# FCC TEST REPORT

**Test report**
**On Behalf of**
**ComNav Technology Ltd.**
**For**
**R550 Data Collector**

**Model No.: R550**

**FCC ID: 2ACHB-R550**

| | |
|---|---|
| **Prepared for :** | **ComNav Technology Ltd.**<br>**Building 2, No.618,Chengliu Middle Rd. Jiading district. Shanghai, China** |
| **Prepared By :** | **Shenzhen HUAK Testing Technology Co., Ltd.**<br>**1F, B2 Building, JunfengZhongchengZhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China** |
| **Date of Test:** | **Jun. 05, 2020 -- Jul. 20, 2020** |
| **Date of Report:** | **Jul. 20, 2020** |
| **Report Number:** | **HK2007011614-7E** |

## TEST RESULTCERTIFICATION

| | |
|---|---|
| **Applicant's name**.....: | ComNav Technology Ltd. |
| Address.....: | Building 2, No.618,Chengliu Middle Rd. Jiading district. Shanghai, China |
| **Manufacture's Name**.....: | ComNav Technology Ltd. |
| Address.....: | Building 2, No.618,Chengliu Middle Rd. Jiading district. Shanghai, China |

**Product description**

| | |
|---|---|
| Trade Mark.....: | SinoGNSS By ComNav Technology Ltd. |
| Product name.....: | R550 Data Collector |
| Model and/or type reference ....: | R550 |
| **Standards**.....: | FCC 47 CFR Part 15 Subpart E |



| | |
|---|---|
| **Date of Test**.....: | |
| Date (s) of performance of tests.....: | Jun. 05, 2020 -- Jul. 13, 2020 |
| Date of Issue.....: | Jul. 13, 2020 |
| Test Result.....: | **Pass** |

Testing Engineer : Gary Qian

(Gary Qian)

Technical Manager : Eden Hu

(Eden Hu)

Authorized Signatory : Jason Zhou

(Jason Zhou)

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# 1.GENERAL INFORMATION

## 1.1 TEST RESULTS

| Requirement | CFR 47 Section | Result |
|---|---|---|
| Antenna requirement | §15.203 | PASS |
| AC Power Line Conducted Emission | §15.207 | PASS |
| Maximum Conducted Output Power | §15.407(a) | PASS |
| 26dB Emission Bandwidth& 99% Occupied Bandwidth | §15.407(a) | PASS |
| 6 dB bandwidth | 15.407 (e) | PASS |
| Power Spectral Density | §15.407(a) | PASS |
| Band edge | §15.407(b) | PASS |
| Radiated Emission | §15.407(a) | PASS |
| Frequency Stability | §15.407(g) | PASS |

***Note:*** *1. PASS: Test item meets the requirement.*

*2. Fail: Test item does not meet the requirement.*

*3. N/A: Test case does not apply to the test object.*

*4. The test result judgment is decided by the limit of test standard.*

## 1.2 TEST FACILITY

Test Firm : Shenzhen HUAK Testing Technology Co., Ltd.

Address 1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China

## 1.3 MEASUREMENT EQUIPMENT USED

The measuring equipment, which was utilized in performing the tests documented here in, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

| Conducted Emissions Test Site | | | | | |
|---|---|---|---|---|---|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Date | Calibration Due |
| Spectrum analyzer | Agilent | N9020A | HKE-048 | 2019-12-26 | 2020-12-25 |
| Spectrum analyzer | R&S | FSP40 | HKE-025 | 2019-12-26 | 2020-12-25 |
| Power meter | Agilent | E4419B | HKE-085 | 2019-12-26 | 2020-12-25 |
| Power Sensor | Agilent | E9300A | HKE-086 | 2019-12-26 | 2020-12-25 |
| Power SPLITTER | Mini-Circuits | ZN2PD-9G | HKE-125 | N.C.R | N.C.R |
| programmable power | Agilent | E3634A | HKE-091 | N.C.R | N.C.R |
| Temperature and humidity | Boyang | HTC-1 | HKE-079 | 2019-12-26 | 2020-12-25 |

| 977 Chamber | | | | | |
|---|---|---|---|---|---|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Date | Calibration Due |
| Spectrum analyzer | Agilent | N9020A | HKE-048 | 2019-12-26 | 2020-12-25 |
| Spectrum analyzer | R&S | FSP40 | HKE-025 | 2019-12-26 | 2020-12-25 |
| Spectrum analyzer | Agilent | N9020A | HKE-089 | 2019-12-26 | 2020-12-25 |
| Receiver | R&S | ESCI 7 | HKE-010 | 2019-12-26 | 2020-12-25 |
| Preamplifier | EMCI | EMC051845SE | HKE-015 | 2019-12-26 | 2020-12-25 |
| Preamplifier | Agilent | 83051A | HKE-016 | 2019-12-26 | 2020-12-25 |
| Broadband antenna | Schwarzbeck | VULB 9163 | HKE-012 | 2019-12-26 | 2020-12-25 |
| Horn antenna | Schwarzbeck | 9120D | HKE-013 | 2019-12-26 | 2020-12-25 |
| Loop antenna | Schwarzbeck | FMZB 1519 B | HKE-014 | 2019-12-26 | 2020-12-25 |
| High gain antenna | Schwarzbeck | LB-180400KF | HKE-054 | 2019-12-26 | 2020-12-25 |
| Position controller | Taiwan MF | MF7802 | HKE-011 | N.C.R | N.C.R |
| Antenna tower | Taiwan MF | CTERG23 | HKE-120 | N.C.R | N.C.R |
| Controller | Taiwan MF | CT1OO | HKE-121 | N.C.R | N.C.R |
| Test Software | | | EZ-EMC | | |

| Conducted Emission | | | | | |
|---|---|---|---|---|---|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Date | Calibration Due |
| Receiver | R&S | ESCI 7 | HKE-010 | 2019-12-26 | 2020-12-25 |
| LISN | R&S | ENV216 | HKE-002 | 2019-12-26 | 2020-12-25 |
| LISN | ENV216 | R&S | HKE-059 | 2019-12-26 | 2020-12-25 |
| ISN | Schwarzbeck | ISN CAT5 8158 | HKE-062 | 2019-12-26 | 2020-12-25 |
| Test Software | EZ-EMC | | | | |

Remark: Each piece of equipment is scheduled for calibration once a year.

## 1.4 Measurement Uncertainty

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR 100 028-1 [2] and shall correspond to an expansion factor(coverage factor) k = 1,96 or k = 2 (which provide confidence levels of respectively 95% and 95,45% in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)).
Table 6 is based on such expansion factors.

**Table6:Maximummeasurementuncertainty**

| Parameter | UNCERTAINTY |
|---|---|
| Radio frequency | ±0.8 × 10-7 |
| RF power, conducted | 0.2054 |
| Maximum frequency deviation:<br>-within 300Hz and 6 kHz of audio frequency | 1.3% |
| -within 6 kHz and 25 kHz of audio frequency | 0.65 dB |
| Adjacent channel power | 0.2054 |
| Conducted spurious emission of transmitter, valid up to 6 GHz | 0.2892 |
| Conducted emission of receivers | +1.2/-1.1 dB |
| Radiated emission of transmitter, valid up to 6 GHz | ±3.94 dB |
| Radiated emission of receiver, valid up to 6 GHz | ±3.94 dB |
| RF level uncertainty for a given BER | ±0.3 dB |
| Temperature | 0.1979 |
| Humidity | ±1 % |

# 2 GENERAL DESCRIPTION

## 2.1 EUT DESCRIPTION

| | | | | |
|---|---|---|---|---|
| Equipment | R550 Data Collector | | | |
| Model Name | R550 | | | |
| Serial No. | N/A | | | |
| Trade Mark | SinoGNSS By ComNav Technology Ltd. | | | |
| FCC ID | 2ACHB-R550 | | | |
| Hardware Version: | Main board: SD55-D3_Main board_P3 8400347FA30 | | | |
| Software Version: | V1.3 | | | |
| Frequency Range : | Band | Mode | Operation frequency | Channels |
| | Band I<br>UNII-1 | IEEE802.11 n HT20<br>IEEE802.11 n HT40<br>IEEE802.11 ac HT20<br>IEEE802.11 ac HT40 | 5180-5240MHz<br>5190-5230MHz<br>5180-5240MHz<br>5190-5230MHz | 4<br>2<br>4<br>2 |
| | BAND III<br>UNII-3 | IEEE802.11 n HT20<br>IEEE802.11 n HT40<br>IEEE802.11 ac HT20<br>IEEE802.11 ac HT40 | 5745-5825 MHz<br>5755-5795 MHz<br>5745-5825 MHz<br>5755-5795 MHz | 5<br>2<br>5<br>2 |
| Antenna Type | FPC Antenna | | | |
| Antenna Gain | -3.1dBi | | | |
| Power Source | DC 3.8V from battery | | | |

Note: the product can not transmit 802.11ac HT80 mode

Data Rate(s) Tested:
6.5/7.2, 13/14.4, 19.5/21.7, 26/28.9, 39/43.3, 52/57.8, 58.5/65, 65/72.2 (n – 20MHz)
13.5/15, 27/30, 40.5/45, 54/60, 81/90, 108/120, 121.5/135, 135/150 (n – 40MHz BW)

**Frequency of Channels during testing**

| **Band 1** | | **Band 3** | |
|---|---|---|---|
| CH. | Frequency (MHz) | CH. | Frequency (MHz) |
| 36 | 5180 | 149 | 5745 |
| 40 | 5200 | 153 | 5765 |
| 44 | 5220 | 157 | 5785 |
| 48 | 5240 | 161 | 5805 |
| | | 165 | 5825 |

**802.11a(20MHz) /802.11n(20MHz) /802.11ac (20MHz) Frequency / Channel Operations**

| Band 1 | | Band 3 | |
|---|---|---|---|
| CH. | Frequency (MHz) | CH. | Frequency (MHz) |
| 38 | 5190 | 151 | 5755 |
| 46 | 5230 | 159 | 5795 |

**802.11n / 802.11ac (40MHz BW) Frequency / Channel Operations**

**Worst Case Configuration: transmitting 5.2GHz mode**

| Description | 5 GHz Emission |
|---|---|
| Channel | 36 |
| Operating Frequency (MHz) | 5180 |
| Data Rate (Mbps) | MCS0 |
| Mode | UNII |

## 2.2 Duty Cycles

5GHz NII operation is possible in 20MHz, and 40MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = peak per the guidance of Section B)2)b) of ANSI C63.10-2013 and KDB 789033 D02 v02r01. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

| Duty Cycles(%) | |
|---|---|
| Mode/Band | |
| A(HT20) | 98.89 |
| N(HT20) | 98.32 |
| N(HT40) | 98.24 |
| AC(HT20) | 99.28 |
| AC(HT40) | 99.31 |

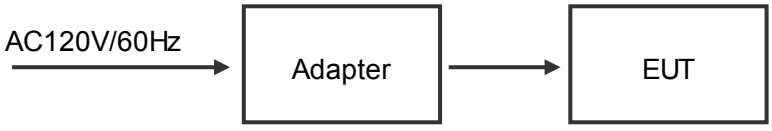
## 2.3 EUT CONFIGURATION

The EUT configuration for testing is installed for RF field strength measurement to meet the Commissions requirement, and is operated in a manner intended to generate the maximum emission in a continuous normal application.

The EUT is operated in the engineering mode to fix the Tx frequency for the purposes of measurement. According to its specifications, the EUT must comply with the requirements of Section 15.407 under the FCC Rules Part 15 Subpart E.

## 2.4 DESCRIPTION OF TEST SETUP

Operation of EUT during conducted testing:




Operation of EUT during Radiation and Above1GHz Radiation testing:

## 2.5 GENERAL TEST PROCEDURES

**Conducted Emissions**

The EUT is placed on the turn table, which is positioned at 0.8 m above the ground plane. According to the requirements in Section 13.3 of ANSI C63.10:2013, the conducted emission from the EUT is measuredinthefrequencyrangebetween0.15MHzand30MHz,usingtheCISPRQuasi-Peakdetector mode.

**Radiated Emissions**

Under 1GHz:

The EUT is placed on a turn table, which is 0.8m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.10:2013.

Above 1GHz:

The EUT is placed on a turn table, which is 1.5m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.10:2013.

## 2.6 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

Exceptasshowninparagraph(d)ofthissection,onlyspuriousemissionsarepermittedinanyofthe frequency bands listed below:

| MHz | MHz | MHz | GHz |
|---|---|---|---|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.50 - 5.15 |
| 0.495 - 0.505 (1) | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960.0 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.50 - 25.67 | 1300 - 1427 | 8.025 - 8.500 |
| 4.17725 - 4.17775 | 37.50 - 38.25 | 1435.0 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73.00 - 74.60 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.80 - 75.20 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108.00 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.90 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 -156.52525 | 2483.5 – 2500.0 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.70 - 156.90 | 2655 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.1700 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.20 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358.0 | 36.43 - 36.5(2) |
| 12.57675 - 12.57725 | 322.0- 335.4 | 3600 - 4400 | |
| 13.36 - 13.41 | | | |

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510MHz.

[2] Above 38.6

Except as provided in paragraphs (d) and (e),the field strength of emissions appearing within these frequencybandsshallnotexceedthelimitsshowninSection15.209.Atfrequenciesequaltoorless than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

## 2.7 DESCRIPTION OF TEST MODES

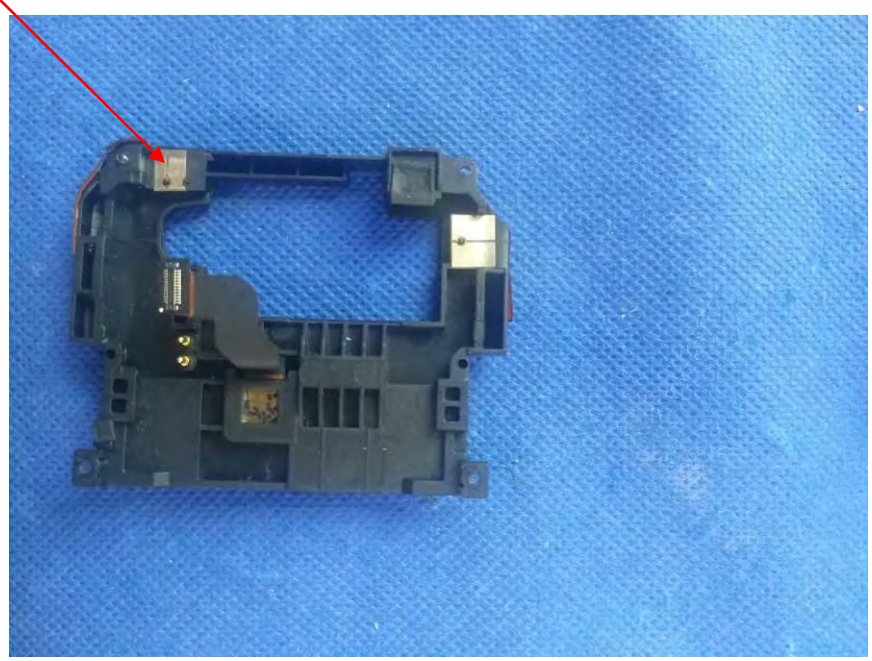
| Description | Modulation Technology | Modulation Type |
|---|---|---|
| 26dB Bandwidth and 99% bandwidth | OFDM | BPSK |
| 6dB Bandwidth | OFDM | BPSK |
| Maximum conducted output power | OFDM | BPSK |
| Band edges measurement | OFDM | BPSK |
| Peak Power Spectral Density | OFDM | BPSK |
| Radiated undesirable emission | OFDM | BPSK |
| Power line conducted emission | OFDM | BPSK |

## 2.8 ANTENNA DESCRIPTION

an intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by theresponsiblepartycanbeusedwiththedevice.Theuseofapermanentlyattachedoranantennathat uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section"

* the antenna of this EUT is a unique(FPC Antenna for WiFi).
* the EUT complies with the requirement of 15.203.

WIFI ANTENNA



# 3.SETUP OF EQUIPMENT UNDER TEST

## 3.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

## 3.2 SUPPORT EQUIPMENT

| Description | Information | Manufacturer | Remark | Certificate |
|---|---|---|---|---|
| Adapter | MODEL:KA1801A-0902000DE<br>INPUT:100-240V ~50/60Hz 0.55A max<br>OUTPUT:9V 2000mA | Shenzhen Keyu Power Supply Technology Co.,Ltd | Provide by applicant | SDOC |
| / | / | / | / | / |

**Remark:**

*1.* All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2.Groundingwas established in accordance with the manufacturer's requirements and conditions for the intended use.

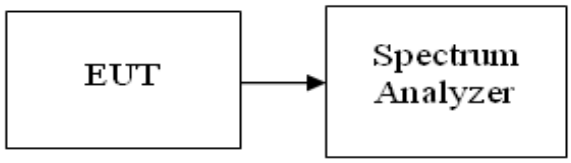
# 4 TEST REQUIREMENTS AND RESULTS

## 4.1 26 DB EMISSION BANDWIDTH

**LIMIT**

According to§15.403(i),for purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Compliance with the emissions limits is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

**TEST CONFIGURATION**



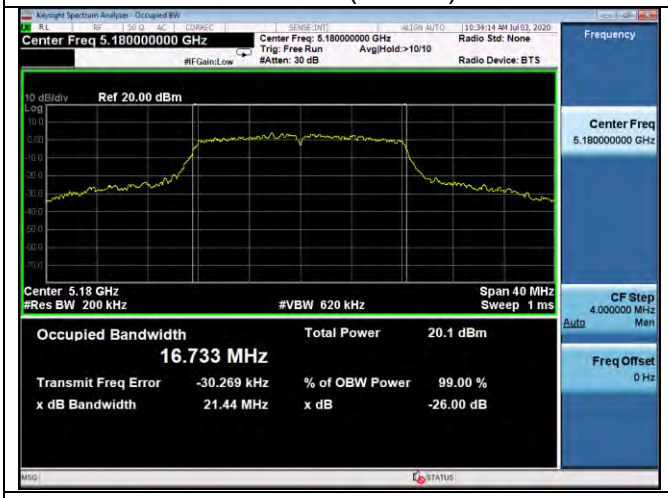
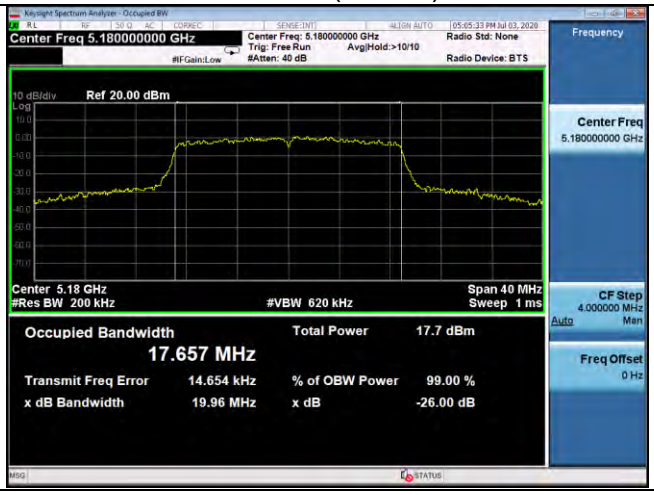
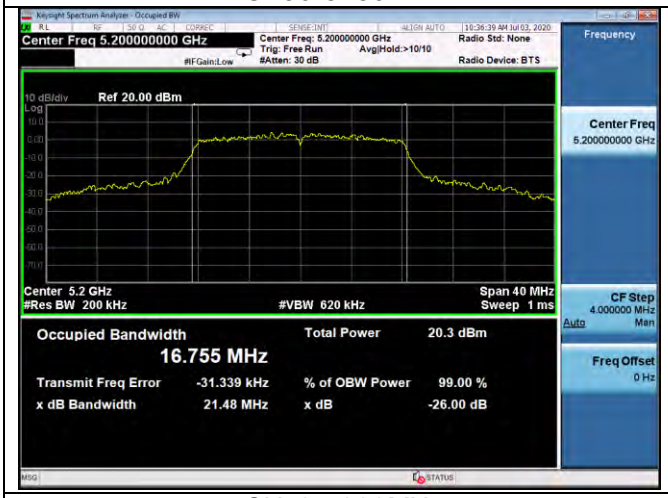
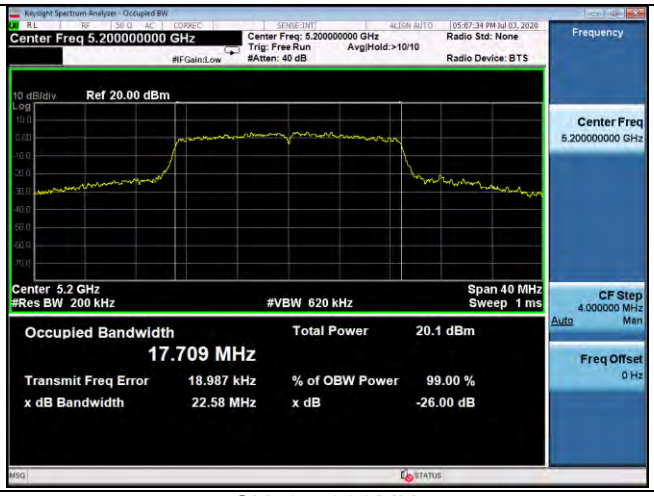
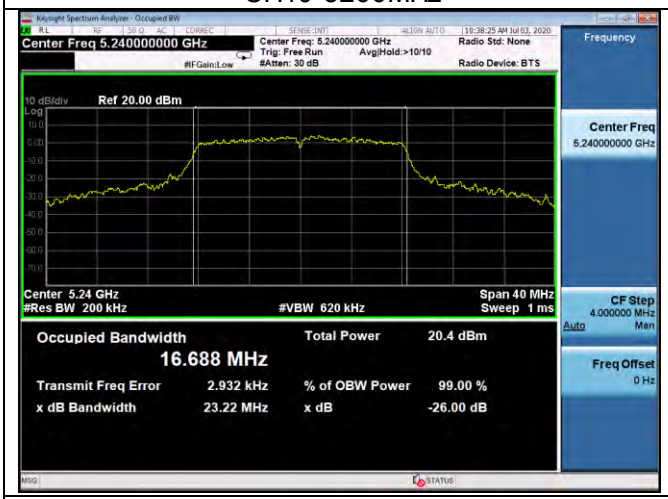
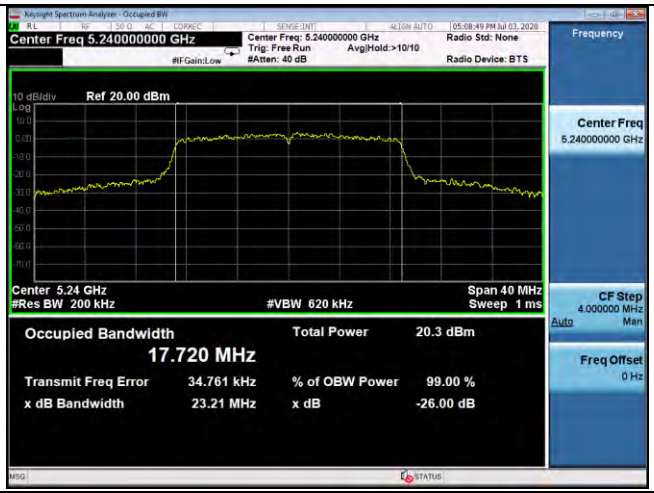

**TEST PROCEDURE**

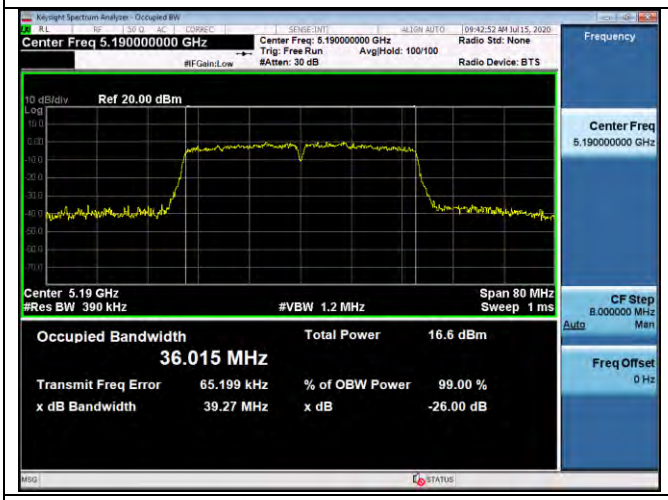
1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low-loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzers RBW = approximately 1% of the emission bandwidth, VBW >RBW, Detector = Peak, Span>26dB bandwidth, and Sweep = auto ,Trace mode = max hold.
4. Measurethemaximumwidthoftheemissionthatis26dBdownfromthemaximumofthe 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%.
5. Repeat until all the rest channels were investigated.

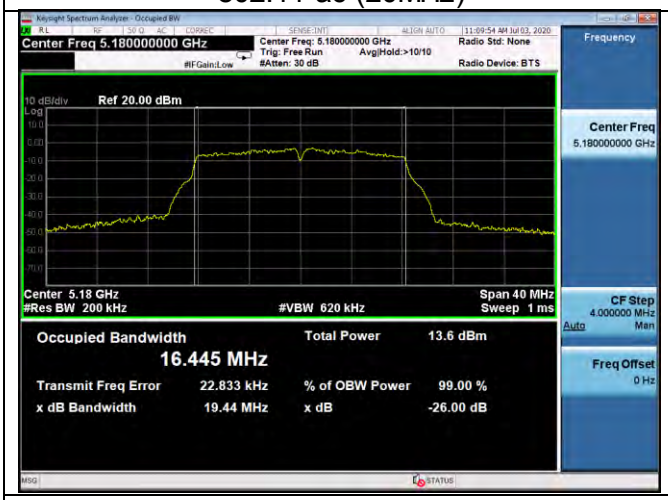
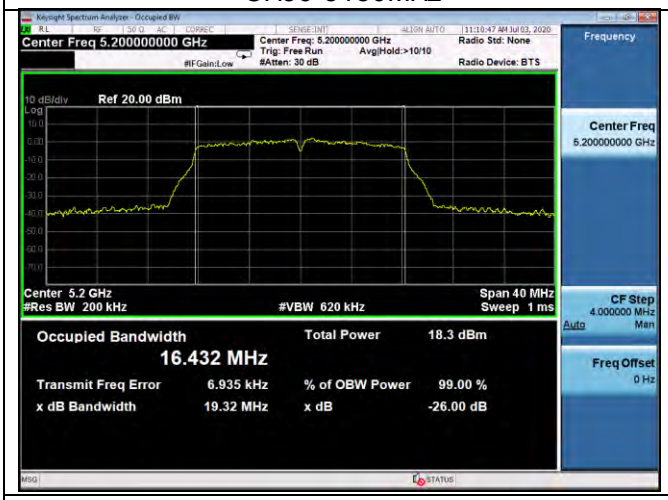
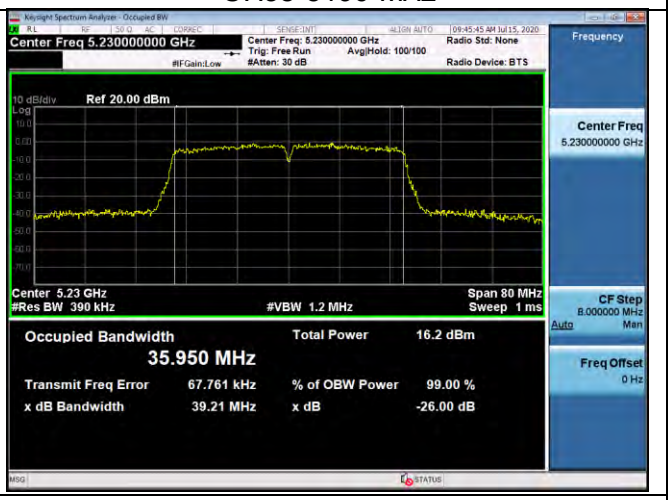
**TEST RESULTS**

| BAND | 802.11 Mode | Channel No. | Frequency [MHz] | 26dB Bandwidth [MHz] |
|---|---|---|---|---|
| BAND 1 | a (20MHz) | 36 | 5180 | 21.44 |
| | | 40 | 5200 | 21.48 |
| | | 48 | 5240 | 23.22 |
| | n (20MHz) | 36 | 5180 | 19.96 |
| | | 40 | 5200 | 22.58 |
| | | 48 | 5240 | 23.21 |
| | n (40MHz) | 38 | 5190 | 39.27 |
| | | 46 | 5230 | 39.11 |
| | ac (20MHz) | 36 | 5180 | 19.44 |
| | | 40 | 5200 | 19.32 |
| | | 48 | 5240 | 19.48 |
| | ac(40MHz) | 38 | 5190 | 39.00 |
| | | 46 | 5230 | 39.21 |

**Test plots as follows:**

| 802.11 a (20MHz) | 802.11n (20MHz) |
|---|---|
|  |  |
| CH36-5180MHz | CH36-5180MHz |
|  |  |
| CH40-5200MHz | CH40-5200MHz |
|  |  |
| CH48-5240MHz | CH48-5240MHz |

| 802.11 n (40MHz) | |
|---|---|
|  |  |
| CH38-5190 MHz | CH46-5230 MHz |

| 802.11 ac (20MHz) | 802.11 ac (40MHz) |
|---|---|
|  |  |
| CH36-5180MHz | CH38-5190 MHz |
|  |  |
| CH40-5200MHz | CH46-5230 MHz |

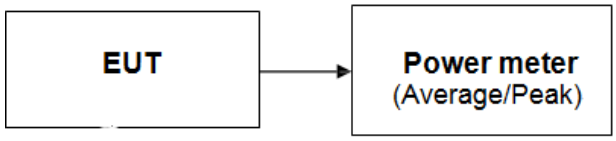
| | |
|---|---|
|  | |
| CH48-5240MHz | |

## 4.2 -6dB Bandwidth

**LIMIT**

In the 5.725 - 5.850GHz band, the 6dB bandwidth must be ⩾ 500 kHz.

**EST CONFIGURATION**




*The EUT was connected to a spectrum analyzer through a 50Ω RF cable.*

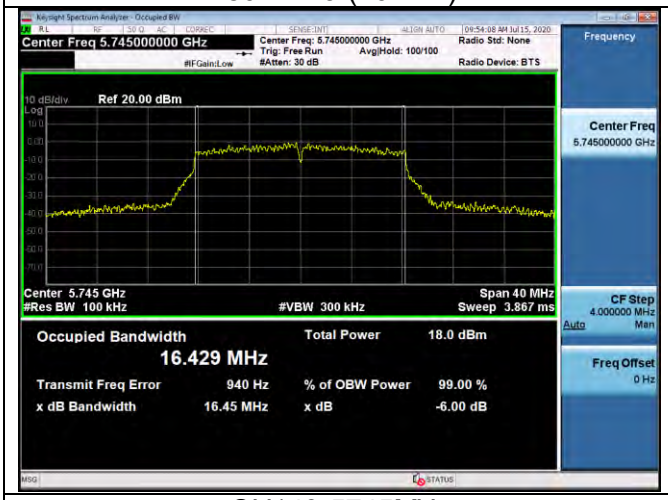
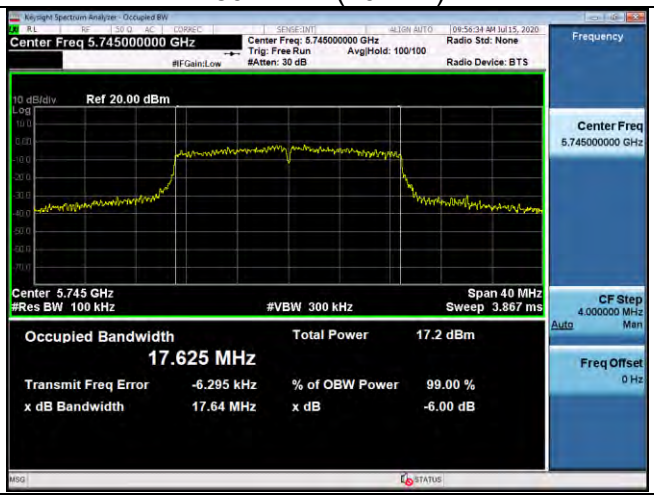
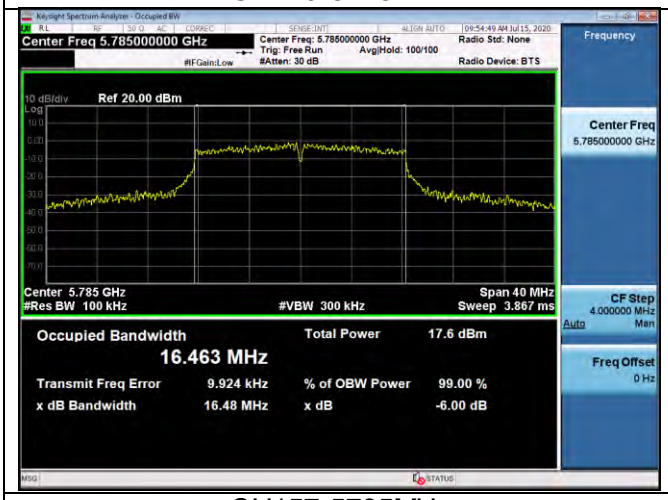
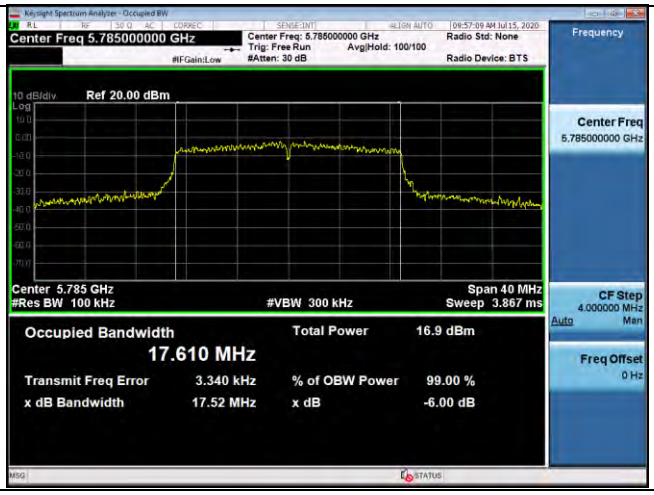
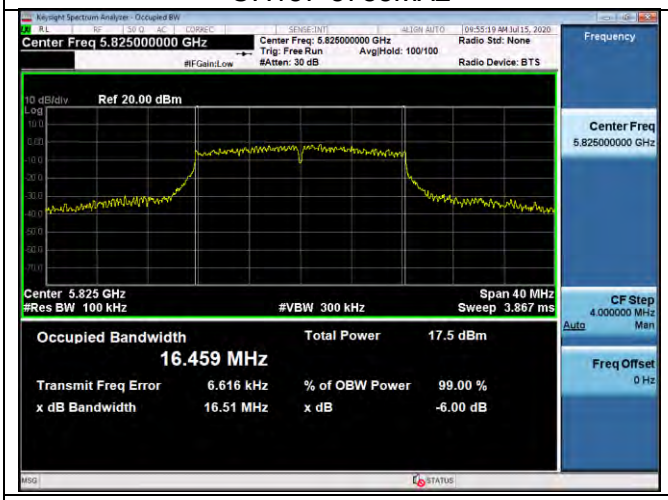
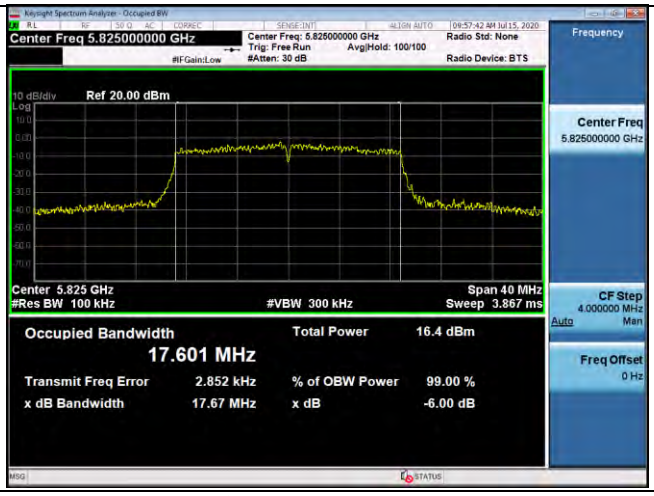
**TEST PROCEDURE**

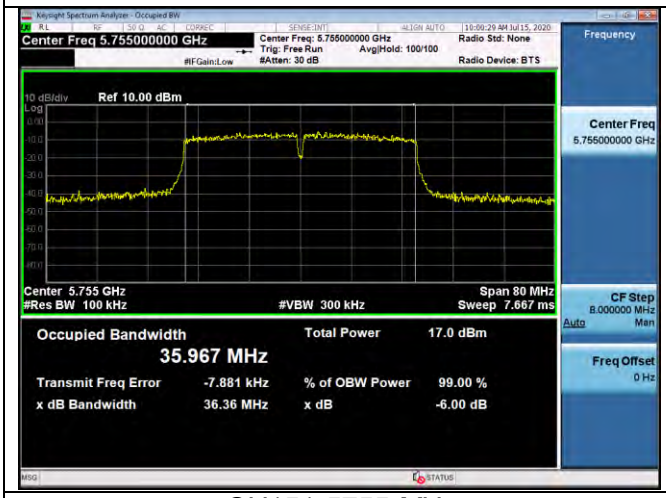
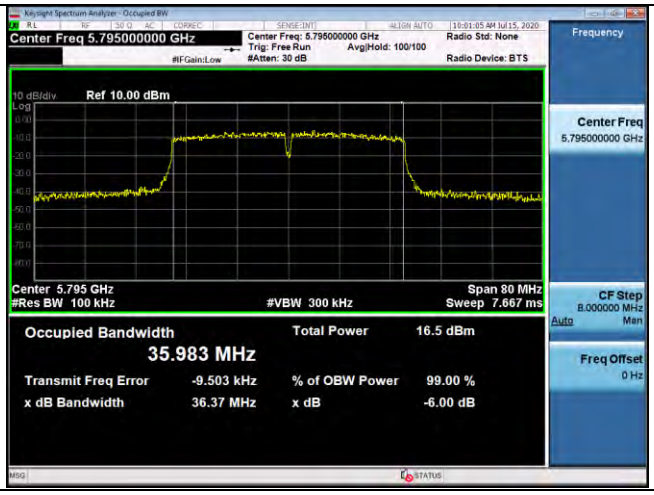
1. KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Make the measurement with the spectrum analyzer's resolution bandwidth RBW = 1% EBW, VBW≥3RBW, In order to make an accurate measurement.
4. Measure and record the results in the test report.

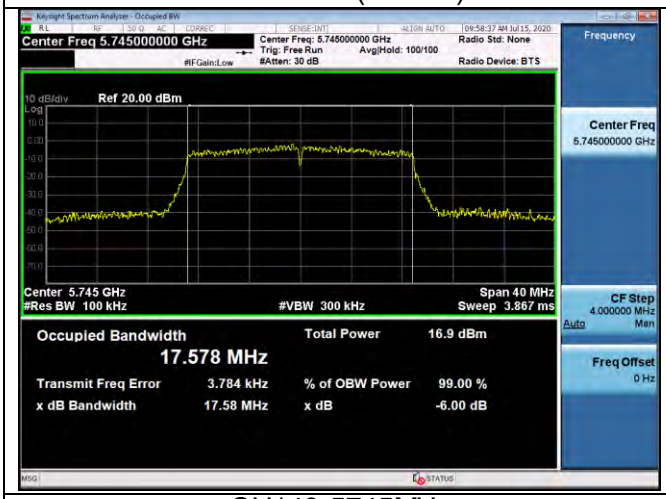
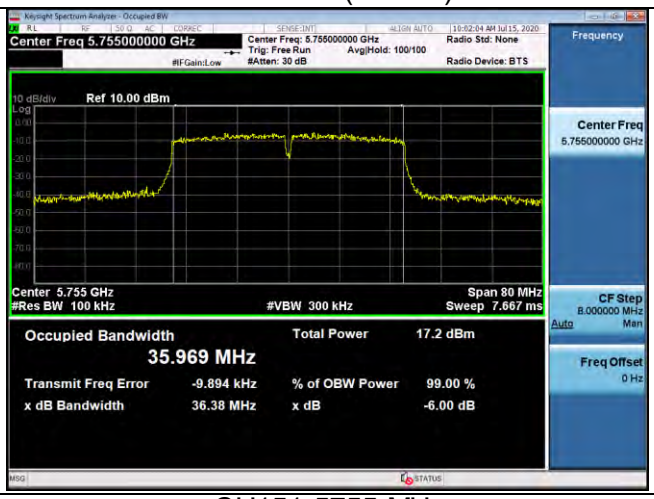
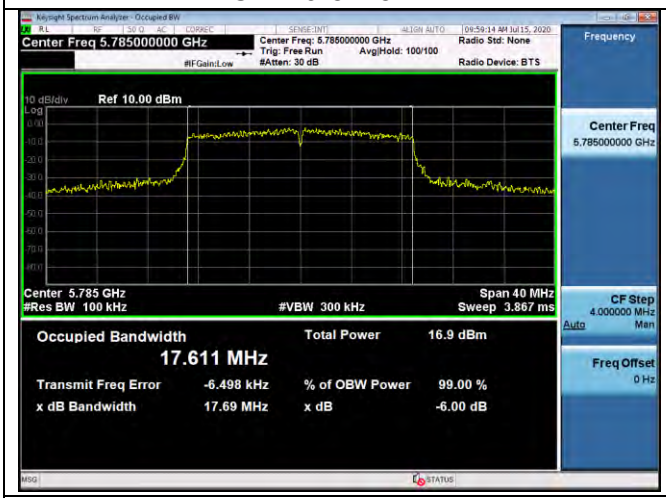
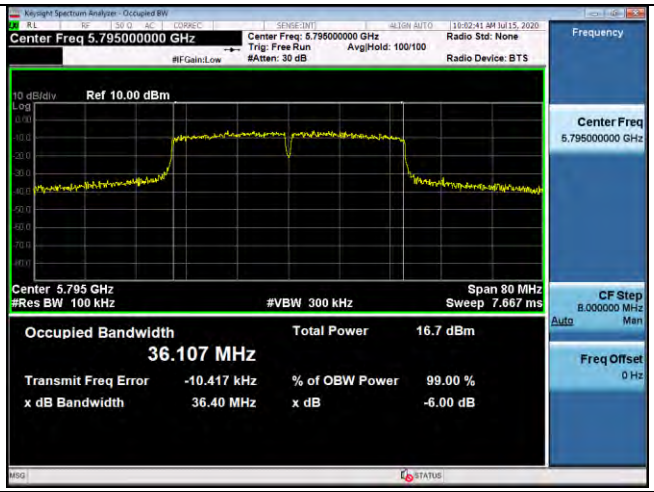
**TEST RESULTS**

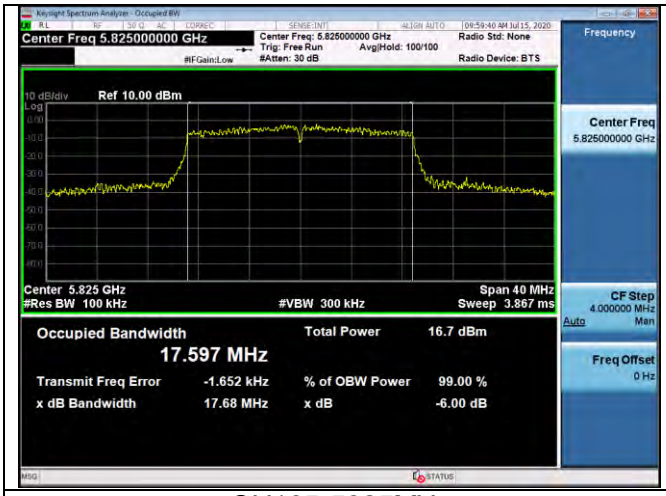
| BAND | 802.11 Mode | Channel No. | Frequency [MHz] | -6db Bandwidth [MHz] |
|---|---|---|---|---|
| BAND 3 | a (20MHz) | 149 | 5745 | 16.45 |
| | | 157 | 5785 | 16.48 |
| | | 165 | 5825 | 16.51 |
| | n (20MHz) | 149 | 5745 | 17.64 |
| | | 157 | 5785 | 17.52 |
| | | 165 | 5825 | 17.67 |
| | n (40MHz) | 151 | 5755 | 36.36 |
| | | 159 | 5795 | 36.37 |
| | ac (20MHz) | 149 | 5745 | 17.58 |
| | | 157 | 5785 | 17.69 |
| | | 165 | 5825 | 17.68 |
| | ac(40MHz) | 151 | 5755 | 36.38 |
| | | 159 | 5795 | 36.40 |
| Limit | ⩾ 500 kHz | | | |
| Result | PASS | | | |

**Test plots as follows:**

| 802.11 a (20MHz) | 802.11 n (20MHz) |
|---|---|
|  |  |
| CH149-5745MHz | CH149-5745MHz |
|  |  |
| CH157-5785MHz | CH157-5785MHz |
|  |  |
| CH165-5825MHz | CH165-5825MHz |

| 802.11 n (40MHz) | |
|---|---|
|  |  |
| CH151-5755 MHz | CH159-5795 MHz |

| 802.11 ac (20MHz) | 802.11 ac (40MHz) |
|---|---|
|  |  |
| CH149-5745MHz | CH151-5755 MHz |
|  |  |
| CH157-5785MHz | CH159-5795 MHz |

| | |
|---|---|
|  | |
| CH165-5825MHz | |

## 4.3 MAXIMUM CONDUCTED OUTPUT POWER

**LIMIT**

According to §15.407(a),

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.

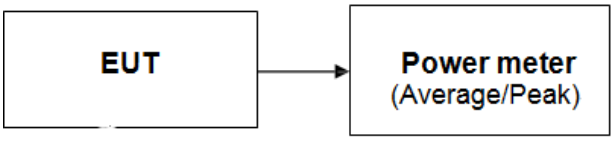
For the 5.25-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250mW or 11dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz.

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

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W

The peak power shall not exceed the limit as follow:

**TEST CONFIGURATION**




*The EUT was connected to a spectrum analyzer through a 50Ω RF cable.*

**TEST PROCEDURE**

The testing follows Method PM of FCC KDB789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM (Measurement using an RF peak power meter):

1. Measurement is performed using a wideband RF power meter.
2. TheEUTisconfiguredtotransmitcontinuouslywithaconsistentdutycycleatitsmaximum power control level.

**TEST RESULTS**

| BAND | 802.11 Mode | Channel No. | Frequency [MHz] | Conducted Power [dBm] | Limit [dBm] |
|---|---|---|---|---|---|
| BAND 1 | a (20MHz) | 36 | 5180 | 8.38 | 23.98 |
| | | 40 | 5200 | 8.78 | 23.98 |
| | | 48 | 5240 | 8.71 | 23.98 |
| | n (20MHz) | 36 | 5180 | 7.27 | 23.98 |
| | | 40 | 5200 | 7.25 | 23.98 |
| | | 48 | 5240 | 7.16 | 23.98 |
| | n (40MHz) | 38 | 5190 | 6.93 | 23.98 |
| | | 46 | 5230 | 6.62 | 23.98 |

| | | | | | |
|---|---|---|---|---|---|
| | ac (20MHz) | 36 | 5180 | 5.35 | 23.98 |
| | | 40 | 5200 | 7.41 | 23.98 |
| | | 48 | 5240 | 7.24 | 23.98 |
| | ac(40MHz) | 38 | 5190 | 6.03 | 23.98 |
| | | 46 | 5230 | 6.64 | 23.98 |

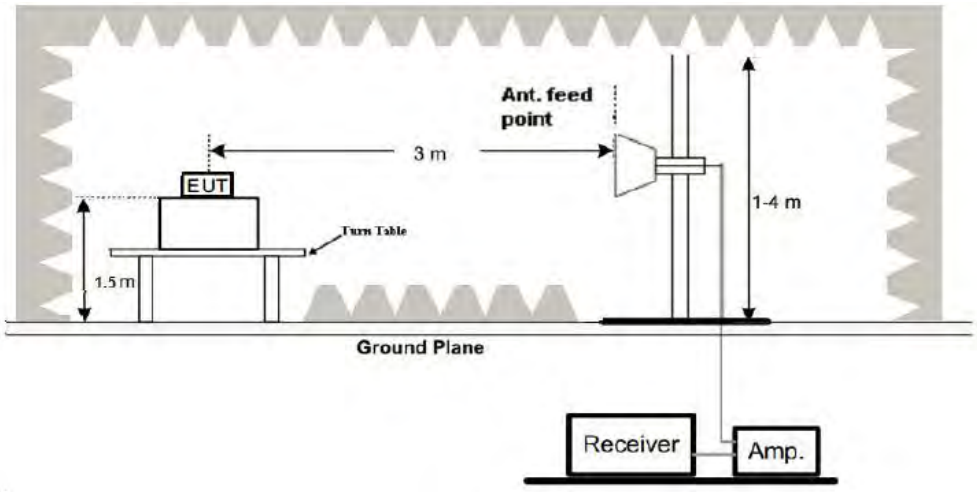
| BAND | 802.11 Mode | Channel No. | Frequency [MHz] | Conducted Power [dBm] | Limit [dBm] |
|---|---|---|---|---|---|
| BAND 3 | a (20MHz) | 149 | 5745 | 10.53 | 30.00 |
| | | 157 | 5785 | 10.11 | 30.00 |
| | | 165 | 5825 | 10.21 | 30.00 |
| | n (20MHz) | 149 | 5745 | 9.15 | 30.00 |
| | | 157 | 5785 | 9.70 | 30.00 |
| | | 165 | 5825 | 9.21 | 30.00 |
| | n (40MHz) | 151 | 5755 | 9.87 | 30.00 |
| | | 159 | 5795 | 8.41 | 30.00 |
| | ac (20MHz) | 149 | 5745 | 9.25 | 30.00 |
| | | 157 | 5785 | 8.41 | 30.00 |
| | | 165 | 5825 | 7.24 | 30.00 |
| | ac(40MHz) | 151 | 5755 | 7.03 | 30.00 |
| | | 159 | 5795 | 8.64 | 30.00 |

## 4.4 BAND EDGES MEASUREMENT

**LIMIT**

According to §15.407(b),
(1) The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.
(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency block edges as the design of the equipment permits.

**TEST CONFIGURATION**




**TESTPROCEDURE**

1. The EUT is placed on a turntable, which is 1.5m above the ground plane.
2. The turntable shall be rotated for 360degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to findout highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=1,VBW=3MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / Sweep=AUTO

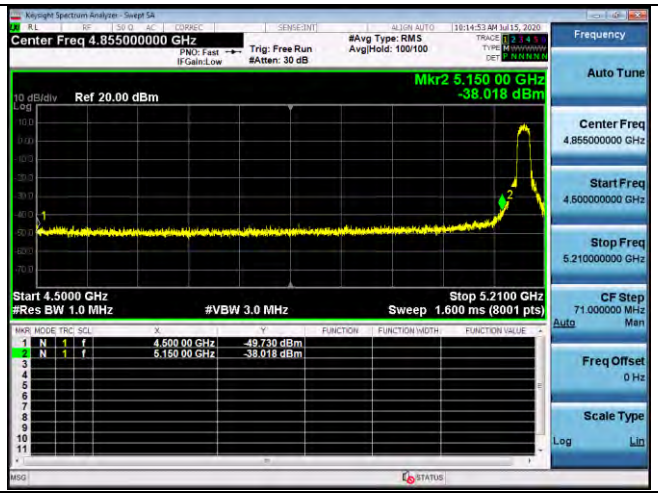
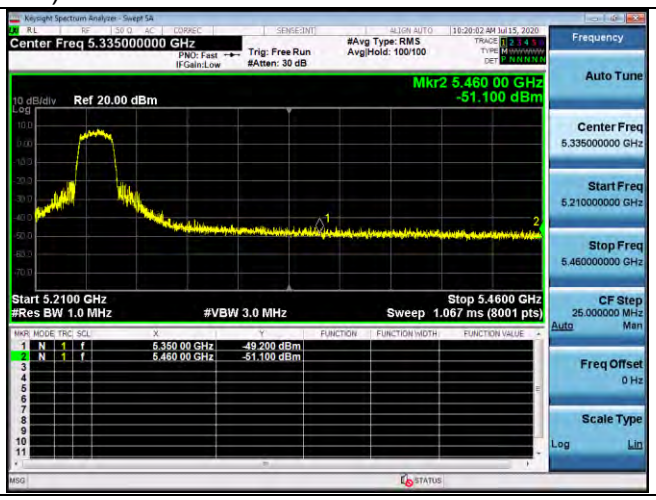
   VBW=10Hz,whenduty cycle is no less than 98 percent.

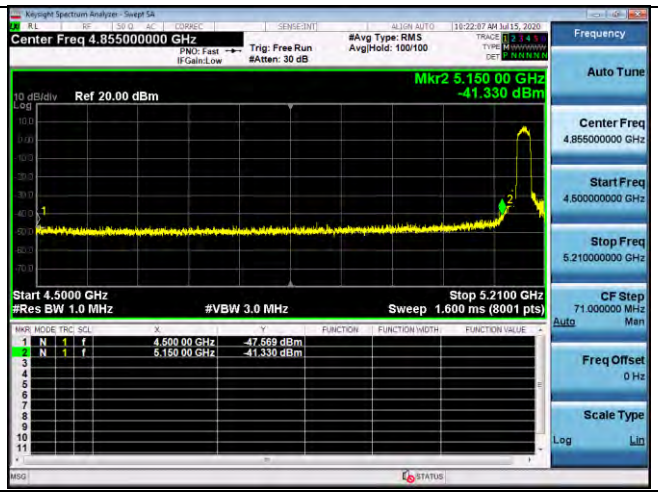
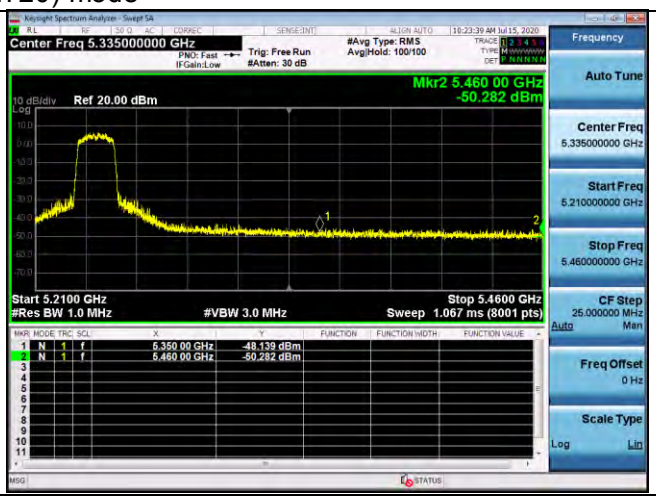
   VBW≧1/T, when duty cycle is less than98 percent, where is the minimum transmissiondurationoverwhichthetransmitterisonandistransmittingatitsmaximun power control level for the tested mode of operation.

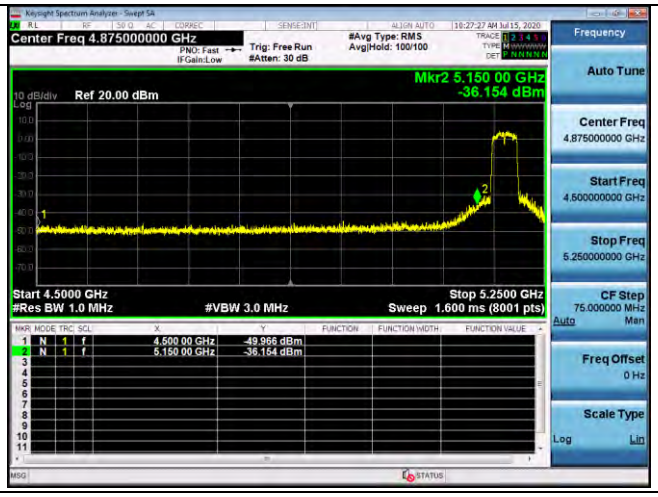
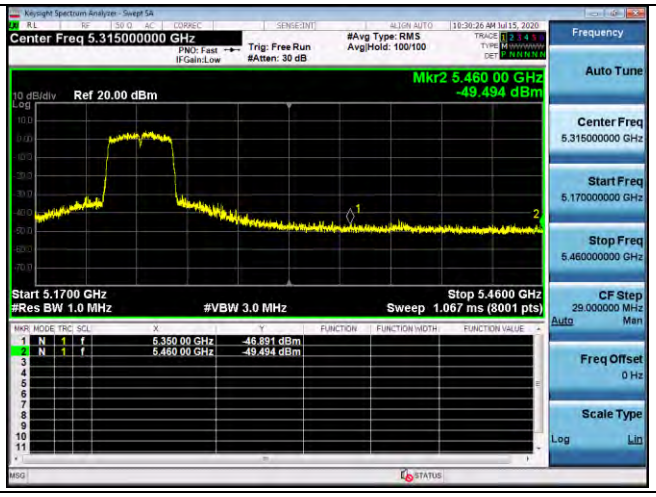
| Duty Cycles(%) | |
|---|---|
| Mode/Band | |
| A(HT20) | 98.89 |
| N(HT20) | 98.32 |
| N(HT40) | 98.24 |
| AC(HT20) | 99.28 |
| AC(HT40) | 99.31 |

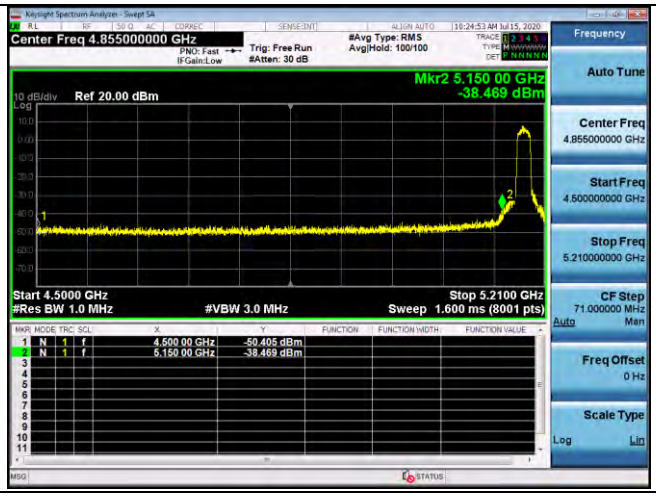
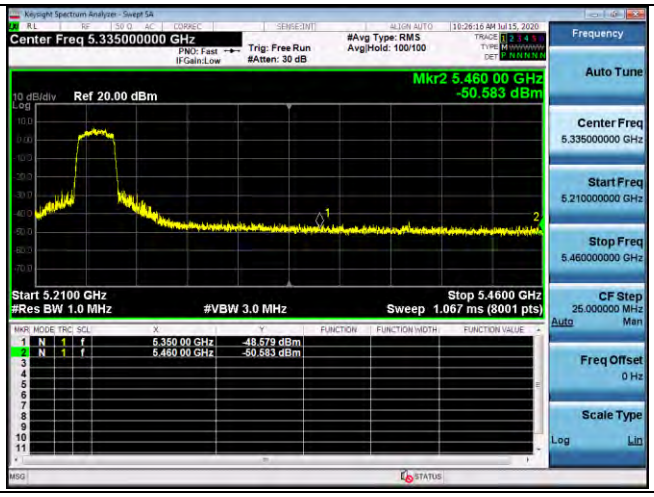
**TESTRESULTS**

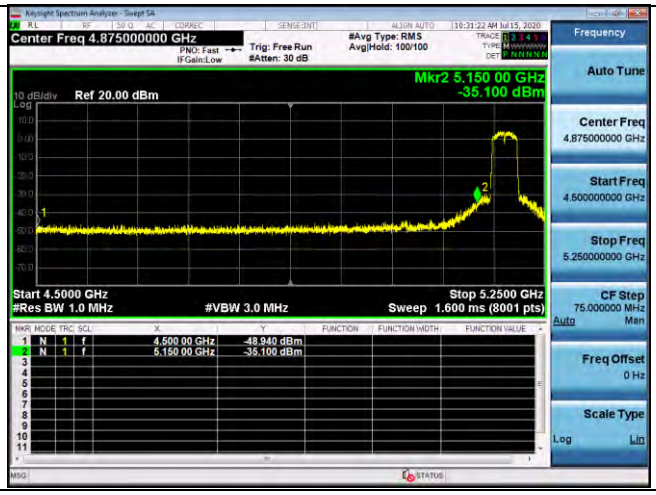
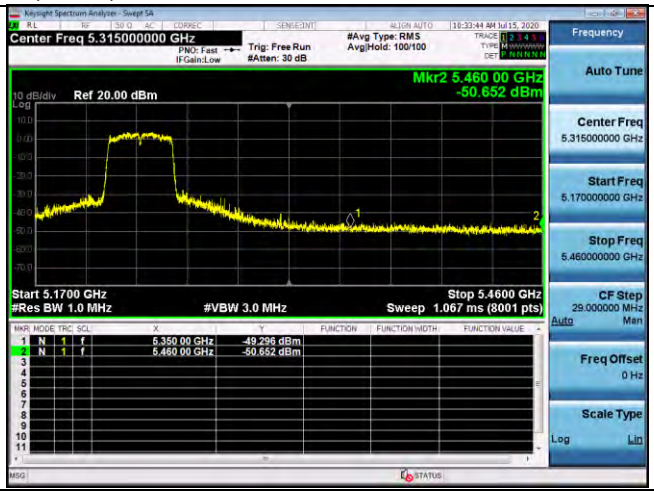
Band 1

| IEEE802.11a(HT20) mode | |
|---|---|
|  |  |
| Left—5180 MHz | Right--5240 MHz |

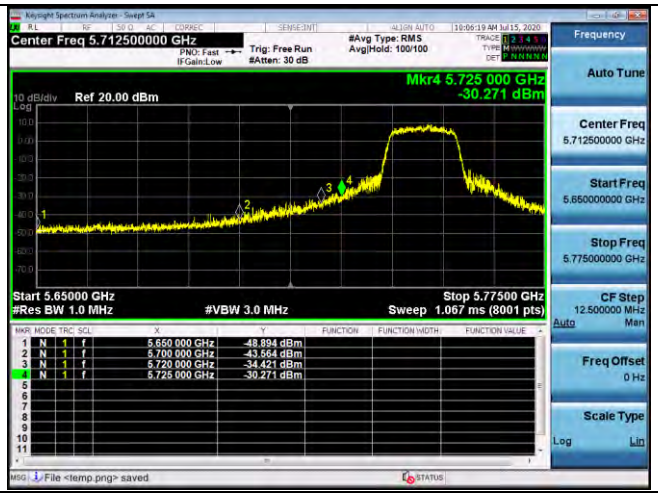
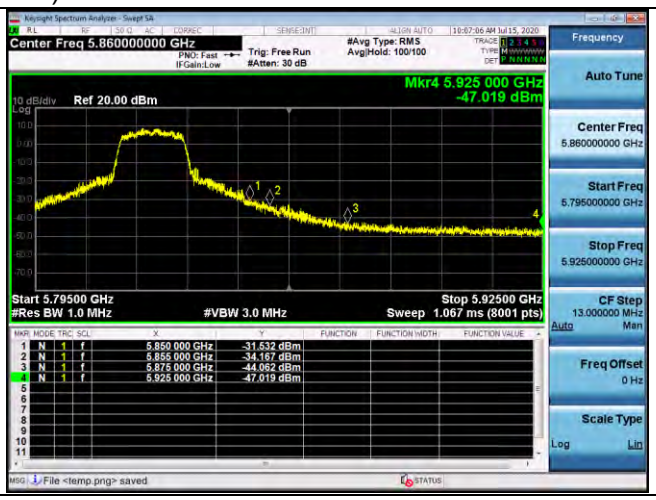
| IEEE802.11n(HT20) mode | |
|---|---|
|  |  |
| Left—5180 MHz | Right--5240 MHz |

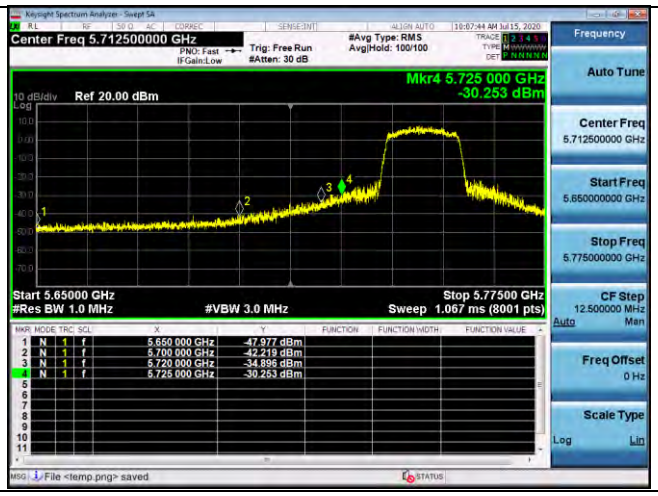
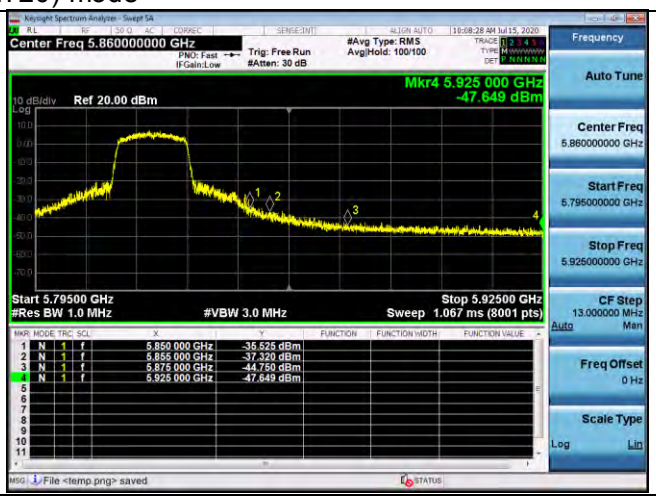
| IEEE802.11n(HT40) mode | |
|---|---|
|  |  |
| Left--5190 MHz | Right--5230 MHz |

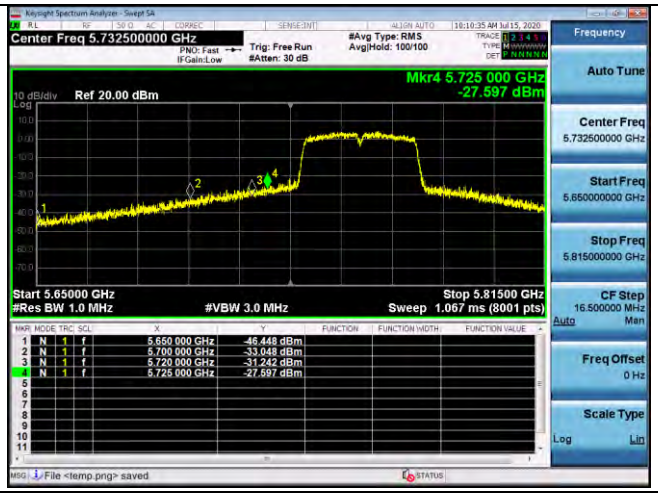
| Band1--IEEE802.11ac(HT20) mode | |
|---|---|
|  |  |
| Left--5190 MHz | Right--5230 MHz |

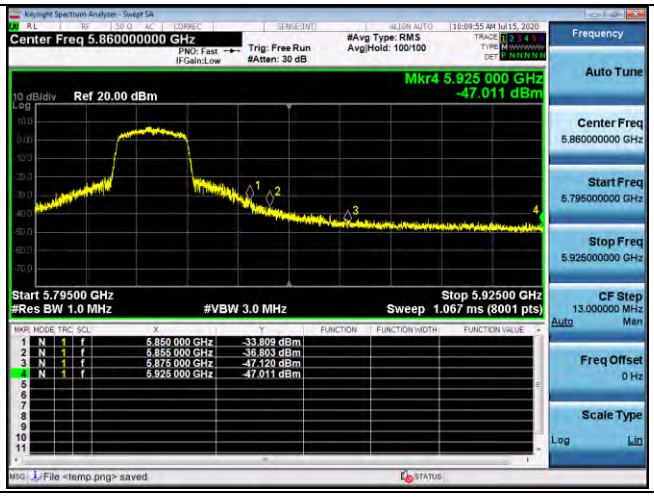
| Band1--IEEE802.11ac(HT40) mode | |
|---|---|
|  |  |
| Left--5190 MHz | Right--5230 MHz |

Band 3

| IEEE802.11a(HT20) mode | |
|---|---|
|  |  |
| Left—5745 MHz | Right--5825 MHz |

| IEEE802.11n(HT20) mode | |
|---|---|
|  |  |
| Left—5755 MHz | Right--5895 MHz |

| IEEE802.11n(HT40) mode | |
|---|---|
|  |  |
| Left--5190 MHz | Right--5230 MHz |

| Band1--IEEE802.11ac(HT20) mode | |
|---|---|
|  |  |
| Left—5745 MHz | Right--5825 MHz |

| Band1--IEEE802.11ac(HT40) mode | |
|---|---|
|  |  |
| Left—5755 MHz | Right--5895 MHz |

## 4.5 POWER SPECTRAL DENSITY

**LIMIT**

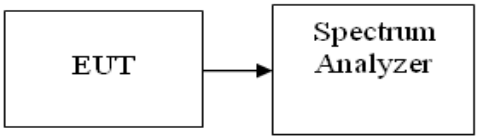
Accordingto§15.407(a),

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.

For the 5.25-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any I megahertz band

*If transmitting antennas of directionalgaingreaterthan6dBiareused, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.*

**TEST CONFIGURATION**




**TEST PROCEDURE**

1. Place the EUTon the table andset it in transmitting mode.
   Remove the antenna from the EUTand then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 1MHz, VBW = 3MHz,Span must be greater than 26dB bandwidth, adjust as necessary, Sweep= auto, Detector RMS
3. Record themax. reading.

**TESTRESULTS**

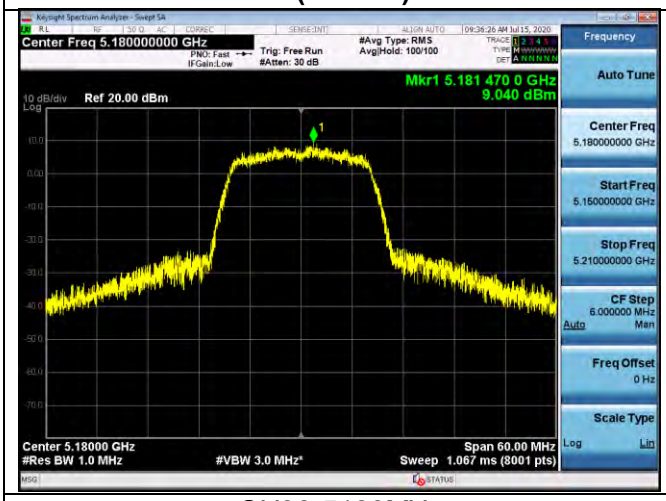
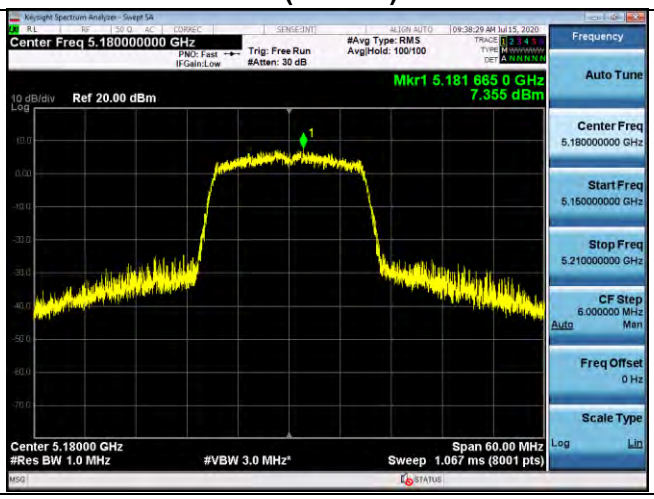
| BAND | 802.11 Mode | Channel No. | Frequency [MHz] | Measured Power Spectral Density [dBm/MHz] | Power Spectral Density Limit [dBm/MHz] |
|---|---|---|---|---|---|
| BAND 1 | a (20MHz) | 36 | 5180 | 9.040 | 11 |
| | | 40 | 5200 | 9.329 | 11 |
| | | 48 | 5240 | 8.821 | 11 |
| | n (20MHz) | 36 | 5180 | 7.355 | 11 |
| | | 40 | 5200 | 8.001 | 11 |
| | | 48 | 5240 | 7.268 | 11 |
| | n (40MHz) | 38 | 5190 | 4.694 | 11 |
| | | 46 | 5230 | 3.505 | 11 |
| | ac (20MHz) | 36 | 5180 | 8.078 | 11 |
| | | 40 | 5200 | 7.814 | 11 |
| | | 48 | 5240 | 7.327 | 11 |
| | ac(40MHz) | 38 | 5190 | 3.56 | 11 |
| | | 46 | 5230 | 3.636 | 11 |

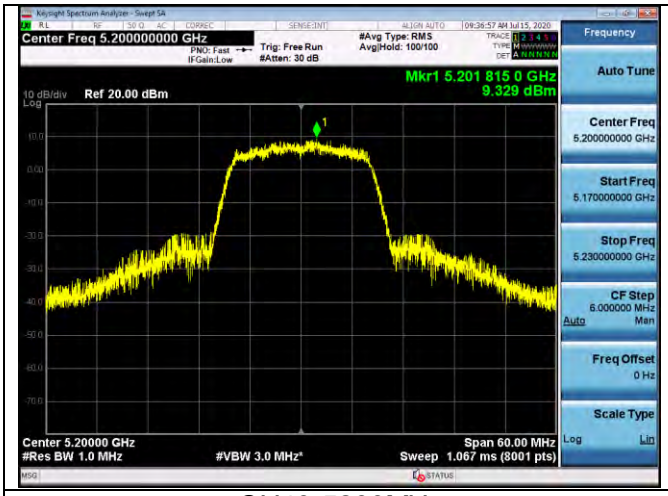
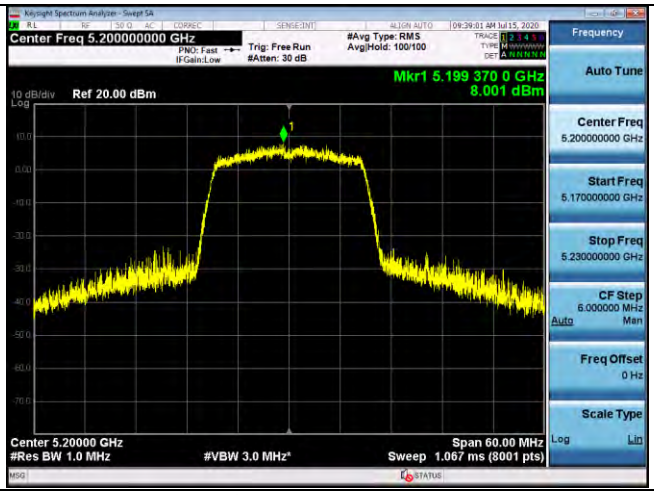
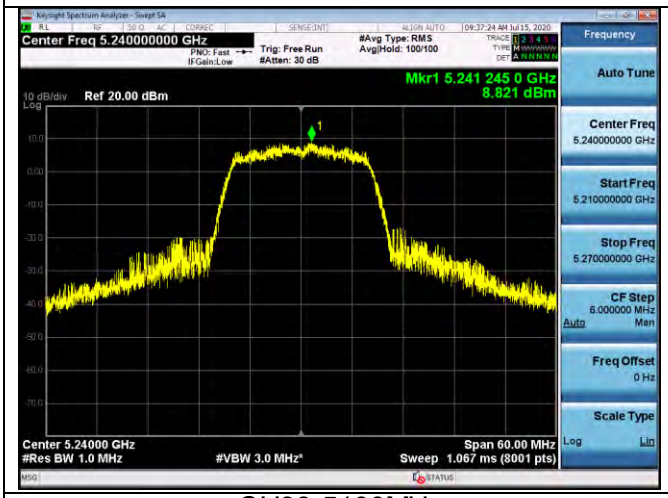
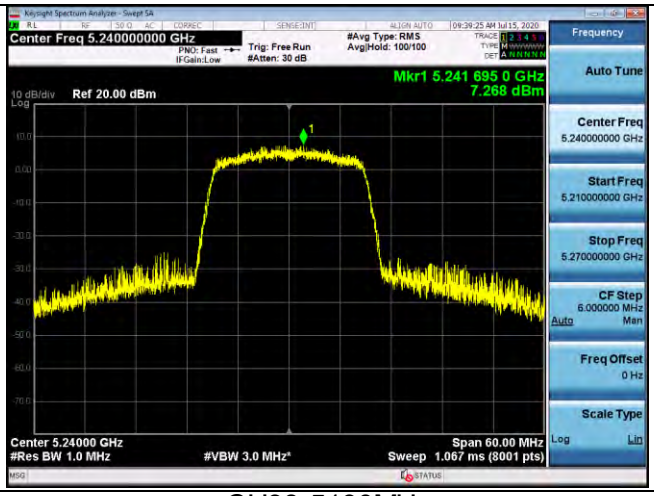
| BAND | 802.11 Mode | Channel No. | Frequency [MHz] | Measured PSD[dBm/510KHz] | Covert PSD [dBm/500KHz] | Limit [dBm/500KHz] |
|---|---|---|---|---|---|---|
| BAND 3 | a (20MHz) | 149 | 5745 | 6.053 | 5.967 | 30 |
| | | 157 | 5785 | 5.687 | 5.601 | 30 |
| | | 165 | 5825 | 4.614 | 4.528 | 30 |
| | n (20MHz) | 149 | 5745 | 5.548 | 5.462 | 30 |
| | | 157 | 5785 | 5.358 | 5.272 | 30 |
| | | 165 | 5825 | 4.915 | 4.829 | 30 |
| | n (40MHz) | 151 | 5755 | 3.018 | 2.932 | 30 |
| | | 159 | 5795 | 2.310 | 2.224 | 30 |
| | ac (20MHz) | 149 | 5745 | 4.869 | 4.783 | 30 |
| | | 157 | 5785 | 4.419 | 4.333 | 30 |
| | | 165 | 5825 | 4.411 | 4.325 | 30 |
| | ac (40MHz) | 151 | 5755 | 2.695 | 2.609 | 30 |
| | | 159 | 5795 | 2.788 | 2.702 | 30 |

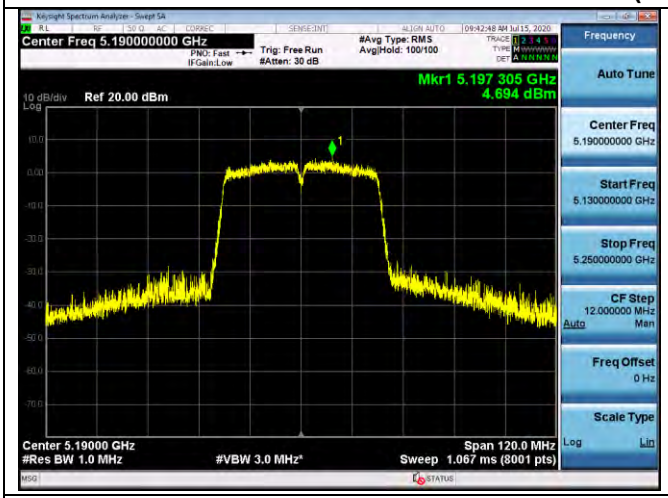
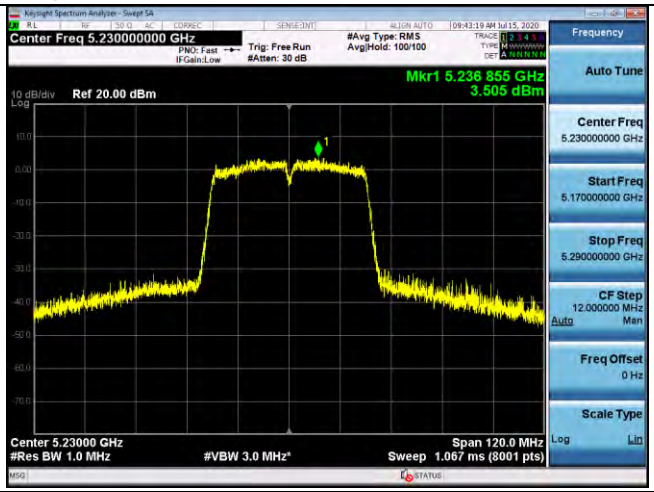
Note: Covert PSD [dBm/500KHz]= PSD[dBm/510KHz]+10*log(500/510)

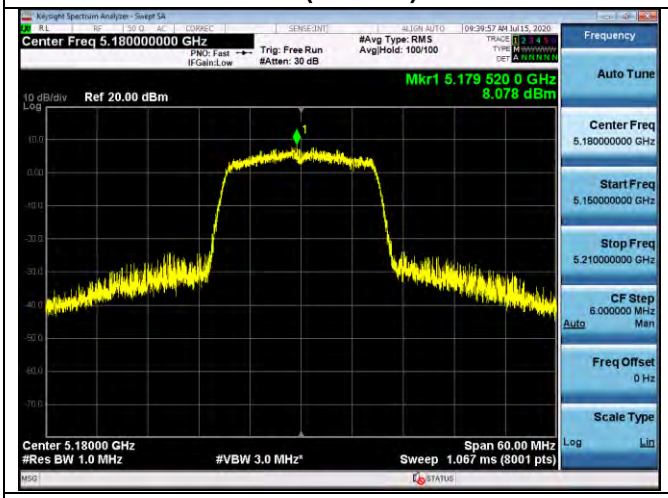
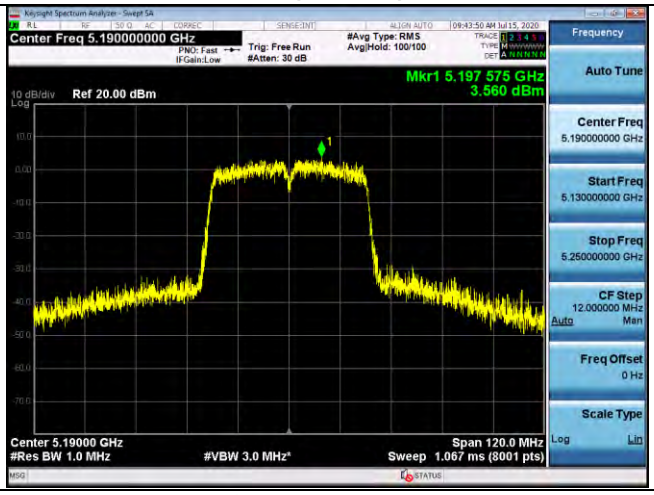
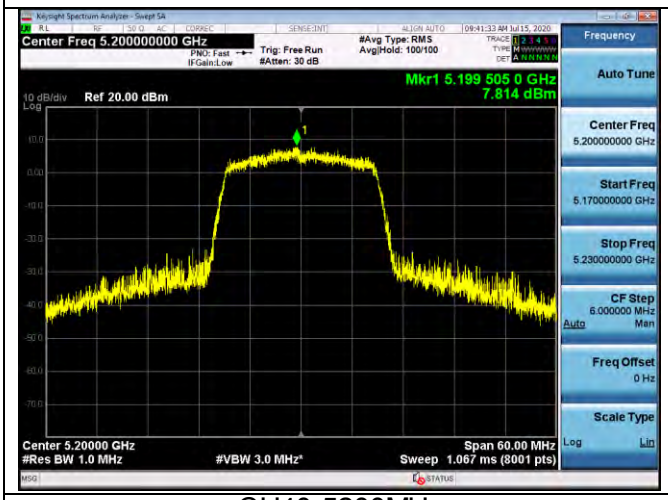
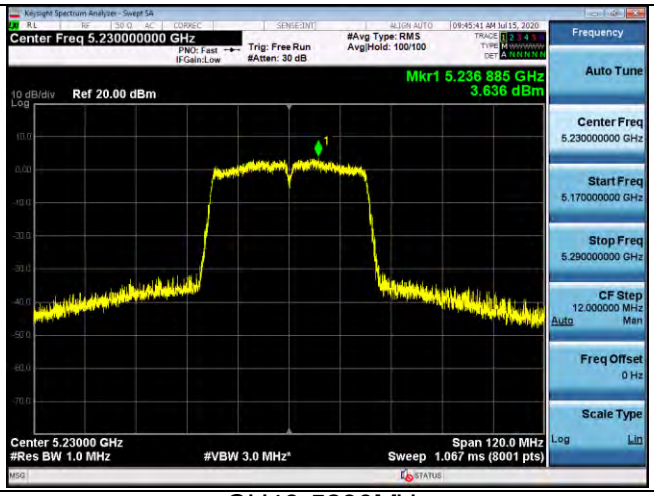
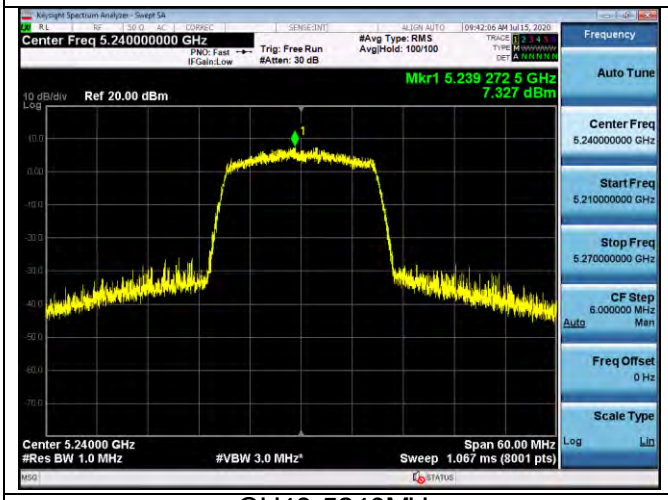
**Test plots as follows:**

**BAND 1**

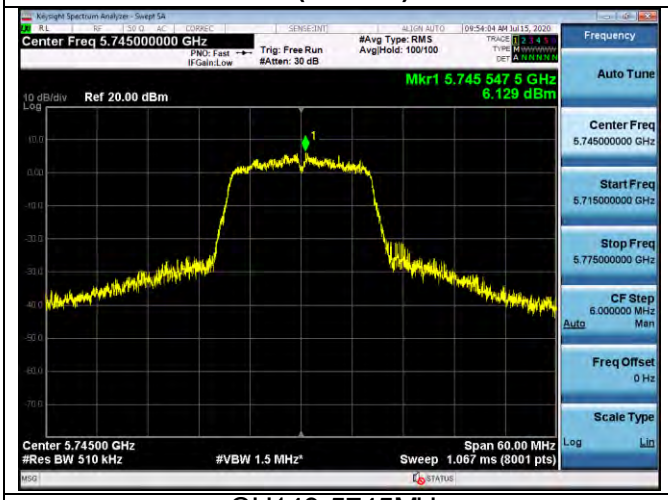
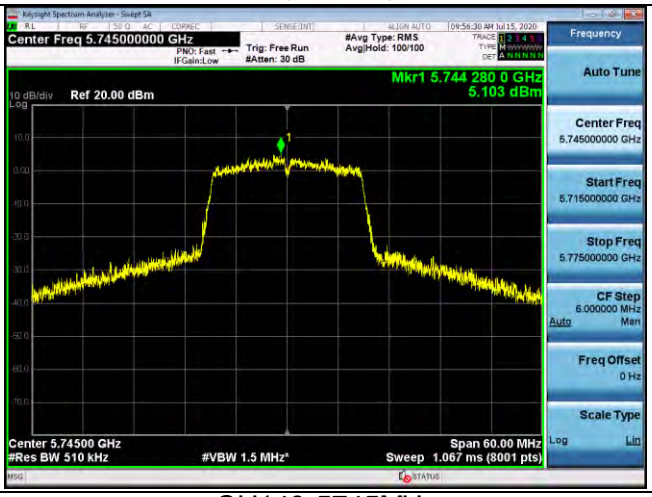
| a (20MHz) | n (20MHz) |
|---|---|
|  |  |
| CH36-5180MHz | CH36-5180MHz |

| | |
|---|---|
|  |  |
| CH40-5200MHz | CH40-5200MHz |
|  |  |
| CH38-5190MHz | CH38-5190MHz |

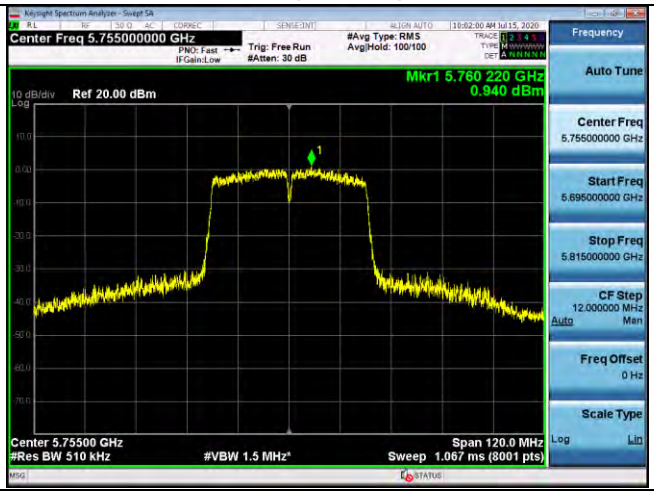
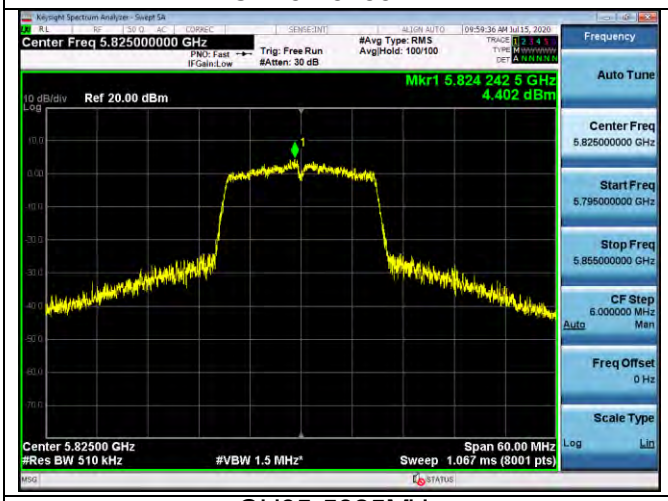
| n (40MHz) | |
|---|---|
|  |  |
| CH38-5190MHz | CH46-5230MHz |

| ac (20MHz) | ac (40MHz) |
|---|---|
|  |  |
| CH36-5180MHz | CH38-5190MHz |
|  |  |
| CH40-5200MHz | CH46-5230MHz |
|  | |
| CH48-5240MHz | |

**BAND 3**

| a (20MHz) | n (20MHz) |
|---|---|
|  |  |
| CH149-5745MHz | CH149-5745MHz |
|  |  |
| CH157-5785MHz | CH157-5785MHz |
|  |  |
| CH65-5825MHz | CH65-5825MHz |

| n (40MHz) | |
|---|---|
|  |  |
| CH151-5755MHz | CH159-5795MHz |

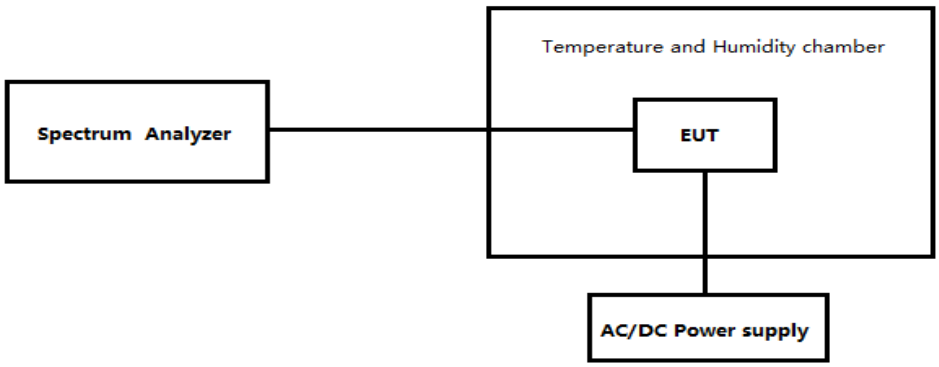
| ac (20MHz) | ac (40MHz) |
|---|---|
|  |  |
| CH149-5745MHz | CH151-5755MHz |
|  |  |
| CH157-5785MHz | CH159-5795MHz |
|  | |
| CH65-5825MHz | |

## 4.6 FREQUENCY STABILITY MEASUREMENT

**LIMIT**

According to§15.407(g),Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

**TESTCONFIGURATION**




**TESTPROCEDURE**

1. To ensure emission at the band edge is main tainted within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, whichissettomaximumholdfunctionandpeakdetector.Thepeakvalueofthepowerenvelopewas measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

**TESTRESULTS**

The report only shows the test results in the worst test mode:

| MODE | CH. | FRE. | CH. | FRE. |
|---|---|---|---|---|
| 802.11a(HT20) | 36 | 5180 MHz | 149 | 5745 MHz |
| 802.11n(HT20) | 36 | 5180 MHz | 149 | 5745 MHz |
| 802.11n(HT40) | 46 | 5230 MHz | 151 | 5755 MHz |
| 802.11ac(HT20) | 36 | 5180 MHz | 149 | 5745 MHz |
| 802.11ac(HT40) | 46 | 5230 MHz | 151 | 5755 MHz |

BAND 1

802.11a(HT20)-CH36

| Temperature (°C) | Voltage (V) | Freq.(MHz) | Center Frequency (MHz) | Frequency Deviation (MHz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| 25 | Vmin | 5180 | 5180 | 5180.015 | 0.015 |
| 25 | Vmax | 5180 | 5180 | 5180.031 | 0.031 |
| 25 | Vnor | 5180 | 5180 | 5180.007 | 0.007 |
| -10 | Vnor | 5180 | 5180 | 5180.010 | 0.010 |
| 40 | Vnor | 5180 | 5180 | 5180.003 | 0.003 |

802.11n(HT20)-CH36

| Temperature (°C) | Voltage (V) | Freq.(MHz) | Center Frequency (MHz) | Frequency Deviation (MHz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| 25 | Vmin | 5180 | 5180.018 | 0.018 | 3.425 |
| 25 | Vmax | 5180 | 5180.030 | 0.030 | 5.857 |
| 25 | Vnor | 5180 | 5180.024 | 0.024 | 4.689 |
| -10 | Vnor | 5180 | 5180.027 | 0.027 | 5.291 |
| 40 | Vnor | 5180 | 5180.034 | 0.034 | 6.519 |

802.11n(HT40)-CH46

| Temperature (°C) | Voltage (V) | Freq.(MHz) | Center Frequency (MHz) | Frequency Deviation (MHz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| 25 | $V_{min}$ | 5230 | 5230.015 | 0.015 | 2.822 |
| 25 | $V_{max}$ | 5230 | 5230.014 | 0.014 | 2.669 |
| 25 | $V_{nor}$ | 5230 | 5230.007 | 0.007 | 1.422 |
| -10 | $V_{nor}$ | 5230 | 5230.035 | 0.035 | 6.768 |
| 40 | $V_{nor}$ | 5230 | 5230.017 | 0.017 | 3.200 |

802.11ac(HT20)-CH36

| Temperature (°C) | Voltage (V) | Freq.(MHz) | Center Frequency (MHz) | Frequency Deviation (MHz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| 25 | $V_{min}$ | 5180 | 5180.031 | 0.031 | 6.011 |
| 25 | $V_{max}$ | 5180 | 5180.033 | 0.033 | 6.407 |
| 25 | $V_{nor}$ | 5180 | 5180.010 | 0.010 | 1.971 |
| -10 | $V_{nor}$ | 5180 | 5180.031 | 0.031 | 6.080 |
| 40 | $V_{nor}$ | 5180 | 5180.016 | 0.016 | 3.124 |

802.11ac(HT40)-CH46

| Temperature (°C) | Voltage (V) | Freq.(MHz) | Center Frequency (MHz) | Frequency Deviation (MHz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| 25 | $V_{min}$ | 5230 | 5230.029 | 0.029 | 5.572 |
| 25 | $V_{max}$ | 5230 | 5230.015 | 0.015 | 2.942 |
| 25 | $V_{nor}$ | 5230 | 5230.019 | 0.019 | 3.652 |
| -10 | $V_{nor}$ | 5230 | 5230.016 | 0.016 | 3.088 |
| 40 | $V_{nor}$ | 5230 | 5230.017 | 0.017 | 3.217 |

BAND 3

802.11a(HT20)- CH149

| Temperature (°C) | Voltage (V) | Freq.(MHz) | Center Frequency (MHz) | Frequency Deviation (MHz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| 25 | Vmin | 5745 | 5745.025 | 0.025 | 4.403 |
| 25 | Vmax | 5745 | 5745.002 | 0.002 | 0.328 |
| 25 | Vnor | 5745 | 5745.007 | 0.007 | 1.236 |
| -10 | Vnor | 5745 | 5745.038 | 0.038 | 6.593 |
| 40 | Vnor | 5745 | 5745.008 | 0.008 | 1.390 |

802.11n(HT20)- CH149

| Temperature (°C) | Voltage (V) | Freq.(MHz) | Center Frequency (MHz) | Frequency Deviation (MHz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| 25 | Vmin | 5745 | 5745.019 | 0.019 | 3.261 |
| 25 | Vmax | 5745 | 5745.024 | 0.024 | 4.203 |
| 25 | Vnor | 5745 | 5745.032 | 0.032 | 5.585 |
| -10 | Vnor | 5745 | 5745.029 | 0.029 | 4.999 |
| 40 | Vnor | 5745 | 5745.018 | 0.018 | 3.151 |

802.11n(HT40)-CH151

| Temperature (°C) | Voltage (V) | Freq.(MHz) | Center Frequency (MHz) | Frequency Deviation (MHz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| 25 | $V_{min}$ | 5755 | 5755.013 | 0.013 | 2.342 |
| 25 | $V_{max}$ | 5755 | 5755.021 | 0.021 | 3.652 |
| 25 | $V_{nor}$ | 5755 | 5755.021 | 0.021 | 3.708 |
| -10 | $V_{nor}$ | 5755 | 5755.019 | 0.019 | 3.275 |
| 40 | $V_{nor}$ | 5755 | 5755.028 | 0.028 | 4.895 |

802.11ac(HT20)- CH149

| Temperature (°C) | Voltage (V) | Freq.(MHz) | Center Frequency (MHz) | Frequency Deviation (MHz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| 25 | $V_{min}$ | 5745 | 5745.010 | 0.010 | 1.727 |
| 25 | $V_{max}$ | 5745 | 5745.023 | 0.023 | 4.017 |
| 25 | $V_{nor}$ | 5745 | 5745.038 | 0.038 | 6.553 |
| -10 | $V_{nor}$ | 5745 | 5745.026 | 0.026 | 4.612 |
| 40 | $V_{nor}$ | 5745 | 5745.007 | 0.007 | 1.206 |

802.11ac(HT40)- CH151

| Temperature (°C) | Voltage (V) | Freq.(MHz) | Center Frequency (MHz) | Frequency Deviation (MHz) | Frequency Stability (ppm) |
|---|---|---|---|---|---|
| 25 | $V_{min}$ | 5755 | 5755.013 | 0.013 | 2.344 |
| 25 | $V_{max}$ | 5755 | 5755.013 | 0.013 | 2.342 |
| 25 | $V_{nor}$ | 5755 | 5755.028 | 0.028 | 4.855 |
| -10 | $V_{nor}$ | 5755 | 5755.006 | 0.006 | 1.128 |
| 40 | $V_{nor}$ | 5755 | 5755.006 | 0.006 | 1.097 |

## 4.7 RADIATED UNDESIRABLE EMISSION

**LIMIT**

Radiated emissions from9 kHz to25 GHz were measured according to the methods defines in ANSI C63.10-2013.The EUT was placed above the ground plane, 0.8 meter for frequency below 1GHzand1.5meterforfrequencyabove1GHz.Theinterfacecablesandequipmentpositionswere varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

1. For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of –27dBm/MHz.

   For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

   For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRPof -27 dBm/MHz.

2. KDB789033v02r01G)2)c)Asspecifiedin15.407(b),emissionsabove1000MHzthatareoutsideofthe restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

3. According to§15.209(a),exceptasprovidedelsewhereinthisSubpart,theemissionsfroman intentionalradiatorshallnotexceedthefieldstrengthlevelsspecifiedinthefollowingtable:

| FREQUENCIES(MHz) | FIELDSTRENGTH (microvolt/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 |

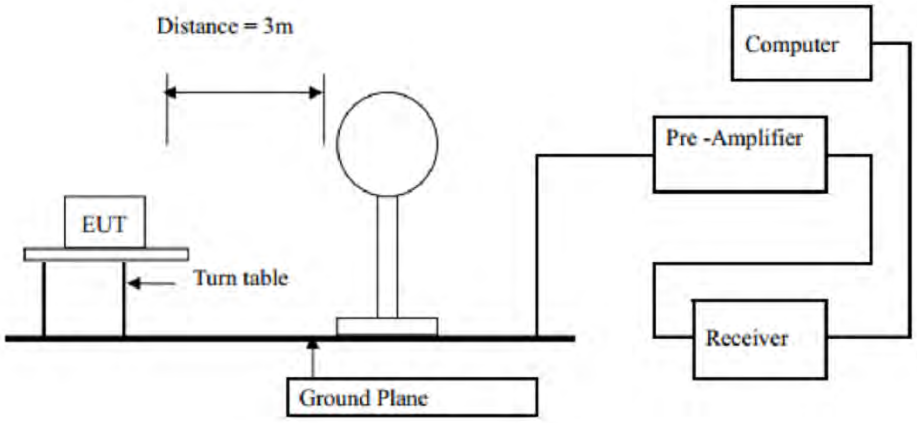
***Remark:*** *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806MHz.However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231and 15.241.*

4. In the emission table above, the tighter limit applies at the band edges.

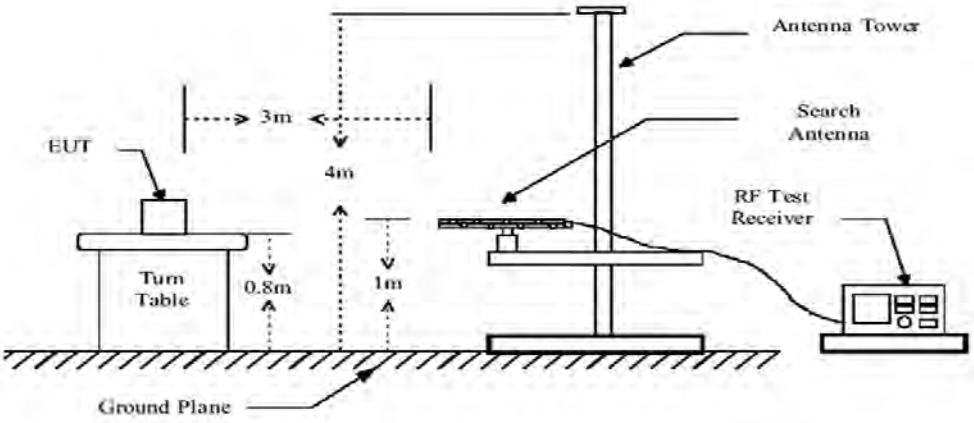
| Frequency (MHz) | Field Strength(μV/mat | Field Strength(dBμV/mat |
|---|---|---|
| 30-88 | 100 | 40 |
| 88-216 | 150 | 43.5 |
| 216-960 | 200 | 46 |
| Above 960 | 500 | 54 |

**Test Configuration**

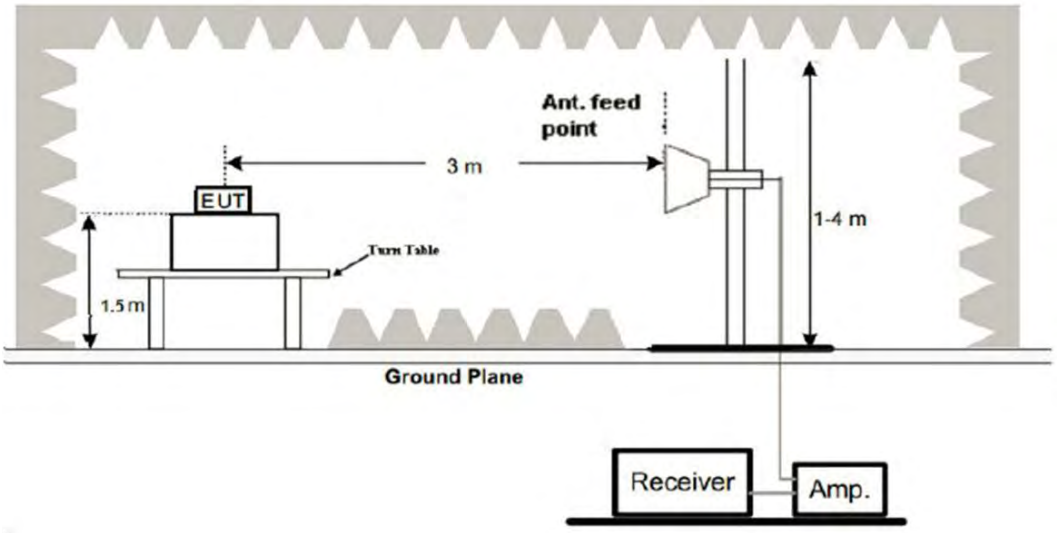
Below 30MHz




Below1GHz




Above 1 GHz



**TESTPROCEDURE**

1. The EUT is placed on a turntable above ground plane, which is 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz.
2. The turntable shall be rotated for 360degrees to determine the position of maximum emission level.
3. EUTisset3mawayfromthereceivingantenna,whichisvariedfrom1mto4mtofindoutthehighest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz:

   RBW=100kHz/ VBW=300kHz / Sweep=AUTO

   Above 1GHz:

   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

   (b) AVERAGE: RBW=1MHz / Sweep=AUTO

   VBW=10Hz,whenduty cycle is no less than 98 percent.

   VBW≧1/T, when duty cycle is less than98 percent, where is the minimum transmissiondurationoverwhichthetransmitterisonandistransmittingatitsmaximun power control level for the tested mode of operation.
7. Repeat above procedures until the measurements for all frequencies are complete.

**TES TRESULTS**

**Harmonics and Spurious Emissions**

**Frequency Range (9 kHz-30MHz)**

| Frequency (MHz) | Level@3m (dBμV/m) | Limit@3m (dBμV/m) |
|---|---|---|
| -- | -- | -- |
| -- | -- | -- |
| -- | -- | -- |
| -- | -- | -- |

***Note:*** *1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor*

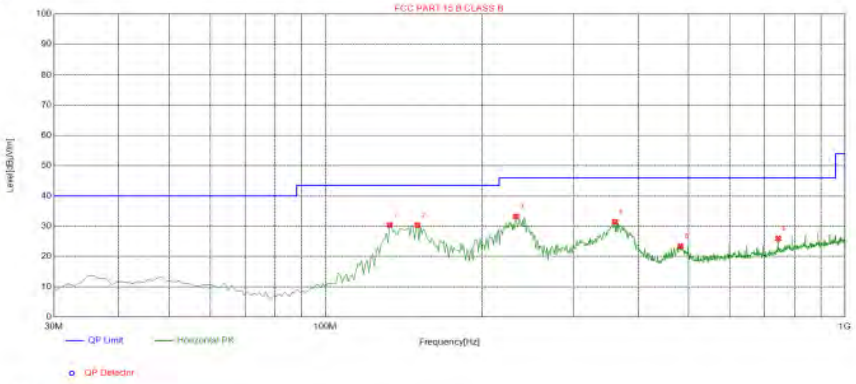
*2. The emission levels are 20 dB belowthe limit value, which are not reported. It is deemed to comply with the requirement*

## Test Results

radiated emission 30MHz – 1Ghz:

**Horizontal**

Test Graph



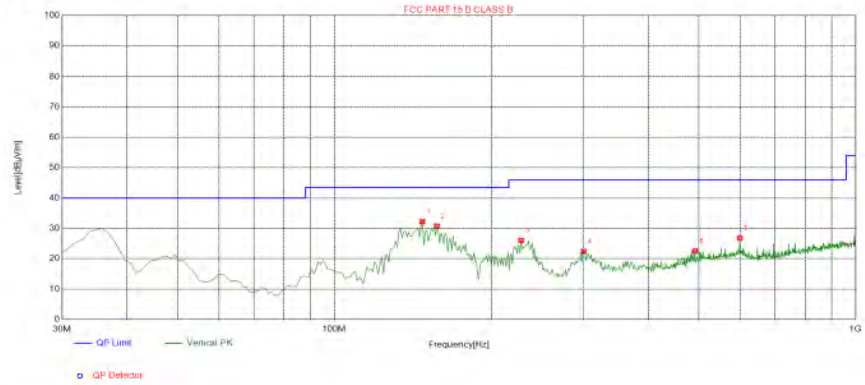

Suspected List

| Suspected List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Factor [dB] | Reading [dBµV/m] | Level [dBµV/m] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 132.9229 | -18.75 | 49.16 | 30.41 | 43.50 | 13.09 | 100 | 28 | Horizontal |
| 2 | 150.4004 | -18.91 | 49.28 | 30.37 | 43.50 | 13.13 | 100 | 35 | Horizontal |
| 3 | 232.9329 | -14.18 | 47.39 | 33.21 | 46.00 | 12.79 | 100 | 282 | Horizontal |
| 4 | 361.1011 | -11.31 | 42.76 | 31.45 | 46.00 | 14.55 | 100 | 94 | Horizontal |
| 5 | 482.4725 | -8.47 | 31.86 | 23.39 | 46.00 | 22.61 | 100 | 237 | Horizontal |
| 6 | 744.6346 | -3.94 | 29.82 | 25.88 | 46.00 | 20.12 | 100 | 305 | Horizontal |

Remark: Margin = Limit – Level
Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
Level=Test receiver reading + correction factor

**Vertical**

**Test Graph**




**Suspected List**

| Suspected List | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Factor [dB] | Reading [dBµV/m] | Level [dBµV/m] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1 | 147.4875 | -19.00 | 51.22 | 32.22 | 43.50 | 11.28 | 100 | 202 | Vertical |
| 2 | 157.1972 | -18.42 | 49.16 | 30.74 | 43.50 | 12.76 | 100 | 202 | Vertical |
| 3 | 228.0781 | -14.37 | 40.40 | 26.03 | 46.00 | 19.97 | 100 | 166 | Vertical |
| 4 | 300.9009 | -12.72 | 35.15 | 22.43 | 46.00 | 23.57 | 100 | 3 | Vertical |
| 5 | 492.1822 | -8.50 | 31.05 | 22.55 | 46.00 | 23.45 | 100 | 137 | Vertical |
| 6 | 599.9600 | -6.11 | 32.90 | 26.79 | 46.00 | 19.21 | 100 | 47 | Vertical |

Remark: Margin = Limit – Level
Correction Factor= Antenna Factor + Cable loss – Pre-amplifier
Level=Test receiver reading + correction factor

**Above 1 GHz**

Note: The test results only show the worst test results of mode 802.11n (HT20)/(HT40)

| TEST MODE | BW | TEST CH. | TEST FRE.(MHz) |
|---|---|---|---|
| BAND1 -- 802.11n | 20 | 36 | 5180 |
| | | 40 | 5200 |
| | | 48 | 5240 |
| | 40 | 38 | 5190 |
| | | 46 | 5230 |
| BAND 3-- 802.11n | 20 | 149 | 5745 |
| | | 157 | 5785 |
| | | 165 | 5825 |
| | 40 | 151 | 5755 |
| | | 159 | 5795 |

NOTE: The test result only shows the result of harmonics, because no waveform was found except for the background waveform

Operation Mode: Band 1 -IEEE 802.11n(HT20) Low Channel

Horizontal

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 10360.17 | 37.47 | 10.64 | 48.11 | 74.00 | -25.89 | | | peak |
| 2 | 15542.00 | 30.24 | 12.29 | 42.53 | 74.00 | -31.47 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Vertical

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 10360.17 | 36.38 | 10.64 | 47.02 | 74.00 | -26.98 | | | peak |
| 2 | 15542.00 | 34.35 | 12.29 | 46.64 | 74.00 | -27.36 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Operation Mode: Band 1 - IEEE 802.11n(HT20) Mid Channel

Horizontal

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 10400.44 | 37.10 | 10.64 | 47.74 | 74.00 | -26.26 | | | peak |
| 2 | 15600.19 | 30.83 | 12.29 | 43.12 | 74.00 | -30.88 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Vertical

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 10400.44 | 38.23 | 10.64 | 48.87 | 74.00 | -25.13 | | | peak |
| 2 | 15600.19 | 34.59 | 12.29 | 46.88 | 74.00 | -27.12 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Operation Mode: Band 1 - IEEE 802.11n(HT20) High Channel

Horizontal

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 10480.80 | 39.44 | 10.64 | 50.08 | 74.00 | -23.92 | | | peak |
| 2 | 15720.35 | 34.50 | 12.29 | 46.79 | 74.00 | -27.21 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Vertical

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 10480.80 | 36.85 | 10.64 | 47.49 | 74.00 | -26.51 | | | peak |
| 2 | 15720.35 | 34.94 | 12.29 | 47.23 | 74.00 | -26.77 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Operation Mode: Band 1 - IEEE 802.11n (HT40) mode Low Channel

Horizontal

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 10380.75 | 37.74 | 10.64 | 48.38 | 74.00 | -25.62 | | | peak |
| 2 | 15570.88 | 34.94 | 12.29 | 47.23 | 74.00 | -26.77 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Vertical

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 10380.75 | 36.02 | 10.64 | 46.66 | 74.00 | -27.34 | | | peak |
| 2 | 15570.88 | 33.59 | 12.29 | 45.88 | 74.00 | -28.12 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Operation Mode: Band 1 - IEEE 802.11n (HT40) mode /High Channel

Horizontal

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 11571.50 | 38.46 | 11.36 | 49.82 | 74.00 | -24.18 | | | peak |
| 2 | 17356.31 | 30.11 | 12.74 | 42.85 | 74.00 | -31.15 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Vertical

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 11571.50 | 38.46 | 11.36 | 49.82 | 74.00 | -24.18 | | | peak |
| 2 | 17356.31 | 30.11 | 12.74 | 42.85 | 74.00 | -31.15 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Operation Mode: Band 3 -IEEE 802.11n(HT20) Low Channel

Horizontal

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 11491.33 | 36.60 | 11.36 | 47.96 | 74.00 | -26.04 | | | peak |
| 2 | 17236.32 | 34.41 | 12.74 | 47.15 | 74.00 | -26.85 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Vertical

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 11491.33 | 37.33 | 11.36 | 48.69 | 74.00 | -25.31 | | | peak |
| 2 | 17236.32 | 30.88 | 12.74 | 43.62 | 74.00 | -30.38 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Operation Mode: Band 3 -IEEE 802.11n(HT20) Mid Channel

Horizontal

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 11571.50 | 37.07 | 11.36 | 48.43 | 74.00 | -25.57 | | | peak |
| 2 | 17356.96 | 35.15 | 12.74 | 47.89 | 74.00 | -26.11 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Vertical

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 11571.50 | 36.73 | 11.36 | 48.09 | 74.00 | -25.91 | | | peak |
| 2 | 17356.96 | 32.51 | 12.74 | 45.25 | 74.00 | -28.75 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Operation Mode: Band 3 -IEEE 802.11n(HT20) high Channel

Horizontal

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 11652.60 | 39.13 | 11.36 | 50.49 | 74.00 | -23.51 | | | peak |
| 2 | 17477.81 | 34.39 | 12.74 | 47.13 | 74.00 | -26.87 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Vertical

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 11652.60 | 36.50 | 11.36 | 47.86 | 74.00 | -26.14 | | | peak |
| 2 | 17477.81 | 35.57 | 12.74 | 48.31 | 74.00 | -25.69 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Operation Mode: Band 3 -IEEE 802.11n(HT40) low Channel

Horizontal

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 11510.80 | 38.44 | 11.36 | 49.80 | 74.00 | -24.20 | | | peak |
| 2 | 17265.47 | 34.85 | 12.74 | 47.59 | 74.00 | -26.41 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Vertical

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 11510.80 | 39.96 | 11.36 | 51.32 | 74.00 | -22.68 | | | peak |
| 2 | 17265.47 | 33.41 | 12.74 | 46.15 | 74.00 | -27.85 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Operation Mode: Band 3 -IEEE 802.11n(HT40) high Channel

Horizontal

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 11592.50 | 38.99 | 11.36 | 50.35 | 74.00 | -23.65 | | | peak |
| 2 | 17386.92 | 33.87 | 12.74 | 46.61 | 74.00 | -27.39 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Vertical

| No. | Frequency | Reading | Correct | Result | Limit | Margin | Height | Degree | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | (MHz) | (dBuV) | Factor(dB/m) | (dBuV/m) | (dBuV/m) | (dB) | (cm) | (deg.) | |
| 1 | 11592.50 | 39.49 | 11.36 | 50.85 | 74.00 | -23.15 | | | peak |
| 2 | 17386.92 | 30.42 | 12.74 | 43.16 | 74.00 | -30.84 | | | peak |
| N/A | | | | | | | | | |
| | | | | | | | | | |

Radiated Band Edge Test:

Operation Mode: Band 1-- 802.11n20 Mode - CH Low

Horizontal

| Frequency | Reading | Factor | Emission level | Limits | Margin | Detector type |
|---|---|---|---|---|---|---|
| (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| 5150 | 53.28 | -2.49 | 50.79 | 74.00 | -23.21 | PK |
| 5150 | / | -2.49 | / | 54.00 | / | AV |
| Remark: Factor= Antenna Factor + Cable loss – Pre-amplifier | | | | | | |

Vertical:

| Frequency | Reading | Factor | Emission level | Limits | Margin | Detector type |
|---|---|---|---|---|---|---|
| (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| 5150 | 48.09 | -2.49 | 45.60 | 74.00 | -28.40 | PK |
| 5150 | / | -2.49 | / | 54.00 | / | AV |
| Remark: Factor= Antenna Factor + Cable loss – Pre-amplifier | | | | | | |

Operation Mode: Band 1-- 802.11n20 Mode - CH high

Horizontal

| Frequency | Reading | Factor | Emission level | Limits | Margin | Detector type |
|---|---|---|---|---|---|---|
| (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| 5350 | 49.51 | -2.49 | 47.02 | 74.00 | -26.98 | PK |
| 5350 | / | -2.49 | / | 54.00 | / | AV |
| Remark: Factor= Antenna Factor + Cable loss – Pre-amplifier | | | | | | |

Vertical:

| Frequency | Reading | Factor | Emission level | Limits | Margin | Detector type |
|---|---|---|---|---|---|---|
| (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| 5350 | 51.41 | -2.49 | 48.92 | 74.00 | -25.08 | PK |
| 5350 | / | -2.49 | / | 54.00 | / | AV |
| Remark: Factor= Antenna Factor + Cable loss – Pre-amplifier | | | | | | |

Operation Mode: BAND I-- 802.11 n40 Mode - CH Low

Horizontal

| Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector type |
|---|---|---|---|---|---|---|
| 5150 | 53.78 | -2.49 | 51.29 | 74.00 | -22.71 | PK |
| 5150 | / | -2.49 | / | 54.00 | / | AV |
| Remark: Factor= Antenna Factor + Cable loss – Pre-amplifier | | | | | | |

Vertical:

| Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector type |
|---|---|---|---|---|---|---|
| 5150 | 49.21 | -2.49 | 46.72 | 74.00 | -27.28 | PK |
| 5150 | / | -2.49 | / | 54.00 | / | AV |
| Remark: Factor= Antenna Factor + Cable loss – Pre-amplifier | | | | | | |

Operation Mode: BAND I-- 802.11 n40 Mode - CH high

Horizontal

| Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector type |
|---|---|---|---|---|---|---|
| 5350 | 46.86 | -2.49 | 44.37 | 74.00 | -29.63 | PK |
| 5350 | / | -2.49 | / | 54.00 | / | AV |
| Remark: Factor= Antenna Factor + Cable loss – Pre-amplifier | | | | | | |

Vertical:

| Frequency (MHz) | Reading (dBuV) | Factor (dB) | Emission level (dBuV/m) | Limits (dBuV/m) | Margin (dB) | Detector type |
|---|---|---|---|---|---|---|
| 5350 | 52.76 | -2.49 | 50.27 | 74.00 | -23.73 | PK |
| 5350 | / | -2.49 | / | 54.00 | / | AV |
| Remark: Factor= Antenna Factor + Cable loss – Pre-amplifier | | | | | | |

Operation Mode: BAND 3-- 802.11 n20 Mode - CH low

Horizontal

| Frequency | Meter Reading | Factor | Emission level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| 5650 | 54.62 | -2.06 | 52.56 | 68.2 | -15.64 | PK |
| 5650 | 38.15 | -2.06 | 36.09 | 48.2 | -12.11 | AV |
| 5700 | 85.25 | -1.96 | 83.29 | 105.2 | -21.91 | PK |
| 5700 | 63.48 | -1.96 | 61.52 | 85.2 | -23.68 | AV |
| 5720 | 89.84 | -2.87 | 86.97 | 110.8 | -23.83 | PK |
| 5720 | 66.76 | -2.87 | 63.89 | 90.8 | -26.91 | AV |
| 5725 | 108.95 | -2.14 | 106.81 | 122.2 | -15.39 | PK |
| 5725 | 86.52 | -2.14 | 84.38 | 102.2 | -17.82 | AV |

Vertical:

| Frequency | Meter Reading | Factor | Emission level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| 5650 | 58.69 | -2.06 | 56.63 | 68.2 | -11.57 | PK |
| 5650 | 34.13 | -2.06 | 32.07 | 48.2 | -16.13 | AV |
| 5700 | 84.89 | -1.96 | 82.93 | 105.2 | -22.27 | PK |
| 5700 | 63.62 | -1.96 | 61.66 | 85.2 | -23.54 | AV |
| 5720 | 89.94 | -2.87 | 87.07 | 110.8 | -23.73 | PK |
| 5720 | 64.64 | -2.87 | 61.77 | 90.8 | -29.03 | AV |
| 5725 | 106.41 | -2.14 | 104.27 | 122.2 | -17.93 | PK |
| 5725 | 84.49 | -2.14 | 82.35 | 102.2 | -19.85 | AV |

Operation Mode: BAND 3-- 802.11 n20 Mode - CH high

Horizontal

| Frequency | Meter Reading | Factor | Emission level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| 5850 | 104.46 | -1.97 | 102.49 | 122.20 | -19.71 | PK |
| 5850 | 87.65 | -1.97 | 85.68 | 102.20 | -16.52 | AV |
| 5855 | 86.80 | -2.13 | 84.67 | 110.80 | -26.13 | PK |
| 5855 | 66.61 | -2.13 | 64.48 | 90.80 | -26.32 | AV |
| 5785 | 83.39 | -2.65 | 80.74 | 105.20 | -24.46 | PK |
| 5785 | 60.11 | -2.65 | 57.46 | 85.20 | -27.74 | AV |
| 5925 | 54.56 | -2.28 | 52.28 | 68.20 | -15.92 | PK |
| 5925 | 33.24 | -2.28 | 30.96 | 48.20 | -17.24 | AV |

Vertical:

| Frequency | Meter Reading | Factor | Emission level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| 5850 | 104.91 | -1.97 | 102.94 | 122.20 | -19.26 | PK |
| 5850 | 88.41 | -1.97 | 86.44 | 102.20 | -15.76 | AV |
| 5855 | 89.79 | -2.13 | 87.66 | 110.80 | -23.14 | PK |
| 5855 | 66.65 | -2.13 | 64.52 | 90.80 | -26.28 | AV |
| 5785 | 85.73 | -2.65 | 83.08 | 105.20 | -22.12 | PK |
| 5785 | 64.03 | -2.65 | 61.38 | 85.20 | -23.82 | AV |
| 5925 | 57.38 | -2.28 | 55.10 | 68.20 | -13.10 | PK |
| 5925 | 36.79 | -2.28 | 34.51 | 48.20 | -13.69 | AV |

Operation Mode: BAND 3-- 802.11 n40 Mode - CH low

Horizontal

| Frequency | Meter Reading | Factor | Emission level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| 5650 | 53.91 | -1.97 | 51.94 | 68.2 | -16.26 | PK |
| 5650 | 38.87 | -1.97 | 36.90 | 48.2 | -11.30 | AV |
| 5700 | 85.51 | -2.13 | 83.38 | 105.2 | -21.82 | PK |
| 5700 | 61.58 | -2.13 | 59.45 | 85.2 | -25.75 | AV |
| 5720 | 90.12 | -2.65 | 87.47 | 110.8 | -23.33 | PK |
| 5720 | 69.80 | -2.65 | 67.15 | 90.8 | -23.65 | AV |
| 5725 | 106.40 | -2.28 | 104.12 | 122.2 | -18.08 | PK |
| 5725 | 84.00 | -2.28 | 81.72 | 102.2 | -20.48 | AV |

Vertical:

| Frequency | Meter Reading | Factor | Emission level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| 5650 | 55.88 | -1.97 | 53.91 | 68.2 | -14.29 | PK |
| 5650 | 33.41 | -1.97 | 31.44 | 48.2 | -16.76 | AV |
| 5700 | 84.70 | -2.13 | 82.57 | 105.2 | -22.63 | PK |
| 5700 | 63.39 | -2.13 | 61.26 | 85.2 | -23.94 | AV |
| 5720 | 88.33 | -2.65 | 85.68 | 110.8 | -25.12 | PK |
| 5720 | 66.09 | -2.65 | 63.44 | 90.8 | -27.36 | AV |
| 5725 | 107.19 | -2.28 | 104.91 | 122.2 | -17.29 | PK |
| 5725 | 84.82 | -2.28 | 82.54 | 102.2 | -19.66 | AV |

Operation Mode: BAND 3-- 802.11 n40 Mode - CH high

Horizontal

| Frequency | Meter Reading | Factor | Emission level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| 5850 | 108.63 | -1.97 | 106.66 | 122.20 | -15.54 | PK |
| 5850 | 86.40 | -1.97 | 84.43 | 102.20 | -17.77 | AV |
| 5855 | 88.74 | -2.13 | 86.61 | 110.80 | -24.19 | PK |
| 5855 | 64.79 | -2.13 | 62.66 | 90.80 | -28.14 | AV |
| 5785 | 85.96 | -2.65 | 83.31 | 105.20 | -21.89 | PK |
| 5785 | 62.11 | -2.65 | 59.46 | 85.20 | -25.74 | AV |
| 5925 | 57.85 | -2.28 | 55.57 | 68.20 | -12.63 | PK |
| 5925 | 33.20 | -2.28 | 30.92 | 48.20 | -17.28 | AV |

Vertical:

| Frequency | Meter Reading | Factor | Emission level | Limits | Margin | Detector Type |
|---|---|---|---|---|---|---|
| (MHz) | (dBuV) | (dB) | (dBuV/m) | (dBuV/m) | (dB) | |
| 5850 | 107.65 | -1.97 | 105.68 | 122.20 | -16.52 | PK |
| 5850 | 88.53 | -1.97 | 86.56 | 102.20 | -15.64 | AV |
| 5855 | 88.18 | -2.13 | 86.05 | 110.80 | -24.75 | PK |
| 5855 | 69.43 | -2.13 | 67.30 | 90.80 | -23.50 | AV |
| 5785 | 82.23 | -2.65 | 79.58 | 105.20 | -25.62 | PK |
| 5785 | 63.46 | -2.65 | 60.81 | 85.20 | -24.39 | AV |
| 5925 | 54.13 | -2.28 | 51.85 | 68.20 | -16.35 | PK |
| 5925 | 33.91 | -2.28 | 31.63 | 48.20 | -16.57 | AV |

## 4.8 POWERLINE CONDUCTED EMISSIONS

**LIMIT**

According to§15.207(a),except as shown in paragraphs (b) and(c) of this section, for an intentional radiatorthatisdesignedtobeconnectedtothepublicutility(AC)powerline,theradiofrequencyvoltagethatis conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50ohms line impedancestabilizationnetwork(LISN).Compliancewiththeprovisionsofthisparagraphshallbebased on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

| Frequency Range (MHz) | Limits (dBµV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 to 0.50 | 66 to 56* | 56 to 46* |
| 0.50 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |

** Decreases with the logarithm of the frequency.*

**TEST CONFIGURATION**

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

**TEST PROCEDURE**

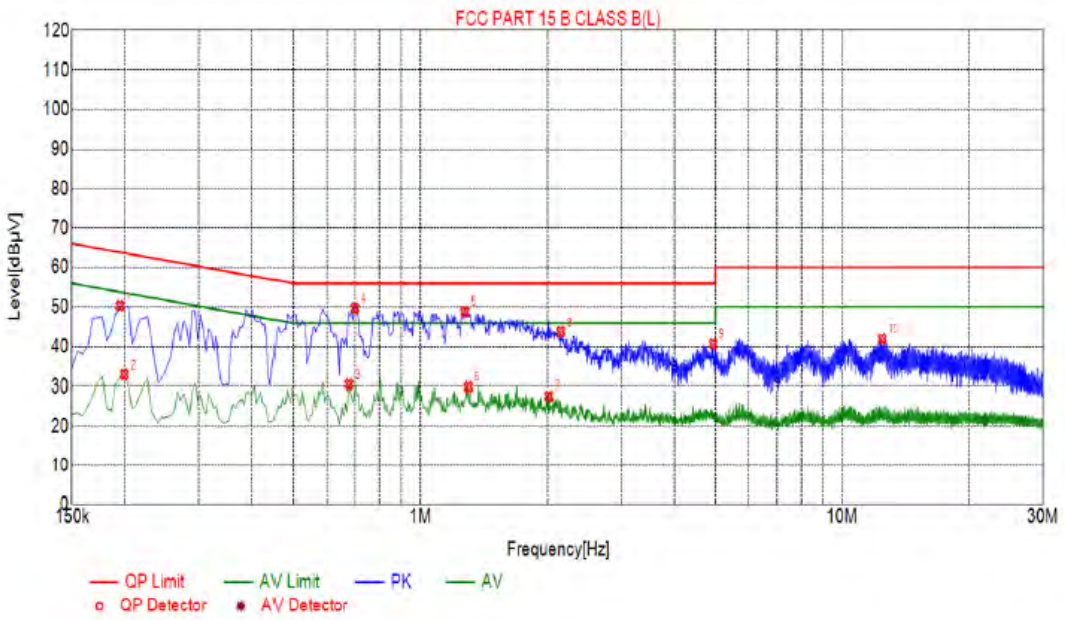
1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

**TESTRESULTS**

The initialstepin collecting conducted dataisa spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

**TestData**

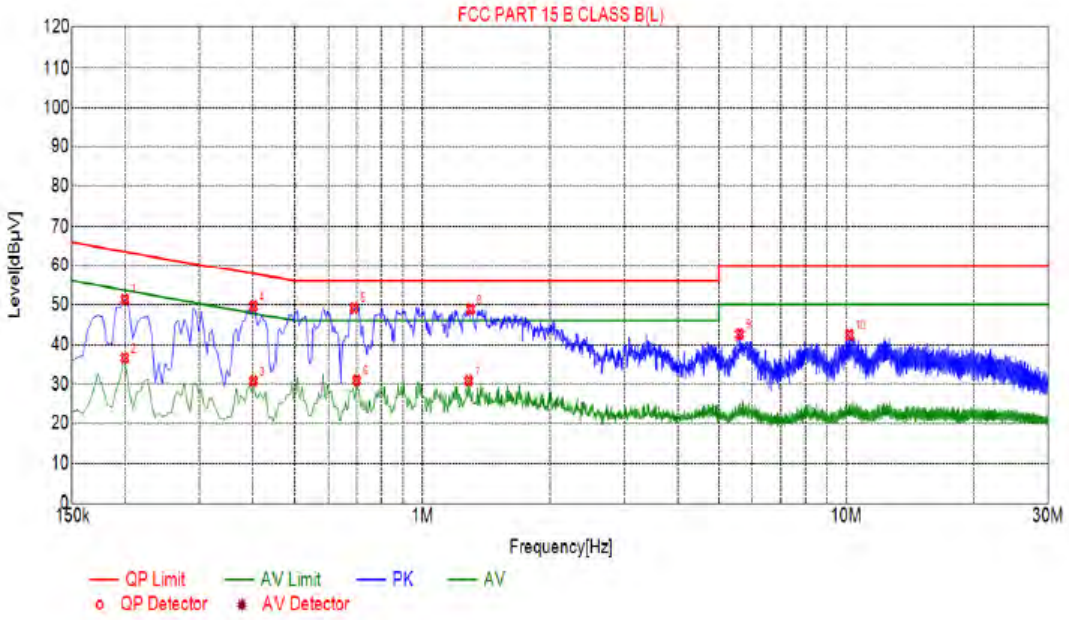
**Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)**




| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV] | Factor [dB] | Limit [dBµV] | Margin [dB] | Reading [dBµV] | Detector | Type |
| 1 | 0.1950 | 50.28 | 10.03 | 63.82 | 13.54 | 40.25 | PK | L |
| 2 | 0.1995 | 32.92 | 10.03 | 53.63 | 20.71 | 22.89 | AV | L |
| 3 | 0.6765 | 30.55 | 10.05 | 46.00 | 15.45 | 20.50 | AV | L |
| 4 | 0.6990 | 49.78 | 10.05 | 56.00 | 6.22 | 39.73 | PK | L |
| 5 | 1.2750 | 48.88 | 10.09 | 56.00 | 7.12 | 38.79 | PK | L |
| 6 | 1.2975 | 29.89 | 10.10 | 46.00 | 16.11 | 19.79 | AV | L |
| 7 | 2.0130 | 27.67 | 10.15 | 46.00 | 18.33 | 17.52 | AV | L |
| 8 | 2.1525 | 43.79 | 10.16 | 56.00 | 12.21 | 33.63 | PK | L |
| 9 | 4.9425 | 40.66 | 10.26 | 56.00 | 15.34 | 30.40 | PK | L |
| 10 | 12.4395 | 41.98 | 9.98 | 60.00 | 18.02 | 32.00 | PK | L |

Remark: Margin = Limit – Level
Correction factor = Cable lose + LISN insertion loss
Level=Test receiver reading + correction factor

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)

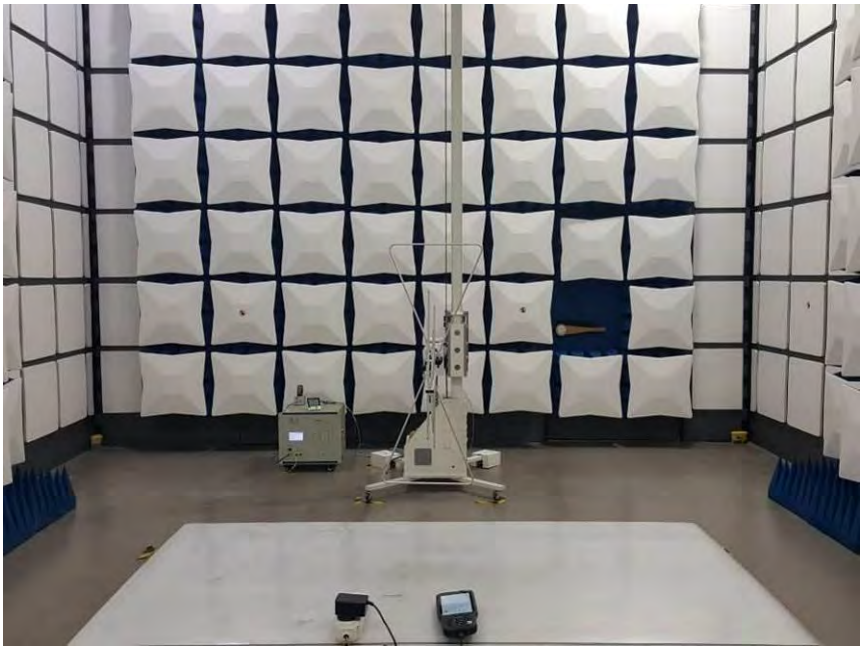



| Suspected List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| NO. | Freq. [MHz] | Level [dBµV] | Factor [dB] | Limit [dBµV] | Margin [dB] | Reading [dBµV] | Detector | Type |
| 1 | 0.1995 | 51.27 | 10.03 | 63.63 | 12.36 | 41.24 | PK | L |
| 2 | 0.1995 | 36.62 | 10.03 | 53.63 | 17.01 | 26.59 | AV | L |
| 3 | 0.4020 | 30.75 | 10.04 | 47.81 | 17.06 | 20.71 | AV | L |
| 4 | 0.4020 | 49.60 | 10.04 | 57.81 | 8.21 | 39.56 | PK | L |
| 5 | 0.6900 | 49.15 | 10.05 | 56.00 | 6.85 | 39.10 | PK | L |
| 6 | 0.6990 | 30.88 | 10.05 | 46.00 | 15.12 | 20.83 | AV | L |
| 7 | 1.2840 | 30.82 | 10.09 | 46.00 | 15.18 | 20.73 | AV | L |
| 8 | 1.2975 | 48.83 | 10.10 | 56.00 | 7.17 | 38.73 | PK | L |
| 9 | 5.6085 | 42.63 | 10.25 | 60.00 | 17.37 | 32.38 | PK | L |
| 10 | 10.1805 | 42.43 | 10.06 | 60.00 | 17.57 | 32.37 | PK | L |

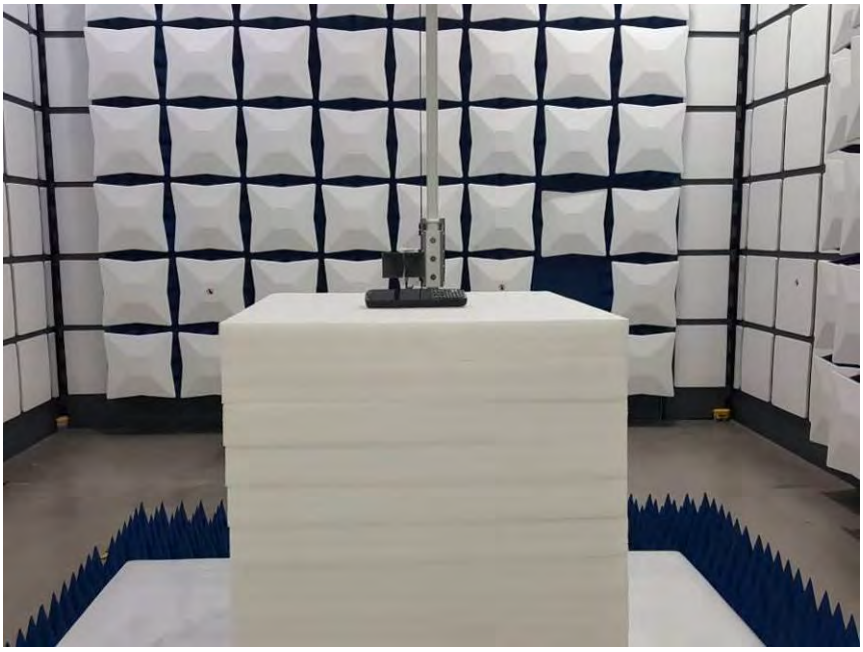
Remark: Margin = Limit – Level
Correction factor = Cable lose + LISN insertion loss
Level=Test receiver reading + correction factor

## 7 PHOTOS OF TEST SETUP

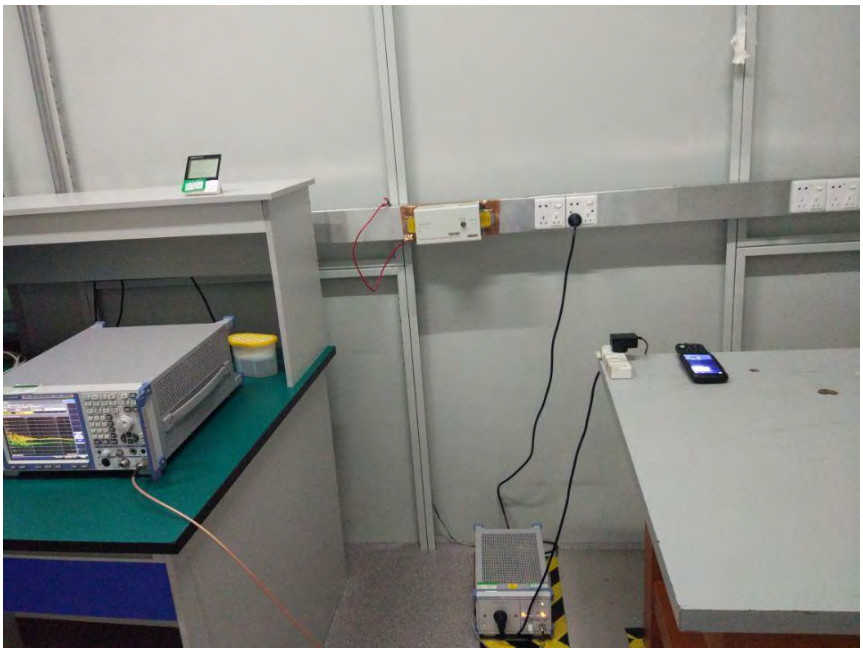
30MHz-1000MHz



Above 1000MHz



Conducted Emission



## 8 PHOTOS OF THE EUT

Please refer to the report No.: HK2007011614-8E

**********END OF REPORT**********