

## ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

### INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART E REQUIREMENT AND INDUSTRY CANADA RSS 210 CLASS II PC REPORT

OF

**Product Name:** 802.11ac/a/b/g/n + BT Wireless Module  
**Brand Name:** UG  
**Model No.:** NFA-BAC-MR-02  
**Model Difference:** N/A  
**FCC ID:** COFNFABACMR02  
**IC:** 10293A- NFABACMR02  
**Report No.:** ER/2014/40012  
**Issue Date:** May. 06, 2014  
**FCC Rule Part:** §15.407  
**IC Rule Part:** RSS-210 issue 8:2010, Annex 9  
**Prepared for:** UNIVERSAL GLOBAL SCIENTIFIC INDUSTRIAL CO., LTD.  
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**VERIFICATION OF COMPLIANCE**

**Applicant:** UNIVERSAL GLOBAL SCIENTIFIC INDUSTRIAL CO., LTD.  
141, Lane 351, Sec. 1, Taiping Road, TsaoTuen, Nantou 54261, Taiwan

**Product Name:** 802.11ac/a/b/g/n + BT Wireless Module

**Brand Name:** UG

**Model No.:** NFA-BAC-MR-02

**Model Difference:** N/A

**FCC ID:** COFNFABACMR02

**IC:** 10293A- NFABACMR02

**File Number:** ER/2014/40012

**Date of test:** Apr. 03, 2014 ~ Apr. 25, 2014

**Date of EUT Received:** Apr. 03, 2014

**We hereby certify that:**

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4:2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.407 and RSS-210 issue 8: 2010 Annex 9. The test results of this report relate only to the tested sample identified in this report.

**Test By:****Date:**

May. 06, 2014

*Marcus Tseng / Engineer***Prepared By:****Date:**

May. 06, 2014

*Violetta Tang / Clerk***Approved By:****Date:**

May. 06, 2014

*Jim Chang / Supervisor*

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## Version

| Version No. | Date          | Description                  |
|-------------|---------------|------------------------------|
| 00          | May. 06, 2014 | Initial creation of document |
|             |               |                              |
|             |               |                              |

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## 1. GENERAL INFORMATION

### 1.1. Product Description

#### 1.2. General Information of Notebook:

|                             |  |
|-----------------------------|--|
| Product Name:               | Notebook Computer  |
| Brand Name:                 | Lenovo   |
| Model No.:                  | Lenovo N20 Chrome, 80G1, 20419, Lenovo N20p Chrome, 80G2, 20425  |
| Model Difference:           | Market Segmentation  |
| Hardware Version:           | N/A  |
| Software Version:           | N/A  |
| Model No. for BT Module:    | NFA-BAC-MR-02  |
| Module FCC ID:              | COFNFABACMR02  |
| Module IC:                  | 10293A- NFABACMR02   |
| Scope:                      | The test report covers the radiated emissions requirements of the standards referenced in the report to allow system level approval of the module in this specific host. |
| Class II Permissive change: | 802.11ac/a/b/g/n + BT Wireless Module (NFA-BAC-MR-02) card Installed in an Notebook Computer   |
| Power Supply:               | 11.1Vdc Rechargeable Li-polymer battery pack or 20Vdc from AC/DC adapter   |
|                             | Battery: 1. Model No.: L13M6P61, Supplier: Simplon   |
|                             | Battery: 2. Model No.: L13L3P61, Supplier: LG  |
|                             | Adapter: 1. Model No.: ADLX45NCC3A, Supplier: Chicony  |
|                             | Adapter: 2. Model No.: ADLX45NDC3A , Supplier: Delta   |
|                             | Adapter: 3. Model No.: ADLX45NLC3A, Supplier: Liteon   |

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**WLAN 5GHz:**

| Wi-Fi | Frequency Range    | Channels | Rated Power (Avg.) / Average Rated Power(EIRP)   | Modulation Technology | Type of Emission Listed in Test Report/Original Grant: |
|-------|--------------------|----------|--|-----------------------|--|
| 11a   | 5150~5250          | 4        | 15.93dBm (Avg.)<br>16.61dBm (EIRP)   | OFDM                  | 17M8D1D  |
|       | 5250~5350          | 4        | 14.96dBm (Avg.)<br>16.52dBm (EIRP)   |                       | 18M0D1D  |
|       | 5470~5600          | 5        | 15.99dBm (Avg.)<br>18.76dBm (EIRP)   |                       | 18M0D1D  |
|       | 5650~5725          | 3        | 15.19dBm (Avg.)<br>17.96dBm (EIRP)   |                       | 18M0D1D  |
| 11ac  | (20M)<br>5150~5250 | 4        | Avg. Power:<br>ac 20M: 14.27dBm<br>(MIMO Chain 0): 14.53dBm<br>(MIMO Chain 1): 13.19dBm<br>(MIMO Chain 0+1): 16.81dBm<br>EIRP:<br>ac 20M: 15.01dBm<br>(MIMO Chain 0+1): 18.22dBm | OFDM                  | 17M8D1D  |
|       | (20M)<br>5250~5350 | 4        | Avg. Power:<br>ac 20M: 14.98dBm<br>(MIMO Chain 0): 15.69dBm<br>(MIMO Chain 1): 14.73dBm<br>(MIMO Chain 0+1): 18.25dBm<br>EIRP:<br>ac 20M: 16.55dBm<br>(MIMO Chain 0+1): 20.93dBm |                       | 18M0D1D  |
|       | (20M)<br>5470~5600 | 5        | Avg. Power:<br>ac 20M: 15.71dBm<br>(MIMO Chain 0): 15.24dBm<br>(MIMO Chain 1): 15.41dBm<br>(MIMO Chain 0+1): 18.34dBm<br>EIRP:<br>ac 20M: 18.48dBm<br>(MIMO Chain 0+1): 23.88dBm |                       | 18M0D1D  |
|       | (20M)<br>5650~5725 | 3        | Avg. Power:<br>ac 20M: 11.68dBm<br>(MIMO Chain 0): 10.91dBm<br>(MIMO Chain 1): 12.02dBm<br>(MIMO Chain 0+1): 14.51dBm<br>EIRP:<br>ac 20M: 14.45dBm<br>(MIMO Chain 0+1): 20.05dBm |                       | 18M0D1D  |

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|      |                    |   |   |      |         |
|------|--------------------|---|---|------|---------|
| 11ac | (40M)<br>5150-5250 | 2 | Avg. Power:<br>ac 40M: 13.82dBm<br>(MIMO Chain 0): 13.34dBm<br>(MIMO Chain 1): 13.62dBm<br>(MIMO Chain 0+1): 16.49dBm<br>EIRP<br>ac 40M: 14.56dBm<br>(MIMO Chain 0+1): 17.94dBm | OFDM | 36M6D1D |
|      | (40M)<br>5250-5350 | 2 | Avg. Power:<br>ac 40M: 14.56dBm<br>(MIMO Chain 0): 14.78dBm<br>(MIMO Chain 1): 13.81dBm<br>(MIMO Chain 0+1): 17.33dBm<br>EIRP<br>ac 40M: 16.13dBm<br>(MIMO Chain 0+1): 20.00dBm |      | 36M8D1D |
|      | (40M)<br>5470-5600 | 2 | Avg. Power:<br>ac 40M: 13.88dBm<br>(MIMO Chain 0): 14.55dBm<br>(MIMO Chain 1): 14.20dBm<br>(MIMO Chain 0+1): 17.39dBm<br>EIRP<br>ac 40M: 17.18dBm<br>(MIMO Chain 0+1): 22.93dBm |      | 36M6D1D |
|      | (40M)<br>5650-5725 | 1 | Avg. Power:<br>HT40: 13.09dBm<br>(MIMO Chain 0): 12.82dBm<br>(MIMO Chain 1): 13.25dBm<br>(MIMO Chain 0+1): 16.05dBm<br>EIRP<br>ac 40M: 15.86dBm<br>(MIMO Chain 0+1): 21.59dBm   |      | 36M6D1D |

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|                     |                    |   |  |      |         |  |
|---------------------|--------------------|---|--|------|---------|--|
| 11ac                | (80M)<br>5150-5250 | 1   | Avg. Power:<br>ac 80M: 9.07dBm<br>(MIMO Chain 0): 9.77dBm<br>(MIMO Chain 1): 6.44dBm<br>(MIMO Chain 0+1): 11.43dBm<br>EIRP<br>ac 80M: 9.81dBm<br>(MIMO Chain 0+1): 12.72dBm  | OFDM | 76M3D1D |  |
|                     | (80M)<br>5250-5350 | 1   | Avg. Power:<br>ac 80M: 8.65dBm<br>(MIMO Chain 0): 9.25dBm<br>(MIMO Chain 1): 7.01dBm<br>(MIMO Chain 0+1): 11.28dBm<br>EIRP<br>ac 80M: 10.22dBm<br>(MIMO Chain 0+1): 13.86dBm |      | 76M3D1D |  |
|                     | (80M)<br>5470-5600 | 1   | Avg. Power:<br>ac 80M: 8.48dBm<br>(MIMO Chain 0): 8.05dBm<br>(MIMO Chain 1): 8.36dBm<br>(MIMO Chain 0+1): 11.22dBm<br>EIRP<br>ac 80M: 11.25dBm<br>(MIMO Chain 0+1): 16.75dBm |      | 76M3D1D |  |
| Antenna Designation |                    | PIFA Antenna, Supplier: High-Tek Electronics Co., Ltd<br>TX1 Antenna:<br>5GHz Gain: 0.68dBi (5150MHz-5250MHz)<br>5GHz Gain: 0.68dBi (5250MHz-5350MHz)<br>5GHz Gain: 2.77dBi (5470MHz-5725MHz)<br>TX2 Antenna:<br>5GHz Gain: 0.74dBi (5150MHz-5250MHz)<br>5GHz Gain: 1.57dBi (5250MHz-5350MHz)<br>5GHz Gain: 2.77dBi (5470MHz-5725MHz) |  |      |         |  |
| Modulation type     |                    | CCK, DQPSK, DBPSK for DSSS<br>64QAM, 16QAM, QPSK, BPSK for OFDM   |  |      |         |  |
| Transition Rate:    |                    | 802.11 a: 6/9/12/18/24/36/48/54Mbps<br>802.11 ac (20M): 6.5 – 144Mbps;<br>802.11 ac (40M): 13.5 – 300Mbps;<br>802.11 ac (80M): 29.3 - 866.7Mbps   |  |      |         |  |

This report applies for frequency bands 5150MHz-5250MHz, 5250MHz-5350MHz and 5470MHz-5725MHz.

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**IEEE 802.11n Spec:**

| MCS Index | Nss | Modulation | R   | NBPSC | NCBPS |       | NDBPS |       | Datarate(Mbps) |       |        |       |
|-----------|-----|------------|-----|-------|-------|-------|-------|-------|----------------|-------|--------|-------|
|           |     |            |     |       | 20MHz |       | 40MHz |       | 20MHz          |       | 40MHz  |       |
|           |     |            |     |       | 20MHz | 40MHz | 20MHz | 40MHz | 20MHz          | 40MHz | 20MHz  | 40MHz |
| 0         | 1   | BPSK       | 1/2 | 1     | 52    | 108   | 26    | 54    | 6.5            | 13.5  | 7.200  | 15    |
| 1         | 1   | QPSK       | 1/2 | 2     | 104   | 216   | 52    | 108   | 13.0           | 27.0  | 14.400 | 30    |
| 2         | 1   | QPSK       | 3/4 | 2     | 104   | 216   | 78    | 162   | 19.5           | 40.5  | 21.700 | 45    |
| 3         | 1   | 16-QAM     | 1/2 | 4     | 208   | 432   | 104   | 216   | 26.0           | 54.0  | 28.900 | 60    |
| 4         | 1   | 16-QAM     | 3/4 | 4     | 208   | 432   | 156   | 324   | 39.0           | 81.0  | 43.300 | 90    |
| 5         | 1   | 64-QAM     | 2/3 | 6     | 312   | 648   | 208   | 432   | 52.0           | 108.0 | 57.800 | 120   |
| 6         | 1   | 64-QAM     | 3/4 | 6     | 312   | 648   | 234   | 486   | 58.5           | 121.5 | 65.000 | 135   |
| 7         | 1   | 64-QAM     | 5/6 | 6     | 312   | 648   | 260   | 540   | 65.0           | 135.0 | 72.200 | 150   |

| Symbol | Explanation                             |
|--------|---|
| NSS    | Number of spatial streams               |
| R      | Code rate                               |
| NBPSC  | Number of coded bite per single carrier |
| NCBPS  | Number of coded bite per symbol         |
| NDBPS  | Number of data bite per symbol          |
| GI     | Guard interval                          |

**802.11n\_HT20 MCS8 -15**

| MCS Index | Modulation | R   | N <sub>BPSCS</sub> (i <sub>SS</sub> ) | N <sub>SD</sub> | N <sub>SP</sub> | N <sub>CBPS</sub> | N <sub>DBPS</sub> | Data rate (Mb/s) |                      |
|-----------|------------|-----|---------------------------------------|-----------------|-----------------|-------------------|-------------------|------------------|----------------------|
|           |            |     |                                       |                 |                 |                   |                   | 800 ns GI        | 400 ns GI (see NOTE) |
| 8         | BPSK       | 1/2 | 1                                     | 52              | 4               | 104               | 52                | 13.0             | 14.4                 |
| 9         | QPSK       | 1/2 | 2                                     | 52              | 4               | 208               | 104               | 26.0             | 28.9                 |
| 10        | QPSK       | 3/4 | 2                                     | 52              | 4               | 208               | 156               | 39.0             | 43.3                 |
| 11        | 16-QAM     | 1/2 | 4                                     | 52              | 4               | 416               | 208               | 52.0             | 57.8                 |
| 12        | 16-QAM     | 3/4 | 4                                     | 52              | 4               | 416               | 312               | 78.0             | 86.7                 |
| 13        | 64-QAM     | 2/3 | 6                                     | 52              | 4               | 624               | 416               | 104.0            | 115.6                |
| 14        | 64-QAM     | 3/4 | 6                                     | 52              | 4               | 624               | 468               | 117.0            | 130.0                |
| 15        | 64-QAM     | 5/6 | 6                                     | 52              | 4               | 624               | 520               | 130.0            | 144.4                |

NOTE—The 400 ns GI rate values are rounded to 1 decimal place.

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802.11n\_HT40 MCS8 -15

| MCS Index | Modulation | $R$ | $N_{BPSCS}(i_{SS})$ | $N_{SD}$ | $N_{SP}$ | $N_{CBPS}$ | $N_{DBPS}$ | Data rate (Mb/s) |           |
|-----------|------------|-----|---------------------|----------|----------|------------|------------|------------------|-----------|
|           |            |     |                     |          |          |            |            | 800 ns GI        | 400 ns GI |
| 8         | BPSK       | 1/2 | 1                   | 108      | 6        | 216        | 108        | 27.0             | 30.0      |
| 9         | QPSK       | 1/2 | 2                   | 108      | 6        | 432        | 216        | 54.0             | 60.0      |
| 10        | QPSK       | 3/4 | 2                   | 108      | 6        | 432        | 324        | 81.0             | 90.0      |
| 11        | 16-QAM     | 1/2 | 4                   | 108      | 6        | 864        | 432        | 108.0            | 120.0     |
| 12        | 16-QAM     | 3/4 | 4                   | 108      | 6        | 864        | 648        | 162.0            | 180.0     |
| 13        | 64-QAM     | 2/3 | 6                   | 108      | 6        | 1296       | 864        | 216.0            | 240.0     |
| 14        | 64-QAM     | 3/4 | 6                   | 108      | 6        | 1296       | 972        | 243.0            | 270.0     |
| 15        | 64-QAM     | 5/6 | 6                   | 108      | 6        | 1296       | 1080       | 270.0            | 300.0     |

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## 1.1. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: COFNFABACMR02** filing to comply with Section 15.407 of the FCC Part 15, Subpart C Rules. And **IC: 10293A- NFABACMR02** filing to comply with Industry Canada RSS-210 issue 8: 2010 Annex 9. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure.

## 1.2. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4:2009 & KDB 789033 D01 published on 04, 08, 2013. Radiated testing was performed at an antenna to EUT distance 3 meters.

Tested in accordance with FCC KDB789033 D01 for compliance to FCC 47CFR 15.407 requirements.

## 1.3. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan 333 which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2009. FCC Registration Number is: 990257. Canada Registration Number: 4620A-4.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 & 10 meters) and FCC Registration Number: 94644.

## 1.4. Special Accessories

There are no special accessories used while test was conducted.

## 1.5. Equipment Modifications

There was no modification incorporated into the EUT.

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## 2. SYSTEM TEST CONFIGURATION

### 2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2. EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

### 2.3. Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. According to the general criterion in Section 7.1 of ANSI C63.4:2009. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz, and the measurement procedure 7.3 in ANSI 63.4:2009 & 6.2.2, is followed to carry out the test. The CISPR Quasi-Peak and Average detector mode is employed according to §15.107

#### 2.3.2 Radiated Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13 and of ANSI C63.4:2009.,

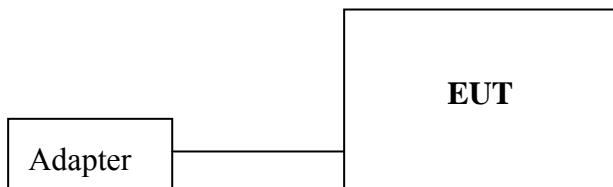
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## 2.4. Configuration of Tested System

**Fig. 2-1 Radiated Emission & Conducted (Antenna Port) Configuration**



**Table 2-1 Equipment Used in Tested System**

| Item | Equipment          | Mfr/Brand | Model/Type No. | Series No. | Data Cable | Power Cord |
|------|--------------------|-----------|----------------|------------|------------|------------|
| 1.   | WLAN Test Software | N/A       | N/A            | N/A        | N/A        | N/A        |

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### 3. SUMMARY OF TEST RESULT

| FCC/IC Rules  | Description Of Test                            | Result    |
|---|--|-----------|
| §15.207<br>RSS-Gen §7.2.4   | AC Power Line Conducted Emission               | N/A       |
| §15.407(a) (1) (2)<br>RSS 210 A9.2<br>RSS-Gen §4.6.1                      | 26 dB and 99% Emission Bandwidth               | N/A       |
| §15.407(a) (1) (2)<br>RSS 210 A9.2(1)(2)(3)                               | The Maximum Output Power Measurement           | Compliant |
| §15.407(a) (5)<br>RSS 210 A9.2(1)(2)(3)                                   | Peak Power Spectral Density Measurement        | N/A       |
| 15.407(a)(6)  | Peak Excursion Measurement                     | N/A       |
| §15.407(b) (1) (2) (3)<br>RSS 210 A9.2(1)(2)(3)                           | Undesirable Emission – Conducted Measurement   | N/A       |
| §15.407(b) (1) (2) (3)(6) (7)<br>RSS 210 A9.2 (1) (2)(3)<br>RSS-Gen 7.2.5 | Undesirable Emission – Radiated Measurement    | Compliant |
| §15.407(c)<br>RSS 210 A9.4(4)   | Transmission in case of Absence of Information | N/A       |
| §15.407(g)  | Frequency Stability                            | N/A       |
| §15.203<br>RSS-Gen 7.1.2  | Antenna Requirement                            | Compliant |
| §15.407(h)<br>RSS 210 A9.3  | TPC and DFS Measurement                        | N/A       |

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#### 4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

Test program used to control the EUT for staying in continuous transmitting mode is programmed.

a mode:

5150MHz-5250MHz: Channel lowest(5180MHz)、 Mid(5220MHz) and Highest(5240MHz).

5250MHz-5350MHz: Channel lowest(5260MHz)、 Mid(5300MHz) and Highest(5320MHz).

5470MHz-5725MHz: Channel lowest(5500MHz)、 Mid(5580MHz) and Highest(5700MHz) and with 6Mbps data rate are chosen for full testing.

ac 20M mode:

5150MHz-5250MHz: Channel lowest(5180MHz)、 Mid(5220MHz) and Highest(5240MHz).

5250MHz-5350MHz: Channel lowest(5260MHz)、 Mid(5300MHz) and Highest(5320MHz).

5470MHz-5725MHz: Channel lowest(5500MHz)、 Mid(5580MHz) and Highest(5700MHz)with 6.5Mbps data rate are chosen for full testing

ac 40M mode:

5150MHz-5250MHz: Channel lowest (5190MHz) and Highest (5230MHz).

5250MHz-5350MHz: Channel lowest (5270MHz) and Highest (5310MHz).

5470MHz-5725MHz: Channel lowest(5510MHz)、 Mid(5550MHz) and Highest(5670MHz)with 13.5Mbps data rate are chosen for full testing

ac 80M mode:

5150MHz-5250MHz: Channel 5210MHz.

5250MHz-5350MHz: Channel 5530MHz.

29.3Mbps data rate are chosen for full testing

The worst case is determined by the output power that generates the highest emission. As examined in the section of output power measurement, the section 7.5, the lowest data rate at a/ac (20M)/ac (40M)/ac (80M) resulted the highest level of fundamental emission, and therefore, the lowest data rate is chosen as the worst-case to conduct the remaining of other mandatory test cases.

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for 802.11a/ac WLAN Transmitter for channel Low, Mid and High, the worst case E2 position was reported.

Pre-scanned was done on TX1 Antenna and TX2 Antenna, and TX2 Antenna results higher emission at 5GHz. Therefore, the completed set of measurement was done on Antenna Aux to be presented on this test report.

For radiation spurious emission test relevant ac (20M)/ac (40M)/ac (80M), MIMO mode that generates the higher emission is chosen to be tested in comparison with transmission at SISO mode.

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## Directional gain (MIMO)

The Tx transmission to construct MIMO operation is cyclic delay diversity, and the following deduction to obtain the array gain of MIMO operation is based on the approach given by KDB 662911 D01.

Array gain = 3.01dBi (peak spectral density, conducted spurious emission)

Gain that is combined with different magnitude of two antennas:

(ii) If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream:

- Directional gain may be calculated by using the formulas applicable to equal gain antennas with  $G_{ANT}$  set equal to the gain of the antenna having the highest gain; or,

$$\text{DirectionalGain} = 10 \cdot \log \left[ \frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

$N_{SS}$  = the number of independent spatial streams of data;

$N_{ANT}$  = the total number of antennas

$g_{j,k} = 10^{G_k/20}$  if the  $k$ th antenna is being fed by spatial stream  $j$ , or zero if it is not;  
 $G_k$  is the gain in dBi of the  $k$ th antenna.

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Directive Gain = 0.67dBi for 802.11 ac 20M, 0.71dBi for 802.11 ac 40M (5150~5250MHz)  
, 0.55dBi for 802.11 ac 80M (5150~5250MHz)

Directive Gain = 1.12dBi for 802.11 ac 20M, 1.10dBi for 802.11 ac 40M (5250~5350MHz)  
, 1.01dBi for 802.11 ac 80M (5250~5350MHz)

Directive Gain = 2.77dBi for 802.11 ac 20M, 2.77dBi for 802.11 ac 40M (5470~5725MHz)  
, 2.77dBi for 802.11 ac 80M (5470~5725MHz)

MIMO Gain = 1.41dBi for 802.11 ac 20M, 1.45dBi for 802.11 ac 40M (5150~5250MHz)  
, 1.29dBi for 802.11 ac 80M (5150~5250MHz)

MIMO Gain = 2.69dBi for 802.11 ac 20M, 2.67dBi for 802.11 ac 40M (5250~5350MHz)  
, 2.58dBi for 802.11 ac 80M (5250~5350MHz)

MIMO Gain = 5.54dBi for 802.11 ac 20M, 5.54dBi for 802.11 ac 40M (5470~5725MHz)  
, 5.54dBi for 802.11 ac 80M (5470~5725MHz)

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## Duty Cycle Analysis:

*Pre-analysis Check: While conducting average power measurement, duty cycle of each mode (a/ac (20M)/ac (40M)/ac (80M)) shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle. All duty cycle is pre-scanned, resulted as obtained below, and showed only the most representative ones*

*Tabular results as indicates below entails the results of duty factor for all supported modes.*

### Formula:

$$\text{Duty Cycle} = T_{on} / (T_{on} + T_{off})$$

### Test Procedure:

*Set span = 0, RBW = 8MHz, the largest as possible, VBW = 8MHz, Detector = Peak, and RBW, and VBW = the highest RBW the spectrum is capable of, where zero-span is permissible, that > 50/T, where T is ~ 4.3ms*

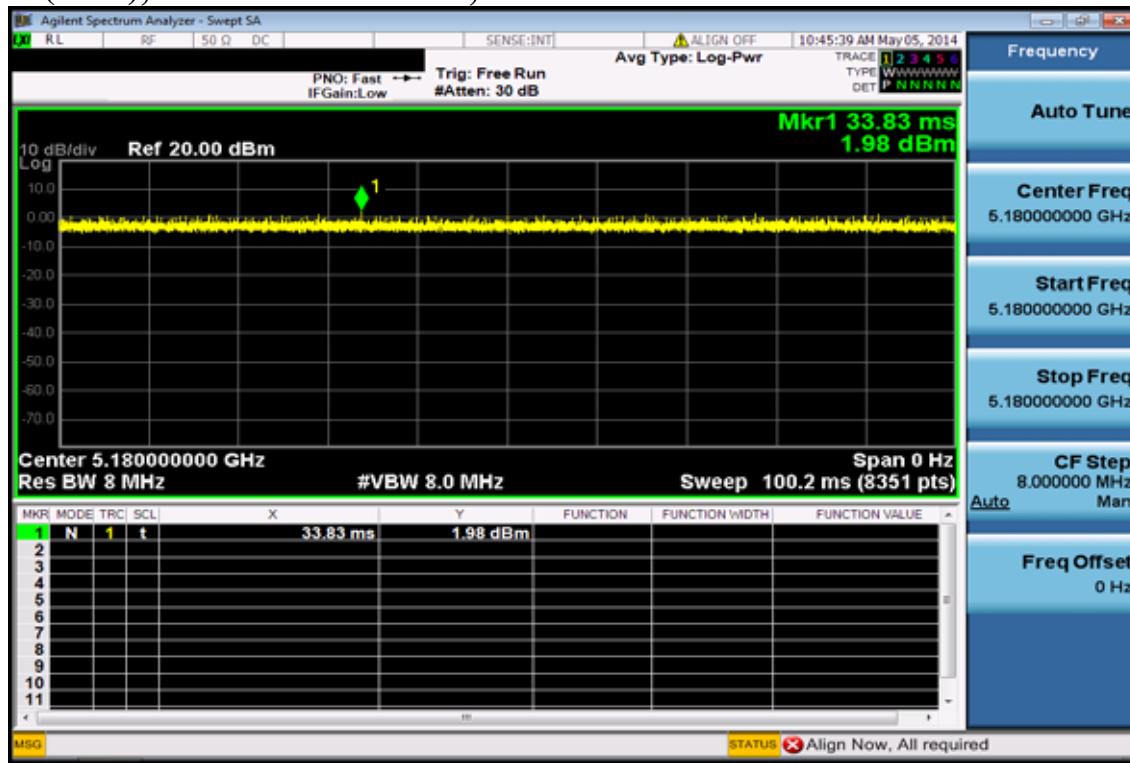
### Duty Cycle:

| 5150-5725MHz    | Antenna | Duty Cycle | Duty Factor (dBm) |
|-----------------|---------|------------|-------------------|
| 802.11a         | Single  | 0.99       | 0.04              |
| 802.11 ac (20M) | SISO    | 0.99       | 0.04              |
|                 | MIMO    | 0.99       | 0.04              |
| 802.11 ac (40M) | SISO    | 0.99       | 0.04              |
|                 | MIMO    | 0.99       | 0.04              |
| 802.11 ac (80M) | SISO    | 0.99       | 0.04              |
|                 | MIMO    | 0.99       | 0.04              |

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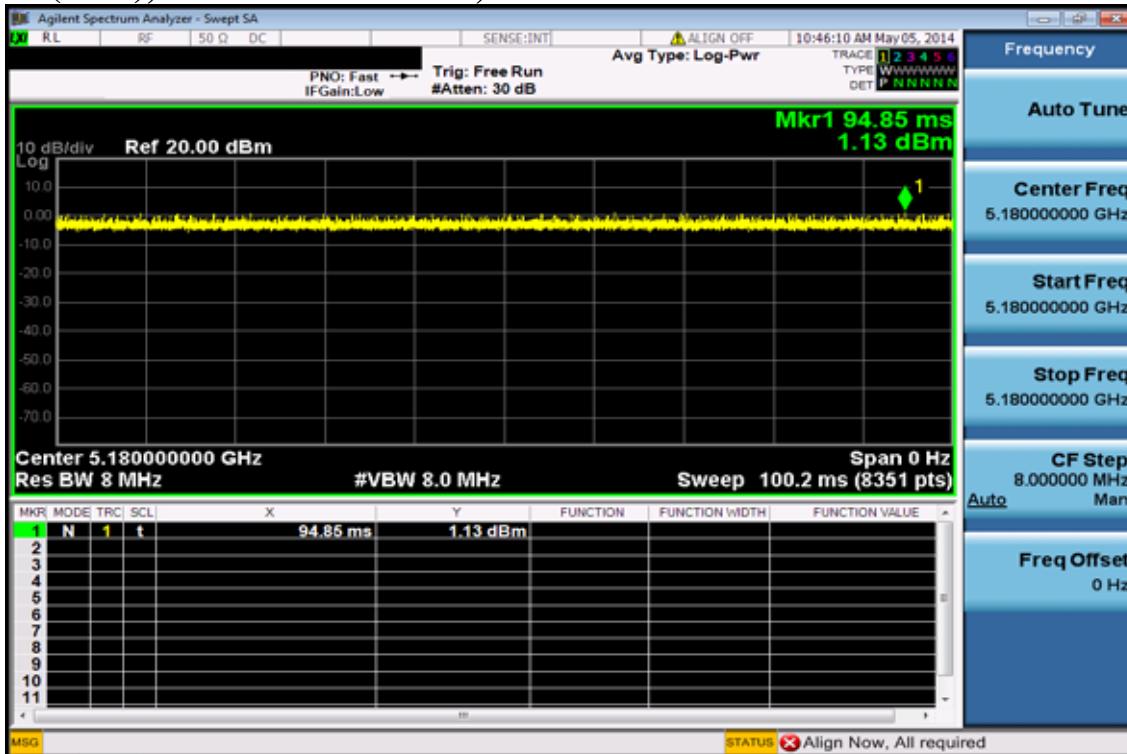
**DUTY CYCLE OF TEST SIGNAL  
802.11a, CH Low 5180 MHz****802.11ac (20M), CH Low 5180 MHz, SISO**

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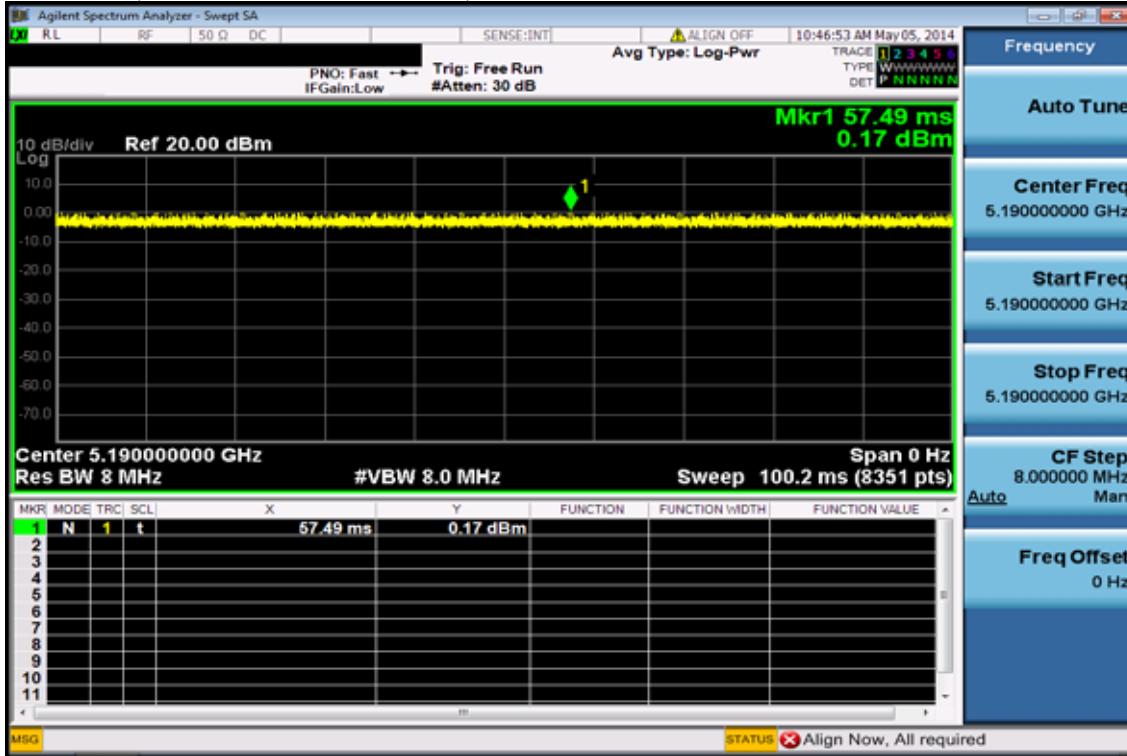
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## 802.11 ac (20M), CH Low 5180 MHz, MIMO



## 802.11ac (40M), CH Low 5190 MHz, SISO

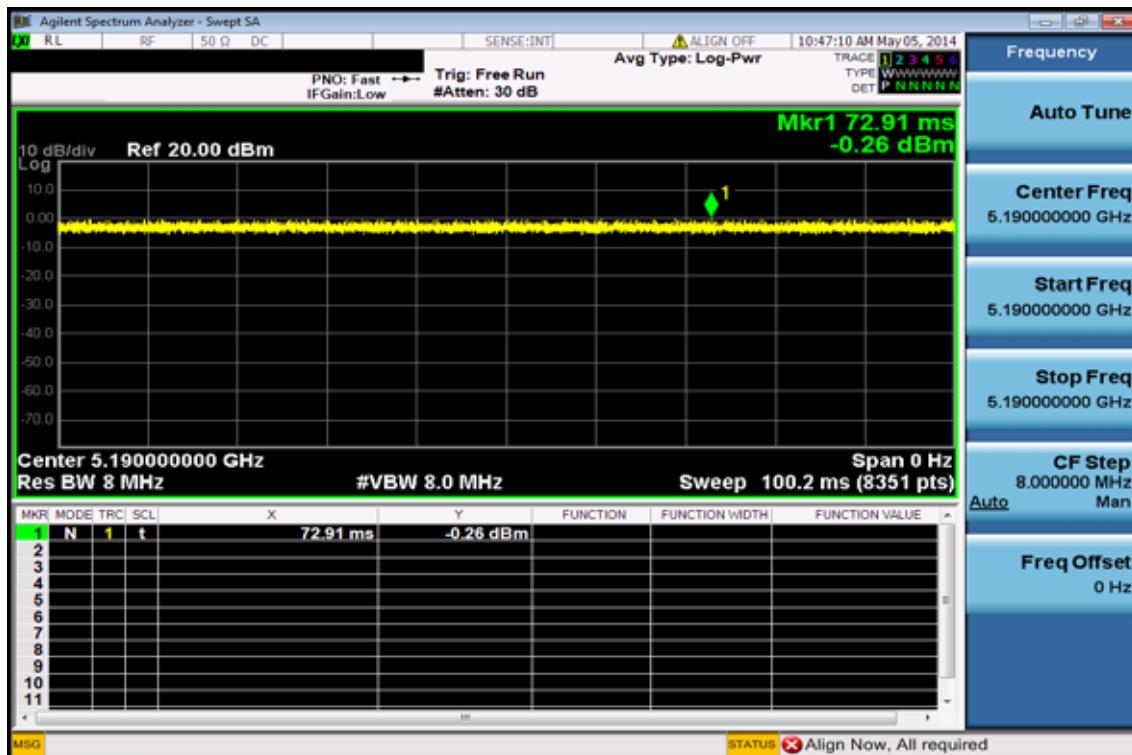


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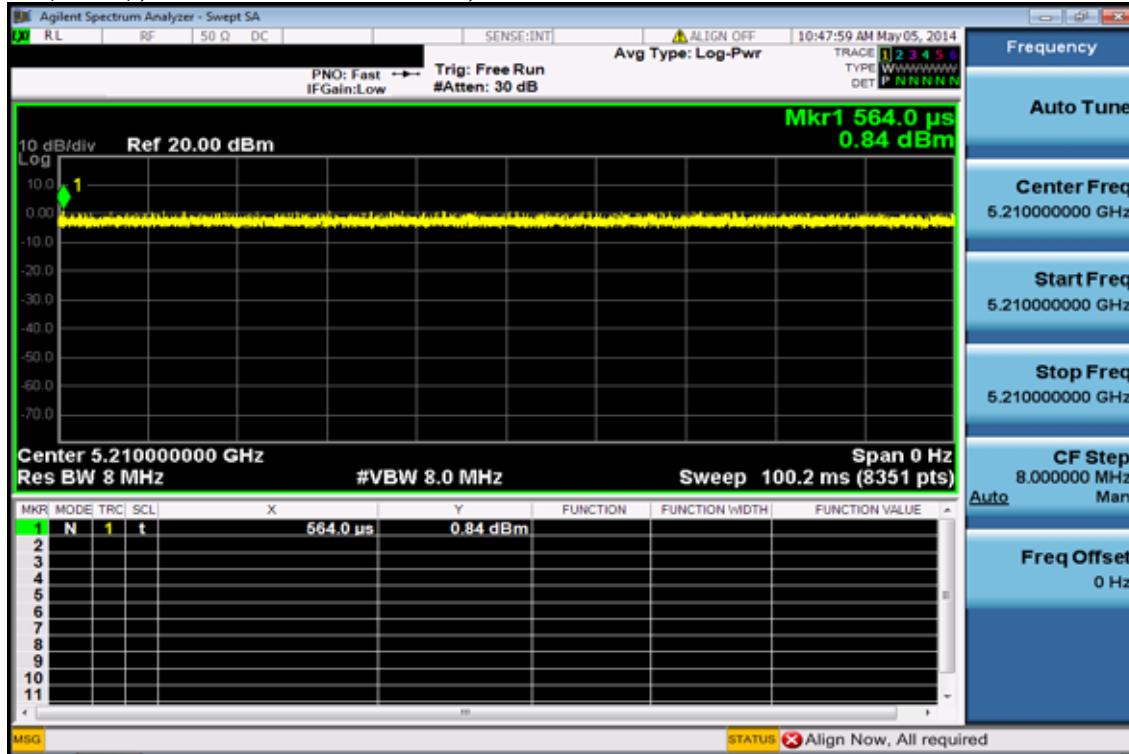
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## 802.11 ac (40M), CH Low 5190 MHz, MIMO



## 802.11ac (80M), CH Low 5210 MHz, SISO

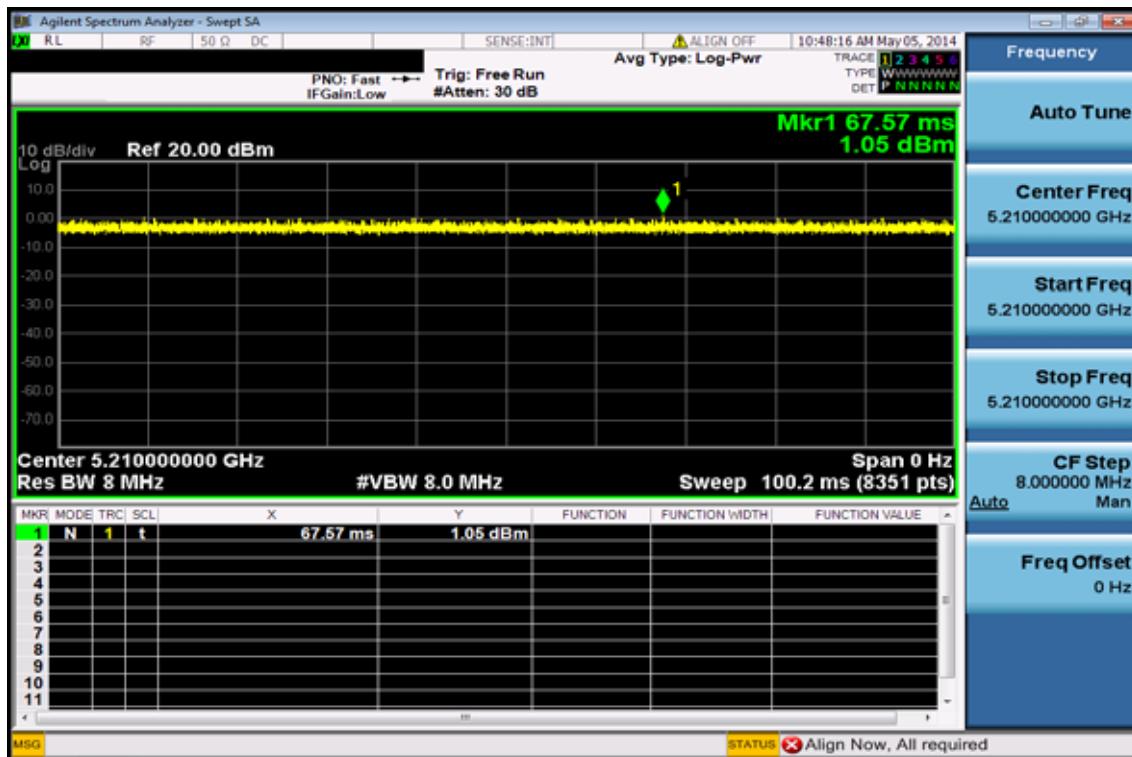


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## 802.11 ac (80M), CH Low 5210 MHz, MIMO



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## 5. MEASUREMENT UNCERTAINTY

| Test Items                                     | Uncertainty             |
|--|-------------------------|
| AC Power Line Conducted Emission               | +/- 2.586 dB            |
| 26 dB and 99% Emission Bandwidth               | +/- 123.36 Hz           |
| The Maximum Output Power Measurement           | +/- 1.42 dB             |
| Peak Power Spectral Density Measurement        | +/- 1.55 dB             |
| Peak Excursion Measurement                     | +/- 1.55 dB             |
| Undesirable Emission – Conducted Measurement   | +/- 1.55 dB             |
| Transmission in case of Absence of Information | +/- 1.55 dB             |
| Frequency Stability                            | +/- 123.36 Hz           |
| TPC and DFS Measurement                        | +/- 123.36 Hz           |
| Temperature                                    | +/- 0.8 °C              |
| Humidity                                       | +/- 4.7 %               |
| DC / AC Power Source                           | DC= +/- 1%, AC=+/- 0.2% |

### Radiated Spurious Emission:

|  |                            |
|--|----------------------------|
| Measurement uncertainty<br>(Polarization : <b>Vertical</b> ) | 30MHz - 180MHz: +/- 3.37dB |
|  | 180MHz -417MHz: +/- 3.19dB |
|  | 0.417GHz-1GHz: +/- 3.19dB  |
|  | 1GHz - 18GHz: +/- 4.04dB   |
|  | 18GHz - 40GHz: +/- 4.04dB  |

|  |                            |
|--|----------------------------|
| Measurement uncertainty<br>(Polarization : <b>Horizontal</b> ) | 30MHz - 167MHz: +/- 4.22dB |
|  | 167MHz -500MHz: +/- 3.44dB |
|  | 0.5GHz-1GHz: +/- 3.39dB    |
|  | 1GHz - 18GHz: +/- 4.08dB   |
|  | 18GHz - 40GHz: +/- 4.08dB  |

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

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## 6. CONDUCTED EMISSION TEST

### 6.1. Standard Applicable

According to §15.207 and RSS-Gen §7.2.4, frequency range within 150 KHz to 30 MHz shall not exceed the Limit table as below.

| Frequency range<br>MHz | Limits<br>dB(uV) |          |
|------------------------|------------------|----------|
|                        | Quasi-peak       | Average  |
| 0.15 to 0.50           | 66 to 56         | 56 to 46 |
| 0.50 to 5              | 56               | 46       |
| 5 to 30                | 60               | 50       |

Note

- 1.The lower limit shall apply at the transition frequencies
- 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

### 6.2. Measurement Equipment Used:

| Conducted Emission Test Site |            |                         |                  |              |            |
|------------------------------|------------|-------------------------|------------------|--------------|------------|
| EQUIPMENT<br>TYPE            | MFR        | MODEL<br>NUMBER         | SERIAL<br>NUMBER | LAST<br>CAL. | CAL DUE.   |
| EMI Test Receiver            | R&S        | ESCI7                   | 100760           | 05/27/2013   | 05/26/2014 |
| LISN                         | Rolf-Heine | NNB-2/16Z               | 99012            | 03/26/2014   | 03/25/2015 |
| LISN                         | FCC        | FCC-LISN-50/250-25-2-01 | 04034            | 03/19/2014   | 03/18/2015 |
| Coaxial Cables               | N/A        | WK CE Cable             | N/A              | 11/26/2013   | 11/25/2014 |

### 6.3. EUT Setup

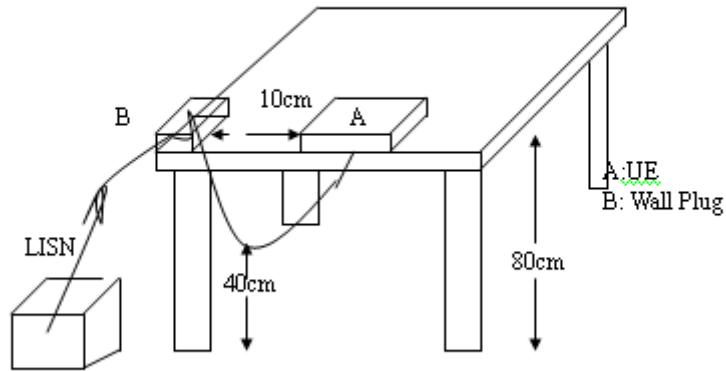
1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4:2009.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The LISN was connected with 120Vac/60Hz power source.

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## 6.4. Test SET-UP (Block Diagram of Configuration)



## 6.5. Measurement Procedure

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all phases of power being supplied by given UE are completed

## 6.6. Measurement Result

Please refer to FCC Part15B Test Report for the plots.

Report No.: T140306L10-D, Test Lab: Compliance Certification Services Inc. Linkuo Laboratory

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## 7. 26dB and 99%EMISSION BANDWIDTH MEASUREMENT

### 7.1 Standard Applicable

According to §15.407(a). No Limit required.

According to RSS 210 A9.2 (1), No Limit required

RSS-Gen §4.6, the transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

### 7.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
3.
  - a. 26dB Band width Measurement: Set the spectrum analyzer as 1% of emission BW Sweep=auto, Detector = Peak, Trace Mode = Max Hold, Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.
  - b. A) 99% Bandwidth Measurement: set resolution BW as close to 1% of the selected span without it is being lower than 1%, & VBW = 3 XRBW. Detector = Peak or Sample, where sample must be selected whenever it is appropriate, Trace Mode = Max Hold
- B) Mark the peak frequency and -26dB (upper and lower) frequency.

4. Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.

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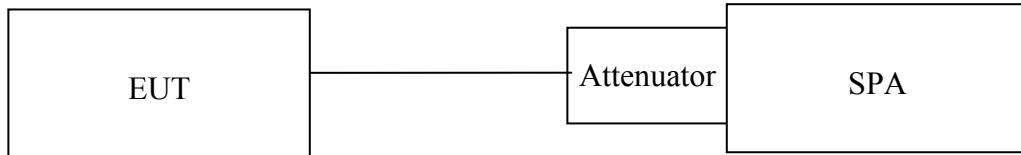
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### 7.3 Measurement Equipment Used:

| Conducted Emission Test Site |               |                 |               |            |            |
|------------------------------|---------------|-----------------|---------------|------------|------------|
| EQUIPMENT TYPE               | MFR           | MODEL NUMBER    | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| Power Meter                  | Anritsu       | ML2495A         | 1005007       | 01/13/2014 | 01/12/2015 |
| Power Sensor                 | Anritsu       | MA2411B         | 917032        | 01/13/2014 | 01/12/2015 |
| Spectrum Analyzer            | Agilent       | E4446A          | MY51100003    | 05/30/2013 | 05/29/2014 |
| Spectrum Analyzer            | Agilent       | E4440A          | MY45304525    | 03/08/2014 | 03/07/2015 |
| DC Block                     | Mini-Circuits | BLK-18-S+       | 1             | 02/27/2014 | 02/26/2015 |
| Low Loss Cable               | HUBER+SUHNER  | SUCOFLEX 104PEA | N/A           | 01/03/2014 | 01/02/2015 |
| Attenuator                   | Mini-Circuit  | BW-S10W2+       | 002           | 02/27/2014 | 02/26/2015 |
| Splitter                     | Agilent       | 11636B          | N/A           | 02/27/2014 | 02/26/2015 |

### 7.4 Test Set-up:



### 7.5 Measurement Result: N/A

### 7.6 Measurement Result: N/A

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## 8. The MAXIMUM OUTPUT POWER MEASUREMENT

### 8.1 Standard Applicable

According to §15.407(a)

1. For the band 5.15-5.25 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B.
2. For the band 5.25-5.35 GHz and 5.47-5.725GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10log B.
3. For the band 5.725-5.825 GHz, the maximum conducted power over the frequency of operation shall not exceed the lesser of 1W (30dBm) or 17 dBm + 10log B.

According to RSS-210 A9.2

1. For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or  $10 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.
2. For the bands 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10} B$ , dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

In addition, devices with maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

In addition to the above requirements, devices operating in the band 5250-5350 MHz with maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. elevation mask where  $\theta$  is the angle above the local horizontal plane (of the earth) as shown below:

- (i) -13 dB(W/MHz) for  $0^\circ \leq \theta < 8^\circ$
- (ii)  $-13 - 0.716(\theta-8)$  dB(W/MHz) for  $8^\circ \leq \theta < 40^\circ$
- (iii)  $-35.9 - 1.22(\theta-40)$  dB(W/MHz) for  $40^\circ \leq \theta \leq 45^\circ$
- (iv) -42 dB(W/MHz) for  $\theta > 45^\circ$

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3. For the band 5725-5825 MHz, the maximum conducted output power shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever power is less. The power spectral density shall not exceed 17 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 4.0 W or  $23 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

Fixed point-to-point systems for this band are permitted to have an e.i.r.p. greater than 4 W, provided that the higher e.i.r.p. is achieved by employing higher gain antennas, but not higher transmitter output powers. Point-to-multipoint systems, omni-directional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding 4 W e.i.r.p. However, remote stations of point-to-multipoint systems shall be permitted to operate at greater than 4 W e.i.r.p, under the same conditions as for point-to-point systems.

where B is the 26dB emission bandwidth in MHz.

## 8.2 Measurement Procedure

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
3. Set the offset  $10 * \log(1/x)$ ,  $n_{HT20}=0.10$ ,  $n_{HT40}=0.12$
4. Record the max. reading.
5. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.
6. Employing step 1 to4 obtaining per-chain basis in MIMO operation, and sum the power in linear to result the output of MIMO operation at frequency of interest (, where MIMO is applicable).

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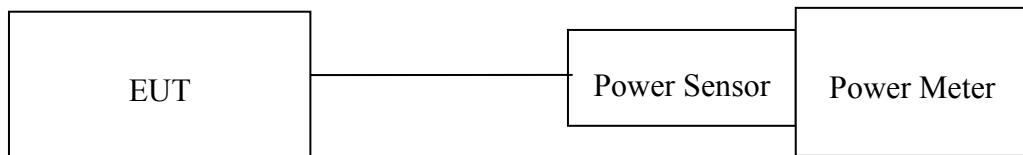
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Note: For EIRP/ERP measurement complying with RSS-210 9.2, the formula as deduced in 1.3.2 of KDB 412172 D01 is used to calculate.  $ERP/EIRP = Pt + Gt - Lc$ , where  $Pt$  = transmitter output power measured directly at antenna port, expressing in dBm, and  $Gt$  = gain of the transmitting antenna in dBi that can be referred in antenna spec provided by the manufacturer in section 1.1,  $Lc$  = signal attenuation in the cable between the transmitting port and antenna.

### **8.3 Measurement Equipment Used:**

Refer to section 7.3 for details.

### **8.4 Test Set-up:**



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## 8.5 Measurement Result

### 802.11a (Antenna Main)

| Cable loss = 0 |                 | The Maximum Output Power |   |
|----------------|-----------------|--------------------------|---|
| CH             | Frequency (MHz) | Data Rate                | Required Limit                                    |
|                |                 | 6                        |   |
| 36             | 5180            | 14.92                    | <b>16.99dBm or<br/>4+10log(B) =<br/>18.03dBm</b>  |
| 44             | 5220            | 14.97                    | <b>16.99dBm or<br/>4+10log(B) =<br/>17.26dBm</b>  |
| 48             | 5240            | <b>15.93</b>             | <b>16.99dBm or<br/>4+10log(B) =<br/>17.25dBm</b>  |
| 52             | 5260            | <b>14.96</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>24.01dBm</b> |
| 60             | 5300            | 14.74                    | <b>23.98dBm or<br/>11+10log(B) =<br/>24.02dBm</b> |
| 64             | 5320            | 14.60                    | <b>23.98dBm or<br/>11+10log(B) =<br/>24.05dBm</b> |
| 100            | 5500            | 15.27                    | <b>23.98dBm or<br/>11+10log(B) =<br/>24.02dBm</b> |
| 116            | 5580            | <b>15.99</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>24.03dBm</b> |
| 140            | 5700            | <b>15.19</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>24.00dBm</b> |

*Note: Limit is re-adjusted in terms of dBm*

*10\*log(50mW) = 16.99dBm for the limit on the band of 5150~5250MHz*

*10\*log(250mW)=23.98dBm for the limit on the band of 5260~5320MHz, &5470~5725MHz*

*Note: Cable loss is 11.10dB is set as the offset on the spectrum to compensate the loss causing by cable*

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## 802.11ac (20M) – SISO (Antenna Main)

| Cable loss = 0 |                 | The Maximum Output Power |   |
|----------------|-----------------|--------------------------|---|
| CH             | Frequency (MHz) | Data Rate                | Required Limit                                    |
|                |                 | MCS0                     |   |
| 36             | 5180            | 12.67                    | <b>16.99dBm or<br/>4+10log(B) =<br/>17.08dBm</b>  |
| 44             | 5220            | <b>13.19</b>             | <b>16.99dBm or<br/>4+10log(B) =<br/>17.45dBm</b>  |
| 48             | 5240            | 12.73                    | <b>16.99dBm or<br/>4+10log(B) =<br/>17.11dBm</b>  |
| 52             | 5260            | <b>14.98</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>25.55dBm</b> |
| 60             | 5300            | 14.50                    | <b>23.98dBm or<br/>11+10log(B) =<br/>24.89dBm</b> |
| 64             | 5320            | 11.84                    | <b>23.98dBm or<br/>11+10log(B) =<br/>24.04dBm</b> |
| 100            | 5500            | 13.27                    | <b>23.98dBm or<br/>11+10log(B) =<br/>25.18dBm</b> |
| 116            | 5580            | <b>15.18</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>25.66dBm</b> |
| 140            | 5700            | <b>11.01</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>24.16dBm</b> |

*Note: Offset 11.10dB*

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## 802.11ac (40M) – SISO (Antenna Main)

| Cable loss = 0 |                 | The Maximum Output Power |   |
|----------------|-----------------|--------------------------|---|
| CH             | Frequency (MHz) | Data Rate                | Required Limit                                    |
|                |                 | MCS0                     |   |
| 38             | 5190            | 8.34                     | <b>16.99dBm or<br/>4+10log(B) =<br/>20.19dBm</b>  |
| 46             | 5230            | <b>13.09</b>             | <b>16.99dBm or<br/>4+10log(B) =<br/>20.09dBm</b>  |
| 54             | 5270            | <b>14.27</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>28.46dBm</b> |
| 62             | 5310            | 10.49                    | <b>23.98dBm or<br/>11+10log(B) =<br/>27.21dBm</b> |
| 102            | 5510            | 7.98                     | <b>23.98dBm or<br/>11+10log(B) =<br/>27.21dBm</b> |
| 110            | 5550            | <b>13.88</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>27.85dBm</b> |
| 134            | 5670            | <b>12.81</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>27.62dBm</b> |

*Note: Offset 11.10dB*

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**802.11ac (80M) – SISO (Antenna Main)**

| Cable loss = 0 |                        | <b>The Maximum Output Power</b> |   |
|----------------|------------------------|---------------------------------|---|
| <b>CH</b>      | <b>Frequency (MHz)</b> | <b>Data Rate</b>                | <b>Required Limit</b>                             |
|                |                        | <b>MCS0</b>                     |   |
| 42             | 5210                   | <b>7.66</b>                     | <b>16.99dBm or<br/>4+10log(B) =<br/>23.15dBm</b>  |
| 58             | 5290                   | <b>7.96</b>                     | <b>23.98dBm or<br/>11+10log(B) =<br/>30.14dBm</b> |
| 106            | 5530                   | <b>7.81</b>                     | <b>23.98dBm or<br/>11+10log(B) =<br/>31.60dBm</b> |

*Note: Offset 11.10dB*

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## 802.11a (Antenna Aux)

| Cable loss = 0 |                 | The Maximum Output Power |   |
|----------------|-----------------|--------------------------|---|
| CH             | Frequency (MHz) | Data Rate                | Required Limit                                    |
|                |                 | 6                        |   |
| 36             | 5180            | <b>14.98</b>             | <b>16.99dBm or<br/>4+10log(B) =<br/>18.03dBm</b>  |
| 44             | 5220            | 14.94                    | <b>16.99dBm or<br/>4+10log(B) =<br/>17.26dBm</b>  |
| 48             | 5240            | 15.58                    | <b>16.99dBm or<br/>4+10log(B) =<br/>17.25dBm</b>  |
| 52             | 5260            | 14.93                    | <b>23.98dBm or<br/>11+10log(B) =<br/>24.01dBm</b> |
| 60             | 5300            | <b>14.95</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>24.02dBm</b> |
| 64             | 5320            | 14.94                    | <b>23.98dBm or<br/>11+10log(B) =<br/>24.05dBm</b> |
| 100            | 5500            | 15.11                    | <b>23.98dBm or<br/>11+10log(B) =<br/>24.02dBm</b> |
| 116            | 5580            | <b>15.60</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>24.03dBm</b> |
| 140            | 5700            | <b>15.12</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>24.00dBm</b> |

Note: Limit is re-adjusted in terms of dBm

$10*\log(50mW) = 16.99dBm$  for the limit on the band of 5150~5250MHz

$10*\log(250mW)=23.98dBm$  for the limit on the band of 5260~5320MHz, & 5470~5725MHz

Note: Cable loss is 11.10dB is set as the offset on the spectrum to compensate the loss causing by cable

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## 802.11ac (20M) – SISO (Antenna Aux)

| Cable loss = 0 |                 | The Maximum Output Power |   |
|----------------|-----------------|--------------------------|---|
| CH             | Frequency (MHz) | Data Rate                | Required Limit                                    |
|                |                 | MCS0                     |   |
| 36             | 5180            | 14.09                    | <b>16.99dBm or<br/>4+10log(B) =<br/>17.08dBm</b>  |
| 44             | 5220            | 14.21                    | <b>16.99dBm or<br/>4+10log(B) =<br/>17.45dBm</b>  |
| 48             | 5240            | <b>14.27</b>             | <b>16.99dBm or<br/>4+10log(B) =<br/>17.11dBm</b>  |
| 52             | 5260            | <b>14.98</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>25.55dBm</b> |
| 60             | 5300            | 14.66                    | <b>23.98dBm or<br/>11+10log(B) =<br/>24.89dBm</b> |
| 64             | 5320            | 11.93                    | <b>23.98dBm or<br/>11+10log(B) =<br/>24.04dBm</b> |
| 100            | 5500            | 13.29                    | <b>23.98dBm or<br/>11+10log(B) =<br/>25.18dBm</b> |
| 116            | 5580            | <b>15.71</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>25.66dBm</b> |
| 140            | 5700            | <b>11.68</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>24.16dBm</b> |

Note: Offset 11.10dB

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## 802.11ac (40M) – SISO (Antenna Aux)

| Cable loss = 0 |                 | The Maximum Output Power |   |
|----------------|-----------------|--------------------------|---|
| CH             | Frequency (MHz) | Data Rate                | Required Limit                                    |
|                |                 | MCS0                     |   |
| 38             | 5190            | 9.83                     | <b>16.99dBm or<br/>4+10log(B) =<br/>20.19dBm</b>  |
| 46             | 5230            | <b>13.82</b>             | <b>16.99dBm or<br/>4+10log(B) =<br/>20.09dBm</b>  |
| 54             | 5270            | <b>14.56</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>28.46dBm</b> |
| 62             | 5310            | 10.62                    | <b>23.98dBm or<br/>11+10log(B) =<br/>27.21dBm</b> |
| 102            | 5510            | <b>7.73</b>              | <b>23.98dBm or<br/>11+10log(B) =<br/>27.21dBm</b> |
| 110            | 5550            | 14.41                    | <b>23.98dBm or<br/>11+10log(B) =<br/>27.85dBm</b> |
| 134            | 5670            | <b>13.09</b>             | <b>23.98dBm or<br/>11+10log(B) =<br/>27.62dBm</b> |

*Note: Offset 11.10dB*

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**802.11ac (80M) – SISO (Antenna Aux)**

| Cable loss = 0 |                        | <b>The Maximum Output Power</b> |   |
|----------------|------------------------|---------------------------------|---|
| <b>CH</b>      | <b>Frequency (MHz)</b> | <b>Data Rate</b>                | <b>Required Limit</b>                             |
|                |                        | <b>MCS0</b>                     |   |
| 42             | 5210                   | <b>9.07</b>                     | <b>16.99dBm or<br/>4+10log(B) =<br/>23.15dBm</b>  |
| 58             | 5290                   | <b>8.65</b>                     | <b>23.98dBm or<br/>11+10log(B) =<br/>30.14dBm</b> |
| 106            | 5530                   | <b>8.48</b>                     | <b>23.98dBm or<br/>11+10log(B) =<br/>31.60dBm</b> |

*Note: Offset 11.10dB*

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## 802.11ac (20M) MIMO operation CH0

| Cable loss = 0 |                 | The Maximum Output Power CH 0 |  |
|----------------|-----------------|-------------------------------|--|
| CH             | Frequency (MHz) | Data Rate                     | Required Limit                           |
|                |                 | MCS8                          |  |
| 36             | 5180            | 14.53                         | 16.99dBm or<br>4+10log(B) =<br>17.08dBm  |
| 44             | 5220            | 14.41                         | 16.99dBm or<br>4+10log(B) =<br>17.45dBm  |
| 48             | 5240            | 14.31                         | 16.99dBm or<br>4+10log(B) =<br>17.11dBm  |
| 52             | 5260            | 15.69                         | 23.98dBm or<br>11+10log(B) =<br>25.55dBm |
| 60             | 5300            | 15.29                         | 23.98dBm or<br>11+10log(B) =<br>24.89dBm |
| 64             | 5320            | 12.15                         | 23.98dBm or<br>11+10log(B) =<br>24.04dBm |
| 100            | 5500            | 12.99                         | 23.98dBm or<br>11+10log(B) =<br>25.18dBm |
| 116            | 5580            | 15.24                         | 23.98dBm or<br>11+10log(B) =<br>25.66dBm |
| 140            | 5700            | 10.91                         | 23.98dBm or<br>11+10log(B) =<br>24.16dBm |

Note: Offset 11.10dB

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## 802.11ac (20M) MIMO operation CH1

| Cable loss = 0 |                 | The Maximum Output Power CH 1 |   |
|----------------|-----------------|-------------------------------|---|
| CH             | Frequency (MHz) | Data Rate                     | Required Limit                                    |
|                |                 | MCS8                          |   |
| 36             | 5180            | 12.21                         | <b>16.99dBm or<br/>4+10log(B) =<br/>17.08dBm</b>  |
| 44             | 5220            | 13.08                         | <b>16.99dBm or<br/>4+10log(B) =<br/>17.45dBm</b>  |
| 48             | 5240            | <b>13.19</b>                  | <b>16.99dBm or<br/>4+10log(B) =<br/>17.11dBm</b>  |
| 52             | 5260            | <b>14.73</b>                  | <b>23.98dBm or<br/>11+10log(B) =<br/>25.55dBm</b> |
| 60             | 5300            | 14.72                         | <b>23.98dBm or<br/>11+10log(B) =<br/>24.89dBm</b> |
| 64             | 5320            | 14.05                         | <b>23.98dBm or<br/>11+10log(B) =<br/>24.04dBm</b> |
| 100            | 5500            | 11.99                         | <b>23.98dBm or<br/>11+10log(B) =<br/>25.18dBm</b> |
| 116            | 5580            | <b>15.41</b>                  | <b>23.98dBm or<br/>11+10log(B) =<br/>25.66dBm</b> |
| 140            | 5700            | <b>12.02</b>                  | <b>23.98dBm or<br/>11+10log(B) =<br/>24.16dBm</b> |

Note: Offset 11.10dB

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**802.11ac (20M) MIMO operation CH 0 + CH 1**

| Cable loss = 0 |                            | <b>The Maximum Output Power<br/>CH 0 +CH 1</b> |   |
|----------------|----------------------------|--|---|
| <b>CH</b>      | <b>Frequency<br/>(MHz)</b> | <b>Data Rate</b>                               | <b>Required Limit</b>                             |
|                |                            | <b>MCS8</b>                                    |   |
| 36             | 5180                       | 16.53  | <b>16.99dBm or<br/>4+10log(B) =<br/>17.08dBm</b>  |
| 44             | 5220                       | <b>16.81</b>                                   | <b>16.99dBm or<br/>4+10log(B) =<br/>17.45dBm</b>  |
| 48             | 5240                       | 16.80  | <b>16.99dBm or<br/>4+10log(B) =<br/>17.11dBm</b>  |
| 52             | 5260                       | <b>18.25</b>                                   | <b>23.98dBm or<br/>11+10log(B) =<br/>25.55dBm</b> |
| 60             | 5300                       | 18.02  | <b>23.98dBm or<br/>11+10log(B) =<br/>24.89dBm</b> |
| 64             | 5320                       | 15.08  | <b>23.98dBm or<br/>11+10log(B) =<br/>24.04dBm</b> |
| 100            | 5500                       | 16.26  | <b>23.98dBm or<br/>11+10log(B) =<br/>25.18dBm</b> |
| 116            | 5580                       | <b>18.34</b>                                   | <b>23.98dBm or<br/>11+10log(B) =<br/>25.66dBm</b> |
| 140            | 5700                       | <b>14.51</b>                                   | <b>23.98dBm or<br/>11+10log(B) =<br/>24.16dBm</b> |

*Note: Offset 11.10dB*

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## 802.11 ac (40M) MIMO operation CH 0

| Cable loss = 0 |                 | The Maximum Output Power CH 0 |   |
|----------------|-----------------|-------------------------------|---|
| CH             | Frequency (MHz) | Data Rate                     | Required Limit                                    |
|                |                 | MCS8                          |   |
| 38             | 5190            | 10.29                         | <b>16.99dBm or<br/>4+10log(B) =<br/>20.19dBm</b>  |
| 46             | 5230            | <b>13.34</b>                  | <b>16.99dBm or<br/>4+10log(B) =<br/>20.09dBm</b>  |
| 54             | 5270            | <b>14.78</b>                  | <b>23.98dBm or<br/>11+10log(B) =<br/>28.46dBm</b> |
| 62             | 5310            | 10.84                         | <b>23.98dBm or<br/>11+10log(B) =<br/>27.21dBm</b> |
| 102            | 5510            | 7.61                          | <b>23.98dBm or<br/>11+10log(B) =<br/>27.21dBm</b> |
| 110            | 5550            | <b>14.55</b>                  | <b>23.98dBm or<br/>11+10log(B) =<br/>27.85dBm</b> |
| 134            | 5670            | <b>12.82</b>                  | <b>23.98dBm or<br/>11+10log(B) =<br/>27.62dBm</b> |

Note: Offset 11.10dB

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## 802.11 ac (40M) MIMO operation CH 1

| Cable loss = 0 |                 | The Maximum Output Power CH 1 |   |
|----------------|-----------------|-------------------------------|---|
| CH             | Frequency (MHz) | Data Rate                     | Required Limit                                    |
|                |                 | MCS8                          |   |
| 38             | 5190            | 8.22                          | <b>16.99dBm or<br/>4+10log(B) =<br/>20.19dBm</b>  |
| 46             | 5230            | <b>13.62</b>                  | <b>16.99dBm or<br/>4+10log(B) =<br/>20.09dBm</b>  |
| 54             | 5270            | <b>13.81</b>                  | <b>23.98dBm or<br/>11+10log(B) =<br/>28.46dBm</b> |
| 62             | 5310            | 10.72                         | <b>23.98dBm or<br/>11+10log(B) =<br/>27.21dBm</b> |
| 102            | 5510            | 8.48                          | <b>23.98dBm or<br/>11+10log(B) =<br/>27.21dBm</b> |
| 110            | 5550            | <b>14.20</b>                  | <b>23.98dBm or<br/>11+10log(B) =<br/>27.85dBm</b> |
| 134            | 5670            | <b>13.25</b>                  | <b>23.98dBm or<br/>11+10log(B) =<br/>27.62dBm</b> |

Note: Offset 11.10dB

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**802.11 ac (40M) MIMO operation CH 0 + CH 1**

| Cable loss = 0 |                            | <b>The Maximum Output Power<br/>CH 0 +CH1</b> |   |
|----------------|----------------------------|---|---|
| <b>CH</b>      | <b>Frequency<br/>(MHz)</b> | <b>Data Rate</b>                              | <b>Required Limit</b>                             |
|                |                            | <b>MCS8</b>                                   |   |
| 38             | 5190                       | 12.39   | <b>16.99dBm or<br/>4+10log(B) =<br/>20.19dBm</b>  |
| 46             | 5230                       | <b>16.49</b>                                  | <b>16.99dBm or<br/>4+10log(B) =<br/>20.09dBm</b>  |
| 54             | 5270                       | <b>17.33</b>                                  | <b>23.98dBm or<br/>11+10log(B) =<br/>28.46dBm</b> |
| 62             | 5310                       | 13.79   | <b>23.98dBm or<br/>11+10log(B) =<br/>27.21dBm</b> |
| 102            | 5510                       | 11.08   | <b>23.98dBm or<br/>11+10log(B) =<br/>27.21dBm</b> |
| 110            | 5550                       | <b>17.39</b>                                  | <b>23.98dBm or<br/>11+10log(B) =<br/>27.85dBm</b> |
| 134            | 5670                       | <b>16.05</b>                                  | <b>23.98dBm or<br/>11+10log(B) =<br/>27.62dBm</b> |

*Note: Offset 11.10dB*

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**802.11ac (80M) MIMO operation CH 0**

| Cable loss = 0 |                        | <b>The Maximum Output Power CH 0</b> |   |
|----------------|------------------------|--------------------------------------|---|
| <b>CH</b>      | <b>Frequency (MHz)</b> | <b>Data Rate</b>                     | <b>Required Limit</b>                             |
|                |                        | <b>MCS0</b>                          |   |
| 42             | 5210                   | <b>9.77</b>                          | <b>16.99dBm or<br/>4+10log(B) =<br/>23.15dBm</b>  |
| 58             | 5290                   | <b>9.25</b>                          | <b>23.98dBm or<br/>11+10log(B) =<br/>30.14dBm</b> |
| 106            | 5530                   | <b>8.05</b>                          | <b>23.98dBm or<br/>11+10log(B) =<br/>31.60dBm</b> |

**802.11ac (80M) MIMO operation CH 1**

| Cable loss = 0 |                        | <b>The Maximum Output Power CH 1</b> |   |
|----------------|------------------------|--------------------------------------|---|
| <b>CH</b>      | <b>Frequency (MHz)</b> | <b>Data Rate</b>                     | <b>Required Limit</b>                             |
|                |                        | <b>MCS0</b>                          |   |
| 42             | 5210                   | <b>6.44</b>                          | <b>16.99dBm or<br/>4+10log(B) =<br/>23.15dBm</b>  |
| 58             | 5290                   | <b>7.01</b>                          | <b>23.98dBm or<br/>11+10log(B) =<br/>30.14dBm</b> |
| 106            | 5530                   | <b>8.36</b>                          | <b>23.98dBm or<br/>11+10log(B) =<br/>31.60dBm</b> |

*Note: Offset 11.10dB*

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**802.11ac (80M) MIMO operation CH 0 + CH 1**

| Cable loss = 0 |                            | <b>The Maximum Output Power<br/>CH 0+ CH 1</b> |   |
|----------------|----------------------------|--|---|
| <b>CH</b>      | <b>Frequency<br/>(MHz)</b> | <b>Data Rate</b>                               | <b>Required Limit</b>                             |
|                |                            | <b>MCS0</b>                                    |   |
| 42             | 5210                       | <b>11.43</b>                                   | <b>16.99dBm or<br/>4+10log(B) =<br/>23.15dBm</b>  |
| 58             | 5290                       | <b>11.28</b>                                   | <b>23.98dBm or<br/>11+10log(B) =<br/>30.14dBm</b> |
| 106            | 5530                       | <b>11.22</b>                                   | <b>23.98dBm or<br/>11+10log(B) =<br/>31.60dBm</b> |

*Note: Offset 11.10dB*

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## ERP/EIRP Measurement:

## 802.11a (Antenna Main)

| Cable loss = 0 |                 | EIRP      |  |
|----------------|-----------------|-----------|--|
| CH             | Frequency (MHz) | Data Rate | Required Limit                           |
|                |                 | 6         |  |
| 36             | 5180            | 15.60     | 23.01dBm or<br>10+10log(B) =<br>22.22dBm |
| 44             | 5220            | 15.65     | 23.01dBm or<br>10+10log(B) =<br>22.22dBm |
| 48             | 5240            | 16.61     | 23.01dBm or<br>10+10log(B) =<br>22.22dBm |
| 52             | 5260            | 15.64     | 30.00dBm or<br>17+10log(B) =<br>29.22dBm |
| 60             | 5300            | 15.42     | 30.00dBm or<br>17+10log(B) =<br>29.22dBm |
| 64             | 5320            | 15.28     | 30.00dBm or<br>17+10log(B) =<br>29.19dBm |
| 100            | 5500            | 18.04     | 30.00dBm or<br>17+10log(B) =<br>29.25dBm |
| 116            | 5580            | 18.76     | 30.00dBm or<br>17+10log(B) =<br>29.28dBm |
| 140            | 5700            | 17.96     | 30.00dBm or<br>17+10log(B) =<br>29.22dBm |

Note: Limit is re-adjusted in terms of dBm

$10 * \log(50mW) = 16.99dBm$  for the limit on the band of 5150~5250MHz

$10 * \log(250mW) = 23.98dBm$  for the limit on the band of 5260~5320MHz, & 5470~5725MHz

Note: Cable loss is 11.10dB is set as the offset on the spectrum to compensate the loss causing by cable

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## 802.11ac (20M) – SISO (Antenna Main)

| Cable loss = 0 |                 | EIRP      |  |
|----------------|-----------------|-----------|--|
| CH             | Frequency (MHz) | Data Rate | Required Limit                           |
|                |                 | MCS0      |  |
| 36             | 5180            | 13.35     | 23.01dBm or<br>10+10log(B) =<br>22.52dBm |
| 44             | 5220            | 13.87     | 23.01dBm or<br>10+10log(B) =<br>22.49dBm |
| 48             | 5240            | 13.41     | 23.01dBm or<br>10+10log(B) =<br>22.49dBm |
| 52             | 5260            | 15.66     | 30.00dBm or<br>17+10log(B) =<br>29.55dBm |
| 60             | 5300            | 15.18     | 30.00dBm or<br>17+10log(B) =<br>29.49dBm |
| 64             | 5320            | 12.52     | 30.00dBm or<br>17+10log(B) =<br>29.52dBm |
| 100            | 5500            | 16.04     | 30.00dBm or<br>17+10log(B) =<br>29.49dBm |
| 116            | 5580            | 17.95     | 30.00dBm or<br>17+10log(B) =<br>29.55dBm |
| 140            | 5700            | 13.78     | 30.00dBm or<br>17+10log(B) =<br>29.49dBm |

Note: Offset 11.10dB

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**802.11ac (40M) – SISO (Antenna Main)**

| Cable loss = 0 |                 | EIRP      |  |
|----------------|-----------------|-----------|--|
| CH             | Frequency (MHz) | Data Rate | Required Limit                           |
|                |                 | MCS0      |  |
| 38             | 5190            | 9.02      | 23.01dBm or<br>10+10log(B) =<br>25.63dBm |
| 46             | 5230            | 13.77     | 23.01dBm or<br>10+10log(B) =<br>25.63dBm |
| 54             | 5270            | 14.95     | 30.00dBm or<br>17+10log(B) =<br>32.63dBm |
| 62             | 5310            | 11.17     | 30.00dBm or<br>17+10log(B) =<br>32.61dBm |
| 102            | 5510            | 10.75     | 30.00dBm or<br>17+10log(B) =<br>32.61dBm |
| 110            | 5550            | 16.65     | 30.00dBm or<br>17+10log(B) =<br>32.63dBm |
| 134            | 5670            | 15.58     | 30.00dBm or<br>17+10log(B) =<br>32.63dBm |

*Note: Offset 11.10dB*

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**802.11ac (80M) – SISO (Antenna Main)**

| Cable loss = 0 |                 | EIRP      |  |
|----------------|-----------------|-----------|--|
| CH             | Frequency (MHz) | Data Rate | Required Limit                           |
|                |                 | MCS0      |  |
| 42             | 5210            | 8.34      | 23.01dBm or<br>10+10log(B) =<br>28.83dBm |
| 58             | 5290            | 8.64      | 30.00dBm or<br>17+10log(B) =<br>35.81dBm |
| 106            | 5530            | 10.58     | 30.00dBm or<br>17+10log(B) =<br>35.83dBm |

*Note: Offset 11.10dB*

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**802.11a (Antenna Aux)**

| Cable loss = 0 |                 | EIRP         |   |
|----------------|-----------------|--------------|---|
| CH             | Frequency (MHz) | Data Rate    | Required Limit                                    |
|                |                 | 6            |   |
| 36             | 5180            | <b>15.72</b> | <b>23.01dBm or<br/>10+10log(B) =<br/>22.22dBm</b> |
| 44             | 5220            | 15.68        | <b>23.01dBm or<br/>10+10log(B) =<br/>22.22dBm</b> |
| 48             | 5240            | 16.32        | <b>23.01dBm or<br/>10+10log(B) =<br/>22.22dBm</b> |
| 52             | 5260            | 16.50        | <b>30.00dBm or<br/>17+10log(B) =<br/>29.22dBm</b> |
| 60             | 5300            | <b>16.52</b> | <b>30.00dBm or<br/>17+10log(B) =<br/>29.22dBm</b> |
| 64             | 5320            | 16.51        | <b>30.00dBm or<br/>17+10log(B) =<br/>29.19dBm</b> |
| 100            | 5500            | 17.88        | <b>30.00dBm or<br/>17+10log(B) =<br/>29.25dBm</b> |
| 116            | 5580            | <b>18.37</b> | <b>30.00dBm or<br/>17+10log(B) =<br/>29.28dBm</b> |
| 140            | 5700            | <b>17.89</b> | <b>30.00dBm or<br/>17+10log(B) =<br/>29.22dBm</b> |

*Note: Limit is re-adjusted in terms of dBm*

*10\*log(50mW) = 16.99dBm for the limit on the band of 5150~5250MHz*

*10\*log(250mW)=23.98dBm for the limit on the band of 5260~5320MHz, & 5470~5725MHz*

*Note: Cable loss is 11.10dB is set as the offset on the spectrum to compensate the loss causing by cable*

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802.11ac (20M) – SISO (Antenna Aux)

| Cable loss = 0 |                 | EIRP      |  |
|----------------|-----------------|-----------|--|
| CH             | Frequency (MHz) | Data Rate | Required Limit                           |
|                |                 | MCS0      |  |
| 36             | 5180            | 14.83     | 23.01dBm or<br>10+10log(B) =<br>22.46dBm |
| 44             | 5220            | 14.95     | 23.01dBm or<br>10+10log(B) =<br>22.49dBm |
| 48             | 5240            | 15.01     | 23.01dBm or<br>10+10log(B) =<br>22.52dBm |
| 52             | 5260            | 16.55     | 30.00dBm or<br>17+10log(B) =<br>29.49dBm |
| 60             | 5300            | 16.23     | 30.00dBm or<br>17+10log(B) =<br>29.49dBm |
| 64             | 5320            | 13.50     | 30.00dBm or<br>17+10log(B) =<br>29.46dBm |
| 100            | 5500            | 16.06     | 30.00dBm or<br>17+10log(B) =<br>29.52dBm |
| 116            | 5580            | 18.48     | 30.00dBm or<br>17+10log(B) =<br>29.55dBm |
| 140            | 5700            | 14.45     | 30.00dBm or<br>17+10log(B) =<br>29.52dBm |

Note: Offset 11.10dB

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## 802.11ac (40M) – SISO (Antenna Aux)

| Cable loss = 0 |                 | EIRP      |  |
|----------------|-----------------|-----------|--|
| CH             | Frequency (MHz) | Data Rate | Required Limit                           |
|                |                 | MCS0      |  |
| 38             | 5190            | 10.57     | 23.01dBm or<br>10+10log(B) =<br>25.59dBm |
| 46             | 5230            | 14.56     | 23.01dBm or<br>10+10log(B) =<br>25.63dBm |
| 54             | 5270            | 16.13     | 30.00dBm or<br>17+10log(B) =<br>32.63dBm |
| 62             | 5310            | 12.19     | 30.00dBm or<br>17+10log(B) =<br>32.66dBm |
| 102            | 5510            | 10.50     | 30.00dBm or<br>17+10log(B) =<br>32.63dBm |
| 110            | 5550            | 17.18     | 30.00dBm or<br>17+10log(B) =<br>32.63dBm |
| 134            | 5670            | 15.86     | 30.00dBm or<br>17+10log(B) =<br>32.63dBm |

Note: Offset 11.10dB

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**802.11ac (80M) – SISO (Antenna Aux)**

| Cable loss = 0 |                 | EIRP      |  |
|----------------|-----------------|-----------|--|
| CH             | Frequency (MHz) | Data Rate | Required Limit                           |
|                |                 | MCS0      |  |
| 42             | 5210            | 9.81      | 23.01dBm or<br>10+10log(B) =<br>28.83dBm |
| 58             | 5290            | 10.22     | 30.00dBm or<br>17+10log(B) =<br>35.83dBm |
| 106            | 5530            | 11.25     | 30.00dBm or<br>17+10log(B) =<br>35.83dBm |

*Note: Offset 11.10dB*

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## 802.11ac (20M) MIMO operation CH0 + CH 1

| Cable loss = 0 |                 | EIRP CH 0 +CH 1 |  |
|----------------|-----------------|-----------------|--|
| CH             | Frequency (MHz) | Data Rate       | Required Limit                           |
|                |                 | MCS8            |  |
| 36             | 5180            | 17.95           | 23.01dBm or<br>10+10log(B) =<br>22.52dBm |
| 44             | 5220            | 18.22           | 23.01dBm or<br>10+10log(B) =<br>22.49dBm |
| 48             | 5240            | 18.21           | 23.01dBm or<br>10+10log(B) =<br>22.52dBm |
| 52             | 5260            | 20.93           | 30.00dBm or<br>17+10log(B) =<br>29.55dBm |
| 60             | 5300            | 19.11           | 30.00dBm or<br>17+10log(B) =<br>29.49dBm |
| 64             | 5320            | 20.71           | 30.00dBm or<br>17+10log(B) =<br>29.52dBm |
| 100            | 5500            | 21.80           | 30.00dBm or<br>17+10log(B) =<br>29.52dBm |
| 116            | 5580            | 23.88           | 30.00dBm or<br>17+10log(B) =<br>29.55dBm |
| 140            | 5700            | 20.05           | 30.00dBm or<br>17+10log(B) =<br>29.52dBm |

Note: Offset 11.10dB

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**802.11 ac (40M) MIMO operation CH 0 + CH 1**

| Cable loss = 0 |                 | EIRP CH 0 + CH1 |  |
|----------------|-----------------|-----------------|--|
| CH             | Frequency (MHz) | Data Rate       | Required Limit                           |
|                |                 | MCS8            |  |
| 38             | 5190            | 13.84           | 23.01dBm or<br>10+10log(B) =<br>25.63dBm |
| 46             | 5230            | 17.94           | 23.01dBm or<br>10+10log(B) =<br>25.63dBm |
| 54             | 5270            | 20.00           | 30.00dBm or<br>17+10log(B) =<br>32.63dBm |
| 62             | 5310            | 16.46           | 30.00dBm or<br>17+10log(B) =<br>32.66dBm |
| 102            | 5510            | 16.62           | 30.00dBm or<br>17+10log(B) =<br>32.63dBm |
| 110            | 5550            | 22.93           | 30.00dBm or<br>17+10log(B) =<br>32.63dBm |
| 134            | 5670            | 21.59           | 30.00dBm or<br>17+10log(B) =<br>32.63dBm |

*Note: Offset 11.10dB*

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**802.11ac (80M) MIMO operation CH 0 +CH 1**

| Cable loss = 0 |                        | <b>EIRP CH 0 + CH 1</b> |   |
|----------------|------------------------|-------------------------|---|
| <b>CH</b>      | <b>Frequency (MHz)</b> | <b>Data Rate</b>        | <b>Required Limit</b>                             |
|                |                        | <b>MCS0</b>             |   |
| 42             | 5210                   | <b>12.72</b>            | <b>23.01dBm or<br/>10+10log(B) =<br/>28.83dBm</b> |
| 58             | 5290                   | <b>13.86</b>            | <b>30.00dBm or<br/>17+10log(B) =<br/>35.83dBm</b> |
| 106            | 5530                   | <b>16.75</b>            | <b>30.00dBm or<br/>17+10log(B) =<br/>35.83dBm</b> |

*Note: Offset 11.10dB*

\* Note: EIRP = Average Power + Gain, where the nominal gain of the antenna:

0.68dBi for 5150-5250MHz for Antenna Main, 0.74dBi for 5150-5250MHz for Antenna Aux,

0.68dBi for 5250-5350MHz for Antenna Main, 1.57dBi for 5250-5350MHz for Antenna Aux,

2.77dBi for 5470-5725MHz for Antenna Main, 2.77dBi for 5740-5725MHz for Antenna Aux

MIMO Gain: 1.41dBi for 802.11ac 20M, 1.45dBi for 802.11ac 40M, 1.29dBi for 802.11ac 80M (5150-5250MHz), 2.69dBi for 802.11ac 20M, 2.67dBi for 802.11ac 40M, 2.58dBi for 802.11ac 80M (5250-5350MHz), and 5.54dBi for 802.11ac 20M, 802.11ac 40M and 802.11ac 80M (5470-5725MHz) where MIMO gain = directive gain + nominal gain.

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## 9. PEAK POWER SPECTRAL DENSITY

### 9.1 Standard Applicable

According to §15.407(a)

1. For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band.
2. For the band 5.25-5.35 GHz and 5.47-5.725GHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band.

If transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to RSS-210 A9.2

1. For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or  $10 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.
2. For the bands 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10} B$ , dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

In addition, devices with maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

In addition to the above requirements, devices operating in the band 5250-5350 MHz with maximum e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. elevation mask where  $\theta$  is the angle above the local horizontal plane (of the earth) as shown below:

- (i) -13 dB (W/MHz) for  $0^\circ \leq \theta < 80^\circ$
- (ii)  $-13 - 0.716(\theta - 80)$  dB (W/MHz) for  $80^\circ \leq \theta < 400^\circ$
- (iii)  $-35.9 - 1.22(\theta - 40)$  dB (W/MHz) for  $40^\circ \leq \theta \leq 450^\circ$
- (iv) -42 dB (W/MHz) for  $\theta > 450^\circ$

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## 9.2 Measurement Procedure (following procedure F, & E) d) method SA-2 in KDB789033 D01)

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
3. Set RBW=1MHz, VBW=3MHz, Span=50MHz/80MHz (Base Mode), where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth)
4. User the cursor on spectrum to peak search the highest level of trace
5. Add offset, duty factor n\_HT20=0.10, n\_HT40=0.12
6. Record the max. reading.
7. Repeat above procedures until all default test channel (low, middle, and high) was complete.
8. For MIMO mode, add the appropriate offset.

## 9.3 Measurement Equipment Used:

Refer to section 7.3 for details.

## 9.4 Test Set-up:

Refer to section 7.4 for details.

*Remark: as per KDB 662291, MIMO mode is accomplished by the addition of  $10 \log(N)$ , where  $N = 2$  as the simultaneous emission of PSD*

## 9.5 Measurement Result: N/A

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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## 10. PEAK EXCURSION MEASUREMENT

### 10.1 Standard Applicable

15.407(a)(6) The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

### 10.2 Measurement Procedure (following procedure G in KDB789033)

1. Pre-evaluation in selection for test mode based on KDB789033
2. Tests mode selection is based on the variations in signal structure,
  - (i) All signal types - OFDM;
  - (ii) All modulation types (BPSK, QPSK, 16-QAM, 64-QAM);
  - (iii) All bandwidth modes (20MHz, and 40MHz for 802.11n);
  - (iv) All variations in signal parameters (inapplicable);
  - (v) Error-correction coding rate (not required);
3. Place the EUT on the table and set it in transmitting mode.
4. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to spectrum.
5. Set RBW=1MHz, VBW = 3MHz, span =enough to capture the signal of the interest, Max. Hold, Detector = peak
6. use the procedure specified in KDB 789033 F) to determine the PPSD
7. compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD by the subtraction
8. Repeat above procedures until all default test mode of default frequency band of the test is completed.

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Table 18-4—Modulation-dependent parameters

| Modulation | Coding rate ( $R$ ) | Coded bits per subcarrier ( $N_{BPSC}$ ) | Coded bits per OFDM symbol ( $N_{CBPS}$ ) | Data bits per OFDM symbol ( $N_{DBPS}$ ) | Data rate (Mb/s) (20 MHz channel spacing) | Data rate (Mb/s) (10 MHz channel spacing) | Data rate (Mb/s) (5 MHz channel spacing) |
|------------|---------------------|--|---|--|---|---|--|
| BPSK       | 1/2                 | 1  | 48  | 24                                       | 6   | 3   | 1.5                                      |
| BPSK       | 3/4                 | 1  | 48  | 36                                       | 9   | 4.5                                       | 2.25                                     |
| QPSK       | 1/2                 | 2  | 96  | 48                                       | 12  | 6   | 3  |
| QPSK       | 3/4                 | 2  | 96  | 72                                       | 18  | 9   | 4.5                                      |
| 16-QAM     | 1/2                 | 4  | 192                                       | 96                                       | 24  | 12  | 6  |
| 16-QAM     | 3/4                 | 4  | 192                                       | 144                                      | 36  | 18  | 9  |
| 64-QAM     | 2/3                 | 6  | 288                                       | 192                                      | 48  | 24  | 12                                       |
| 64-QAM     | 3/4                 | 6  | 288                                       | 216                                      | 54  | 27  | 13.5                                     |

802.11n\_20

Table 20-30—MCS parameters for mandatory 20 MHz,  $N_{SS} = 1$ ,  $N_{ES} = 1$ 

| MCS Index | Modulation | $R$ | $N_{BPSCS}(i_{SS})$ | $N_{SD}$ | $N_{SP}$ | $N_{CBPS}$ | $N_{DBPS}$ | Data rate (Mb/s) |                      |
|-----------|------------|-----|---------------------|----------|----------|------------|------------|------------------|----------------------|
|           |            |     |                     |          |          |            |            | 800 ns GI        | 400 ns GI (see NOTE) |
| 0         | BPSK       | 1/2 | 1                   | 52       | 4        | 52         | 26         | 6.5              | 7.2                  |
| 1         | QPSK       | 1/2 | 2                   | 52       | 4        | 104        | 52         | 13.0             | 14.4                 |
| 2         | QPSK       | 3/4 | 2                   | 52       | 4        | 104        | 78         | 19.5             | 21.7                 |
| 3         | 16-QAM     | 1/2 | 4                   | 52       | 4        | 208        | 104        | 26.0             | 28.9                 |
| 4         | 16-QAM     | 3/4 | 4                   | 52       | 4        | 208        | 156        | 39.0             | 43.3                 |
| 5         | 64-QAM     | 2/3 | 6                   | 52       | 4        | 312        | 208        | 52.0             | 57.8                 |
| 6         | 64-QAM     | 3/4 | 6                   | 52       | 4        | 312        | 234        | 58.5             | 65.0                 |
| 7         | 64-QAM     | 5/6 | 6                   | 52       | 4        | 312        | 260        | 65.0             | 72.2                 |

NOTE—Support of 400 ns GI is optional on transmit and receive.

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Table 20-34—MCS parameters for optional 40 MHz,  $N_{SS} = 1$ ,  $N_{ES} = 1$ 

| MCS Index | Modulation | $R$ | $N_{BPSCS}(i_{SS})$ | $N_{SD}$ | $N_{SP}$ | $N_{CBPS}$ | $N_{DBPS}$ | Data rate (Mb/s) |           |
|-----------|------------|-----|---------------------|----------|----------|------------|------------|------------------|-----------|
|           |            |     |                     |          |          |            |            | 800 ns GI        | 400 ns GI |
| 0         | BPSK       | 1/2 | 1                   | 108      | 6        | 108        | 54         | 13.5             | 15.0      |
| 1         | QPSK       | 1/2 | 2                   | 108      | 6        | 216        | 108        | 27.0             | 30.0      |
| 2         | QPSK       | 3/4 | 2                   | 108      | 6        | 216        | 162        | 40.5             | 45.0      |
| 3         | 16-QAM     | 1/2 | 4                   | 108      | 6        | 432        | 216        | 54.0             | 60.0      |
| 4         | 16-QAM     | 3/4 | 4                   | 108      | 6        | 432        | 324        | 81.0             | 90.0      |
| 5         | 64-QAM     | 2/3 | 6                   | 108      | 6        | 648        | 432        | 108.0            | 120.0     |
| 6         | 64-QAM     | 3/4 | 6                   | 108      | 6        | 648        | 486        | 121.5            | 135.0     |
| 7         | 64-QAM     | 5/6 | 6                   | 108      | 6        | 648        | 540        | 135.0            | 150.0     |

802.11n\_20\_MIMO

| MCS Index | Modulation | $R$ | $N_{BPSCS}(i_{SS})$ | $N_{SD}$ | $N_{SP}$ | $N_{CBPS}$ | $N_{DBPS}$ | Data rate (Mb/s) |                         |
|-----------|------------|-----|---------------------|----------|----------|------------|------------|------------------|-------------------------|
|           |            |     |                     |          |          |            |            | 800 ns GI        | 400 ns GI<br>(see NOTE) |
| 8         | BPSK       | 1/2 | 1                   | 52       | 4        | 104        | 52         | 13.0             | 14.4                    |
| 9         | QPSK       | 1/2 | 2                   | 52       | 4        | 208        | 104        | 26.0             | 28.9                    |
| 10        | QPSK       | 3/4 | 2                   | 52       | 4        | 208        | 156        | 39.0             | 43.3                    |
| 11        | 16-QAM     | 1/2 | 4                   | 52       | 4        | 416        | 208        | 52.0             | 57.8                    |
| 12        | 16-QAM     | 3/4 | 4                   | 52       | 4        | 416        | 312        | 78.0             | 86.7                    |
| 13        | 64-QAM     | 2/3 | 6                   | 52       | 4        | 624        | 416        | 104.0            | 115.6                   |
| 14        | 64-QAM     | 3/4 | 6                   | 52       | 4        | 624        | 468        | 117.0            | 130.0                   |
| 15        | 64-QAM     | 5/6 | 6                   | 52       | 4        | 624        | 520        | 130.0            | 144.4                   |

NOTE—The 400 ns GI rate values are rounded to 1 decimal place.

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802.11n\_40\_MIMO

| MCS Index | Modulation | R   | $N_{BPSCS}(i_{SS})$ | $N_{SD}$ | $N_{SP}$ | $N_{CBPS}$ | $N_{DBPS}$ | Data rate (Mb/s) |           |
|-----------|------------|-----|---------------------|----------|----------|------------|------------|------------------|-----------|
|           |            |     |                     |          |          |            |            | 800 ns GI        | 400 ns GI |
| 8         | BPSK       | 1/2 | 1                   | 108      | 6        | 216        | 108        | 27.0             | 30.0      |
| 9         | QPSK       | 1/2 | 2                   | 108      | 6        | 432        | 216        | 54.0             | 60.0      |
| 10        | QPSK       | 3/4 | 2                   | 108      | 6        | 432        | 324        | 81.0             | 90.0      |
| 11        | 16-QAM     | 1/2 | 4                   | 108      | 6        | 864        | 432        | 108.0            | 120.0     |
| 12        | 16-QAM     | 3/4 | 4                   | 108      | 6        | 864        | 648        | 162.0            | 180.0     |
| 13        | 64-QAM     | 2/3 | 6                   | 108      | 6        | 1296       | 864        | 216.0            | 240.0     |
| 14        | 64-QAM     | 3/4 | 6                   | 108      | 6        | 1296       | 972        | 243.0            | 270.0     |
| 15        | 64-QAM     | 5/6 | 6                   | 108      | 6        | 1296       | 1080       | 270.0            | 300.0     |

Note: The test mode to be performed is circle in red as presents above

### 10.3 Measurement Equipment Used:

Refer to section 7.3 for details.

Remark: as per KDB 662291, MIMO mode is accomplished by the addition of  $10 \log(N)$ , where  $N = 2$  as the simultaneous emission of Peak Excursion.

### 10.4 Test Set-up:

Refer to section 7.4 for details.

### 10.5 Test Results: N/A

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## 11. UNDESIRABLE EMISSION - CONDUCTED MEASUREMENT

### 11.1 Standard Applicable

According to §15.407(b),

(b) Undesirable Emission Limits: Except as shown in Paragraph (b)(6) of this section, the peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.
- (3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.
- (4) The above emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

According to RSS-210 A9.2

1. For transmitters operating in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.
2. Emissions outside the band 5250-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p.
3. For transmitters operating in the band 5470-5725 MHz, all emissions outside that band shall not exceed -27 dBm/MHz e.i.r.p.

Procedure H2) a) b) c) are adopted, KDB 789033 D01, where the conducted measurement is being used to comply with out of emission requirement as per FCC 15.407 b) 1) 2) 3), and RSS-210 A9.2 1), 2), and 3)

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## 11.2 Measurement Procedure

### Conducted Emission:

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 100 kHz, VBW = 300 kHz while frequency of the measurement is swept below 1GHz, RBW = 1MHz & VBW = 3MHz while frequency of the measurement is swept above 1GHz on Spectrum. Detector = Peak, set DL as the limit line to -27dBm, add the offset = 4.7dB for frequency below 1GHz, and 2dB for frequency above 1GHz.
3. Sweep the frequency to determine spurious emission as seen on spectrum from span of 30 to 1G, 1G to 3G, 3G to 6G, 6G to 13G, 13G to 18G, 18G to 26.5G and 26.5G to 40GHz
4. Via Software, combine 6 spans of frequency range into one plot

Conducted RF measurements of the transmitter output were made at the band edges and the adjacent restricted bands.

Also, conducted RF measurements of the transmitter output over the 30 MHz to 40 GHz band were made in order to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

Note: the spike on the spectrum is the fundamental emission that does not account for the test outside the frequency band as required by associative regulatory provision.

## 11.3 Measurement Equipment Used:

Refer to section 7.3 for details.

## 11.4 Test Set-up:

Refer to section 7.4 for details.

## 11.5 Measurement Result: N/A.

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## 12. UNDESIRABLE EMISSION - RADIATED MEASUREMENT

### 12.1 Standard Applicable

According to §15.407(b) (6) (7),

(b) Undesirable Emission Limits: Except as shown in Paragraph (b)(6) of this section, the peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.
- (2) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
- (3) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

Procedure H1) a) b) c) are adopted, KDB 789033 D01, where the conducted measurement is being used to comply with out of emission requirement as per FCC 15.407 b) 6) 7), and RSS-Gen 7.2.2.

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## §15.205- RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz                        | MHz                 | MHz             | GHz              |
|----------------------------|---------------------|-----------------|------------------|
| 0.090 - 0.110              | 16.42 - 16.423      | 399.9 - 410     | 4.5 - 5.15       |
| <sup>1</sup> 0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614       | 5.35 - 5.46      |
| 2.1735 - 2.1905            | 16.80425 - 16.80475 | 960 - 1240      | 7.25 - 7.75      |
| 4.125 - 4.128              | 25.5 - 25.67        | 1300 - 1427     | 8.025 - 8.5      |
| 4.17725 - 4.17775          | 37.5 - 38.25        | 1435 - 1626.5   | 9.0 - 9.2        |
| 4.20725 - 4.20775          | 73 - 74.6           | 1645.5 - 1646.5 | 9.3 - 9.5        |
| 6.215 - 6.218              | 74.8 - 75.2         | 1660 - 1710     | 10.6 - 12.7      |
| 6.26775 - 6.26825          | 108 - 121.94        | 1718.8 - 1722.2 | 13.25 - 13.4     |
| 6.31175 - 6.31225          | 123 - 138           | 2200 - 2300     | 14.47 - 14.5     |
| 8.291 - 8.294              | 149.9 - 150.05      | 2310 - 2390     | 15.35 - 16.2     |
| 8.362 - 8.366              | 156.52475 -         | 2483.5 - 2500   | 17.7 - 21.4      |
| 8.37625 - 8.38675          | 156.52525           | 2655 - 2900     | 22.01 - 23.12    |
| 8.41425 - 8.41475          | 156.7 - 156.9       | 3260 - 3267     | 23.6 - 24.0      |
| 12.29 - 12.293             | 162.0125 - 167.17   | 3332 - 3339     | 31.2 - 31.8      |
| 12.51975 - 12.52025        | 167.72 - 173.2      | 3345.8 - 3358   | 36.43 - 36.5     |
| 12.57675 - 12.57725        | 240 - 285           | 3600 - 4400     | ( <sup>2</sup> ) |
| 13.36 - 13.41              | 322 - 335.4         |                 |                  |

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

<sup>2</sup> Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

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## §15.209- RADIATED EMISSION LIMITS: GENERAL REQUIREMENTS

### FCC PART 15.209

| MEASURING DISTANCE OF 3 METER |                                  |                            |
|-------------------------------|----------------------------------|----------------------------|
| FREQUENCY RANGE<br>(MHz)      | FIELD STRENGTH<br>(Microvolts/m) | FIELD STRENGTH<br>(dBuV/m) |
| 30-88                         | 100                              | 40                         |
| 88-216                        | 150                              | 43.5                       |
| 216-960                       | 200                              | 46                         |
| Above 960                     | 500                              | 54                         |

#### According to RSS-Gen section 4.9 Transmitter Unwanted Emissions

The measurement method shall be described in the test report. When the applicable unwanted emissions limits are defined in relative terms, the same parameter, peak power or average power, used for the transmitter output power measurement, shall be used for unwanted emission measurements.

In measuring unwanted emissions, the spectrum shall be investigated from 30 MHz or the lowest radio frequency signal generated in the equipment, whichever is lower, without going below 9 kHz, up to at least the frequency given in (a) and (b):

- (a) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
- (b) If the equipment operates at or above 10 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

Particular attention should be paid to harmonics and sub-harmonics of the carrier frequency, as well as to those frequencies removed from the carrier by multiples of the oscillator frequency. Radiation at the frequencies of multiplier stages should also be checked.

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value need not be reported.

When limits are expressed in absolute terms, compliance with the emission limits shall be demonstrated using a CISPR quasi-peak detector and the related measurement bandwidth for emissions below 1000 MHz. As an alternative to CISPR quasi-peak measurement, compliance with the emission limits can be demonstrated using measuring equipment employing a peak detector function properly adjusted for factors such as pulse desensitization as required, with an equal or greater measurement bandwidth relative to the applicable CISPR quasi-peak bandwidth.

Above 1000 MHz, compliance with the emission limits shall be demonstrated using an average detector with a minimum resolution bandwidth of 1 MHz.

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### According to RSS-Gen section 7.2.2 Emissions Falling Within Restricted Frequency Bands

Restricted bands, identified in Table 1, are designated primarily for safety-of-life services (distress calling and certain aeronautical bands), certain satellite downlinks, radio astronomy and some government uses. Except where otherwise indicated, the following restrictions apply:

- (a) Fundamental components of modulation of licence-exempt radio apparatus shall not fall within the restricted bands of Table 1;
- (b) Unwanted emissions falling into restricted bands of Table 1 shall comply with the limits specified in RSS-Gen;
- (c) Unwanted emissions not falling within restricted frequency bands shall either comply with the limits specified in the applicable RSS, or with those specified in RSS-Gen.

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**Table 3: Restricted Frequency Bands** <sup>(Note)</sup>

| MHz                 | MHz           | GHz         |
|---------------------|---------------|-------------|
| 0.090-0.110         | 240-285       | 9.0-9.2     |
| 2.1735-2.1905       | 322-335.4     | 9.3-9.5     |
| 3.020-3.026         | 399.9-410     | 10.6-12.7   |
| 4.125-4.128         | 608-614       | 13.25-13.4  |
| 4.17725-4.17775     | 960-1427      | 14.47-14.5  |
| 4.20725-4.20775     | 1435-1626.5   | 15.35-16.2  |
| 5.677-5.683         | 1645.5-1646.5 | 17.7-21.4   |
| 6.215-6.218         | 1660-1710     | 22.01-23.12 |
| 6.26775-6.26825     | 1718.8-1722.2 | 23.6-24.0   |
| 6.31175-6.31225     | 2200-2300     | 31.2-31.8   |
| 8.291-8.294         | 2310-2390     | 36.43-36.5  |
| 8.362-8.366         | 2655-2900     | Above 38.6  |
| 8.37625-8.38675     | 3260-3267     |             |
| 8.41425-8.41475     | 3332-3339     |             |
| 12.29-12.293        | 3345.8-3358   |             |
| 12.51975-12.52025   | 3500-4400     |             |
| 12.57675-12.57725   | 4500-5150     |             |
| 13.36-13.41         | 5350-5460     |             |
| 16.42-16.423        | 7250-7750     |             |
| 16.69475-16.69525   | 8025-8500     |             |
| 16.80425-16.80475   |               |             |
| 25.5-25.67          |               |             |
| 37.5-38.25          |               |             |
| 73-74.6             |               |             |
| 74.8-75.2           |               |             |
| 108-138             |               |             |
| 156.52475-156.52525 |               |             |
| 156.7-156.9         |               |             |

**Note:** Certain frequency bands listed in Table 1 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in the 200- and 300- series RSSs, such as RSS-210 and RSS-310, which contain the requirements that apply to licence-exempt radio apparatus.

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### 12.1.1 Transmitter Spurious Emission Limits

Spurious emissions from licence-exempt transmitters shall comply with the field strength limits shown below. Additionally, the level of any transmitter spurious emission shall not exceed the level of the transmitter's fundamental emission.

**Table 5: General Field Strength Limits for Transmitters at Frequencies Above 30 MHz**

| Frequency (MHz) | Field Strength (microvolt/m at 3 metres) |
|-----------------|--|
| 30-88           | 100                                      |
| 88-216          | 150                                      |
| 216-960         | 200                                      |
| Above 960       | 500                                      |

**Note:** Transmitting devices are not permitted in Table 1 bands or, unless stated otherwise, in TV bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-806 MHz).

### 12.1.2 Unwanted Emission that complies with the undesirable emission ruling by 15.407 (b) (1) (2) (3), RSS-210 A9.2 (1) (2) (3)

| Frequencies (MHz) | EIRP Limit (dBm) | Equivalent Field Strength at 3m (dBuV/m) |
|-------------------|------------------|--|
| 5150 – 5250       | -27              | 68.3                                     |
| 5250 – 5350       | -27              | 68.3                                     |
| 5470 - 5725       | -27              | 68.3                                     |

Limit derivation in terms of Field Strength:

$EIRP = ((E \cdot d)^2) / 30$ , where E is the field in V/m, d is the measurement distance (3m), EIRP is the equivalent isotropically radiated power in Watts.

$$\begin{aligned} E &= 1000000 * (30 * EIRP)^{(1/2)} / 3 \text{ uV/m} \\ &= 68.3 \text{ dBuV/m} \end{aligned}$$

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## 12.2 EUT Setup

1. The radiated emission tests were performed in the 3 meter open-test site, using the setup in accordance with the ANSI C63.4:2009.
2. The EUT was put in the front of the test table. The host PC system was placed on the center of the back edge on the test table. The peripherals like modem, monitor printer, K/B, and mouse were placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The keyboard was placed directly in the front of the monitor, flushed with the front tabletop. The mouse was placed next to the Keyboard, flushed with the back of keyboard.
4. The spacing between the peripherals was 10 centimeters.
5. External I/O cables were draped along the edge of the test table and bundle when necessary.
6. The host PC system was connected with 120Vac/60Hz power source.

## 12.3 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until all frequency measured were complete.

For measurements below 1GHz, follow the KDB 789033 D01 requirements in section H3), “General Requirements for Unwanted Emissions Measurements” Compliance shall be demonstrated using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

For Measurement above 1GHz, for peak unwanted emission measurements follow the KDB 789033 D01 requirements in section H5) b), for average unwanted emission measurements follow the KDB 789033 D01 requirements in section H6) c) or d).

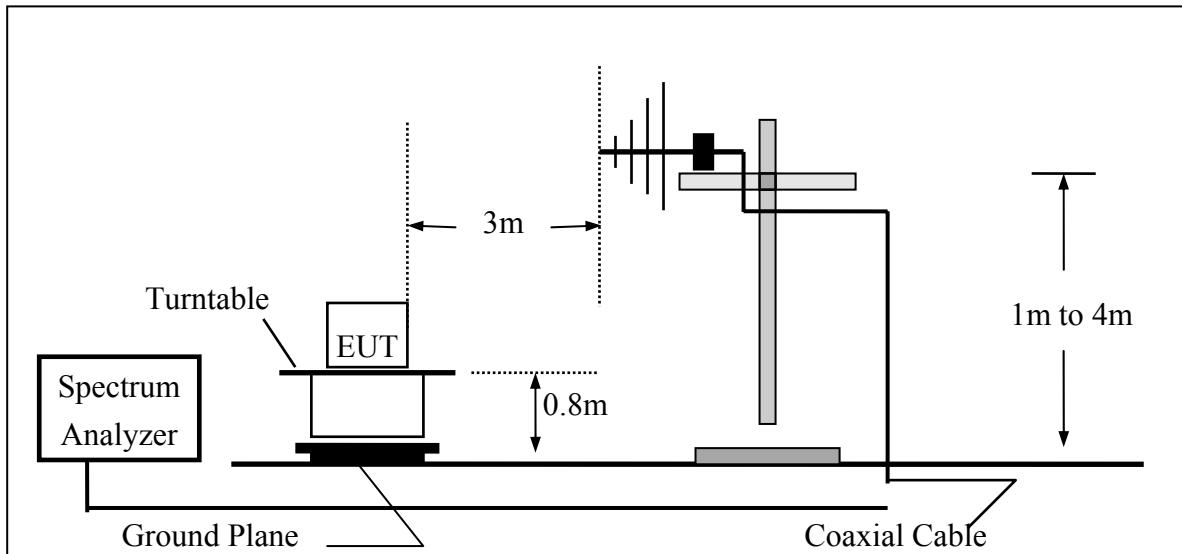
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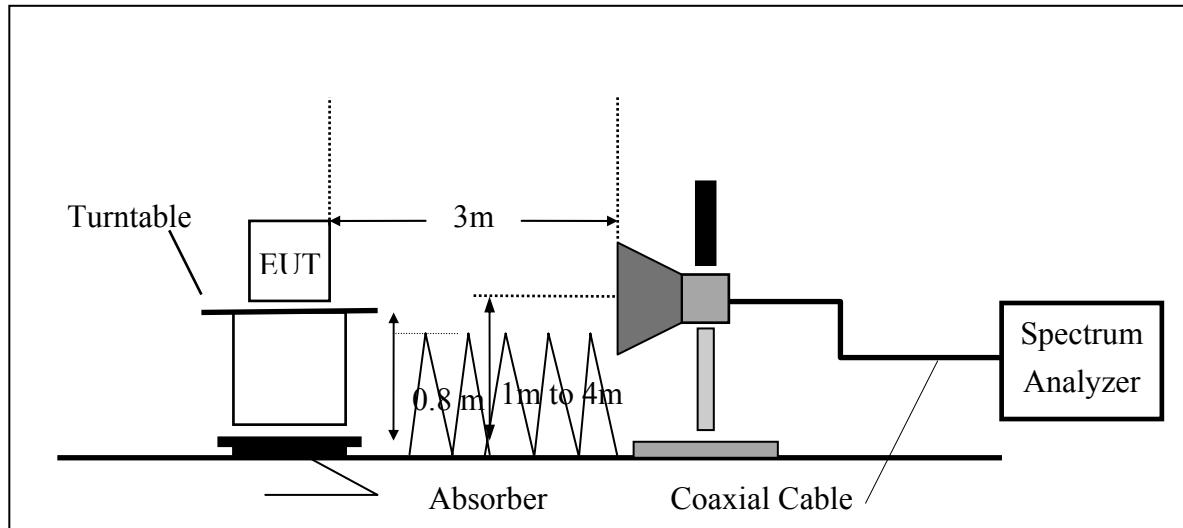
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## 12.4 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



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## 12.5 Measurement Equipment Used:

| 966 Chamber                  |                       |              |               |            |            |
|------------------------------|-----------------------|--------------|---------------|------------|------------|
| EQUIPMENT TYPE               | MFR                   | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| EMI Test Receiver            | R&S                   | ESCI7        | 100760        | 05/27/2013 | 05/26/2014 |
| Spectrum Analyzer            | Agilent               | E4446A       | MY51100003    | 05/30/2013 | 05/29/2014 |
| EXA Spectrum Analyzer        | Agilent               | N9010A       | MY50420195    | 01/20/2014 | 01/19/2015 |
| Spectrum Analyzer            | R&S                   | FSV-30       | 101398        | 10/22/2013 | 10/21/2014 |
| Loop Antenna                 | ETS.LINDGREN          | 6502         | 00148045      | 07/05/2013 | 07/04/2014 |
| Bilog Antenna                | SCHWAZBECK            | VULB9168     | 378           | 01/02/2014 | 01/01/2015 |
| Horn antenna                 | ETS.LINDGREN          | 3117         | 123995        | 05/31/2013 | 05/30/2014 |
| Horn Antenna                 | Schwarzbeck           | BBHA9170     | 184           | 01/23/2014 | 01/22/2015 |
| Pre-Amplifier                | EMC Instruments Corp. | EMC0126530   | 980038        | 01/03/2014 | 01/02/2015 |
| Pre-Amplifier                | Agilent               | 8447D        | 2944A07676    | 01/03/2014 | 01/02/2015 |
| Pre-Amplifier                | Agilent               | 8449B        | 3008A00578    | 01/03/2014 | 01/02/2015 |
| Pre-Amplifier                | EMC Instruments Corp. | EMC184045    | 980135        | 01/24/2014 | 01/23/2015 |
| 5150-5350 Band Reject Filter | Micro-Tronics         | BRM50703     | 1             | 01/03/2014 | 01/02/2015 |
| 5470-5725 Band Reject Filter | Micro-Tronics         | BRM50704     | 1             | 01/03/2014 | 01/02/2015 |
| 5725-5875 Band Reject Filter | Micro-Tronics         | BRM50705     | 1             | 01/03/2014 | 01/02/2015 |
| 1GHz High Pass Filter        | Micro-Tronics         | HPM50108     | 32            | 02/27/2014 | 02/26/2015 |
| 2GHz High Pass Filter        | Micro-Tronics         | HPM50110     | 36            | 02/27/2014 | 02/26/2015 |
| Attenuator                   | Mini-Circuit          | BW-S10W2+    | 002           | 02/27/2014 | 02/26/2015 |
| Turn Table                   | HD                    | DT420        | N/A           | N.C.R      | N.C.R      |
| Antenna Tower                | HD                    | MA240-N      | 240/657       | N.C.R      | N.C.R      |
| Controller                   | HD                    | HD100        | N/A           | N.C.R      | N.C.R      |
| Low Loss Cable               | Huber Suhner          | 966_Rx       | 9             | 01/03/2014 | 01/02/2015 |
| 3m Site NSA                  | SGS                   | 966 chamber  | N/A           | 07/15/2013 | 07/14/2014 |

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## 12.6 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF - CL - AG$$

|       |                        |  |
|-------|------------------------|--|
| Where | FS = Field Strength    | CL = Cable Attenuation Factor (Cable Loss) |
|       | RA = Reading Amplitude | AG = Amplifier Gain                        |
|       | AF = Antenna Factor    |  |

## 12.7 Measurement Result

Refer to attach tabular data sheets.

### NOTE:

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 100kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.

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### Radiated Spurious Emission Measurement Result 802.11a, 5150~5250 MHz

|                       |           |                          |                    |
|-----------------------|-----------|--------------------------|--------------------|
| Operation Band        | :802.11 a | Test Date                | :2014-04-16        |
| Fundamental Frequency | :5180 MHz | Temp./Humi.              | :20.3 deg_C /58 RH |
| Operation Mode        | :TX LOW   | Engineer                 | :Curry             |
| EUT Pol.              | :E2 Plane | Measurement Antenna Pol. | :VERTICAL          |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB     |
| 10360.00     | H               | Peak             | 26.61                     | 15.55        | 42.16                      | 68.30        | -26.14 |
| 15540.00     | H               | ---              |                           |              |                            |              |        |
| 20720.00     | H               | ---              |                           |              |                            |              |        |
| 25900.00     | H               | ---              |                           |              |                            |              |        |
| 31080.00     | H               | ---              |                           |              |                            |              |        |
| 36260.00     | H               | ---              |                           |              |                            |              |        |

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Operation Band :802.11 a  
Fundamental Frequency :5180 MHz  
Operation Mode :TX LOW  
EUT Pol. :E2 Plane  
Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 10360.00     | H               | Peak             | 26.14                     | 15.55        | 41.69            | 68.30        | -26.61       |
| 15540.00     | H               | ---              |                           |              |                  |              |              |
| 20720.00     | H               | ---              |                           |              |                  |              |              |
| 25900.00     | H               | ---              |                           |              |                  |              |              |
| 31080.00     | H               | ---              |                           |              |                  |              |              |
| 36260.00     | H               | ---              |                           |              |                  |              |              |

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Operation Band :802.11 a  
Fundamental Frequency :5200 MHz  
Operation Mode :TX MID  
EUT Pol. :E2 Plane  
Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB $\mu$ V/m |
| 10400.00     | H               | Peak             | 26.60                     | 15.26        | 41.86                      | 68.30        | -26.44       |
| 15600.00     | H               | ---              |                           |              |                            |              |              |
| 20800.00     | H               | ---              |                           |              |                            |              |              |
| 26000.00     | H               | ---              |                           |              |                            |              |              |
| 31200.00     | H               | ---              |                           |              |                            |              |              |
| 36400.00     | H               | ---              |                           |              |                            |              |              |

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Operation Band :802.11 a  
Fundamental Frequency :5200 MHz  
Operation Mode :TX MID  
EUT Pol. :E2 Plane  
Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 10400.00     | H               | Peak             | 25.92                     | 15.26        | 41.18            | 68.30        | -27.12       |
| 15600.00     | H               | ---              |                           |              |                  |              |              |
| 20800.00     | H               | ---              |                           |              |                  |              |              |
| 26000.00     | H               | ---              |                           |              |                  |              |              |
| 31200.00     | H               | ---              |                           |              |                  |              |              |
| 36400.00     | H               | ---              |                           |              |                  |              |              |

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Operation Band :802.11 a  
Fundamental Frequency :5240 MHz  
Operation Mode :TX HIGH  
EUT Pol. :E2 Plane

Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB $\mu$ V/m |
| 10480.00     | H               | Peak             | 26.09                     | 15.69        | 41.78                      | 68.30        | -26.52       |
| 15720.00     | H               | ---              |                           |              |                            |              |              |
| 20960.00     | H               | ---              |                           |              |                            |              |              |
| 26200.00     | H               | ---              |                           |              |                            |              |              |
| 31440.00     | H               | ---              |                           |              |                            |              |              |
| 36680.00     | H               | ---              |                           |              |                            |              |              |

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Operation Band :802.11 a  
Fundamental Frequency :5240 MHz  
Operation Mode :TX HIGH  
EUT Pol. :E2 Plane  
Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 10480.00     | H               | Peak             | 25.68                     | 15.69        | 41.37            | 68.30        | -26.93       |
| 15720.00     | H               | ---              |                           |              |                  |              |              |
| 20960.00     | H               | ---              |                           |              |                  |              |              |
| 26200.00     | H               | ---              |                           |              |                  |              |              |
| 31440.00     | H               | ---              |                           |              |                  |              |              |
| 36680.00     | H               | ---              |                           |              |                  |              |              |

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|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 a      | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5180 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit  | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|--------|--------|
|         |         |          | Mode       | Reading Level |              |              |        |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB     |        |
| 5123.08 | S       | Average  | 32.65      | 7.45          | 40.10        | 54.00        | -13.90 |        |
| 5123.08 | S       | Peak     | 51.75      | 7.45          | 59.20        | 74.00        | -14.80 |        |
| 5150.00 | E       | Average  | 43.44      | 7.54          | 50.98        | 54.00        | -3.02  |        |
| 5150.00 | E       | Peak     | 63.48      | 7.54          | 71.02        | 74.00        | -2.98  |        |

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 a      | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5180 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit  | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|--------|--------|
|         |         |          | Mode       | Reading Level |              |              |        |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB     |        |
| 5123.44 | S       | Average  | 30.12      | 7.45          | 37.57        | 54.00        | -16.43 |        |
| 5123.44 | S       | Peak     | 49.56      | 7.45          | 57.01        | 74.00        | -16.99 |        |
| 5150.00 | E       | Average  | 40.82      | 7.54          | 48.36        | 54.00        | -5.64  |        |
| 5150.00 | E       | Peak     | 60.68      | 7.54          | 68.22        | 74.00        | -5.78  |        |

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|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 a       | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5240 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge High | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   | Factor | Actual       | Limit        | Margin |
|---------|---------|----------|------------|--------|--------------|--------------|--------|
|         |         |          | Mode       |        | FS           | @3m          |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB     | dB $\mu$ V/m | dB $\mu$ V/m | dB     |
| 5150.00 | E       | Average  | 31.70      | 7.54   | 39.24        | 54.00        | -14.76 |
| 5150.00 | E       | Peak     | 45.87      | 7.54   | 53.41        | 74.00        | -20.59 |

|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 a       | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5240 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge High | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   | Factor | Actual       | Limit        | Margin |
|---------|---------|----------|------------|--------|--------------|--------------|--------|
|         |         |          | Mode       |        | FS           | @3m          |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB     | dB $\mu$ V/m | dB $\mu$ V/m | dB     |
| 5150.00 | E       | Average  | 31.21      | 7.54   | 38.75        | 54.00        | -15.25 |
| 5150.00 | E       | Peak     | 43.87      | 7.54   | 51.41        | 74.00        | -22.59 |

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### Radiated Spurious Emission Measurement Result 802.11ac (20M), 5150~5250MHz (MIMO)

Operation Band :802.11 AC20M Test Date :2014-04-16  
Fundamental Frequency :5180 MHz Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX LOW Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB     |
| 10360.00     | H               | Peak             | 25.50                     | 15.55        | 41.05                      | 68.30        | -27.25 |
| 15540.00     | H               | ---              |                           |              |                            |              |        |
| 20720.00     | H               | ---              |                           |              |                            |              |        |
| 25900.00     | H               | ---              |                           |              |                            |              |        |
| 31080.00     | H               | ---              |                           |              |                            |              |        |
| 36260.00     | H               | ---              |                           |              |                            |              |        |

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Operation Band :802.11 AC20M      Test Date :2014-04-16  
Fundamental Frequency :5180 MHz      Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX LOW      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 10360.00     | H               | Peak             | 24.14                     | 15.55        | 39.69            | 68.30        | -28.61       |
| 15540.00     | H               | ---              |                           |              |                  |              |              |
| 20720.00     | H               | ---              |                           |              |                  |              |              |
| 25900.00     | H               | ---              |                           |              |                  |              |              |
| 31080.00     | H               | ---              |                           |              |                  |              |              |
| 36260.00     | H               | ---              |                           |              |                  |              |              |

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Operation Band :802.11 AC20M Test Date :2014-04-16  
Fundamental Frequency :5200 MHz Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX MID Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB $\mu$ V/m |
| 10400.00     | H               | Peak             | 26.47                     | 15.26        | 41.73                      | 68.30        | -26.57       |
| 15600.00     | H               | ---              |                           |              |                            |              |              |
| 20800.00     | H               | ---              |                           |              |                            |              |              |
| 26000.00     | H               | ---              |                           |              |                            |              |              |
| 31200.00     | H               | ---              |                           |              |                            |              |              |
| 36400.00     | H               | ---              |                           |              |                            |              |              |

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Operation Band :802.11 AC20M      Test Date :2014-04-16  
Fundamental Frequency :5200 MHz      Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX MID      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual             | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|--------------------|--------------|--------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V/m | dB $\mu$ V/m | dB     |
| 10400.00     | H               | Peak             | 26.03                     | 15.26        | 41.29              | 68.30        | -27.01 |
| 15600.00     | H               | ---              |                           |              |                    |              |        |
| 20800.00     | H               | ---              |                           |              |                    |              |        |
| 26000.00     | H               | ---              |                           |              |                    |              |        |
| 31200.00     | H               | ---              |                           |              |                    |              |        |
| 36400.00     | H               | ---              |                           |              |                    |              |        |

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Operation Band :802.11 AC20M Test Date :2014-04-16  
Fundamental Frequency :5240 MHz Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX HIGH Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB $\mu$ V/m |
| 10480.00     | H               | Peak             | 26.11                     | 15.69        | 41.80                      | 68.30        | -26.50       |
| 15720.00     | H               | ---              |                           |              |                            |              |              |
| 20960.00     | H               | ---              |                           |              |                            |              |              |
| 26200.00     | H               | ---              |                           |              |                            |              |              |
| 31440.00     | H               | ---              |                           |              |                            |              |              |
| 36680.00     | H               | ---              |                           |              |                            |              |              |

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Operation Band :802.11 AC20M      Test Date :2014-04-16  
Fundamental Frequency :5240 MHz      Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX HIGH      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 10480.00     | H               | Peak             | 25.89                     | 15.69        | 41.58            | 68.30        | -26.72       |
| 15720.00     | H               | ---              |                           |              |                  |              |              |
| 20960.00     | H               | ---              |                           |              |                  |              |              |
| 26200.00     | H               | ---              |                           |              |                  |              |              |
| 31440.00     | H               | ---              |                           |              |                  |              |              |
| 36680.00     | H               | ---              |                           |              |                  |              |              |

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|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC20M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5180 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5150.00 | E       | Average  | 40.77      | 7.54          | 48.31        | 54.00        | -5.69 |        |
| 5150.00 | E       | Peak     | 59.72      | 7.54          | 67.26        | 74.00        | -6.74 |        |

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC20M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5180 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5150.00 | E       | Average  | 36.55      | 7.54          | 44.09        | 54.00        | -9.91 |        |
| 5150.00 | E       | Peak     | 56.56      | 7.54          | 64.10        | 74.00        | -9.90 |        |

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|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC20M   | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5240 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   | Factor | Actual       | Limit        | Margin |
|---------|---------|----------|------------|--------|--------------|--------------|--------|
|         |         |          | Mode       |        | FS           | @3m          |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB     | dB $\mu$ V/m | dB $\mu$ V/m | dB     |
| 5150.00 | E       | Average  | 32.47      | 7.54   | 40.01        | 54.00        | -13.99 |
| 5150.00 | E       | Peak     | 45.61      | 7.54   | 53.15        | 74.00        | -20.85 |

|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC20M   | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5240 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   | Factor | Actual       | Limit        | Margin |
|---------|---------|----------|------------|--------|--------------|--------------|--------|
|         |         |          | Mode       |        | FS           | @3m          |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB     | dB $\mu$ V/m | dB $\mu$ V/m | dB     |
| 5150.00 | E       | Average  | 29.89      | 7.54   | 37.43        | 54.00        | -16.57 |
| 5150.00 | E       | Peak     | 41.51      | 7.54   | 49.05        | 74.00        | -24.95 |

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**Radiated Spurious Emission Measurement Result 802.11ac (40M), 5150~5250MHz (MIMO)**

|                       |               |                          |                  |
|-----------------------|---------------|--------------------------|------------------|
| Operation Band        | :802.11 AC40M | Test Date                | :2014-04-16      |
| Fundamental Frequency | :5190 MHz     | Temp./Humi.              | :22 deg_C /62 RH |
| Operation Mode        | :TX LOW       | Engineer                 | :Curry           |
| EUT Pol.              | :E2 Plane     | Measurement Antenna Pol. | :VERTICAL        |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB     |
| 10380.00     | H               | Peak             | 18.73                     | 15.40        | 34.13                      | 68.30        | -34.17 |
| 15570.00     | H               | ---              |                           |              |                            |              |        |
| 20760.00     | H               | ---              |                           |              |                            |              |        |
| 25950.00     | H               | ---              |                           |              |                            |              |        |
| 31140.00     | H               | ---              |                           |              |                            |              |        |
| 36330.00     | H               | ---              |                           |              |                            |              |        |

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Operation Band :802.11 AC40M      Test Date :2014-04-16  
Fundamental Frequency :5190 MHz      Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX LOW      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 10380.00     | H               | Peak             | 19.29                     | 15.40        | 34.69            | 68.30        | -33.61       |
| 15570.00     | H               | ---              |                           |              |                  |              |              |
| 20760.00     | H               | ---              |                           |              |                  |              |              |
| 25950.00     | H               | ---              |                           |              |                  |              |              |
| 31140.00     | H               | ---              |                           |              |                  |              |              |
| 36330.00     | H               | ---              |                           |              |                  |              |              |

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Operation Band :802.11 AC40M Test Date :2014-04-16  
Fundamental Frequency :5230 MHz Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX HIGH Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB $\mu$ V/m |
| 10460.00     | H               | Peak             | 18.33                     | 15.46        | 33.79                      | 68.30        | -34.51       |
| 15690.00     | H               | ---              |                           |              |                            |              |              |
| 20920.00     | H               | ---              |                           |              |                            |              |              |
| 26150.00     | H               | ---              |                           |              |                            |              |              |
| 31380.00     | H               | ---              |                           |              |                            |              |              |
| 36610.00     | H               | ---              |                           |              |                            |              |              |

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Operation Band :802.11 AC40M      Test Date :2014-04-16  
Fundamental Frequency :5230 MHz      Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX HIGH      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 10460.00     | H               | Peak             | 19.60                     | 15.46        | 35.06            | 68.30        | -33.24       |
| 15690.00     | H               | ---              |                           |              |                  |              |              |
| 20920.00     | H               | ---              |                           |              |                  |              |              |
| 26150.00     | H               | ---              |                           |              |                  |              |              |
| 31380.00     | H               | ---              |                           |              |                  |              |              |
| 36610.00     | H               | ---              |                           |              |                  |              |              |

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|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC40M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5190MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5150.00 | E       | Average  | 43.44      | 7.54          | 50.98        | 54.00        | -3.02 |        |
| 5150.00 | E       | Peak     | 59.33      | 7.54          | 66.87        | 74.00        | -7.13 |        |

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC40M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5190MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit  | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|--------|--------|
|         |         |          | Mode       | Reading Level |              |              |        |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB     |        |
| 5150.00 | E       | Average  | 40.24      | 7.54          | 47.78        | 54.00        | -6.22  |        |
| 5150.00 | E       | Peak     | 56.33      | 7.54          | 63.87        | 74.00        | -10.13 |        |

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|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC40M   | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5230MHz        | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   | Factor | Actual       | Limit        | Margin |
|---------|---------|----------|------------|--------|--------------|--------------|--------|
|         |         |          | Mode       |        | FS           | @3m          |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB     | dB $\mu$ V/m | dB $\mu$ V/m | dB     |
| 5150.00 | E       | Average  | 32.02      | 7.54   | 39.56        | 54.00        | -14.44 |
| 5150.00 | E       | Peak     | 49.26      | 7.54   | 56.80        | 74.00        | -17.20 |

|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC40M   | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5230MHz        | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   | Factor | Actual       | Limit        | Margin |
|---------|---------|----------|------------|--------|--------------|--------------|--------|
|         |         |          | Mode       |        | FS           | @3m          |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB     | dB $\mu$ V/m | dB $\mu$ V/m | dB     |
| 5150.00 | E       | Average  | 31.09      | 7.54   | 38.63        | 54.00        | -15.37 |
| 5150.00 | E       | Peak     | 45.90      | 7.54   | 53.44        | 74.00        | -20.56 |

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### Radiated Spurious Emission Measurement Result 802.11ac (80M), 5150~5250MHz (MIMO)

Operation Band :802.11 AC80M Test Date :2014-04-16  
Fundamental Frequency :5210 MHz Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX LOW Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB     |
| 10420.00     | H               | Peak             | 24.54                     | 15.09        | 39.63                      | 68.30        | -28.67 |
| 15630.00     | H               | ---              |                           |              |                            |              |        |
| 20840.00     | H               | ---              |                           |              |                            |              |        |
| 26050.00     | H               | ---              |                           |              |                            |              |        |
| 31260.00     | H               | ---              |                           |              |                            |              |        |
| 36470.00     | H               | ---              |                           |              |                            |              |        |

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Operation Band :802.11 AC80M      Test Date :2014-04-16  
Fundamental Frequency :5210 MHz      Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX LOW      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 10420.00     | H               | Peak             | 23.94                     | 15.09        | 39.03            | 68.30        | -29.27       |
| 15630.00     | H               | ---              |                           |              |                  |              |              |
| 20840.00     | H               | ---              |                           |              |                  |              |              |
| 26050.00     | H               | ---              |                           |              |                  |              |              |
| 31260.00     | H               | ---              |                           |              |                  |              |              |
| 36470.00     | H               | ---              |                           |              |                  |              |              |

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|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC80M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5210 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5140.08 | S       | Average  | 41.39      | 7.51          | 48.90        | 54.00        | -5.10 |        |
| 5140.08 | S       | Peak     | 60.23      | 7.51          | 67.74        | 74.00        | -6.26 |        |
| 5150.00 | E       | Average  | 38.34      | 7.54          | 45.88        | 54.00        | -8.12 |        |
| 5150.00 | E       | Peak     | 56.99      | 7.54          | 64.53        | 74.00        | -9.47 |        |

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC80M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5210 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit  | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|--------|--------|
|         |         |          | Mode       | Reading Level |              |              |        |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB     |        |
| 5140.32 | S       | Average  | 37.44      | 7.51          | 44.95        | 54.00        | -9.05  |        |
| 5140.32 | S       | Peak     | 57.62      | 7.51          | 65.13        | 74.00        | -8.87  |        |
| 5150.00 | E       | Average  | 35.76      | 7.54          | 43.30        | 54.00        | -10.70 |        |
| 5150.00 | E       | Peak     | 52.94      | 7.54          | 60.48        | 74.00        | -13.52 |        |

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**Radiated Spurious Emission Measurement Result 802.11a, 5250MHz-5350MHz**

|                       |           |                          |                    |
|-----------------------|-----------|--------------------------|--------------------|
| Operation Band        | :802.11 a | Test Date                | :2014-04-16        |
| Fundamental Frequency | :5260 MHz | Temp./Humi.              | :20.3 deg_C /58 RH |
| Operation Mode        | :TX LOW   | Engineer                 | :Curry             |
| EUT Pol.              | :E2 Plane | Measurement Antenna Pol. | :VERTICAL          |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB     |
| 10520.00     | H               | Peak             | 28.03                     | 15.56        | 43.59                      | 68.30        | -24.71 |
| 15780.00     | H               | ---              |                           |              |                            |              |        |
| 21040.00     | H               | ---              |                           |              |                            |              |        |
| 26300.00     | H               | ---              |                           |              |                            |              |        |
| 31560.00     | H               | ---              |                           |              |                            |              |        |
| 36820.00     | H               | ---              |                           |              |                            |              |        |

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Operation Band :802.11 a  
Fundamental Frequency :5260 MHz  
Operation Mode :TX LOW  
EUT Pol. :E2 Plane  
Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 10520.00     | H               | Peak             | 25.67                     | 15.56        | 41.23            | 68.30        | -27.07       |
| 15780.00     | H               | ---              |                           |              |                  |              |              |
| 21040.00     | H               | ---              |                           |              |                  |              |              |
| 26300.00     | H               | ---              |                           |              |                  |              |              |
| 31560.00     | H               | ---              |                           |              |                  |              |              |
| 36820.00     | H               | ---              |                           |              |                  |              |              |

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Operation Band :802.11 a  
Fundamental Frequency :5300 MHz  
Operation Mode :TX MID  
EUT Pol. :E2 Plane  
Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|------------------------------|--------------|--------|
|              |                 |                  |                           |              |                              | dB $\mu$ V/m | dB     |
| 10600.00     | H               | Average          | 25.61                     | 15.83        | 41.44                        | 54.00        | -12.56 |
| 10600.00     | H               | Peak             | 29.06                     | 15.83        | 44.89                        | 74.00        | -29.11 |
| 15900.00     | H               | ---              |                           |              |                              |              |        |
| 21200.00     | H               | ---              |                           |              |                              |              |        |
| 26500.00     | H               | ---              |                           |              |                              |              |        |
| 31800.00     | H               | ---              |                           |              |                              |              |        |
| 37100.00     | H               | ---              |                           |              |                              |              |        |

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Operation Band :802.11 a  
Fundamental Frequency :5300 MHz  
Operation Mode :TX MID  
EUT Pol. :E2 Plane  
Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 10600.00     | H               | Average          | 23.71                     | 15.83        | 39.54            | 54.00        | -14.46       |
| 10600.00     | H               | Peak             | 26.49                     | 15.83        | 42.32            | 74.00        | -31.68       |
| 15900.00     | H               | ---              |                           |              |                  |              |              |
| 21200.00     | H               | ---              |                           |              |                  |              |              |
| 26500.00     | H               | ---              |                           |              |                  |              |              |
| 31800.00     | H               | ---              |                           |              |                  |              |              |
| 37100.00     | H               | ---              |                           |              |                  |              |              |

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Operation Band :802.11 a  
Fundamental Frequency :5320 MHz  
Operation Mode :TX HIGH  
EUT Pol. :E2 Plane  
Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB $\mu$ V/m |
| 10640.00     | H               | Average          | 28.88                     | 15.84        | 44.72                      | 54.00        | -9.28        |
| 10640.00     | H               | Peak             | 31.09                     | 15.84        | 46.93                      | 74.00        | -27.07       |
| 15960.00     | H               | ---              |                           |              |                            |              |              |
| 21280.00     | H               | ---              |                           |              |                            |              |              |
| 26600.00     | H               | ---              |                           |              |                            |              |              |
| 31920.00     | H               | ---              |                           |              |                            |              |              |
| 37240.00     | H               | ---              |                           |              |                            |              |              |

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Operation Band :802.11 a  
Fundamental Frequency :5320 MHz  
Operation Mode :TX HIGH  
EUT Pol. :E2 Plane  
Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 10640.00     | H               | Average          | 23.72                     | 15.84        | 39.56            | 54.00        | -14.44       |
| 10640.00     | H               | Peak             | 25.29                     | 15.84        | 41.13            | 74.00        | -32.87       |
| 15960.00     | H               | ---              |                           |              |                  |              |              |
| 21280.00     | H               | ---              |                           |              |                  |              |              |
| 26600.00     | H               | ---              |                           |              |                  |              |              |
| 31920.00     | H               | ---              |                           |              |                  |              |              |
| 37240.00     | H               | ---              |                           |              |                  |              |              |

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|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 a      | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5260 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit  | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|--------|--------|
|         |         |          | Mode       | Reading Level |              |              |        |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB     |        |
| 5350.00 | E       | Average  | 30.25      | 7.79          | 38.04        | 54.00        | -15.96 |        |
| 5350.00 | E       | Peak     | 42.98      | 7.79          | 50.77        | 74.00        | -23.23 |        |

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 a      | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5260 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plan       | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit  | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|--------|--------|
|         |         |          | Mode       | Reading Level |              |              |        |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB     |        |
| 5350.00 | E       | Average  | 30.65      | 7.79          | 38.44        | 54.00        | -15.56 |        |
| 5350.00 | E       | Peak     | 43.25      | 7.79          | 51.04        | 74.00        | -22.96 |        |

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|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 a       | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5320 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5350.00 | E       | Average  | 41.72      | 7.79          | 49.51        | 54.00        | -4.49 |        |
| 5350.00 | E       | Peak     | 62.40      | 7.79          | 70.19        | 74.00        | -3.81 |        |

|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 a       | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5320 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5350.00 | E       | Average  | 41.01      | 7.79          | 48.80        | 54.00        | -5.20 |        |
| 5350.00 | E       | Peak     | 59.44      | 7.79          | 67.23        | 74.00        | -6.77 |        |

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### Radiated Spurious Emission Measurement Result 802.11ac (20M), 5250~5350MHz (MIMO)

Operation Band :802.11 AC20M Test Date :2014-04-16  
Fundamental Frequency :5260 MHz Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX LOW Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB     |
| 10520.00     | H               | Peak             | 28.22                     | 15.56        | 43.78                      | 68.30        | -24.52 |
| 15780.00     | H               | ---              |                           |              |                            |              |        |
| 21040.00     | H               | ---              |                           |              |                            |              |        |
| 26300.00     | H               | ---              |                           |              |                            |              |        |
| 31560.00     | H               | ---              |                           |              |                            |              |        |
| 36820.00     | H               | ---              |                           |              |                            |              |        |

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Operation Band :802.11 AC20M      Test Date :2014-04-16  
Fundamental Frequency :5260 MHz      Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX LOW      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 10520.00     | H               | Peak             | 29.80                     | 15.56        | 45.36            | 68.30        | -22.94       |
| 15780.00     | H               | ---              |                           |              |                  |              |              |
| 21040.00     | H               | ---              |                           |              |                  |              |              |
| 26300.00     | H               | ---              |                           |              |                  |              |              |
| 31560.00     | H               | ---              |                           |              |                  |              |              |
| 36820.00     | H               | ---              |                           |              |                  |              |              |

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Operation Band :802.11 AC20M Test Date :2014-04-16  
Fundamental Frequency :5300 MHz Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX MID Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V |              |        |
| 10600.00     | H               | Average          | 25.86                     | 15.83        | 41.69            | 54.00        | -12.31 |
| 10600.00     | H               | Peak             | 28.37                     | 15.83        | 44.20            | 74.00        | -29.80 |
| 15900.00     | H               | ---              |                           |              |                  |              |        |
| 21200.00     | H               | ---              |                           |              |                  |              |        |
| 26500.00     | H               | ---              |                           |              |                  |              |        |
| 31800.00     | H               | ---              |                           |              |                  |              |        |
| 37100.00     | H               | ---              |                           |              |                  |              |        |

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Operation Band :802.11 AC20M      Test Date :2014-04-16  
Fundamental Frequency :5300 MHz      Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX MID      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 10600.00     | H               | Average          | 23.58                     | 15.83        | 39.41            | 54.00        | -14.59       |
| 10600.00     | H               | Peak             | 26.03                     | 15.83        | 41.86            | 74.00        | -32.14       |
| 15900.00     | H               | ---              |                           |              |                  |              |              |
| 21200.00     | H               | ---              |                           |              |                  |              |              |
| 26500.00     | H               | ---              |                           |              |                  |              |              |
| 31800.00     | H               | ---              |                           |              |                  |              |              |
| 37100.00     | H               | ---              |                           |              |                  |              |              |

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Operation Band :802.11 AC20M Test Date :2014-04-16  
Fundamental Frequency :5320 MHz Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX HIGH Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB $\mu$ V/m |
| 10640.00     | H               | Average          | 28.99                     | 15.84        | 44.83                      | 54.00        | -9.17        |
| 10640.00     | H               | Peak             | 31.15                     | 15.84        | 46.99                      | 74.00        | -27.01       |
| 15960.00     | H               | ---              |                           |              |                            |              |              |
| 21280.00     | H               | ---              |                           |              |                            |              |              |
| 26600.00     | H               | ---              |                           |              |                            |              |              |
| 31920.00     | H               | ---              |                           |              |                            |              |              |
| 37240.00     | H               | ---              |                           |              |                            |              |              |

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**Operation Band** :802.11 AC20M      **Test Date** :2014-04-16  
**Fundamental Frequency** :5320 MHz      **Temp./Humi.** :20.3 deg\_C /58 RH  
**Operation Mode** :TX HIGH      **Engineer** :Curry  
**EUT Pol.** :E2 Plane      **Measurement Antenna Pol.** :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit               | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|---------------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | @3m<br>dB $\mu$ V/m | dB $\mu$ V/m |
| 10640.00     | H               | Average          | 23.68                     | 15.84        | 39.52            | 54.00               | -14.48       |
| 10640.00     | H               | Peak             | 25.39                     | 15.84        | 41.23            | 74.00               | -32.77       |
| 15960.00     | H               | ---              |                           |              |                  |                     |              |
| 21280.00     | H               | ---              |                           |              |                  |                     |              |
| 26600.00     | H               | ---              |                           |              |                  |                     |              |
| 31920.00     | H               | ---              |                           |              |                  |                     |              |
| 37240.00     | H               | ---              |                           |              |                  |                     |              |

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|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC20M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5260 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit  | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|--------|--------|
|         |         |          | Mode       | Reading Level |              |              |        |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB     |        |
| 5350.00 | E       | Average  | 31.11      | 7.79          | 38.90        | 54.00        | -15.10 |        |
| 5350.00 | E       | Peak     | 47.38      | 7.79          | 55.17        | 74.00        | -18.83 |        |

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC20M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5260 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit  | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|--------|--------|
|         |         |          | Mode       | Reading Level |              |              |        |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB     |        |
| 5350.00 | E       | Average  | 30.54      | 7.79          | 38.33        | 54.00        | -15.67 |        |
| 5350.00 | E       | Peak     | 44.12      | 7.79          | 51.91        | 74.00        | -22.09 |        |

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|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC20M   | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5320 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5350.00 | S       | Average  | 41.19      | 7.79          | 48.98        | 54.00        | -5.02 |        |
| 5350.00 | S       | Peak     | 62.60      | 7.79          | 70.39        | 74.00        | -3.61 |        |
| 5351.28 | E       | Average  | 41.68      | 7.78          | 49.46        | 54.00        | -4.54 |        |
| 5351.28 | E       | Peak     | 65.22      | 7.78          | 73.00        | 74.00        | -1.00 |        |

|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC20M   | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5320 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5350.00 | S       | Average  | 39.30      | 7.79          | 47.09        | 54.00        | -6.91 |        |
| 5350.00 | S       | Peak     | 62.00      | 7.79          | 69.79        | 74.00        | -4.21 |        |
| 5351.40 | E       | Average  | 40.71      | 7.78          | 48.49        | 54.00        | -5.51 |        |
| 5351.40 | E       | Peak     | 63.04      | 7.78          | 70.82        | 74.00        | -3.18 |        |

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### Radiated Spurious Emission Measurement Result 802.11ac (40M), 5250~5350MHz (MIMO)

Operation Band :802.11 AC40M Test Date :2014-04-16  
Fundamental Frequency :5270 MHz Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX LOW Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB     |
| 10540.00     | H               | Peak             | 31.61                     | 15.47        | 47.08                      | 68.30        | -21.22 |
| 15810.00     | H               | ---              |                           |              |                            |              |        |
| 21080.00     | H               | ---              |                           |              |                            |              |        |
| 26350.00     | H               | ---              |                           |              |                            |              |        |
| 31620.00     | H               | ---              |                           |              |                            |              |        |
| 36890.00     | H               | ---              |                           |              |                            |              |        |

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Operation Band :802.11 AC40M      Test Date :2014-04-16  
Fundamental Frequency :5270 MHz      Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX LOW      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 10540.00     | H               | Peak             | 24.09                     | 15.47        | 39.56            | 68.30        | -28.74       |
| 15810.00     | H               | ---              |                           |              |                  |              |              |
| 21080.00     | H               | ---              |                           |              |                  |              |              |
| 26350.00     | H               | ---              |                           |              |                  |              |              |
| 31620.00     | H               | ---              |                           |              |                  |              |              |
| 36890.00     | H               | ---              |                           |              |                  |              |              |

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Operation Band :802.11 AC40M Test Date :2014-04-16  
Fundamental Frequency :5310 MHz Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX HIGH Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V |              |        |
| 10620.00     | H               | Average          | 27.65                     | 15.84        | 43.49            | 54.00        | -10.51 |
| 10620.00     | H               | Peak             | 31.40                     | 15.84        | 47.24            | 74.00        | -26.76 |
| 15930.00     | H               | ---              |                           |              |                  |              |        |
| 21240.00     | H               | ---              |                           |              |                  |              |        |
| 26550.00     | H               | ---              |                           |              |                  |              |        |
| 31860.00     | H               | ---              |                           |              |                  |              |        |
| 37170.00     | H               | ---              |                           |              |                  |              |        |

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Operation Band :802.11 AC40M      Test Date :2014-04-16  
 Fundamental Frequency :5310 MHz      Temp./Humi. :22 deg\_C /62 RH  
 Operation Mode :TX HIGH      Engineer :Curry  
 EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Detector<br>Mode | Note<br>F/H/E/S | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V/m | Limit<br>@3m<br>dB $\mu$ V/m | Margin |
|--------------|------------------|-----------------|---------------------------|--------------|------------------------------|------------------------------|--------|
|              |                  |                 | dB $\mu$ V                |              | dB $\mu$ V/m                 | dB $\mu$ V/m                 | dB     |
| 10640.00     | Peak             | H               | 39.69                     | 15.97        | 55.66                        | 74.00                        | -18.34 |
| 10640.00     | Average          | H               | 25.05                     | 15.97        | 41.02                        | 54.00                        | -12.98 |
| 15930.00     | H                | ---             |                           |              |                              |                              |        |
| 21240.00     | H                | ---             |                           |              |                              |                              |        |
| 26550.00     | H                | ---             |                           |              |                              |                              |        |
| 31860.00     | H                | ---             |                           |              |                              |                              |        |
| 37170.00     | H                | ---             |                           |              |                              |                              |        |

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|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC40M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5270MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   | Factor | Actual       | Limit        | Margin |
|---------|---------|----------|------------|--------|--------------|--------------|--------|
|         |         |          | Mode       |        | FS           | @3m          |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB     | dB $\mu$ V/m | dB $\mu$ V/m | dB     |
| 5350.00 | E       | Average  | 34.75      | 7.79   | 42.54        | 54.00        | -11.46 |
| 5350.00 | E       | Peak     | 57.46      | 7.79   | 65.25        | 74.00        | -8.75  |

|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC40M   | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5270MHz        | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   | Factor | Actual       | Limit        | Margin |
|---------|---------|----------|------------|--------|--------------|--------------|--------|
|         |         |          | Mode       |        | FS           | @3m          |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB     | dB $\mu$ V/m | dB $\mu$ V/m | dB     |
| 5350.00 | E       | Average  | 33.41      | 7.79   | 41.20        | 54.00        | -12.80 |
| 5350.00 | E       | Peak     | 54.69      | 7.79   | 62.48        | 74.00        | -11.52 |

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|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC40M   | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5310MHz        | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5350.00 | E       | Average  | 41.37      | 7.79          | 49.16        | 54.00        | -4.84 |        |
| 5350.00 | E       | Peak     | 57.07      | 7.79          | 64.86        | 74.00        | -9.14 |        |

|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC40M   | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5310MHz        | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit  | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|--------|--------|
|         |         |          | Mode       | Reading Level |              |              |        |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB     |        |
| 5350.00 | E       | Average  | 38.56      | 7.79          | 46.35        | 54.00        | -7.65  |        |
| 5350.00 | E       | Peak     | 53.83      | 7.79          | 61.62        | 74.00        | -12.38 |        |

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### Radiated Spurious Emission Measurement Result 802.11ac (80M), 5250~5350MHz (MIMO)

Operation Band :802.11 AC80M Test Date :2014-04-16  
Fundamental Frequency :5290 MHz Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX HIGH Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB     |
| 10580.00     | H               | Peak             | 31.96                     | 15.71        | 47.67                      | 68.30        | -20.63 |
| 15870.00     | H               | ---              |                           |              |                            |              |        |
| 21160.00     | H               | ---              |                           |              |                            |              |        |
| 26450.00     | H               | ---              |                           |              |                            |              |        |
| 31740.00     | H               | ---              |                           |              |                            |              |        |
| 37030.00     | H               | ---              |                           |              |                            |              |        |

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Operation Band :802.11 AC80M      Test Date :2014-04-16  
Fundamental Frequency :5290 MHz      Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX HIGH      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           |                    | Margin<br>dB |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | FS<br>dB $\mu$ V/m |              |
| 10580.00     | H               | Peak             | 23.11                     | 15.71        | 38.82            | 68.30              | -29.48       |
| 15870.00     | H               | ---              |                           |              |                  |                    |              |
| 21160.00     | H               | ---              |                           |              |                  |                    |              |
| 26450.00     | H               | ---              |                           |              |                  |                    |              |
| 31740.00     | H               | ---              |                           |              |                  |                    |              |
| 37030.00     | H               | ---              |                           |              |                  |                    |              |

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|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC80M   | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5290 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5350.00 | S       | Average  | 45.05      | 7.79          | 52.84        | 54.00        | -1.16 |        |
| 5350.00 | S       | Peak     | 62.10      | 7.79          | 69.89        | 74.00        | -4.11 |        |
| 5364.24 | E       | Average  | 44.73      | 7.75          | 52.48        | 54.00        | -1.52 |        |
| 5364.24 | E       | Peak     | 64.47      | 7.75          | 72.22        | 74.00        | -1.78 |        |

|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC80M   | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5290 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5350.00 | S       | Average  | 42.23      | 7.79          | 50.02        | 54.00        | -3.98 |        |
| 5350.00 | S       | Peak     | 59.99      | 7.79          | 67.78        | 74.00        | -6.22 |        |
| 5355.00 | E       | Average  | 43.02      | 7.77          | 50.79        | 54.00        | -3.21 |        |
| 5355.00 | E       | Peak     | 60.96      | 7.77          | 68.73        | 74.00        | -5.27 |        |

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### Radiated Spurious Emission Measurement Result 802.11a, 5470~5725 MHz

|                       |           |                          |                    |
|-----------------------|-----------|--------------------------|--------------------|
| Operation Band        | :802.11 a | Test Date                | :2014-04-16        |
| Fundamental Frequency | :5500 MHz | Temp./Humi.              | :20.3 deg_C /58 RH |
| Operation Mode        | :TX LOW   | Engineer                 | :Curry             |
| EUT Pol.              | :E2 Plane | Measurement Antenna Pol. | :VERTICAL          |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB     |
| 11000.00     | H               | Average          | 26.11                     | 16.70        | 42.81                      | 54.00        | -11.19 |
| 11000.00     | H               | Peak             | 28.78                     | 16.70        | 45.48                      | 74.00        | -28.52 |
| 16500.00     | H               | ---              |                           |              |                            |              |        |
| 22000.00     | H               | ---              |                           |              |                            |              |        |
| 27500.00     | H               | ---              |                           |              |                            |              |        |
| 33000.00     | H               | ---              |                           |              |                            |              |        |
| 38500.00     | H               | ---              |                           |              |                            |              |        |

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Operation Band :802.11 a  
Fundamental Frequency :5500 MHz  
Operation Mode :TX LOW  
EUT Pol. :E2 Plane

Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 11000.00     | H               | Average          | 23.17                     | 16.70        | 39.87            | 54.00        | -14.13       |
| 11000.00     | H               | Peak             | 25.62                     | 16.70        | 42.32            | 74.00        | -31.68       |
| 16500.00     | H               | ---              |                           |              |                  |              |              |
| 22000.00     | H               | ---              |                           |              |                  |              |              |
| 27500.00     | H               | ---              |                           |              |                  |              |              |
| 33000.00     | H               | ---              |                           |              |                  |              |              |
| 38500.00     | H               | ---              |                           |              |                  |              |              |

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Operation Band :802.11 a  
Fundamental Frequency :5580 MHz  
Operation Mode :TX MID  
EUT Pol. :E2 Plane  
Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB $\mu$ V/m |
| 11160.00     | H               | Average          | 27.21                     | 16.97        | 44.18                      | 54.00        | -9.82        |
| 11160.00     | H               | Peak             | 30.16                     | 16.97        | 47.13                      | 74.00        | -26.87       |
| 16740.00     | H               | ---              |                           |              |                            |              |              |
| 22320.00     | H               | ---              |                           |              |                            |              |              |
| 27900.00     | H               | ---              |                           |              |                            |              |              |
| 33480.00     | H               | ---              |                           |              |                            |              |              |
| 39060.00     | H               | ---              |                           |              |                            |              |              |

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Operation Band :802.11 a  
Fundamental Frequency :5580 MHz  
Operation Mode :TX MID  
EUT Pol. :E2 Plane  
Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 11160.00     | H               | Average          | 23.24                     | 16.97        | 40.21            | 54.00        | -13.79       |
| 11160.00     | H               | Peak             | 25.59                     | 16.97        | 42.56            | 74.00        | -31.44       |
| 16740.00     | H               | ---              |                           |              |                  |              |              |
| 22320.00     | H               | ---              |                           |              |                  |              |              |
| 27900.00     | H               | ---              |                           |              |                  |              |              |
| 33480.00     | H               | ---              |                           |              |                  |              |              |
| 39060.00     | H               | ---              |                           |              |                  |              |              |

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Operation Band :802.11 a  
Fundamental Frequency :5700 MHz  
Operation Mode :TX HIGH  
EUT Pol. :E2 Plane  
Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V |              |        |
| 11400.00     | H               | Average          | 25.84                     | 17.51        | 43.35            | 54.00        | -10.65 |
| 11400.00     | H               | Peak             | 28.43                     | 17.51        | 45.94            | 74.00        | -28.06 |
| 17100.00     | H               | ---              |                           |              |                  |              |        |
| 22800.00     | H               | ---              |                           |              |                  |              |        |
| 28500.00     | H               | ---              |                           |              |                  |              |        |
| 34200.00     | H               | ---              |                           |              |                  |              |        |
| 39900.00     | H               | ---              |                           |              |                  |              |        |

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Operation Band :802.11 a  
Fundamental Frequency :5700 MHz  
Operation Mode :TX HIGH  
EUT Pol. :E2 Plane  
Test Date :2014-04-16  
Temp./Humi. :20.3 deg\_C /58 RH  
Engineer :Curry  
Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 11400.00     | H               | Average          | 23.73                     | 17.51        | 41.24            | 54.00        | -12.76       |
| 11400.00     | H               | Peak             | 25.99                     | 17.51        | 43.50            | 74.00        | -30.50       |
| 17100.00     | H               | ---              |                           |              |                  |              |              |
| 22800.00     | H               | ---              |                           |              |                  |              |              |
| 28500.00     | H               | ---              |                           |              |                  |              |              |
| 34200.00     | H               | ---              |                           |              |                  |              |              |
| 39900.00     | H               | ---              |                           |              |                  |              |              |

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|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 a      | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5500 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5470.00 | E       | Average  | 42.87      | 7.89          | 50.76        | 54.00        | -3.24 |        |
| 5470.00 | E       | Peak     | 61.24      | 7.89          | 69.13        | 74.00        | -4.87 |        |

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 a      | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5500 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5470.00 | E       | Average  | 40.08      | 7.89          | 47.97        | 54.00        | -6.03 |        |
| 5470.00 | E       | Peak     | 58.88      | 7.89          | 66.77        | 74.00        | -7.23 |        |

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|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 a       | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5700 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5725.00 | E       | Average  | 42.30      | 8.29          | 50.59        | 54.00        | -3.41 |        |
| 5725.00 | E       | Peak     | 59.78      | 8.29          | 68.07        | 74.00        | -5.93 |        |

|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 a       | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5700 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5725.00 | E       | Average  | 39.90      | 8.29          | 48.19        | 54.00        | -5.81 |        |
| 5725.00 | E       | Peak     | 58.93      | 8.29          | 67.22        | 74.00        | -6.78 |        |

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### Radiated Spurious Emission Measurement Result 802.11ac (20M), 5470~5725MHz (MIMO)

Operation Band :802.11 AC20M Test Date :2014-04-16  
Fundamental Frequency :5500 MHz Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX LOW Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB     |
| 11000.00     | H               | Average          | 26.08                     | 16.70        | 42.78                      | 54.00        | -11.22 |
| 11000.00     | H               | Peak             | 28.88                     | 16.70        | 45.58                      | 74.00        | -28.42 |
| 16500.00     | H               | ---              |                           |              |                            |              |        |
| 22000.00     | H               | ---              |                           |              |                            |              |        |
| 27500.00     | H               | ---              |                           |              |                            |              |        |
| 33000.00     | H               | ---              |                           |              |                            |              |        |
| 38500.00     | H               | ---              |                           |              |                            |              |        |

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Operation Band :802.11 AC20M      Test Date :2014-04-16  
Fundamental Frequency :5500 MHz      Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX LOW      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 11000.00     | H               | Average          | 23.28                     | 16.70        | 39.98            | 54.00        | -14.02       |
| 11000.00     | H               | Peak             | 25.79                     | 16.70        | 42.49            | 74.00        | -31.51       |
| 16500.00     | H               | ---              |                           |              |                  |              |              |
| 22000.00     | H               | ---              |                           |              |                  |              |              |
| 27500.00     | H               | ---              |                           |              |                  |              |              |
| 33000.00     | H               | ---              |                           |              |                  |              |              |
| 38500.00     | H               | ---              |                           |              |                  |              |              |

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Operation Band :802.11 AC20M Test Date :2014-04-16  
Fundamental Frequency :5580 MHz Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX MID Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB $\mu$ V/m |
| 11160.00     | H               | Average          | 27.31                     | 16.97        | 44.28                      | 54.00        | -9.72        |
| 11160.00     | H               | Peak             | 30.22                     | 16.97        | 47.19                      | 74.00        | -26.81       |
| 16740.00     | H               | ---              |                           |              |                            |              |              |
| 22320.00     | H               | ---              |                           |              |                            |              |              |
| 27900.00     | H               | ---              |                           |              |                            |              |              |
| 33480.00     | H               | ---              |                           |              |                            |              |              |
| 39060.00     | H               | ---              |                           |              |                            |              |              |

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Operation Band :802.11 AC20M      Test Date :2014-04-16  
Fundamental Frequency :5580 MHz      Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX MID      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 11160.00     | H               | Average          | 23.33                     | 16.97        | 40.30            | 54.00        | -13.70       |
| 11160.00     | H               | Peak             | 25.68                     | 16.97        | 42.65            | 74.00        | -31.35       |
| 16740.00     | H               | ---              |                           |              |                  |              |              |
| 22320.00     | H               | ---              |                           |              |                  |              |              |
| 27900.00     | H               | ---              |                           |              |                  |              |              |
| 33480.00     | H               | ---              |                           |              |                  |              |              |
| 39060.00     | H               | ---              |                           |              |                  |              |              |

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Operation Band :802.11 AC20M Test Date :2014-04-16  
Fundamental Frequency :5700 MHz Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX HIGH Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V |              |        |
| 11400.00     | H               | Average          | 25.75                     | 17.51        | 43.26            | 54.00        | -10.74 |
| 11400.00     | H               | Peak             | 28.57                     | 17.51        | 46.08            | 74.00        | -27.92 |
| 17100.00     | H               | ---              |                           |              |                  |              |        |
| 22800.00     | H               | ---              |                           |              |                  |              |        |
| 28500.00     | H               | ---              |                           |              |                  |              |        |
| 34200.00     | H               | ---              |                           |              |                  |              |        |
| 39900.00     | H               | ---              |                           |              |                  |              |        |

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Operation Band :802.11 AC20M      Test Date :2014-04-16  
Fundamental Frequency :5700 MHz      Temp./Humi. :20.3 deg\_C /58 RH  
Operation Mode :TX HIGH      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 11400.00     | H               | Average          | 23.82                     | 17.51        | 41.33            | 54.00        | -12.67       |
| 11400.00     | H               | Peak             | 26.02                     | 17.51        | 43.53            | 74.00        | -30.47       |
| 17100.00     | H               | ---              |                           |              |                  |              |              |
| 22800.00     | H               | ---              |                           |              |                  |              |              |
| 28500.00     | H               | ---              |                           |              |                  |              |              |
| 34200.00     | H               | ---              |                           |              |                  |              |              |
| 39900.00     | H               | ---              |                           |              |                  |              |              |

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|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC20M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5500 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5470.00 | E       | Average  | 41.73      | 7.89          | 49.62        | 54.00        | -4.38 |        |
| 5470.00 | E       | Peak     | 62.87      | 7.89          | 70.76        | 74.00        | -3.24 |        |

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC20M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5500 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5470.00 | E       | Average  | 37.92      | 7.89          | 45.81        | 54.00        | -8.19 |        |
| 5470.00 | E       | Peak     | 59.08      | 7.89          | 66.97        | 74.00        | -7.03 |        |

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|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC20M   | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5700 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5725.00 | S       | Average  | 42.57      | 8.29          | 50.86        | 54.00        | -3.14 |        |
| 5725.00 | S       | Peak     | 64.57      | 8.29          | 72.86        | 74.00        | -1.14 |        |
| 5727.20 | E       | Average  | 40.91      | 8.29          | 49.20        | 54.00        | -4.80 |        |
| 5727.20 | E       | Peak     | 64.03      | 8.29          | 72.32        | 74.00        | -1.68 |        |

|                       |                 |                          |                   |
|-----------------------|-----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC20M   | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5700 MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge HIGH | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane       | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5725.00 | S       | Average  | 41.53      | 8.29          | 49.82        | 54.00        | -4.18 |        |
| 5725.00 | S       | Peak     | 59.08      | 8.29          | 67.37        | 74.00        | -6.63 |        |
| 5727.20 | E       | Average  | 40.70      | 8.29          | 48.99        | 54.00        | -5.01 |        |
| 5727.20 | E       | Peak     | 60.32      | 8.29          | 68.61        | 74.00        | -5.39 |        |

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**Radiated Spurious Emission Measurement Result 802.11ac (40M), 5470~5725MHz (MIMO)**

Operation Band :802.11 AC40M Test Date :2014-04-16  
Fundamental Frequency :5510 MHz Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX LOW Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB     |
| 11020.00     | H               | Average          | 30.43                     | 16.71        | 47.14                      | 54.00        | -6.86  |
| 11020.00     | H               | Peak             | 33.49                     | 16.71        | 50.20                      | 74.00        | -23.80 |
| 16530.00     | H               | ---              |                           |              |                            |              |        |
| 22040.00     | H               | ---              |                           |              |                            |              |        |
| 27550.00     | H               | ---              |                           |              |                            |              |        |
| 33060.00     | H               | ---              |                           |              |                            |              |        |
| 38570.00     | H               | ---              |                           |              |                            |              |        |

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Operation Band :802.11 AC40M      Test Date :2014-04-16  
Fundamental Frequency :5510 MHz      Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX LOW      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 11020.00     | H               | Average          | 21.56                     | 16.71        | 38.27            | 54.00        | -15.73       |
| 11020.00     | H               | Peak             | 24.41                     | 16.71        | 41.12            | 74.00        | -32.88       |
| 16530.00     | H               | ---              |                           |              |                  |              |              |
| 22040.00     | H               | ---              |                           |              |                  |              |              |
| 27550.00     | H               | ---              |                           |              |                  |              |              |
| 33060.00     | H               | ---              |                           |              |                  |              |              |
| 38570.00     | H               | ---              |                           |              |                  |              |              |

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Operation Band :802.11 AC40M Test Date :2014-04-16  
Fundamental Frequency :5550 MHz Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX MID Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB $\mu$ V/m |
| 11100.00     | H               | Average          | 29.85                     | 16.80        | 46.65                      | 54.00        | -7.35        |
| 11100.00     | H               | Peak             | 31.42                     | 16.80        | 48.22                      | 74.00        | -25.78       |
| 16650.00     | H               | ---              |                           |              |                            |              |              |
| 22200.00     | H               | ---              |                           |              |                            |              |              |
| 27750.00     | H               | ---              |                           |              |                            |              |              |
| 33300.00     | H               | ---              |                           |              |                            |              |              |
| 38850.00     | H               | ---              |                           |              |                            |              |              |

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Operation Band :802.11 AC40M      Test Date :2014-04-16  
Fundamental Frequency :5550 MHz      Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX MID      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit               | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|---------------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | @3m<br>dB $\mu$ V/m | dB $\mu$ V/m |
| 11100.00     | H               | Average          | 16.36                     | 16.80        | 33.16            | 54.00               | -20.84       |
| 11100.00     | H               | Peak             | 18.48                     | 16.80        | 35.28            | 74.00               | -38.72       |
| 16650.00     | H               | ---              |                           |              |                  |                     |              |
| 22200.00     | H               | ---              |                           |              |                  |                     |              |
| 27750.00     | H               | ---              |                           |              |                  |                     |              |
| 33300.00     | H               | ---              |                           |              |                  |                     |              |
| 38850.00     | H               | ---              |                           |              |                  |                     |              |

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Operation Band :802.11 AC40M      Test Date :2014-04-16  
 Fundamental Frequency :5670 MHz      Temp./Humi. :22 deg\_C /62 RH  
 Operation Mode :TX HIGH      Engineer :Curry  
 EUT Pol. :E2 Plane      Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“--“ : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB $\mu$ V/m |
| 11340.00     | H               | Average          | 33.92                     | 17.32        | 51.24                      | 54.00        | -2.76        |
| 11340.00     | H               | Peak             | 35.90                     | 17.32        | 53.22                      | 74.00        | -20.78       |
| 17010.00     | H               | ---              |                           |              |                            |              |              |
| 22680.00     | H               | ---              |                           |              |                            |              |              |
| 28350.00     | H               | ---              |                           |              |                            |              |              |
| 34020.00     | H               | ---              |                           |              |                            |              |              |
| 39690.00     | H               | ---              |                           |              |                            |              |              |

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Operation Band :802.11 AC40M      Test Date :2014-04-16  
Fundamental Frequency :5670 MHz      Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX HIGH      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit               | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|---------------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | @3m<br>dB $\mu$ V/m | dB $\mu$ V/m |
| 11340.00     | H               | Average          | 21.85                     | 17.32        | 39.17            | 54.00               | -14.83       |
| 11340.00     | H               | Peak             | 23.86                     | 17.32        | 41.18            | 74.00               | -32.82       |
| 17010.00     | H               | ---              |                           |              |                  |                     |              |
| 22680.00     | H               | ---              |                           |              |                  |                     |              |
| 28350.00     | H               | ---              |                           |              |                  |                     |              |
| 34020.00     | H               | ---              |                           |              |                  |                     |              |
| 39690.00     | H               | ---              |                           |              |                  |                     |              |

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|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC40M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5510MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5470.00 | E       | Average  | 39.67      | 7.89          | 47.56        | 54.00        | -6.44 |        |
| 5470.00 | E       | Peak     | 56.75      | 7.89          | 64.64        | 74.00        | -9.36 |        |

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC40M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5510MHz       | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit  | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|--------|--------|
|         |         |          | Mode       | Reading Level |              |              |        |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB     |        |
| 5470.00 | E       | Average  | 38.35      | 7.89          | 46.24        | 54.00        | -7.76  |        |
| 5470.00 | E       | Peak     | 54.95      | 7.89          | 62.84        | 74.00        | -11.16 |        |

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Operation Band :802.11 AC40M Test Date :2014-04-16  
 Fundamental Frequency :5670 MHz Temp./Humi. :24 deg\_C / 61 RH  
 Operation Mode :Band Edge HIGH Engineer :Curry  
 EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit  | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|--------|--------|
|         |         |          | Mode       | Reading Level |              |              |        |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB     |        |
| 5725.00 | E       | Average  | 38.05      | 8.29          | 46.34        | 54.00        | -7.66  |        |
| 5725.00 | E       | Peak     | 52.01      | 8.29          | 60.30        | 74.00        | -13.70 |        |

Operation Band :802.11 AC40M Test Date :2014-04-16  
 Fundamental Frequency :5670 MHz Temp./Humi. :24 deg\_C / 61 RH  
 Operation Mode :Band Edge HIGH Engineer :Curry  
 EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit  | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|--------|--------|
|         |         |          | Mode       | Reading Level |              |              |        |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB     |        |
| 5725.00 | E       | Average  | 36.77      | 8.29          | 45.06        | 54.00        | -8.94  |        |
| 5725.00 | E       | Peak     | 48.43      | 8.29          | 56.72        | 74.00        | -17.28 |        |

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### Radiated Spurious Emission Measurement Result 802.11ac (80M), 5470~5725MHz (MIMO)

Operation Band :802.11 AC80M Test Date :2014-04-16  
Fundamental Frequency :5530 MHz Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX LOW Engineer :Curry  
EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual<br>FS<br>dB $\mu$ V | Limit<br>@3m | Margin |
|--------------|-----------------|------------------|---------------------------|--------------|----------------------------|--------------|--------|
|              |                 |                  |                           |              |                            | dB $\mu$ V/m | dB     |
| 11060.00     | H               | Average          | 30.14                     | 16.68        | 46.82                      | 54.00        | -7.18  |
| 11060.00     | H               | Peak             | 33.86                     | 16.68        | 50.54                      | 74.00        | -23.46 |
| 16590.00     | H               | ---              |                           |              |                            |              |        |
| 22120.00     | H               | ---              |                           |              |                            |              |        |
| 27650.00     | H               | ---              |                           |              |                            |              |        |
| 33180.00     | H               | ---              |                           |              |                            |              |        |
| 38710.00     | H               | ---              |                           |              |                            |              |        |

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Operation Band :802.11 AC80M      Test Date :2014-04-16  
Fundamental Frequency :5530 MHz      Temp./Humi. :22 deg\_C /62 RH  
Operation Mode :TX LOW      Engineer :Curry  
EUT Pol. :E2 Plane      Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

| Freq.<br>MHz | Note<br>F/H/E/S | Detector<br>Mode | Spectrum<br>Reading Level | Factor<br>dB | Actual           | Limit        | Margin       |
|--------------|-----------------|------------------|---------------------------|--------------|------------------|--------------|--------------|
|              |                 |                  |                           |              | FS<br>dB $\mu$ V | dB $\mu$ V/m | dB $\mu$ V/m |
| 11060.00     | H               | Average          | 21.46                     | 16.68        | 38.14            | 54.00        | -15.86       |
| 11060.00     | H               | Peak             | 23.19                     | 16.68        | 39.87            | 74.00        | -34.13       |
| 16590.00     | H               | ---              |                           |              |                  |              |              |
| 22120.00     | H               | ---              |                           |              |                  |              |              |
| 27650.00     | H               | ---              |                           |              |                  |              |              |
| 33180.00     | H               | ---              |                           |              |                  |              |              |
| 38710.00     | H               | ---              |                           |              |                  |              |              |

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|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC80M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5530 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :VERTICAL         |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5456.48 | S       | Average  | 45.02      | 7.87          | 52.89        | 54.00        | -1.11 |        |
| 5456.48 | S       | Peak     | 64.65      | 7.87          | 72.52        | 74.00        | -1.48 |        |
| 5470.00 | E       | Average  | 44.78      | 7.89          | 52.67        | 54.00        | -1.33 |        |
| 5470.00 | E       | Peak     | 62.56      | 7.89          | 70.45        | 74.00        | -3.55 |        |

|                       |                |                          |                   |
|-----------------------|----------------|--------------------------|-------------------|
| Operation Band        | :802.11 AC80M  | Test Date                | :2014-04-16       |
| Fundamental Frequency | :5530 MHz      | Temp./Humi.              | :24 deg_C / 61 RH |
| Operation Mode        | :Band Edge LOW | Engineer                 | :Curry            |
| EUT Pol.              | :E2 Plane      | Measurement Antenna Pol. | :HORIZONTAL       |

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---“ : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|-------|--------|
|         |         |          | Mode       | Reading Level |              |              |       |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB    |        |
| 5461.16 | S       | Average  | 43.81      | 7.88          | 51.69        | 54.00        | -2.31 |        |
| 5461.16 | S       | Peak     | 63.52      | 7.88          | 71.40        | 74.00        | -2.60 |        |
| 5470.00 | E       | Average  | 40.82      | 7.89          | 48.71        | 54.00        | -5.29 |        |
| 5470.00 | E       | Peak     | 58.62      | 7.89          | 66.51        | 74.00        | -7.49 |        |

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Operation Band :802.11 AC80M Test Date :2014-04-16  
 Fundamental Frequency :5530 MHz Temp./Humi. :24 deg\_C / 61 RH  
 Operation Mode :Band Edge HIGH Engineer :Curry  
 EUT Pol. :E2 Plane Measurement Antenna Pol. :VERTICAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit  | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|--------|--------|
|         |         |          | Mode       | Reading Level |              |              |        |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB     |        |
| 5725.00 | E       | Average  | 30.90      | 8.29          | 39.19        | 54.00        | -14.81 |        |
| 5725.00 | E       | Peak     | 43.88      | 8.29          | 52.17        | 74.00        | -21.83 |        |

Operation Band :802.11 AC80M Test Date :2014-04-16  
 Fundamental Frequency :5530 MHz Temp./Humi. :24 deg\_C / 61 RH  
 Operation Mode :Band Edge HIGH Engineer :Curry  
 EUT Pol. :E2 Plane Measurement Antenna Pol. :HORIZONTAL

Actual FS(dB $\mu$ V/m) = SPA. Reading level(dB $\mu$ V) + Factor(dB)

Factor(dB) = Antenna Factor(dB $\mu$ V/m) + Cable Loss(dB) - Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

The trace on RE (radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

| Freq.   | Note    | Detector | Spectrum   |               | Factor       | Actual       | Limit  | Margin |
|---------|---------|----------|------------|---------------|--------------|--------------|--------|--------|
|         |         |          | Mode       | Reading Level |              |              |        |        |
| MHz     | F/H/E/S | PK/QP/AV | dB $\mu$ V | dB            | dB $\mu$ V/m | dB $\mu$ V/m | dB     |        |
| 5725.00 | E       | Average  | 30.77      | 8.29          | 39.06        | 54.00        | -14.94 |        |
| 5725.00 | E       | Peak     | 43.72      | 8.29          | 52.01        | 74.00        | -21.99 |        |

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## 13. TRANSMISSION IN THE ABSENCE OF DATA

### 13.1 Standard Applicable

According to §15.407(c)

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

According to RSS-210 A9.4(4)

The device shall automatically discontinue transmission in case of absence of information to transmit, or operational failure. A description on how this is done shall accompany the application for equipment certification. Note that this is not intended to prohibit transmission of control or signaling information or the use of repetitive codes where required by the technology.

### 13.2 Result:

No non-compliance noted:

Refer to the theory of operation.

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## 14. FREQUENCY STABILITY

### 14.1 Standard Applicable

According to §15.407 (g) Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

### 14.2 Result: N/A.

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## 15. ANTENNA REQUIREMENT

### 15.1 Standard Applicable

For intentional device, according to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device.

According to RSS-GEN 7.1.2, a transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest-gain antenna of each combination of transmitter and antenna type for which certification is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type and having equal or lesser gain as an antenna that had been successfully tested for certification with the transmitter, will also be considered certified with the transmitter, and may be used and marketed with the transmitter. The manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

### 15.2 Antenna Connected Construction

The directional gains of antenna used for transmitting is 2.77dBi for frequency band of 5150~5725MHz, 1.41dBi for 802.11ac 20M, 1.45dBi for 802.11ac 40M, 1.29dBi for 802.11ac 80M (5150~5250MHz\_MIMO gain); 2.69dBi for 802.11ac 20M, 2.67dBi for 802.11ac 40M, 2.58dBi for 802.11ac 80M (5250~5350MHz\_MIMO gain), and 5.54dBi for 802.11ac 20M, 802.11ac 40M and 802.11ac 80M (5470~5725MHz\_MIMO Gain). and the antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

*~ End of Report ~*

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