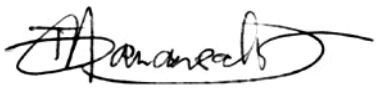
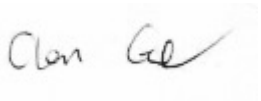
# RF TEST REPORT

SIEMIC
GLOBAL TESTING & CERTIFICATIONS
*YOUR CHOICE FOR- TCB FCB CB NB CAB RCB*

**Report No.: FCC_RF_SL16012101-SOL-001_UNII**
**Supersede Report No.: None**

| | | |
|---|---|---|
| Applicant | : | Compex Systems Pte Ltd. |
| Product Name | : | SkyWay Excel/Access System |
| Model No. | : | AS5810/XL5810 |
| Test Standard | : | 47 CFR 15.407 |
| Test Method | : | ANSI C63.10: 2013<br>789033 D02 General UNII Test Procedures New Rules v01 |
| FCC ID | : | TK4WLM200N5-23ESD |
| Dates of test | : | 03/04/2016 – 04/13/2016 |
| Issue Date | : | 04/14/2016 |
| Test Result | : | ☒ Pass ☐ Fail |
| Equipment complied with the specification [X]<br>Equipment did not comply with the specification [ ] | | |

| This Test Report is Issued Under the Authority of: | |
|---|---|
|  |  |
| **Teody Manansala** | **Chen Ge** |
| Test Engineer | Engineer Reviewer |
| **This test report may be reproduced in full only**<br>**Test result presented in this test report is applicable to the tested sample only** | |

**Issued By:**
**SIEMIC Laboratories**
**775 Montague Expressway, Milpitas, 95035 CA**

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TESTING CERT # 2742-01

# Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

## 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 |
| Japan | VCCI, JATE, TELEC, RFT | EMI, RF/Wireless, Telecom |
| Mexico | NOM, COFETEL, Caniety | Safety, EMC, RF/Wireless, Telecom |
| Europe | A2LA, NIST | EMC, RF, Telecom, Safety |
| Israel | MOC, NIST | EMC, RF, Telecom, Safety |

## Accreditations for Product Certifications

| Country | Accreditation Body | Scope |
|---|---|---|
| USA | FCC TCB, NIST | EMC, RF, Telecom |
| 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 History

| Report No. | Report Version | Description | Issue Date |
|---|---|---|---|
| FCC_RF_SL16012101-SOL-001_UNII | None | Original | 04/14/2016 |
| | | | |
| | | | |
| | | | |
| | | | |

## 2 Executive Summary

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

Company: Compex Systems Pte Ltd.
Product: SkyWay Excel/Access System
Model: AS5810/XL5810

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

## 3 Customer information

| | |
|---|---|
| Applicant Name | Compex Systems Pte Ltd. |
| Applicant Address | No.9 Harrison Road, Harrison Industrial Building, 369651 Singapore. |
| Manufacturer Name | Compex Systems Pte Ltd. |
| Manufacturer Address | No.9 Harrison Road, Harrison Industrial Building, 369651 Singapore. |

## 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 | SkyWay Excel/Access System |
| Model No. | AS5810/XL5810 |
| Trade Name | SkyWay |
| Serial No. | N/A |
| Host Model No. | N/A |
| Input Power | 100-240VDC, 50/60Hz 0.7A |
| Output Power | 48VDC 0.7A |
| Power Adapter Manu/Model | Solectek PoE Power Supply/1584301 |
| Power Adapter SN | N/A |
| Product Hardware version | V3.0 |
| Product Software version | V4.8.0 |
| Radio Hardware version | V3.0 |
| Radio Software version | N/A |
| Test Software version | N/A |
| Date of EUT received | 02/10/2016 |
| Equipment Class/ Category | UNII |
| Port/Connectors | Ethernet |

## 6.2 Radio Description

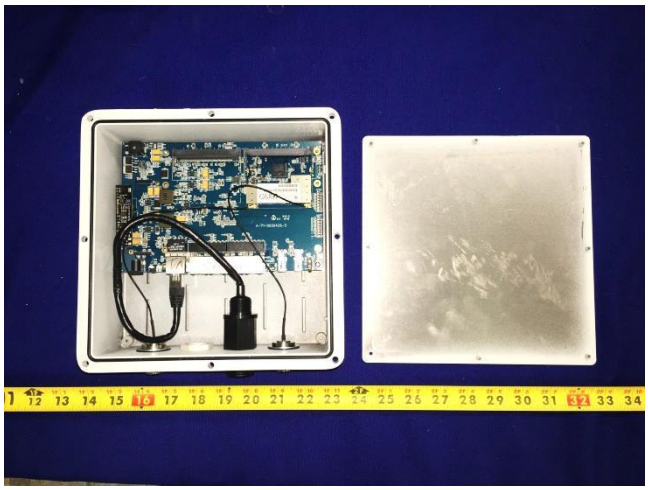
| Radio Type | 10MHz Bandwidth | 20MHz Bandwidth | 40MHz Bandwidth |
|---|---|---|---|
| Operating Frequency | 5160-5240MHz<br>5745-5825MHz | 5170-5240MHz<br>5755-5815MHz | 5190-5230MHz<br>5745-5825MHz |
| Modulation | OFDM (BPSK, QPSK, 16QAM, 64QAM) | OFDM (BPSK, QPSK, 16QAM, 64QAM) | OFDM (BPSK, QPSK, 16QAM, 64QAM) |
| Channel Spacing | 10MHz | 20MHz (5GHz) | 40MHz |
| Number of Channels | 6 (5GHz) | 6 (5GHz) | 6 (5GHz) |
| Antenna Type | Panel Antenna | | |
| Antenna Gain | 23dBi | | |
| Antenna Connector Type | N-Type Female | | |

**EUT Power Settings**

| Band 1 | | | |
|---|---|---|---|
| **Test mode** | **Freq(MHz)** | **CH** | **Power settings** |
| 10MHz Bandwidth | 5160 | Low | 10 |
| | 5200 | Mid | 20 |
| | 5240 | High | 10 |
| 20MHz Bandwidth | 5170 | Low | 10 |
| | 5210 | Mid | 20 |
| | 5230 | High | 10 |
| 40MHz Bandwidth | 5190 | Low | 10 |
| | 5230 | Mid | 10 |

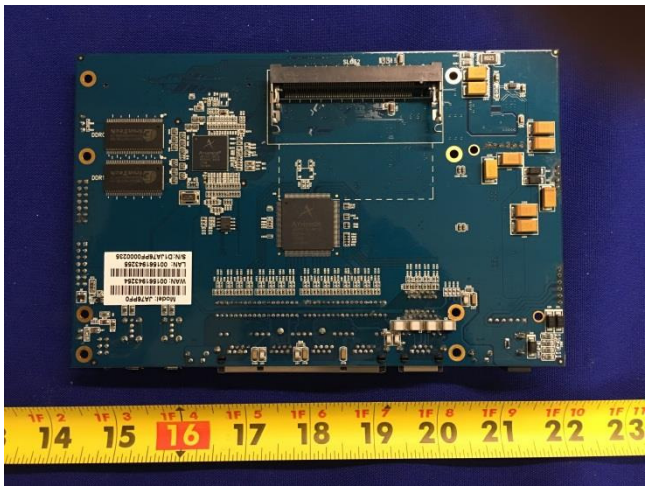
| Band 4 | | | |
|---|---|---|---|
| **Test mode** | **Freq(MHz)** | **CH** | **Power settings** |
| 10MHz Bandwidth | 5735 | Low | 12 |
| | 5775 | Mid | 20 |
| | 5825 | High | 12 |
| 20MHz Bandwidth | 5755 | Low | 12 |
| | 5795 | Mid | 20 |
| | 5815 | High | 12 |
| 40MHz Bandwidth | 5745 | Low | 12 |
| | 5785 | High | 20 |
| | 5825 | Mid | 12 |

## 6.3 EUT Photos

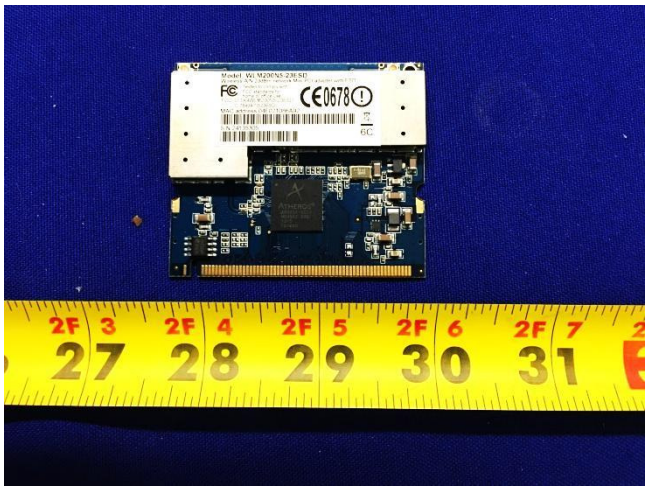


PCBA Bottom View

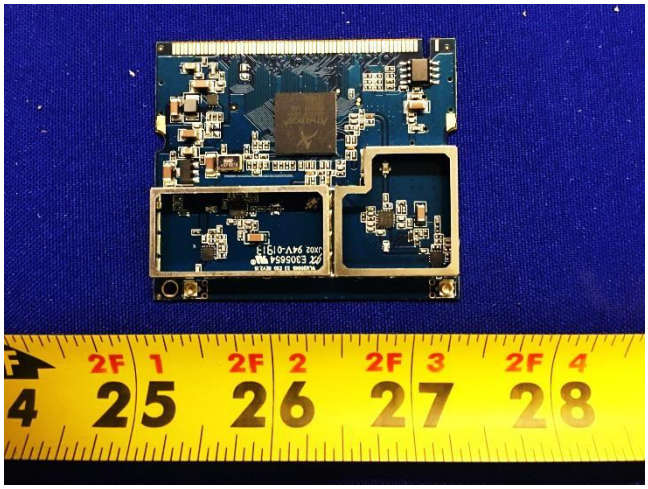
PCBA Top View



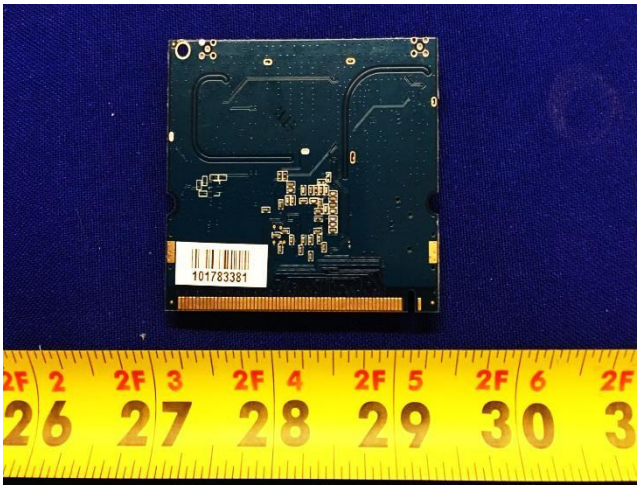
PCBA Bottom View



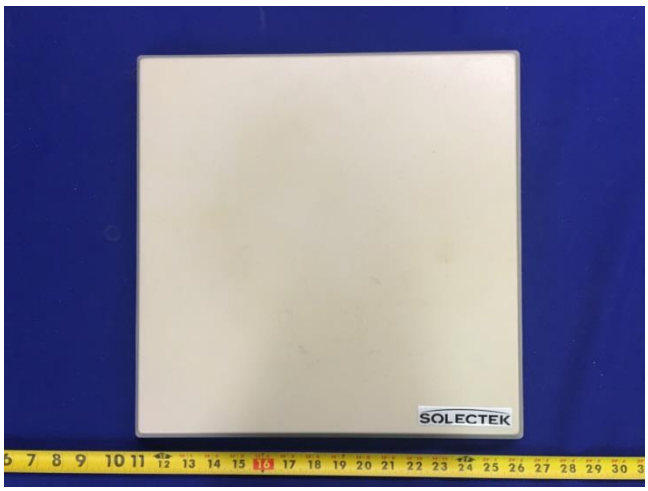
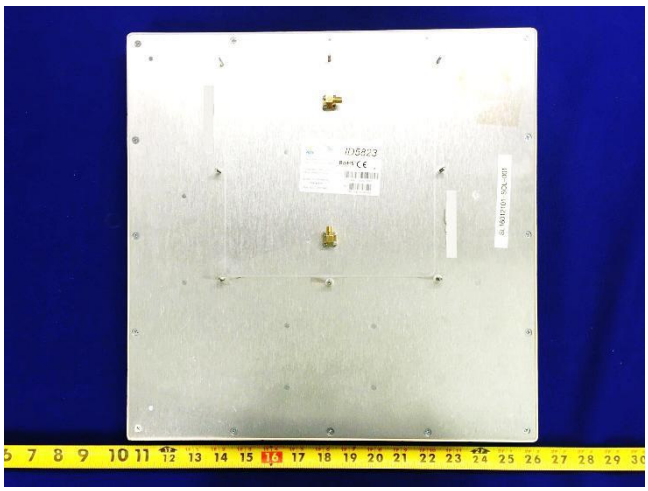
EUT Radio with Shielding Top View



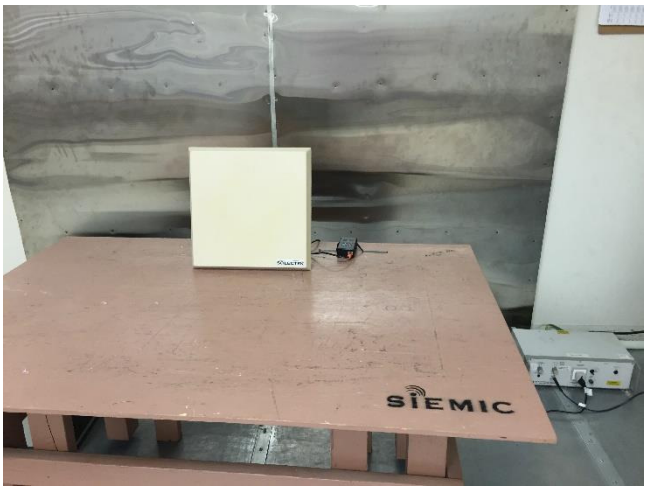
EUT Radio without Shielding Top View



EUT Radio Bottom View

| | |
|---|---|
|  |  |
| **Antenna Front View** | **Antenna Rear View** |
|  |  |
| **PoE Top View** | **PoE Bottom View** |

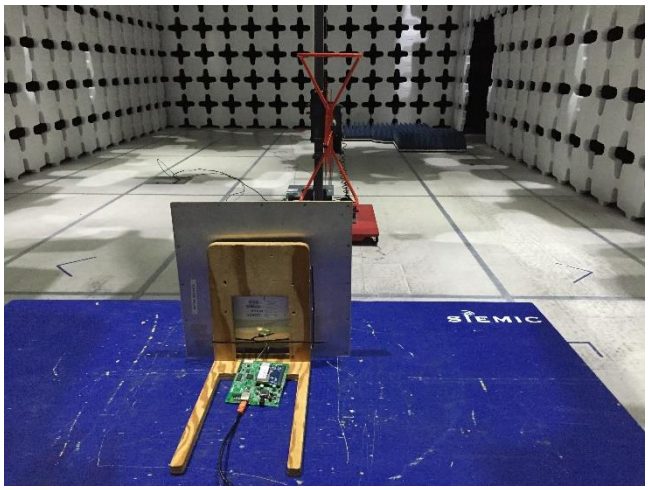
## 6.4 EUT Test Setup Photos




AC Line Conducted Emissions – Front View

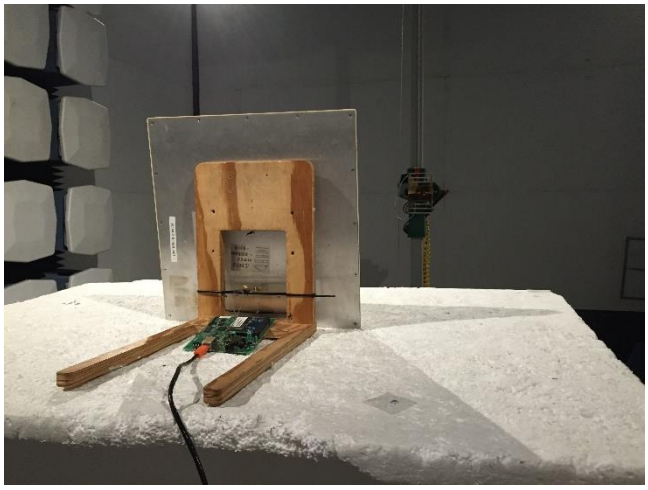
AC Line Conducted Emissions – Rear View

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 | Laptop | P05F Latitude E5410 | N/A | Dell | - |
| | | | | | |
| | | | | | |

## 7.2 Cabling Description

| Name | Connection Start | | Connection Stop | | Length / shielding Info | | Note |
|---|---|---|---|---|---|---|---|
| | From | I/O Port | To | I/O Port | Length (m) | Shielding | |
| - | EUT | Ethernet | PoE | Ethernet | 2 | Unshielded | - |
| - | PoE | Ethernet | Laptop | Ethernet | 2 | Unshielded | |

## 7.3 Test Software Description

| Test Item | Software | Description |
|---|---|---|
| RF Testing | Internet Explorer | 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<br>789033 D02 General UNII Test Procedures New Rules v01 | ☒ Pass<br>☐ N/A |
| AC Conducted Emissions Voltage | FCC | 15.207(a) | ANSI C63.10: 2013 | ☒ Pass<br>☐ 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 | ☒ Pass<br>☐ N/A |
| 99% Occupied Bandwidth | FCC | 15.407(a)(2) | 789033 D02 General UNII Test Procedures New Rules v01 | ☒ Pass |

| | | | | |
|---|---|---|---|---|
| | | | | ☐ N/A |
| Maximum conducted Output Power | FCC | 15.407 (a)(2) | 789033 D02 General UNII Test Procedures New Rules v01 | ☒ Pass<br>☐ N/A |
| Power reduction (Antenna Gain > 6 dBi) | FCC | 15.407 (a)(2) | - | ☐ Pass<br>☒ N/A |
| Band Edge and Radiated Spurious Emissions | FCC | 15.407(b)(2), 15.407(b)(6) | ANSI C63.10: 2013<br>789033 D02 General UNII Test Procedures New Rules v01 | ☒ Pass<br>☐ N/A |
| Power Spectral Density | FCC | 15.407 (a)(2) | 789033 D02 General UNII Test Procedures New Rules v01 | ☒ Pass<br>☐ N/A |

| | |
|---|---|
| Remark | 1. All measurement uncertainties are not taken into consideration for all presented test result.<br>2. 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. |

# 9 Measurement Uncertainty

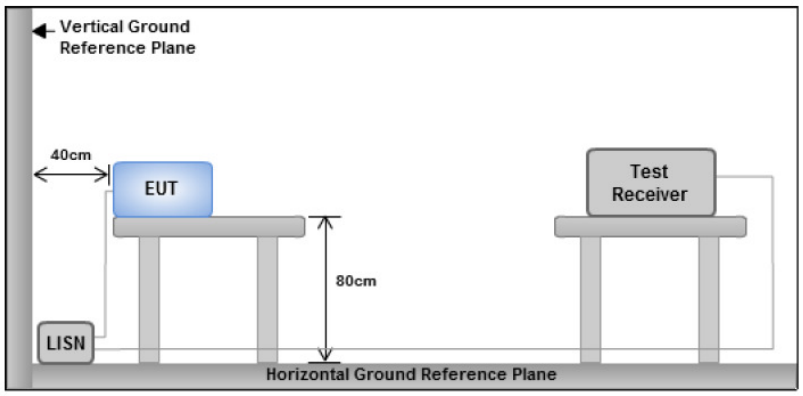
| Emissions | | | |
|---|---|---|---|
| **Test Item** | **Frequency Range** | **Description** | **Uncertainty** |
| AC Conducted Emissions Voltage | 150KHz – 30MHz | Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 | ±3.5dB |
| Band Edge 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 |

# 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 |  Note: 1. Support units were connected to second LISN.<br>2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes | | |
| Procedure | - 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.<br>- The power supply for the EUT was fed through a 50Ω/50µH EUT LISN, connected to filtered mains.<br>- The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.<br>- All other supporting equipment was powered separately from another main supply. | | |
| Remark | EUT was tested at 120VAC, 60Hz | | |
| Result | ☒ Pass ☐ Fail | | |

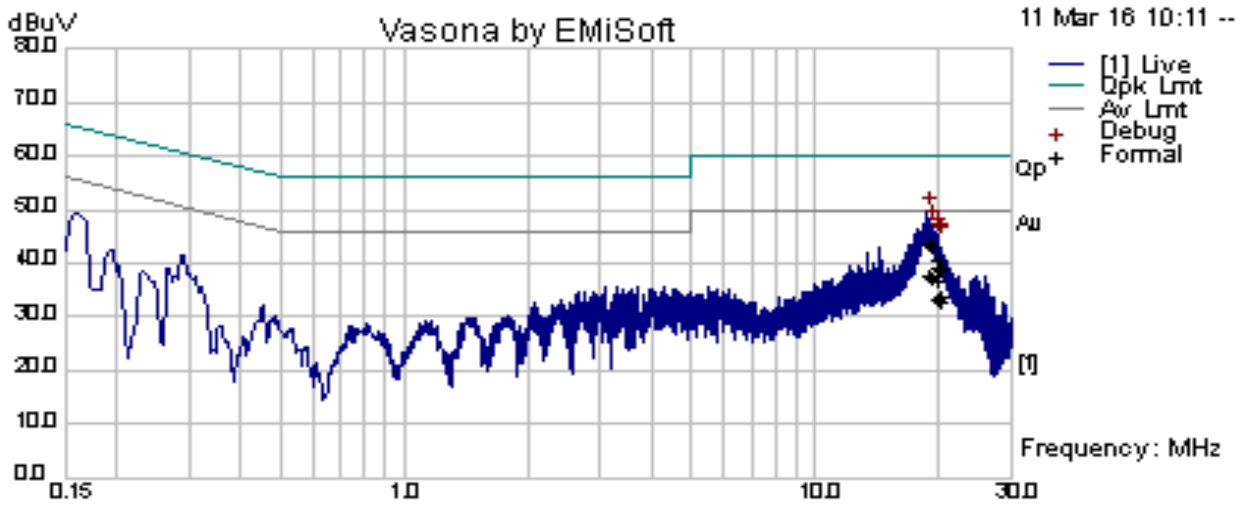
**Test Data** ☒ Yes ☐ N/A

**Test Plot** ☒ Yes (See below) ☐ N/A

**Test was done by Teody Manansala at Conducted Emission test site.**

## Conducted Emission Test Results

| Test specification: | Conducted Emissions | | | |
|---|---|---|---|---|
| Environmental Conditions: | Temp(°C): | 21 | Result: | ☒ Pass ☐ Fail |
| | Humidity (%): | 42 | | |
| | Atmospheric(mbar): | 1021 | | |
| Mains Power: | 120Vac, 60Hz | | | |
| Tested by: | Teody Manansala | | | |
| Test Date: | 03/11/2016 | | | |
| Remarks | AC Line @ Line | | | |

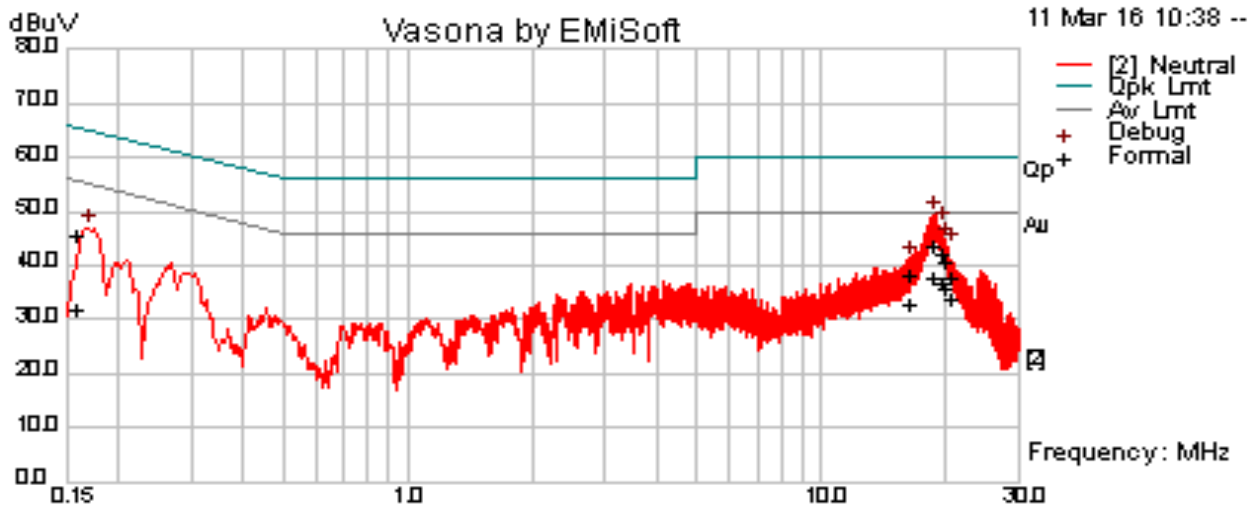



**Line Plot at 120Vac, 60Hz**

| Frequency (MHz) | Raw (dBuV) | Cable Loss (dB) | Factors (dB) | Level (dBuV) | Measurement Type | Line | Limit (dBuV) | Margin (dB) | Pass /Fail |
|---|---|---|---|---|---|---|---|---|---|
| 18.74 | 33.14 | 10.07 | 0.67 | 43.88 | Quasi Peak | Live | 60.00 | -16.12 | Pass |
| 19.08 | 32.59 | 10.07 | 0.68 | 43.33 | Quasi Peak | Live | 60.00 | -16.67 | Pass |
| 19.69 | 29.74 | 10.07 | 0.69 | 40.49 | Quasi Peak | Live | 60.00 | -19.51 | Pass |
| 20.00 | 28.36 | 10.07 | 0.69 | 39.12 | Quasi Peak | Live | 60.00 | -20.88 | Pass |
| 19.97 | 28.45 | 10.07 | 0.69 | 39.21 | Quasi Peak | Live | 60.00 | -20.79 | Pass |
| 20.05 | 27.91 | 10.07 | 0.69 | 38.67 | Quasi Peak | Live | 60.00 | -21.33 | Pass |
| 18.74 | 27.07 | 10.07 | 0.67 | 37.80 | Average | Live | 50.00 | -12.20 | Pass |
| 19.08 | 26.73 | 10.07 | 0.68 | 37.47 | Average | Live | 50.00 | -12.53 | Pass |
| 19.69 | 25.93 | 10.07 | 0.69 | 36.69 | Average | Live | 50.00 | -13.31 | Pass |
| 20.00 | 23.02 | 10.07 | 0.69 | 33.78 | Average | Live | 50.00 | -16.22 | Pass |
| 19.97 | 22.48 | 10.07 | 0.69 | 33.24 | Average | Live | 50.00 | -16.76 | Pass |
| 20.05 | 22.09 | 10.07 | 0.69 | 32.85 | Average | Live | 50.00 | -17.15 | Pass |

## Conducted Emission Test Results

| Test specification: | Conducted Emissions | | | |
|---|---|---|---|---|
| Environmental Conditions: | Temp(°C): | 21 | Result: | ☒ Pass ☐ Fail |
| | Humidity (%): | 42 | | |
| | Atmospheric(mbar): | 1021 | | |
| Mains Power: | 120Vac, 60Hz | | | |
| Tested by: | Teody Manansala | | | |
| Test Date: | 03/11/2016 | | | |
| Remarks | AC Line @ Neutral | | | |



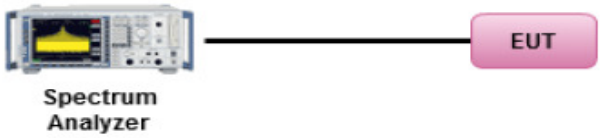

**Neutral Plot at 120Vac, 60Hz**

| Frequency (MHz) | Raw (dBuV) | Cable Loss (dB) | Factors (dB) | Level (dBuV) | Measurement Type | Line | Limit (dBuV) | Margin (dB) | Pass /Fail |
|---|---|---|---|---|---|---|---|---|---|
| 18.57 | 33.07 | 10.07 | 0.67 | 43.80 | Quasi Peak | Neutral | 60.00 | -16.20 | Pass |
| 19.40 | 31.43 | 10.07 | 0.68 | 42.18 | Quasi Peak | Neutral | 60.00 | -17.82 | Pass |
| 19.79 | 29.70 | 10.07 | 0.69 | 40.46 | Quasi Peak | Neutral | 60.00 | -19.54 | Pass |
| 20.38 | 27.17 | 10.07 | 0.70 | 37.93 | Quasi Peak | Neutral | 60.00 | -22.07 | Pass |
| 0.16 | 33.86 | 10.00 | 1.70 | 45.56 | Quasi Peak | Neutral | 65.58 | -20.01 | Pass |
| 16.23 | 27.61 | 10.06 | 0.62 | 38.29 | Quasi Peak | Neutral | 60.00 | -21.71 | Pass |
| 18.57 | 27.17 | 10.07 | 0.67 | 37.90 | Average | Neutral | 50.00 | -12.10 | Pass |
| 19.40 | 26.06 | 10.07 | 0.68 | 36.81 | Average | Neutral | 50.00 | -13.19 | Pass |
| 19.79 | 24.96 | 10.07 | 0.69 | 35.72 | Average | Neutral | 50.00 | -14.28 | Pass |
| 20.38 | 23.01 | 10.07 | 0.70 | 33.78 | Average | Neutral | 50.00 | -16.22 | Pass |
| 0.16 | 20.37 | 10.00 | 1.70 | 32.07 | Average | Neutral | 55.58 | -23.50 | Pass |
| 16.23 | 22.29 | 10.06 | 0.62 | 32.98 | Average | Neutral | 50.00 | -17.02 | 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. | ☒ |
| | a) (2) | 26 dB Emission BW: Report only for power limit calculation. | ☐ |
| | e) | Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz. | ☒ |
| Test Setup |  | | |
| Test Procedure | 789033 D02 General UNII Test Procedures New Rules v01<br><br>26dB Emission bandwidth measurement procedure (Other than 5.725-5.85 GHz)<br>- Allow the trace to stabilize.<br>- Use the spectrum analyzer built-in measurement function to determine the 26dB BW.<br>o Set RBW = around 1% of emission bandwidth<br>o Set VBW > RBW<br>o Detector = Peak<br>o Trace mode = max hold<br>- Capture the plot.<br>- Repeat above steps for different test channel and other modulation type.<br><br>6 dB Minimum emission bandwidth measurement procedure (for 5.725-5.85 GHz)<br>- Allow the trace to stabilize.<br>- Use the spectrum analyzer built-in measurement function to determine the 6dB BW.<br>o Set RBW = 100 KHz<br>o Set VBW ≥ 3 x RBW<br>o Detector = Peak<br>o Trace mode = max hold<br>o Sweep = auto couple<br>- Capture the plot.<br>- Repeat above steps for different test channel and other modulation type. | | |

| Test Date | 03/04/2015 | Environmental condition | Temperature 22ºC<br>Relative Humidity 38%<br>Atmospheric Pressure 1020mbar |
|---|---|---|---|
| Remark | None | | |
| Result | ☒ Pass ☐ Fail | | |

**Test Data** ☒ Yes ☐ N/A

**Test Plot** ☒ Yes ☐ N/A

**Test was done by Teody Manansala at RF test site.**

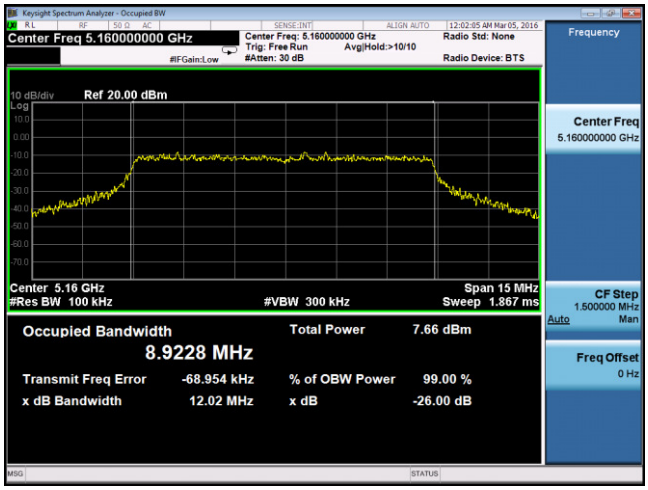
**26dB and 99% Bandwidth measurement result for 5.2GHz**

| Test mode | Freq (MHz) | CH | Result (MHz) | | Limit (MHz) |
|---|---|---|---|---|---|
| | | | 26dB | 99% | |
| 10MHz Bandwidth | 5160 | Low | 12.02 | 8.923 | - |
| | 5200 | Mid | 12.16 | 8.941 | - |
| | 5240 | High | 11.82 | 8.943 | - |
| 20MHz Bandwidth | 5170 | Low | 21.16 | 17.723 | - |
| | 5210 | Mid | 22.39 | 17.819 | - |
| | 5230 | High | 22.64 | 17.821 | - |
| 40MHz Bandwidth | 5190 | Low | 42.83 | 36.830 | - |
| | 5230 | High | 45.44 | 37.014 | - |

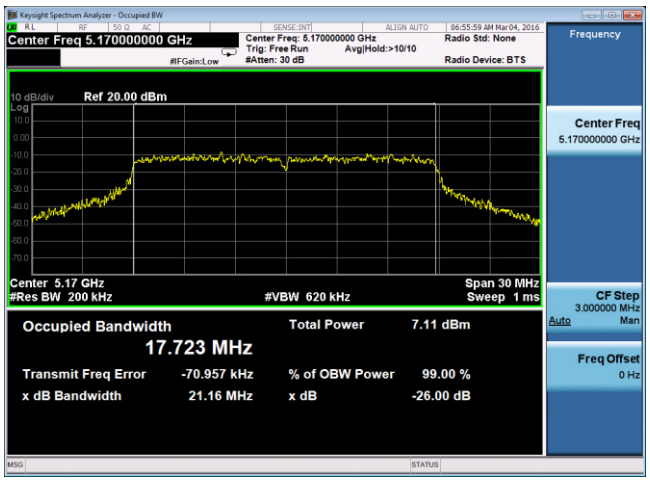
**6dB and 99% Bandwidth measurement result for 5.8GHz**

| Test mode | Freq (MHz) | CH | Result (MHz) | | Limit (6dB) (MHz) | Result |
|---|---|---|---|---|---|---|
| | | | 6dB | 99% | | |
| 10MHz Bandwidth | 5735 | Low | 8.82 | 8.977 | >0.5 | pass |
| | 5775 | Mid | 8.82 | 8.955 | >0.5 | pass |
| | 5825 | High | 8.86 | 8.912 | >0.5 | pass |
| 20MHz Bandwidth | 5755 | Low | 17.55 | 17.659 | >0.5 | pass |
| | 5795 | Mid | 17.58 | 17.664 | >0.5 | pass |
| | 5815 | High | 17.60 | 17.665 | >0.5 | pass |
| 40MHz Bandwidth | 5745 | Low | 36.07 | 36.166 | >0.5 | pass |
| | 5785 | High | 35.70 | 36.598 | >0.5 | pass |
| | 5775 | Mid | 36.31 | 36.515 | >0.5 | pass |

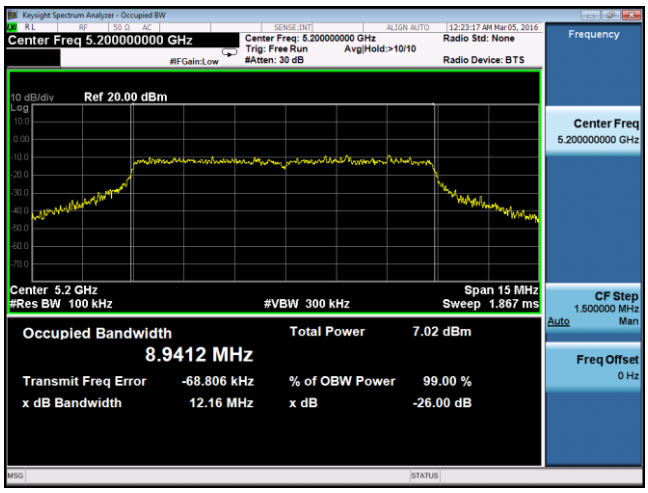
## 26dB & 99% Bandwidth Test Plots



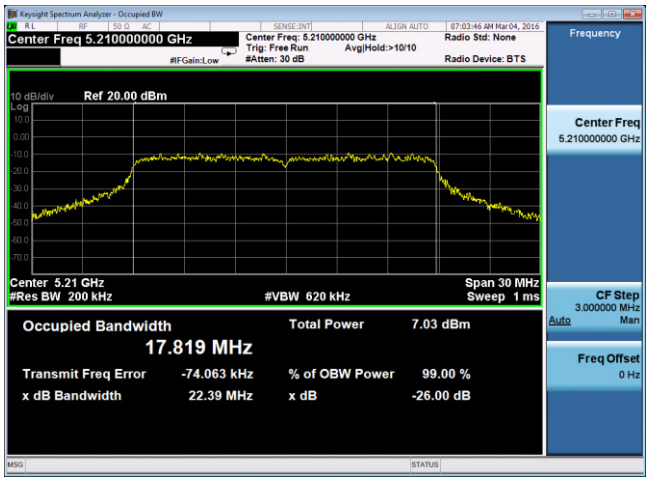

26dB & 99% BW – 10M 5160MHz




26dB & 99% BW – 20M 5170MHz

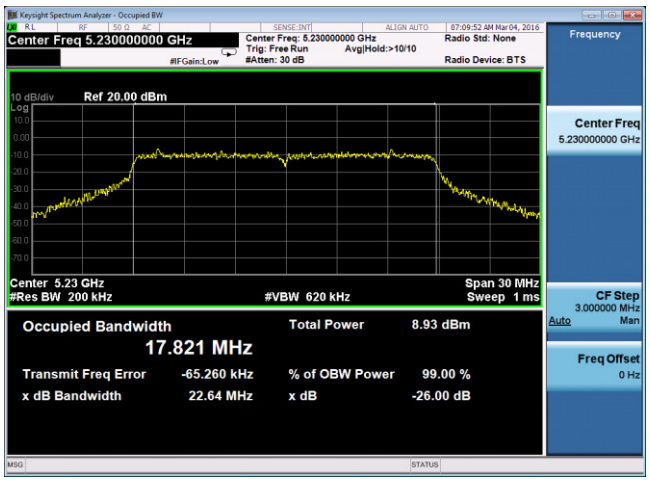



26dB & 99% BW – 10M 5200MHz

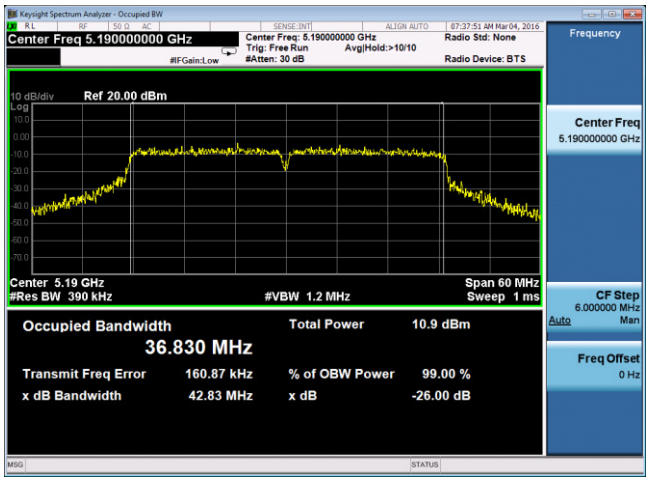



26dB & 99% BW – 20M 5210MHz

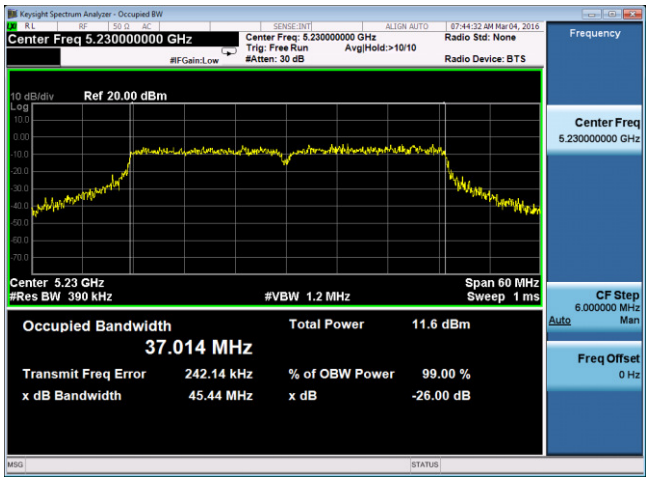

26dB & 99% BW – 10M 5240MHz




26dB & 99% BW – 20M 5230MHz

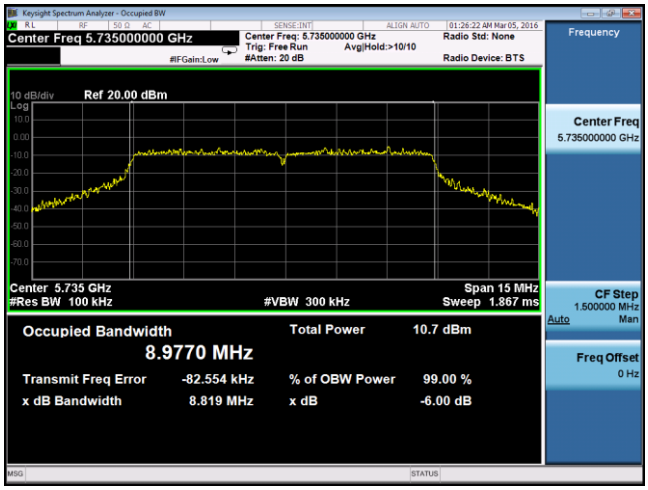



**26dB & 99% BW – 40M 5190MHz**

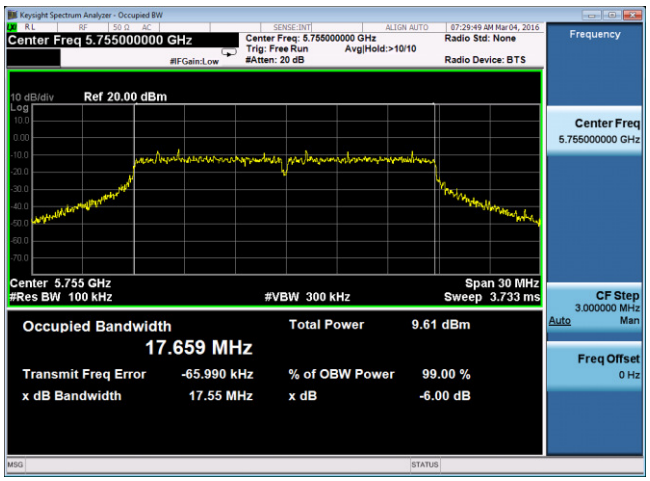



**26dB & 99% BW – 40M 5230MHz**

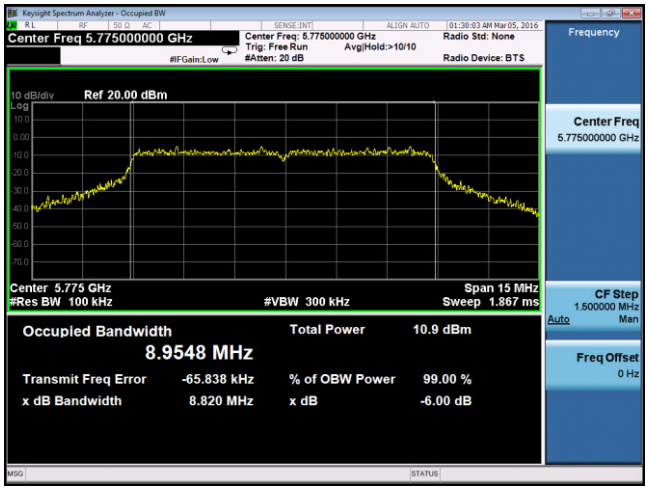
## 6dB Bandwidth Test Plots



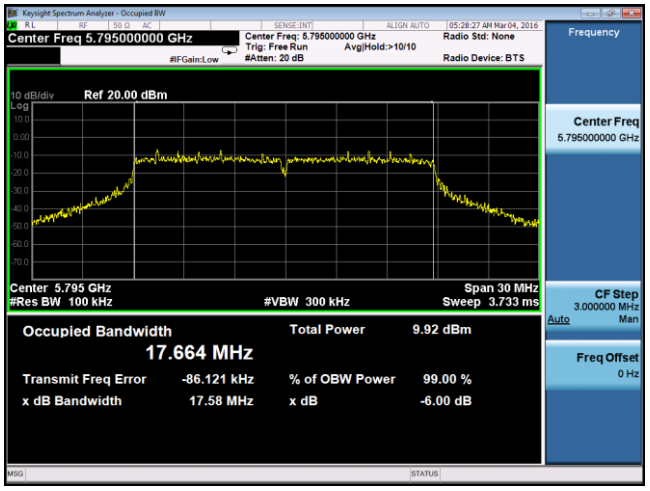

99% & 6dB BW – 10M 5735MHz



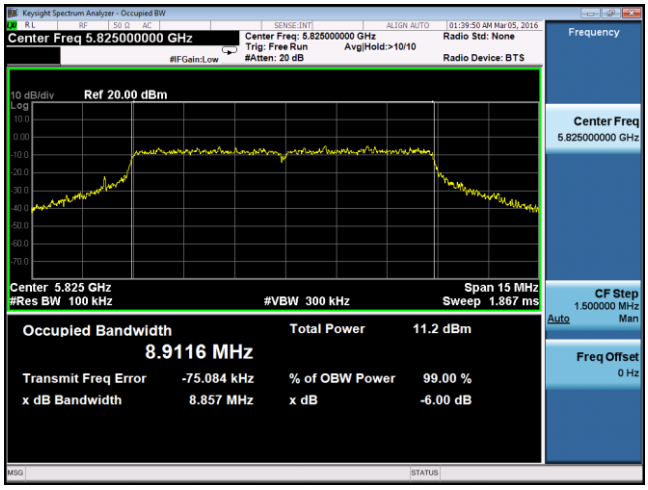

99% & 6dB BW – 20M 5755MHz



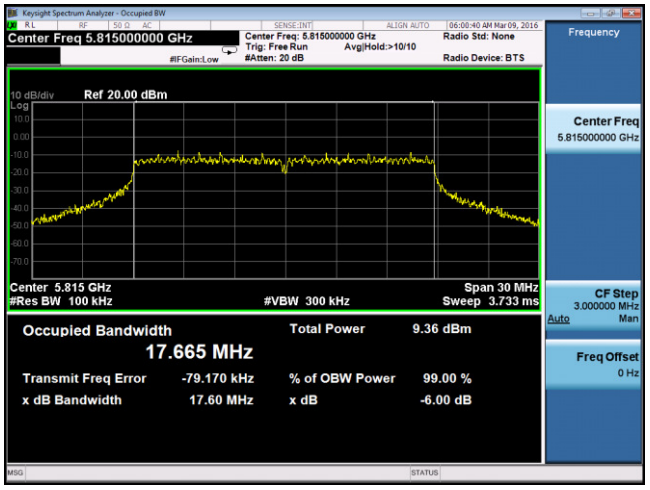

99% & 6dB BW – 10M 5775MHz



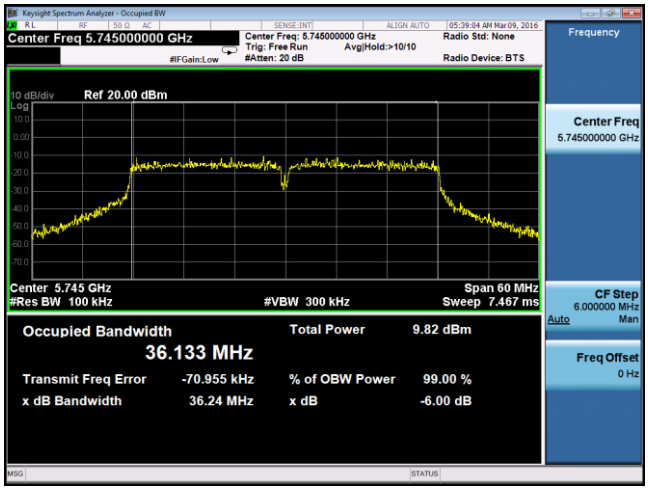

99% & 6dB BW – 20M 5795MHz



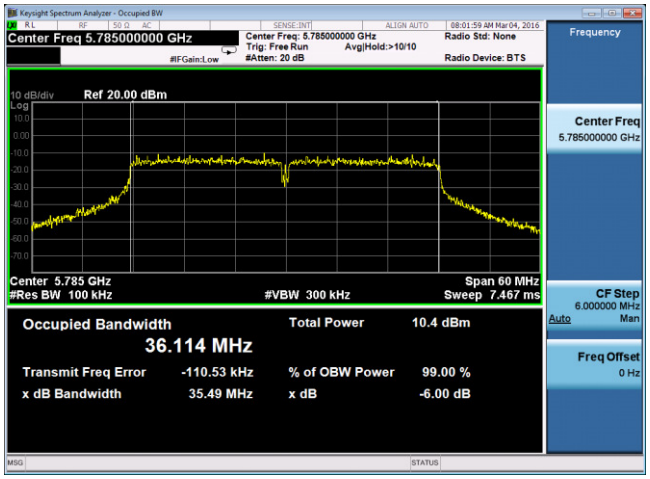

99% & 6dB BW – 10M 5825MHz



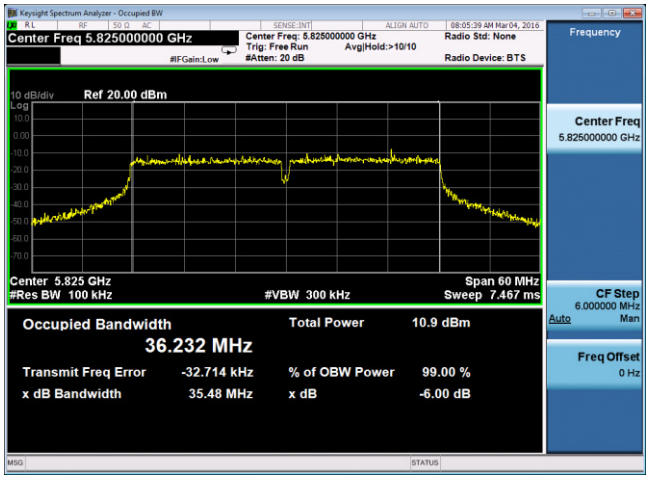

99% & 6dB BW – 20M 5815MHz




99% & 6dB BW – 40M 5745MHz




99% & 6dB BW – 40M 5785MHz




99% & 6dB BW – 40M 5825MHz

## 10.3 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). | ☒ |
| | 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. | ☐ |
| | 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. | ☐ |
| | 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. | ☐ |
| | 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. | ☐ |
| | 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. | ☒ |

| | | | | |
|---|---|---|---|---|
| Test Setup |  | | | |
| Test Procedure | 789033 D02 General UNII Test Procedures New Rules v01<br><br>Measurement using a Power Meter (PM)<br><br>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.<br>- Connect EUT's RF output power to power meter<br>- Set EUT to be continuous transmission mode<br>- Measurement the average output power using power meter and record the result<br>- Repeat above steps for different test channel and other modulation type. | | | |
| Test Date | 03/04/2015 | Environmental condition | Temperature<br>Relative Humidity<br>Atmospheric Pressure | 21ºC<br>40%<br>1019mbar |
| Remark | N/A | | | |
| Result | ☒ Pass ☐ Fail | | | |

**Test Data** ☒ Yes ☐ N/A

**Test Plot** ☐ Yes (See below) ☒ N/A

**Test was done by Teody Manansala at RF test site.**

**Output Power measurement result :**

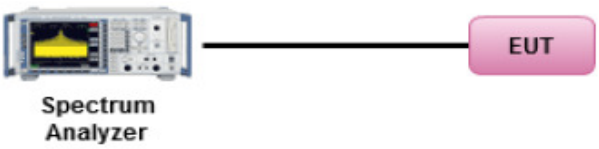
| Band 1 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Test mode | Freq(MHz) | CH | Conducted Power (dBm) | | | Limit (dBm) | Result |
| | | | Chain 1 | Chain 2 | Combined | | |
| 10MHz Bandwidth | 5160 | Low | 6.21 | 1.07 | 7.37 | 30 | Pass |
| | 5200 | Mid | 20.28 | 19.77 | 23.04 | 30 | Pass |
| | 5240 | High | 8.11 | 2.40 | 9.14 | 30 | Pass |
| 20MHz Bandwidth | 5170 | Low | 6.13 | 1.37 | 7.38 | 30 | Pass |
| | 5210 | Mid | 20.23 | 19.84 | 23.04 | 30 | Pass |
| | 5230 | High | 8.26 | 2.55 | 9.29 | 30 | Pass |
| 40MHz Bandwidth | 5190 | Low | 7.16 | 3.31 | 8.66 | 30 | Pass |
| | 5230 | High | 9.45 | 4.47 | 10.65 | 30 | Pass |

| Band 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Test mode | Freq(MHz) | CH | Conducted Power (dBm) | | | Limit (dBm) | Result |
| | | | Chain 1 | Chain 2 | Combined | | |
| 10MHz Bandwidth | 5735 | Low | 9.91 | 9.23 | 12.59 | 30 | Pass |
| | 5775 | Mid | 19.33 | 19.95 | 22.66 | 30 | Pass |
| | 5825 | High | 10.63 | 9.54 | 13.13 | 30 | Pass |
| 20MHz Bandwidth | 5755 | Low | 9.31 | 9.27 | 12.30 | 30 | Pass |
| | 5775 | Mid | 19.82 | 20.23 | 23.04 | 30 | Pass |
| | 5815 | High | 9.76 | 9.65 | 12.72 | 30 | Pass |
| 40MHz Bandwidth | 5745 | Low | 10.96 | 9.74 | 13.40 | 30 | Pass |
| | 5785 | Mid | 20.08 | 19.74 | 22.92 | 30 | Pass |
| | 5825 | High | 10.54 | 10.28 | 13.42 | 30 | Pass |

## 10.4 Peak Spectral Density

**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 power spectral density shall not exceed 17 dBm in any 1 megahertz band. | ☒ |
| | a)(1)(ii) | 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. | ☒ |
| | a)(2) | For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. | ☒ |
| | a)(3) | For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. | ☒ |

| | | | | |
|---|---|---|---|---|
| Test Setup |  | | | |
| Test Procedure | 789033 D02 General UNII Test Procedures New Rules v01, II.F. Method SA-1<br><br>Maximum spectral density measurement procedure<br>- Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.<br>- Set RBW = 1 MHz<br>- Set VBW ≥ 3 MHz<br>- Detector = RMS.<br>- Sweep time = auto couple.<br>- Trace mode = max hold.<br>- Trace average at least 100 traces in power averaging<br>- Use the peak marker function to determine the maximum amplitude level within the RBW. Apply correction to the result if different RBW is used. | | | |
| Test Date | 03/05/2016 | Environmental condition | Temperature<br>Relative Humidity<br>Atmospheric Pressure | 22ºC<br>42%<br>1020mbar |
| Remark | - | | | |
| Result | ☒ Pass ☐ Fail | | | |

**Test Data** ☒ Yes ☐ N/A

**Test Plot** ☒ Yes (See below) ☐ N/A

**Test was done by Teody Manansala at RF test site.**