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## FCC TEST REPORT

Under:  
FCC 15 Subpart C, Paragraph 15.209  
Operation within the bands 125 kHz  
DCD - Part 15 Low Power Transmitter Below 1705 kHz

Prepared For:

**Grandstream Networks, Inc.**

126 Brookline Ave, 3rd Floor Boston, MA 02215, USA

|                                  |
|----------------------------------|
| <b>FCC ID: YZZGDS3705</b>        |
| <b>EUT: IP Audio Door System</b> |
| <b>Model: GDS3705</b>            |

|  |
|--|
| May 30, 2018                           |
| <b>Issue Date:</b>                     |
| Original Report                        |
| <b>Report Type:</b>                    |
|  |
| <b>Test Engineer:</b> Jacky Huang      |
|  |
| <b>Review By:</b> Apollo Liu / Manager |

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**Report Revision History**

| <b>Report #</b>  | <b>Version</b> | <b>Description</b>           | <b>Issued Date</b> |
|------------------|----------------|------------------------------|--------------------|
| KSZ2018032301J01 | Rev.01         | Initial issue of report      | April 23, 2018     |
| KSZ2018032301J01 | Rev.02         | Update section 4.7 & 7.2 & 9 | May 30, 2018       |

## 1. General Information

### 1. 1 Notes

The test results of this report relate exclusively to the test item specified in 1.6. The KMO Lab does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the KMO Lab.

### 1. 2 Testing Laboratory

|                                       |   |
|---------------------------------------|---|
| <b>Test Firm Name:</b>                | <b>Ke Mei Ou Lab Co., Ltd.</b>  |
| <b>Test Firm Address:</b>             | 2013-2016, 20th Floor, Business Center, Jiahui Xin Cheng, No 3027, Shen Nan Road, Fu Tian, Shen Zhen, Guang Dong, P. R. China |
| <b>FCC Designation Number:</b>        | CN1532  |
| <b>Test Firm Registration Number:</b> | 344480  |
| <b>Internet:</b>                      | <a href="http://www.kmolab.com">www.kmolab.com</a>  |
| <b>Email:</b>                         | <a href="mailto:kmo@kmolab.com">kmo@kmolab.com</a>  |

ANSI-ASQ National Accreditation Board/ACCLASS ISO/IEC 17025 Accredited Lab for telecommunication standards. The Registration Number is AT-1532. The testing quality system meets with ISO/IEC-17025 requirements, This approval results is accepted by MRA of ILAC.

### 1. 3 Details of Applicant

**Name:** Grandstream Networks, Inc.  
**Address:** 126 Brookline Ave, 3rd Floor Boston, MA 02215, USA

### 1. 4 Application Details

Date of Receipt of Application: March 23, 2018  
Date of Receipt of Test Item: March 23, 2018  
Date of Test : March 28~May 30, 2018

### 1. 5 Details of Manufacturer

**Name:** Grandstream Networks, Inc.  
**Address:** 126 Brookline Ave, 3rd Floor Boston, MA 02215, USA

### 1. 6 Test Item

| EUT Feature               |  |
|---------------------------|--|
| <b>EUT Description:</b>   | IP Audio Door System   |
| <b>Brand Name:</b>        | Grandstream  |
| <b>Model Name:</b>        | GDS3705  |
| <b>EUT RF Technology:</b> | <input checked="" type="checkbox"/> DCD - Part 15 Low Power Transmitter Below 1705 kHz |
| <b>HW Version:</b>        | v1.4A  |
| <b>SW Version:</b>        | 1.0.0.23   |
| <b>EUT Stage:</b>         | Identical Prototype  |

Note: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

| Standard Product Specification   |  |
|----------------------------------|--|
| <b>Channel Frequency:</b>        | 125 kHz  |
| <b>Channel Number:</b>           | 1  |
| <b>Type of Modulation</b>        | ASK  |
| <b>EUT Operational Condition</b> | <input type="checkbox"/> AC<br><input checked="" type="checkbox"/> DC → <input type="checkbox"/> From Battery <input type="checkbox"/> External AC adapter <input checked="" type="checkbox"/> POE |

### Additional Information

| Specification of Accessory                     |                     |   |                   |   |
|--|---------------------|---|-------------------|---|
| <input type="checkbox"/> AC/DC Adapter #1 (US) | <b>Brand Name</b>   | - | <b>Model Name</b> | - |
|  | <b>Power Rating</b> | - |                   |   |
| <input type="checkbox"/> AC/DC Adapter #2 (US) | <b>Brand Name</b>   | - | <b>Model Name</b> | - |
|  | <b>Power Rating</b> | - |                   |   |

## 1. 7 Applicable Standards

| Applicable Standards  |
|---|
| According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:<br>FCC Part 15 Subpart C<br>ANSI C63.10-2013 |
| Note: All test items were verified and recorded according to the standards and without any deviation during the test.   |

## 2. Technical Test

### 2. 1 Summary of Test Results

**The EUT has been tested according to the following specifications:**

| FCC Rules | Test Type                         | Limit      | Result      | Notes     |
|-----------|-----------------------------------|------------|-------------|-----------|
| 15.203    | Antenna Requirement               | FCC 15.203 | <b>PASS</b> | Complies. |
| 15.207    | AC Power-line Conducted Emissions | FCC 15.207 | <b>PASS</b> | DC Power  |
| 15.209    | Transmitter Radiated Emissions    | FCC 15.209 | <b>PASS</b> | Complies. |
| 15.215(c) | Emission Bandwidth                | N/A        | <b>PASS</b> | Complies. |

### 2. 2 Antenna Requirement

#### A. Regulation

FCC section 15.203, An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of Part 15C. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

#### B. Result

| Antenna Information                 |  |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | Integral antenna (antenna permanently attached)  |
| <input type="checkbox"/>            | Temporary RF connector provided  |
| <input type="checkbox"/>            | No temporary RF connector provided   |
| <input checked="" type="checkbox"/> | Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement.<br>In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path. |
| <input type="checkbox"/>            | External antenna (dedicated antennas)  |
| <input type="checkbox"/>            | Single power level with corresponding antenna(s).  |
| <input type="checkbox"/>            | Multiple power level and corresponding antenna(s).   |

### 2. 3 Measurement Uncertainty

| Measurement         | Frequency       | Uncertainty |
|---------------------|-----------------|-------------|
| Conducted emissions | 0.15MHz~30MHz   | 1.72        |
| Radiated emissions  | 30MHz ~ 300MHz  | 3.88        |
| Radiated emissions  | 300MHz ~1000MHz | 3.86        |
| Radiated emissions  | >1000MHz        | 4.42        |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## 3. EUT Modifications

No modification by test lab.

## 4. Conducted Power Line Test

### 4.1 Test Equipment

Please refer to Section 8 this report.

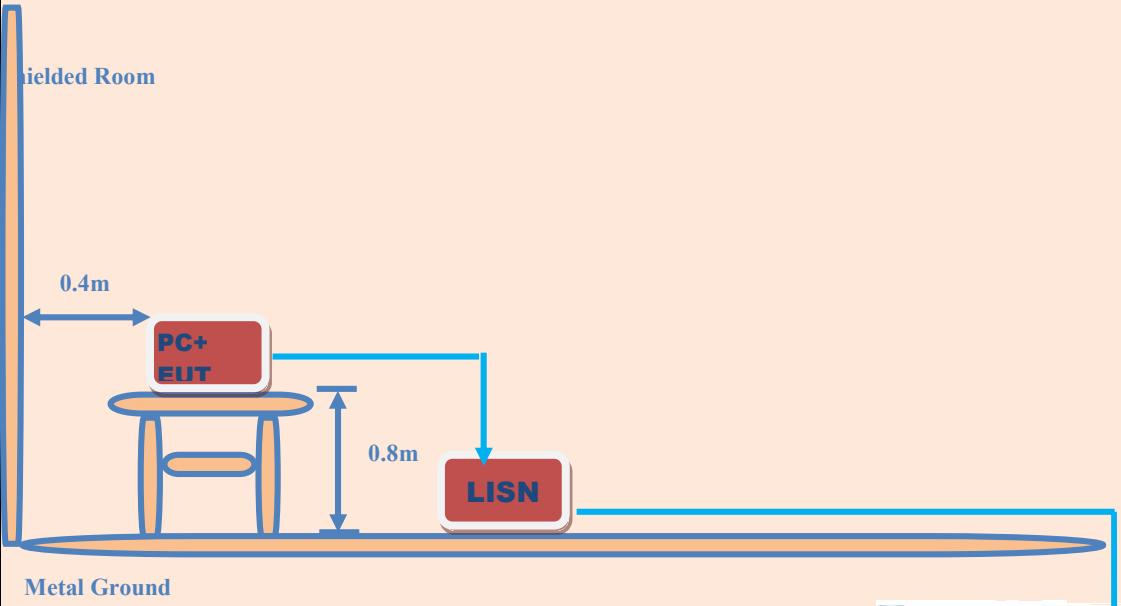
### 4.2 Test Procedure

#### Test Method

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement. Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

### 4.3 Test Setup

| Test Setup   |  |
|--|--|
| AC Line Conducted Emissions  |  |
|   | <p>PC+EUT</p> <p>LISN</p> <p>0.4m</p> <p>0.8m</p> <p>shielded Room</p> <p>Metal Ground</p> |
| <p>This test is applicable for radio equipment and/or ancillary equipment for fixed use powered by the AC mains. This test shall be performed on a representative configuration of the radio equipment, the associated ancillary equipment, or a representative configuration of the combination of radio and ancillary equipment. This test assesses the level of internally generated electrical noise present on the AC power input/output ports.</p> |  |

#### 4.4 Configuration of the EUT

The EUT was configured according to ANSI C63.10:2013. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

| EUT Operation Test Setup            |                                    |                                     |   |
|-------------------------------------|------------------------------------|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Operated Mode for Worst Duty Cycle | <input checked="" type="checkbox"/> | Operated normal mode for worst duty cycle |
| <input checked="" type="checkbox"/> | Test Signal Duty Cycle (x)         | <input checked="" type="checkbox"/> | 100.00%                                   |
| <input checked="" type="checkbox"/> | Modulation                         | <input checked="" type="checkbox"/> | ASK                                       |
| <input checked="" type="checkbox"/> | Test Channel Frequencies (kHz)     | <input checked="" type="checkbox"/> | 125                                       |
|                                     |                                    | <input type="checkbox"/>            | Operated test mode for worst duty cycle   |
|                                     |                                    | <input type="checkbox"/>            | Other                                     |
|                                     |                                    | <input type="checkbox"/>            | Other                                     |
|                                     |                                    | <input type="checkbox"/>            | Other                                     |

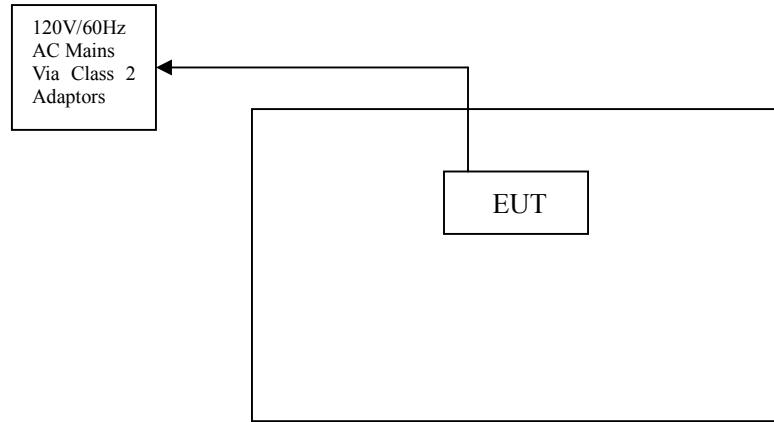
| The Worst Case Mode for Following Conformance Tests |                                     |  |   |
|---|-------------------------------------|--|---|
| <input checked="" type="checkbox"/>                 | Tests Item                          |  |   |
|   | <input checked="" type="checkbox"/> | AC power-line conducted emissions  | <input checked="" type="checkbox"/> Emission Bandwidth, Field Strength of Fundamental Emissions Transmitter Radiated Unwanted Emissions |
| <input checked="" type="checkbox"/>                 | Condition                           |  |   |
|   | <input checked="" type="checkbox"/> | AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz | <input checked="" type="checkbox"/> Radiated measurement  |
| <input checked="" type="checkbox"/>                 | Operating Mode                      |  |   |
|   | <input checked="" type="checkbox"/> | Operating Mode Description   | <input type="checkbox"/> Other  |
| <input checked="" type="checkbox"/>                 | Orthogonal Planes of EUT            |  |   |
|   | <input type="checkbox"/>            | X Plane  | <input type="checkbox"/> Y Plane  |
|   | <input checked="" type="checkbox"/> | Y Plane  | <input type="checkbox"/> Other  |

| Support Unit                  |              |                     |            |                            |
|-------------------------------|--------------|---------------------|------------|----------------------------|
| Device                        | Manufacturer | Model #<br>Serial # | FCC ID     | Cable                      |
| Notebook                      | ACER         | ZQE                 | HLZ-AR5B97 | 1.5m unshielded power cord |
| AC/DC Adapter <sup>Note</sup> | Frecom       | F18W8-120150SPAUY   | DOC        | 1.5m unshielded power cord |

Note: Support for AC power-line conducted emission testing only.

#### 4. 5 EUT Operating Condition

Operating condition is according to ANSI C63.10:2013.

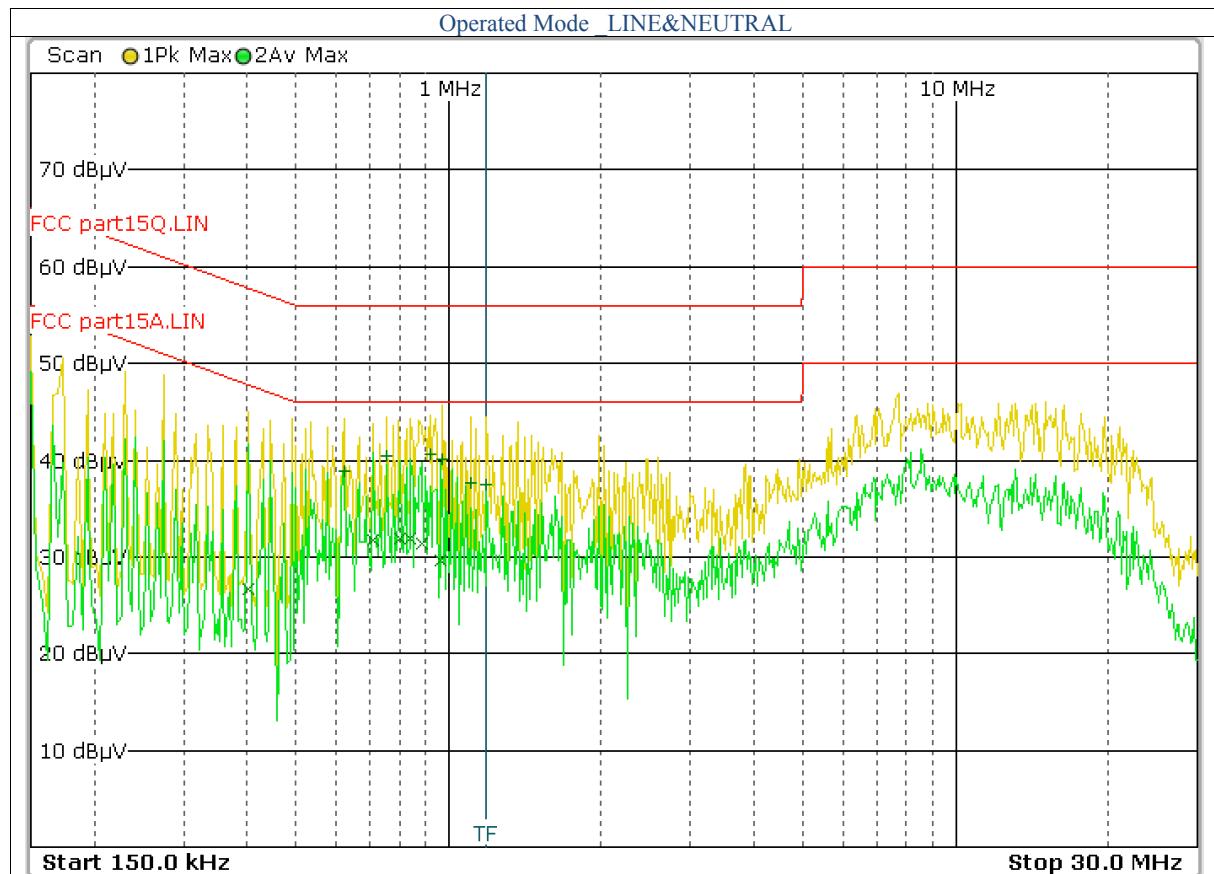


#### 4. 6 Conducted Power Line Emission Limits

| FCC Part 15 Paragraph 15.207 (dBuV) |             |
|-------------------------------------|-------------|
| Frequency Range (MHz)               | QP/AV       |
| 0.15 – 0.5                          | 66-56/56-46 |
| 0.5 – 5.0                           | 56/46       |
| 5.0 - 30                            | 60/50       |

**Note:** In the above table, the tighter limit applies at the band edges.

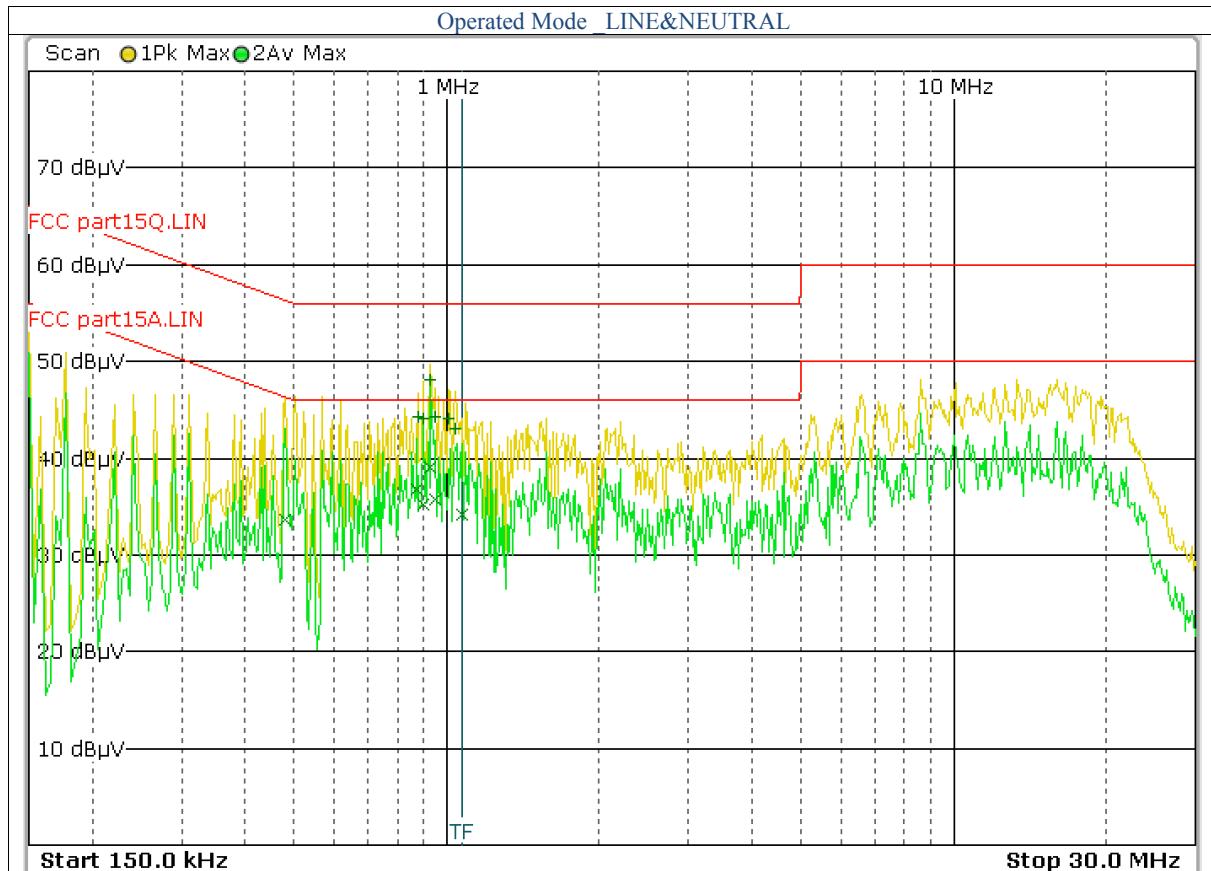
#### 4.7 Conducted Power Line Test Result



| FCC15           |                                  |       |             |                                |       |              |                             |       |                             |        |
|-----------------|----------------------------------|-------|-------------|--------------------------------|-------|--------------|-----------------------------|-------|-----------------------------|--------|
| Frequency (MHz) | Read Level (dB $\mu$ V)<br>QP AV |       | Factor (dB) | Emission (dB $\mu$ V)<br>QP AV |       | Line/Neutral | Limit (dB $\mu$ V)<br>QP AV |       | Margin(dB $\mu$ V)<br>QP AV |        |
| 0.622           | 28.40                            | 18.16 | 10.40       | 38.80                          | 28.56 | Line         | 56.00                       | 46.00 | -17.20                      | -17.44 |
| 0.754           | 30.00                            | 21.29 | 10.40       | 40.40                          | 31.69 | Line         | 56.00                       | 46.00 | -15.60                      | -14.31 |
| 0.802           | 30.55                            | 21.52 | 10.40       | 40.95                          | 31.92 | Line         | 56.00                       | 46.00 | -15.05                      | -14.08 |
| 0.918           | 30.15                            | 21.05 | 10.40       | 40.55                          | 31.45 | Line         | 56.00                       | 46.00 | -15.45                      | -14.55 |
| 0.974           | 29.61                            | 19.26 | 10.40       | 40.01                          | 29.66 | Line         | 56.00                       | 46.00 | -15.99                      | -16.34 |
| 1.106           | 27.16                            | 16.27 | 10.40       | 37.56                          | 26.67 | Line         | 56.00                       | 46.00 | -18.44                      | -19.33 |
| FCC15           |                                  |       |             |                                |       |              |                             |       |                             |        |

**Note:**

- 1.Uncertainty in conducted emission measured is  $<+/ -2$ dB.
- 2.The emission levels of other frequencies were very low against the limit.
- 3.All Reading Levels are Quasi-Peak and Average value.
- 4.Emission = Meter Reading + Factor; Factor = Insertion Loss + Cable Loss.
- 5.Margin Value= Emission Level - Limit Value.



| FCC15           |                   |       |             |                 |       |              |              |       |              |        |
|-----------------|-------------------|-------|-------------|-----------------|-------|--------------|--------------|-------|--------------|--------|
| Frequency (MHz) | Read Level (dBuV) |       | Factor (dB) | Emission (dBuV) |       | Line/Neutral | Limit (dBuV) |       | Margin(dBuV) |        |
|                 | QP                | AV    |             | QP              | AV    |              | QP           | AV    | QP           | AV     |
| 0.482           | 29.73             | 23.29 | 10.40       | 40.13           | 33.69 | Neutral      | 56.30        | 46.30 | -16.17       | -12.61 |
| 0.878           | 33.89             | 26.43 | 10.40       | 44.29           | 36.83 | Neutral      | 56.00        | 46.00 | -11.71       | -9.17  |
| 0.898           | 33.67             | 24.83 | 10.40       | 44.07           | 35.23 | Neutral      | 56.00        | 46.00 | -11.93       | -10.77 |
| 0.930           | 37.68             | 28.61 | 10.40       | 48.08           | 39.01 | Neutral      | 56.00        | 46.00 | -7.92        | -6.99  |
| 0.946           | 33.80             | 25.33 | 10.40       | 44.20           | 35.73 | Neutral      | 56.00        | 46.00 | -11.80       | -10.27 |
| 1.006           | 33.64             | 23.73 | 10.40       | 44.04           | 34.13 | Neutral      | 56.00        | 46.00 | -11.96       | -11.87 |

## FCC15

## Note:

- 1.Uncertainty in conducted emission measured is <+/ -2dB.
- 2.The emission levels of other frequencies were very low against the limit.
- 3.All Reading Levels are Quasi-Peak and Average value.
- 4.Emission = Meter Reading + Factor; Factor = Insertion Loss + Cable Loss.
- 5.Margin Value= Emission Level - Limit Value.

## 5. Radiated Emission Test

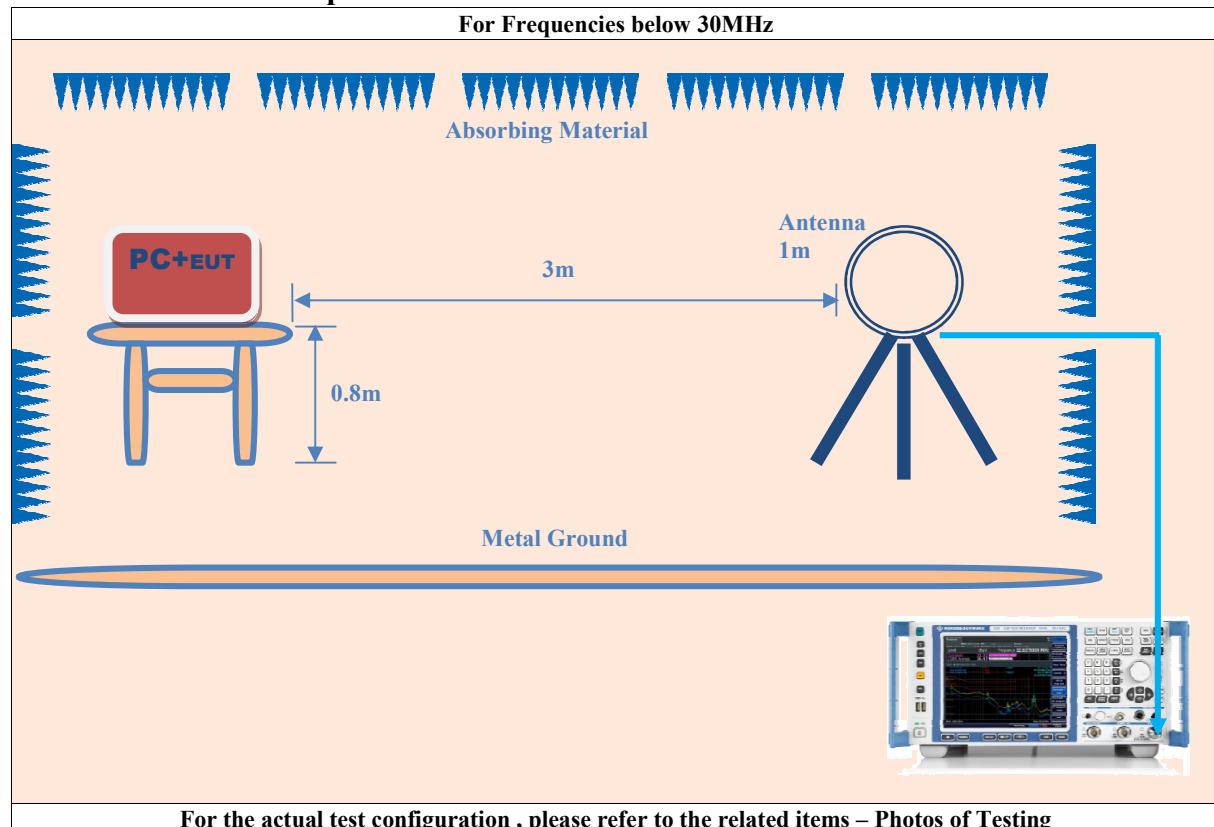
### 5. 1 Test Equipment

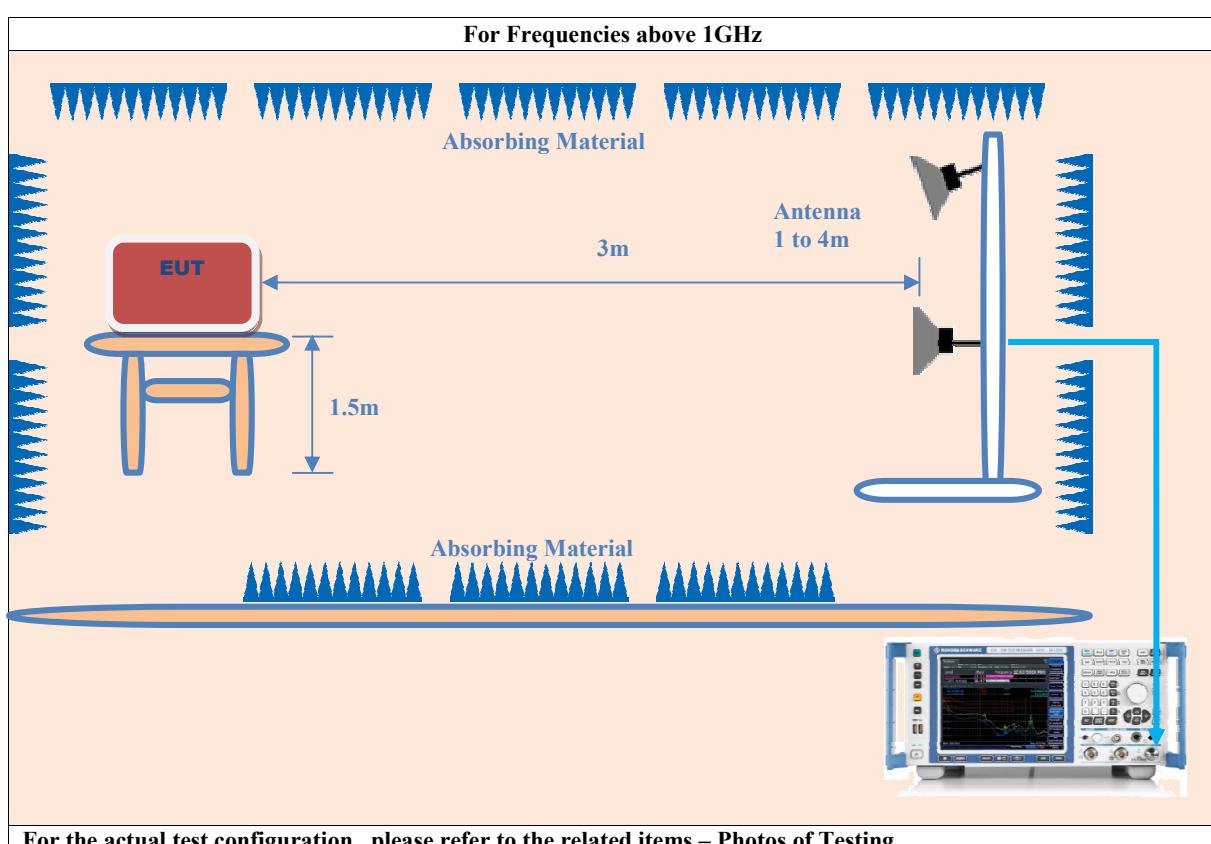
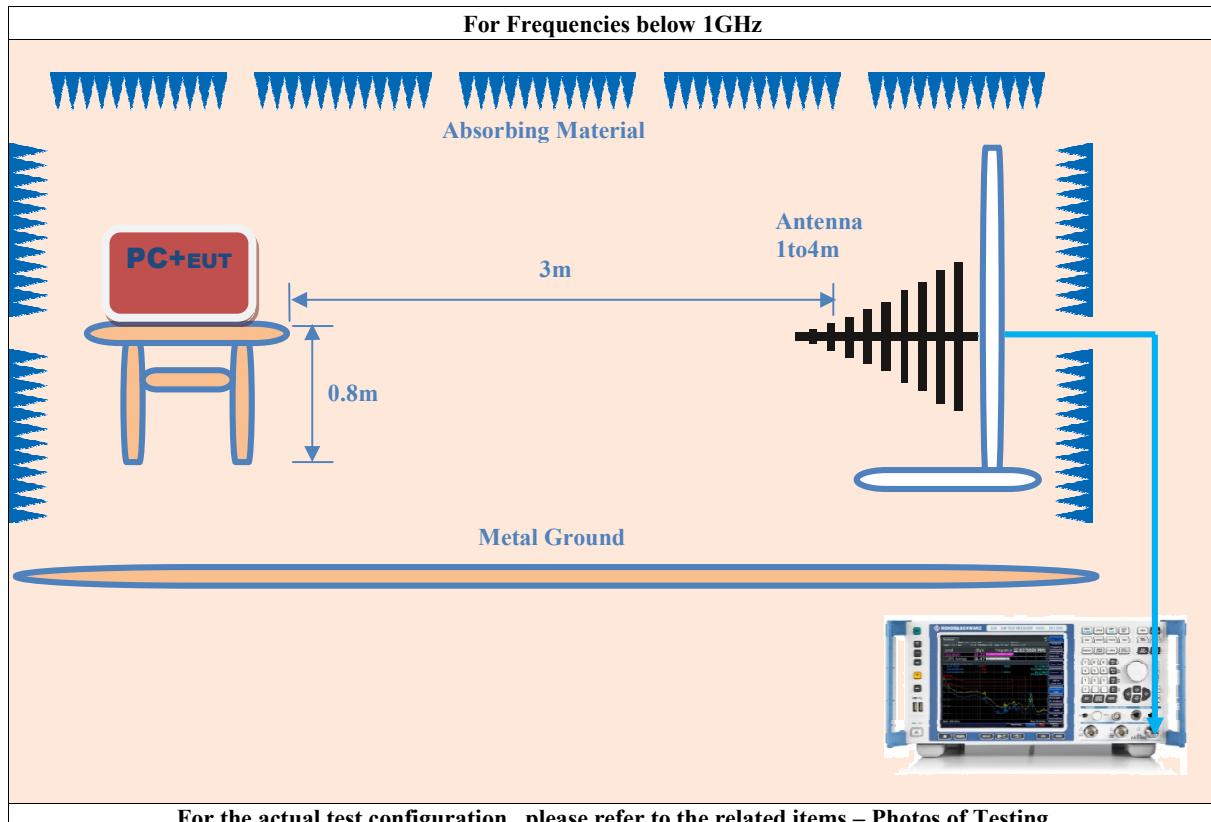
Please refer to Section 8 this report.

### 5. 2 Test Procedure

1. The EUT was tested according to ANSI C63.10:2013.
2. The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8m. All set up is according to ANSI C63.10:2013.
3. The frequency spectrum from 9kHz to 25 GHz was investigated. All readings from 9kHz to 150kHz are quasi-peak values with a resolution bandwidth of 200 Hz. All readings from 150kHz to 30MHz are quasi-peak values with a resolution bandwidth of 9 KHz. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 KHz Measurements were made at 3 meters.( Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz. The frequency bands 9-90 kHz, 110-490 kHz measurements employing an average detector and other below 30MHz measurements employing a CISPR quasi-peak detector. Test distance is 3m.)
4. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. The Receiving antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency. Emissions below 30MHz were measured with a loop antenna while emission above 30MHz were measured using a broadband E-field antenna.
5. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
6. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.10:2013.

### 5. 3 Radiated Test Setup





## 5.4 Configuration of the EUT

Same as section 4.4 of this report

## 5.5 EUT Operating Condition

Same as section 4.5 of this report

## 5.6 Radiated Emission Limit

In any 100 KHz bandwidth outside the operating frequency band, the radio frequency power that is produced by modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either at least 20 dB below that in any 100 KHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified in section 15.209(a), which lesser attenuation.

All other emissions inside restricted bands specified in section 15.205(a) shall not exceed the general radiated emission limits specified in section 15.209(a)

### Note:

Applies to harmonics/spurious emissions that fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

47 CFR §15.237(c): The emission limits as specified above are based on measurement instrument employing an average detector. The provisions in section 15.35 for limiting peak emissions apply.

FCC CFR 47, Part 15, Subpart C, Para, 15.205(a) – Restricted Frequency Bands

| MHz                    | MHz                 | MHz           | GHz         |
|------------------------|---------------------|---------------|-------------|
| 0.090–0.110.....       | 16.42–16.423        | 399.9–410     | 4.5–5.15    |
| 10.495–0.505 .....     | 16.69475–16.69525   | 608–614       | 5.35–5.46   |
| 2.1735–2.1905.....     | 16.80425–16.80475   | 960–1240      | 7.25–7.75   |
| 4.125–4.128.....       | 25.5–25.67          | 1300–1427     | 8.025–8.5   |
| 4.17725–4.17775.....   | 37.5–38.25          | 1435–1626.5   | 9.0–9.2     |
| 4.20725–4.20775.....   | 73–74.6             | 1645.5–1646.5 | 9.3–9.5     |
| 6.215–6.218.....       | 74.8–75.2           | 1660–1710     | 10.6–12.7   |
| 6.26775–6.26825.....   | 108–121.94          | 1718.8–1722.2 | 13.25–13.4  |
| 6.31175–6.31225.....   | 123–138             | 2200–2300     | 14.47–14.5  |
| 8.291–8.294.....       | 149.9–150.05        | 2310–2390     | 15.35–16.2  |
| 8.362–8.366.....       | 156.52475–156.52525 | 2483.5–2500   | 17.7–21.4   |
| 8.37625–8.38675.....   | 156.7–156.9         | 2690–2900     | 22.01–23.12 |
| 8.41425–8.41475.....   | 162.0125–167.17     | 3260–3267     | 23.6–24.0   |
| 12.29–12.293.....      | 167.72–173.2        | 332–3339      | 31.2–31.8   |
| 12.51975–12.52025..... | 240–285             | 3345.8–3358   | 36.43–36.5  |
| 12.57675–12.57725..... | 322–335.4           | 3600–4400     | (?)         |
| 13.36–13.41.....       |                     |               |             |

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490–0.510 MHz.

<sup>2</sup>Above 38.6

FCC 47 CFR, Part 15.209(a) – Field Strength Limits within Restricted Frequency Bands

| Frequency(MHz)   | Field strength<br>(microvolts/meter) | Measure-<br>mentdis-<br>tance<br>(meters) |
|------------------|--------------------------------------|---|
| 0.009–0.490..... | 2400/F(kHz)                          | 300                                       |
| 0.490–1.705..... | 24000/F(kHz)                         | 30  |
| 1.705–30.0.....  | 30                                   | 30  |
| 30–88.....       | 100**                                | 3   |
| 88–216.....      | 150**                                | 3   |
| 216–960.....     | 200**                                | 3   |
| Above 960.....   | 500                                  | 3   |

## 5. 7 Radiated Emission Test Result

### Tx Radiated Emissions (Below 30MHz) 125 kHz

| Frequency (MHz) | Read Level (dBuV) | Factor (dB) | Emission (dBuV/m) | Face/ Side | Limit QP (dBuV/m) | Margin QP (dB) |
|-----------------|-------------------|-------------|-------------------|------------|-------------------|----------------|
| 0.125           | 53.28             | 8.90        | 62.18             | Side       | 105.66            | -43.48         |
| 0.125           | 49.18             | 8.90        | 58.08             | Face       | 105.66            | -47.58         |
| -               |                   |             |                   |            |                   |                |
| -               |                   |             |                   |            |                   |                |
| -               |                   |             |                   |            |                   |                |
| -               |                   |             |                   |            |                   |                |

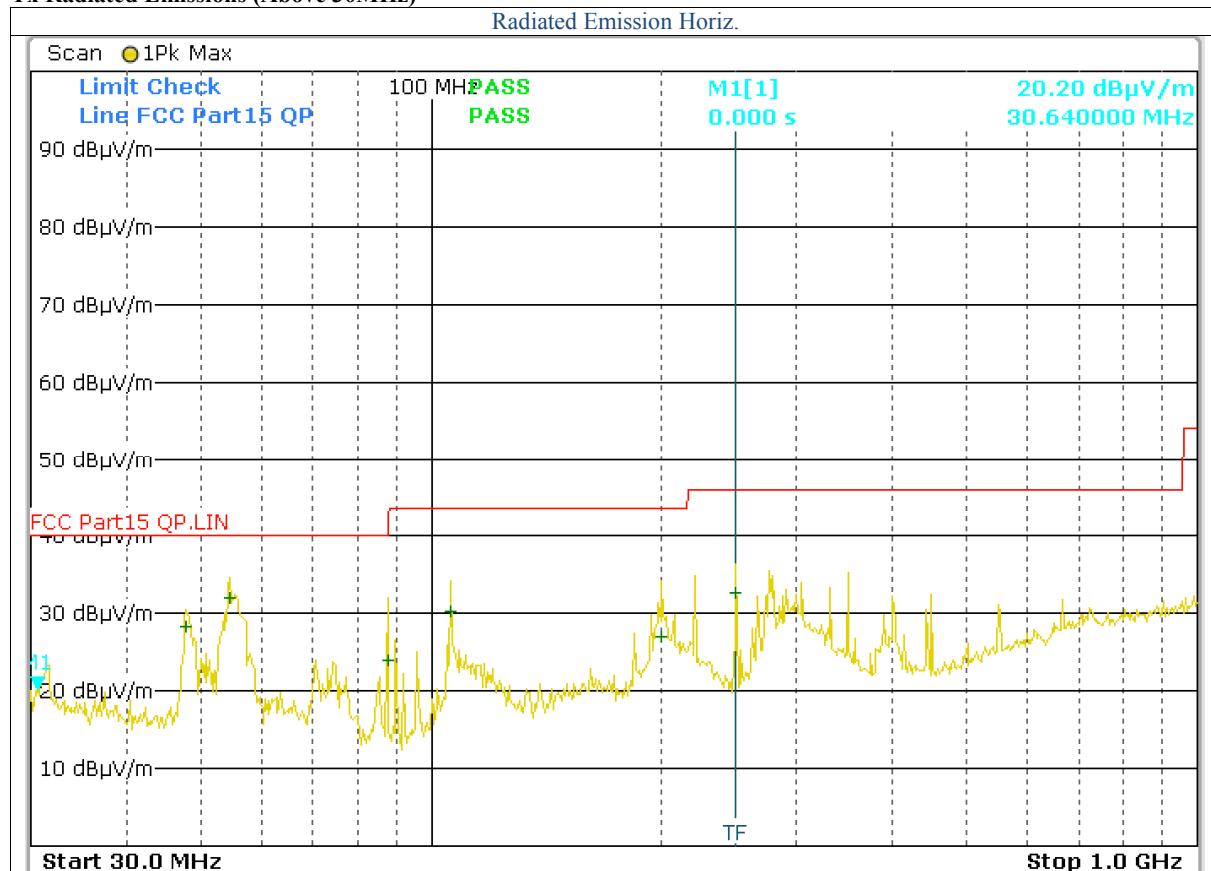
### Tx Radiated Emissions (Below 30MHz)

| Frequency (MHz) | Read Level (dBuV) | Factor (dB) | Emission (dBuV/m) | Horiz./ Vert. | Limit (dBuV/m) | Margin (dB) |
|-----------------|-------------------|-------------|-------------------|---------------|----------------|-------------|
| 3.750           | 33.45             | 8.70        | 42.15             | Side          | 69.50          | -27.35      |
| 12.536          | 34.52             | 9.10        | 43.62             | Side          | 69.50          | -25.88      |
| 3.756           | 31.48             | 8.70        | 40.18             | Face          | 69.50          | -29.32      |
| 12.536          | 32.29             | 9.10        | 41.39             | Face          | 69.50          | -28.11      |
| -               |                   |             |                   |               |                |             |
| -               |                   |             |                   |               |                |             |

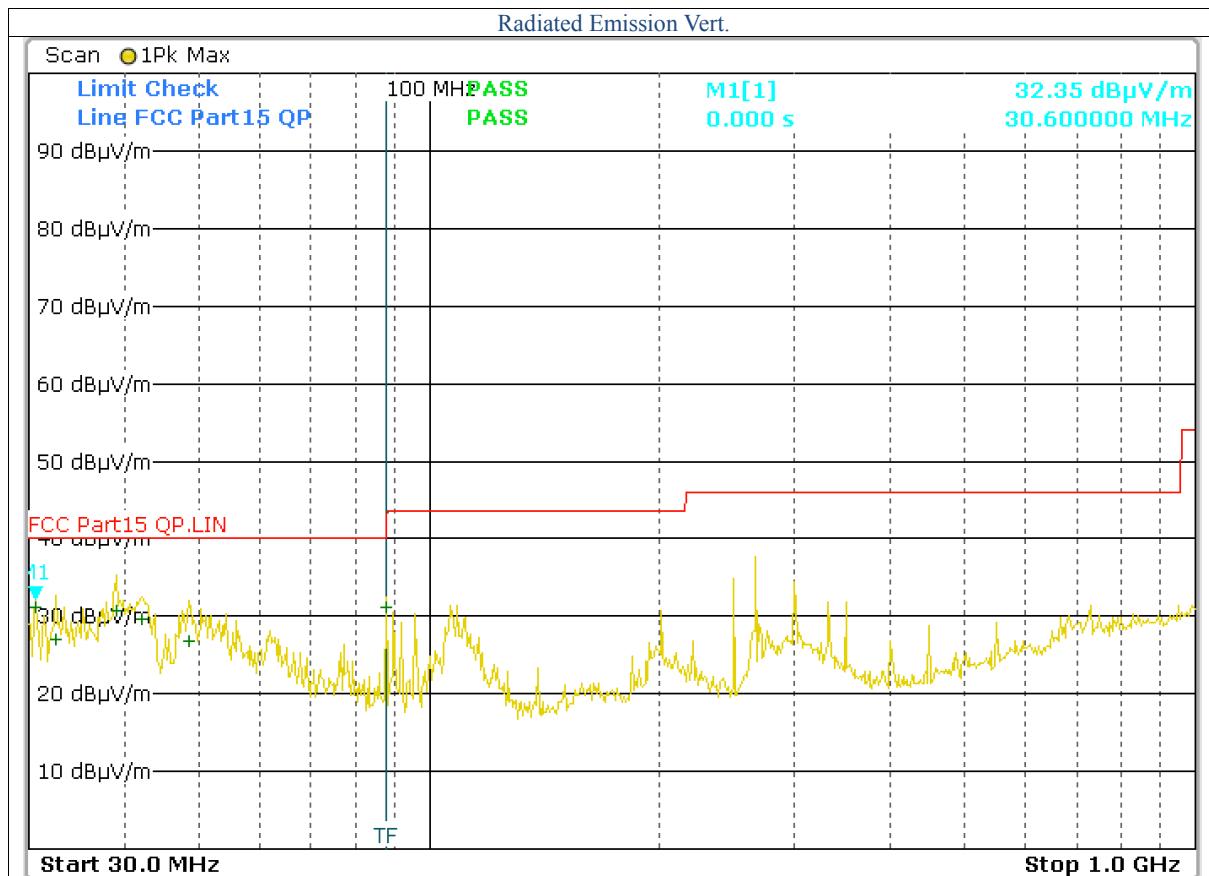
**Note:**

- (1) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
- (2) "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- (3) Emission Level = Reading Level + Probe Factor + Cable Loss.

## Tx Radiated Emissions (Above 30MHz)



| Frequency (MHz) | Read Level (dB $\mu$ V) | Factor (dB) | Emission (dB $\mu$ V/m) | Horiz./Vert. | Limit (dB $\mu$ V/m) | Margin (dB) |
|-----------------|-------------------------|-------------|-------------------------|--------------|----------------------|-------------|
| 47.920          | 17.22                   | 11.09       | 28.31                   | Horiz./      | 40.0                 | -11.69      |
| 54.600          | 21.30                   | 10.66       | 31.96                   | Horiz./      | 40.0                 | -8.04       |
| 87.900          | 16.58                   | 7.43        | 24.01                   | Horiz./      | 40.0                 | -15.99      |
| 106.200         | 21.56                   | 8.67        | 30.23                   | Horiz./      | 43.5                 | -13.27      |
| 199.960         | 13.12                   | 13.87       | 26.99                   | Horiz./      | 43.5                 | -16.51      |
| 250.040         | 17.68                   | 14.94       | 32.62                   | Horiz./      | 46.0                 | -13.38      |



| Frequency (MHz) | Read Level (dB $\mu$ V) | Factor (dB) | Emission (dB $\mu$ V/m) | Horiz./Vert. | Limit (dB $\mu$ V/m) | Margin (dB) |
|-----------------|-------------------------|-------------|-------------------------|--------------|----------------------|-------------|
| 30.600          | 19.12                   | 12.06       | 31.18                   | Vert.        | 40.0                 | -8.82       |
| 32.560          | 14.96                   | 12.06       | 27.02                   | Vert.        | 40.0                 | -12.98      |
| 39.000          | 19.00                   | 11.78       | 30.78                   | Vert.        | 40.0                 | -9.22       |
| 42.080          | 18.18                   | 11.54       | 29.72                   | Vert.        | 40.0                 | -10.28      |
| 48.520          | 15.69                   | 11.09       | 26.78                   | Vert.        | 40.0                 | -13.22      |
| 87.800          | 23.64                   | 7.43        | 31.07                   | Vert.        | 40.0                 | -8.93       |

**Note:**

- (1) All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
- (2) "N/A" remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
- (3) Emission Level = Reading Level + Probe Factor + Cable Loss.

## 6. Band Edge

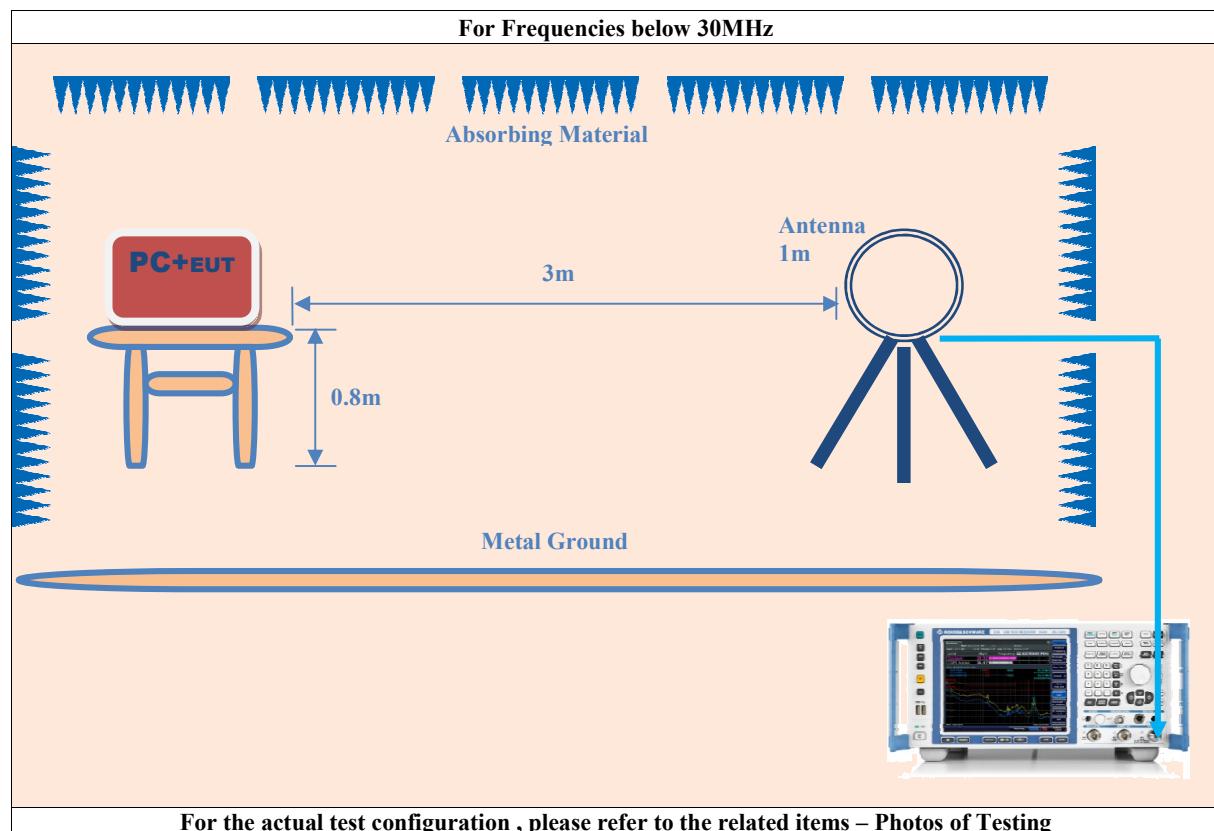
### 6. 1 Test Equipment

Please refer to Section 9 this report.

### 6. 2 Test Procedure

1. The EUT was tested according to ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.
2. For radiated measurement. Loop antenna was rotated about the horizontal and vertical axis and the equipment to be measured and the test antenna shall be oriented to obtain the maximum emitted field strength level

### 6. 3 Radiated Test Setup



## 6. 4 Configuration of the EUT

Same as section 4 . 4 of this report

## 6. 5 EUT Operating Condition

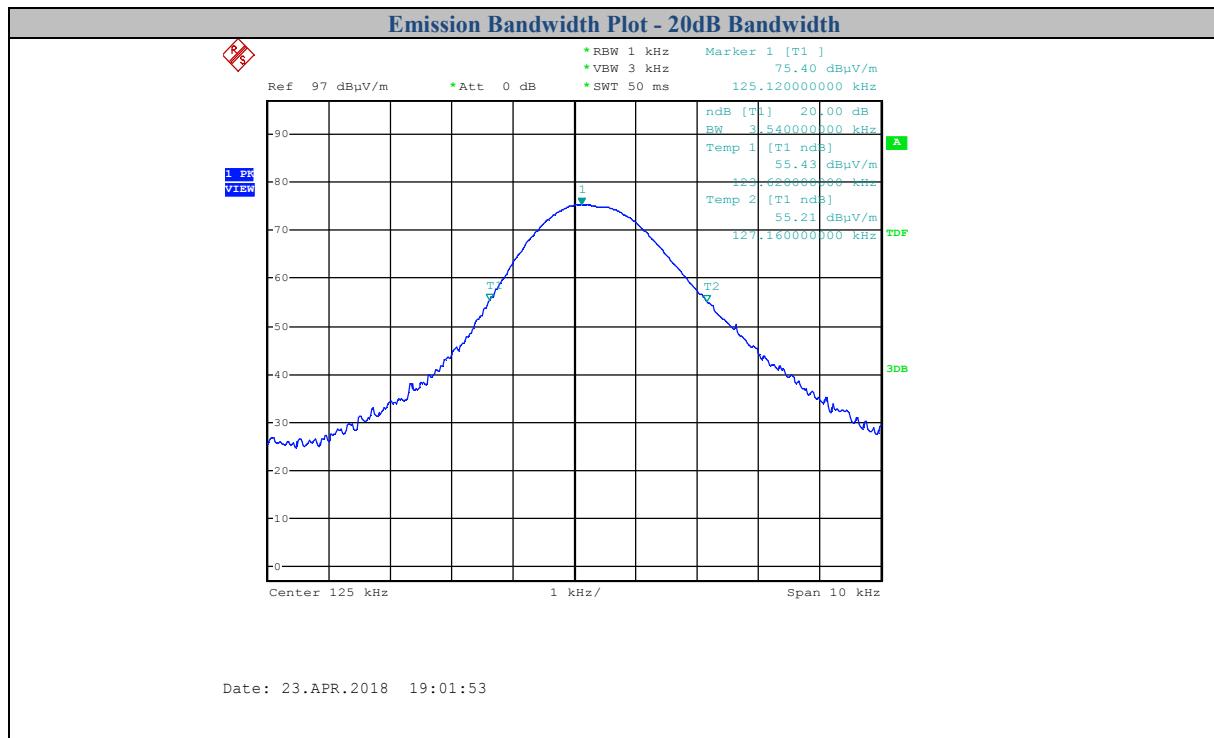
Same as section 4.5 of this report.

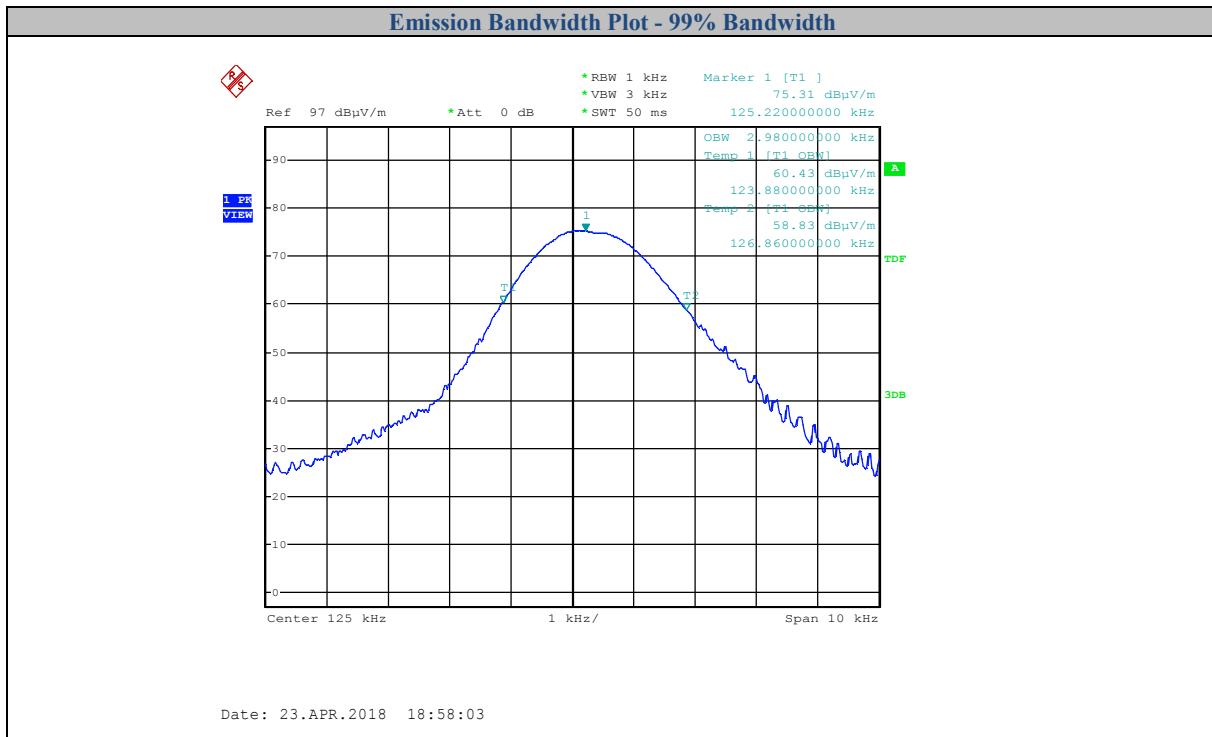
## 6. 6 Band Edge FCC 15.215(c) Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.217 through §15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the 20 dB bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

## 6. 7 Band Edge Test Result

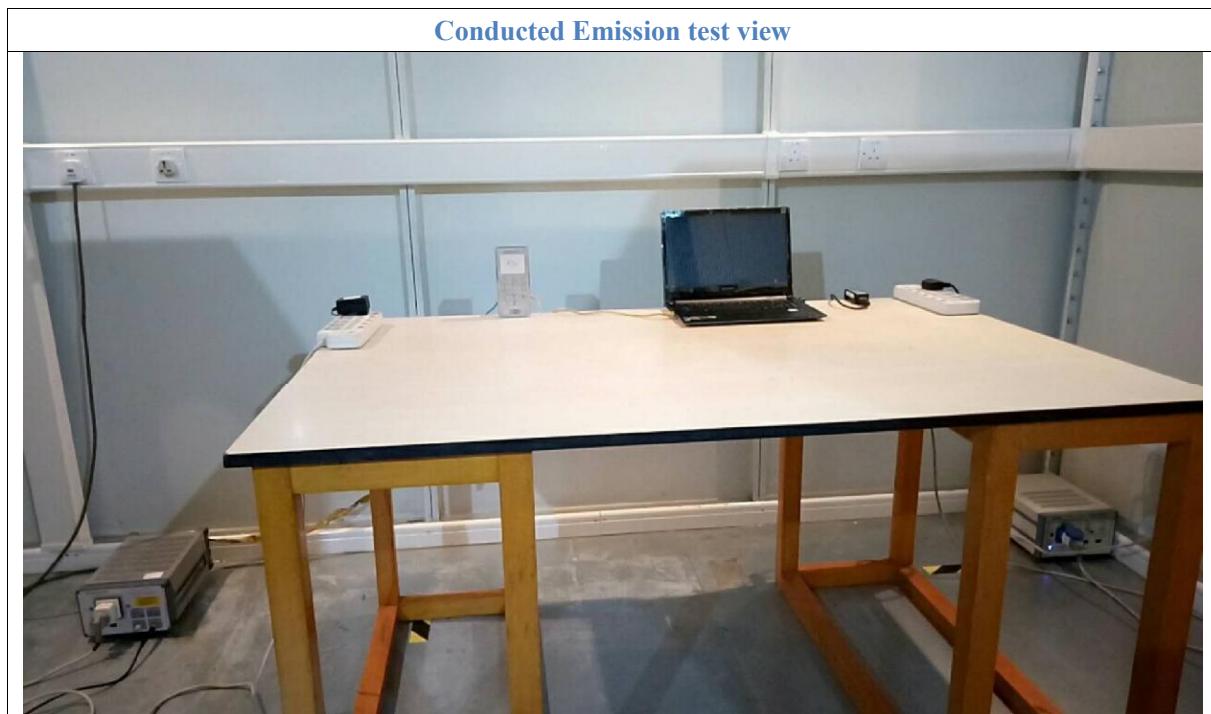
| Occupied Channel Bandwidth |                      |                     |
|----------------------------|----------------------|---------------------|
| Frequency (kHz)            | 20dB Bandwidth (kHz) | 99% Bandwidth (kHz) |
| 125                        | 3.52                 | 3.06                |
| Limit:                     |                      | N/A                 |
| Results:                   |                      | PASS                |





## 7. Photo of Testing

### 7.1 Emission test view



**Radiated Emission test view (Below 30MHz)**



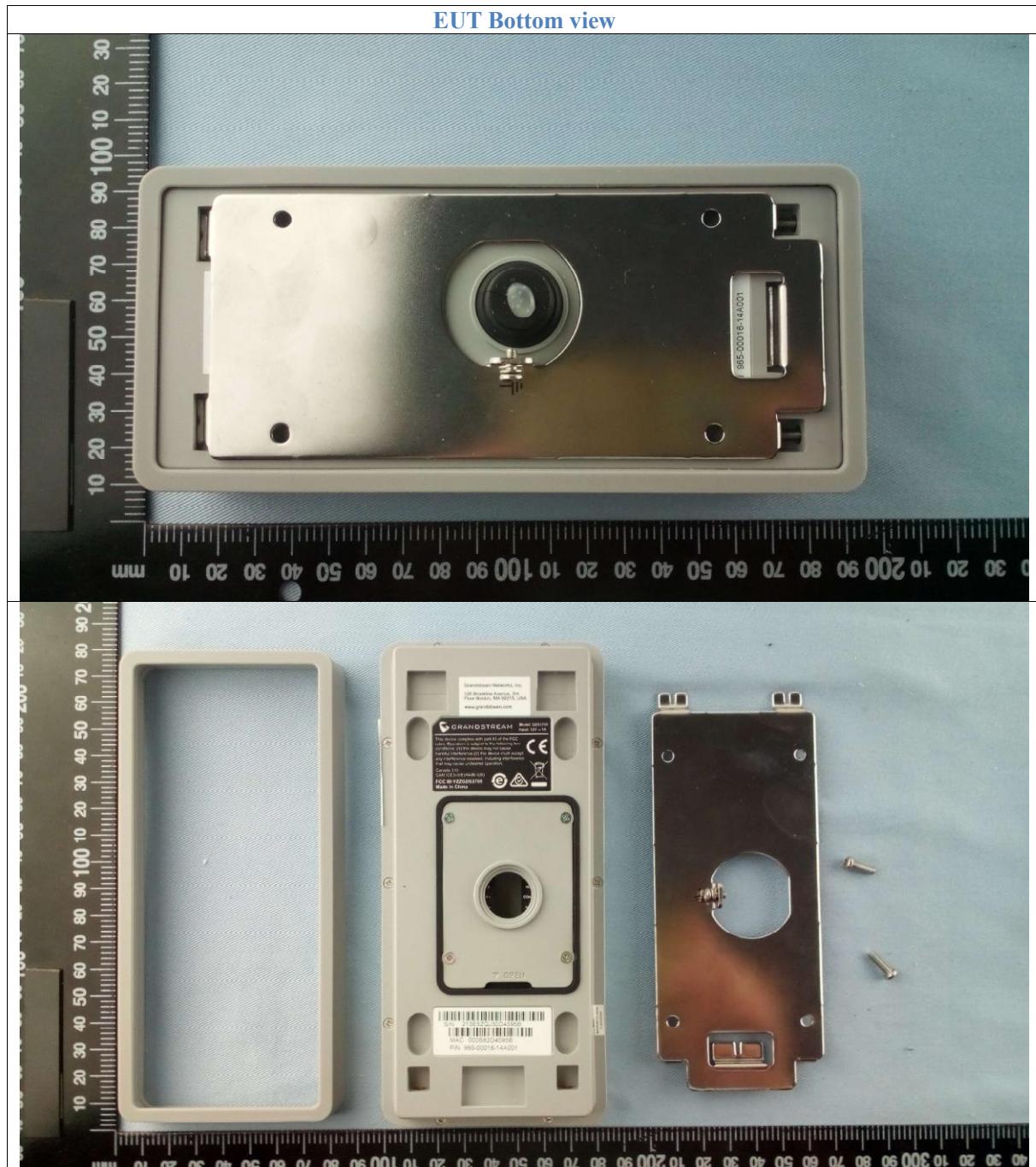
**Radiated Emission test view (Above 30MHz)**



## 7.2 Photograph - EUT

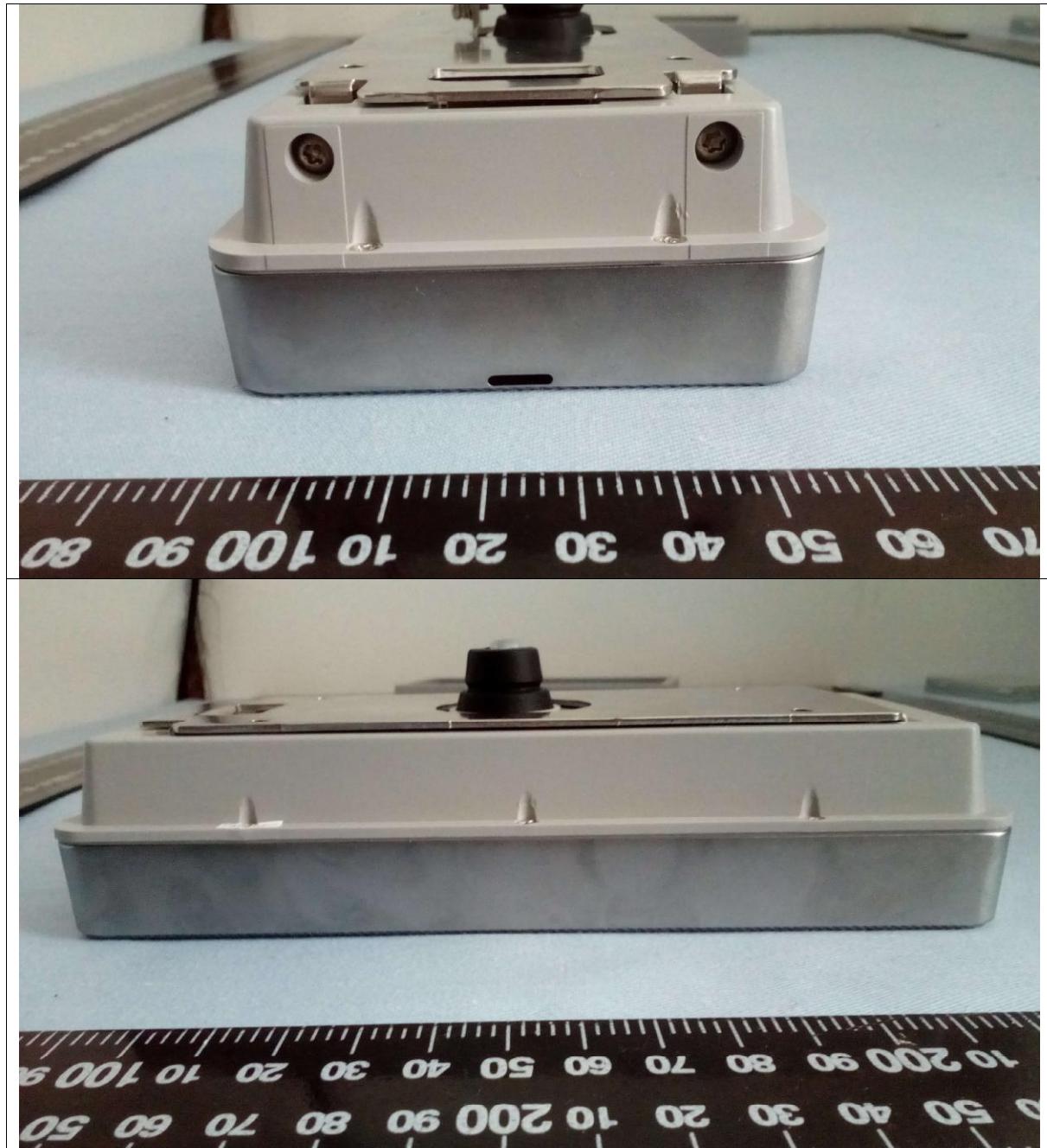


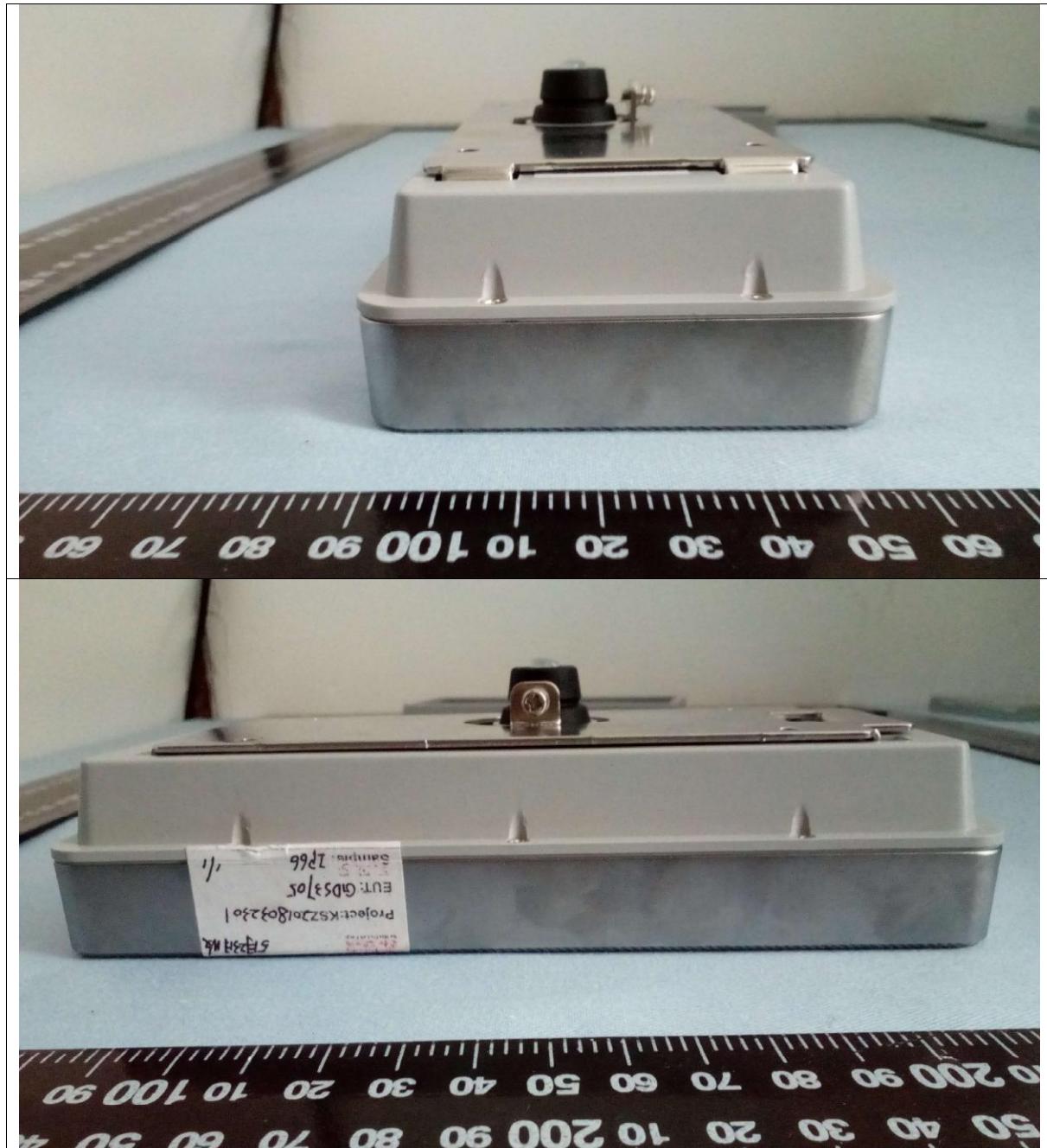


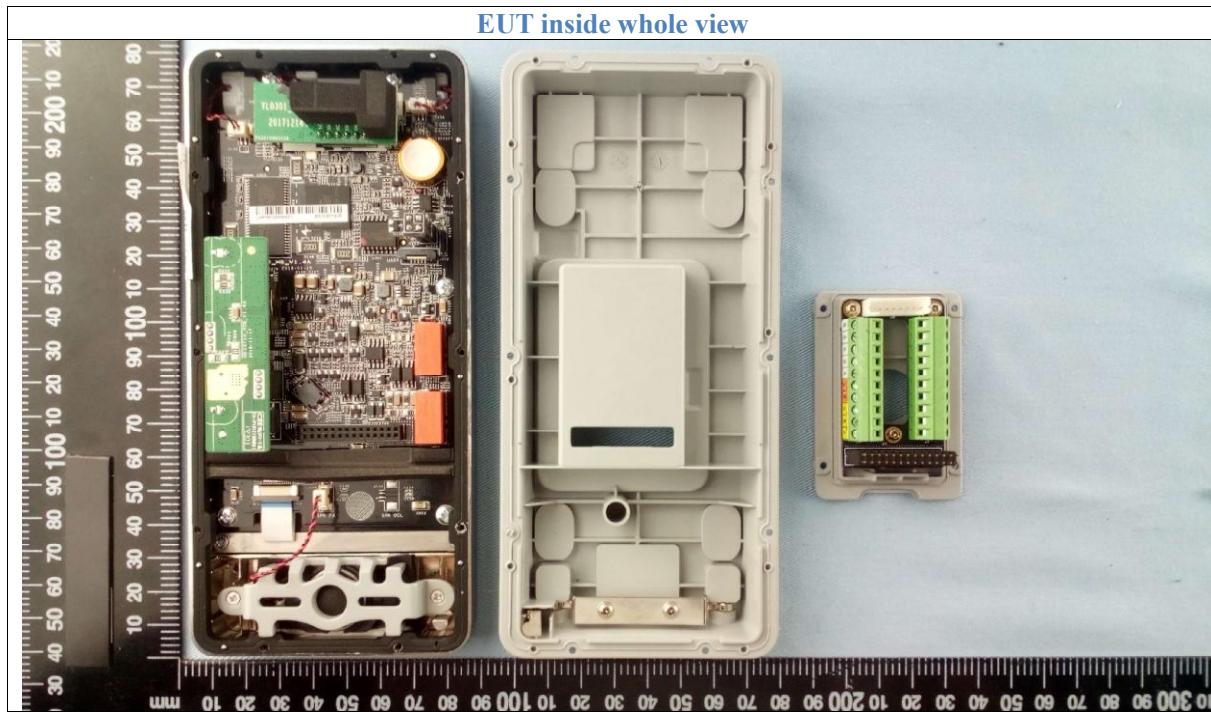




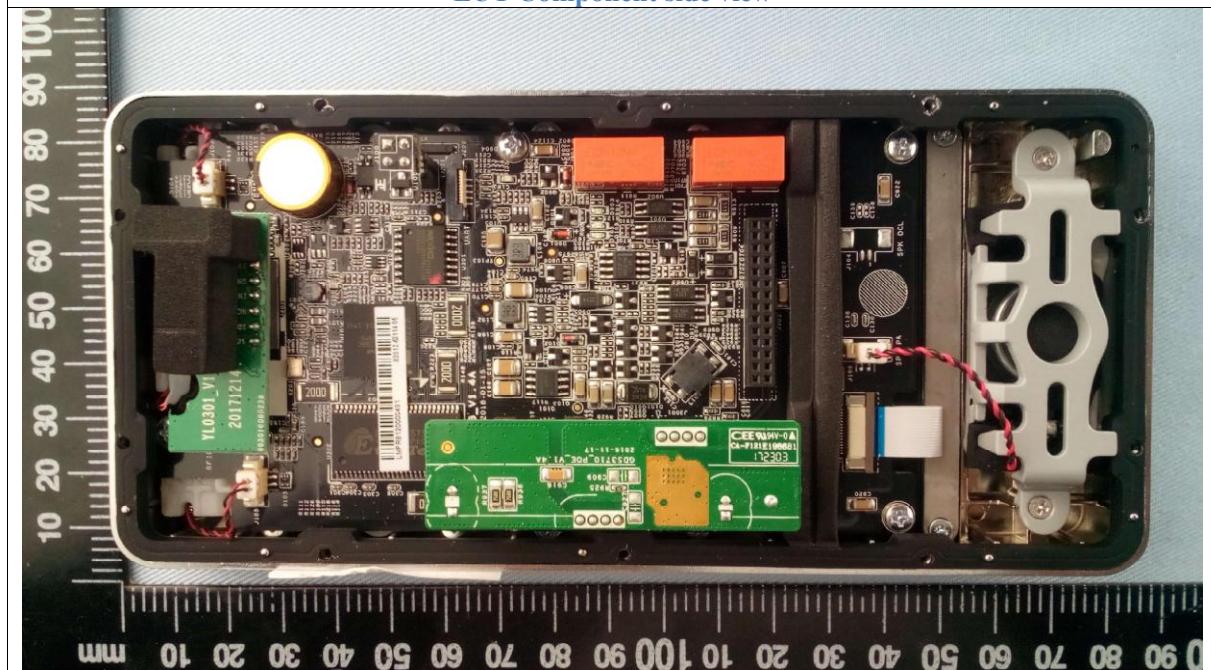


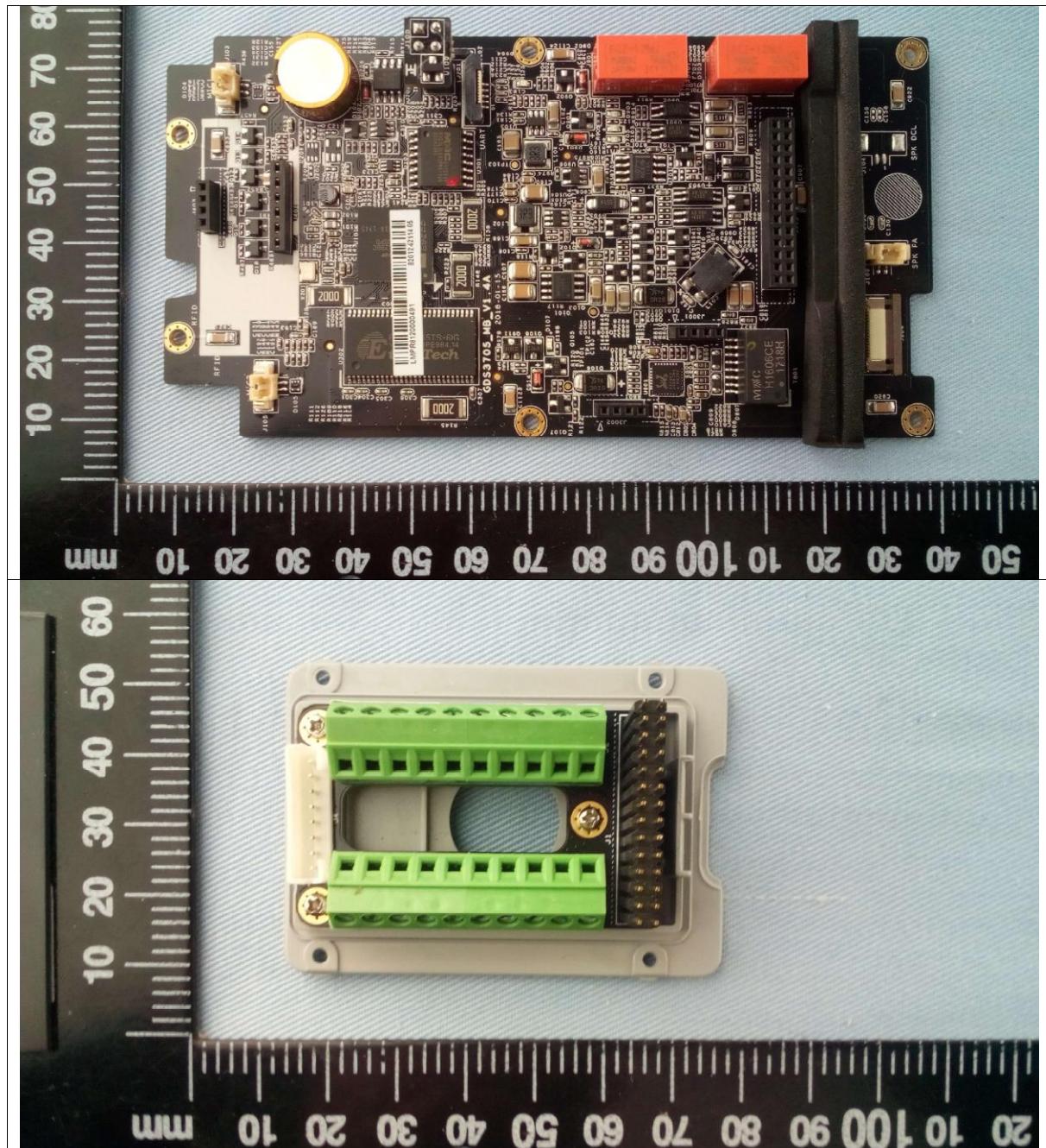


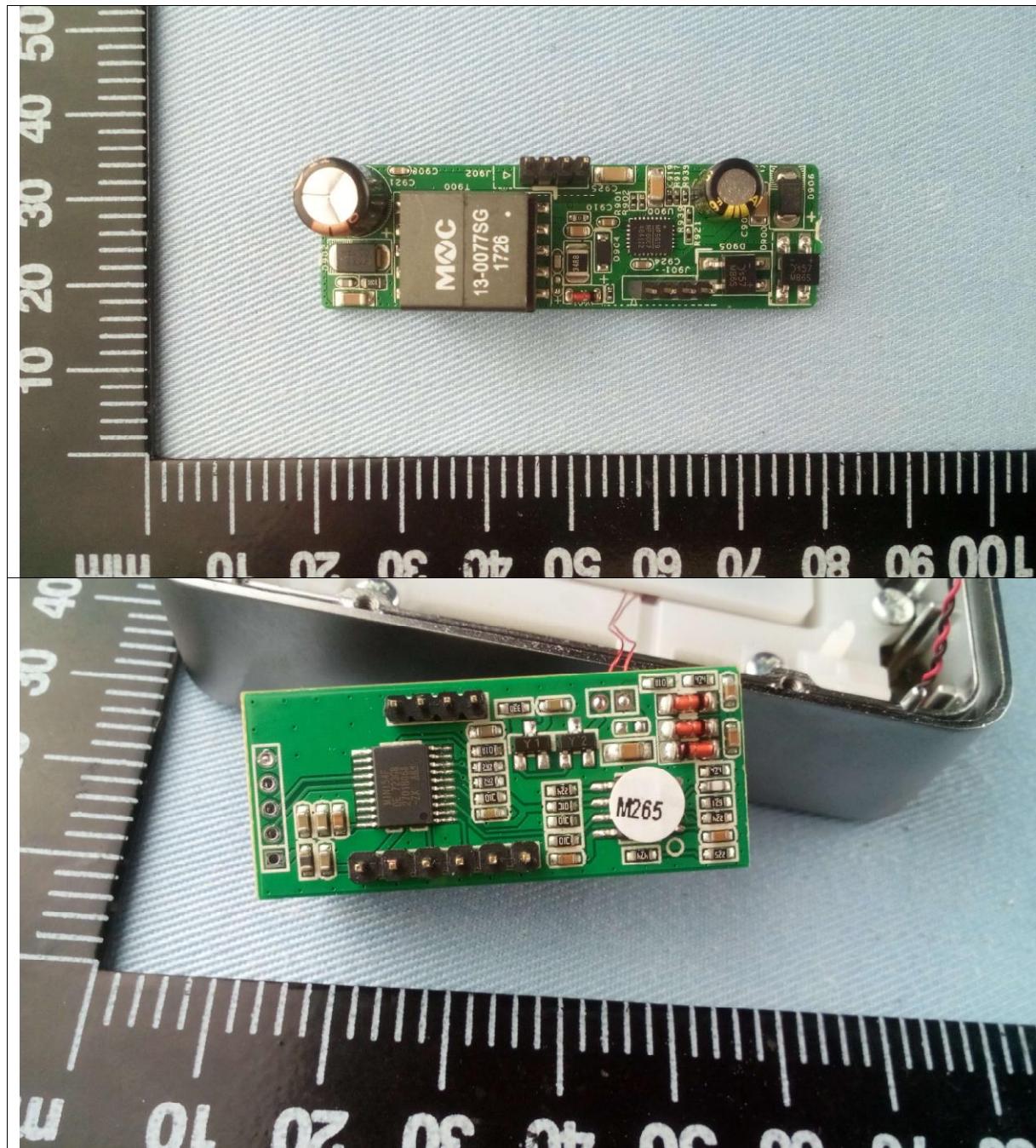


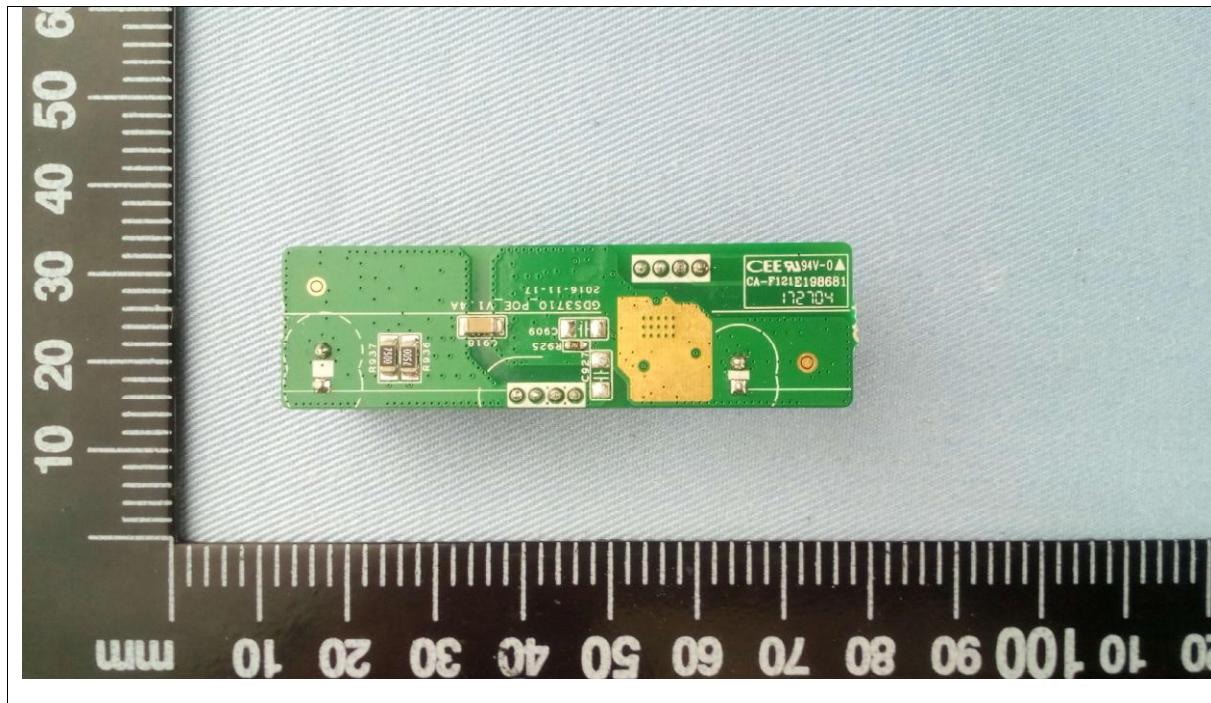
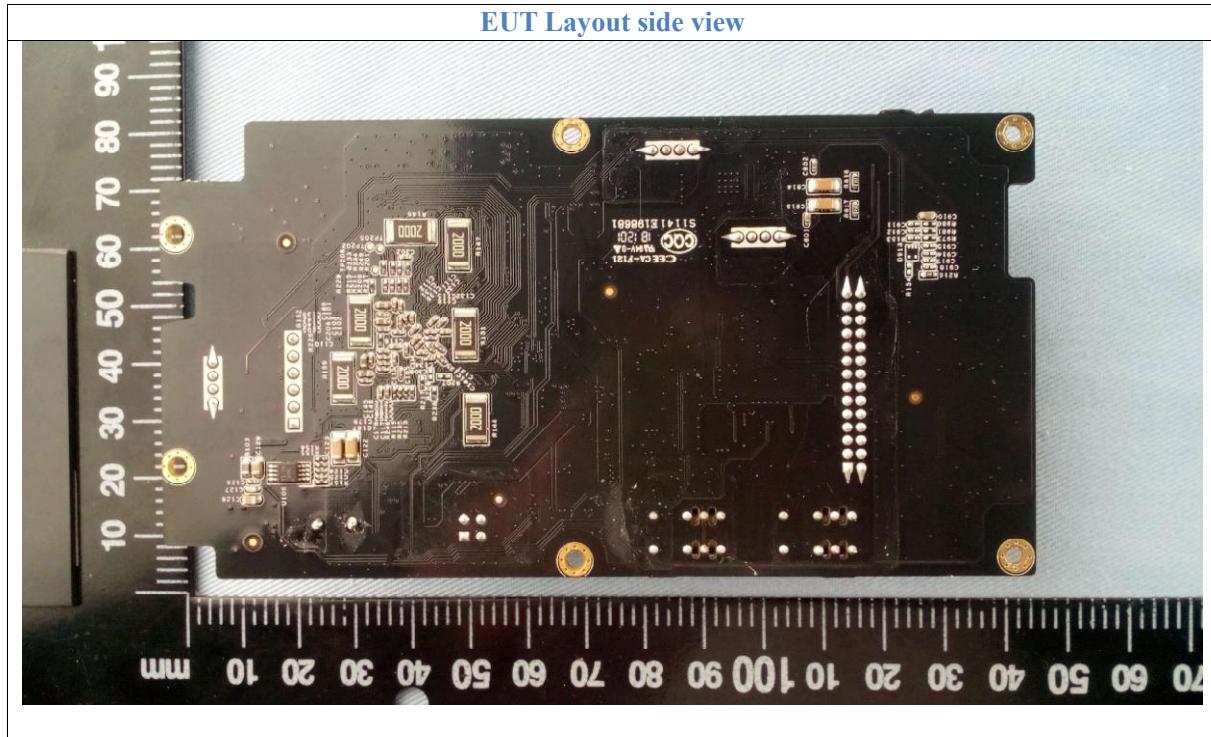


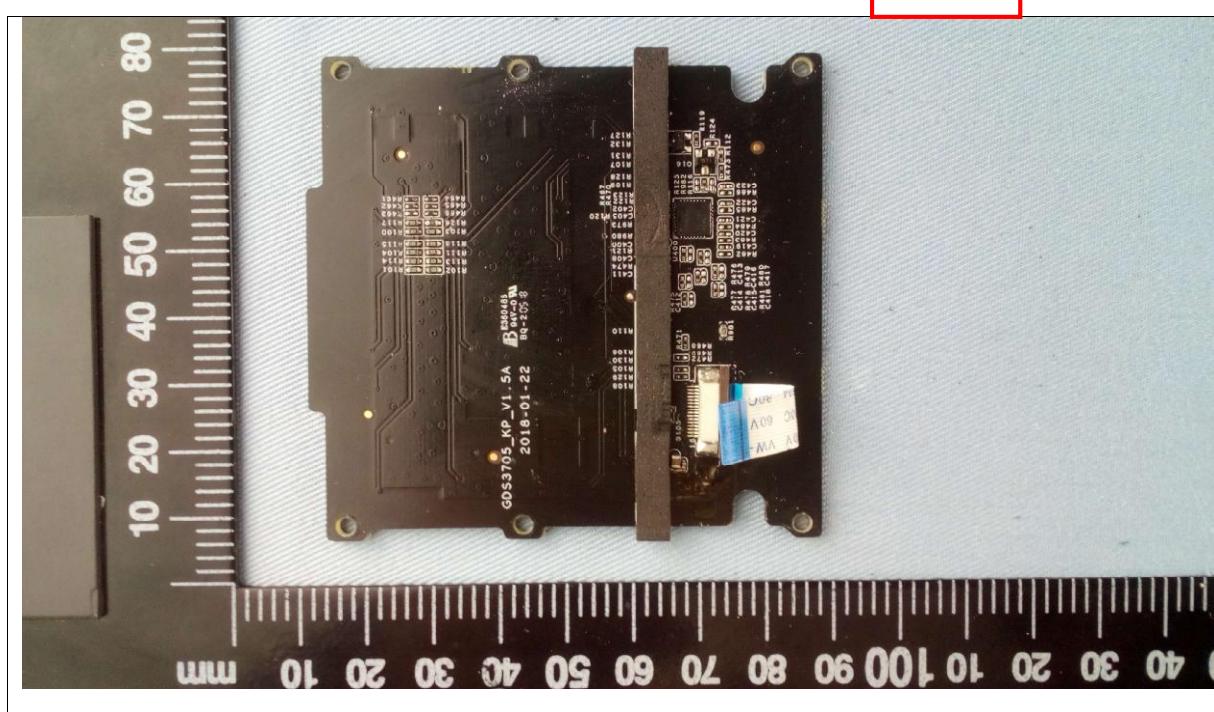
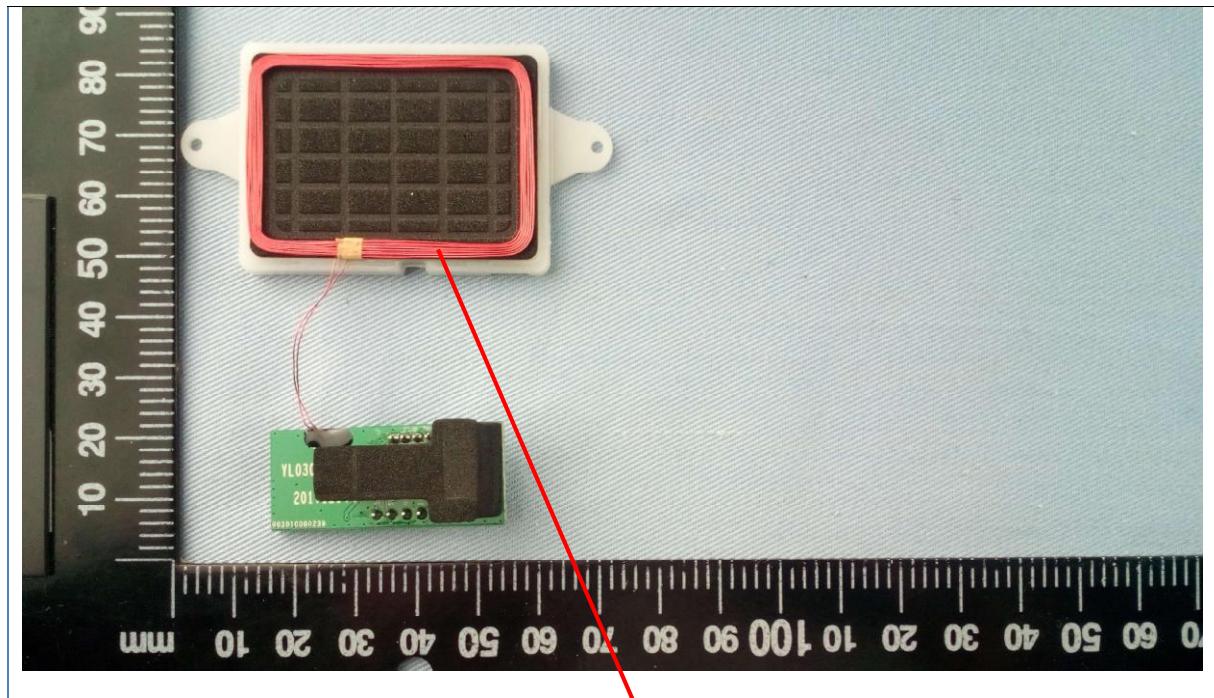
## EUT Component side view

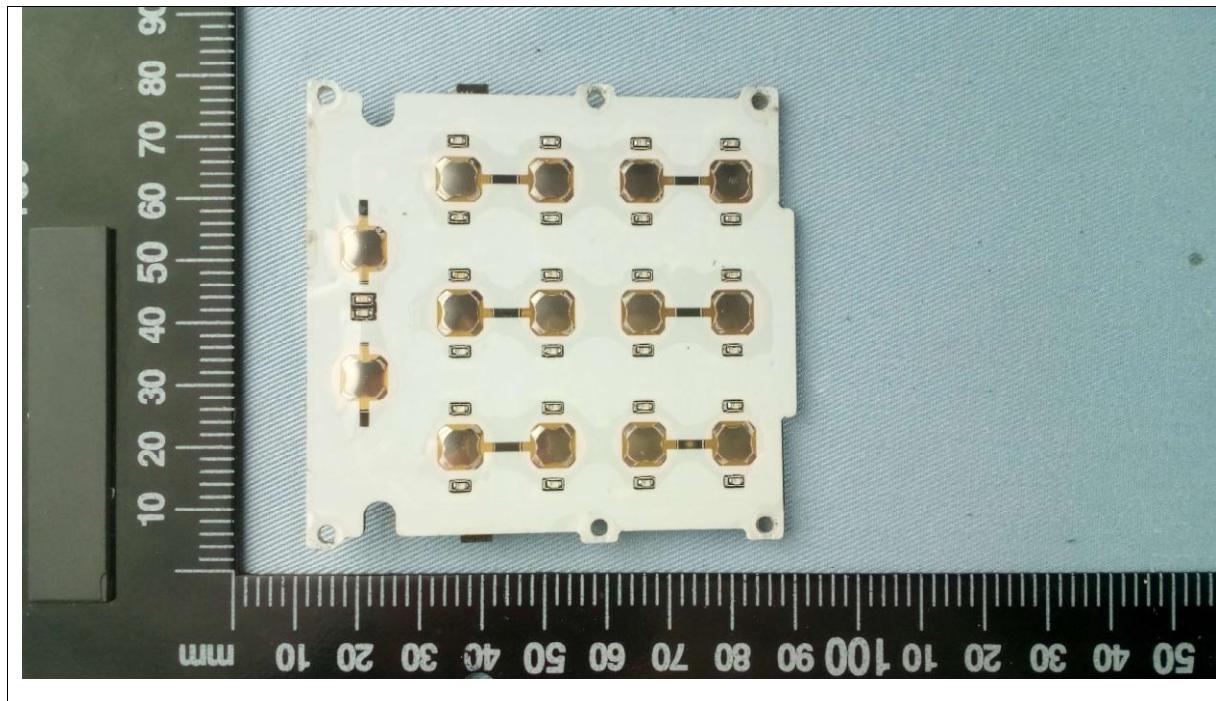












## 8. FCC ID Label



The following note shall be conspicuously placed in the user manual: **“Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of this device.”**

The Label must not be a stick-on paper label. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.



## 9. Test Equipment

The following test equipments were used during the radiated & conducted emission test:

| Equipment/<br>Facilities | Manufacturer       | Model #       | Serial No.    | Cal/Char Date | Due Date     |
|--------------------------|--------------------|---------------|---------------|---------------|--------------|
| Turntable                | Innco systems GmbH | CT-0801       | N/A           | NCR           | NCR          |
| Antenna Tower            | Innco systems GmbH | MA-4640-XP-ET | N/A           | NCR           | NCR          |
| Controller               | Innco systems GmbH | CO3000        | 955/38850716L | NCR           | NCR          |
| EMI Test Receiver        | Rohde & Schwarz    | ESR7          | 101091        | Dec.6, 2016   | Dec.6, 2018  |
| Spectrum Analyzer        | Rohde & Schwarz    | FSP40         | 100273        | Dec.14, 2017  | Dec.14, 2019 |
| Loop Antenna             | Rohde & Schwarz    | HFH2-Z2       | 100022        | Feb.21, 2018  | Feb.21, 2020 |
| AMN                      | Rohde & Schwarz    | ESH3-Z5       | 100197        | Dec.25, 2017  | Dec.25, 2019 |
| AMN                      | CYBERTEK           | EM5040A       | E115040054    | Sep.6, 2016   | Sep.6, 2018  |
| KMO Shielded Room        | KMO                | KMO-001       | N/A           | NCR           | NCR          |
| 3m Anechoic Chamber      | KMO                | KMO-3AC       | N/A           | Dec.23, 2017  | Dec.23, 2019 |