------|----------------------------|--------------------------------|-------------|----------------|-------------|----------|
| 3      | 30.5598         | 33.52                | Qp  | 27             | -31          | 29.52                      | 40                             | -10.48      | 277            | 100         | V        |
| 4      | 48.7156         | 41.92                | Qp  | 14.2           | -30.8        | 25.32                      | 40                             | -14.68      | 304            | 100         | V        |
| 5      | 76.5345         | 40.76                | Qp  | 13.9           | -30.5        | 24.16                      | 40                             | -15.84      | 31             | 101         | V        |
| 1      | 93.7937         | 39.33                | Qp  | 14.6           | -30.4        | 23.53                      | 40                             | -16.47      | 181            | 314         | H        |
| 2      | 198.3027        | 30.67                | Qp  | 18.2           | -29.5        | 19.37                      | 40                             | -20.63      | 55             | 147         | H        |
| 6      | 205.6049        | 34.87                | Qp  | 16.8           | -29.5        | 22.17                      | 40                             | -17.83      | 91             | 169         | H        |

Qp - Quasi-Peak detector

## 9. AC MAINS LINE CONDUCTED EMISSIONS

### LIMITS

FCC §15.207 (a)

RSS-Gen 8.8

| Frequency of Emission (MHz) | Conducted Limit (dBµV) |            |
|-----------------------------|------------------------|------------|
|                             | 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.

ICES-001 Issue 5 Table 1:

**Table 1: Conducted emission limits for induction cooking appliances (AC mains terminals)**

| Frequency range (MHz)                                                                                                                                     | Appliances rated 100 V, without an earth connection<br>Quasi-peak (dBµV) | Appliances rated 100 V, without an earth connection<br>Average (dBµV) | All other appliances<br>Quasi-peak (dBµV) | All other appliances<br>Average (dBµV) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------|----------------------------------------|
| 0.009 – 0.05                                                                                                                                              | 122                                                                      | —                                                                     | 110                                       | —                                      |
| 0.05 – 0.15                                                                                                                                               | 102 to 92 *                                                              | —                                                                     | 90 to 80 *                                | —                                      |
| 0.15 – 0.5                                                                                                                                                | 72 to 62 *                                                               | 62 to 52 *                                                            | 66 to 56 *                                | 56 to 46 *                             |
| 0.5 – 5                                                                                                                                                   | 56                                                                       | 46                                                                    | 56                                        | 46                                     |
| 5 – 30                                                                                                                                                    | 60                                                                       | 50                                                                    | 60                                        | 50                                     |
| <b>Note:</b> The more stringent limit applies at transition frequencies.<br>* The limit level in dBµV decreases linearly with the logarithm of frequency. |                                                                          |                                                                       |                                           |                                        |

### TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ICES 01

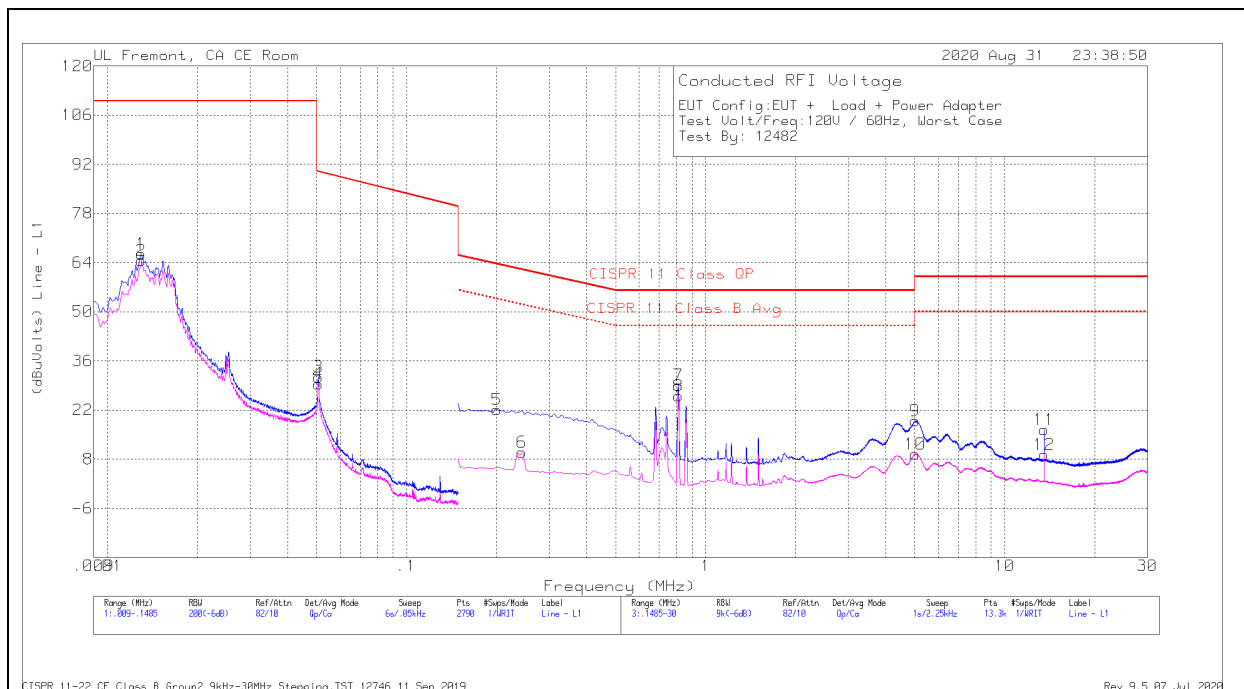
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

### RESULTS

## 9.1.1. STANDBY MODE

### LINE 1 RESULTS



### WORST EMISSIONS

#### Range 1: Line - L1 .009 - .1485MHz

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | PRE0186446 LISN L1 | LC Cables C1&C3 | Limiter (dB) | Corrected Reading (dBuVolts) | CISPR 11 Class QP | Margin (dB) | CISPR 11 Class B Avg | Margin (dB) |
|--------|-----------------|----------------------|-----|--------------------|-----------------|--------------|------------------------------|-------------------|-------------|----------------------|-------------|
| 1      | .013            | 56                   | Qp  | .1                 | 0               | 10.5         | 66.6                         | 110               | -43.4       | -                    | -           |
| 2      | .013            | 53.95                | Ca  | .1                 | 0               | 10.5         | 64.55                        | -                 | -           | -                    | -           |
| 3      | .05075          | 21.37                | Qp  | .1                 | 0               | 10           | 31.47                        | 89.86             | -58.39      | -                    | -           |
| 4      | .05075          | 19.41                | Ca  | .1                 | 0               | 10           | 29.51                        | -                 | -           | -                    | -           |

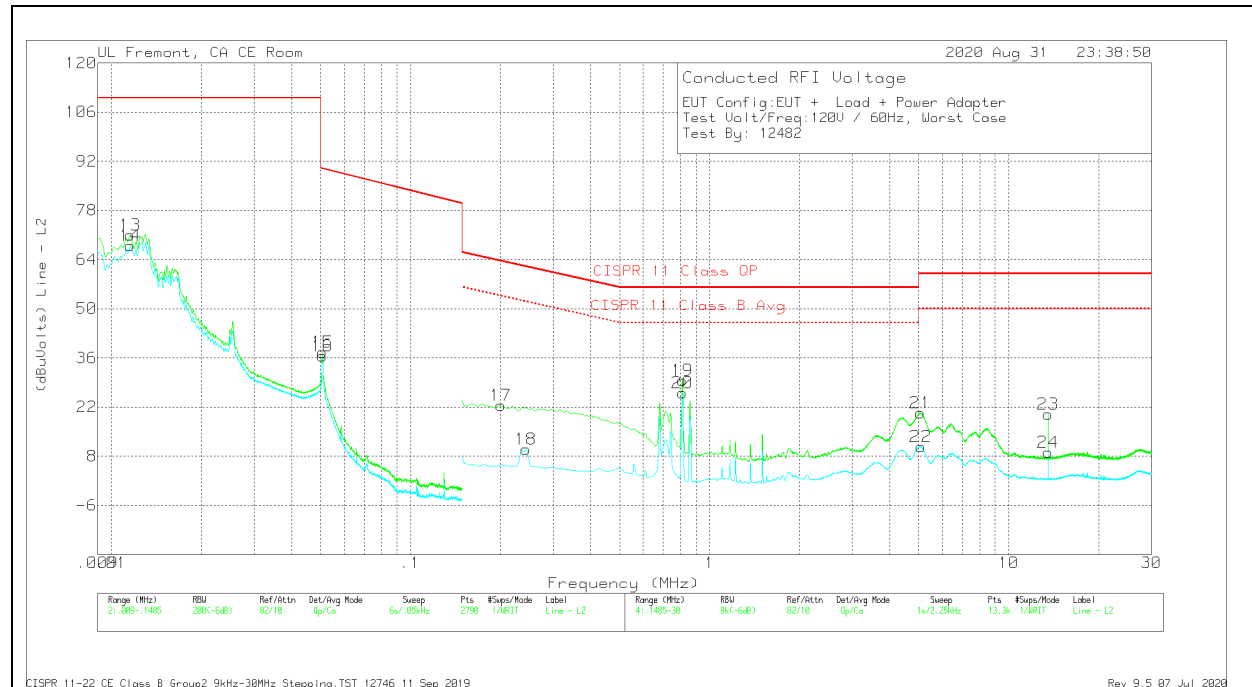
#### Range 3: Line - L1 .1485 - 30MHz

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | PRE0186446 LISN L1 | LC Cables C1&C3 | Limiter (dB) | Corrected Reading (dBuVolts) | CISPR 11 Class QP | Margin (dB) | CISPR 11 Class B Avg | Margin (dB) |
|--------|-----------------|----------------------|-----|--------------------|-----------------|--------------|------------------------------|-------------------|-------------|----------------------|-------------|
| 5      | .20025          | 12.12                | Qp  | 0                  | 0               | 10           | 22.12                        | 63.54             | -41.42      | -                    | -           |
| 6      | .243            | .03                  | Ca  | 0                  | 0               | 10           | 10.03                        | -                 | -           | 51.99                | -41.96      |
| 7      | .81             | 19.06                | Qp  | 0                  | 0               | 10           | 29.06                        | 56                | -26.94      | -                    | -           |
| 8      | .81             | 16                   | Ca  | 0                  | 0               | 10           | 26                           | -                 | -           | 46                   | -20         |
| 9      | 5.01975         | 8.72                 | Qp  | 0                  | .1              | 10.1         | 18.92                        | 60                | -41.08      | -                    | -           |
| 10     | 5.01975         | -7.2                 | Ca  | 0                  | .1              | 10.1         | 9.48                         | -                 | -           | 50                   | -40.52      |
| 11     | 13.56075        | 6.04                 | Qp  | .1                 | .2              | 10.1         | 16.44                        | 60                | -43.56      | -                    | -           |
| 12     | 13.56075        | -1.19                | Ca  | .1                 | .2              | 10.1         | 9.21                         | -                 | -           | 50                   | -40.79      |

Qp - Quasi-Peak detector

Ca - CISPR average detection

## LINE 2 RESULTS



## WORST EMISSIONS

| Range 2: Line - L2 .009 - .1485MHz |                 |                      |     |                    |                 |              |                              |                   |             |                      |             |
|------------------------------------|-----------------|----------------------|-----|--------------------|-----------------|--------------|------------------------------|-------------------|-------------|----------------------|-------------|
| Marker                             | Frequency (MHz) | Meter Reading (dBuV) | Det | PRE0186446 LISN L2 | LC Cables C2&C3 | Limiter (dB) | Corrected Reading (dBuVolts) | CISPR 11 Class QP | Margin (dB) | CISPR 11 Class B Avg | Margin (dB) |
| 13                                 | .01155          | 60.38                | Qp  | .1                 | 0               | 10.5         | 70.98                        | 110               | -39.02      | -                    | -           |
| 14                                 | .01155          | 57.36                | Ca  | .1                 | 0               | 10.5         | 67.96                        | -                 | -           | -                    | -           |
| 15                                 | .05075          | 27.56                | Qp  | .1                 | 0               | 10           | 37.66                        | 89.86             | -52.2       | -                    | -           |
| 16                                 | .05075          | 26.54                | Ca  | .1                 | 0               | 10           | 36.64                        | -                 | -           | -                    | -           |

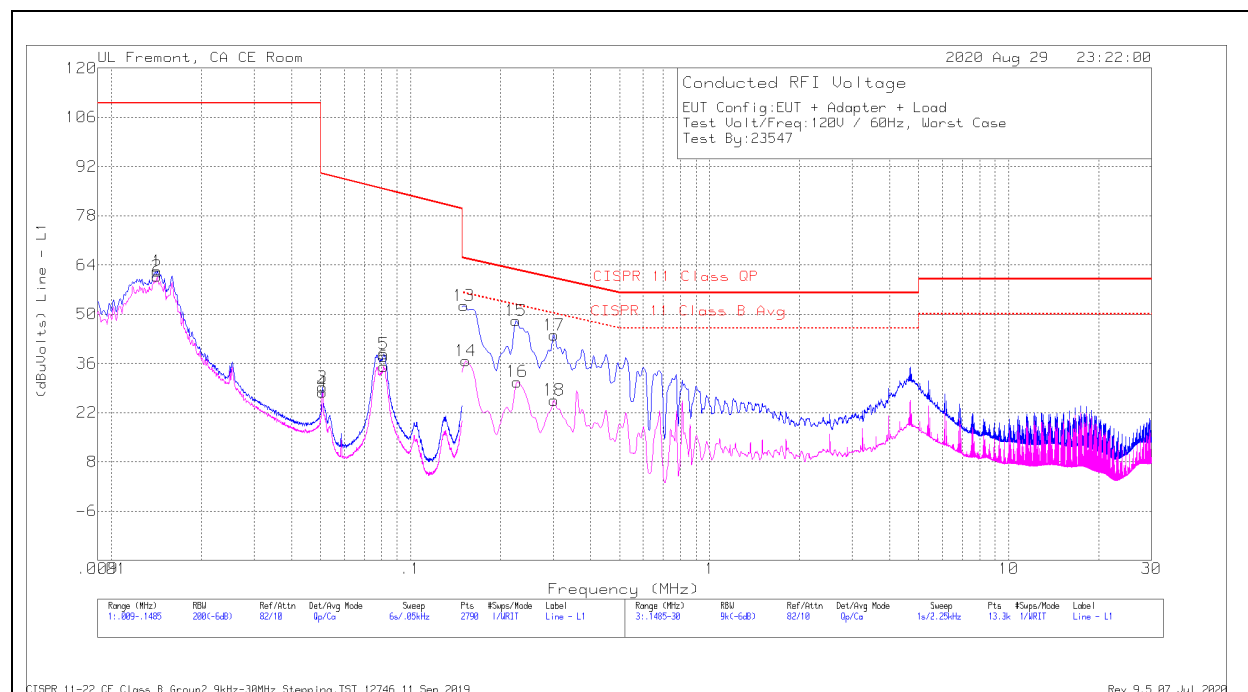
| Range 4: Line - L2 .1485 - 30MHz |                 |                      |     |                    |                 |              |                              |                   |             |                      |             |
|----------------------------------|-----------------|----------------------|-----|--------------------|-----------------|--------------|------------------------------|-------------------|-------------|----------------------|-------------|
| Marker                           | Frequency (MHz) | Meter Reading (dBuV) | Det | PRE0186446 LISN L2 | LC Cables C2&C3 | Limiter (dB) | Corrected Reading (dBuVolts) | CISPR 11 Class QP | Margin (dB) | CISPR 11 Class B Avg | Margin (dB) |
| 17                               | .20025          | 12.48                | Qp  | 0                  | 0               | 10           | 22.48                        | 63.54             | -41.06      | -                    | -           |
| 18                               | .243            | -.09                 | Ca  | 0                  | 0               | 10           | 9.91                         | -                 | -           | 51.99                | -42.08      |
| 19                               | .81             | 19.53                | Qp  | 0                  | 0               | 10           | 29.53                        | 56                | -26.47      | -                    | -           |
| 20                               | .81             | 16.1                 | Ca  | 0                  | 0               | 10           | 26.1                         | -                 | -           | 46                   | -19.9       |
| 21                               | 5.06025         | 10.1                 | Qp  | 0                  | .1              | 10.1         | 20.3                         | 60                | -39.7       | -                    | -           |
| 22                               | 5.07825         | .46                  | Ca  | 0                  | .1              | 10.1         | 10.66                        | -                 | -           | 50                   | -39.34      |
| 23                               | 13.56075        | 9.53                 | Qp  | .1                 | .2              | 10.1         | 19.93                        | 60                | -40.07      | -                    | -           |
| 24                               | 13.56075        | -1.29                | Ca  | .1                 | .2              | 10.1         | 9.11                         | -                 | -           | 50                   | -40.89      |

Qp - Quasi-Peak detector

Ca - CISPR average detection

## 9.1.2. OPERATING MODE WITH iPhone @ 15W LOAD

### LINE 1 RESULTS



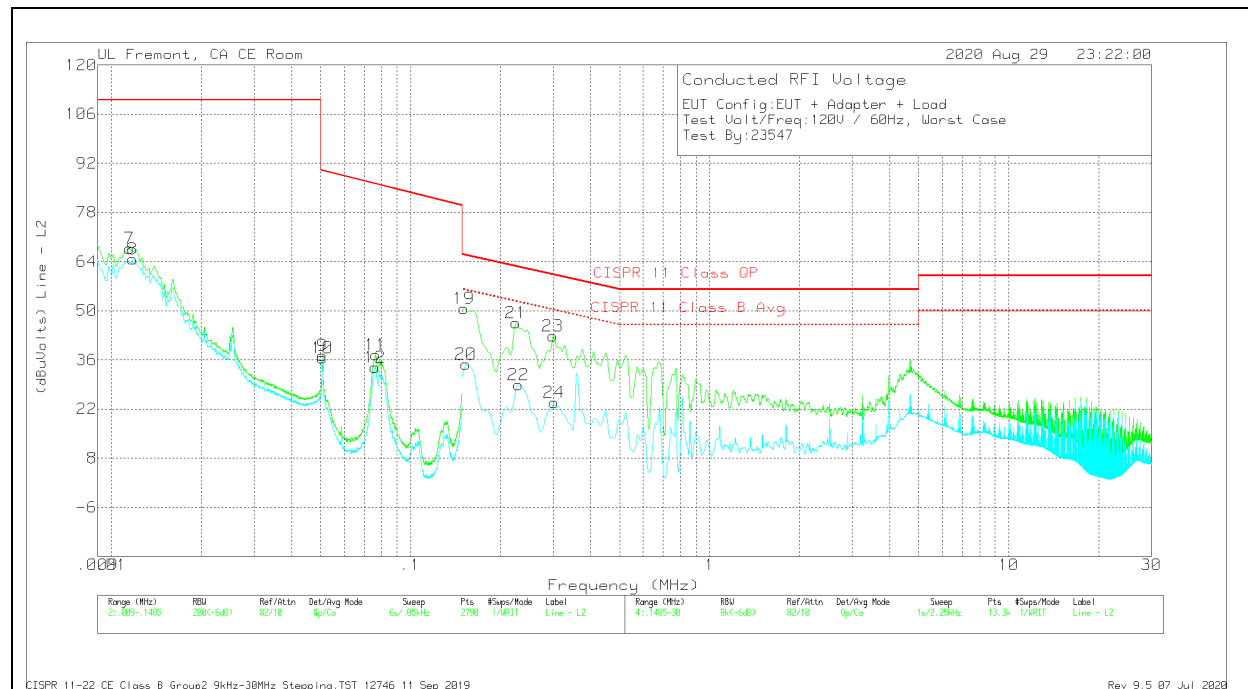
### WORST EMISSIONS

| Range 1: Line - L1 .009 - .1485MHz |                 |                      |     |                    |                 |              |                              |                   |             |                      |             |
|------------------------------------|-----------------|----------------------|-----|--------------------|-----------------|--------------|------------------------------|-------------------|-------------|----------------------|-------------|
| Marker                             | Frequency (MHz) | Meter Reading (dBuV) | Det | PRE0186446 LISN L1 | LC Cables C1&C3 | Limiter (dB) | Corrected Reading (dBuVolts) | CISPR 11 Class QP | Margin (dB) | CISPR 11 Class B Avg | Margin (dB) |
| 1                                  | .01425          | 51.82                | Qp  | .1                 | 0               | 10.4         | 62.32                        | 110               | -47.68      | -                    | -           |
| 2                                  | .01425          | 50.26                | Ca  | .1                 | 0               | 10.4         | 60.76                        | -                 | -           | -                    | -           |
| 3                                  | .0508           | 19.16                | Qp  | .1                 | 0               | 10           | 29.26                        | 89.85             | -60.59      | -                    | -           |
| 4                                  | .05085          | 17.72                | Ca  | .1                 | 0               | 10           | 27.82                        | -                 | -           | -                    | -           |
| 5                                  | .0814           | 28.59                | Qp  | .1                 | 0               | 10           | 38.69                        | 85.52             | -46.83      | -                    | -           |
| 6                                  | .0813           | 25                   | Ca  | .1                 | 0               | 10           | 35.1                         | -                 | -           | -                    | -           |

| Range 3: Line - L1 .1485 - 30MHz |                 |                      |     |                    |                 |              |                              |                   |             |                      |             |
|----------------------------------|-----------------|----------------------|-----|--------------------|-----------------|--------------|------------------------------|-------------------|-------------|----------------------|-------------|
| Marker                           | Frequency (MHz) | Meter Reading (dBuV) | Det | PRE0186446 LISN L1 | LC Cables C1&C3 | Limiter (dB) | Corrected Reading (dBuVolts) | CISPR 11 Class QP | Margin (dB) | CISPR 11 Class B Avg | Margin (dB) |
| 13                               | .15075          | 42.39                | Qp  | .1                 | 0               | 10           | 52.49                        | 65.88             | -13.39      | -                    | -           |
| 14                               | .153            | 26.66                | Ca  | .1                 | 0               | 10           | 36.76                        | -                 | -           | 55.84                | -19.08      |
| 15                               | .225            | 38.13                | Qp  | 0                  | 0               | 10           | 48.13                        | 62.58             | -14.45      | -                    | -           |
| 16                               | .22725          | 20.76                | Ca  | 0                  | 0               | 10           | 30.76                        | -                 | -           | 52.55                | -21.79      |
| 17                               | .3015           | 33.97                | Qp  | 0                  | 0               | 10           | 43.97                        | 60.17             | -16.2       | -                    | -           |
| 18                               | .3015           | 15.58                | Ca  | 0                  | 0               | 10           | 25.58                        | -                 | -           | 50.2                 | -24.62      |

Qp - Quasi-Peak detector  
Ca - CISPR average detection

## LINE 2 RESULTS



## WORST EMISSIONS

| Range 2: Line - L2 .009 - .1485MHz |                 |                      |     |                    |                 |              |                              |                   |             |                      |             |
|------------------------------------|-----------------|----------------------|-----|--------------------|-----------------|--------------|------------------------------|-------------------|-------------|----------------------|-------------|
| Marker                             | Frequency (MHz) | Meter Reading (dBuV) | Det | PRE0186446 LISN L2 | LC Cables C2&C3 | Limiter (dB) | Corrected Reading (dBuVolts) | CISPR 11 Class QP | Margin (dB) | CISPR 11 Class B Avg | Margin (dB) |
| 7                                  | .0115           | 57.17                | Qp  | .1                 | 0               | 10.5         | 67.77                        | 110               | -42.23      | -                    | -           |
| 8                                  | .0118           | 54.18                | Ca  | .1                 | 0               | 10.5         | 64.78                        | -                 | -           | -                    | -           |
| 9                                  | .05075          | 27.15                | Qp  | .1                 | 0               | 10           | 37.25                        | 89.86             | -52.61      | -                    | -           |
| 10                                 | .05075          | 26.4                 | Ca  | .1                 | 0               | 10           | 36.5                         | -                 | -           | -                    | -           |
| 11                                 | .0763           | 27.29                | Qp  | .1                 | 0               | 10           | 37.39                        | 86.12             | -48.73      | -                    | -           |
| 12                                 | .07625          | 23.76                | Ca  | .1                 | 0               | 10           | 33.86                        | -                 | -           | -                    | -           |

| Range 4: Line - L2 .1485 - 30MHz |                 |                      |     |                    |                 |              |                              |                   |             |                      |             |
|----------------------------------|-----------------|----------------------|-----|--------------------|-----------------|--------------|------------------------------|-------------------|-------------|----------------------|-------------|
| Marker                           | Frequency (MHz) | Meter Reading (dBuV) | Det | PRE0186446 LISN L2 | LC Cables C2&C3 | Limiter (dB) | Corrected Reading (dBuVolts) | CISPR 11 Class QP | Margin (dB) | CISPR 11 Class B Avg | Margin (dB) |
| 19                               | .15075          | 40.71                | Qp  | 0                  | 0               | 10           | 50.71                        | 65.88             | -15.17      | -                    | -           |
| 20                               | .153            | 24.8                 | Ca  | 0                  | 0               | 10           | 34.8                         | -                 | -           | 55.84                | -21.04      |
| 21                               | .225            | 36.59                | Qp  | 0                  | 0               | 10           | 46.59                        | 62.58             | -15.99      | -                    | -           |
| 22                               | .2295           | 18.91                | Ca  | 0                  | 0               | 10           | 28.91                        | -                 | -           | 52.47                | -23.56      |
| 23                               | .29925          | 32.76                | Qp  | 0                  | 0               | 10           | 42.76                        | 60.23             | -17.47      | -                    | -           |
| 24                               | .3015           | 13.83                | Ca  | 0                  | 0               | 10           | 23.83                        | -                 | -           | 50.2                 | -26.37      |

Qp - Quasi-Peak detector

Ca - CISPR average detection

## 10. SETUP PHOTOS

Please refer to 13181006-EP1V1 for setup photos

**END OF TEST REPORT**