

FCC Test Report

Report No.: RF150410E09C-1

FCC ID: PY315100300

Test Model: R6400

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Release Control Record

| Issue No. | Description | Date Issued |
|----------------|-------------------|---------------|
| RF150410E09C-1 | Original release. | Oct. 01, 2015 |

2 Summary of Test Results

| 47 CFR FCC Part 15, Subpart E (SECTION 15.407) | | | |
|--|--|--------|--|
| FCC Clause | Test Item | Result | Remarks |
| 15.407(b) (1/2/3/4/6) | Radiated Emissions & Band Edge Measurement | Pass | Meet the requirement of limit. Minimum passing margin is -0.1dB at 5906.00MHz, 5946.00MHz |
| 15.407(a)(1/2 /3) | Max Average Transmit Power | Pass | Meet the requirement of limit. |
| 15.407(a)(1/2 /3) | Peak Power Spectral Density | Pass | Meet the requirement of limit. |
| 15.407(e) | 6dB bandwidth | Pass | Meet the requirement of limit. (U-NII-3 Band only) |
| 15.407(g) | Frequency Stability | Pass | Meet the requirement of limit. |
| 15.203 | Antenna Requirement | Pass | Antenna connector is i-pex(MHF) not a standard connector. |

NOTE: 1. This report is prepared for FCC Class II change. (Upgrade the standard to section 15.407 under new rule for U-NII-3 band)

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) (±) |
|--------------------------------|---------------|--------------------------------|
| Radiated Emissions up to 1 GHz | 30MHz ~ 1GHz | 5.37 dB |
| Radiated Emissions above 1 GHz | 1GHz ~ 6GHz | 3.65 dB |
| | 6GHz ~ 18GHz | 3.88 dB |
| | 18GHz ~ 40GHz | 4.11 dB |

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

| | |
|-----------------------|--|
| Product | AC1750 Smart WiFi Router |
| Brand | NETGEAR |
| Test Model | R6400 |
| Status of EUT | ENGINEERING SAMPLE |
| Power Supply Rating | DC 12V from adapter power |
| Modulation Type | CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only |
| Modulation Technology | DSSS, OFDM |
| Transfer Rate | 802.11b: up to 11Mbps 802.11a: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps |
| Operating Frequency | For 15.407 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz |
| | For 15.247 2.412 ~ 2.462GHz |
| Number of Channel | For 15.407 9 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 4 for 802.11n (HT40), 802.11ac (VHT40) 2 for 802.11ac (VHT80) |
| | For 15.247 11 for 802.11b, 802.11g, 802.11n (HT20), VHT20 7 for 802.11n (HT40), VHT40 |
| Output Power | For 15.407 (U-NII-3 band) CDD Mode: 802.11a: 251.978mW Beamforming Mode: 802.11ac (VHT20): 342.088mW 802.11ac (VHT40): 557.193mW 802.11ac (VHT80): 178.17mW |
| Antenna Type | Refer to Note |
| Antenna Connector | Refer to Note |
| Accessory Device | Adapter x 1 |
| Data Cable Supplied | NA |

Note:

- This report is prepared for FCC Class II change. The difference compared with the Report No.: RF150410E09-1 design is as the following:
 - ◆ Upgrade the standard to section 15.407 under new rule for U-NII-3 band.
- According to above conditions, all test items of U-NII-3 band (except for Conducted Emission test item) need to be performed. And all data was verified to meet the requirements.
- 2.4GHz and 5GHz technology can transmit at same time.
- The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.

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

| Antenna No. | Transmitter Circuit | Ant. Gain(dBi) <Including cable loss> | Frequency range (GHz to GHz) | Ant. Type | Connecter Type |
|--------------|---------------------|--|---------------------------------|-----------|----------------|
| 98612PIPF003 | Chain (0) | 3.4 | 2.4~2.4835 | Dipole | i-pex(MHF) |
| | | 3.94 | 5.15~5.25 | | |
| | | 3.73 | 5.725~5.85 | | |
| 98612PIPF004 | Chain (1) | 3.23 | 2.4~2.4835 | Dipole | i-pex(MHF) |
| | | 3.66 | 5.15~5.25 | | |
| | | 3.77 | 5.725~5.85 | | |
| 98612PIPF005 | Chain (2) | 3.36 | 2.4~2.4835 | Dipole | i-pex(MHF) |
| | | 3.32 | 5.15~5.25 | | |
| | | 3.74 | 5.725~5.85 | | |

6. The EUT must be supplied with a power adapter and following four different models could be chosen as following table:

| No | P/N | Brand Name | Model No. | Spec. |
|----|--------------|------------|-----------------------------|--|
| 1 | 332-10758-01 | NETGEAR | 2ABL030F 1 NA | Input: 100-120V, 1.0A, 50/60Hz Output: 12.0V, 2.5A DC output cable: 1.8m, unshielded |
| 2 | 332-10756-01 | NETGEAR | 2ABL030F NA | Input: 100-240V, 1.0A, 50/60Hz Output: 12.0V, 2.5A DC output cable: 1.8m, unshielded |
| 3 | 332-10759-01 | NETGEAR | ADS-40FPA-12 12030GPCU-L | Input: 100-120V, 1.0A, 60Hz Output: 12.0V, 2.5A DC output cable: 1.7m, unshielded |
| 4 | 332-10757-01 | NETGEAR | ADS-40FPA-12 12030GPCU | Input: 100-240V, 1.0A, 50/60Hz Output: 12.0V, 2.5A DC output cable: 1.7m, unshielded |

From the above adapters, the worst radiated test item was found in Adapter 1. Therefore only the test data of the mode was recorded in this report.

7. The EUT incorporates a MIMO function with beamforming for 5GHz (802.11n & 802.11ac mode).

| 2.4GHz Band | | | |
|-------------------------|------------------------|----------------------------------|-----|
| MODULATION MODE | DATA RATE (MCS) | TX & RX CONFIGURATION | |
| 802.11b | 1 ~ 11Mbps | 3TX | 3RX |
| 802.11g | 6 ~ 54Mbps | 3TX | 3RX |
| 802.11n (HT20) | MCS 0~7 | 3TX | 3RX |
| | MCS 8~15 | 3TX | 3RX |
| | MCS 16~23 | 3TX | 3RX |
| 802.11n (HT40) | MCS 0~7 | 3TX | 3RX |
| | MCS 8~15 | 3TX | 3RX |
| | MCS 16~23 | 3TX | 3RX |
| 5GHz Band | | | |
| MODULATION MODE | DATA RATE (MCS) | TX & RX CONFIGURATION | |
| 802.11a | 6 ~ 54Mbps | 3TX | 3RX |
| 802.11n (HT20) | MCS 0~7 | 3TX | 3RX |
| | MCS 8~15 | 3TX | 3RX |
| | MCS 16~23 | 3TX | 3RX |
| 802.11n (HT40) | MCS 0~7 | 3TX | 3RX |
| | MCS 8~15 | 3TX | 3RX |
| | MCS 16~23 | 3TX | 3RX |
| 802.11ac (VHT20) | MCS0~8 Nss=1 | 3TX | 3RX |
| | MCS0~8 Nss=2 | 3TX | 3RX |
| | MCS0~9 Nss=3 | 3TX | 3RX |
| 802.11ac (VHT40) | MCS0~9 Nss=1 | 3TX | 3RX |
| | MCS0~9 Nss=2 | 3TX | 3RX |
| | MCS0~9 Nss=3 | 3TX | 3RX |
| 802.11ac (VHT80) | MCS0~9 Nss=1 | 3TX | 3RX |
| | MCS0~9 Nss=2 | 3TX | 3RX |
| | MCS0~9 Nss=3 | 3TX | 3RX |

Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

8. The above EUT information was declared by the 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 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

| Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|
| 149 | 5745MHz | 161 | 5805MHz |
| 153 | 5765MHz | 165 | 5825MHz |
| 157 | 5785MHz | | |

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

| Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|
| 151 | 5755MHz | 159 | 5795MHz |

1 channel is provided for 802.11ac (VHT80):

| Channel | Frequency |
|---------|-----------|
| 155 | 5775MHz |

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
APCM: Antenna Port Conducted Measurement

NOTE:

1. "-" means no effect.
2. The test mode was reference to the worst case in the original test report.

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.

| CDD Mode | | | | | | |
|-------------------------|------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| MODE | FREQ. BAND (MHz) | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
| 802.11a | 5745-5825 | 149 to 165 | 149, 157, 165 | OFDM | BPSK | 6 |
| Beamforming Mode | | | | | | |
| MODE | FREQ. BAND (MHz) | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
| 802.11ac (VHT20) | 5745-5825 | 149 to 165 | 149, 157, 165 | OFDM | BPSK | 6.5 |
| 802.11ac (VHT40) | | 151 to 159 | 151, 159 | OFDM | BPSK | 13.5 |
| 802.11ac (VHT80) | | 155 | 155 | OFDM | BPSK | 29.3 |

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.

| CDD Mode | | | | | | |
|-----------------|------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| MODE | FREQ. BAND (MHz) | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
| 802.11a | 5745-5825 | 149 to 165 | 157 | OFDM | BPSK | 6 |

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.

| CDD Mode | | | | | | |
|-------------------------|------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| MODE | FREQ. BAND (MHz) | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
| 802.11a | 5745-5825 | 149 to 165 | 149, 157, 165 | OFDM | BPSK | 6 |
| Beamforming Mode | | | | | | |
| MODE | FREQ. BAND (MHz) | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
| 802.11ac (VHT20) | 5745-5825 | 149 to 165 | 149, 157, 165 | OFDM | BPSK | 6.5 |
| 802.11ac (VHT40) | | 151 to 159 | 151, 159 | OFDM | BPSK | 13.5 |
| 802.11ac (VHT80) | | 155 | 155 | OFDM | BPSK | 29.3 |

Test Condition:

| APPLICABLE TO | ENVIRONMENTAL CONDITIONS | INPUT POWER | TESTED BY |
|-----------------|--------------------------|--------------|---------------|
| RE≥1G | 26deg. C, 71%RH | 120Vac, 60Hz | Andy Ho |
| RE<1G | 24deg. C, 68%RH | 120Vac, 60Hz | Robert Cheng |
| APCM | 25deg. C, 60%RH | 120Vac, 60Hz | Anderson Chen |

3.3 Duty Cycle of Test Signal

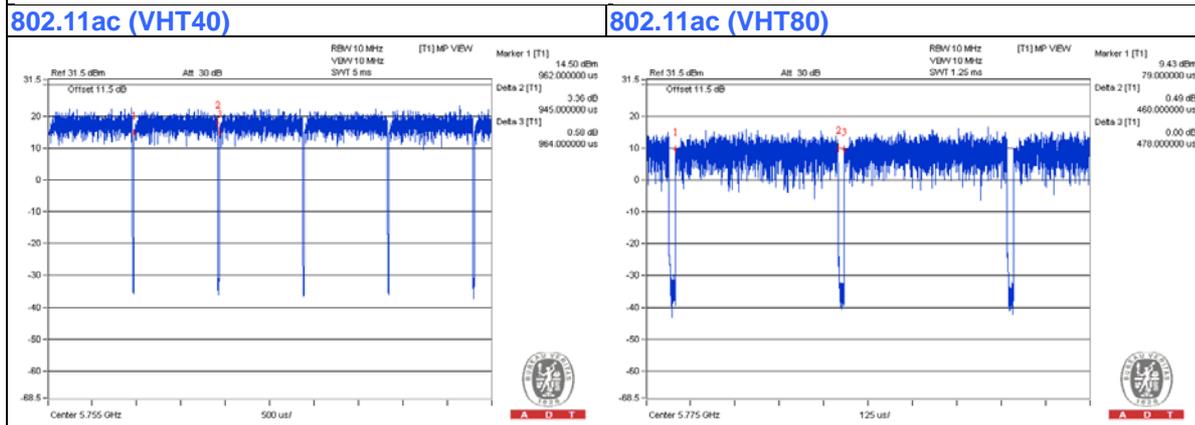
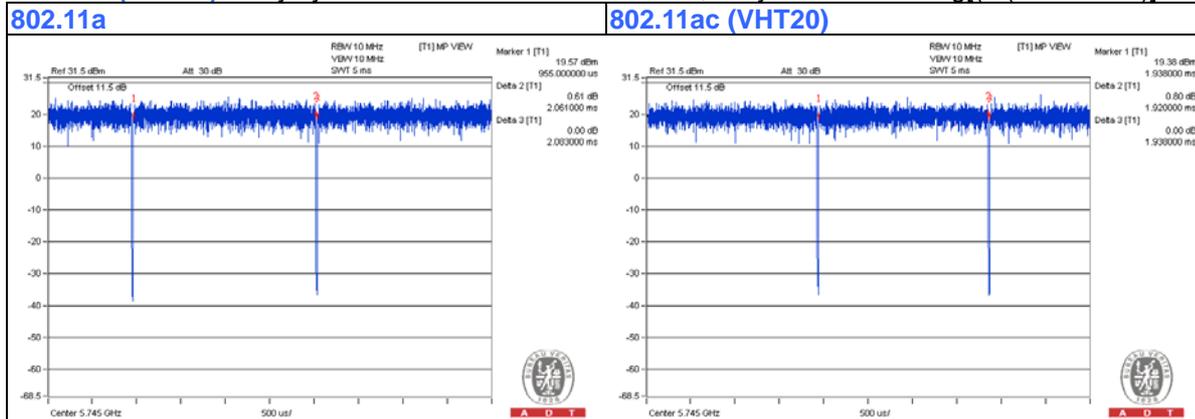
If duty cycle of test signal is $\geq 98\%$, duty factor is not required.
 If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11a: Duty cycle = 2.061 ms/2.083 ms = 0.989

802.11ac(VHT20): Duty cycle = 1.92 ms/1.938 ms = 0.991

802.11ac(VHT40): Duty cycle = 0.945 ms/0.964 ms = 0.98

802.11ac(VHT80): Duty cycle = 0.46 ms/0.478 ms = 0.962, Duty factor = $10 * \log[(1/(0.46/0.478))] = 0.2$



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.

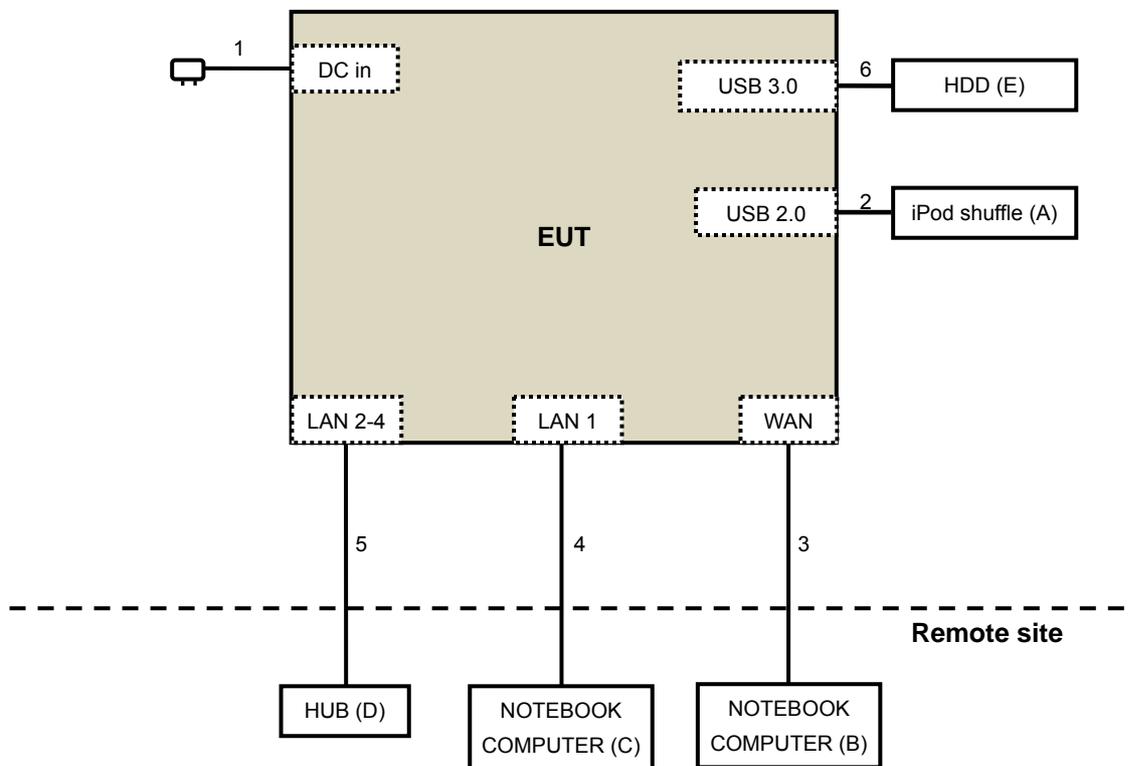
| ID | Product | Brand | Model No. | Serial No. | FCC ID | Remarks |
|----|-------------------|-------|------------------------|---------------|---------|-----------------|
| A. | iPod shuffle | Apple | MC749TA/A | CC4DN29UDFDM | NA | Provided by Lab |
| B. | NOTEBOOK COMPUTER | DELL | E5430 | 4YV4VY1 | FCC DoC | Provided by Lab |
| C. | NOTEBOOK COMPUTER | DELL | E5430 | HYV4VY1 | FCC DoC | Provided by Lab |
| D. | HUB | ZyXEL | ES-116P | S060H02000215 | FCC DoC | Provided by Lab |
| E. | HDD | WD | WDBACW0010HB K-SESN | WCAZAL625787 | FCC DoC | Provided by Lab |

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 | 1 | 1.8 | No | 0 | Supplied by Client |
| 2. | USB | 1 | 0.1 | Yes | 0 | Provided by Lab |
| 3. | RJ-45 | 1 | 10 | No | 0 | Provided by Lab |
| 4. | RJ-45 | 1 | 10 | No | 0 | Provided by Lab |
| 5. | RJ-45 | 3 | 10 | No | 0 | Provided by Lab |
| 6. | USB | 1 | 0.45 | Yes | 0 | Provided by Lab |

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)
789033 D02 General UNII Test Procedure New Rules v01
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

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.

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

| APPLICABLE TO | LIMIT | |
|--|--|--|
| 789033 D02 General UNII Test Procedure New Rules v01 | FIELD STRENGTH AT 3m | |
| | PK:74 (dBuV/m) | AV:54 (dBuV/m) |
| APPLICABLE TO | EIRP LIMIT | EQUIVALENT FIELD STRENGTH AT 3m |
| 15.407(b)(1) | PK:-27 (dBm/MHz) | PK:68.2(dBuV/m) |
| 15.407(b)(2) | | |
| 15.407(b)(3) | | |
| 15.407(b)(4) | PK:-27 (dBm/MHz) ^{*1} PK:-17 (dBm/MHz) ^{*2} | PK: 68.2(dBuV/m) ^{*1} PK:78.2 (dBuV/m) ^{*2} |

NOTE: ^{*1} beyond 10MHz of the band edge ^{*2} within 10 MHz of band edge

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

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

4.1.2 Test Instruments

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---|--------------------------|---|-----------------|------------------|
| Test Receiver Agilent | N9038A | MY51210105 | July 24, 2015 | July 23, 2016 |
| Pre-Amplifier Mini-Circuits | ZFL-1000VH 2B | AMP-ZFL-03 | Nov. 12, 2014 | Nov. 11, 2015 |
| Trilog Broadband Antenna SCHWARZBECK | VULB 9168 | 9168-360 | Feb. 06, 2015 | Feb. 05, 2016 |
| RF Cable | 8D-FB | CHGCAB-001-1 CHGCAB-001-2 | Oct. 04, 2014 | Oct. 03, 2015 |
| | RF-141 | CHGCAB-004 | Oct. 04, 2014 | Oct. 03, 2015 |
| Horn_Antenna AISI | AIH.8018 | 0000320091110 | Feb. 09, 2015 | Feb. 08, 2016 |
| Pre-Amplifier Agilent | 8449B | 3008A02578 | June 23, 2015 | June 22, 2016 |
| RF Cable | NA | 131205 131216 131217 SNMY23684/4 | Jan. 16, 2015 | Jan. 15, 2016 |
| Spectrum Analyzer R&S | FSV40 | 100964 | June 26, 2015 | June 25, 2016 |
| Pre-Amplifier SPACEK LABS | SLKKa-48-6 | 9K16 | Dec. 12, 2014 | Dec. 11, 2015 |
| Horn_Antenna SCHWARZBECK | BBHA 9170 | 9170-424 | Feb. 05, 2015 | Feb. 04, 2016 |
| RF Cable | NA | 329751/4 RF104-204 | Dec. 11, 2014 | Dec. 10, 2015 |
| Software | ADT_Radiate d_V8.7.07 | NA | NA | NA |
| Antenna Tower & Turn Table CT | NA | NA | NA | NA |
| Spectrum Analyzer R&S | FSP 40 | 100060 | May 08, 2015 | May 07, 2016 |
| Power meter Anritsu | ML2495A | 1014008 | Apr. 28, 2015 | Apr. 27, 2016 |
| Power sensor Anritsu | MA2411B | 0917122 | Apr. 28, 2015 | Apr. 27, 2016 |
| Temperature & Humidity Chamber GIANTFORCE | GTH-150-40- SP-AR | MAA0812-008 | Jan. 12, 2015 | Jan. 11, 2016 |

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. G.
3. The FCC Site Registration No. is 966073.
4. The VCCI Site Registration No. is G-137.
5. The CANADA Site Registration No. is IC 7450H-2.
6. Tested Date: Sep. 17 to 22, 2015

4.1.3 Test Procedure

- a. 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 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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. 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.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

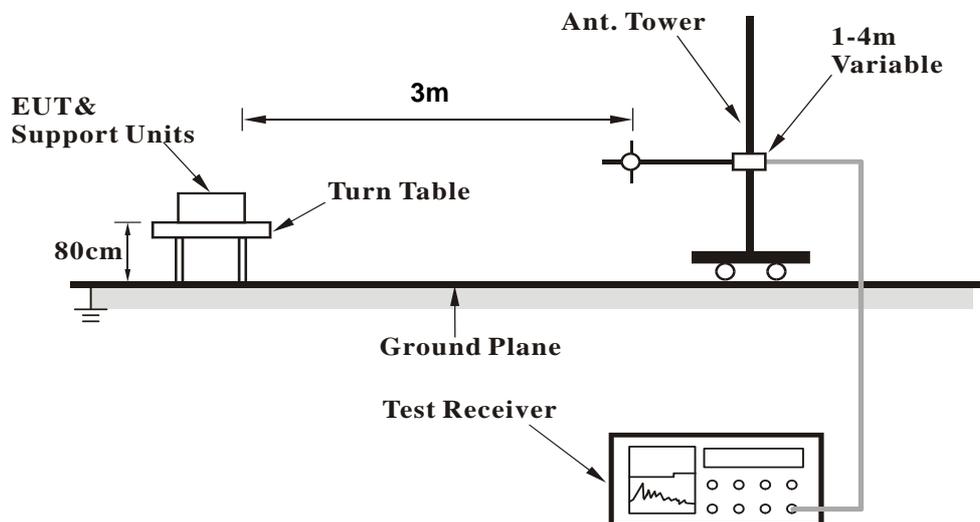
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

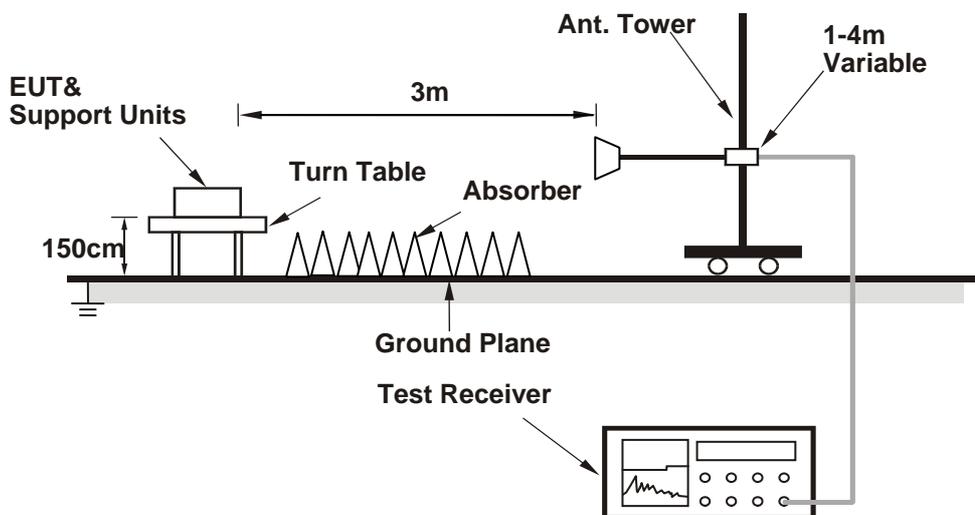
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Condition

1. Placed the EUT on testing table.
2. Connect the EUT with the support units B-C (NOTEBOOK COMPUTER) which is placed on remote site.
3. Controlling software (MTool.exe[2.0.1.8]) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data

CDD Mode

802.11a

| | | | |
|------------------------|----------------|------------------------------|--------------|
| CHANNEL | TX Channel 149 | DETECTOR FUNCTION | Peak (PK) |
| FREQUENCY RANGE | 1GHz ~ 40GHz | | Average (AV) |

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 | #5585.00 | 51.7 PK | 68.2 | -16.5 | 1.15 H | 114 | 40.63 | 11.07 |
| 2 | #5725.00 | 63.4 PK | 78.2 | -14.8 | 1.29 H | 80 | 51.85 | 11.55 |
| 3 | *5745.00 | 106.3 PK | | | 1.29 H | 80 | 94.67 | 11.63 |
| 4 | *5745.00 | 96.4 AV | | | 1.29 H | 80 | 84.77 | 11.63 |
| 5 | #5850.00 | 53.4 PK | 78.2 | -24.8 | 1.29 H | 80 | 41.65 | 11.75 |
| 6 | #5906.00 | 54.5 PK | 68.2 | -13.7 | 1.32 H | 132 | 42.74 | 11.76 |
| 7 | 11490.00 | 55.8 PK | 74.0 | -18.2 | 1.18 H | 335 | 38.50 | 17.30 |
| 8 | 11490.00 | 43.2 AV | 54.0 | -10.8 | 1.18 H | 335 | 25.90 | 17.30 |
| 9 | #17235.00 | 59.6 PK | 74.0 | -14.4 | 1.04 H | 360 | 32.79 | 26.81 |
| 10 | #17235.00 | 46.2 AV | 54.0 | -7.8 | 1.04 H | 360 | 19.39 | 26.81 |

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 | #5585.00 | 66.0 PK | 68.2 | -2.2 | 1.59 V | 182 | 54.93 | 11.07 |
| 2 | #5725.00 | 74.8 PK | 78.2 | -3.4 | 1.59 V | 225 | 63.25 | 11.55 |
| 3 | *5745.00 | 117.6 PK | | | 1.59 V | 225 | 105.97 | 11.63 |
| 4 | *5745.00 | 107.8 AV | | | 1.59 V | 225 | 96.17 | 11.63 |
| 5 | #5850.00 | 64.8 PK | 78.2 | -13.4 | 1.59 V | 225 | 53.05 | 11.75 |
| 6 | #5906.00 | 68.1 PK | 68.2 | -0.1 | 1.62 V | 160 | 56.34 | 11.76 |
| 7 | 11490.00 | 55.4 PK | 74.0 | -18.6 | 1.25 V | 187 | 38.10 | 17.30 |
| 8 | 11490.00 | 43.9 AV | 54.0 | -10.1 | 1.25 V | 187 | 26.60 | 17.30 |
| 9 | #17235.00 | 60.2 PK | 74.0 | -13.8 | 1.02 V | 106 | 33.39 | 26.81 |
| 10 | #17235.00 | 47.4 AV | 54.0 | -6.6 | 1.02 V | 106 | 20.59 | 26.81 |

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. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|----------------|--------------------------|--------------|
| CHANNEL | TX Channel 157 | DETECTOR FUNCTION | Peak (PK) |
| FREQUENCY RANGE | 1GHz ~ 40GHz | | Average (AV) |

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 | #5626.00 | 54.8 PK | 68.2 | -13.4 | 1.32 H | 124 | 43.62 | 11.18 |
| 2 | *5785.00 | 107.4 PK | | | 1.32 H | 82 | 95.66 | 11.74 |
| 3 | *5785.00 | 97.6 AV | | | 1.32 H | 82 | 85.86 | 11.74 |
| 4 | #5850.00 | 53.5 PK | 78.2 | -24.7 | 1.32 H | 82 | 41.75 | 11.75 |
| 5 | #5946.00 | 54.5 PK | 68.2 | -13.7 | 1.15 H | 116 | 42.51 | 11.99 |
| 6 | 11570.00 | 56.3 PK | 74.0 | -17.7 | 1.13 H | 327 | 38.39 | 17.91 |
| 7 | 11570.00 | 43.4 AV | 54.0 | -10.6 | 1.13 H | 327 | 25.49 | 17.91 |
| 8 | #17355.00 | 59.7 PK | 74.0 | -14.3 | 1.11 H | 355 | 32.56 | 27.14 |
| 9 | #17355.00 | 46.2 AV | 54.0 | -7.8 | 1.11 H | 355 | 19.06 | 27.14 |

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 | #5626.00 | 68.0 PK | 68.2 | -0.2 | 1.82 V | 181 | 56.82 | 11.18 |
| 2 | *5785.00 | 118.7 PK | | | 1.68 V | 224 | 106.96 | 11.74 |
| 3 | *5785.00 | 108.8 AV | | | 1.68 V | 224 | 97.06 | 11.74 |
| 4 | #5850.00 | 66.7 PK | 78.2 | -11.5 | 1.68 V | 224 | 54.95 | 11.75 |
| 5 | #5946.00 | 68.1 PK | 68.2 | -0.1 | 1.59 V | 161 | 56.11 | 11.99 |
| 6 | 11570.00 | 55.8 PK | 74.0 | -18.2 | 1.20 V | 183 | 37.89 | 17.91 |
| 7 | 11570.00 | 44.3 AV | 54.0 | -9.7 | 1.20 V | 183 | 26.39 | 17.91 |
| 8 | #17355.00 | 60.2 PK | 74.0 | -13.8 | 1.02 V | 113 | 33.06 | 27.14 |
| 9 | #17355.00 | 47.6 AV | 54.0 | -6.4 | 1.02 V | 113 | 20.46 | 27.14 |

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. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|----------------|--------------------------|--------------|
| CHANNEL | TX Channel 165 | DETECTOR FUNCTION | Peak (PK) |
| FREQUENCY RANGE | 1GHz ~ 40GHz | | Average (AV) |

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 | #5667.00 | 54.3 PK | 68.2 | -13.9 | 1.32 H | 120 | 42.95 | 11.35 |
| 2 | *5825.00 | 108.2 PK | | | 1.26 H | 80 | 96.42 | 11.78 |
| 3 | *5825.00 | 97.7 AV | | | 1.26 H | 80 | 85.92 | 11.78 |
| 4 | #5850.00 | 56.8 PK | 78.2 | -21.4 | 1.26 H | 80 | 45.05 | 11.75 |
| 5 | #5986.00 | 54.9 PK | 68.2 | -13.3 | 1.16 H | 116 | 42.69 | 12.21 |
| 6 | 11650.00 | 55.1 PK | 74.0 | -18.9 | 1.16 H | 322 | 36.94 | 18.16 |
| 7 | 11650.00 | 42.7 AV | 54.0 | -11.3 | 1.16 H | 322 | 24.54 | 18.16 |
| 8 | #17475.00 | 59.3 PK | 74.0 | -14.7 | 1.08 H | 346 | 31.38 | 27.92 |
| 9 | #17475.00 | 46.0 AV | 54.0 | -8.0 | 1.08 H | 346 | 18.08 | 27.92 |

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 | #5667.00 | 67.5 PK | 68.2 | -0.7 | 1.89 V | 179 | 56.15 | 11.35 |
| 2 | *5825.00 | 118.6 PK | | | 1.63 V | 225 | 106.82 | 11.78 |
| 3 | *5825.00 | 108.6 AV | | | 1.63 V | 225 | 96.82 | 11.78 |
| 4 | #5850.00 | 70.4 PK | 78.2 | -7.8 | 1.63 V | 225 | 58.65 | 11.75 |
| 5 | #5986.00 | 68.0 PK | 68.2 | -0.2 | 1.50 V | 225 | 55.79 | 12.21 |
| 6 | 11650.00 | 55.5 PK | 74.0 | -18.5 | 1.20 V | 189 | 37.34 | 18.16 |
| 7 | 11650.00 | 43.9 AV | 54.0 | -10.1 | 1.20 V | 189 | 25.74 | 18.16 |
| 8 | #17475.00 | 60.3 PK | 74.0 | -13.7 | 1.02 V | 114 | 32.38 | 27.92 |
| 9 | #17475.00 | 47.3 AV | 54.0 | -6.7 | 1.02 V | 114 | 19.38 | 27.92 |

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. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT20)

| | | | |
|------------------------|----------------|------------------------------|--------------|
| CHANNEL | TX Channel 149 | DETECTOR FUNCTION | Peak (PK) |
| FREQUENCY RANGE | 1GHz ~ 40GHz | | Average (AV) |

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 | #5593.00 | 56.5 PK | 68.2 | -11.7 | 1.15 H | 114 | 45.43 | 11.07 |
| 2 | #5715.00 | 56.0 PK | 68.2 | -12.2 | 1.24 H | 64 | 44.47 | 11.53 |
| 3 | #5725.00 | 65.6 PK | 78.2 | -12.6 | 1.24 H | 64 | 54.05 | 11.55 |
| 4 | *5745.00 | 105.4 PK | | | 1.24 H | 64 | 93.77 | 11.63 |
| 5 | *5745.00 | 95.3 AV | | | 1.24 H | 64 | 83.67 | 11.63 |
| 6 | #5850.00 | 52.4 PK | 78.2 | -25.8 | 1.24 H | 64 | 40.65 | 11.75 |
| 7 | #5904.00 | 55.0 PK | 68.2 | -13.2 | 1.32 H | 132 | 43.25 | 11.75 |
| 8 | 11490.00 | 55.5 PK | 74.0 | -18.5 | 1.10 H | 342 | 38.20 | 17.30 |
| 9 | 11490.00 | 43.0 AV | 54.0 | -11.0 | 1.10 H | 342 | 25.70 | 17.30 |
| 10 | #17235.00 | 59.4 PK | 74.0 | -14.6 | 1.09 H | 360 | 32.59 | 26.81 |
| 11 | #17235.00 | 46.1 AV | 54.0 | -7.9 | 1.09 H | 360 | 19.29 | 26.81 |

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 | #5593.00 | 67.7 PK | 68.2 | -0.5 | 1.76 V | 223 | 56.63 | 11.07 |
| 2 | #5715.00 | 67.5 PK | 68.2 | -0.7 | 1.72 V | 226 | 55.97 | 11.53 |
| 3 | #5725.00 | 77.2 PK | 78.2 | -1.0 | 1.72 V | 226 | 65.65 | 11.55 |
| 4 | *5745.00 | 118.6 PK | | | 1.72 V | 226 | 106.97 | 11.63 |
| 5 | *5745.00 | 106.4 AV | | | 1.72 V | 226 | 94.77 | 11.63 |
| 6 | #5850.00 | 63.9 PK | 78.2 | -14.3 | 1.72 V | 226 | 52.15 | 11.75 |
| 7 | #5904.00 | 66.8 PK | 68.2 | -1.4 | 1.73 V | 184 | 55.05 | 11.75 |
| 8 | 11490.00 | 54.9 PK | 74.0 | -19.1 | 1.23 V | 174 | 37.60 | 17.30 |
| 9 | 11490.00 | 43.7 AV | 54.0 | -10.3 | 1.23 V | 174 | 26.40 | 17.30 |
| 10 | #17235.00 | 60.7 PK | 74.0 | -13.3 | 1.06 V | 106 | 33.89 | 26.81 |
| 11 | #17235.00 | 47.8 AV | 54.0 | -6.2 | 1.06 V | 106 | 20.99 | 26.81 |

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. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|----------------|--------------------------|--------------|
| CHANNEL | TX Channel 157 | DETECTOR FUNCTION | Peak (PK) |
| FREQUENCY RANGE | 1GHz ~ 40GHz | | Average (AV) |

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 | #5624.00 | 54.2 PK | 68.2 | -14.0 | 1.32 H | 124 | 43.03 | 11.17 |
| 2 | #5725.00 | 49.6 PK | 78.2 | -28.6 | 1.33 H | 68 | 38.05 | 11.55 |
| 3 | *5785.00 | 107.2 PK | | | 1.33 H | 68 | 95.46 | 11.74 |
| 4 | *5785.00 | 97.2 AV | | | 1.33 H | 68 | 85.46 | 11.74 |
| 5 | #5850.00 | 53.4 PK | 78.2 | -24.8 | 1.33 H | 68 | 41.65 | 11.75 |
| 6 | #5945.00 | 54.2 PK | 68.2 | -14.0 | 1.15 H | 116 | 42.23 | 11.97 |
| 7 | 11570.00 | 55.5 PK | 74.0 | -18.5 | 1.13 H | 333 | 37.59 | 17.91 |
| 8 | 11570.00 | 43.0 AV | 54.0 | -11.0 | 1.13 H | 333 | 25.09 | 17.91 |
| 9 | #17355.00 | 59.4 PK | 74.0 | -14.6 | 1.09 H | 345 | 32.26 | 27.14 |
| 10 | #17355.00 | 45.7 AV | 54.0 | -8.3 | 1.09 H | 345 | 18.56 | 27.14 |

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 | #5624.00 | 67.5 PK | 68.2 | -0.7 | 1.87 V | 191 | 56.33 | 11.17 |
| 2 | #5725.00 | 61.0 PK | 78.2 | -17.2 | 1.82 V | 184 | 49.45 | 11.55 |
| 3 | *5785.00 | 118.6 PK | | | 1.82 V | 184 | 106.86 | 11.74 |
| 4 | *5785.00 | 107.7 AV | | | 1.82 V | 184 | 95.96 | 11.74 |
| 5 | #5850.00 | 64.2 PK | 78.2 | -14.0 | 1.82 V | 184 | 52.45 | 11.75 |
| 6 | #5945.00 | 67.9 PK | 68.2 | -0.3 | 1.71 V | 186 | 55.93 | 11.97 |
| 7 | 11570.00 | 55.8 PK | 74.0 | -18.2 | 1.30 V | 184 | 37.89 | 17.91 |
| 8 | 11570.00 | 44.1 AV | 54.0 | -9.9 | 1.30 V | 184 | 26.19 | 17.91 |
| 9 | #17355.00 | 60.1 PK | 74.0 | -13.9 | 1.03 V | 111 | 32.96 | 27.14 |
| 10 | #17355.00 | 47.2 AV | 54.0 | -6.8 | 1.03 V | 111 | 20.06 | 27.14 |

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. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|----------------|------------------------------|--------------|
| CHANNEL | TX Channel 165 | DETECTOR FUNCTION | Peak (PK) |
| FREQUENCY RANGE | 1GHz ~ 40GHz | | Average (AV) |

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 | *5825.00 | 108.5 PK | | | 1.21 H | 72 | 96.72 | 11.78 |
| 2 | *5825.00 | 97.4 AV | | | 1.21 H | 72 | 85.62 | 11.78 |
| 3 | #5850.00 | 65.7 PK | 78.2 | -12.5 | 1.21 H | 72 | 53.95 | 11.75 |
| 4 | #5860.00 | 54.9 PK | 68.2 | -13.3 | 1.21 H | 72 | 43.15 | 11.75 |
| 5 | #5985.00 | 56.2 PK | 68.2 | -12.0 | 1.16 H | 116 | 43.99 | 12.21 |
| 6 | 11650.00 | 55.6 PK | 74.0 | -18.4 | 1.12 H | 334 | 37.44 | 18.16 |
| 7 | 11650.00 | 42.7 AV | 54.0 | -11.3 | 1.12 H | 334 | 24.54 | 18.16 |
| 8 | #17475.00 | 58.8 PK | 74.0 | -15.2 | 1.09 H | 360 | 30.88 | 27.92 |
| 9 | #17475.00 | 45.5 AV | 54.0 | -8.5 | 1.09 H | 360 | 17.58 | 27.92 |

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 | *5825.00 | 118.5 PK | | | 1.77 V | 174 | 106.72 | 11.78 |
| 2 | *5825.00 | 107.5 AV | | | 1.77 V | 174 | 95.72 | 11.78 |
| 3 | #5850.00 | 77.1 PK | 78.2 | -1.1 | 1.77 V | 174 | 65.35 | 11.75 |
| 4 | #5860.00 | 66.1 PK | 68.2 | -2.1 | 1.77 V | 174 | 54.35 | 11.75 |
| 5 | #5985.00 | 67.7 PK | 68.2 | -0.5 | 1.73 V | 178 | 55.49 | 12.21 |
| 6 | 11650.00 | 55.3 PK | 74.0 | -18.7 | 1.21 V | 181 | 37.14 | 18.16 |
| 7 | 11650.00 | 44.1 AV | 54.0 | -9.9 | 1.21 V | 181 | 25.94 | 18.16 |
| 8 | #17475.00 | 60.6 PK | 74.0 | -13.4 | 1.04 V | 108 | 32.68 | 27.92 |
| 9 | #17475.00 | 47.7 AV | 54.0 | -6.3 | 1.04 V | 108 | 19.78 | 27.92 |

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. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT40)

| | | | |
|------------------------|----------------|--------------------------|--------------|
| CHANNEL | TX Channel 151 | DETECTOR FUNCTION | Peak (PK) |
| FREQUENCY RANGE | 1GHz ~ 40GHz | | Average (AV) |

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 | #5715.00 | 55.7 PK | 68.2 | -12.5 | 1.24 H | 84 | 44.17 | 11.53 |
| 2 | #5722.90 | 66.1 PK | 78.2 | -12.1 | 1.24 H | 84 | 54.55 | 11.55 |
| 3 | *5755.00 | 105.6 PK | | | 1.24 H | 84 | 93.96 | 11.64 |
| 4 | *5755.00 | 94.5 AV | | | 1.24 H | 84 | 82.86 | 11.64 |
| 5 | #5918.00 | 56.3 PK | 74.0 | -17.7 | 1.24 H | 116 | 44.47 | 11.83 |
| 6 | #5918.00 | 41.9 AV | 54.0 | -12.1 | 1.24 H | 116 | 30.07 | 11.83 |
| 7 | 11510.00 | 55.6 PK | 74.0 | -18.4 | 1.07 H | 333 | 38.30 | 17.30 |
| 8 | 11510.00 | 43.1 AV | 54.0 | -10.9 | 1.07 H | 333 | 25.80 | 17.30 |
| 9 | #17265.00 | 59.7 PK | 74.0 | -14.3 | 1.04 H | 360 | 32.99 | 26.71 |
| 10 | #17265.00 | 46.0 AV | 54.0 | -8.0 | 1.04 H | 360 | 19.29 | 26.71 |

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 | #5715.00 | 67.3 PK | 68.2 | -0.9 | 1.77 V | 226 | 55.77 | 11.53 |
| 2 | #5722.90 | 77.5 PK | 78.2 | -0.7 | 1.77 V | 226 | 65.95 | 11.55 |
| 3 | *5755.00 | 117.7 PK | | | 1.77 V | 226 | 106.06 | 11.64 |
| 4 | *5755.00 | 106.0 AV | | | 1.77 V | 226 | 94.36 | 11.64 |
| 5 | #5918.00 | 67.9 PK | 74.0 | -6.1 | 1.76 V | 186 | 56.07 | 11.83 |
| 6 | #5918.00 | 53.1 AV | 54.0 | -0.9 | 1.76 V | 186 | 41.27 | 11.83 |
| 7 | 11510.00 | 55.6 PK | 74.0 | -18.4 | 1.28 V | 186 | 38.30 | 17.30 |
| 8 | 11510.00 | 44.1 AV | 54.0 | -9.9 | 1.28 V | 186 | 26.80 | 17.30 |
| 9 | #17265.00 | 60.3 PK | 74.0 | -13.7 | 1.00 V | 115 | 33.59 | 26.71 |
| 10 | #17265.00 | 47.7 AV | 54.0 | -6.3 | 1.00 V | 115 | 20.99 | 26.71 |

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. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

| | | | |
|------------------------|----------------|--------------------------|--------------|
| CHANNEL | TX Channel 159 | DETECTOR FUNCTION | Peak (PK) |
| FREQUENCY RANGE | 1GHz ~ 40GHz | | Average (AV) |

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 | #5312.00 | 50.5 PK | 74.0 | -23.5 | 1.50 H | 90 | 40.04 | 10.46 |
| 2 | #5312.00 | 40.6 AV | 54.0 | -13.4 | 1.50 H | 90 | 30.14 | 10.46 |
| 3 | *5795.00 | 108.5 PK | | | 1.26 H | 94 | 96.72 | 11.78 |
| 4 | *5795.00 | 97.6 AV | | | 1.26 H | 94 | 85.82 | 11.78 |
| 5 | #5850.00 | 64.2 PK | 78.2 | -14.0 | 1.26 H | 94 | 52.45 | 11.75 |
| 6 | #5860.00 | 53.0 PK | 68.2 | -15.2 | 1.26 H | 94 | 41.25 | 11.75 |
| 7 | #5958.00 | 56.2 PK | 68.2 | -12.0 | 1.38 H | 123 | 44.15 | 12.05 |
| 8 | 11590.00 | 61.3 PK | 74.0 | -12.7 | 1.07 H | 346 | 43.19 | 18.11 |
| 9 | 11590.00 | 49.3 AV | 54.0 | -4.7 | 1.07 H | 346 | 31.19 | 18.11 |
| 10 | #17385.00 | 62.2 PK | 74.0 | -11.8 | 1.03 H | 360 | 34.75 | 27.45 |
| 11 | #17385.00 | 50.2 AV | 54.0 | -3.8 | 1.03 H | 360 | 22.75 | 27.45 |

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 | #5312.00 | 61.7 PK | 74.0 | -12.3 | 2.08 V | 184 | 51.24 | 10.46 |
| 2 | #5312.00 | 52.0 AV | 54.0 | -2.0 | 2.08 V | 184 | 41.54 | 10.46 |
| 3 | *5795.00 | 120.9 PK | | | 1.87 V | 184 | 109.12 | 11.78 |
| 4 | *5795.00 | 108.8 AV | | | 1.87 V | 184 | 97.02 | 11.78 |
| 5 | #5850.00 | 75.6 PK | 78.2 | -2.6 | 1.87 V | 183 | 63.85 | 11.75 |
| 6 | #5860.00 | 67.3 PK | 68.2 | -0.9 | 1.87 V | 183 | 55.55 | 11.75 |
| 7 | #5958.00 | 67.8 PK | 68.2 | -0.4 | 1.62 V | 184 | 55.75 | 12.05 |
| 8 | 11590.00 | 62.4 PK | 74.0 | -11.6 | 1.21 V | 197 | 44.29 | 18.11 |
| 9 | 11590.00 | 50.6 AV | 54.0 | -3.4 | 1.21 V | 197 | 32.49 | 18.11 |
| 10 | #17385.00 | 63.6 PK | 74.0 | -10.4 | 1.06 V | 97 | 36.15 | 27.45 |
| 11 | #17385.00 | 51.4 AV | 54.0 | -2.6 | 1.06 V | 97 | 23.95 | 27.45 |

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. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT80)

| | | | |
|------------------------|----------------|------------------------------|--------------|
| CHANNEL | TX Channel 155 | DETECTOR FUNCTION | Peak (PK) |
| FREQUENCY RANGE | 1GHz ~ 40GHz | | Average (AV) |

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 | #5715.00 | 55.8 PK | 68.2 | -12.4 | 1.31 H | 161 | 44.27 | 11.53 |
| 2 | #5725.00 | 64.8 PK | 78.2 | -13.4 | 1.20 H | 90 | 53.25 | 11.55 |
| 3 | *5775.00 | 101.2 PK | | | 1.20 H | 90 | 89.48 | 11.72 |
| 4 | *5775.00 | 88.5 AV | | | 1.20 H | 90 | 76.78 | 11.72 |
| 5 | #5850.00 | 56.7 PK | 78.2 | -21.5 | 1.20 H | 90 | 44.95 | 11.75 |
| 6 | #5860.00 | 54.7 PK | 74.0 | -19.3 | 1.20 H | 90 | 42.95 | 11.75 |
| 7 | #5860.00 | 40.6 AV | 54.0 | -13.4 | 1.20 H | 90 | 28.85 | 11.75 |
| 8 | 11550.00 | 54.9 PK | 74.0 | -19.1 | 1.12 H | 325 | 37.19 | 17.71 |
| 9 | 11550.00 | 42.6 AV | 54.0 | -11.4 | 1.12 H | 325 | 24.89 | 17.71 |
| 10 | #17325.00 | 59.7 PK | 74.0 | -14.3 | 1.05 H | 360 | 32.85 | 26.85 |
| 11 | #17325.00 | 46.1 AV | 54.0 | -7.9 | 1.05 H | 360 | 19.25 | 26.85 |

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 | #5715.00 | 67.3 PK | 68.2 | -0.9 | 1.75 V | 225 | 55.77 | 11.53 |
| 2 | #5725.00 | 76.2 PK | 78.2 | -2.0 | 1.75 V | 225 | 64.65 | 11.55 |
| 3 | *5775.00 | 113.0 PK | | | 1.75 V | 225 | 101.28 | 11.72 |
| 4 | *5775.00 | 100.1 AV | | | 1.75 V | 225 | 88.38 | 11.72 |
| 5 | #5850.00 | 68.1 PK | 78.2 | -10.1 | 1.75 V | 225 | 56.35 | 11.75 |
| 6 | #5860.00 | 66.2 PK | 74.0 | -7.8 | 1.75 V | 225 | 54.45 | 11.75 |
| 7 | #5860.00 | 51.8 AV | 54.0 | -2.2 | 1.75 V | 225 | 40.05 | 11.75 |
| 8 | 11550.00 | 55.9 PK | 74.0 | -18.1 | 1.20 V | 179 | 38.19 | 17.71 |
| 9 | 11550.00 | 44.3 AV | 54.0 | -9.7 | 1.20 V | 179 | 26.59 | 17.71 |
| 10 | #17325.00 | 60.0 PK | 74.0 | -14.0 | 1.02 V | 109 | 33.15 | 26.85 |
| 11 | #17325.00 | 47.3 AV | 54.0 | -6.7 | 1.02 V | 109 | 20.45 | 26.85 |

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. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Below 1GHz Data
CDD Mode
802.11a

| | | | |
|------------------------|----------------|--------------------------|-----------------|
| CHANNEL | TX Channel 157 | DETECTOR FUNCTION | Quasi-Peak (QP) |
| FREQUENCY RANGE | Below 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 | 82.19 | 30.2 QP | 40.0 | -9.8 | 1.50 H | 65 | 48.39 | -18.16 |
| 2 | 135.77 | 37.1 QP | 43.5 | -6.4 | 1.34 H | 200 | 50.77 | -13.65 |
| 3 | 192.14 | 32.0 QP | 43.5 | -11.5 | 1.64 H | 200 | 47.80 | -15.79 |
| 4 | 596.41 | 34.6 QP | 46.0 | -11.4 | 1.74 H | 211 | 39.05 | -4.44 |
| 5 | 630.00 | 35.5 QP | 46.0 | -10.5 | 1.24 H | 200 | 39.18 | -3.64 |
| 6 | 815.57 | 34.0 QP | 46.0 | -12.0 | 1.20 H | 200 | 34.32 | -0.31 |

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 | 75.28 | 33.1 QP | 40.0 | -6.9 | 1.20 V | 241 | 49.66 | -16.54 |
| 2 | 108.64 | 31.4 QP | 43.5 | -12.1 | 1.34 V | 200 | 47.50 | -16.09 |
| 3 | 189.51 | 30.2 QP | 43.5 | -13.3 | 2.11 V | 301 | 45.79 | -15.55 |
| 4 | 200.21 | 33.7 QP | 43.5 | -9.8 | 1.67 V | 200 | 49.73 | -16.02 |
| 5 | 668.41 | 33.3 QP | 46.0 | -12.7 | 1.24 V | 300 | 36.64 | -3.30 |
| 6 | 815.11 | 37.6 QP | 46.0 | -8.4 | 4.00 V | 300 | 37.93 | -0.32 |

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

4.2 Transmit Power Measurement

4.2.1 Limits of Transmit Power Measurement

| Operation Band | EUT Category | | Limit |
|----------------|--------------|-----------------------------------|---|
| U-NII-1 | | Outdoor Access Point | 1 Watt (30 dBm) (Max. e.i.r.p \leq 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

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

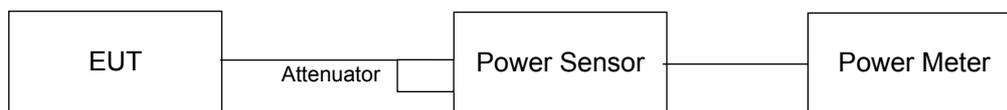
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.2.2 Test Setup



4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 Test Procedure

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.

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Condition

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

4.2.7 Test Result

CDD Mode

POWER OUTPUT:

| Chan. | Chan. Freq. (MHz) | Maximum Conducted Power (dBm) | | | Total Power (mW) | Total Power (dBm) | Limit (dBm) | Pass / Fail |
|----------------|-------------------|-------------------------------|---------|---------|------------------|-------------------|-------------|-------------|
| | | Chain 0 | Chain 1 | Chain 2 | | | | |
| 802.11a | | | | | | | | |
| 149 | 5745 | 18.68 | 17.56 | 18.26 | 197.794 | 22.96 | 30 | Pass |
| 157 | 5785 | 19.18 | 18.38 | 18.90 | 229.284 | 23.60 | 30 | Pass |
| 165 | 5825 | 19.30 | 19.04 | 19.38 | 251.978 | 24.01 | 30 | Pass |

Beamforming Mode

| Chan. | Chan. Freq. (MHz) | Maximum Conducted Power (dBm) | | | Total Power (mW) | Total Power (dBm) | Limit (dBm) | Pass / Fail |
|-------------------------|-------------------|-------------------------------|---------|---------|------------------|-------------------|-------------|-------------|
| | | Chain 0 | Chain 1 | Chain 2 | | | | |
| 802.11ac (VHT20) | | | | | | | | |
| 149 | 5745 | 18.56 | 18.59 | 18.66 | 217.507 | 23.37 | 27.48 | Pass |
| 157 | 5785 | 19.61 | 19.53 | 19.61 | 272.565 | 24.35 | 27.48 | Pass |
| 165 | 5825 | 20.53 | 20.56 | 20.62 | 342.088 | 25.34 | 27.48 | Pass |
| 802.11ac (VHT40) | | | | | | | | |
| 151 | 5755 | 19.74 | 19.66 | 19.93 | 285.06 | 24.55 | 27.48 | Pass |
| 159 | 5795 | 22.88 | 22.60 | 22.58 | 557.193 | 27.46 | 27.48 | Pass |
| 802.11ac (VHT80) | | | | | | | | |
| 155 | 5775 | 17.48 | 17.90 | 17.82 | 178.17 | 22.51 | 27.48 | Pass |

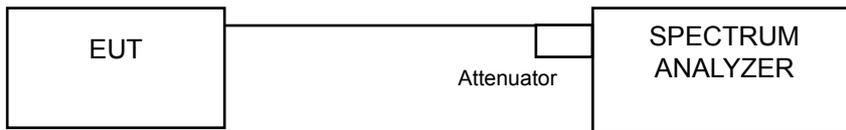
Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G2/20})^2 / 3] = 8.52\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (8.52 - 6) = 27.48\text{dBm}$.

4.3 Peak Power Spectral Density Measurement

4.3.1 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 |

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For 802.11a, 802.11ac (VHT20) & 802.11ac (VHT40):

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 $BWCF = 10\log(500\text{kHz}/300\text{kHz})$
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

For 802.11ac (VHT80):

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 $BWCF = 10\log(500\text{kHz}/300\text{kHz})$
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 and add $10 \log (1/\text{duty cycle})$

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

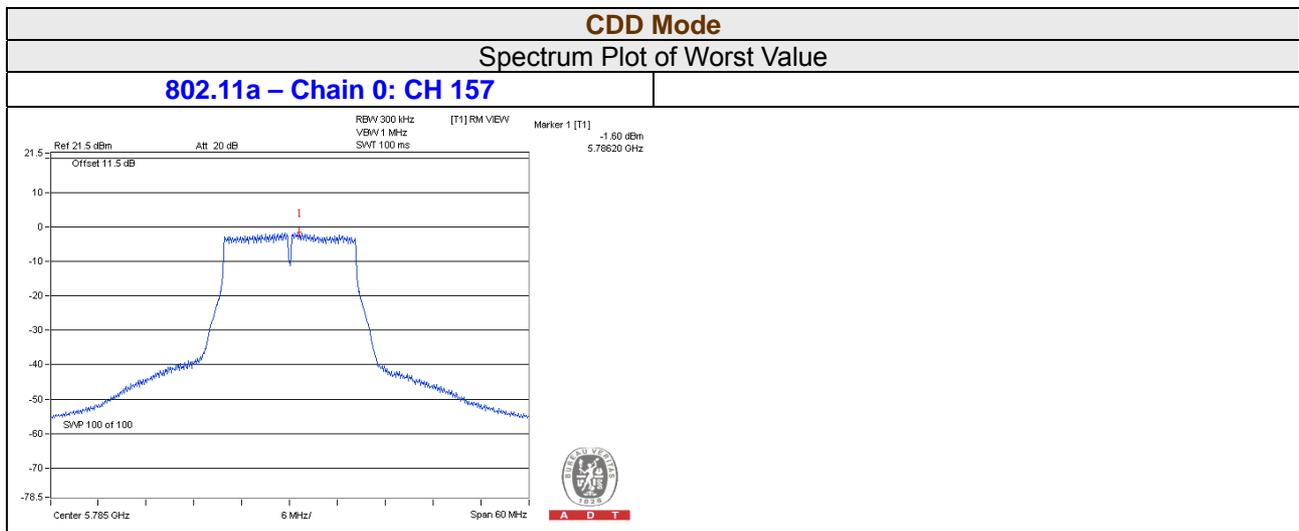
Same as Item 4.2.6.

4.3.7 Test Results

CDD Mode

| TX chain | Channel | Freq. (MHz) | PSD (dBm/300kHz) | PSD (dBm/500kHz) | 10 log (N=3) dB | Total PSD (dBm/500kHz) | Limit (dBm/500kHz) | Pass /Fail |
|----------------|---------|-------------|------------------|------------------|-----------------|------------------------|--------------------|------------|
| 802.11a | | | | | | | | |
| 0 | 149 | 5745 | -2.24 | -0.02 | 4.77 | 4.75 | 27.48 | Pass |
| | 157 | 5785 | -1.60 | 0.62 | 4.77 | 5.39 | 27.48 | Pass |
| | 165 | 5825 | -1.68 | 0.54 | 4.77 | 5.31 | 27.48 | Pass |
| 1 | 149 | 5745 | -2.77 | -0.55 | 4.77 | 4.22 | 27.48 | Pass |
| | 157 | 5785 | -1.85 | 0.37 | 4.77 | 5.14 | 27.48 | Pass |
| | 165 | 5825 | -1.67 | 0.55 | 4.77 | 5.32 | 27.48 | Pass |
| 2 | 149 | 5745 | -3.11 | -0.89 | 4.77 | 3.88 | 27.48 | Pass |
| | 157 | 5785 | -2.20 | 0.02 | 4.77 | 4.79 | 27.48 | Pass |
| | 165 | 5825 | -2.07 | 0.15 | 4.77 | 4.92 | 27.48 | Pass |

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G2/20})^2 / 3] = 8.52\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30-(8.52-6) = 27.48\text{dBm}$.



Beamforming Mode

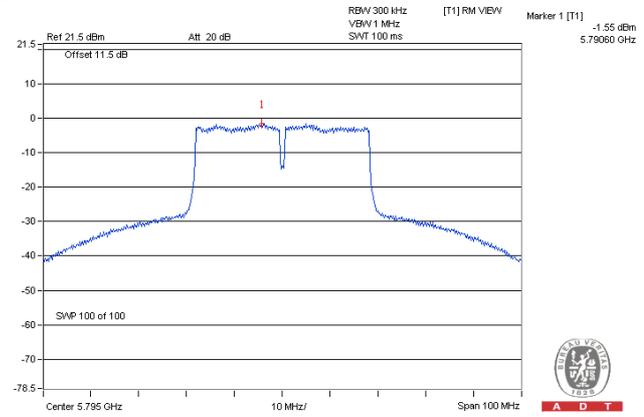
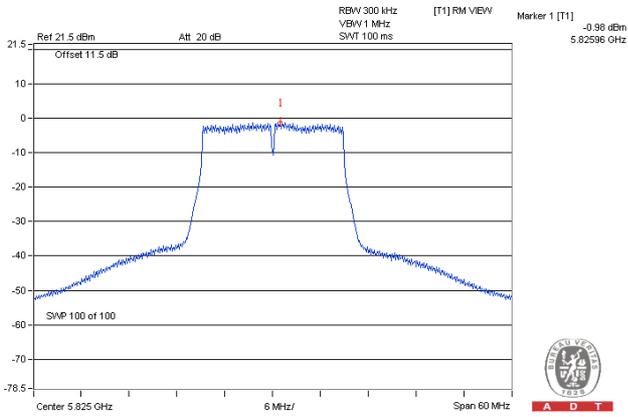
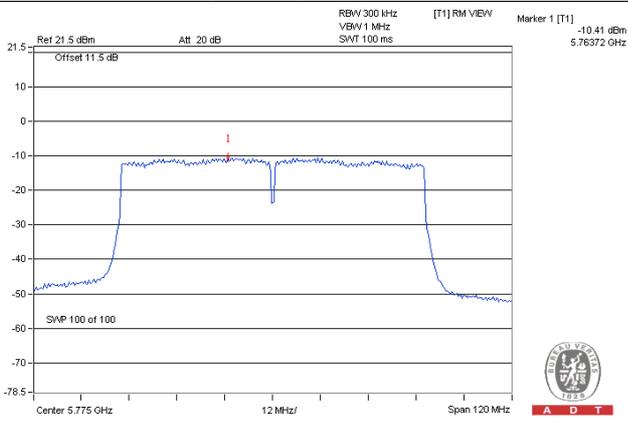
| TX chain | Channel | Freq. (MHz) | PSD (dBm/300kHz) | PSD (dBm/500kHz) | 10 log (N=3) dB | Total PSD (dBm/500kHz) | Limit (dBm/500kHz) | Pass /Fail |
|-------------------------|---------|-------------|------------------|------------------|-----------------|------------------------|--------------------|------------|
| 802.11ac (VHT20) | | | | | | | | |
| 0 | 149 | 5745 | -2.50 | -0.28 | 4.77 | 4.49 | 27.48 | Pass |
| | 157 | 5785 | -1.70 | 0.52 | 4.77 | 5.29 | 27.48 | Pass |
| | 165 | 5825 | -0.98 | 1.24 | 4.77 | 6.01 | 27.48 | Pass |
| 1 | 149 | 5745 | -3.27 | -1.05 | 4.77 | 3.72 | 27.48 | Pass |
| | 157 | 5785 | -2.23 | -0.01 | 4.77 | 4.76 | 27.48 | Pass |
| | 165 | 5825 | -1.56 | 0.66 | 4.77 | 5.43 | 27.48 | Pass |
| 2 | 149 | 5745 | -3.09 | -0.87 | 4.77 | 3.90 | 27.48 | Pass |
| | 157 | 5785 | -2.57 | -0.35 | 4.77 | 4.42 | 27.48 | Pass |
| | 165 | 5825 | -1.37 | 0.85 | 4.77 | 5.62 | 27.48 | Pass |
| 802.11ac (VHT40) | | | | | | | | |
| 0 | 151 | 5755 | -4.39 | -2.17 | 4.77 | 2.60 | 27.48 | Pass |
| | 159 | 5795 | -1.55 | 0.67 | 4.77 | 5.44 | 27.48 | Pass |
| 1 | 151 | 5755 | -5.29 | -3.07 | 4.77 | 1.70 | 27.48 | Pass |
| | 159 | 5795 | -1.94 | 0.28 | 4.77 | 5.05 | 27.48 | Pass |
| 2 | 151 | 5755 | -5.30 | -3.08 | 4.77 | 1.69 | 27.48 | Pass |
| | 159 | 5795 | -1.99 | 0.23 | 4.77 | 5.00 | 27.48 | Pass |

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G2/20})^2 / 3] = 8.52\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30-(8.52-6) = 27.48\text{dBm}$.

| TX chain | Chan. | Chan. Freq. (MHz) | PSD W/O Duty Factor | | 10 log (N=3) dB | Duty Factor (dB) | Total PSD With Duty Factor (dBm/500kHz) | Limit (dBm/500kHz) | Pass /Fail |
|-------------------------|-------|-------------------|---------------------|--------------|-----------------|------------------|---|--------------------|------------|
| | | | (dBm/300kHz) | (dBm/500kHz) | | | | | |
| 802.11ac (VHT80) | | | | | | | | | |
| 0 | 155 | 5775 | -10.41 | -8.19 | 4.77 | 0.2 | -3.25 | 27.48 | Pass |
| 1 | 155 | 5775 | -10.45 | -8.23 | 4.77 | 0.2 | -3.29 | 27.48 | Pass |
| 2 | 155 | 5775 | -10.44 | -8.22 | 4.77 | 0.2 | -3.28 | 27.48 | Pass |

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G2/20})^2 / 3] = 8.52\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30-(8.52-6) = 27.48\text{dBm}$.

2. Refer to section 3.3 for duty cycle spectrum plot.

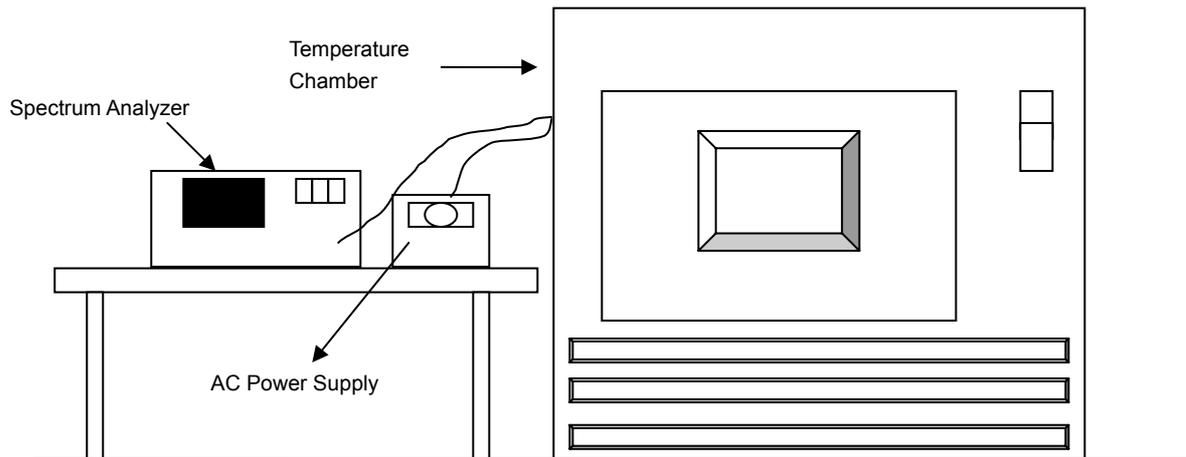
Beamforming Mode**Spectrum Plot of Worst Value****802.11ac (VHT20) – Chain 0: CH 165****802.11ac (VHT40) – Chain 0: CH 159****802.11ac (VHT80) – Chain 0: CH 155**

4.4 Frequency Stability Measurement

4.4.1 Limits of Frequency Stability Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedure

- a. The EUT was placed inside the environmental test chamber and powered by nominal AC 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.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

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

4.4.7 Test Results

| FREQUENCY STABILITY VERSUS TEMP. | | | | | | | | | |
|----------------------------------|--------------------------|--------------------------------|---------------------------|--------------------------------|---------------------------|--------------------------------|---------------------------|--------------------------------|---------------------------|
| OPERATING FREQUENCY: 5745MHz | | | | | | | | | |
| TEMP. (°C) | POWER SUPPLY (Vac) | 0 MINUTE | | 2 MINUTE | | 5 MINUTE | | 10 MINUTE | |
| | | Measured Frequency (MHz) | Frequency Drift (%) | Measured Frequency (MHz) | Frequency Drift (%) | Measured Frequency (MHz) | Frequency Drift (%) | Measured Frequency (MHz) | Frequency Drift (%) |
| 50 | 120 | 5744.9874 | -0.00022 | 5744.9863 | -0.00024 | 5744.9854 | -0.00025 | 5744.9872 | -0.00022 |
| 40 | 120 | 5744.9921 | -0.00014 | 5744.9912 | -0.00015 | 5744.9882 | -0.00021 | 5744.9914 | -0.00015 |
| 30 | 120 | 5744.9761 | -0.00042 | 5744.9796 | -0.00036 | 5744.9762 | -0.00041 | 5744.9782 | -0.00038 |
| 20 | 120 | 5744.9948 | -0.00009 | 5744.9971 | -0.00005 | 5744.994 | -0.00010 | 5744.9949 | -0.00009 |
| 10 | 120 | 5744.9785 | -0.00037 | 5744.9821 | -0.00031 | 5744.9818 | -0.00032 | 5744.9839 | -0.00028 |
| 0 | 120 | 5744.9848 | -0.00026 | 5744.984 | -0.00028 | 5744.9828 | -0.00030 | 5744.9854 | -0.00025 |
| -10 | 120 | 5745.0277 | 0.00048 | 5745.0275 | 0.00048 | 5745.0261 | 0.00045 | 5745.0262 | 0.00046 |
| -20 | 120 | 5745.028 | 0.00049 | 5745.0293 | 0.00051 | 5745.027 | 0.00047 | 5745.0255 | 0.00044 |
| -30 | 120 | 5744.982 | -0.00031 | 5744.9818 | -0.00032 | 5744.9871 | -0.00022 | 5744.9842 | -0.00028 |

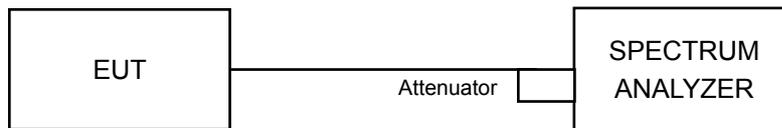
| FREQUENCY STABILITY VERSUS VOLTAGE | | | | | | | | | |
|------------------------------------|--------------------------|--------------------------------|---------------------------|--------------------------------|---------------------------|--------------------------------|---------------------------|--------------------------------|---------------------------|
| OPERATING FREQUENCY: 5745MHz | | | | | | | | | |
| TEMP. (°C) | POWER SUPPLY (Vac) | 0 MINUTE | | 2 MINUTE | | 5 MINUTE | | 10 MINUTE | |
| | | Measured Frequency (MHz) | Frequency Drift (%) | Measured Frequency (MHz) | Frequency Drift (%) | Measured Frequency (MHz) | Frequency Drift (%) | Measured Frequency (MHz) | Frequency Drift (%) |
| 20 | 138 | 5744.994 | -0.00010 | 5744.9979 | -0.00004 | 5744.9934 | -0.00011 | 5744.9942 | -0.00010 |
| | 120 | 5744.9948 | -0.00009 | 5744.9971 | -0.00005 | 5744.994 | -0.00010 | 5744.9949 | -0.00009 |
| | 102 | 5744.9956 | -0.00008 | 5744.9964 | -0.00006 | 5744.9949 | -0.00009 | 5744.994 | -0.00010 |

4.5 6dB Bandwidth Measurement

4.5.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

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

MEASUREMENT PROCEDURE REF

- a. Set resolution bandwidth (RBW) = 100kHz
- b. Set the video bandwidth (VBW) $\geq 3 \times$ 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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

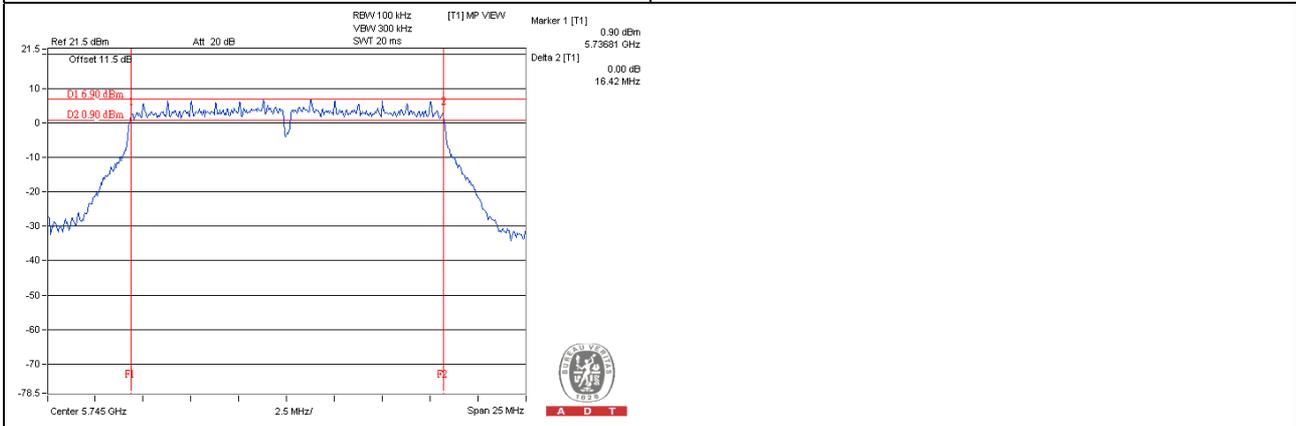
4.5.7 Test Results

CDD Mode

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | | | Minimum Limit (MHz) | Pass / Fail |
|----------------|-----------------|---------------------|---------|---------|---------------------|-------------|
| | | Chain 0 | Chain 1 | Chain 2 | | |
| 802.11a | | | | | | |
| 149 | 5745 | 16.42 | 16.44 | 16.46 | 0.5 | Pass |
| 157 | 5785 | 16.44 | 16.46 | 16.45 | 0.5 | Pass |
| 165 | 5825 | 16.42 | 16.44 | 16.46 | 0.5 | Pass |

SPECTRUM PLOT OF WORST VALUE

802.11a – Chain 0: CH 149



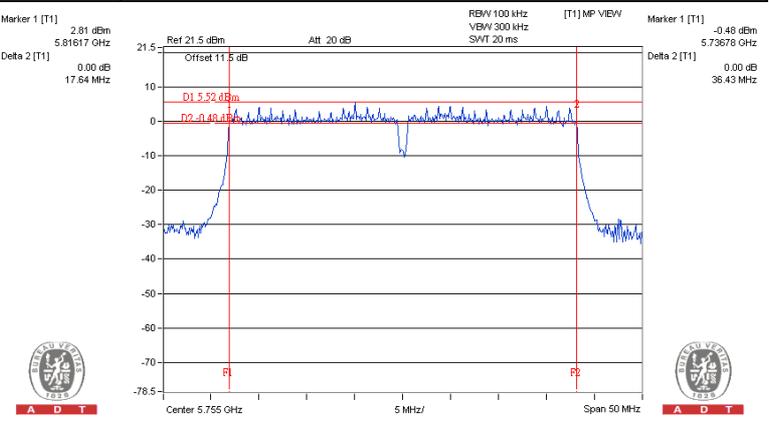
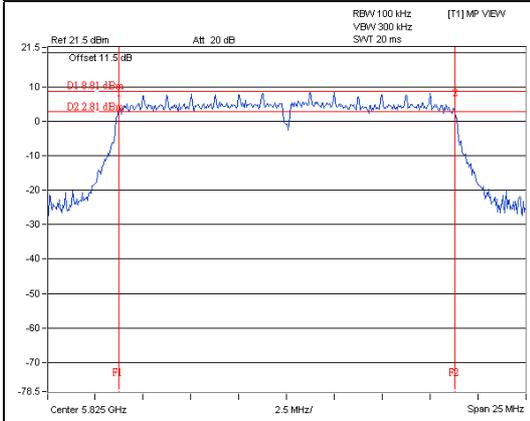
Beamforming Mode

| Channel | Frequency (MHz) | 6dB Bandwidth (MHz) | | | Minimum Limit (MHz) | Pass / Fail |
|-------------------------|-----------------|---------------------|---------|---------|---------------------|-------------|
| | | Chain 0 | Chain 1 | Chain 2 | | |
| 802.11ac (VHT20) | | | | | | |
| 149 | 5745 | 17.65 | 17.72 | 17.70 | 0.5 | Pass |
| 157 | 5785 | 17.66 | 17.72 | 17.70 | 0.5 | Pass |
| 165 | 5825 | 17.64 | 17.70 | 17.66 | 0.5 | Pass |
| 802.11ac (VHT40) | | | | | | |
| 151 | 5755 | 36.45 | 36.47 | 36.43 | 0.5 | Pass |
| 159 | 5795 | 36.47 | 36.46 | 36.43 | 0.5 | Pass |
| 802.11ac (VHT80) | | | | | | |
| 155 | 5775 | 75.88 | 76.47 | 76.12 | 0.5 | Pass |

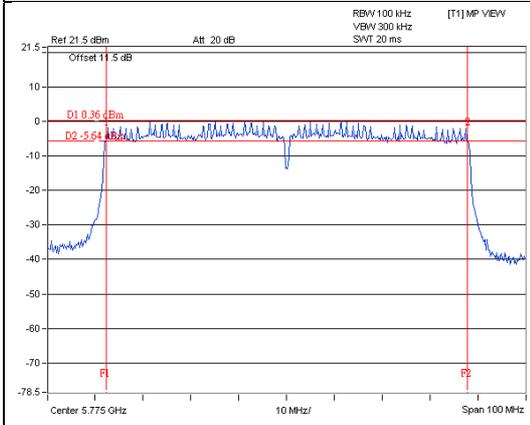
SPECTRUM PLOT OF WORST VALUE

802.11ac (VHT20) – Chain 0: CH165

802.11ac (VHT40) – Chain 2: CH151



802.11ac (VHT80) – Chain 0: CH155



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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Fax: 886-2-26051924

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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