



427 West 12800 South
Draper, UT 84020

Test Report Certification

FCC ID	SWX-LTUINS
ISED ID	6545A-LTUINS
Equipment Under Test	LTU-Instant
Test Report Serial Number	TR6343_02
Date of Test(s)	2, 4, 8, 29 June and 9 July 2021
Report Issue Date	5 August 2021

Test Specification	Applicant
47 CFR FCC Part 15, Subpart E	Ubiquiti Inc. 685 Third Avenue New York, NY 10019 U.S.A.



NVLAP LAB CODE 600241-0

Certification of Engineering Report

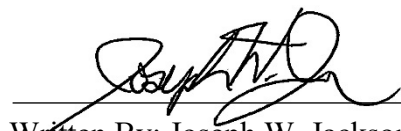
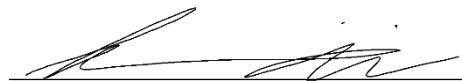
This report has been prepared by Unified Compliance Laboratory (UCL) to document compliance of the device described below with the requirement of Federal Communication Commissions (FCC) Part 15, Subpart E. This report may be reproduced in full. Partial reproduction of this report may only be made with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

Applicant	Ubiquiti Inc.
Manufacturer	Ubiquiti Inc.
Brand Name	LTU
Model Number	LTU-Instant
FCC ID	SWX-LTUINS
ISED ID	6545A-LTUINS

On this 5th day of August 2021, 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: Joseph W. Jackson
Reviewed By: Alex Macon

Revision History		
Revision	Description	Date
01	Original Report Release	5 August 2021
02	Added information to section 5.1 Added detail to results section 5.3 Added information to section 5.5.1 Added array gain to section 5.6	8 August 2021

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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	Mark Feil
Title	Compliance Manager

1.2 Manufacturer

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

2 Equipment Under Test (EUT)

2.1 Identification of EUT

Brand Name	LTU
Model Number	LTU-Instant
Serial Number	68D79A1F3019
Dimensions (cm)	20.2 x 6.4 x 5.6

2.2 Description of EUT

The LTU-Instant is a fixed point-to-multi-point transceivers, meant for outdoor use, operating in the 5GHz frequency bands. A Bluetooth LE transceiver is included for device management. An Ethernet port is used for data transfer and to provide power using a POE-24V-5X-HD POE supply.

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

Band	WiFi Mode	Modulation Bandwidth	Modulation Type	Frequency (MHz)
UNII-3	n	10 MHz	HT	5730, 5790, 5845
	n	20 MHz	HT	5735, 5790, 5840
	n	30 MHz	HT	5740, 5790, 5835
	ac	40 MHz	VHT	5745, 5790, 5830
	ac	50 MHz	VHT	5750, 5790, 5825

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.

Brand Name Model Number Serial Number	Description	Name of Interface Ports / Interface Cables
BN: LTU MN: LTU-Instant SN: 68D79A1F3019	Point-to-multi-point Transceiver	See Section 2.4
BN: Ubiquiti Inc. MN: POE-24V-5X-HD SN: N/A	PoE Power Supply	See Section 2.4
BN: Dell MN: XPS 13	Laptop Personal Computer	Ethernet/Shielded or Unshielded Cat 5e Cable

SN: N/A		
BN: HP MN: Spectre SN: N/A	Laptop Personal Computer	Ethernet/Shielded or Unshielded Cat 5e Cable

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 (PoE Injector)	1	3 conductor power cord/80 cm
PoE (PoE Injector)	1	Shielded Cat 5e cable/8 meters
Lan (PoE Injector)	1	Un-Shielded Cat 5e cable/1 meters

2.5 Operating Environment

Power Supply	120 Vac to 24 Volt PoE Power
AC Mains Frequency	60 Hz
Temperature	20.1 – 26.6 °C
Humidity	31.0 – 54.2 %
Barometric Pressure	1019 mBar

2.6 Operating Modes

The LTU-Instant was tested using test software in order to enable to constant transmission of over 98%. 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

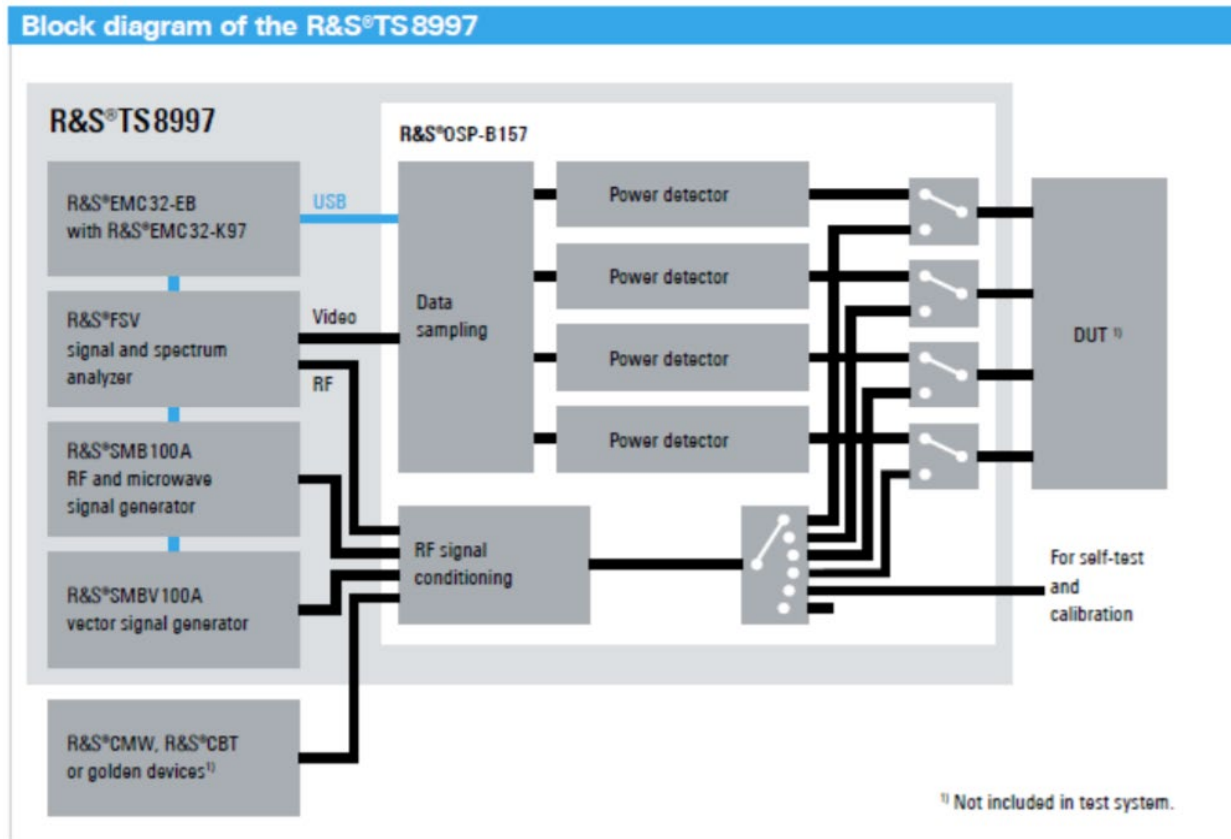


Diagram 1: Test Configuration Block Diagram

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

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
15.407(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(c)	RSS-247 §6.2.2, §6.2.3	Bandwidth Requirement	5725 to 5850	Compliant
15.407(e)	RSS-247 §6.2.2, §6.2.3	Peak Output Power	5725 to 5850	Compliant
15.407(f)	RSS-247 §6.2.2, §6.2.3	Antenna Conducted Spurious Emissions	0.009 to 40000	N/A
15.407(g)	RSS-247 §6.2.2, §6.2.3	Radiated Spurious Emissions	0.009 to 40000	Compliant
15.407(h)	RSS-247 §6.2.2, §6.2.3	Peak Power Spectral Density	5725 to 5850	Compliant

The testing was performed according to the procedures in ANSI C63.10-2013, KDB 789033 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 chambers 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	9/17/2021
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 1:List of equipment used for Conducted Emissions Testing at Mains Port

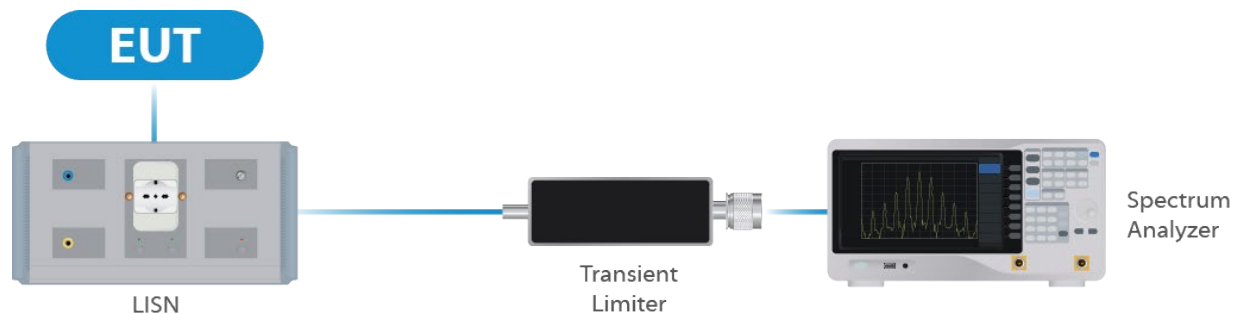


Figure 1: Conducted Emissions Test

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	8/24/2020	8/24/2021
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	9/8/2020	9/8/2021
Switch Extension	R&S	OSP-150W	UCL-2870	3/3/2021	3/3/2022

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

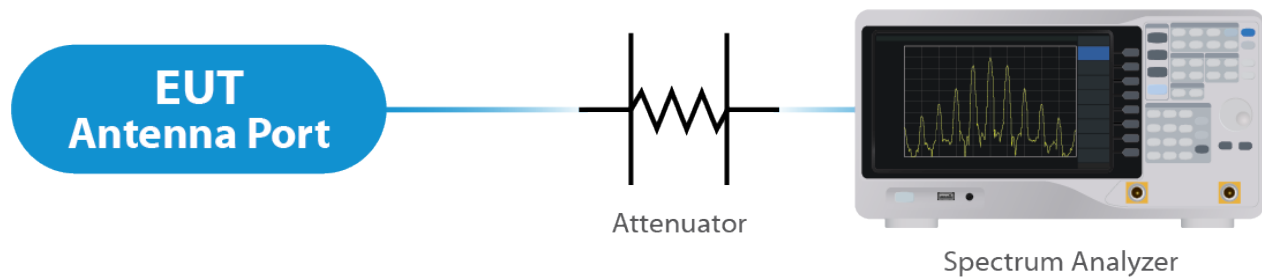


Figure 2: Direct Connect at the Antenna Port Test



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	9/10/2020	9/10/2021
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	11/16/2021
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	9/29/2020	9/29/2021
Test Software	UCL	Revision 1	UCL-3108	N/A	N/A

Table 3:List of equipment used for Radiated Emissions

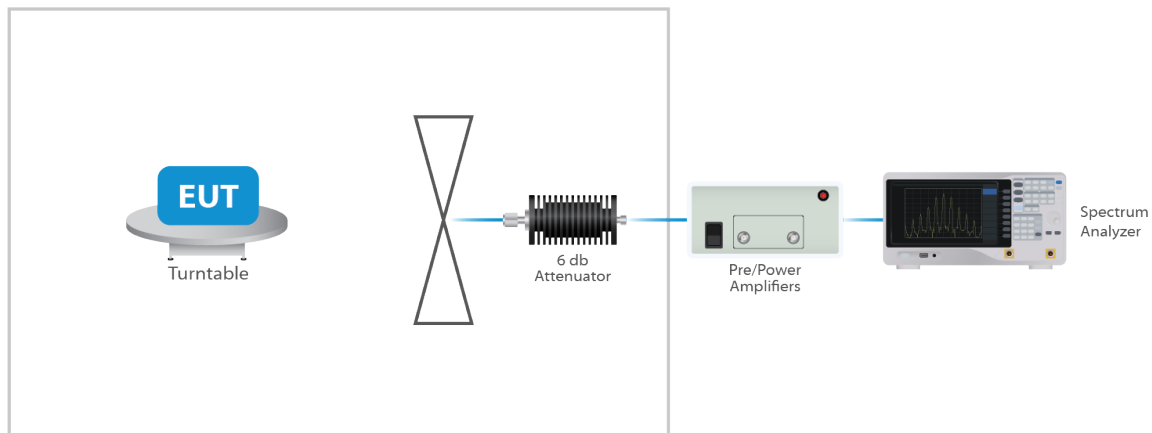


Figure 4: Radiated Emissions Test

4.4 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.

4.5 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
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 integral antenna and an optional accessory dish antenna. The Maximum gain of the integral antenna is 3 dBi and the optional dish antenna is 22 dBi. The integral antenna is not user replaceable while the optional dish antenna is user replaceable.

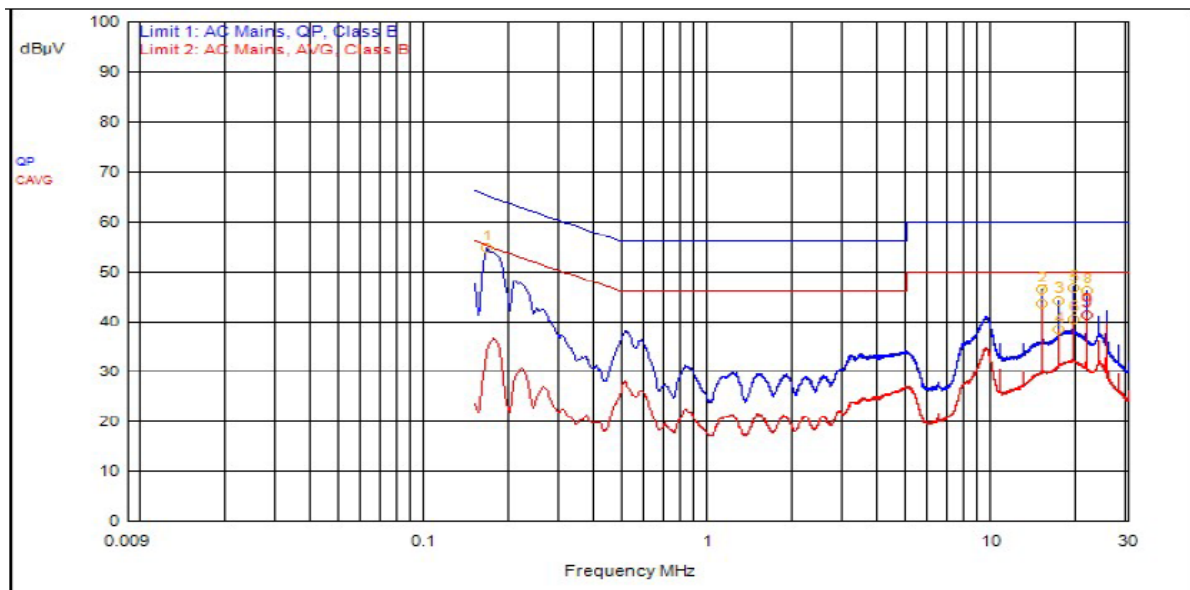
The 2 chains of the radio are cross-polarized.

Results

The EUT complied with the specification

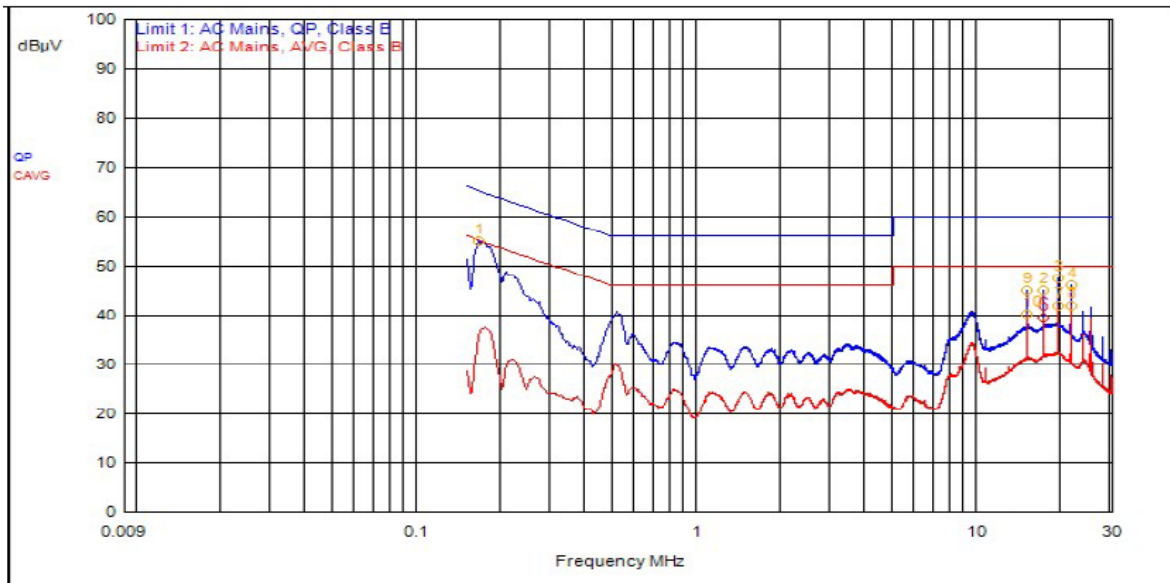
5.2 Conducted Emissions at Mains Ports Data

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	165,000kHz	12.4	0.0		QPeak	42.2	54.6	65.2	-10.6		
5	19.161MHz	12.3	0.2		QPeak	34.4	46.8	60.0	-13.2		
2	14.904MHz	12.5	0.2		QPeak	33.6	46.3	60.0	-13.7		
8	21.294MHz	12.3	0.2		QPeak	33.6	46.1	60.0	-13.9		
3	17.034MHz	12.4	0.2		QPeak	31.5	44.1	60.0	-15.9		
4	17.034MHz	12.4	0.2		C_AVG	25.6	38.2			50.0	-11.8
6	19.161MHz	12.3	0.2		C_AVG	28.2	40.6			50.0	-9.4
7	14.904MHz	12.5	0.2		C_AVG	30.8	43.5			50.0	-6.5
9	21.291MHz	12.3	0.2		C_AVG	28.9	41.4			50.0	-8.6

5.2.2 Neutral



ID	Frequency	Probe	Cable	Atten.	Detector	Meter Read	Meas Level	Limit 1	Limit 1 Dist.	Limit 2	Limit 2 Dist.
1	165,000kHz	12.4	0.0		QPeak	42.7	55.1	65.2	-10.1		
3	19.155MHz	12.3	0.2		QPeak	35.0	47.5	60.0	-12.5		
4	21.285MHz	12.3	0.2		QPeak	33.6	46.1	60.0	-13.9		
2	17.028MHz	12.4	0.2		QPeak	32.4	45.0	60.0	-15.0		
9	14.898MHz	12.5	0.2		QPeak	32.3	45.0	60.0	-15.0		
6	17.028MHz	12.4	0.2		C_AVG	26.8	39.4			50.0	-10.6
7	19.155MHz	12.3	0.2		C_AVG	29.5	41.9			50.0	-8.1
8	21.285MHz	12.3	0.2		C_AVG	29.4	41.9			50.0	-8.1
10	14.898MHz	12.5	0.2		C_AVG	27.5	40.2			50.0	-9.8

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.

Nominal BW (MHz)	Frequency (MHz)	99% Bandwidth (MHz)	26 dB Bandwidth (MHz)
HT 10	5730	9.4	10.45
HT 10	5790	9.4	10.45
HT 10	5845	9.4	10.45
HT 20	5735	18.8	13.3
HT 20	5790	18.8	20.8
HT 20	5840	18.8	21.0
HT 30	5740	28.2	31.2
HT 30	5790	28.35	31.2
HT 30	5835	28.5	31.2
VHT 40	5745	37.75	41.55
VHT 40	5790	37.75	41.55
VHT 40	5830	37.75	41.55
VHT 50	5750	47.25	52.25
VHT 50	5790	47.25	52.25
VHT 50	5825	47.25	52.50

Result

All chains were tested and the highest bandwidth per chain is reported above.

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

5.4 §15.403(a)(3) 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 23.29 dBm or 213.30 mW. The limit is 30 dBm, or 1 Watt when using antennas with 6 dBi or less gain. The integral antenna has a gain of 3 dBi with the dish antenna having a gain of 22 dBi. TP setting reflected are with the 3 dBi antenna.

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured EIRP	Measured PSD
HT 10	5745	Mcs0	22	23.29	26.29	8.17
HT 10	5775	Mcs0	22	22.55	25.55	7.6
HT 10	5825	Mcs0	22	22.78	25.78	7.52
HT 20	5745	Mcs0	22	22.51	25.51	4.72
HT 20	5775	Mcs0	22	22.58	25.58	5.28
HT 20	5825	Mcs0	22	22.71	25.71	4.55
HT 30	5755	Mcs0	22	22.20	25.20	3.19
HT 30	5775	Mcs0	22	22.54	25.54	3.09
HT 30	5795	Mcs0	22	22.58	25.58	2.72
VHT 40	5745	Mcs0	22	22.28	25.28	1.06
VHT 40	5775	Mcs0	22	22.45	25.45	1.73
VHT 40	5825	Mcs0	22	22.31	25.31	1.82
VHT 50	5755	Mcs0	22	22.08	25.08	0.57
VHT 50	5775	Mcs0	22	22.38	25.38	0.42
VHT 50	5795	Mcs0	22	22.35	25.35	1.14

Table 4: 3 dBi Antenna

Modulation (BW)	Frequency (MHz)	Data Rate	Conducted Output Power
HT 10	5745	Mcs0	4.29
HT 10	5775	Mcs0	3.55
HT 10	5825	Mcs0	3.78
HT 20	5745	Mcs0	3.51
HT 20	5775	Mcs0	3.58
HT 20	5825	Mcs0	3.71
HT 30	5755	Mcs0	3.20
HT 30	5775	Mcs0	3.54
HT 30	5795	Mcs0	3.58
VHT 40	5745	Mcs0	3.28
VHT 40	5775	Mcs0	3.45
VHT 40	5825	Mcs0	3.31
VHT 50	5755	Mcs0	3.08
VHT 50	5775	Mcs0	3.38
VHT 50	5795	Mcs0	3.35

Table 5: 22 dBi Antenna

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).

5.5 §15.407(b)(7) Spurious Emissions

5.5.1 Conducted Spurious Emissions

The frequency range from the lowest frequency generated or used in the device to the tenth harmonic of the highest fundamental frequency was investigated to measure any antenna-conducted emissions. The graphs show the measurement data from spurious emissions noted across the frequency range when transmitting at the lowest frequency, middle frequency and upper frequency. Shown within the annex are plots with the EUT turned to the upper and lower channels with the antenna gain of 3 dBi accounted for. These demonstrate compliance with the provisions of this section at the band edges.

All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Result

Conducted spurious emissions were attenuated below the limit; therefore, the EUT complies with the specification.

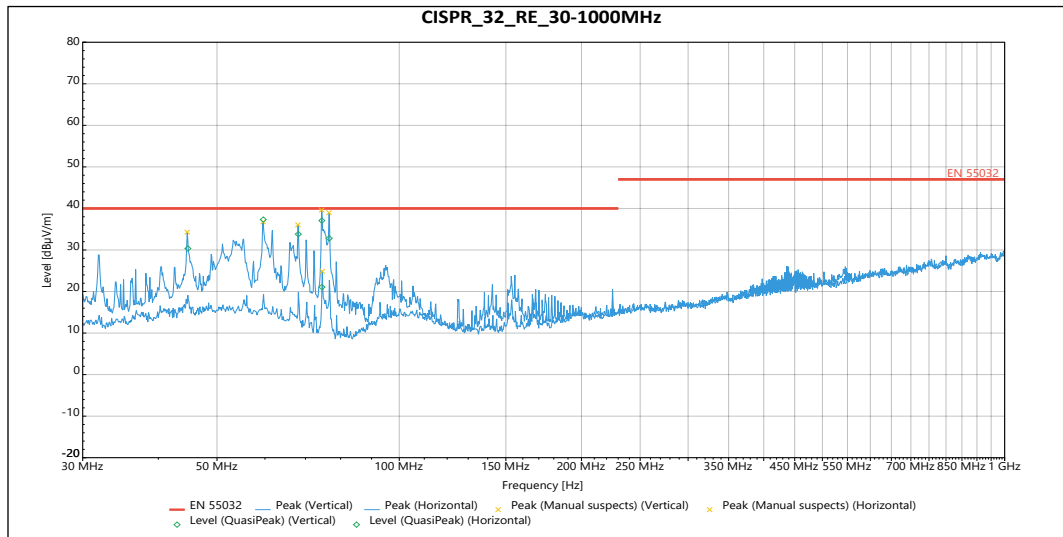
5.5.2 Radiated Spurious Emissions in the Restricted Bands of § 15.205

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 TP22.

Correction Factor = Antenna Factor + Cable Loss - Pre-amp Gain, 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.



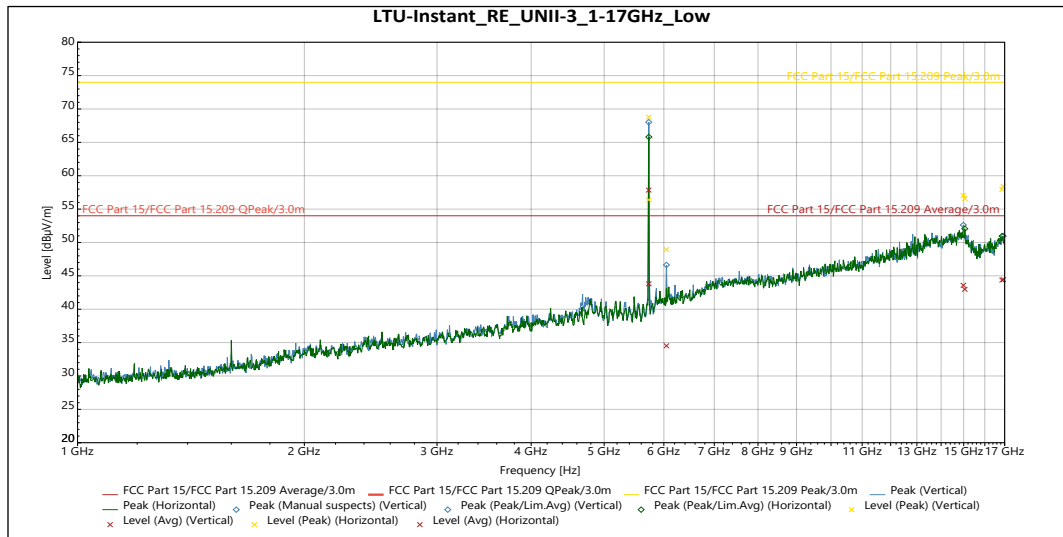
Vertical

Source	Frequency	Level (dBμV/m)	Limit (dBμV/m)	Margin	Azimuth (°)	Height	Pol.	Correction (dB)
QuasiPeak	44.757 MHz	30.346	40	-9.654	330	2.42	Vertical	-12.503
QuasiPeak	59.621 MHz	37.312	40	-2.688	15	3.755	Vertical	-13.354
QuasiPeak	68.125 MHz	33.808	40	-6.192	29	3.969	Vertical	-15.683
QuasiPeak	74.501 MHz	37.074	40	-2.926	2	3.916	Vertical	-18.179
QuasiPeak	76.612 MHz	32.787	40	-7.213	1	3.791	Vertical	-18.798

Horizontal

Source	Frequency	Level (dBμV/m)	Limit (dBμV/m)	Margin	Azimuth (°)	Height	Pol.	Correction (dB)
QuasiPeak	74.534 MHz	21.063	40	-18.937	15	1.593	Horizontal	-18.192

Table 6: Radiated Emissions 30 – 1000 MHz



Vertical

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Peak	6.0478 GHz	48.933	74	-25.067	162	2.4	Vertical	3.183
Peak	14.985 GHz	57.058	74	-16.942	266	1.991	Vertical	14.458
Peak	16.931 GHz	58.419	74	-15.581	135	3.254	Vertical	16.43

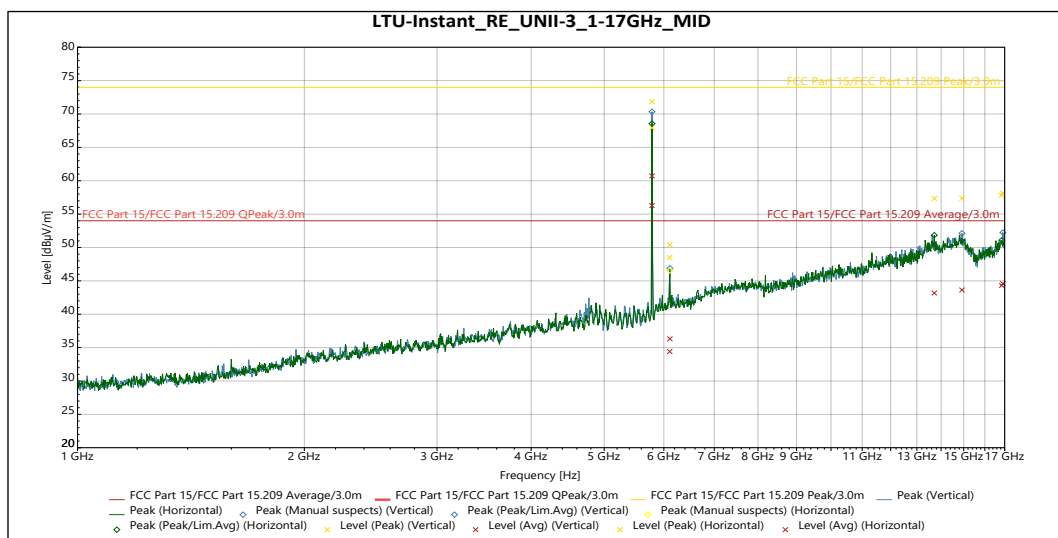
Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Avg	6.0478 GHz	34.517	54	-19.483	162	2.4	Vertical	3.183
Avg	14.985 GHz	43.576	54	-10.424	266	1.991	Vertical	14.458
Avg	16.931 GHz	44.43	54	-9.57	135	3.254	Vertical	16.43

Horizontal

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Peak	15.051 GHz	56.584	74	-17.416	56	2.928	Horizontal	14.065
Peak	16.867 GHz	57.955	74	-16.045	136	3.808	Horizontal	16.405

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Avg	15.051 GHz	42.98	54	-11.02	56	2.928	Horizontal	14.065
Avg	16.867 GHz	44.357	54	-9.643	136	3.808	Horizontal	16.405

Table 7: Transmitting on the Lowest Frequency 5730 MHz 1 – 17 GHz



Vertical

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Peak	6.1114 GHz	50.414	74	-23.586	157	2.354	Vertical	3.447
Peak	14.922 GHz	57.368	74	-16.632	97	3.62	Vertical	14.695
Peak	16.908 GHz	58.138	74	-15.862	173	1.851	Vertical	16.581

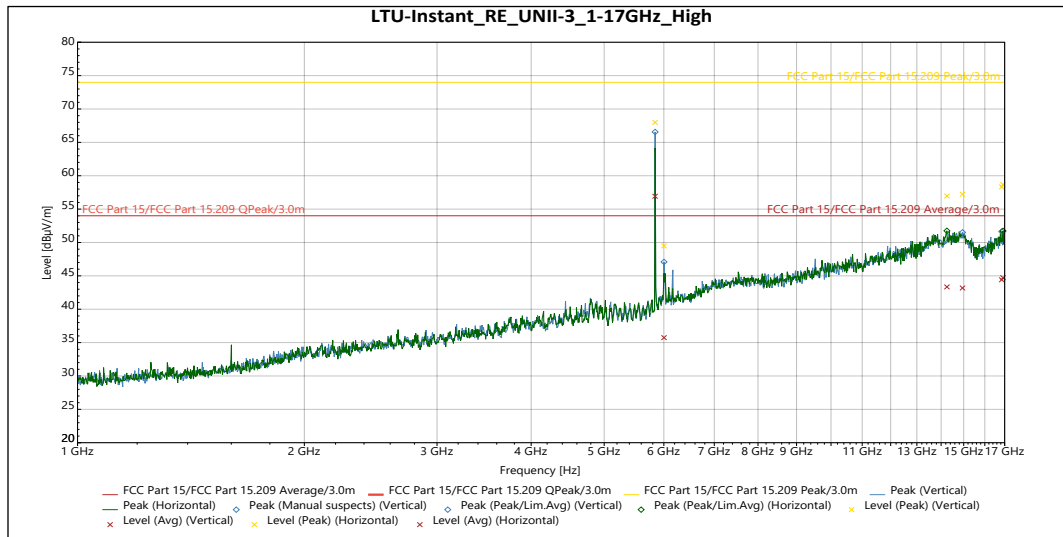
Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Avg	6.1114 GHz	36.311	54	-17.689	157	2.354	Vertical	3.447
Avg	14.922 GHz	43.627	54	-10.373	97	3.62	Vertical	14.695
Avg	16.908 GHz	44.593	54	-9.407	173	1.851	Vertical	16.581

Horizontal

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Peak	6.108 GHz	48.503	74	-25.497	188	3.087	Horizontal	3.451
Peak	13.712 GHz	57.335	74	-16.665	188	2.218	Horizontal	14.196
Peak	16.852 GHz	57.824	74	-16.176	201	2.369	Horizontal	16.295

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Avg	6.108 GHz	34.413	54	-19.587	188	3.087	Horizontal	3.451
Avg	13.712 GHz	43.185	54	-10.815	188	2.218	Horizontal	14.196
Avg	16.852 GHz	44.311	54	-9.689	201	2.369	Horizontal	16.295

Table 8: Transmitting on the Middle Frequency 5790 MHz 1 – 17 GHz



Vertical

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Peak	6.0031 GHz	49.477	74	-24.523	253	1.527	Vertical	3.299
Peak	14.946 GHz	57.232	74	-16.768	142	2.785	Vertical	14.176
Peak	16.851 GHz	58.328	74	-15.672	321	3.772	Vertical	16.285

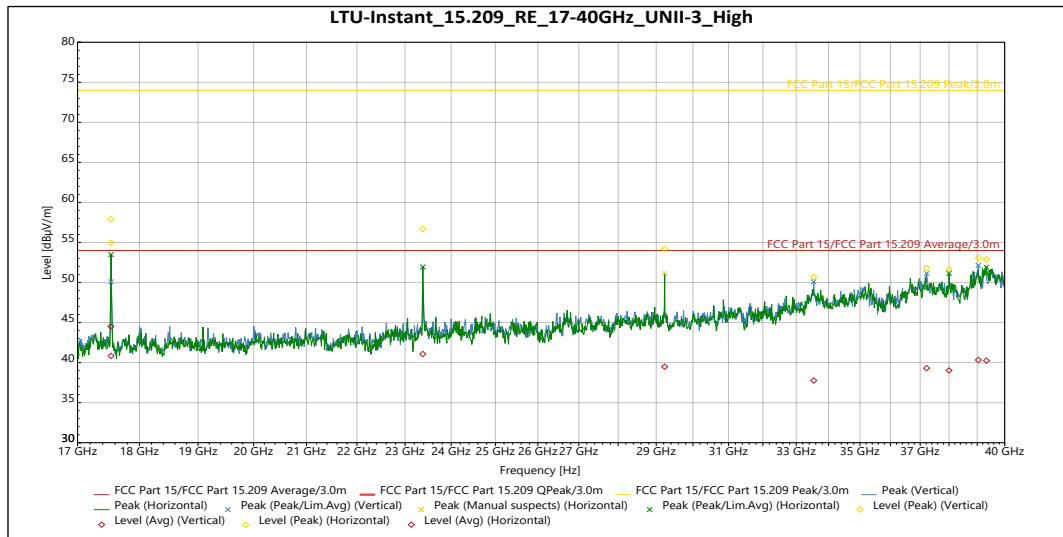
Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Avg	6.0031 GHz	35.737	54	-18.263	253	1.527	Vertical	3.299
Avg	14.946 GHz	43.178	54	-10.822	142	2.785	Vertical	14.176
Avg	16.851 GHz	44.41	54	-9.59	321	3.772	Vertical	16.285

Horizontal

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Peak	14.251 GHz	56.965	74	-17.035	171	3.791	Horizontal	14.323
Peak	16.915 GHz	58.665	74	-15.335	273	3.277	Horizontal	16.571

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Avg	14.251 GHz	43.342	54	-10.658	171	3.791	Horizontal	14.323
Avg	16.915 GHz	44.725	54	-9.275	273	3.277	Horizontal	16.571

Table 9: Transmitting on the Highest Frequency 5845 MHz 1 – 17 GHz



Vertical

Source	Frequency	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
Peak	17.535 GHz	54.964	74	-19.036	322	Vertical	-6.02
Peak	33.537 GHz	50.687	74	-23.313	159	Vertical	1.3
Peak	37.22 GHz	51.823	74	-22.177	1	Vertical	1.456
Peak	39.042 GHz	53.069	74	-20.931	156	Vertical	3.238

Source	Frequency	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
Avg	17.535 GHz	40.845	54	-13.155	322	Vertical	-6.02
Avg	33.537 GHz	37.768	54	-16.232	159	Vertical	1.3
Avg	37.22 GHz	39.309	54	-14.691	1	Vertical	1.456
Avg	39.042 GHz	40.329	54	-13.671	156	Vertical	3.238

Horizontal

Source	Frequency	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
Peak	17.532 GHz	57.894	74	-16.106	46	Horizontal	-6.027
Peak	23.38 GHz	56.686	74	-17.314	313	Horizontal	-5.19
Peak	29.227 GHz	54.193	74	-19.807	312	Horizontal	-4.49
Peak	37.999 GHz	51.64	74	-22.36	214	Horizontal	1.409
Peak	39.335 GHz	52.87	74	-21.13	145	Horizontal	3.087

Source	Frequency	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
Avg	17.532 GHz	44.513	54	-9.487	46	Horizontal	-6.027
Avg	23.38 GHz	41.069	54	-12.931	313	Horizontal	-5.19
Avg	29.227 GHz	39.487	54	-14.513	312	Horizontal	-4.49
Avg	37.999 GHz	39.018	54	-14.982	214	Horizontal	1.409
Avg	39.335 GHz	40.25	54	-13.75	145	Horizontal	3.087

Table 10: Transmitting on the Highest Frequency 5845 MHz 17 – 40 GHz (worse 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 30 dBm in any 500 kHz band during any time interval of continuous transmission.

Results of this testing are summarized.

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Measured PSD
HT 10	5745	Mcs0	22	8.17
HT 10	5775	Mcs0	22	7.6
HT 10	5825	Mcs0	22	7.52
HT 20	5745	Mcs0	22	4.72
HT 20	5775	Mcs0	22	5.28
HT 20	5825	Mcs0	22	4.55
HT 30	5755	Mcs0	22	3.19
HT 30	5775	Mcs0	22	3.09
HT 30	5795	Mcs0	22	2.72
VHT 40	5745	Mcs0	22	1.06
VHT 40	5775	Mcs0	22	1.73
VHT 40	5825	Mcs0	22	1.82
VHT 50	5755	Mcs0	22	0.57
VHT 50	5775	Mcs0	22	0.42
VHT 50	5795	Mcs0	22	1.14

Table 11: 3 dBi Antenna

Modulation (BW)	Frequency (MHz)	Data Rate	Measured PSD
HT 10	5745	Mcs0	- 10.83
HT 10	5775	Mcs0	- 11.40
HT 10	5825	Mcs0	- 11.48
HT 20	5745	Mcs0	- 14.28
HT 20	5775	Mcs0	- 13.72
HT 20	5825	Mcs0	- 14.45
HT 30	5755	Mcs0	- 15.81
HT 30	5775	Mcs0	- 15.91
HT 30	5795	Mcs0	- 16.28
VHT 40	5745	Mcs0	- 17.94
VHT 40	5775	Mcs0	- 17.27
VHT 40	5825	Mcs0	- 17.18
VHT 50	5755	Mcs0	- 18.43
VHT 50	5775	Mcs0	- 18.58
VHT 50	5795	Mcs0	- 17.86

Table 12: 22 dBi Antenna

Result

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

-- End of Test Report --