

# **CERTIFICATION TEST REPORT**

# **Report Number. :** 12234189-E2V3

- Applicant : SATELLITE TRACKING OF PEOPLE LLC 1212 NORTH POST OAK RD, SUITE 100, HOUSTON, TX 77055, U.S.A.
  - Model : BluHome
  - FCC ID : S5EBHV40318
    - IC : 9086A-BHV40318
- **EUT Description :** OFFENDER HOME MONITORING BASE STATION
- Test Standard(s) : FCC 47 CFR PART 15 SUBPART C ISED RSS-247 ISSUE 2 ISED RSS-GEN ISSUE 5

Date Of Issue: March 14, 2019

Prepared by: UL Verification Services Inc. 47173 Benicia Street Fremont, CA 94538, U.S.A. TEL: (510) 319-4000 FAX: (510) 661-0888



#### **Revision History**

| Rev. | lssue<br>Date | Revisions  | Revised By |
|------|---------------|--|------------|
| V1   | 5/8/2018      | Initial Issue  |            |
| V2   | 7/9/2018      | Updated typo on company address and<br>NVLAP/ILAC logo   | Tina Chu   |
| V3   | 3/14/2019     | Updated typo on company phone number and NVLAP/ILAC logo | Tina Chu   |

Page 2 of 30

# **TABLE OF CONTENTS**

| 1.  | ATTESTATION OF TEST RESULTS                       | 4  |
|-----|---|----|
| 2.  | TEST METHODOLOGY                                  | 6  |
| 3.  | FACILITIES AND ACCREDITATION                      | 6  |
| 4.  | CALIBRATION AND UNCERTAINTY                       | 6  |
| 4.  | 1. MEASURING INSTRUMENT CALIBRATION               | 6  |
| 4.  | 2. SAMPLE CALCULATION                             | 6  |
| 4.  | 3. MEASUREMENT UNCERTAINTY                        | 7  |
| 5.  | EQUIPMENT UNDER TEST                              | 8  |
| 5.  | 1. DESCRIPTION OF EUT                             | 8  |
| 5.  | 2. MAXIMUM OUTPUT POWER                           | 8  |
| 5.  | 3. DESCRIPTION OF AVAILABLE ANTENNAS              | 8  |
| 5.  | 4. SOFTWARE AND FIRMWARE                          | 8  |
| 5.  | 5. WORST-CASE CONFIGURATION AND MODE              | 8  |
| 5.  | 6. DESCRIPTION OF TEST SETUP                      | 9  |
| 6.  | TEST AND MEASUREMENT EQUIPMENT                    | 11 |
| 7.  | MEASUREMENT METHODS                               | 12 |
| 8.  | ANTENNA PORT TEST RESULTS                         | 13 |
| 8.  | 1. ON TIME AND DUTY CYCLE                         | 13 |
| 8.  | 2. 6 dB BANDWIDTH                                 | 14 |
| 8.  | 3. 99% BANDWIDTH                                  | 15 |
| 8.  | 4. OUTPUT PEAK POWER                              | 16 |
| 8.  | 5. POWER SPECTRAL DENSITY                         | 17 |
| 8.  | 6. CONDUCTED SPURIOUS EMISSIONS LIMITS            | 18 |
| 9.  | RADIATED TEST RESULTS                             | 19 |
| 9.  | 1. TRANSMITTER RADIATED EMISISONS 9 kHz TO 30 MHz | 21 |
| 9.  | 2. TRANSMITTER RADIATED EMISSIONS 30 TO 1000 MHz  | 22 |
| 9.  | 3. TRANSMITTER RADIATED EMISSIONS 1 TO 18 GHz     | 24 |
| 10. | AC POWER LINE CONDUCTED EMISSIONS                 | 26 |
| 11. | SETUP PHOTOS                                      | 29 |

Page 3 of 30

# **1. ATTESTATION OF TEST RESULTS**

| COMPANY NAME:    | SATELLITE TRACKING OF PEOPLE LLC<br>1212 NORTH POST OAK RD, SUITE 100,<br>HOUSTON, TX 77055, U.S.A. |
|------------------|---|
| EUT DESCRIPTION: | OFFENDER HOME MONITORING BASE STATION   |
| MODEL:           | BluHome   |
|                  |   |
| SERIAL NUMBER:   | 13-800003(RADIATED); 1565326 (CONDUCTED)  |

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

UL 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.

Page 4 of 30

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Page 5 of 30

# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05, RSS-GEN Issue 5, and RSS-247 Issue 2.

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, and 47658 Kato Road, Fremont, California, USA. Line conducted emissions are measured only at the 47173 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            |
|--------------------------|--------------------------|--------------------------|
| Chamber A (ISED:2324B-1) | Chamber D (ISED:22541-1) | Chamber I (ISED:2324A-5) |
| Chamber B (ISED:2324B-2) | Chamber E (ISED:22541-2) | Chamber J (ISED:2324A-6) |
| Chamber C (ISED:2324B-3) | Chamber F (ISED:22541-3) | Chamber K (ISED:2324A-1) |
|                          | Chamber G (ISED:22541-4) | Chamber L (ISED:2324A-3) |
|                          | Chamber H (ISED:22541-5) |                          |

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. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

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

### 4.2. SAMPLE CALCULATION

#### RADIATED EMISSIONS

Where relevant, the following sample calculation is provided: Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB) 36.5 dBuV + 18.7 dB/m + 0.6 dB - 26.9 dB = 28.9 dBuV/m

#### MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided: Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss. 36.5 dBuV + 0 dB + 10.1 dB + 0 dB = 46.6 dBuV

Page 6 of 30

# 4.3. MEASUREMENT UNCERTAINTY

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

| PARAMETER                               | UNCERTAINTY |
|---|-------------|
| Conducted Disturbance, 9KHz to 0.15 MHz | 3.84 dB     |
| Conducted Disturbance, 0.15 to 30 MHz   | 3.65 dB     |
| Radiated Disturbance, 9KHz to 30 MHz    | 3.15 dB     |
| Radiated Disturbance, 30 to 1000 MHz    | 5.36 dB     |
| Radiated Disturbance,1000 to 18000 MHz  | 4.32 dB     |
| Radiated Disturbance,18000 to 26000 MHz | 4.45 dB     |
| Radiated Disturbance,26000 to 40000 MHz | 5.24 dB     |
| Occupied Channel Bandwidth              | ± 0.39 dB   |

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

Page 7 of 30

# 5. EQUIPMENT UNDER TEST

# 5.1. DESCRIPTION OF EUT

The EUT is an offender Home monitoring base station. It is a desktop device that includes 915 MHz (LoRa) ISM Proximity application, Cellular/Wifi/PSTN support and location services based via GNSS.

# 5.2. MAXIMUM OUTPUT POWER

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

| Frequency<br>Range<br>(MHz) | Mode   | Output Power<br>(dBm) | Output Power<br>(mW) |
|-----------------------------|--------|-----------------------|----------------------|
| 915                         | normal | 5.62                  | 3.65                 |

# 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a metal SMT antenna delivers the device antenna, with a maximum gain of 1dBi.

### 5.4. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was V1.1.

The test utility software used during testing was V1.1\_FCC.

# 5.5. WORST-CASE CONFIGURATION AND MODE

All radiated emission was performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The EUT is a desktop device(X-Orientation, Flatbed). Therefore, all final radiated testing was performed with the EUT in desktop orientation(X-Orientation, Flatbed).

915MHz, Wifi and cellular do not transmit simultaneously.

Page 8 of 30

# 5.6. DESCRIPTION OF TEST SETUP

#### **SUPPORT EQUIPMENT & PERIPHERALS**

N/A

#### I/O CABLES (CONDUCTED EMISSIONS)

|              | I/O CABLE LIST |                            |                           |            |                        |                |  |  |  |
|--------------|----------------|----------------------------|---------------------------|------------|------------------------|----------------|--|--|--|
| Cable<br>No. | Port           | # of<br>Identical<br>Ports | Connector Cable Type Type |            | Cable<br>Length<br>(m) | Remarks        |  |  |  |
| 1            | AC/DC          | 1                          | 2-prong                   | Unshielded | 1.5                    | Attached cable |  |  |  |
| 2            | Antenna        | 1                          | SMA                       | Shielded   | 0.05                   |                |  |  |  |

#### I/O CABLES (RADIATED EMISSIONS AND AC POWER LINE EMISSIONS)

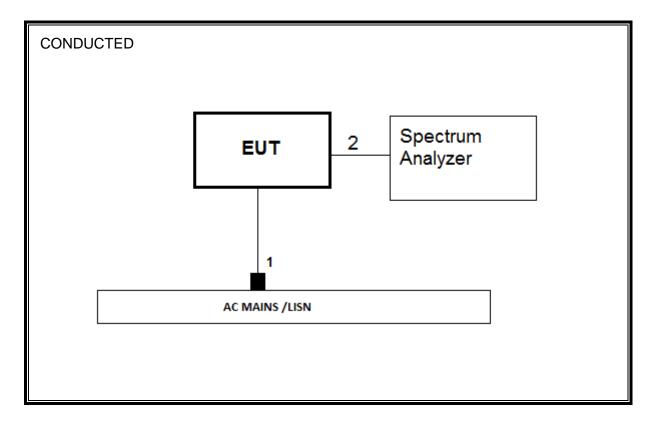
|              | I/O CABLE LIST |                            |                   |            |     |                |  |  |
|--------------|----------------|----------------------------|-------------------|------------|-----|----------------|--|--|
| Cable<br>No. | Port           | # of<br>Identical<br>Ports | Connector<br>Type | Remarks    |     |                |  |  |
| 1            | AC/DC          | 1                          | 2-prong           | Unshielded | 1.5 | Attached cable |  |  |

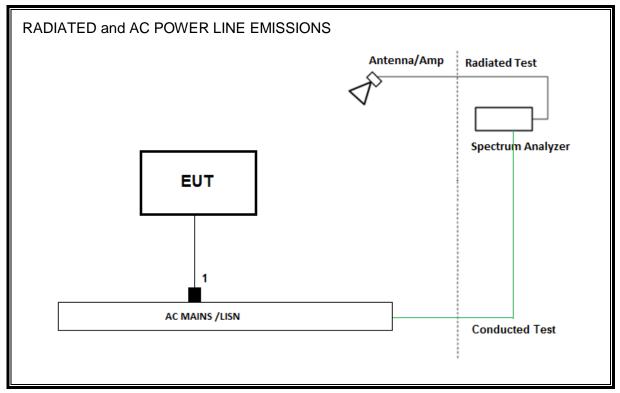
#### TEST SETUP-CONDUCTED TEST

The EUT was installed in a typical configuration. Refer to the following diagram;

Page 9 of 30

#### SETUP DIAGRAM





Page 10 of 30

# 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                      | Asset                 | Cal Due     |  |  |  |
| Antenna, Active Loop 9kHz-30MHz             | COM-POWER             | AL-130R                    | PRE0165308            | 12/13/2018  |  |  |  |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz | Sunorl Sciences Corp. | JB1                        | T130                  | 10/16/2018  |  |  |  |
| Amplifer, 100kHz to 1GHz, 32dB              | Keysight              | 8447D                      | T15                   | 08/14/2018  |  |  |  |
| Spectrum Analyzer, PXA, 3Hz to 44GHz        | Keysight              | N9030A                     | T1466                 | 04/16/2019  |  |  |  |
| Antenna, Horn 1-18GHz                       | ETS-Lindgren          | 3117                       | T120                  | 06/26/2018  |  |  |  |
| Amplifier, 1 to 18GHz                       | Miteq                 | AFS42-00101800-<br>25-S-42 | T931                  | 02/24/2019  |  |  |  |
| Filter, HPF 3.0GHz                          | Micro-Tronics         | HPM17543                   | T486                  | 04/03/2019  |  |  |  |
| Spectrum Analyzer, PXA 3Hz to 44GHz         | Keysight              | N9030A                     | T1210                 | 07/17/2018  |  |  |  |
| Power Sensor, P-series, 50MHz to<br>18GHz   | Agilent               | N1921A                     | T1223                 | 04/03/2019  |  |  |  |
| Power Meter, P-series single channel        | Agilent               | N911A                      | T1271                 | 04/10/2019  |  |  |  |
| PXA Spectrum Analyzer,<br>3Hz to 44GHz      | KEYSIGHT              | N9030A                     | T1450                 | 02/05/2019  |  |  |  |
|   | AC Line Conduc        | ted                        |                       |             |  |  |  |
| EMI Test receiver 10Hz- 7GHz                | Rhode& Schwarz        | ESR                        | T1436                 | 02/23/2019  |  |  |  |
| L.I.S.N                                     | FCC INC.              | FCC LISN 50/250            | T1310                 | 06/15/2018  |  |  |  |
| Power Cable, Line Conducted<br>Emissions    | UL                    | PG1                        | T861                  | 08/31/2018  |  |  |  |
| UL AUTOMATION SOFTWARE                      |                       |                            |                       |             |  |  |  |
| Radiated Software                           | UL                    | UL EMC                     | Ver 9.5, De           | c 01, 2016  |  |  |  |
| Conducted Software                          | UL                    | UL EMC                     | Ver 8.2, Dec 14, 2017 |             |  |  |  |
| AC Line Conducted Software                  | UL                    | UL EMC                     | Ver 9.5, Ma           | iy 26, 2015 |  |  |  |

#### NOTES:

- 1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
- 2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

Page 11 of 30

# 7. MEASUREMENT METHODS

6 dB BW: ANSI C63.10 Subclause -11.8.1

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

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

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

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

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

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

<u>Band-edge:</u> ANSI C63.10 Subclause -11.13.3.4 Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction

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

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

Page 12 of 30

# 8. ANTENNA PORT TEST RESULTS

# 8.1. ON TIME AND DUTY CYCLE

#### <u>LIMITS</u>

None; for reporting purposes only.

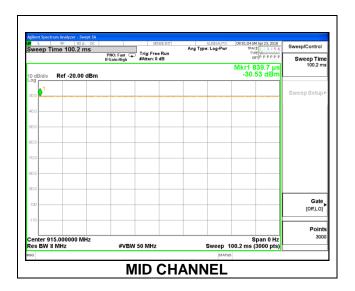
#### PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

#### ON TIME AND DUTY CYCLE RESULTS

|         | <b>ON</b> Time | Period | Duty Cycle | Duty    | Duty Cycle               | 1/B         |
|---------|----------------|--------|------------|---------|--------------------------|-------------|
| Mode    | В              |        | x          | Cycle   | <b>Correction Factor</b> | Minimum VBW |
|         | (msec)         | (msec) | (linear)   | (%)     | (dB)                     | (kHz)       |
| 915 MHz | 1.000          | 1.000  | 1.000      | 100.00% | 0.00                     | 0.010       |

#### DUTY CYCLE PLOT



Page 13 of 30

### 8.2. 6 dB BANDWIDTH

#### <u>LIMITS</u>

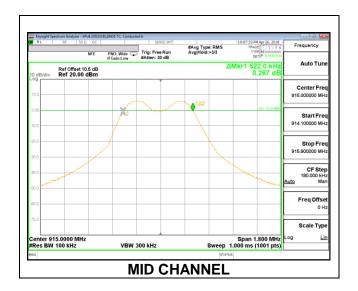
FCC §15.247 (a) (2)

ISED RSS-247 Clause 5.2 (a)

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

#### **RESULTS**

| Channel | Frequency | 6dB Bandwidth | Minimum Limit |
|---------|-----------|---------------|---------------|
|         | (MHz)     | (KHz)         | (KHz)         |
| Mid     | 915       | 522           | 500           |



Page 14 of 30

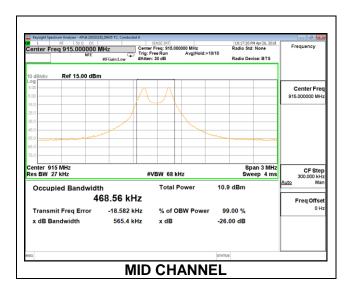
### 8.3. 99% **BANDWIDTH**

#### LIMITS

None; for reporting purposes only.

#### **RESULTS**

| Channel | Frequency<br>(MHz) | 99% Bandwidth<br>(KHz) |
|---------|--------------------|------------------------|
| Mid     | 915                | 468.56                 |



Page 15 of 30

# 8.4. OUTPUT PEAK POWER

#### <u>LIMITS</u>

FCC §15.247 (b) (3)

ISED RSS-247 Clauses 5.4 (d)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

#### <u>RESULTS</u>

| Tested By: | 29435 TC  |
|------------|-----------|
| Date:      | 4/26/2018 |

Limits

| Channel | Frequency | Directional | FCC   | IC    | IC    | Max   |
|---------|-----------|-------------|-------|-------|-------|-------|
|         |           | Gain        | Power | Power | EIRP  | Power |
|         |           |             | Limit | Limit | Limit |       |
|         | (MHz)     | (dBi)       | (dBm) | (dBm) | (dBm) | (dBm) |
| Mid     | 915       | 1.00        | 30.00 | 30    | 36    | 30.00 |

Results

| Channel | Frequency | Chain 0 | Total  | Power | Margin |
|---------|-----------|---------|--------|-------|--------|
|         |           | Meas    | Corr'd | Limit |        |
|         |           | Peak    | Peak   |       |        |
|         |           |         | Power  |       |        |
|         | (MHz)     | (dBm)   | (dBm)  | (dBm) | (dB)   |
| Mid     | 915       | 5.62    | 5.62   | 30.00 | -24.38 |

# 8.5. POWER SPECTRAL DENSITY

#### LIMITS

FCC §15.247 (e)

ISED RSS-247 Clause 5.2 (b)

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

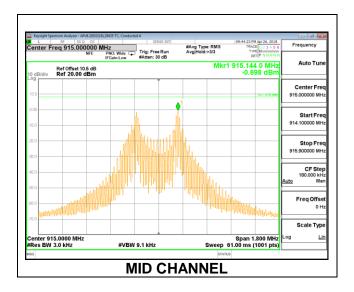
#### **RESULTS**

 Tested By:
 29435 TC

 Date:
 4/26/2018

| Duty Cycle CF (dB) 0.00 | Included in Calculations of Corr'd PSD |
|-------------------------|--|
|-------------------------|--|

| Channel | Frequency | Chain 0 | Limit       | Margin |      |
|---------|-----------|---------|-------------|--------|------|
|         |           | Meas    | Meas Corr'd |        |      |
|         | (MHz)     | (dBm)   | PSD         |        |      |
|         |           |         | (dBm)       | (dBm)  | (dB) |
| Mid     | 915.0     | -0.70   | -0.70       | 8.0    | -8.7 |



Page 17 of 30

### 8.6. CONDUCTED SPURIOUS EMISSIONS LIMITS

#### LIMITS

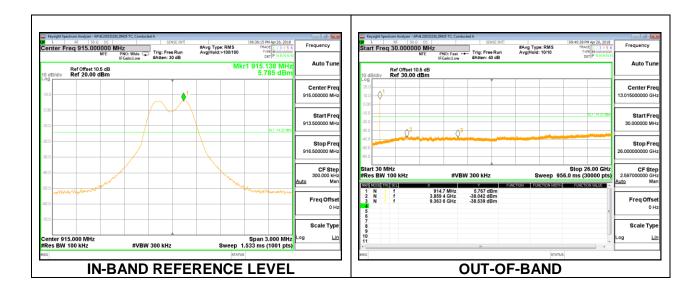
FCC §15.247 (d)

ISED RSS-247 Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

#### **RESULTS**

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



# 9. RADIATED TEST RESULTS

#### LIMITS

FCC §15.205 and §15.209

IC RSS-GEN, Section 8.9 and 8.10.

| Frequency Range<br>(MHz) | Field Strength Limit<br>(uV/m) at 3 m | Field Strength Limit<br>(dBuV/m) at 3 m |  |  |  |  |
|--------------------------|---------------------------------------|---|--|--|--|--|
| 0.009-0.490              | 2400/F(kHz) @ 300m                    | 2400/F(kHz) @ 300m                      |  |  |  |  |
| 0.490-1.705              | 24000/F(kHz) @ 30m                    | 24000/F(kHz) @ 30m                      |  |  |  |  |
| 1.705-30.0               | 30 @ 30m                              | 30 @ 30m                                |  |  |  |  |
| 30 - 88                  | 100                                   | 40                                      |  |  |  |  |
| 88 - 216                 | 150                                   | 43.5                                    |  |  |  |  |
| 216 - 960                | 200                                   | 46                                      |  |  |  |  |
| Above 960                | 500                                   | 54                                      |  |  |  |  |

#### TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

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

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

The spectrum from 1 GHz to 18 GHz, below 1GHz and above 18GHz emissions are investigated with the transmitter set to the single channel in each applicable band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

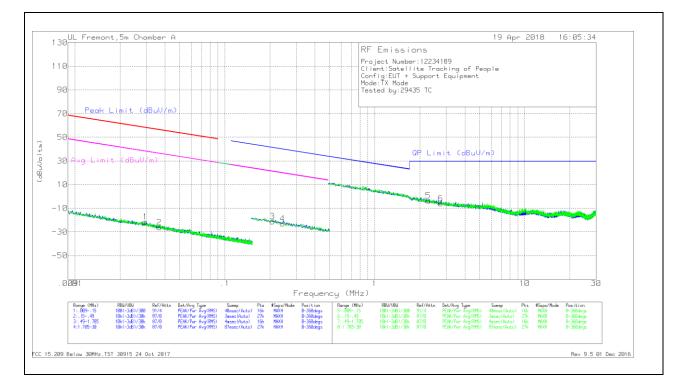
#### KDB 414788 Open Field Site(OFS) and Chamber Correlation Justification

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

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

Page 20 of 30

#### **RESULTS**



### 9.1. TRANSMITTER RADIATED EMISISONS 9 kHz TO 30 MHz

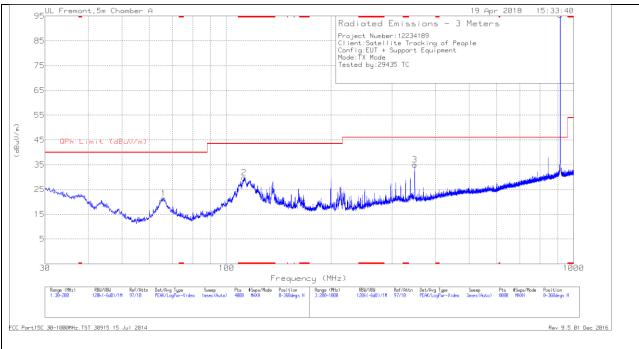
#### **Radiated Emissions**

| Marker | Frequency<br>(MHz) | Meter<br>Reading | Det | Loop<br>Antenna | Cbl<br>(dB) | Dist<br>Corr | Corrected<br>Reading | Peak<br>Limit | Margin<br>(dB) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Peak<br>Limit | Margin<br>(dB) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Azimuth<br>(Degs) |
|--------|--------------------|------------------|-----|-----------------|-------------|--------------|----------------------|---------------|----------------|-----------------------|----------------|---------------|----------------|-----------------------|----------------|-------------------|
|        |                    | (dBuV)           |     | (dB/m)          |             | 300m         | (dBuVolts)           | (dBuV/m)      |                |                       |                | (dBuV/m)      |                |                       |                |                   |
| 1      | .02948             | 42.97            | Pk  | 15.5            | .1          | -80          | -21.43               | 58.2          | -79.63         | 38.2                  | -59.63         | -             | -              | -                     | -              | 0-360             |
| 2      | .03665             | 38.63            | Pk  | 15.1            | .1          | -80          | -26.17               | 56.3          | -82.47         | 36.3                  | -62.47         | -             | -              | -                     | -              | 0-360             |
| 3      | .20818             | 44.96            | Pk  | 13.9            | .1          | -80          | -21.04               | -             | -              | -                     | -              | 41.25         | -62.29         | 21.25                 | -42.29         | 0-360             |
| 4      | .24283             | 43               | Pk  | 13.9            | .1          | -80          | -23                  | -             | -              | -                     | -              | 39.91         | -62.91         | 19.91                 | -42.91         | 0-360             |

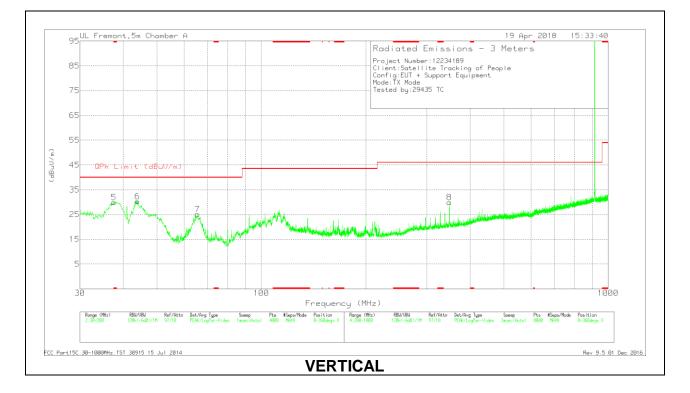
| Marker | Frequency<br>(MHz) | Meter<br>Reading<br>(dBuV) | Det | Loop<br>Antenna<br>(dB/m) | Cbl<br>(dB) | Dist<br>Corr<br>30m | Corrected<br>Reading<br>(dBuVolts) | QP Limit<br>(dBuV/m) | Margin<br>(dB) | Peak<br>Limit<br>(dBuV/m) | Margin<br>(dB) | Avg Limit<br>(dBuV/m) | Margin<br>(dB) | Azimuth<br>(Degs) |
|--------|--------------------|----------------------------|-----|---------------------------|-------------|---------------------|------------------------------------|----------------------|----------------|---------------------------|----------------|-----------------------|----------------|-------------------|
| 5      | 2.28088            | 21.88                      | Pk  | 14.4                      | .2          | -40                 | -3.52                              | 29.5                 | -33.02         | -                         | -              | -                     | -              | 0-360             |
| 6      | 2.74566            | 19.35                      | Pk  | 14.4                      | .3          | -40                 | -5.95                              | 29.5                 | -35.45         | -                         | -              | -                     | •              | 0-360             |

Pk - Peak detector

### 9.2. TRANSMITTER RADIATED EMISSIONS 30 TO 1000 MHz



HORIZONTAL



Page 22 of 30

#### <u>DATA</u>

| Marker | Frequency<br>(MHz) | Meter<br>Reading<br>(dBuV) | Det | AF T130 (dB/m) | Amp/Cbl (dB/m) | Corrected<br>Reading<br>(dBuV/m) | QPk Limit (dBuV/m) | Margin<br>(dB) | Azimuth<br>(Degs) | Height<br>(cm) | Polarity |
|--------|--------------------|----------------------------|-----|----------------|----------------|----------------------------------|--------------------|----------------|-------------------|----------------|----------|
| 2      | * 112.3863         | 39.1                       | Pk  | 17             | -26.3          | 29.8                             | 43.52              | -13.72         | 0-360             | 300            | Н        |
| 5      | * 37.567           | 37.46                      | Pk  | 19.7           | -27.2          | 29.96                            | 40                 | -10.04         | 0-360             | 100            | V        |
| 6      | 43.9436            | 42.43                      | Pk  | 15             | -27.1          | 30.33                            | 40                 | -9.67          | 0-360             | 100            | V        |
| 7      | 65.4117            | 39.84                      | Pk  | 12.1           | -26.8          | 25.14                            | 40                 | -14.86         | 0-360             | 100            | V        |
| 1      | 65.7943            | 36.13                      | Pk  | 12.1           | -26.8          | 21.43                            | 40                 | -18.57         | 0-360             | 300            | н        |
| 8      | 348.4193           | 36.49                      | Pk  | 18.2           | -24.8          | 29.89                            | 46.02              | -16.13         | 0-360             | 200            | V        |
| 3      | 348.5193           | 41.49                      | Pk  | 18.3           | -24.8          | 34.99                            | 46.02              | -11.03         | 0-360             | 101            | н        |

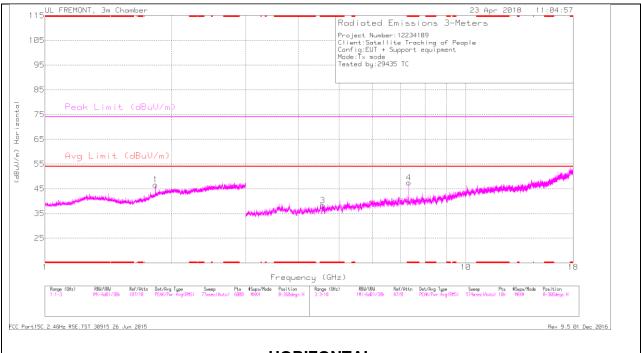
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band Pk - Peak detector

NOTE: Marker 9 & 4 are fundamental signals

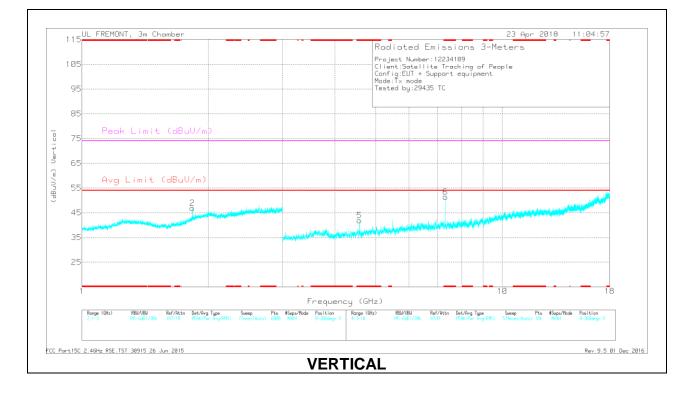
Page 23 of 30

### 9.3. TRANSMITTER RADIATED EMISSIONS 1 TO 18 GHz

#### HARMONICS AND SPURIOUS EMISSIONS WORST-CASE MID CHANNEL (915 MHz)



#### HORIZONTAL



Page 24 of 30

#### **Radiated Emissions**

| Marker | Frequency | Meter   | Det  | AF T120 (dB/m) | Amp/Cbl/Fltr/P | Corrected | Avg Limit | Margin | Peak Limit | PK Margin | Azimuth | Height | Polarity |
|--------|-----------|---------|------|----------------|----------------|-----------|-----------|--------|------------|-----------|---------|--------|----------|
|        | (GHz)     | Reading |      |                | ad (dB)        | Reading   | (dBuV/m)  | (dB)   | (dBuV/m)   | (dB)      | (Degs)  | (cm)   |          |
|        |           | (dBuV)  |      |                |                | (dBuV/m)  |           |        |            |           |         |        |          |
| 3      | * 4.574   | 39.58   | PK2  | 34.1           | -28            | 45.68     | -         | -      | 74         | -28.32    | 84      | 101    | Н        |
|        | * 4.576   | 28.71   | MAv1 | 34.1           | -28.1          | 34.71     | 54        | -19.29 | -          | -         | 84      | 101    | Н        |
| 4      | * 7.319   | 42.06   | PK2  | 35.7           | -25.9          | 51.86     | -         | -      | 74         | -22.14    | 2       | 217    | Н        |
|        | * 7.319   | 34.54   | MAv1 | 35.7           | -25.9          | 44.34     | 54        | -9.66  | -          | -         | 2       | 217    | Н        |
| 5      | * 4.576   | 42.29   | PK2  | 34.1           | -28.1          | 48.29     | -         | -      | 74         | -25.71    | 30      | 277    | V        |
|        | * 4.576   | 33.85   | MAv1 | 34.1           | -28.1          | 39.85     | 54        | -14.15 | -          | -         | 30      | 277    | V        |
| 6      | * 7.319   | 44.81   | PK2  | 35.7           | -25.9          | 54.61     | -         | -      | 74         | -19.39    | 3       | 234    | V        |
|        | * 7.319   | 38.65   | MAv1 | 35.7           | -25.9          | 48.45     | 54        | -5.55  | -          | -         | 3       | 234    | V        |
| 1      | 1.83      | 44.13   | PK2  | 30.7           | -21.4          | 53.43     | -         | -      | -          | -         | 320     | 349    | Н        |
|        | 1.83      | 35.74   | MAv1 | 30.7           | -21.4          | 45.04     | -         | -      | -          | -         | 320     | 349    | Н        |
| 2      | 1.83      | 44.16   | PK2  | 30.7           | -21.4          | 53.46     | -         | -      | -          | -         | 171     | 212    | V        |
|        | 1.83      | 36.41   | MAv1 | 30.7           | -21.4          | 45.71     | -         | -      | -          | -         | 171     | 212    | V        |

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band PK2 - KDB558074 Method: Maximum Peak MAv1 - KDB558074 Option 1 Maximum RMS Average

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Page 25 of 30

# **10. AC POWER LINE CONDUCTED EMISSIONS**

#### <u>LIMITS</u>

FCC §15.207 (a)

RSS-Gen 8.8

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

\*Decreases with the logarithm of the frequency.

#### TEST PROCEDURE

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

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

Line conducted data is recorded for both Line 1 (HOT) and Line 2 (NEUTRAL).

#### **RESULTS**

Page 26 of 30

#### LINE 1 RESULTS



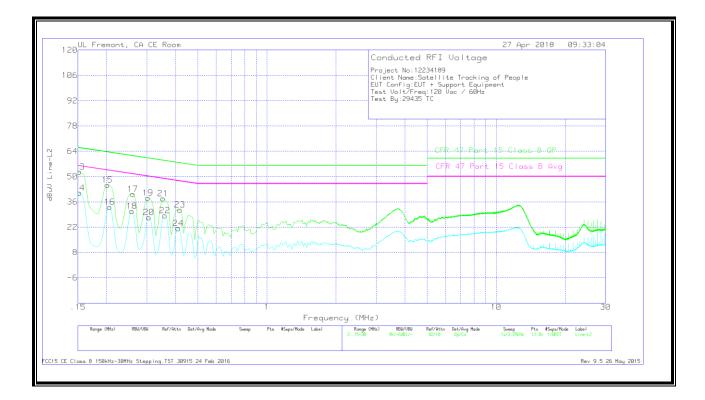
#### WORST EMISSIONS

| Range  | 1: Line-L1 .       | 15 - 30MH                  | lz  |         |                    |                 |                              |                                 |                   |                                  |                             |
|--------|--------------------|----------------------------|-----|---------|--------------------|-----------------|------------------------------|---------------------------------|-------------------|----------------------------------|-----------------------------|
| Marker | Frequency<br>(MHz) | Meter<br>Reading<br>(dBuV) | Det | LISN L1 | LC Cables<br>C1&C3 | Limiter<br>(dB) | Corrected<br>Reading<br>dBuV | CFR 47<br>Part 15<br>Class B QP | QP Margin<br>(dB) | CFR 47<br>Part 15<br>Class B Avg | Av(CISPR)<br>Margin<br>(dB) |
| 1      | .15225             | 43.76                      | Qp  | .1      | 0                  | 10.1            | 53.96                        | 65.88                           | -11.92            | -                                | -                           |
| 2      | .15225             | 28.51                      | Ca  | .1      | 0                  | 10.1            | 38.71                        | -                               | -                 | 55.88                            | -17.17                      |
| 3      | .19725             | 37.8                       | Qp  | 0       | 0                  | 10.1            | 47.9                         | 63.73                           | -15.83            | -                                | -                           |
| 4      | .1995              | 22.14                      | Ca  | 0       | 0                  | 10.1            | 32.24                        | -                               | -                 | 53.63                            | -21.39                      |
| 5      | .25125             | 30.83                      | Qp  | 0       | 0                  | 10.1            | 40.93                        | 61.72                           | -20.79            | -                                | -                           |
| 6      | .25125             | 16.52                      | Ca  | 0       | 0                  | 10.1            | 26.62                        | -                               | -                 | 51.72                            | -25.1                       |
| 7      | .294               | 27.76                      | Qp  | 0       | 0                  | 10.1            | 37.86                        | 60.41                           | -22.55            | -                                | -                           |
| 8      | .2985              | 15.4                       | Ca  | 0       | 0                  | 10.1            | 25.5                         | -                               | -                 | 50.28                            | -24.78                      |
| 9      | .34575             | 30.19                      | Qp  | 0       | 0                  | 10.1            | 40.29                        | 59.06                           | -18.77            | -                                | -                           |
| 10     | .35025             | 15.69                      | Ca  | 0       | 0                  | 10.1            | 25.79                        | -                               | -                 | 48.96                            | -23.17                      |
| 11     | .40875             | 23.65                      | Qp  | 0       | 0                  | 10.1            | 33.75                        | 57.67                           | -23.92            | -                                | -                           |
| 12     | .402               | 8.87                       | Ca  | 0       | 0                  | 10.1            | 18.97                        | -                               | -                 | 47.81                            | -28.84                      |

Qp - Quasi-Peak detector

Ca - CISPR average detection

#### LINE 2 RESULTS



#### WORST EMISSIONS

| Range 2: Line-L2 .15 - 30MHz |           |         |     |         |           |         |           |            |           |             |           |
|------------------------------|-----------|---------|-----|---------|-----------|---------|-----------|------------|-----------|-------------|-----------|
| Marker                       | Frequency | Meter   | Det | LISN L2 | LC Cables | Limiter | Corrected | CFR 47     | QP Margin | CFR 47      | Av(CISPR) |
|                              | (MHz)     | Reading |     |         | C2&C3     | (dB)    | Reading   | Part 15    | (dB)      | Part 15     | Margin    |
|                              |           | (dBuV)  |     |         |           |         | dBuV      | Class B QP |           | Class B Avg | (dB)      |
| 13                           | .15225    | 42.47   | Qp  | 0       | 0         | 10.1    | 52.57     | 65.88      | -13.31    | -           | -         |
| 14                           | .15225    | 30.87   | Ca  | 0       | 0         | 10.1    | 40.97     | -          | -         | 55.88       | -14.91    |
| 15                           | .20175    | 35.19   | Qp  | 0       | 0         | 10.1    | 45.29     | 63.54      | -18.25    | -           | -         |
| 16                           | .20625    | 23.07   | Ca  | 0       | 0         | 10.1    | 33.17     | -          | -         | 53.35       | -20.18    |
| 17                           | .26025    | 30.16   | Qp  | 0       | 0         | 10.1    | 40.26     | 61.42      | -21.16    | -           | -         |
| 18                           | .258      | 20.74   | Ca  | 0       | 0         | 10.1    | 30.84     | -          | -         | 51.5        | -20.66    |
| 19                           | .303      | 28.05   | Qp  | 0       | 0         | 10.1    | 38.15     | 60.16      | -22.01    | -           | -         |
| 20                           | .30525    | 17.32   | Ca  | 0       | 0         | 10.1    | 27.42     | -          | -         | 50.1        | -22.68    |
| 21                           | .3525     | 27.76   | Qp  | 0       | 0         | 10.1    | 37.86     | 58.9       | -21.04    | -           | -         |
| 22                           | .35925    | 18.29   | Ca  | 0       | 0         | 10.1    | 28.39     | -          | -         | 48.75       | -20.36    |
| 23                           | .41775    | 21.56   | Qp  | 0       | 0         | 10.1    | 31.66     | 57.49      | -25.83    | -           | -         |
| 24                           | .411      | 11.19   | Ca  | 0       | 0         | 10.1    | 21.29     | -          | -         | 47.63       | -26.34    |

**Qp** - Quasi-Peak detector

Ca - CISPR average detection

Page 28 of 30