

ISED CABid: ES1909

Lab. Company Number: 4621A

Test Report No:

77793RRF.003A1

## Partial Test Report

USA FCC Part 15.407, 15.209

CANADA RSS-247, RSS-Gen

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (*) Identification of item tested         | Telematic control unit with wireless technologies, used in automotive industry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| (*) Trademark                             | VW AG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| (*) Model and /or type reference          | TKCMOD12N00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| (*) Derived model not tested              | TKCMOD12E00, TKCMOD11000, TKCMOD12C00, TKCMOD12J00, TKCMOD12R00, TKCMOD12T00 and TKCMOD13C00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Other identification of the product       | FCC ID: T8GCONMOD<br>IC: 6434ACONMOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| (*) Features                              | GSM, UMTS, LTE, 5G, GNSS, Wi-Fi, BTLE, BT EDR<br>HW version: H25<br>SW version: X638                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Applicant                                 | HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH<br>BECKER-GOERING-STR., 16, 76307, KARLSBAD,<br>GERMANY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Test method requested, standard           | USA FCC Part 15.407 (10-1-23) Edition: Unlicensed National Information Infrastructure (U-NII) Devices. General technical requirements.<br>USA FCC Part 15.209 (10-1-23) Edition: Radiated emission limits; general requirements.<br>CANADA RSS-247 Issue 3 (August 2023).<br>CANADA RSS-Gen Issue 5 Amendment 2 (February 2021).<br>Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices 789033 D02<br>General U-NII Test Procedures New Rules v02r01 dated Dec 14, 2017.<br>ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices. |
| Approved by (name / position & signature) | José Manuel Gómez Galván<br>EMC Consumer & RF<br>Lab. Manager                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Date of issue                             | 2024-08-12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Report template No                        | FDT08_25<br>(*) "Data provided by the client"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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## Acronyms

| Acronym ID     | Acronym Description                    |
|----------------|----------------------------------------|
| Avg Power      | Maximum Average Conducted Output Power |
| DC             | Duty Cycle                             |
| Detector       | Detector used                          |
| Ebw            | Emission Bandwidth                     |
| Freq           | Frequency                              |
| Freq Rng       | Frequency Range                        |
| MP             | Measurement Point                      |
| Max EIRP       | Maximum Burst EIRP                     |
| Mod            | Modulation                             |
| Mode           | MIMO Mode                              |
| Occ Ch BW      | Occupied Channel Bandwidth             |
| Operation Band | Operation Band                         |
| PSD            | Power Spectral Density                 |
| Pol            | Polarization                           |
| Port           | Active Port                            |
| TPC            | TPC                                    |
| Unwanted Freq  | Unwanted Emissions Frequency           |
| Unwanted Lvl   | Unwanted Emissions Level               |

## Competences and guarantees

DEKRA Testing and Certification S.A.U. is a testing laboratory accredited by the National Accreditation Body (ENAC -Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification S.A.U. is an FCC-recognized accredited testing laboratory with appropriate scope of accreditation that covers the performed tests in this report.

DEKRA Testing and Certification S.A.U. is an ISED-recognized accredited testing laboratory, CABid: ES1909, Company Number: 4621A, with the appropriate scope of accreditation that covers the performed tests in this report.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification S.A.U. has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification S.A.U. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification S.A.U. at the time of performance of the test.

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The results presented in this Test Report apply only to the particular item under test established in this document.

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## General conditions

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1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
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4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification S.A.U. and the Accreditation Bodies.

## Uncertainty

---

Uncertainty (factor  $k=2$ ) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

The total uncertainty of the measurement system for the radiated emissions of EUT from 30 MHz to 1 GHz is:  
Measurement uncertainty  $\leq \pm 5,35$  dB with factor ( $k = 2$ ).

The total uncertainty of the measurement system for the radiated emissions of EUT from 1 GHz to 17 GHz is:  
Measurement uncertainty  $\leq \pm 4,32$  dB with factor ( $k = 2$ ).

The total uncertainty of the measurement system for the radiated emissions of EUT from 17 GHz to 40 GHz is:  
Measurement uncertainty  $\leq \pm 5,55$  dB with factor ( $k = 2$ ).

The total uncertainty of the measurement system for the conducted testing of EUT is:

RF Average Output Power: Measurement uncertainty  $\leq \pm 2,01$  dB

Duty Cycle: Measurement uncertainty  $\leq \pm 0,84$  ms

Power Spectral Density: Measurement uncertainty  $\leq \pm 2,01$  dB

Occupied/26 dBc Bandwidth: Measurement uncertainty

$\leq \pm 57,76$  kHz for BW 20MHz;

$\leq \pm 115,53$  kHz for BW 40MHz; and

$\leq \pm 231,06$  kHz for BW 80MHz.

6 dB Bandwidth: Measurement uncertainty

$\leq \pm 34,67$  kHz for BW 20MHz;

$\leq \pm 46,22$  kHz for BW 40MHz; and

$\leq \pm 80,90$  kHz for BW 80MHz.

Conducted Band-edge spurious emissions: Measurement uncertainty  $\leq \pm 2,57$  dB

DFS Channel closing & Move time: Measurement uncertainty  $\leq \pm 0,84$  ms

DFS Detection Threshold Level: Measurement uncertainty  $\leq \pm 1,81$  dB

## Data provided by the client

---

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
2. The sample of the model TKCMOD12N00 is a telematics control unit with wireless technologies, used in automotive, equipped with one modem, OEM. This unit was designed for automotive usage and contains the following features: GSM, UMTS, LTE, 5G, GNSS, WiFi (a, b, g, n, ac), Bluetooth Low Energy (BTLE) and Bluetooth EDR.
3. Declaration of similarity:

HARMAN AUTOMOTIVE DIVISION  
HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH  
BECKER-GÖRING-STRASSE 16  
76307 KARLSBAD, GERMANY



### Declaration of similarity

To whom it may concern,

We, **Harman Becker Automotive Systems GmbH**, located in  
**Becker-Goering-Str. 16; 76307 Karlsbad, Germany**

Hereby declare that the following units: TKCMOD12E00, TKCMOD12N00,  
TKCMOD11000, TKCMOD12C00, TKCMOD12J00, TKCMOD12R00,  
TKCMOD12T00 and TKCMOD13C00

have integrated the same BT/Wifi chipset.

The different naming comes from country specific, features enabled or network  
access device type.

| Targeted countries                           | Product Name | Type                         | NAD-HW | GNSS | Bluetooth<br>h WLAN | NAD<br>Services | CV2X |
|----------------------------------------------|--------------|------------------------------|--------|------|---------------------|-----------------|------|
| Rest of the world (offline variant)          | TKCMOD11000  | V046                         | EU     | x    | x                   |                 |      |
| EU + some other countries                    | TKCMOD12E00  | V037, V042, V043, V044, V049 | EU     | x    | x                   | x               |      |
| Canada/Mexico/USA                            | TKCMOD12N00  | V038, V039, V047             | NA     | x    | x                   | x               |      |
| China (without CV2X)                         | TKCMOD12C00  | V105                         | CN     | x    | x                   | x               |      |
| Japan                                        | TKCMOD12J00  | V045                         | RW     | x    | x                   | x               |      |
| Armenia/Belarus/Kazakhstan/Russia/Uzbekistan | TKCMOD12R00  | V048                         | EU     | x    | x                   | x               |      |
| Turkey                                       | TKCMOD12T00  | V040                         | EU     | x    | x                   | x               |      |
| China (with CV2X)                            | TKCMOD13C00  | V106                         | CN     | x    | x                   | x               | x    |

This declaration is intended to be included in the test reports where applies

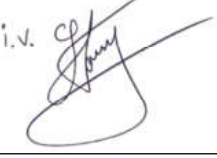
Regards

HARMAN AUTOMOTIVE DIVISION  
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4. Declaration of Comparability.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <br><b>HARMAN</b><br>A SAMSUNG COMPANY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                      |
| <b>Declaration of Comparability</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                      |
| <b>HARMAN BECKER</b><br><b>Automotive Systems GmbH</b><br><b>Becker-Göring-Str. 16</b><br><b>D-76307 Karlsbad, Germany</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                      |
| <b>declares under our sole responsibility, that the product</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                      |
| <b>Description of object</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | : Telematic system with BT, WLAN, GNSS, GSM, UMTS, LTE, 5G                           |
| <b>Brand/ Customer</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | : VW AG / VW-Group                                                                   |
| <b>Model name</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | : TKCMOD12E00/ TKCMOD11000 (CONMOD PPE)                                              |
| <b>Variant</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | : V037/ V046                                                                         |
| <b>Hardware / Software version</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | : H22 / X152 (corresponds CL1/2/3/4)                                                 |
| <b>Is comparable to:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                      |
| <b>Description of object</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | : Telematic system with BT, WLAN, GNSS, GSM, UMTS, LTE, 5G                           |
| <b>Brand/ Customer</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | : VW AG / VW-Group                                                                   |
| <b>Model name</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | : TKCMOD12E00/ TKCMOD11000 (CONMOD PPE)                                              |
| <b>Variant</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | : V037/ V046                                                                         |
| <b>Hardware / SW version</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | : H25 / X638 (corresponds CL6)                                                       |
| <p>We declare as authorized responsible person, that the products above have HW and SW changes which have no impact for the certification activities.</p> <p>The application SW is changed from X152 to X638 version and HW is changed from H22 to H25. These changes do not impact the following parameters: used frequency ranges / used frequency bands, the used modulation type, the maximum RF power, the circumstances under which the transmitter operates, the basic frequency and/or stabilizing circuitry, frequency multiplication stages, the basic modulator circuitry or maximum RF power, the field strength ratings, slew rates for clocking of output pins and drivers.</p> <p>In conclusion, we can say that all HW and SW updates do not influence any type approval for TKCMOD12E00 / TKCMOD11000 (ConMod PPE) in Cluster 6 (H25/X638) – variants listed above.</p> |                                                                                      |
| <b>Declared by:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>checked by: Daniel Galln (PM) / 17.07.2024</b>                                    |
| <b>Mr. STOICA Iulian, Customer Lead Certification</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Bucharest<br>(Place)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 17.07.2024<br>(Date)                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | (Signature)                                                                          |
| <b>Mr. OLTEANU Marius, Product Compliance Expert.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Bucharest<br>(Place)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 17.07.2024<br>(Date)                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | (Signature)                                                                          |

### HW Changes on TCU side.

From HW perspective: all the updates performed on HW level are listed below.

- Change of PCB solder mask to enable the population of a shield at a voltage regulator to improve EMC behavior (1)
- Add shield at voltage regulator to improve EMC behavior (1)
- Add two capacitors at functional LED lines to improve EMC behavior (2)
- Value change of two resistors at backlight LED line to improve EMC behavior (2)
- CAN transceiver replacement, same silicon, same datasheet but better CAN FD performance (3)
- Capacitor value change to improve the switch on behavior of A2B power supply (4)
- Introduce second source for switching transistor in GNSS power supply (5)
- Introduce second source (TDK) for A2B bus inductors (6)

More details please find in the attached document :

- „ConMod-HW-Changes-CL6-H22toH25“



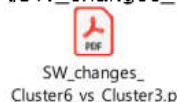
### SW Changes on TCU side – X152 version to X638 version:

For Cluster 6, the SW update from X152 version to X638 version is listed in the following documents:

- Harman
  - „ConMOD\_changes\_X152\_X638“



- Conti
  - „SW\_changes\_Cluster6\_vs\_Cluster3“



- E-Solutions
  - „Delta X152-X638 Pol“



There have been:

- No changes of the used frequency ranges / bands
- No changes of the used modulation type
- No changes of the maximum RF power
- No changes of the circumstances under which the transmitter operates
- No changes of the basic frequency and/or stabilizing circuitry
- No changes of the frequency multiplication stages
- No changes of the basic modulator circuitry or maximum RF power
- No changes of the field strength ratings
- No changes of slew rates for clocking of output pins and drivers

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results. The laboratory is not responsible for such information and it is not covered by accreditation.



## Usage of samples

Samples undergoing test have been selected by: The client.

| Id   | Control Number | Description                                                                     | Model       | Serial N°        | Date Reception | of | Application        |
|------|----------------|---------------------------------------------------------------------------------|-------------|------------------|----------------|----|--------------------|
| S/01 | 77793B_5.1     | Telematic control unit with wireless technologies, used in automotive industry. | TKCMOD12N00 | V04789R081900013 | 2024-05-16     |    | Element Under Test |
| S/01 | 77617B_15.1    | Power cable (OABR Adapter Cable)                                                | -           | -                | 2023-11-20     |    | Auxiliary Element  |
| S/01 | 77617B_94.1    | Harness                                                                         | -           | -                | 2024-02-20     |    | Auxiliary Element  |
| S/02 | 77793B_5.1     | Telematic control unit with wireless technologies, used in automotive industry. | TKCMOD12N00 | V04789R081900013 | 2024-05-16     |    | Element Under Test |
| S/02 | 67003B_17.1    | BT_WLAN 2 antenna                                                               | -           | -                | 2021-09-07     |    | Auxiliary Element  |
| S/02 | 67003B_226.1   | BT_WLAN3 antenna                                                                | 5B4.035.510 | -                | 2021-12-10     |    | Auxiliary Element  |
| S/02 | 77617B_162.1   | Harness                                                                         | -           | -                | 2024-04-05     |    | Auxiliary Element  |
| S/02 | 77617B_22.1    | Yellow Box                                                                      | -           | 14886            | 2023-11-20     |    | Auxiliary Element  |

Notes referenced to samples during the project:

| Id   | Type             |
|------|------------------|
| S/01 | Conducted tests. |
| S/02 | Radiated tests.  |



Test sample description

|                                               |                           |                                             |                          |                      |          |                                   |     |
|-----------------------------------------------|---------------------------|---------------------------------------------|--------------------------|----------------------|----------|-----------------------------------|-----|
| Ports..... :                                  | Port name and description |                                             | Cable                    |                      |          |                                   |     |
|                                               |                           |                                             | Specified max length [m] | Attached during test | Shielded | Coupled to patient <sup>(3)</sup> |     |
|                                               | RF connector - code       |                                             |                          | [ ]                  | [X]      | [ ]                               |     |
|                                               | RF connector - code       |                                             |                          | [X]                  | [X]      | [ ]                               |     |
|                                               | RF connector - code       |                                             |                          | [X]                  | [ ]      | [ ]                               |     |
| --                                            |                           |                                             |                          |                      |          |                                   |     |
| Supplementary information to the ports..... : | --                        |                                             |                          |                      |          |                                   |     |
| Rated power supply .....                      | Voltage and Frequency     |                                             |                          | Reference poles      |          |                                   |     |
|                                               |                           |                                             |                          | L1                   | L2       | L3                                | N   |
|                                               | [ ]                       | AC:                                         | [ ]                      | [ ]                  | [ ]      | [ ]                               | [ ] |
| [X]                                           |                           | DC: 12V car battery (4.8 VDC inside of TCU) |                          |                      |          |                                   |     |
| Rated Power .....                             | 12V DC                    |                                             |                          |                      |          |                                   |     |
| Clock frequencies.....                        | See Block Diagram         |                                             |                          |                      |          |                                   |     |
| Other parameters .....                        | See Technical description |                                             |                          |                      |          |                                   |     |
| Software version .....                        | X638                      |                                             |                          |                      |          |                                   |     |
| Hardware version .....                        | H25                       |                                             |                          |                      |          |                                   |     |
| Dimensions in cm (W x H x D) .....            | 260 x 148 x 26mm          |                                             |                          |                      |          |                                   |     |
| Mounting position .....                       | [ ]                       | Table top equipment                         |                          |                      |          |                                   |     |
|                                               | [ ]                       | Wall/Ceiling mounted equipment              |                          |                      |          |                                   |     |
|                                               | [ ]                       | Floor standing equipment                    |                          |                      |          |                                   |     |
|                                               | [ ]                       | Hand-held equipment                         |                          |                      |          |                                   |     |
|                                               | [X]                       | Other: Automotive telematics control unit   |                          |                      |          |                                   |     |
| Modules/parts..... :                          | Module/parts of test item |                                             |                          | Type                 |          | Manufacturer                      |     |
|                                               | --                        |                                             |                          |                      |          |                                   |     |
| Accessories (not part of the test item) ..... | Description               |                                             |                          | Type                 |          | Manufacturer                      |     |
|                                               | Cable Harness             |                                             |                          | --                   |          |                                   |     |
|                                               | 2G/3G4G/5G Antenna        |                                             |                          | --                   |          | Hirschmann/<br>Molex              |     |
|                                               | eCall button/LED          |                                             |                          | --                   |          |                                   |     |
|                                               | SOS Loudspeaker           |                                             |                          | --                   |          |                                   |     |
|                                               | Wake-up unit Box          |                                             |                          | --                   |          |                                   |     |
|                                               | --                        |                                             |                          |                      |          |                                   |     |
| Documents as provided by the applicant..... : | Description               |                                             |                          | File name            |          | Issue date                        |     |
|                                               | Technical Description     |                                             |                          |                      |          |                                   |     |
|                                               | --                        |                                             |                          |                      |          |                                   |     |

<sup>(3)</sup> Only for Medical Equipment

## Identification of the client

HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH  
BECKER-GOERING-STR., 16, 76307, KARLSBAD, GERMANY

## Testing period and place

|               |                                        |
|---------------|----------------------------------------|
| Test Location | DEKRA Testing and Certification S.A.U. |
| Date (start)  | 2024-05-27                             |
| Date (finish) | 2024-06-14                             |

## Document history

| Report number  | Date       | Description                                                                                                                                                            |
|----------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 77793RRF.003   | 2024-07-18 | First release.                                                                                                                                                         |
| 77793RRF.003A1 | 2024-08-12 | Second release. This test report is modified due to typos and missing information.<br>This modification test report cancels and replaces the test report 77793RRF.003. |

## Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

|                   |                              |
|-------------------|------------------------------|
| Temperature       | Min. = 15 °C<br>Max. = 35 °C |
| Relative humidity | Min. = 20 %<br>Max. = 75 %   |

In the semianechoic chamber, the following limits were not exceeded during the test.

|                   |                              |
|-------------------|------------------------------|
| Temperature       | Min. = 15 °C<br>Max. = 35 °C |
| Relative humidity | Min. = 20 %<br>Max. = 75 %   |

In the chamber for conducted measurements, the following limits were not exceeded during the test:

|                   |                              |
|-------------------|------------------------------|
| Temperature       | Min. = 15 °C<br>Max. = 35 °C |
| Relative humidity | Min. = 20 %<br>Max. = 75 %   |

### Remarks and comments

The tests have been performed by the technical personnel: José Manuel Jiménez González and Rafael Fernandez Martin.

Used instrumentation:

| Control No. | Equipment                                  | Model           | Manufacturer      | Next Calibration |
|-------------|--------------------------------------------|-----------------|-------------------|------------------|
| 07760       | DIGITAL MULTIMETER                         | 175             | FLUKE             | 2024-11-08       |
| 06615       | ETHERNET TEMPERATURE AND HUMIDITY LOGGER   | HWg-STE         | HW GROUP          | 2025-04-04       |
| 06609       | ETHERNET TEMPERATURE AND HUMIDITY LOGGER   | HWg-STE         | HW GROUP          | 2025-04-22       |
| 07040       | EXTENSION FOR OPEN SWITCH UNIT UP TO 40GHz | OSP-B157Wx      | ROHDE AND SCHWARZ | 2025-04-19       |
| 09029       | HIGH PASS FILTER 17-40 GHZ                 | STHP-17-40G-92  | TEMSTRON/TEM WELL | 2025-03-29       |
| 07091       | HIGH PASS FILTER 7-18 GHZ                  | ST-7GA3619-HS   | TEMSTRON/TEM WELL | 2025-04-08       |
| 04657       | HORN ANTENNA 18-40GHz                      | BBHA 9170       | SCHWARZBECK       | 2026-06-12       |
| 07193       | MULTI-DEVICE CONTROLLER                    | CO3000          | INNCO             | N/A              |
| 08848       | OPEN SWITCH UNIT UP TO 7.5 GHz             | OSP-B157W8 PLUS | ROHDE & SCHWARZ   | 2024-12-21       |
| 03335       | POWER SENSOR 10MHz-8GHz                    | NRP-Z11         | ROHDE AND SCHWARZ | 2024-05-29       |
| 00922       | POWER SUPPLY DC 40 V / 40 A                | NGPE 40/40      | ROHDE AND SCHWARZ | N/A              |
| 08856       | PRE-AMPLIFIER G>30dB 18-40GHz              | BLMA 1840-4A    | BONN ELEKTRONIK   | 2025-02-27       |
| 06142       | PRE-AMPLIFIER G>38dB 30MHz-6GHz            | BLNA 0360-01N   | BONN ELEKTRONIK   | 2024-06-28       |
| 06791       | SEMIANECHOIC ABSORBER LINED CHAMBER IV     | FACT 3 200 STP  | ETS LINDGREN      | N/A              |
| 06793       | SHIELDED ROOM                              | S101            | ETS LINDGREN      | N/A              |
| 06668       | SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz    | FSV40           | ROHDE AND SCHWARZ | 2024-12-14       |
| 07794       | SIGNAL AND SPECTRUM ANALYZER 10Hz-40GHz    | FSV40           | ROHDE AND SCHWARZ | 2025-04-21       |
| 04848       | EMC/RF MEASUREMENT SOFTWARE                | EMC32           | ROHDE AND SCHWARZ | N/A              |
| 06611       | TEMPERATURE AND HUMIDITY PROBE             | HWg-STE         | HW GROUP          | 2025-04-04       |
| 07798       | EMC/RF MEASUREMENT SOFTWARE                | WMS32           | ROHDE AND SCHWARZ | N/A              |

## Testing verdicts

|                |     |
|----------------|-----|
| Fail           | F   |
| Inconclusive   | I   |
| Not applicable | N/A |
| Not measured   | N/M |
| Pass           | P   |

## Summary

### A. U-NII-3 Band: 5.725 - 5.85 GHz

| FCC PART 15 PARAGRAPH / RSS-247               |                                                          |         |        |
|-----------------------------------------------|----------------------------------------------------------|---------|--------|
| Requirement – Test case                       |                                                          | Verdict | Remark |
| FCC 15.407 (a)(3) / RSS-247 6.2.4.1           | Transmitter Maximum conducted Output Power               | P       | (1)    |
| FCC 15.407 (e) / RSS-247 6.2.4.1              | 6 dB bandwidth.                                          | P       | (1)    |
| FCC 15.407 (a)(3) / RSS-247 6.2.4.1           | Transmitter Maximum Power Spectral Density               | P       | (1)    |
| FCC 15.407 (b)(4)(6) / RSS-247 6.2.4.2        | Transmitter Out of Band and Band Edge Radiated Emissions | P       | (1)    |
| Duty Cycle                                    |                                                          | P       | (1)    |
| 99% Occupied Bandwidth                        |                                                          | P       | (1)    |
| 26 dB Emission Bandwidth (EBW)                |                                                          | P       | (1)    |
| <u>Supplementary information and remarks:</u> |                                                          |         |        |
| (1) Only tests for MIMO 2x2 requested.        |                                                          |         |        |

# Appendix A: Test results for the U-NII-3 Band 5.725 - 5.85 GHz

|                                                                                                                                                                                        |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| TEST CONDITIONS .....                                                                                                                                                                  | 15         |
| TEST CASES DETAILS .....                                                                                                                                                               | 20         |
| <i>RSS-247 6.2.4.1 / FCC 15.407 (a) (3) [Avcp] Maximum Conducted output power UNII-3 .....</i>                                                                                         | <i>20</i>  |
| <i>RSS-247 6.2.4.1 / FCC 15.407 (a) (3) [Psd] Transmitter Maximum Power Spectral Density UNII-3 .....</i>                                                                              | <i>24</i>  |
| <i>RSS-247 6.2.4.1 / FCC 15.407 (e) [6dBw] 6 dB Emission Bandwidth .....</i>                                                                                                           | <i>44</i>  |
| <i>RSS-247 6.2.4.2 / FCC 15.407 (b) (4) (6) [Rse] Transmitter Out of Band and Band Edge Radiated Emissions<br/>for transmitters operating solely in the 5.725-5.850 GHz band .....</i> | <i>64</i>  |
| <i>RSS-Gen 6.6 / RSS-247 6.2. [99dBW] Transmitter 99% Occupied Bandwidth .....</i>                                                                                                     | <i>121</i> |
| <i>Section 15.407 Subclause 15.403(i) [Ebw] Transmitter 26 dB Emission Bandwidth (EBW).....</i>                                                                                        | <i>141</i> |

# TEST CONDITIONS

(\*): Data provided by the client.

POWER SUPPLY (\*):

Vnominal: 12 Vdc  
Type of Power Supply: Vehicle Battery.

ANTENNAS:

Type of Antenna: External.

|                   | Mode                                      | Maximum Declared Antenna Gain | Effective Declared Antenna Gain |
|-------------------|-------------------------------------------|-------------------------------|---------------------------------|
| Configuration #1: | SISO – Port 2<br>MIMO – Port 2 and Port 3 | +3.2dBi                       | +2.3dBi                         |
| Configuration #2: | SISO – Port 2<br>MIMO – Port 2 and Port 3 | +5dBi                         | +2.5dBi                         |

|                    |                                             |                         |
|--------------------|---------------------------------------------|-------------------------|
| Technology Tested: | WLAN (IEEE 802.11 a/n/ac): U-NII-3 band     |                         |
| Modes:             | 802.11a: 6, 9, 12, 18, 24, 36, 48 & 54 Mbps |                         |
|                    | 802.11n HT20: MCS0 to MCS7                  |                         |
|                    | 802.11n HT40: MCS0 to MCS7                  |                         |
|                    | 802.11ac VHT20: MCS0 to MCS8                |                         |
|                    | 802.11ac VHT40: MCS0 to MCS9                |                         |
|                    | 802.11ac VHT80: MCS0 to MCS9                |                         |
| Beamforming:       | No                                          |                         |
| Frequency Range:   | 5725 MHz to 5850 MHz                        |                         |
| Channel Spacing:   | 20 MHz                                      |                         |
| Transmit Channels  | Channel                                     | Channel Frequency (MHz) |
|                    | Low: 149                                    | 5745                    |
|                    | Middle: 157                                 | 5785                    |
|                    | High: 165                                   | 5825                    |
| Channel Spacing:   | 40 MHz                                      |                         |
| Transmit Channels  | Channel                                     | Channel Frequency (MHz) |
|                    | Low: 151                                    | 5755                    |
|                    | High: 159                                   | 5795                    |
| Channel Spacing:   | 80 MHz                                      |                         |
| Transmit Channels  | Middle: 155                                 | 5775                    |



POWER SETTING (\*):

**UNII-3:**

| Channel | Frequency | 11a | 11n | 11ac |
|---------|-----------|-----|-----|------|
| 149     | 5745 MHz  | 14  | 14  | 14   |
| 157     | 5785 MHz  | 14  | 14  | 14   |
| 165     | 5825 MHz  | 14  | 14  | 14   |
| 151     | 5755 MHz  | 14  | 14  | 14   |
| 159     | 5795 MHz  |     | 14  | 14   |
| 155     | 5775 MHz  |     | 14  | 14   |

The test set-up was made in accordance to the general provisions of FCC Unlicensed National Information Infrastructure (U-NII) Devices 789033 D02 General U-NII Test Procedures New Rules v02r01 dated Dec 14, 2017.

The EUT was tested in the following operating mode:

- Continuously transmitting with a modulated carrier at maximum power in all required channels using the supported data rates/modulations types.

The field strength at the band edges was evaluated for each mode on the lowest and highest channels at the rated power for the channel under test.

For all modes, the EUT was configured in test mode using a software application. The application was used to enable a continuous transmission and to select the test channels as required. The client supplied instructions to configure the EUT. The customer supplied a document containing the setup instructions.

The worst cases for testing were identified for output power and spurious levels at the band edges which were selected based on preliminary testing that correspond to next data rates:

- 802.11 a20: 6 Mbps
- 802.11 n HT20: MCS0
- 802.11 n HT40: MCS0
- 802.11 ac VHT20: MCS0
- 802.11 ac VHT40: MCS0
- 802.11 ac VHT80: MCS0

### CONDUCTED MEASUREMENTS:

The equipment under test was set up in a shielded room and it is connected to the TS8997 using a low loss RF cable. The reading of the spectrum analyser is corrected taking into account the cable loss.



### RADIATED MEASUREMENTS:

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna (Bilog antenna for the range between 30 MHz to 1000 MHz and 1 GHz-17 GHz Double ridge horn antenna) is situated at a distance of 3 m and at a distance of 1.5 m for the frequency range 17 GHz-26 GHz (17 GHz-40 GHz horn antenna).

For radiated emissions in the range 17 GHz-26 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

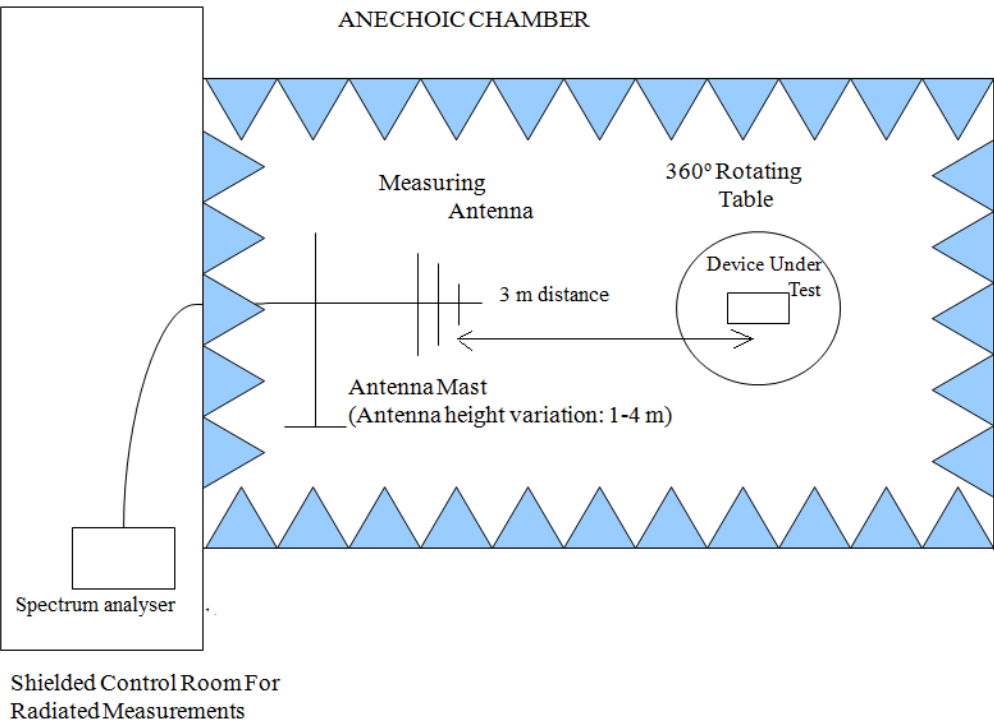
The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height (Bilog antenna and Double ridge horn antenna) was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

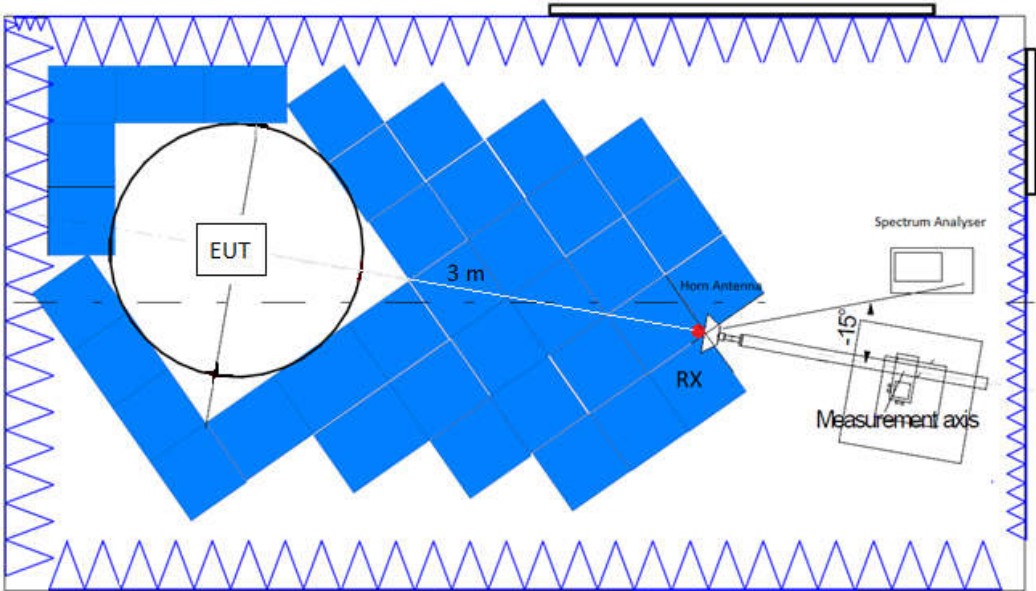
The final measured value, for the given emission, in the tables below incorporates the calibrated antenna factor and cable loss.

A resolution bandwidth/video bandwidth of 100 kHz / 300 kHz was used for frequencies below 1 GHz and 1 MHz / 3 MHz for frequencies above 1 GHz.

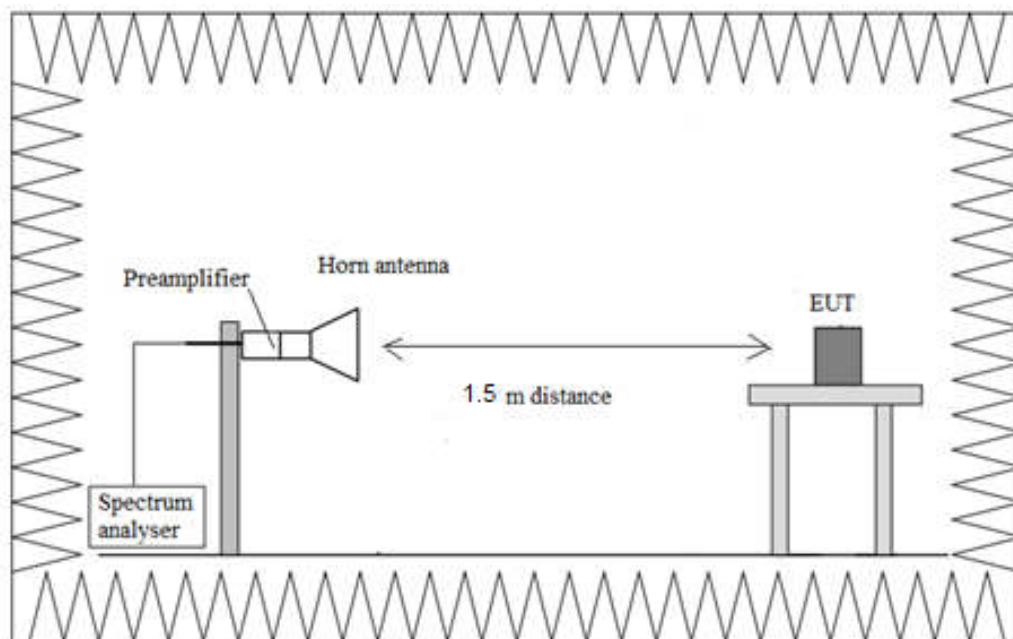
Radiated measurements setup from 30 MHz to 1 GHz:



Radiated measurements setup from 1 GHz to 17 GHz:



Radiated measurements setup  $f > 17$  GHz:



TEST CASES DETAILS

RSS-247 6.2.4.1 / FCC 15.407 (a) (3) [Avcp] Maximum Conducted output power UNII-3

Limits

For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30 dBm). If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

CONFIGURATION 2:

Modulation: 802.11a (OFDM 6 Mbit/s)

Mode: SISO

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Avg Power (dBm) | Max EIRP (dBm) |
|----------------------|------|------------|-----|-----------------|----------------|
| [5725, 5850]         | 3    | 5745.00000 | No  | 13.13           | 15.63          |
|                      |      | 5785.00000 |     | 14.12           | 16.62          |
|                      |      | 5825.00000 |     | 13.08           | 15.58          |

Modulation: 802.11n HT20 (OFDM MCS0 6.5 Mbit/s)

Mode: SISO

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Avg Power (dBm) | Max EIRP (dBm) |
|----------------------|------|------------|-----|-----------------|----------------|
| [5725, 5850]         | 3    | 5745.00000 | No  | 13.19           | 15.69          |
|                      |      | 5785.00000 |     | 13.79           | 16.29          |
|                      |      | 5825.00000 |     | 13.12           | 15.62          |

Modulation: 802.11ac VHT20 (OFDM MCS0)

Mode: SISO

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Avg Power (dBm) | Max EIRP (dBm) |
|----------------------|------|------------|-----|-----------------|----------------|
| [5725, 5850]         | 3    | 5745.00000 | No  | 13.09           | 15.59          |
|                      |      | 5785.00000 |     | 13.98           | 16.48          |
|                      |      | 5825.00000 |     | 13.00           | 15.50          |

Modulation: 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)

Mode: SISO

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Avg Power (dBm) | Max EIRP (dBm) |
|----------------------|------|------------|-----|-----------------|----------------|
| [5725, 5850]         | 3    | 5755.00000 | No  | 10.33           | 12.83          |
|                      |      | 5795.00000 |     | 10.67           | 13.17          |

Modulation: 802.11ac VHT40 (OFDM MCS0)

Mode: SISO

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Avg Power (dBm) | Max EIRP (dBm) |
|----------------------|------|------------|-----|-----------------|----------------|
| [5725, 5850]         | 3    | 5755.00000 | No  | 10.91           | 13.41          |
|                      |      | 5795.00000 |     | 10.75           | 13.25          |

Modulation: 802.11ac VHT80 (OFDM MCS0)

Mode: SISO

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Avg Power (dBm) | Max EIRP (dBm) |
|----------------------|------|------------|-----|-----------------|----------------|
| [5725, 5850]         | 3    | 5775.00000 | No  | 10.52           | 13.02          |

Verdict

Pass

CONFIGURATION 2:

Modulation: 802.11n HT20 (OFDM MCS0 6.5 Mbit/s)

MIMO Mode: MIMO CDD Mode 2x2

Results

The maximum conducted output power was measured according to 789033 D02 General UNII Test Procedures New Rules v02r01 clause E.3.b) (Method PM-G) (duty cycle is < 98%).

For all modes of operation, the antenna gain is less than 6 dBi.

The e.i.r.p. levels are calculated by adding the declared maximum antenna gain (dBi).

Assuming CDD (modulation OFDM), and NSS = 1 (worst case):

Array Gain = 0 dB (NANT ≤ 4)

Directional Gain = GANT + Array Gain = 2.5 dBi + 0 dB = 2.5 dBi

Maximum Declared Antenna Gain for RF Output Power: 2.5 dBi

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Avg Power (dBm) | Max EIRP (dBm) |
|----------------------|------|------------|-----|-----------------|----------------|
| [5725, 5850]         | 1+2  | 5745.00000 | No  | 10.28           | 12.78          |
|                      |      | 5785.00000 |     | 9.98            | 12.48          |
|                      |      | 5825.00000 |     | 9.95            | 12.45          |

Modulation: 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Avg Power (dBm) | Max EIRP (dBm) |
|----------------------|------|------------|-----|-----------------|----------------|
| [5725, 5850]         | 1+2  | 5755.00000 | No  | 9.29            | 11.79          |
|                      |      | 5795.00000 |     | 8.55            | 11.05          |

Modulation: 802.11a (OFDM 6 Mbit/s)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Avg Power (dBm) | Max EIRP (dBm) |
|----------------------|------|------------|-----|-----------------|----------------|
| [5725, 5850]         | 1+2  | 5745.00000 | No  | 10.46           | 12.96          |
|                      |      | 5785.00000 |     | 10.10           | 12.60          |
|                      |      | 5825.00000 |     | 10.21           | 12.71          |

Modulation: 802.11ac VHT20 (OFDM MCS0)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Avg Power (dBm) | Max EIRP (dBm) |
|----------------------|------|------------|-----|-----------------|----------------|
| [5725, 5850]         | 1+2  | 5745.00000 | No  | 10.35           | 12.85          |
|                      |      | 5785.00000 |     | 9.96            | 12.46          |
|                      |      | 5825.00000 |     | 10.01           | 12.51          |

Modulation: 802.11ac VHT40 (OFDM MCS0)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Avg Power (dBm) | Max EIRP (dBm) |
|----------------------|------|------------|-----|-----------------|----------------|
| [5725, 5850]         | 1+2  | 5755.00000 | No  | 9.30            | 11.80          |
|                      |      | 5795.00000 |     | 8.56            | 11.06          |

Modulation: 802.11ac VHT80 (OFDM MCS0)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Avg Power (dBm) | Max EIRP (dBm) |
|----------------------|------|------------|-----|-----------------|----------------|
| [5725, 5850]         | 1+2  | 5775.00000 | No  | 9.26            | 11.76          |

Verdict

Pass



# RSS-247 6.2.4.1 / FCC 15.407 (a) (3) [Psd] Transmitter Maximum Power Spectral Density UNII-3

## Limits

The maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

## Results

For all modes of operation, the antenna gain is less than 6 dBi.  
The e.i.r.p. levels are calculated by adding the declared maximum antenna gain (dBi).

Assuming CDD (modulation OFDM), and NSS = 1 (worst case):  
Array Gain = 10 log(NANT/NSS) dB = 10 log(2) = 3.01 dB  
Directional Gain = GANT + Array Gain = 2.5 dBi + 3.01 dB = 5.51 dBi

## CONFIGURATION 2:

Modulation: 802.11n HT20 (OFDM MCS0 6.5 Mbit/s)  
MIMO Mode: MIMO CDD Mode 2x2

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Freq (MHz)  | PSD (dBm) |
|----------------------|------|------------|-----|-------------|-----------|
| [5725, 5850]         | 1+2  | 5745.00000 | No  | 5744.405941 | -5.49     |
|                      |      | 5785.00000 |     | 5784.405941 | -5.71     |
|                      |      | 5825.00000 |     | 5825.594059 | -5.64     |

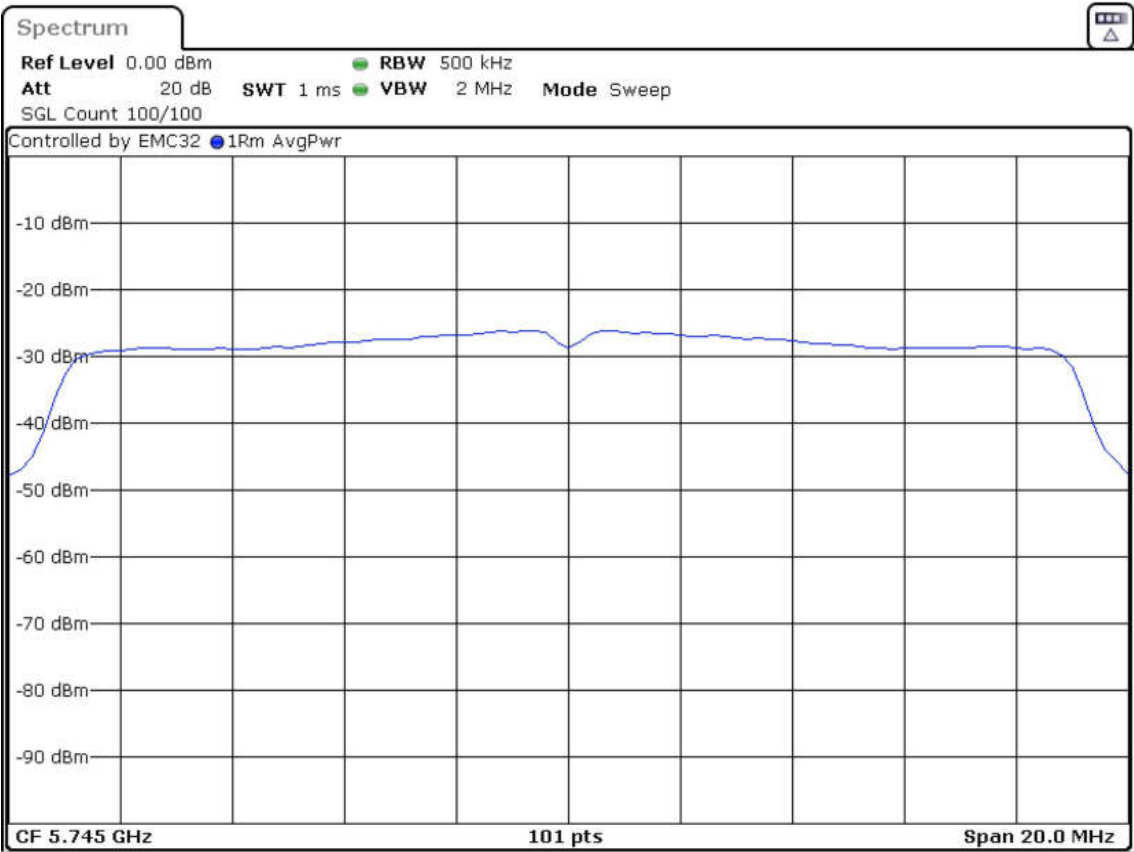
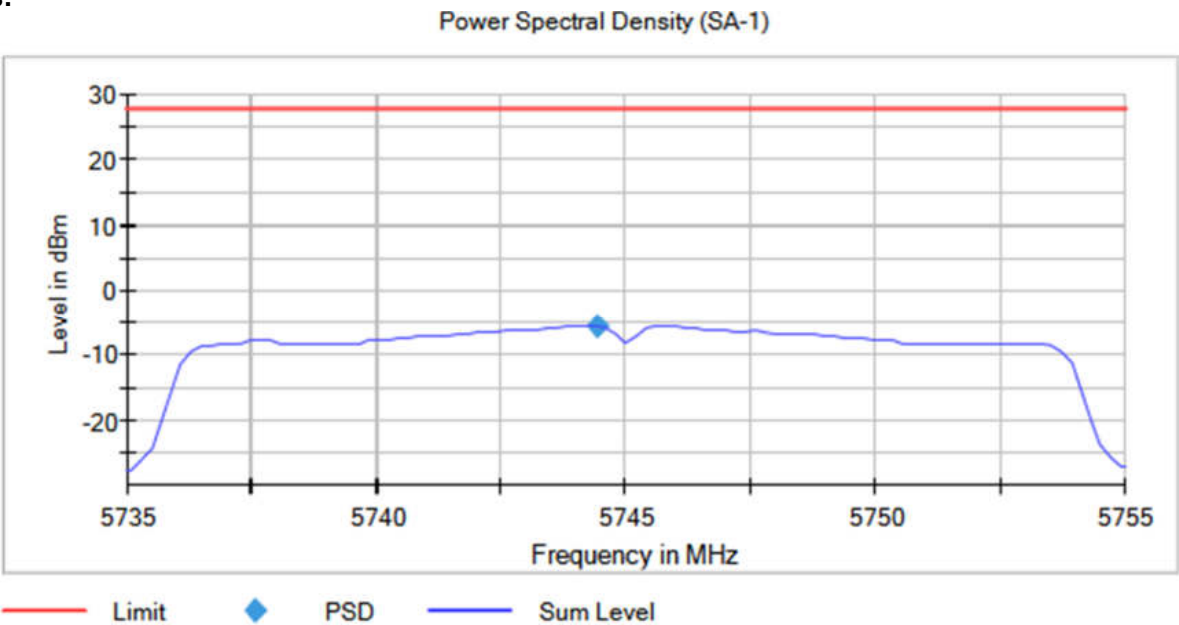
## Verdict

Pass

Attachments

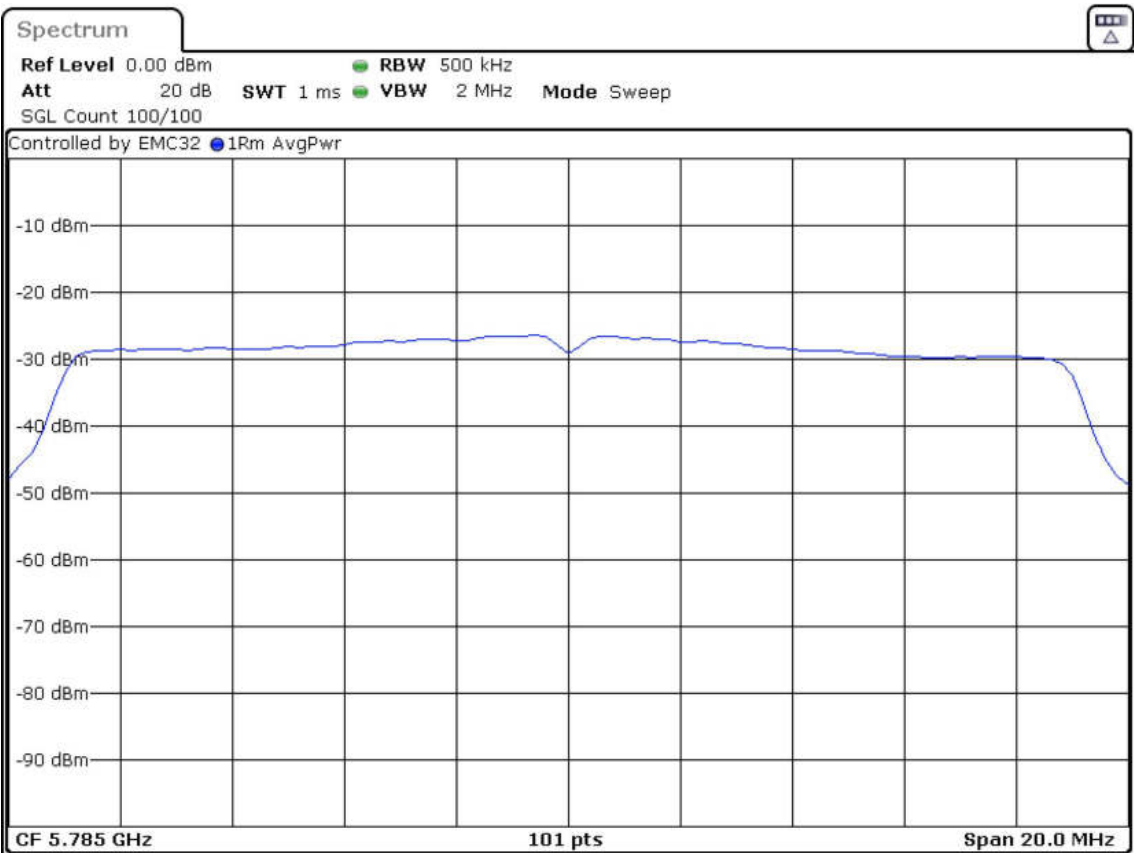
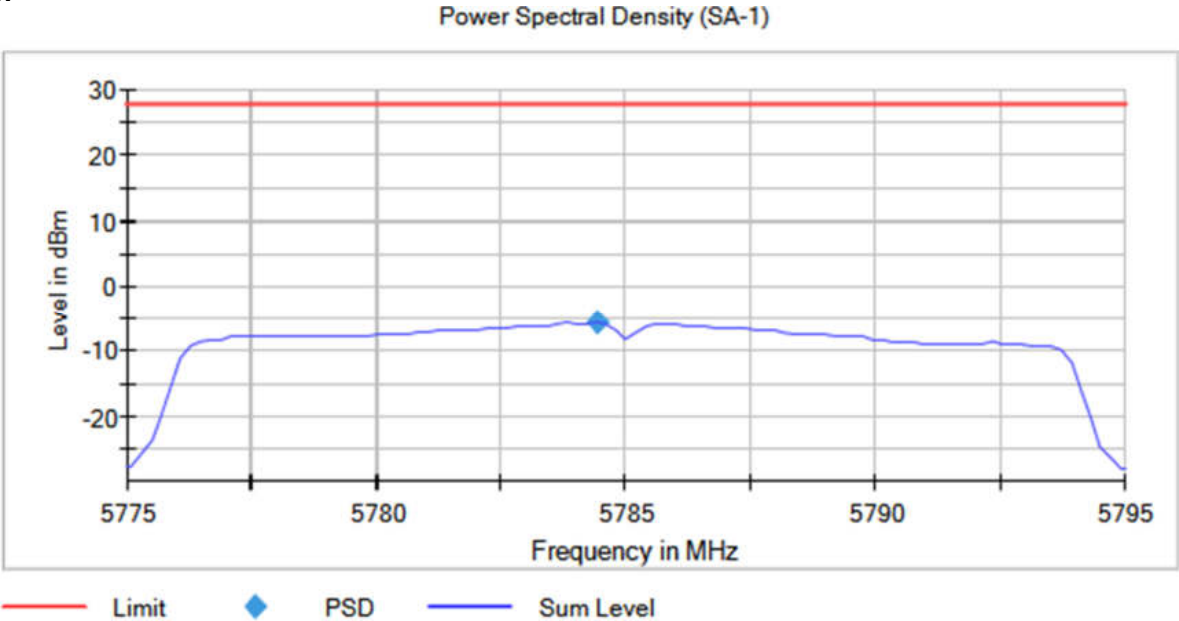
Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5745.00000    Modulation = 802.11n HT20 (OFDM MCS0 6.5 Mbit/s)  
TPC = No    MIMO Mode = MIMO CDD Mode 2x2

Images:



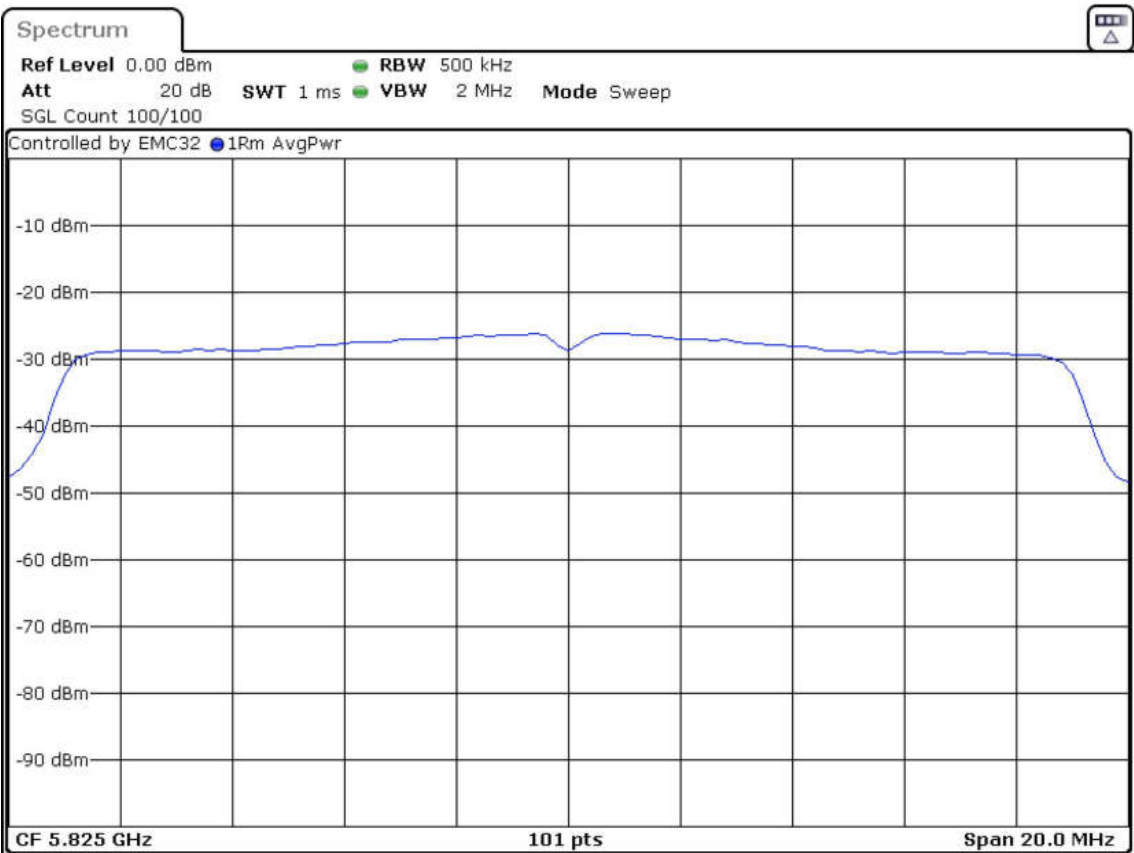
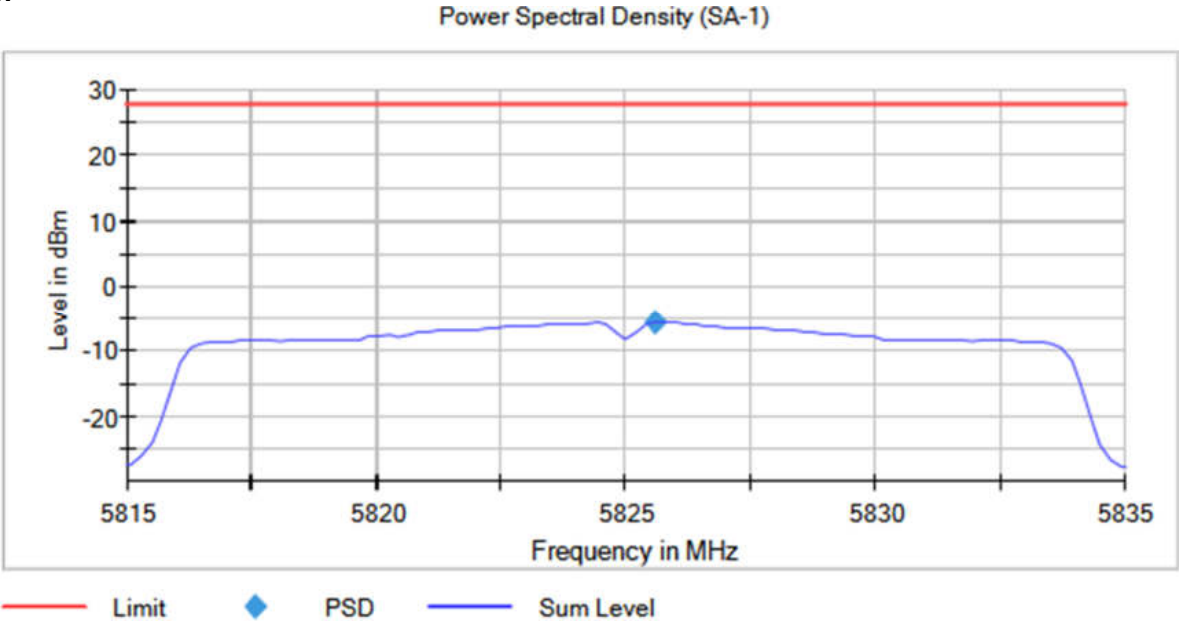
Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5785.00000    Modulation = 802.11n HT20 (OFDM MCS0 6.5 Mbit/s)  
TPC = No    MIMO Mode = MIMO CDD Mode 2x2

Images:



Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5825.00000    Modulation = 802.11n HT20 (OFDM MCS0 6.5 Mbit/s)  
TPC = No    MIMO Mode = MIMO CDD Mode 2x2

Images:



CONFIGURATION 2:

Modulation: 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Freq (MHz)  | PSD (dBm) |
|----------------------|------|------------|-----|-------------|-----------|
| [5725, 5850]         | 1+2  | 5755.00000 | No  | 5752.875000 | -10.66    |
|                      |      | 5795.00000 |     | 5797.625000 | -11.22    |

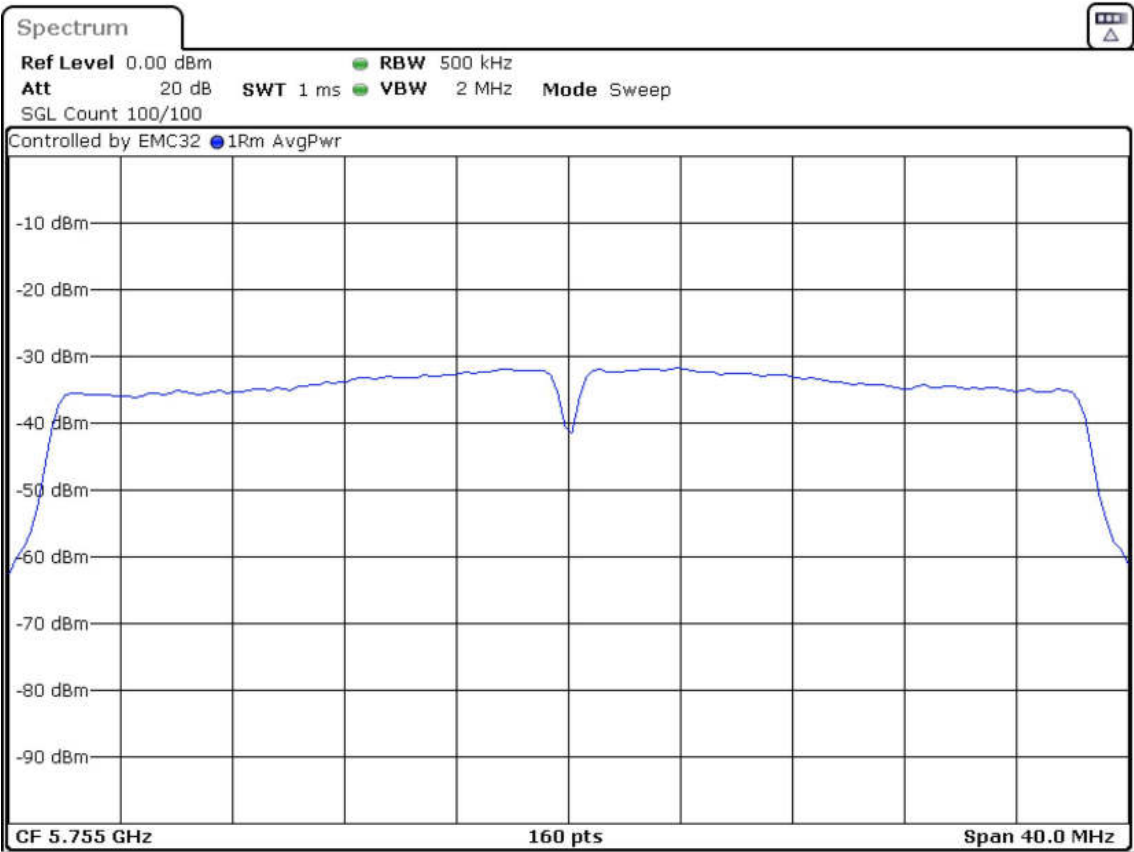
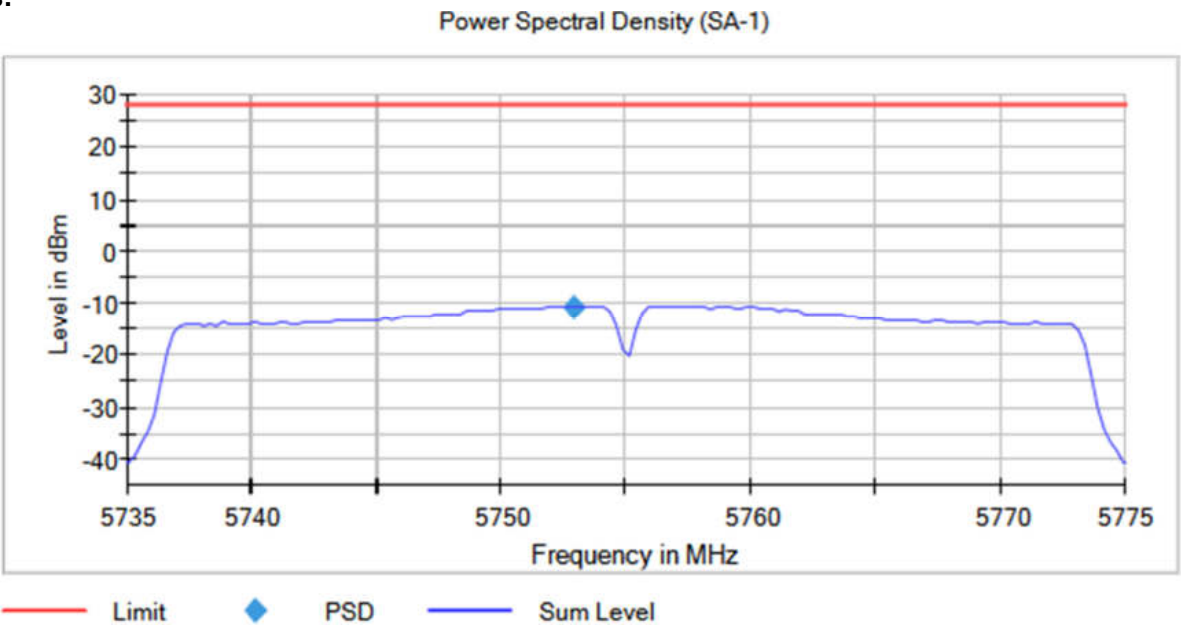
Verdict

Pass

Attachments

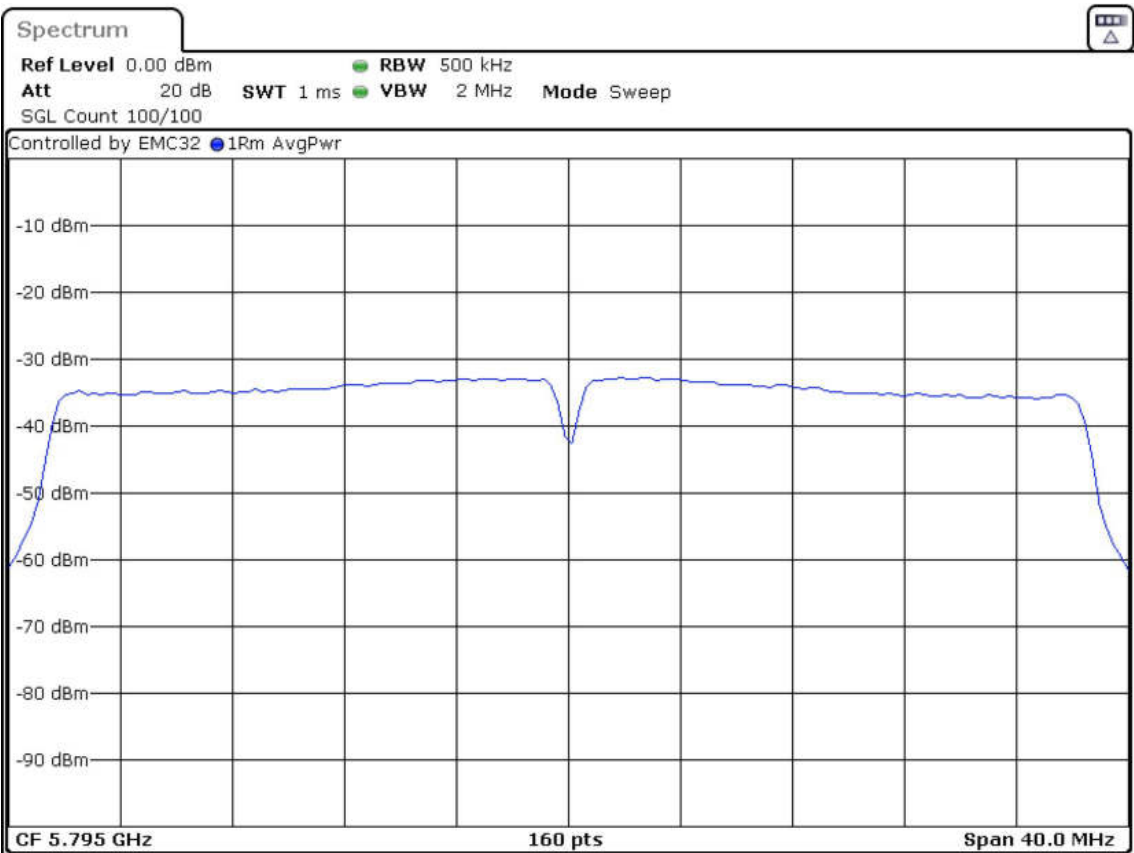
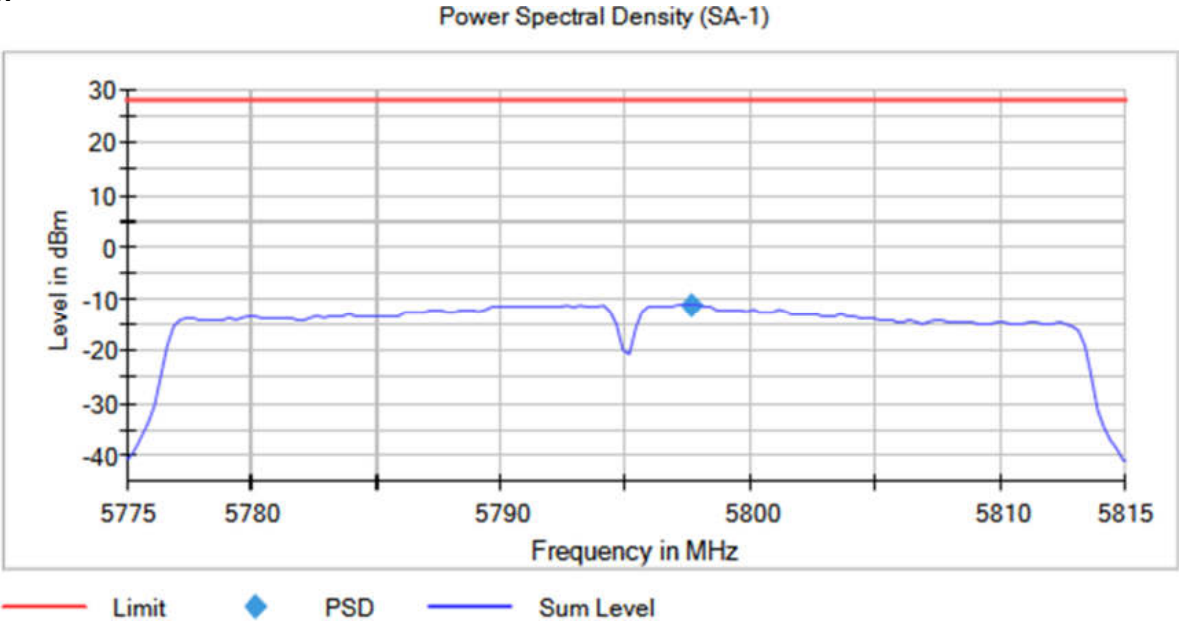
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Frequency MHz = 5755.00000    Modulation = 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)  
TPC = No    MIMO Mode = MIMO CDD Mode 2x2

Images:



Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5795.00000    Modulation = 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)  
TPC = No    MIMO Mode = MIMO CDD Mode 2x2

Images:



CONFIGURATION 2:

Modulation: 802.11a (OFDM 6 Mbit/s)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Freq (MHz)  | PSD (dBm) |
|----------------------|------|------------|-----|-------------|-----------|
| [5725, 5850]         | 1+2  | 5745.00000 | No  | 5744.405941 | -4.29     |
|                      |      | 5785.00000 |     | 5784.405941 | -4.32     |
|                      |      | 5825.00000 |     | 5825.792079 | -4.49     |

Verdict

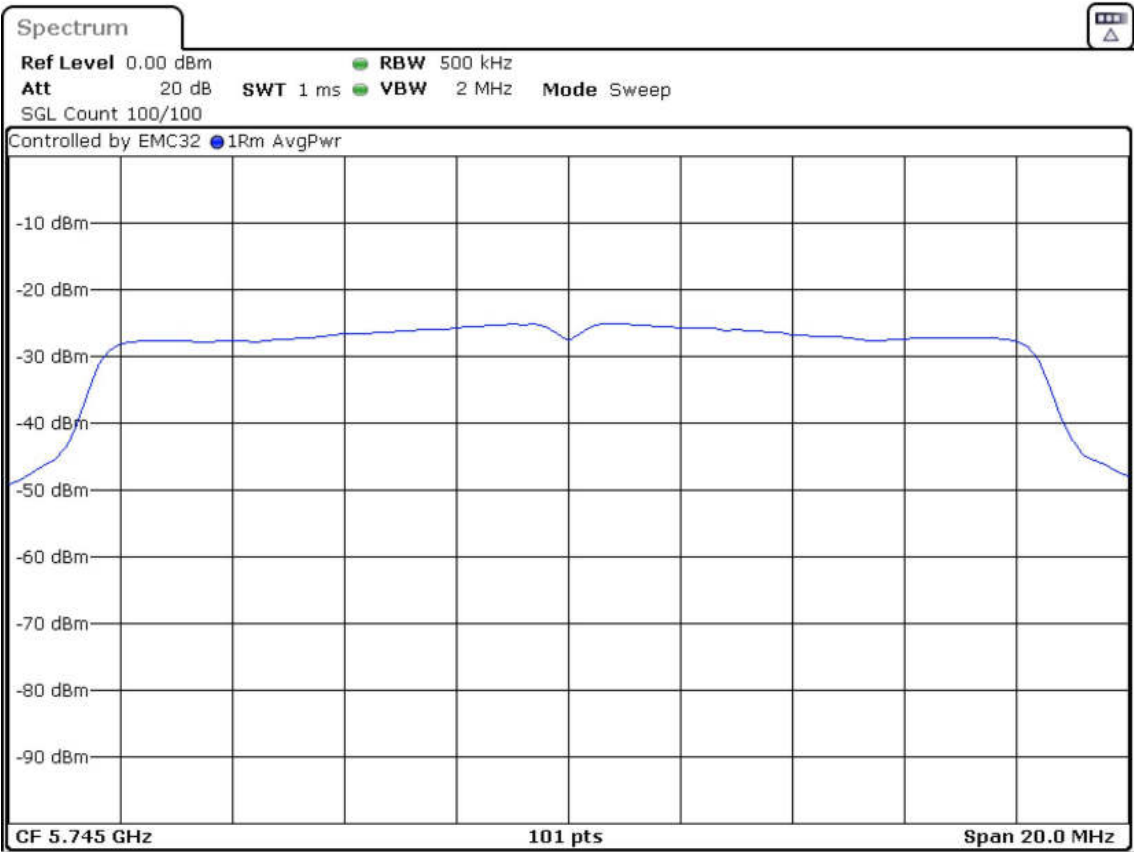
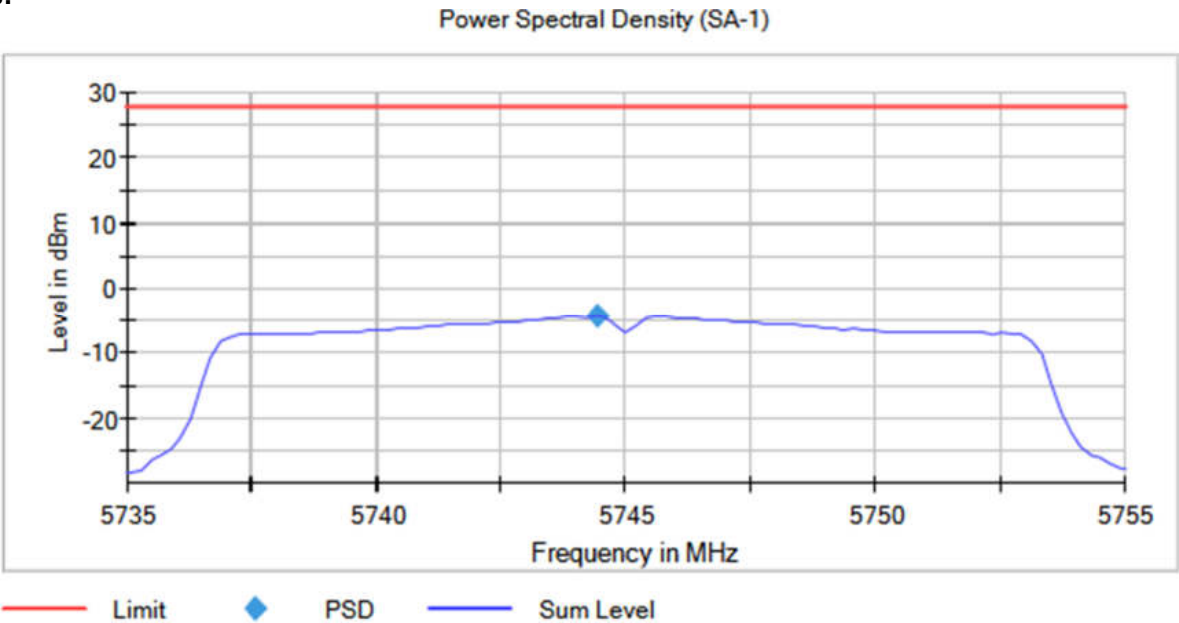
Pass



Attachments

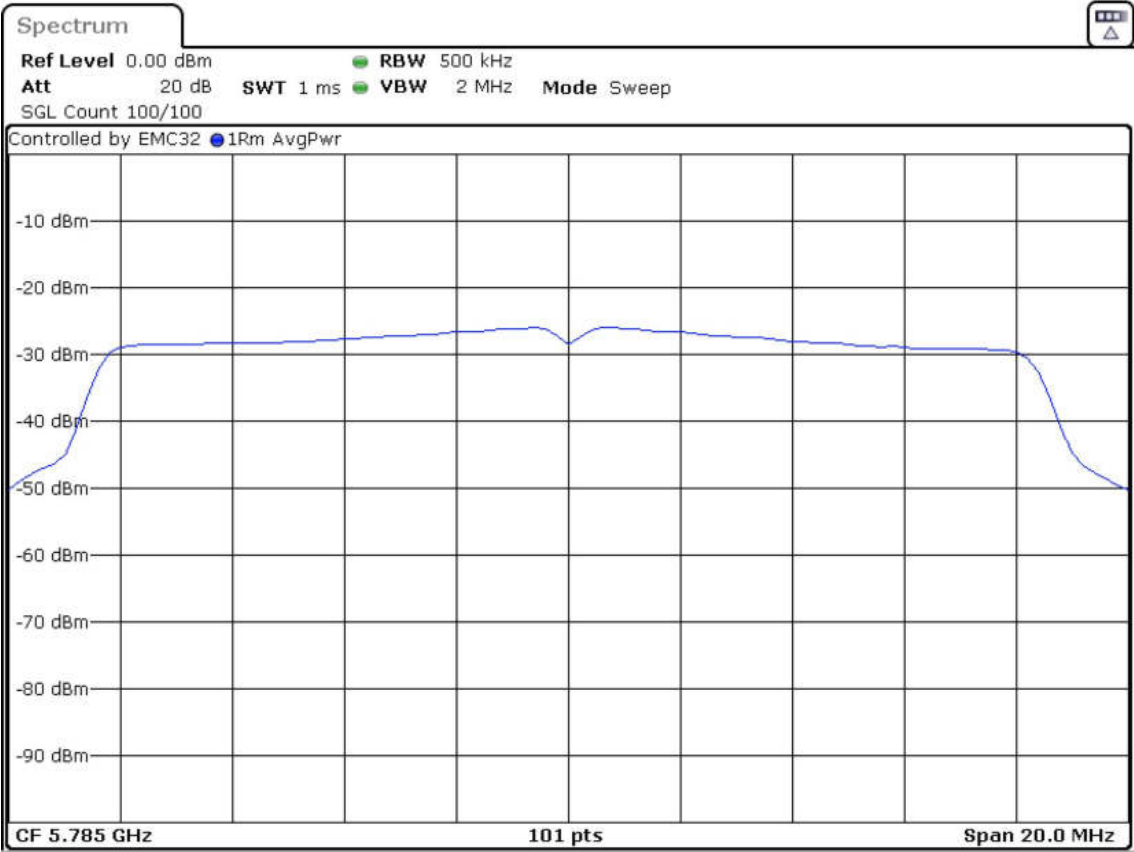
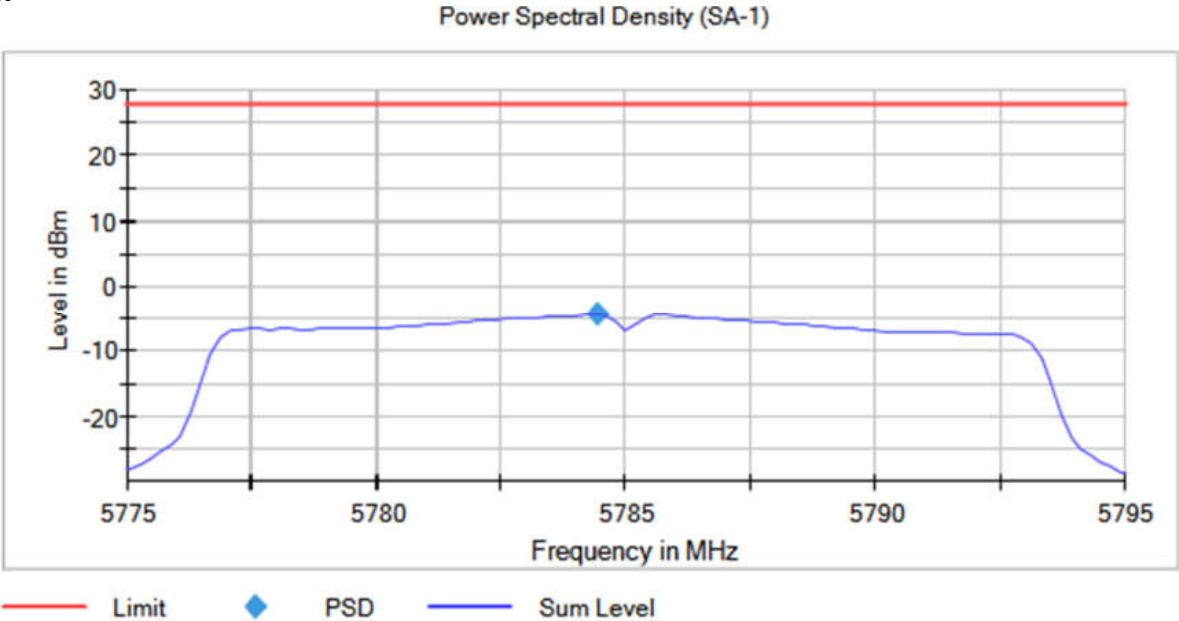
Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5745.00000    Modulation = 802.11a (OFDM 6 Mbit/s)  
TPC = No    MIMO Mode = MIMO CDD Mode 2x2

Images:



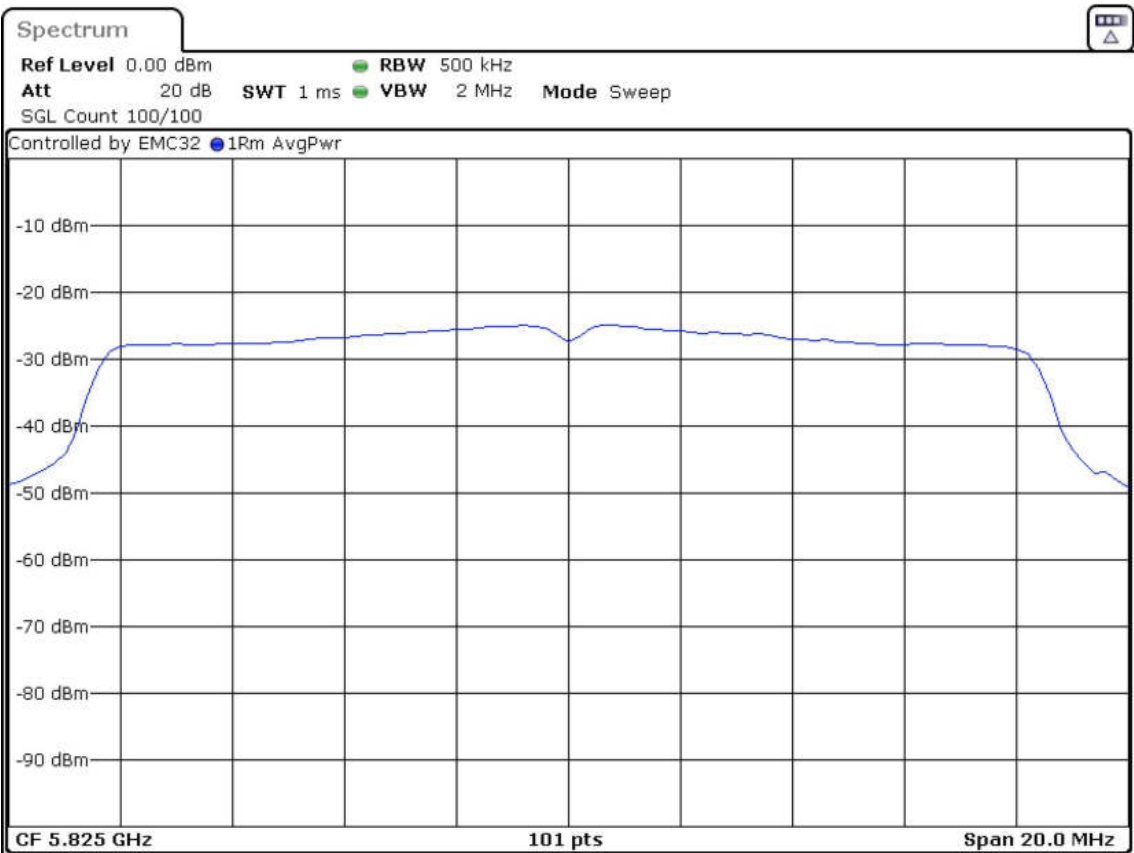
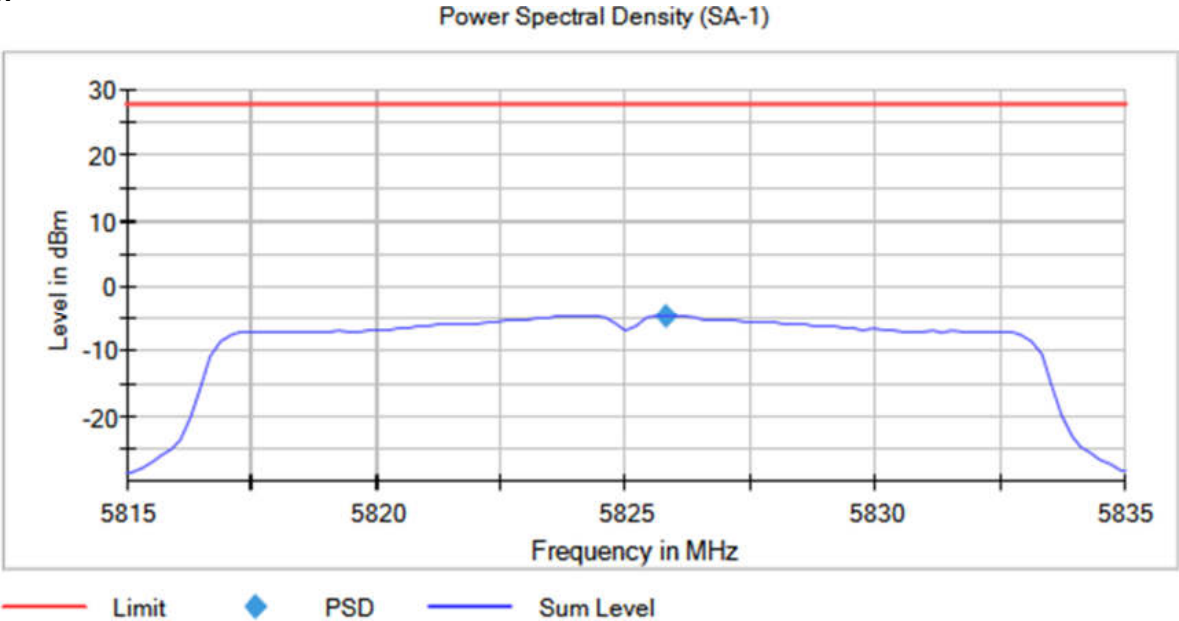
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Frequency MHz = 5785.00000    Modulation = 802.11a (OFDM 6 Mbit/s)  
TPC = No    MIMO Mode = MIMO CDD Mode 2x2

Images:



Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5825.00000    Modulation = 802.11a (OFDM 6 Mbit/s)  
TPC = No    MIMO Mode = MIMO CDD Mode 2x2

Images:



CONFIGURATION 2:

Modulation: 802.11ac VHT20 (OFDM MCS0)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Freq (MHz)  | PSD (dBm) |
|----------------------|------|------------|-----|-------------|-----------|
| [5725, 5850]         | 1+2  | 5745.00000 | No  | 5745.792079 | -5.64     |
|                      |      | 5785.00000 |     | 5784.207921 | -5.65     |
|                      |      | 5825.00000 |     | 5825.792079 | -5.57     |

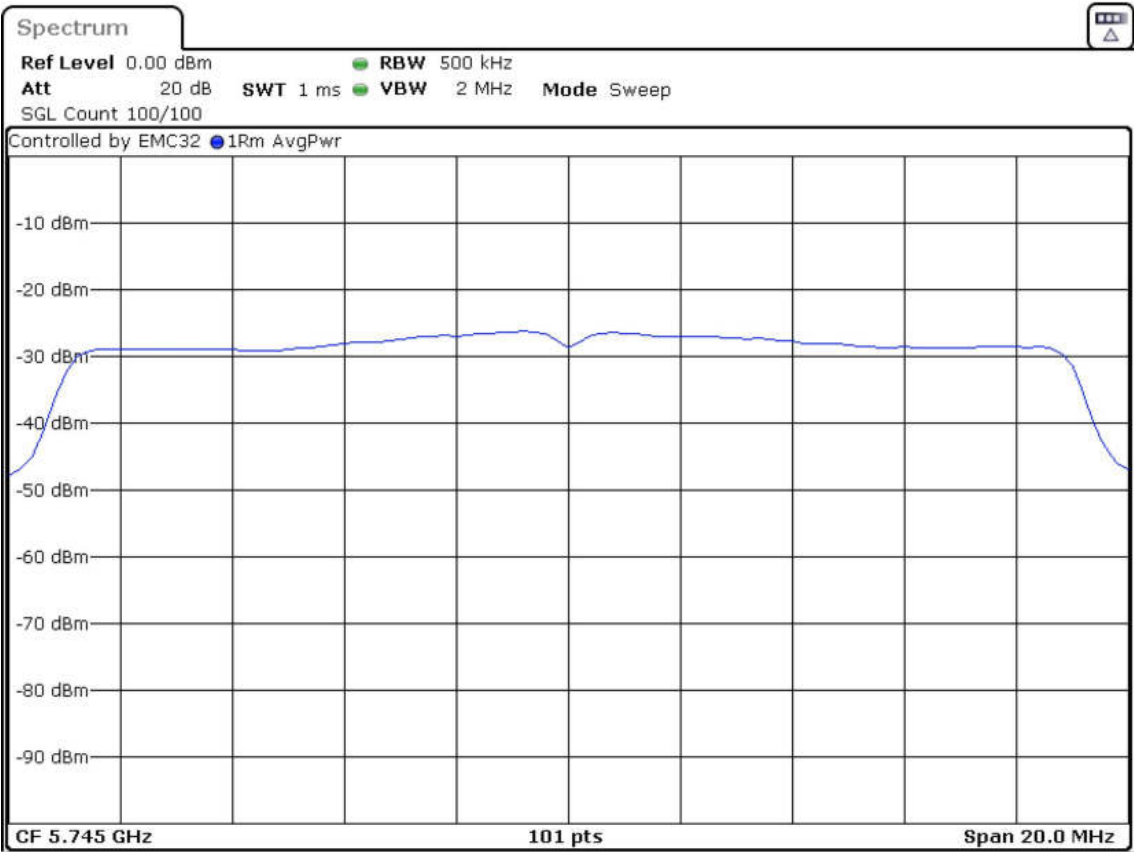
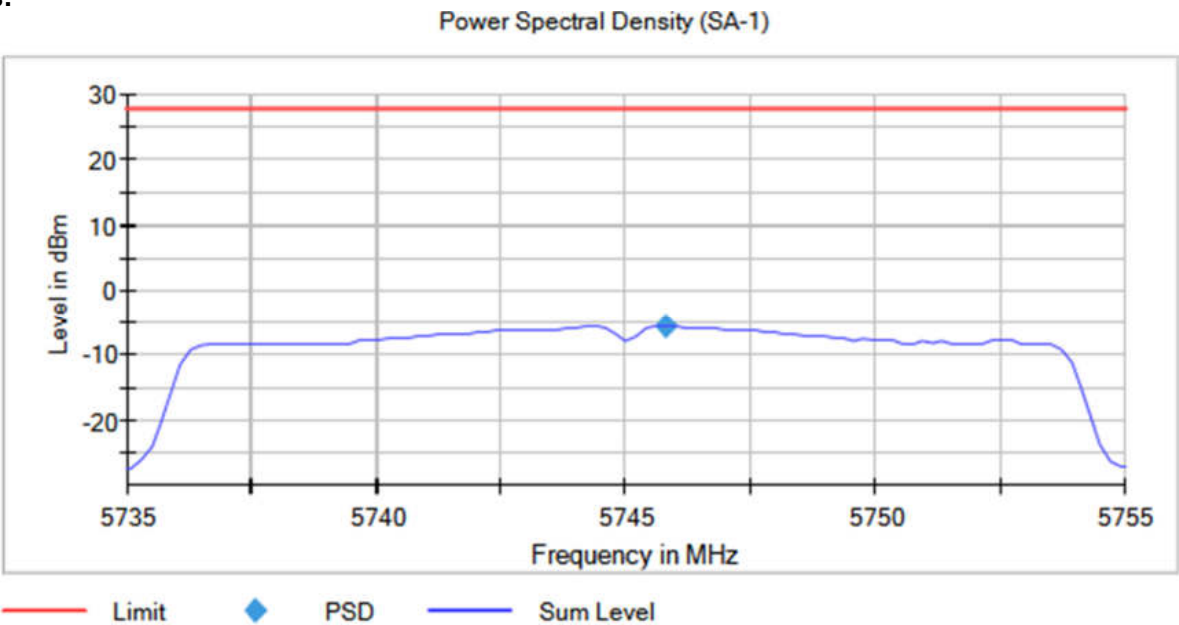
Verdict

Pass

Attachments

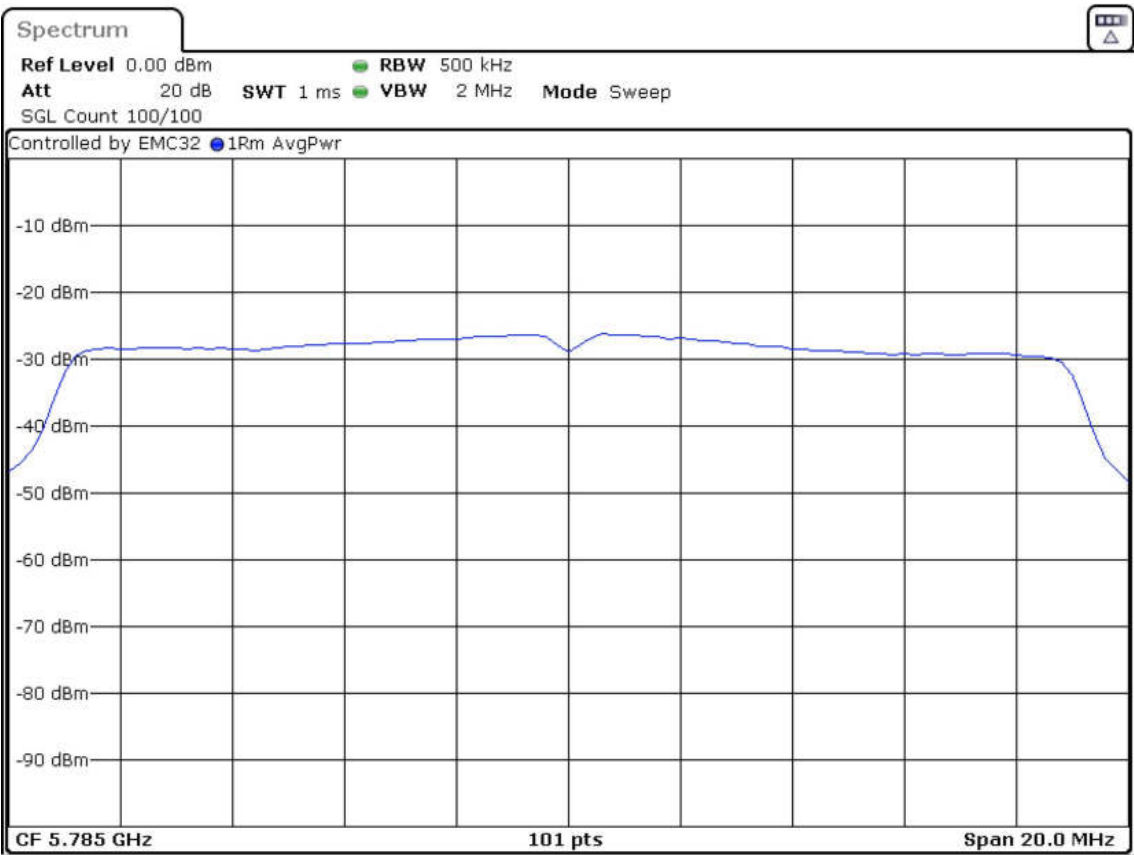
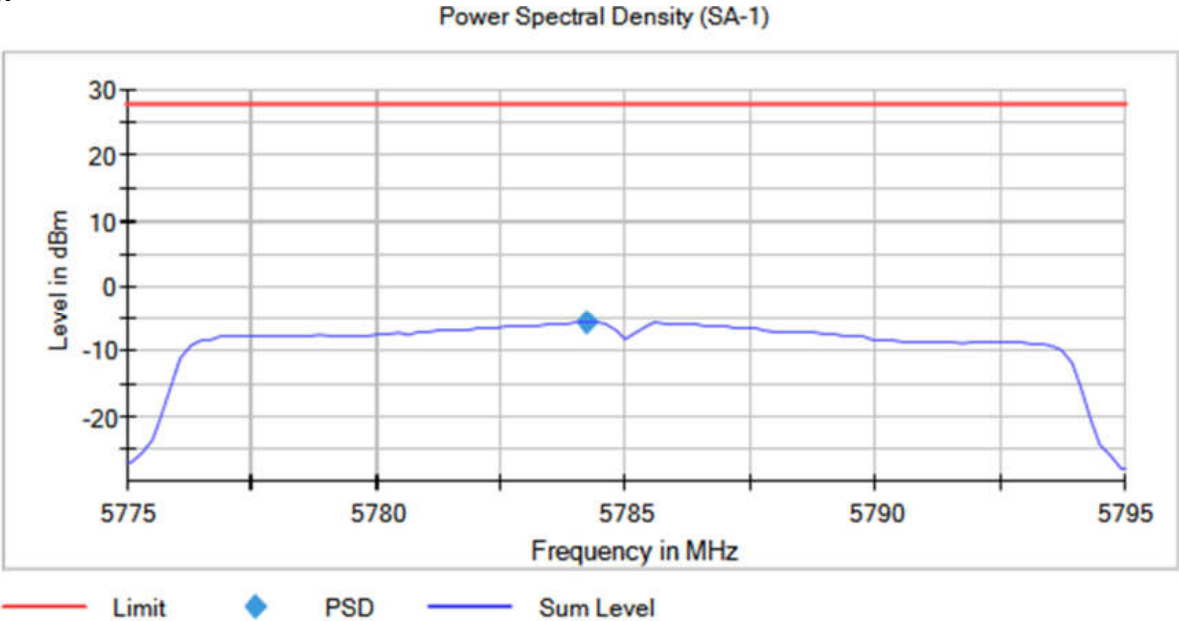
Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5745.00000    Modulation = 802.11ac VHT20 (OFDM MCS0)  
TPC = No    MIMO Mode = MIMO CDD Mode 2x2

Images:



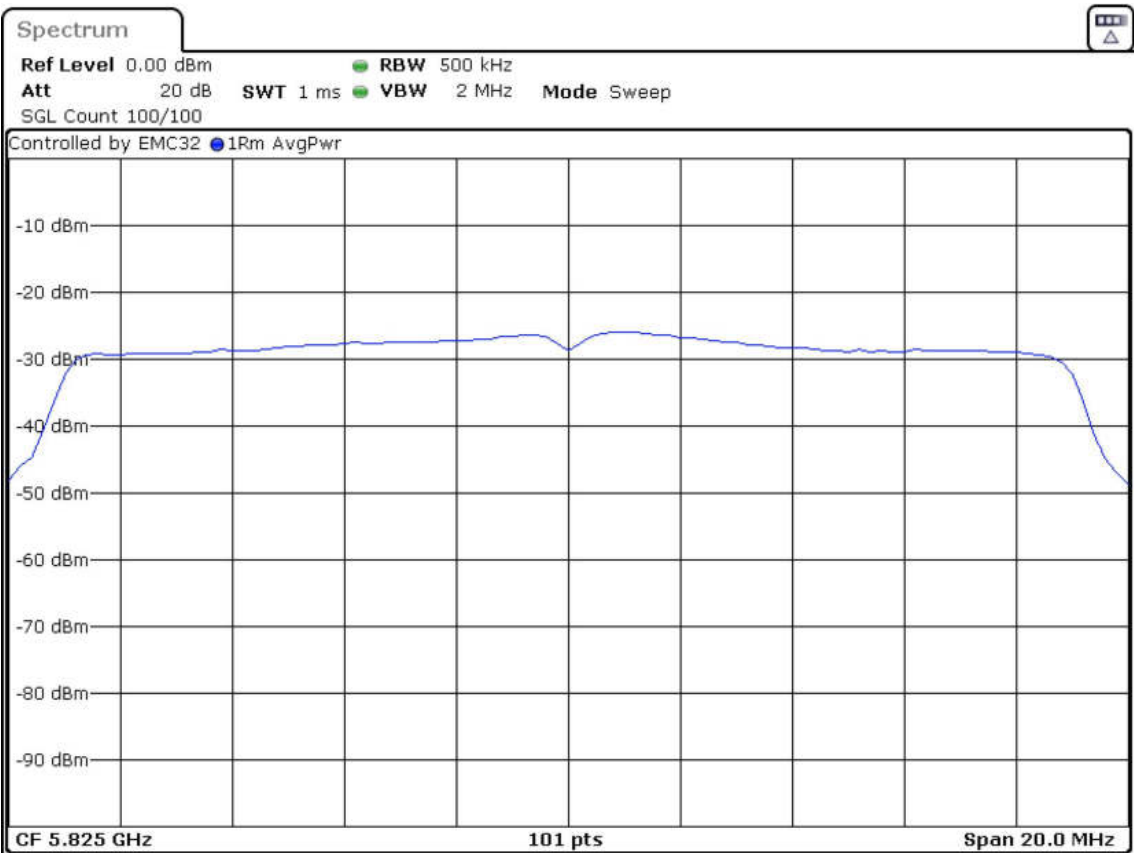
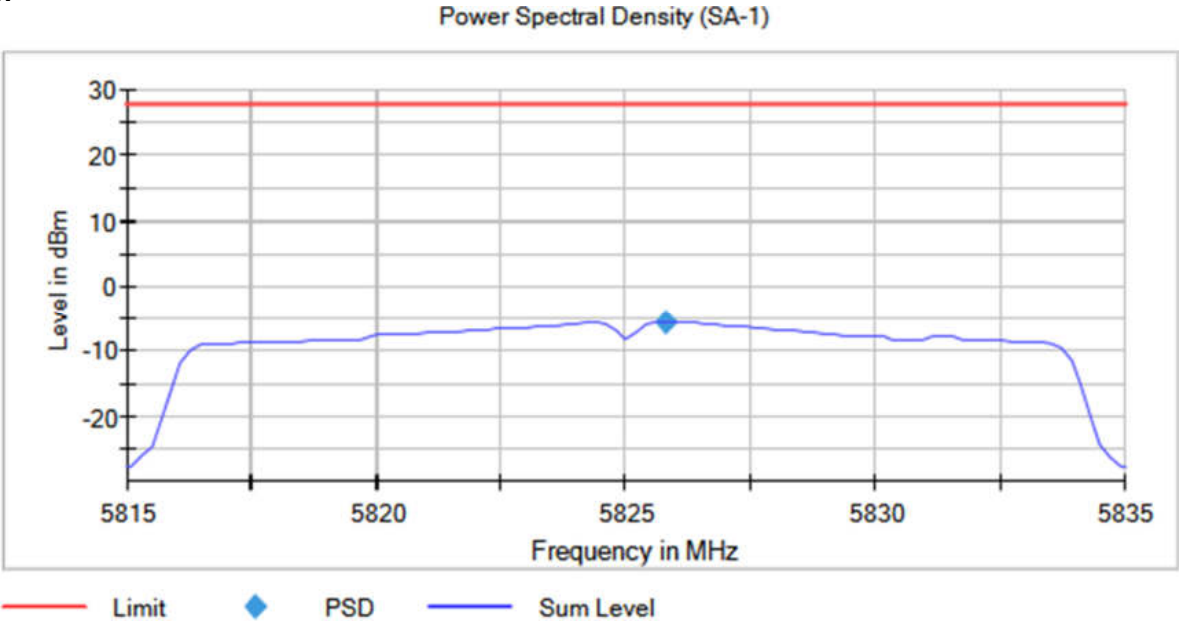
Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5785.00000    Modulation = 802.11ac VHT20 (OFDM MCS0)  
TPC = No    MIMO Mode = MIMO CDD Mode 2x2

Images:



Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5825.00000    Modulation = 802.11ac VHT20 (OFDM MCS0)  
TPC = No    MIMO Mode = MIMO CDD Mode 2x2

Images:



CONFIGURATION 2:

Modulation: 802.11ac VHT40 (OFDM MCS0)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Freq (MHz)  | PSD (dBm) |
|----------------------|------|------------|-----|-------------|-----------|
| [5725, 5850]         | 1+2  | 5755.00000 | No  | 5755.875000 | -10.56    |
|                      |      | 5795.00000 |     | 5792.625000 | -11.23    |

Verdict

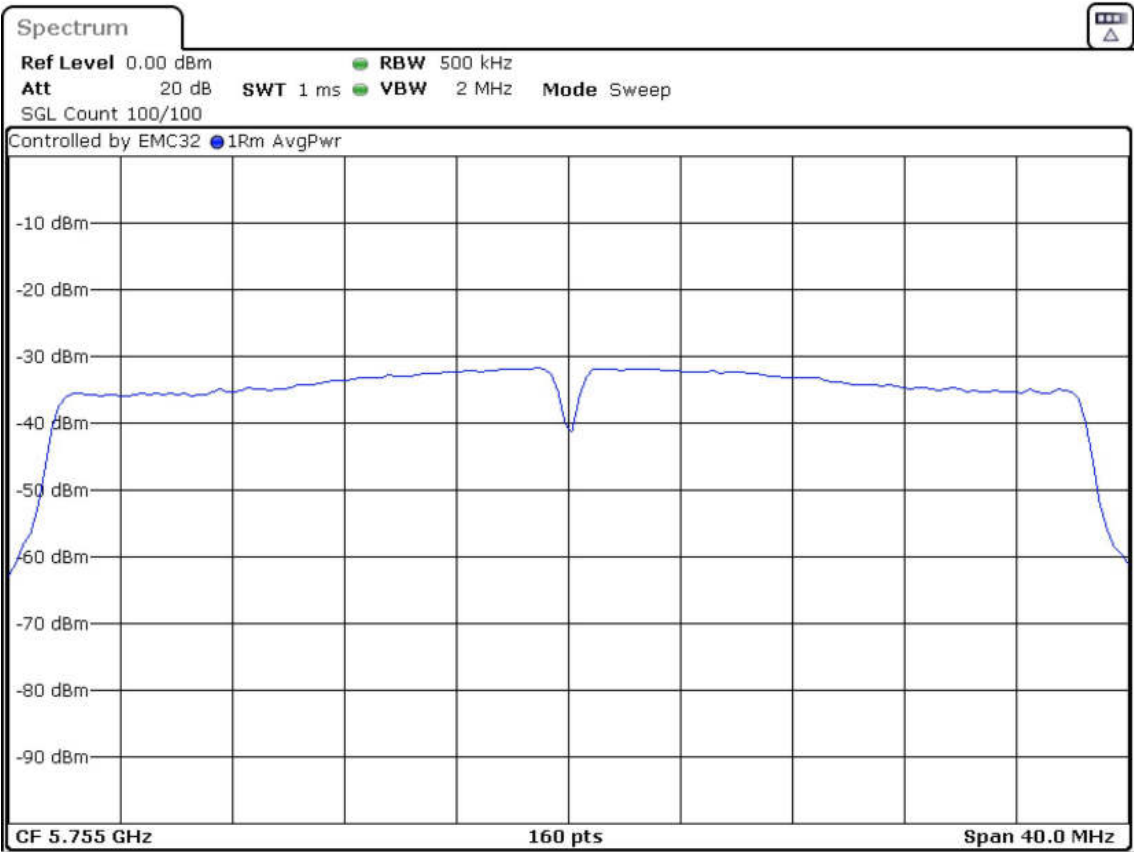
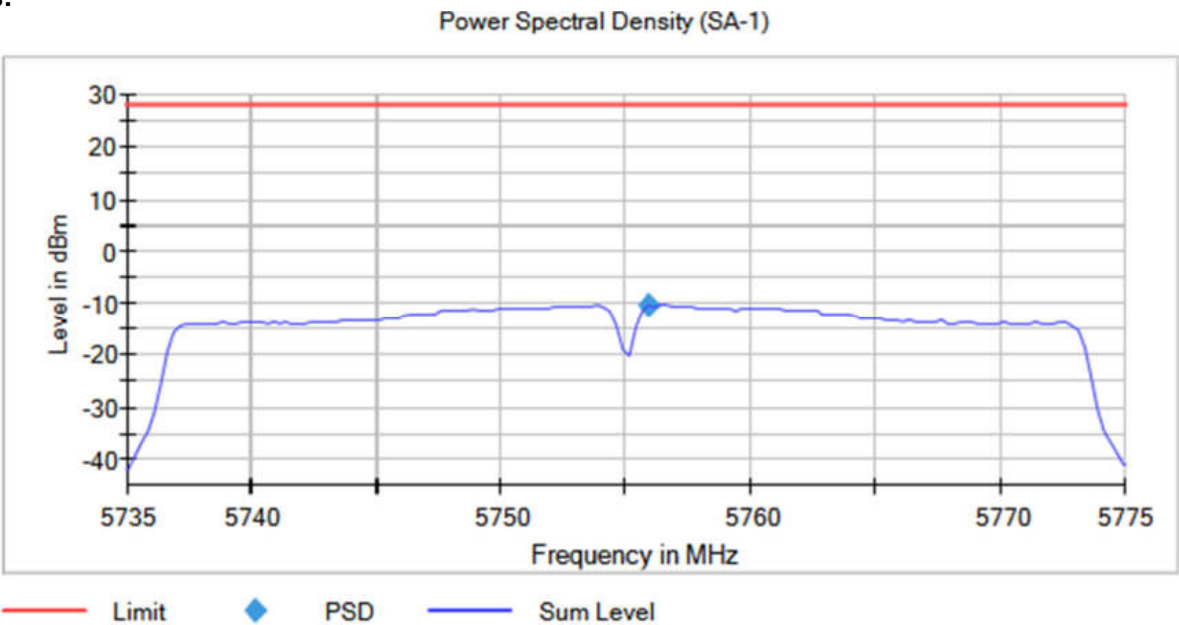
Pass



Attachments

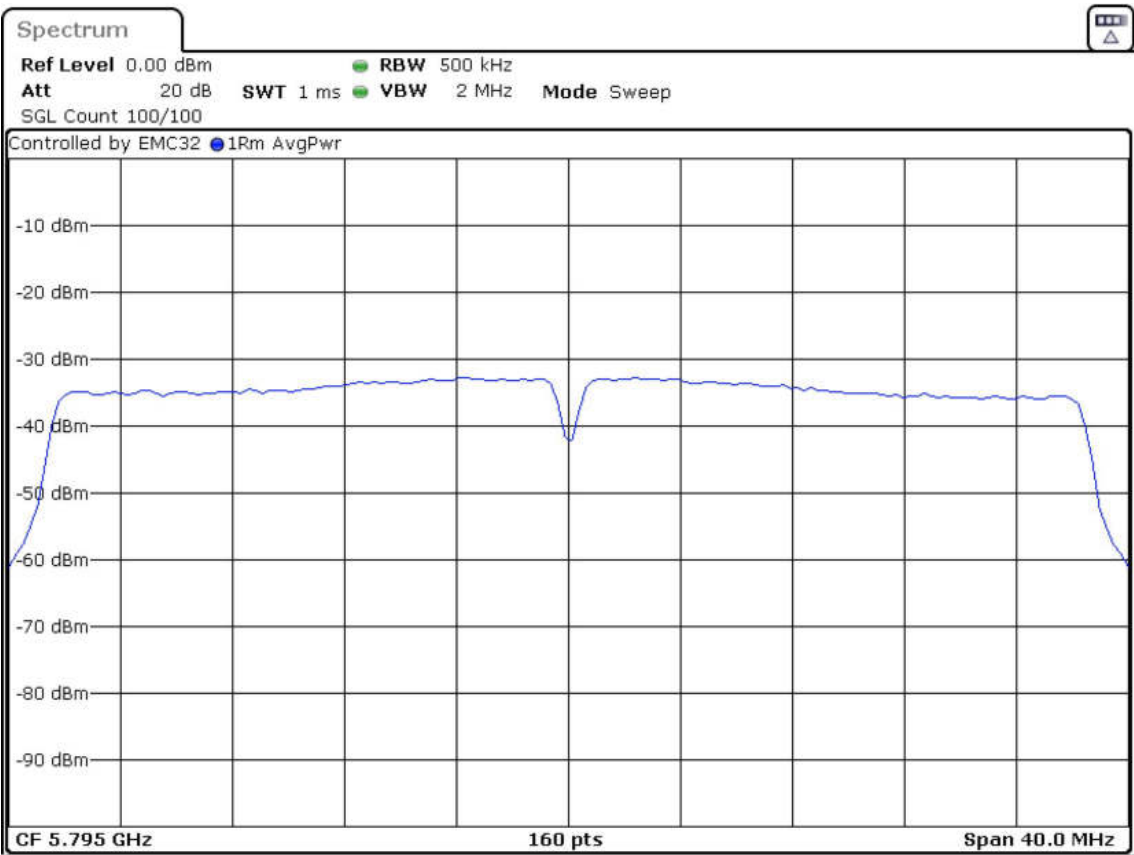
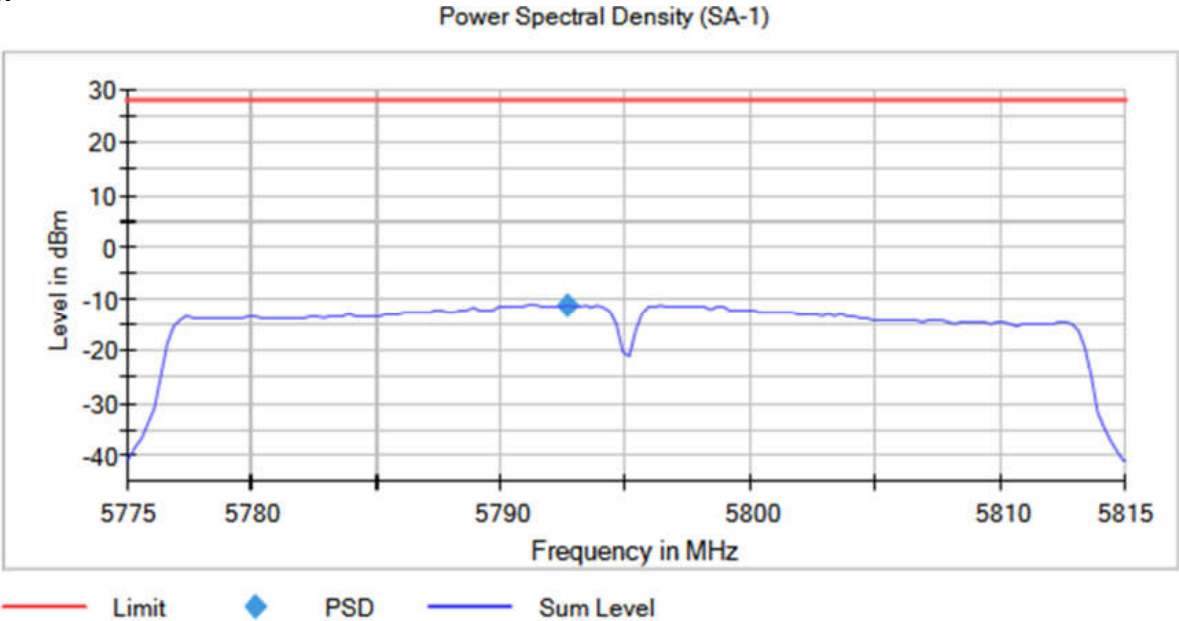
Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5755.00000    Modulation = 802.11ac VHT40 (OFDM MCS0)  
TPC = No    MIMO Mode = MIMO CDD Mode 2x2

Images:



Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5795.00000    Modulation = 802.11ac VHT40 (OFDM MCS0)  
TPC = No    MIMO Mode = MIMO CDD Mode 2x2

Images:



CONFIGURATION 2:

Modulation: 802.11ac VHT80 (OFDM MCS0)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | TPC | Freq (MHz)  | PSD (dBm) |
|----------------------|------|------------|-----|-------------|-----------|
| [5725, 5850]         | 1+2  | 5775.00000 | No  | 5779.875000 | -14.89    |

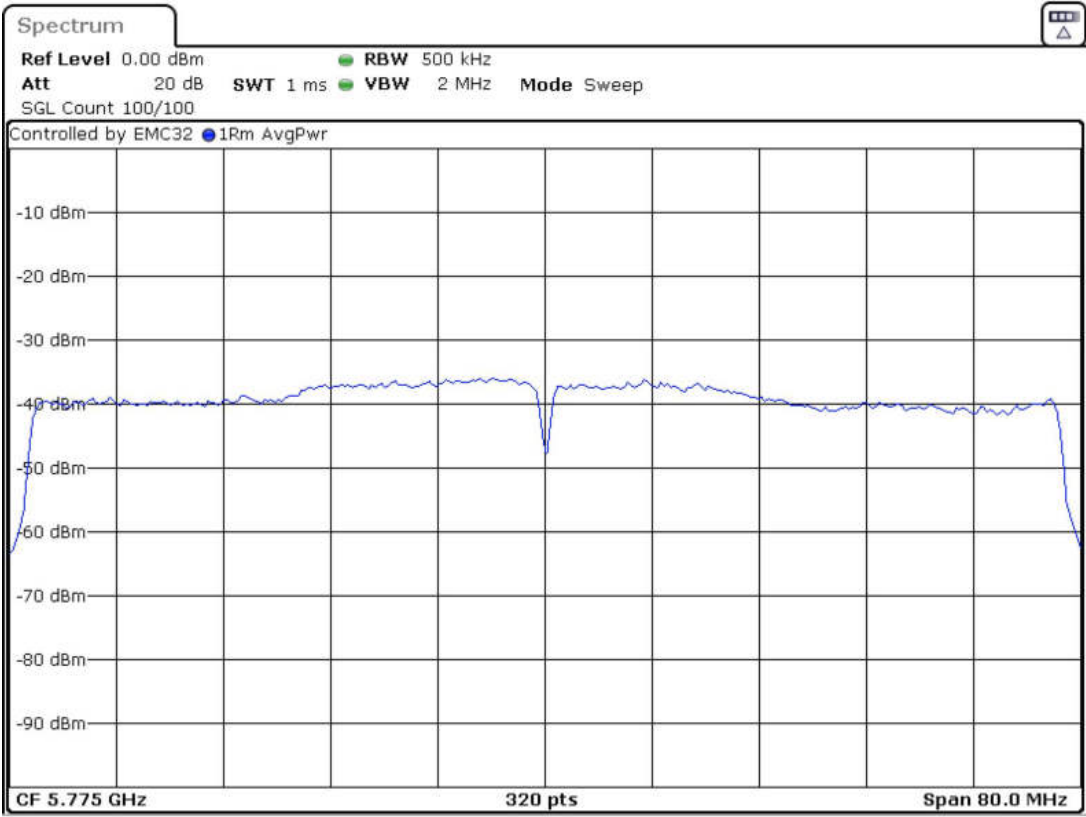
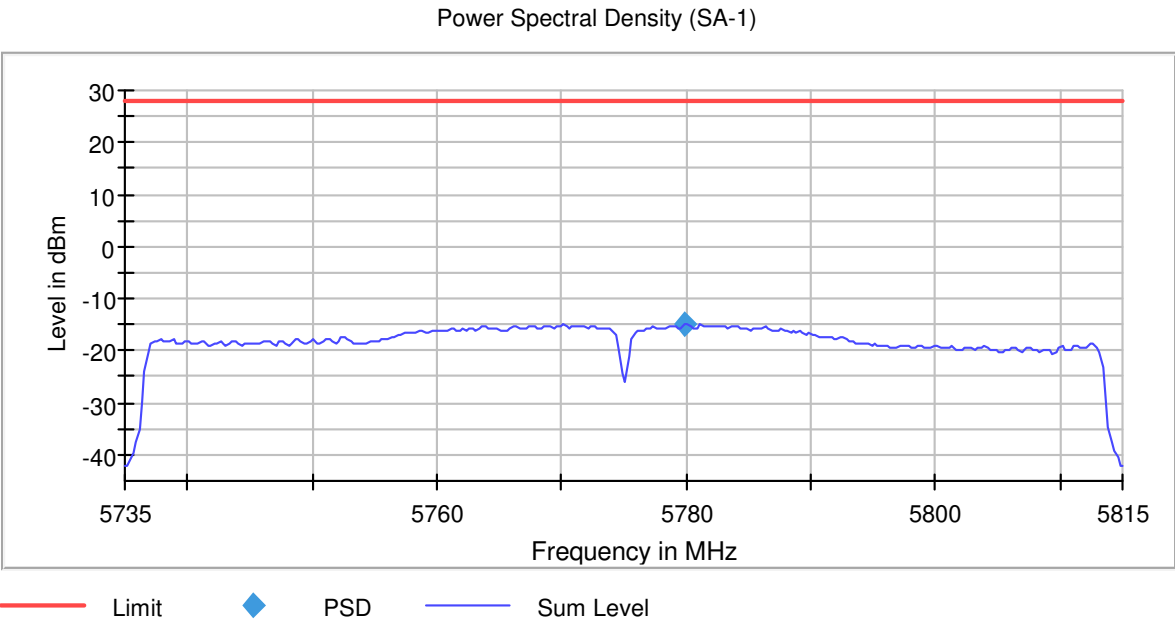
Verdict

Pass

Attachments

Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5775.00000    Modulation = 802.11ac VHT80 (OFDM MCS0)  
TPC = No    MIMO Mode = MIMO CDD Mode 2x2

Images:



# RSS-247 6.2.4.1 / FCC 15.407 (e) [6dBw] 6 dB Emission Bandwidth

## Limits

The minimum 6 dB bandwidth shall be at least 500 kHz.

## CONFIGURATION 2:

Modulation: 802.11n HT20 (OFDM MCS0 6.5 Mbit/s)

MIMO Mode: MIMO CDD Mode 2x2

## Results

| Operation Band (MHz) | Port | Freq (MHz) | Ebw (MHz) |
|----------------------|------|------------|-----------|
| [5725, 5850]         | 1+2  | 5745.00000 | 17.650    |
|                      |      | 5785.00000 | 17.650    |
|                      |      | 5825.00000 | 17.650    |

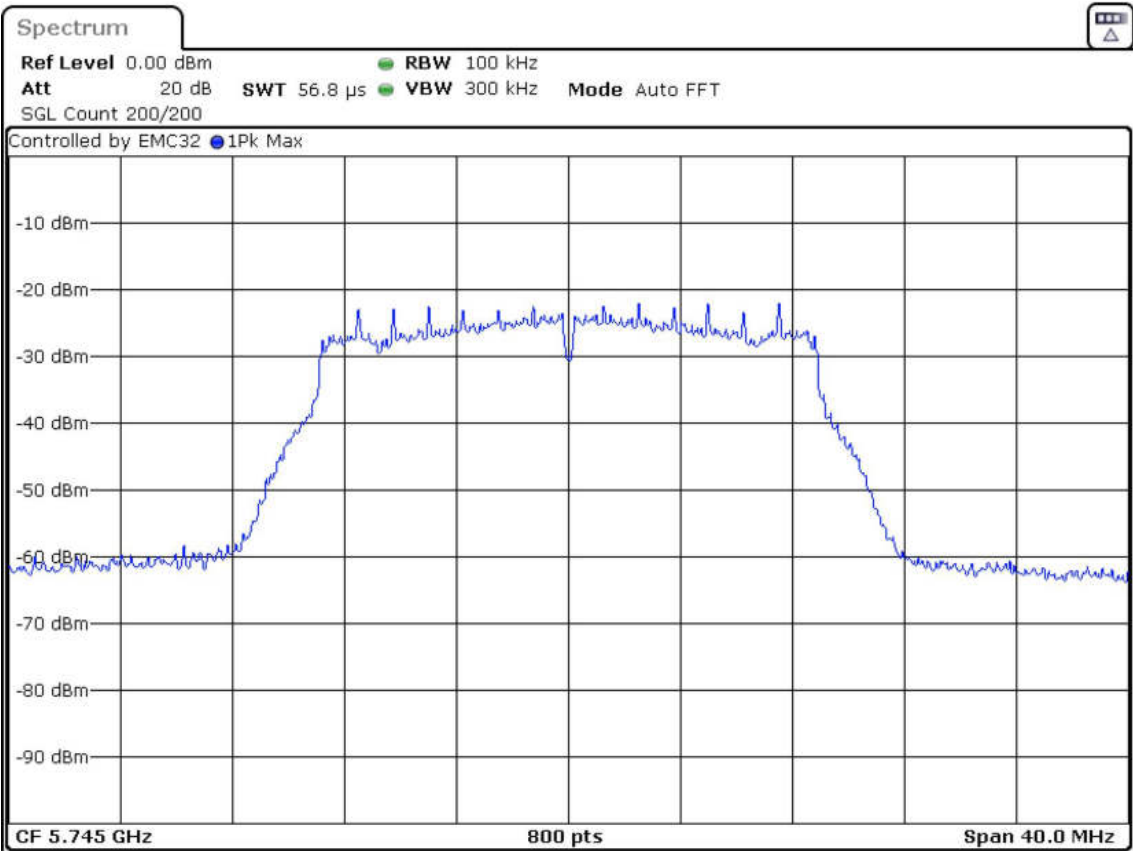
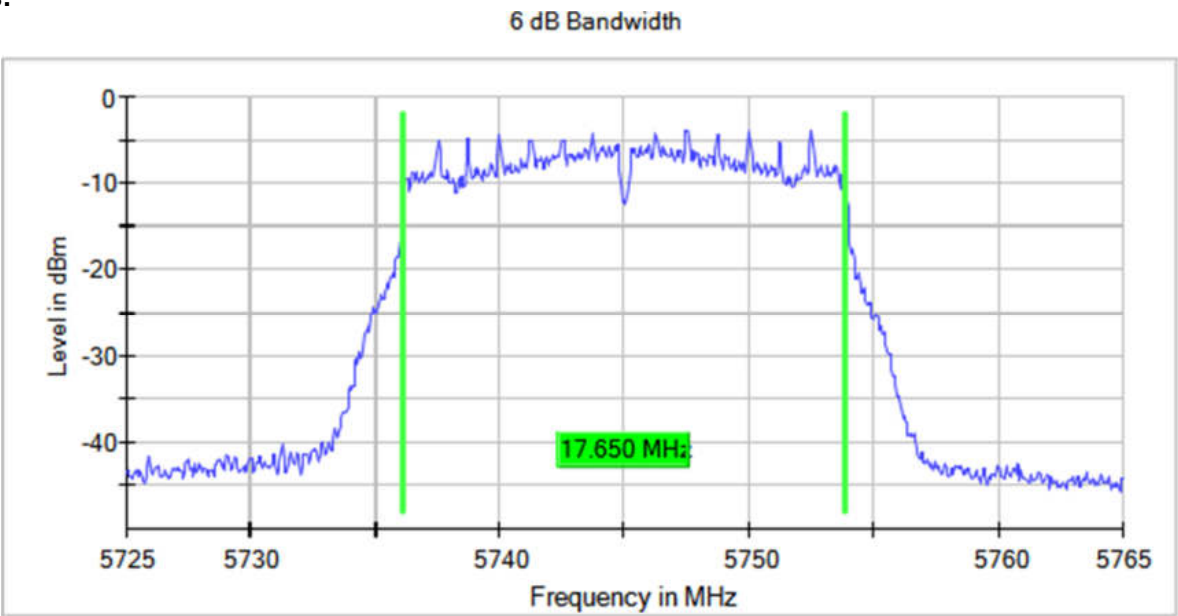
## Verdict

Pass

Attachments

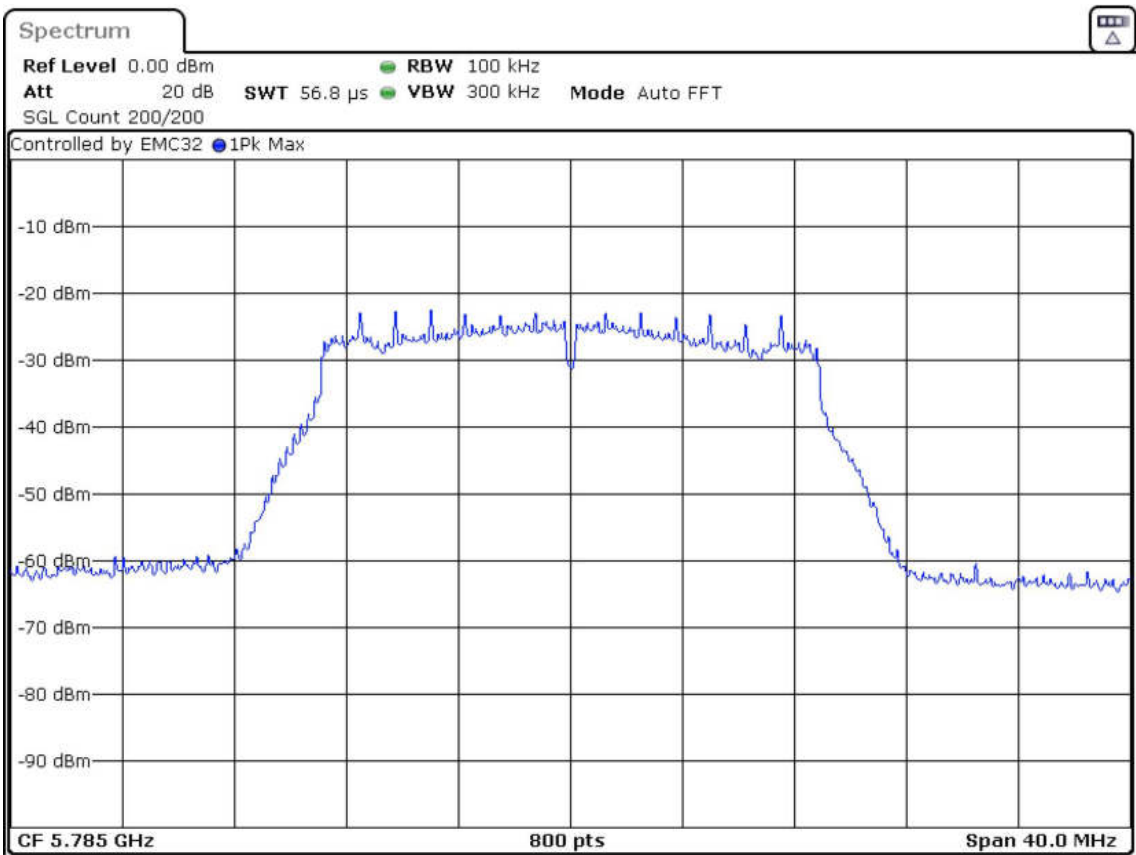
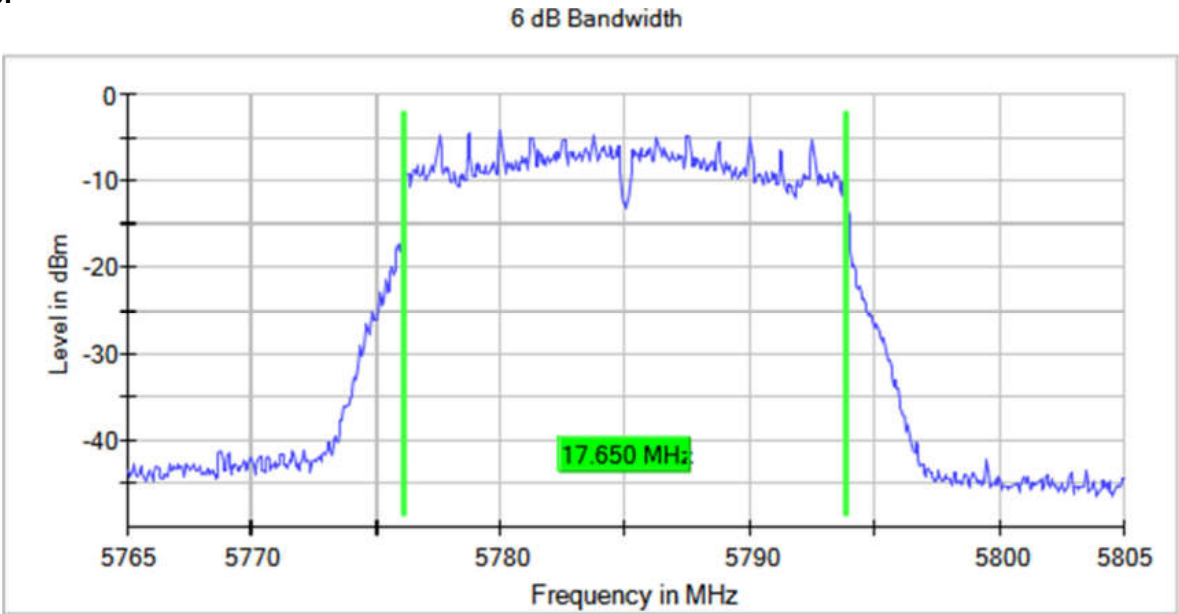
Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5745.00000    Modulation = 802.11n HT20 (OFDM MCS0 6.5 Mbit/s)  
MIMO Mode = MIMO CDD Mode 2x2

Images:



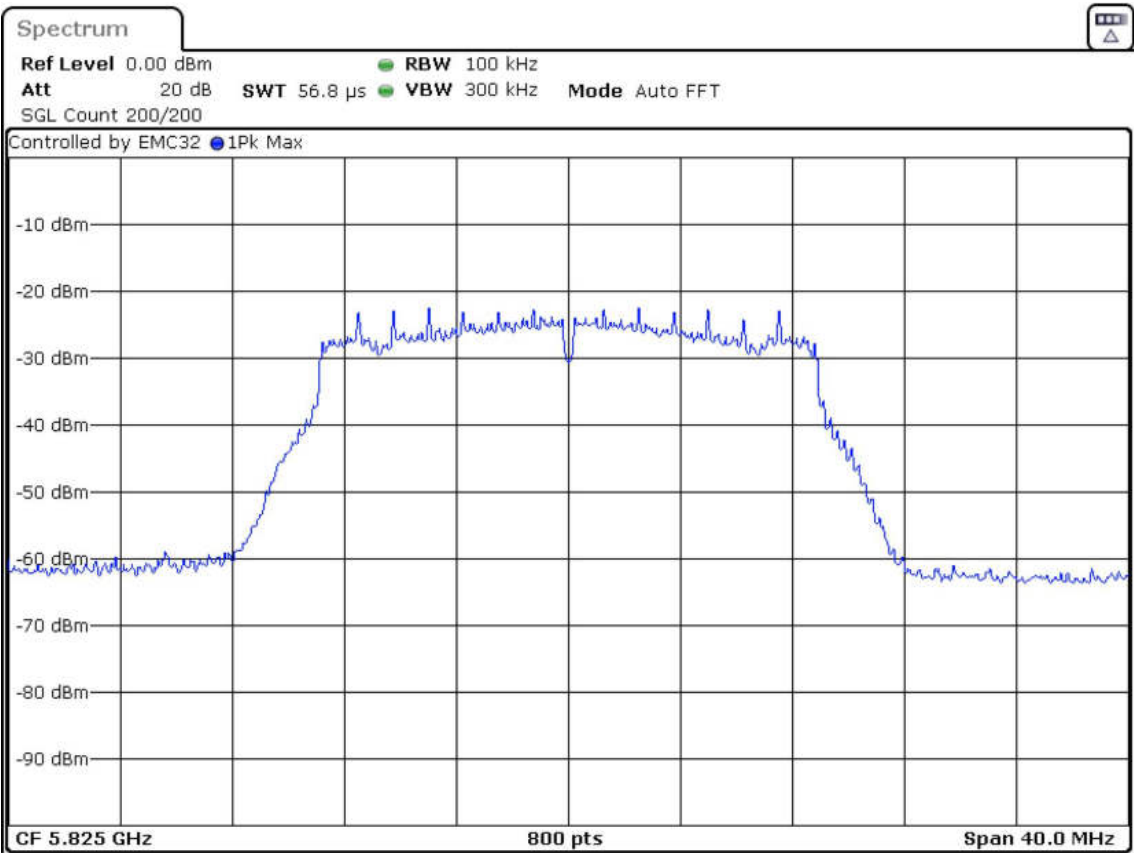
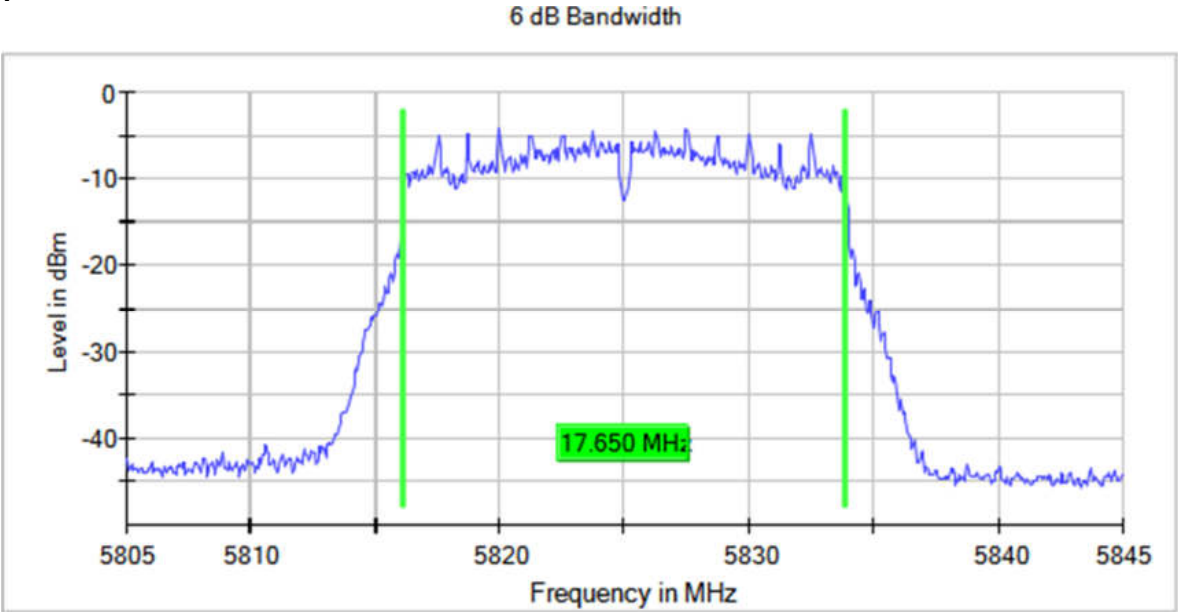
Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5785.00000    Modulation = 802.11n HT20 (OFDM MCS0 6.5 Mbit/s)  
MIMO Mode = MIMO CDD Mode 2x2

Images:



Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5825.00000    Modulation = 802.11n HT20 (OFDM MCS0 6.5 Mbit/s)  
MIMO Mode = MIMO CDD Mode 2x2

Images:





CONFIGURATION 2:

Modulation: 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | Ebw (MHz) |
|----------------------|------|------------|-----------|
| [5725, 5850]         | 1+2  | 5755.00000 | 35.550    |
|                      |      | 5795.00000 | 36.000    |

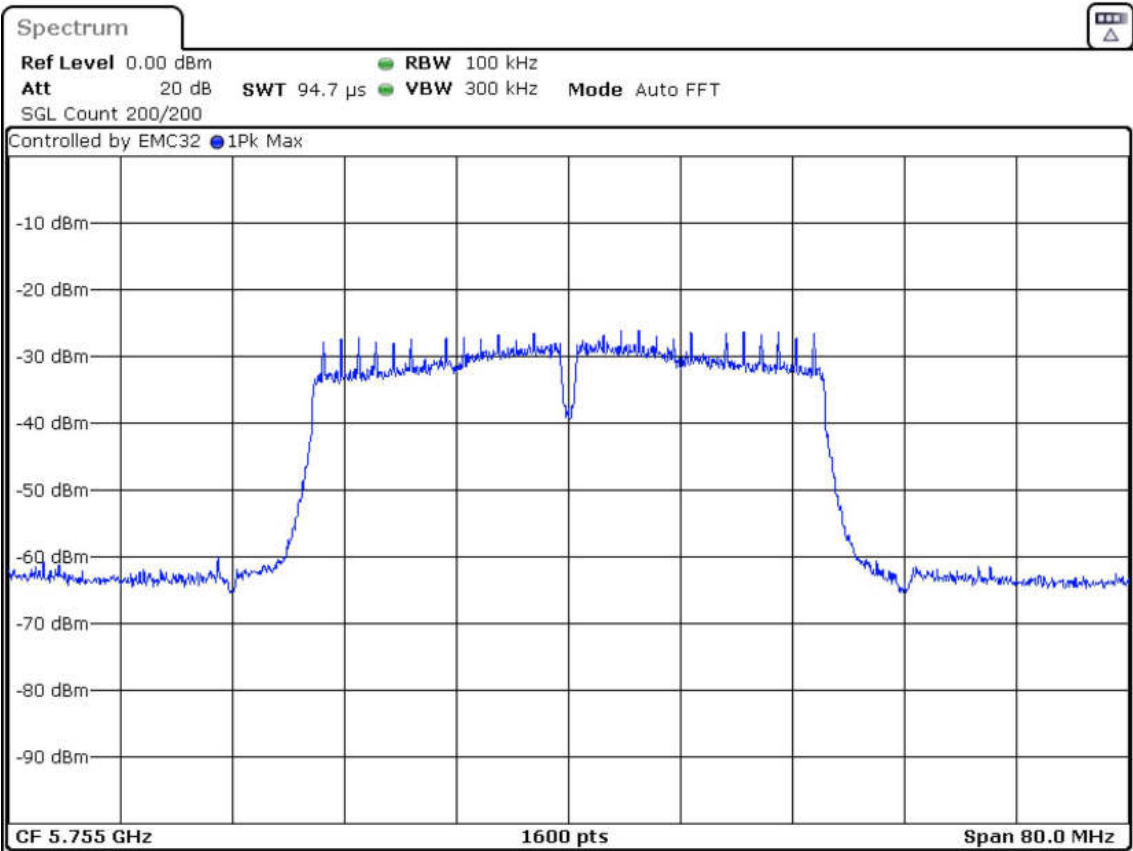
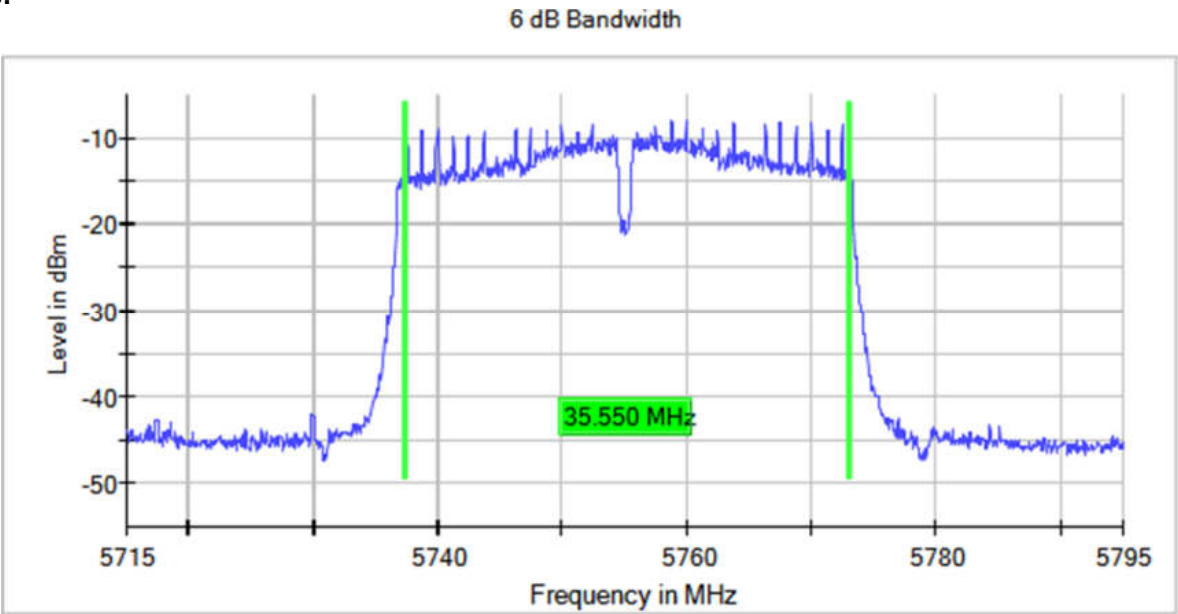
Verdict

Pass

Attachments

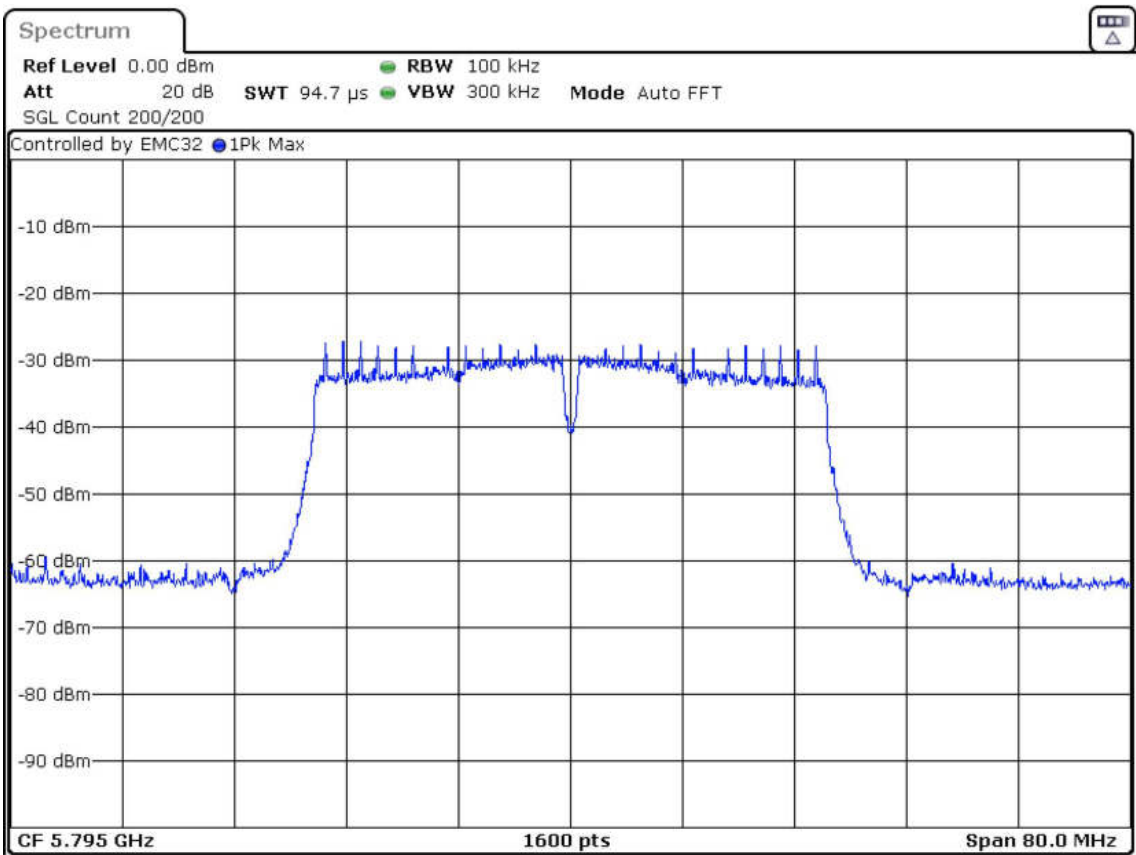
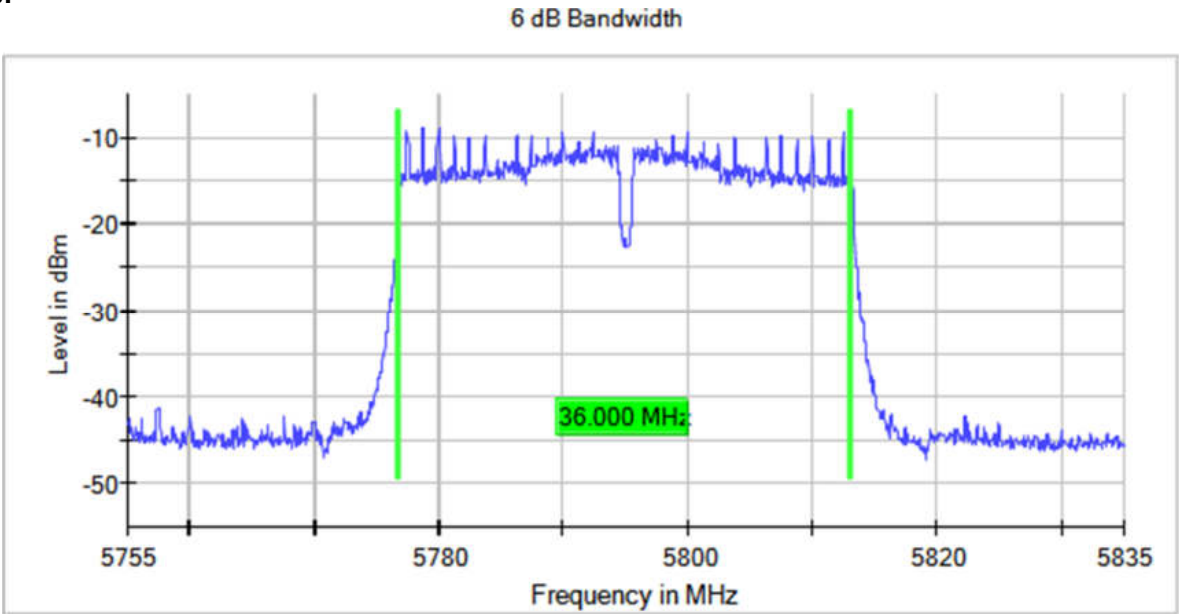
Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5755.00000    Modulation = 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)  
MIMO Mode = MIMO CDD Mode 2x2

Images:



Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5795.00000    Modulation = 802.11n HT40 (OFDM MCS0 13.5 Mbit/s)  
MIMO Mode = MIMO CDD Mode 2x2

Images:



CONFIGURATION 2:

Modulation: 802.11a (OFDM 6 Mbit/s)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | Ebw (MHz) |
|----------------------|------|------------|-----------|
| [5725, 5850]         | 1+2  | 5745.00000 | 16.450    |
|                      |      | 5785.00000 | 16.400    |
|                      |      | 5825.00000 | 16.450    |

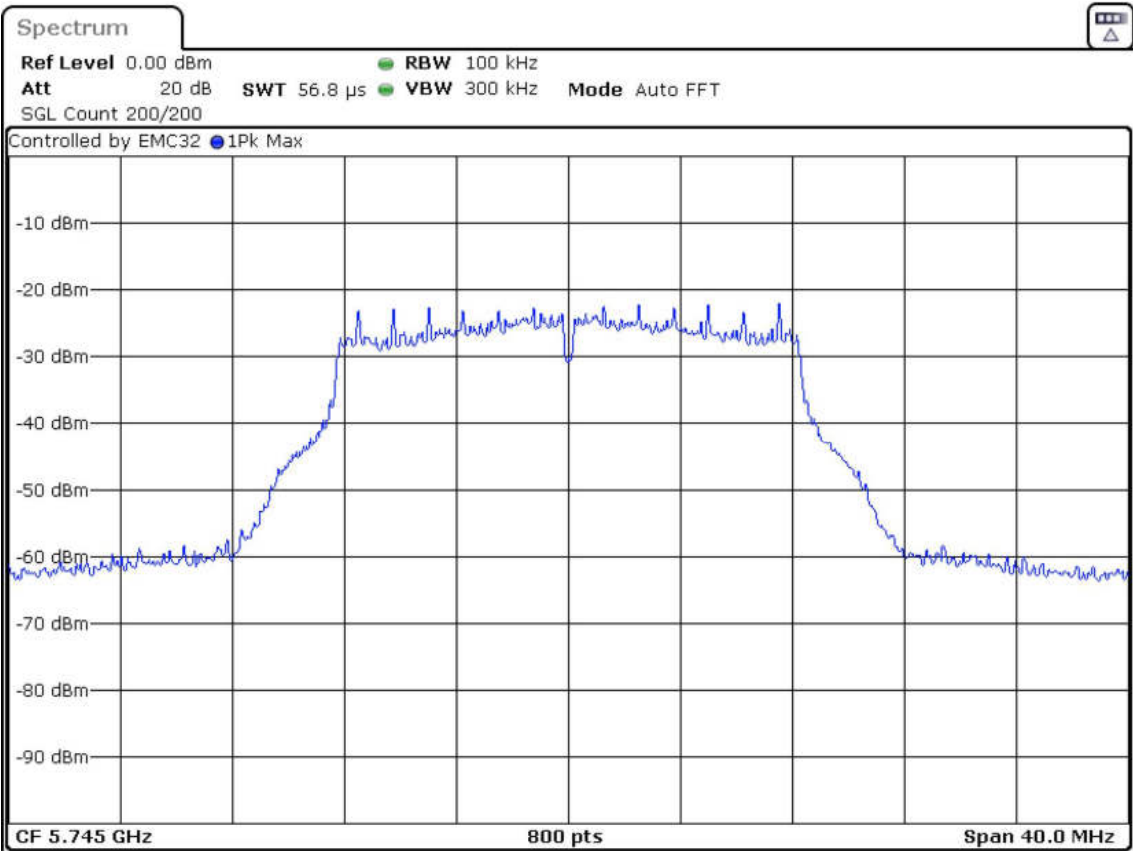
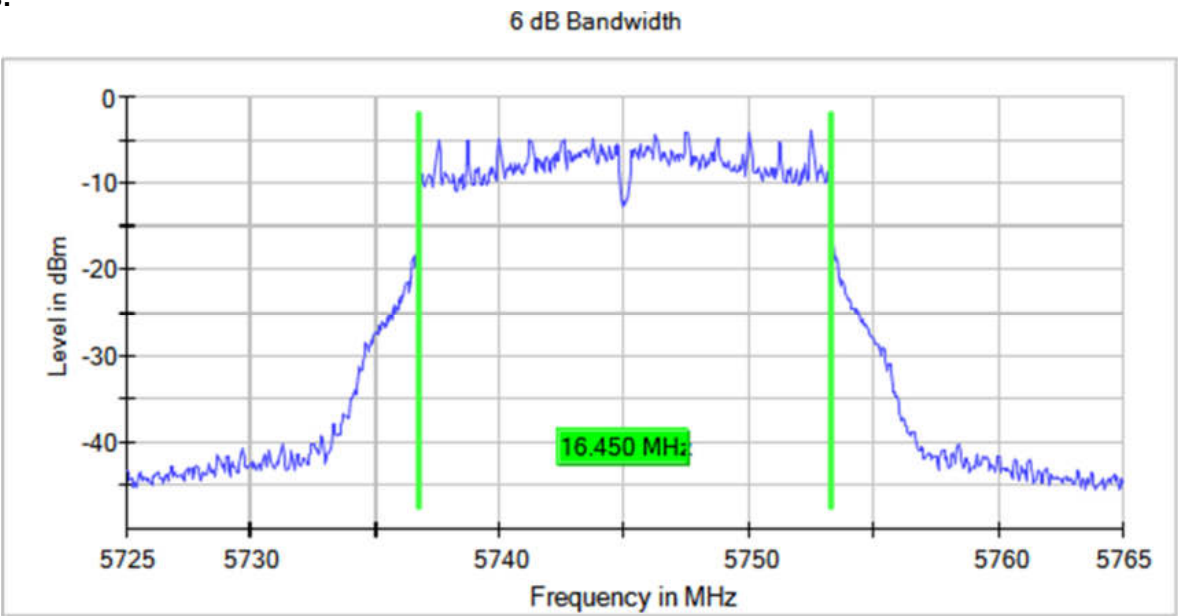
Verdict

Pass

Attachments

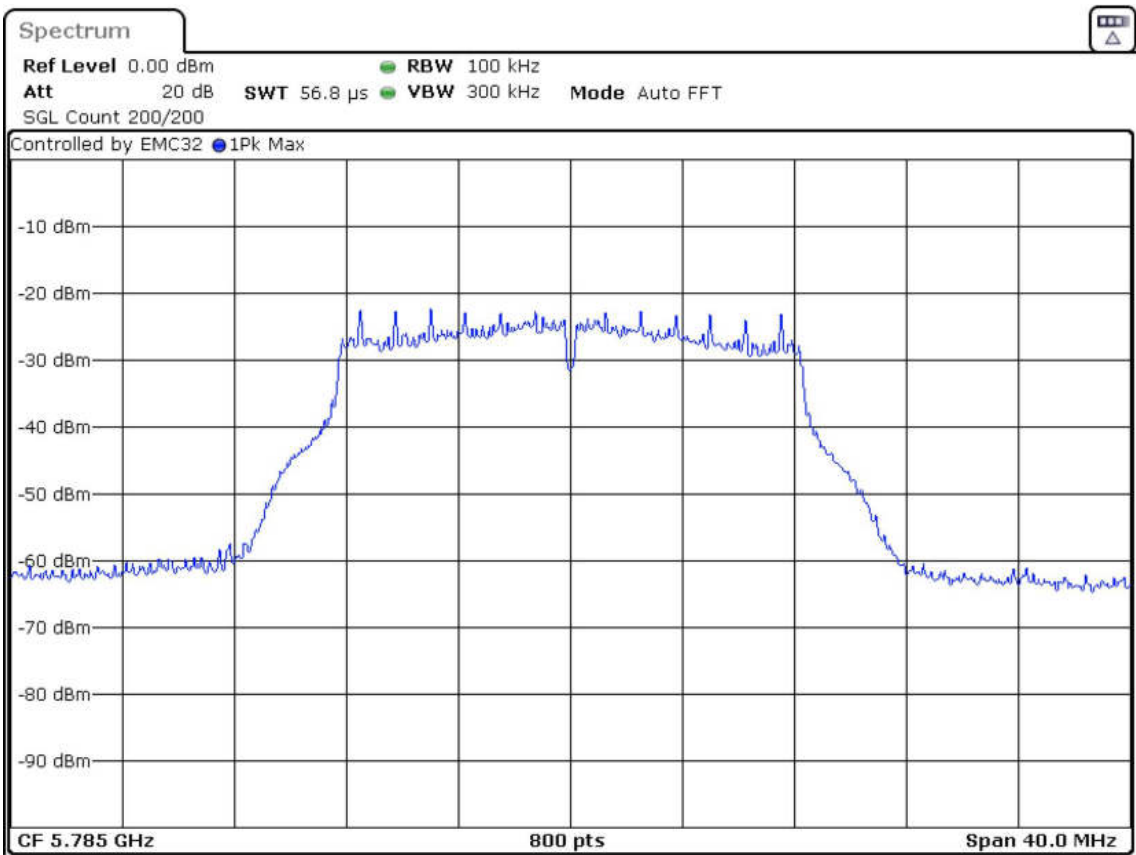
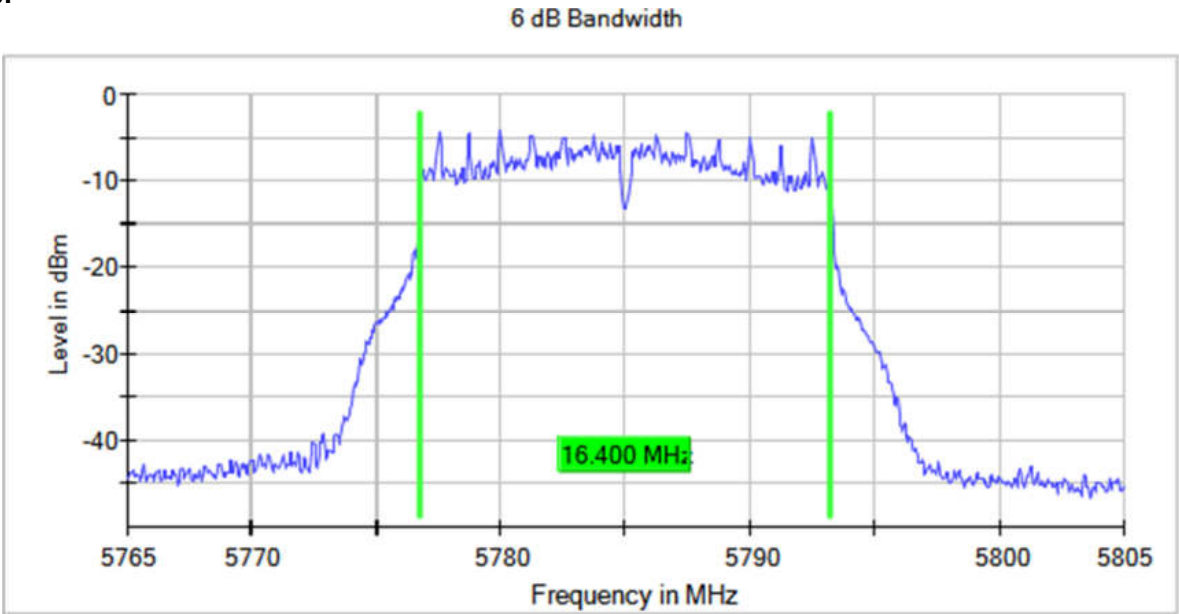
Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5745.00000    Modulation = 802.11a (OFDM 6 Mbit/s)  
MIMO Mode = MIMO CDD Mode 2x2

Images:



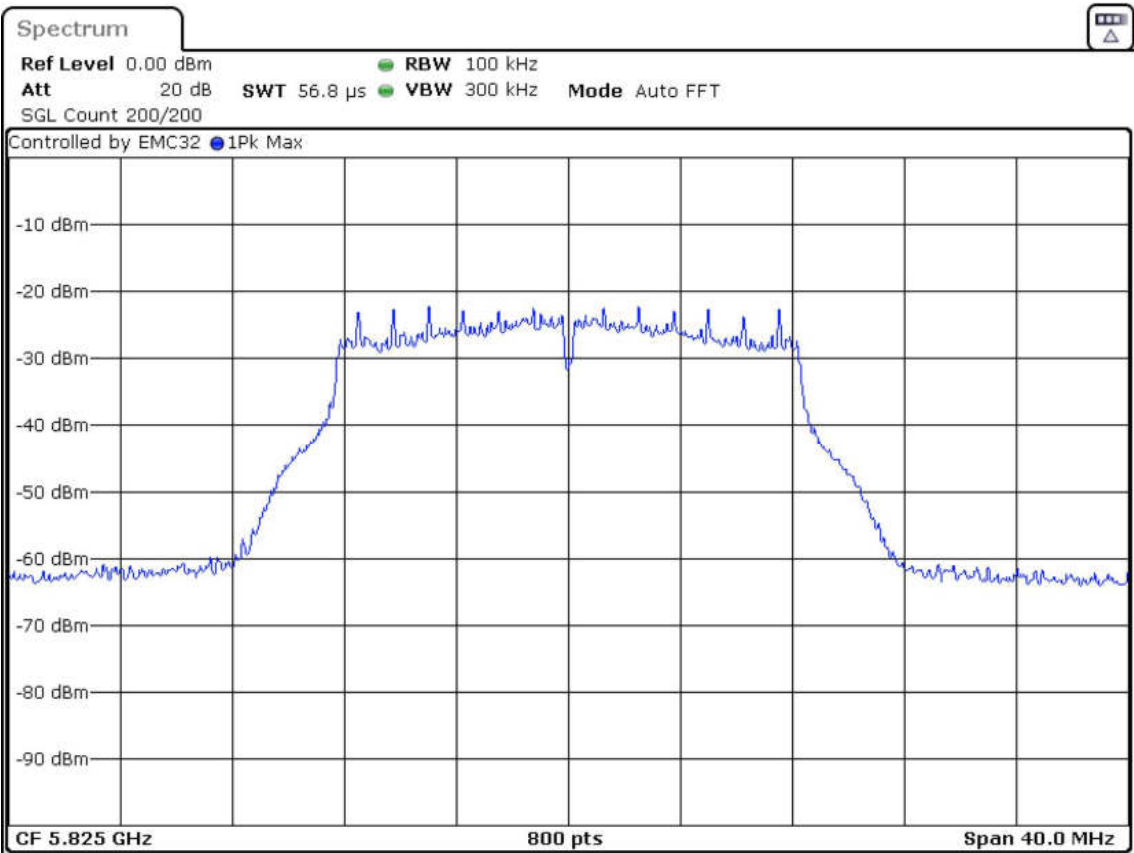
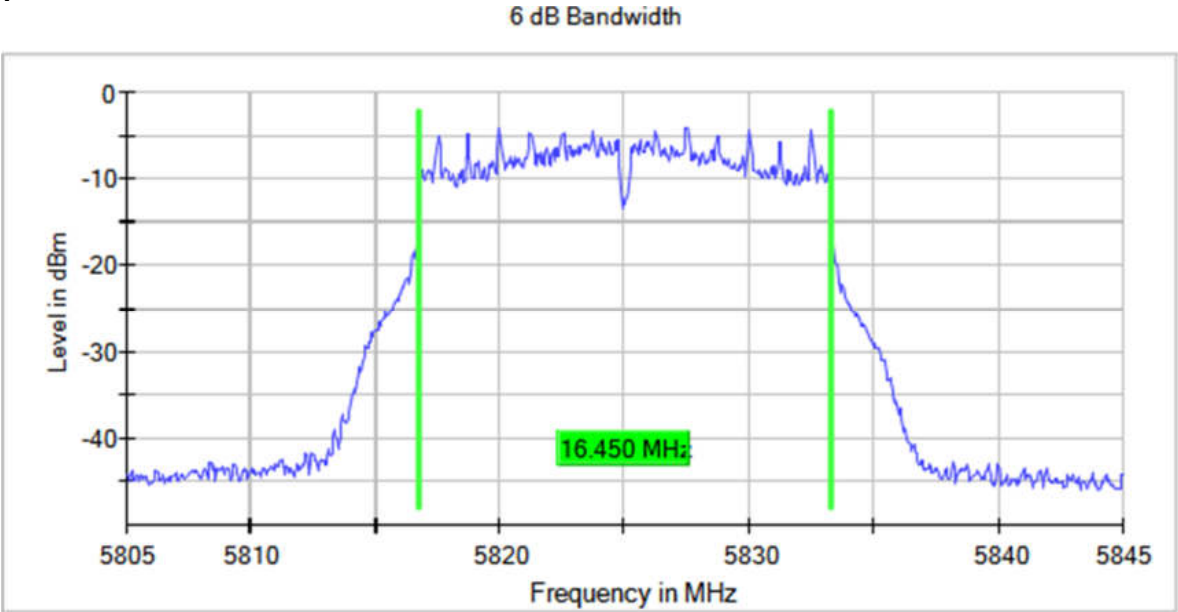
Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5785.00000    Modulation = 802.11a (OFDM 6 Mbit/s)  
MIMO Mode = MIMO CDD Mode 2x2

Images:



Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5825.00000    Modulation = 802.11a (OFDM 6 Mbit/s)  
MIMO Mode = MIMO CDD Mode 2x2

Images:



CONFIGURATION 2:

Modulation: 802.11ac VHT20 (OFDM MCS0)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | Ebw (MHz) |
|----------------------|------|------------|-----------|
| [5725, 5850]         | 1+2  | 5745.00000 | 17.650    |
|                      |      | 5785.00000 | 17.650    |
|                      |      | 5825.00000 | 17.650    |

Verdict

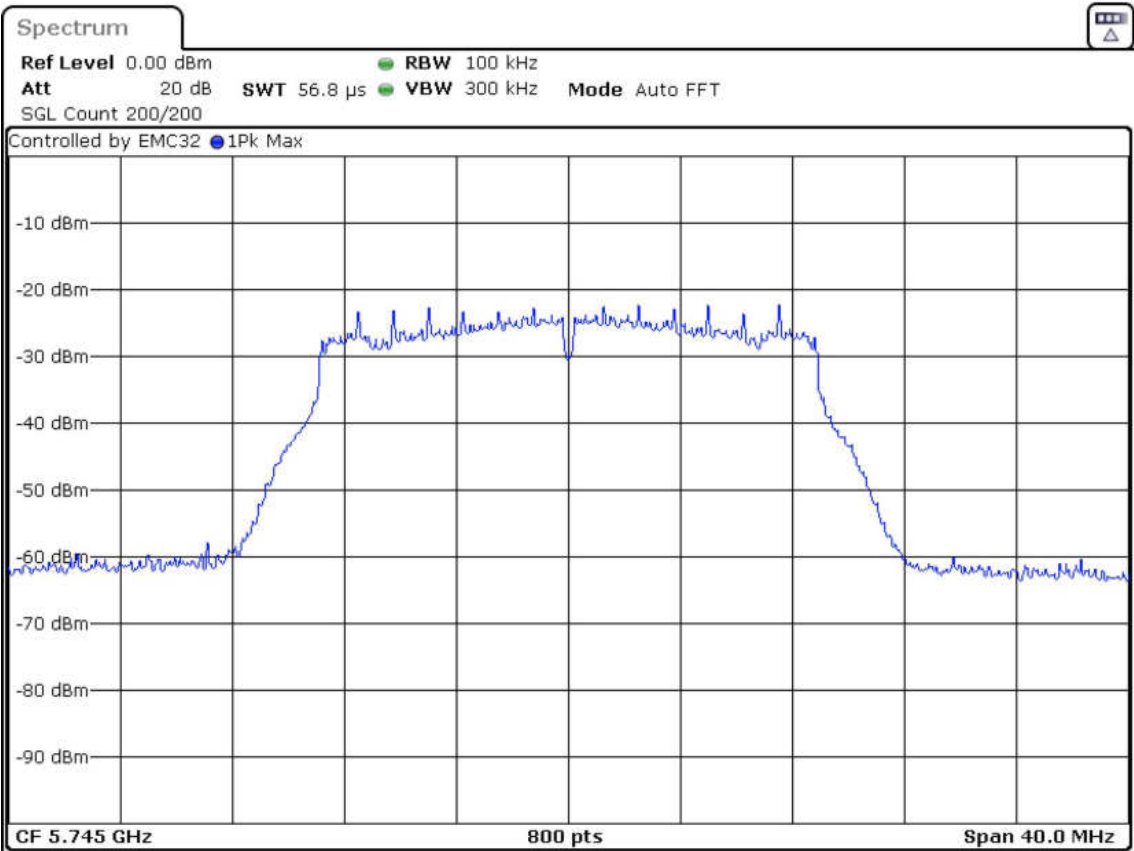
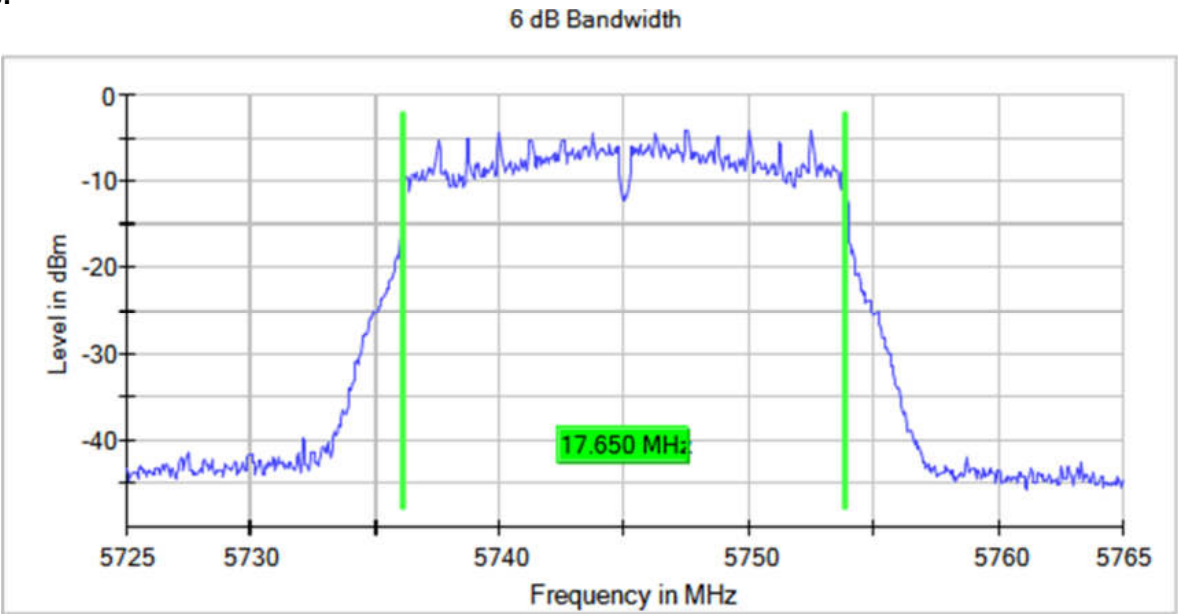
Pass



Attachments

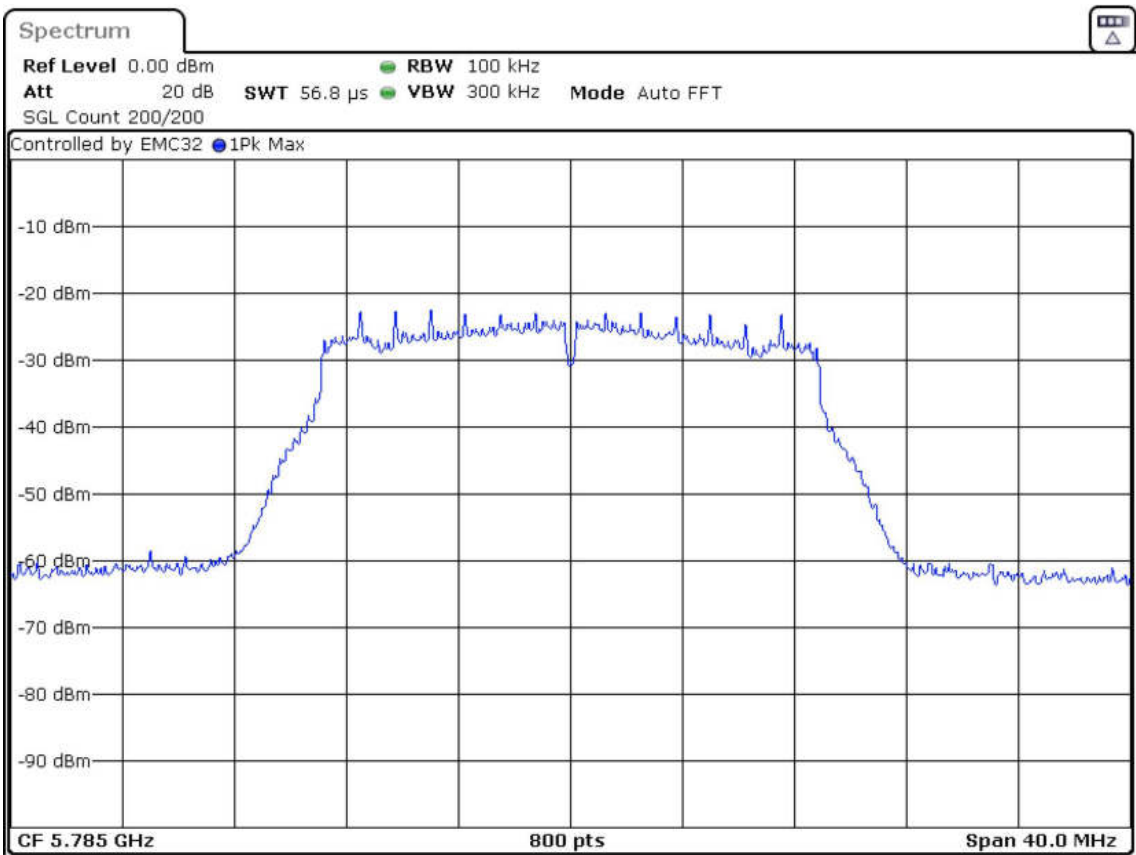
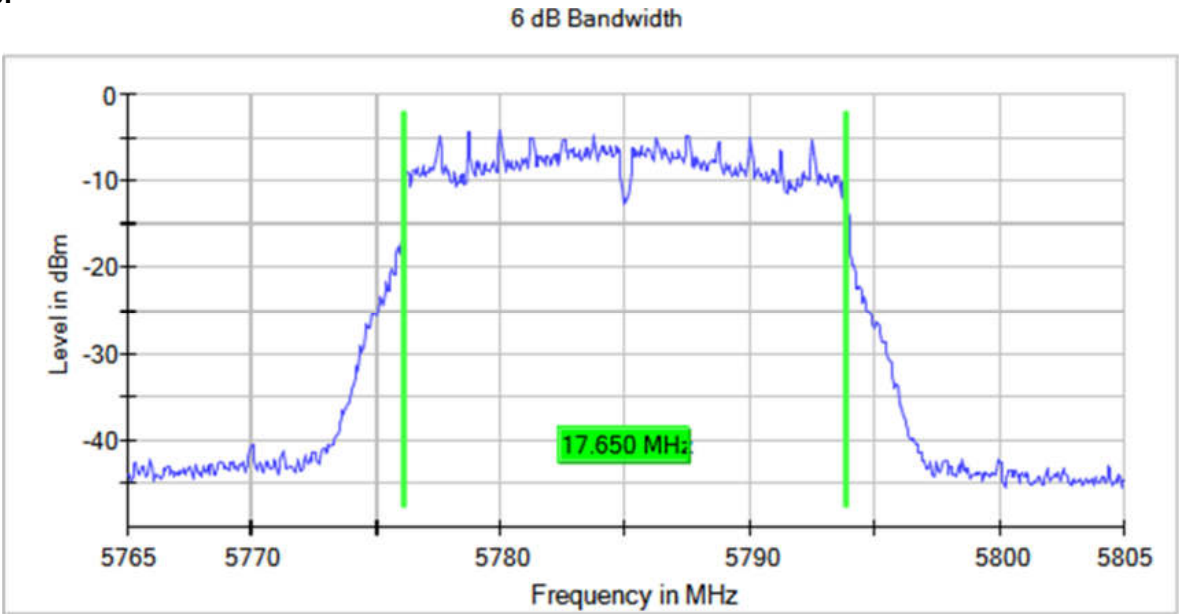
Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5745.00000    Modulation = 802.11ac VHT20 (OFDM MCS0)  
MIMO Mode = MIMO CDD Mode 2x2

Images:



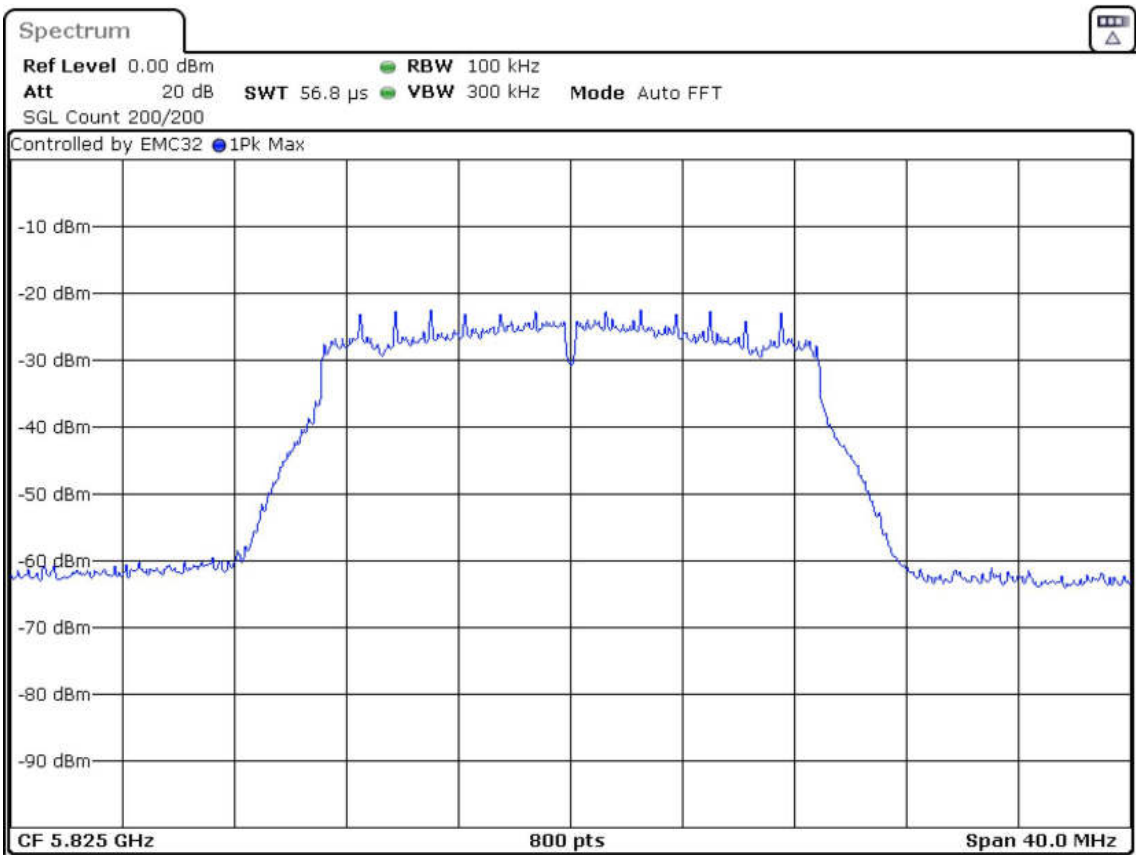
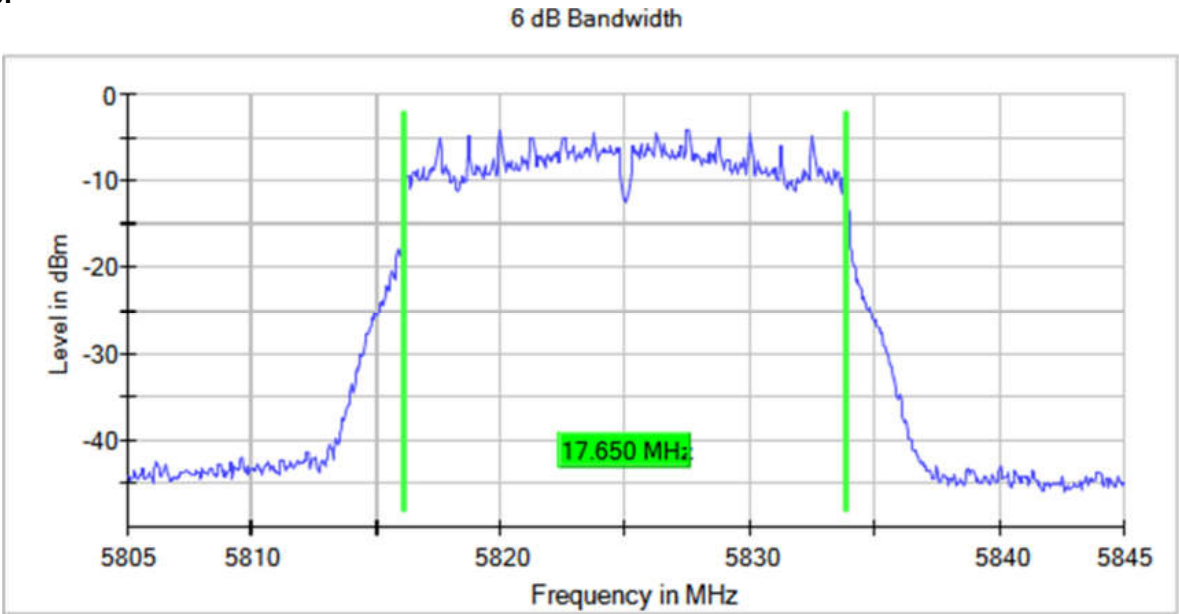
Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5785.00000    Modulation = 802.11ac VHT20 (OFDM MCS0)  
MIMO Mode = MIMO CDD Mode 2x2

Images:



Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5825.00000    Modulation = 802.11ac VHT20 (OFDM MCS0)  
MIMO Mode = MIMO CDD Mode 2x2

Images:



CONFIGURATION 2:

Modulation: 802.11ac VHT40 (OFDM MCS0)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | Ebw (MHz) |
|----------------------|------|------------|-----------|
| [5725, 5850]         | 1+2  | 5755.00000 | 35.550    |
|                      |      | 5795.00000 | 35.600    |

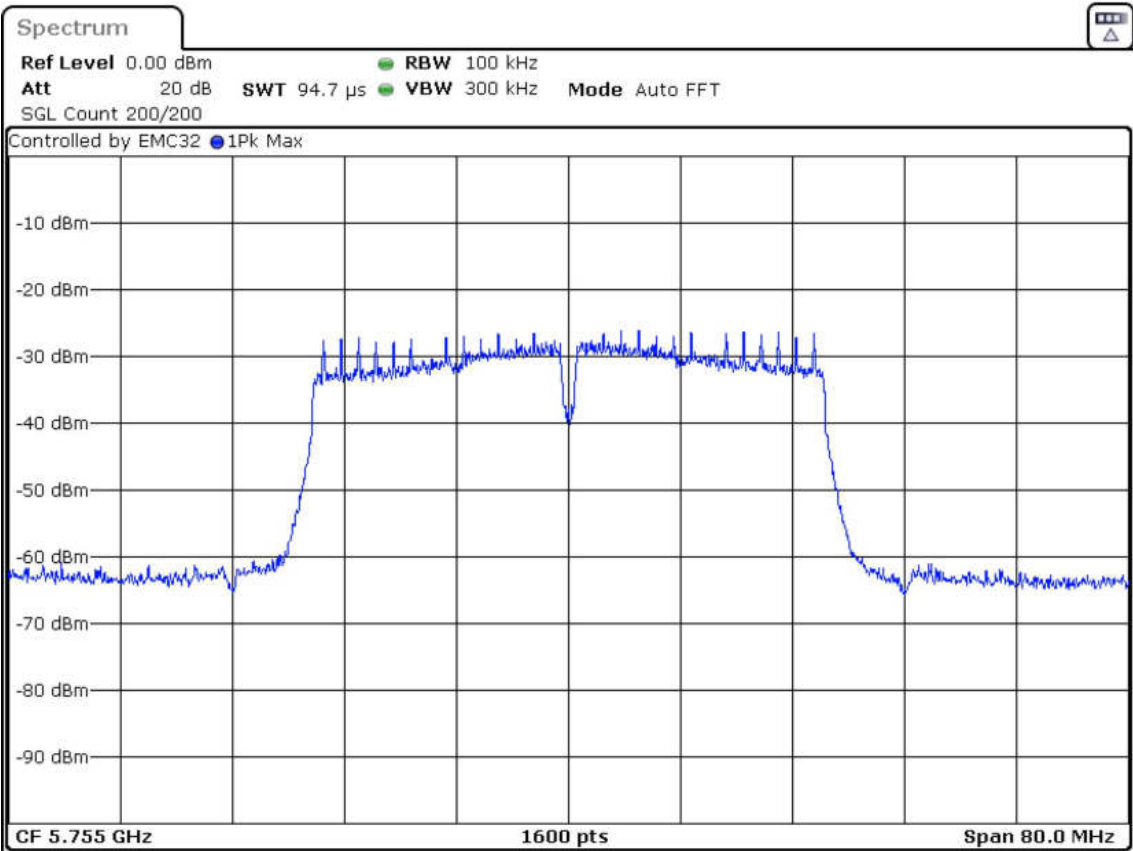
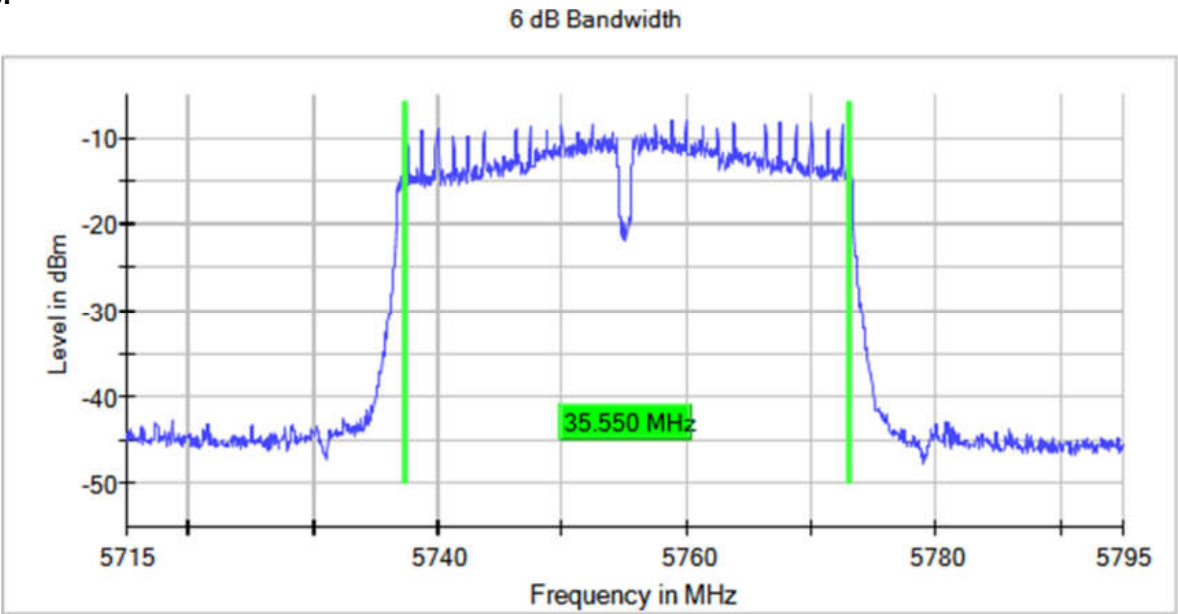
Verdict

Pass

Attachments

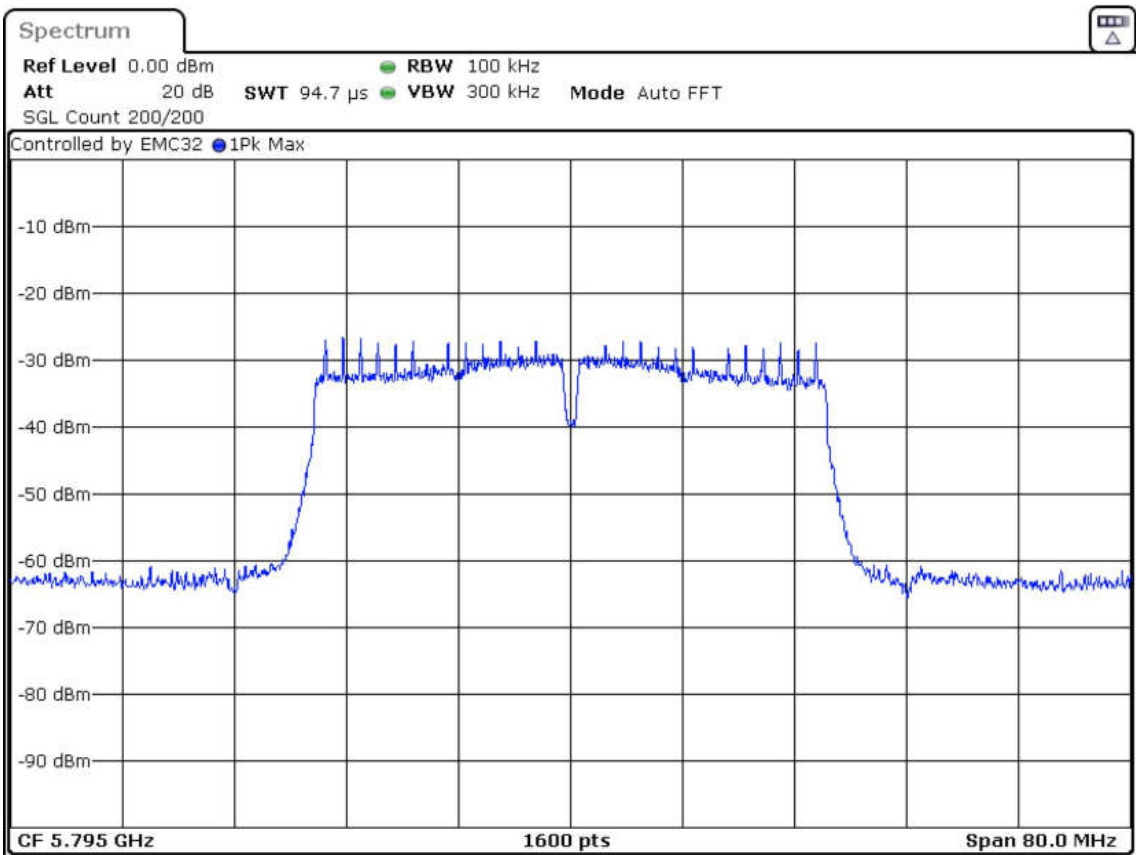
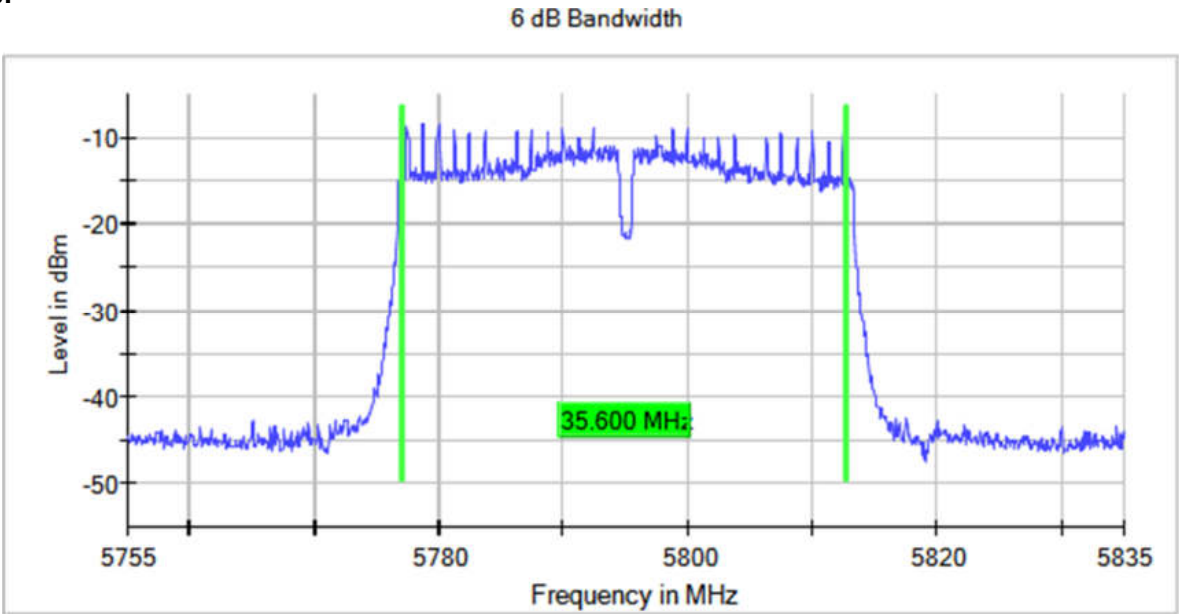
Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5755.00000    Modulation = 802.11ac VHT40 (OFDM MCS0)  
MIMO Mode = MIMO CDD Mode 2x2

Images:



Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5795.00000    Modulation = 802.11ac VHT40 (OFDM MCS0)  
MIMO Mode = MIMO CDD Mode 2x2

Images:



CONFIGURATION 2:

Modulation: 802.11ac VHT80 (OFDM MCS0)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq (MHz) | Ebw (MHz) |
|----------------------|------|------------|-----------|
| [5725, 5850]         | 1+2  | 5775.00000 | 75.250    |

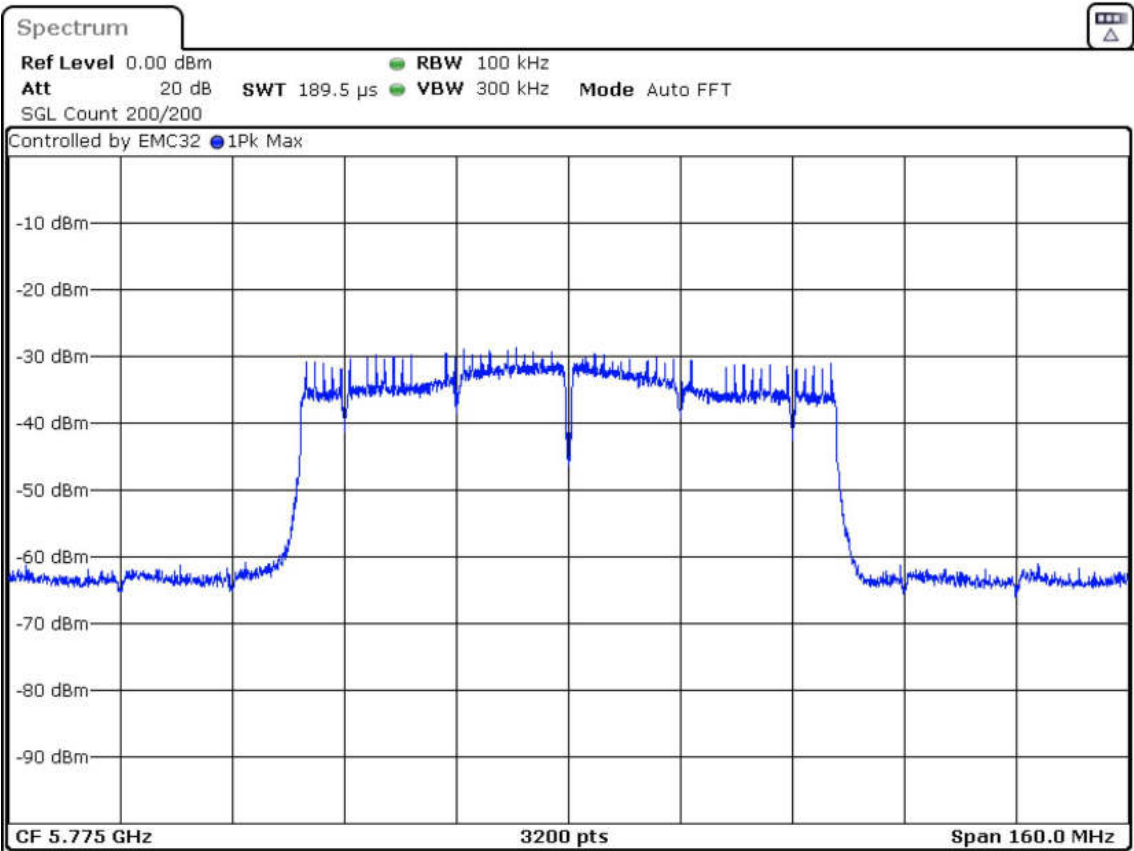
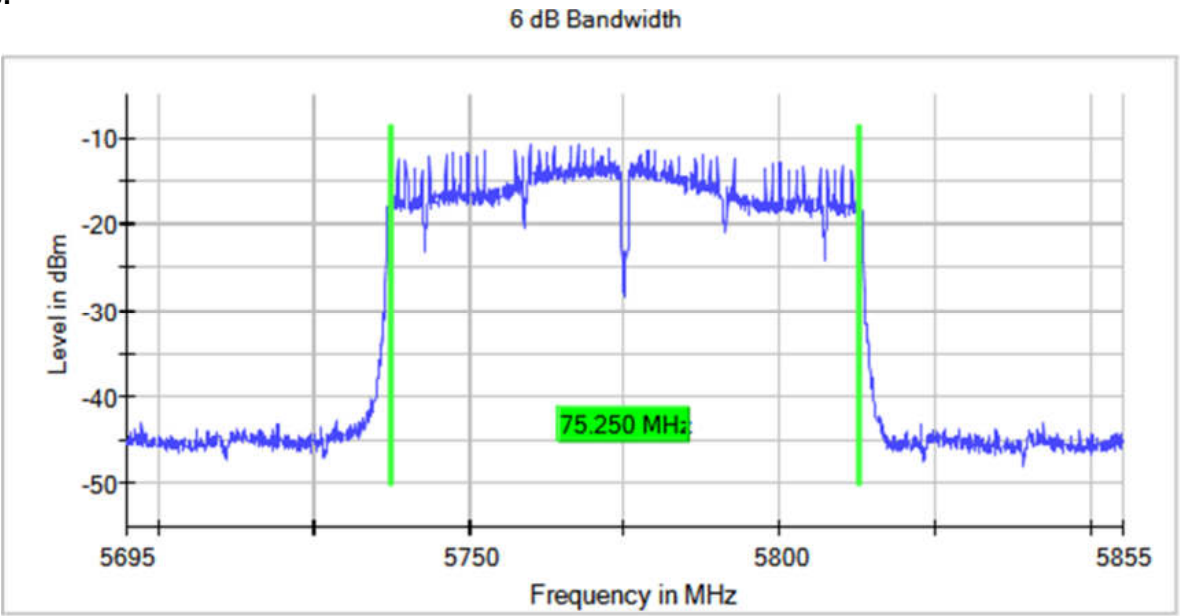
Verdict

Pass

Attachments

Operation Band MHz = [5725, 5850]    Active Port = 1+2  
Frequency MHz = 5775.00000    Modulation = 802.11ac VHT80 (OFDM MCS0)  
MIMO Mode = MIMO CDD Mode 2x2

Images:





## RSS-247 6.2.4.2 / FCC 15.407 (b) (4) (6) [Rse] Transmitter Out of Band and Band Edge Radiated Emissions for transmitters operating solely in the 5.725-5.850 GHz band

### Limits

For transmitters operating in the 5.725–5.85 GHz band: All emissions shall be limited to a level of –27 dBm/MHz (68.23 dBμV/m at 3 m distance) at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)):

| Frequency Range (MHz) | Field strength (μV/m) | Field strength (dBμV/m) | Measurement distance (m) |
|-----------------------|-----------------------|-------------------------|--------------------------|
| 0.009-0.490           | 2400/F(kHz)           | -                       | 300                      |
| 0.490-1.705           | 24000/F(kHz)          | -                       | 300                      |
| 1.705 - 30.0          | 30                    | -                       | 30                       |
| 30 - 88               | 100                   | 40                      | 3                        |
| 88 - 216              | 150                   | 43.5                    | 3                        |
| 216 - 960             | 200                   | 46                      | 3                        |
| 960 - 40000           | 500                   | 54                      | 3                        |

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.

### Frequency range tested for Radiated emissions:

Start frequency: no radiofrequency signal generated in the device found below 10th sub-harmonic, no further investigation required.

Stop frequency: it has been performed the radiated spurious emissions until 10th harmonic

### Results

The situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

All tests were performed in a semi-anechoic chamber at a distance of 3m for the frequency range 1 GHz-17 GHz and a distance of 1m for frequency range 17GHz-40GHz.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyser. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

**OUT OF BAND EMISSIONS:** For spurious emissions outside of the U-NII-3 band edge mask of 5.65-5.925 GHz, the worst-case was determined after preliminary measurements of the E.I.R.P. density (radiated).

The worst-case was determined by measuring the eirp density (radiated). Test performed on the worst-case.

**CONFIGURATION 2:**

Modulation: 802.11a (OFDM 6 Mbit/s) as worst case

MIMO Mode: MIMO CDD Mode 2x2

| Operation Band (MHz) | Port | Freq Rng (GHz) | Freq (MHz) | Unwanted Freq (MHz) | Unwanted Lvl (dBµV/m) | Pol | Detector |
|----------------------|------|----------------|------------|---------------------|-----------------------|-----|----------|
| [5725, 5850]         | 1+2  | [0.03, 1]      | 5745.00000 | 124.999             | 35.30                 | V   | PK       |
|                      |      |                |            | 124.999             | 33.34                 | V   | QP       |
|                      |      |                |            | 249.978             | 43.50                 | H   | PK       |
|                      |      |                |            | 249.978             | 41.55                 | H   | QP       |
|                      |      |                |            | 40.943              | 36.95                 | V   | PK       |
|                      |      |                |            | 40.943              | 30.25                 | V   | QP       |
|                      |      |                |            | 479.989             | 41.96                 | H   | PK       |
|                      |      |                |            | 479.989             | 40.62                 | H   | QP       |
|                      |      |                |            | 48.006              | 37.49                 | V   | PK       |
|                      |      |                |            | 48.006              | 29.84                 | V   | QP       |
|                      |      |                |            | 960.048             | 40.76                 | V   | PK       |
|                      |      |                |            | 960.048             | 36.46                 | V   | QP       |
|                      |      |                | 5785.00000 | 124.969             | 34.66                 | V   | PK       |
|                      |      |                |            | 124.969             | 32.39                 | V   | QP       |
|                      |      |                |            | 250.008             | 42.77                 | H   | PK       |
|                      |      |                |            | 250.008             | 41.62                 | H   | QP       |
|                      |      |                |            | 42.155              | 36.55                 | V   | PK       |
|                      |      |                |            | 42.155              | 28.83                 | V   | QP       |
|                      |      |                |            | 47.824              | 40.25                 | V   | PK       |
|                      |      |                |            | 47.824              | 31.83                 | V   | QP       |
|                      |      |                |            | 49.188              | 37.09                 | V   | PK       |
|                      |      |                |            | 49.188              | 29.40                 | V   | QP       |
|                      |      |                |            | 859.805             | 39.77                 | H   | PK       |
|                      |      |                |            | 859.805             | 34.44                 | H   | QP       |
|                      |      |                | 5825.00000 | 124.999             | 35.23                 | V   | PK       |
|                      |      |                |            | 124.999             | 33.50                 | V   | QP       |
|                      |      |                |            | 249.978             | 40.60                 | V   | PK       |
|                      |      |                |            | 249.978             | 38.98                 | V   | QP       |
|                      |      |                |            | 374.956             | 39.45                 | H   | PK       |
|                      |      |                |            | 374.956             | 35.77                 | H   | QP       |
|                      |      |                |            | 42.519              | 36.16                 | V   | PK       |

| Operation Band (MHz) | Port | Freq Rng (GHz) | Freq (MHz) | Unwanted Freq (MHz) | Unwanted Lvl (dBµV/m) | Pol | Detector |
|----------------------|------|----------------|------------|---------------------|-----------------------|-----|----------|
|                      |      |                |            | 42.519              | 28.16                 | V   | QP       |
|                      |      |                |            | 47.551              | 38.05                 | V   | PK       |
|                      |      |                |            | 47.551              | 31.12                 | V   | QP       |
|                      |      |                |            | 944.680             | 37.49                 | V   | PK       |
|                      |      |                |            | 944.680             | 31.82                 | V   | QP       |
|                      |      | [1, 6.5]       | 5785.00000 | 4982.200            | 54.94                 | V   | PK       |
|                      |      |                |            | 4982.200            | 41.64                 | V   | AVG      |
|                      |      |                |            | 4993.600            | 56.83                 | V   | PK       |
|                      |      |                |            | 4993.600            | 42.24                 | V   | AVG      |
|                      |      | [6.5, 17]      | 5745.00000 | 11487.080           | 63.82                 | H   | PK       |
|                      |      |                |            | 11487.080           | 51.65                 | H   | AVG      |
|                      |      |                | 5785.00000 | 11576.330           | 61.41                 | H   | PK       |
|                      |      |                |            | 11576.330           | 49.86                 | H   | AVG      |
|                      |      |                | 5825.00000 | 11647.520           | 54.63                 | H   | PK       |
|                      |      |                |            | 11647.520           | 42.56                 | H   | AVG      |

Verdict

Pass

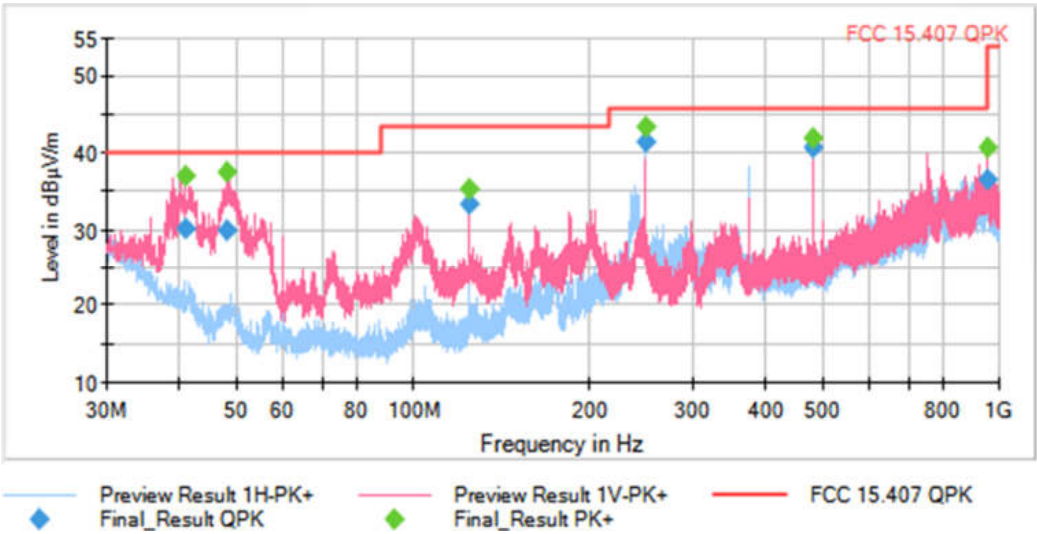
Attachments

The measurement settings for each range of frequency is as follows:

| Subrange                               | Step Size   | Detectors | Bandwidth | Sweep Time | Preamp |
|----------------------------------------|-------------|-----------|-----------|------------|--------|
| Receiver: [ESW 44]<br>30 MHz - 1 GHz   | 30,312 kHz  | PK+       | 100 kHz   | 1 s        | 0 dB   |
| Subrange                               | Step Size   | Detectors | Bandwidth | Sweep Time | Preamp |
| Receiver: [ESW 44]<br>1 GHz - 6,5 GHz  | 100 kHz     | PK+ ; AVG | 1 MHz     | 1 s        | 0 dB   |
| Subrange                               | Step Size   | Detectors | Bandwidth | Sweep Time | Preamp |
| Receiver: [ESW 44]<br>6,5 GHz - 17 GHz | 105 kHz     | PK+ ; AVG | 1 MHz     | 1 s        | 30 dB  |
| Subrange                               | Step Size   | Detectors | Bandwidth | Sweep Time | Preamp |
| Receiver: [ESW 44]<br>17 GHz - 40 GHz  | 766,667 kHz | PK+ ; AVG | 1 MHz     | 1 s        | 0 dB   |

Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [0.03, 1]      Frequency MHz = 5745.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:

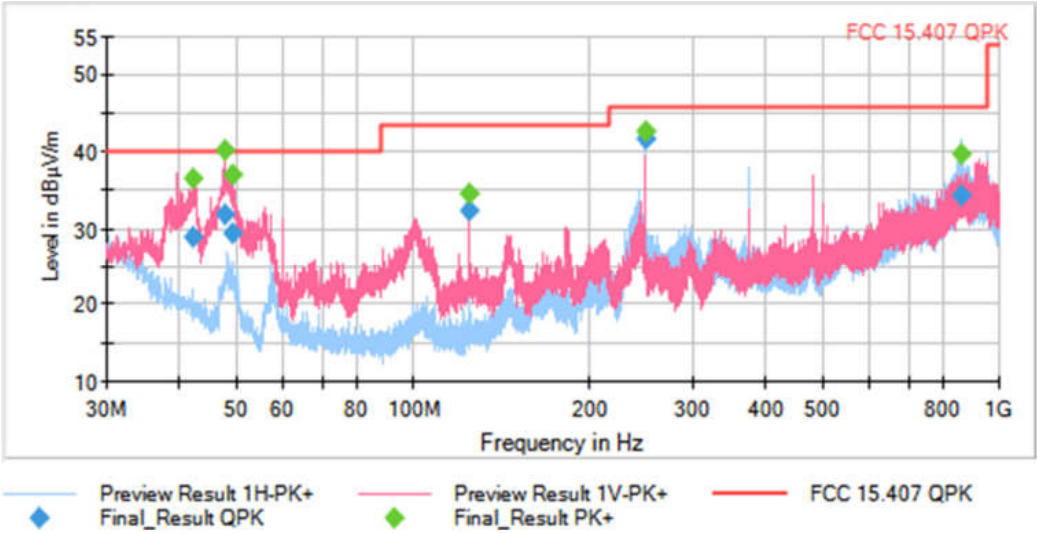


Tables:  
Spectrum Analyzer Parameters

|  | Subrange           | Step Size  | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|------------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 44] |            |           |           |            |        |
|  | 30 MHz - 1 GHz     | 30,312 kHz | PK+       | 100 kHz   | 1 s        | 30 dB  |

Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [0.03, 1]      Frequency MHz = 5785.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:

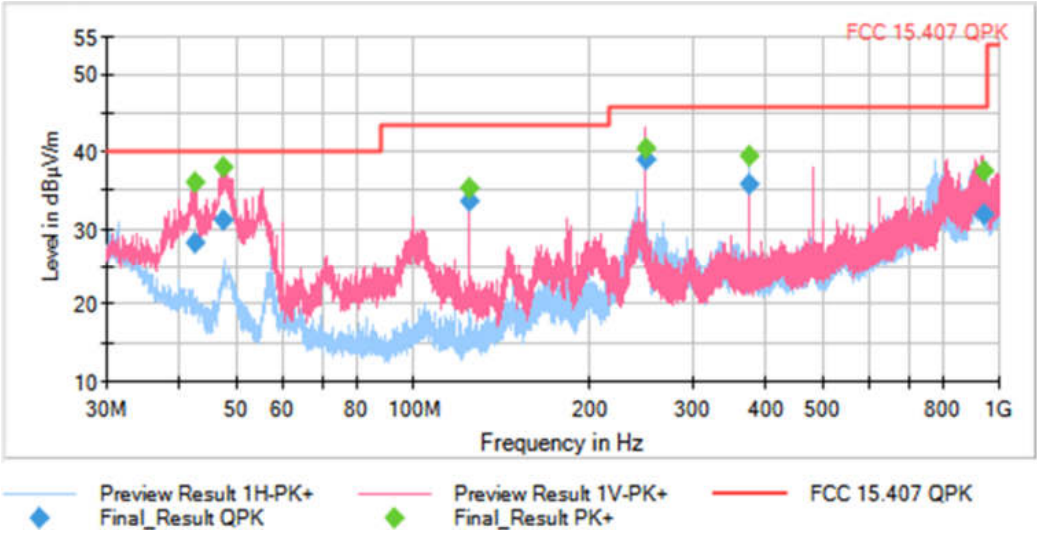


Tables:  
Spectrum Analyzer Parameters

|  | Subrange           | Step Size  | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|------------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 44] |            |           |           |            |        |
|  | 30 MHz - 1 GHz     | 30,312 kHz | PK+       | 100 kHz   | 1 s        | 30 dB  |

Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [0.03, 1]      Frequency MHz = 5825.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:

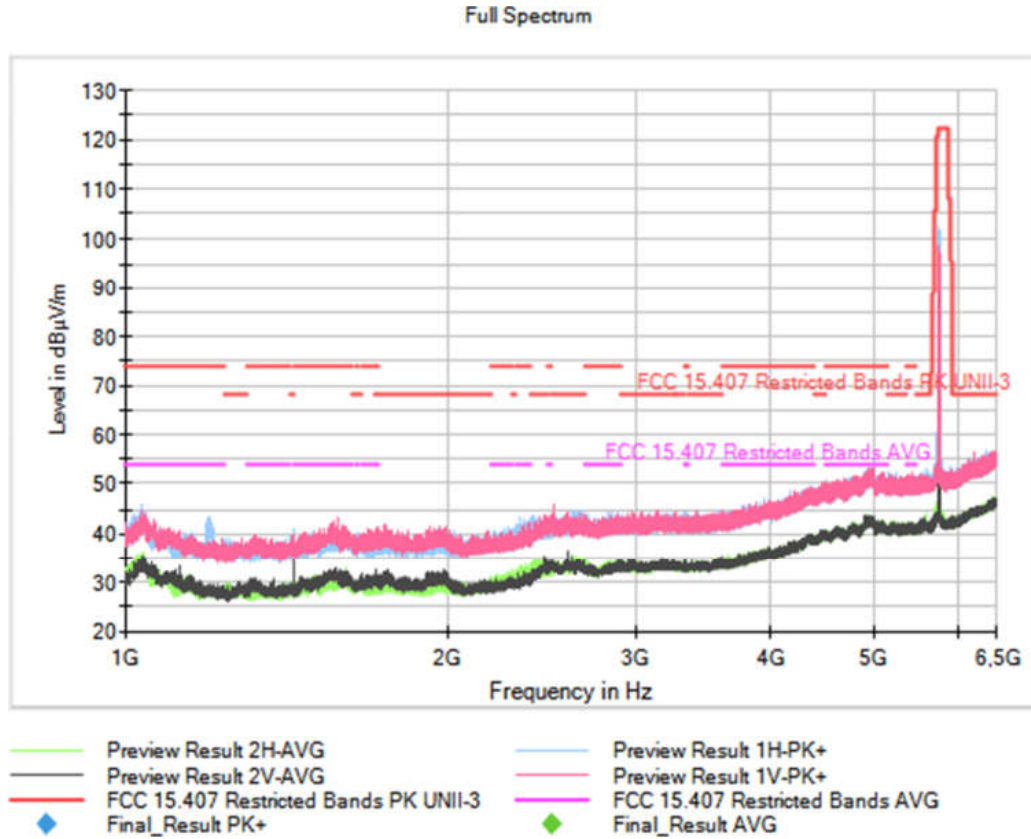


Tables:  
Spectrum Analyzer Parameters

|  | Subrange           | Step Size  | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|------------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 44] |            |           |           |            |        |
|  | 30 MHz - 1 GHz     | 30,312 kHz | PK+       | 100 kHz   | 1 s        | 30 dB  |

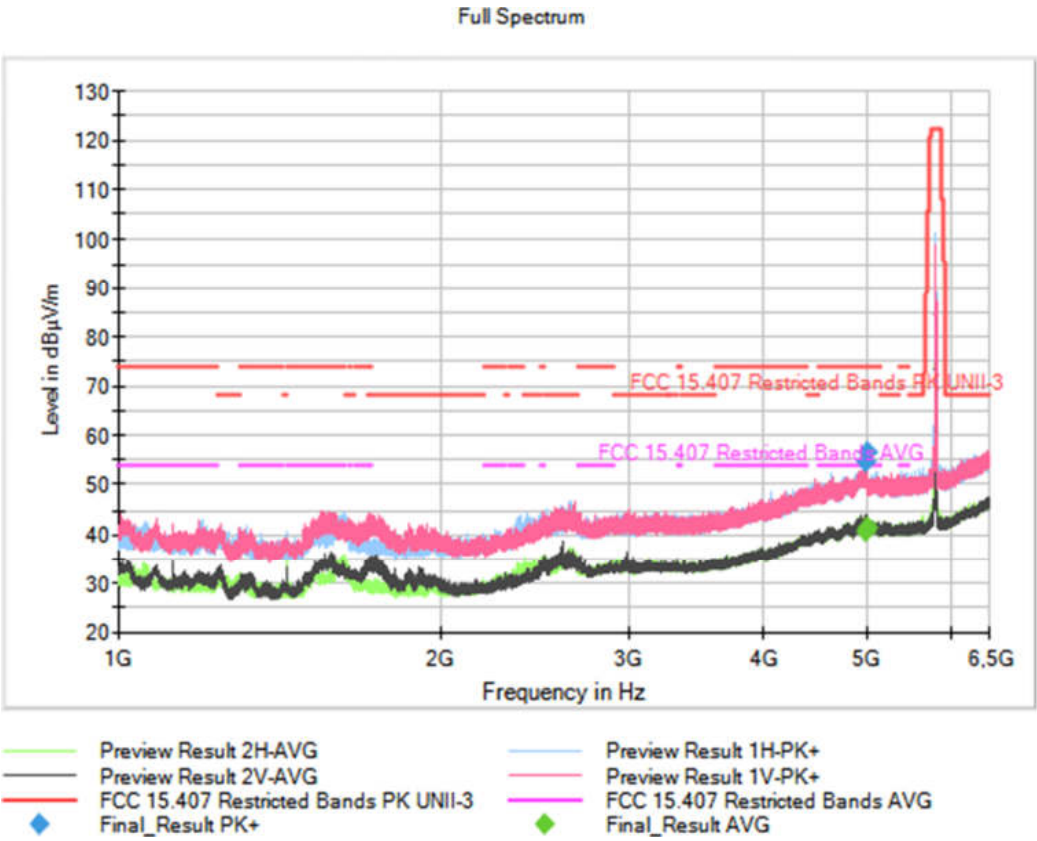
Operation Band MHz = [5725, 5850]      Active Port = 1+2  
 Frequency Range GHz = [1, 6.5]      Frequency MHz = 5745.00000  
 Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

**Images:**



Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [1, 6.5]      Frequency MHz = 5785.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

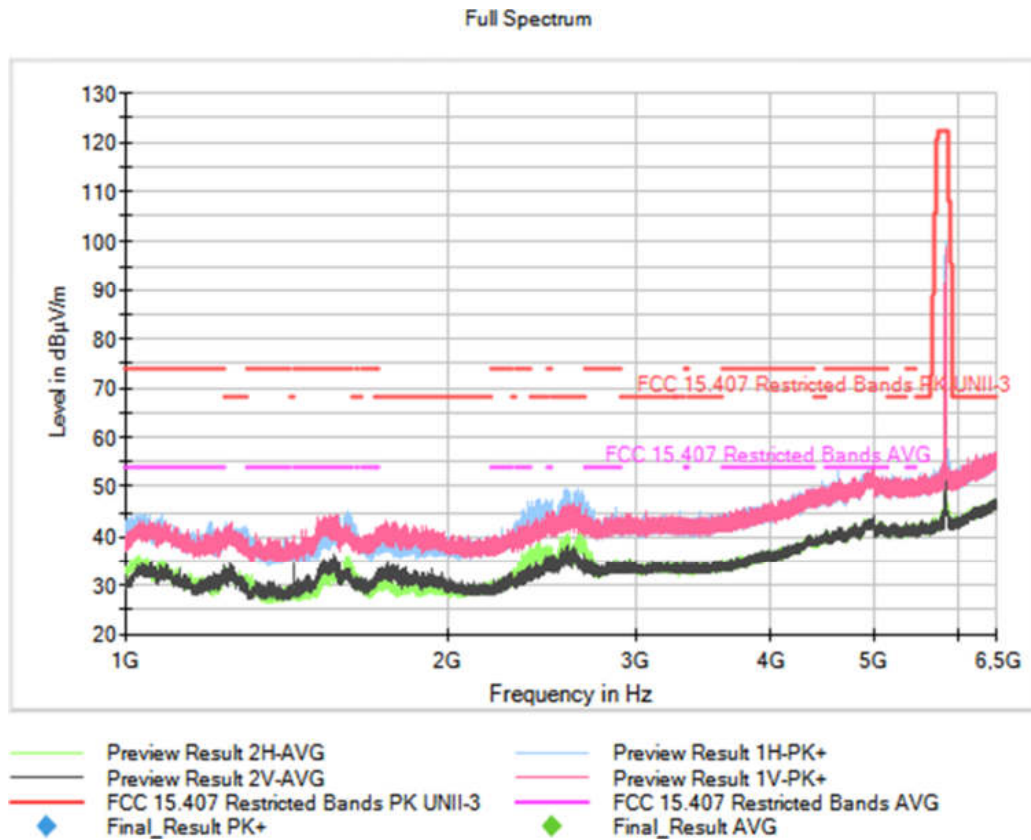
Images:





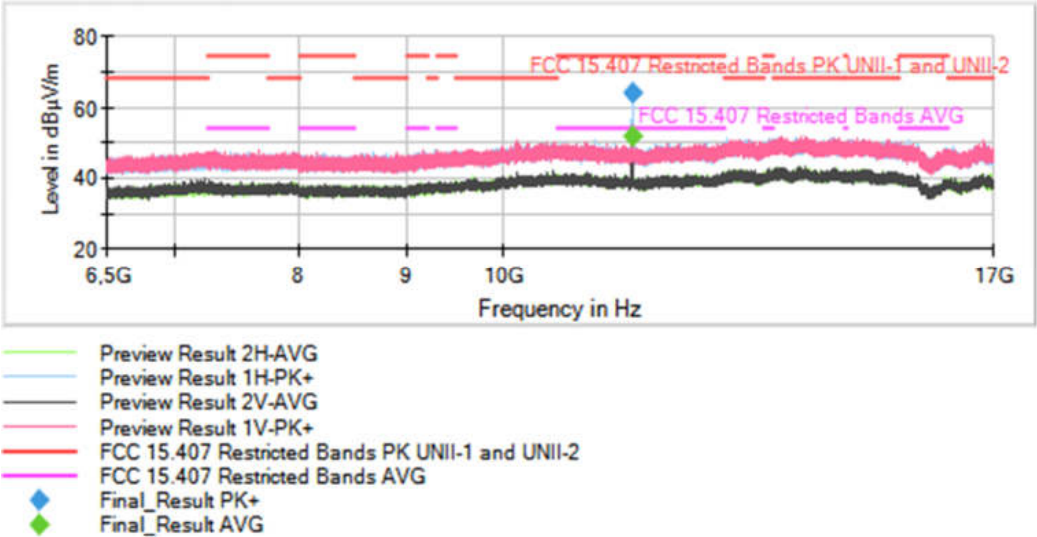
Operation Band MHz = [5725, 5850]      Active Port = 1+2  
 Frequency Range GHz = [1, 6.5]      Frequency MHz = 5825.00000  
 Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

**Images:**



Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [6.5, 17]      Frequency MHz = 5745.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:



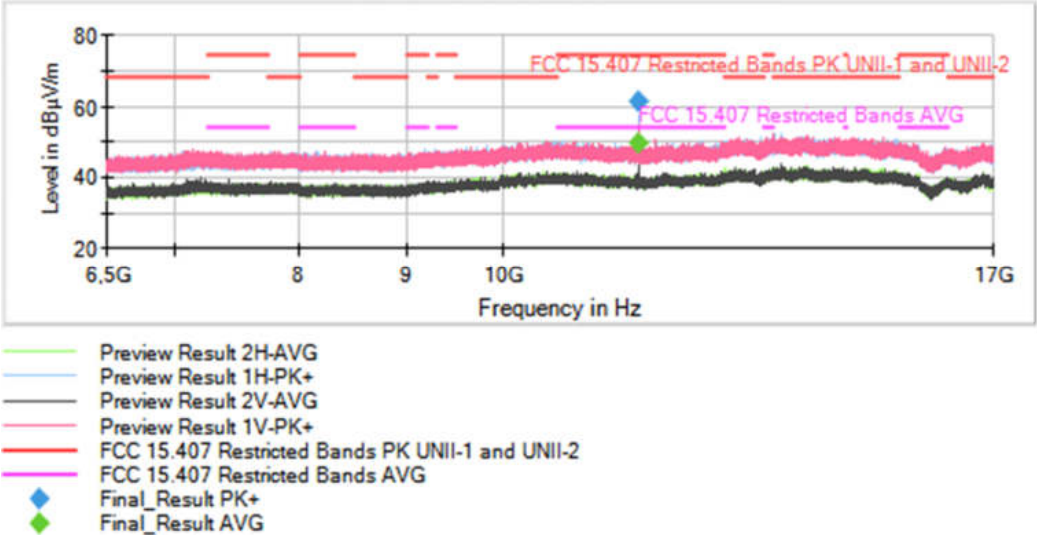
Tables:

Spectrum Analyzer Parameters

|  | Subrange           | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|-----------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 44] |           |           |           |            |        |
|  | 6,5 GHz - 17 GHz   | 105 kHz   | PK+ ; AVG | 1 MHz     | 1 s        | 30 dB  |

Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [6.5, 17]      Frequency MHz = 5785.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:



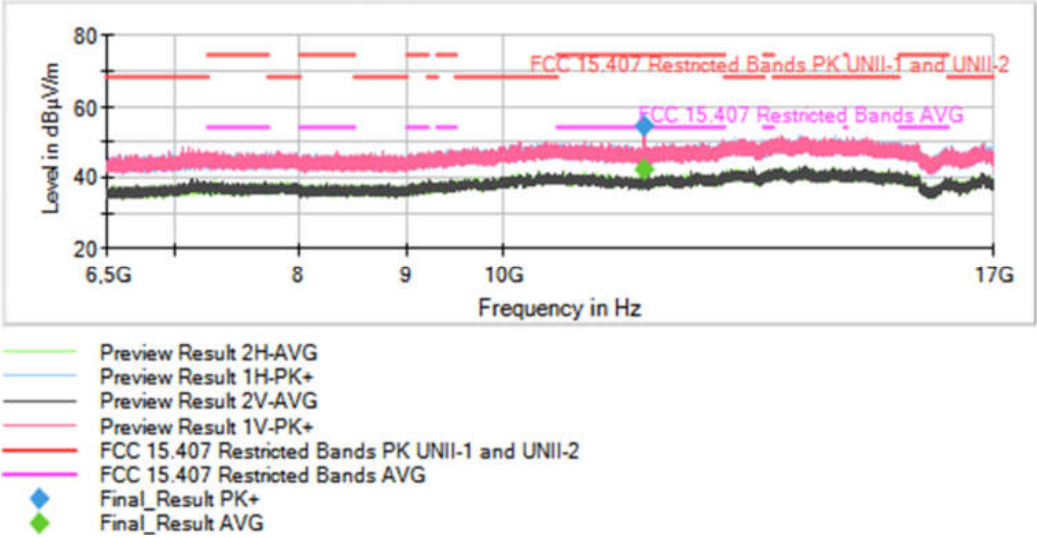
Tables:

Spectrum Analyzer Parameters

|  | Subrange           | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|-----------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 44] |           |           |           |            |        |
|  | 6,5 GHz - 17 GHz   | 105 kHz   | PK+ ; AVG | 1 MHz     | 1 s        | 30 dB  |

Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [6.5, 17]      Frequency MHz = 5825.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:

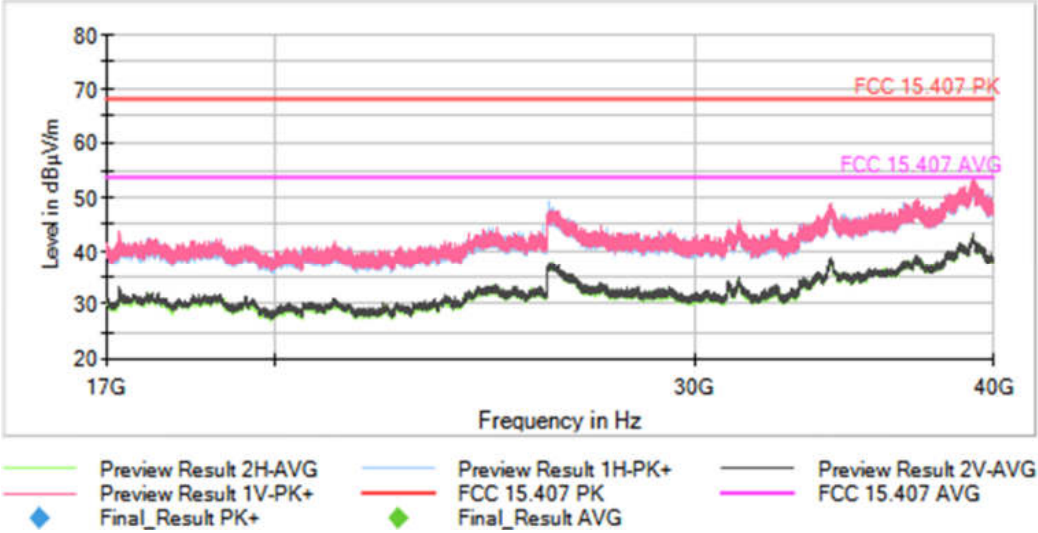


Tables:  
Spectrum Analyzer Parameters

|  | Subrange           | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|-----------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 44] |           |           |           |            |        |
|  | 6,5 GHz - 17 GHz   | 105 kHz   | PK+ ; AVG | 1 MHz     | 1 s        | 30 dB  |

Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [17, 40]      Frequency MHz = 5745.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:

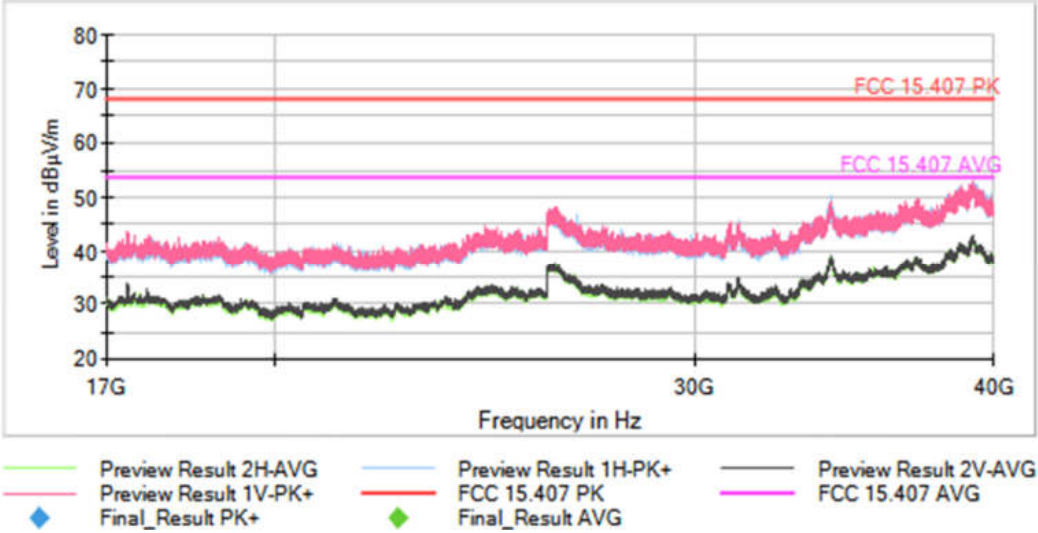


Tables:  
Spectrum Analyzer Parameters

|  | Subrange           | Step Size   | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|-------------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 44] |             |           |           |            |        |
|  | 17 GHz - 40 GHz    | 766,667 kHz | PK+ ; AVG | 1 MHz     | 1 s        | 0 dB   |

Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [17, 40]      Frequency MHz = 5785.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:



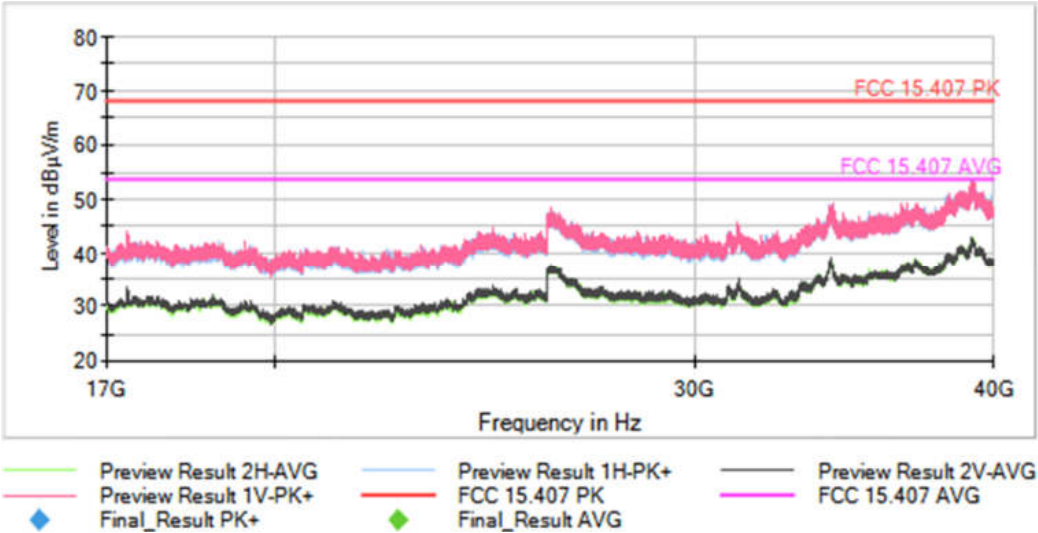
Tables:

Spectrum Analyzer Parameters

|  | Subrange           | Step Size   | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|-------------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 44] |             |           |           |            |        |
|  | 17 GHz - 40 GHz    | 766,667 kHz | PK+ ; AVG | 1 MHz     | 1 s        | 0 dB   |

Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [17, 40]      Frequency MHz = 5825.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:



Tables:

Spectrum Analyzer Parameters

|  | Subrange           | Step Size   | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|-------------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 44] |             |           |           |            |        |
|  | 17 GHz - 40 GHz    | 766,667 kHz | PK+ ; AVG | 1 MHz     | 1 s        | 0 dB   |

CONFIGURATION 1:

Modulation: 802.11a (OFDM 6 Mbit/s)

MIMO Mode: MIMO CDD Mode 2x2

Results

| Operation Band (MHz) | Port | Freq Rng (GHz) | Freq (MHz) | Unwanted Freq (MHz) | Unwanted Lvl (dBµV/m) | PoI | Detector |
|----------------------|------|----------------|------------|---------------------|-----------------------|-----|----------|
| [5725, 5850]         | 1+2  | [0.03, 1]      | 5745.00000 | 124.969             | 31.03                 | V   | PK       |
|                      |      |                |            | 124.969             | 28.44                 | V   | QP       |
|                      |      |                |            | 242.309             | 40.28                 | H   | PK       |
|                      |      |                |            | 242.309             | 32.32                 | H   | QP       |
|                      |      |                |            | 249.978             | 42.81                 | V   | PK       |
|                      |      |                |            | 249.978             | 41.28                 | V   | QP       |
|                      |      |                |            | 47.703              | 33.56                 | V   | PK       |
|                      |      |                |            | 47.703              | 27.21                 | V   | QP       |
|                      |      |                |            | 479.959             | 38.52                 | H   | PK       |
|                      |      |                |            | 479.959             | 36.40                 | H   | QP       |
|                      |      |                |            | 54.402              | 34.72                 | V   | PK       |
|                      |      |                |            | 54.402              | 26.36                 | V   | QP       |
|                      |      |                |            | 64.223              | 34.47                 | V   | PK       |
|                      |      |                |            | 64.223              | 28.73                 | V   | QP       |
|                      |      |                | 5785.00000 | 124.969             | 38.29                 | V   | PK       |
|                      |      |                |            | 124.969             | 36.69                 | V   | QP       |
|                      |      |                |            | 374.987             | 37.70                 | H   | PK       |
|                      |      |                |            | 374.987             | 34.95                 | H   | QP       |
|                      |      |                | 5825.00000 | 124.999             | 29.47                 | V   | PK       |
|                      |      |                |            | 124.999             | 27.79                 | V   | QP       |
|                      |      |                |            | 374.987             | 37.73                 | H   | PK       |
|                      |      |                |            | 374.987             | 35.05                 | H   | QP       |
|                      |      | [1, 6.5]       | 5745.00000 | 1125.200            | 38.32                 | V   | PK       |
|                      |      |                |            | 1198.500            | 41.26                 | H   | PK       |
|                      |      |                |            | 1675.600            | 41.85                 | V   | PK       |
|                      |      |                |            | 1682.200            | 41.85                 | V   | PK       |
|                      |      |                | 5785.00000 | 1124.900            | 39.42                 | V   | PK       |
|                      |      |                |            | 1201.500            | 42.62                 | H   | PK       |
|                      |      |                |            | 1391.600            | 40.77                 | V   | PK       |
|                      |      |                |            | 1439.800            | 41.12                 | V   | PK       |
|                      |      |                |            | 2399.900            | 43.71                 | H   | PK       |
|                      |      |                | 5825.00000 | 1124.600            | 38.38                 | V   | PK       |
|                      |      |                |            | 1202.500            | 43.43                 | H   | PK       |
|                      |      |                |            | 1390.900            | 40.41                 | V   | PK       |
|                      |      |                |            | 1439.800            | 41.66                 | H   | PK       |



| Operation Band (MHz) | Port | Freq Rng (GHz) | Freq (MHz) | Unwanted Freq (MHz) | Unwanted Lvl (dBµV/m) | Pol | Detector |
|----------------------|------|----------------|------------|---------------------|-----------------------|-----|----------|
|                      |      | [6.5, 17]      |            | 2400.100            | 42.90                 | H   | PK       |
|                      |      |                | 5745.00000 | 11490.650           | 64.23                 | H   | PK       |
|                      |      |                |            | 11490.650           | 53.29                 | H   | AVG      |
|                      |      |                | 5785.00000 | 11569.190           | 61.66                 | H   | PK       |
|                      |      |                |            | 11569.190           | 50.27                 | H   | AVG      |
|                      |      |                | 5825.00000 | 11652.140           | 63.39                 | H   | PK       |
|                      |      |                |            | 11652.140           | 52.17                 | H   | AVG      |

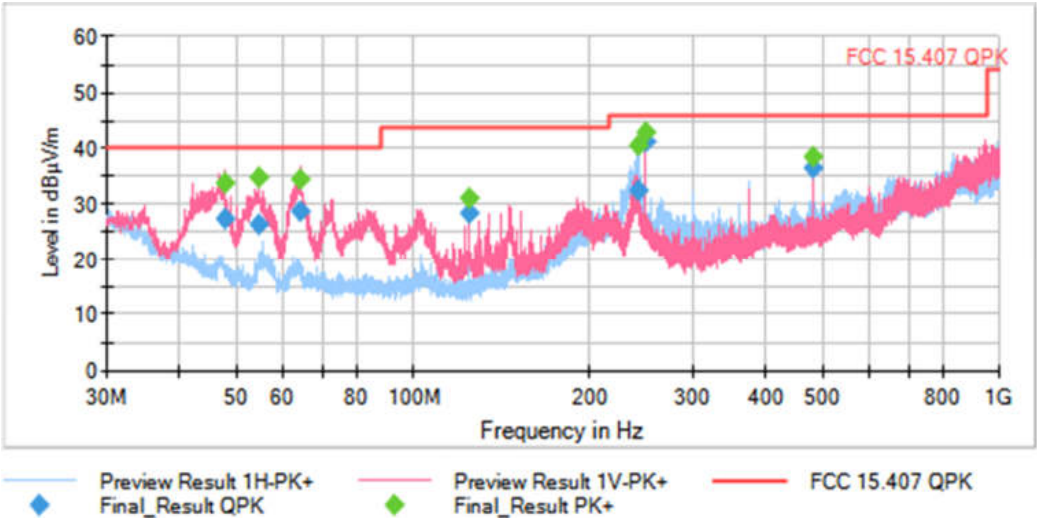
Verdict

Pass

Attachments

Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [0.03, 1]      Frequency MHz = 5745.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:



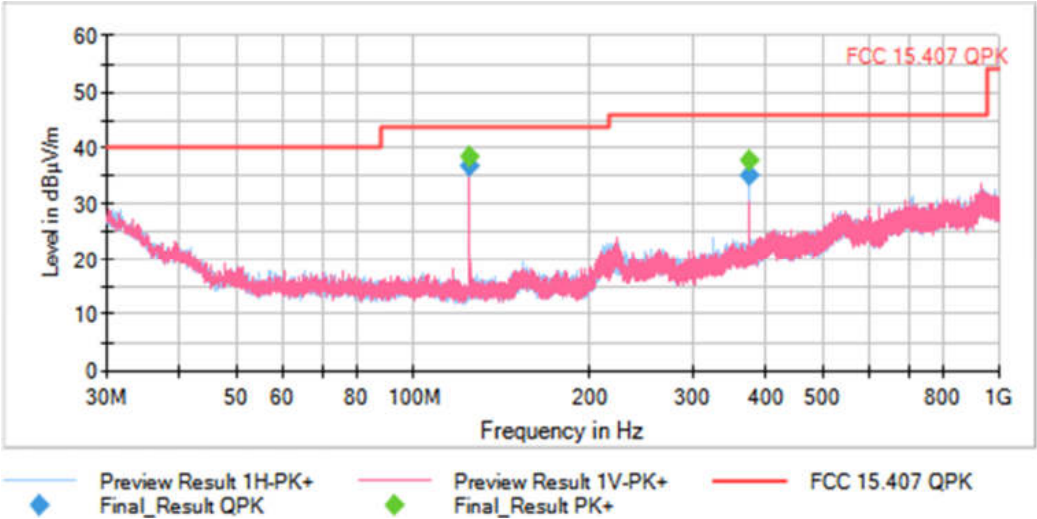
Tables:

Spectrum Analyzer Parameters

|  | Subrange           | Step Size  | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|------------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 26] |            |           |           |            |        |
|  | 30 MHz - 1 GHz     | 30,312 kHz | PK+       | 100 kHz   | 1 s        | 0 dB   |

Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [0.03, 1]      Frequency MHz = 5785.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:

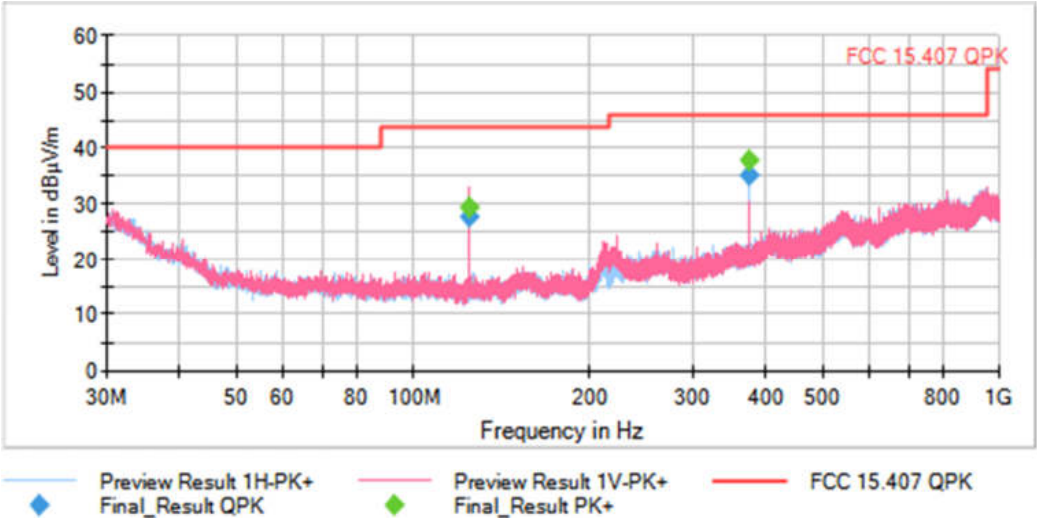


Tables:  
Spectrum Analyzer Parameters

|  | Subrange           | Step Size  | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|------------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 26] |            |           |           |            |        |
|  | 30 MHz - 1 GHz     | 30,312 kHz | PK+       | 100 kHz   | 1 s        | 30 dB  |

Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [0.03, 1]      Frequency MHz = 5825.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:

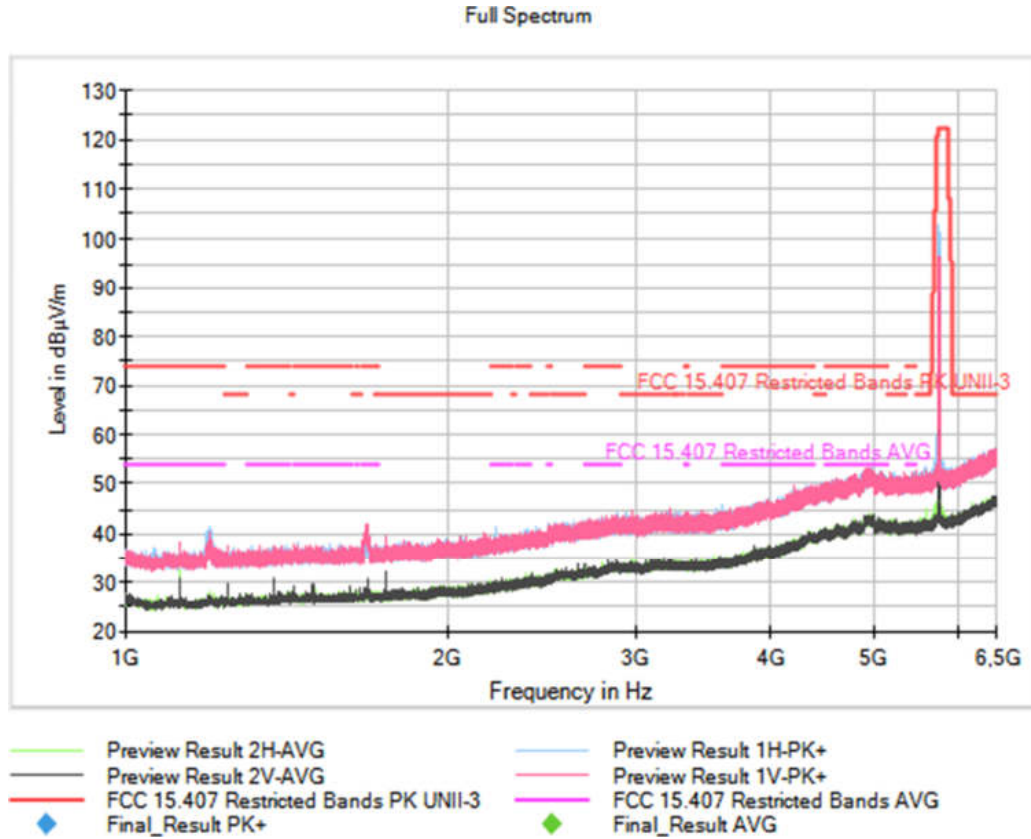


Tables:  
Spectrum Analyzer Parameters

|  | Subrange           | Step Size  | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|------------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 26] |            |           |           |            |        |
|  | 30 MHz - 1 GHz     | 30,312 kHz | PK+       | 100 kHz   | 1 s        | 30 dB  |

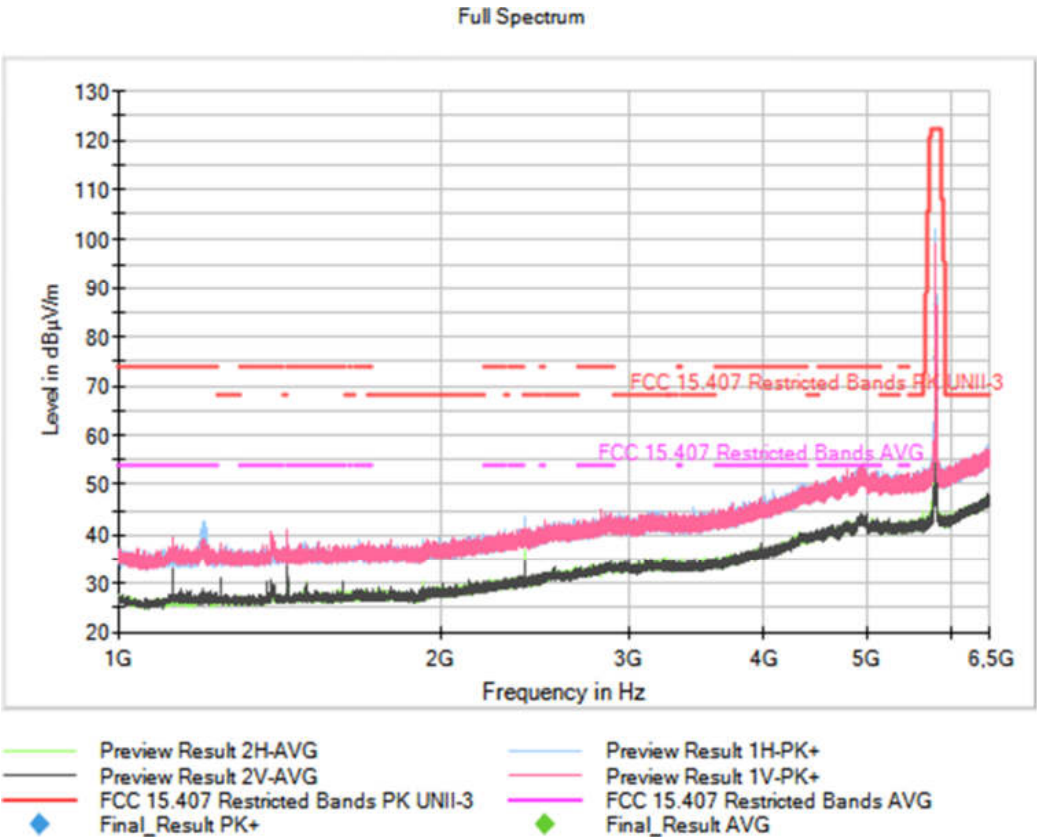
Operation Band MHz = [5725, 5850]      Active Port = 1+2  
 Frequency Range GHz = [1, 6.5]      Frequency MHz = 5745.00000  
 Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

**Images:**



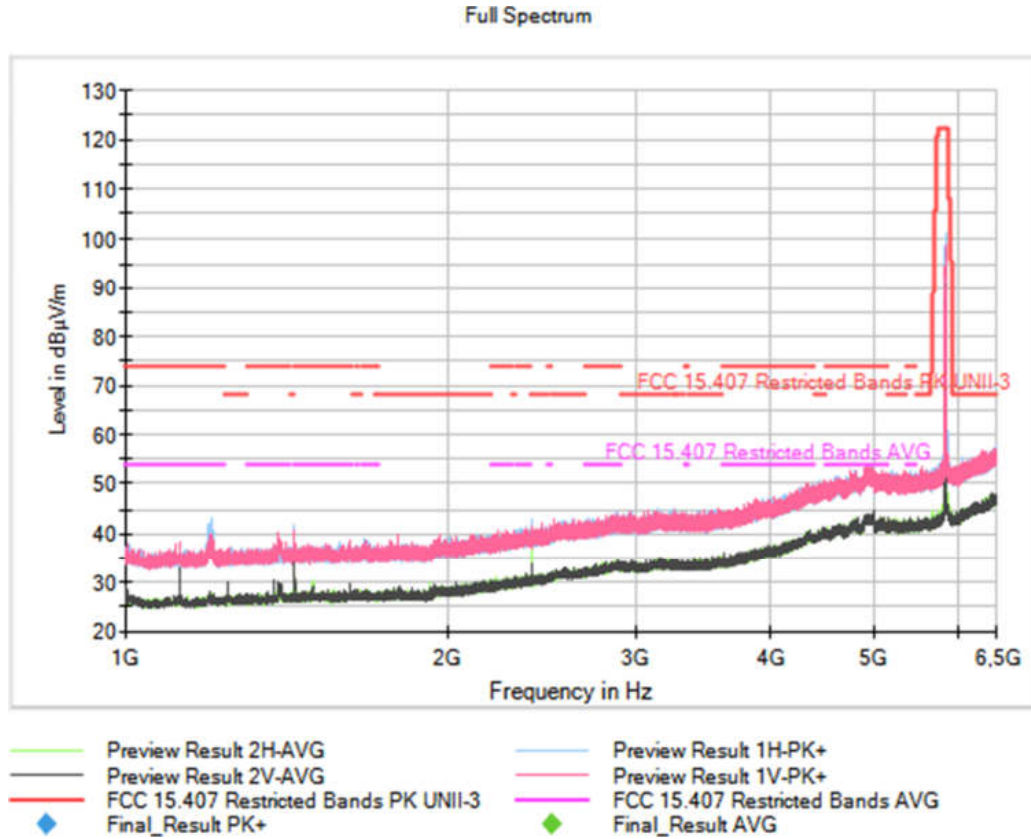
Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [1, 6.5]      Frequency MHz = 5785.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:



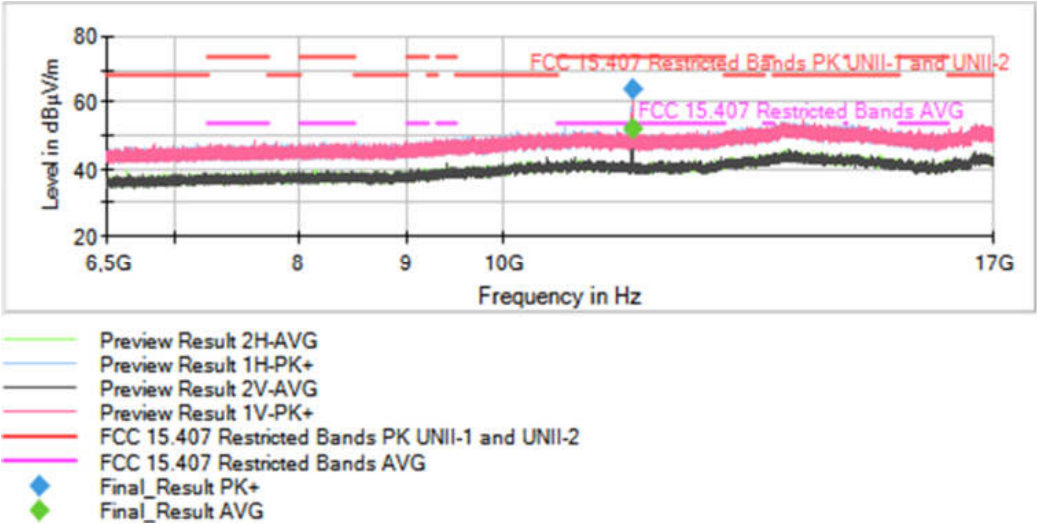
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**Images:**



Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [6.5, 17]      Frequency MHz = 5745.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:



Tables:

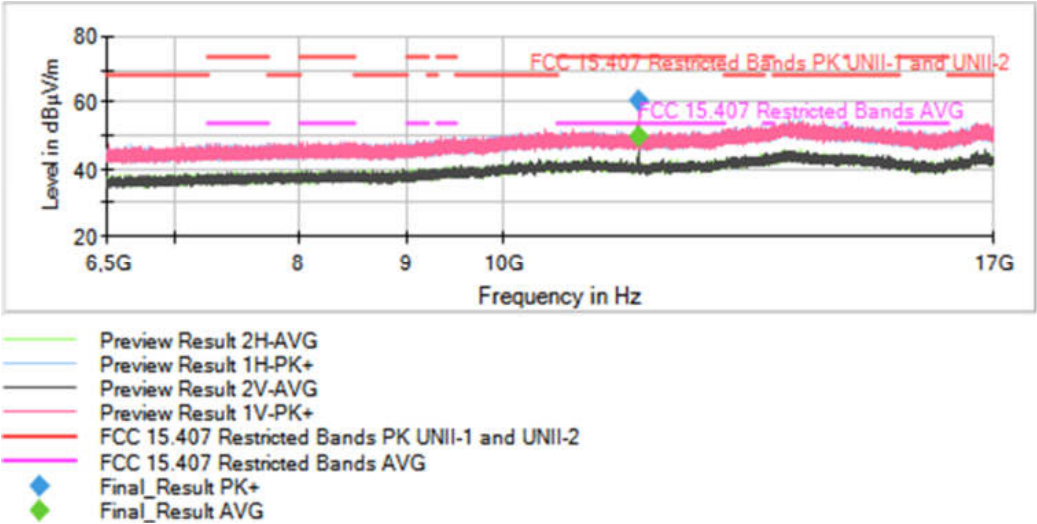
Spectrum Analyzer Parameters

|  | Subrange           | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|-----------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 44] |           |           |           |            |        |
|  | 6,5 GHz - 17 GHz   | 105 kHz   | PK+ ; AVG | 1 MHz     | 1 s        | 30 dB  |



Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [6.5, 17]      Frequency MHz = 5785.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:



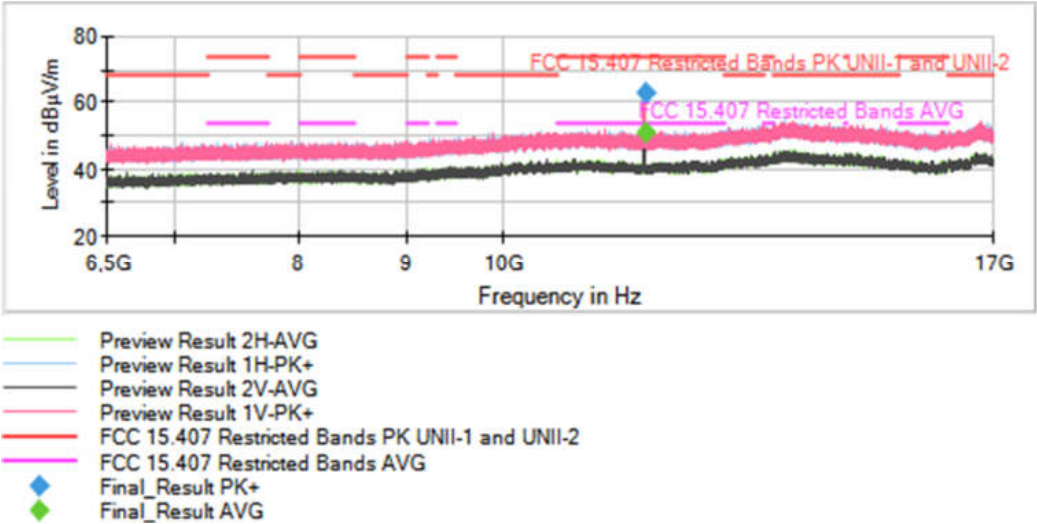
Tables:

Spectrum Analyzer Parameters

|  | Subrange           | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|-----------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 44] |           |           |           |            |        |
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Frequency Range GHz = [6.5, 17]      Frequency MHz = 5825.00000  
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Images:



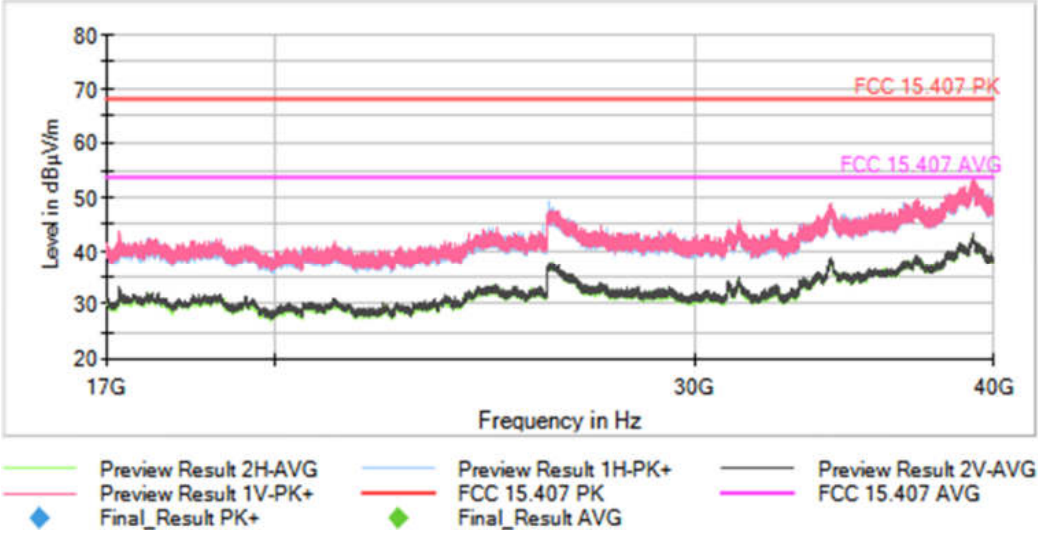
Tables:

Spectrum Analyzer Parameters

|  | Subrange           | Step Size | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|-----------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 44] |           |           |           |            |        |
|  | 6,5 GHz - 17 GHz   | 105 kHz   | PK+ ; AVG | 1 MHz     | 1 s        | 30 dB  |

Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [17, 40]      Frequency MHz = 5745.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:

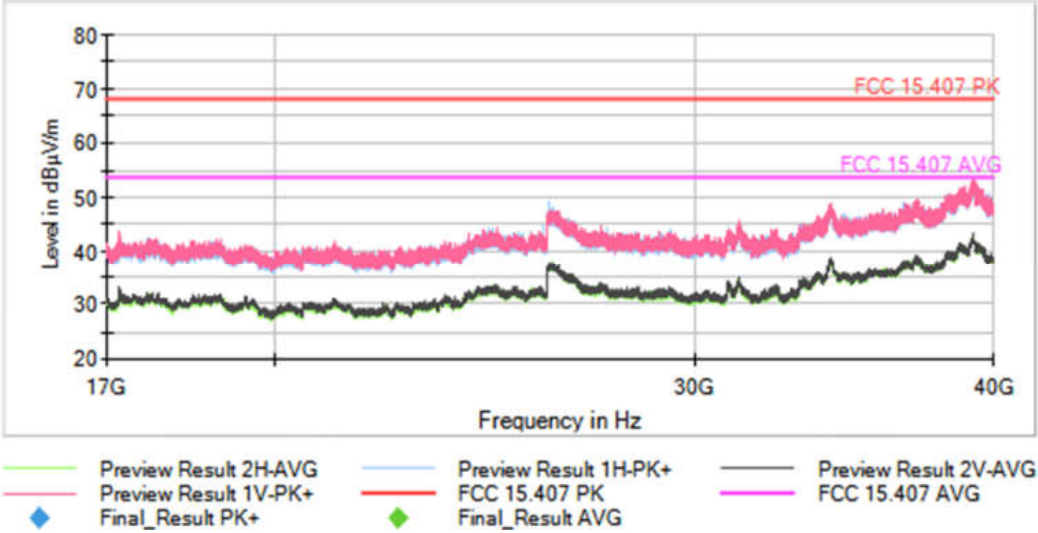


Tables:  
Spectrum Analyzer Parameters

|  | Subrange           | Step Size   | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|-------------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 44] |             |           |           |            |        |
|  | 17 GHz - 40 GHz    | 766,667 kHz | PK+ ; AVG | 1 MHz     | 1 s        | 0 dB   |

Operation Band MHz = [5725, 5850]      Active Port = 1+2  
Frequency Range GHz = [17, 40]      Frequency MHz = 5785.00000  
Modulation = 802.11a (OFDM 6 Mbit/s)      MIMO Mode = MIMO CDD Mode 2x2

Images:



Tables:

Spectrum Analyzer Parameters

|  | Subrange           | Step Size   | Detectors | Bandwidth | Sweep Time | Preamp |
|--|--------------------|-------------|-----------|-----------|------------|--------|
|  | Receiver: [ESW 44] |             |           |           |            |        |
|  | 17 GHz - 40 GHz    | 766,667 kHz | PK+ ; AVG | 1 MHz     | 1 s        | 0 dB   |