

RF TEST REPORT



Report No.: FCC_RF_SL15080601-ICT-016_UNII Rev. 1.0
Supersede Report No.: FCC_RF_SL15080601-ICT-016_UNII

| | | |
|---|---|--|
| Applicant | : | Intermec Technologies Corporation |
| Product Name | : | Mobile Computer |
| Model No. | : | 1007CP02 |
| Test Standard | : | 47 CFR 15.407 |
| Test Method | : | ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v01 |
| FCC ID | : | EHA-1007CP02 |
| IC ID | : | 1223A-1007C02 |
| Dates of test | : | October 22, 2015 to October 29, 2015 |
| Issue Date | : | December 21 , 2015 |
| Test Result | : | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |
| Equipment complied with the specification <input checked="" type="checkbox"/> | | |
| Equipment did not comply with the specification <input type="checkbox"/> | | |

| | |
|--|---|
| This Test Report is Issued Under the Authority of: | |
| | |
| Teody Manansala Test Engineer | Nima Molaei Engineer Reviewer |
| This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only | |

Issued By:
SIEMIC Laboratories
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Accreditations for Conformity Assessment

| Country/Region | Accreditation Body | Scope |
|----------------|------------------------|-----------------------------------|
| USA | FCC, A2LA | EMC, RF/Wireless, Telecom |
| Canada | IC, A2LA, NIST | EMC, RF/Wireless, Telecom |
| Taiwan | BSMI, NCC, NIST | EMC, RF, Telecom, Safety |
| Hong Kong | OFTA, NIST | RF/Wireless, Telecom |
| Australia | NATA, NIST | EMC, RF, Telecom, Safety |
| Korea | KCC/RRA, NIST | EMI, EMS, RF, Telecom, Safety |
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| Europe | A2LA, NIST | EMC, RF, Telecom, Safety |
| Israel | MOC, NIST | EMC, RF, Telecom, Safety |

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| Country | Accreditation Body | Scope |
|-----------|--------------------|-----------------------|
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| Canada | IC FCB, NIST | EMC, RF, Telecom |
| Singapore | iDA, NIST | EMC, RF, Telecom |
| EU | NB | EMC & R&TTE Directive |
| Japan | MIC (RCB 208) | RF, Telecom |
| Hong Kong | OFTA (US002) | RF, Telecom |

CONTENTS

1 REPORT REVISION HISTORY4

2 EXECUTIVE SUMMARY5

3 CUSTOMER INFORMATION5

4 TEST SITE INFORMATION5

5 MODIFICATION5

6 EUT INFORMATION6

6.1 EUT Description6

6.2 Radio Description6

6.3 EUT Photos - External8

6.4 EUT Photos - Internal10

6.5 EUT Test Setup Photos12

7 SUPPORTING EQUIPMENT/SOFTWARE AND CABLING DESCRIPTION13

7.1 Supporting Equipment13

7.2 Cabling Description13

7.3 Test Software Description13

8 TEST SUMMARY14

9 MEASUREMENT UNCERTAINTY15

10 MEASUREMENTS, EXAMINATION AND DERIVED RESULTS16

10.1 Conducted Emissions16

10.2 26 dB Bandwidth & 6 dB Bandwidth19

10.3 Peak Output Power23

10.4 Peak Spectral Density25

10.5 Radiated Emissions below 1GHz29

10.6 Radiated Spurious Emissions above 1GHz32

10.7 Dynamic Frequency Selection (DFS)41

ANNEX A. TEST INSTRUMENT54

ANNEX B. RADAR TYPE WAVEFORM CHARACTERISTIC55

ANNEX C. SIEMIC ACCREDITATION74

1 Report Revision History

| Report No. | Report Version | Description | Issue Date |
|---|----------------|--|------------|
| FCC_RF_SL15080601-ICT-016_UNII | None | Original | 12/02/2015 |
| FCC_RF_SL15080601-ICT-016_UNII Rev. 1.0 | 1.0 | Adding all the Frequency for 5GHZ band and power setting Adding DFS test data | 12/21/2015 |
| | | | |
| | | | |
| | | | |

2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: Intermec Technologies Corporation
Product: Mobile Computer
Model: 1007CP02L with HSM 5603ER

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page. This report is a permissive change for Band 1 and Band 4 on the new rules of UNII Band. You can refer to the original report for Band 2 and Band 3 testing. (FCC Test report SL12011201-ICT-001(WLAN_15.407) Rev1.0.pdf)

3 Customer information

| | | |
|----------------------|---|--|
| Applicant Name | : | Intermec Technologies Corporation |
| Applicant Address | : | 6001 36th Avenue West, Everett, WA 98203 |
| Manufacturer Name | : | Intermec Technologies Corporation |
| Manufacturer Address | : | 6001 36th Avenue West, Everett, WA 98203 |

4 Test site information

| | |
|----------------------|---|
| Lab performing tests | SIEMIC Laboratories |
| Lab Address | 775 Montague Expressway, Milpitas, CA 95035 |
| FCC Test Site No. | 881796 |
| IC Test Site No. | 4842D-2 |
| VCCI Test Site No. | A0133 |

5 Modification

| Index | Item | Description | Note |
|-------|------|-------------|------|
| - | - | - | - |
| | | | |
| | | | |
| | | | |
| | | | |

6 EUT Information

6.1 EUT Description

| | | |
|---------------------------|---|---------------------------|
| Product Name | : | Mobile Computer |
| Model No. | : | 1007CP02L with HSM 5603ER |
| Trade Name | : | Intermec |
| Serial No. | : | N/A |
| Host Model No. | : | N/A |
| Input Power | : | 4.4/4.7VDC 2/1.5A |
| Power Adapter Manu/Model | : | PSA10F-050Q |
| Power Adapter SN | : | N/A |
| Product Hardware version | : | 145-558-004 |
| Product Software version | : | CE OS 5.2.29217 |
| Radio Hardware version | : | LBEH5Z9UWC |
| Radio Software version | : | 1.61.22.72. |
| Test Software version | : | 1.10.00.0027 |
| Date of EUT received | : | October 15, 2015 |
| Equipment Class/ Category | : | UNII |
| Port/Connectors | : | I/O Port |

6.2 Radio Description

| Radio Type | 802.11a | 802.11n-20M |
|------------------------|--|--|
| Operating Frequency | 5180-5240MHz 5260-5320MHz 5500-5700MHz 5745-5805MHz | 5180-5240MHz 5260-5320MHz 5500-5700MHz 5745-5805MHz |
| Modulation | OFDM (BPSK, QPSK, 16QAM, 64QAM) | OFDM (BPSK, QPSK, 16QAM, 64QAM) |
| Channel Spacing | 20MHz | 20MHz |
| Number of Channels | 23 | 23 |
| Antenna Type | Planar Inverted F-Antenna | |
| Antenna Gain | 4.85dBi (for 5GHz) | |
| Antenna Connector Type | U.FL connector | |

EUT Power Settings

| 5.2 GHz | | | |
|-----------|-----------|------|----------------|
| Test mode | Freq(MHz) | CH | Power settings |
| 802.11a | 5180 | Low | 13.25 |
| | 5200 | Mid | 13.25 |
| | 5240 | High | 13.25 |
| 802.11n20 | 5180 | Low | 11.75 |
| | 5200 | Mid | 11.75 |
| | 5240 | High | 11.75 |

| 5.3 GHz | | | |
|-----------|-----------|------|----------------|
| Test mode | Freq(MHz) | CH | Power settings |
| 802.11a | 5260 | Low | 13.25 |
| | 5280 | Mid | 13.25 |
| | 5320 | High | 13.25 |
| 802.11n20 | 5260 | Low | 11.75 |
| | 5280 | Mid | 11.75 |
| | 5320 | High | 11.75 |

| 5.6 GHz | | | |
|-----------|-----------|------|----------------|
| Test mode | Freq(MHz) | CH | Power settings |
| 802.11a | 5500 | Low | 13.00 |
| | 5580 | Mid | 13.00 |
| | 5700 | High | 12.50 |
| 802.11n20 | 5500 | Low | 11.50 |
| | 5580 | Mid | 11.50 |
| | 5700 | High | 11.00 |

| 5.8 GHz | | | |
|-----------|-----------|------|----------------|
| Test mode | Freq(MHz) | CH | Power settings |
| 802.11a | 5745 | Low | 11.375 |
| | 5785 | Mid | 11.375 |
| | 5805 | High | 11.375 |
| 802.11n20 | 5745 | Low | 9.875 |
| | 5785 | Mid | 9.875 |
| | 5805 | High | 9.875 |

6.3 EUT Photos - External



Top View



Bottom View



Front View



Rear View



Left View



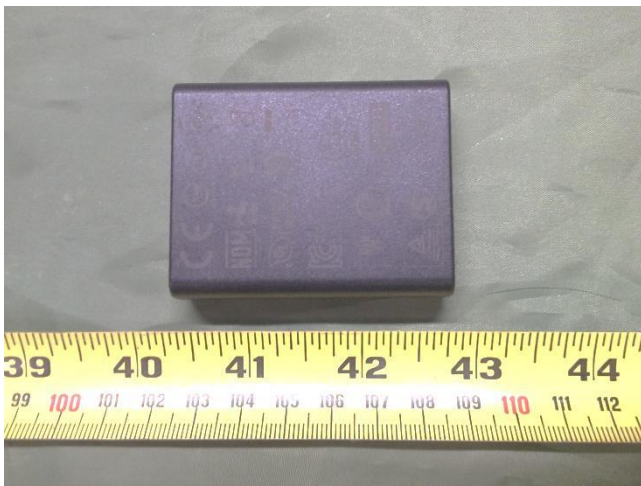
Right View



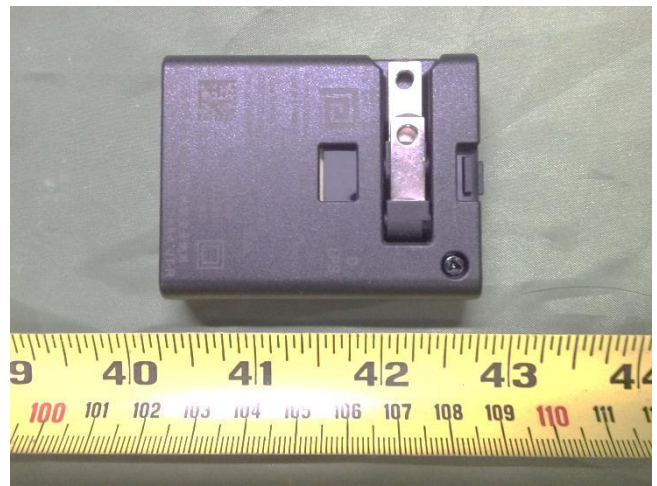
Battery –Top View



Battery –Bottom View



DC Adapter –Top View



DC Adapter –Bottom View

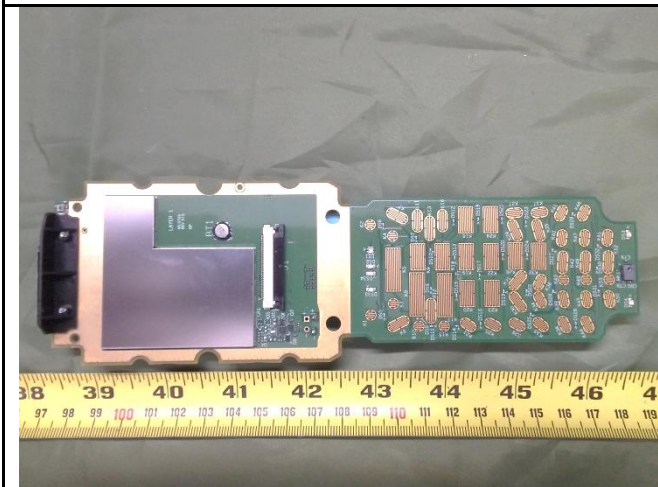
6.4 EUT Photos - Internal



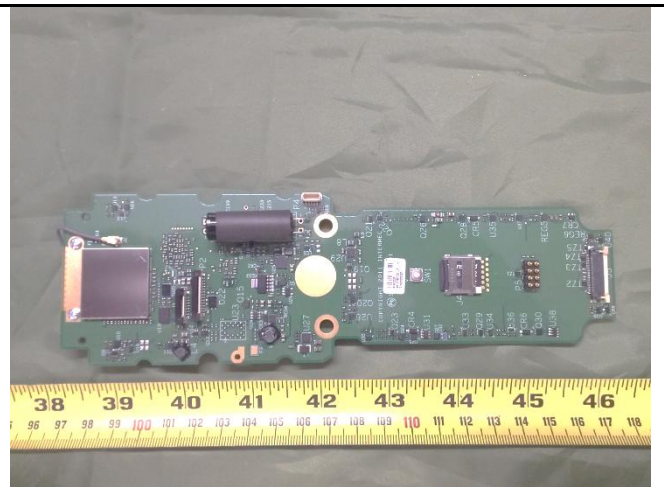
EUT – Rear cover off



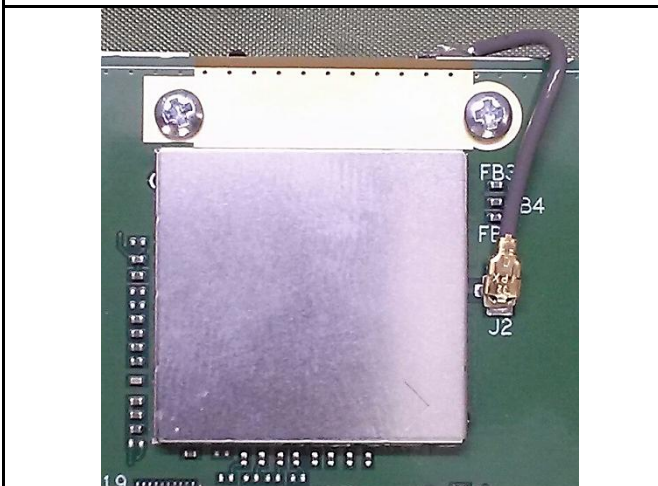
EUT – without scan engine



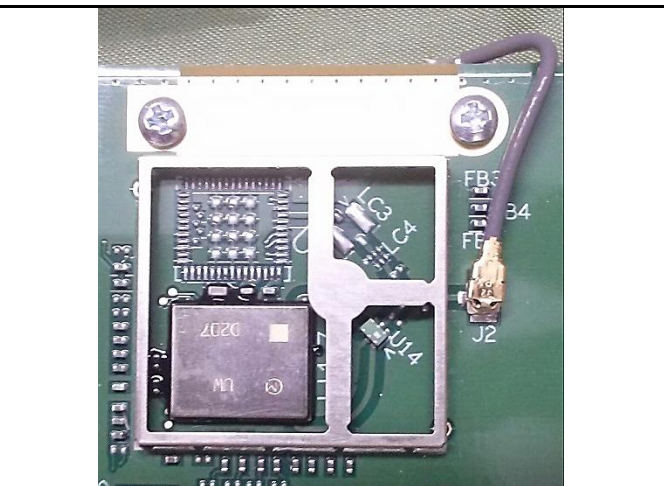
Main Board - Front View



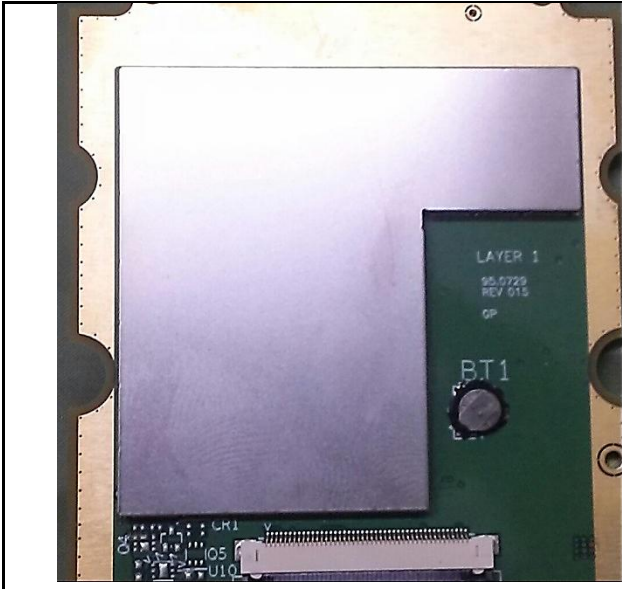
Main Board - Rear View



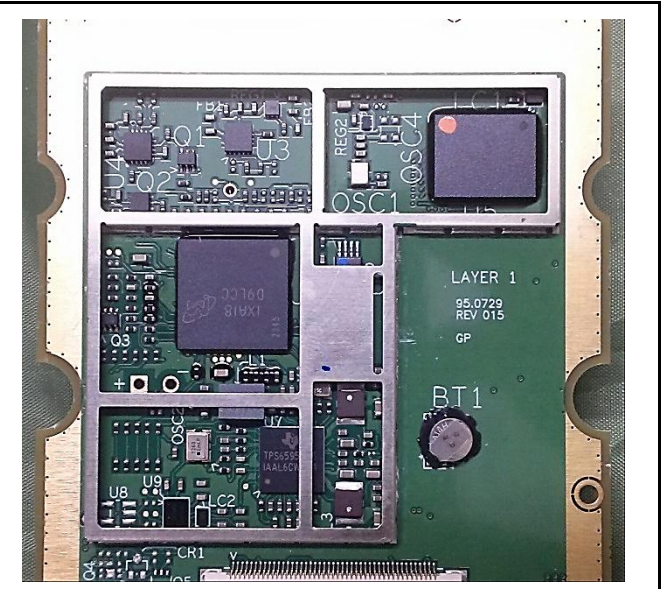
WLAN Board with Shielding



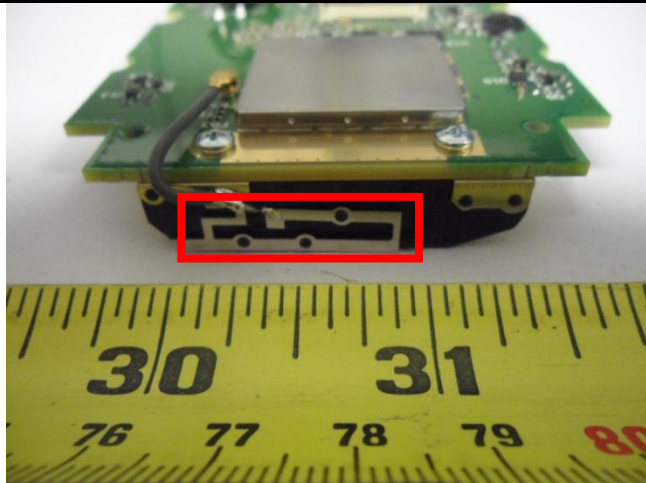
WLAN Board without Shielding



Bluetooth Board with Shielding

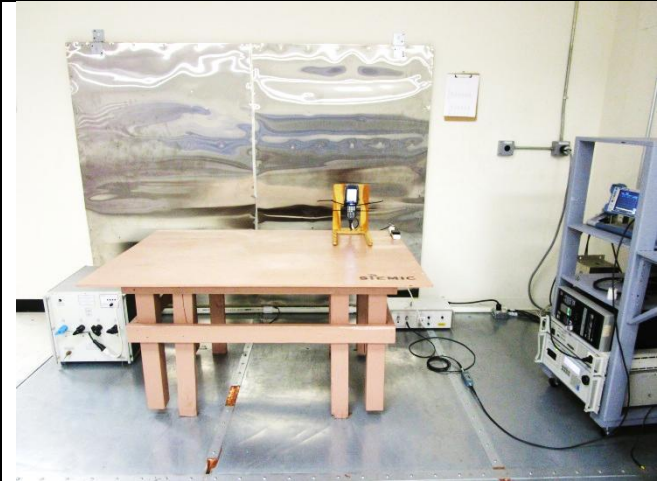


Bluetooth Board without Shielding



BT & WLAN Antenna View

6.5 EUT Test Setup Photos



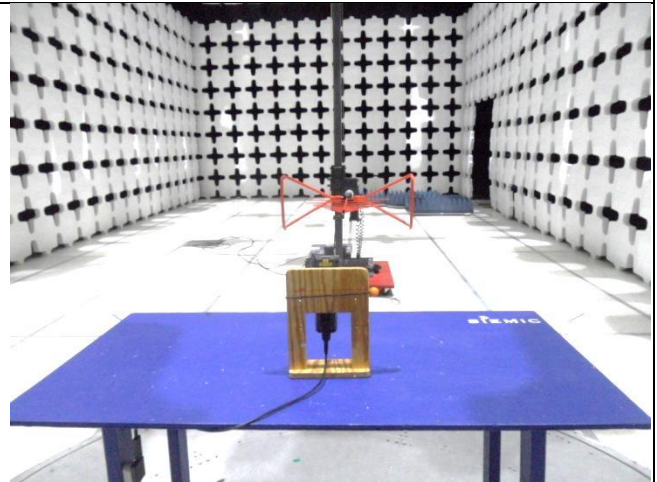
AC Conducted Emission (Front View)



AC Conducted Emission (Rear View)



Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View



Radiated Emissions (>1GHz) – Front View



Radiated Emissions (>1GHz) – Rear View

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

| Item | Supporting Equipment Description | Model | Serial Number | Manufacturer | Note |
|------|----------------------------------|-------------|---------------|--------------|------|
| 1 | DC charger | PSA10F-050Q | N/A | INTERMEC | - |
| | | | | | |
| | | | | | |

7.2 Cabling Description

| Name | Connection Start | | Connection Stop | | Length / shielding Info | | Note |
|------|------------------|----------|-----------------|----------|-------------------------|-----------|------|
| | From | I/O Port | To | I/O Port | Length (m) | Shielding | |
| - | DC Charger | USB | EUT | USB | 0.5 | Shielded | - |
| | | | | | | | |

7.3 Test Software Description

| Test Item | Software | Description |
|------------|-------------------|--|
| RF Testing | TTE test software | Set the EUT to transmit continuously in diferent test mode |
| | | |
| | | |

8 Test Summary

| Test Item | Test standard | | Test Method/Procedure | Pass / Fail |
|--------------------------------|---------------|-----------|--|--|
| Restricted Band of Operation | FCC | 15.205 | ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v01 | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A |
| AC Conducted Emissions Voltage | FCC | 15.207(a) | ANSI C63.10: 2013 | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A |

| Test Item | Test standard | | Test Method/Procedure | Pass / Fail |
|---|---------------|-------------------------------|--|--|
| 26 & 6 dB Emission Bandwidth | FCC | 15.407 (a)(2) | 789033 D02 General UNII Test Procedures New Rules v01 | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A |
| 99% Occupied Bandwidth | FCC | 15.407(a)(2) | 789033 D02 General UNII Test Procedures New Rules v01 | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A |
| Maximum conducted Output Power | FCC | 15.407 (a)(2) | 789033 D02 General UNII Test Procedures New Rules v01 | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A |
| Power reduction (Antenna Gain > 6 dBi) | FCC | 15.407 (a)(2) | - | <input type="checkbox"/> Pass <input checked="" type="checkbox"/> N/A |
| Band Edge and Radiated Spurious Emissions | FCC | 15.407(b)(2), 15.407(b)(6) | ANSI C63.10: 2013 789033 D02 General UNII Test Procedures New Rules v01 | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A |
| Power Spectral Density | FCC | 15.407 (a)(2) | 789033 D02 General UNII Test Procedures New Rules v01 | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A |
| Dynamic Frequency Selection (DFS) | FCC | 47CFR15.407 (h) | 905462 D02 UNII DFS Compliance Procedures New Rules v01 | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A |

| | |
|--------|---|
| Remark | <ol style="list-style-type: none"> All measurement uncertainties are not taken into consideration for all presented test result. The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual. This report is permissive change on new rules of the UNII Band. Kindly refer to the original report (FCC Test report SL12011201-ICT-001(WLAN_15.407) Rev1.0.pdf) |
|--------|---|

9 Measurement Uncertainty

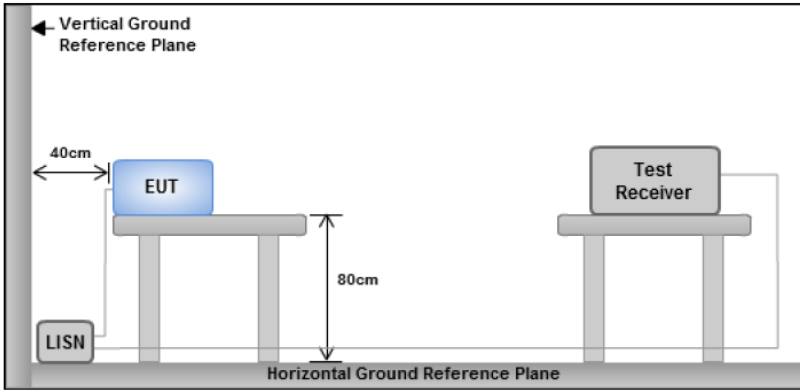
| Emissions | | | |
|--|-----------------|---|---------------|
| Test Item | Frequency Range | Description | Uncertainty |
| Band Edge and Radiated Spurious Emissions | 30MHz – 1GHz | Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m) | +5.6dB/-4.5dB |
| Band Edge and Radiated Spurious Emissions | 1GHz – 40GHz | Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m) | +4.3dB/-4.1dB |
| Dynamic frequency selection (DFS) Conducted Measurement | 5GHz – 6GHz | Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 | ±1.5dB |

10 Measurements, Examination and Derived Results

10.1 Conducted Emissions

Conducted Emission Limit

| Frequency ranges (MHz) | Limit (dBuV) | |
|------------------------|--------------|---------|
| | QP | Average |
| 0.15 ~ 0.5 | 66 – 56 | 56 – 46 |
| 0.5 ~ 5 | 56 | 46 |
| 5 ~ 30 | 60 | 50 |

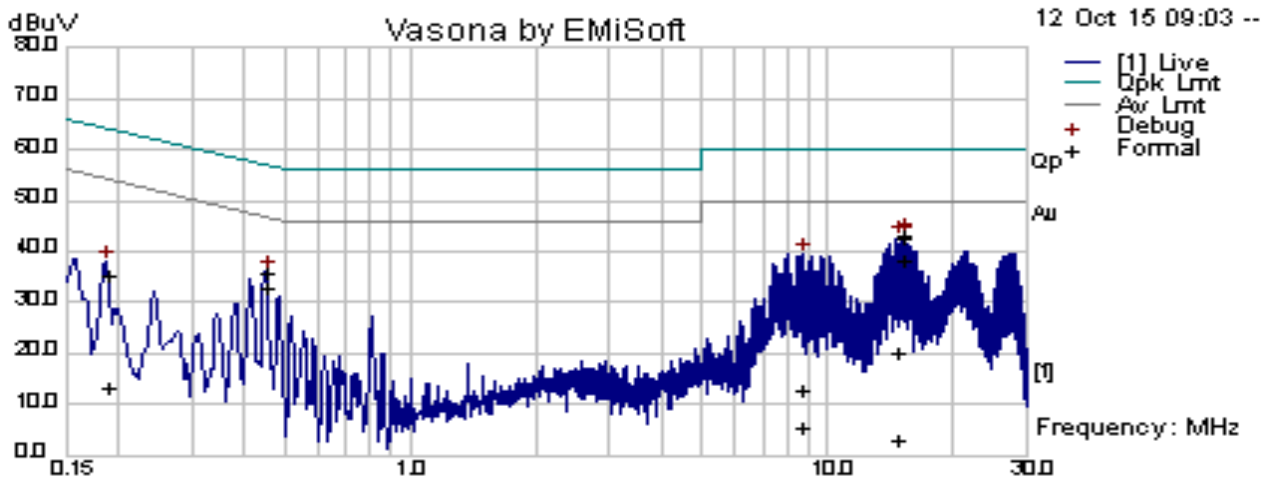
| Spec | Item | Requirement | Applicable |
|--------------|--|--|------------|
| 47CFR§15.207 | a) | For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency 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/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequency ranges. | ☒ |
| Test Setup |  <p style="text-align: center;">Note: 1. Support units were connected to second LISN. 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes</p> | | |
| Procedure | <ul style="list-style-type: none"> - The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B. - The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains. - The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. - All other supporting equipment was powered separately from another main supply. | | |
| Remark | EUT was tested at 120VAC, 60Hz | | |
| Result | ☒ Pass ☐ Fail | | |

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Conducted Emission Test Results

| | | | | | |
|---------------------------|---------------------|------|--|---------|---|
| Test specification: | Conducted Emissions | | | Result: | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |
| Environmental Conditions: | Temp(°C): | 21 | | | |
| | Humidity (%): | 42 | | | |
| | Atmospheric(mbar): | 1021 | | | |
| Mains Power: | 120Vac, 60Hz | | | | |
| Tested by: | Teody Manansala | | | | |
| Test Date: | 10/12/2015 | | | | |
| Remarks | AC Line @ Line | | | | |

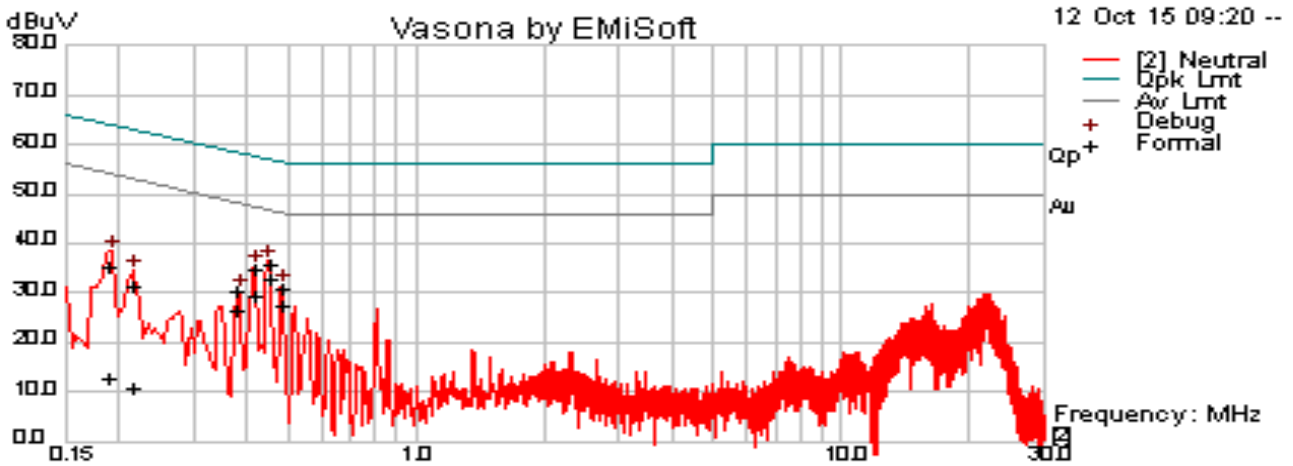


Line Plot at 120Vac, 60Hz

| Frequency (MHz) | Raw (dBuV) | Cable Loss (dB) | Factors (dB) | Level (dBuV) | Measurement Type | Line | Limit (dBuV) | Margin (dB) | Pass /Fail |
|-----------------|------------|-----------------|--------------|--------------|------------------|------|--------------|-------------|------------|
| 15.12 | 31.83 | 10.06 | 0.60 | 42.49 | Quasi Peak | Live | 60.00 | -17.51 | Pass |
| 15.24 | 32.62 | 10.06 | 0.60 | 43.28 | Quasi Peak | Live | 60.00 | -16.72 | Pass |
| 14.65 | 9.47 | 10.06 | 0.60 | 20.12 | Quasi Peak | Live | 60.00 | -39.88 | Pass |
| 8.66 | 2.09 | 10.05 | 0.55 | 12.69 | Quasi Peak | Live | 60.00 | -47.31 | Pass |
| 0.45 | 25.03 | 10.01 | 0.71 | 35.75 | Quasi Peak | Live | 56.87 | -21.12 | Pass |
| 0.19 | 24.02 | 10.00 | 1.39 | 35.41 | Quasi Peak | Live | 64.04 | -28.63 | Pass |
| 15.12 | 27.64 | 10.06 | 0.60 | 38.31 | Average | Live | 50.00 | -11.69 | Pass |
| 15.24 | 27.44 | 10.06 | 0.60 | 38.10 | Average | Live | 50.00 | -11.90 | Pass |
| 14.65 | -7.61 | 10.06 | 0.60 | 3.05 | Average | Live | 50.00 | -46.95 | Pass |
| 8.66 | -5.06 | 10.05 | 0.55 | 5.54 | Average | Live | 50.00 | -44.46 | Pass |
| 0.45 | 21.90 | 10.01 | 0.71 | 32.62 | Average | Live | 46.87 | -14.25 | Pass |
| 0.19 | 1.67 | 10.00 | 1.39 | 13.06 | Average | Live | 54.04 | -40.98 | Pass |

Conducted Emission Test Results

| | | | | | |
|---------------------------|---------------------|------|--|---------|---|
| Test specification: | Conducted Emissions | | | Result: | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |
| Environmental Conditions: | Temp(°C): | 21 | | | |
| | Humidity (%): | 42 | | | |
| | Atmospheric(mbar): | 1021 | | | |
| Mains Power: | 120Vac, 60Hz | | | | |
| Tested by: | Teody Manansala | | | | |
| Test Date: | 10/12/2015 | | | | |
| Remarks | AC Line @ Neutral | | | | |



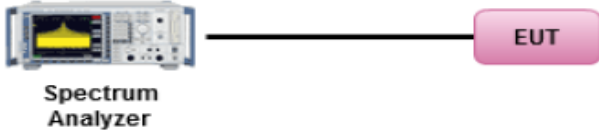
Neutral Plot at 120Vac, 60Hz

| Frequency (MHz) | Raw (dBuV) | Cable Loss (dB) | Factors (dB) | Level (dBuV) | Measurement Type | Line | Limit (dBuV) | Margin (dB) | Pass /Fail |
|-----------------|------------|-----------------|--------------|--------------|------------------|---------|--------------|-------------|------------|
| 0.45 | 25.23 | 10.01 | 0.71 | 35.95 | Quasi Peak | Neutral | 56.87 | -20.92 | Pass |
| 0.42 | 24.02 | 10.01 | 0.74 | 34.77 | Quasi Peak | Neutral | 57.54 | -22.77 | Pass |
| 0.48 | 20.45 | 10.01 | 0.69 | 31.15 | Quasi Peak | Neutral | 56.26 | -25.11 | Pass |
| 0.19 | 24.15 | 10.00 | 1.39 | 35.54 | Quasi Peak | Neutral | 64.08 | -28.54 | Pass |
| 0.38 | 19.74 | 10.01 | 0.77 | 30.52 | Quasi Peak | Neutral | 58.27 | -27.75 | Pass |
| 0.22 | 20.05 | 10.00 | 1.22 | 31.27 | Quasi Peak | Neutral | 62.94 | -31.67 | Pass |
| 0.45 | 22.05 | 10.01 | 0.71 | 32.77 | Average | Neutral | 46.87 | -14.10 | Pass |
| 0.42 | 18.79 | 10.01 | 0.74 | 29.54 | Average | Neutral | 47.54 | -18.00 | Pass |
| 0.48 | 16.60 | 10.01 | 0.69 | 27.29 | Average | Neutral | 46.26 | -18.96 | Pass |
| 0.19 | 1.30 | 10.00 | 1.39 | 12.70 | Average | Neutral | 54.08 | -41.38 | Pass |
| 0.38 | 15.92 | 10.01 | 0.77 | 26.70 | Average | Neutral | 48.27 | -21.57 | Pass |
| 0.22 | -0.43 | 10.00 | 1.22 | 10.79 | Average | Neutral | 52.94 | -42.15 | Pass |

Note: The results above show only the worst case.

10.2 26 dB Bandwidth & 6 dB Bandwidth

Requirement(s):

| Spec | Item | Requirement | Applicable |
|----------------|--|--|--|
| § 15.407 | - | 26 dB Emission BW: Report only for reference. | <input checked="" type="checkbox"/> |
| | a) (2) | 26 dB Emission BW: Report only for power limit calculation. | <input checked="" type="checkbox"/> |
| | e) | Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz. | <input checked="" type="checkbox"/> |
| Test Setup |  | | |
| Test Procedure | <p>789033 D02 General UNII Test Procedures New Rules v01</p> <p><u>26dB Emission bandwidth measurement procedure (Other than 5.725-5.85 GHz)</u></p> <ul style="list-style-type: none"> - Allow the trace to stabilize. - Use the spectrum analyzer built-in measurement function to determine the 26dB BW. <ul style="list-style-type: none"> o Set RBW = around 1% of emission bandwidth o Set VBW > RBW o Detector = Peak o Trace mode = max hold - Capture the plot. - Repeat above steps for different test channel and other modulation type. <p><u>6 dB Minimum emission bandwidth measurement procedure (for 5.725-5.85 GHz)</u></p> <ul style="list-style-type: none"> - Allow the trace to stabilize. - Use the spectrum analyzer built-in measurement function to determine the 6dB BW. <ul style="list-style-type: none"> o Set RBW = 100 KHz o Set VBW ≥ 3 x RBW o Detector = Peak o Trace mode = max hold o Sweep = auto couple - Capture the plot. - Repeat above steps for different test channel and other modulation type. | | |
| Test Date | 11/19/2015 | Environmental condition | Temperature 22°C Relative Humidity 38% Atmospheric Pressure 1020mbar |
| Remark | None | | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | |

Equipment Setting

| Test | RBW | VBW | Span | Detector | Sweep | Trace | Notes |
|--------------------------|-----------------|----------|----------------------|----------|-------|---------|-------|
| 26 dB Emission Bandwidth | 1% of 26 dB EBW | >RBW | >EBW | PK | Auto | Maxhold | - |
| 6 dB Bandwidth | 100 KHz | ≥3 x RBW | 1.5 - 5 times of OBW | PK | Auto | Maxhold | - |

Test Data Yes N/A

Test Plot Yes N/A

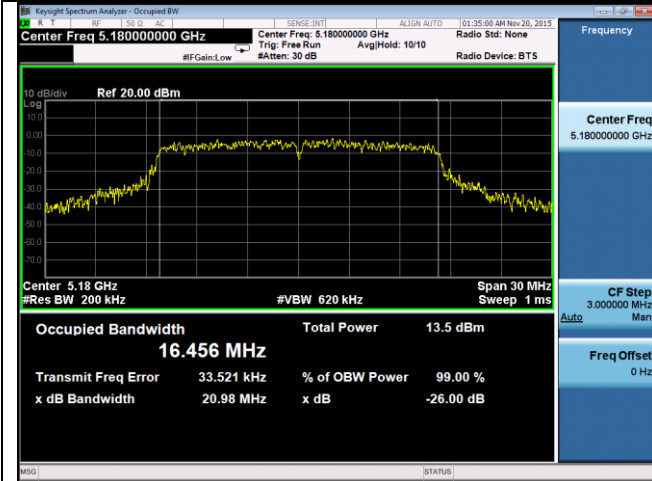
26dB Bandwidth measurement result for 5.2GHz

| Test mode | Freq (MHz) | CH | Result(MHz) | Limit (MHz) |
|-----------|------------|------|-------------|-------------|
| | | | 26dB | |
| 802.11a | 5180 | Low | 20.98 | - |
| | 5200 | Mid | 20.82 | - |
| | 5240 | High | 19.32 | - |
| 802.11n20 | 5180 | Low | 22.09 | - |
| | 5200 | Mid | 22.30 | - |
| | 5240 | High | 21.88 | - |

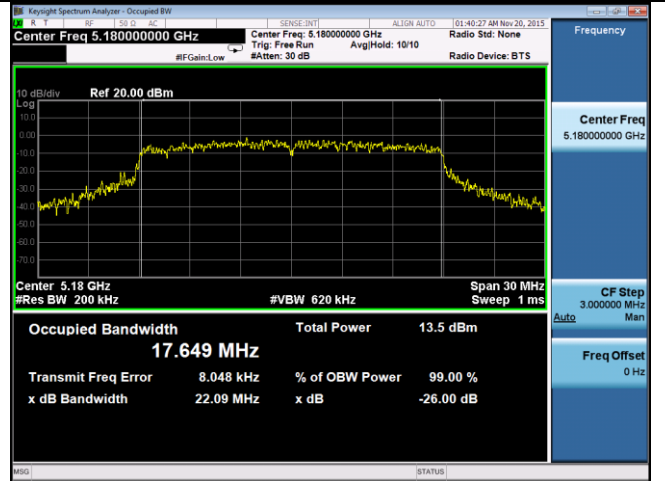
6dB Bandwidth measurement result for 5.8GHz

| Test mode | Freq (MHz) | CH | 6dB Result(MHz) | Limit (MHz) | Result |
|-----------|------------|------|-----------------|-------------|--------|
| 802.11a | 5745 | Low | 16.05 | >0.5 | pass |
| | 5785 | Mid | 15.63 | >0.5 | pass |
| | 5805 | High | 16.34 | >0.5 | pass |
| 802.11n20 | 5745 | Low | 17.55 | >0.5 | pass |
| | 5785 | Mid | 17.29 | >0.5 | pass |
| | 5805 | High | 17.60 | >0.5 | pass |

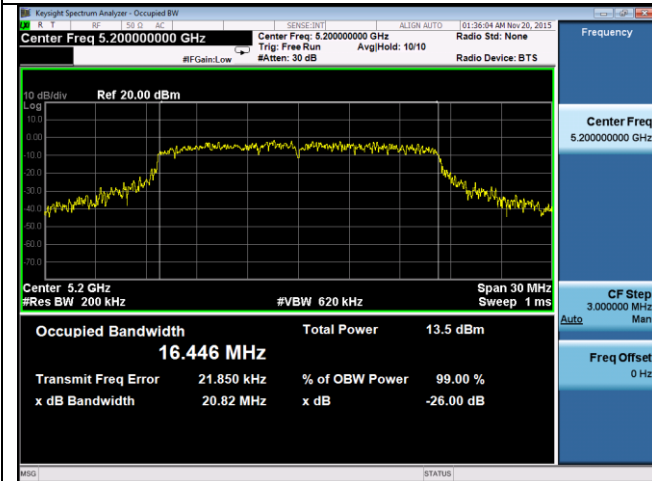
26dB & 99% Bandwidth Test Plots



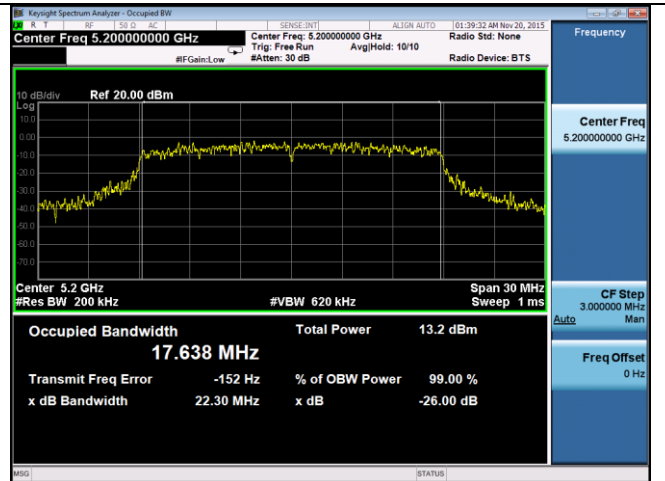
26dB BW - 802.11a 5180MHz



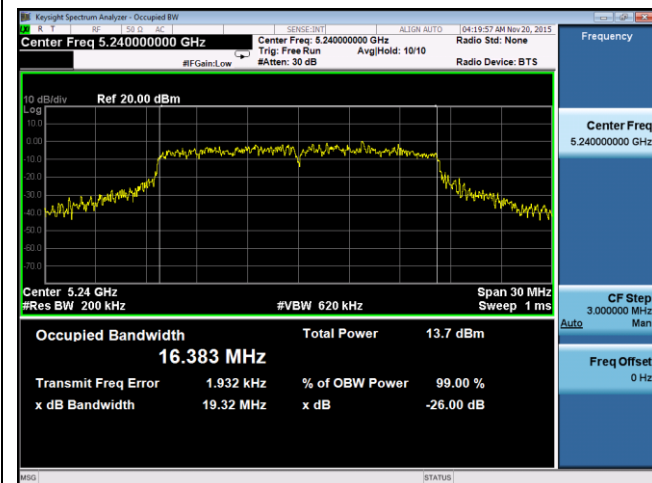
26dB BW - 802.11n-20M 5180MHz



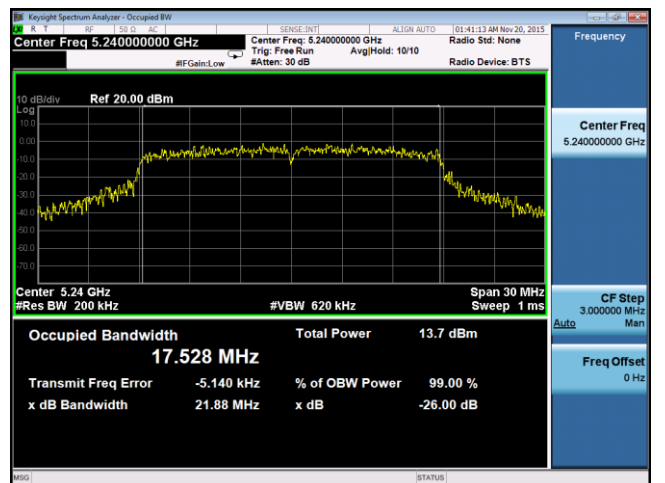
26dB BW - 802.11a 5200MHz



26dB BW - 802.11n-20M 5200MHz



26dB BW - 802.11a 5240MHz

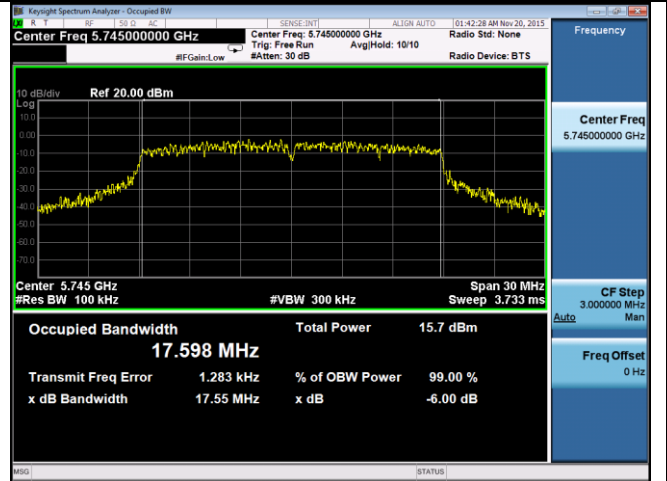


26dB BW - 802.11n-20M 5240MHz

6dB Bandwidth Test Plots



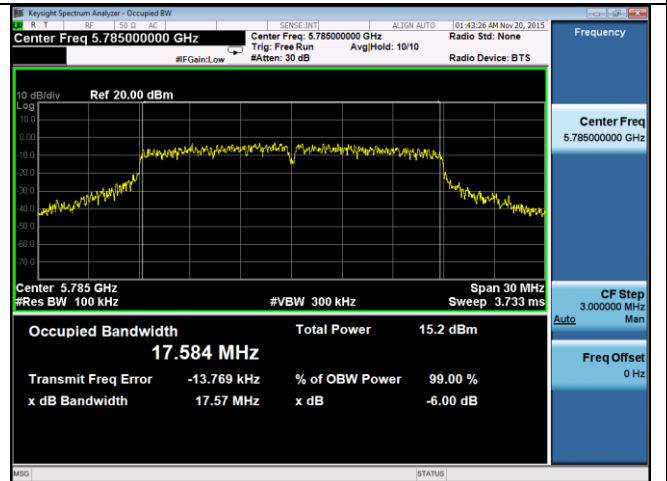
6dB BW 802.11a 5745MHz



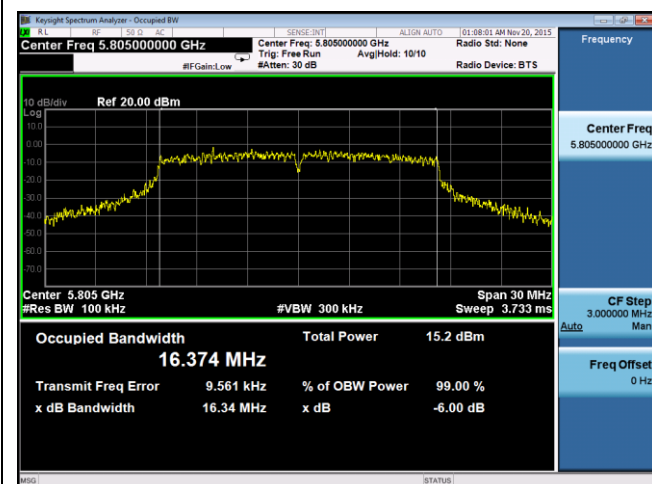
6dB BW 802.11n-20M 5745MHz



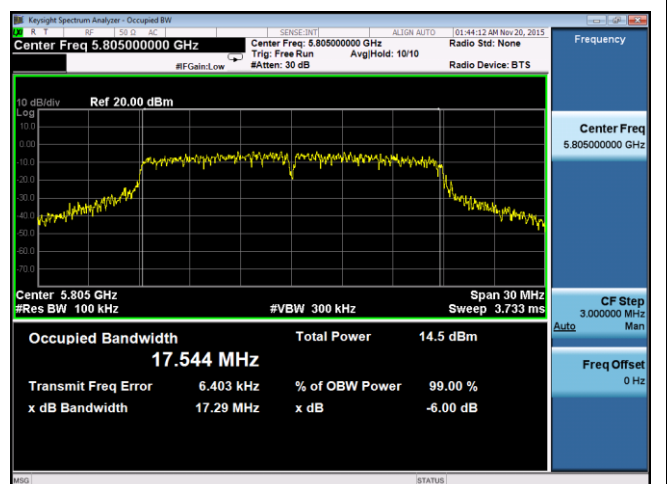
99% & 6dB BW 802.11a 5785MHz



99% & 6dB BW 802.11n-20M 5785MHz



6dB BW 802.11a 5805MHz



6dB BW 802.11n-20M 5805MHz

10.3 Peak Output Power

Requirement(s):

| Spec | Item | Requirement | Applicable |
|----------|------------|---|-------------------------------------|
| § 15.407 | a)(1)(i) | For an outdoor 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm). | <input type="checkbox"/> |
| | a)(1)(ii) | 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. | <input type="checkbox"/> |
| | a)(1)(iii) | For fixed point-to-point access points 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. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. | <input type="checkbox"/> |
| | a)(1)(iv) | For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. | <input checked="" type="checkbox"/> |
| | a)(2) | For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. | <input type="checkbox"/> |
| | a)(3) | For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. | <input checked="" type="checkbox"/> |



| | | | |
|----------------|---|--|--|
| Test Procedure | <p>789033 D02 General UNII Test Procedures New Rules v01</p> <p><u>Measurement using a Power Meter (PM)</u></p> <p>Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.</p> <ul style="list-style-type: none"> - Connect EUT's RF output power to power meter - Set EUT to be continuous transmission mode - Measurement the average output power using power meter and record the result - Repeat above steps for different test channel and other modulation type. | | |
|----------------|---|--|--|

| | | | |
|-----------|------------|-------------------------|--|
| Test Date | 09/10/2015 | Environmental condition | Temperature 21°C Relative Humidity 40% Atmospheric Pressure 1019mbar |
|-----------|------------|-------------------------|--|

| | |
|--------|--|
| Remark | - |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |

Test Data Yes N/A

Test Plot Yes (See below) N/A

Output Power measurement result :

| 5.2 GHz | | | | | |
|-----------|-----------|------|-----------------------|-------------|--------|
| Test mode | Freq(MHz) | CH | Conducted Power (dBm) | Limit (dBm) | Result |
| 802.11a | 5180 | Low | 11.77 | 30 | pass |
| | 5200 | Mid | 11.67 | 30 | pass |
| | 5240 | High | 11.79 | 30 | pass |
| 802.11n20 | 5180 | Low | 11.71 | 30 | pass |
| | 5200 | Mid | 11.59 | 30 | pass |
| | 5240 | High | 11.79 | 30 | pass |

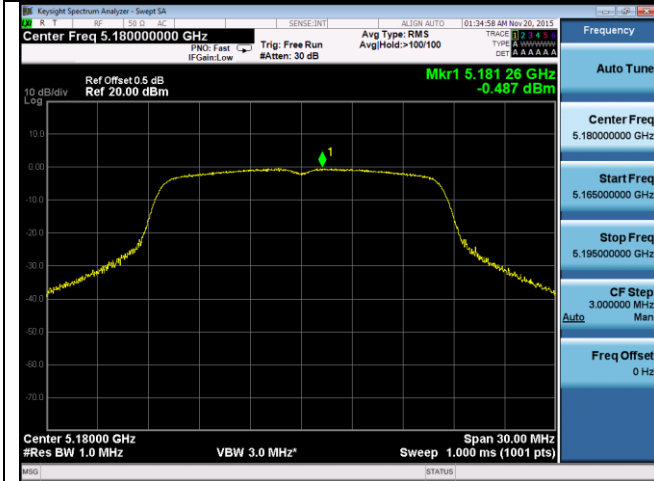
| 5.8 GHz | | | | | |
|-----------|-----------|------|-----------------------|-------------|--------|
| Test mode | Freq(MHz) | CH | Conducted Power (dBm) | Limit (dBm) | Result |
| 802.11a | 5745 | Low | 13.03 | 30 | Pass |
| | 5785 | Mid | 12.81 | 30 | Pass |
| | 5805 | High | 12.40 | 30 | Pass |
| 802.11n20 | 5745 | Low | 13.01 | 30 | Pass |
| | 5785 | Mid | 12.75 | 30 | Pass |
| | 5805 | High | 12.43 | 30 | Pass |

PSD measurement results :

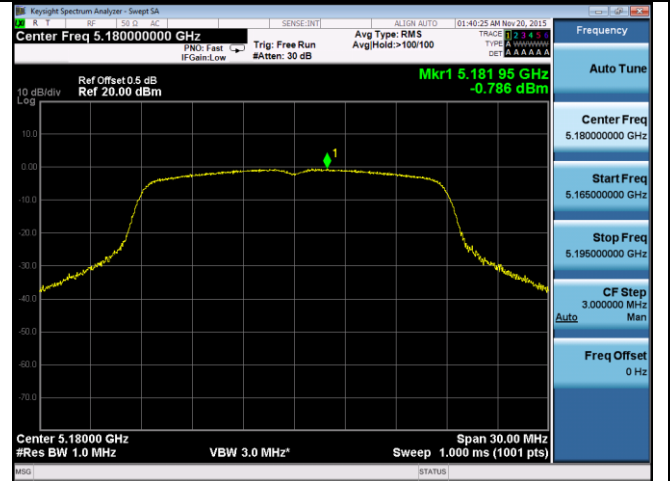
| 5.2 GHz | | | | | |
|-----------|-----------|------|-------------------------|-----------------|--------|
| Test mode | Freq(MHz) | CH | Conducted PSD (dBm/MHz) | Limit (dBm/MHz) | Result |
| 802.11a | 5180 | Low | -0.487 | 11 | Pass |
| | 5200 | Mid | -0.457 | 11 | Pass |
| | 5240 | High | -0.219 | 11 | Pass |
| 802.11n20 | 5180 | Low | -0.786 | 11 | Pass |
| | 5200 | Mid | -0.712 | 11 | Pass |
| | 5240 | High | -0.118 | 11 | Pass |

| 5.8 GHz | | | | | | | |
|--------------|---|------|----------------------------|--------------------|---------------------------|--------------------|--------|
| Test mode | Freq(MHz) | CH | Conducted PSD (dBm/100KHz) | Correction Factor* | Combined PSD (dBm/500KHz) | Limit (dBm/500KHz) | Result |
| 802.11a | 5745 | Low | -6.797 | 6.99 | 0.193 | 30 dBm | Pass |
| | 5785 | Mid | -7.686 | 6.99 | -0.696 | 30 dBm | Pass |
| | 5805 | High | -7.976 | 6.99 | -0.986 | 30 dBm | Pass |
| 802.11n20 | 5745 | Low | -7.634 | 6.99 | -0.644 | 30 dBm | Pass |
| | 5785 | Mid | -7.753 | 6.99 | -0.763 | 30 dBm | Pass |
| | 5805 | High | -8.229 | 6.99 | -1.239 | 30 dBm | Pass |
| *Note | BW correction factor = $10\log(500\text{kHz}/\text{RBW})$ | | | | | | |

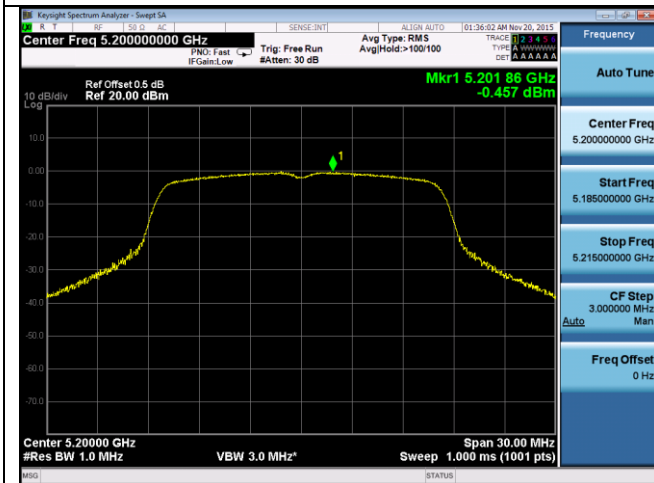
Test Plots



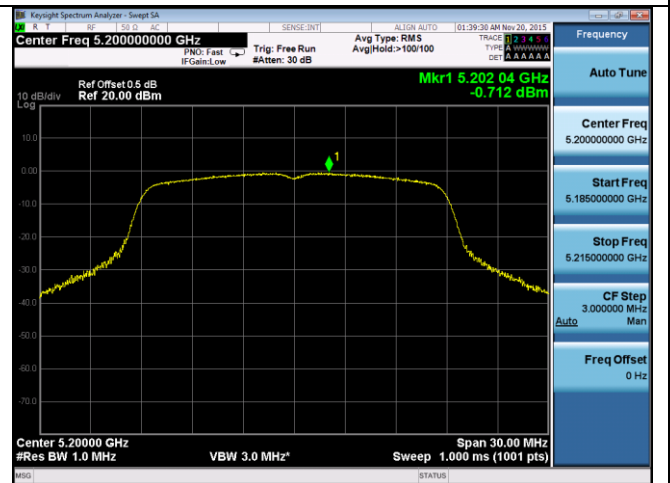
PSD-802.11a 5180MHz



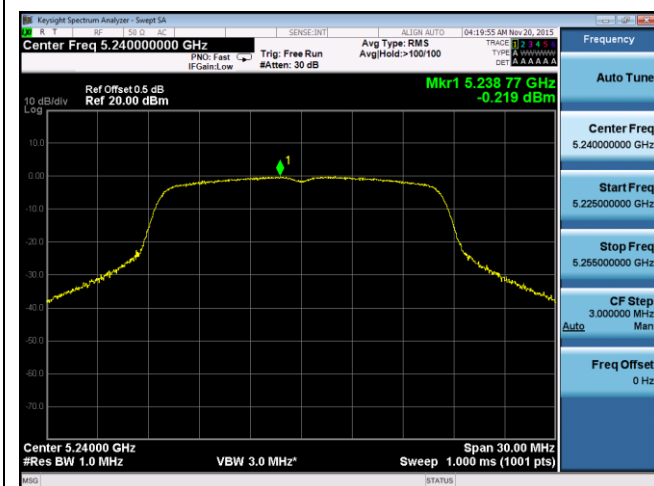
PSD-802.11n-20M 5180MHz



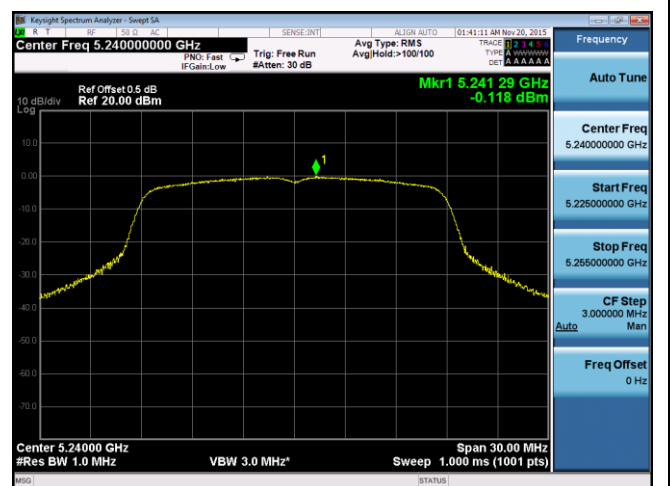
PSD-802.11a 5200MHz



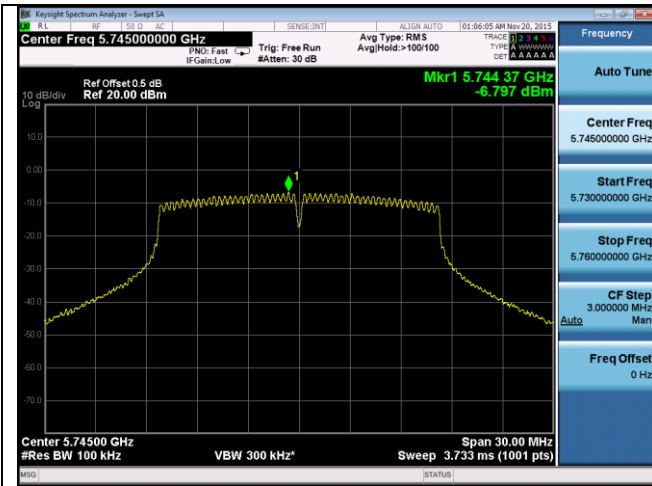
PSD-802.11n-20M 5200 MHz



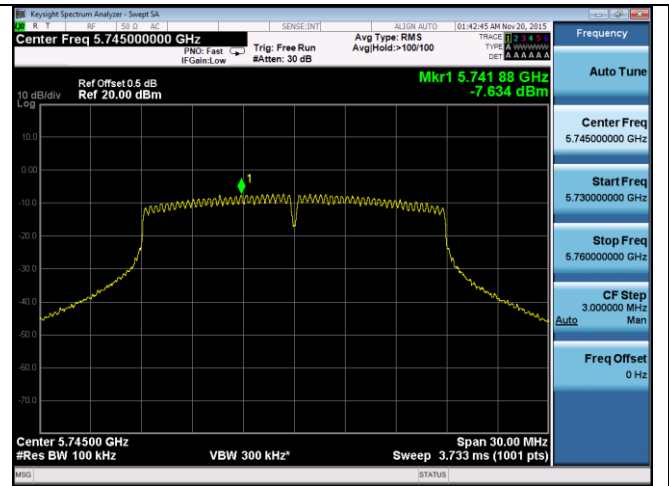
PSD-802.11a 5240MHz



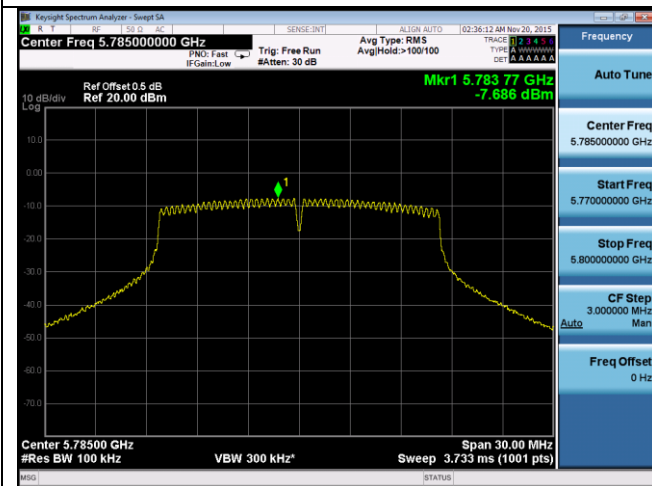
PSD-802.11n-20M 5240MHz



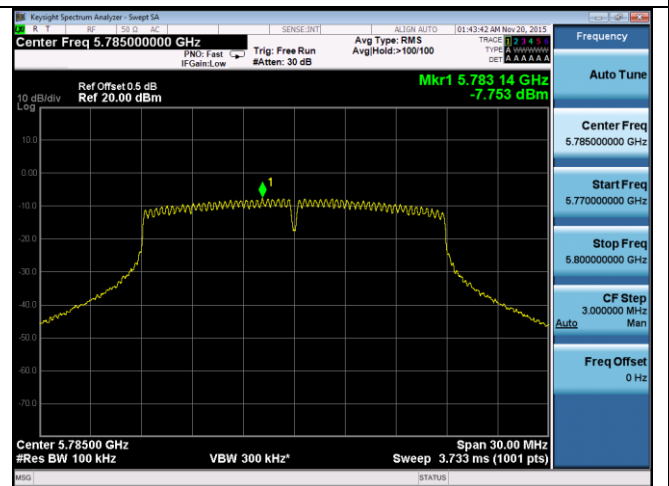
PSD-802.11a 5745MHz



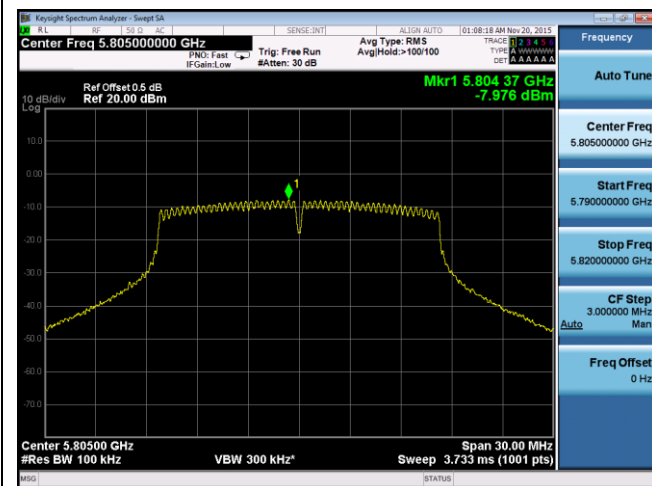
PSD-802.11n-20M 5745MHz



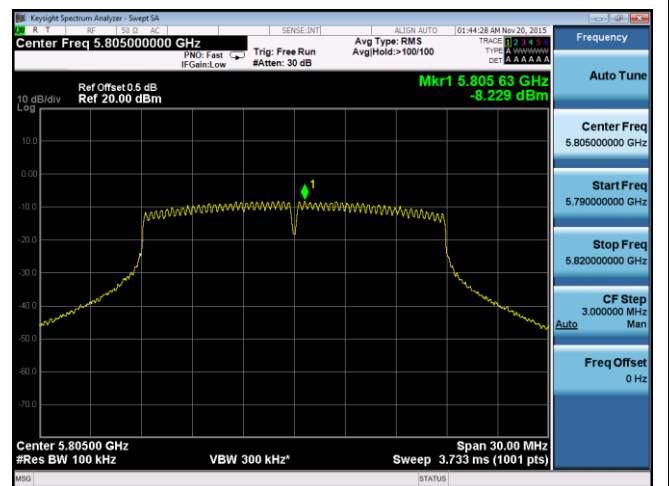
PSD-802.11a 5785MHz



PSD-802.11n-20M 5785MHz



PSD-802.11a 5805MHz



PSD-802.11n-20M 5805MHz

10.5 Radiated Emissions below 1GHz

Requirement(s):

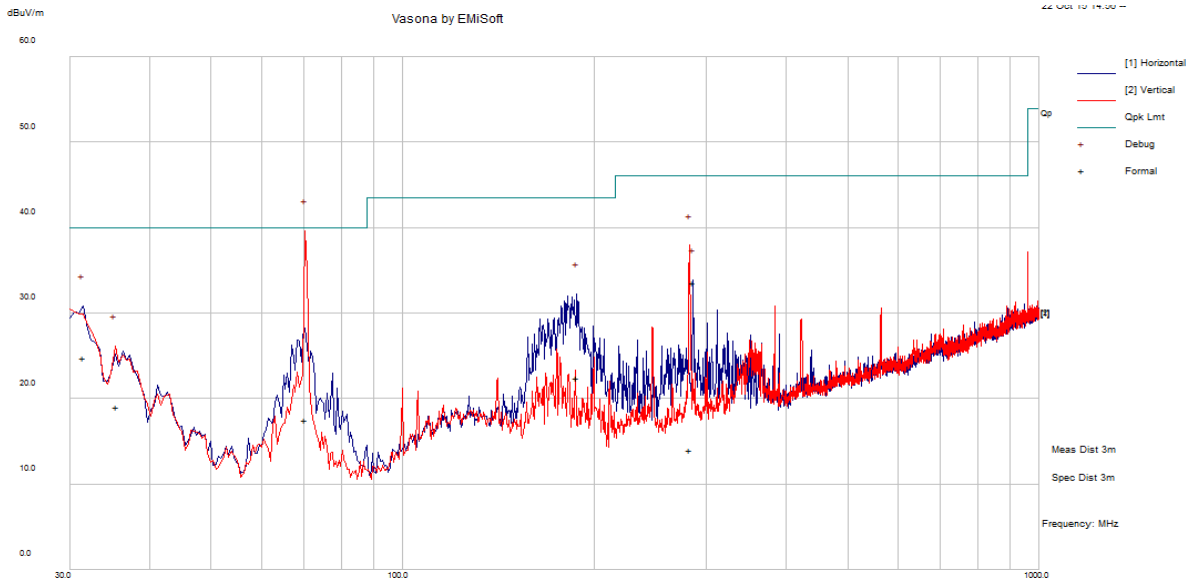
| Spec | Requirement | Applicable | | | | | | | | | | |
|-----------------------------------|--|-----------------------|-----------------------|---------|-----|----------|-----|---------|-----|-----------|-----|---|
| 47CFR§ 15.407(b) 15.209 (a) | <p>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges</p> <table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength (uV/m)</th> </tr> </thead> <tbody> <tr> <td>30 – 88</td> <td>100</td> </tr> <tr> <td>88 – 216</td> <td>150</td> </tr> <tr> <td>216 960</td> <td>200</td> </tr> <tr> <td>Above 960</td> <td>500</td> </tr> </tbody> </table> | Frequency range (MHz) | Field Strength (uV/m) | 30 – 88 | 100 | 88 – 216 | 150 | 216 960 | 200 | Above 960 | 500 | ☒ |
| Frequency range (MHz) | Field Strength (uV/m) | | | | | | | | | | | |
| 30 – 88 | 100 | | | | | | | | | | | |
| 88 – 216 | 150 | | | | | | | | | | | |
| 216 960 | 200 | | | | | | | | | | | |
| Above 960 | 500 | | | | | | | | | | | |
| Test Setup | | | | | | | | | | | | |
| Procedure | <ol style="list-style-type: none"> The EUT was switched on and allowed to warm up to its normal operating condition. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: <ol style="list-style-type: none"> Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. The EUT was then rotated to the direction that gave the maximum emission. Finally, the antenna height was adjusted to the height that gave the maximum emission. A Quasi-peak measurement was then made for that frequency point. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured. | | | | | | | | | | | |
| Remark | Both horizontal and vertical polarities were investigated. The results show only the worst case. | | | | | | | | | | | |
| Result | ☒ Pass ☐ Fail | | | | | | | | | | | |

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Radiated Emission Test Results (Below 1GHz) (Omnidirectional Antenna)

| | | | | | |
|---------------------------|--------------------|------|--|--------|------|
| Test specification | Above 1GHz | | | Result | Pass |
| Environmental Conditions: | Temp (°C): | 25.7 | | | |
| | Humidity (%) | 29 | | | |
| | Atmospheric (mPa): | 1021 | | | |
| Mains Power: | 110VAC, 60Hz | | | | |
| Tested by: | Teody Manansala | | | | |
| Test Date: | 22-Oct-15 | | | | |
| Remarks: | 5.2GHz 11a 5200MHz | | | | |

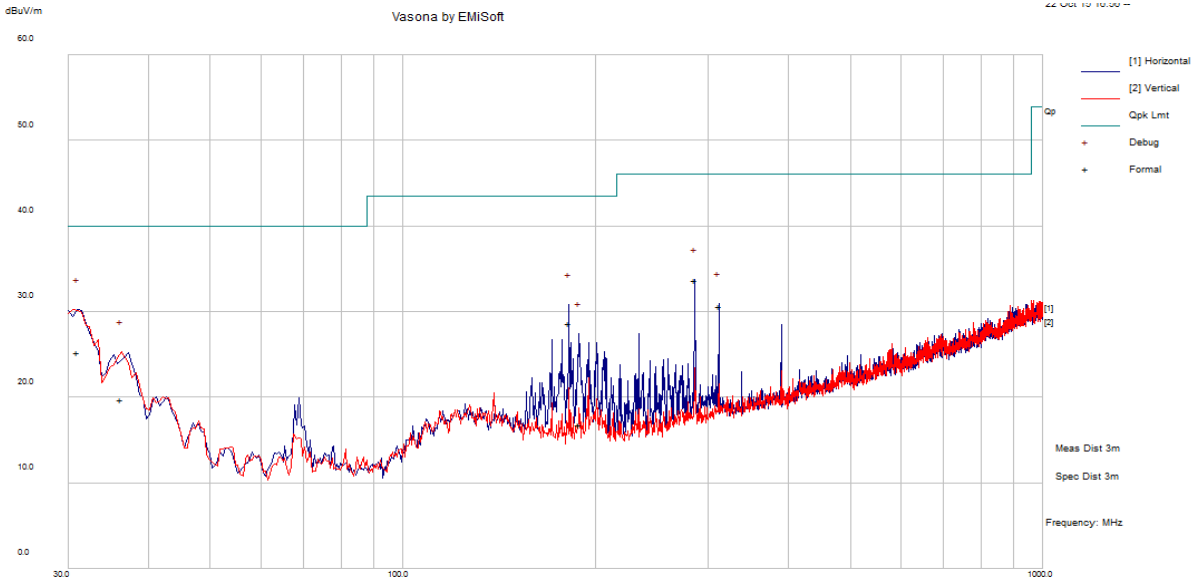


Quasi Max Measurement

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|--------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 70.25 | 46.19 | 1.35 | -30.05 | 17.48 | Quasi Max | V | 252.00 | 301.00 | 40.00 | -22.52 | Pass |
| 282.54 | 36.51 | 2.91 | -25.43 | 13.99 | Quasi Max | V | 185.00 | 231.00 | 46.02 | -32.03 | Pass |
| 31.51 | 39.76 | 0.81 | -15.78 | 24.79 | Quasi Max | H | 164.00 | 93.00 | 40.00 | -15.21 | Pass |
| 187.70 | 47.56 | 2.32 | -27.47 | 22.41 | Quasi Max | H | 132.00 | 144.00 | 43.52 | -21.11 | Pass |
| 285.99 | 56.21 | 2.91 | -25.50 | 33.62 | Quasi Max | H | 103.00 | 54.00 | 46.02 | -12.40 | Pass |
| 35.56 | 37.40 | 0.87 | -19.24 | 19.02 | Quasi Max | V | 180.00 | 179.00 | 40.00 | -20.98 | Pass |

Note: Both horizontal and vertical polarities were investigated. The results above show only the worst case.

| | | | | | |
|---------------------------|----------------------|------|--|--------|------|
| Test specification | Above 1GHz | | | Result | Pass |
| Environmental Conditions: | Temp (°C): | 25.7 | | | |
| | Humidity (%) | 29 | | | |
| | Atmospheric (mPa): | 1021 | | | |
| Mains Power: | 110VAC, 60Hz | | | | |
| Tested by: | Teody Manansala | | | | |
| Test Date: | 10-Sep-15 | | | | |
| Remarks: | 5.2GHz 11n20 5785MHz | | | | |



Quasi Max Measurement

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|--------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 30.98 | 39.68 | 0.81 | -15.30 | 25.19 | Quasi Max | H | 109.00 | 13.00 | 40.00 | -14.81 | Pass |
| 285.99 | 56.24 | 2.91 | -25.50 | 33.64 | Quasi Max | H | 100.00 | 54.00 | 46.02 | -12.38 | Pass |
| 182.00 | 54.11 | 2.25 | -27.68 | 28.69 | Quasi Max | H | 102.00 | 164.00 | 43.52 | -14.83 | Pass |
| 36.25 | 38.70 | 0.87 | -19.79 | 19.78 | Quasi Max | V | 100.00 | 7.00 | 40.00 | -20.22 | Pass |
| 312.00 | 52.33 | 3.08 | -24.76 | 30.65 | Quasi Max | H | 101.00 | 126.00 | 46.02 | -15.37 | Pass |
| 188.63 | 41.86 | 2.33 | -27.43 | 16.76 | Quasi Max | H | 209.00 | 347.00 | 43.52 | -26.76 | Pass |

Note: Both horizontal and vertical polarities were investigated. The results above show only the worst case.

10.6 Radiated Spurious Emissions above 1GHz

Requirement(s):

| Spec | Item | Requirement | Applicable |
|---|--|--|-------------------------------------|
| 47CFR§ 15.407(b)(2), 15.407(b)(6) | (1) | For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. | <input checked="" type="checkbox"/> |
| | (2) | For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band. | <input type="checkbox"/> |
| | (3) | For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz. | <input type="checkbox"/> |
| | (4) | For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz. | <input checked="" type="checkbox"/> |
| | (5) | Restricted band, emission must also comply with the radiated emission limits specified in 15.209 | <input checked="" type="checkbox"/> |
| Test Setup | | | |
| Procedure | <ol style="list-style-type: none"> The EUT was switched on and allowed to warm up to its normal operating condition. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: <ol style="list-style-type: none"> Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. The EUT was then rotated to the direction that gave the maximum emission. Finally, the antenna height was adjusted to the height that gave the maximum emission. An average measurement was then made for that frequency point. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured. | | |
| Remark | The EUT was scanned up to 40GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case. | | |
| Result | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail | | |

Equipment Setting

| Test | RBW | VBW | Span | Detector | Sweep | Trace | Notes |
|----------------------------|------|------|---------------|----------|-------|----------|-----------------|
| Radiated Spurious Emission | 1MHz | 3MHz | 1GHz - 40 GHz | Peak | Auto | Max hold | PK Measurement |
| Radiated Spurious Emission | 1MHz | 10Hz | 1GHz - 40 GHz | Peak | Auto | Max hold | Ave Measurement |

Test Data Yes (See below) N/A

Test Plot Yes (See below) N/A

Radiated Emission Test Results (Above 1GHz)

802.11a – 5180MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|--------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 18001.90 | 92.92 | 0.00 | -31.99 | 60.93 | Peak Max | H | 192.00 | 359.00 | 74.00 | -13.07 | Pass |
| 14694.46 | 39.00 | 13.45 | 7.90 | 60.35 | Peak Max | V | 227.00 | 42.00 | 74.00 | -13.65 | Pass |
| 1000.22 | 37.14 | 2.44 | 9.68 | 49.25 | Peak Max | H | 278.00 | 65.00 | 74.00 | -24.75 | Pass |
| 18001.90 | 79.92 | 0.00 | -31.99 | 47.93 | Average Max | H | 192.00 | 359.00 | 54.00 | -6.07 | Pass |
| 14694.46 | 26.30 | 13.45 | 7.90 | 47.65 | Average Max | V | 227.00 | 42.00 | 54.00 | -6.35 | Pass |
| 1000.22 | 24.07 | 2.44 | 9.68 | 36.19 | Average Max | H | 278.00 | 65.00 | 54.00 | -17.81 | Pass |

802.11a – 5200MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 17693.23 | 36.94 | 13.00 | 10.60 | 60.53 | Peak Max | V | 196.00 | 154.00 | 74.00 | -13.47 | Pass |
| 14557.66 | 39.30 | 13.20 | 8.26 | 60.76 | Peak Max | H | 248.00 | 99.00 | 74.00 | -13.24 | Pass |
| 1986.27 | 37.84 | 3.31 | 11.37 | 52.52 | Peak Max | H | 237.00 | 293.00 | 74.00 | -21.48 | Pass |
| 17693.23 | 24.34 | 13.00 | 10.60 | 47.94 | Average Max | V | 196.00 | 154.00 | 54.00 | -6.06 | Pass |
| 14557.66 | 26.58 | 13.20 | 8.26 | 48.05 | Average Max | H | 248.00 | 99.00 | 54.00 | -5.95 | Pass |
| 1986.27 | 25.24 | 3.31 | 11.37 | 39.92 | Average Max | H | 237.00 | 293.00 | 54.00 | -14.08 | Pass |

802.11a – 5240MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 14799.09 | 39.52 | 13.63 | 7.62 | 60.78 | Peak Max | H | 212.00 | 297.00 | 74.00 | -13.22 | Pass |
| 3996.66 | 35.65 | 5.83 | 12.22 | 53.69 | Peak Max | H | 222.00 | 99.00 | 74.00 | -20.31 | Pass |
| 1034.54 | 36.09 | 2.46 | 9.62 | 48.18 | Peak Max | V | 251.00 | 317.00 | 74.00 | -25.82 | Pass |
| 14799.09 | 26.60 | 13.63 | 7.62 | 47.85 | Average Max | H | 212.00 | 297.00 | 54.00 | -6.15 | Pass |
| 3996.66 | 22.81 | 5.83 | 12.22 | 40.85 | Average Max | H | 222.00 | 99.00 | 54.00 | -13.15 | Pass |
| 1034.54 | 23.37 | 2.46 | 9.62 | 35.46 | Average Max | V | 251.00 | 317.00 | 54.00 | -18.54 | Pass |

802.11n20 – 5180MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 15034.85 | 39.73 | 13.92 | 6.98 | 60.64 | Peak Max | H | 200.00 | 153.00 | 74.00 | -13.36 | Pass |
| 3998.80 | 36.81 | 5.83 | 12.22 | 54.86 | Peak Max | H | 164.00 | 26.00 | 74.00 | -19.14 | Pass |
| 2022.13 | 37.45 | 3.42 | 11.41 | 52.28 | Peak Max | H | 216.00 | 349.00 | 74.00 | -21.72 | Pass |
| 15034.85 | 26.40 | 13.92 | 6.98 | 47.30 | Average Max | H | 200.00 | 153.00 | 54.00 | -6.70 | Pass |
| 3998.80 | 23.42 | 5.83 | 12.22 | 41.47 | Average Max | H | 164.00 | 26.00 | 54.00 | -12.53 | Pass |
| 2022.13 | 24.96 | 3.42 | 11.41 | 39.79 | Average Max | H | 216.00 | 349.00 | 54.00 | -14.21 | Pass |

802.11n20 – 5200MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 5156.72 | 38.20 | 6.35 | 9.58 | 54.13 | Peak Max | V | 208.00 | 46.00 | 74.00 | -19.87 | Pass |
| 4167.03 | 35.83 | 5.97 | 11.50 | 53.30 | Peak Max | V | 212.00 | 236.00 | 74.00 | -20.70 | Pass |
| 14593.11 | 39.46 | 13.27 | 8.17 | 60.90 | Peak Max | H | 287.00 | 26.00 | 74.00 | -13.10 | Pass |
| 5156.72 | 25.25 | 6.35 | 9.58 | 41.18 | Average Max | V | 208.00 | 46.00 | 54.00 | -12.82 | Pass |
| 4167.03 | 22.58 | 5.97 | 11.50 | 40.05 | Average Max | V | 212.00 | 236.00 | 54.00 | -13.95 | Pass |
| 14593.11 | 26.67 | 13.27 | 8.17 | 48.10 | Average Max | H | 287.00 | 26.00 | 54.00 | -5.90 | Pass |

802.11n20 – 5240MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 14900.16 | 39.35 | 13.81 | 7.36 | 60.51 | Peak Max | H | 203.00 | 228.00 | 74.00 | -13.49 | Pass |
| 17796.98 | 37.19 | 13.00 | 10.70 | 60.89 | Peak Max | H | 235.00 | 92.00 | 74.00 | -13.11 | Pass |
| 2023.81 | 37.32 | 3.42 | 11.40 | 52.15 | Peak Max | V | 247.00 | 339.00 | 74.00 | -21.85 | Pass |
| 14900.16 | 26.75 | 13.81 | 7.36 | 47.91 | Average Max | H | 203.00 | 228.00 | 54.00 | -6.09 | Pass |
| 17796.98 | 24.07 | 13.00 | 10.70 | 47.78 | Average Max | H | 235.00 | 92.00 | 54.00 | -6.22 | Pass |
| 2023.81 | 24.89 | 3.42 | 11.40 | 39.71 | Average Max | V | 247.00 | 339.00 | 54.00 | -14.29 | Pass |

802.11a – 5745MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 6245.39 | 40.44 | 7.63 | 10.48 | 58.54 | Peak Max | V | 212.00 | 0.00 | 74.00 | -15.46 | Pass |
| 9685.47 | 37.92 | 12.07 | 7.55 | 57.55 | Peak Max | V | 219.00 | 352.00 | 74.00 | -16.45 | Pass |
| 3999.94 | 36.16 | 5.83 | 12.23 | 54.21 | Peak Max | H | 146.00 | 264.00 | 74.00 | -19.79 | Pass |
| 6245.39 | 28.06 | 7.63 | 10.48 | 46.16 | Average Max | V | 212.00 | 0.00 | 54.00 | -7.84 | Pass |
| 9685.47 | 25.04 | 12.07 | 7.55 | 44.67 | Average Max | V | 219.00 | 352.00 | 54.00 | -9.33 | Pass |
| 3999.94 | 22.92 | 5.83 | 12.23 | 40.98 | Average Max | H | 146.00 | 264.00 | 54.00 | -13.02 | Pass |

802.11a – 5785MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 14626.37 | 39.10 | 13.33 | 8.08 | 60.50 | Peak Max | H | 154.00 | 2.00 | 74.00 | -13.50 | Pass |
| 6314.66 | 40.98 | 7.83 | 10.32 | 59.13 | Peak Max | V | 211.00 | 113.00 | 74.00 | -14.87 | Pass |
| 4065.85 | 35.48 | 5.89 | 11.94 | 53.31 | Peak Max | V | 207.00 | 55.00 | 74.00 | -20.69 | Pass |
| 14626.37 | 26.59 | 13.33 | 8.08 | 48.00 | Average Max | H | 154.00 | 2.00 | 54.00 | -6.00 | Pass |
| 6314.66 | 27.87 | 7.83 | 10.32 | 46.02 | Average Max | V | 211.00 | 113.00 | 54.00 | -7.98 | Pass |
| 4065.85 | 22.85 | 5.89 | 11.94 | 40.67 | Average Max | V | 207.00 | 55.00 | 54.00 | -13.33 | Pass |

802.11a – 5805MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 6279.42 | 40.45 | 7.73 | 10.40 | 58.58 | Peak Max | V | 152.00 | 43.00 | 74.00 | -15.42 | Pass |
| 12036.97 | 37.96 | 12.27 | 8.55 | 58.78 | Peak Max | H | 180.00 | 239.00 | 74.00 | -15.22 | Pass |
| 4100.46 | 35.35 | 5.92 | 11.79 | 53.05 | Peak Max | V | 153.00 | 168.00 | 74.00 | -20.95 | Pass |
| 6279.42 | 27.42 | 7.73 | 10.40 | 45.55 | Average Max | V | 152.00 | 43.00 | 54.00 | -8.45 | Pass |
| 12036.97 | 25.38 | 12.27 | 8.55 | 46.21 | Average Max | H | 180.00 | 239.00 | 54.00 | -7.79 | Pass |
| 4100.46 | 22.72 | 5.92 | 11.79 | 40.42 | Average Max | V | 153.00 | 168.00 | 54.00 | -13.58 | Pass |

802.11n20 – 5745MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 5565.94 | 38.43 | 6.62 | 9.98 | 55.02 | Peak Max | V | 271.00 | 359.00 | 74.00 | -18.98 | Pass |
| 17726.28 | 37.46 | 13.00 | 10.63 | 61.09 | Peak Max | V | 215.00 | 71.00 | 74.00 | -12.91 | Pass |
| 14558.11 | 39.43 | 13.20 | 8.26 | 60.89 | Peak Max | H | 285.00 | 1.00 | 74.00 | -13.11 | Pass |
| 5565.94 | 25.00 | 6.62 | 9.98 | 41.60 | Average Max | V | 271.00 | 359.00 | 54.00 | -12.40 | Pass |
| 17726.28 | 24.56 | 13.00 | 10.63 | 48.19 | Average Max | V | 215.00 | 71.00 | 54.00 | -5.81 | Pass |
| 14558.11 | 26.64 | 13.20 | 8.26 | 48.10 | Average Max | H | 285.00 | 1.00 | 54.00 | -5.90 | Pass |

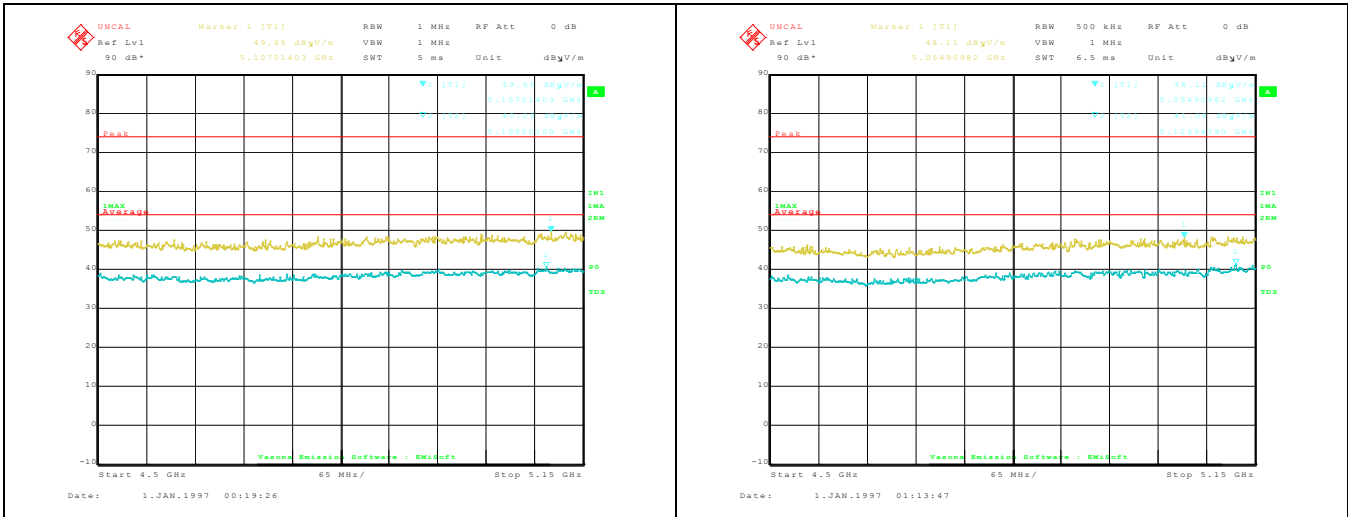
802.11n20 – 5785MHz

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 14559.96 | 39.69 | 13.21 | 8.26 | 61.15 | Peak Max | H | 174.00 | 0.00 | 74.00 | -12.85 | Pass |
| 17658.70 | 37.07 | 13.00 | 10.56 | 60.63 | Peak Max | V | 250.00 | 160.00 | 74.00 | -13.37 | Pass |
| 6245.21 | 40.83 | 7.63 | 10.48 | 58.94 | Peak Max | V | 194.00 | 56.00 | 74.00 | -15.06 | Pass |
| 14559.96 | 26.66 | 13.21 | 8.26 | 48.12 | Average Max | H | 174.00 | 0.00 | 54.00 | -5.88 | Pass |
| 17658.70 | 24.43 | 13.00 | 10.56 | 47.99 | Average Max | V | 250.00 | 160.00 | 54.00 | -6.01 | Pass |
| 6245.21 | 28.23 | 7.63 | 10.48 | 46.34 | Average Max | V | 194.00 | 56.00 | 54.00 | -7.66 | Pass |

802.11n20 – 5805MHz

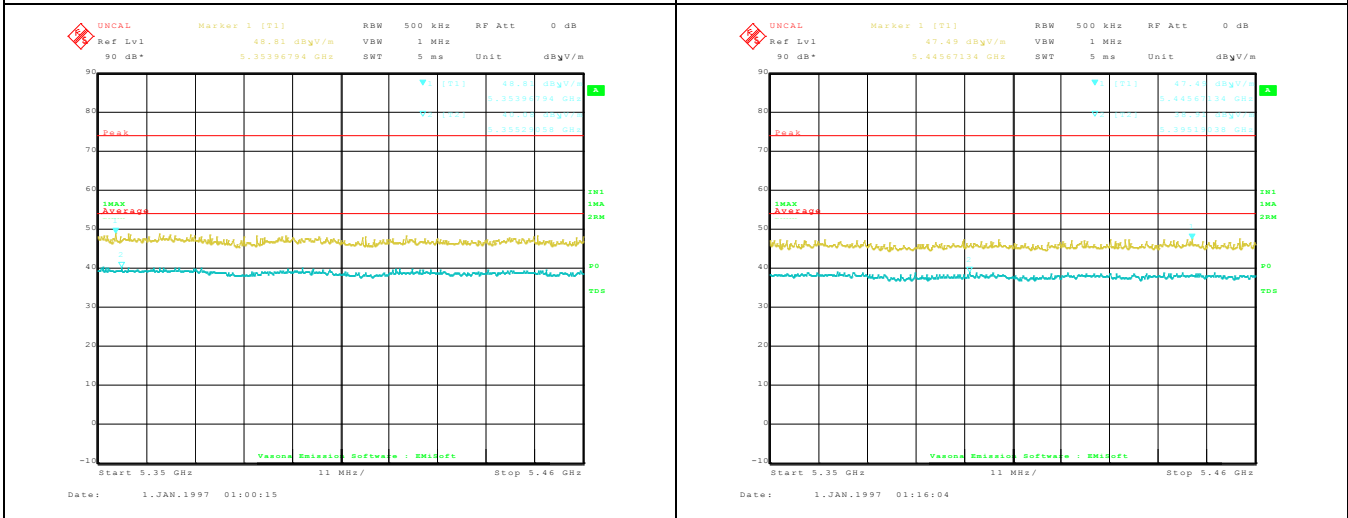
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|-------|--------------|------------------|-----|--------|---------|--------------|-----------|------------|
| 14763.46 | 38.88 | 13.57 | 7.72 | 60.16 | Peak Max | H | 179.00 | 49.00 | 74.00 | -13.84 | Pass |
| 6350.61 | 40.72 | 7.94 | 10.23 | 58.89 | Peak Max | H | 229.00 | 260.00 | 74.00 | -15.11 | Pass |
| 4099.43 | 35.48 | 5.92 | 11.79 | 53.19 | Peak Max | H | 217.00 | 335.00 | 74.00 | -20.81 | Pass |
| 14763.46 | 26.58 | 13.57 | 7.72 | 47.86 | Average Max | H | 179.00 | 49.00 | 54.00 | -6.14 | Pass |
| 6350.61 | 28.17 | 7.94 | 10.23 | 46.34 | Average Max | H | 229.00 | 260.00 | 54.00 | -7.66 | Pass |
| 4099.43 | 22.79 | 5.92 | 11.79 | 40.50 | Average Max | H | 217.00 | 335.00 | 54.00 | -13.50 | Pass |

Restricted Band Measurement Plots:



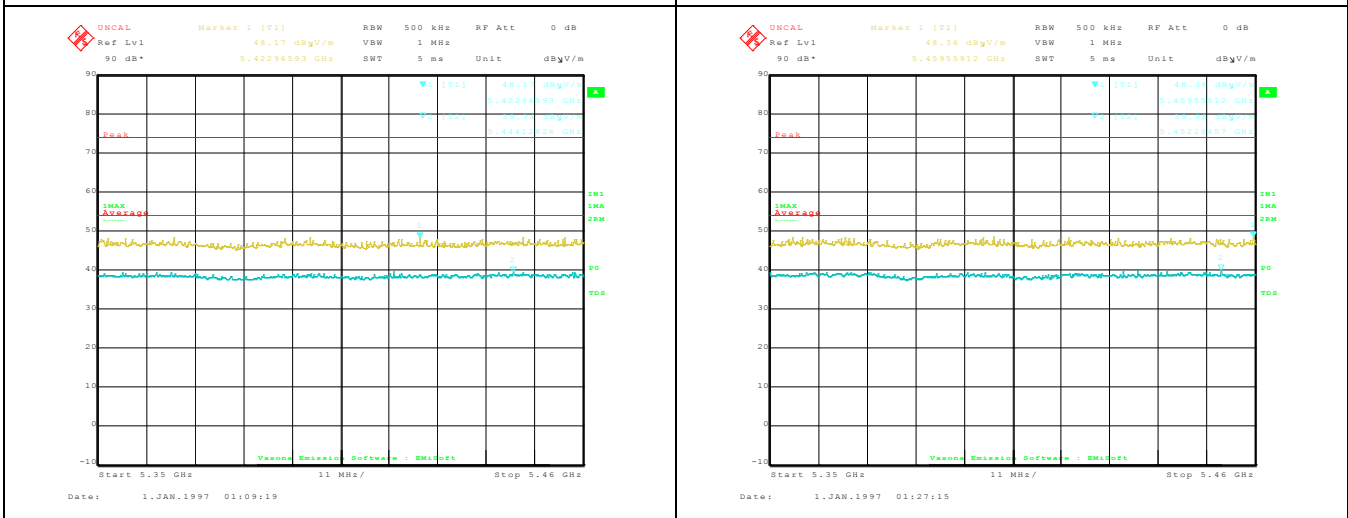
Lower Band 802.11a 5180MHz

Lower Band 802.11n-20M 5180MHz



Higher Band 802.11a 5320MHz

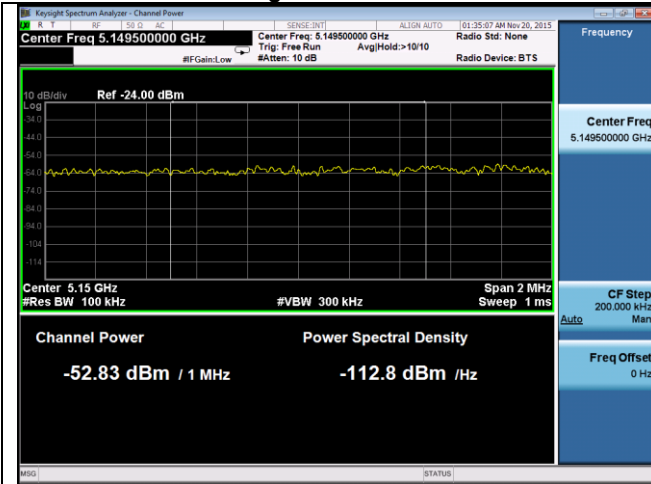
Higher Band 802.11n-20M 5320MHz



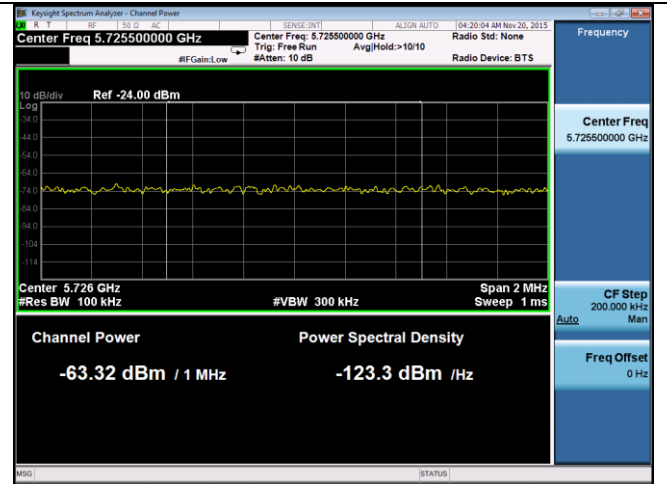
Lower Band 802.11a 5500MHz

Lower band 802.11n-20M 5500MHz

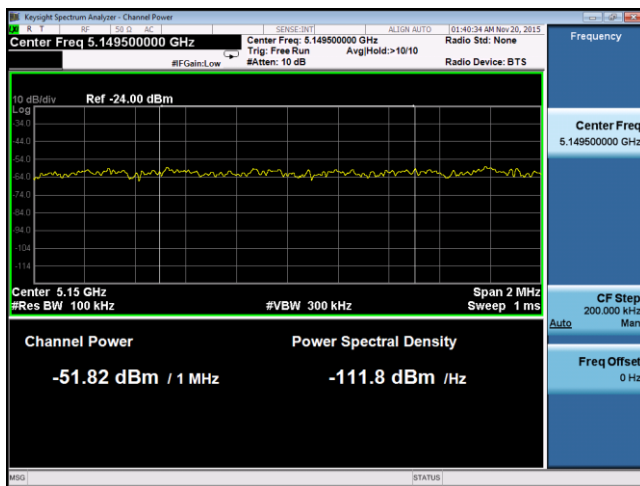
Conducted Band Edge Measurement Plots:



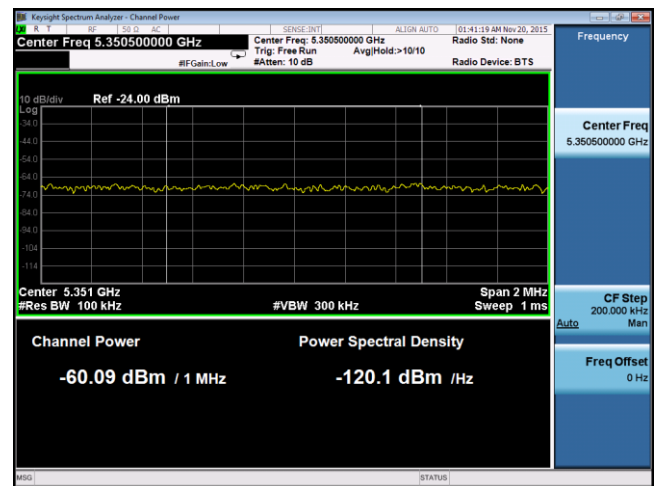
5.2GHz Band Edge-802.11a 5180 MHz (Limit-17 eirp)



5.2GHz Band Edge-802.11a 5240 MHz (Limit-27 eirp)



5.2GHz Band Edge-802.11n20 5180 MHz (Limit-17 eirp)



5.2GHz Band Edge-802.11n20 5240 MHz (Limit-27 eirp)