# FCC Test Report

| | |
|---|---|
| **Report No.:** | RF170326E02B-1 |
| **FCC ID:** | C3K1803 |
| **Test Model:** | 1803 |
| **Received Date:** | Mar. 26, 2017 |
| **Test Date:** | May 12 to 19, 2017 |
| **Issued Date:** | June 30, 2017 |
| **Applicant:** | Microsoft Corporation |
| **Address:** | One Microsoft Way Redmond WA 98052 |
| **Issued By:** | Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory |
| **Lab Address:** | E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C. |
| **Test Location (1):** | E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C. |
| **Test Location (2):** | No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C. |

Testing Laboratory
2022

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## Release Control Record

| Issue No. | Description | Date Issued |
|---|---|---|
| RF170326E02B-1 | Original release. | June 30, 2017 |

## 1 Certificate of Conformity

| | |
|---|---|
| **Product:** | 1T1R dual-band wireless accessory radio |
| **Brand:** | Microsoft |
| **Test Model:** | 1803 |
| **Sample Status:** | ENGINEERING SAMPLE |
| **Applicant:** | Microsoft Corporation |
| **Test Date:** | May 12 to 19, 2017 |
| **Standard:** | 47 CFR FCC Part 15, Subpart E (Section 15.407)<br>ANSI C63.10: 2013 |

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :** _____ , **Date:** June 30, 2017

Wendy Wu / Specialist

**Approved by :** _____ , **Date:** June 30, 2017

May Chen / Manager

## 2 Summary of Test Results

| 47 CFR FCC Part 15, Subpart E (Section 15.407) | | | |
|---|---|---|---|
| FCC Clause | Test Item | Result | Remarks |
| 15.407(b)(6) | AC Power Conducted Emissions | Pass | Meet the requirement of limit. Minimum passing margin is -11.94dB at 0.56969MHz. |
| 15.407(b) (1/2/3/4(i/ii)/6) | Radiated Emissions & Band Edge Measurement* | Pass | Meet the requirement of limit. Minimum passing margin is -5.4dB at 133.66MHz. |
| 15.407(a)(1/2/3) | Max Average Transmit Power | Pass | Meet the requirement of limit. |
| --- | Occupied Bandwidth Measurement | - | Reference only. |
| 15.407(a)(1/2/3) | Peak Power Spectral Density | Pass | Meet the requirement of limit. |
| 15.407(g) | Frequency Stability | Pass | Meet the requirement of limit. |
| 15.203 | Antenna Requirement | Pass | No antenna connector is used. |

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement | Frequency | Expanded Uncertainty (k=2) (±) |
|---|---|---|
| Conducted Emissions at mains ports | 150kHz ~ 30MHz | 1.84 dB |
| Radiated Emissions up to 1 GHz | 30MHz ~ 1GHz | 5.30 dB |
| Radiated Emissions above 1 GHz | 1GHz ~ 6GHz | 5.16 dB |
| | 6GHz ~ 18GHz | 4.91 dB |
| | 18GHz ~ 40GHz | 5.30 dB |

### 2.2 Modification Record

There were no modifications required for compliance.

## 3 General Information

### 3.1 General Description of EUT (DFS Band)

| | |
|---|---|
| Product | dual-band wireless accessory radio |
| Brand | Microsoft |
| Test Model | 1803 |
| Status of EUT | ENGINEERING SAMPLE |
| Power Supply Rating | 3.3Vdc from host equipment |
| Modulation Type | 64QAM, 16QAM, QPSK, BPSK for OFDM |
| Modulation Technology | OFDM |
| Transfer Rate | 802.11n : up to 72.2Mbps |
| Operating Frequency | 5.26GHz ~ 5.32GHz, 5.50 ~ 5.58GHz & 5.66 ~5.72GHz |
| Number of Channel | 13 for 802.11n (HT20) |
| Output Power | 5.26GHz ~ 5.32GHz: 8.872mW<br>5.50 ~ 5.58GHz & 5.66 ~5.70GHz: 8.65mW |
| Antenna Type | Refer to Note |
| Antenna Connector | Refer to Note |
| Accessory Device | NA |
| Data Cable Supplied | NA |

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF170326E02-1 as the following:
   - ◆ Add DFS band <5.26GHz ~ 5.32GHz, 5.50 ~ 5.58GHz & 5.66 ~5.72GHz>
2. According to above condition, all test items need to be performed. And all data weres verified to meet the requirements.
3. Simultaneously transmission condition.

| Condition | Technology | |
|---|---|---|
| 1 | WLAN 2.4GHz | WLAN 5GHz |
| **Note:** The emission of the simultaneous operation has been evaluated and no non-compliance was found. | | |

4. The EUT has three type models, which are identical to each other in all aspects except for the following:

| Type | MTK P/N | Different |
|---|---|---|
| Type 1 | M1023477-009 (LiteOn) | For Marketing request. |
| Type 2 | M1023477-010 (LiteOn) | |
| Type 3 | M1023477-011 (Askey) | |
| Note: From the above types, Type 1 was selected as representative model for the test and its data was recorded in this report. | | |

5. The EUT incorporates a SISO function.

| 2.4GHz Band | | | |
|---|---|---|---|
| **MODULATION MODE** | **DATA RATE (MCS)** | **TX & RX CONFIGURATION** | |
| **802.11n (HT20)** | MCS 0~7 | 1TX | 1RX |
| **5GHz Band** | | | |
| **MODULATION MODE** | **DATA RATE (MCS)** | **TX & RX CONFIGURATION** | |
| **802.11n (HT20)** | MCS 0~7 | 1TX (fixed on Ant 3) | 1RX (diversity) |

6. The antennas provided to the EUT, please refer to the following table:

| Antenna No. | Brand | Model | Gain (dBi) | Antenna Type | Connector Type | Frequency range (GHz to GHz) | Function |
|---|---|---|---|---|---|---|---|
| Ant. 1 (for WLAN 2.4GHz) | Microsoft | NA | 5.2 | PCB | NA | 2.4~2.4835 | TX/RX |
| Ant. 2 (for WLAN 5GHz) Chan (0) | | | 4.7 | | | 5.15~5.85 | RX |
| Ant. 3 (for WLAN 5GHz) Chan (1) | | | 6.1 | | | 5.15~5.85 | TX/RX |

7. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

## 3.2 Description of Test Modes

**For 5260 ~ 5320MHz**

4 channels are provided for 802.11n (HT20):

| Channel | Frequency | Channel | Frequency |
|---|---|---|---|
| 52 | 5260 MHz | 60 | 5300 MHz |
| 56 | 5280 MHz | 64 | 5320 MHz |

**For 5500 ~ 5580MHz & 5660 ~ 5720MHz**

9 channels are provided for802.11n (HT20):

| Channel | Frequency | Channel | Frequency |
|---|---|---|---|
| 100 | 5500 MHz | 132 | 5660 MHz |
| 104 | 5520 MHz | 136 | 5680 MHz |
| 108 | 5540 MHz | 140 | 5700 MHz |
| 112 | 5560 MHz | 144 | 5720 MHz |
| 116 | 5580 MHz | | |

### 3.2.1 Test Mode Applicability and Tested Channel Detail

| EUT Configure Mode | Applicable To | | | | Description |
|---|---|---|---|---|---|
| | RE≥1G | RE<1G | PLC | APCM | |
| - | √ | √ | √ | √ | - |

Where **RE≥1G:** Radiated Emission above 1GHz **RE<1G:** Radiated Emission below 1GHz
**PLC:** Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

**NOTE:**
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.

**Radiated Emission Test (Above 1GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| Mode | FREQ. Band (MHz) | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|---|---|---|
| 802.11n (HT20) | 5260-5320 | 52 to 64 | 52, 60, 64 | OFDM | BPSK | 6.5 |
| | 5500-5720 | 100 to 144 | 100, 116, 140, 144 | OFDM | BPSK | 6.5 |

**Radiated Emission Test (Below 1GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| Mode | FREQ. Band (MHz) | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|---|---|---|
| 802.11n (HT20) | 5260-5320 | 52 to 64 | 60 | OFDM | BPSK | 6.5 |
| | 5500-5720 | 100 to 144 | | | | |

**Power Line Conducted Emission Test:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| Mode | FREQ. Band (MHz) | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|---|---|---|
| 802.11n (HT20) | 5260-5320 | 52 to 64 | 60 | OFDM | BPSK | 6.5 |
| | 5500-5720 | 100 to 144 | | | | |

**Antenna Port Conducted Measurement:**

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| Mode | FREQ. Band (MHz) | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|---|---|---|
| 802.11n (HT20) | 5260-5320 | 52 to 64 | 52, 60, 64 | OFDM | BPSK | 6.5 |
| | 5500-5720 | 100 to 144 | 100, 116, 140, 144 | OFDM | BPSK | 6.5 |

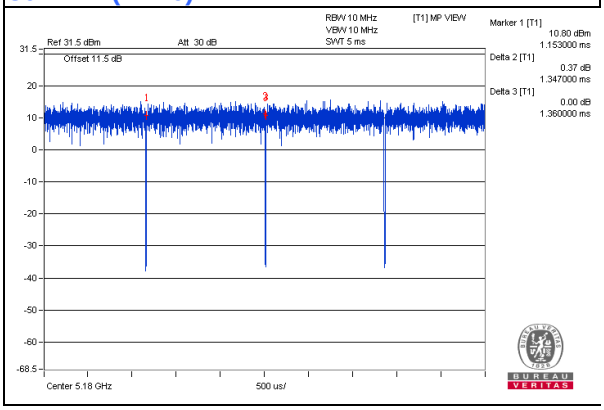
**Test Condition:**

| Applicable To | Environmental Conditions | Input Power (System) | Tested By |
|---|---|---|---|
| **RE≥1G** | 23deg. C, 66%RH | 120Vac, 60Hz | Terry Huang |
| **RE<1G** | 22deg. C, 64%RH | 120Vac, 60Hz | Terry Huang |
| **PLC** | 25deg. C, 75%RH | 120Vac, 60Hz | Andy Ho |
| **APCM** | 24deg. C, 68%RH | 120Vac, 60Hz | Anderson Chen |

### 3.3 Duty Cycle of Test Signal

Duty cycle of test signal is ≥ 98 %, duty factor is not required.
**802.11n (HT20):** Duty cycle = 1.347 ms/1.36 ms = 0.99

**802.11n (HT20)**



## 3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

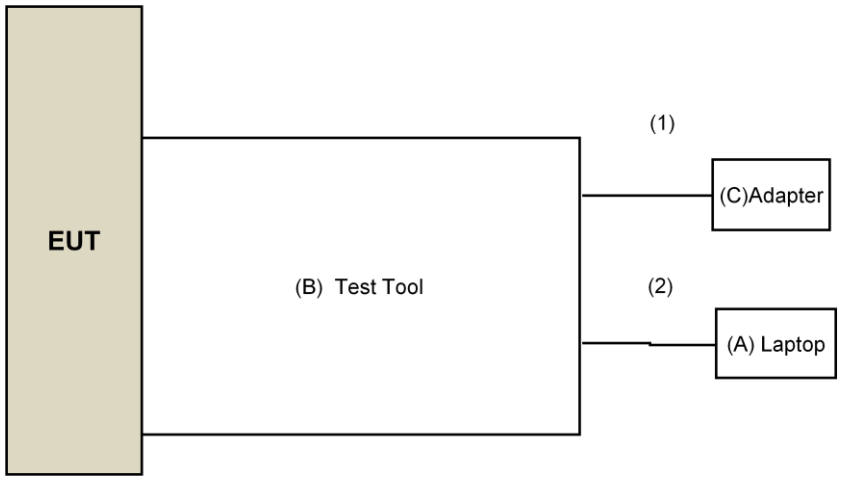
| ID | Product | Brand | Model No. | Serial No. | FCC ID | Remarks |
|---|---|---|---|---|---|---|
| A | Laptop | DELL | E6420 | B92T3R1 | FCC DoC | Supplied by Client |
| B | Test Tool | NA | NA | NA | NA | Supplied by client |
| C | Adapter | CUI | EPSA050250U | NA | NA | Supplied by client |

Note:

1. All power cords of the above support units are non-shielded (1.8m).

| ID | Descriptions | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks |
|---|---|---|---|---|---|---|
| 1. | DC Cable | 1 | 1.5 | No | 0 | Supplied by client |
| 2. | USB Cable | 1 | 1.7 | Yes | 0 | Supplied by client |

### 3.4.1 Configuration of System under Test



## 3.5 General Description of Applied Standard

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart E (15.407)**
**KDB 789033 D02 General UNII Test Procedure New Rules v01r04**
**ANSI C63.10-2013**

All test items have been performed and recorded as per the above standards.

## 4 Test Types and Results

### 4.1 Unwanted Emission Measurement (Radiated Versus Conducted)

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

| Frequencies (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009 ~ 0.490 | 2400/F(kHz) | 300 |
| 0.490 ~ 1.705 | 24000/F(kHz) | 30 |
| 1.705 ~ 30.0 | 30 | 30 |
| 30 ~ 88 | 100 | 3 |
| 88 ~ 216 | 150 | 3 |
| 216 ~ 960 | 200 | 3 |
| Above 960 | 500 | 3 |

**NOTE**:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
4. Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v01r04</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK:74 (dBµV/m)</td><td>AV:54 (dBµV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK:-27 (dBm/MHz)</td><td rowspan="3">PK:68.2(dBµV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☒</td><td>15.407(b)(4)(i)</td><td>PK:-27 (dBm/MHz) *1<br>PK:10 (dBm/MHz) *2<br>PK:15.6 (dBm/MHz) *3<br>PK:27 (dBm/MHz) *4</td><td>PK: 68.2(dBµV/m) *1<br>PK:105.2 (dBµV/m) *2<br>PK: 110.8(dBµV/m) *3<br>PK:122.2 (dBµV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="5">*1 beyond 75 MHz or more above of the band edge.<br>*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.<br>*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.<br>*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</td></tr>
</table>

**Note:**

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3}$$ µV/m, where P is the eirp (Watts).

4.1.2 Test Instruments

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---|---|---|---|---|
| Test Receiver<br>Keysight | N9038A | MY54450088 | July 20, 2016 | July 19, 2017 |
| Pre-Amplifier(*)<br>EMCI | EMC001340 | 980142 | Jan. 20, 2016 | Jan. 19, 2018 |
| Loop Antenna(*)<br>Electro-Metrics | EM-6879 | 264 | Dec. 16, 2016 | Dec. 15, 2018 |
| RF Cable | NA | LOOPCAB-001<br>LOOPCAB-002 | Jan. 17, 2017 | Jan. 16, 2018 |
| Pre-Amplifier<br>Mini-Circuits | ZFL-1000VH2B | AMP-ZFL-01 | Nov. 10, 2016 | Nov. 09, 2017 |
| Trilog Broadband Antenna<br>SCHWARZBECK | VULB 9168 | 9168-406 | Dec. 13, 2016 | Dec. 12, 2017 |
| RF Cable | 8D | 966-4-1<br>966-4-2<br>966-4-3 | Apr. 01, 2017 | Mar. 31, 2018 |
| Fixed attenuator<br>Mini-Circuits | UNAT-5+ | PAD-3m-4-01 | Oct. 05, 2016 | Oct. 04, 2017 |
| Horn_Antenna<br>SCHWARZBECK | BBHA 9120D | 9120D-783 | Dec. 27, 2016 | Dec. 26, 2017 |
| Pre-Amplifier<br>EMCI | EMC12630SE | 980385 | Feb. 02, 2017 | Feb. 01, 2018 |
| RF Cable | EMC104-SM-SM-1200<br>EMC104-SM-SM-2000<br>EMC104-SM-SM-5000 | 160923<br>150318<br>150323 | Feb. 02, 2017<br>Mar. 29, 2017<br>Mar. 29, 2017 | Feb. 01, 2018<br>Mar. 28, 2018<br>Mar. 28, 2018 |
| Pre-Amplifier<br>EMCI | EMC184045SE | 980387 | Feb. 02, 2017 | Feb. 01, 2018 |
| Horn_Antenna<br>SCHWARZBECK | BBHA 9170 | BBHA9170608 | Dec. 15, 2016 | Dec. 14, 2017 |
| RF Cable | SUCOFLEX 102 | 36432/2<br>36433/2 | Jan. 15, 2017 | Jan. 14, 2018 |
| Software | ADT_Radiated_V8.7.08 | NA | NA | NA |
| Antenna Tower & Turn Table<br>Max-Full | MF-7802 | MF780208410 | NA | NA |
| Boresight Antenna Fixture | FBA-01 | FBA-SIP02 | NA | NA |
| Spectrum Analyzer<br>R&S | FSv40 | 100964 | June 28, 2016 | June 27, 2017 |
| Power meter<br>Anritsu | ML2495A | 0824006 | May 26, 2016 | May 25, 2017 |
| Power sensor<br>Anritsu | MA2411B | 0738172 | May 26, 2016 | May 25, 2017 |
| DC Power Supply<br>GOOD WILL INSTRUMENT CO., LTD. | GPC - 3030D | 7700087 | NA | NA |
| Digital Multimeter<br>FLUKE | 87III | 73680266 | Nov. 10, 2016 | Nov. 09, 2017 |

**Note:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. The FCC Site Registration No. is 292998
4. The CANADA Site Registration No. is 20331-2
5 *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
6 Loop antenna was used for all emissions below 30 MHz.
7. Tested Date: May 12 to 16, 2017

### 4.1.3 Test Procedure

Following FCC KDB 789033 D02 General UNII Test Procedures:
Radiated versus Conducted Measurements.
The unwanted emission limits in both the restricted and non-restricted bands are based on antenna-port conducted measurements in conjunction with cabinet emissions tests are permitted to demonstrate compliance.
The following steps was performed:

a. Cabinet emissions measurements. Radiated measurement was performed to ensure that cabinet emissions are below the emission limits. For the cabinet-emission measurements the antenna was replaced by a termination matching the nominal impedance of the antenna.

b. Conducted tests was performed using equipment that matches the nominal impedance of the antenna assembly used with the EUT

c. EIRP calculation. A value representative of an upper bound on out-of-band antenna gain (in dBi) shall be added to the measured antenna-port conducted emission power to compute EIRP within the specified measurement bandwidth. (For emissions in the restricted bands, additional calculations are required to convert EIRP to field strength at the specified distance.) The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater

d. For all of Radiation emission test

**For Radiated emission below 30MHz**

d-1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

d-2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d-3. Both X and Y axes of the antenna are set to make the measurement.

d-4. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

d-5. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

**For Radiated emission above 30MHz**

d-1. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at a 3 meters chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

d-2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d-3. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d-4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

d-5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

d-6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

**Note:**

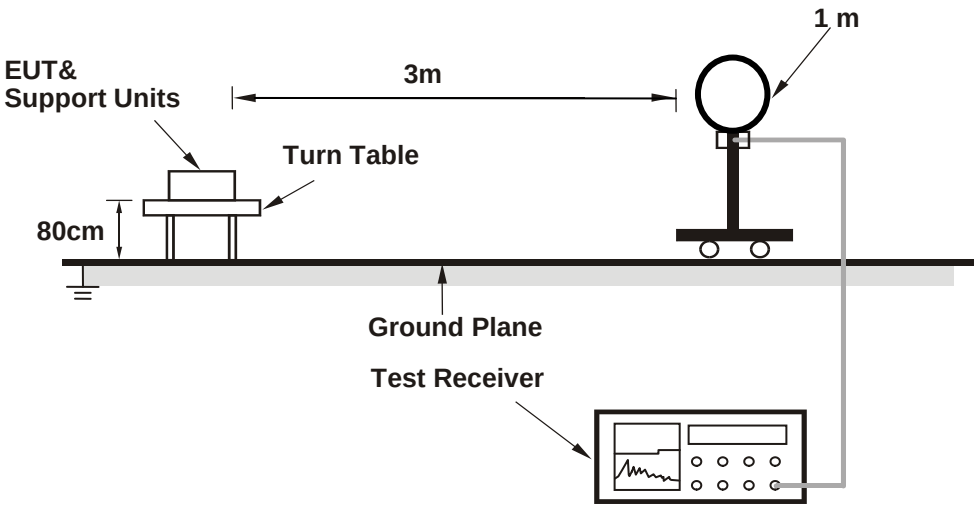
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

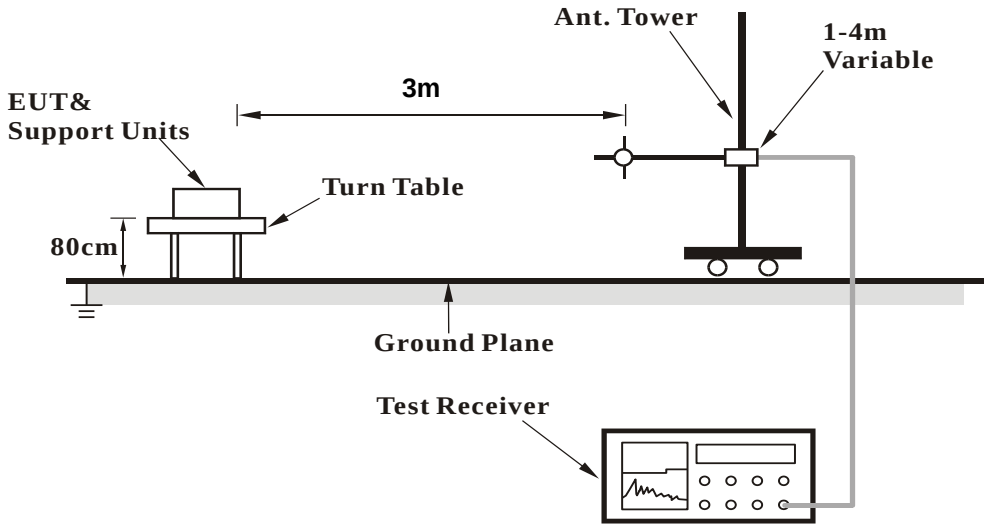
No deviation.

4.1.5 Test Setup

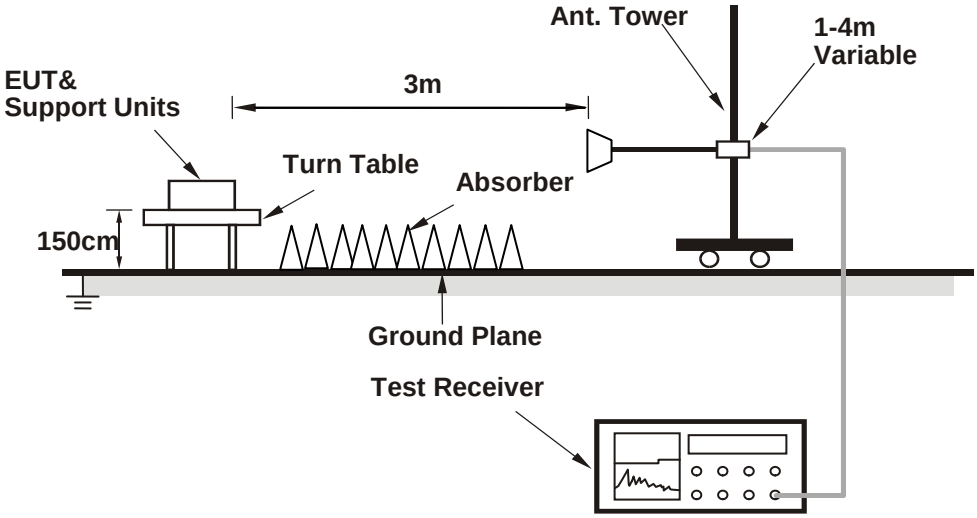
**For Radiated emission below 30MHz**



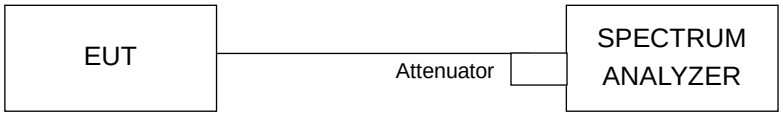

**For Radiated emission 30MHz to 1GHz**



**For Radiated emission above 1GHz**




**For conducted configuration:**




4.1.6 EUT Operating Condition

1. Connect the EUT with the support unit A (Laptop) which is placed on test table.
2. The communication partner run test program “MT7662UQA.exe _V1.0.3.13” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.1.7 Test Results (Radiated Measurement)

| Radiated versus Conducted Measurement | |
|---|---|
| ☐ Conducted measurement | ☒ Radiated measurement |
| For Radiated measurement:<br>The level of unwanted emissions was measured when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation)<br>For Conducted measurement:<br>The level of unwanted emissions was measured as their power in a specified load (conducted spurious emissions). | |

**Radiated test was done with 50ohm terminator on antenna port**

## Above 1GHz Data

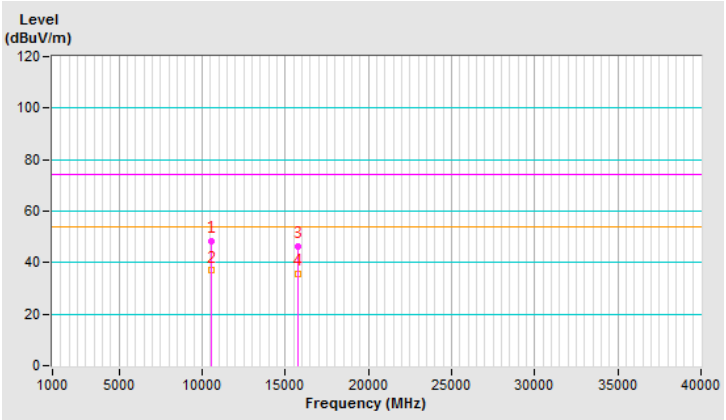
## 802.11n (HT20)

| | | | |
|---|---|---|---|
| **CHANNEL** | TX Channel 52 | **DETECTOR FUNCTION** | Peak (PK)<br>Average (AV) |
| **FREQUENCY RANGE** | 1GHz ~ 40GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **NO.** | **FREQ. (MHz)** | **EMISSION LEVEL (dBuV/m)** | **LIMIT (dBuV/m)** | **MARGIN (dB)** | **ANTENNA HEIGHT (m)** | **TABLE ANGLE (Degree)** | **RAW VALUE (dBuV)** | **CORRECTION FACTOR (dB/m)** |
| 1 | #10520.00 | 48.3 PK | 74.0 | -25.7 | 2.47 H | 19 | 34.5 | 13.8 |
| 2 | #10520.00 | 36.9 AV | 54.0 | -17.1 | 2.47 H | 19 | 23.1 | 13.8 |
| 3 | 15780.00 | 46.3 PK | 74.0 | -27.7 | 1.59 H | 323 | 32.2 | 14.1 |
| 4 | 15780.00 | 35.6 AV | 54.0 | -18.4 | 1.59 H | 323 | 21.5 | 14.1 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " # ": The radiated frequency is out of the restricted band.

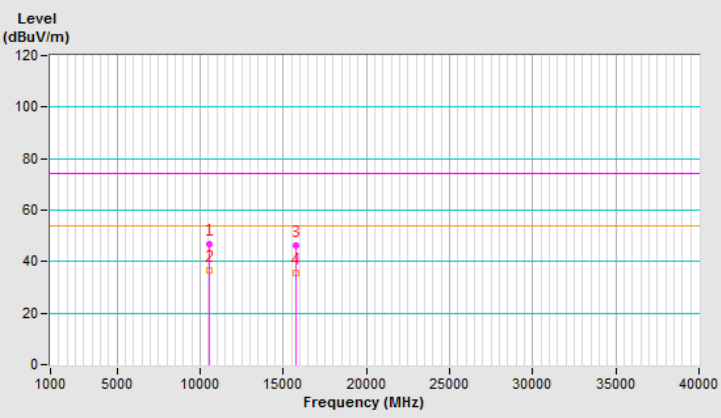


| CHANNEL | TX Channel 52 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 40GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | #10520.00 | 47.0 PK | 74.0 | -27.0 | 1.00 V | 123 | 33.2 | 13.8 |
| 2 | #10520.00 | 36.6 AV | 54.0 | -17.4 | 1.00 V | 123 | 22.8 | 13.8 |
| 3 | 15780.00 | 46.2 PK | 74.0 | -27.8 | 2.03 V | 53 | 32.1 | 14.1 |
| 4 | 15780.00 | 35.5 AV | 54.0 | -18.5 | 2.03 V | 53 | 21.4 | 14.1 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " # ": The radiated frequency is out of the restricted band.

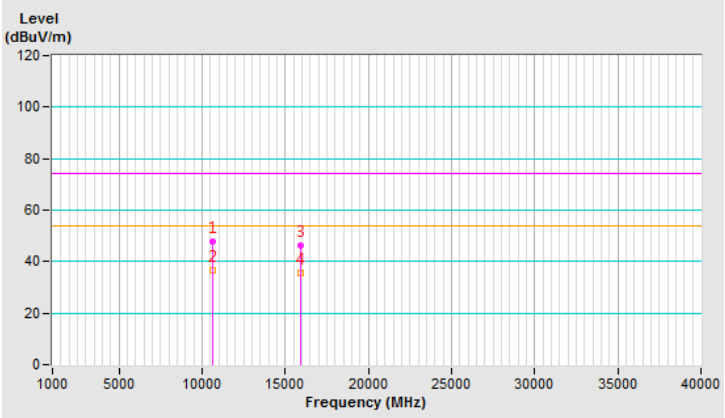


| | | | |
|---|---|---|---|
| **CHANNEL** | TX Channel 60 | **DETECTOR FUNCTION** | Peak (PK)<br>Average (AV) |
| **FREQUENCY RANGE** | 1GHz ~ 40GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **NO.** | **FREQ. (MHz)** | **EMISSION LEVEL (dBuV/m)** | **LIMIT (dBuV/m)** | **MARGIN (dB)** | **ANTENNA HEIGHT (m)** | **TABLE ANGLE (Degree)** | **RAW VALUE (dBuV)** | **CORRECTION FACTOR (dB/m)** |
| 1 | 10600.00 | 48.0 PK | 74.0 | -26.0 | 2.38 H | 2 | 34.2 | 13.8 |
| 2 | 10600.00 | 36.7 AV | 54.0 | -17.3 | 2.38 H | 2 | 22.9 | 13.8 |
| 3 | 15900.00 | 46.2 PK | 74.0 | -27.8 | 1.62 H | 298 | 33.0 | 13.2 |
| 4 | 15900.00 | 35.5 AV | 54.0 | -18.5 | 1.62 H | 298 | 22.3 | 13.2 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

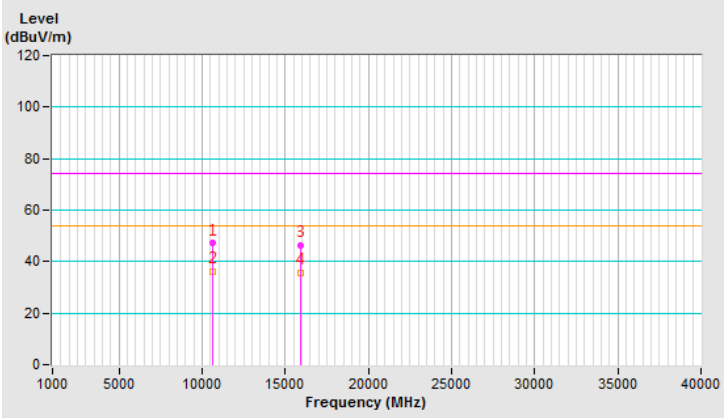


| CHANNEL | TX Channel 60 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 40GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 10600.00 | 47.1 PK | 74.0 | -26.9 | 1.03 V | 125 | 33.3 | 13.8 |
| 2 | 10600.00 | 36.2 AV | 54.0 | -17.8 | 1.03 V | 125 | 22.4 | 13.8 |
| 3 | 15900.00 | 46.2 PK | 74.0 | -27.8 | 2.02 V | 64 | 33.0 | 13.2 |
| 4 | 15900.00 | 35.6 AV | 54.0 | -18.4 | 2.02 V | 64 | 22.4 | 13.2 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

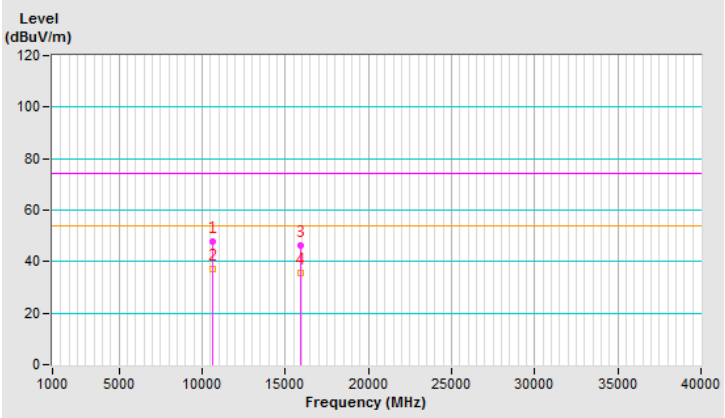


| | | | |
|---|---|---|---|
| **CHANNEL** | TX Channel 64 | **DETECTOR FUNCTION** | Peak (PK)<br>Average (AV) |
| **FREQUENCY RANGE** | 1GHz ~ 40GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **NO.** | **FREQ. (MHz)** | **EMISSION LEVEL (dBuV/m)** | **LIMIT (dBuV/m)** | **MARGIN (dB)** | **ANTENNA HEIGHT (m)** | **TABLE ANGLE (Degree)** | **RAW VALUE (dBuV)** | **CORRECTION FACTOR (dB/m)** |
| 1 | 10640.00 | 47.9 PK | 74.0 | -26.1 | 2.47 H | 5 | 33.9 | 14.0 |
| 2 | 10640.00 | 37.1 AV | 54.0 | -16.9 | 2.47 H | 5 | 23.1 | 14.0 |
| 3 | 15960.00 | 46.5 PK | 74.0 | -27.5 | 1.59 H | 307 | 33.0 | 13.5 |
| 4 | 15960.00 | 35.6 AV | 54.0 | -18.4 | 1.59 H | 307 | 22.1 | 13.5 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

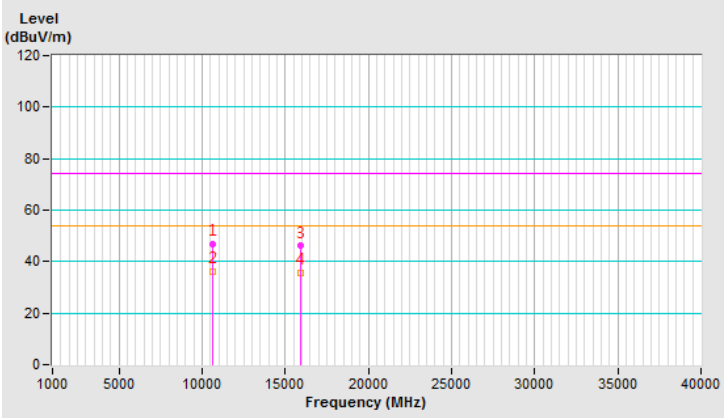


| | | | |
|---|---|---|---|
| **CHANNEL** | TX Channel 64 | **DETECTOR FUNCTION** | Peak (PK)<br>Average (AV) |
| **FREQUENCY RANGE** | 1GHz ~ 40GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **NO.** | **FREQ. (MHz)** | **EMISSION LEVEL (dBuV/m)** | **LIMIT (dBuV/m)** | **MARGIN (dB)** | **ANTENNA HEIGHT (m)** | **TABLE ANGLE (Degree)** | **RAW VALUE (dBuV)** | **CORRECTION FACTOR (dB/m)** |
| 1 | 10640.00 | 46.8 PK | 74.0 | -27.2 | 1.00 V | 134 | 32.8 | 14.0 |
| 2 | 10640.00 | 36.2 AV | 54.0 | -17.8 | 1.00 V | 134 | 22.2 | 14.0 |
| 3 | 15960.00 | 46.1 PK | 74.0 | -27.9 | 1.97 V | 56 | 32.6 | 13.5 |
| 4 | 15960.00 | 35.5 AV | 54.0 | -18.5 | 1.97 V | 56 | 22.0 | 13.5 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

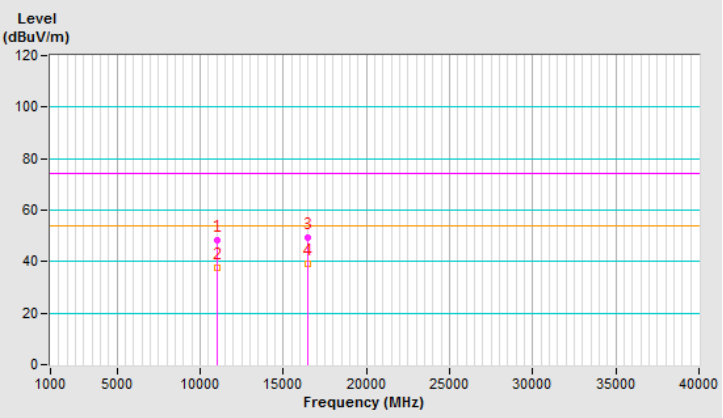


| CHANNEL | TX Channel 100 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 40GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 11000.00 | 48.4 PK | 74.0 | -25.6 | 2.46 H | 16 | 33.6 | 14.8 |
| 2 | 11000.00 | 37.5 AV | 54.0 | -16.5 | 2.46 H | 16 | 22.7 | 14.8 |
| 3 | #16500.00 | 49.3 PK | 74.0 | -24.7 | 1.57 H | 307 | 33.7 | 15.6 |
| 4 | #16500.00 | 39.4 AV | 54.0 | -14.6 | 1.57 H | 307 | 23.8 | 15.6 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " # ": The radiated frequency is out of the restricted band.

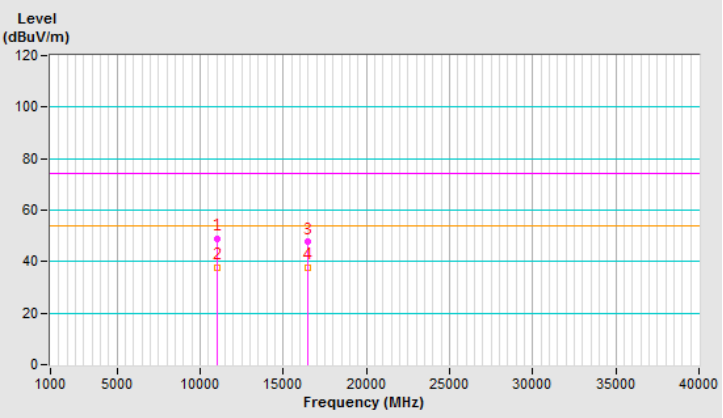


| | | | |
|---|---|---|---|
| **CHANNEL** | TX Channel 100 | **DETECTOR FUNCTION** | Peak (PK)<br>Average (AV) |
| **FREQUENCY RANGE** | 1GHz ~ 40GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **NO.** | **FREQ. (MHz)** | **EMISSION LEVEL (dBuV/m)** | **LIMIT (dBuV/m)** | **MARGIN (dB)** | **ANTENNA HEIGHT (m)** | **TABLE ANGLE (Degree)** | **RAW VALUE (dBuV)** | **CORRECTION FACTOR (dB/m)** |
| 1 | 11000.00 | 48.9 PK | 74.0 | -25.1 | 1.00 V | 142 | 34.1 | 14.8 |
| 2 | 11000.00 | 37.7 AV | 54.0 | -16.3 | 1.00 V | 142 | 22.9 | 14.8 |
| 3 | #16500.00 | 47.6 PK | 74.0 | -26.4 | 1.96 V | 51 | 32.0 | 15.6 |
| 4 | #16500.00 | 37.6 AV | 54.0 | -16.4 | 1.96 V | 51 | 22.0 | 15.6 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " # ": The radiated frequency is out of the restricted band.

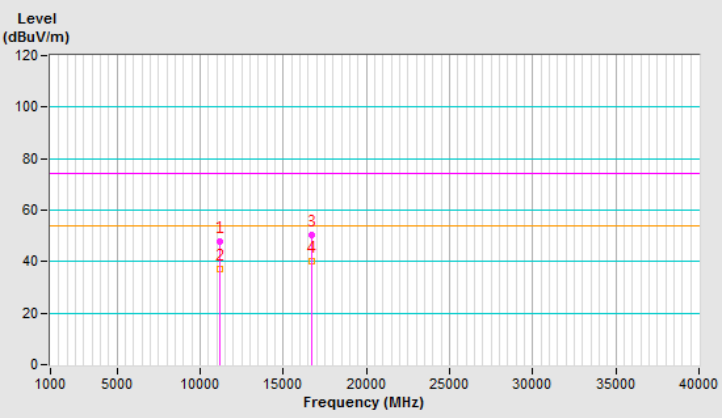


| CHANNEL | TX Channel 116 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 40GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 11160.00 | 48.0 PK | 74.0 | -26.0 | 2.45 H | 9 | 33.6 | 14.4 |
| 2 | 11160.00 | 37.3 AV | 54.0 | -16.7 | 2.45 H | 9 | 22.9 | 14.4 |
| 3 | #16740.00 | 50.4 PK | 74.0 | -23.6 | 1.56 H | 298 | 33.9 | 16.5 |
| 4 | #16740.00 | 40.1 AV | 54.0 | -13.9 | 1.56 H | 298 | 23.6 | 16.5 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " # ": The radiated frequency is out of the restricted band.

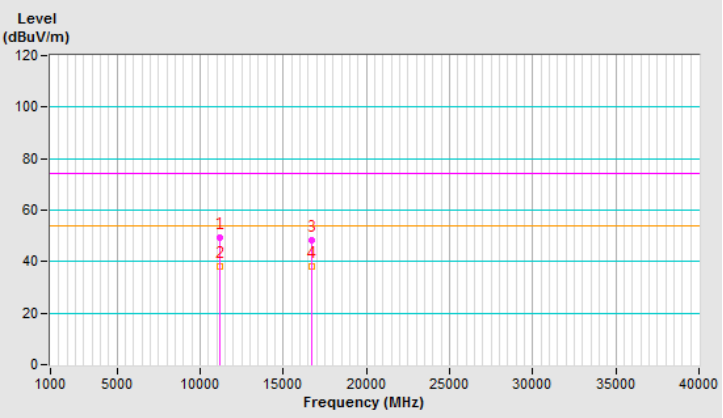


| | | | |
|---|---|---|---|
| **CHANNEL** | TX Channel 116 | **DETECTOR FUNCTION** | Peak (PK)<br>Average (AV) |
| **FREQUENCY RANGE** | 1GHz ~ 40GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **NO.** | **FREQ. (MHz)** | **EMISSION LEVEL (dBuV/m)** | **LIMIT (dBuV/m)** | **MARGIN (dB)** | **ANTENNA HEIGHT (m)** | **TABLE ANGLE (Degree)** | **RAW VALUE (dBuV)** | **CORRECTION FACTOR (dB/m)** |
| 1 | 11160.00 | 49.3 PK | 74.0 | -24.7 | 1.00 V | 148 | 34.9 | 14.4 |
| 2 | 11160.00 | 38.2 AV | 54.0 | -15.8 | 1.00 V | 148 | 23.8 | 14.4 |
| 3 | #16740.00 | 48.2 PK | 74.0 | -25.8 | 1.94 V | 64 | 31.7 | 16.5 |
| 4 | #16740.00 | 38.0 AV | 54.0 | -16.0 | 1.94 V | 64 | 21.5 | 16.5 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " # ": The radiated frequency is out of the restricted band.

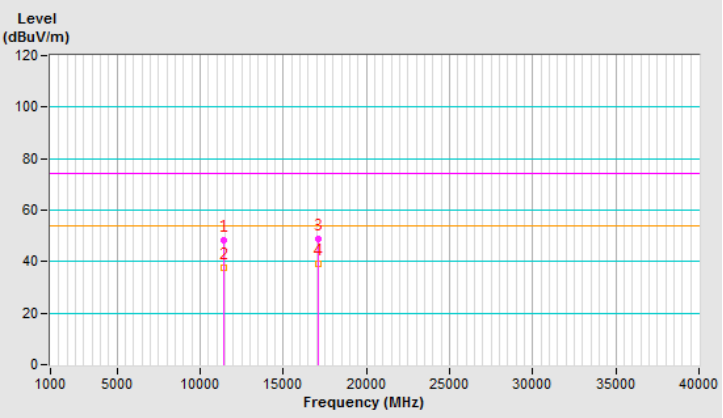


| CHANNEL | TX Channel 140 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 40GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 11400.00 | 48.4 PK | 74.0 | -25.6 | 2.46 H | 15 | 34.0 | 14.4 |
| 2 | 11400.00 | 37.7 AV | 54.0 | -16.3 | 2.46 H | 15 | 23.3 | 14.4 |
| 3 | #17100.00 | 48.8 PK | 74.0 | -25.2 | 1.55 H | 291 | 30.3 | 18.5 |
| 4 | #17100.00 | 39.1 AV | 54.0 | -14.9 | 1.55 H | 291 | 20.6 | 18.5 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " # ": The radiated frequency is out of the restricted band.

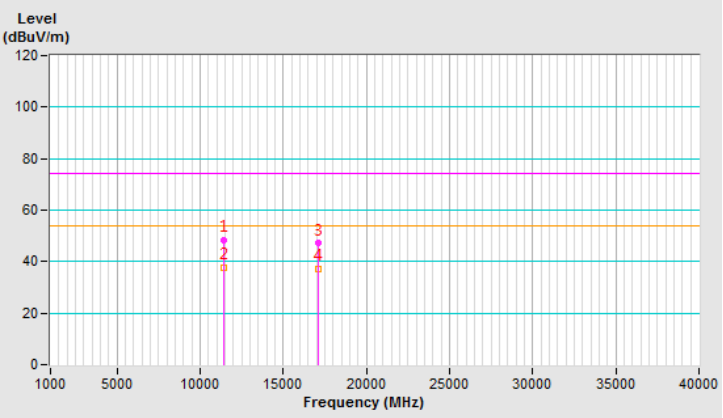


| CHANNEL | TX Channel 140 | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|---|---|---|---|
| FREQUENCY RANGE | 1GHz ~ 40GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 11400.00 | 48.5 PK | 74.0 | -25.5 | 1.04 V | 148 | 34.1 | 14.4 |
| 2 | 11400.00 | 37.6 AV | 54.0 | -16.4 | 1.04 V | 148 | 23.2 | 14.4 |
| 3 | #17100.00 | 47.1 PK | 74.0 | -26.9 | 1.98 V | 37 | 28.6 | 18.5 |
| 4 | #17100.00 | 37.2 AV | 54.0 | -16.8 | 1.98 V | 37 | 18.7 | 18.5 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " # ": The radiated frequency is out of the restricted band.

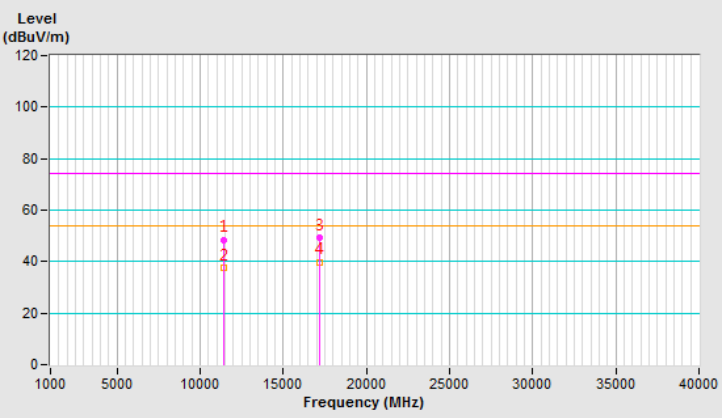


| | | | |
|---|---|---|---|
| **CHANNEL** | TX Channel 144 | **DETECTOR FUNCTION** | Peak (PK)<br>Average (AV) |
| **FREQUENCY RANGE** | 1GHz ~ 40GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **NO.** | **FREQ. (MHz)** | **EMISSION LEVEL (dBuV/m)** | **LIMIT (dBuV/m)** | **MARGIN (dB)** | **ANTENNA HEIGHT (m)** | **TABLE ANGLE (Degree)** | **RAW VALUE (dBuV)** | **CORRECTION FACTOR (dB/m)** |
| 1 | 11440.00 | 48.2 PK | 74.0 | -25.8 | 2.46 H | 14 | 34.0 | 14.2 |
| 2 | 11440.00 | 37.4 AV | 54.0 | -16.6 | 2.46 H | 14 | 23.2 | 14.2 |
| 3 | #17160.00 | 49.1 PK | 74.0 | -24.9 | 1.56 H | 298 | 30.8 | 18.3 |
| 4 | #17160.00 | 39.6 AV | 54.0 | -14.4 | 1.56 H | 298 | 21.3 | 18.3 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " # ": The radiated frequency is out of the restricted band.

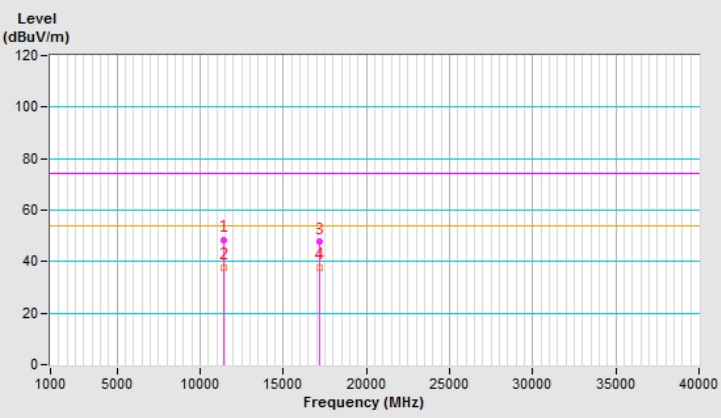


| | | | |
|---|---|---|---|
| **CHANNEL** | TX Channel 144 | **DETECTOR FUNCTION** | Peak (PK)<br>Average (AV) |
| **FREQUENCY RANGE** | 1GHz ~ 40GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **NO.** | **FREQ. (MHz)** | **EMISSION LEVEL (dBuV/m)** | **LIMIT (dBuV/m)** | **MARGIN (dB)** | **ANTENNA HEIGHT (m)** | **TABLE ANGLE (Degree)** | **RAW VALUE (dBuV)** | **CORRECTION FACTOR (dB/m)** |
| 1 | 11440.00 | 48.3 PK | 74.0 | -25.7 | 1.10 V | 157 | 34.1 | 14.2 |
| 2 | 11440.00 | 37.7 AV | 54.0 | -16.3 | 1.10 V | 157 | 23.5 | 14.2 |
| 3 | #17160.00 | 47.6 PK | 74.0 | -26.4 | 1.95 V | 45 | 29.3 | 18.3 |
| 4 | #17160.00 | 37.5 AV | 54.0 | -16.5 | 1.95 V | 45 | 19.2 | 18.3 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " # ": The radiated frequency is out of the restricted band.



**Below 1GHz Data:**

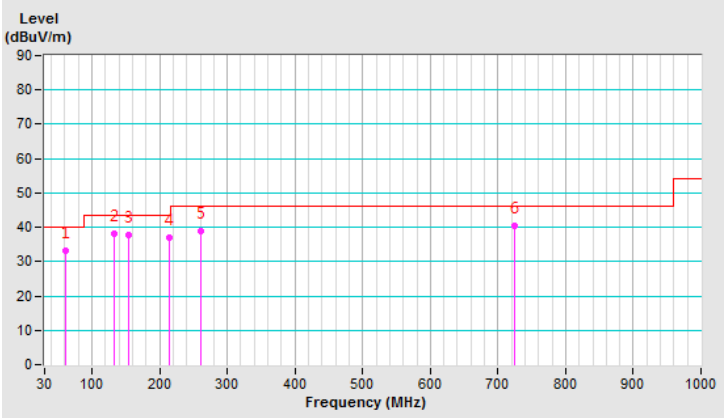
**802.11n (HT20)**

| | | | |
|---|---|---|---|
| **CHANNEL** | TX Channel 60 | **DETECTOR FUNCTION** | Quasi-Peak (QP) |
| **FREQUENCY RANGE** | 9kHz ~ 1GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **NO.** | **FREQ. (MHz)** | **EMISSION LEVEL (dBuV/m)** | **LIMIT (dBuV/m)** | **MARGIN (dB)** | **ANTENNA HEIGHT (m)** | **TABLE ANGLE (Degree)** | **RAW VALUE (dBuV)** | **CORRECTION FACTOR (dB/m)** |
| 1 | 61.91 | 33.0 QP | 40.0 | -7.0 | 2.30 H | 31 | 42.0 | -9.0 |
| **2** | **133.66** | **38.1 QP** | **43.5** | **-5.4** | **1.80 H** | **246** | **46.9** | **-8.8** |
| 3 | 154.12 | 37.8 QP | 43.5 | -5.7 | 1.70 H | 340 | 45.6 | -7.8 |
| 4 | 213.34 | 37.0 QP | 43.5 | -6.5 | 2.30 H | 74 | 48.5 | -11.5 |
| 5 | 260.00 | 38.8 QP | 46.0 | -7.2 | 1.70 H | 336 | 48.0 | -9.2 |
| 6 | 724.01 | 40.4 QP | 46.0 | -5.6 | 1.20 H | 327 | 39.2 | 1.2 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz.

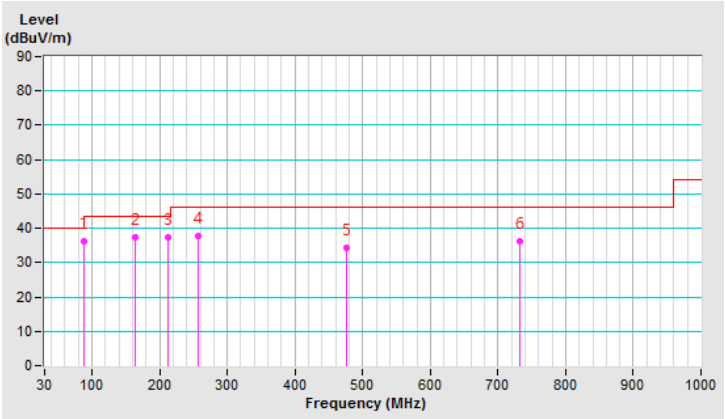


| | | | |
|---|---|---|---|
| **CHANNEL** | TX Channel 165 | **DETECTOR FUNCTION** | Quasi-Peak (QP) |
| **FREQUENCY RANGE** | 9kHz ~ 1GHz | | |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **NO.** | **FREQ. (MHz)** | **EMISSION LEVEL (dBuV/m)** | **LIMIT (dBuV/m)** | **MARGIN (dB)** | **ANTENNA HEIGHT (m)** | **TABLE ANGLE (Degree)** | **RAW VALUE (dBuV)** | **CORRECTION FACTOR (dB/m)** |
| 1 | 88.44 | 36.2 QP | 43.5 | -7.3 | 1.50 V | 275 | 50.4 | -14.2 |
| 2 | 163.61 | 37.3 QP | 43.5 | -6.2 | 1.50 V | 211 | 45.2 | -7.9 |
| 3 | 213.08 | 37.2 QP | 43.5 | -6.3 | 1.30 V | 117 | 48.7 | -11.5 |
| 4 | 257.00 | 37.8 QP | 46.0 | -8.2 | 1.80 V | 60 | 47.0 | -9.2 |
| 5 | 476.01 | 34.4 QP | 46.0 | -11.6 | 1.50 V | 333 | 37.5 | -3.1 |
| 6 | 731.88 | 36.2 QP | 46.0 | -9.8 | 1.00 V | 325 | 34.7 | 1.5 |

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz.



### 4.1.8 Test Results (Conducted Measurement)

| Radiated versus Conducted Measurement | |
|---|---|
| ☒ Conducted measurement | ☐ Radiated measurement |

For Radiated measurement:

The level of unwanted emissions was measured when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation)

For Conducted measurement:

The level of unwanted emissions was measured as their power in a specified load (conducted spurious emissions).

| Conducted Measurement Factor |
|---|

a. The max antenna gain will be used for conducted measurement shown as “Correction factor” in spurious emissions tables. (Antenna gain= 6.1dBi)
b. For the out of band spurious the gain for the specific band may have been used rather than the highest gain across all bands.
c. For the band edge the gain for the specific band may have been used.
d. In restricted bands below 1000 MHz, add upper bound on ground plane reflection:

For f = 30 – 1000 MHz, add 4.7 dB.

Note: The conducted emission test was considered some factor to compute test result.

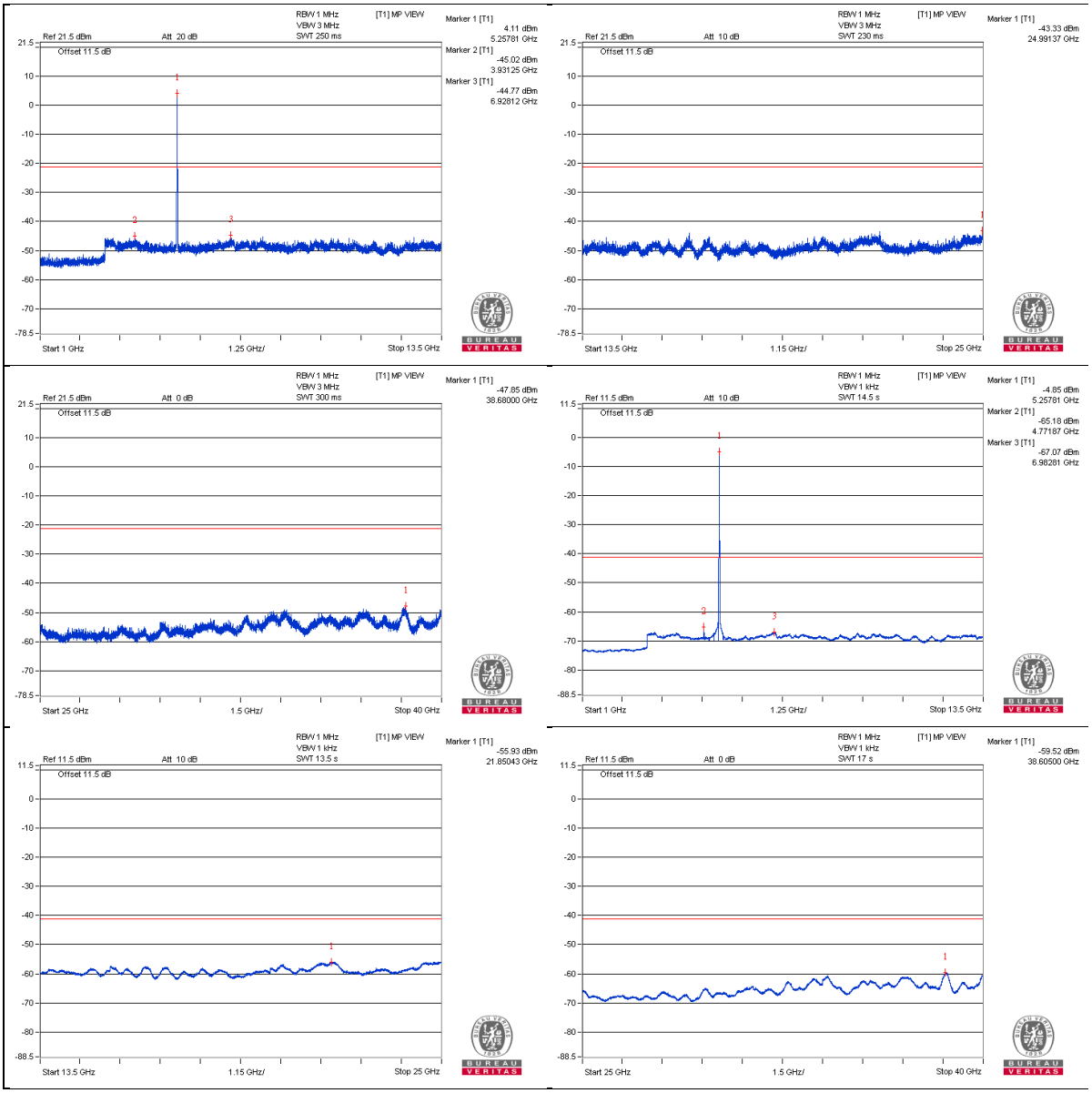
## Above 1GHz Data

### 802.11n (HT20) - Channel 52

**Conducted spurious emission table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 3507.81 PK | 53.81 | 74 | -20.19 | -47.55 | 6.1 | -41.45 |
| 2 | 3506.25 AV | 33.21 | 54 | -20.79 | -68.15 | 6.1 | -62.05 |
| 3 | 7021.87 PK | 54.9 | 74 | -19.1 | -46.46 | 6.1 | -40.36 |
| 4 | 7014.06 AV | 34.24 | 54 | -19.76 | -67.12 | 6.1 | -61.02 |
| 5 | 10521.87 PK | 53.85 | 74 | -20.15 | -47.51 | 6.1 | -41.41 |
| 6 | 10515.62 AV | 32.77 | 54 | -21.23 | -68.59 | 6.1 | -62.49 |
| 7 | 15788.5 PK | 52.4 | 74 | -21.6 | -48.96 | 6.1 | -42.86 |
| 8 | 15774.12 AV | 41.87 | 54 | -12.13 | -59.49 | 6.1 | -53.39 |

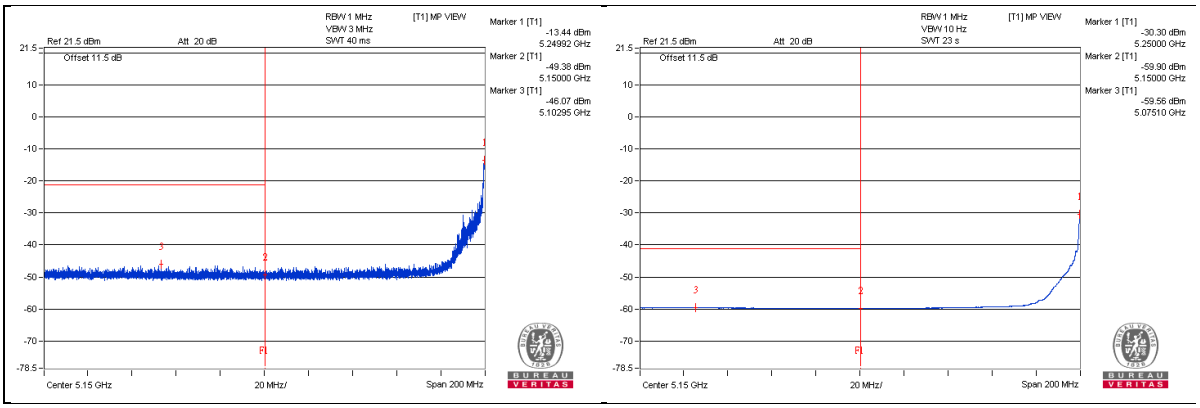
Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.


RBW 1 MHz
VBW 3 MHz
SWT 250 ms
[T1] MP VIEW
Marker 1 [T1]
4.11 dBm
5.25781 GHz
Marker 2 [T1]
-45.02 dBm
3.93125 GHz
Marker 3 [T1]
-44.77 dBm
6.92812 GHz
Ref 21.5 dBm
Att 20 dB
Offset 11.5 dB
Start 1 GHz
1.25 GHz/
Stop 13.5 GHz
RBW 1 MHz
VBW 3 MHz
SWT 230 ms
[T1] MP VIEW
Marker 1 [T1]
-43.33 dBm
24.99137 GHz
Ref 21.5 dBm
Att 10 dB
Offset 11.5 dB
Start 13.5 GHz
1.15 GHz/
Stop 25 GHz
RBW 1 MHz
VBW 3 MHz
SWT 300 ms
[T1] MP VIEW
Marker 1 [T1]
-47.85 dBm
38.68000 GHz
Ref 21.5 dBm
Att 0 dB
Offset 11.5 dB
Start 25 GHz
1.5 GHz/
Stop 40 GHz
RBW 1 MHz
VBW 1 kHz
SWT 14.5 s
[T1] MP VIEW
Marker 1 [T1]
-4.85 dBm
5.25781 GHz
Marker 2 [T1]
-65.18 dBm
4.77187 GHz
Marker 3 [T1]
-67.07 dBm
6.98281 GHz
Ref 11.5 dBm
Att 10 dB
Offset 11.5 dB
Start 1 GHz
1.25 GHz/
Stop 13.5 GHz
RBW 1 MHz
VBW 1 kHz
SWT 13.5 s
[T1] MP VIEW
Marker 1 [T1]
-55.93 dBm
21.85043 GHz
Ref 11.5 dBm
Att 10 dB
Offset 11.5 dB
Start 13.5 GHz
1.15 GHz/
Stop 25 GHz
RBW 1 MHz
VBW 1 kHz
SWT 17 s
[T1] MP VIEW
Marker 1 [T1]
-59.52 dBm
38.60500 GHz
Ref 11.5 dBm
Att 0 dB
Offset 11.5 dB
Start 25 GHz
1.5 GHz/
Stop 40 GHz

**Bandedge table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 5102.95 PK | 55.29 | 74 | -18.71 | -46.07 | 6.1 | -39.97 |
| 2 | 5075.1 AV | 41.8 | 54 | -12.2 | -59.56 | 6.1 | -53.46 |

Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.

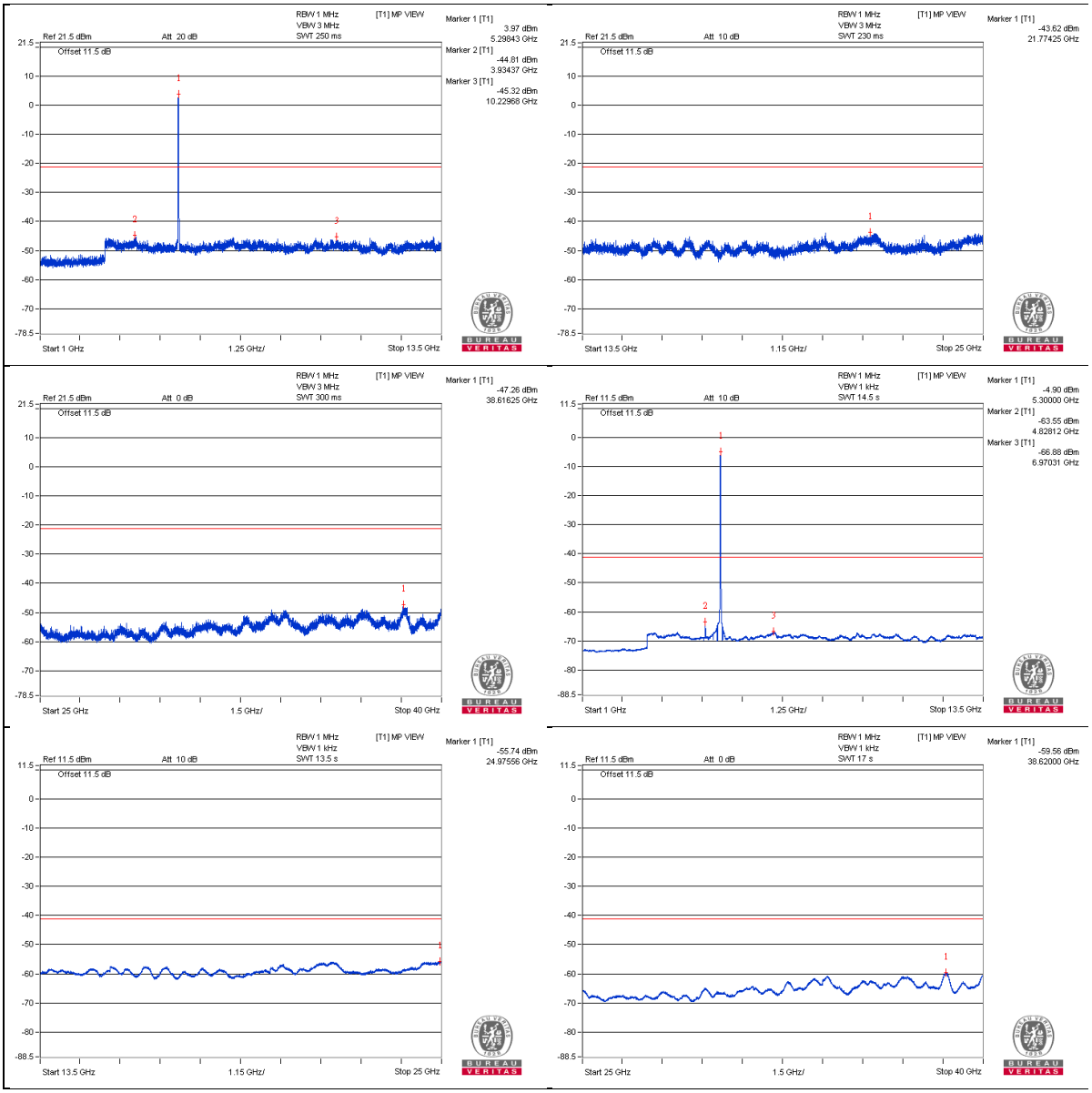


## 802.11n (HT20) - Channel 60

**Conducted spurious emission table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 3542.18 PK | 53.68 | 74 | -20.32 | -47.68 | 6.1 | -41.58 |
| 2 | 3532.81 AV | 33.33 | 54 | -20.67 | -68.03 | 6.1 | -61.93 |
| 3 | 7062.5 PK | 53.47 | 74 | -20.53 | -47.89 | 6.1 | -41.79 |
| 4 | 7065.62 AV | 32.97 | 54 | -21.03 | -68.39 | 6.1 | -62.29 |
| 5 | 10595.31 PK | 53.62 | 74 | -20.38 | -47.74 | 6.1 | -41.64 |
| 6 | 10609.37 AV | 32.7 | 54 | -21.3 | -68.66 | 6.1 | -62.56 |
| 7 | 15909.25 PK | 54.2 | 74 | -19.8 | -47.16 | 6.1 | -41.06 |
| 8 | 15896.31 AV | 42.69 | 54 | -11.31 | -58.67 | 6.1 | -52.57 |

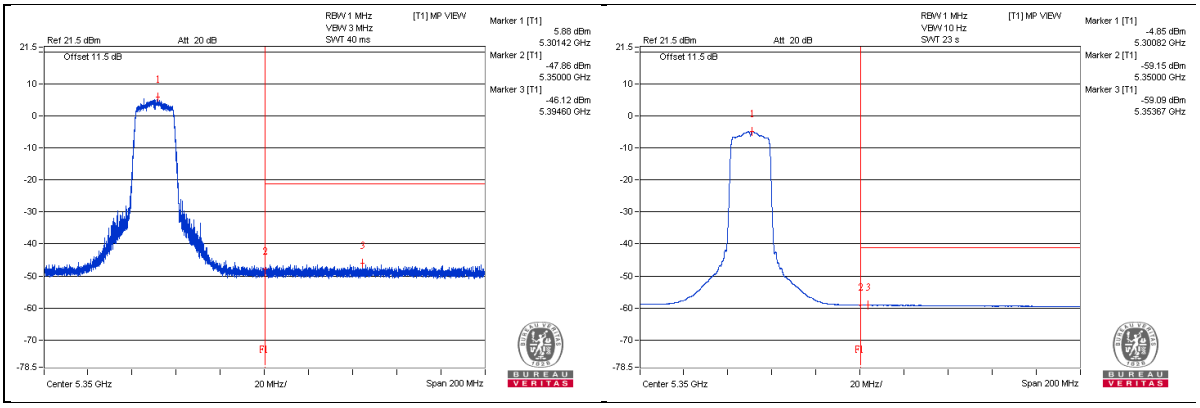
Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.


RBW 1 MHz
VBW 3 MHz
SWT 250 ms
[T1] MP VIEW
Marker 1 [T1]
3.97 dBm
5.29843 GHz
Marker 2 [T1]
-44.81 dBm
3.93437 GHz
Marker 3 [T1]
-45.32 dBm
10.22968 GHz
Ref 21.5 dBm
Att 20 dB
Offset 11.5 dB
Start 1 GHz
1.25 GHz/
Stop 13.5 GHz
RBW 1 MHz
VBW 3 MHz
SWT 230 ms
[T1] MP VIEW
Marker 1 [T1]
-43.62 dBm
21.77425 GHz
Ref 21.5 dBm
Att 10 dB
Offset 11.5 dB
Start 13.5 GHz
1.15 GHz/
Stop 25 GHz
RBW 1 MHz
VBW 3 MHz
SWT 300 ms
[T1] MP VIEW
Marker 1 [T1]
-47.26 dBm
38.61625 GHz
Ref 21.5 dBm
Att 0 dB
Offset 11.5 dB
Start 25 GHz
1.5 GHz/
Stop 40 GHz
RBW 1 kHz
VBW 1 kHz
SWT 14.5 s
[T1] MP VIEW
Marker 1 [T1]
-4.90 dBm
5.30000 GHz
Marker 2 [T1]
-63.55 dBm
4.82812 GHz
Marker 3 [T1]
-66.88 dBm
6.97031 GHz
Ref 11.5 dBm
Att 10 dB
Offset 11.5 dB
Start 1 GHz
1.25 GHz/
Stop 13.5 GHz
RBW 1 kHz
VBW 1 kHz
SWT 13.5 s
[T1] MP VIEW
Marker 1 [T1]
-55.74 dBm
24.97556 GHz
Ref 11.5 dBm
Att 10 dB
Offset 11.5 dB
Start 13.5 GHz
1.15 GHz/
Stop 25 GHz
RBW 1 kHz
VBW 1 kHz
SWT 17 s
[T1] MP VIEW
Marker 1 [T1]
-59.56 dBm
38.62000 GHz
Ref 11.5 dBm
Att 0 dB
Offset 11.5 dB
Start 25 GHz
1.5 GHz/
Stop 40 GHz

**Bandedge table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 5394.6 PK | 55.24 | 74 | -18.76 | -46.12 | 6.1 | -40.02 |
| 2 | 5353.67 AV | 42.27 | 54 | -11.73 | -59.09 | 6.1 | -52.99 |

Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.

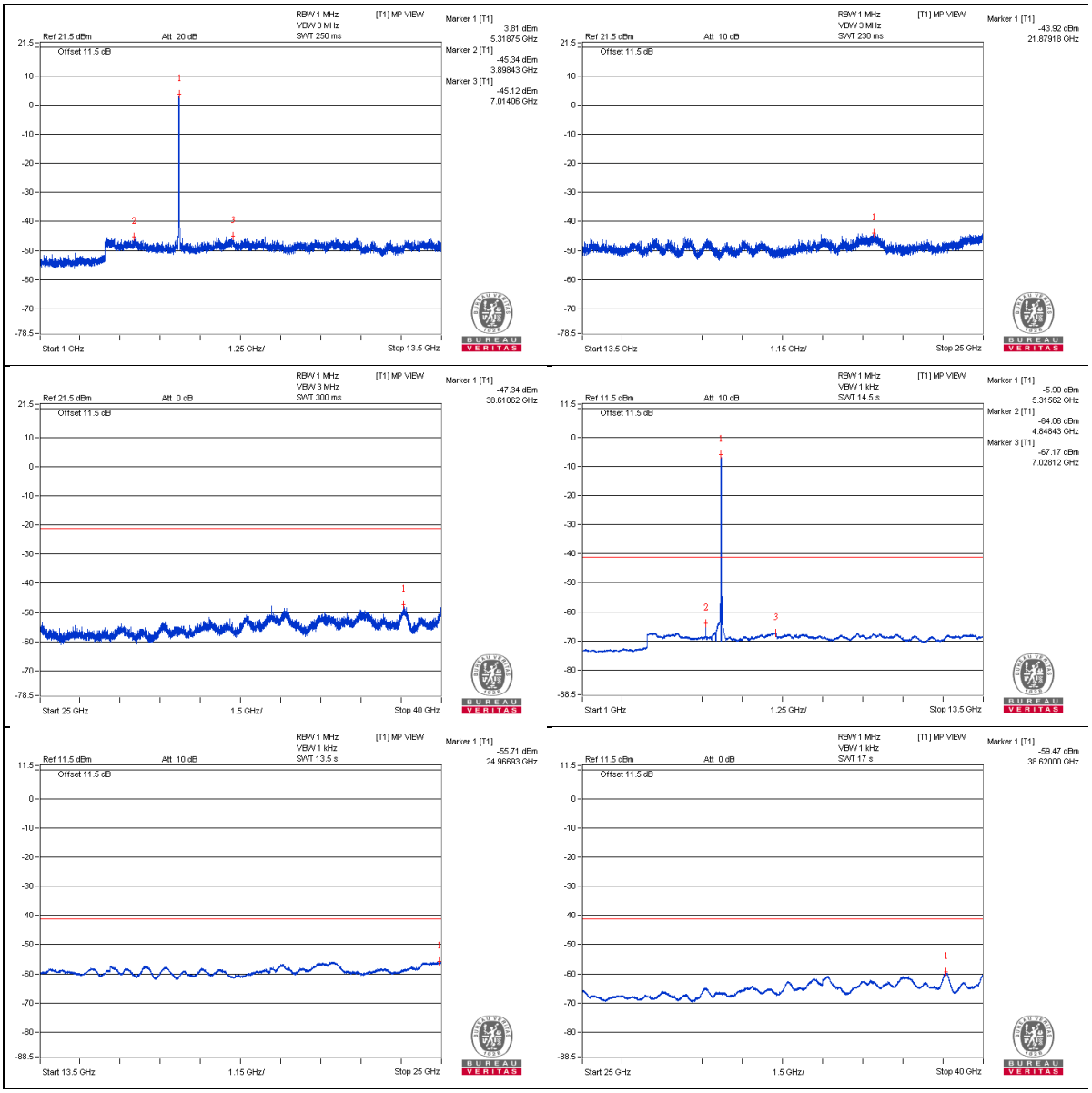


## 802.11n (HT20) - Channel 64

**Conducted spurious emission table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 3537.5 PK | 53.52 | 74 | -20.48 | -47.84 | 6.1 | -41.74 |
| 2 | 3546.87 AV | 33.37 | 54 | -20.63 | -67.99 | 6.1 | -61.89 |
| 3 | 7100 PK | 54.23 | 74 | -19.77 | -47.13 | 6.1 | -41.03 |
| 4 | 7093.75 AV | 32.69 | 54 | -21.31 | -68.67 | 6.1 | -62.57 |
| 5 | 10635.93 PK | 54.09 | 74 | -19.91 | -47.27 | 6.1 | -41.17 |
| 6 | 10646.87 AV | 32.95 | 54 | -21.05 | -68.41 | 6.1 | -62.31 |
| 7 | 15963.87 PK | 54.74 | 74 | -19.26 | -46.62 | 6.1 | -40.52 |
| 8 | 15955.25 AV | 43.16 | 54 | -10.84 | -58.2 | 6.1 | -52.1 |

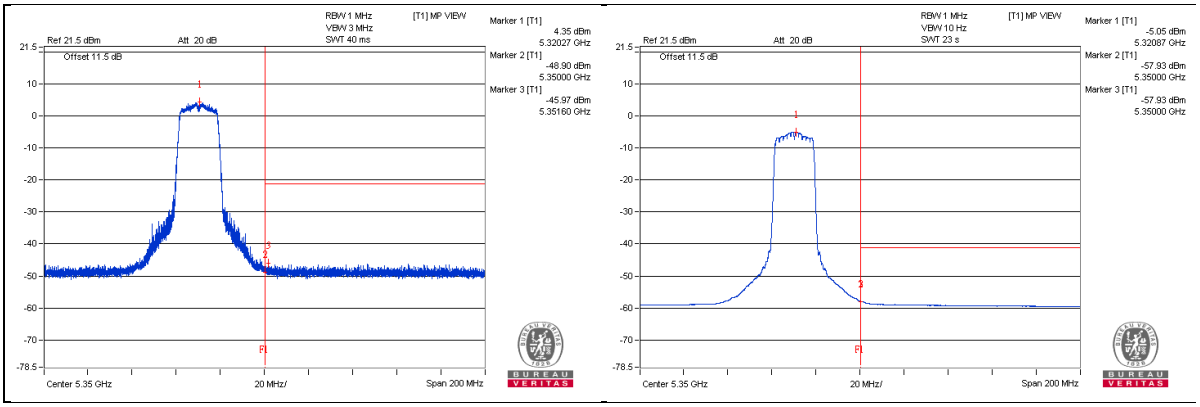
Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.


RBW 1 MHz
VBW 3 MHz
SWT 250 ms
[T1] MP VIEW
Marker 1 [T1]
3.81 dBm
5.31875 GHz
Marker 2 [T1]
-45.34 dBm
3.89843 GHz
Marker 3 [T1]
-45.12 dBm
7.01406 GHz
Ref 21.5 dBm
Att 20 dB
Offset 11.5 dB
Start 1 GHz
1.25 GHz/
Stop 13.5 GHz
RBW 1 MHz
VBW 3 MHz
SWT 230 ms
[T1] MP VIEW
Marker 1 [T1]
-43.92 dBm
21.87918 GHz
Ref 21.5 dBm
Att 10 dB
Offset 11.5 dB
Start 13.5 GHz
1.15 GHz/
Stop 25 GHz
RBW 1 MHz
VBW 3 MHz
SWT 300 ms
[T1] MP VIEW
Marker 1 [T1]
-47.34 dBm
38.61062 GHz
Ref 21.5 dBm
Att 0 dB
Offset 11.5 dB
Start 25 GHz
1.5 GHz/
Stop 40 GHz
RBW 1 MHz
VBW 1 kHz
SWT 14.5 s
[T1] MP VIEW
Marker 1 [T1]
-5.90 dBm
5.31562 GHz
Marker 2 [T1]
-64.06 dBm
4.84843 GHz
Marker 3 [T1]
-67.17 dBm
7.02812 GHz
Ref 11.5 dBm
Att 10 dB
Offset 11.5 dB
Start 1 GHz
1.25 GHz/
Stop 13.5 GHz
RBW 1 MHz
VBW 1 kHz
SWT 13.5 s
[T1] MP VIEW
Marker 1 [T1]
-55.71 dBm
24.96693 GHz
Ref 11.5 dBm
Att 10 dB
Offset 11.5 dB
Start 13.5 GHz
1.15 GHz/
Stop 25 GHz
RBW 1 MHz
VBW 1 kHz
SWT 17 s
[T1] MP VIEW
Marker 1 [T1]
-59.47 dBm
38.62000 GHz
Ref 11.5 dBm
Att 0 dB
Offset 11.5 dB
Start 25 GHz
1.5 GHz/
Stop 40 GHz

**Bandedge table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 5351.6 PK | 55.39 | 74 | -18.61 | -45.97 | 6.1 | -39.87 |
| 2 | 5350 AV | 43.43 | 54 | -10.57 | -57.93 | 6.1 | -51.83 |

Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.

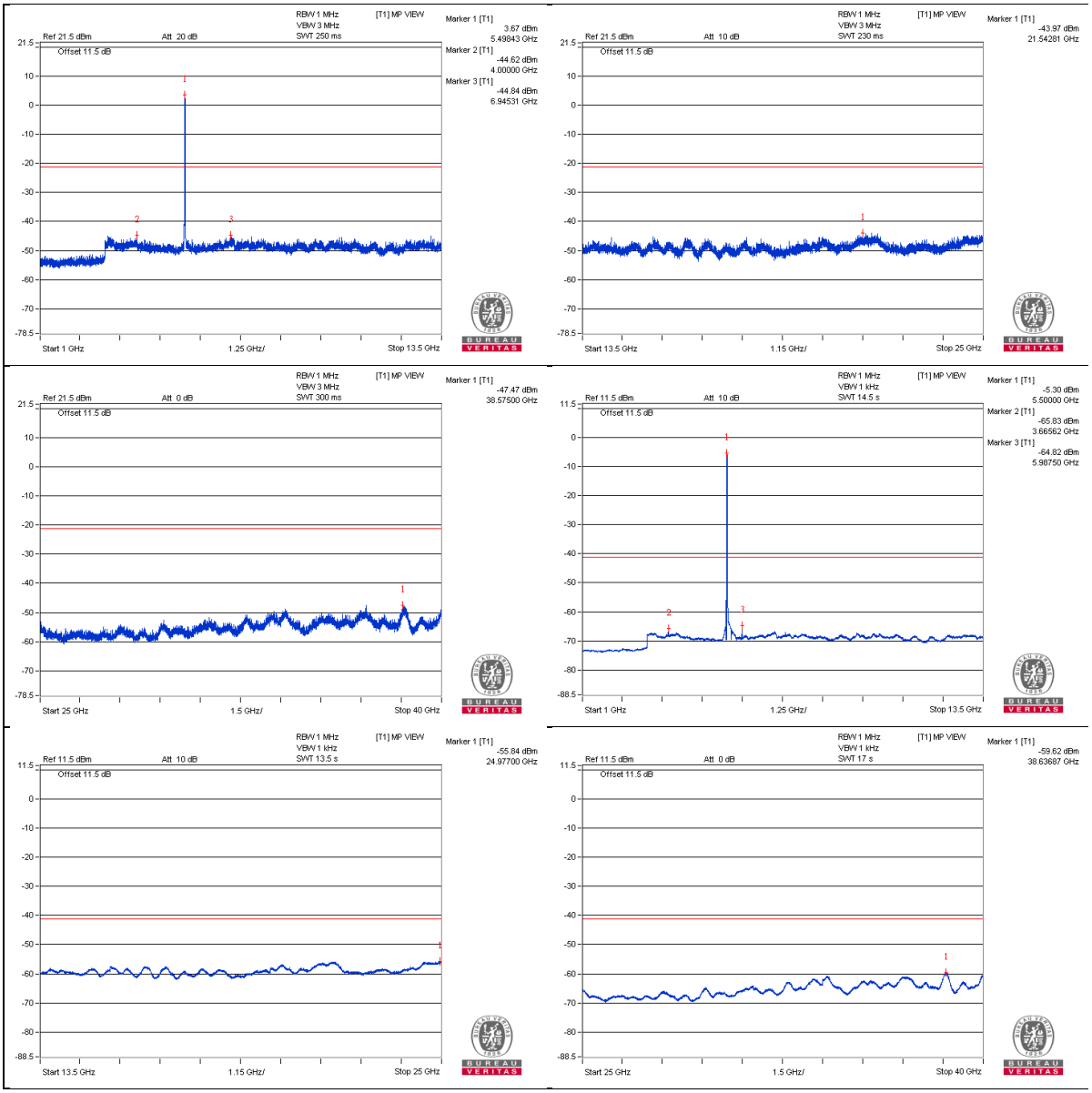


## 802.11n (HT20) - Channel 100

**Conducted spurious emission table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 3671.87 PK | 54.43 | 74 | -19.57 | -46.93 | 6.1 | -40.83 |
| 2 | 3665.62 AV | 35.53 | 54 | -18.47 | -65.83 | 6.1 | -59.73 |
| 3 | 7337.5 PK | 54.04 | 74 | -19.96 | -47.32 | 6.1 | -41.22 |
| 4 | 7332.81 AV | 34.34 | 54 | -19.66 | -67.02 | 6.1 | -60.92 |
| 5 | 11000 PK | 53.5 | 74 | -20.5 | -47.86 | 6.1 | -41.76 |
| 6 | 11000 AV | 32.61 | 54 | -21.39 | -68.75 | 6.1 | -62.65 |
| 7 | 16501.5 PK | 55.69 | 74 | -18.31 | -45.67 | 6.1 | -39.57 |
| 8 | 16494.31 AV | 43.7 | 54 | -10.3 | -57.66 | 6.1 | -51.56 |

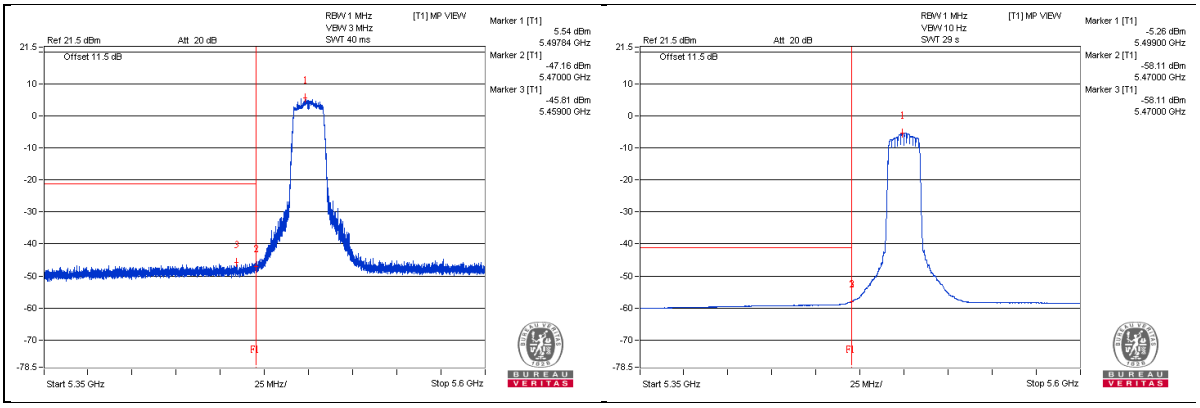
Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.


RBW 1 MHz
VBW 3 MHz
SWT 250 ms
[T1] MP VIEW
Ref 21.5 dBm
Att 20 dB
Offset 11.5 dB
Marker 1 [T1]
3.67 dBm
5.49843 GHz
Marker 2 [T1]
-44.62 dBm
4.00000 GHz
Marker 3 [T1]
-44.84 dBm
6.94531 GHz
Start 1 GHz
1.25 GHz/
Stop 13.5 GHz
RBW 1 MHz
VBW 3 MHz
SWT 230 ms
[T1] MP VIEW
Ref 21.5 dBm
Att 10 dB
Offset 11.5 dB
Marker 1 [T1]
-43.97 dBm
21.54281 GHz
Start 13.5 GHz
1.15 GHz/
Stop 25 GHz
RBW 1 MHz
VBW 3 MHz
SWT 300 ms
[T1] MP VIEW
Ref 21.5 dBm
Att 0 dB
Offset 11.5 dB
Marker 1 [T1]
-47.47 dBm
38.57500 GHz
Start 25 GHz
1.5 GHz/
Stop 40 GHz
RBW 1 MHz
VBW 1 kHz
SWT 14.5 s
[T1] MP VIEW
Ref 11.5 dBm
Att 10 dB
Offset 11.5 dB
Marker 1 [T1]
-5.30 dBm
5.50000 GHz
Marker 2 [T1]
-65.83 dBm
3.66562 GHz
Marker 3 [T1]
-64.82 dBm
5.98750 GHz
Start 1 GHz
1.25 GHz/
Stop 13.5 GHz
RBW 1 MHz
VBW 1 kHz
SWT 13.5 s
[T1] MP VIEW
Ref 11.5 dBm
Att 10 dB
Offset 11.5 dB
Marker 1 [T1]
-55.84 dBm
24.97700 GHz
Start 13.5 GHz
1.15 GHz/
Stop 25 GHz
RBW 1 MHz
VBW 1 kHz
SWT 17 s
[T1] MP VIEW
Ref 11.5 dBm
Att 0 dB
Offset 11.5 dB
Marker 1 [T1]
-59.62 dBm
38.63687 GHz
Start 25 GHz
1.5 GHz/
Stop 40 GHz

**Bandedge table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 5459 PK | 55.55 | 74 | -18.45 | -45.81 | 6.1 | -39.71 |
| 2 | 5470 AV | 43.25 | 54 | -10.75 | -58.11 | 6.1 | -52.01 |

Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.

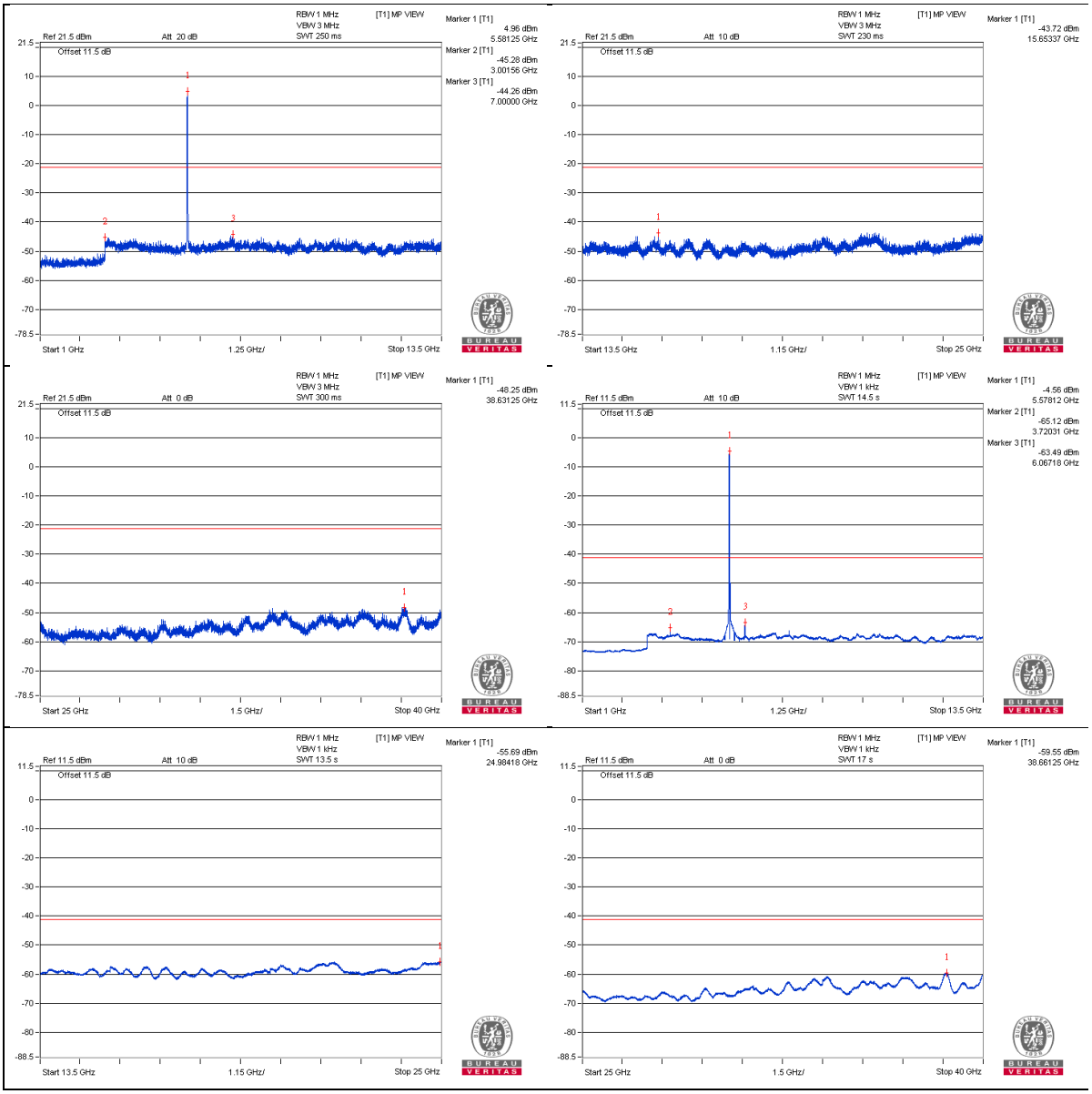


## 802.11n (HT20) - Channel 116

**Conducted spurious emission table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 3710.93 PK | 54.89 | 74 | -19.11 | -46.47 | 6.1 | -40.37 |
| 2 | 3720.31 AV | 36.24 | 54 | -17.76 | -65.12 | 6.1 | -59.02 |
| 3 | 7450 PK | 54.34 | 74 | -19.66 | -47.02 | 6.1 | -40.92 |
| 4 | 7440.62 AV | 35.04 | 54 | -18.96 | -66.32 | 6.1 | -60.22 |
| 5 | 11164.06 PK | 52.52 | 74 | -21.48 | -48.84 | 6.1 | -42.74 |
| 6 | 11160.93 AV | 31.95 | 54 | -22.05 | -69.41 | 6.1 | -63.31 |
| 7 | 16730.06 PK | 51.81 | 74 | -22.19 | -49.55 | 6.1 | -43.45 |
| 8 | 16730.06 AV | 40.58 | 54 | -13.42 | -60.78 | 6.1 | -54.68 |

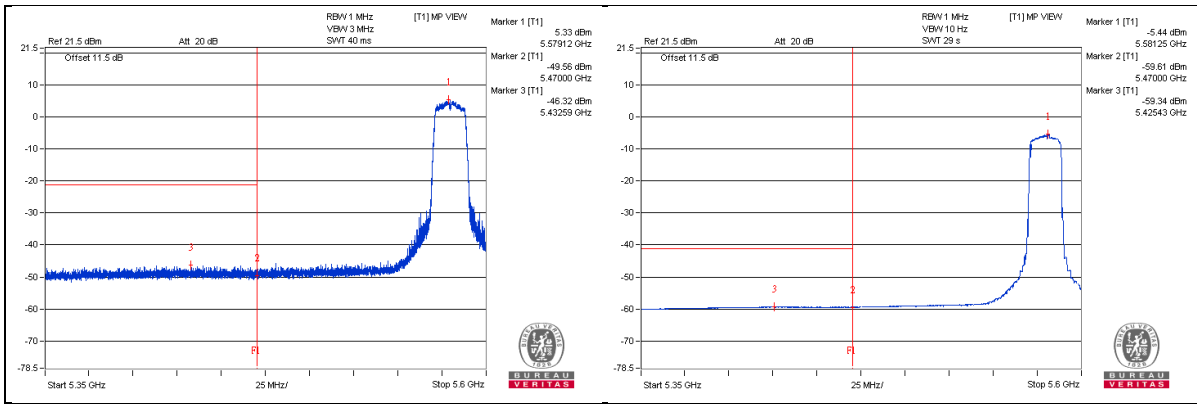
Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.


RBW 1 MHz
VBW 3 MHz
SWT 250 ms
[T1] MP VIEW
Marker 1 [T1]
4.96 dBm
5.58125 GHz
Marker 2 [T1]
-45.28 dBm
3.00156 GHz
Marker 3 [T1]
-44.26 dBm
7.00000 GHz
Ref 21.5 dBm
Att 20 dB
Offset 11.5 dB
Start 1 GHz
1.25 GHz/
Stop 13.5 GHz
RBW 1 MHz
VBW 3 MHz
SWT 230 ms
[T1] MP VIEW
Marker 1 [T1]
-43.72 dBm
15.65337 GHz
Ref 21.5 dBm
Att 10 dB
Offset 11.5 dB
Start 13.5 GHz
1.15 GHz/
Stop 25 GHz
RBW 1 MHz
VBW 3 MHz
SWT 300 ms
[T1] MP VIEW
Marker 1 [T1]
-48.25 dBm
38.63125 GHz
Ref 21.5 dBm
Att 0 dB
Offset 11.5 dB
Start 25 GHz
1.5 GHz/
Stop 40 GHz
RBW 1 MHz
VBW 1 kHz
SWT 14.5 s
[T1] MP VIEW
Marker 1 [T1]
-4.56 dBm
5.57812 GHz
Marker 2 [T1]
-65.12 dBm
3.72031 GHz
Marker 3 [T1]
-63.49 dBm
6.06718 GHz
Ref 11.5 dBm
Att 10 dB
Offset 11.5 dB
Start 1 GHz
1.25 GHz/
Stop 13.5 GHz
RBW 1 MHz
VBW 1 kHz
SWT 13.5 s
[T1] MP VIEW
Marker 1 [T1]
-55.69 dBm
24.98418 GHz
Ref 11.5 dBm
Att 10 dB
Offset 11.5 dB
Start 13.5 GHz
1.15 GHz/
Stop 25 GHz
RBW 1 MHz
VBW 1 kHz
SWT 17 s
[T1] MP VIEW
Marker 1 [T1]
-59.55 dBm
38.66125 GHz
Ref 11.5 dBm
Att 0 dB
Offset 11.5 dB
Start 25 GHz
1.5 GHz/
Stop 40 GHz

**Bandedge table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 5432.59 PK | 55.04 | 74 | -18.96 | -46.32 | 6.1 | -40.22 |
| 2 | 5425.43 AV | 42.02 | 54 | -11.98 | -59.34 | 6.1 | -53.24 |

Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.

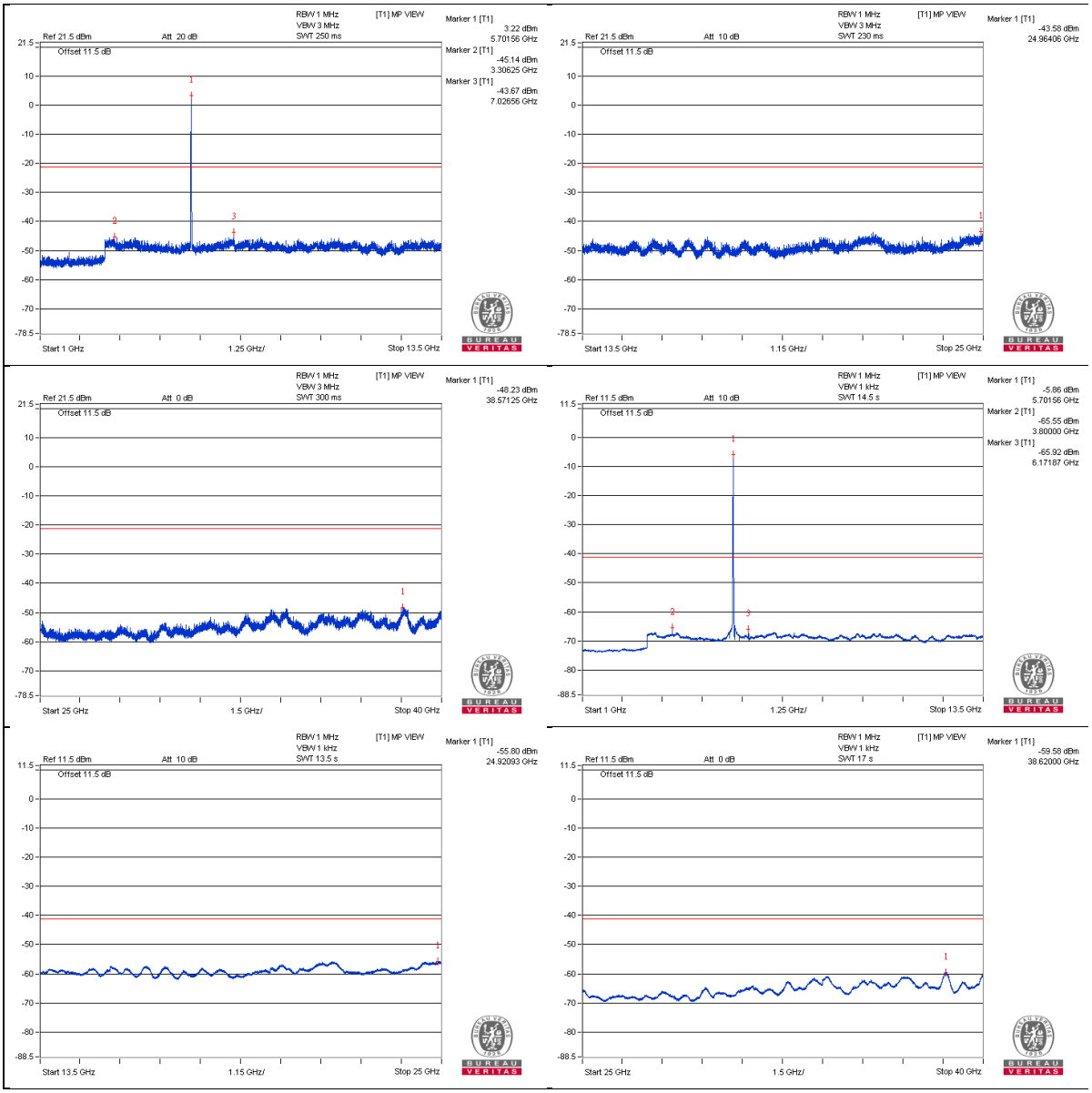


## 802.11n (HT20) - Channel 140

**Conducted spurious emission table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 3795.31 PK | 55.18 | 74 | -18.82 | -46.18 | 6.1 | -40.08 |
| 2 | 3800 AV | 35.81 | 54 | -18.19 | -65.55 | 6.1 | -59.45 |
| 3 | 7604.68 PK | 53.89 | 74 | -20.11 | -47.47 | 6.1 | -41.37 |
| 4 | 7600 AV | 34.12 | 54 | -19.88 | -67.24 | 6.1 | -61.14 |
| 5 | 11407.81 PK | 53.69 | 74 | -20.31 | -47.67 | 6.1 | -41.57 |
| 6 | 11398.43 AV | 33.32 | 54 | -20.68 | -68.04 | 6.1 | -61.94 |
| 7 | 17105.25 PK | 54.94 | 74 | -19.06 | -46.42 | 6.1 | -40.32 |
| 8 | 17096.62 AV | 43.61 | 54 | -10.39 | -57.75 | 6.1 | -51.65 |

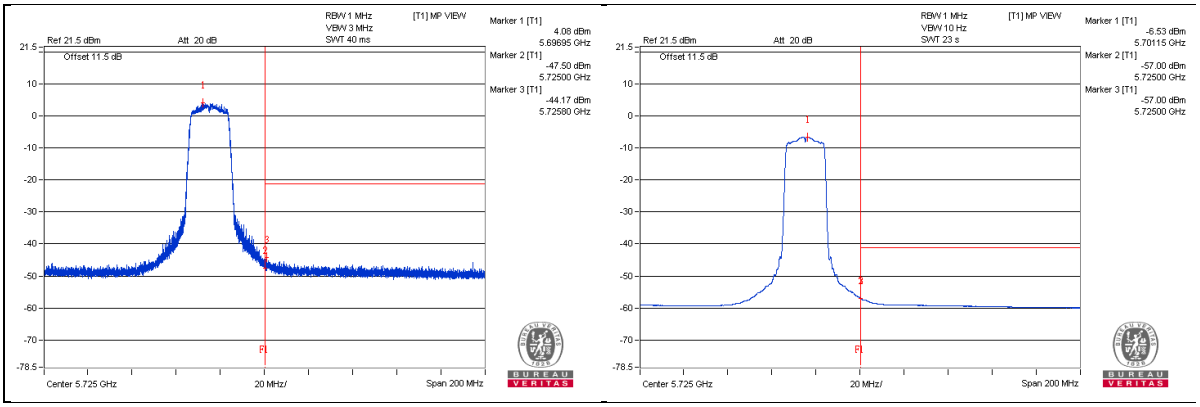
Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.


RBW 1 MHz
VBW 3 MHz
SWT 250 ms
[T1] MP VIEW
Marker 1 [T1]
3.22 dBm
5.70156 GHz
Marker 2 [T1]
-45.14 dBm
3.30625 GHz
Marker 3 [T1]
-43.67 dBm
7.02656 GHz
Ref 21.5 dBm
Att 20 dB
Offset 11.5 dB
Start 1 GHz
1.25 GHz/
Stop 13.5 GHz
RBW 1 MHz
VBW 3 MHz
SWT 230 ms
[T1] MP VIEW
Marker 1 [T1]
-43.58 dBm
24.96406 GHz
Ref 21.5 dBm
Att 10 dB
Offset 11.5 dB
Start 13.5 GHz
1.15 GHz/
Stop 25 GHz
RBW 1 MHz
VBW 3 MHz
SWT 300 ms
[T1] MP VIEW
Marker 1 [T1]
-48.23 dBm
38.57125 GHz
Ref 21.5 dBm
Att 0 dB
Offset 11.5 dB
Start 25 GHz
1.5 GHz/
Stop 40 GHz
RBW 1 MHz
VBW 1 kHz
SWT 14.5 s
[T1] MP VIEW
Marker 1 [T1]
-5.86 dBm
5.70156 GHz
Marker 2 [T1]
-65.55 dBm
3.80000 GHz
Marker 3 [T1]
-65.92 dBm
6.17187 GHz
Ref 11.5 dBm
Att 10 dB
Offset 11.5 dB
Start 1 GHz
1.25 GHz/
Stop 13.5 GHz
RBW 1 MHz
VBW 1 kHz
SWT 13.5 s
[T1] MP VIEW
Marker 1 [T1]
-55.80 dBm
24.92093 GHz
Ref 11.5 dBm
Att 10 dB
Offset 11.5 dB
Start 13.5 GHz
1.15 GHz/
Stop 25 GHz
RBW 1 MHz
VBW 1 kHz
SWT 17 s
[T1] MP VIEW
Marker 1 [T1]
-59.58 dBm
38.62000 GHz
Ref 11.5 dBm
Att 0 dB
Offset 11.5 dB
Start 25 GHz
1.5 GHz/
Stop 40 GHz

**Bandedge table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 5725.8 PK | 57.19 | 74 | -16.81 | -44.17 | 6.1 | -38.07 |
| 2 | 5725 AV | 44.36 | 54 | -9.64 | -57 | 6.1 | -50.9 |

Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.

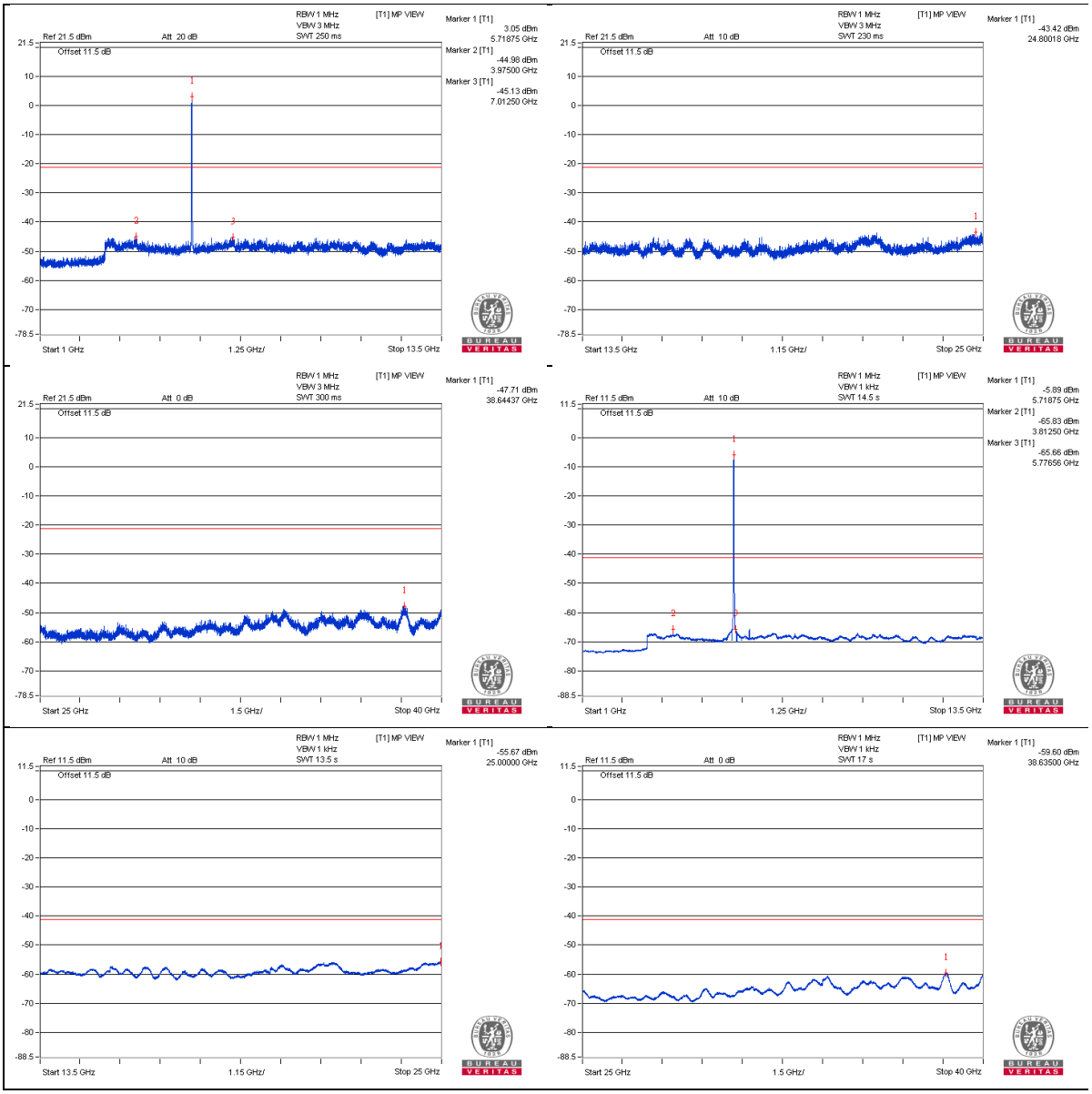


## 802.11n (HT20) - Channel 144

**Conducted spurious emission table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 3814.06 PK | 55.04 | 74 | -18.96 | -46.32 | 6.1 | -40.22 |
| 2 | 3812.5 AV | 35.53 | 54 | -18.47 | -65.83 | 6.1 | -59.73 |
| 3 | 7625 PK | 53.72 | 74 | -20.28 | -47.64 | 6.1 | -41.54 |
| 4 | 7626.56 AV | 34.21 | 54 | -19.79 | -67.15 | 6.1 | -61.05 |
| 5 | 11435.93 PK | 54.05 | 74 | -19.95 | -47.31 | 6.1 | -41.21 |
| 6 | 11442.18 AV | 32.91 | 54 | -21.09 | -68.45 | 6.1 | -62.35 |
| 7 | 17157 PK | 53.66 | 74 | -20.34 | -47.7 | 6.1 | -41.6 |
| 8 | 17169.93 AV | 43.11 | 54 | -10.89 | -58.25 | 6.1 | -52.15 |

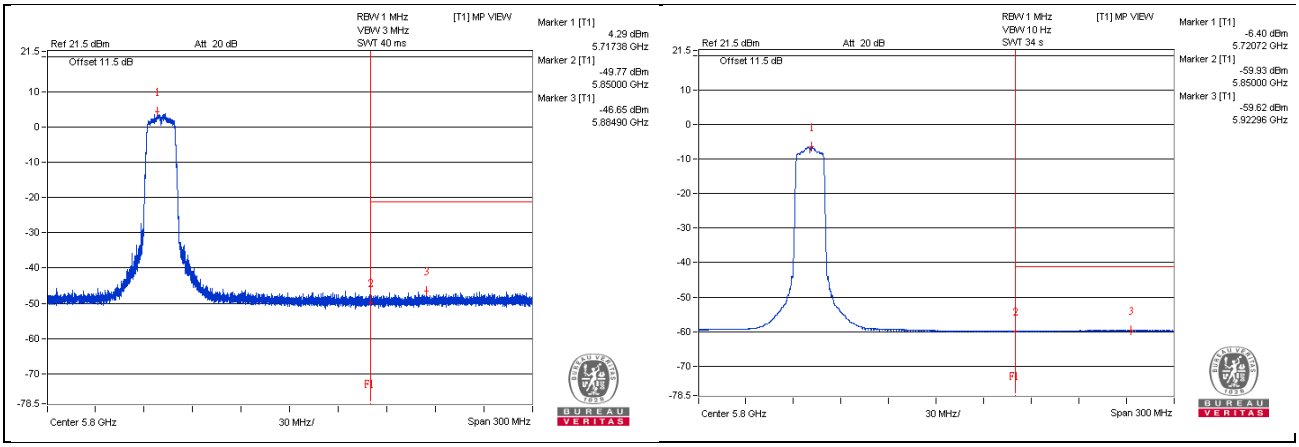
Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.


RBW 1 MHz
VBW 3 MHz
SWT 250 ms
[T1] MP VIEW
Marker 1 [T1]
3.05 dBm
5.71875 GHz
Marker 2 [T1]
-44.98 dBm
3.97500 GHz
Marker 3 [T1]
-45.13 dBm
7.01250 GHz
Ref 21.5 dBm
Att 20 dB
Offset 11.5 dB
Start 1 GHz
1.25 GHz/
Stop 13.5 GHz
RBW 1 MHz
VBW 3 MHz
SWT 230 ms
[T1] MP VIEW
Marker 1 [T1]
-43.42 dBm
24.80018 GHz
Ref 21.5 dBm
Att 10 dB
Offset 11.5 dB
Start 13.5 GHz
1.15 GHz/
Stop 25 GHz
RBW 1 MHz
VBW 3 MHz
SWT 300 ms
[T1] MP VIEW
Marker 1 [T1]
-47.71 dBm
38.64437 GHz
Ref 21.5 dBm
Att 0 dB
Offset 11.5 dB
Start 25 GHz
1.5 GHz/
Stop 40 GHz
RBW 1 MHz
VBW 1 kHz
SWT 14.5 s
[T1] MP VIEW
Marker 1 [T1]
-5.89 dBm
5.71875 GHz
Marker 2 [T1]
-65.83 dBm
3.81250 GHz
Marker 3 [T1]
-65.66 dBm
5.77656 GHz
Ref 11.5 dBm
Att 10 dB
Offset 11.5 dB
Start 1 GHz
1.25 GHz/
Stop 13.5 GHz
RBW 1 MHz
VBW 1 kHz
SWT 13.5 s
[T1] MP VIEW
Marker 1 [T1]
-55.67 dBm
25.00000 GHz
Ref 11.5 dBm
Att 10 dB
Offset 11.5 dB
Start 13.5 GHz
1.15 GHz/
Stop 25 GHz
RBW 1 MHz
VBW 1 kHz
SWT 17 s
[T1] MP VIEW
Marker 1 [T1]
-59.60 dBm
38.63500 GHz
Ref 11.5 dBm
Att 0 dB
Offset 11.5 dB
Start 25 GHz
1.5 GHz/
Stop 40 GHz

**Bandedge table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 5884.9 PK | 54.71 | 74 | -19.29 | -46.65 | 6.1 | -40.55 |
| 2 | 5922.96 AV | 41.74 | 54 | -12.26 | -59.62 | 6.1 | -53.52 |

Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.



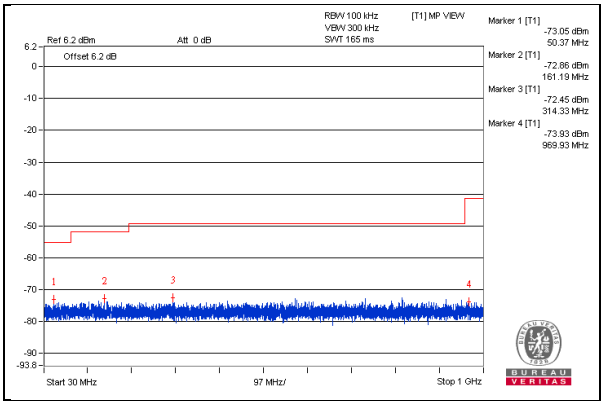
## Below 1GHz Data:

## 802.11n (HT20) - Channel 60

**Conducted spurious emission table**

| No. | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Raw Value (dBm) | Correction Factor (dB) | EIRP Level (dBm) |
|---|---|---|---|---|---|---|---|
| 1 | 50.37 | 28.31 | 40 | -11.69 | -73.05 | 6.1 | -66.95 |
| 2 | 161.19 | 28.5 | 43.5 | -15 | -72.86 | 6.1 | -66.76 |
| 3 | 314.33 | 28.91 | 46 | -17.09 | -72.45 | 6.1 | -66.35 |
| 4 | 585.32 | 28.43 | 46 | -17.57 | -72.93 | 6.1 | -66.83 |
| 5 | 740.28 | 28.49 | 46 | -17.51 | -72.87 | 6.1 | -66.77 |
| 6 | 919.61 | 28.38 | 46 | -17.62 | -72.98 | 6.1 | -66.88 |

Note :
Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8
d = measurement distance in 3 meters.
Emission levels include upper bound on ground plane reflection (4.7dB) for below 1GHz emission.



## 4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

| Frequency (MHz) | Conducted Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 - 0.5 | 66 - 56 | 56 - 46 |
| 0.50 - 5.0 | 56 | 46 |
| 5.0 - 30.0 | 60 | 50 |

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

4.2.2 Test Instruments

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---|---|---|---|---|
| Test Receiver R&S | ESCS 30 | 847124/029 | Oct. 24, 2016 | Oct. 23, 2017 |
| Line-Impedance Stabilization Network (for EUT) R&S | ESH3-Z5 | 848773/004 | Oct. 26, 2016 | Oct. 25, 2017 |
| Line-Impedance Stabilization Network (for Peripheral) R&S | ENV216 | 100072 | June 13, 2016 | June 12, 2017 |
| 50 ohms Terminator | N/A | EMC-02 | Sep. 29, 2016 | Sep. 28, 2017 |
| RF Cable | 5D-FB | COCCAB-001 | Sep. 30, 2016 | Sep. 29, 2017 |
| 10 dB PAD Mini-Circuits | HAT-10+ | CONATT-004 | June 20, 2016 | June 19, 2017 |
| Software BVADT | BVADT_Cond_ V7.3.7.4 | NA | NA | NA |

**Note:**
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. 1.
3 Tested Date: May 19, 2017

4.2.3 Test Procedure

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

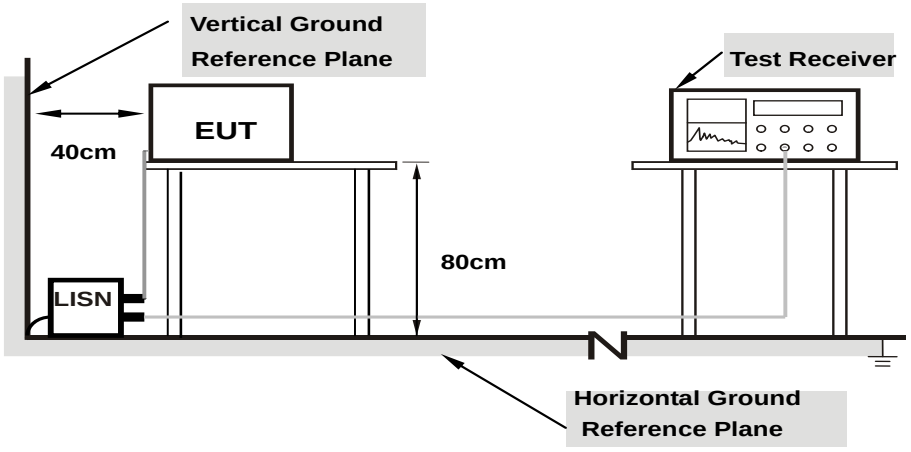
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup




**Note: 1.Support units were connected to second LISN.**

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Condition

Same as 4.1.6.

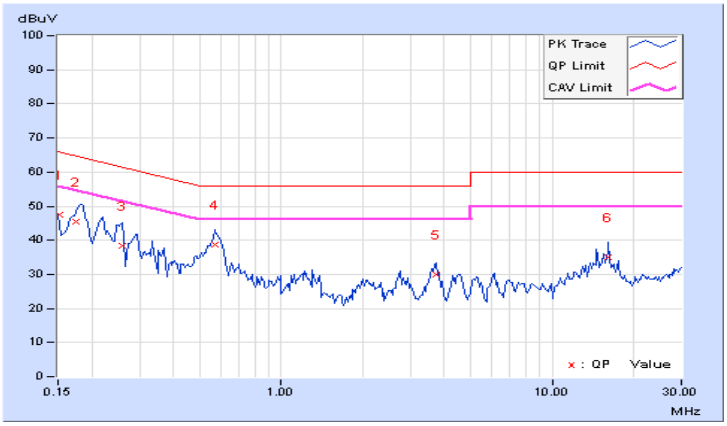
4.2.7 Test Results

| Phase | Line (L) | Detector Function | Quasi-Peak (QP) / Average (AV) |
|---|---|---|---|

| Phase Of Power : Line (L) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No | Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | | Emission Level (dBuV) | | Limit (dBuV) | | Margin (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.15100 | 10.20 | 37.43 | 26.76 | 47.63 | 36.96 | 65.94 | 55.94 | -18.31 | -18.98 |
| 2 | 0.17425 | 10.20 | 35.40 | 22.72 | 45.60 | 32.92 | 64.76 | 54.76 | -19.16 | -21.84 |
| 3 | 0.25938 | 10.21 | 28.01 | 19.03 | 38.22 | 29.24 | 61.45 | 51.45 | -23.23 | -22.21 |
| 4 | 0.56797 | 10.26 | 28.35 | 22.42 | 38.61 | 32.68 | 56.00 | 46.00 | -17.39 | -13.32 |
| 5 | 3.71194 | 10.31 | 19.54 | 12.94 | 29.85 | 23.25 | 56.00 | 46.00 | -26.15 | -22.75 |
| 6 | 16.15406 | 11.39 | 23.73 | 19.41 | 35.12 | 30.80 | 60.00 | 50.00 | -24.88 | -19.20 |

**Remarks:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

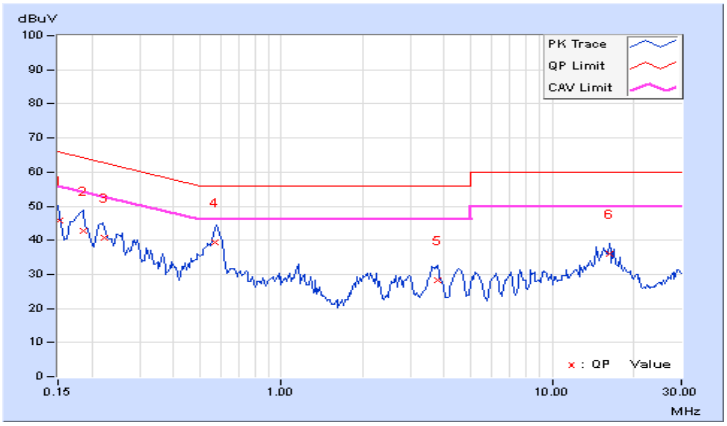


| Phase | Neutral (N) | Detector Function | Quasi-Peak (QP) / Average (AV) |
|---|---|---|---|

| Phase Of Power : Neutral (N) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No | Frequency (MHz) | Correction Factor (dB) | Reading Value (dBuV) | | Emission Level (dBuV) | | Limit (dBuV) | | Margin (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.15100 | 10.19 | 35.72 | 24.89 | 45.91 | 35.08 | 65.94 | 55.94 | -20.03 | -20.86 |
| 2 | 0.18616 | 10.18 | 32.43 | 20.63 | 42.61 | 30.81 | 64.21 | 54.21 | -21.60 | -23.40 |
| 3 | 0.22131 | 10.18 | 30.53 | 18.50 | 40.71 | 28.68 | 62.77 | 52.77 | -22.06 | -24.09 |
| **4** | **0.56969** | **10.25** | **29.10** | **23.81** | **39.35** | **34.06** | **56.00** | **46.00** | **-16.65** | **-11.94** |
| 5 | 3.77544 | 10.23 | 17.95 | 12.41 | 28.18 | 22.64 | 56.00 | 46.00 | -27.82 | -23.36 |
| 6 | 16.31859 | 11.17 | 24.90 | 20.88 | 36.07 | 32.05 | 60.00 | 50.00 | -23.93 | -17.95 |

**Remarks:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



## 4.3 Transmit Power Measurment

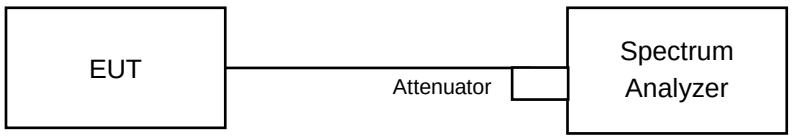
### 4.3.1 Limits of Transmit Power Measurement

| Operation Band | EUT Category | | Limit |
|---|---|---|---|
| U-NII-1 | | Outdoor Access Point | 1 Watt (30 dBm)<br>(Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon) |
| | | Fixed point-to-point Access Point | 1 Watt (30 dBm) |
| | | Indoor Access Point | 1 Watt (30 dBm) |
| | | Mobile and Portable client device | 250mW (24 dBm) |
| U-NII-2A | √ | | 250mW (24 dBm) or 11 dBm+10 log B* |
| U-NII-2C | √ | | 250mW (24 dBm) or 11 dBm+10 log B* |
| U-NII-3 | √ | | 1 Watt (30 dBm) |

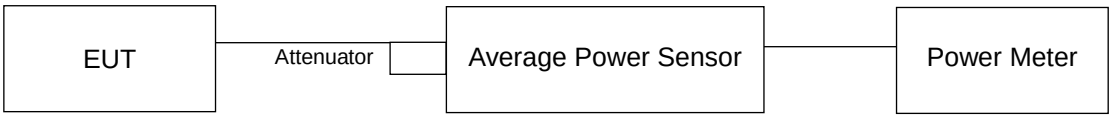
*B is the 26 dB emission bandwidth in megahertz

### 4.3.2 Test Setup

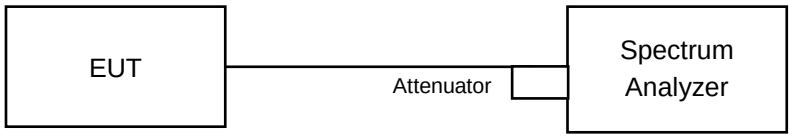
**For channel straddling 5725MHz:**




**For other channels:**




**For 26dB Occupied Bandwidth**




### 4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

**FOR POWER OUTPUT MEASUREMENT**

**For channel straddling 5725MHz:**

Method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW =1MHz.
3. Set the VBW ≥ 3 x RBW.
4. Number of points in sweep ≥ 2 Span / RBW.
5. Sweep time = auto.
6. Set trigger to free run (duty cycle ≥ 98 percent)
7. Detector = RMS.
8. Trace average at least 100 traces in power averaging mode
9. Compute power by integrating the spectrum across the 26 dB EBW of the signal.

**For other channels:**

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

**FOR 26dB OCCUPIED BANDWIDTH**

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

**802.11n (HT20)**

**Power Output:**

| Channel | Channel Frequency (MHz) | Maximum Conducted Power (mW) | Maximum Conducted Power (dBm) | Power Limit (dBm) | Pass/Fail |
|---|---|---|---|---|---|
| 52 | 5260 | 8.63 | 9.36 | 23.90 | Pass |
| 60 | 5300 | 8.872 | 9.48 | 23.90 | Pass |
| 64 | 5320 | 8.551 | 9.32 | 23.90 | Pass |
| 100 | 5500 | 8.531 | 9.31 | 23.90 | Pass |
| 116 | 5580 | 8.65 | 9.37 | 23.90 | Pass |
| 140 | 5700 | 8.472 | 9.28 | 23.90 | Pass |
| *144 (UNII-2C Band) | 5720 | 3.767 | 5.76 | 22.73 | Pass |
| *144 (UNII-3 Band) | 5720 | 0.8511 | -0.70 | 29.90 | Pass |

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

1. For UNII-2A, UNII-2C: Antenna gain = 6.1dBi > 6dBi, so the power limit shall be reduced to 24-(6.1-6) =23.90dBm.
2. For UNII-2C<only for CH144(UNII-2C Band): Antenna gain = 6.1dBi > 6dBi , so the power limit shall be reduced to “Determined Conducted Limit-(6.1-6)
3. For UNII-3: Antenna gain = 6.1dBi > 6dBi, so the power limit shall be reduced to 30-(6.1-6) =29.90dBm.

The Average Power for the straddle channel:

| Chan. | Chan. Freq. (MHz) | Average Power (mW) | Average Power (dBm) |
|---|---|---|---|
| *144 | 5720 | 4.6181 | 6.64 |
| Note: The total power was calculated through formula and record the value for reference only. | | | |

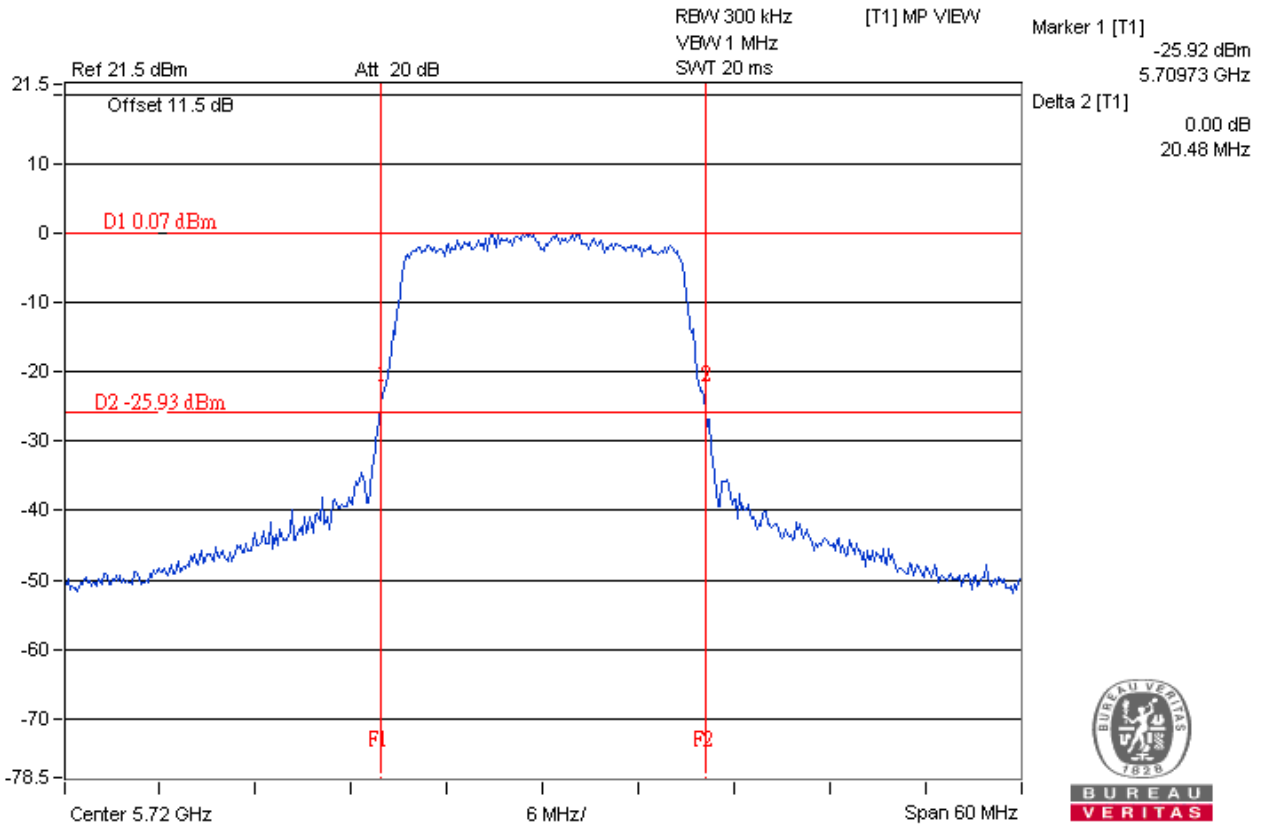
## 26dB BANDWIDTH:

| Channel | Channel Frequency (MHz) | 26dBc Bandwidth (MHz) |
|---|---|---|
| 52 | 5260 | 20.54 |
| 60 | 5300 | 20.36 |
| 64 | 5320 | 20.44 |
| 100 | 5500 | 20.61 |
| 116 | 5580 | 20.50 |
| 140 | 5700 | 20.50 |
| 144 (UNII-2C Band) | 5720 | 15.27 |

**Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth**

| Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C > | | | |
|---|---|---|---|
| Channel Number | Freq.(MHz) | Min. B(MHz) | Determined Conducted Limit (dBm) |
| 52 | 5260 | 20.54 | 24.12 > 24 |
| 60 | 5300 | 20.36 | 24.08 > 24 |
| 64 | 5320 | 20.44 | 24.1 > 24 |
| 100 | 5500 | 20.61 | 24.14 > 24 |
| 116 | 5580 | 20.50 | 24.11 > 24 |
| 140 | 5700 | 20.50 | 24.11 > 24 |
| 2C-144 | 5720 | 15.27 | 22.83 < 24 |

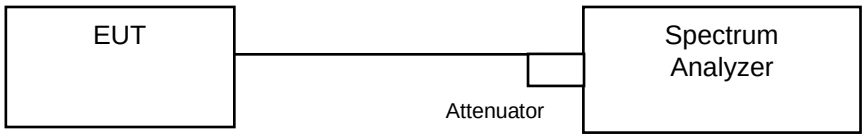
| Spectrum Plot of Worst Value |
| --- |
| **CH144 (UNII-2C Band)** |




For CH144 (U_NII-2C) 26dBc BW = 5725MHz - Marker 1

## 4.4 Occupied Bandwidth Measurement

### 4.4.1 Test Setup




### 4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to SAMPLE. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

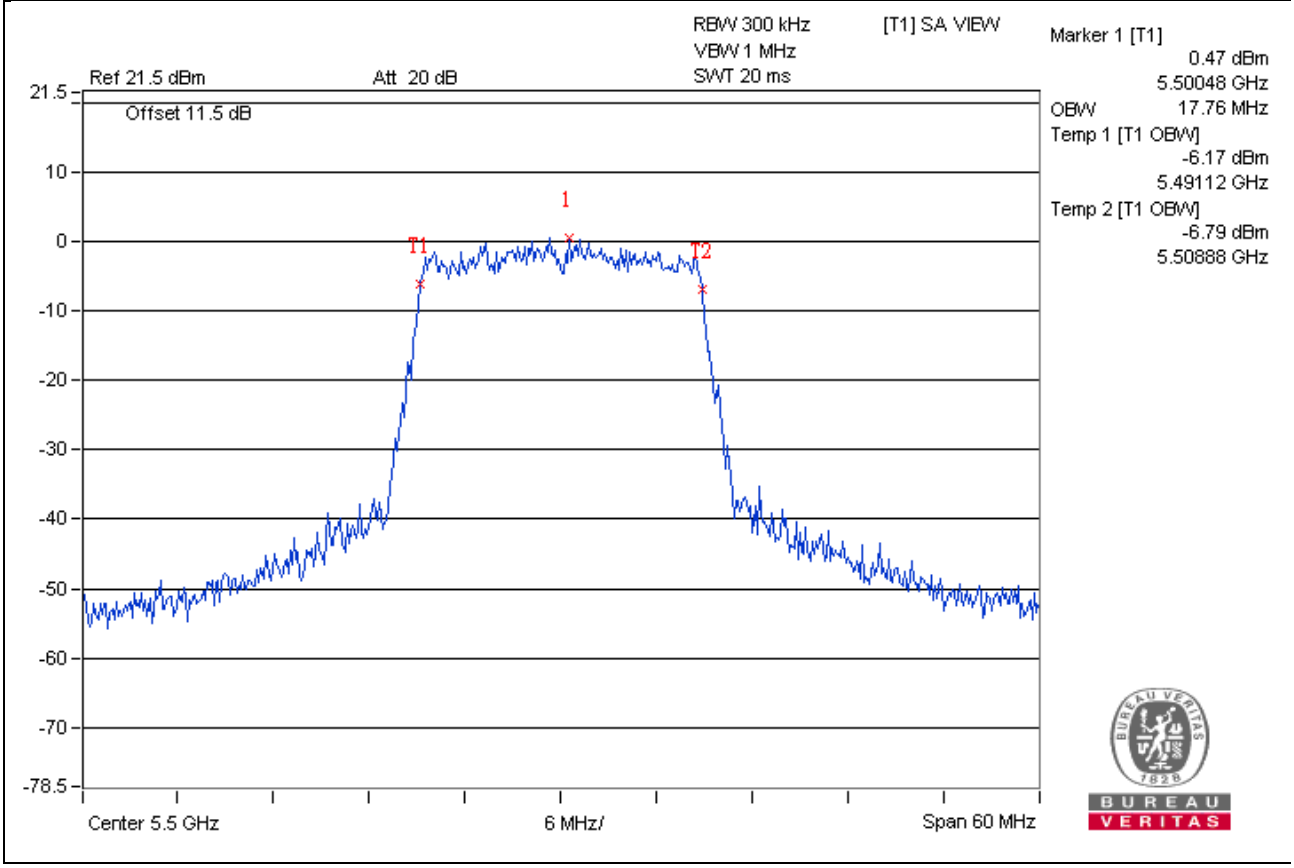
4.4.4 Test Results

**802.11n (HT20)**

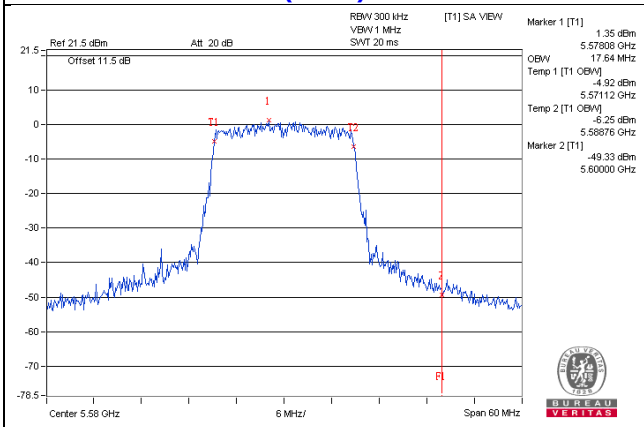
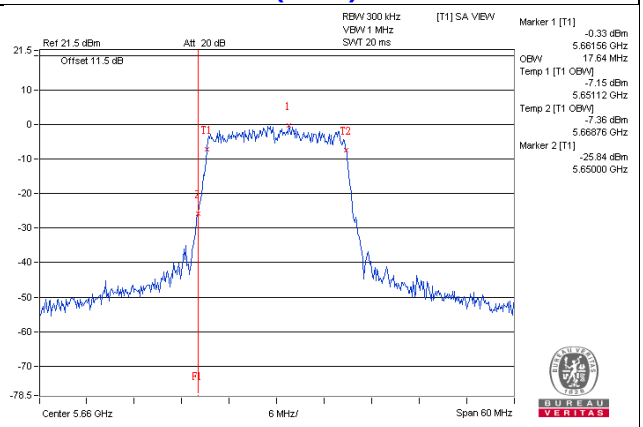
| Channel | Channel Frequency (MHz) | Occupied Bandwidth (MHz) |
|---|---|---|
| 52 | 5260 | 17.64 |
| 60 | 5300 | 17.64 |
| 64 | 5320 | 17.64 |
| 100 | 5500 | 17.76 |
| 116 | 5580 | 17.64 |
| 140 | 5700 | 17.64 |
| 144 (UNII-2C Band) | 5720 | 13.88 |
| 144 (UNII-3 Band) | 5720 | 3.76 |

Spectrum Plot of Worst Value

**CH 100**



Verify that the 5600 – 5650 MHz band is notched.
Test results demonstrating last channel shall not exceed the band edge on 5600~5650MHz

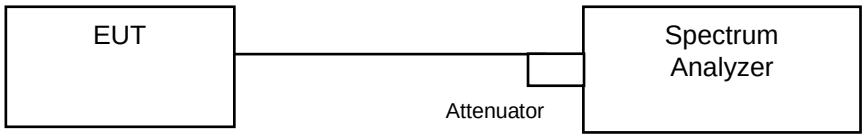
| 802.11n (HT20) / CH116 | 802.11n (HT20) / CH132 |
|---|---|
|  |  |

## 4.5 Peak Power Spectral Density Measurement

### 4.5.1 Limits of Peak Power Spectral Density Measurement

| Operation Band | EUT Category | | Limit |
|---|---|---|---|
| U-NII-1 | | Outdoor Access Point | 17dBm/ MHz |
| | | Fixed point-to-point Access Point | |
| | √ | Indoor Access Point | |
| | | Mobile and Portable client device | 11dBm/ MHz |
| U-NII-2A | √ | | 11dBm/ MHz |
| U-NII-2C | √ | | 11dBm/ MHz |
| U-NII-3 | √ | | 30dBm/ 500kHz |

### 4.5.2 Test Setup




### 4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.5.4 Test Procedure

**For U-NII-2A, U-NII-2C band:**

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value

**For U-NII-3:**

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz/300kHz)
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value

### 4.5.5 Deviation from Test Standard

No deviation.

### 4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

**ForU-NII-2A, U-NII-2C band:**

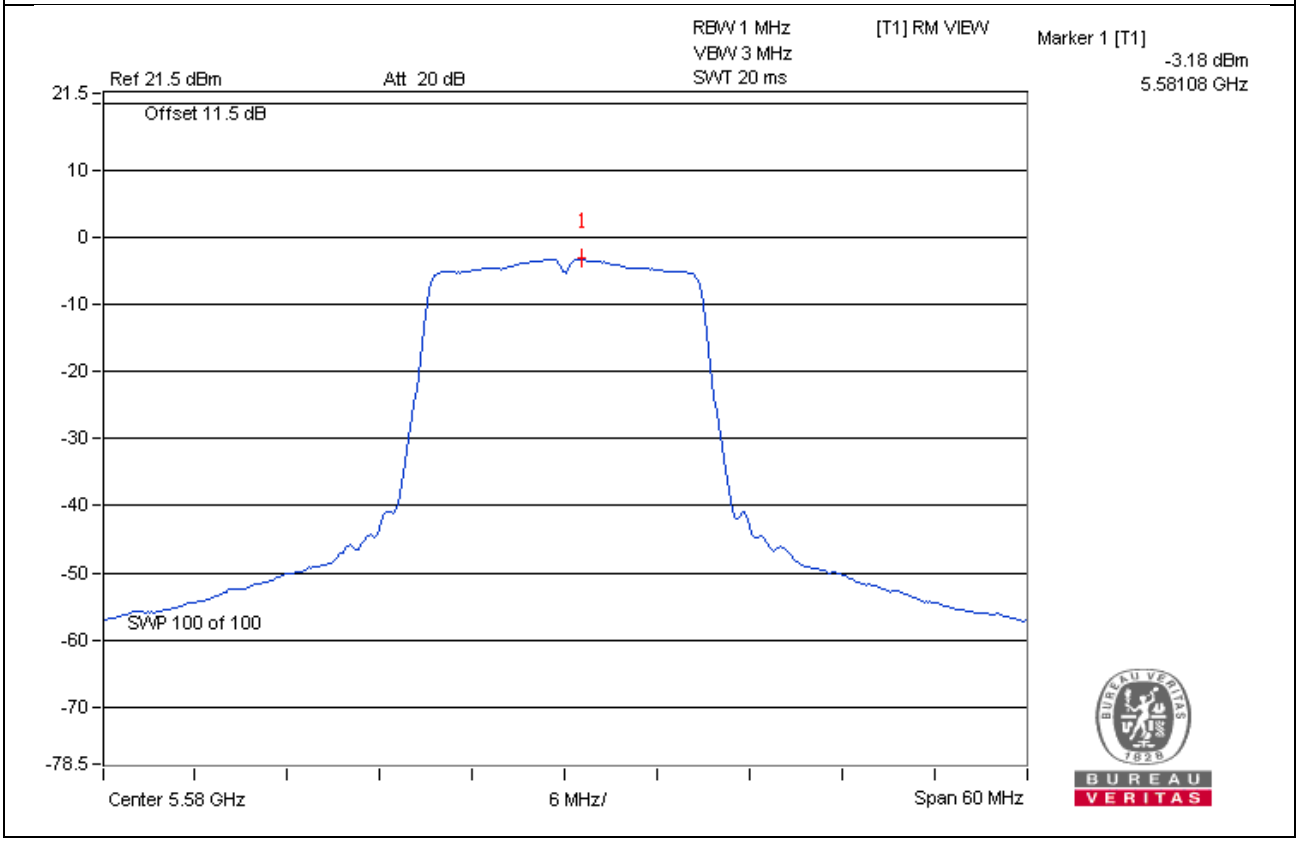
**802.11n (HT20)**

| Chan. | Chan. Freq. (MHz) | PSD (dBm/MHz) | MAX. Limit (dBm/MHz) | Pass / Fail |
|---|---|---|---|---|
| 52 | 5260 | -3.84 | 10.90 | Pass |
| 60 | 5300 | -3.67 | 10.90 | Pass |
| 64 | 5320 | -3.71 | 10.90 | Pass |
| 100 | 5500 | -3.71 | 10.90 | Pass |
| 116 | 5580 | -3.18 | 10.90 | Pass |
| 140 | 5700 | -3.64 | 10.90 | Pass |
| 144 (UNII-2C Band) | 5720 | -3.94 | 10.90 | Pass |

**Note:** 1. For UNII-2A, UNII-2C: Antenna gain = 6.1dBi > 6dBi, so the power density limit shall be reduced to 11-(6.1-6) =10.90dBm.

Spectrum Plot of Worst Value

**CH 116**



**For U-NII-3 Band:**

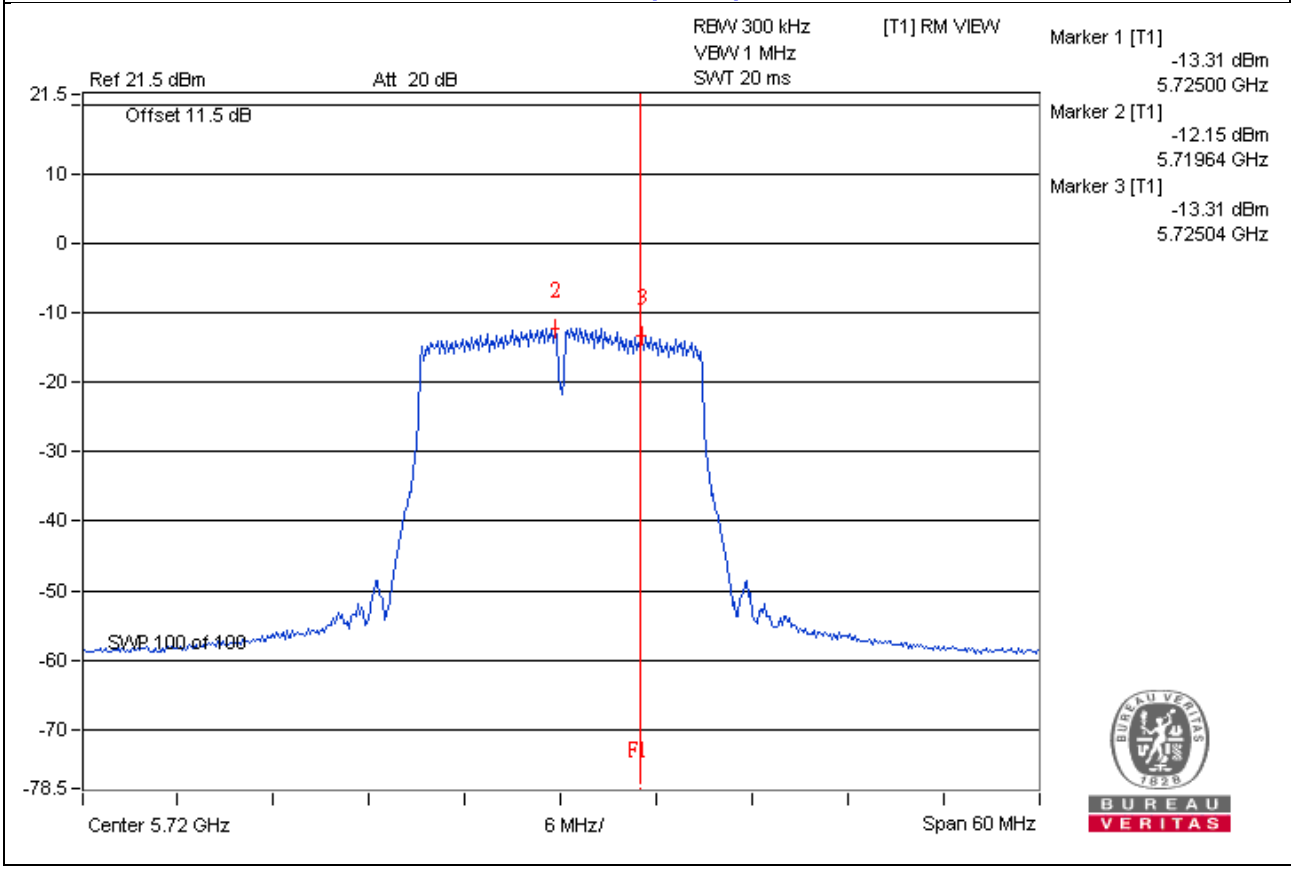
**802.11n (HT20)**

| Chan. | Chan. Freq. (MHz) | PSD | | Total PSD (dBm/500kHz) | Limit (dBm/500kHz) | Pass /Fail |
|---|---|---|---|---|---|---|
| | | (dBm/300kHz) | (dBm/500kHz) | | | |
| 144 (UNII-3 Band) | 5720 | -13.31 | -11.09 | -11.09 | 29.90 | Pass |

**Note:** 1. Antenna gain = 6.1dBi > 6dBi, so the power density limit shall be reduced to 30-(6.1-6) =29.90dBm.

Spectrum Plot of Worst Value

**CH 144 (UNII-3)**

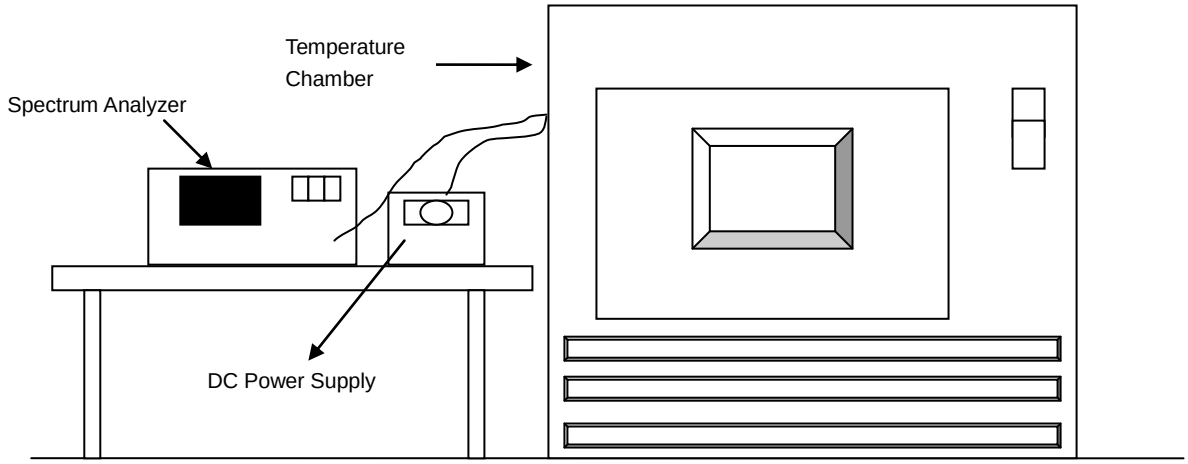


## 4.6 Frequency Stability Measurement

### 4.6.1 Limits of Frequency Stability Measurement

The frequency of the carrier signal shall be maintained within band of operation

### 4.6.2 Test Setup




### 4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.6.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
b. Turn the EUT on and couple its output to a spectrum analyzer.
c. Turn the EUT off and set the chamber to the highest temperature specified.
d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 Minutes.
e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
.

### 4.6.5 Deviation from Test Standard

No deviation.

### 4.6.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

4.6.7 Test Results

| Frequency Stability Versus Temp. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Frequency: 5260 MHz | | | | | | | | | |
| TEMP. (℃) | Power Supply (Vdc) | 0 Minute | | 2 Minute | | 5 Minute | | 10 Minute | |
| | | Measured Frequency (MHz) | Pass/Fail | Measured Frequency (MHz) | Pass/Fail | Measured Frequency (MHz) | Pass/Fail | Measured Frequency (MHz) | Pass/Fail |
| 50 | 3.3 | 5259.9842 | PASS | 5259.9883 | PASS | 5259.9874 | PASS | 5259.9859 | PASS |
| 40 | 3.3 | 5259.9994 | PASS | 5260.0033 | PASS | 5259.9989 | PASS | 5260.0009 | PASS |
| 30 | 3.3 | 5260.0208 | PASS | 5260.0237 | PASS | 5260.0208 | PASS | 5260.0238 | PASS |
| 20 | 3.3 | 5260.017 | PASS | 5260.0184 | PASS | 5260.0141 | PASS | 5260.0185 | PASS |
| 10 | 3.3 | 5260.0205 | PASS | 5260.0185 | PASS | 5260.0179 | PASS | 5260.0226 | PASS |
| 0 | 3.3 | 5259.999 | PASS | 5260.0013 | PASS | 5259.9983 | PASS | 5260.0003 | PASS |
| -10 | 3.3 | 5259.9947 | PASS | 5259.9958 | PASS | 5259.9951 | PASS | 5259.9953 | PASS |
| -20 | 3.3 | 5260.0096 | PASS | 5260.0131 | PASS | 5260.0116 | PASS | 5260.0129 | PASS |
| -30 | 3.3 | 5260.0119 | PASS | 5260.0088 | PASS | 5260.0111 | PASS | 5260.0077 | PASS |

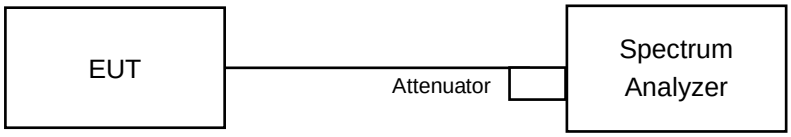
| Frequency Stability Versus Voltage | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Operating Frequency: 5260MHz | | | | | | | | | |
| TEMP. (℃) | Power Supply (Vdc) | 0 Minute | | 2 Minute | | 5 Minute | | 10 Minute | |
| | | Measured Frequency (MHz) | Pass/Fail | Measured Frequency (MHz) | Pass/Fail | Measured Frequency (MHz) | Pass/Fail | Measured Frequency (MHz) | Pass/Fail |
| 20 | 3.3 | 5260.016 | PASS | 5260.0185 | PASS | 5260.0134 | PASS | 5260.0184 | PASS |
| | 3.3 | 5260.017 | PASS | 5260.0184 | PASS | 5260.0141 | PASS | 5260.0185 | PASS |
| | 3.3 | 5260.0165 | PASS | 5260.0179 | PASS | 5260.0143 | PASS | 5260.0177 | PASS |

## 4.7 6dB Bandwidth Measurment

### 4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

### 4.7.2 Test Setup




### 4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.7.4 Test Procedure

**MEASUREMENT PROCEDURE REF**

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

### 4.7.5 Deviation from Test Standard

No deviation.

### 4.7.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

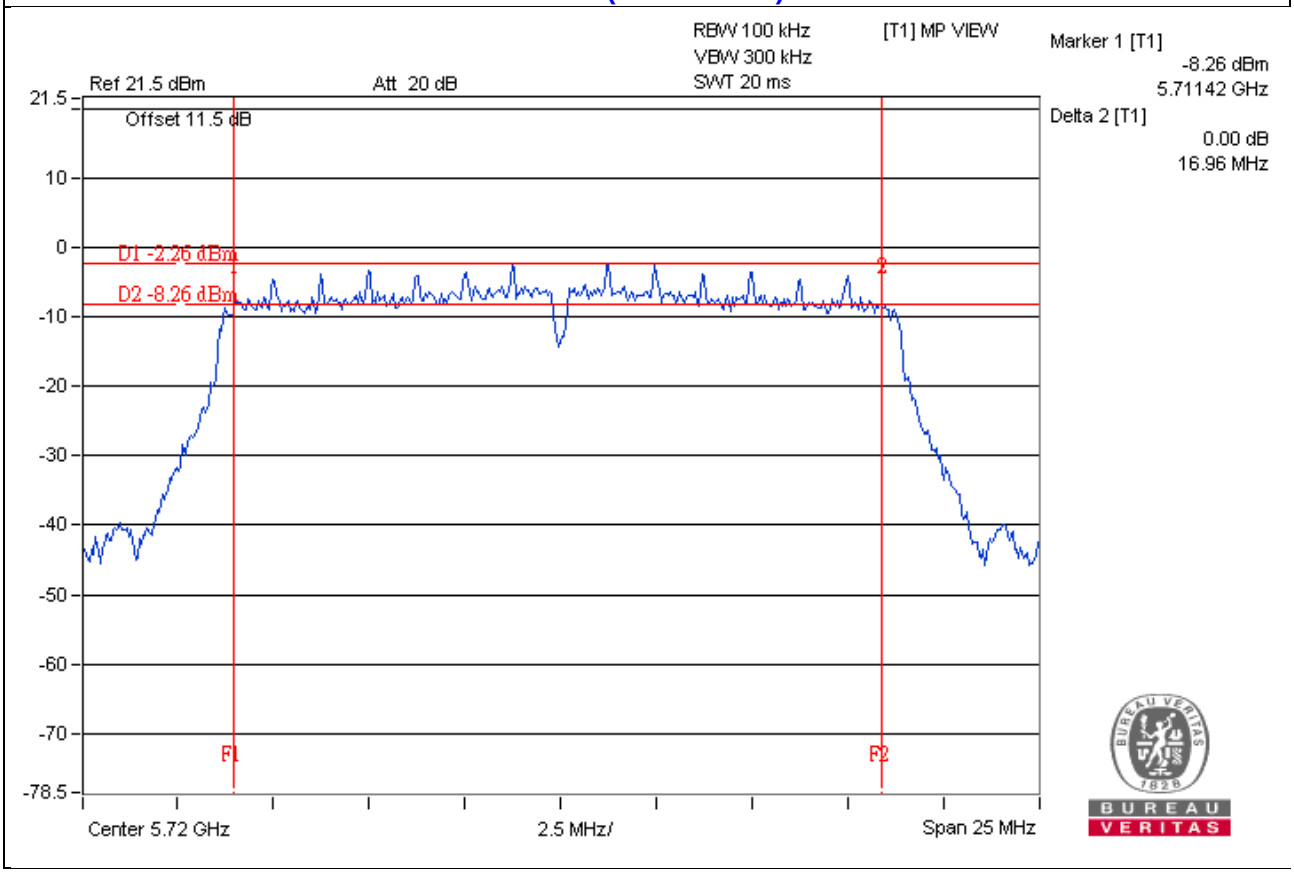
4.7.7 Test Results

**802.11n (HT20)**

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | Minimum Limit (MHz) | Pass / Fail |
|---|---|---|---|---|
| 144 (U-NII-3 Band)* | 5720 | 3.38 | 0.5 | PASS |

Note: *The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

| Spectrum Plot of Worst Value |
|---|
| **CH 144 (U-NII-3 Band)** |



## 5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

**Appendix – Information on the Testing Laboratories**

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following: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The address and road map of all our labs can be found in our web site also.

**--- END ---**