

# FCC Test Report

**Equipment** : 150N Wireless LAN USB Adapter  
**Brand Name** : EDIMAX  
**Model No.** : EW-7711ULn / GWU-H711ULn  
**FCC ID** : NDD9577111311  
**Standard** : 47 CFR FCC Part 15B  
**Device Class** : Class B  
**Applicant** : EDIMAX TECHNOLOGY CO., LTD.  
**Manufacturer** : No.3, Wu-Chuan 3rd Road, Wu-Ku Industrial Park,  
New Taipei City, Taiwan

The product sample received on Dec. 02, 2013 and completely tested on Dec. 07, 2013. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2009 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

  
Kero Kuo / Engineering Supervisor



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## Summary of Test Result

| Conformance Test Specifications |                  |                                   |   |            |          |
|---------------------------------|------------------|-----------------------------------|---|------------|----------|
| Report Clause                   | Ref. Std. Clause | Description                       | Measured  | Limit      | Result   |
| 3.1                             | 15.107           | AC Power-line Conducted Emissions | [dBuV]: 0.200747MHz<br>50.80 (Margin 12.78dB) – QP<br>34.53 (Margin 19.05dB) - AV | Ref. 3.3.1 | Complied |
| 3.2                             | 15.109           | Radiated Emissions                | [dBuV/m at 3m]: 797.60MHz<br>31.54 (Margin 5.46dB) - Peak                         | Ref. 3.2.1 | Complied |

## Revision History

| Report No. | Version | Description             | Issued Date   |
|------------|---------|-------------------------|---------------|
| FC3N2305   | Rev. 01 | Initial issue of report | Jan. 14, 2014 |
|            |         |                         |               |
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|            |         |                         |               |

# 1 General Description

## 1.1 Information

### 1.1.1 Equipment Authorization Category

| FCC Equipment Authorization of Unintentional Radiators Category |  |
|---|--|
| <input checked="" type="checkbox"/>                             | Class B personal computers and peripherals: Declaration of Conformity or Certification   |
| <input type="checkbox"/>  | Class A personal computers and peripherals: Verification   |
| <input checked="" type="checkbox"/>                             | Receivers operation above 960 MHz or below 30 MHz, except for radar detectors and CB receivers, do not require equipment authorization (verification, Declaration of Conformity, or certification) |
| <input type="checkbox"/>  | Receivers operation within 30 MHz to 960 MHz, except for radar detectors and CB receivers, require equipment authorization (Declaration of Conformity)   |

### 1.1.2 RF General Information

| RF General Information       |                        |
|------------------------------|------------------------|
| <b>Frequency Range (MHz)</b> | <b>Evaluation Mode</b> |
| 2400-2483.5                  | 2.4GHz WLAN            |

### 1.1.3 Antenna Information

| Antenna Category                    |   |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Integral antenna (antenna permanently attached) |
| <input type="checkbox"/>            | External antenna (dedicated antennas)           |

### 1.1.4 Type of EUT

| Identify EUT                        |   |
|-------------------------------------|---|
| EUT Serial Number                   | N/A   |
| Presentation of Equipment           | <input checked="" type="checkbox"/> Production ; <input type="checkbox"/> Pre-Production ; <input type="checkbox"/> Prototype |
| Type of EUT                         |   |
| <input checked="" type="checkbox"/> | Stand-alone   |
| <input type="checkbox"/>            | Combined (EUT where the radio part is fully integrated within another device)<br>Combined Equipment - Brand Name / Model No.: |
| <input type="checkbox"/>            | Plug-in radio (EUT intended for a variety of host systems)<br>Host System - Brand Name / Model No.:                           |
| <input type="checkbox"/>            | Other:  |

### 1.1.5 EUT Operational Condition

|                          |   |   |   |
|--------------------------|---|---|---|
| <b>Supply Voltage</b>    | <input type="checkbox"/> AC mains           | <input checked="" type="checkbox"/> DC 5Vdc |   |
| <b>Type of DC Source</b> | <input type="checkbox"/> Internal DC supply | <input type="checkbox"/> FromDC Adapter     | <input checked="" type="checkbox"/> From Host |

## 1.2 Support Equipment

| Support Equipment |                                 |            |            |         |
|-------------------|---------------------------------|------------|------------|---------|
| No.               | Equipment                       | Brand Name | Model Name | FCC ID  |
| <b>In Local</b>   |                                 |            |            |         |
| 1                 | NoteBook                        | DELL       | E5430      | DoC     |
| 2                 | (USB) Printer                   | EPSON      | C61        | N/A     |
| 3                 | (USB) Mouse<br>(For Below 1GHz) | Microsoft  | 1113       | Doc     |
| 4                 | (USB) Mouse<br>(For Above 1GHz) | DELL       | MOC5UO     | Doc     |
| <b>In Remote</b>  |                                 |            |            |         |
| 1                 | Wireless AP                     | ASUS       | RT-AC66U   | MSQ-RTA |

## 1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15B
- ANSI C63.4-2009

## 1.4 Testing Location Information

| Testing Location                               |        |  |               |                  |
|--|--------|--|---------------|------------------|
| <input checked="" type="checkbox"/>            | HWA YA | ADD : No. 52, Hwa Ya 1 <sup>st</sup> Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. |               |                  |
|  |        | TEL : 886-3-327-3456 FAX : 886-3-327-0973  |               |                  |
| Test Condition                                 |        | Test Site No.  | Test Engineer | Test Environment |
| AC Conduction                                  |        | CO04-HY  | Zeus          | 24°C / 51%       |
| Radiated Emission<br>(Below 1GHz)              |        | 10CH01   | Nigel         | 13°C / 50%       |
| Radiated Emission<br>(Above 1GHz)              |        | 03CH04   | Allan         | 25°C / 50%       |
| Test site registered number [643075] with FCC. |        |  |               |                  |

## 1.5 Measurement Uncertainty



ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

| Measurement Uncertainty           |               |             |
|-----------------------------------|---------------|-------------|
| Test Item                         |               | Uncertainty |
| AC power-line conducted emissions |               | ±2.26 dB    |
| All emissions, radiated           | 30 – 1000 MHz | ±2.56 dB    |
|                                   | 1 – 18 GHz    | ±3.59 dB    |
|                                   | 18 – 40 GHz   | ±3.82 dB    |
|                                   | 40 – 200 GHz  | N/A         |

## 2 Test Configuration of EUT

### 2.1 The Worst Case Measurement Configuration

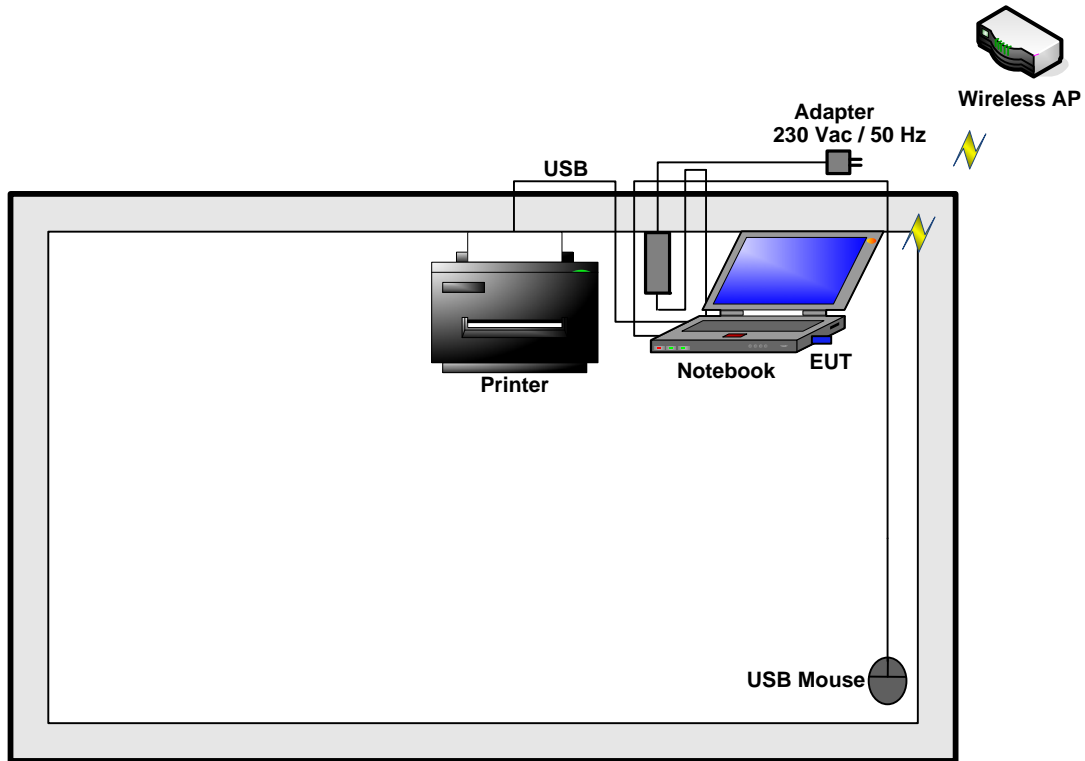
| The Worst Case Mode for Following Conformance Tests |   |
|---|---|
| <b>Tests Item</b>                                   | AC power-line conducted emissions   |
| <b>Condition</b>                                    | AC power-line conducted measurement for line and neutral<br>Test Voltage: 120Vac / 60Hz |
| <b>Operating Mode</b>                               | <b>Operating Mode Description</b>   |
| 1   | EUT with Notebook via WiFi link   |

| The Worst Case Mode for Following Conformance Tests |   |   |
|---|---|---|
| <b>Tests Item</b>                                   | Radiated Emissions  |   |
| <b>Test Condition</b>                               | Radiated measurement  |   |
| <b>Search Range</b>                                 | <b>Highest Frequency Generated or Used in Device</b>  | <b>Upper Frequency of Radiated Measurement</b>  |
|   | Below 1.705MHz  | No radiated testing required  |
|   | 1.705MHz-108MHz   | 1GHz  |
|   | 108MHz-500MHz   | 2GHz  |
|   | 500MHz-1GHz   | 5GHz  |
|   | Above 1GHz  | 5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower.      |
| <b>User Position</b>                                | <input type="checkbox"/> EUT will be placed in fixed position.  |   |
|   | <input checked="" type="checkbox"/> EUT will be placed in mobile position and operating multiple positions. EUT shall be performed two orthogonal planes. The worst plane is X. |   |
|   | <input type="checkbox"/> EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed two or three orthogonal planes.  |   |
|   | <input checked="" type="checkbox"/> 1. EUT with Notebook via WiFi link  |   |
|   | For operating mode 1 is the worst case and it was record in this test report.   |   |
| <b>Orthogonal Planes of EUT</b>                     | <b>X Plane</b>  | <b>Y Plane</b>  |
|   |    |  |

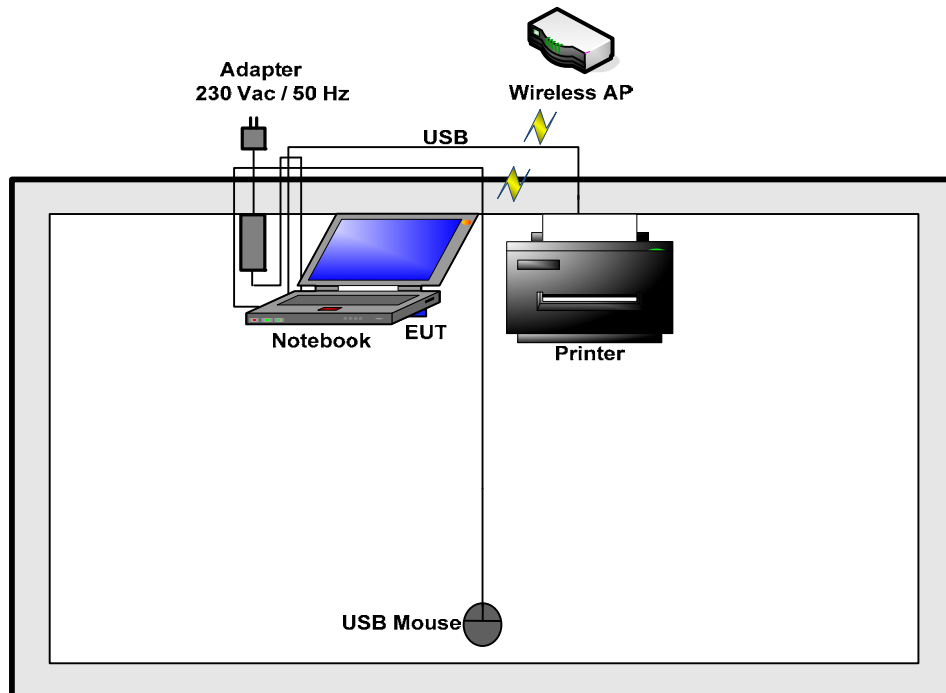


## 2.2 Test Setup Diagram

**Test Setup Diagram – AC Line Conducted Emission Test**



**Test Setup Diagram - Radiated Test**



### 3 Transmitter Test Result

### 3.1 AC Power-line Conducted Emissions

### 3.1.1 AC Power-line Conducted Emissions Limit

| AC Power-line Conducted Emissions Limit (Class B) |            |           |
|---|------------|-----------|
| Frequency Emission (MHz)                          | Quasi-Peak | Average   |
| 0.15-0.5  | 66 - 56 *  | 56 - 46 * |
| 0.5-5   | 56         | 46        |
| 5-30  | 60         | 50        |

Note 1: \* Decreases with the logarithm of the frequency.

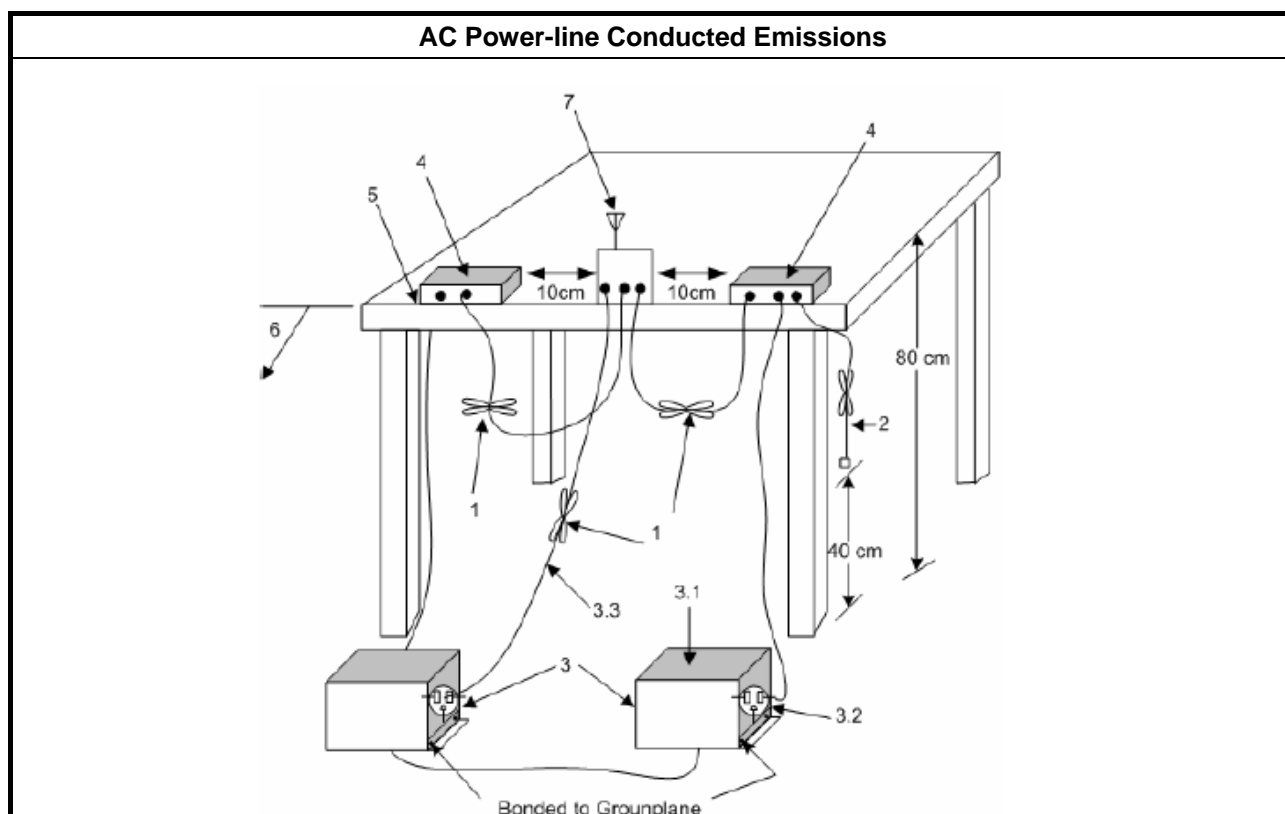
### 3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

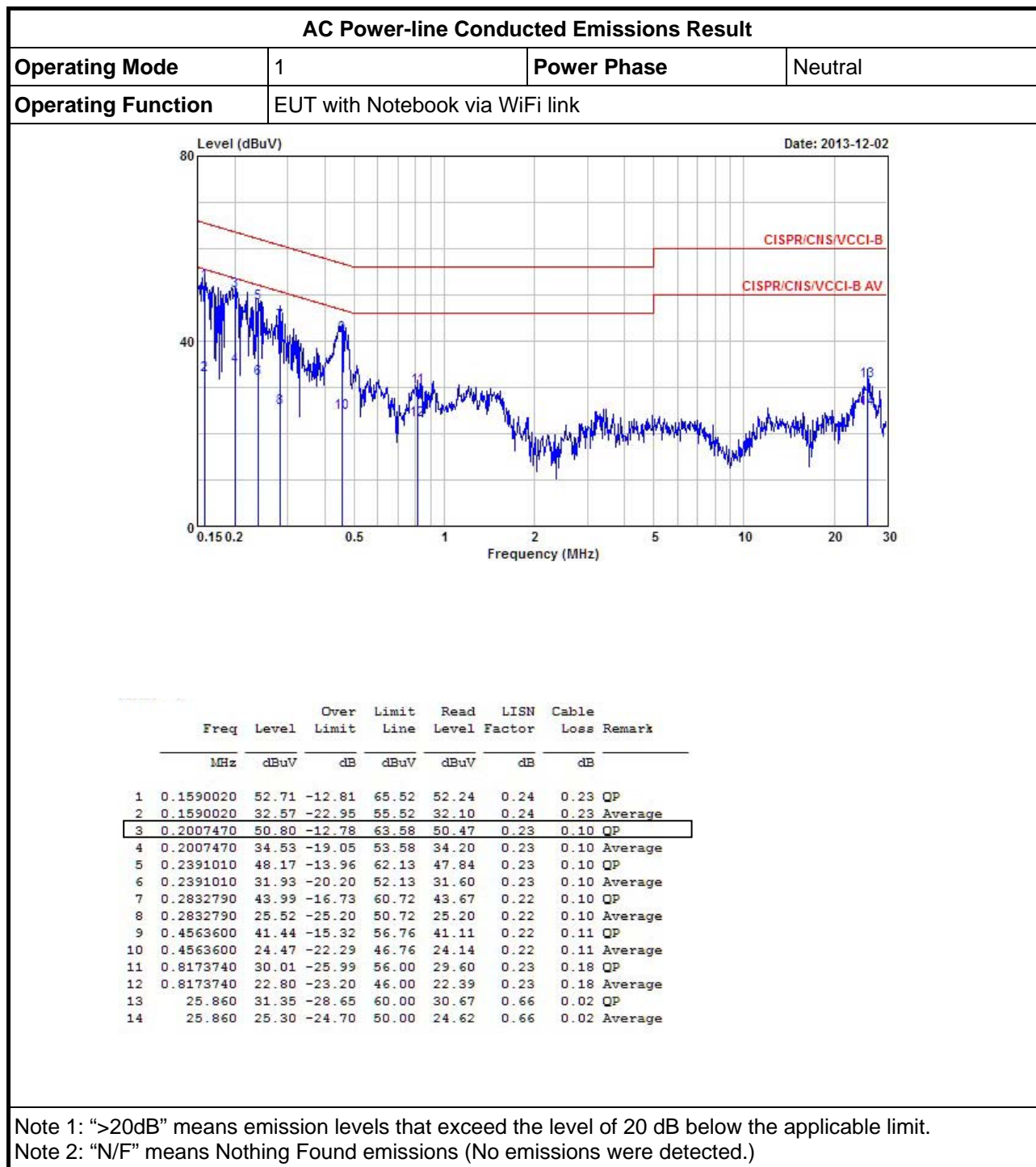
### 3.1.3 Test Procedures

| Test Method                         |  |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | Refer as ANSI C63.4, clause 7.3 for AC power-line conducted emissions. |

### 3.1.4 Test Setup

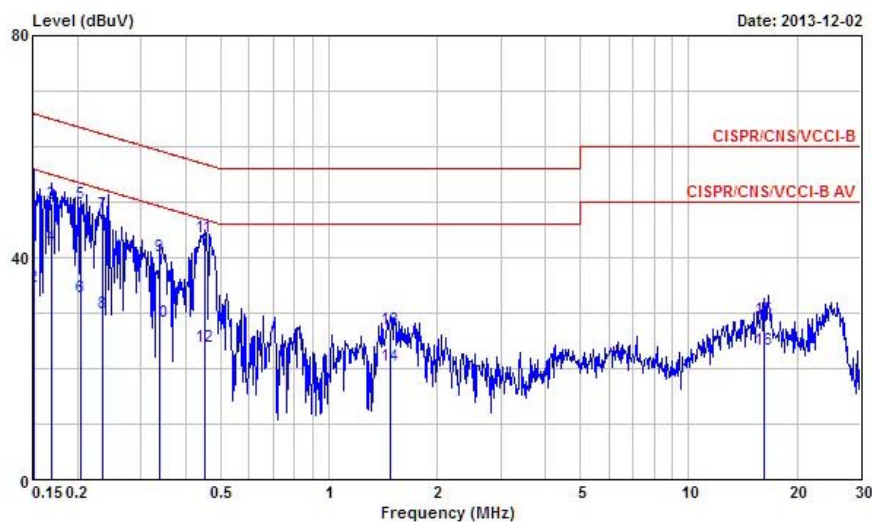


### 3.1.5 Test Result of AC Power-line Conducted Emissions



**AC Power-line Conducted Emissions Result**

|                    |                                 |             |      |
|--------------------|---------------------------------|-------------|------|
| Operating Mode     | 1                               | Power Phase | Line |
| Operating Function | EUT with Notebook via WiFi link |             |      |



|    | Freq      | Level | Over   | Limit | Read  | LISN   | Cable |         |
|----|-----------|-------|--------|-------|-------|--------|-------|---------|
|    | MHz       | dBuV  | Limit  | Line  | Level | Factor | Loss  | Remark  |
|    |           |       | dB     | dBuV  | dBuV  | dB     | dB    |         |
| 1  | 0.1507970 | 50.20 | -15.76 | 65.96 | 49.83 | 0.11   | 0.26  | QP      |
| 2  | 0.1507970 | 34.75 | -21.21 | 55.96 | 34.38 | 0.11   | 0.26  | Average |
| 3  | 0.1694400 | 49.86 | -15.13 | 64.99 | 49.56 | 0.11   | 0.19  | QP      |
| 4  | 0.1694400 | 42.11 | -12.88 | 54.99 | 41.81 | 0.11   | 0.19  | Average |
| 5  | 0.2050460 | 49.66 | -13.74 | 63.40 | 49.45 | 0.11   | 0.10  | QP      |
| 6  | 0.2050460 | 32.87 | -20.53 | 53.40 | 32.66 | 0.11   | 0.10  | Average |
| 7  | 0.2353310 | 48.01 | -14.25 | 62.26 | 47.80 | 0.11   | 0.10  | QP      |
| 8  | 0.2353310 | 29.91 | -22.35 | 52.26 | 29.70 | 0.11   | 0.10  | Average |
| 9  | 0.3391950 | 40.15 | -19.07 | 59.22 | 39.95 | 0.10   | 0.10  | QP      |
| 10 | 0.3391950 | 28.51 | -20.71 | 49.22 | 28.31 | 0.10   | 0.10  | Average |
| 11 | 0.4515500 | 43.68 | -13.17 | 56.85 | 43.47 | 0.10   | 0.11  | QP      |
| 12 | 0.4515500 | 24.06 | -22.79 | 46.85 | 23.85 | 0.10   | 0.11  | Average |
| 13 | 1.480     | 27.18 | -28.82 | 56.00 | 26.80 | 0.12   | 0.26  | QP      |
| 14 | 1.480     | 20.42 | -25.58 | 46.00 | 20.04 | 0.12   | 0.26  | Average |
| 15 | 16.230    | 28.97 | -31.03 | 60.00 | 28.48 | 0.29   | 0.20  | QP      |
| 16 | 16.230    | 23.36 | -26.64 | 50.00 | 22.87 | 0.29   | 0.20  | Average |

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.  
 Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

## 3.2 Radiated Spurious Emissions

### 3.2.1 Radiated Spurious Emissions Limit

| <b>CISPR 22 Limits for radiated disturbance of class B ITE at a measuring distance of 10 m</b>   |  |
|--|--|
| <b>Frequency range (MHz)</b>   | <b>Quasi-peak limits (dB<math>\mu</math>V/m)</b> |
| 30 to 230  | 30   |
| 230 to 1000  | 37   |
| Note 1: The lower limit shall apply at the transition frequency.<br>Note 2: Additional provisions may be required for cases where interference occurs. |  |

| <b>FCC Part 15B Radiated Spurious Emissions Limit (Class B)</b>   |                              |                                |                             |
|---|------------------------------|--------------------------------|-----------------------------|
| <b>Frequency Range (MHz)</b>  | <b>Field Strength (uV/m)</b> | <b>Field Strength (dBuV/m)</b> | <b>Measure Distance (m)</b> |
| Above 960   | 500                          | 54                             | 3                           |
| Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements). |                              |                                |                             |

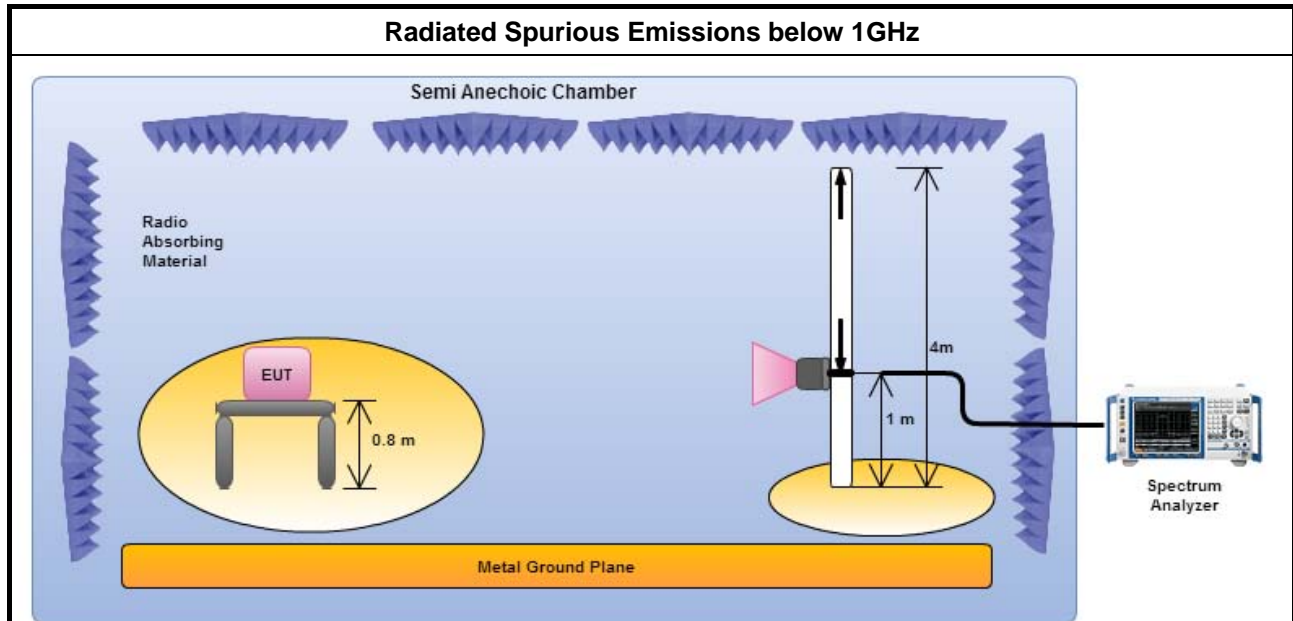
### 3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

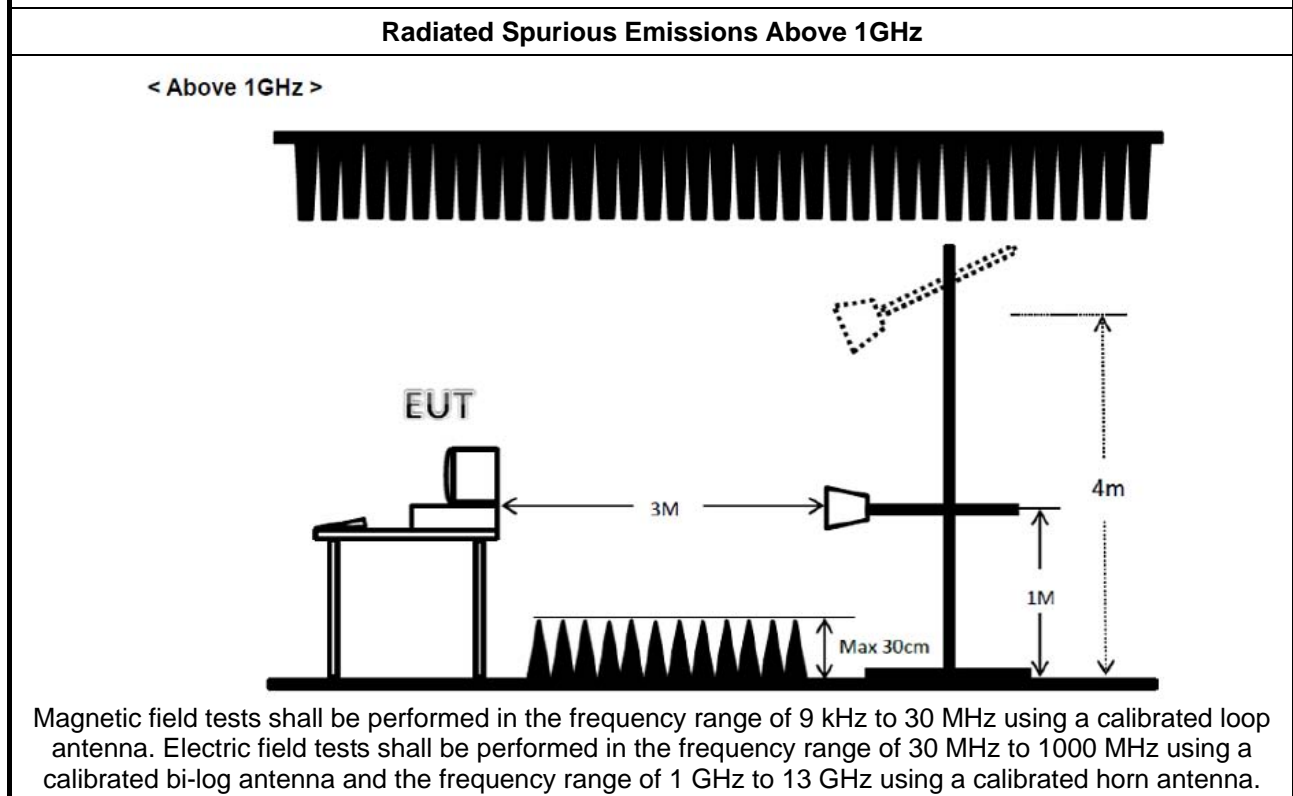
### 3.2.3 Test Procedures

| Test Method – General Information   |   |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is higher, to at least 5 times the highest tunable or local oscillator frequency, whichever is higher, without exceeding 40 GHz.   |
| <input checked="" type="checkbox"/> | Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements). |
| <input checked="" type="checkbox"/> | Measurements in the frequency range 10 GHz - 40GHz are typically made at a closer distance 1m, because the instrumentation noise floor is typically close to the radiated emission limit.   |
| <input checked="" type="checkbox"/> | For radiated measurement.   |
| <input type="checkbox"/>            | Refer as ANSI C63.4, clause 8.3.1.1 and 8.3.2.2 for radiated emissions from below 30 MHz.   |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.4, clause 8.3.1.1 and 8.3.2.2 for radiated emissions from 30 MHz-1 GHz. For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the QP-Limit so that the QP level does not need to be reported in addition.  |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.4, clause 8.3.2.1 and 8.3.2 for radiated emissions from above 1 GHz. For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.   |

### 3.2.4 Test Setup



Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna and the frequency range of 1 GHz to 13 GHz using a calibrated horn antenna.

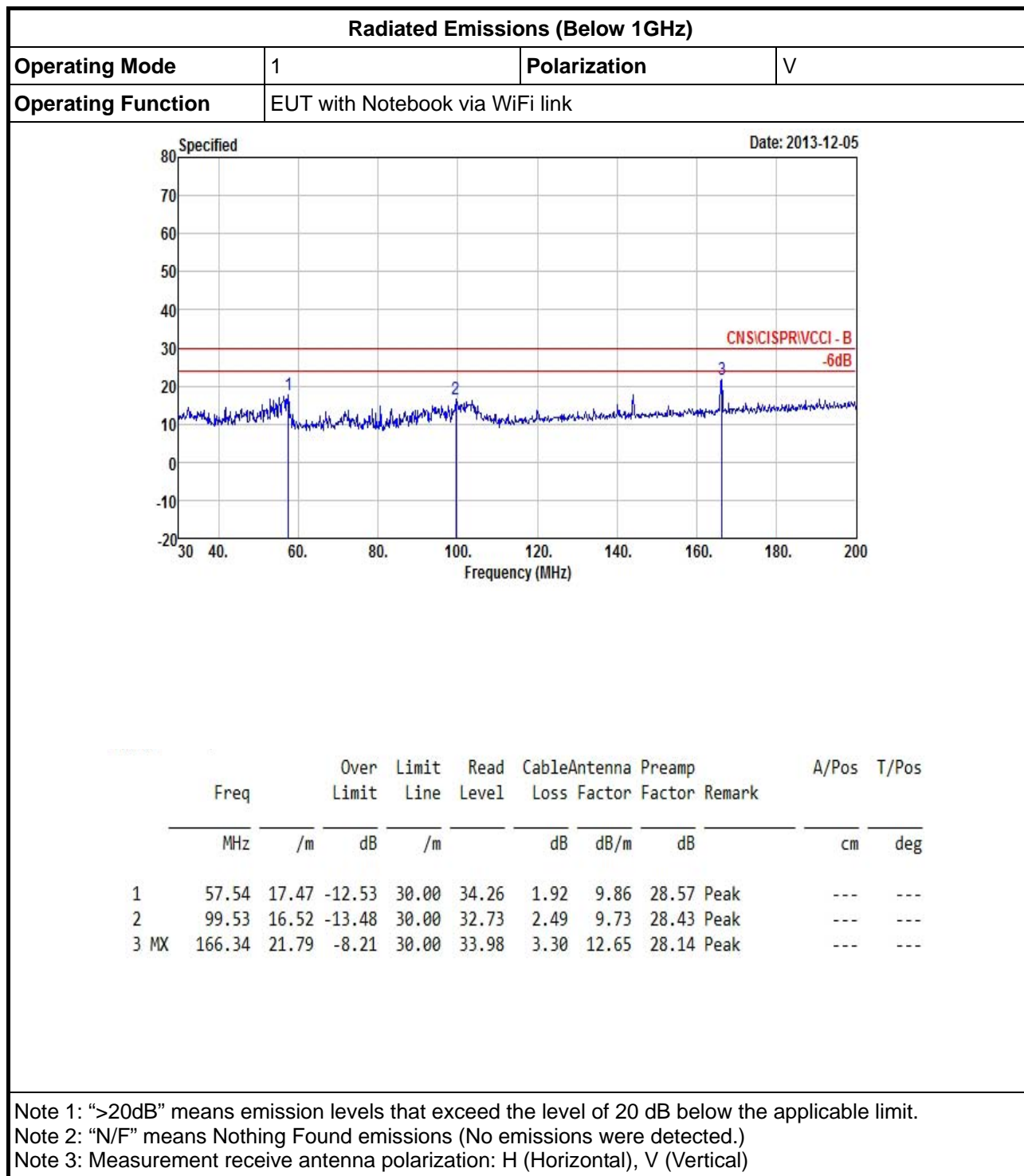


For radiated emissions 30 MHz to 1 GHz, test distance is 10m.

For radiated emissions 1 GHz to 13 GHz, test distance is 3m.



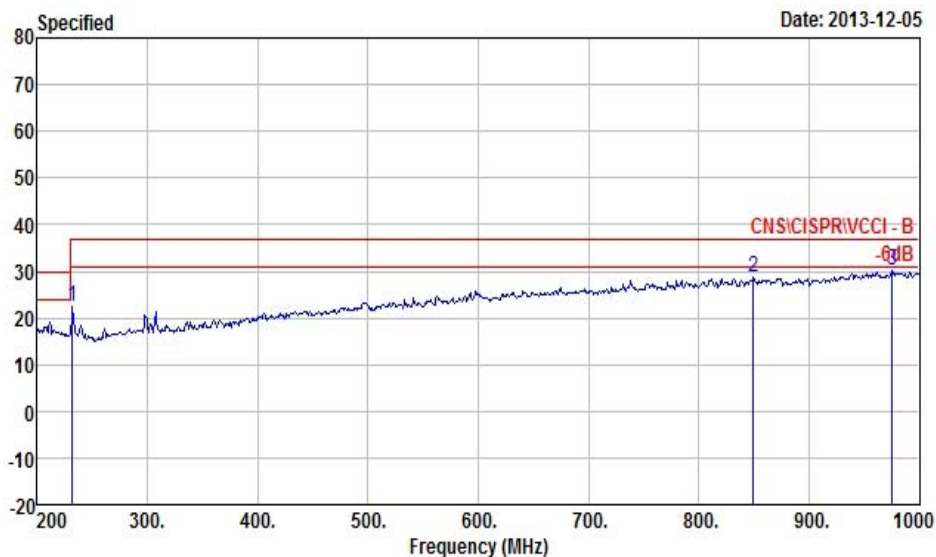
### 3.2.5 Radiated Emissions (Below 1GHz)





**Radiated Emissions (Below 1GHz)**

|                    |                                 |              |   |
|--------------------|---------------------------------|--------------|---|
| Operating Mode     | 1                               | Polarization | V |
| Operating Function | EUT with Notebook via WiFi link |              |   |



|      | Freq   |       | Over   | Limit | Read  | CableAntenna | Preamp |        | A/Pos  | T/Pos |
|------|--------|-------|--------|-------|-------|--------------|--------|--------|--------|-------|
|      |        |       | Limit  | Line  | Level | Loss         | Factor | Factor | Remark |       |
|      | MHz    | /m    | dB     | /m    |       | dB           | dB/m   | dB     |        | cm    |
| 1    | 232.00 | 22.52 | -14.48 | 37.00 | 32.98 | 3.95         | 13.00  | 27.41  | Peak   | ---   |
| 2    | 849.60 | 28.63 | -8.37  | 37.00 | 27.24 | 8.10         | 20.95  | 27.66  | Peak   | ---   |
| 3 MX | 976.00 | 30.14 | -6.86  | 37.00 | 27.20 | 8.30         | 21.79  | 27.15  | Peak   | ---   |

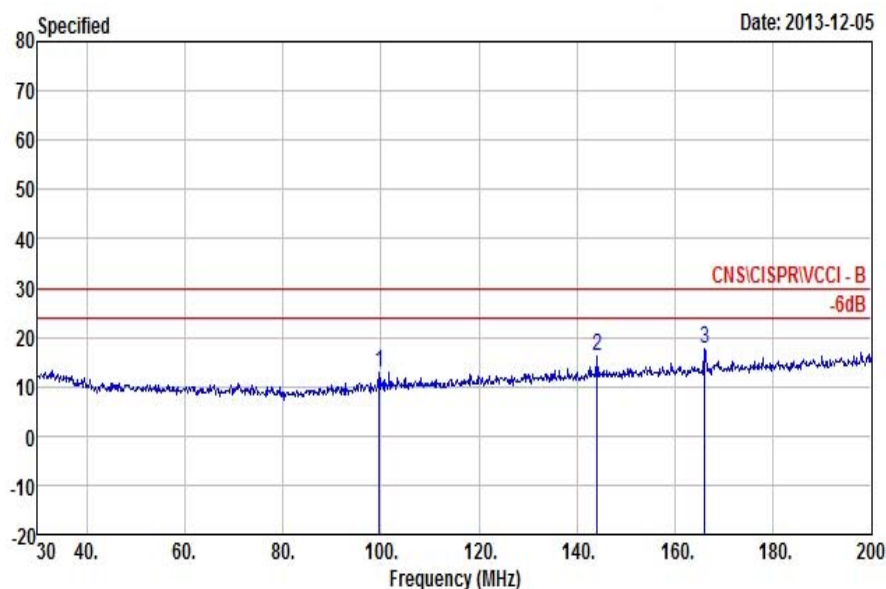
Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

**Radiated Emissions (Below 1GHz)**

|                           |                                 |                     |   |
|---------------------------|---------------------------------|---------------------|---|
| <b>Operating Mode</b>     | 1                               | <b>Polarization</b> | H |
| <b>Operating Function</b> | EUT with Notebook via WiFi link |                     |   |



|      | Freq   |       | Over   | Limit | Read  | CableAntenna | Preamp |        | A/Pos  | T/Pos |
|------|--------|-------|--------|-------|-------|--------------|--------|--------|--------|-------|
|      | MHz    | /m    | Limit  | Line  | Level | Loss         | Factor | Factor | Remark |       |
|      | MHz    | /m    | dB     | /m    |       | dB           | dB/m   | dB     |        | cm    |
| 1    | 99.70  | 12.94 | -17.06 | 30.00 | 29.13 | 2.49         | 9.75   | 28.43  | Peak   | ---   |
| 2    | 144.07 | 16.05 | -13.95 | 30.00 | 29.50 | 2.99         | 11.80  | 28.24  | Peak   | ---   |
| 3 MX | 166.00 | 17.52 | -12.48 | 30.00 | 29.72 | 3.30         | 12.64  | 28.14  | Peak   | ---   |

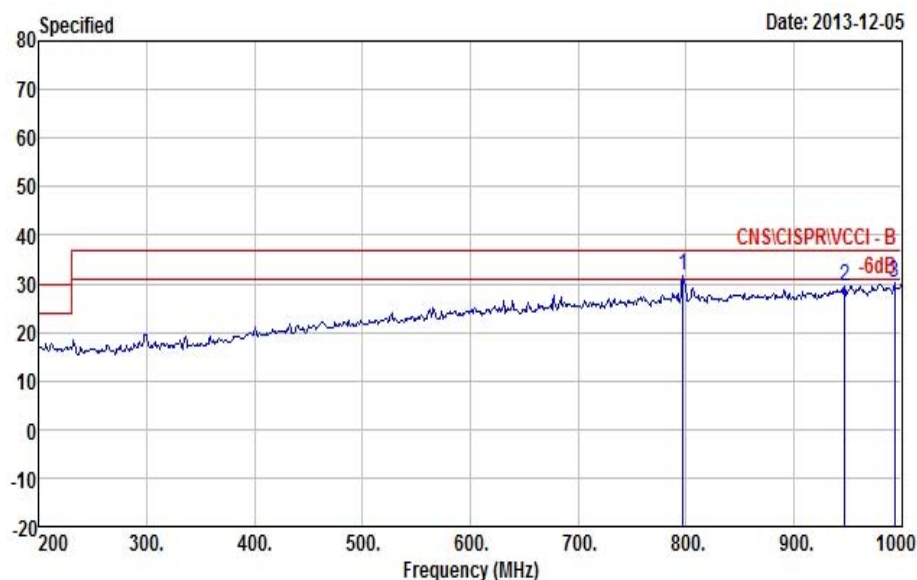
Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

**Radiated Emissions (Below 1GHz)**

|                    |                                 |              |   |
|--------------------|---------------------------------|--------------|---|
| Operating Mode     | 1                               | Polarization | H |
| Operating Function | EUT with Notebook via WiFi link |              |   |



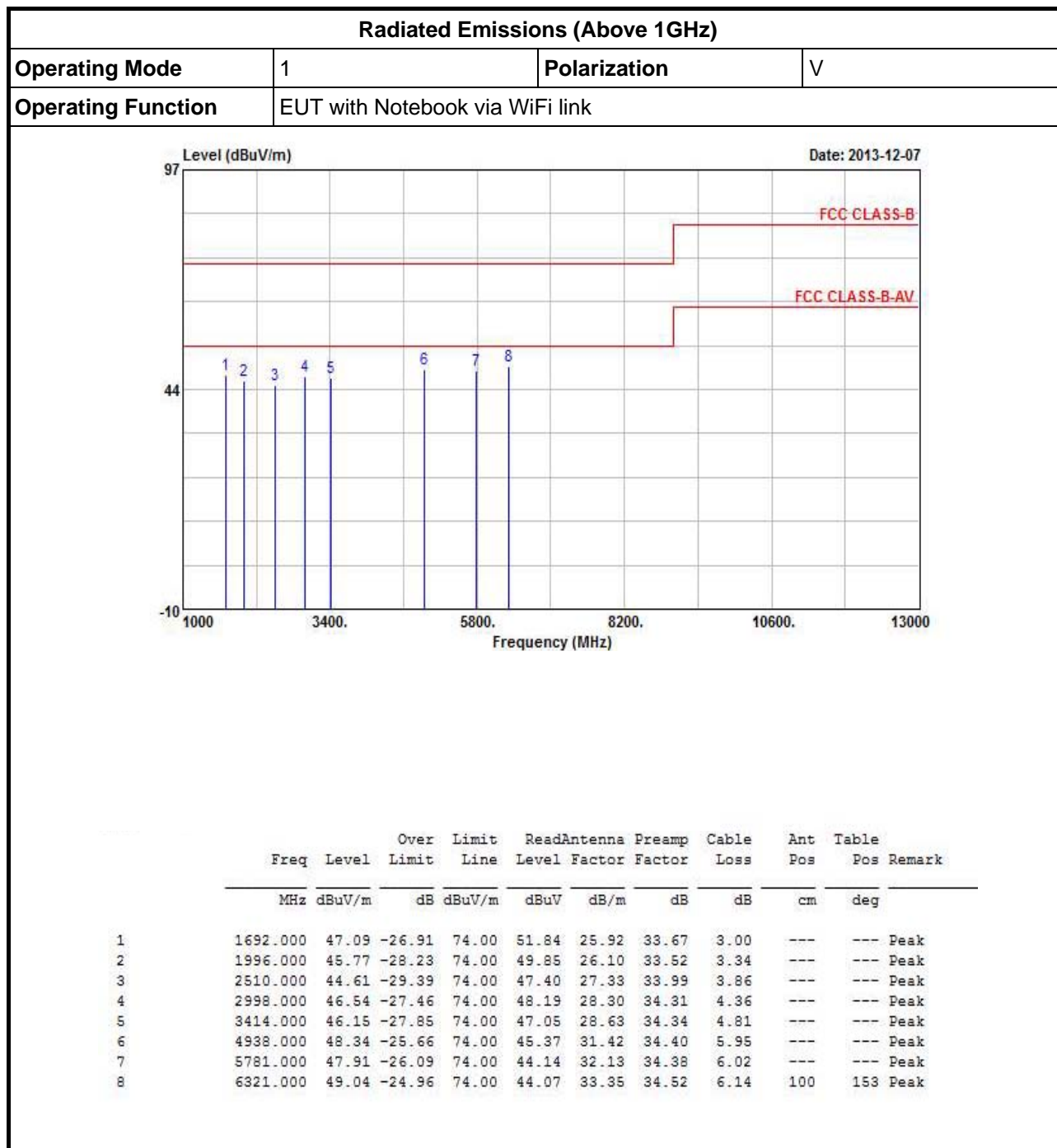
|      | Freq   |       | Over  | Limit | Read  | CableAntenna |        | Preamp |        | A/Pos | T/Pos |
|------|--------|-------|-------|-------|-------|--------------|--------|--------|--------|-------|-------|
|      |        |       | Limit | Line  | Level | Loss         | Factor | Factor | Remark |       |       |
|      | MHz    | /m    | dB    | /m    |       | dB           | dB/m   | dB     |        | cm    | deg   |
| 1 MX | 797.60 | 31.54 | -5.46 | 37.00 | 30.87 | 7.66         | 20.88  | 27.87  | Peak   | 105   | 200   |
| 2    | 947.20 | 29.52 | -7.48 | 37.00 | 27.01 | 8.29         | 21.49  | 27.27  | Peak   | ---   | ---   |
| 3    | 993.60 | 30.13 | -6.87 | 37.00 | 27.01 | 8.24         | 21.97  | 27.09  | Peak   | ---   | ---   |

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

### 3.2.6 Radiated Emissions (Above 1GHz)



Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

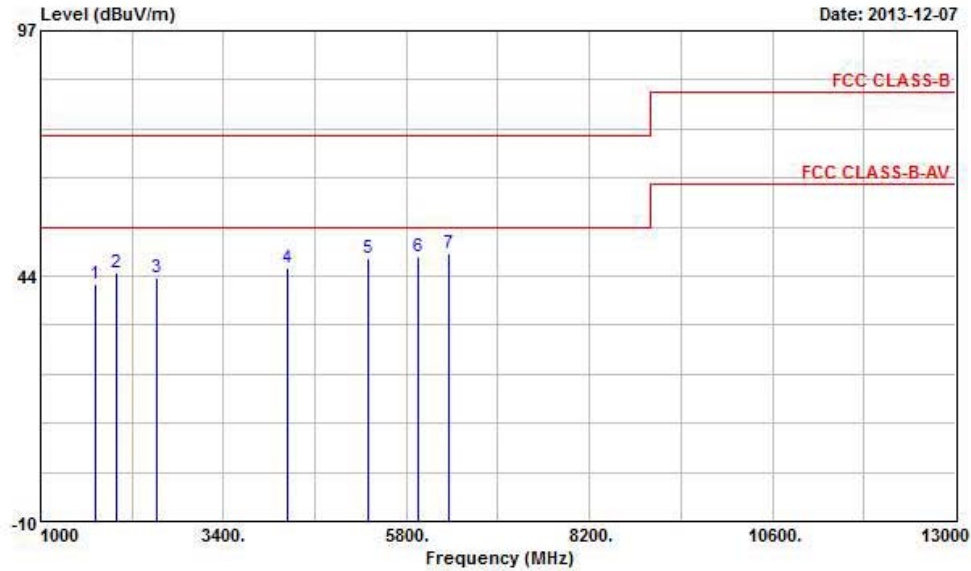
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: Measurements in the frequency range 1GHz~5GHz are typically made at a distance 3m.

Note 5: Measurements in the frequency range above 5GHz are typically made at a distance 1m.

**Radiated Emissions (Above 1GHz)**

|                           |                                 |                     |   |
|---------------------------|---------------------------------|---------------------|---|
| <b>Modulation Mode</b>    | 1                               | <b>Polarization</b> | H |
| <b>Operating Function</b> | EUT with Notebook via WiFi link |                     |   |



|   | Freq     | Level  | Over<br>Limit | Limit<br>Line | ReadAntenna<br>Level | Preamp<br>Factor | Cable<br>Factor | Cable<br>Loss | Ant<br>Pos | Table<br>Pos | Remark |
|---|----------|--------|---------------|---------------|----------------------|------------------|-----------------|---------------|------------|--------------|--------|
|   | MHz      | dBuV/m | dB            | dBuV/m        | dBuV                 | dB/m             | dB              | dB            | cm         | deg          |        |
| 1 | 1716.000 | 41.82  | -32.18        | 74.00         | 46.52                | 25.93            | 33.65           | 3.02          | ---        | ---          | Peak   |
| 2 | 1988.000 | 44.31  | -29.69        | 74.00         | 48.43                | 26.09            | 33.52           | 3.31          | ---        | ---          | Peak   |
| 3 | 2516.000 | 43.08  | -30.92        | 74.00         | 45.87                | 27.33            | 33.99           | 3.86          | ---        | ---          | Peak   |
| 4 | 4230.000 | 45.13  | -28.87        | 74.00         | 43.88                | 30.06            | 34.35           | 5.54          | ---        | ---          | Peak   |
| 5 | 5298.000 | 47.52  | -26.48        | 74.00         | 44.16                | 31.68            | 34.32           | 6.00          | ---        | ---          | Peak   |
| 6 | 5946.000 | 47.81  | -26.19        | 74.00         | 43.89                | 32.34            | 34.45           | 6.03          | ---        | ---          | Peak   |
| 7 | 6357.000 | 48.56  | -25.44        | 74.00         | 43.48                | 33.45            | 34.52           | 6.15          | ---        | ---          | Peak   |

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.

Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Note 4: Measurements in the frequency range 1GHz~5GHz are typically made at a distance 3m.

Note 5: Measurements in the frequency range above 5GHz are typically made at a distance 1m.

## 4 Test Equipment and Calibration Data

| Instrument             | Manufacturer                   | Model No. | Serial No.      | Characteristics | Calibration Date | Remark               |
|------------------------|--------------------------------|-----------|-----------------|-----------------|------------------|----------------------|
| EMC Receiver           | R&S                            | ESCS 30   | 100174          | 9kHz ~ 2.75GHz  | Mar. 26, 2013    | Conduction (CO04-HY) |
| LISN                   | SCHWARZBECK<br>MESS-ELEKTRONIK | NSLK 8127 | 8127-477        | 9kHz ~ 30MHz    | Jan. 21, 2013    | Conduction (CO04-HY) |
| LISN<br>(Support Unit) | EMCO                           | 3810/2NM  | 9703-1839       | 9kHz ~ 30MHz    | Apr. 18, 2013    | Conduction (CO04-HY) |
| RF Cable-CON           | HUBER+SUHNER                   | RG213/U   | 7.61183201e+012 | 9kHz ~ 30MHz    | Oct. 30, 2013    | Conduction (CO04-HY) |
| EMI Filter             | LINDGREN                       | LRE-2030  | 2651            | < 450 Hz        | N/A              | Conduction (CO04-HY) |

Note: Calibration Interval of instruments listed above is one year.

| Instrument                | Manufacturer                        | Model No.              | Serial No.   | Characteristics        | Calibration Date | Remark                |
|---------------------------|-------------------------------------|------------------------|--------------|------------------------|------------------|-----------------------|
| 10m Semi Anechoic Chamber | SIDT FRANKONIA                      | SAC-10M                | 10CH01-HY    | 30MHz ~ 1GHz<br>10m/3m | Jun. 10, 2013    | Radiation (10CH01-HY) |
| Spectrum Analyzer         | R&S                                 | FSP7                   | 838858/013   | 9kHz ~ 7GHz            | Feb. 21, 2013    | Radiation (10CH01-HY) |
| Receiver                  | R&S                                 | ESI7                   | 838496/009   | 20Hz ~ 7GHz            | Jul. 23, 2013    | Radiation (10CH01-HY) |
| Amplifier                 | Agilent                             | 8447D                  | 2944A10825   | 100kHz ~ 1.3GHz        | Apr. 19, 2013    | Radiation (10CH01-HY) |
| Amplifier                 | Agilent                             | 8447D                  | 2944A10826   | 100kHz ~ 1.3GHz        | Apr. 12, 2013    | Radiation (10CH01-HY) |
| Biconical Antenna         | Schwarz beck                        | VHBB 9124              | 286          | 30MHz ~ 200MHz         | Aug. 02, 2013    | Radiation (10CH01-HY) |
| Log Antenna               | Schwarz beck                        | VUSLP 9111             | 206          | 200MHz ~ 1GHz          | Aug. 02, 2013    | Radiation (10CH01-HY) |
| Turn Table                | HD                                  | DT 60 RPS              | 1513/004/00  | 0 ~ 360 degree         | N/A              | Radiation (10CH01-HY) |
| Antenna Mast              | HD                                  | MA240                  | 240/556/00   | 1 ~ 4 m                | N/A              | Radiation (10CH01-HY) |
| Antenna Mast              | HD                                  | MA240                  | 240/559/00   | 1 ~ 4 m                | N/A              | Radiation (10CH01-HY) |
| RF Cable-R10m             | BELDEN                              | RG8/U                  | CB023-INSIDE | 30MHz ~ 1GHz           | Nov. 14, 2013    | Radiation (10CH01-HY) |
| RF Cable-R10m             | Suhner Switzerland<br>+ Rosenberger | RG223/U +<br>UAA220A-0 | CB022-DOOR   | 30MHz ~ 1GHz           | Nov. 14, 2013    | Radiation (10CH01-HY) |

Note: Calibration Interval of instruments listed above is one year.

| Instrument               | Manufacturer | Model No.    | Serial No.        | Characteristics     | Calibration Date | Remark                   |
|--------------------------|--------------|--------------|-------------------|---------------------|------------------|--------------------------|
| 3m Semi Anechoic Chamber | TDK          | SAC-3M       | 03CH04-HY         | 1 GHz ~ 6 GHz<br>3m | May. 17, 2013    | Radiation<br>(03CH04-HY) |
| Receiver                 | R&S          | ESU          | 100422            | 20Hz ~ 26.5GHz      | Apr. 02, 2013    | Radiation<br>(03CH04-HY) |
| Amplifier                | Agilent      | 8449B        | 3008A02326        | 1 GHz ~ 26.5 GHz    | May. 17, 2013    | Radiation<br>(03CH04-HY) |
| Horn Antenna             | SCHWARZBECK  | BBHA9120     | BBHA9120D113<br>0 | 1 GHz ~ 18 GHz      | Sep.10, 2013     | Radiation<br>(03CH04-HY) |
| Turn Table               | Chaintek     | 3000         | MF7802056         | 0 ~ 360 degree      | NCR              | Radiation<br>(03CH04-HY) |
| Antenna Mast             | MF           | MF-7802      | MF780208163       | 1 m ~ 4 m           | NCR              | Radiation<br>(03CH04-HY) |
| RF Cable-HIGH            | SUHNER       | SUCOFLEX 106 | CB063-HF          | 1 GHz ~ 40 GHz      | Nov. 21, 2013    | Radiation<br>(03CH04-HY) |

Note: Calibration Interval of instruments listed above is one year.