



## STC Test Report

**Date :** 2016-05-06

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**No. :** HM170231

**Applicant:** Gatekeeper System (HK) Ltd.  
Unit 2305, Level 23, Tower 2, Metroplaza, No. 223 Hing Fong Road, Kwai Fong, N.T., Hong Kong

**Manufacturer:** Gatekeeper System (HK) Ltd.  
Unit 2305, Level 23, Tower 2, Metroplaza, No. 223 Hing Fong Road, Kwai Fong, N.T., Hong Kong

**Description of Sample(s):** Product: Remote Controlled Locking Wheel  
Brand Name: Gatekeeper Systems  
Model Number: W-9470A  
FCC ID: W3Z-W9470A

**Date Sample(s) Received:** 2016-04-12

**Date Tested:** 2016-04-25

**Investigation Requested:** Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2014 and ANSI C63.10:2013 for FCC Certification.

**Conclusion(s):** The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

**Remark(s):** ---

  
\_\_\_\_\_  
CHEUNG Chi, Kenneth  
Authorized Signatory  
ElectroMagnetic Compatibility Department  
For and on behalf of  
The Hong Kong Standards and Testing Centre Ltd.



The Hong Kong Standards and Testing Centre Limited

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### **1.0 General Details**

#### **1.1 Equipment Under Test [EUT]**

##### **Description of Sample(s)**

Product: Remote Controlled Locking Wheel  
Manufacturer: Gatekeeper System (HK) Ltd.  
Unit 2305, Level 23, Tower 2, Metroplaza, No. 223 Hing Fong Road,  
Kwai Fong, N.T., Hong Kong  
Brand Name: Gatekeeper Systems  
Model Number: W-9470A  
Rating: 3Vd.c. ("CR17450" Lithium Battery x 1)

#### **1.2 Description of EUT Operation**

The Equipment Under Test (EUT) is a Remote Controlled Locking Wheel of Gatekeeper System (HK) Ltd., it consist with two 2.4GHz transceivers.  
The W-9470A has two modes which affect the characteristics of its RF emissions operational mode and program download mode. Operational mode transmissions are modulated at 20kbps FSK (Frequency Shift Keying), with a deviation of 19 kHz (Carson's rule bandwidth about 80 kHz). Program download mode transmissions are modulated with 500 kbps MSK (Minimum Shift Keying)

#### **1.3 Date of Order**

2016-04-12

#### **1.4 Submitted Sample(s):**

3 Sample(s)

#### **1.5 Test Duration**

2016-04-25

#### **1.6 Country of Origin**

China

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### **2.0 Technical Details**

#### **2.1 Investigations Requested**

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2015 Regulations and ANSI C63.10:2013 for FCC Certification.

#### **2.2 Test Standards and Results Summary Tables**

| <b>EMISSION<br/>Results Summary</b>                       |                  |                  |                     |                                     |                          |
|---|------------------|------------------|---------------------|-------------------------------------|--------------------------|
| Test Condition  | Test Requirement | Test Method      | Class /<br>Severity | Test Result                         |                          |
|   |                  |                  |                     | Pass                                | Fail                     |
| Field Strength of<br>Fundamental &<br>Harmonics Emissions | FCC 47CFR 15.249 | ANSI C63.10:2013 | N/A                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Radiated Emissions  | FCC 47CFR 15.209 | ANSI C63.10:2013 | N/A                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Note: N/A - Not Applicable

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### **3.0 Test Results**

#### **3.1 Emission**

##### **3.1.1 Field Strength of Fundamental & Harmonics Emissions**

|                    |                  |
|--------------------|------------------|
| Test Requirement:  | FCC 47CFR 15.249 |
| Test Method:       | ANSI C63.10:2013 |
| Test Date:         | 2016-04-25       |
| Mode of Operation: | On Mode          |

#### **Test Method:**

The sample was placed 0.8m above the ground plane on a standard radiated emission test site. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. In the frequency range of 9kHz to 30MHz, The center of the loop antenna shall be 1 meter above the ground and rotated loop axis for maximum reading. The emissions worst-case are shown in Test Results of the following pages.

Remark: 3 orthogonal axis apply to hand-held device only.

\*: Semi-anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

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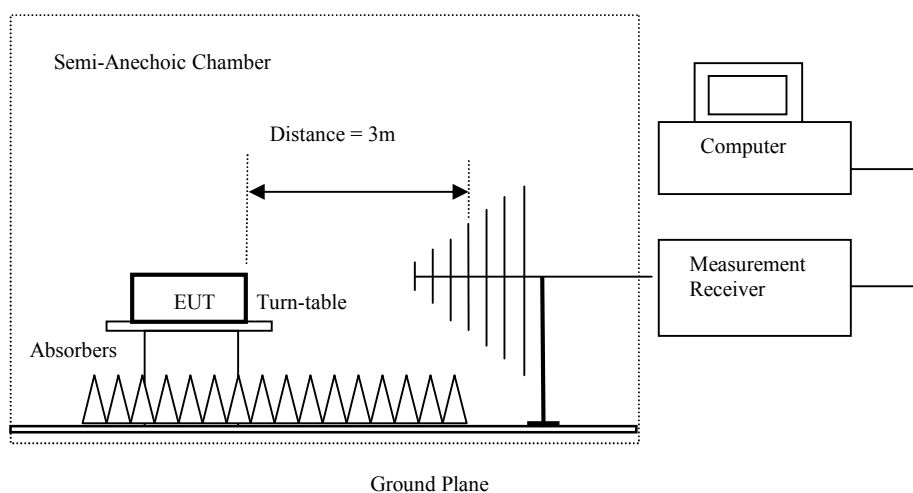
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### Spectrum Analyzer Setting:

|                        |  |
|------------------------|--|
| 9KHz – 30MHz (Pk & Av) | RBW: 10kHz                                       |
|                        | VBW: 30kHz                                       |
|                        | Sweep: Auto                                      |
|                        | Span: Fully capture the emissions being measured |
|                        | Trace: Max. hold                                 |
| 30MHz – 1GHz (QP)      | RBW: 120kHz                                      |
|                        | VBW: 120kHz                                      |
|                        | Sweep: Auto                                      |
|                        | Span: Fully capture the emissions being measured |
|                        | Trace: Max. hold                                 |
| Above 1GHz (Pk & Av)   | RBW: 3MHz  |
|                        | VBW: 3MHz  |
|                        | Sweep: Auto                                      |
|                        | Span: Fully capture the emissions being measured |
|                        | Trace: Max. hold                                 |

### Test Setup:



Absorbers placed on top of the ground plane are for measurements above 1000MHz only.

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**Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:**

| Fundamental frequency [MHz] | Field strength of fundamental (millivolts/meter) | Field strength of harmonics (microvolts/meter) |
|-----------------------------|--|--|
| 902-928 MHz                 | 50   | 500  |
| 2400-2483.5 MHz             | 50   | 500  |
| 5725-5875 MHz               | 50   | 500  |
| 24.0-24.25 GHz              | 250  | 2500   |

**Result of Data mode, (Channel 2), (Above 1GHz): Pass**

| Field Strength of Fundamental and Harmonics Emissions<br>Peak Value |   |                                |                             |                          |                     |                  |
|---|---|--------------------------------|-----------------------------|--------------------------|---------------------|------------------|
| Frequency MHz   | Measured Level @3m dB $\mu$ V/m                             | Correction Factor dB $\mu$ V/m | Field Strength dB $\mu$ V/m | Field Strength $\mu$ V/m | Limit @3m $\mu$ V/m | E-Field Polarity |
| 2401.4  | 56.4  | 27.9                           | 84.3                        | 16,405.9                 | 500,000             | Vertical         |
| * 4802.7  | 15.1  | 32.1                           | 47.2                        | 229.1                    | 5,000               | Vertical         |
| 7204.3  | 2.5   | 38.6                           | 41.1                        | 113.5                    | 5,000               | Vertical         |
| 9605.6  | Emissions detected are more than 20 dB below the FCC Limits |                                |                             |                          | 5,000               | Vertical         |
| * 12007.0   |   |                                |                             |                          | 5,000               | Vertical         |
| 14408.4   |   |                                |                             |                          | 5,000               | Vertical         |
| 16809.8   |   |                                |                             |                          | 5,000               | Vertical         |
| * 19211.2   |   |                                |                             |                          | 5,000               | Vertical         |
| 21612.6   |   |                                |                             |                          | 5,000               | Vertical         |
| 24014.0   |   |                                |                             |                          | 5,000               | Vertical         |

| Field Strength of Fundamental and Harmonics Emissions<br>Average Value |   |                                |                             |                          |                     |                  |
|--|---|--------------------------------|-----------------------------|--------------------------|---------------------|------------------|
| Frequency MHz  | Measured Level @3m dB $\mu$ V/m                             | Correction Factor dB $\mu$ V/m | Field Strength dB $\mu$ V/m | Field Strength $\mu$ V/m | Limit @3m $\mu$ V/m | E-Field Polarity |
| 2401.4   | 54.4  | 27.9                           | 82.3                        | 13,031.7                 | 50,000              | Vertical         |
| * 4802.7   | 9.2   | 32.1                           | 41.3                        | 116.1                    | 500                 | Vertical         |
| 7204.3   | -0.8  | 38.6                           | 37.8                        | 77.6                     | 500                 | Vertical         |
| 9605.6   | Emissions detected are more than 20 dB below the FCC Limits |                                |                             |                          | 500                 | Vertical         |
| * 12007.0  |   |                                |                             |                          | 500                 | Vertical         |
| 14408.4  |   |                                |                             |                          | 500                 | Vertical         |
| 16809.8  |   |                                |                             |                          | 500                 | Vertical         |
| * 19211.2  |   |                                |                             |                          | 500                 | Vertical         |
| 21612.6  |   |                                |                             |                          | 500                 | Vertical         |
| 24014.0  |   |                                |                             |                          | 500                 | Vertical         |

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**Result of Data mode, (Channel 126), (Above 1GHz): Pass**

| <b>Field Strength of Fundamental and Harmonics Emissions</b> |  |                                      |                                   |                                |                        |                     |
|--|--|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| <b>Peak Value</b>  |  |                                      |                                   |                                |                        |                     |
| Frequency<br>MHz   | Measured<br>Level @3m<br>dB $\mu$ V/m                          | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 2426.2   | 55.2   | 27.9                                 | 83.1                              | 14,288.9                       | 500,000                | Vertical            |
| * 4852.3   | 15.0   | 32.1                                 | 47.1                              | 226.5                          | 5,000                  | Vertical            |
| * 7278.4   | 2.3  | 38.6                                 | 40.9                              | 110.9                          | 5,000                  | Vertical            |
| 9704.8   | Emissions detected are more than<br>20 dB below the FCC Limits |                                      |                                   |                                | 5,000                  | Vertical            |
| * 12131.0  |  |                                      |                                   |                                | 5,000                  | Vertical            |
| 14557.2  |  |                                      |                                   |                                | 5,000                  | Vertical            |
| 16983.4  |  |                                      |                                   |                                | 5,000                  | Vertical            |
| * 19409.6  |  |                                      |                                   |                                | 5,000                  | Vertical            |
| 21835.8  |  |                                      |                                   |                                | 5,000                  | Vertical            |
| 24262.0  |  |                                      |                                   |                                | 5,000                  | Vertical            |

| <b>Field Strength of Fundamental and Harmonics Emissions</b> |  |                                      |                                   |                                |                        |                     |
|--|--|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| <b>Average Value</b>   |  |                                      |                                   |                                |                        |                     |
| Frequency<br>MHz   | Measured<br>Level @3m<br>dB $\mu$ V/m                          | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 2426.2   | 53.8   | 27.9                                 | 81.7                              | 12,161.9                       | 50,000                 | Vertical            |
| * 4852.3   | 9.2  | 32.1                                 | 41.3                              | 116.1                          | 500                    | Vertical            |
| * 7278.4   | 0.1  | 38.6                                 | 38.7                              | 86.1                           | 500                    | Vertical            |
| 9704.8   | Emissions detected are more than<br>20 dB below the FCC Limits |                                      |                                   |                                | 500                    | Vertical            |
| * 12131.0  |  |                                      |                                   |                                | 500                    | Vertical            |
| 14557.2  |  |                                      |                                   |                                | 500                    | Vertical            |
| 16983.4  |  |                                      |                                   |                                | 500                    | Vertical            |
| * 19409.6  |  |                                      |                                   |                                | 500                    | Vertical            |
| 21835.8  |  |                                      |                                   |                                | 500                    | Vertical            |
| 24262.0  |  |                                      |                                   |                                | 500                    | Vertical            |

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**Result of Data mode, (Channel 254), (Above 1GHz): Pass**

| <b>Field Strength of Fundamental and Harmonics Emissions</b> |  |                                |                             |                           |                   |                     |
|--|--|--------------------------------|-----------------------------|---------------------------|-------------------|---------------------|
| <b>Peak Value</b>  |  |                                |                             |                           |                   |                     |
| Frequency<br>MHz   | Measured<br>Level @3m<br>dBμV/m                                | Correction<br>Factor<br>dBμV/m | Field<br>Strength<br>dBμV/m | Field<br>Strength<br>μV/m | Limit @3m<br>μV/m | E-Field<br>Polarity |
| 2451.8   | 56.4   | 27.9                           | 84.3                        | 16,405.9                  | 500,000           | Vertical            |
| * 4903.5   | 14.0   | 32.1                           | 46.1                        | 201.8                     | 5,000             | Vertical            |
| * 7355.3   | 3.5  | 38.6                           | 42.1                        | 127.4                     | 5,000             | Vertical            |
| 9807.2   | Emissions detected are more than<br>20 dB below the FCC Limits |                                |                             |                           | 5,000             | Vertical            |
| * 12259.0  |  |                                |                             |                           | 5,000             | Vertical            |
| 14710.8  |  |                                |                             |                           | 5,000             | Vertical            |
| 17162.6  |  |                                |                             |                           | 5,000             | Vertical            |
| * 19614.4  |  |                                |                             |                           | 5,000             | Vertical            |
| 22066.2  |  |                                |                             |                           | 5,000             | Vertical            |
| 24518.0  |  |                                |                             |                           | 5,000             | Vertical            |

| <b>Field Strength of Fundamental and Harmonics Emissions</b> |  |                                |                             |                           |                   |                     |
|--|--|--------------------------------|-----------------------------|---------------------------|-------------------|---------------------|
| <b>Average Value</b>   |  |                                |                             |                           |                   |                     |
| Frequency<br>MHz   | Measured<br>Level @3m<br>dBμV/m                                | Correction<br>Factor<br>dBμV/m | Field<br>Strength<br>dBμV/m | Field<br>Strength<br>μV/m | Limit @3m<br>μV/m | E-Field<br>Polarity |
| 2451.8   | 54.2   | 27.9                           | 82.1                        | 12,735.0                  | 50,000            | Vertical            |
| * 4903.5   | 8.2  | 32.1                           | 40.3                        | 103.5                     | 500               | Vertical            |
| * 7355.3   | 0.1  | 38.6                           | 38.7                        | 86.1                      | 500               | Vertical            |
| 9807.2   | Emissions detected are more than<br>20 dB below the FCC Limits |                                |                             |                           | 500               | Vertical            |
| * 12259.0  |  |                                |                             |                           | 500               | Vertical            |
| 14710.8  |  |                                |                             |                           | 500               | Vertical            |
| 17162.6  |  |                                |                             |                           | 500               | Vertical            |
| * 19614.4  |  |                                |                             |                           | 500               | Vertical            |
| 22066.2  |  |                                |                             |                           | 500               | Vertical            |
| 24518.0  |  |                                |                             |                           | 500               | Vertical            |

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**Result of Announce mode (Channel 8), (Above 1GHz): Pass**

| <b>Field Strength of Fundamental and Harmonics Emissions</b> |  |                                |                             |                           |                   |                     |
|--|--|--------------------------------|-----------------------------|---------------------------|-------------------|---------------------|
| <b>Peak Value</b>  |  |                                |                             |                           |                   |                     |
| Frequency<br>MHz   | Measured<br>Level @3m<br>dBμV/m                                | Correction<br>Factor<br>dBμV/m | Field<br>Strength<br>dBμV/m | Field<br>Strength<br>μV/m | Limit @3m<br>μV/m | E-Field<br>Polarity |
| 2403.5   | 55.2   | 27.9                           | 83.1                        | 14,288.9                  | 500,000           | Vertical            |
| * 4807.3   | 10.2   | 32.1                           | 42.3                        | 130.3                     | 5,000             | Vertical            |
| 7211.3   | 1.7  | 38.6                           | 40.3                        | 103.5                     | 5,000             | Vertical            |
| 9614.0   | Emissions detected are more than<br>20 dB below the FCC Limits |                                |                             |                           | 5,000             | Vertical            |
| * 12017.5  |  |                                |                             |                           | 5,000             | Vertical            |
| 14421.0  |  |                                |                             |                           | 5,000             | Vertical            |
| 16824.5  |  |                                |                             |                           | 5,000             | Vertical            |
| * 19228.0  |  |                                |                             |                           | 5,000             | Vertical            |
| 21631.5  |  |                                |                             |                           | 5,000             | Vertical            |
| 24035.0  |  |                                |                             |                           | 5,000             | Vertical            |

| <b>Field Strength of Fundamental and Harmonics Emissions</b> |  |                                |                             |                           |                   |                     |
|--|--|--------------------------------|-----------------------------|---------------------------|-------------------|---------------------|
| <b>Average Value</b>   |  |                                |                             |                           |                   |                     |
| Frequency<br>MHz   | Measured<br>Level @3m<br>dBμV/m                                | Correction<br>Factor<br>dBμV/m | Field<br>Strength<br>dBμV/m | Field<br>Strength<br>μV/m | Limit @3m<br>μV/m | E-Field<br>Polarity |
| 2403.5   | 48.6   | 27.9                           | 76.5                        | 6,683.4                   | 50,000            | Vertical            |
| * 4807.3   | 3.3  | 32.1                           | 35.4                        | 58.9                      | 500               | Vertical            |
| 7211.3   | -1.0   | 38.6                           | 37.6                        | 75.9                      | 500               | Vertical            |
| 9614.0   | Emissions detected are more than<br>20 dB below the FCC Limits |                                |                             |                           | 500               | Vertical            |
| * 12017.5  |  |                                |                             |                           | 500               | Vertical            |
| 14421.0  |  |                                |                             |                           | 500               | Vertical            |
| 16824.5  |  |                                |                             |                           | 500               | Vertical            |
| * 19228.0  |  |                                |                             |                           | 500               | Vertical            |
| 21631.5  |  |                                |                             |                           | 500               | Vertical            |
| 24035.0  |  |                                |                             |                           | 500               | Vertical            |

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**Result of Announce mode (Channel 120), (Above 1GHz): Pass**

| <b>Field Strength of Fundamental and Harmonics Emissions</b> |  |                                |                             |                           |                   |                     |
|--|--|--------------------------------|-----------------------------|---------------------------|-------------------|---------------------|
| <b>Peak Value</b>  |  |                                |                             |                           |                   |                     |
| Frequency<br>MHz   | Measured<br>Level @3m<br>dBμV/m                                | Correction<br>Factor<br>dBμV/m | Field<br>Strength<br>dBμV/m | Field<br>Strength<br>μV/m | Limit @3m<br>μV/m | E-Field<br>Polarity |
| 2438.7   | 54.2   | 27.9                           | 82.1                        | 12,735.0                  | 500,000           | Vertical            |
| * 4877.7   | 8.3  | 32.1                           | 40.4                        | 104.7                     | 5,000             | Vertical            |
| * 7316.5   | 1.5  | 38.6                           | 40.1                        | 101.2                     | 5,000             | Vertical            |
| 9754.8   | Emissions detected are more than<br>20 dB below the FCC Limits |                                |                             |                           | 5,000             | Vertical            |
| * 12193.5  |  |                                |                             |                           | 5,000             | Vertical            |
| 14632.2  |  |                                |                             |                           | 5,000             | Vertical            |
| 17070.9  |  |                                |                             |                           | 5,000             | Vertical            |
| * 19509.6  |  |                                |                             |                           | 5,000             | Vertical            |
| 21948.3  |  |                                |                             |                           | 5,000             | Vertical            |
| 24387.0  |  |                                |                             |                           | 5,000             | Vertical            |

| <b>Field Strength of Fundamental and Harmonics Emissions</b> |  |                                |                             |                           |                   |                     |
|--|--|--------------------------------|-----------------------------|---------------------------|-------------------|---------------------|
| <b>Average Value</b>   |  |                                |                             |                           |                   |                     |
| Frequency<br>MHz   | Measured<br>Level @3m<br>dBμV/m                                | Correction<br>Factor<br>dBμV/m | Field<br>Strength<br>dBμV/m | Field<br>Strength<br>μV/m | Limit @3m<br>μV/m | E-Field<br>Polarity |
| 2438.7   | 48.4   | 27.9                           | 76.3                        | 6,531.3                   | 50,000            | Vertical            |
| * 4877.7   | 2.2  | 32.1                           | 34.3                        | 51.9                      | 500               | Vertical            |
| * 7316.5   | -0.5   | 38.6                           | 38.1                        | 80.4                      | 500               | Vertical            |
| 9754.8   | Emissions detected are more than<br>20 dB below the FCC Limits |                                |                             |                           | 500               | Vertical            |
| * 12193.5  |  |                                |                             |                           | 500               | Vertical            |
| 14632.2  |  |                                |                             |                           | 500               | Vertical            |
| 17070.9  |  |                                |                             |                           | 500               | Vertical            |
| * 19509.6  |  |                                |                             |                           | 500               | Vertical            |
| 21948.3  |  |                                |                             |                           | 500               | Vertical            |
| 24387.0  |  |                                |                             |                           | 500               | Vertical            |

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### Result of Announce mode (Channel 247), (Above 1GHz): Pass

| Field Strength of Fundamental and Harmonics Emissions |  |                                |                             |                           |                   |                     |
|---|--|--------------------------------|-----------------------------|---------------------------|-------------------|---------------------|
| Peak Value  |  |                                |                             |                           |                   |                     |
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dBμV/m                                | Correction<br>Factor<br>dBμV/m | Field<br>Strength<br>dBμV/m | Field<br>Strength<br>μV/m | Limit @3m<br>μV/m | E-Field<br>Polarity |
| 2478.6  | 54.0   | 27.9                           | 81.9                        | 12,445.1                  | 500,000           | Vertical            |
| * 4957.1  | 8.2  | 32.1                           | 40.3                        | 103.5                     | 5,000             | Vertical            |
| * 7436.1  | 2.5  | 38.6                           | 41.1                        | 113.5                     | 5,000             | Vertical            |
| 9914.4  | Emissions detected are more than<br>20 dB below the FCC Limits |                                |                             |                           | 5,000             | Vertical            |
| * 12393.0   |  |                                |                             |                           | 5,000             | Vertical            |
| 14871.6   |  |                                |                             |                           | 5,000             | Vertical            |
| 17350.2   |  |                                |                             |                           | 5,000             | Vertical            |
| * 19828.8   |  |                                |                             |                           | 5,000             | Vertical            |
| 22307.4   |  |                                |                             |                           | 5,000             | Vertical            |
| 24786.0   |  |                                |                             |                           | 5,000             | Vertical            |

| Field Strength of Fundamental and Harmonics Emissions |  |                                |                             |                           |                   |                     |
|---|--|--------------------------------|-----------------------------|---------------------------|-------------------|---------------------|
| Average Value   |  |                                |                             |                           |                   |                     |
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dBμV/m                                | Correction<br>Factor<br>dBμV/m | Field<br>Strength<br>dBμV/m | Field<br>Strength<br>μV/m | Limit @3m<br>μV/m | E-Field<br>Polarity |
| 2478.6  | 47.4   | 27.9                           | 75.3                        | 5,821.0                   | 50,000            | Vertical            |
| * 4957.1  | 0.1  | 32.1                           | 32.2                        | 40.7                      | 500               | Vertical            |
| * 7436.1  | 0.2  | 38.6                           | 38.8                        | 87.1                      | 500               | Vertical            |
| 9914.4  | Emissions detected are more than<br>20 dB below the FCC Limits |                                |                             |                           | 500               | Vertical            |
| * 12393.0   |  |                                |                             |                           | 500               | Vertical            |
| 14871.6   |  |                                |                             |                           | 500               | Vertical            |
| 17350.2   |  |                                |                             |                           | 500               | Vertical            |
| * 19828.8   |  |                                |                             |                           | 500               | Vertical            |
| 22307.4   |  |                                |                             |                           | 500               | Vertical            |
| 24786.0   |  |                                |                             |                           | 500               | Vertical            |

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

\*: Denotes restricted band of operation.  
Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Calculated measurement uncertainty : 9kHz to 30MHz 2.4dB  
 30MHz to 1GHz 4.9dB  
 1GHz to 6GHz 4.02dB  
 6GHz to 18GHz 4.03dB

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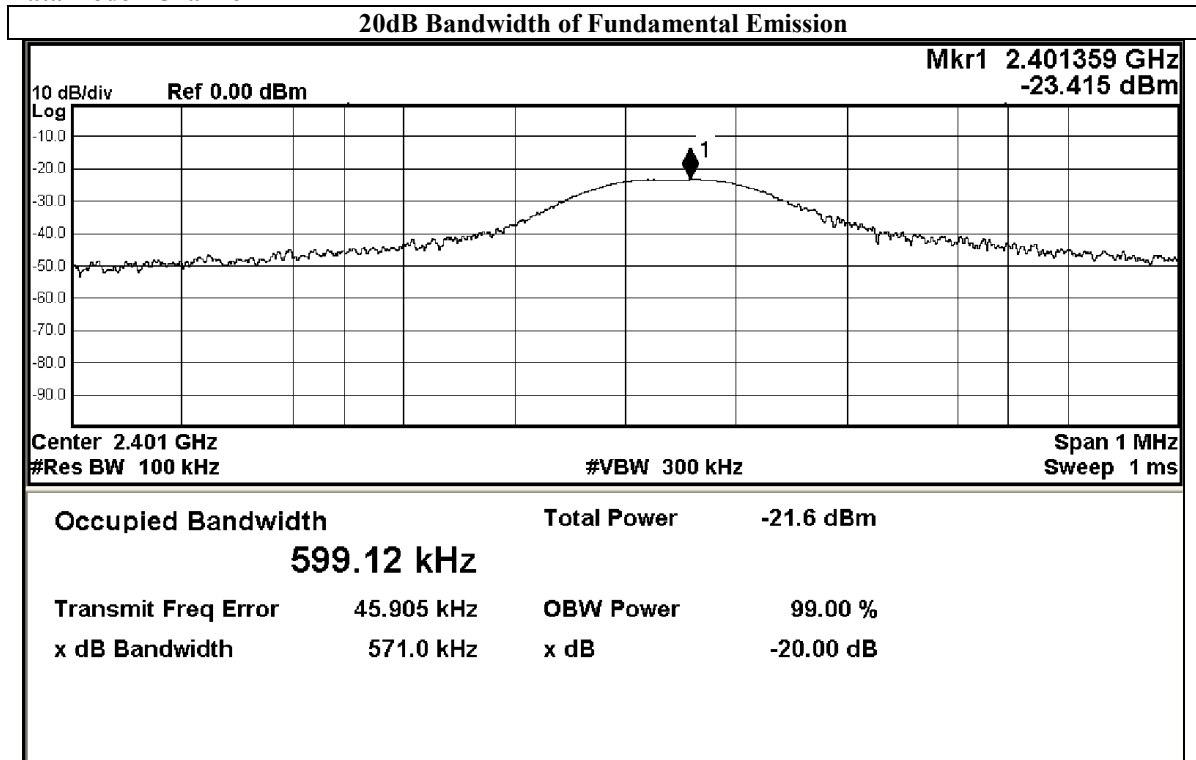
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**Limits for 20dB Bandwidth of Fundamental Emission:**

|                          |                         |
|--------------------------|-------------------------|
| Frequency Range<br>[MHz] | 20dB Bandwidth<br>[MHz] |
| 2401.6                   | 0.571                   |

**Data mode - Channel 2**





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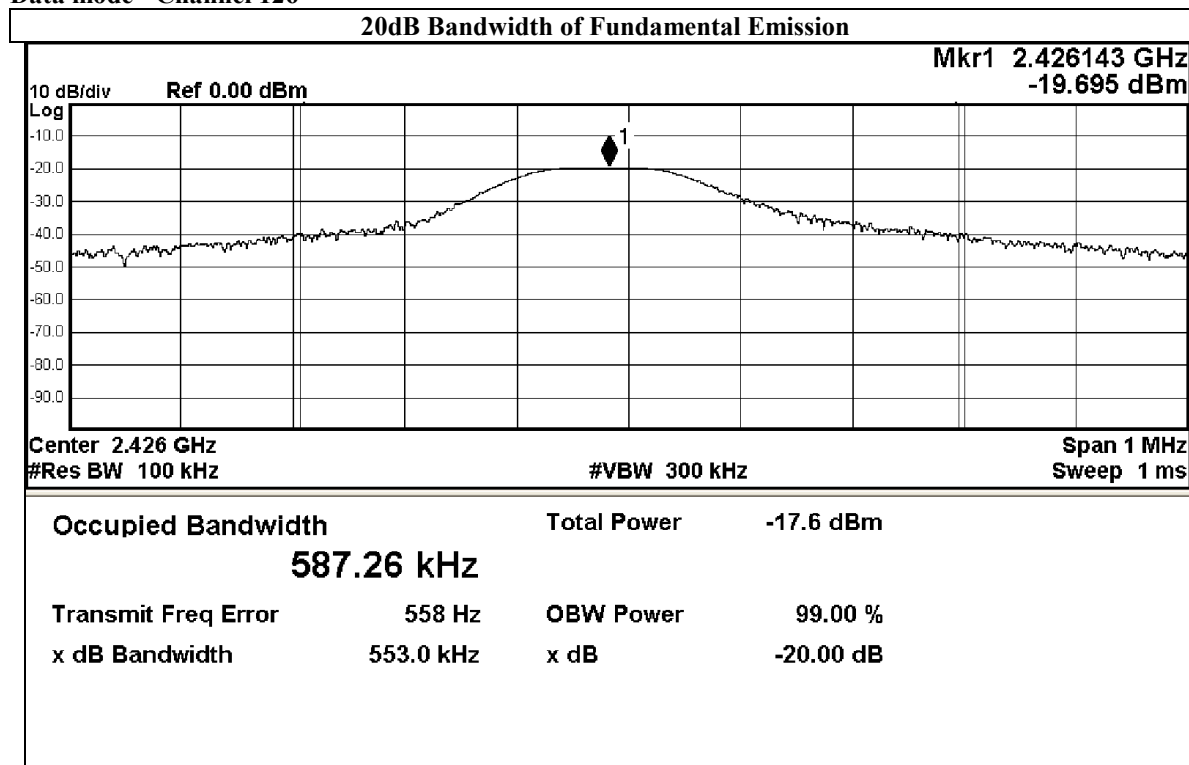
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|                          |                         |
|--------------------------|-------------------------|
| Frequency Range<br>[MHz] | 20dB Bandwidth<br>[MHz] |
| 2426.1                   | 0.553                   |

Data mode - Channel 126



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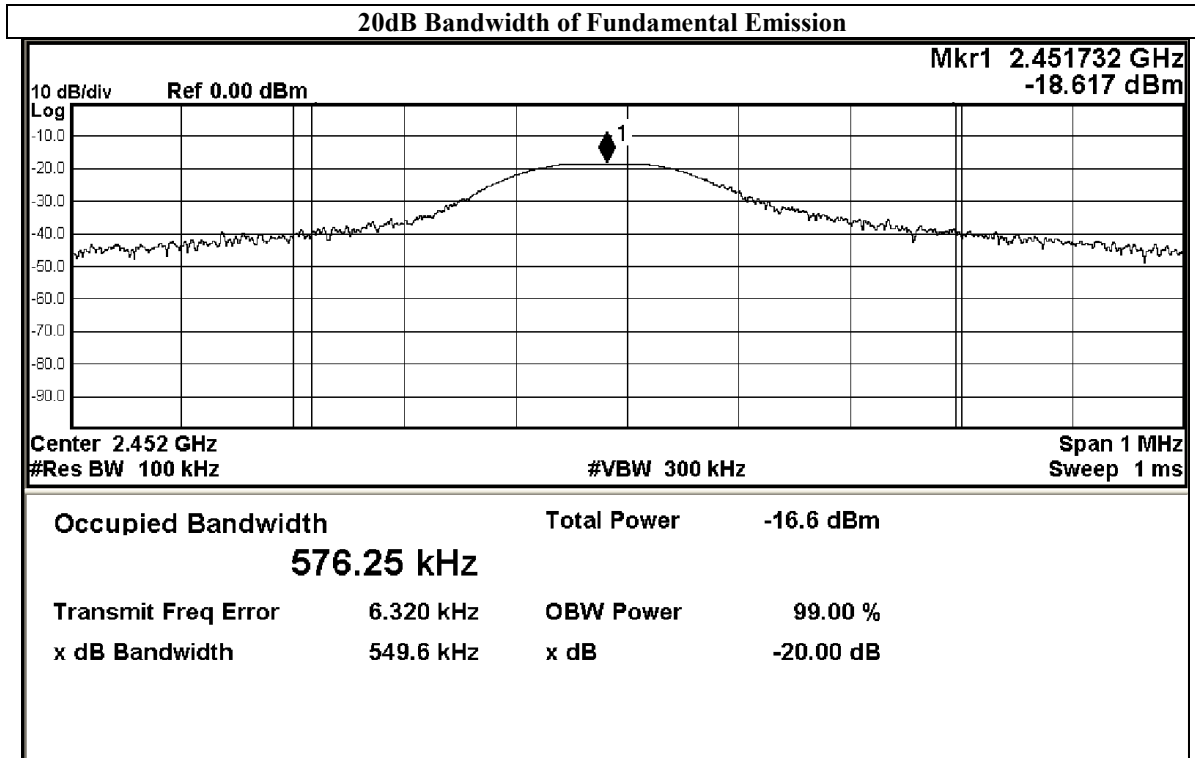
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|                          |                         |
|--------------------------|-------------------------|
| Frequency Range<br>[MHz] | 20dB Bandwidth<br>[MHz] |
| 2451.7                   | 0.550                   |

Data mode - Channel 254





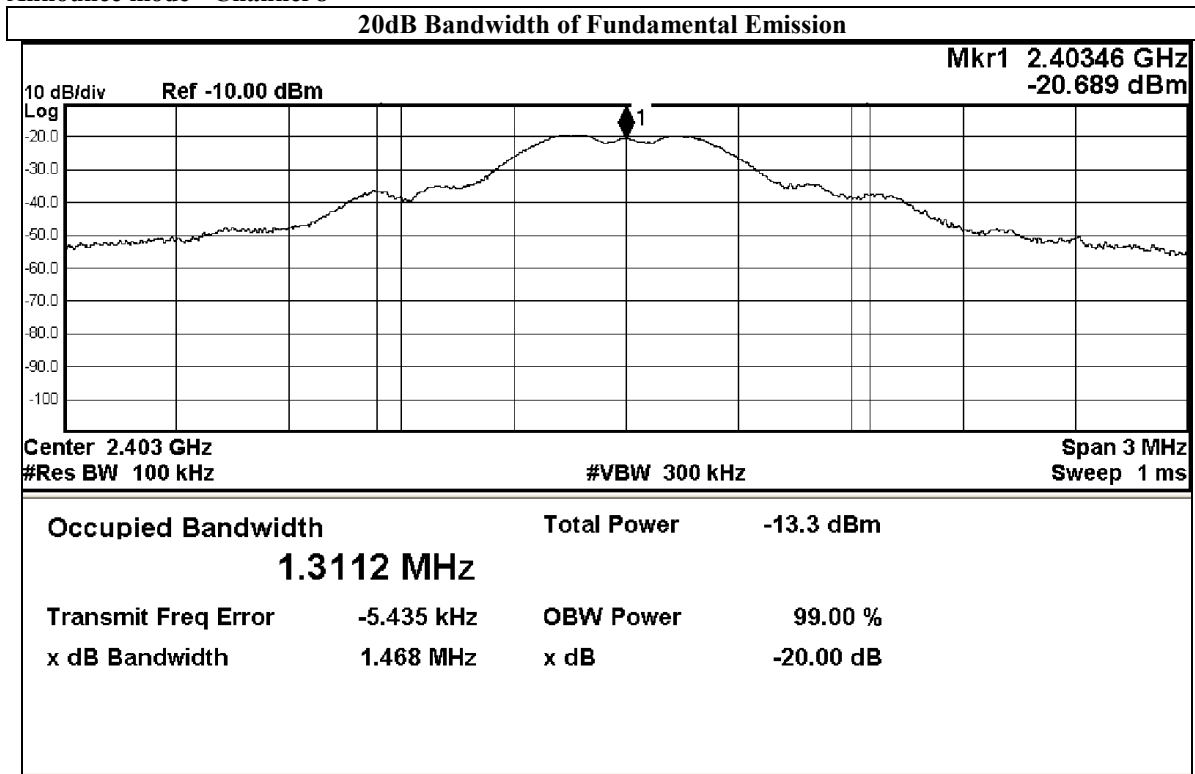
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|                          |                         |
|--------------------------|-------------------------|
| Frequency Range<br>[MHz] | 20dB Bandwidth<br>[MHz] |
| 2403.5                   | 1.468                   |

**Announce mode - Channel 8**







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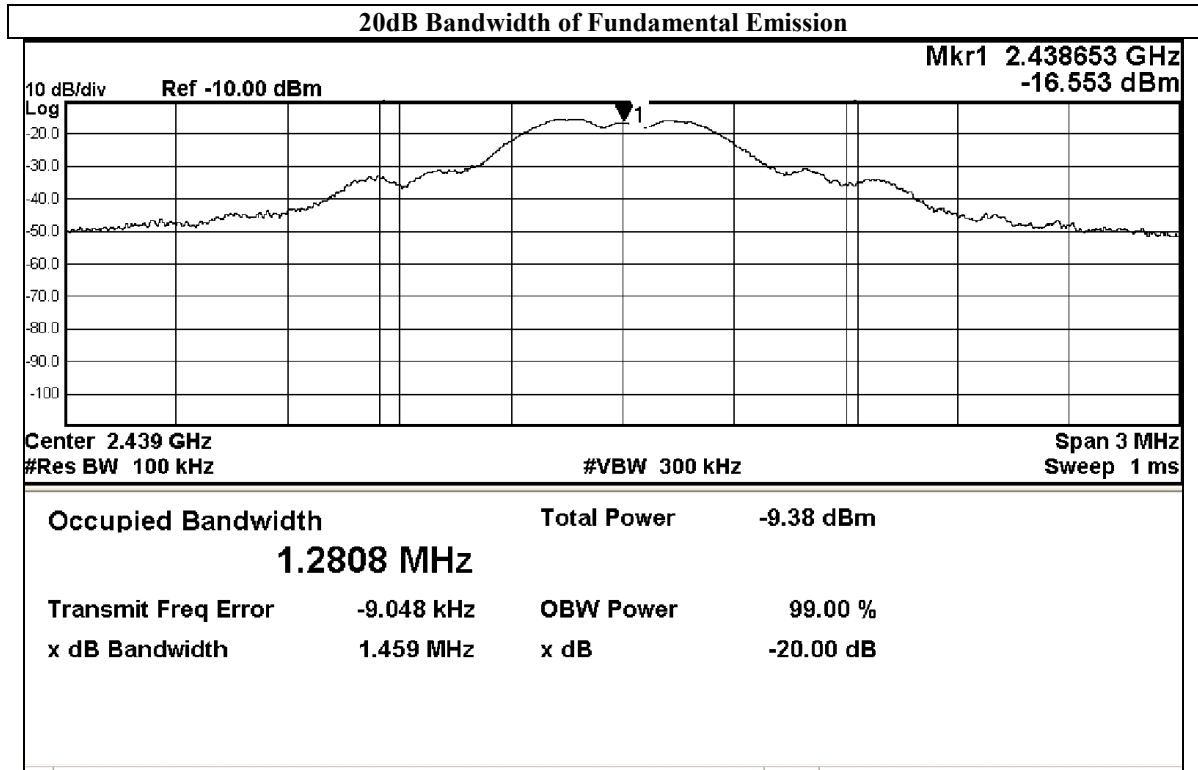
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|                          |                         |
|--------------------------|-------------------------|
| Frequency Range<br>[MHz] | 20dB Bandwidth<br>[MHz] |
| 2438.7                   | 1.459                   |

## Announce mode - Channel 120



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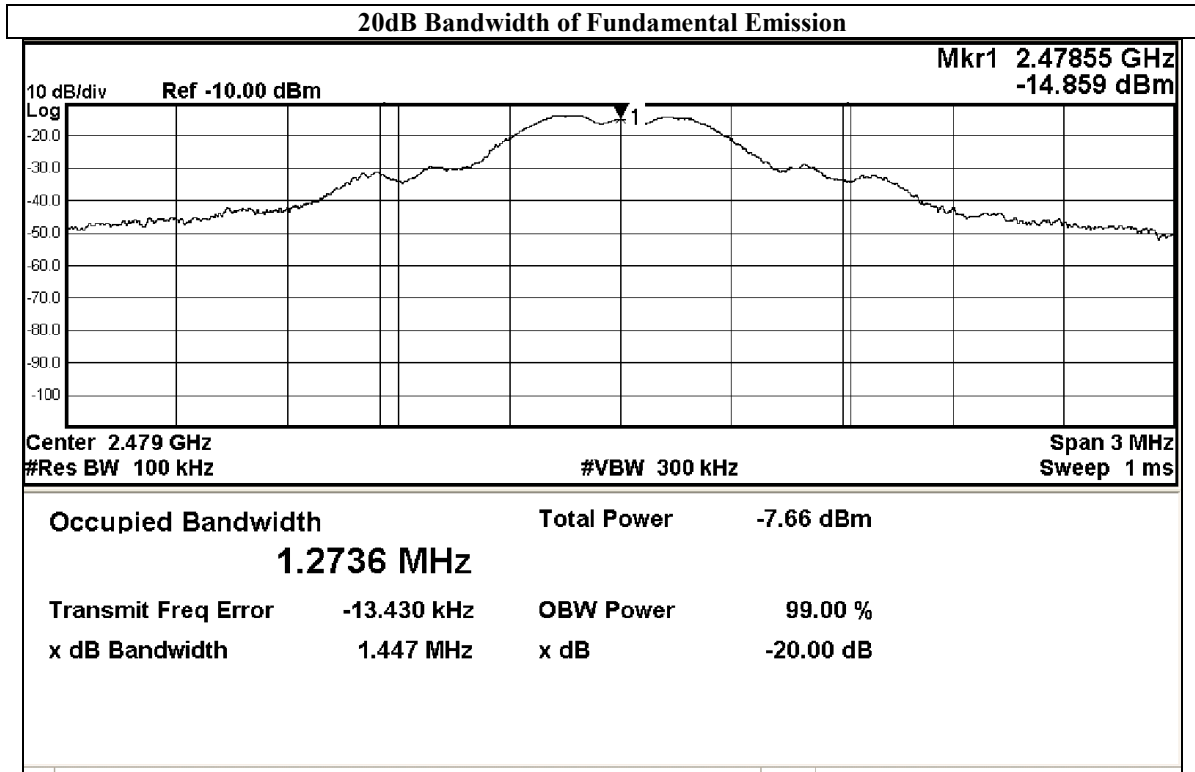
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|                          |                         |
|--------------------------|-------------------------|
| Frequency Range<br>[MHz] | 20dB Bandwidth<br>[MHz] |
| 2478.6                   | 1.447                   |

Announce mode - Channel 247





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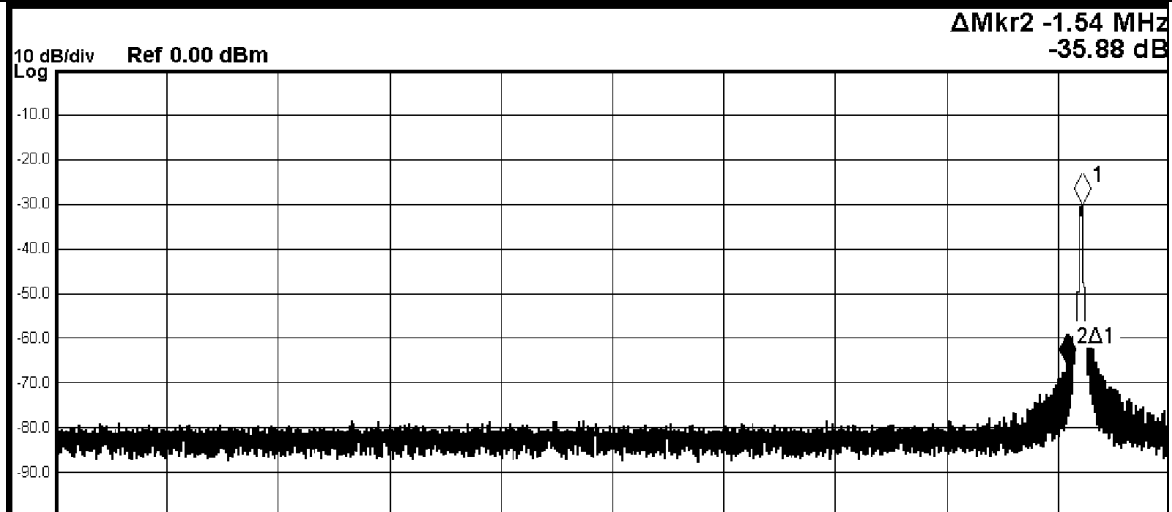
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### Band Edge Measurement:

|                                |  |
|--------------------------------|--|
| Frequency Range<br>[MHz]       | Radiated Emission Attenuated below the Fundamental<br>[dB] |
| Data mode – Lowest Fundamental | 35.9   |

### 35.9dB Level Reduction at Lower Band Edge



| MKR | MODE | TRC | SCL   | X             | Y          | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |
|-----|------|-----|-------|---------------|------------|----------|----------------|----------------|
| 1   | N    | 1   | f     | 2.401 42 GHz  | -30.28 dBm |          |                |                |
| 3   | Δ1   | 1   | f (Δ) | -1.54 MHz (Δ) | -35.88 dB  |          |                |                |
| 4   |      |     |       |               |            |          |                |                |
| 5   |      |     |       |               |            |          |                |                |



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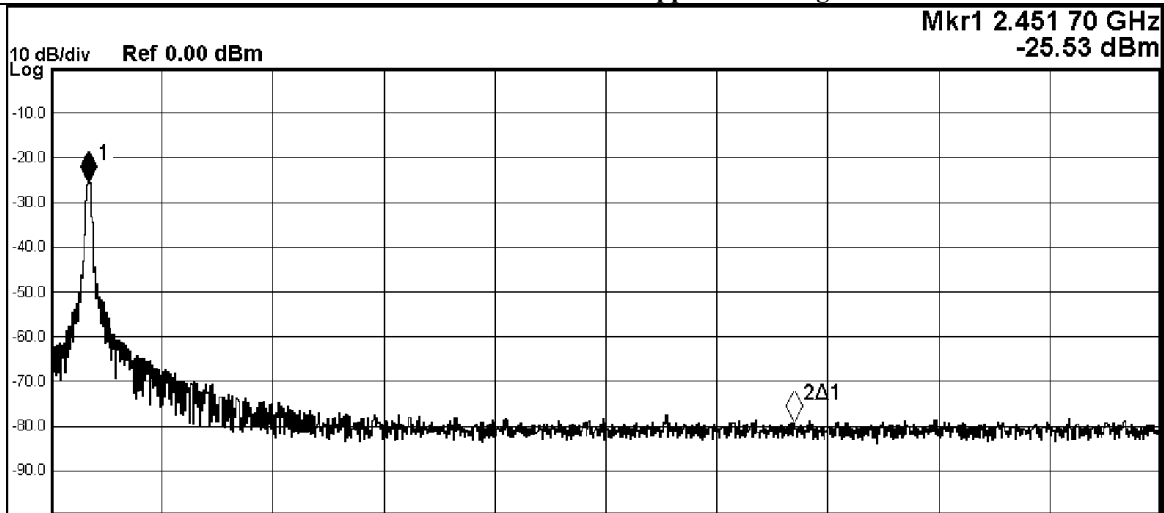
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**Band Edge Measurement:**

|                                 |  |
|---------------------------------|--|
| Frequency Range<br>[MHz]        | Radiated Emission Attenuated below the Fundamental<br>[dB] |
| Data mode – Highest Fundamental | 53.8   |

**53.8dB Level Reduction at Upper Band Edge**



Start 2.45000 GHz Stop 2.50000 GHz  
 #Res BW 100 kHz #VBW 300 kHz Sweep 4.800 ms (1001 pts)

| MKR | MODE | TRC | SCL   | X             | Y          | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |
|-----|------|-----|-------|---------------|------------|----------|----------------|----------------|
| N   | 1    | f   |       | 2.451 70 GHz  | -25.53 dBm |          |                |                |
| 2   | Δ1   | 1   | f (Δ) | 31.80 MHz (Δ) | -53.60 dB  |          |                |                |
| 3   |      |     |       |               |            |          |                |                |
| 4   |      |     |       |               |            |          |                |                |
| 5   |      |     |       |               |            |          |                |                |



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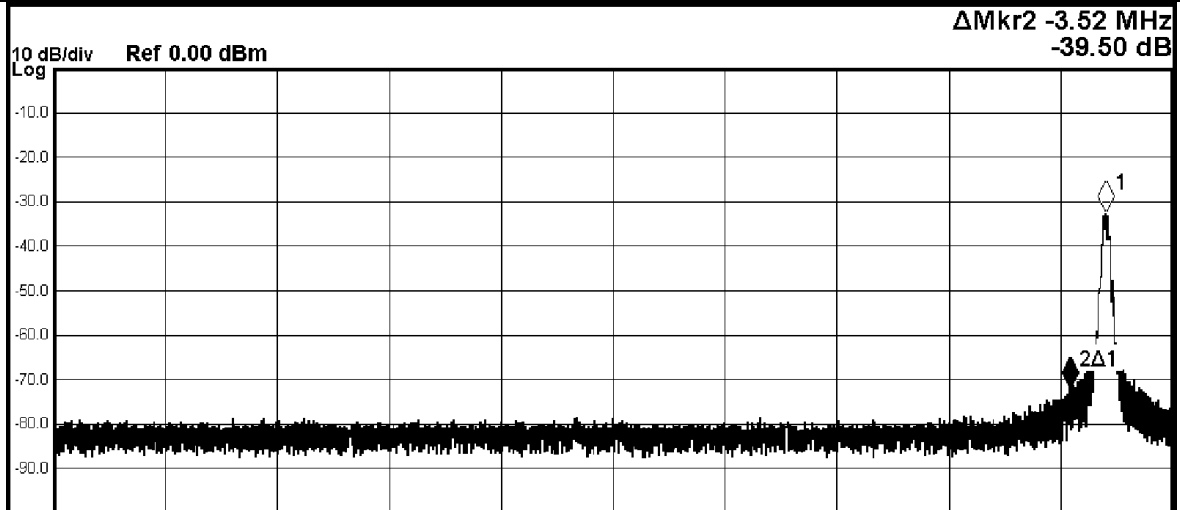
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**Band Edge Measurement:**

|                                    |  |
|------------------------------------|--|
| Frequency Range<br>[MHz]           | Radiated Emission Attenuated below the Fundamental<br>[dB] |
| Announce mode – Lowest Fundamental | 39.5   |

**39.5dB Level Reduction at Lower Band Edge**



Start 2.30000 GHz Stop 2.41000 GHz  
 #Res BW 100 kHz #VBW 300 kHz Sweep 10.53 ms (1001 pts)

| MKR | MODE | TRC | SCL   | X             | Y          | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |
|-----|------|-----|-------|---------------|------------|----------|----------------|----------------|
| 1   | N    | 1   | f     | 2.403 40 GHz  | -32.52 dBm |          |                |                |
| 3   | Δ1   | 1   | f (Δ) | -3.52 MHz (Δ) | -39.50 dB  |          |                |                |
| 4   |      |     |       |               |            |          |                |                |
| 5   |      |     |       |               |            |          |                |                |
| 6   |      |     |       |               |            |          |                |                |



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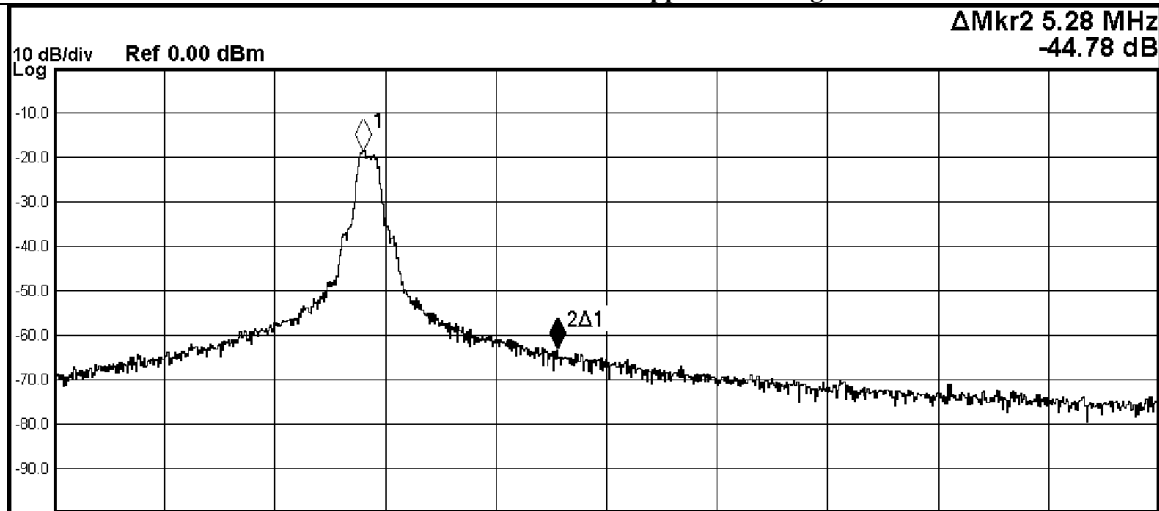
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**Band Edge Measurement:**

|                                     |  |
|-------------------------------------|--|
| Frequency Range<br>[MHz]            | Radiated Emission Attenuated below the Fundamental<br>[dB] |
| Announce mode – Highest Fundamental | 44.8   |

**44.8dB Level Reduction at Upper Band Edge**



Start 2.47000 GHz Stop 2.50000 GHz  
 #Res BW 100 kHz #VBW 300 kHz Sweep 2.933 ms (1001 pts)

| MKR | MODE | TRC | SCL | X            | Y          | FUNCTION | FUNCTION WIDTH | FUNCTION VALUE |
|-----|------|-----|-----|--------------|------------|----------|----------------|----------------|
| 1   | N    | 1   | f   | 2.478 40 GHz | -18.54 dBm |          |                |                |
| Δ1  | 1    | f   | (Δ) | 5.28 MHz (Δ) | -44.78 dB  |          |                |                |
| 3   |      |     |     |              |            |          |                |                |
| 4   |      |     |     |              |            |          |                |                |
| 5   |      |     |     |              |            |          |                |                |



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### Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

| Frequency Range<br>[MHz] | Quasi-Peak Limits<br>[ $\mu$ V/m] |
|--------------------------|-----------------------------------|
| 0.009-0.490              | 2400/F (kHz)                      |
| 0.490-1.705              | 24000/F (kHz)                     |
| 1.705-30                 | 30                                |
| 30-88                    | 100                               |
| 88-216                   | 150                               |
| 216-960                  | 200                               |
| Above960                 | 500                               |

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

### Result of On mode, (9kHz – 30MHz): PASS

Emissions detected are more than 20 dB below the FCC Limits

### Result of On mode, (30MHz – 1GHz): PASS

| Field Strength of Fundamental and Harmonics Emissions<br>Quasi-Peak Value |                                       |                                      |                                   |                                |                        |                     |
|---|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Frequency<br>MHz  | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 63.4  | 0.3                                   | 9.2                                  | 9.5                               | 3.0                            | 100                    | Vertical            |
| 101.7   | 0.1                                   | 10.3                                 | 10.4                              | 3.3                            | 150                    | Vertical            |
| 210.4   | 0.2                                   | 14.0                                 | 14.2                              | 5.1                            | 150                    | Horizontal          |
| 246.5   | 0.7                                   | 15.7                                 | 16.4                              | 6.6                            | 200                    | Horizontal          |
| 337.9   | 0.5                                   | 18.6                                 | 19.1                              | 9.0                            | 200                    | Horizontal          |
| 421.3   | 0.5                                   | 21.1                                 | 21.6                              | 12.0                           | 200                    | Horizontal          |

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### Result of On mode (Data mode, Band-edge measurement), (1GHz – 18GHz): PASS

| Field Strength of Fundamental and Harmonics Emissions |                                       |                                      |                                   |                                |                        |                     |
|---|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Peak Value  |                                       |                                      |                                   |                                |                        |                     |
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 2399.1  | 22.4                                  | 27.9                                 | 50.3                              | 327.3                          | 5,000                  | Vertical            |
| 2485.1  | 12.3                                  | 28.0                                 | 40.3                              | 103.5                          | 5,000                  | Vertical            |

| Field Strength of Fundamental and Harmonics Emissions |                                       |                                      |                                   |                                |                        |                     |
|---|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Average Value   |                                       |                                      |                                   |                                |                        |                     |
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 2399.1  | 16.9                                  | 27.9                                 | 44.8                              | 173.8                          | 500                    | Vertical            |
| 2485.1  | 5.8                                   | 28.0                                 | 33.8                              | 49.0                           | 500                    | Vertical            |

### Result of On mode (Announce mode, Band-edge measurement), (1GHz – 18GHz): PASS

| Field Strength of Fundamental and Harmonics Emissions |                                       |                                      |                                   |                                |                        |                     |
|---|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Peak Value  |                                       |                                      |                                   |                                |                        |                     |
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 2399.1  | 21.2                                  | 27.9                                 | 49.1                              | 285.1                          | 5,000                  | Vertical            |
| 2484.6  | 21.3                                  | 28.0                                 | 49.3                              | 291.7                          | 5,000                  | Vertical            |

| Field Strength of Fundamental and Harmonics Emissions |                                       |                                      |                                   |                                |                        |                     |
|---|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Average Value   |                                       |                                      |                                   |                                |                        |                     |
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 2399.1  | 12.4                                  | 27.9                                 | 40.3                              | 103.5                          | 500                    | Vertical            |
| 2484.6  | 12.6                                  | 28.0                                 | 40.6                              | 107.2                          | 500                    | Vertical            |

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**Result of Receiver mode, (9kHz – 30MHz): PASS**

Emissions detected are more than 20 dB below the Limits

**Result of Receiver mode, (30MHz – 1GHz): PASS**

Emissions detected are more than 20 dB below the Limits

**Result of Receiver mode, (1GHz – 18GHz): PASS**

| Field Strength of Fundamental and Harmonics Emissions |                                       |                                      |                                   |                                |                        |                     |
|---|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Peak Value  |                                       |                                      |                                   |                                |                        |                     |
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 2437.2  | 6.2                                   | 27.9                                 | 34.1                              | 50.7                           | 5,000                  | Vertical            |

| Field Strength of Fundamental and Harmonics Emissions |                                       |                                      |                                   |                                |                        |                     |
|---|---------------------------------------|--------------------------------------|-----------------------------------|--------------------------------|------------------------|---------------------|
| Average Value   |                                       |                                      |                                   |                                |                        |                     |
| Frequency<br>MHz                                      | Measured<br>Level @3m<br>dB $\mu$ V/m | Correction<br>Factor<br>dB $\mu$ V/m | Field<br>Strength<br>dB $\mu$ V/m | Field<br>Strength<br>$\mu$ V/m | Limit @3m<br>$\mu$ V/m | E-Field<br>Polarity |
| 2437.2  | 5.1                                   | 27.9                                 | 33.0                              | 44.7                           | 500                    | Vertical            |

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz  
Correction Factor included Antenna Factor and Cable Attenuation.

|                                    |   |               |        |
|------------------------------------|---|---------------|--------|
| Calculated measurement uncertainty | : | 30MHz to 1GHz | 4.9dB  |
|                                    |   | 1GHz to 6GHz  | 4.02dB |
|                                    |   | 6GHz to 18GHz | 4.03dB |

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### Appendix A

#### LIST OF MEASUREMENT EQUIPMENT

##### Radiated Emission

| EQP NO. | DESCRIPTION                                  | MANUFACTURER             | MODEL NO. | SERIAL NO. | LAST CAL   | DUE CAL    |
|---------|--|--------------------------|-----------|------------|------------|------------|
| EMD062  | DOUBLE-RIDGED WAVEGUIDE HORN ANTENNA         | ETS-LINDGREN             | 3117      | 00075933   | 2014/11/15 | 2016/11/15 |
| EM215   | MULTIDEVICE CONTROLLER                       | EMCO                     | 2090      | 00024676   | N/A        | N/A        |
| EM216   | MINI MAST SYSTEM                             | EMCO                     | 2075      | 00026842   | N/A        | N/A        |
| EM217   | ELECTRIC POWERED TURNTABLE                   | EMCO                     | 2088      | 00029144   | N/A        | N/A        |
| EM218   | ANECHOIC CHAMBER                             | ETS-LINDGREN             | FACT-3    | --         | 2016/04/19 | 2017/04/19 |
| EM320   | BICONILOG ANTENNA                            | ETS-LINDGREN             | 3142D     | 00094856   | 2014/08/06 | 2016/08/06 |
| EM229   | EMI TEST RECEIVER                            | R&S                      | ESIB40    | 100248     | 2015/06/01 | 2016/06/01 |
| EM358   | LOOP ANTENNA                                 | ETS_LINDGREN             | 6502      | 00206533   | 2016/03/16 | 2018/03/16 |
| EM299   | DOUBLE-RIDGED WAVEGUIDE HORN ANTENNA         | ETS-LINDGREN             | 3115      | 00114120   | 2016/04/27 | 2018/04/27 |
| EM302   | PRECISION OMNIDIRECTIONAL DIPOLE (1 – 6GHZ)  | SEIBERSDORF LABORATORIES | POD 16    | 161806/L   | 2016/05/11 | 2018/05/11 |
| EM303   | PRECISION OMNIDIRECTIONAL DIPOLE (6 – 18GHZ) | SEIBERSDORF LABORATORIES | POD 618   | 6181908/L  | 2016/05/11 | 2018/05/11 |

#### Remarks:

CM Corrective Maintenance

N/A Not Applicable or Not Available

TBD To Be Determined

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## STC Test Report

Date : 2016-05-06

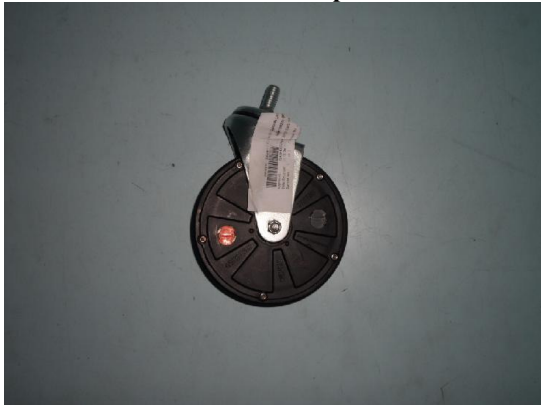
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### Appendix B

#### Photographs of EUT

**Front View of the product**



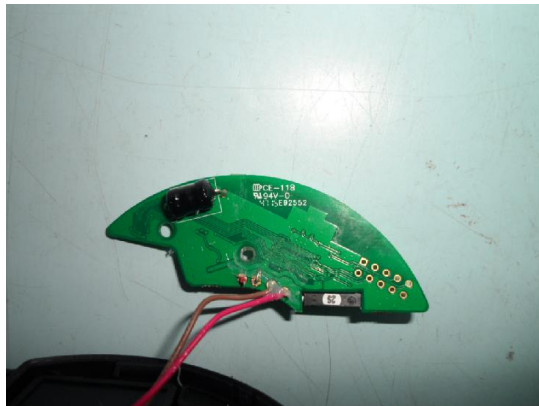
**Rear View of the product**



**Inner Circuit Top View**



**Inner Circuit Bottom View**



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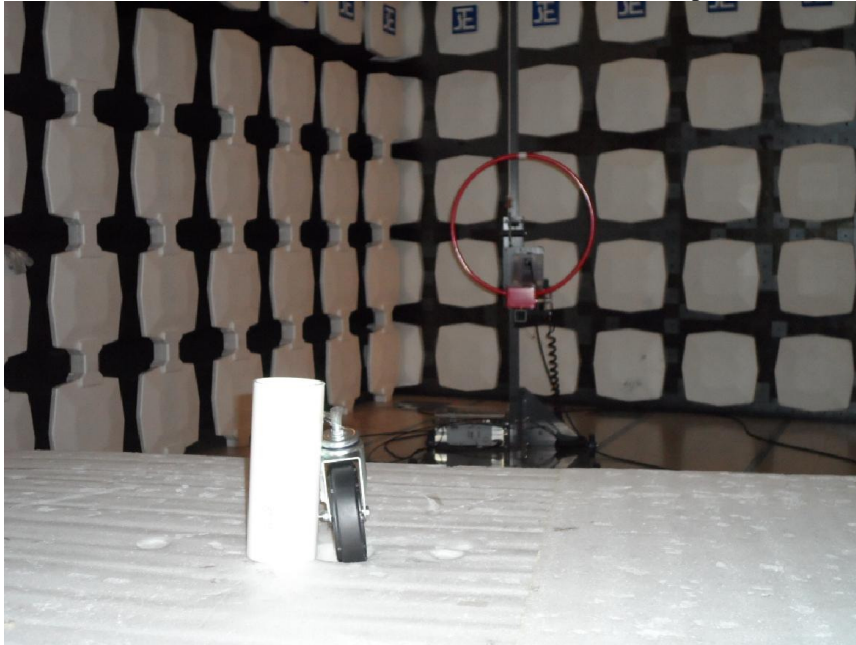
Date : 2016-05-06

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### Photographs of EUT

**Measurement of Radiated Emission Test Set Up**



**Measurement of Radiated Emission Test Set Up**



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## STC Test Report

Date : 2016-05-06

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Photographs of EUT

**Measurement of Radiated Emission Test Set Up**



**\*\*\*\*\* End of Test Report \*\*\*\*\***

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9. Subject to the variable length of retention time for test data and report stored hereinto as to otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of this test report for a period of three years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after the retention period. Under no circumstances shall we be liable for damages of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.
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