



427 West 12800 South  
Draper, UT 84020

## Test Report Certification

<b>FCC ID</b>	SWX-LTUXR
<b>ISED ID</b>	6545A-LTUXR
<b>Equipment Under Test</b>	LTU-XR
<b>Test Report Serial Number</b>	TR6817_02
<b>Date of Tests</b>	10-11 June; 9 July; 11, 16-17 November 2021 and 5 January 2022
<b>Report Issue Date</b>	18 January 2022

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



NVLAP LAB CODE 600241-0

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## 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.

<b>Applicant</b>	Ubiquiti Inc.
<b>Manufacturer</b>	Ubiquiti Inc.
<b>Brand Name</b>	LTU
<b>Model Number</b>	LTU-XR
<b>FCC ID</b>	SWX-LTUXR
<b>ISED ID</b>	6545A-LTUXR

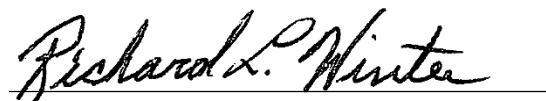
On this 18th day of January 2022, I individually and for Unified Compliance Laboratory certify that the statements made in this engineering report are true, complete, and correct to the best of my knowledge and are made in good faith.

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 Rodriguez



Reviewed By: Richard L. Winter

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<b>Revision History</b>		
<b>Revision</b>	<b>Description</b>	<b>Date</b>
01	Original Report Release	18 January 2022
02	Corrected ISED ID and Amended Frequency Table in Section 2.2	1 February 2022

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# 1 Client Information

## 1.1 Applicant

<b>Company</b>	Ubiquiti Inc. 685 Third Avenue New York, NY 10017 U.S.A.
<b>Contact Name</b>	Mark Feil
<b>Title</b>	Compliance Manager

## 1.2 Manufacturer

<b>Company</b>	Ubiquiti Inc. 685 Third Avenue New York, NY 10017 U.S.A.
<b>Contact Name</b>	Mark Feil
<b>Title</b>	Compliance Manager

## 2 Equipment Under Test (EUT)

### 2.1 Identification of EUT

<b>Brand Name</b>	LTU
<b>Model Number</b>	LTU-XR
<b>Serial Number</b>	68D79A1FC26
<b>Dimensions (cm)</b>	74.7 x 52.5 x 34.7

### 2.2 Description of EUT

The LTU-XR is a high-performance point-to-multi-point transceiver operating in the 5 GHz WiFi band. The LTU-XR is designed to provide 550 Mbps wireless throughput and allows independent transmit and receive channel configurations to avoid local interference. The LTU-XR has an integrated Bluetooth transceiver for system management control. The LTU-XR is powered from a Model POE-24-12W-G-WH PoE Power adapter.

Band	Modulation Bandwidth	Frequency (MHz)
UNII-2A	10 MHz	5255, 5260, 5300, 5320
	20 MHz	5260, 5300, 5335
	30 MHz	5270, 5300, 5330
	40 MHz	5270, 5300, 5325
	50 MHz	5275, 5300, 5320
UNII-2C	10 MHz	5480, 5500, 5520, 5540, 5560, 5580, 5600*, 5620*, 5640*, 5660, 5680, 5700, 5710
	20 MHz	5485, 5500, 5520, 5540, 5560, 5580, 5600*, 5620*, 5640*, 5660, 5680, 5700, 5710
	30 MHz	5490, 5500, 5520, 5540, 5560, 5580, 5600*, 5620*, 5640*, 5660, 5680, 5705
	40 MHz	5495, 5500, 5520, 5540, 5560, 5580, 5600*, 5620*, 5640*, 5660, 5680, 5700
	50 MHz	5500, 5520, 5540, 5560, 5580, 5600*, 5620*, 5640*, 5660, 5690
* Frequency not applicable in Canada		

**Table 1: UNII-2A and UNII-2C Channel Settings**

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.

### 2.3 EUT and Support Equipment

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

<b>Brand Name Model Number Serial Number</b>	<b>Description</b>	<b>Name of Interface Ports / Interface Cables</b>
BN: LTU MN: LTU-XR (Note 1) SN: 68D79A1F2C26	Wireless Transceiver	See Section 2.4
BN: Ubiquiti MN: POE-24-12W-G-WH (Note 1) SN: N/A	PoE Power Adapter	Shielded or Un-Shielded Cat 5e cable (Note 2)
BN: Dell MN: XPS 13 SN: N/A	Laptop Computer	Shielded or Un-Shielded Cat 5e cable (Note 2)

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

<b>Name of Ports</b>	<b>No. of Ports Fitted to EUT</b>	<b>Cable Description/Length</b>
AC Mains	1	3 Conductor power cord/80cm
PoE	1	Shielded or UN-Shielded Cat 5e Cable/>3 meters
Data	1	Shielded or UN-Shielded Cat 5e Cable/>3 meters

## 2.5 Operating Environment

<b>Power Supply</b>	120 VAC to 24 Volt PoE Power
<b>AC Mains Frequency</b>	60 Hz
<b>Temperature</b>	21.4-24.8 °C
<b>Humidity</b>	22.7-53.6 %
<b>Barometric Pressure</b>	1012.5 mBar

## 2.6 Operating Modes

The LTU-XR was tested using test software to enable to constant transmission. The measurements within this report are corrected to reference a 98% duty cycle. All emission modes of 10/20/30/40/50 MHz were investigated.

## 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

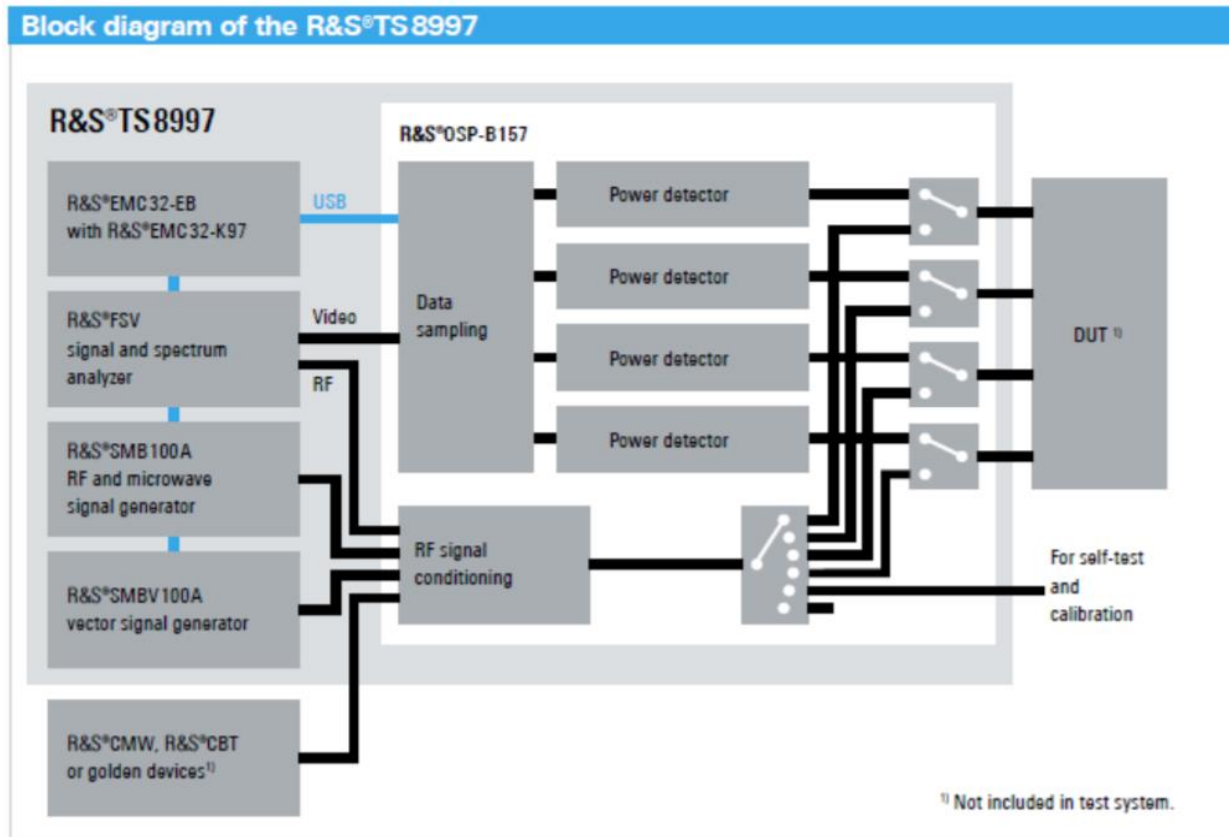


Diagram 1: Test Configuration Block Diagram

## 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

<b>Title</b>	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
<b>Purpose of Test</b>	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
15.407(a)	N/A	Antenna requirements	Structural Requirement	Compliant
15.407(b)	RSS-Gen	Conducted Disturbance at Mains Port	0.15 to 30	Compliant
15.407(a)	RSS-247 §6.2.2, §6.2.3	Bandwidth Requirement	5260 to 5245	Compliant
15.407(a)	RSS-247 §6.2.2, §6.2.3	Peak Output Power	5260 to 5245	Compliant
15.407(b)	RSS-247 §6.2.2, §6.2.3	Antenna Conducted Spurious Emissions	0.009 to 40000	Compliant
15.407(b)	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	5260 to 5245	Compliant
15.407(h)	RSS-247 §6.3	DFS Requirements	5260 to 5245	Compliant

The testing was performed according to the procedures in ANSI C63.10-2013, KDB 558074 and 47 CFR Part 15. Where applicable, KDB 662911 was followed to sum required measurements.

### 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 2022. 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 2022. Unified Compliance Laboratory has been assigned Conformity Assessment Number US0223 by ISED.

## 4 Test Equipment

### 4.1 Conducted Emissions at Mains Ports

Type of Equipment	Manufacturer	Model Number	Asset Number	Date of Last Calibration	Due Date of Calibration
EMI Receiver	AFJ	FFT3010	UCL-2500	9/18/2020	3/17/2022
LISN	AFJ	LS16C/10	UCL-2512	5/26/2020	5/26/2022
Cat6 ISN	Teseq	ISN T8-Cat6	UCL-2971	5/18/2020	5/18/2022
ISN	Teseq	ISN T800	UCL-2974	6/4/2021	6/4/2022
LISN	Com-Power	LIN-120C	UCL-2612	5/19/2021	5/19/2022
AC Power Source	Laplace Instruments	AC1000A	UCL-2857	N/A	N/A
Test Software	UCL	Revision 1	UCL-3107	N/A	N/A

Table 2: List of equipment used for Conducted Emissions Testing at Mains Port

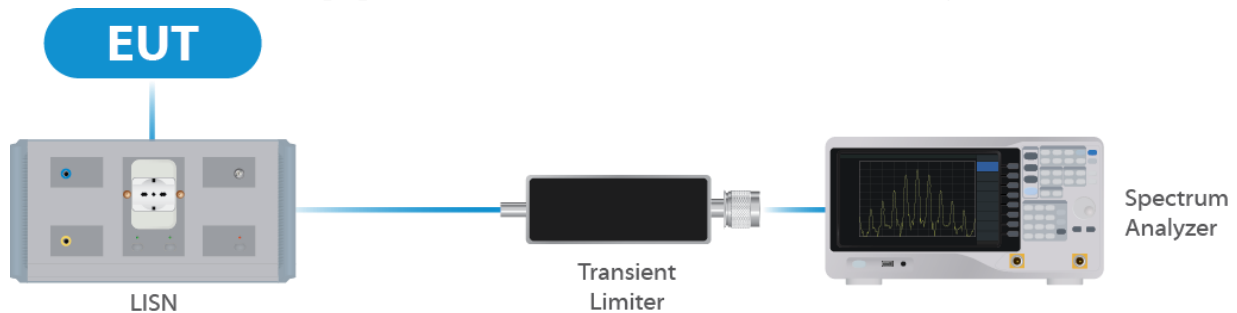
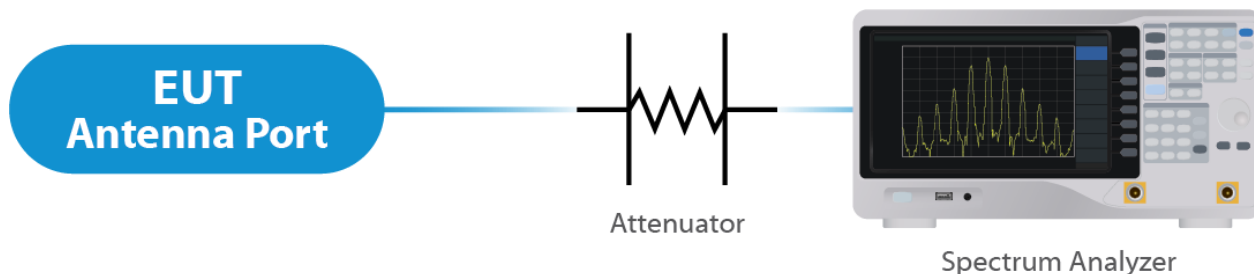


Figure 1: Conducted Emissions Test

### 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	1/03/2022	1/03/2023
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	1/03/2022	1/03/2023
Switch Extension	R&S	OSP-150W	UCL-2870	1/03/2022	1/03/2023

Table 3: List of equipment used for Direct Connect at the Antenna Port



**Figure 2: Direct Connect at the Antenna Port Test**



**Figure 3: Output Power Measurement**

### 4.3 Radiated Emissions

Type of Equipment	Manufacturer	Model Number	Asset Number	Date of Last Calibration	Due Date of Calibration
EMI Receiver	Keysight	N9038A	UCL-2778	6/21/2021	6/21/2022
Pre-Amplifier 9 kHz – 1 GHz	Sonoma Instruments	310N	UCL-2889	10/7/2021	10/7/2022
Broadband Antenna	Scwarzbeck	VULB 9163	UCL-3062	8/28/2020	8/27/2022
Broadband Antenna	Scwarzbeck	VULB 9163	UCL-3071	5/19/2020	5/19/2022
Double Ridge Horn Antenna	Scwarzbeck	BBHA 9120D	UCL-3065	7/8/2021	7/8/2022
Log Periodic	Scwarzbeck	STLP 9129	UCL-3068	11/16/2020	11/16/2022
15 - 40 GHz Horn Antenna	Scwarzbeck	BBHA 9170	UCL-2487	5/21/2020	5/21/2022
1 – 18 GHz Amplifier	Com-Power	PAM 118A	UCL-3833	10/7/2021	10/7/2022
Test Software	UCL	Revision 1	UCL-3108	N/A	N/A

**Table 4: List of equipment used for Radiated Emissions**

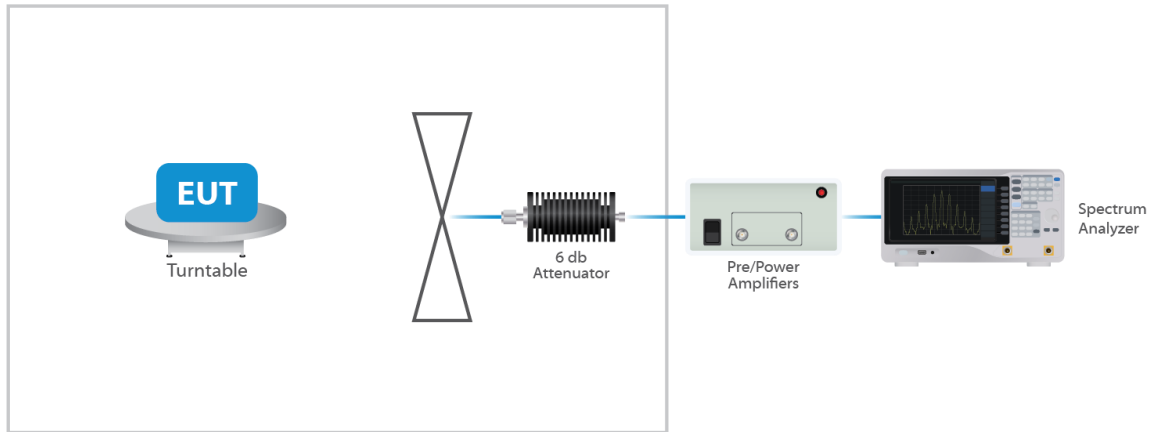


Figure 4: Radiated Emissions Test

## 4.4 DFS Testing

### 4.4.1 Client Test Set Up

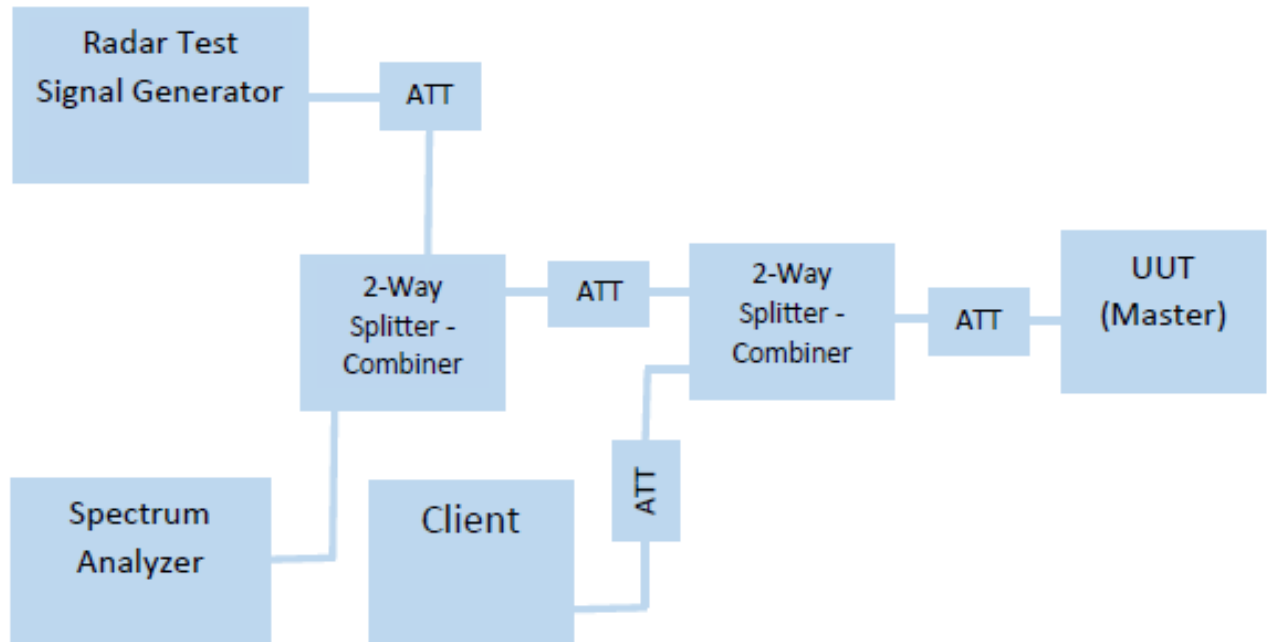


Figure 5: DFS Test Set Up – Client

## 4.5 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.

## 4.6 Measurement Uncertainty

Test	Uncertainty ( $\pm$ 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
<b>Direct Connect Tests</b>	<b>K Factor</b>	<b>Value</b>
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 integral antenna and an optional accessory dish antenna. The Maximum gain of the antenna is 3dBi and the optional dish antenna is 29 dBi. This integral antenna is not user replaceable while the optional dish antenna is user replaceable.

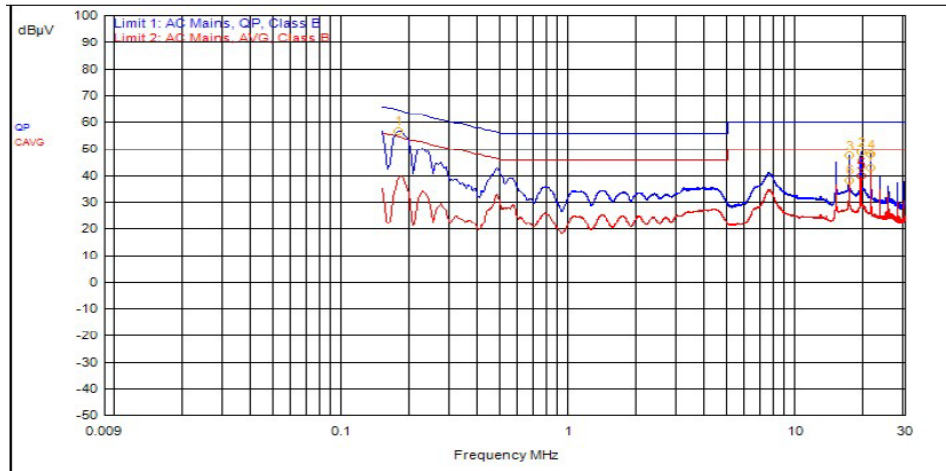
The two chains of the radio are cross polarized.

#### Results

The EUT complied with the specification.

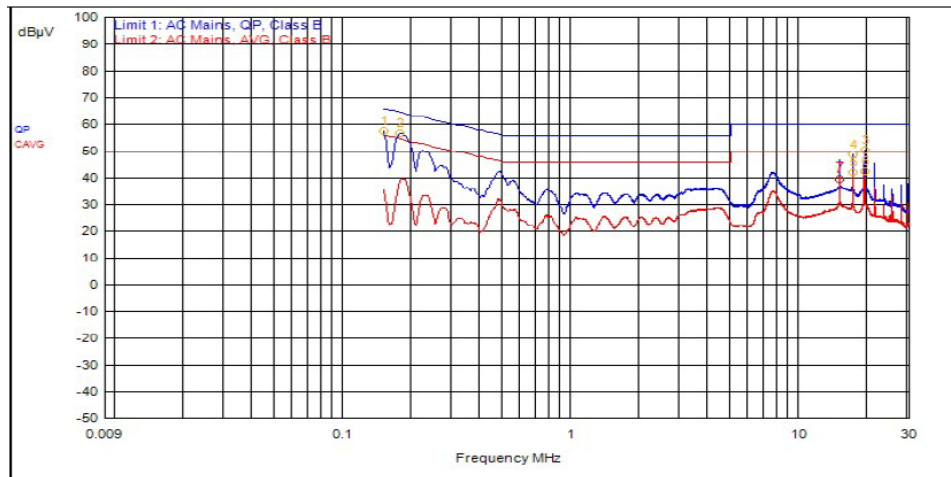
## 5.2 Conducted Emissions at Mains Ports Data

### 5.2.1 Line



ID	Frequency	Probe	Cable	Atten.	Detector	Meter Read	Meas Level	Limit 1	Limit 1 Dist.	Limit 2	Limit 2 Dist.
1	177,000kHz	12.4	0.0		QPeak	44.2	56.6	64.6	-8.0		
2	19.074MHz	12.3	0.2		QPeak	36.1	48.6	60.0	-11.4		
4	21.195MHz	12.3	0.2		QPeak	35.3	47.8	60.0	-12.2		
3	16.956MHz	12.4	0.2		QPeak	35.0	47.6	60.0	-12.4		
5	19.074MHz	12.3	0.2		C_AVG	27.4	39.9			50.0	-10.1
6	16.953MHz	12.4	0.2		C_AVG	25.6	38.2			50.0	-11.8
7	21.195MHz	12.3	0.2		C_AVG	30.4	42.8			50.0	-7.2

## 5.2.2 Neutral



ID	Frequency	Probe	Cable	Atten.	Detector	Meter Read	Meas Level	Limit 1	Limit 1 Dist.	Limit 2	Limit 2 Dist.
2	177,000kHz	12.4	0.0		QPeak	44.2	56.6	64.6	-8.0		
1	150,000kHz	12.4	0.0		QPeak	45.1	57.4	66.0	-8.6		
3	19.080MHz	12.3	0.2		QPeak	37.8	50.3	60.0	-9.7		
4	16.959MHz	12.4	0.2		QPeak	36.3	48.9	60.0	-11.1		
5	16.959MHz	12.4	0.2		C_AVG	29.4	42.0			50.0	-8.0
6	19.077MHz	12.3	0.2		C_AVG	30.2	42.7			50.0	-7.3
7	14.838MHz	12.5	0.2		C_AVG	26.9	39.6			50.0	-10.4

### Result

The EUT complied with the specification limit.

## 5.3 §15.403(i) 26 dB Emissions Bandwidth

All chains were measured under the guidance of KDB 789033 Section II.C. and KDB 66291 D01. Please see associated annex for details on instrument settings.

### 5.3.1 UNII-2A

Bandwidth (MHz)	Frequency (MHz)	99% Bandwidth (MHz)	Emissions 26dB Bandwidth (MHz)
10	5255	9.40	10.45
10	5300	9.35	10.45
10	5340	9.40	10.35
20	5260	18.70	20.70
20	5300	18.70	20.80
20	5335	18.80	23.40
30	5270	28.20	31.35



30	5300	28.20	31.20
30	5330	28.30	31.50
40	5270	37.75	40.95
40	5300	37.75	41.40
40	5325	37.75	41.40
50	5275	47.25	52.00
50	5300	47.25	52.25
50	5320	47.25	52.00

### 5.3.2 UNII-2C

Bandwidth (MHz)	Frequency (MHz)	99% Bandwidth (MHz)	Emissions 26 dB Bandwidth (MHz)
10	5480	9.40	10.40
10	5600	9.35	10.40
10	5715	9.35	10.45
20	5485	18.70	20.80
20	5600	18.80	20.80
20	5710	18.80	20.80
30	5490	28.05	31.20
30	5600	28.20	31.35
30	5705	28.20	31.05
40	5495	37.75	41.55
40	5600	37.75	41.40
40	5700	37.75	41.40
50	5500	47.00	52.00
50	5600	47.00	52.00
50	5690	47.25	52.00

#### Result

The 26 dB bandwidths are reported for information purposes. Please see Annex for all bandwidth measurements.

### 5.4 §15.407(a)(2) Maximum Average Output Power

All chains were measured and summed under the guidance of KDB 789033 Section II. E.2. and KDB 66291 D01. Please see associated annex for details on instrument settings.

The maximum average RF conducted output power measured for this device was 24.86 dBm or 306.20 mW. The limit is 30 dBm, or 1 Watt when using an antenna with 23 dBi (Fixed point to point) or less

gain. The integral antenna has a gain of 3 dBi with the dish antenna having a gain of 29 dBi. TP setting reflected are with the 29 dBi antenna.

#### 5.4.1 UNII-2A

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured EIRP	Measured PSD
HT10	5255	Mcs0	21	21.12	24.12	8.88
HT10	5300	Mcs0	20	20.68	23.68	8.28
HT10	5340	Mcs0	20	20.51	23.51	8.17
HT20	5260	Mcs0	22	21.78	24.78	6.76
HT20	5300	Mcs0	22	21.88	24.88	7.01
HT20	5335	Mcs0	22	21.90	24.90	6.93
HT30	5270	Mcs0	22	21.76	24.76	5.20
HT30	5300	Mcs0	22	21.79	24.79	4.95
HT30	5330	Mcs0	22	21.84	24.84	5.13
VHT40	5270	Mcs0	22	21.6	24.60	3.86
VHT40	5300	Mcs0	22	21.73	24.73	4.04
VHT40	5325	Mcs0	22	21.80	24.80	4.37
VHT50	5275	Mcs0	22	21.51	24.51	3.14
VHT50	5300	Mcs0	22	21.61	24.61	3.12
VHT50	5320	Mcs0	22	21.74	24.74	3.25

#### 5.4.2 UNII-2C

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured EIRP	Measured PSD
HT10	5480	Mcs0	20	20.30	23.30	8.46
HT10	5600	Mcs0	20	20.26	23.26	8.73
HT10	5715	Mcs0	19	20.29	23.29	8.40
HT20	5485	Mcs0	22	21.93	24.93	7.52
HT20	5600	Mcs0	22	21.86	24.86	7.81
HT20	5710	Mcs0	22	22.46	25.46	7.58
HT30	5490	Mcs0	22	24.86	24.85	5.51
HT30	5600	Mcs0	22	21.77	24.77	6.06
HT30	5705	Mcs0	22	22.25	25.25	5.95

VHT40	5495	Mcs0	22	21.68	24.68	4.71
VHT40	5600	Mcs0	22	22.03	25.03	4.73
VHT40	5700	Mcs0	22	22.08	25.08	4.97
VHT50	5500	Mcs0	22	21.55	24.55	3.39
VHT50	5600	Mcs0	22	21.62	24.55	3.54
VHT50	5690	Mcs0	22	22.03	25.03	3.79

### Result

In the configuration tested, the maximum average RF output power was less than 1 watt; therefore, the EUT complied with the requirements of the specification.

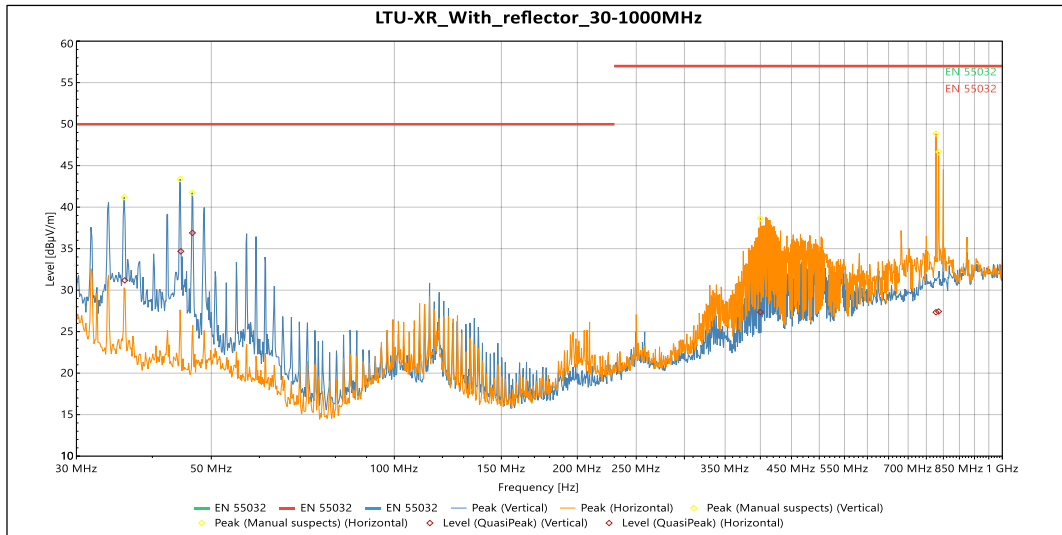
## 5.5 §15.407(b) Spurious Emissions

### 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. To reduce test time, the radiated spurious emissions at the lowest, middle, and highest channel were measured at the maximum power of TP22, as this setting was found to be worst case for spurious emissions. Power was subsequently reduced during in-band and band edge testing. The band edge at the restricted band was measured using radiated measurement. All emissions modes were tested, and the worst-case measurement are shown below. For frequencies above 1 GHz, a measurement of 3 meters was used. For frequencies below 1 GHz, a measurement distance of 10 meters was used.

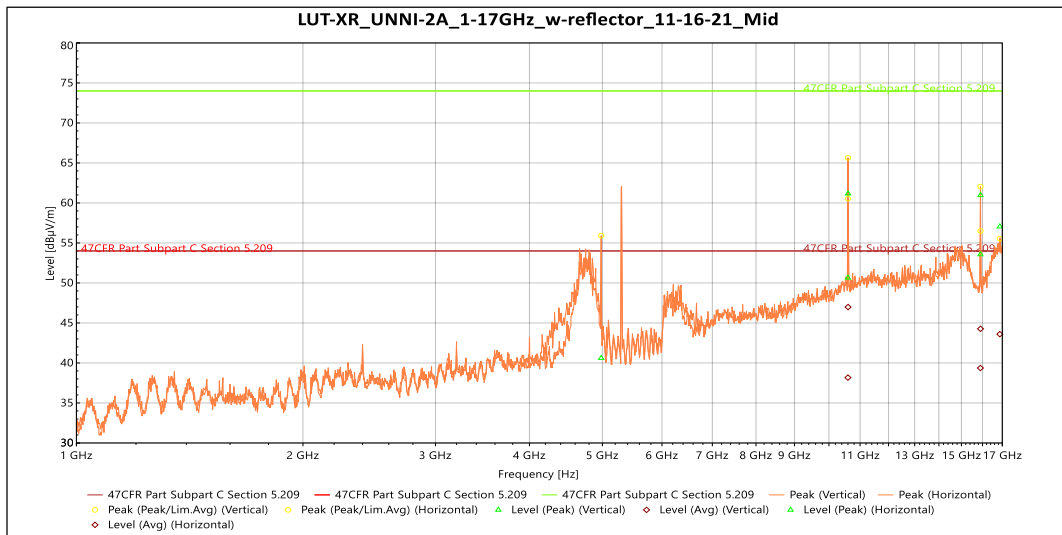
Correction Factor = Antenna Factor + Cable Loss - Pre-amp Gain, and is added to the Receiver Reading

### 5.5.2 UNII-2A



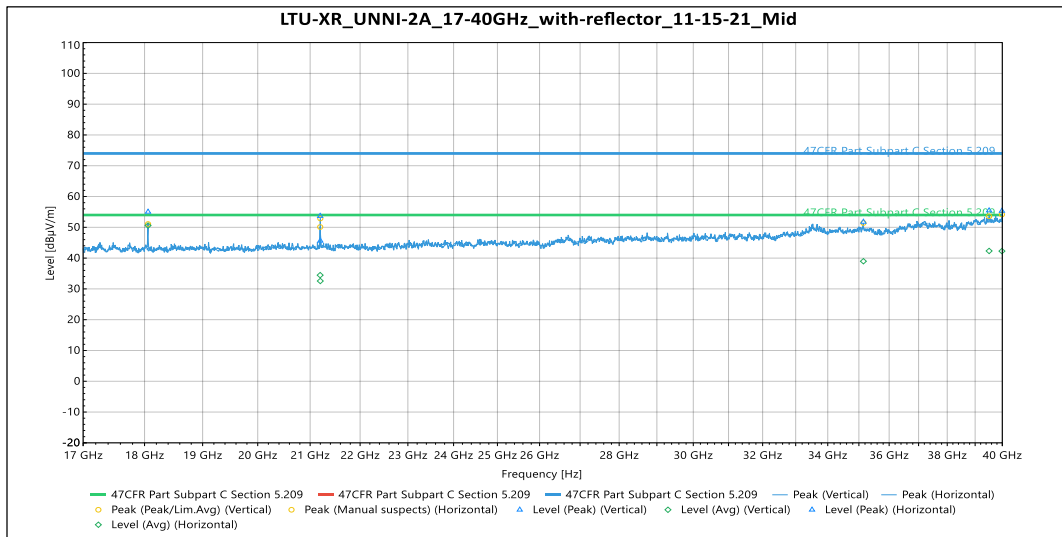
Frequency	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Correction (dB)
36.028 MHz	1	31.184	50	-18.816	50	3.307	Vertical	-6.644
44.546 MHz	1	34.677	50	-15.323	80	1	Vertical	-6.345
46.552 MHz	1	36.896	50	-13.104	103	1.142	Vertical	-6.268
400.01 MHz	2	27.348	57	-29.652	328	1.143	Horizontal	-4.787
777.78 MHz	2	27.338	57	-29.662	50	1.863	Horizontal	1.709
785.62 MHz	2	27.431	57	-29.569	82	1.5	Horizontal	1.687

Graph 1: Radiated Spurious Emissions on 30MHz-1GHz



Frequency	Peak/Avg	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
10.599 GHz	Peak	50.654	74	-23.346	160	2.321	Vertical	4.957
15.903 GHz	Peak	60.981	74	-13.019	306	1.643	Vertical	4.706
16.87 GHz	Peak	57.053	74	-16.947	62	3.157	Vertical	11.989
10.599 GHz	Avg	38.173	54	-15.827	160	2.321	Vertical	4.957

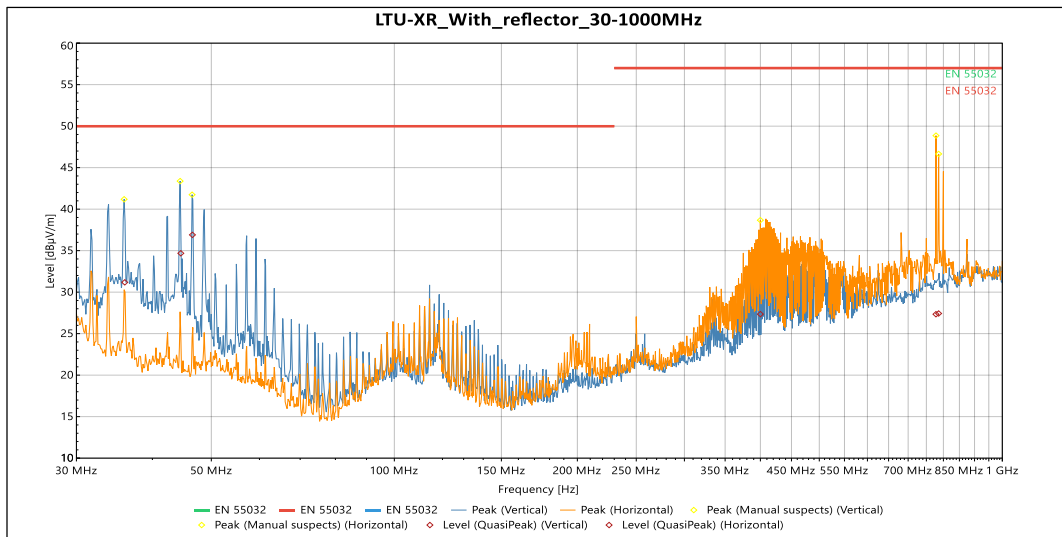
Frequency	Peak/Avg	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
15.903 GHz	Avg	44.27	54	-9.73	306	1.643	Vertical	4.706
16.87 GHz	Avg	43.604	54	-10.396	62	3.157	Vertical	11.989
4.9817 GHz	Peak	40.61	74	-33.39	297	2.812	Horizontal	-8.185
10.603 GHz	Peak	61.166	74	-12.834	336	2.812	Horizontal	5.065
15.899 GHz	Peak	53.574	74	-20.426	326	1.5	Horizontal	4.586
4.9817 GHz	Avg	27.536	54	-26.464	297	2.812	Horizontal	-8.185
10.603 GHz	Avg	46.986	54	-7.014	336	2.812	Horizontal	5.065
15.899 GHz	Avg	39.368	54	-14.632	326	1.5	Horizontal	4.586

**Graph 2: Radiated Spurious Emissions on 1-16GHz (worst-case)**


Frequency	Peak/Avg	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
21.197 GHz	Peak	53.665	74	-20.335	322	Vertical	-5.541
35.148 GHz	Peak	51.756	74	-22.244	66	Vertical	1.051
39.985 GHz	Peak	55.315	74	-18.685	186	Vertical	3.611
21.197 GHz	Avg	34.46	54	-19.54	322	Vertical	-5.541
35.148 GHz	Avg	38.979	54	-15.021	66	Vertical	1.051
39.985 GHz	Avg	42.266	54	-11.734	186	Vertical	3.611
18.059 GHz	Peak	55.016	74	-18.984	343	Horizontal	-6.351
21.2 GHz	Peak	45.62	74	-28.38	86	Horizontal	-5.563
39.511 GHz	Peak	55.451	74	-18.549	191	Horizontal	3.252
18.059 GHz	Avg	50.584	54	-3.416	343	Horizontal	-6.351
21.2 GHz	Avg	32.558	54	-21.442	86	Horizontal	-5.563
39.511 GHz	Avg	42.318	54	-11.682	191	Horizontal	3.252

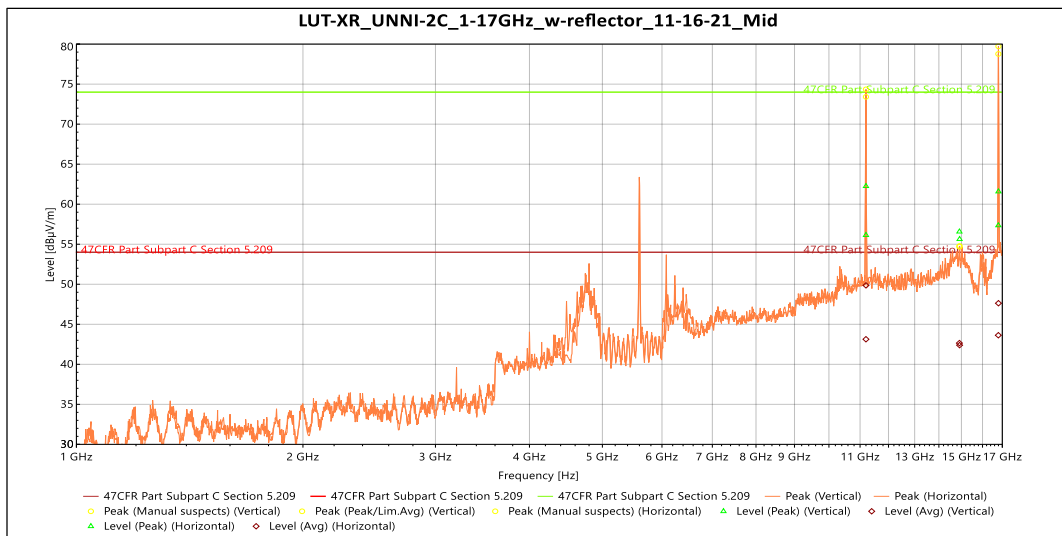
**Graph 3: Radiated Spurious Emissions on 16-40GHz (worst-case)**

### 5.5.3 UNII-2C



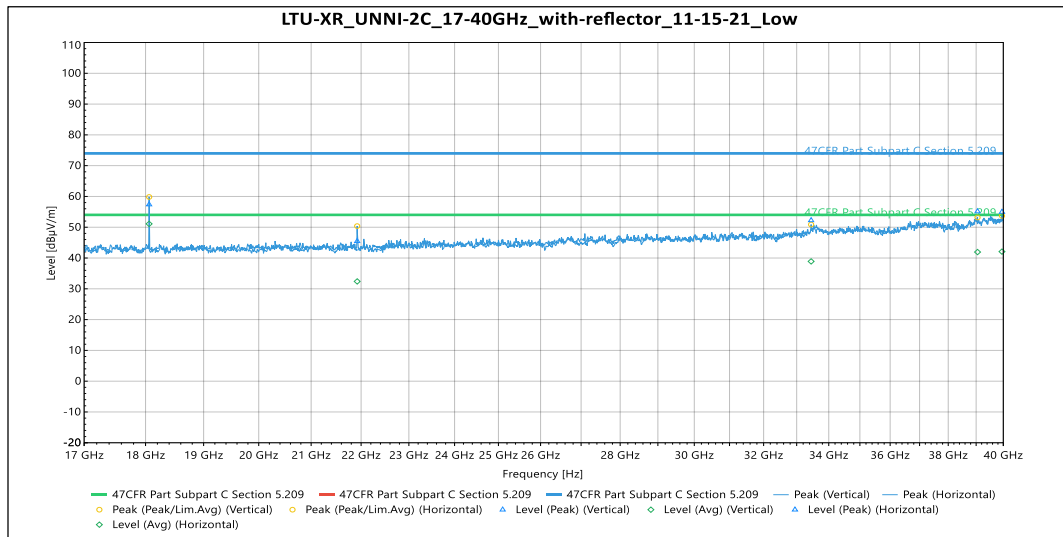
Frequency	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Correction (dB)
36.028 MHz	1	31.184	50	-18.816	50	3.307	Vertical	-6.644
44.546 MHz	1	34.677	50	-15.323	80	1	Vertical	-6.345
46.552 MHz	1	36.896	50	-13.104	103	1.142	Vertical	-6.268
400.01 MHz	2	27.348	57	-29.652	328	1.143	Horizontal	-4.787
777.78 MHz	2	27.338	57	-29.662	50	1.863	Horizontal	1.709
785.62 MHz	2	27.431	57	-29.569	82	1.5	Horizontal	1.687

Graph 4: Radiated Spurious Emissions on 30MHz-1GHz



Frequency	Peak/Avg	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
11.2 GHz	Peak	56.142	74	-17.858	314	2.15	Vertical	4.653
14.916 GHz	Peak	55.626	74	-18.374	78	2.146	Vertical	9.881
16.794 GHz	Peak	57.353	74	-16.647	310	2.146	Vertical	11.588
11.2 GHz	Avg	43.13	54	-10.87	314	2.15	Vertical	4.653

Frequency	Peak/Avg	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Azimuth ( $^{\circ}$ )	Height (m)	Pol.	Correction (dB)
14.916 GHz	Avg	42.387	54	-11.613	78	2.146	Vertical	9.881
16.794 GHz	Avg	43.628	54	-10.372	310	2.146	Vertical	11.588
11.201 GHz	Peak	62.252	74	-11.748	295	2.816	Horizontal	4.635
14.908 GHz	Peak	56.573	74	-17.427	289	3.798	Horizontal	10.069
16.8 GHz	Peak	61.582	74	-12.418	325	1.5	Horizontal	11.494
11.201 GHz	Avg	49.856	54	-4.144	295	2.816	Horizontal	4.635
14.908 GHz	Avg	42.653	54	-11.347	289	3.798	Horizontal	10.069
16.8 GHz	Avg	47.63	54	-6.37	325	1.5	Horizontal	11.494

**Graph 5: Radiated Spurious Emissions om 1-16GHz (worst-case)**


Frequency	Peak/Avg	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Azimuth ( $^{\circ}$ )	Pol.	Correction (dB)
21.92 GHz	Peak	45.47	74	-28.53	339	Vertical	-5.714
33.447 GHz	Peak	52.245	74	-21.755	5	Vertical	1.571
39.051 GHz	Peak	55.143	74	-18.857	92	Vertical	3.172
21.92 GHz	Avg	32.403	54	-21.597	339	Vertical	-5.714
33.447 GHz	Avg	38.902	54	-15.098	5	Vertical	1.571
39.051 GHz	Avg	41.944	54	-12.056	92	Vertical	3.172
18.06 GHz	Peak	57.378	74	-16.622	339	Horizontal	-6.363
39.95 GHz	Peak	54.959	74	-19.041	206	Horizontal	3.58
18.06 GHz	Avg	51.092	54	-2.908	339	Horizontal	-6.363
39.95 GHz	Avg	42.084	54	-11.916	206	Horizontal	3.58

**Graph 6: Radiated Spurious Emissions on 16-40GHz (worst-case)**

## 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 66291 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 11 dBm in any 1 MHz band during any time interval of continuous transmission. Results of this testing are summarized. With a 29 dBi antenna, the conducted limit for power spectral density is 11 dBm. As per KDB 662911, When the EUT is using spatial-multiplexing in HT to HE modes, there is no additional array gain to accommodate. When the EUT uses Nss=1 data rates, the antenna gain is 29 dBi + Array gain of 6.02 dB which is a total of 35.02 dBi. Results of this testing are summarized.

### 5.6.1 UNII-2A

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured EIRP	Measured PSD
HT10	5255	Mcs0	21	21.12	24.12	8.88
HT10	5300	Mcs0	20	20.68	23.68	8.28
HT10	5340	Mcs0	20	20.51	23.51	8.17
HT20	5260	Mcs0	22	21.78	24.78	6.76
HT20	5300	Mcs0	22	21.88	24.88	7.01
HT20	5335	Mcs0	22	21.90	24.90	6.93
HT30	5270	Mcs0	22	21.76	24.76	5.20
HT30	5300	Mcs0	22	21.79	24.79	4.95
HT30	5330	Mcs0	22	21.84	24.84	5.13
VHT40	5270	Mcs0	22	21.6	24.60	3.86
VHT40	5300	Mcs0	22	21.73	24.73	4.04
VHT40	5325	Mcs0	22	21.80	24.80	4.37
VHT50	5275	Mcs0	22	21.51	24.51	3.14
VHT50	5300	Mcs0	22	21.61	24.61	3.12
VHT50	5320	Mcs0	22	21.74	24.74	3.25

### 5.6.2 UNII-2C

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power*	Measured EIRP	Measured PSD
HT10	5480	Mcs0	20	20.30	23.30	8.46



HT10	5600	Mcs0	20	20.26	23.26	8.73
HT10	5715	Mcs0	19	20.29	23.29	8.40
HT20	5485	Mcs0	22	21.93	24.93	7.52
HT20	5600	Mcs0	22	21.86	24.86	7.81
HT20	5710	Mcs0	22	22.46	25.46	7.58
HT30	5490	Mcs0	22	24.86	24.85	5.51
HT30	5600	Mcs0	22	21.77	24.77	6.06
HT30	5705	Mcs0	22	22.25	25.25	5.95
VHT40	5495	Mcs0	22	21.68	24.68	4.71
VHT40	5600	Mcs0	22	22.03	25.03	4.73
VHT40	5700	Mcs0	22	22.08	25.08	4.97
VHT50	5500	Mcs0	22	21.55	24.55	3.39
VHT50	5600	Mcs0	22	21.62	24.55	3.54
VHT50	5690	Mcs0	22	22.03	25.03	3.79

### Result

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

## 5.7 DFS Requirement

This product is a client without radar detection. The outcome of the required DFS tests is located in the DFS Annex. The product passes all required DFS tests for a client without radar detection.

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
<i>Non-Occupancy Period</i>	Yes	Not Required	Yes
<i>DFS Detection Threshold</i>	Yes	Not Required	Yes
<i>Channel Availability Check Time</i>	Yes	Not Required	Not Required
<i>U-NII Detection Bandwidth</i>	Yes	Not Required	Yes

Requirement	Operational Mode	
	Master Device or Client Without Radar Detection	Client Without Radar Detection
<i>DFS Detection Threshold</i>	Yes	Not Required
<i>Channel Closing Transmission Time</i>	Yes	Yes
<i>Channel Move Time</i>	Yes	Yes
<i>U-NII Detection Bandwidth</i>	Yes	Not Required

-- End of Test Report --