



UL LLC  
12 Laboratory Dr.  
Research Triangle Park, NC  
27709

[www.ul.com/emc](http://www.ul.com/emc)  
(919) 549-1400

Report Number: 16J23633N-E8  
Project Number: 16J23633  
Date: 2016-09-06  
FCC ID: PY7-22041R

# Electromagnetic Compatibility Test Report

For

**SONY MOBILE COMMUNICATIONS, INC.**  
4-12-3 HIGASHI-SHINAGAWA,  
SHINAGAWA -KU, TOKYO, 140-0002, JAPAN

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Report Number: 16J23633N-E8V2  
FCC ID: PY7-22041R  
Client Name: SOMC

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Issued: 2016-09-06

## Test Report Details

Tests Performed By: **UL LLC  
12 Laboratory Dr.  
Research Triangle Park, NC 27709**

Tests Performed For: **Sony Mobile Communications, Inc.  
4-12-3 HIGASHI-SHINAGAWA,  
SHINAGAWA -KU,TOKYO, 140-0002, JAPAN**

Test Report Date: **2016-09-06**

Product Type: **GSM/WCDMA/LTE Phone with BT, BLE, DTS/UNII a/b/g/n/ac  
& NFC**

Product standards **CFR 47 FCC Part 15 Subpart B: 2016**

FCC ID: **PY7-22041R**

Sample Serial Number: **CB512AXMRR**

EUT Category: **ITE**

Testing Start Date: **2016-08-09**

Date Testing Complete: **2016-08-16**

**Overall Results: Compliant**

UL LLC reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. UL LLC shall have no liability for any deductions, inferences or generalizations drawn by the client or others from UL LLC issued reports. 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 any government.

This report may contain test results that are not covered by the NVLAP or A2LA accreditation. The scope of accreditation is limited to the specific tests that are listed on the NVLAP and/or A2LA websites referenced at the end of this report.

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Report Revision History

| Ver. | Issue Date | Revisions  | Revised By   |
|------|------------|--|--------------|
| V1   | 2016-08-19 | Initial issue  | Brian Kiewra |
| V2   | 2016-09-06 | Corrected project number typo on cover page.<br>Corrected standard references on p.2, Section 2.3, and Section 4.2.<br>Removed loop antenna from equipment list on p. 20.<br>Changed Model Number to FCC ID. | Brian Kiewra |

## 1.0 GENERAL - Product Description

### 1.1 Equipment Description

GSM/WCDMA/LTE Phone with BT, BLE, DTS/UNII a/b/g/n/ac & NFC

### 1.2 Equipment Marking Plate

None

### 1.3 Device Configuration During Test

#### 1.3.1 Equipment Used During Test:

| Use  | Product Type | Manufacturer              | Model                 | Comments  |
|--|--------------|---------------------------|-----------------------|---|
| EUT  | Phone        | Sony Mobile Communication | PY7-22041R            | NA  |
| AE   | Laptop       | Lenovo                    | T450                  | TYPE 20BU-S04K00 S/N PC-0A2UQU 16/01                      |
| AE   | AC Adapter   | Lenovo                    | ADLX65NCC2A           | SN's:<br>11S45N0263Z1ZS995256HR<br>11S36200284ZZ1005255WE |
| AE   | Mouse        | Logitech                  | B100                  | M/N: M-U0026<br>P/N: 810-002149<br>S/N: 1451HS05PWZ8      |
| AE   | Keyboard     | Logitech                  | Internet 350 Keyboard | M/N: Y-US76A<br>P/N: 820-000172<br>PID: SC70812           |
| Note1: EUT - Equipment Under Test, AE - Auxiliary/Associated Equipment, or SIM - Simulator (Not Subjected to Test)       |              |                           |                       |   |
| Note 2: Laptop Ethernet was plugged into facility wall jack that was connected to facility switch, running ping session. |              |                           |                       |   |

#### 1.3.2 Input/Output Ports:

| I/O Cable List |          |                      |                |            |                  |                                 |
|----------------|----------|----------------------|----------------|------------|------------------|---------------------------------|
| Cable No       | Port     | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks                         |
| 1              | DC Power | 2                    | Power          | Shielded   | 1.2m             | N/A                             |
| 2              | Audio    | 1                    | Mini-Jack      | Unshielded | 1m               | N/A                             |
| 3              | USB      | 1                    | Mini-USB       | Shielded   | 0.9 m            | UCB16 cable from EUT to Laptop  |
| 3              | USB      | 2                    | USB            | Shielded   | 2m               | From laptop to keyboard & mouse |
| 4              | AC Power | 2                    | IEC            | Unshielded | 1m               | N/A                             |
| 5              | Ethernet | 1                    | RJ45           | Unshielded | 2m               | N/A                             |

**1.3.3 EUT Internal Operating Frequencies:**

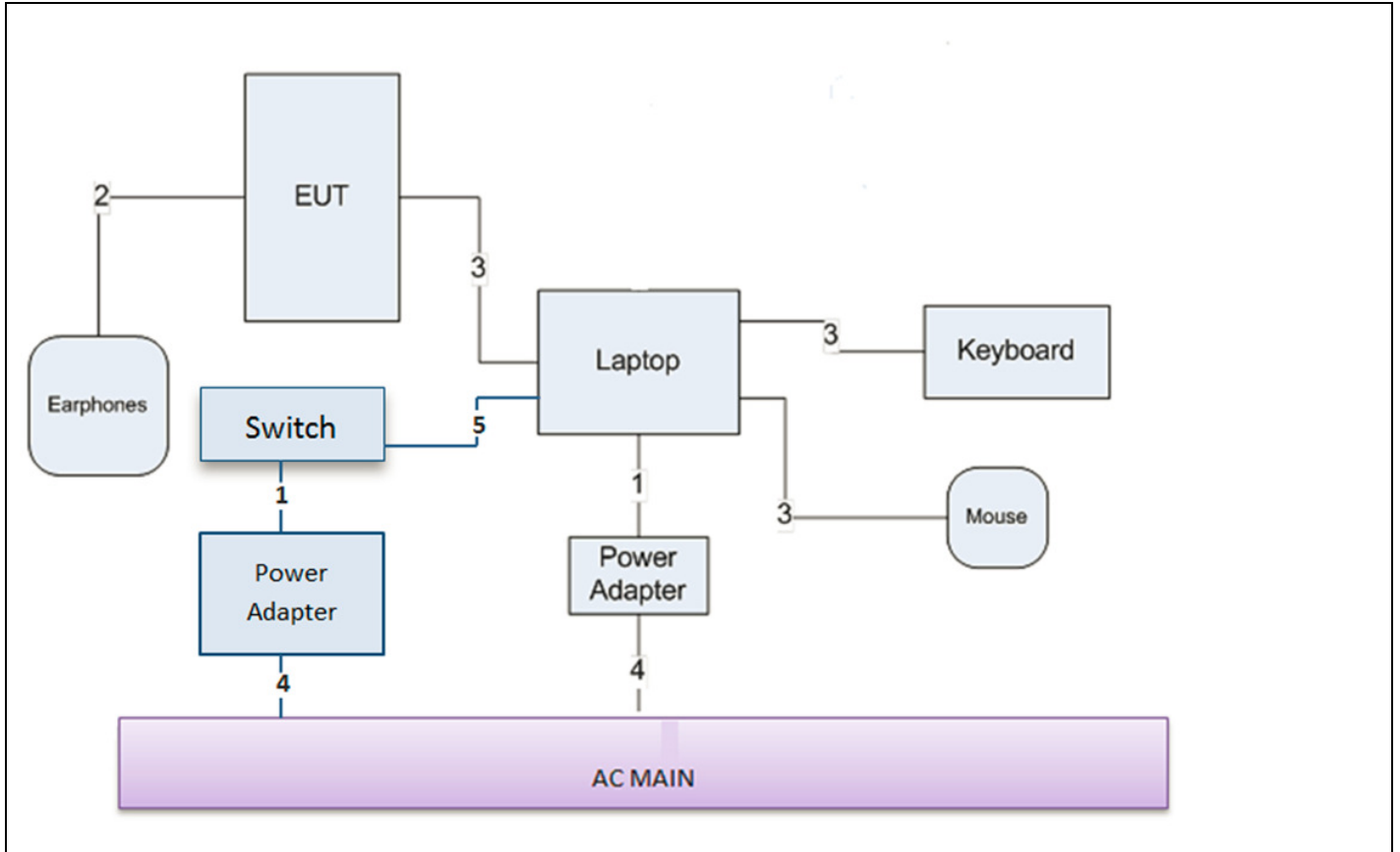
| Frequency (MHz) | Description                   |
|-----------------|-------------------------------|
| 5825            | Highest Channel in 5.8G Band. |

**1.3.4 Power Interface:**

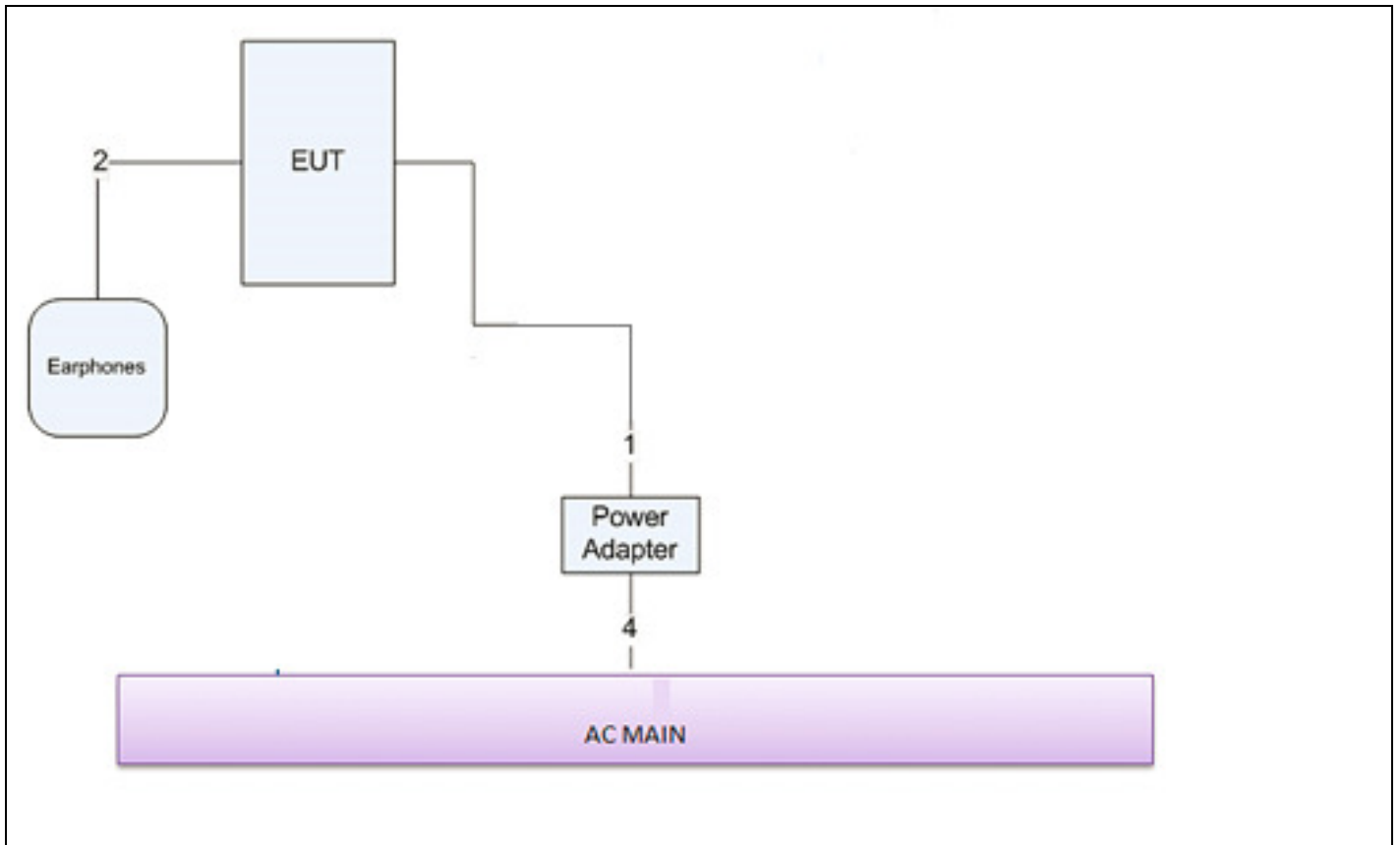
| Mode # /Rated | Voltage (V) | Current (A) | Power (W) | Frequency (DC/AC-Hz) | Phases (#) | Comments |
|---------------|-------------|-------------|-----------|----------------------|------------|----------|
| Rated         | 100-240     | -           | -         | 50-60                | 1          | NA       |
| 1             | 120         | -           | -         | 60                   | 1          | NA       |

**1.4 Block Diagram:**

The diagram below illustrates the configuration of the equipment above.







### 1.5 EUT Configurations

| Mode # | Description  |
|--------|--|
| 1      | Charging - The EUT was configured as table top equipment. The EUT is installed in a typical configuration. The EUT is connected to an AC adapter for charging and in a functional mode.                        |
| 2      | Laptop Sync Mode - The EUT was configured as table top equipment. The EUT is installed in a typical configuration. The EUT is connected to a laptop via USB, is charging and transferring data via the laptop. |

### 1.6 EUT Operation Modes

| Mode # | Description                      |
|--------|----------------------------------|
| 1      | Test software exercised the EUT. |

### 1.7 Rational for EUT Configuration

| Mode # | Description   |
|--------|---|
| 1      | The selected EUT configuration was chosen to maximize emissions |

## 2.0 Summary

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by UL LLC in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

### 2.1 Deviations from standard test methods

None

### 2.2 Device Modifications Necessary for Compliance

None

**2.3 Reference Standards**

| Standard Number           | Standard Name                                     | Standard Date |
|---------------------------|---|---------------|
| 47 CFR Part 15, Subpart B | Radio Frequency Devices – Unintentional Radiators | 2016          |

**2.4 Results Summary**

This product is considered Class B.

| Requirement – Test          | Result (Compliant / Non-Compliant)* |
|-----------------------------|-------------------------------------|
| Conducted Emissions - Mains | Compliant                           |
| Radiated Emissions          | Compliant                           |

Test Engineer:



EMC Engineer  
UL – Consumer Technology Division

Reviewer:



Jeff Moser  
EMC Program Manager  
UL – Consumer Technology Division

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### 3.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or the manufacturers' recommendation, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

### 4.0 EMISSIONS TEST RESULTS

The emissions tests were performed according to following regulations:

----- United States -----

|                                      |   |
|--------------------------------------|---|
| Code of Federal Regulations Title 47 | Part 15, Subpart B, Radio Frequency Devices |
|--------------------------------------|---|

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be verified at the time the test is conducted.

|                         |            |                      |         |                           |           |
|-------------------------|------------|----------------------|---------|---------------------------|-----------|
| Ambient Temperature, °C | 22.5 ± 2.5 | Relative Humidity, % | 45 ± 15 | Barometric Pressure, mBar | 950 ± 150 |
|-------------------------|------------|----------------------|---------|---------------------------|-----------|

#### Measurement Uncertainty

| Test                              | Uncertainty |
|-----------------------------------|-------------|
| Conducted Emissions (0.150-30MHz) | ± 3.65dB    |
| Radiated Emissions (30-1000 MHz)  | ± 5.36dB    |
| Radiated Emissions (1-40 GHz)     | ± 5.24dB    |

Note – The above values represent worst-case for each frequency range.

#### Sample Calculations

Radiated Field Strength and Conducted Emissions data contained within this report is calculated on the following basis:

- Field Strength (dBuV/m) = Meter Reading (dBuV) + AF (dB/m) - Gain (dB) + Cable Loss (dB)
- Conducted Voltage (dBuV) = Meter Reading (dBuV) + Cable Loss (dB) + LISN IL (dB)
- Conducted Current (dBuA) = Meter Reading (dBuV) + Cable Loss (dB) - Transducer Factor (dBohms)

**4.1 Test Conditions and Results – MAINS TERMINAL – CONDUCTED EMISSIONS**

|  |   |                   |
|--|---|-------------------|
| Test Description   | Measurements were made on a ground plane. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN. |                   |
| Basic Standard   | FCC Part 15, Subparts A & B in conjunction with ANSI C63.4:2014   |                   |
| UL LPG   | 80-EM-S0026   |                   |
|  | Frequency range on each side of line  | Measurement Point |
| Fully configured sample scanned over the following frequency range | 150kHz to 30MHz   | Mains             |
| <b>Limits - Class B</b>  |   |                   |
| Frequency (MHz)  | Limit (dB $\mu$ V)  |                   |
|  | Quasi-Peak  | Average           |
| 0.15-0.5   | 66 to 56  | 56 to 46          |
| 0.5-5  | 56  | 46                |
| 5-30   | 60  | 50                |
| Supplementary information: None                                    |   |                   |

**Table 1 Conducted Emissions EUT Configuration Settings**

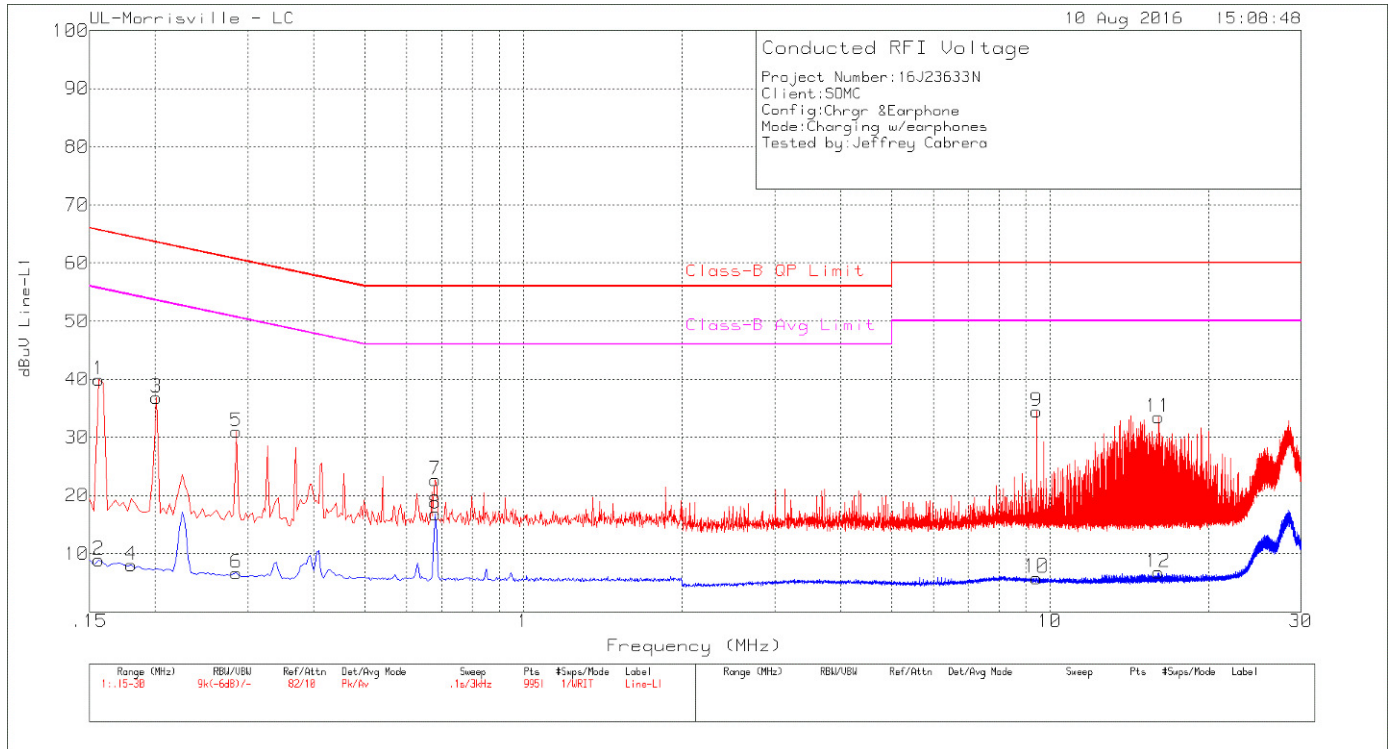
| Power Interface Mode #          | EUT Configurations Mode # | EUT Operation Mode # |
|---------------------------------|---------------------------|----------------------|
| 1 (120V)                        | 1 (Charging)<br>2 (Sync)  | 1                    |
| Supplementary information: None |                           |                      |

**Table 2 Conducted Emissions Test Equipment**

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

| Equipment ID       | Description   | Manufacturer          | Model Number              | Last Cal.  | Next Cal.  |
|--------------------|---|-----------------------|---------------------------|------------|------------|
| CBL077             | Coax cable, RG223, N-male to BNC-male, 20-ft.                 | Pasternack            | PE3476-240                | 2016-06-15 | 2017-06-30 |
| HI0078             | Temp/Humid/Pressure Meter                                     | Springfield Precision | PreciseTemp               | 2016-06-13 | 2017-06-13 |
| LISN003            | LISN, 50-ohm/50-uH, 2-conductor, 25A                          | Fischer Custom Com.   | FCC-LISN-50-25-2-01-550V  | 2015-08-24 | 2016-08-31 |
| LISN008            | LISN, 50-ohm/50-uH, 2-conductor, 25A (For support gear only.) | Solar Electronics     | 8012-50-R-24-BNC          | 2015-09-03 | 2016-09-30 |
| MM0167             | Multi-meter   | Agilent               | U1232A                    | 2015-08-17 | 2016-08-31 |
| PRE0101521 (75141) | EMI Test Receiver 9kHz-7GHz                                   | Rohde & Schwarz       | ESCI 7                    | 2015-08-26 | 2016-08-31 |
| TL001              | Transient Limiter, 0.009-30MHz                                | Com-Power             | LIT-930A                  | 2016-06-09 | 2017-06-30 |
| PS214              | AC Power Source   | Elgar                 | CW2501M (s/n 1523A02396)  | NA         | NA         |
| PS215              | AC Power Source   | Elgar                 | CW2501M (s/n 1523A02397)  | NA         | NA         |
| SOFTEMI            | EMI Software  | UL                    | Version 9.5               | NA         | NA         |
|                    | <b>Miscellaneous (if needed)</b>                              |                       |                           |            |            |
| ATA220             | ISN for Unshielded Balanced Pairs                             | Teseq, Inc.           | ISN T8                    | 2015-08-24 | 2016-08-31 |
| TN0129             | ISN for Shielded Balanced Pairs                               | Teseq, Inc.           | ISN ST08                  | 2015-08-24 | 2016-08-31 |
| TN0145             | ISN for Cat-6 Unshielded Balanced Pairs                       | Teseq, Inc.           | ISN T8-Cat6               | 2015-08-25 | 2016-08-31 |
| CDECABLE001        | ANSI C63.4 1m extension cable.                                | UL                    | Per Annex B of ANSI C63.4 | 2016-06-04 | 2017-06-30 |

**Figure 3 Conducted Emissions Graph – Line 1 Charging**



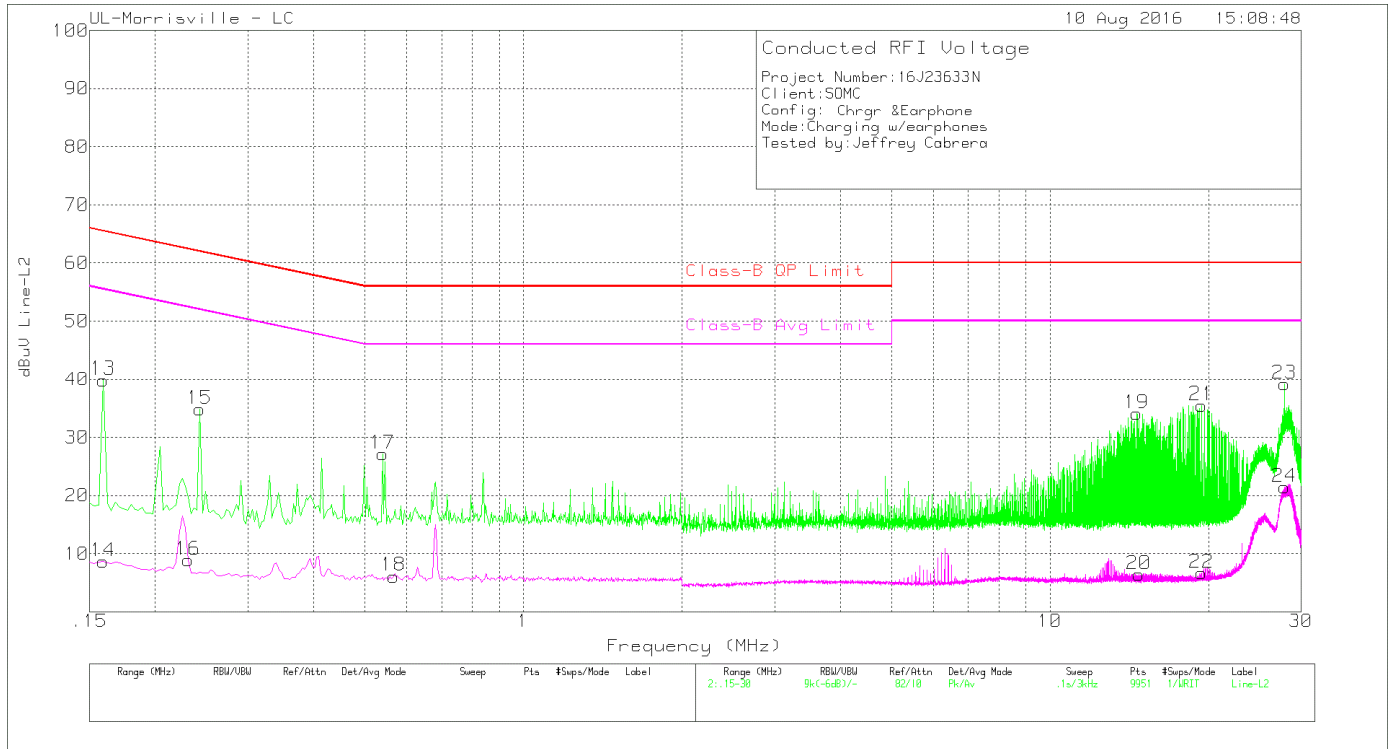
**Table 3 Conducted Emissions Data Points – Line 1 Charging**

| Range 1: Line-L1 .15 - 30MHz |                 |                      |     |               |                  |                        |                  |             |                   |             |
|------------------------------|-----------------|----------------------|-----|---------------|------------------|------------------------|------------------|-------------|-------------------|-------------|
| Marker                       | Frequency (MHz) | Meter Reading (dBuV) | Det | LISN VCF [dB] | Cbl/Limiter (dB) | Corrected Reading dBuV | Class-B QP Limit | Margin (dB) | Class-B Avg Limit | Margin (dB) |
| 1                            | .156            | 29.72                | Pk  | .2            | 10               | 39.92                  | 65.67            | -25.75      | -                 | -           |
| 2                            | .156            | -1.25                | Av  | .2            | 10               | 8.95                   | -                | -           | 55.67             | -46.72      |
| 3                            | .201            | 26.72                | Pk  | .1            | 10               | 36.82                  | 63.57            | -26.75      | -                 | -           |
| 4                            | .18             | -2.18                | Av  | .2            | 10               | 8.02                   | -                | -           | 54.49             | -46.47      |
| 5                            | .285            | 20.94                | Pk  | .1            | 10               | 31.04                  | 60.67            | -29.63      | -                 | -           |
| 6                            | .285            | -3.39                | Av  | .1            | 10               | 6.71                   | -                | -           | 50.67             | -43.96      |
| 7                            | .681            | 12.74                | Pk  | 0             | 10               | 22.74                  | 56               | -33.26      | -                 | -           |
| 8                            | .681            | 6.86                 | Av  | 0             | 10               | 16.86                  | -                | -           | 46                | -29.14      |
| 9                            | 9.441           | 24.03                | Pk  | .1            | 10.3             | 34.43                  | 60               | -25.57      | -                 | -           |
| 10                           | 9.441           | -4.54                | Av  | .1            | 10.3             | 5.86                   | -                | -           | 50                | -44.14      |
| 11                           | 16.086          | 22.84                | Pk  | .2            | 10.5             | 33.54                  | 60               | -26.46      | -                 | -           |
| 12                           | 16.086          | -3.92                | Av  | .2            | 10.5             | 6.78                   | -                | -           | 50                | -43.22      |

Pk - Peak detector  
 Av - Average detection



**Figure 4 Conducted Emissions Graph – Line 2 Charging**

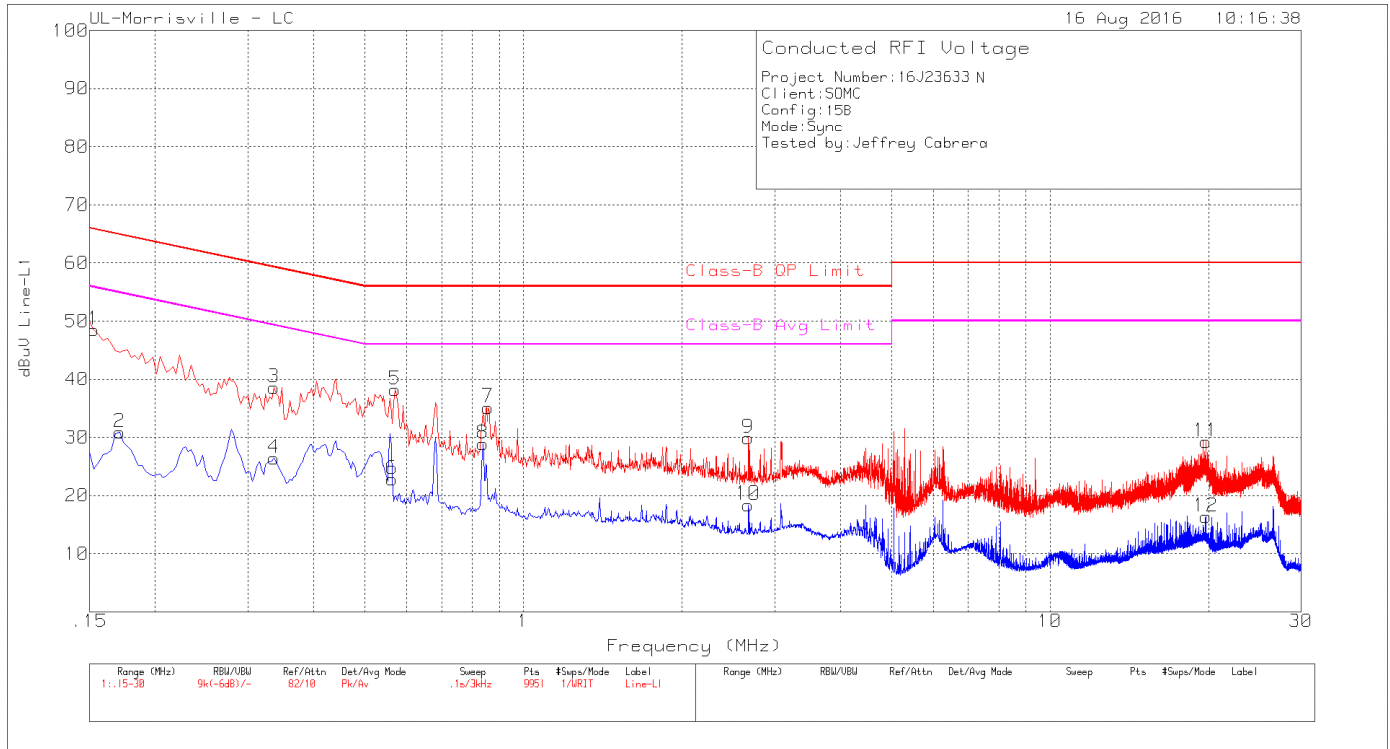


**Table 4 Conducted Emissions Data Points – Line 2 Charging**

| Range 2: Line-L2 .15 - 30MHz |                 |                      |     |               |                  |                        |                  |             |                   |             |
|------------------------------|-----------------|----------------------|-----|---------------|------------------|------------------------|------------------|-------------|-------------------|-------------|
| Marker                       | Frequency (MHz) | Meter Reading (dBuV) | Det | LISN VCF [dB] | Cbl/Limiter (dB) | Corrected Reading dBuV | Class-B QP Limit | Margin (dB) | Class-B Avg Limit | Margin (dB) |
| 13                           | .159            | 29.68                | Pk  | .2            | 10               | 39.88                  | 65.52            | -25.64      | -                 | -           |
| 14                           | .159            | -1.5                 | Av  | .2            | 10               | 8.7                    | -                | -           | 55.52             | -46.82      |
| 15                           | .243            | 24.76                | Pk  | .1            | 10               | 34.86                  | 61.99            | -27.13      | -                 | -           |
| 16                           | .231            | -1.2                 | Av  | .1            | 10               | 8.9                    | -                | -           | 52.41             | -43.51      |
| 17                           | .54             | 17.19                | Pk  | 0             | 10               | 27.19                  | 56               | -28.81      | -                 | -           |
| 18                           | .567            | -3.89                | Av  | 0             | 10               | 6.11                   | -                | -           | 46                | -39.89      |
| 19                           | 14.625          | 23.58                | Pk  | .1            | 10.4             | 34.08                  | 60               | -25.92      | -                 | -           |
| 20                           | 14.754          | -4.12                | Av  | .1            | 10.4             | 6.38                   | -                | -           | 50                | -43.62      |
| 21                           | 19.383          | 24.83                | Pk  | .2            | 10.5             | 35.53                  | 60               | -24.47      | -                 | -           |
| 22                           | 19.416          | -3.98                | Av  | .2            | 10.5             | 6.72                   | -                | -           | 50                | -43.28      |
| 23                           | 27.897          | 28.18                | Pk  | .3            | 10.7             | 39.18                  | 60               | -20.82      | -                 | -           |
| 24                           | 27.927          | 10.47                | Av  | .3            | 10.7             | 21.47                  | -                | -           | 50                | -28.53      |

Pk - Peak detector  
 Av - Average detection

**Figure 5 Conducted Emissions Graph – Line 1 Sync**

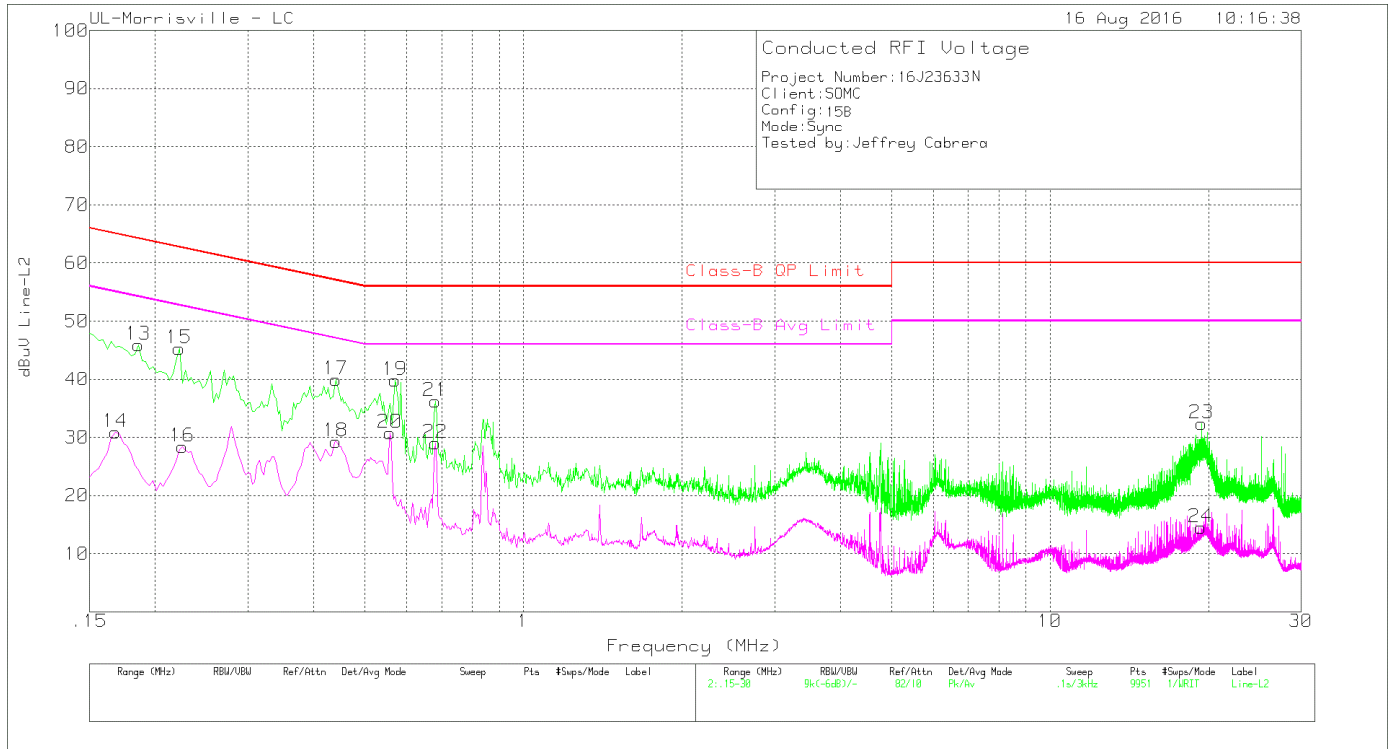


**Table 5 Conducted Emissions Data Points – Line 1 Sync**

| Range 1: Line-L1 .15 - 30MHz |                 |                      |     |               |                  |                        |                  |             |                   |             |
|------------------------------|-----------------|----------------------|-----|---------------|------------------|------------------------|------------------|-------------|-------------------|-------------|
| Marker                       | Frequency (MHz) | Meter Reading (dBuV) | Det | LISN VCF [dB] | Cbl/Limiter (dB) | Corrected Reading dBuV | Class-B QP Limit | Margin (dB) | Class-B Avg Limit | Margin (dB) |
| 1                            | .153            | 38.3                 | Pk  | .2            | 10               | 48.5                   | 65.84            | -17.34      | -                 | -           |
| 2                            | .171            | 20.71                | Av  | .2            | 10               | 30.91                  | -                | -           | 54.91             | -24         |
| 3                            | .336            | 28.5                 | Pk  | .1            | 10               | 38.6                   | 59.3             | -20.7       | -                 | -           |
| 4                            | .336            | 16.32                | Av  | .1            | 10               | 26.42                  | -                | -           | 49.3              | -22.88      |
| 5                            | .57             | 28.11                | Pk  | .1            | 10               | 38.21                  | 56               | -17.79      | -                 | -           |
| 6                            | .564            | 12.69                | Av  | .1            | 10               | 22.79                  | -                | -           | 46                | -23.21      |
| 7                            | .858            | 25.16                | Pk  | 0             | 10               | 35.16                  | 56               | -20.84      | -                 | -           |
| 8                            | .837            | 18.91                | Av  | 0             | 10               | 28.91                  | -                | -           | 46                | -17.09      |
| 9                            | 2.676           | 19.7                 | Pk  | .1            | 10.1             | 29.9                   | 56               | -26.1       | -                 | -           |
| 10                           | 2.676           | 8.2                  | Av  | .1            | 10.1             | 18.4                   | -                | -           | 46                | -27.6       |
| 11                           | 19.782          | 18.62                | Pk  | .2            | 10.5             | 29.32                  | 60               | -30.68      | -                 | -           |
| 12                           | 19.782          | 5.65                 | Av  | .2            | 10.5             | 16.35                  | -                | -           | 50                | -33.65      |

Pk - Peak detector  
 Av - Average detection

**Figure 6 Conducted Emissions Graph – Line 2 Sync**



**Table 6 Conducted Emissions Data Points – Line 2 Sync**

| Range 2: Line-L2 .15 - 30MHz |                 |                      |     |               |                  |                        |                  |             |                   |             |
|------------------------------|-----------------|----------------------|-----|---------------|------------------|------------------------|------------------|-------------|-------------------|-------------|
| Marker                       | Frequency (MHz) | Meter Reading (dBuV) | Det | LISN VCF [dB] | Cbl/Limiter (dB) | Corrected Reading dBuV | Class-B QP Limit | Margin (dB) | Class-B Avg Limit | Margin (dB) |
| 13                           | .186            | 35.73                | Pk  | .2            | 10               | 45.93                  | 64.21            | -18.28      | -                 | -           |
| 14                           | .168            | 20.66                | Av  | .2            | 10               | 30.86                  | -                | -           | 55.06             | -24.2       |
| 15                           | .222            | 35.22                | Pk  | .1            | 10               | 45.32                  | 62.74            | -17.42      | -                 | -           |
| 16                           | .225            | 18.26                | Av  | .1            | 10               | 28.36                  | -                | -           | 52.63             | -24.27      |
| 17                           | .441            | 29.82                | Pk  | .1            | 10               | 39.92                  | 57.04            | -17.12      | -                 | -           |
| 18                           | .441            | 19.19                | Av  | .1            | 10               | 29.29                  | -                | -           | 47.04             | -17.75      |
| 19                           | .57             | 29.8                 | Pk  | 0             | 10               | 39.8                   | 56               | -16.2       | -                 | -           |
| 20                           | .558            | 20.81                | Av  | 0             | 10               | 30.81                  | -                | -           | 46                | -15.19      |
| 21                           | .681            | 26.2                 | Pk  | 0             | 10               | 36.2                   | 56               | -19.8       | -                 | -           |
| 22                           | .681            | 18.98                | Av  | 0             | 10               | 28.98                  | -                | -           | 46                | -17.02      |
| 23                           | 19.434          | 21.69                | Pk  | .2            | 10.5             | 32.39                  | 60               | -27.61      | -                 | -           |
| 24                           | 19.359          | 3.81                 | Av  | .2            | 10.5             | 14.51                  | -                | -           | 50                | -35.49      |

Pk - Peak detector  
 Av - Average detection

**4.2 Test Conditions and Results – RADIATED EMISSIONS**

|  |   |                   |
|--|---|-------------------|
| Test Description   | Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4:2014. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable. |                   |
| Basic Standard   | FCC Part 15, Subparts A & B in conjunction with ANSI C63.4:2014   |                   |
| UL LPG   | 80-EM-S0029   |                   |
|  | Frequency range   | Measurement Point |
| Fully configured sample scanned over the following frequency range | 30MHz – 1GHz  | 3 meter – Class B |
|  | 1-18 GHz  | 3 meter           |
|  | 18-40 GHz   | 1 meter           |
| <b>Limits - Class B</b>  |   |                   |
| Frequency (MHz)  | Limit (dBµV/m)  |                   |
|  | Quasi-Peak  | Average           |
| 30-88  | 40  | NA                |
| 88-216   | 43.5  | NA                |
| 216-960  | 46  | NA                |
| 960-1000   | 54  | NA                |
| 1,000-18,000   | NA  | 54                |
| 18,000-40,000  | NA  | 54                |

**Table 7 Radiated Emissions EUT Configuration Settings**

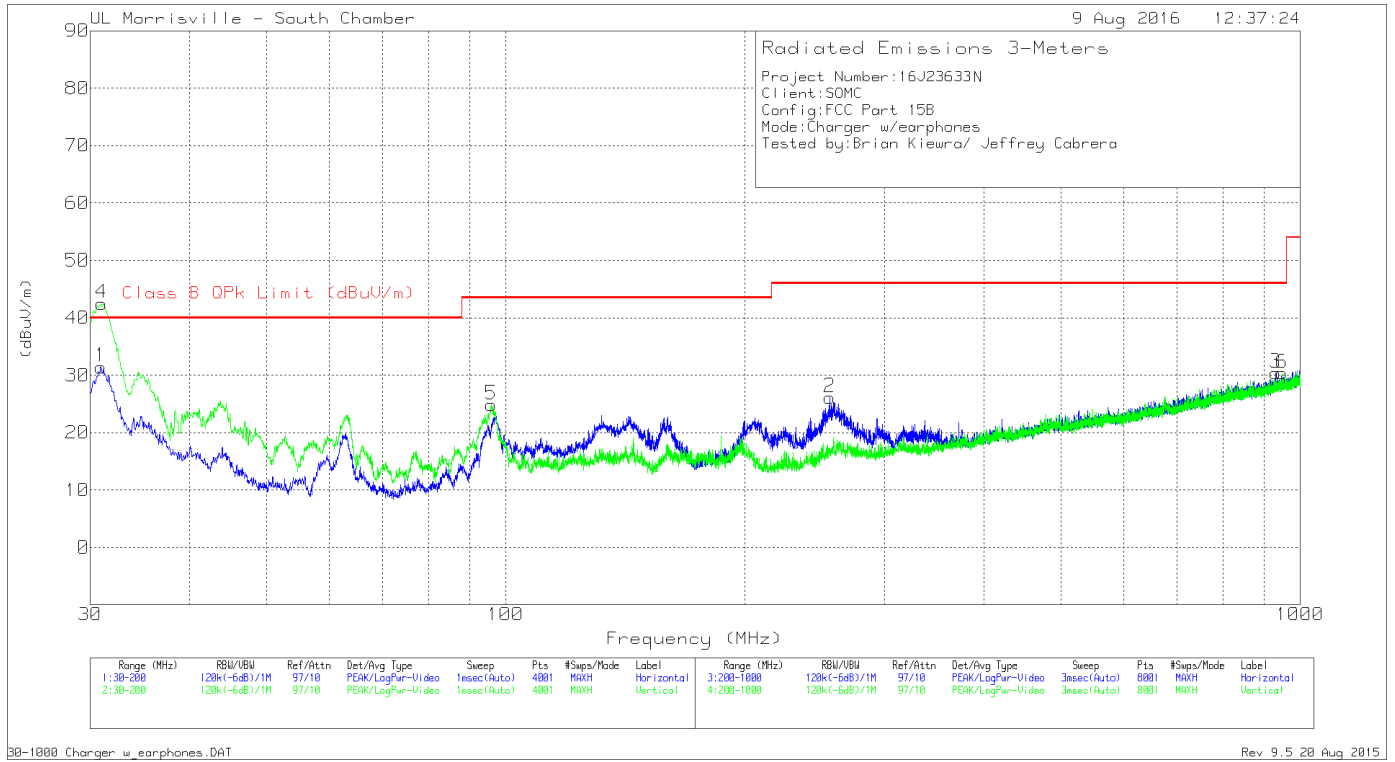
| Power Interface Mode #          | EUT Configurations Mode # | EUT Operation Mode # |
|---------------------------------|---------------------------|----------------------|
| 1 (120V)                        | 1 (Charger)<br>2 (Sync)   | 1                    |
| Supplementary information: None |                           |                      |

**Table 8 Radiated Emissions Test Equipment**

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

| Equip. ID             | Description                                       | Manufacturer          | Model Number | Last Cal.  | Next Cal.  |
|-----------------------|---|-----------------------|--------------|------------|------------|
|                       | <b>30-1000 MHz</b>                                |                       |              |            |            |
| AT0074                | Hybrid Broadband Antenna                          | Sunol Sciences Corp.  | JB3          | 2016-06-07 | 2017-06-30 |
|                       | <b>1-18 GHz</b>                                   |                       |              |            |            |
| AT0069                | Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz | ETS Lindgren          | 3117         | 2016-03-07 | 2017-03-31 |
|                       | <b>18-40 GHz</b>                                  |                       |              |            |            |
| AT0076                | Horn Antenna, 18-26.5GHz                          | ARA                   | MWH-1826/B   | 2015-08-27 | 2016-08-31 |
| AT0077                | Horn Antenna, 26-40GHz                            | ARA                   | MWH-2640/B   | 2015-08-27 | 2016-08-31 |
|                       | <b>Gain-Loss Chains</b>                           |                       |              |            |            |
| S-SAC01               | Gain-loss string: 0.009-30MHz                     | Various               | Various      | 2015-10-07 | 2016-10-31 |
| S-SAC02               | Gain-loss string: 30-1000MHz                      | Various               | Various      | 2016-06-26 | 2017-06-30 |
| S-SAC03               | Gain-loss string: 1-18GHz                         | Various               | Various      | 2015-08-22 | 2016-08-31 |
| S-SAC04               | Gain-loss string: 18-40GHz                        | Various               | Various      | 2016-02-29 | 2017-02-28 |
|                       | <b>Receiver &amp; Software</b>                    |                       |              |            |            |
| SA0025                | Spectrum Analyzer                                 | Agilent               | N9030A       | 2016-03-17 | 2017-03-31 |
| SA0026 (18-40GHz RSE) | Spectrum Analyzer                                 | Agilent               | N9030A       | 2016-02-24 | 2017-02-28 |
| SOFTEMI               | EMI Software                                      | UL                    | Version 9.5  | NA         | NA         |
| HI0078                | Temp/Humid/Pressure Meter                         | Springfield Precision | PreciseTemp  | 2016-06-13 | 2017-06-13 |

**Figure 11 Radiated Emissions Graph – 30-1000 MHz Charger**



**Table 9 Radiated Emissions Data Points - 30-1000 MHz Charger**

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | AT0074 AF (dB/m) | Amp/Cbl (dB) | Corrected Reading (dBuV/m) | Class B QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|------------------|--------------|----------------------------|----------------------------|-------------|----------------|-------------|----------|
| 1      | 30.935          | 37.95                | Pk  | 25.3             | -31.8        | 31.45                      | 40                         | -8.55       | 0-360          | 399         | H        |
| 2      | 255.7           | 39.55                | Pk  | 16.4             | -29.8        | 26.15                      | 46.02                      | -19.87      | 0-360          | 102         | H        |
| 3      | 930.6           | 29.83                | Pk  | 27.3             | -26.7        | 30.43                      | 46.02                      | -15.59      | 0-360          | 299         | H        |
| 4      | 30.8939         | 45.21                | Qp  | 25.3             | -31.8        | 38.71                      | 40                         | -1.29       | 317            | 105         | V        |
| 5      | 95.8538         | 42.89                | Pk  | 13               | -31          | 24.89                      | 43.52                      | -18.63      | 0-360          | 102         | V        |
| 6      | 948.2           | 29.39                | Pk  | 27.5             | -26.5        | 30.39                      | 46.02                      | -15.63      | 0-360          | 199         | V        |

Pk - Peak detector  
 Qp - Quasi-Peak detector

Figure 12 Radiated Emissions Graph – 30-1000 MHz Sync

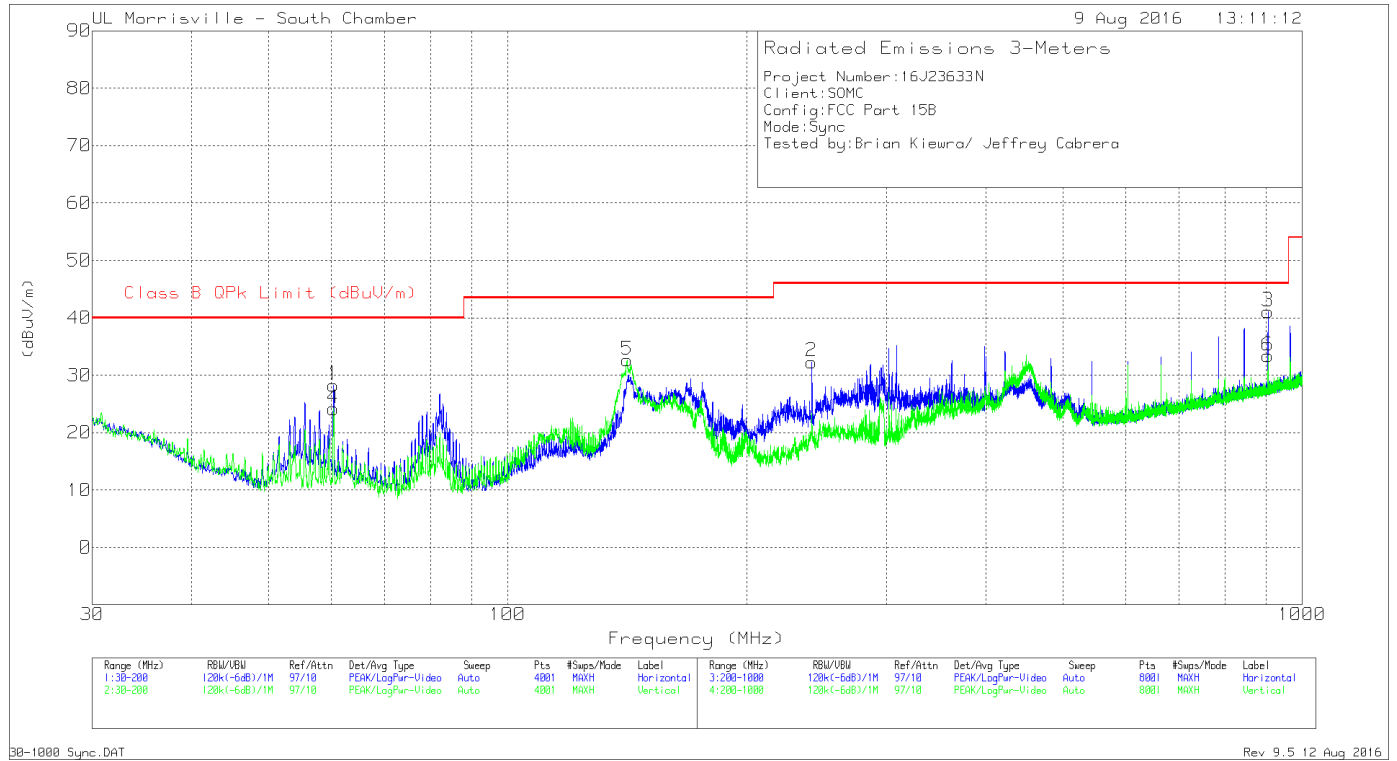


Table 10 Radiated Emissions Data Points - 30-1000 MHz Sync

| Marker | Frequency (MHz) | Meter Reading (dBuV) | Det | AT0074 AF (dB/m) | Amp/Cbl (dB) | Corrected Reading (dBuV/m) | Class B QPk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|------------------|--------------|----------------------------|----------------------------|-------------|----------------|-------------|----------|
| 1      | 60.345          | 47.79                | Pk  | 11.9             | -31.4        | 28.29                      | 40                         | -11.71      | 0-360          | 399         | H        |
| 2      | 241.4           | 46.03                | Pk  | 16.2             | -29.9        | 32.33                      | 46.02                      | -13.69      | 0-360          | 102         | H        |
| 3      | 905.4438        | 40.99                | Qp  | 26.8             | -27          | 40.79                      | 46.02                      | -5.23       | 229            | 105         | H        |
| 4      | 60.3875         | 43.68                | Pk  | 11.9             | -31.4        | 24.18                      | 40                         | -15.82      | 0-360          | 102         | V        |
| 5      | 141.3075        | 45.86                | Pk  | 17.4             | -30.6        | 32.66                      | 43.52                      | -10.86      | 0-360          | 102         | V        |
| 6      | 905.45          | 33.61                | Pk  | 26.8             | -27          | 33.41                      | 46.02                      | -12.61      | 0-360          | 299         | V        |

Pk - Peak detector  
 Qp - Quasi-Peak detector

Figure 13 Radiated Emissions Graph – 1-18 GHz Charger

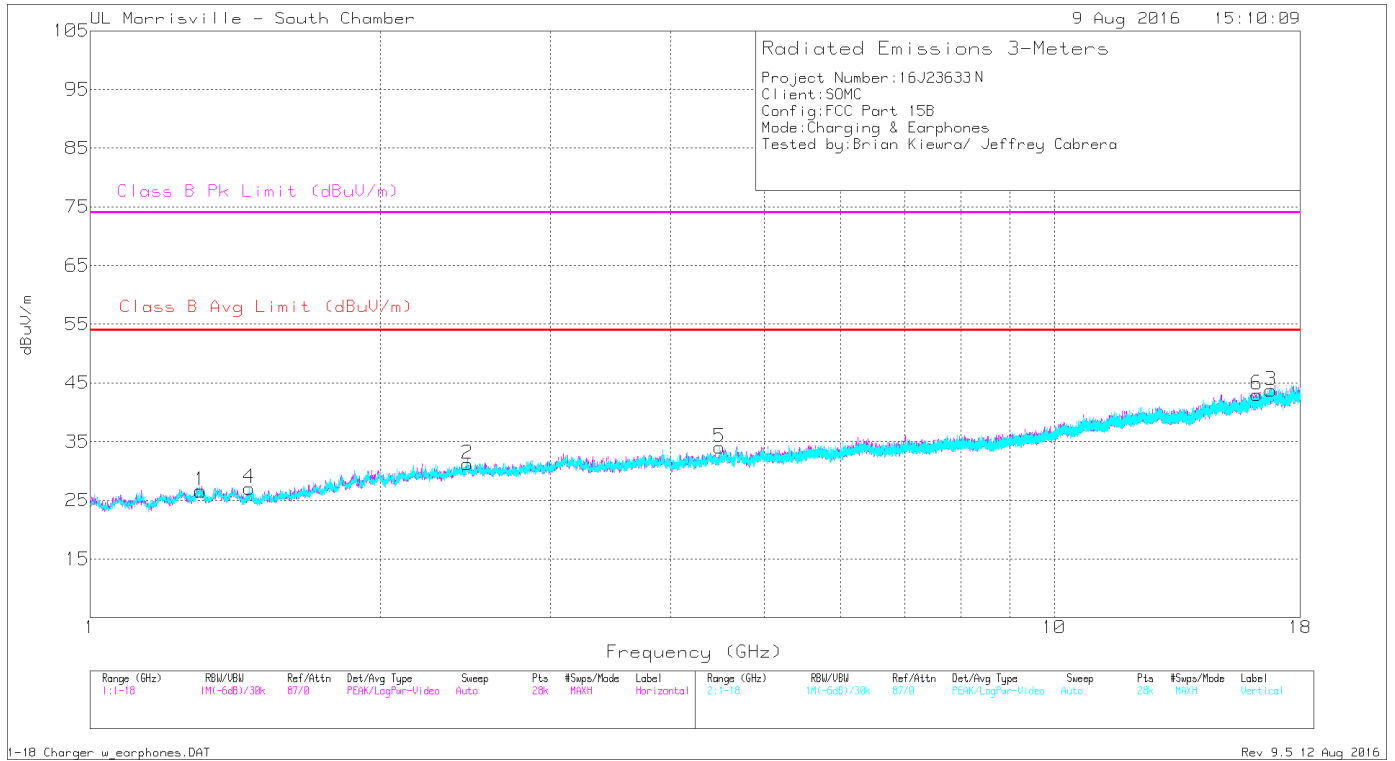


Table 11 Radiated Emissions Data Points – 1-18 GHz Charger

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF AT0069 (dB/m) | Amp/Cbl (dB) | Corrected Reading dBuV/m | Class B Avg Limit (dBuV/m) | Margin (dB) | Class B Pk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|------------------|--------------|--------------------------|----------------------------|-------------|---------------------------|-------------|----------------|-------------|----------|
| 1      | 1.3             | 42.9                 | Pk  | 28.8             | -35.6        | 36.1                     | -                          | -           | 74                        | -37.9       | 182            | 198         | H        |
|        | 1.302           | 28.18                | Av  | 28.8             | -35.6        | 21.38                    | 54                         | -32.62      | -                         | -           | 182            | 198         | H        |
| 2      | 2.462           | 41.72                | Pk  | 32.3             | -34.7        | 39.32                    | -                          | -           | 74                        | -34.68      | 275            | 198         | H        |
|        | 2.463           | 29.08                | Av  | 32.3             | -34.7        | 26.68                    | 54                         | -27.32      | -                         | -           | 275            | 198         | H        |
| 3      | 16.785          | 34.79                | Pk  | 41.6             | -25.1        | 51.29                    | -                          | -           | 74                        | -22.71      | 106            | 198         | H        |
|        | 16.785          | 22.57                | Av  | 41.6             | -25.1        | 39.07                    | 54                         | -14.93      | -                         | -           | 106            | 198         | H        |
| 4      | 1.464           | 42.64                | Pk  | 28.2             | -35.5        | 35.34                    | -                          | -           | 74                        | -38.66      | 190            | 103         | V        |
|        | 1.464           | 29.63                | Av  | 28.2             | -35.5        | 22.33                    | 54                         | -31.67      | -                         | -           | 190            | 103         | V        |
| 5      | 4.496           | 40.4                 | Pk  | 33.8             | -33          | 41.2                     | -                          | -           | 74                        | -32.8       | 228            | 199         | V        |
|        | 4.498           | 27.81                | Av  | 33.9             | -32.9        | 28.81                    | 54                         | -25.19      | -                         | -           | 228            | 199         | V        |
| 6      | 16.221          | 34.84                | Pk  | 40.7             | -24.9        | 50.64                    | -                          | -           | 74                        | -23.36      | 328            | 104         | V        |
|        | 16.221          | 21.92                | Av  | 40.7             | -24.9        | 37.72                    | 54                         | -16.28      | -                         | -           | 328            | 104         | V        |

Pk - Peak detector  
 Av - Average detection



Figure 14 Radiated Emissions Graph – 1-18 GHz Sync

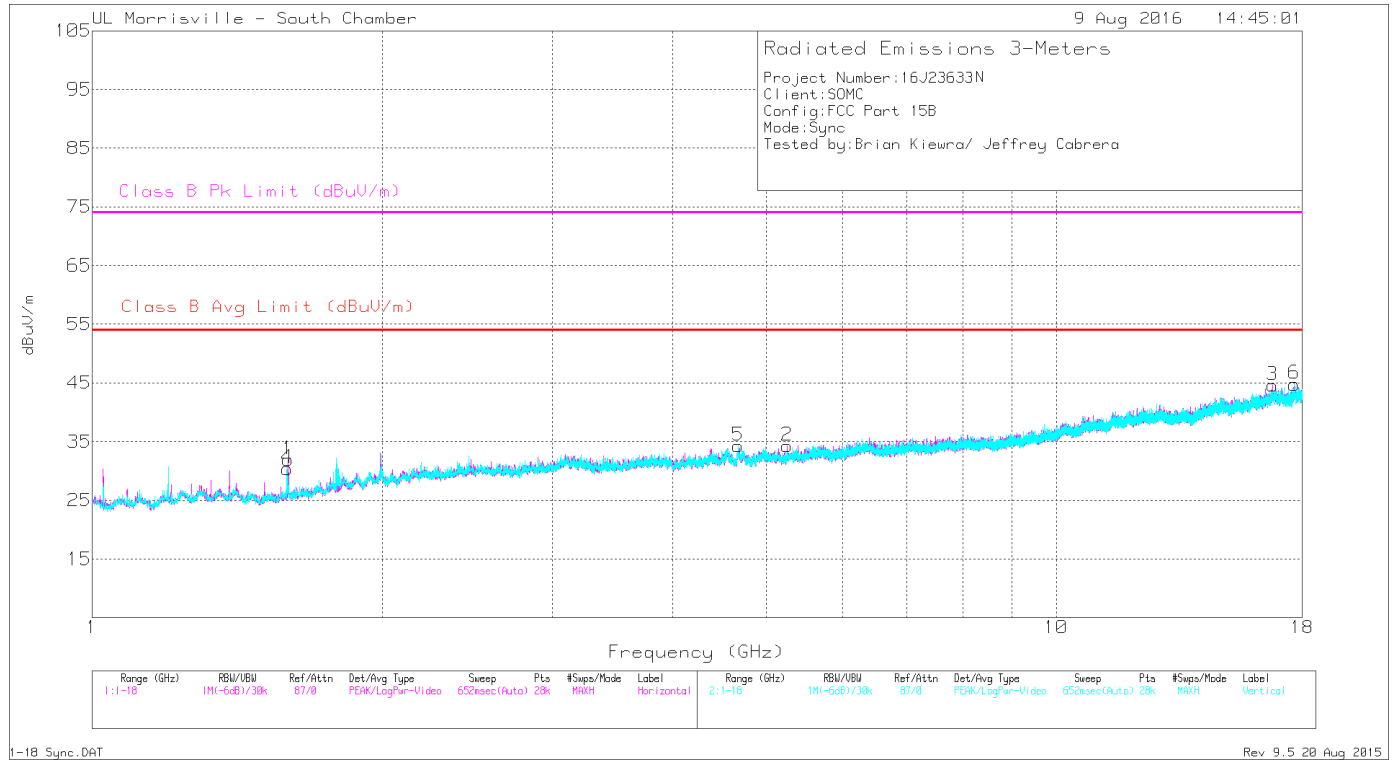
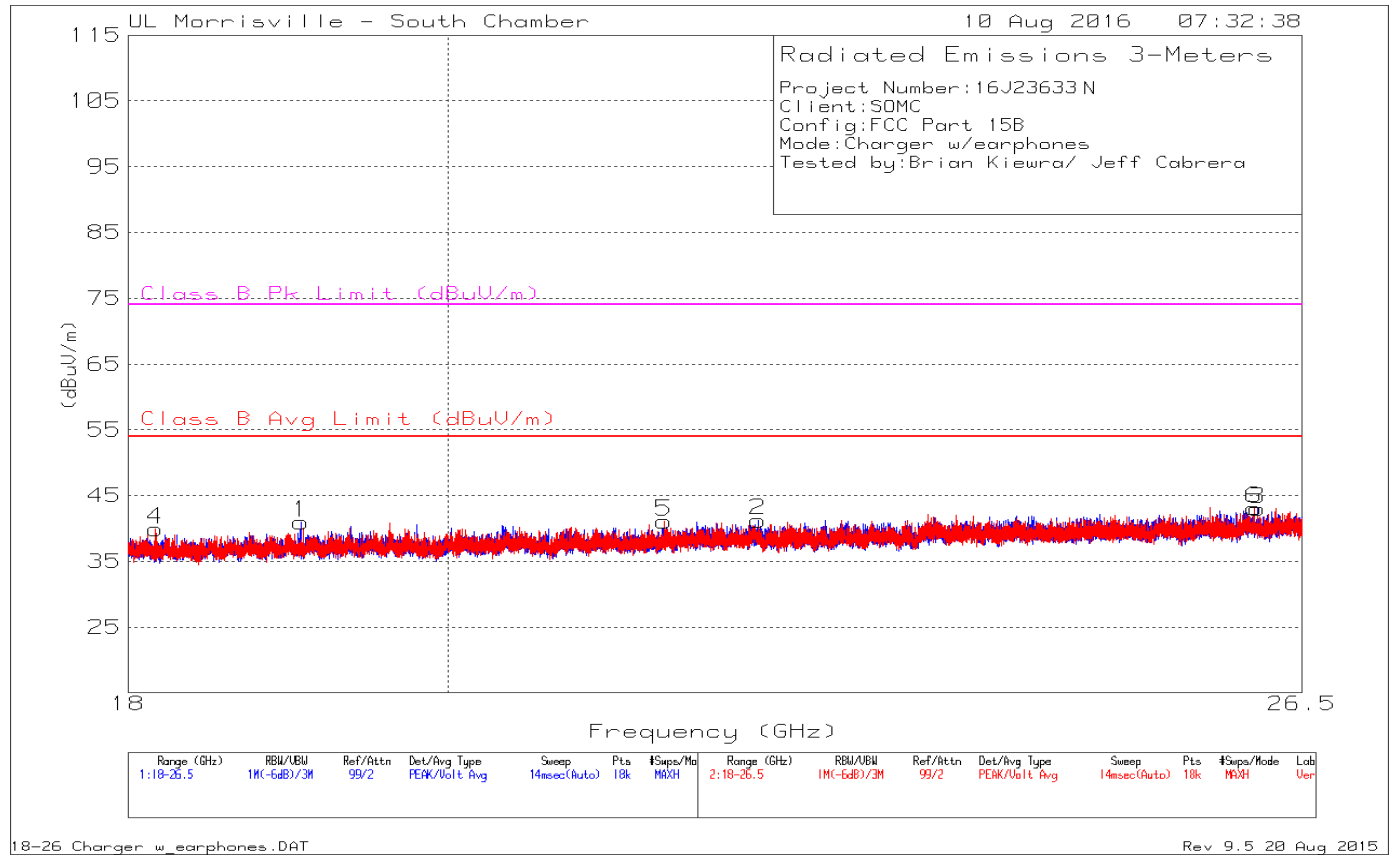


Table 12 Radiated Emissions Data Points – 1-18 GHz Sync

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF AT0069 (dB/m) | Amp/Cbl (dB) | Corrected Reading dBuV/m | Class B Avg Limit (dBuV/m) | Margin (dB) | Class B Pk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|------------------|--------------|--------------------------|----------------------------|-------------|---------------------------|-------------|----------------|-------------|----------|
| 1      | 1.596           | 56.19                | Pk  | 28.3             | -35.3        | 49.19                    | -                          | -           | 74                        | -24.81      | 288            | 103         | H        |
|        | 1.598           | 31.65                | Av  | 28.3             | -35.3        | 24.65                    | 54                         | -29.35      | -                         | -           | 288            | 103         | H        |
| 2      | 5.261           | 39.84                | Pk  | 34.3             | -32          | 42.14                    | -                          | -           | 74                        | -31.86      | 223            | 103         | H        |
|        | 5.258           | 26.87                | Av  | 34.3             | -32          | 29.17                    | 54                         | -24.83      | -                         | -           | 223            | 103         | H        |
| 3      | 16.769          | 35.5                 | Pk  | 41.6             | -25.3        | 51.8                     | -                          | -           | 74                        | -22.2       | 342            | 198         | H        |
|        | 16.769          | 22.86                | Av  | 41.6             | -25.3        | 39.16                    | 54                         | -14.84      | -                         | -           | 342            | 198         | H        |
| 4      | 1.593           | 55.3                 | Pk  | 28.3             | -35.3        | 48.3                     | -                          | -           | 74                        | -25.7       | 56             | 198         | V        |
|        | 1.595           | 29.37                | Av  | 28.3             | -35.3        | 22.37                    | 54                         | -31.63      | -                         | -           | 56             | 198         | V        |
| 5      | 4.675           | 40.19                | Pk  | 34.1             | -32.2        | 42.09                    | -                          | -           | 74                        | -31.91      | 275            | 198         | V        |
|        | 4.676           | 27.84                | Av  | 34.1             | -32.2        | 29.74                    | 54                         | -24.26      | -                         | -           | 275            | 198         | V        |
| 6      | 17.651          | 33.92                | Pk  | 41.2             | -23          | 52.12                    | -                          | -           | 74                        | -21.88      | 334            | 198         | V        |
|        | 17.65           | 21.73                | Av  | 41.2             | -23          | 39.93                    | 54                         | -14.07      | -                         | -           | 334            | 198         | V        |

Pk - Peak detector  
 Av - Average detection

**Figure 15 Radiated Emissions Graph – 18-26 GHz Charger**

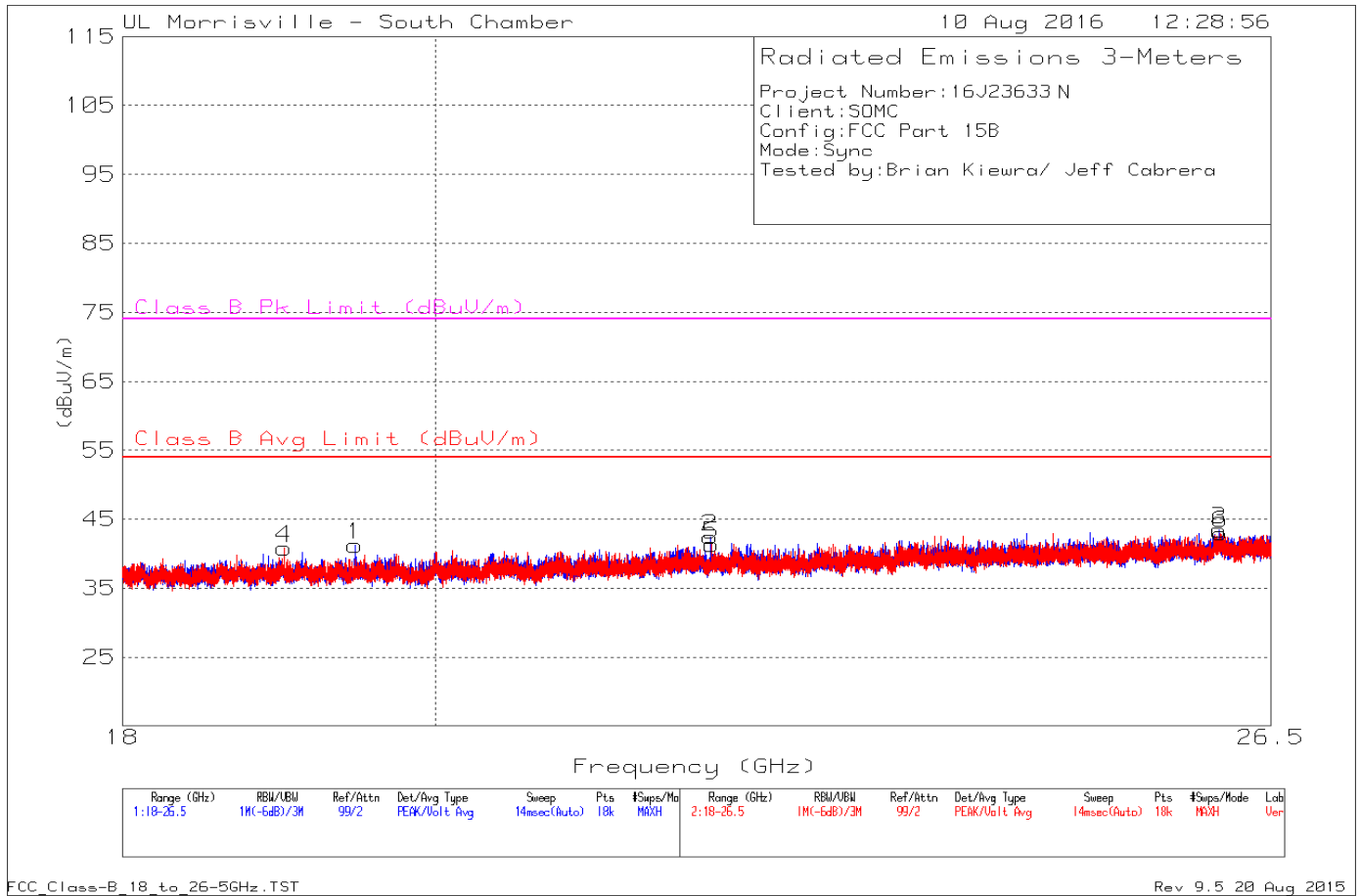


**Table 13 Radiated Emissions Data Points – 18-26 GHz Charger**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF AT0076 (dB/m) | Amp/Cbl (dB) | Corrected Reading (dBuV/m) | Class B Avg Limit (dBuV/m) | Margin (dB) | Class B Pk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|------------------|--------------|----------------------------|----------------------------|-------------|---------------------------|-------------|----------------|-------------|----------|
| 1      | 19.055          | 48.76                | Pk  | 32.9             | -40.7        | 40.96                      | 54                         | -13.04      | 74                        | -33.04      | 0-360          | 102         | H        |
| 2      | 22.154          | 47.23                | Pk  | 33.8             | -39.8        | 41.23                      | 54                         | -12.77      | 74                        | -32.77      | 0-360          | 249         | H        |
| 3      | 26.113          | 45.51                | Pk  | 35               | -37.5        | 43.01                      | 54                         | -10.99      | 74                        | -30.99      | 0-360          | 300         | H        |
| 4      | 18.164          | 48.29                | Pk  | 32.6             | -41          | 39.89                      | 54                         | -14.11      | 74                        | -34.11      | 0-360          | 300         | V        |
| 5      | 21.478          | 47.37                | Pk  | 33.6             | -39.9        | 41.07                      | 54                         | -12.93      | 74                        | -32.93      | 0-360          | 101         | V        |
| 6      | 26.089          | 45.69                | Pk  | 35               | -37.6        | 43.09                      | 54                         | -10.91      | 74                        | -30.91      | 0-360          | 101         | V        |

Pk - Peak detector

**Figure 16 Radiated Emissions Graph – 18-26 GHz Sync**



**Table 14 Radiated Emissions Data Points – 18-26 GHz Sync**

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF AT0076 (dB/m) | Amp/Cbl (dB) | Corrected Reading (dBuV/m) | Class B Avg Limit (dBuV/m) | Margin (dB) | Class B Pk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|------------------|--------------|----------------------------|----------------------------|-------------|---------------------------|-------------|----------------|-------------|----------|
| 1      | 19.468          | 48.86                | Pk  | 32.9             | -40.5        | 41.26                      | 54                         | -12.74      | 74                        | -32.74      | 0-360          | 102         | H        |
| 2      | 21.94           | 48.55                | Pk  | 33.7             | -39.8        | 42.45                      | 54                         | -11.55      | 74                        | -31.55      | 0-360          | 299         | H        |
| 3      | 26.044          | 45.86                | Pk  | 35.1             | -37.5        | 43.46                      | 54                         | -10.54      | 74                        | -30.54      | 0-360          | 149         | H        |
| 4      | 19.009          | 48.81                | Pk  | 32.9             | -40.9        | 40.81                      | 54                         | -13.19      | 74                        | -33.19      | 0-360          | 251         | V        |
| 5      | 21.951          | 47.23                | Pk  | 33.7             | -39.6        | 41.33                      | 54                         | -12.67      | 74                        | -32.67      | 0-360          | 251         | V        |
| 6      | 26.056          | 45.5                 | Pk  | 35.1             | -37.6        | 43                         | 54                         | -11         | 74                        | -31         | 0-360          | 152         | V        |

Pk - Peak detector

Figure 17 Radiated Emissions Graph – 26-40 GHz Charger

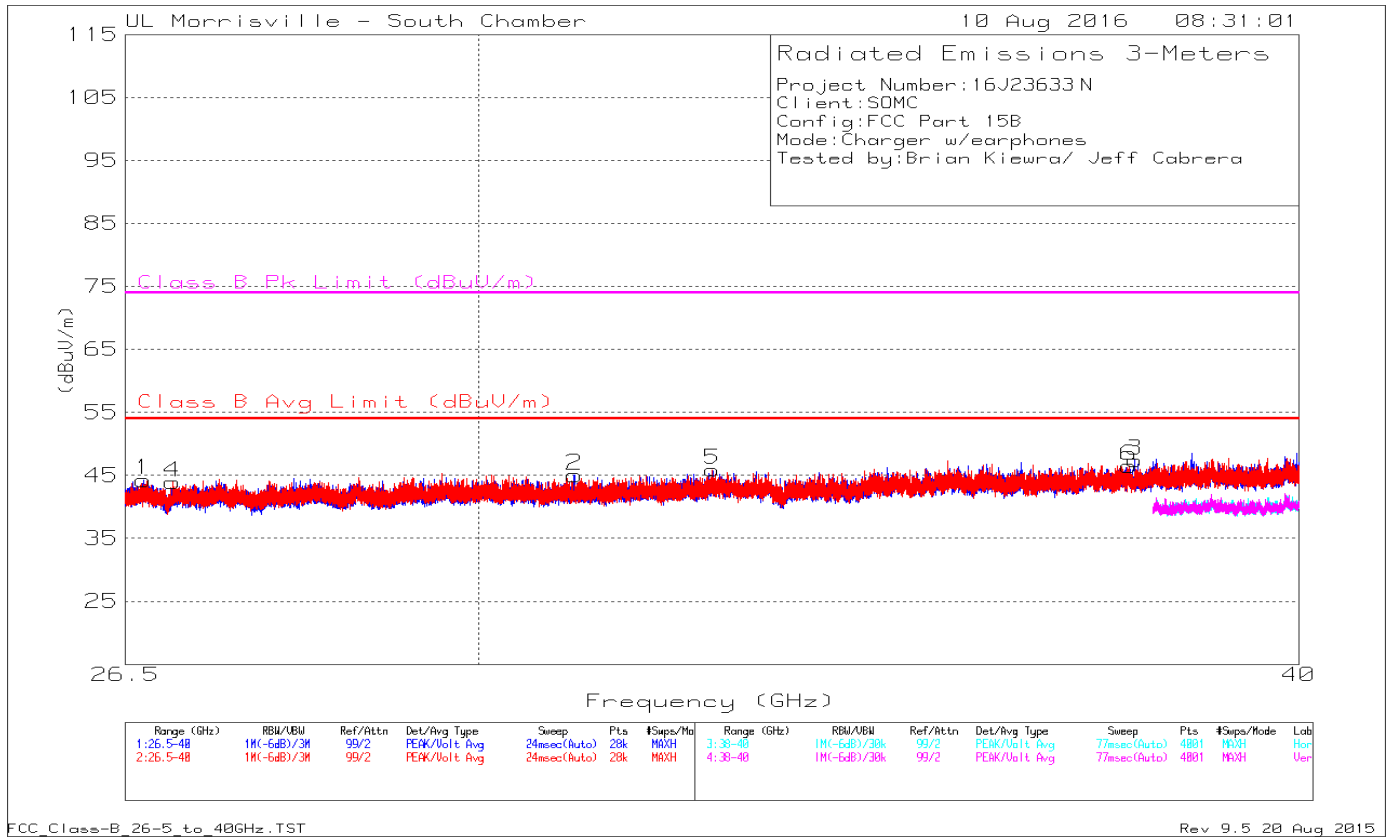


Table 15 Radiated Emissions Data Points – 26-40 GHz Charger

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF AT0077 (dB/m) | Amp/Cbl (dB) | Corrected Reading (dBuV/m) | Class B Avg Limit (dBuV/m) | Margin (dB) | Class B Pk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|------------------|--------------|----------------------------|----------------------------|-------------|---------------------------|-------------|----------------|-------------|----------|
| 1      | 26.671          | 45.67                | Pk  | 35.8             | -37.2        | 44.27                      | 54                         | -9.73       | 74                        | -29.73      | 0-360          | 150         | H        |
| 2      | 31.026          | 44.02                | Pk  | 36.5             | -35.5        | 45.02                      | 54                         | -8.98       | 74                        | -28.98      | 0-360          | 150         | H        |
| 3      | 37.765          | 46.58                | Pk  | 37.8             | -37          | 47.38                      | 54                         | -6.62       | 74                        | -26.62      | 0-360          | 249         | H        |
| 4      | 26.947          | 45.22                | Pk  | 35.8             | -37.1        | 43.92                      | 54                         | -10.08      | 74                        | -30.08      | 0-360          | 252         | V        |
| 5      | 32.563          | 44.78                | Pk  | 36.9             | -35.8        | 45.88                      | 54                         | -8.12       | 74                        | -28.12      | 0-360          | 152         | V        |
| 6      | 37.688          | 45.6                 | Pk  | 37.8             | -36.9        | 46.5                       | 54                         | -7.5        | 74                        | -27.5       | 0-360          | 300         | V        |

Pk - Peak detector

Figure 18 Radiated Emissions Graph – 26-40 GHz Sync

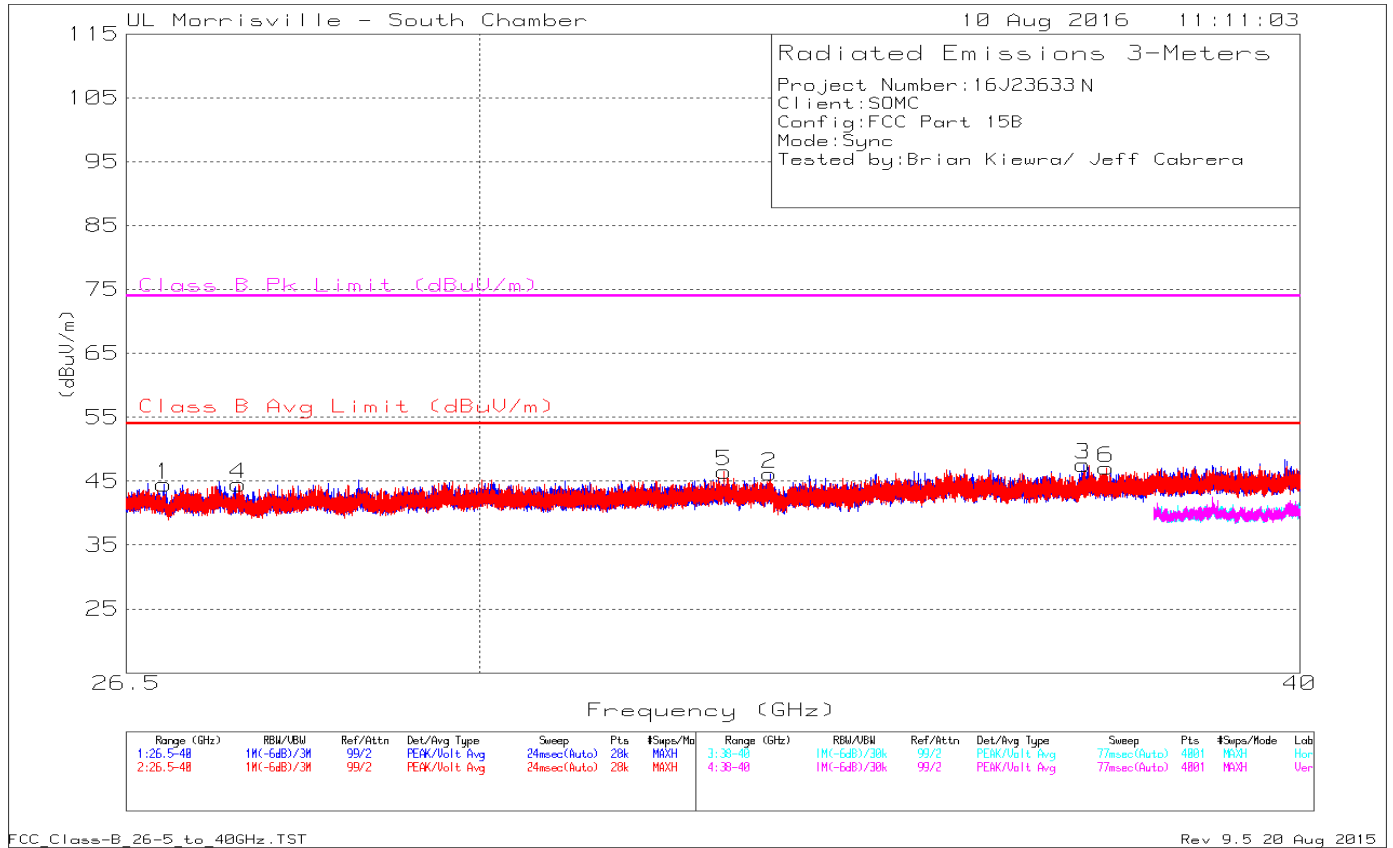


Table 16 Radiated Emissions Data Points – 26-40 GHz Sync

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF AT0077 (dB/m) | Amp/Cbl (dB) | Corrected Reading (dBuV/m) | Class B Avg Limit (dBuV/m) | Margin (dB) | Class B Pk Limit (dBuV/m) | Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|--------|-----------------|----------------------|-----|------------------|--------------|----------------------------|----------------------------|-------------|---------------------------|-------------|----------------|-------------|----------|
| 1      | 26.853          | 45.77                | Pk  | 35.8             | -37.1        | 44.47                      | 54                         | -9.53       | 74                        | -29.53      | 0-360          | 199         | H        |
| 2      | 33.213          | 45.35                | Pk  | 37               | -36.2        | 46.15                      | 54                         | -7.85       | 74                        | -27.85      | 0-360          | 149         | H        |
| 3      | 37.074          | 46.78                | Pk  | 37.9             | -37.1        | 47.58                      | 54                         | -6.42       | 74                        | -26.42      | 0-360          | 149         | H        |
| 4      | 27.565          | 45.22                | Pk  | 35.8             | -36.5        | 44.52                      | 54                         | -9.48       | 74                        | -29.48      | 0-360          | 201         | V        |
| 5      | 32.685          | 45.31                | Pk  | 36.9             | -35.7        | 46.51                      | 54                         | -7.49       | 74                        | -27.49      | 0-360          | 201         | V        |
| 6      | 37.376          | 46.51                | Pk  | 37.9             | -37.3        | 47.11                      | 54                         | -6.89       | 74                        | -26.89      | 0-360          | 252         | V        |

Pk - Peak detector

## Appendix A

### Accreditations and Authorizations



NVLAP Lab code: 200246-0

NVLAP: The National Institute of Standards and Technology (NIST) administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP is comprised of laboratory accreditation programs (LAPs) which are established on the basis of requests and demonstrated need. Each LAP includes specific calibration and/or test standards and related methods and protocols assembled to satisfy the unique needs for accreditation in a field of testing or calibration. NVLAP accredits public and private laboratories based on evaluation of their technical qualifications and competence to carry out specific calibrations or tests. Accreditation criteria are established in accordance with the U.S. Code of Federal Regulations (CFR, Title 15, Part 285), NVLAP Procedures and General Requirements, and encompass the requirements of ISO/IEC 17025. For a full scope listing see <http://www.nist.gov/nvlap/>



FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland (Ref. No. 91039).



Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP-100, Issue 7, Section 3.3. File #: IC 2180C



VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.:

- Test Station 5 (Location A): G-246
- All Other Test Stations: A-0046



ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).



NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 2004/108/EC, Annex III. Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.

NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).

NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22).