

427 West 12800 South Draper, UT 84020

Test Report Certification

| FCC ID | SWX-U7PROO |
|---------------------------|--------------------------------|
| ISED ID | 6545A-U7PROO |
| Equipment Under Test | U7-Pro-Outdoor |
| Test Report Serial Number | TR9533_02 |
| Date of Tests | 2-8 October; 1-4 November 2024 |
| Report Issue Date | 20 November 2024 |

| Test Specification | Applicant |
|-------------------------------|--------------------|
| 47 CFR FCC Part 15, Subpart E | Ubiquiti Inc. |
| | 685 Third Avenue |
| | New York, NY 10017 |
| | U.S.A. |

R Jac-M TESTING

NVLAP LAB CODE 600241-0



Certification of Engineering Report

This report has been prepared by Unified Compliance Laboratory (UCL) to document compliance of the device described below with the requirement of Federal Communication Commissions (FCC) Part 15, Subpart E. This report may be reproduced in full. Partial reproduction of this report may only be made with the written consent of the laboratory. The results in this report apply only to the sample tested with the specifications provided by the manufacturer.

| Applicant | Ubiquiti Inc. |
|--------------|----------------|
| Manufacturer | Ubiquiti Inc. |
| Brand Name | UBIQUITI |
| Model Number | U7-Pro-Outdoor |
| FCC ID | SWX-U7PROO |
| ISED ID | 6545A-U7PROO |

On this 20th day of November 2024, I individually and for Unified Compliance Laboratory certify that the statements made in this engineering report are true, complete and correct to the best of my knowledge and are made in good faith.

Although NVLAP has accredited the Unified Compliance Laboratory testing facilities, this report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. federal government.

Unified Compliance Laboratory

Written By: Kimberly DeBole

shard L.

Reviewed By: Richard L. Winter



| Revision History | | |
|------------------|--|------------------|
| Revision | Description | Date |
| 01 | Original Report Release | 20 November 2024 |
| 02 | Removed Section 5.5.1 Amended Sections 2.2, 3.3.1, 5.1, 5.3, 5.4, 5.6 | 14 February 2025 |



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1 Client Information

1.1 Applicant

| Company | Ubiquiti Inc. 685 Third Avenue New York, NY 10017 U.S.A. |
|--------------|---|
| Contact Name | Alex Macon |
| Title | Compliance |

1.2 Manufacturer

| Company | Ubiquiti Inc. 685 Third Avenue New York, NY 10017 U.S.A. |
|--------------|---|
| Contact Name | Alex Macon |
| Title | Compliance |



2 Equipment Under Test (EUT)

2.1 Identification of EUT

| Brand Name | UBIQUITI |
|-----------------|---------------------|
| Model Number | U7-Pro-Outdoor |
| Serial Number | 942A6F407A26 |
| Dimensions (cm) | 17.0 x 20.8 x 12.18 |

2.2 Description of EUT

The U7-Pro-Outdoor is a WiFi7 access point with 2.4 GHz, 5GHz and 6GHz 2x2 radios. It has external SMA antenna connectors supporting 2.4/5GHz and internal antennas supporting 2.4/5/6GHz. The U7-Pro-Outdoor has an aggregate throughput rate of 9.3 Gbps and is powered by a 2.5Gbe PoE 802.3at through a single RJ45 port.

For CDD transmissions, directional gain is calculated as follows.

Array Gain = 10 log(NANT/NSS) dB NANT = number of transmit antennas and NSS = number of spatial streams. NSS = 1 considered worst case.

For power measurements on IEEE 802.11 devices, Array Gain = 0 dB for NANT \leq 4; Internal Antenna: For PSD measurements when Nss=1: Array Gain = 10 log(NANT/NSS) dB + Antenna Gain (dBi). Or 3.01 dB + 11 dBi = 14.01 dBi. External Antenna:

For PSD measurements when Nss=1: Array Gain = $10 \log(\text{NANT/NSS}) dB$ + Antenna Gain (dBi). Or 3.01 dB + 7 dBi = 10.01 dBi.

| Band | WiFi Mode | Modulation Bandwidth | Modulation Type | Frequency (MHz) |
|---------|--------------|-------------------------|--------------------|------------------|
| | а | 20 MHz | OFDM | 5745, 5775, 5825 |
| LINIL 2 | ax | 20 MHz | HE | 5745, 5775, 5825 |
| UNII-5 | ax | 40 MHz | HE | 5755, 5775, 5795 |
| | ax | 80 MHz | HE | 5775 |

The table below show the channels used within the different modulation bandwidths.

This report covers the circuitry of the device subject to FCC Part 15, Subpart E. The circuitry of the device subject to FCC Part 15 Subpart B was found to be compliant and is covered under a separate Unified Compliance Laboratory test report.

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2.3 EUT and Support Equipment

The EUT and support equipment used during the test are listed below.

| Brand Name Model Number Serial Number | Description | Name of Interface Ports / Interface Cables |
|--|--------------------------|---|
| BN: UBIQUITI MN: U7-Pro-Wall (Note 1) SN: 05BF1C | WiFi Access Point | See Section 2.4 |
| BN: UBIQUITI MN: U-POE-at SN: N/A | PoE Power Adapter | Unshielded Cat 5e cable/1 meters |
| BN: Dell MN: XPS 13 SN: N/A | Laptop Personal Computer | Unshielded Cat 5e cable/1 meters |

Notes: (1) EUT

(2) Interface port connected to EUT (See Section 2.4)

The support equipment listed above was not modified in order to achieve compliance with this standard.

2.4 Interface Ports on EUT

| Name of Ports | No. of Ports Fitted to EUT | Cable Description/Length |
|--------------------|----------------------------|-------------------------------------|
| AC Mains | 1 | 3 conductor power cord/80 cm |
| POE (POE Injector) | 1 | Unshielded Cat 5e cable/8 meters |
| LAN (POE Injector) | 1 | Unshielded Cat 5e cable/1 meters |

2.5 **Operating Environment**

| Power Supply | 120 Volts AC Mains to 48 Volts PoE |
|---------------------|------------------------------------|
| AC Mains Frequency | 60 Hz |
| Temperature | 21 - 26 °C |
| Humidity | 17 - 29 % |
| Barometric Pressure | 1013 mBar |

2.6 Operating Modes

The U7-Pro-Outdoor was tested using test software in order to enable a constant transmission. The measurements within this report are corrected to reference a 100% duty cycle. All emission modes of 802.11 a/ax were investigated. All measurements are reported with the worst-case mode (802.11ax) unless otherwise stated.

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2.7 EUT Exercise Software

EUT firmware version 1.0 was used to operate the transmitter using a constant transmit mode.

2.8 Block Diagram of Test Configuration



Diagram 1: Test Configuration Block Diagram

2.9 Modification Incorporated/Special Accessories on EUT

There were no modifications made to the EUT during testing to comply with the specification.

2.10 Deviation, Opinions Additional Information or Interpretations from Test Standard

There were no deviations, opinions, additional information or interpretations from the test specification.

3 Test Specification, Method and Procedures

3.1 Test Specification

| Title | 47 CFR FCC Part 15, Subpart E, Section 15.407 Limits and methods of measurement of radio interference characteristics of Unlicensed National Information Infrastructure Devices |
|-----------------|---|
| Purpose of Test | The tests were performed to demonstrate initial compliance |

3.2 Methods & Procedures

3.2.1 47 CFR FCC Part 15 Section 15.407

See test standard for details.

3.3 FCC Part 15, Subpart E

3.3.1 Summary of Tests

| FCC Section | ISED Section | Environmental Phenomena | Frequency Range (MHZ) | Result |
|-------------------|---------------------------|---|---------------------------|--------------------------|
| 15.203 | N/A | Antenna requirements | Structural Requirement | Compliant |
| 15.207 | RSS-Gen | Conducted Disturbance at Mains Port | 0.15 to 30 | Compliant |
| 15.407(a) | RSS-247 §6.2.2 | Bandwidth Requirement | 5725 to 5825 | Compliant |
| 15.407(a) | RSS-247 §6.2.2, §6.2.3 | Peak Output Power | 5725 to 5825 | Compliant |
| 15.407(b) | RSS-247 §6.2.2, §6.2.3 | Antenna Conducted Spurious Emissions | 0.009 to 40000 | N/A Note ¹ |
| 15.209 | RSS-247 §6.2.2, §6.2.3 | Radiated Spurious Emissions | 0.009 to 40000 | Compliant |
| 15.407(a) | RSS-247 §6.2.2, §6.2.3 | Peak Power Spectral Density | 5725 to 5825 | Compliant |
| The testing was p | erformed according to the | procedures in ANSI C63.10-20 | 013, KDB 78903 | 3 and 47 |

CFR Part 15. Where applicable, KDB 662911 was followed to sum required measurements. Note ¹: Radiated Spurious was performed per 15.209 with the antenna unterminated.

3.4 Results

In the configuration tested, the EUT complied with the requirements of the specification.

3.5 Test Location

Testing was performed at the Unified Compliance Laboratory 3-meter and 10-meter chamber located at 427 West 12800 South, Draper, UT 84020. Unified Compliance Laboratory is accredited by National Voluntary Laboratory Accreditation Program (NVLAP); NVLAP Code 600241-0 which is effective until



30 June 2025. This site has also been registered with Innovations, Science and Economic Development (ISED) department as was accepted under Appendix B, Phase 1 procedures of the APEC Tel MRA for Canadian recognition. ISED No.: 25346, effective until 30 June 2025.

Unified Compliance Laboratory has been assigned Designation Number US5037 by the FCC and Conformity Assessment Number US0223 by ISED.



4 Test Equipment

| Type of Equipment | Manufacturer | Model Number | Asset Number | Date of Last Calibration | Due Date of Calibration |
|----------------------|------------------------|-----------------|-----------------|-----------------------------|----------------------------|
| EMI Receiver | AFJ | FFT3010 | UCL-6754 | 1/23/2024 | 2/26/2025 |
| LISN | AFJ | LS16C/10 | UCL-2512 | 7/08/2024 | 7/08/2025 |
| ISN | Teseq | ISN T800 | UCL-2974 | 7/09/2024 | 7/09/2025 |
| LISN | AFJ | LS16C\10 | UCL-6749 | 1/29/2024 | 1/29/2025 |
| AC Power Source | Laplace Instruments | AC1000A | UCL-2857 | N/A | N/A |
| Test Software | AFJ | AFJ FFT3010 | UCL-3107 | N/A | N/A |

4.1 Conducted Emissions at Mains Ports

Table 1: List of equipment used for Conducted Emissions Testing at Mains Port



Figure 1: Conducted Emissions Test

4.2 Direct Connect at the Antenna Port Tests

| Type of Equipment | Manufacturer | Model Number | Asset Number | Date of Last Calibration | Due Date of Calibration |
|----------------------------|--------------|-----------------|-----------------|-----------------------------|----------------------------|
| Spectrum Analyzer | R&S | FSV40 | UCL-2861 | 11/27/2023 | 11/27/2024 |
| Signal Generator | R&S | SMB100A | UCL-2864 | N/A | N/A |
| Vector Signal Generator | R&S | SMBV100A | UCL-2873 | N/A | N/A |
| Switch Extension | R&S | OSP- B157WX | UCL-2867 | 4/12/2024 | 4/19/2025 |
| Switch Extension | R&S | OSP-150W | UCL-2870 | 4/12/2024 | 4/19/2025 |
| Test Software | R&S | EMC32 | UCL-9442 | - | - |

Table 2: List of equipment used for Direct Connect at the Antenna Port





Spectrum Analyzer

Figure 2: Direct Connect at the Antenna Port Test

| Equipment |
|------------|
| Under Test |
| |

Figure 3: Output Power Measurement Radiated Emissions

| Type of Equipment | Manufacturer | Model Number | Asset Number | Date of Last Calibration | Due Date of Calibration |
|--------------------------------|-----------------------|-----------------|----------------------------|-----------------------------|----------------------------|
| EMI Receiver | Keysight | N9038A | UCL-2778 | 1/25/2024 | 1/29/2025 |
| Pre-Amplifier 9 kHz – 1 GHz | Sonoma Instruments | 310N | UCL-2889 | 1/19/2024 | 1/19/2026 |
| Broadband Antenna | Broadband Scwarzbeck | | UCL-3062 | 2/22/2023 | 2/22/2025 |
| Broadband Antenna | Broadband Scwarzbeck | | UCL-3071 | 1/11/2023 | 1/11/2025 |
| Double Ridge Horn Antenna | Scwarzbeck | BBHA 9120D | UCL-3065 | 3/10/2023 | 3/10/2025 |
| Log Periodic | Scwarzbeck | STLP 9129 | UCL-3068 | 1/27/2023 | 1/27/2025 |
| 15 - 40 GHz Horn Antenna | Scwarzbeck | BBHA 9170 | UCL-2487 | 3/10/2023 | 3/10/2025 |
| 1 – 18 GHz Amplifier | Com-Power | PAM 118A | UCL-3833 | 1/19/2024 | 1/19/2026 |
| Test Software | Nexio | BatEMC | UCL-5253 & UCL- 5249 | N/A | N/A |

Table 3: List of equipment used for Radiated Emissions





Figure 4: Radiated Emissions Test

4.3 Equipment Calibration

All applicable equipment is calibrated using either an independent calibration laboratory or Unified Compliance Laboratory personnel at intervals defined in ANSI C63.4:2014 following outlined calibration procedures. All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Supporting documentation relative to traceability is on file and is available for examination upon request.

4.4 Measurement Uncertainty

| Test | Uncertainty (<u>+</u> dB) | Confidence (%) |
|---------------------------------------|----------------------------|----------------|
| Conducted Emissions | 1.44 | 95 |
| Radiated Emissions (9 kHz to 30 MHz) | 2.50 | 95 |
| Radiated Emissions (30 MHz to 1 GHz) | 4.38 | 95 |
| Radiated Emissions (1 GHz to 18 GHz) | 4.37 | 95 |
| Radiated Emissions (18 GHz to 40 GHz) | 3.93 | 95 |
| Direct Connect Tests | K Factor | Value |
| Emissions Bandwidth | 2 | 2.0% |
| Output Power | 2 | 1.0 dB |
| Peak Power Spectral Density | 2 | 1.3 dB |
| Band Edge | 2 | 0.8 dB |
| Transmitter Spurious Emissions | 2 | 1.8 dB |



5 Test Results

5.1 §15.203 Antenna Requirements

The EUT uses an internal and an external antenna. Per the manufacturer, the maximum gain of the internal antenna per chain is 11 dBi and the maximum gain for the external antenna is 7 dBi. This is an 802.11 device and utilizes CDD as described in KDB 662911 D01. The internal antenna is not user replaceable; the external antenna is independent and removable.

Results

The EUT complied with the specification.



5.2 Conducted Emissions at Mains Ports Data

5.2.1 Line



| ID | Frequency | Probe | Cable | Atten. | Detector | Meter Read | Meas Level | Limit 1 | Limit 1 Dist. | Limit 2 | Limit 2 Dist. | P/F |
|----|------------|-------|-------|--------|----------|---------------|---------------|---------|------------------|---------|------------------|-----|
| MU | MHz | dB | dB | dB | Type | dBµV | dBµV | dBµV | dB | dBµV | dB | P/F |
| 1 | 534,000kHz | 9.49 | | | QPeak | 38.71 | 48.20 | 56.00 | -7.80 | | | |
| 5 | 498,000kHz | 9.49 | | | QPeak | 34.90 | 44.39 | 56.03 | -11.64 | | | |
| 3 | 750,000kHz | 9.51 | | | QPeak | 32.59 | 42.10 | 56.00 | -13.90 | | | |
| 2 | 537,000kHz | 9.49 | Ĩ | | C_AVG | 31.89 | 41.38 | | | 46.00 | -4.62 | |
| 4 | 747,000kHz | 9.51 | | | C_AVG | 31.66 | 41.17 | | | 46.00 | -4.83 | |
| 6 | 498,000kHz | 9.49 | | | C_AVG | 30.59 | 40.08 | | | 46.03 | -5.96 | |



5.2.2 Neutral



| 1110 | | 00 | | 1,100 | oppr | aspr | och . | | uch . | | 1.00 |
|------|------------|------|------|-------|-------|-------|-------|--------|-------|-------|-----------|
| 1 | 531,000kHz | 9.62 | | QPeak | 38.97 | 48.59 | 56.00 | -7.41 | | | |
| 5 | 498,000kHz | 9.64 | | QPeak | 34.93 | 44.57 | 56.03 | -11.46 | | | |
| 3 | 750,000kHz | 9.52 | | QPeak | 32.25 | 41.77 | 56.00 | -14.23 | | | \square |
| 2 | 534,000kHz | 9.62 | | C_AVG | 32.45 | 42.07 | | | 46.00 | -3.93 | |
| 4 | 747,000kHz | 9.52 | | C_AVG | 31.36 | 40.88 | | | 46.00 | -5.12 | \square |
| 6 | 498,000kHz | 9.64 | | C_AVG | 30.75 | 40.39 | | | 46.03 | -5.64 | |

Result

The EUT complied with the specification limit.

5.3 §15.407(a) 26 dB Emissions Bandwidth

All chains were measured under the guidance of KDB 789033 Section II.C. and KDB 662911 D01. Please see associated annex for details on instrument settings.

5.3.1 Internal Antenna

| Nominal BW (MHz) | Frequency (MHz) | 99% Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|------------------|--------------------|---------------------|--------------------------|
| 20 | 5745 | 17.25 | 24.20 |
| 20 | 5775 | 17.50 | 30.00 |
| 20 | 5825 | 19.00 | 31.40 |
| 20 | 5745 | 19.25 | 23.10 |
| 20 | 5775 | 19.25 | 28.00 |
| 20 | 5825 | 19.10 | 38.50 |
| 40 | 5755 | 19.50 | 38.50 |
| 40 | 5775 | 38.50 | 43.22 |
| 40 | 5795 | 38.50 | 57.19 |
| 80 | 5775 | 39.00 | 51.00 |

5.3.2 External Antenna

| Nominal BW (MHz) | Frequency (MHz) | 99% Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|------------------|--------------------|---------------------|--------------------------|
| 20 | 5745 | 28.75 | 41.00 |
| 20 | 5775 | 28.00 | 43.20 |
| 20 | 5825 | 30.25 | 48.30 |
| 20 | 5745 | 29.70 | 49.50 |
| 20 | 5775 | 32.08 | 57.20 |
| 20 | 5825 | 30.89 | 45.80 |
| 40 | 5755 | 39.00 | 47.40 |
| 40 | 5775 | 40.00 | 87.60 |
| 40 | 5795 | 48.50 | 87.90 |
| 80 | 5775 | 79.00 | 88.00 |

Result

All chains were tested and the highest bandwidth per chain is reported above. Please see Annex for all bandwidth measurements.

5.4 §15.407(a) Maximum Average Output Power

All chains were measured and summed under the guidance of KDB 789033 Section II. E.2. and KDB 662911 D01. Please see associated annex for details on instrument settings.

See Section 2.2 of this report for the directional gain calculation.

The maximum average RF conducted output power measured for this device was 26.90 dBm or 489.78 mW. The limit is 30 dBm, or 1 Watt when using antennas with 6 dBi or less gain. The maximum internal antenna has a gain of 11 dBi and a maximum gain of 7 dBi for the external antenna.

| Modulation (BW) | Frequency (MHz) | Data Rate | TP Setting | Conducted Output Power * | Measured EIRP | Measured PSD |
|--------------------|--------------------|--------------|---------------|-----------------------------|------------------|-----------------|
| OFDM 20 | 5745 | Mcs0 | 23 | 24.35 | 35.35 | 9.29 |
| OFDM 20 | 5775 | Mcs0 | 23 | 24.41 | 35.41 | 9.12 |
| OFDM 20 | 5825 | Mcs0 | 24 | 24.13 | 35.13 | 9.11 |
| HE 20 | 5745 | Mcs0 | 23 | 24.07 | 35.07 | 8.46 |
| HE 20 | 5775 | Mcs0 | 23 | 24.26 | 35.26 | 8.40 |
| HE 20 | 5825 | Mcs0 | 23 | 23.95 | 34.95 | 8.53 |
| HE 40 | 5755 | Mcs0 | 23 | 24.07 | 35.07 | 5.58 |
| HE 40 | 5775 | Mcs0 | 23 | 24.40 | 35.40 | 5.85 |
| HE 40 | 5795 | Mcs0 | 23 | 24.44 | 35.44 | 5.97 |
| HE 80 | 5775 | Mcs0 | 20 | 21.21 | 32.21 | -0.35 |

5.4.1 Internal Antenna

5.4.2 External Antenna

| Modulation (BW) | Frequency (MHz) | Data Rate | TP Setting | Conducted Output Power * | Measured EIRP | Measured PSD |
|--------------------|--------------------|--------------|---------------|-----------------------------|------------------|-----------------|
| OFDM 20 | 5745 | Mcs0 | 31 | 26.67 | 34.67 | 11.88 |
| OFDM 20 | 5775 | Mcs0 | 31 | 26.90 | 34.90 | 10.78 |
| OFDM 20 | 5825 | Mcs0 | 31 | 25.64 | 33.64 | 10.46 |
| HE 20 | 5745 | Mcs0 | 31 | 26.85 | 34.85 | 11.49 |
| HE 20 | 5775 | Mcs0 | 31 | 26.86 | 34.86 | 11.49 |
| HE 20 | 5825 | Mcs0 | 31 | 25.70 | 33.70 | 9.99 |
| HE 40 | 5755 | Mcs0 | 24 | 24.73 | 32.73 | 6.59 |
| HE 40 | 5775 | Mcs0 | 25 | 25.33 | 33.33 | 6.52 |
| HE 40 | 5795 | Mcs0 | 26 | 25.17 | 33.17 | 6.32 |
| HE 80 | 5775 | Mcs0 | 22 | 22.42 | 30.42 | 1.17 |

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Result

In the configuration tested, the maximum summed average RF output power was less than 1 watt; therefore, the EUT complied with the requirements of the specification (see spectrum analyzer plots in attached Annex).

* Gated EIRP shown in the Annex is the conducted measurement.



5.5 §15.209 Spurious Emissions

5.5.1 Radiated Spurious Emissions in the Restricted Bands of § 15.205

The EUT uses various power settings based on the channel in use. In order to reduce test time, the radiated spurious emissions at the lowest, middle, and highest channel were measured at the maximum power of TP31.

Correction Factor = Antenna Factor (dBi) + Cable Loss (dB) - Pre-Amplifier Gain (dB), and is added to the Receiver reading.

Result

All emissions in the restricted bands of § 15.205 met the limits specified in § 15.209; therefore, the EUT complies with the specification. See Annex for Conducted Band edge plots.



Internal Antenna

| Frequency | SR # | Level (dBµV/m) | Limit (dBµV/m) | Margin | Azimuth (°) | Height | Pol. | RBW (Hz) | Correction (dB) |
|----------------|------|-------------------|-------------------|--------|----------------|--------|------------|-------------|--------------------|
| 30.547212 MHz | QP | 26.111 | 30 | -3.889 | 117 | 3.74 | Vertical | 120 kHz | -3.932 |
| 39.82208 MHz | QP | 29.987 | 30 | -0.013 | 58 | 1.08 | Vertical | 120 kHz | -10.068 |
| 58.07336 MHz | QP | 20.844 | 30 | -9.156 | 40 | 2.69 | Vertical | 120 kHz | -16.592 |
| 206.390644 MHz | QP | 24.724 | 30 | -5.276 | 239 | 1 | Vertical | 120 kHz | -12.769 |
| 30.223088 MHz | QP | 25.276 | 30 | -4.724 | 243 | 3.1 | Horizontal | 120 kHz | -3.678 |

Table 4: Radiated Emissions within 30MHz-1GHz





| Frequency | SR # | Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Azimuth (°) | Height (m) | Pol. | Meas. Time (s) | Correction (dB) |
|----------------|------|-------------------|-------------------|----------------|----------------|---------------|------------|----------------------|--------------------|
| 11.4886928 GHz | Peak | 61.521 | 74 | -12.479 | 287 | 1.5 | Vertical | 5 | 11.238 |
| 11.4982911 GHz | Peak | 57.22 | 74 | -16.78 | 280 | 2.287 | Vertical | 5 | 11.322 |
| 14.5935437 GHz | Peak | 57.856 | 74 | -16.144 | 284 | 2.292 | Vertical | 5 | 14.703 |
| 14.6941799 GHz | Peak | 57.712 | 74 | -16.288 | 19 | 2.867 | Vertical | 5 | 15.039 |
| 11.4886928 GHz | Avg | 48.948 | 54 | -5.052 | 287 | 1.5 | Vertical | 5 | 11.238 |
| 11.4982911 GHz | Avg | 43.594 | 54 | -10.406 | 280 | 2.287 | Vertical | 5 | 11.322 |
| 14.5935437 GHz | Avg | 45.139 | 54 | -8.861 | 284 | 2.292 | Vertical | 5 | 14.703 |
| 14.6941799 GHz | Avg | 45.049 | 54 | -8.951 | 19 | 2.867 | Vertical | 5 | 15.039 |
| 11.4877057 GHz | Peak | 58.128 | 74 | -15.872 | 330 | 2.605 | Horizontal | 5 | 11.229 |
| 11.4962968 GHz | Peak | 59.861 | 74 | -14.139 | 309 | 2.867 | Horizontal | 5 | 11.305 |
| 13.8591646 GHz | Peak | 57.916 | 74 | -16.084 | 2 | 1.5 | Horizontal | 5 | 13.903 |
| 14.905945 GHz | Peak | 57.823 | 74 | -16.177 | 76 | 2.292 | Horizontal | 5 | 14.393 |
| 11.4877057 GHz | Avg | 44.976 | 54 | -9.024 | 330 | 2.605 | Horizontal | 5 | 11.229 |
| 11.4962968 GHz | Avg | 45.391 | 54 | -8.609 | 309 | 2.867 | Horizontal | 5 | 11.305 |
| 13.8591646 GHz | Avg | 44.18 | 54 | -9.82 | 2 | 1.5 | Horizontal | 5 | 13.903 |
| 14.905945 GHz | Avg | 44.397 | 54 | -9.603 | 76 | 2.292 | Horizontal | 5 | 14.393 |

 Table 5: Radiated Emissions within 1-17GHz





| Frequency | SR # | Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Azimuth (°) | Pol. | Meas. Time (s) | Correction (dB) |
|----------------|------|-------------------|-------------------|----------------|-------------|------------|-------------------|--------------------|
| 17.2339472 GHz | Peak | 59.115 | 74 | -14.885 | 345 | Vertical | 5 | -0.178 |
| 22.9794446 GHz | Peak | 57.022 | 74 | -16.978 | 79 | Vertical | 5 | 1.103 |
| 34.9603677 GHz | Peak | 56.909 | 74 | -17.091 | 1 | Vertical | 5 | 6.352 |
| 17.2339472 GHz | Avg | 45.462 | 54 | -8.538 | 345 | Vertical | 5 | -0.178 |
| 22.9794446 GHz | Avg | 43.012 | 54 | -10.988 | 79 | Vertical | 5 | 1.103 |
| 34.9603677 GHz | Avg | 43.869 | 54 | -10.131 | 1 | Vertical | 5 | 6.352 |
| 17.240154 GHz | Peak | 56.295 | 74 | -17.705 | 15 | Horizontal | 5 | -0.169 |
| 22.9759366 GHz | Peak | 55.544 | 74 | -18.456 | 29 | Horizontal | 5 | 1.089 |
| 35.0493778 GHz | Peak | 57.018 | 74 | -16.982 | 180 | Horizontal | 5 | 6.128 |
| 17.240154 GHz | Avg | 43.394 | 54 | -10.606 | 15 | Horizontal | 5 | -0.169 |
| 22.9759366 GHz | Avg | 42.155 | 54 | -11.845 | 29 | Horizontal | 5 | 1.089 |
| 35.0493778 GHz | Avg | 43.574 | 54 | -10.426 | 180 | Horizontal | 5 | 6.128 |

Table 6: Radiated Emissions within 17-40GHz



External Antenna



| Frequency | SR # | Level (dBµV/m) | Limit (dBµV/m) | Margin | Azimuth (°) | Height | Pol. | RBW (Hz) | Correction (dB) |
|----------------|------|-------------------|-------------------|--------|----------------|--------|------------|-------------|--------------------|
| 30.547212 MHz | 1 | 26.111 | 30 | -3.889 | 117 | 3.74 | Vertical | 120 kHz | -3.932 |
| 39.82208 MHz | 1 | 29.987 | 30 | -0.013 | 58 | 1.08 | Vertical | 120 kHz | -10.068 |
| 58.07336 MHz | 1 | 20.844 | 30 | -9.156 | 40 | 2.69 | Vertical | 120 kHz | -16.592 |
| 206.390644 MHz | 1 | 24.724 | 30 | -5.276 | 239 | 1 | Vertical | 120 kHz | -12.769 |
| 30.223088 MHz | 2 | 25.276 | 30 | -4.724 | 243 | 3.1 | Horizontal | 120 kHz | -3.678 |

Table 7: Radiated Emissions within 30MHz-1GHz





| Frequency | SR # | Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Azimuth (°) | Height (m) | Pol. | Meas. Time (s) | Correction (dB) |
|----------------|------|-------------------|-------------------|----------------|----------------|---------------|------------|----------------------|--------------------|
| 10.9986154 GHz | Peak | 59.779 | 74 | -14.221 | 352 | 1.714 | Vertical | 5 | 11.377 |
| 11.0022003 GHz | Peak | 56.862 | 74 | -17.138 | 222 | 2.292 | Vertical | 5 | 11.333 |
| 14.2285726 GHz | Peak | 57.674 | 74 | -16.326 | 59 | 3.444 | Vertical | 5 | 14.299 |
| 14.382348 GHz | Peak | 56.889 | 74 | -17.111 | 239 | 3.728 | Vertical | 5 | 14.161 |
| 10.9986154 GHz | Avg | 45.409 | 54 | -8.591 | 352 | 1.714 | Vertical | 5 | 11.377 |
| 11.0022003 GHz | Avg | 43.338 | 54 | -10.662 | 222 | 2.292 | Vertical | 5 | 11.333 |
| 14.2285726 GHz | Avg | 44.319 | 54 | -9.681 | 59 | 3.444 | Vertical | 5 | 14.299 |
| 14.382348 GHz | Avg | 44.124 | 54 | -9.876 | 239 | 3.728 | Vertical | 5 | 14.161 |
| 10.9925714 GHz | Peak | 63.319 | 74 | -10.681 | 339 | 1.5 | Horizontal | 5 | 11.445 |
| 10.994681 GHz | Peak | 62.671 | 74 | -11.329 | 306 | 2.292 | Horizontal | 5 | 11.421 |
| 16.4869368 GHz | Peak | 56.603 | 74 | -17.397 | 273 | 2.867 | Horizontal | 5 | 13.22 |
| 16.5040138 GHz | Peak | 58.571 | 74 | -15.429 | 266 | 1.5 | Horizontal | 5 | 13.406 |
| 10.9925714 GHz | Avg | 49.885 | 54 | -4.115 | 339 | 1.5 | Horizontal | 5 | 11.445 |
| 10.994681 GHz | Avg | 49.053 | 54 | -4.947 | 306 | 2.292 | Horizontal | 5 | 11.421 |
| 16.4869368 GHz | Avg | 43.077 | 54 | -10.923 | 273 | 2.867 | Horizontal | 5 | 13.22 |
| 16.5040138 GHz | Avg | 43.913 | 54 | -10.087 | 266 | 1.5 | Horizontal | 5 | 13.406 |

Table 8: Radiated Emissions within 1-17GHz



| Frequency | SR # | Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Azimuth (°) | Pol. | Correction (dB) |
|----------------|------|----------------|----------------|-------------|-------------|------------|-----------------|
| 17.2319533 GHz | Peak | 56.758 | 74 | -17.242 | 83 | Vertical | -0.18 |
| 33.4870288 GHz | Peak | 55.888 | 74 | -18.112 | 145 | Vertical | 4.677 |
| 34.8524274 GHz | Peak | 56.102 | 74 | -17.898 | 279 | Vertical | 5.723 |
| 17.2319533 GHz | Avg | 44.286 | 0 | 0 | 83 | Vertical | -0.18 |
| 33.4870288 GHz | Avg | 42.09 | 0 | 0 | 145 | Vertical | 4.677 |
| 34.8524274 GHz | Avg | 43.147 | 0 | 0 | 279 | Vertical | 5.723 |
| 22.9798323 GHz | Peak | 57.665 | 74 | -16.335 | 54 | Horizontal | 1.104 |
| 22.9798323 GHz | Avg | 44.214 | 0 | 0 | 54 | Horizontal | 1.104 |

Table 9: Radiated Emissions within 17-40GHz

5.6 §15.407(a) Maximum Power Spectral Density

All chains were measured and summed under the guidance of KDB 789033 Section II. F. and KDB 662911 D01. Please see associated annex for details on instrument settings.

The maximum average power spectral density conducted from the intentional radiator of the antenna shall not be greater than 30 dBm in any 500 kHz band during any time interval of continuous transmission.

See Section 2.2 of this report for the directional gain calculation.

Results of this testing are summarized.

5.6.1 Internal Antenna

| Modulation (BW) | Frequency (MHz) | Data Rate | TP Setting | Conducted Output Power | Measured EIRP | Measured PSD |
|--------------------|--------------------|--------------|---------------|------------------------------|------------------|-----------------|
| OFDM 20 | 5745 | Mcs0 | 23 | 24.35 | 35.35 | 9.29 |
| OFDM 20 | 5775 | Mcs0 | 23 | 24.41 | 35.41 | 9.12 |
| OFDM 20 | 5825 | Mcs0 | 24 | 24.13 | 35.13 | 9.11 |
| HE 20 | 5745 | Mcs0 | 23 | 24.07 | 35.07 | 8.46 |
| HE 20 | 5775 | Mcs0 | 23 | 24.26 | 35.26 | 8.40 |
| HE 20 | 5825 | Mcs0 | 23 | 23.95 | 34.95 | 8.53 |
| HE 40 | 5755 | Mcs0 | 23 | 24.07 | 35.07 | 5.58 |
| HE 40 | 5775 | Mcs0 | 23 | 24.40 | 35.40 | 5.85 |
| HE 40 | 5795 | Mcs0 | 23 | 24.44 | 35.44 | 5.97 |
| HE 80 | 5775 | Mcs0 | 20 | 21.21 | 32.21 | -0.35 |



5.6.2 External Antenna

| Modulation (BW) | Frequency (MHz) | Data Rate | TP Setting | Conducted Output Power | Measured EIRP | Measured PSD |
|--------------------|--------------------|--------------|---------------|------------------------------|------------------|-----------------|
| OFDM 20 | 5745 | Mcs0 | 31 | 26.67 | 34.67 | 11.88 |
| OFDM 20 | 5775 | Mcs0 | 31 | 26.90 | 34.90 | 10.78 |
| OFDM 20 | 5825 | Mcs0 | 31 | 25.64 | 33.64 | 10.46 |
| HE 20 | 5745 | Mcs0 | 31 | 26.85 | 34.85 | 11.49 |
| HE 20 | 5775 | Mcs0 | 31 | 26.86 | 34.86 | 11.49 |
| HE 20 | 5825 | Mcs0 | 31 | 25.70 | 33.70 | 9.99 |
| HE 40 | 5755 | Mcs0 | 24 | 24.73 | 32.73 | 6.59 |
| HE 40 | 5775 | Mcs0 | 25 | 25.33 | 33.33 | 6.52 |
| HE 40 | 5795 | Mcs0 | 26 | 25.17 | 33.17 | 6.32 |
| HE 80 | 5775 | Mcs0 | 22 | 22.42 | 30.42 | 1.17 |

Result

The maximum summed average power spectral density was less than the limit of 30 dBm; therefore, the EUT complies with the specification.



427 West 12800 South, Draper, UT 84020

-- End of Test Report --