



Test report No:
 NIE: 59830RRF.006

Test report

USA FCC Part 15.407, 15.209

CANADA RSS-247, RSS-Gen

Unlicensed National Information Infrastructure (U-NII) Devices.

General technical requirements.

Radiated emission limits; general requirements.

Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices.

General Requirements and Information for the Certification of Radio Apparatus.

| | |
|---|---|
| (*) Identification of item tested | TCAM: Telematics and Connectivity Antenna Module |
| (*) Trademark | Continental |
| (*) Model and /or type reference | TCAM1NA0 |
| Other identification of the product | HW version: E4.2 SW version: PI007.1 FCC ID: KR5TCAM1NA0 IC: 7812D-TCAM1NA0 |
| (*) Features | 2G, 3G, LTE, GNSS, WLAN, BLE, ISM Receiver |
| Applicant | Continental Automotive GmbH Siemensstrasse 12, 93055 Regensburg, Germany |
| Test method requested, standard | USA FCC Part 15.407 (10-1-18) Edition: Unlicensed National Information Infrastructure (U-NII) Devices. General technical requirements. USA FCC Part 15.209 (10-1-18) Edition: Radiated emission limits; general requirements. CANADA RSS-247 Issue 2 (February 2017). CANADA RSS-Gen Issue 5 (March 2019). Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices 789033 D02 General U-NII Test Procedures New Rules v02r01 dated Dec 14, 2017. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices. |
| Summary | IN COMPLIANCE |
| Approved by (name / position & signature) | Jose Carlos Luque RF Lab. Supervisor |
| Date of issue | 2020-04-16 |
| Report template No | FDT08_22 (*) "Data provided by the client" |

Index

| | |
|--|----|
| Competences and guarantees | 3 |
| General conditions | 3 |
| Uncertainty..... | 3 |
| Data provided by the client | 3 |
| Usage of samples | 5 |
| Test sample description..... | 6 |
| Identification of the client | 7 |
| Testing period and place | 8 |
| Document history..... | 8 |
| Environmental conditions | 8 |
| Remarks and comments..... | 9 |
| Testing verdicts..... | 10 |
| Summary | 10 |
| Appendix A: Test Common requirements for all bands..... | 12 |
| Appendix B: Tests results for the U-NII-1 Band 5.15 – 5.25 GHz | 19 |
| Appendix C: Test results for the U-NII-3 Band 5.725 – 5.85 GHz..... | 46 |

Competences and guarantees

DEKRA Testing and Certification 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 is a FCC-recognized accredited testing laboratory with appropriate scope of accreditation that include testing performed in this test report.

DEKRA Testing and Certification is an ISED-recognized accredited testing laboratory with appropriate scope of accreditation that include testing performed in this test report.

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

DEKRA Testing and Certification 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 at the time of performance of the test.

DEKRA Testing and Certification is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

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

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Testing and Certification.

General conditions

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.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification.
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 and the Accreditation Bodies.

Uncertainty

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

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 Telematics and Connectivity Antenna Module model Continental TCAM1NA0 is a vehicle antenna module for telematic and connectivity purposes.

It consists of a fin antenna with integrated telematics transceivers for different wireless services as well as several interfaces to the vehicle.

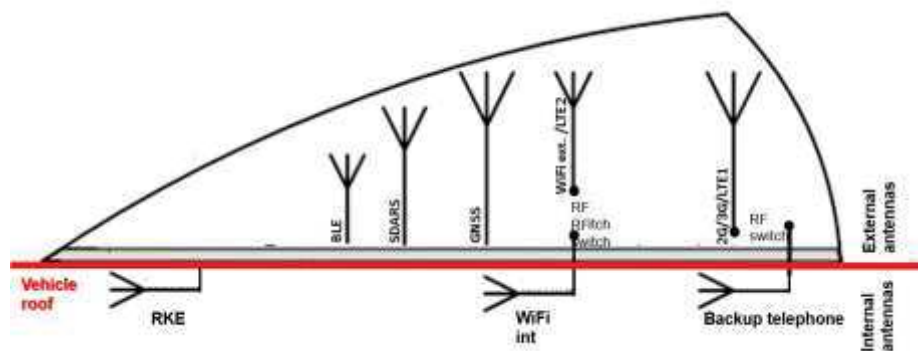
The TCAM1NA0 main parts are:

- Antennas for cellular, WLAN, BLE, ISM receiver (RKE), SDARS with LNA
- GNSS with LNA for Navigation: Beidou, Galileo, GPS, Glonass
- Antenna selection via RF switches
- TCAM internal antennas (all are TCAM internal, no extern antenna connections):
 - Tel1 ant: 2G, 3G, 4G/LTE1 (vehicle outside)
 - Tel2 ant: LTE2 (Rx only) (vehicle outside)
 - MIMO with LTE1- and LTE2-antenna. LTE2 is Rx only
 - Backup telephone antenna: 2G, 3G, 4G/LTE (vehicle inside)
 - Wi-Fi internal antenna (vehicle inside)
 - Wi-Fi external antenna (vehicle outside)
 - BLE antenna (vehicle outside)
 - Stacked patch antenna featuring GNSS
 - ISM receiver antenna
 - SDARS antenna

- CAT4 NAD with 2G/3G/4G/LTE and GNSS, FCC certified
- VoLTE
- ISM receiver module (434MHz) for: RKE (Remote Keyless Entry), PASE (Passive Start and Entry, TPMS (Tire Pressure Monitoring System), FCC tested
- Wi-Fi chip
- BLE chip
- 1st internal embedded Sim-IC
- Service calls

External interfaces:

- Main power supply
- External backup battery
- External SIM card slot (2nd private customer SIM, optional)
- External microphone in the OHC (Overhead Compartment)
- A2B
- External backup speaker
- BroadR-Reach
- CEM connection (K-Line)
- Infotainment CAN
- Airbag input
- Debug interfaces (USB, UART)



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.

Usage of samples

Samples undergoing test have been selected by: The client.

- Sample S/01 is composed of the following elements:

| Control N° | Description | Model | Serial N° | Date of reception |
|------------|---|-------------------------|------------|-------------------|
| 59830B/017 | Telematics and Connectivity Antenna Module | Continental TCAM1NA0 | SNRD004296 | 2019/10/22 |
| 59830B/025 | Harness | -- | -- | 2019/10/29 |
| 59830B/028 | CAN-Box | CAN-STIM3 | 00047 | 2019/10/30 |

Sample S/01 has undergone the following test(s): All RADIATED tests indicated in Appendix A, B and C.

- Sample S/02 is composed of the following elements:

| Control N° | Description | Model | Serial N° | Date of reception |
|------------|---|-------------------------|------------|-------------------|
| 59830B/020 | Telematics and Connectivity Antenna Module | Continental TCAM1NA0 | SNRD004547 | 2019/10/22 |
| 59830B/034 | Harness | -- | -- | 2019/11/11 |
| 59830B/030 | CAN-Box | CAN-STIM3 | 00266 | 2019/11/11 |

Sample S/02 has undergone the following test(s): All CONDUCTED tests indicated in Appendix A, B and C.

Test sample description

| | | | | | | | |
|---|--|--------------------------------|--------------------------|--------------------------|-----------------------------------|--------------------------|--------------------------|
| Ports..... : | Port name and description | Cable | | | | | |
| | | Specified max length [m] | Attached during test | Shielded | Coupled to patient ⁽³⁾ | | |
| | <i>USB diagnostic</i> | ~3m | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | <i>UART diagnostic</i> | ~3m | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | <i>BRR diagnostic</i> | ~3m | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| | | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | |
| Supplementary information to the ports..... : | | | | | | | |
| Rated power supply | Voltage and Frequency | | Reference poles | | | | |
| | | | L1 | L2 | L3 | N | PE |
| | <input type="checkbox"/> | AC: | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | AC: | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input checked="" type="checkbox"/> | DC: 12V | | | | | |
| <input type="checkbox"/> | DC: | | | | | | |
| Rated Power | 4.2 W dc (cellular, Wi-Fi, BLE, GNSS active) | | | | | | |
| Clock frequencies..... | 32.768kHz, 16MHz, 19.2MHz, 24MHz, 25MHz, 27.6MHz, 48MHz | | | | | | |
| Other parameters | Operating temperature Range: -40°C to 85°C Supply Voltage Range: 8 V to 16 V DC | | | | | | |
| Software version | PI007.1 | | | | | | |
| Hardware version | E4.2 | | | | | | |
| Dimensions in cm (W x H x D) | 10.5cm x 15.5cm x 9cm | | | | | | |
| Mounting position | <input type="checkbox"/> | Table top equipment | | | | | |
| | <input type="checkbox"/> | Wall/Ceiling mounted equipment | | | | | |
| | <input type="checkbox"/> | Floor standing equipment | | | | | |

| | | | |
|---|---|--|--------------------------------|
| | <input type="checkbox"/> | Hand-held equipment | |
| | <input checked="" type="checkbox"/> | Other: Vehicular environment equipment | |
| Modules/parts.....: | Module/parts of test item | Type | Manufacturer |
| | Network Access Device (NAD), (cellular, GNSS) | Model: BL28NA-001 | Continental Automotive Systems |
| | ISM/RKE 434 MHz RF receiver module | Model: A2C38291300 | Continental Automotive GmbH |
| | | | |
| | | | |
| Accessories (not part of the test item) | Description | Type | Manufacturer |
| | bracket | | |
| | 1x harness w/o USB | | |
| | 3x harness w USB | | |
| | Inlay disc | | |
| | Design cap | | |
| | | | |
| Documents as provided by the applicant.....: | Description | File name | Issue date |
| | TCAM_Testhouse_Manual_29Oct2019_V1 | | |
| | | | |
| | | | |
| | | | |

⁽³⁾ Only for Medical Equipment

Identification of the client

Continental Automotive GmbH
 Siemensstrasse 12, 93055 Regensburg, Germany

Testing period and place

| | |
|---------------|--|
| Test Location | DEKRA Testing and Certification S.A.U. |
| Date (start) | 2019-11-18 |
| Date (finish) | 2020-02-10 |

Document history

| Report number | Date | Description |
|---------------|------------|---------------|
| 59830RRF.006 | 2020-04-16 | First release |

Environmental conditions

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

| | |
|-------------------|-------------------------------------|
| Temperature | Min. = 15 °C Max. = 35 °C |
| Relative humidity | Min. = 20 % Max. = 75 % |
| Air pressure | Min. = 860 mbar Max. = 1060 mbar |

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

| | |
|-------------------|-------------------------------------|
| Temperature | Min. = 15 °C Max. = 35 °C |
| Relative humidity | Min. = 20 % Max. = 75 % |
| Air pressure | Min. = 860 mbar Max. = 1060 mbar |

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

| | |
|-------------------|-------------------------------------|
| Temperature | Min. = 15 °C Max. = 35 °C |
| Relative humidity | Min. = 20 % Max. = 35 % |
| Air pressure | Min. = 860 mbar Max. = 1060 mbar |

Remarks and comments

The tests have been performed by the technical personnel: Pablo Redondo, Javier Miguel Nadales, Miguel Ángel Torres, José Manuel Jiménez, Cristina Calle, José Carlos Moreno, Verónica García.

Used instrumentation:

Radiated Measurements:

| | Last Calibration | Due Calibration |
|--|------------------|-----------------|
| 1. Semianechoic Absorber Lined Chamber ETS LINDGREN FACT 3 200 STP | N.A. | N.A. |
| 2. Shielded Room ETS LINDGREN S101 | N.A. | N.A. |
| 3. EMI Test Receiver 7 GHz ROHDE AND SCHWARZ ESR7 | 2018/10/23 | 2020/10/23 |
| 4. RF Pre-amplifier 40 dB, 10 MHz - 6 GHz BONN ELEKTRONIK BLNA 0160-01N | 2020/02/07 | 2021/02/07 |
| 5. Biconical/Log Antenna 30MHz - 6GHz ETS LINDGREN 3142E | 2017/09/27 | 2020/09/27 |
| 6. High Pass Filter 7-18 GHz, TEMSTRON /TEMWELL ST-7GA3619-HS | 2019/10/29 | 2020/10/29 |
| 7. RF Pre-amplifier G>30dB, 1-18GHz BONN ELEKTRONIK BLMA 0118-3A | 2019/11/22 | 2020/11/22 |
| 8. Signal and Spectrum Analyzer ROHDE AND SCHWARZ FSV40 | 2018/02/20 | 2020/02/20 |
| 9. Low Noise Amplifier G>30dB, 18 - 40 GHz BONN ELEKTRONIK BLMA 1840-1M | 2018/02/11 | 2020/02/11 |
| 10. Broadband Horn antenna 1-18 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9120 D | 2018/01/03 | 2021/01/03 |
| 11. Broadband Horn Antenna 18 - 40 GHz SCHWARZBECK MESS-ELEKTRONIK BBHA 9170 | 2018/07/19 | 2021/07/19 |
| 12. Pre-amplifier, G>55dB 1-18GHz NARDA AMF-7D-01001800-22-10P | 2019/02/21 | 2020/02/21 |
| 13. DC Power Supply, 30V/5A KEYSIGHT TECHNOLOGIES U8002A | N.A. | N.A. |
| 14. Digital multimeter FLUKE 179 | 2019/06/06 | 2020/06/06 |

Conducted Measurements

| | Last Calibration | Due Calibration |
|--|------------------|-----------------|
| 1. Signal and Spectrum Analyzer ROHDE AND SCHWARZ FSV40 | 2019/10/11 | 2021/10/11 |
| 2. Shielded Room ETS LINDGREN S101 | N.A. | N.A. |
| 3. DC Power Supply, 30V/5A KEYSIGHT TECHNOLOGIES U8002A | N.A. | N.A. |
| 4. Signal and Spectrum Analyzer 10 Hz - 40 GHz ROHDE AND SCHWARZ FSV40 | 2019/09/27 | 2021/09/27 |
| 5. Digital multimeter FLUKE 179 | 2019/06/06 | 2020/06/06 |

Testing verdicts

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

Summary

A. Common requirements for all bands

| FCC PART 15 PARAGRAPH / RSS-247 | | Verdict | Remark |
|---|--|---------|--------|
| Requirement – Test case | | | |
| FCC 15.35 (c) / RSS-Gen 8.2 | Duty Cycle | P | |
| RSS-Gen 6.7 / RSS-247 6.2 | 99% Occupied Bandwidth | P | |
| FCC 15.403 (i) | 26 dB Emission Bandwidth (EBW) | P | |
| FCC 15.407 (g) / RSS-Gen 6.11 | Frequency Stability (Temperature & Voltage Variation) | N/M | (1) |
| <u>Supplementary information and remarks:</u> | | | |
| (1) The manufacturer is responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user manual. | | | |

B. U-NII-1 Band: 5.15 - 5.25 GHz

| FCC PART 15 PARAGRAPH / RSS-247 | | Verdict | Remark |
|---|--|---------|--------|
| Requirement – Test case | | | |
| FCC 15.407 (a)(1)(iv) | Transmitter Maximum conducted Output Power | P | |
| RSS-247 6.2.1.1 | Transmitter Maximum Equivalent Isotropically Radiated Power EIRP | P | |
| FCC 15.407 (a)(1)(iv) | Transmitter Maximum Power Spectral Density | P | |
| RSS-247 6.2.1.1 | Transmitter EIRP Spectral Density | P | |
| FCC 15.407 (b)(1)(6) / RSS-247 6.2.1.2 | Transmitter Out of Band Radiated Emissions | P | |
| FCC 15.407 (b)(1) / RSS-247 6.2.1.2 | Transmitter Band Edge Radiated Emissions | P | |
| RSS-247 6.2.1.1 | Transmitter Power Control | P | |
| <u>Supplementary information and remarks:</u> | | | |
| None. | | | |

C. U-NII-3 Band: 5.725 - 5.85 GHz

| FCC PART 15 PARAGRAPH / RSS-247 | | Verdict | Remark |
|---|--|---------|--------|
| Requirement – Test case | | | |
| FCC 15.407 (a)(3) / RSS-247 6.2.4.1 | Transmitter Maximum conducted Output Power | P | |
| FCC 15.407 (e) / RSS-247 6.2.4.1 | 6 dB bandwidth. | P | |
| FCC 15.407 (a)(3) / RSS-247 6.2.4.1 | Transmitter Maximum Power Spectral Density | P | |
| FCC 15.407 (b)(4) / RSS-247 6.2.4.2 | Transmitter Band Edge Radiated Emissions | P | |
| FCC 15.407 (b)(4)(6) / RSS-247 6.2.4.2 | Transmitter Out of Band Radiated Emissions | P | |
| FCC 15.40 (h)(1) / RSS-247 6.2.4.1 | Transmitter Power Control | N/A | |
| <u>Supplementary information and remarks:</u> | | | |
| None | | | |

Appendix A: Test Common requirements for all bands

INDEX

| | |
|--|----|
| 15.35 (c) / RSS-Gen 8.2 Transmitter Duty Cycle | 14 |
| RSS-Gen 6.7 / RSS-247 6.2 Transmitter 99% Occupied Bandwidth | 15 |
| 15.403(i) Transmitter 26 dB Emission Bandwidth (EBW)..... | 17 |

15.35 (c) / RSS-Gen 8.2 Transmitter Duty Cycle

SPECIFICATION:

When the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

RESULTS:

The results below are for data rates with a duty cycle less than 98%. The results for all rest of modes having a value > 98%.

| Mode | Sub-band U-NII-1 | | | Sub-band U-NII-3 | | |
|------------|---------------------|-------------|----------------------------|---------------------|-------------|----------------------------|
| | Pulse Duration (ms) | Period (ms) | Duty Cycle Correction (dB) | Pulse Duration (ms) | Period (ms) | Duty Cycle Correction (dB) |
| 802.11a20 | 2.0558 | 2.2071 | 0.308 | 2.052507 | 2.159735 | 0.222 |
| 802.11n20 | 1.9219 | 2.042 | 0.263 | 1.913935 | 2.012668 | 0.218 |
| 802.11n40 | 0.94661 | 1.09175 | 0.620 | 0.932527 | 1.090476 | 0.680 |
| 802.11ac80 | 0.46246 | 0.62162 | 1.284 | 0.460572 | 0.632564 | 1.378 |



<< SEE GRAPHICS IN THE ATTACHED FILE 59830RRF006_Graphics_part0.7z >>

RSS-Gen 6.7 / RSS-247 6.2 Transmitter 99% Occupied Bandwidth

The client supplied U.FL RF cables with the EUT in order to perform conducted measurements. The measured additional path loss was included in any path loss calculations.

Measurements were performed on the SISO modes for testing

- 802.11a: 6 Mbit/s / SISO
- 802.11n HT20: MCS0 / SISO
- 802.11n HT40: MCS0 / SISO
- 802.11ac VHT80: MCS0x1 / SISO

Mode 802.11 a20:

U-NII-1 (5150-5250 MHz)

| Channels | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|-------------------------------|------------------------------|---------------------------------|-------------------------------|
| 99% Occupied Bandwidth (MHz) | 16.300 | 16.296 | 16.296 |
| Measurement uncertainty (kHz) | <±5.00 | | |

U-NII-3 (5725-5850 MHz)

| Channels | Low Channel 149 (5745 MHz) | Middle Channel 157 (5785 MHz) | High Channel 165 (5825 MHz) |
|-------------------------------|-------------------------------|----------------------------------|--------------------------------|
| 99% Occupied Bandwidth (MHz) | 16.3400 | 16.316 | 16.32 |
| Measurement uncertainty (kHz) | <±5.00 | | |

Mode 802.11 n20 (HT20):

U-NII-1 (5150-5250 MHz)

| Channels | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|-------------------------------|------------------------------|---------------------------------|-------------------------------|
| 99% Occupied Bandwidth (MHz) | 17.416 | 17.412 | 17.404 |
| Measurement uncertainty (kHz) | <±5.00 | | |

U-NII-3 (5725-5850 MHz)

| Channels | Low Channel 149 (5745 MHz) | Middle Channel 157 (5785 MHz) | High Channel 165 (5825 MHz) |
|-------------------------------|-------------------------------|----------------------------------|--------------------------------|
| 99% Occupied Bandwidth (MHz) | 17.424 | 17.412 | 17.42 |
| Measurement uncertainty (kHz) | <±5.00 | | |

Mode 802.11 n40 (HT40):

U-NII-1 (5150-5250 MHz)

| Channels | Low Channel 38 (5190 MHz) | High Channel 46 (5230 MHz) |
|-------------------------------|------------------------------|-------------------------------|
| 99% Occupied Bandwidth (MHz) | 36.136 | 36.144 |
| Measurement uncertainty (kHz) | <±14.00 | |

U-NII-3 (5725-5850 MHz)

| Channels | Low Channel 151 (5755 MHz) | High Channel 159 (5795 MHz) |
|-------------------------------|-------------------------------|--------------------------------|
| 99% Occupied Bandwidth (MHz) | 36.008 | 36 |
| Measurement uncertainty (kHz) | <±14.00 | |

Mode 802.11 ac80 (VHT80):

U-NII-1 (5150-5250 MHz)

| Channel | Single Channel 42 (5210 MHz) |
|-------------------------------|---------------------------------|
| 99% Occupied Bandwidth (MHz) | 74.88 |
| Measurement uncertainty (kHz) | <±18.00 |

U-NII-3 (5725-5850 MHz)

| Channels | Single Channel 155 (5775 MHz) |
|-------------------------------|----------------------------------|
| 99% Occupied Bandwidth (MHz) | 74.912 |
| Measurement uncertainty (kHz) | <±18.00 |

<< SEE GRAPHICS IN THE ATTACHED FILE 59830RRF006_Graphics_part0.7z >>

15.403(i) Transmitter 26 dB Emission Bandwidth (EBW)

SPECIFICATION:

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

RESULTS:

The 26 dB Emission Bandwidth was measured using the method according to point C) 1) of 789033 D02 General UNII Test Procedures New Rules v02r01.

Mode 802.11 a20:

U-NII-1 (5150-5250 MHz)

| Channels | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|--------------------------------|------------------------------|---------------------------------|-------------------------------|
| 26 dB Emission Bandwidth (MHz) | 19.592 | 19.881 | 19.652 |
| Measurement uncertainty (kHz) | <±5.00 | | |

U-NII-3 (5725-5850 MHz)

| Channels | Low Channel 149 (5745 MHz) | Middle Channel 157 (5785 MHz) | High Channel 165 (5825 MHz) |
|--------------------------------|-------------------------------|----------------------------------|--------------------------------|
| 26 dB Emission Bandwidth (MHz) | 20.326 | 20.0031 | 20.187 |
| Measurement uncertainty (kHz) | <±5.00 | | |

Mode 802.11 n20 (HT20):

U-NII-1 (5150-5250 MHz)

| Channels | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|--------------------------------|------------------------------|---------------------------------|-------------------------------|
| 26 dB Emission Bandwidth (MHz) | 20.620 | 20.977 | 20.916 |
| Measurement uncertainty (kHz) | <±5.00 | | |

U-NII-3 (5725-5850 MHz)

| Channels | Low Channel 149 (5745 MHz) | Middle Channel 157 (5785 MHz) | High Channel 165 (5825 MHz) |
|--------------------------------|-------------------------------|----------------------------------|--------------------------------|
| 26 dB Emission Bandwidth (MHz) | 21.303 | 20.704 | 20.955 |
| Measurement uncertainty (kHz) | <±5.00 | | |

Mode 802.11 n40 (HT40):

U-NII-1 (5150-5250 MHz)

| Channels | Low Channel 38 (5190 MHz) | High Channel 46 (5230 MHz) |
|--------------------------------|------------------------------|-------------------------------|
| 26 dB Emission Bandwidth (MHz) | 47.552 | 46.576 |
| Measurement uncertainty (kHz) | <±14.00 | |

U-NII-3 (5725-5850 MHz)

| Channels | Low Channel 151 (5755 MHz) | High Channel 159 (5795 MHz) |
|--------------------------------|-------------------------------|--------------------------------|
| 26 dB Emission Bandwidth (MHz) | 46.317 | 45.218 |
| Measurement uncertainty (kHz) | <±14.00 | |

Mode 802.11 ac80 (VHT80):

U-NII-1 (5150-5250 MHz)

| Channel | Single Channel 42 (5210 MHz) |
|--------------------------------|---------------------------------|
| 26 dB Emission Bandwidth (MHz) | 81.735 |
| Measurement uncertainty (kHz) | <±18.01 |

U-NII-3 (5725-5850 MHz)

| Channel | Single Channel 155 (5775 MHz) |
|--------------------------------|----------------------------------|
| 26 dB Emission Bandwidth (MHz) | 81.604 |
| Measurement uncertainty (kHz) | <±18.01 |

<< SEE GRAPHICS IN THE ATTACHED FILE 59830RRF006_Graphics_part0.7z >>

Appendix B: Tests results for the U-NII-1 Band 5.15 – 5.25 GHz

INDEX

| | |
|--|----|
| TEST CONDITIONS..... | 21 |
| FCC 15.407 (a)(1)(iv) Transmitter Maximum Conducted Output Power / RSS-247 6.2.1.1 Transmitter Maximum Equivalent Isotropically Radiated Power | 26 |
| RSS-247 6.2.2.1 Transmitter Power Control..... | 29 |
| FCC 15.407 (a)(1)(iv) Transmitter Maximum Power Spectral Density / RSS-247 6.2.1.1 Transmitter EIRP Spectral Density..... | 32 |
| FCC 15.407 (b)(1)(6) / RSS-247 6.2.1.2 Transmitter Out of Band Radiated Emissions | 35 |
| FCC 15.407 (b) (1) / RSS-247 6.2.1.2 Transmitter Band Edge Radiated Emissions | 39 |

TEST CONDITIONS

POWER SUPPLY (V):

V nominal: 12 Vdc.
 Type of Power Supply: External power supply (Car Battery).

ANTENNA:

Type of Antenna: Indoor the vehicle.
 Outdoor the vehicle.

Max. Declared Gain: Indoor: +3.6 dBi. (Antenna gain plus antenna cable loss).
 Outdoor: +2.3 dBi. (Antenna gain plus antenna cable loss).

TEST FREQUENCIES:

| | | |
|---------------------------|---|-------------------------|
| Technology Tested: | WLAN (IEEE 802.11 a,n,ac) / U-NII-1 | |
| Modes: | 802.11a20: 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 MCS9 | |
| | 802.11ac VHT40: MCS0 to MCS9 | |
| | 802.11ac VHT80: MCS0 to MCS9 | |
| Setting of cores / ports: | One core. | |
| Beamforming: | No. | |
| Frequency Range: | 5150 MHz to 5250 MHz | |
| Channel Spacing: | 20 MHz | |
| Transmit Channels | Channel | Channel Frequency (MHz) |
| | Lowest: 36 | 5180 |
| | Middle: 40 | 5200 |
| | Highest: 48 | 5240 |
| Channel Spacing: | 40 MHz | |
| Transmit Channels | Channel | Channel Frequency (MHz) |
| | Lowest: 38 | 5190 |
| | Highest: 46 | 5230 |
| Channel Spacing: | 80 MHz | |
| Transmit Channels | Middle: 42 | 5210 |

802.11 a: Adjustment of Maximum RF Output Power: +9 dBm
 802.11 n20/ac20: Adjustment of Maximum RF Output Power: +10 dBm
 802.11 n40/ac40: Adjustment of Maximum RF Output Power: +10 dBm
 802.11 ac80: Adjustment of Maximum RF Output Power: +9 dBm

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:

- 802.11a20: 6 Mbits
- 802.11n HT20: MCS0
- 802.11ac HT20: MCS0
- 802.11n HT40: MCS0
- 802.11ac HT40: MCS0
- 802.11ac VHT80: MCS0

The conducted test sample has only one connector. The client provided the antenna gains for both antennas (including the losses of lines and switches). The client considered the transmission lines and rf switches as part of the indoor and outdoor antenna.

The client supplied U.FL RF cables with the EUT in order to perform conducted measurements. The measured additional path loss was included in any path loss calculations.

CONDUCTED MEASUREMENTS

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



The DC supply voltage is applied using an external calibrated power supply with a multimeter.

RADIATED MEASUREMENTS

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at a distance of 1 m for the frequency range 1 GHz-40 GHz (1 GHz-18 GHz Double ridge horn antenna and 18 GHz-40 GHz horn antenna).

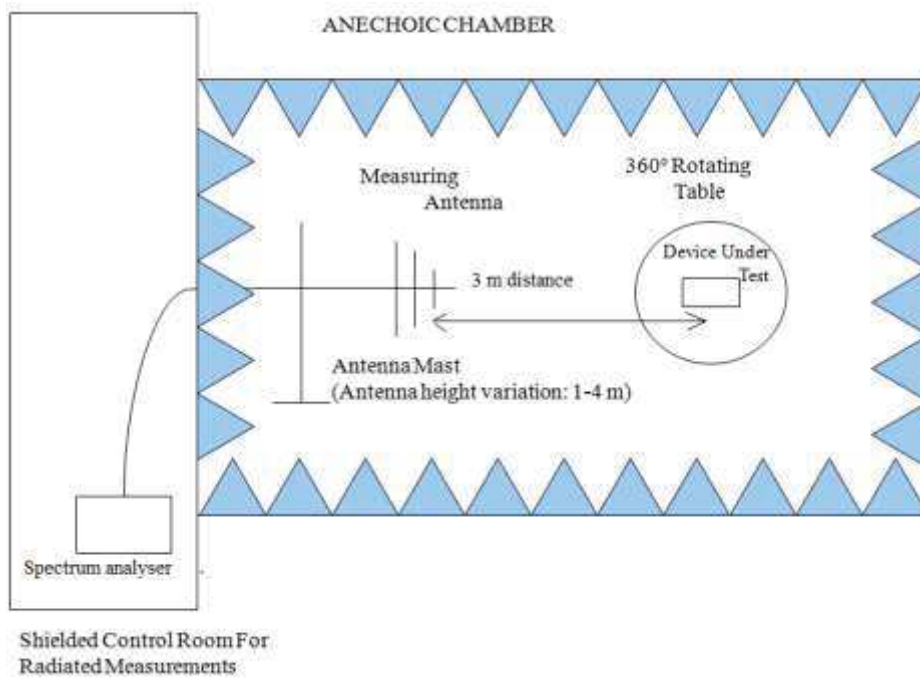
For radiated emissions in the range 1 GHz-40 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

The EUT was placed at a height of 80 cm above the reference ground plane in the center of the chamber turntable to perform the measurements below 1GHz and the EUT was placed at a height of 1.5 meters above the test chamber floor in the center of the chamber turntable to perform the measurements above 1GHz. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

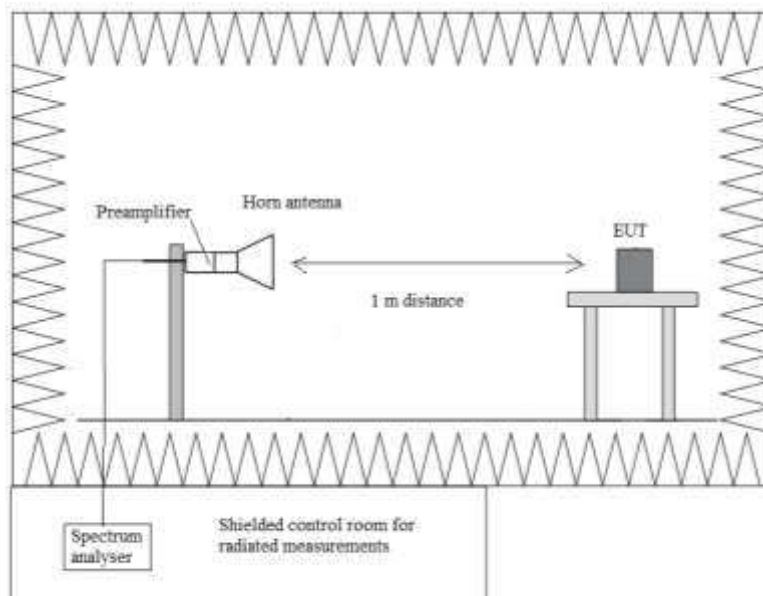
Measurements were made in both horizontal and vertical planes of polarization.

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

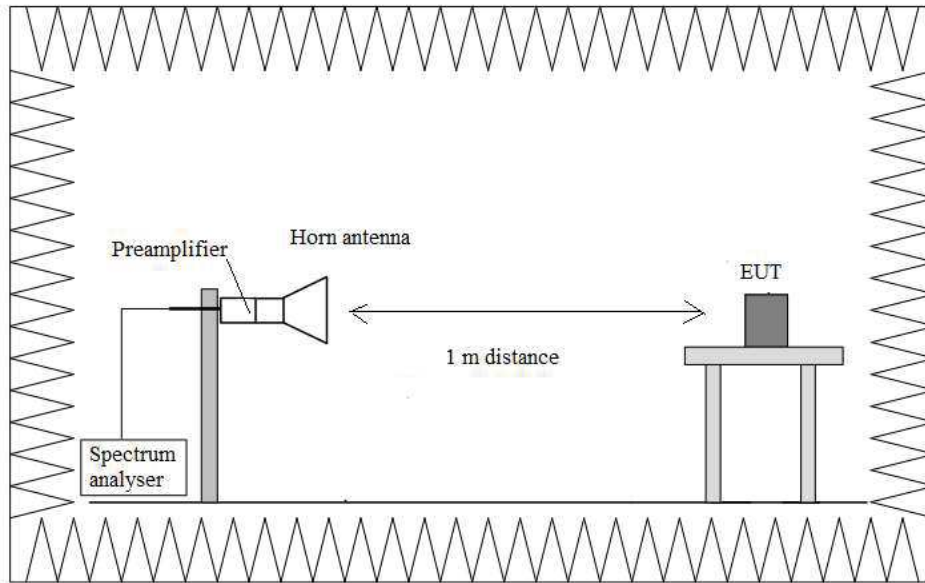
Radiated measurements setup $f < 1$ GHz.



Radiated measurements setup $f > 1$ GHz up to 18 GHz.



Radiated measurements setup $f > 18$ GHz up to 40 GHz.



FCC 15.407 (a)(1)(iv) Transmitter Maximum Conducted Output Power / RSS-247 6.2.1.1 Transmitter Maximum Equivalent Isotropically Radiated Power

SPECIFICATION:

FCC 15.407: For client devices in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24 dBm) provided the maximum antenna gain does not exceed 6 dBi. 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.

RSS-247: For OEM devices installed in vehicles, the maximum e.i.r.p shall not exceed 30mW or $1.76 + 10\log_{10}B$, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p of 30mW.

RESULTS:

The maximum conducted output power was measured using the channel power integration method according to point E) 2) b) (Method SA-1) of 789033 D02 General UNII Test Procedures New Rules v02r01 when the duty cycle is >98% and the channel power integration method according to point E) 2) d) (Method SA-2) of 789033 D02 General UNII Test Procedures New Rules v02r01 when the duty cycle is <98%.

For data rates where the EUT was transmitting at <98% duty cycle, the duty calculated in Appendix A was added to the measured power in order to calculate the total average power during the actual transmission time.

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

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

INDOOR ANTENNA: Maximum Declared Assembly Antenna Gain: +3.6 dBi (Antenna gain plus antenna cable loss).

Mode 802.11 a20

| | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|--------------------------------------|------------------------------|---------------------------------|-------------------------------|
| Max. Conducted Power (dBm) | 6.04 | 6.28 | 6.5 |
| Duty Cycle Correction Factor (dB) | 0.308 | | |
| Max. Conducted Power Corrected (dBm) | 6.348 | 6.588 | 6.808 |
| Max. EIRP power Corrected (dBm) | 9.948 | 10.188 | 10.408 |
| Measurement uncertainty (dB) | <±1.20 | | |

Mode 802.11 n20 (HT20)

| | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|--------------------------------------|------------------------------|---------------------------------|-------------------------------|
| Max. Conducted Power (dBm) | 7.08 | 7.02 | 7.24 |
| Duty Cycle Correction Factor (dB) | 0.263 | | |
| Max. Conducted Power Corrected (dBm) | 7.343 | 7.463 | 7.503 |
| Max. EIRP power Corrected (dBm) | 10.943 | 11.063 | 11.103 |
| Measurement uncertainty (dB) | <±1.20 | | |

Mode 802.11 n40 (HT40)

| | Low Channel 38 (5190 MHz) | High Channel 46 (5230 MHz) |
|--------------------------------------|------------------------------|-------------------------------|
| Max. Conducted Power (dBm) | 6.95 | 7.12 |
| Duty Cycle Correction Factor (dB) | 0.620 | |
| Max. Conducted Power Corrected (dBm) | 7.570 | 7.740 |
| Max. EIRP power Corrected (dBm) | 10.550 | 10.720 |
| Measurement uncertainty (dB) | <±1.20 | |

Mode 802.11 ac80 (VHT80)

| | Single Channel 42 (5210 MHz) |
|--------------------------------------|---------------------------------|
| Max. Conducted Power (dBm) | 5.12 |
| Duty Cycle Correction Factor (dB) | 1.2845 |
| Max. Conducted Power Corrected (dBm) | 6.405 |
| Max. EIRP power Corrected (dBm) | 10.005 |
| Measurement uncertainty (dB) | <±1.20 |

Verdict: PASS

<< SEE GRAPHICS IN THE ATTACHED FILE 59830RRF006_Graphics_part0.7z >>

OUTDOOR ANTENNA: Maximum Declared Assembly Antenna Gain: +2.3 dBi (Antenna gain plus antenna cable loss).

Mode 802.11 a20

| | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|--------------------------------------|------------------------------|---------------------------------|-------------------------------|
| Max. Conducted Power (dBm) | 6.04 | 6.28 | 6.5 |
| Duty Cycle Correction Factor (dB) | 0.308 | | |
| Max. Conducted Power Corrected (dBm) | 6.348 | 6.588 | 6.808 |
| Max. EIRP power Corrected (dBm) | 8.648 | 8.888 | 9.108 |
| Measurement uncertainty (dB) | <±1.20 | | |

Mode 802.11 n20 (HT20)

| | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|--------------------------------------|------------------------------|---------------------------------|-------------------------------|
| Max. Conducted Power (dBm) | 7.08 | 7.02 | 7.24 |
| Duty Cycle Correction Factor (dB) | 0.263 | | |
| Max. Conducted Power Corrected (dBm) | 7.343 | 7.283 | 7.503 |
| Max. EIRP power Corrected (dBm) | 9.643 | 9.583 | 9.803 |
| Measurement uncertainty (dB) | <±1.20 | | |

Mode 802.11 n40 (HT40)

| | Low Channel 38 (5190 MHz) | High Channel 46 (5230 MHz) |
|--------------------------------------|------------------------------|-------------------------------|
| Max. Conducted Power (dBm) | 6.95 | 7.12 |
| Duty Cycle Correction Factor (dB) | 0.620 | |
| Max. Conducted Power Corrected (dBm) | 7.570 | 7.740 |
| Max. EIRP power Corrected (dBm) | 9.870 | 10.040 |
| Measurement uncertainty (dB) | <±1.20 | |

Mode 802.11 ac80 (VHT80)

| | Single Channel 42 (5210 MHz) |
|--------------------------------------|---------------------------------|
| Max. Conducted Power (dBm) | 5.12 |
| Duty Cycle Correction Factor (dB) | 1.2845 |
| Max. Conducted Power Corrected (dBm) | 6.405 |
| Max. EIRP power Corrected (dBm) | 10.005 |
| Measurement uncertainty (dB) | <±1.20 |

Verdict: PASS

<< SEE GRAPHICS IN THE ATTACHED FILE 59830RRF006_Graphics_part0.7z >>

RSS-247 6.2.2.1 Transmitter Power Control

SPECIFICATION:

For OEM devices installed in vehicles, the maximum e.i.r.p shall not exceed 30mW or $1.76 + 10\log_{10}B$, dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p of 30mW.

RESULTS:

The maximum conducted output power was measured using the channel power integration method according to point E) 2) b) (Method SA-1) of 789033 D02 General UNII Test Procedures New Rules v02r01 when the duty cycle is >98% and the channel power integration method according to point E) 2) d) (Method SA-2) of 789033 D02 General UNII Test Procedures New Rules v02r01 when the duty cycle is <98%.

For data rates where the EUT was transmitting at <98% duty cycle, the duty calculated in Appendix A was added to the measured power in order to calculate the total average power during the actual transmission time.

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

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

INDOOR ANTENNA: Maximum Declared Assembly Antenna Gain: +3.6 dBi (Antenna gain plus antenna cable loss).

Mode 802.11 a20 (TPC activated)

| | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|--------------------------------------|------------------------------|---------------------------------|-------------------------------|
| Max. Conducted Power (dBm) | 3.6 | 3.45 | 3.88 |
| Duty Cycle Correction Factor (dB) | 0.308 | | |
| Max. Conducted Power Corrected (dBm) | 3.908 | 3.758 | 4.188 |
| Max. EIRP power Corrected (dBm) | 7.508 | 7.358 | 7.788 |
| Measurement uncertainty (dB) | <±1.20 | | |

Mode 802.11 n20 (HT20) (TPC activated)

| | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|--------------------------------------|------------------------------|---------------------------------|-------------------------------|
| Max. Conducted Power (dBm) | 4.5 | 4.15 | 4.78 |
| Duty Cycle Correction Factor (dB) | 0.263 | | |
| Max. Conducted Power Corrected (dBm) | 4.763 | 4.413 | 5.043 |
| Max. EIRP power Corrected (dBm) | 8.363 | 8.013 | 8.643 |
| Measurement uncertainty (dB) | <±1.20 | | |

Mode 802.11 n40 (HT40) (TPC activated)

| | Low Channel 38 (5190 MHz) | High Channel 46 (5230 MHz) |
|--------------------------------------|------------------------------|-------------------------------|
| Max. Conducted Power (dBm) | 4.84 | 5.03 |
| Duty Cycle Correction Factor (dB) | 0.620 | |
| Max. Conducted Power Corrected (dBm) | 5.460 | 5.650 |
| Max. EIRP power Corrected (dBm) | 9.060 | 9.250 |
| Measurement uncertainty (dB) | <±1.20 | |

Mode 802.11 ac80 (VHT80) (TPC activated)

| | Single Channel 42 (5210 MHz) |
|--------------------------------------|---------------------------------|
| Max. Conducted Power (dBm) | 2.96 |
| Duty Cycle Correction Factor (dB) | 1.2845 |
| Max. Conducted Power Corrected (dBm) | 4.245 |
| Max. EIRP power Corrected (dBm) | 7.845 |
| Measurement uncertainty (dB) | <±1.20 |

Verdict: PASS

<< SEE GRAPHICS IN THE ATTACHED FILE 59830RRF006_Graphics_part0.7z >>

OUTDOOR ANTENNA: Maximum Declared Assembly Antenna Gain: +2.3 dBi (Antenna gain plus antenna cable loss).

Mode 802.11 a20 (TPC activated)

| | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|--------------------------------------|------------------------------|---------------------------------|-------------------------------|
| Max. Conducted Power (dBm) | 3.6 | 3.45 | 3.88 |
| Duty Cycle Correction Factor (dB) | 0.308 | | |
| Max. Conducted Power Corrected (dBm) | 3.908 | 3.758 | 4.188 |
| Max. EIRP power Corrected (dBm) | 6.208 | 6.058 | 6.488 |
| Measurement uncertainty (dB) | <±1.20 | | |

Mode 802.11 n20 (HT20) (TPC activated)

| | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|--------------------------------------|------------------------------|---------------------------------|-------------------------------|
| Max. Conducted Power (dBm) | 4.5 | 4.15 | 4.78 |
| Duty Cycle Correction Factor (dB) | 0.263 | | |
| Max. Conducted Power Corrected (dBm) | 4.763 | 4.413 | 5.043 |
| Max. EIRP power Corrected (dBm) | 7.063 | 6.713 | 7.343 |
| Measurement uncertainty (dB) | <±1.20 | | |

Mode 802.11 n40 (HT40) (TPC activated)

| | Low Channel 38 (5190 MHz) | High Channel 46 (5230 MHz) |
|--------------------------------------|------------------------------|-------------------------------|
| Max. Conducted Power (dBm) | 4.84 | 5.03 |
| Duty Cycle Correction Factor (dB) | 0.620 | |
| Max. Conducted Power Corrected (dBm) | 5.460 | 5.650 |
| Max. EIRP power Corrected (dBm) | 7.76 | 7.95 |
| Measurement uncertainty (dB) | <±1.20 | |

Mode 802.11 ac80 (VHT80) (TPC activated)

| | Single Channel 42 (5210 MHz) |
|--------------------------------------|---------------------------------|
| Max. Conducted Power (dBm) | 2.96 |
| Duty Cycle Correction Factor (dB) | 1.2845 |
| Max. Conducted Power Corrected (dBm) | 4.245 |
| Max. EIRP power Corrected (dBm) | 6.545 |
| Measurement uncertainty (dB) | <±1.20 |

Verdict: PASS

<< SEE GRAPHICS IN THE ATTACHED FILE 59830RRF006_Graphics_part0.7z >>

FCC 15.407 (a)(1)(iv) Transmitter Maximum Power Spectral Density / RSS-247 6.2.1.1 Transmitter EIRP Spectral Density

SPECIFICATION:

FCC 15.407: The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz 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.

RSS-247: The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

RESULTS:

The maximum power spectral density (PSD) was measured using the method according to point F) referencing E.2.b) (Method SA-1) and E.2.b) (Method SA-2) of Guidance 789033 D02 General UNII Test Procedures New Rules v02r01.

The PSD test uses the same setup as the transmitter maximum conducted output power test. The result of the Peak PSD was measured by colocation a marker on the peak of the signal and the results are in the tables below.

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

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

INDOOR ANTENNA: Maximum Declared Assembly Antenna Gain: +3.6 dBi (Antenna gain plus antenna cable loss).

Mode 802.11 a20

| | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|--|------------------------------|---------------------------------|-------------------------------|
| Maximum Average PSD (dBm/MHz) | -4.15 | -4.10 | -3.69 |
| Duty Cycle Correction Factor (dB) | 0.308 | | |
| Maximum Average PSD Corrected (dBm/MHz) | -3.842 | -3.972 | -3.382 |
| Maximum EIRP PSD Corrected (dBm/MHz) | -0.242 | -0.192 | 0.218 |
| Measurement uncertainty (dB) | <±1.20 | | |

Mode 802.11 n20 (HT20)

| | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|--|------------------------------|---------------------------------|-------------------------------|
| Maximum Average PSD (dBm/MHz) | -3.23 | -3.54 | -3.24 |
| Duty Cycle Correction Factor (dB) | 0.263 | | |
| Maximum Average PSD Corrected (dBm/MHz) | -2.967 | -3.277 | -2.977 |
| Maximum EIRP PSD Corrected (dBm/MHz) | 0.633 | 0.323 | 0.623 |
| Measurement uncertainty (dB) | <±1.20 | | |

Mode 802.11 n40 (HT40)

| | Low Channel 38 (5190 MHz) | High Channel 46 (5230 MHz) |
|--|------------------------------|-------------------------------|
| Maximum Average PSD (dBm/MHz) | -6.93 | -6.59 |
| Duty Cycle Correction Factor (dB) | 0.620 | |
| Maximum Average PSD Corrected (dBm/MHz) | -6.310 | -5.970 |
| Maximum EIRP PSD Corrected (dBm/MHz) | -2.710 | -2.370 |
| Measurement uncertainty (dB) | <±1.20 | |

Mode 802.11 ac80 (VHT80)

| | Low Channel 42 (5210 MHz) |
|--|------------------------------|
| Maximum Average PSD (dBm/MHz) | -11.57 |
| Duty Cycle Correction Factor (dB) | 1.2845 |
| Maximum Average PSD Corrected (dBm/MHz) | -10.285 |
| Maximum EIRP PSD Corrected (dBm/MHz) | -6.685 |
| Measurement uncertainty (dB) | <±1.20 |

Verdict: PASS

<< SEE GRAPHICS IN THE ATTACHED FILE 59830RRF006_Graphics_part0.7z >>

INDOOR ANTENNA: Maximum Declared Assembly Antenna Gain: +3.6 dBi (Antenna gain plus antenna cable loss).

Mode 802.11 a20

| | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|--|------------------------------|---------------------------------|-------------------------------|
| Maximum Average PSD (dBm/MHz) | -4.15 | -4.10 | -3.69 |
| Duty Cycle Correction Factor (dB) | 0.308 | | |
| Maximum Average PSD Corrected (dBm/MHz) | -3.842 | -3.792 | -3.382 |
| Maximum EIRP PSD Corrected (dBm/MHz) | -1.542 | -1.492 | -1.082 |
| Measurement uncertainty (dB) | <±1.20 | | |

Mode 802.11 n20 (HT20)

| | Low Channel 36 (5180 MHz) | Middle Channel 40 (5200 MHz) | High Channel 48 (5240 MHz) |
|--|------------------------------|---------------------------------|-------------------------------|
| Maximum Average PSD (dBm/MHz) | -3.23 | -3.54 | -3.24 |
| Duty Cycle Correction Factor (dB) | 0.263 | | |
| Maximum Average PSD Corrected (dBm/MHz) | -2.967 | -3.277 | -2.977 |
| Maximum EIRP PSD Corrected (dBm/MHz) | -0.667 | -0.977 | -0.677 |
| Measurement uncertainty (dB) | <±1.20 | | |

Mode 802.11 n40 (HT40)

| | Low Channel 38 (5190 MHz) | High Channel 46 (5230 MHz) |
|--|------------------------------|-------------------------------|
| Maximum Average PSD (dBm/MHz) | -6.93 | -6.59 |
| Duty Cycle Correction Factor (dB) | 0.61952113 | |
| Maximum Average PSD Corrected (dBm/MHz) | -6.310 | -5.970 |
| Maximum EIRP PSD Corrected (dBm/MHz) | -4.010 | -3.670 |
| Measurement uncertainty (dB) | <±1.20 | |

Mode 802.11 ac80 (VHT80)

| | Low Channel 42 (5210 MHz) |
|--|------------------------------|
| Maximum Average PSD (dBm/MHz) | -11.57 |
| Duty Cycle Correction Factor (dB) | 1.2845 |
| Maximum Average PSD Corrected (dBm/MHz) | -10.285 |
| Maximum EIRP PSD Corrected (dBm/MHz) | -7.9855 |
| Measurement uncertainty (dB) | <±1.20 |

Verdict: PASS

<< SEE GRAPHICS IN THE ATTACHED FILE 59830RRF006_Graphics_part0.7z >>

FCC 15.407 (b)(1)(6) / RSS-247 6.2.1.2 Transmitter Out of Band Radiated Emissions

SPECIFICATION:

For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz (68.23 dBμV/m at 3 m distance).

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 corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

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 1m for the frequency range 1 GHz-40 GHz and a distance of 3m for frequency range 30MHz-1GHz.

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

Test performed on the following worst case:

- 802.11a20: 6 Mbits.

The worst case was determined by measuring the eirp density (radiated).

INDOOR ANTENNA: Maximum Declared Assembly Antenna Gain: +3.6 dBi (Antenna gain plus antenna cable loss).

Frequency range 30 MHz - 1 GHz

The spurious emissions below 1 GHz do not depend on either the operating channel or the modulation mode selected in the EUT.

Spurious frequencies detected at less than 20 dB below the limit:

| Spurious frequency (MHz) | Emission Level (dBµV/m) | Polarization | Detector | Measurement Uncertainty (dB) |
|--------------------------|-------------------------|--------------|------------|------------------------------|
| 52.262 | 26.8 | V | Quasi-Peak | <±3.81 |
| 90.512 | 24.5 | V | Quasi-Peak | <±3.81 |
| 336.084 | 26 | V | Quasi-Peak | <±3.81 |
| 55.689 | 20.3 | H | Quasi-Peak | <±3.81 |

Frequency range 1 - 40 GHz

The results in the next tables show the maximum measured levels in the 1-40 GHz frequency range.

- **Mode 802.11 a20** (worst case)

- LOW CHANNEL. Spurious frequencies detected at less than 20 dB below the limit:

| Spurious frequency (GHz) | Emission Level (dBµV/m) | Polarization | Detector | Measurement Uncertainty (dB) |
|--------------------------|-------------------------|--------------|----------|------------------------------|
| 10.3615 | 48.02 | H | Peak | <±4.72 |
| 20.72025 | 41.28 | V | Peak | <±4.72 |

- MIDDLE CHANNEL. Spurious frequencies detected at less than 20 dB below the limit:

| Spurious frequency (GHz) | Emission Level (dBµV/m) | Polarization | Detector | Measurement Uncertainty (dB) |
|--------------------------|-------------------------|--------------|----------|------------------------------|
| 10.39717 | 46.3 | H | Peak | <±4.72 |
| 20.79998 | 42.42 | V | Peak | <±4.72 |

- HIGH CHANNEL. Spurious frequencies detected at less than 20 dB below the limit:

| Spurious frequency (GHz) | Emission Level (dBµV/m) | Polarization | Detector | Measurement Uncertainty (dB) |
|--------------------------|-------------------------|--------------|----------|------------------------------|
| 10.48017 | 45.81 | H | Peak | <±4.72 |
| 20.96022 | 42.66 | V | Peak | <±4.72 |

Verdict: PASS

<< SEE GRAPHICS IN THE ATTACHED FILE 59830RRF006_Graphics_part0.7z >>

OUTDOOR ANTENNA: Maximum Declared Assembly Antenna Gain: +2.3 dBi (Antenna gain plus antenna cable loss).

Frequency range 30 MHz - 1 GHz

The spurious emissions below 1 GHz do not depend on either the operating channel or the modulation mode selected in the EUT.

Spurious frequencies detected at less than 20 dB below the limit:

| Spurious frequency (MHz) | Emission Level (dBµV/m) | Polarization | Detector | Measurement Uncertainty (dB) |
|--------------------------|-------------------------|--------------|------------|------------------------------|
| 51.777 | 27.3 | V | Quasi-Peak | <±3.81 |

Frequency range 1 - 40 GHz

The results in the next tables show the maximum measured levels in the 1-40 GHz frequency range.

- **Mode 802.11 a20** (worst case)

- LOW CHANNEL. Spurious frequencies detected at less than 20 dB below the limit:

| Spurious frequency (GHz) | Emission Level (dBµV/m) | Polarization | Detector | Measurement Uncertainty (dB) |
|--------------------------|-------------------------|--------------|----------|------------------------------|
| 10.35817 | 51.01 | V | Peak | <±4.72 |
| 20.72025 | 42.57 | V | Peak | <±4.72 |

- MIDDLE CHANNEL. Spurious frequencies detected at less than 20 dB below the limit:

| Spurious frequency (GHz) | Emission Level (dBµV/m) | Polarization | Detector | Measurement Uncertainty (dB) |
|--------------------------|-------------------------|--------------|----------|------------------------------|
| 10.40253 | 49.84 | H | Peak | <±4.72 |
| 20.79998 | 42.39 | V | Peak | <±4.72 |

- HIGH CHANNEL. Spurious frequencies detected at less than 20 dB below the limit:

| Spurious frequency (GHz) | Emission Level (dBµV/m) | Polarization | Detector | Measurement Uncertainty (dB) |
|--------------------------|-------------------------|--------------|----------|------------------------------|
| 10.4805 | 50.61 | H | Peak | <±2.78 |
| 20.96022 | 41.83 | V | Peak | <±4.72 |

Verdict: PASS

<< SEE GRAPHICS IN THE ATTACHED FILE 59830RRF006_Graphics_part0.7z >>

FCC 15.407 (b) (1) / RSS-247 6.2.1.2 Transmitter Band Edge Radiated Emissions

SPECIFICATION:

For transmitters operating in the 5.15–5.25 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz (68.23 dBµV/m at 3 m distance).

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 corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

RESULTS:

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

All emissions outside of the 5.15-5.35GHz band shall not exceed an EIRP of -27dBm/MHz. There are restricted bands of operation below band edge at 4.5-5.15 GHz also above the upper band edge at 5.35-5.46GHz therefore the provision of FCC Part 15.205 apply.

Field strength measurements using peak and average detector performed in the restricted bands below 5.15GHz and above 5.35 GHz.

Test performed on the following worst cases modes in all relevant tests channels:

- 802.11a: 6 Mbit/s.
- 802.11n HT20: MCS0.
- 802.11ac VHT20: MCS0.
- 802.11n HT40: MCS0.
- 802.11ac VHT40: MCS0.
- 802.11ac VHT80: MCS0.

INDOOR ANTENNA: Maximum Declared Assembly Antenna Gain: +3.6 dBi (Antenna gain plus antenna cable loss).

- **Mode 802.11 a20**

- Lower Band Edge Channel 36 (5180 MHz): Inside band spurious emissions in 4.50-5.15 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.14968 | H | 60.3 | - | 60.3 | Peak | <±2.78 |
| | | 45.09 | 0.308 | 45.40 | Average | <±2.78 |

- Upper Band Edge Channel 48 (5240 MHz): Inside band spurious emissions in 5.35-5.46 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.439815 | V | 57.69 | - | 57.69 | Peak | <±2.78 |
| | | 45.06 | 0.308 | 45.37 | Average | <±2.78 |

- **Mode 802.11 n20 (HT20)**

- Lower Band Edge Channel 36 (5180 MHz): Inside band spurious emissions in 4.50-5.15 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.14946 | H | 59.25 | - | 59.25 | Peak | <±2.78 |
| | | 45.15 | 0.263 | 45.41 | Average | <±2.78 |

- Upper Band Edge Channel 48 (5240 MHz): Inside band spurious emissions in 5.35-5.46 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.449642 | V | 57.29 | - | 57.29 | Peak | <±2.78 |
| | | 45.15 | 0.263 | 45.41 | Average | <±2.78 |
| 5.391085 | H | 57.61 | - | 57.61 | Peak | <±2.78 |
| | | 44.89 | 0.263 | 45.15 | Average | <±2.78 |

- **Mode 802.11 ac20 (HT20)**

- Lower Band Edge Channel 36 (5180 MHz): Inside band spurious emissions in 4.50-5.15 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.14686 | V | 58.47 | - | 58.47 | Peak | <±2.78 |
| | | 45.08 | 0.263 | 45.34 | Average | <±2.78 |

- Upper Band Edge Channel 48 (5240 MHz): Inside band spurious emissions in 5.35-5.46 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.447882 | H | 57.64 | - | 57.64 | Peak | <±2.78 |
| | | 45.16 | 0.263 | 45.42 | Average | <±2.78 |

- **Mode 802.11 n40 (HT40)**

- Lower Band Edge Channel 38 (5190 MHz): Inside band spurious emissions in 4.50-5.15 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.14708 | V | 58.68 | - | 58.68 | Peak | <±2.78 |
| | | 45.24 | 0.620 | 45.86 | Average | <±2.78 |

- Upper Band Edge Channel 46 (5230 MHz): Inside band spurious emissions in 5.35-5.46 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.449935 | V | 58.18 | - | 58.18 | Peak | <±2.78 |
| | | 45.17 | 0.620 | 45.79 | Average | <±2.78 |

• **Mode 802.11 ac40 (VHT40)**

- Lower Band Edge Channel 38 (5190 MHz): Inside band spurious emissions in 4.50-5.15 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.14924 | V | 59.78 | - | 59.78 | Peak | <±2.78 |
| | | 45.25 | 0.620 | 45.87 | Average | <±2.78 |

- Upper Band Edge Channel 46 (5230 MHz): Inside band spurious emissions in 5.35-5.46 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.456462 | V | 57.48 | - | 57.48 | Peak | <±2.78 |
| | | 45.04 | 0.620 | 45.66 | Average | <±2.78 |

• **Mode 802.11 ac80 (VHT80)**

- Middle Channel 42 (5210 MHz): Inside band spurious emissions in 4.50-5.15 GHz and 5.35-5.46 GHz adjacent bands.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.12281 | H | 57.13 | - | 57.13 | Peak | <±2.78 |
| | | 45.3 | 1.2845 | 46.59 | Average | <±2.78 |
| 5.439082 | V | 57.48 | - | 57.48 | Peak | <±2.78 |
| | | 44.99 | 1.2845 | 46.28 | Average | <±2.78 |

Verdict: PASS

<< SEE GRAPHICS IN THE ATTACHED FILE 59830RRF006_Graphics_part0.7z >>

OUTDOOR ANTENNA: Maximum Declared Assembly Antenna Gain: +2.3 dBi (Antenna gain plus antenna cable loss).

• **Mode 802.11 a20**

- Lower Band Edge Channel 36 (5180 MHz): Inside band spurious emissions in 4.50-5.15 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.14404 | V | 58.77 | - | 58.77 | Peak | <±2.78 |
| | | 49.22 | 0.308 | 49.53 | Average | <±2.78 |
| 5.09031 | H | 56.68 | - | 56.68 | Peak | <±2.78 |
| | | 48.61 | 0.308 | 48.92 | Average | <±2.78 |

- Upper Band Edge Channel 48 (5240 MHz): Inside band spurious emissions in 5.35-5.46 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.430355 | H | 57.95 | - | 57.95 | Peak | <±2.78 |
| | | 49.73 | 0.308 | 50.04 | Average | <±2.78 |

• **Mode 802.11 n20 (HT20)**

- Lower Band Edge Channel 36 (5180 MHz): Inside band spurious emissions in 4.50-5.15 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.14751 | V | 59.91 | - | 59.91 | Peak | <±2.78 |
| | | 49.26 | 0.263 | 49.52 | Average | <±2.78 |

- Upper Band Edge Channel 48 (5240 MHz): Inside band spurious emissions in 5.35-5.46 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.459652 | V | 57.22 | - | 57.22 | Peak | <±2.78 |
| | | 49.5 | 0.263 | 49.76 | Average | <±2.78 |
| 5.407072 | H | 57.67 | - | 57.67 | Peak | <±2.78 |
| | | 49.67 | 0.263 | 49.93 | Average | <±2.78 |

• **Mode 802.11 ac20 (HT20)**

- Lower Band Edge Channel 36 (5180 MHz): Inside band spurious emissions in 4.50-5.15 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.14859 | V | 60.23 | - | 60.23 | Peak | <±2.78 |
| | | 48.77 | 0.263 | 49.03 | Average | <±2.78 |
| 5.04134 | H | 56.66 | - | 56.66 | Peak | <±2.78 |
| | | 48.78 | 0.263 | 49.04 | Average | <±2.78 |

- Upper Band Edge Channel 48 (5240 MHz): Inside band spurious emissions in 5.35-5.46 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.371615 | V | 57.67 | - | 57.67 | Peak | <±2.78 |
| | | 49.32 | 0.263 | 49.58 | Average | <±2.78 |
| 5.351925 | H | 57.83 | - | 57.83 | Peak | <±2.78 |
| | | 49.22 | 0.263 | 49.48 | Average | <±2.78 |

• **Mode 802.11 n40 (HT40)**

- Lower Band Edge Channel 38 (5190 MHz): Inside band spurious emissions in 4.50-5.15 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.14881 | V | 62.05 | - | 62.05 | Peak | <±2.78 |
| | | 50.81 | 0.620 | 51.43 | Average | <±2.78 |

- Upper Band Edge Channel 46 (5230 MHz): Inside band spurious emissions in 5.35-5.46 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.386172 | V | 57.61 | - | 57.61 | Peak | <±2.78 |
| | | 49.6 | 0.620 | 50.42 | Average | <±2.78 |
| 5.441318 | H | 57.29 | - | 57.29 | Peak | <±2.78 |
| | | 49.52 | 0.620 | 50.14 | Average | <±2.78 |

• **Mode 802.11 ac40 (VHT40)**

- Lower Band Edge Channel 38 (5190 MHz): Inside band spurious emissions in 4.50-5.15 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.14838 | V | 60.41 | - | 60.41 | Peak | <±2.78 |
| | | 48.86 | 0.620 | 49.44 | Average | <±2.78 |
| 5.05044 | H | 57.09 | - | 57.09 | Peak | <±2.78 |
| | | 48.74 | 0.620 | 49.36 | Average | <±2.78 |

- Upper Band Edge Channel 46 (5230 MHz): Inside band spurious emissions in 5.35-5.46 GHz adjacent band.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.376602 | V | 57.86 | - | 57.86 | Peak | <±2.78 |
| | | 49.32 | 0.620 | 49.94 | Average | <±2.78 |
| 5.440218 | H | 57.46 | - | 57.46 | Peak | <±2.78 |
| | | 49.5 | 0.620 | 50.12 | Average | <±2.78 |

• **Mode 802.11 ac80 (VHT80)**

- Middle Channel 42 (5210 MHz): Inside band spurious emissions in 4.50-5.15 GHz and 5.35-5.46 GHz adjacent bands.

| Spurious frequency (GHz) | Polarization | Emission Level (dBµV/m) | Duty cycle Correction | Corrected Emission Level (dBµV/m) | Detector | Measurement Uncertainty (dB) |
|--------------------------|--------------|-------------------------|-----------------------|-----------------------------------|----------|------------------------------|
| 5.13798 | V | 57.3 | - | 57.3 | Peak | <±2.78 |
| | | 49.22 | 1.2845 | 50.51 | Average | <±2.78 |
| 5.14426 | H | 56.78 | - | 56.78 | Peak | <±2.78 |
| | | 48.62 | 1.2845 | 49.91 | Average | <±2.78 |
| 5.399592 | V | 57.66 | - | 57.66 | Peak | <±2.78 |
| | | 49.45 | 1.2845 | 50.74 | Average | <±2.78 |
| 5.448505 | H | 57.46 | - | 57.46 | Peak | <±2.78 |
| | | 49.55 | 1.2845 | 50.84 | Average | <±2.78 |

Verdict: PASS

<< SEE GRAPHICS IN THE ATTACHED FILE 59830RRF006_Graphics_part0.7z >>