UNIFIED COMPLIANCE LABORATORY

427 West 12800 South
Draper, UT 84020

Test Report

Certification

FCC ID	SWX-UDW
ISED ID	6545A-UDW
Equipment Under Test	UDW
Test Report Serial Number	TR7073_01
Date of Tests	12 February; 29 March; 8, 12, 25 April 2022
Report Issue Date	27 April 2022

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

NVLAP TESTING ilac-MRA

NVLAP LAB CODE 600241-0

Certification of Engineering Report

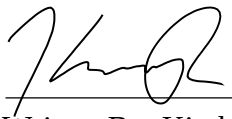
This report has been prepared by Unified Compliance Laboratory (UCL) to document compliance of the device described below with the requirement of Federal Communication Commissions (FCC) Part 15, Subpart E. This report may be reproduced in full. Partial reproduction of this report may only be made with 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	UniFi
Model Number	UDW
FCC ID	SWX-UDW
ISED ID	6545A-UDW

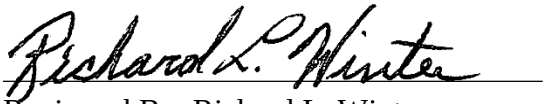
On this 27th day of April 2022, I individually and for Unified Compliance Laboratory certify that the statements made in this engineering report are true, complete, and correct to the best of my knowledge and are made in good faith.

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

Revision History		
Revision	**Description**	**Date**
01	Original Report Release	27 April 2022

Table of Contents

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	UniFi
Model Number	UDW
Serial Number	2F3AB46NCM9W
Dimensions (cm)	54.9 x 34.2 x 6.2

2.2 Description of EUT

The Dream Wall is a standalone UniFi OS gateway controller which facilitates high-density PoE switching with integrated (17) gigabit RJ45 ports [(12x PoE and 5x non-PoE)]. The Dream Wall also promotes high-speed WAN and LAN connection with its (2) 10 GbE SFP ports and dual-band WiFi radio. The 2x2 2.4GHz WiFi radio and 5GHz 4x4 radio delivers a 2.7 Gbps aggregate throughput rate. The Dream Wall is equipped with a built-in Bluetooth for set up, and its 1.3" LCM touchscreen concisely displays critical system and status insights needed for device monitoring and configuration.

Band	WiFi Mode	Modulation Bandwidth	Modulation Type	Frequency (MHz)
UNII-1	a	20 MHz	OFDM	5180, 5200, 5210, 5240
	n	20 MHz	HT	5180, 5200, 5210, 5240
	n	40 MHz	HT	5190, 5230
	ac	20 MHz	VHT	5180, 5200, 5210, 5240
	ac	40 MHz	VHT	5190, 5230
	ac	80 MHz	VHT	5210
	ax	20 MHz	HE	5180, 5200, 5210, 5240
	ax	40 MHz	HE	5190, 5230
	ax	80 MHz	HE	5210

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: UniFi MN: UDW (1) SN: 2F3AB46NCM9W	EUT	See Section 2.4
BN: Dell MN: XPS SN: N/A	Laptop Computer	Ethernet Non-Shielded Cat 5e
BN: HP MN: Spectre x360 SN: N/A	Laptop Computer	USB to Serial EUT Connection

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
10 GbE SFP WAN	1	Copper Direct Attach Cable
10 GbE SFP LAN	1	Copper Direct Attach Cable
2.5 GbE RJ45 WAN	1	Un-shielded Cat 5e Cable
PoE, PoE+, PoE++	12 (4, 4, 4)	Un-shielded Cat 5e Cable
Gigabit Ethernet	5	Un-shielded Cat 5e Cable
AC Power	1	3 Conductor Cable NEMA 5-15P (AC)

2.5 Operating Environment

Power Supply	120V AC
AC Mains Frequency	60 Hz
Temperature	22-24.8 °C
Humidity	20.7-24.37 %
Barometric Pressure	1007 mBar

2.6 Operating Modes

The UDW 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/n/ac/ax were investigated. All measurements are reported with the worst-case mode (802.11ax) unless otherwise stated.

For Conducted emission the device was setup as in normal operation, with the PoE output ports loaded with resistive loads equivalent to 90% (320W) of its max PoE output.

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

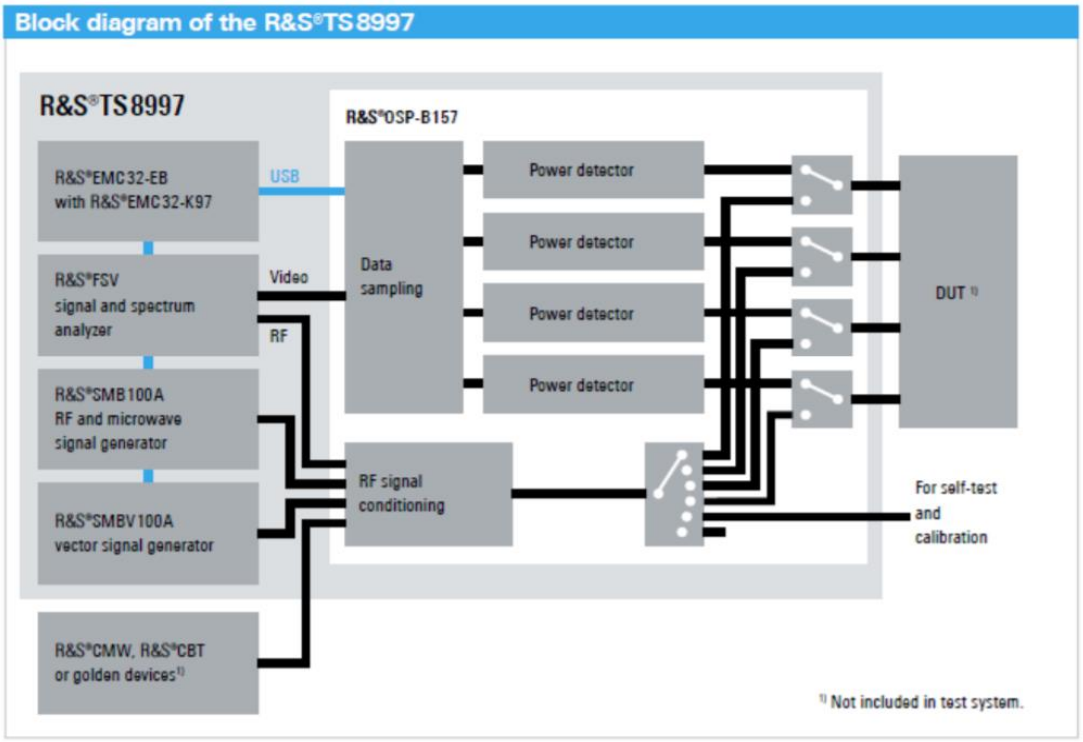


Diagram 1: Test Configuration Block Diagram

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	5180 to 5240	Compliant
15.407(e)	RSS-247 §6.2.2, §6.2.3	Peak Output Power	5180 to 5240	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	30 to 40000	Compliant
15.407(h)	RSS-247 §6.2.2, §6.2.3	Peak Power Spectral Density	5180 to 5240	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 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-6754	12/8/2021	12/8/2022
LISN	AFJ	LS16C/10	UCL-6749	12/6/2021	12/6/2023
Cat6 ISN	Teseq	ISN T8-Cat6	UCL-2971	1/30/2022	1/30/2023
ISN	Teseq	ISN T800	UCL-2974	6/4/2021	6/4/2022
LISN	Com-Power	LIN-120C	UCL-2612	1/6/2022	1/6/2023
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

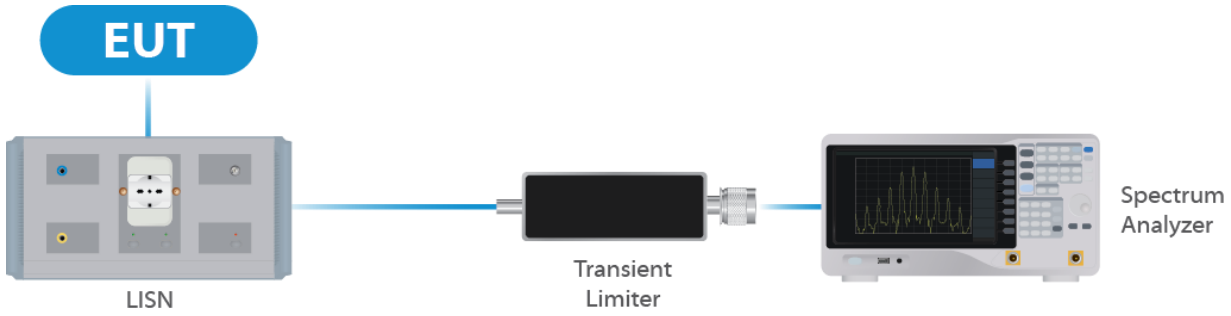


Figure 1: Conducted Emissions Test

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

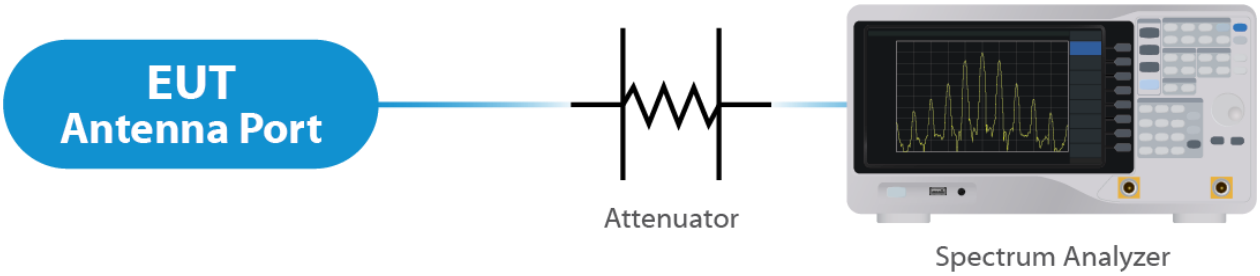


Figure 2: Direct Connect at the Antenna Port Test

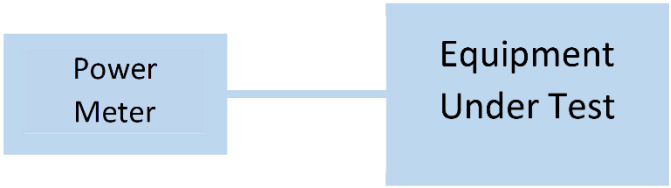


Figure 3: Output Power Measurement

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	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 3: List of equipment used for Radiated Emissions

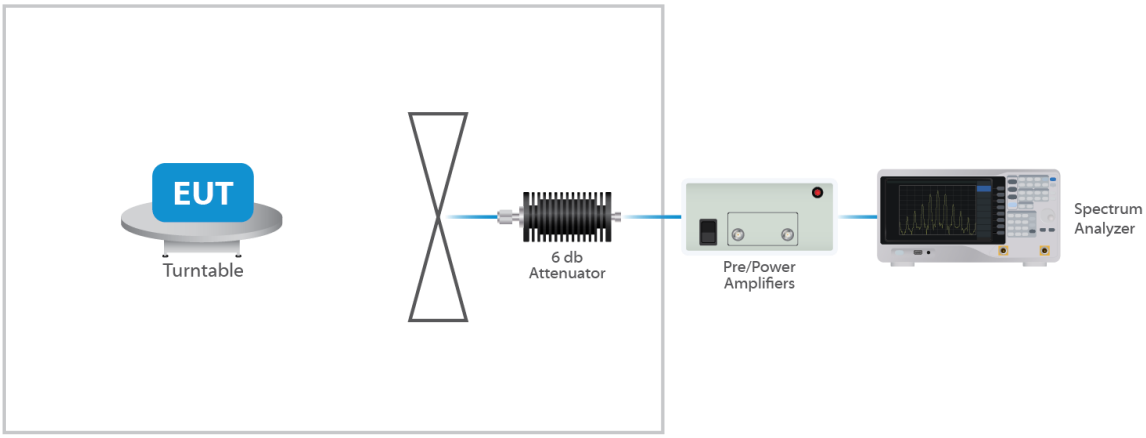


Figure 4: Radiated Emissions Test

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 (± 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

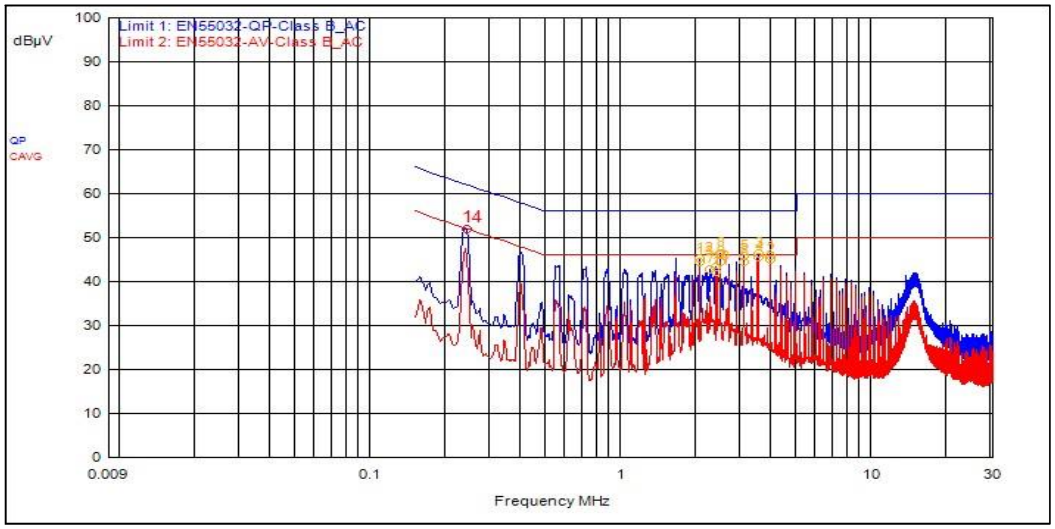
The EUT uses an integral folding antenna structure. The maximum gain of the antenna is 6 dBi. This is an 802.11 device and utilizes CDD as described in KDB 662911 D01. The antenna is not user replaceable.
For power measurements on IEEE 802.11 devices, Array Gain = 0 dB for NANT ≤ 4;
For PSD measurements when Nss=1: Array Gain = 10 log(Nant/Nss) dB = 6.02dB

Results

The EUT complied with the specification

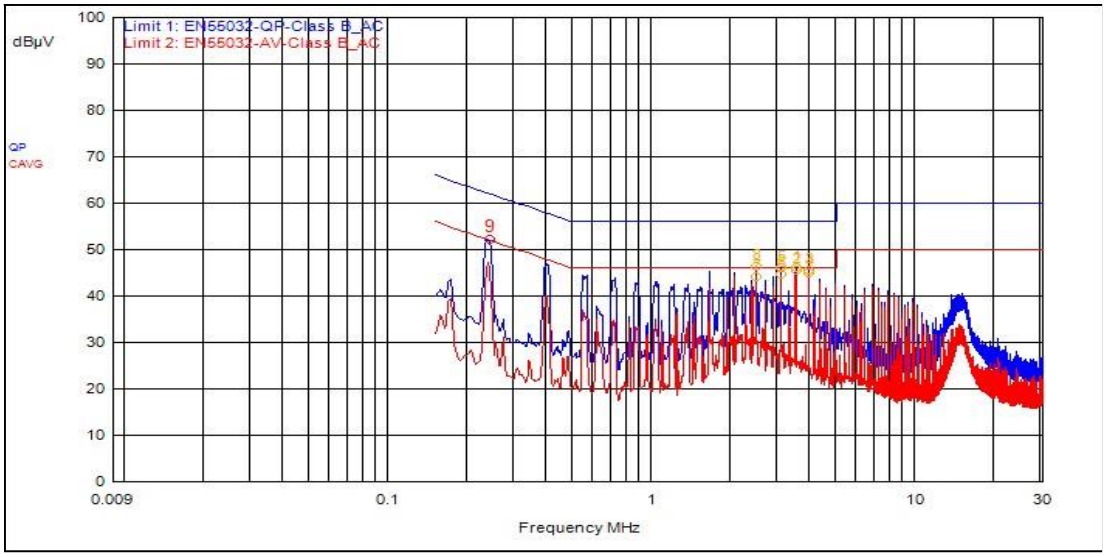
5.2 Conducted Emissions at Mains Ports Data

5.2.1 Line



ID	Frequency	Probe	Cable	Atten.	Detector	Meter Read	Meas Level	Limit 1	Limit 1 Dist.	Limit 2	Limit 2 Dist.
8	2.451MHz	9.5	0.8		QPeak	36.1	46.4	56.0	-9.6		
3	3.474MHz	9.5	0.7		QPeak	36.0	46.3	56.0	-9.7		
1	3.882MHz	9.5	0.7		QPeak	35.6	45.9	56.0	-10.1		
5	3.066MHz	9.5	0.8		QPeak	35.6	45.9	56.0	-10.1		
14	240,000kHz	9.5	0.0		QPeak	42.4	52.0	62.1	-10.1		
12	2.043MHz	9.5	0.6		QPeak	35.2	45.3	56.0	-10.7		
10	2.376MHz	9.5	0.7		QPeak	33.1	43.4	56.0	-12.6		
7	2.247MHz	9.5	0.7		QPeak	32.7	42.9	56.0	-13.1		
2	3.882MHz	9.5	0.7		C_AVG	34.8	45.1			46.0	-0.9
4	3.474MHz	9.5	0.7		C_AVG	35.3	45.5			46.0	-0.5
6	3.066MHz	9.5	0.8		C_AVG	34.1	44.4			46.0	-1.6
9	2.451MHz	9.5	0.8		C_AVG	34.1	44.4			46.0	-1.6
11	2.376MHz	9.5	0.7		C_AVG	31.9	42.2			46.0	-3.8
13	2.043MHz	9.5	0.6		C_AVG	34.2	44.4			46.0	-1.6

5.2.2 Neutral



ID	Frequency	Probe	Cable	Atten.	Detector	Meter Read	Meas Level	Limit 1	Limit 1 Dist.	Limit 2	Limit 2 Dist.
8	2.451MHz	9.5	0.8		QPeak	36.0	46.3	56.0	-9.7		
1	3.474MHz	9.6	0.7		QPeak	35.9	46.2	56.0	-9.8		
5	3.066MHz	9.6	0.8		QPeak	35.7	46.1	56.0	-9.9		
9	240,000kHz	9.5	0.0		QPeak	42.5	52.1	62.1	-10.0		
3	3.882MHz	9.6	0.7		QPeak	35.4	45.6	56.0	-10.4		
2	3.474MHz	9.6	0.7		C_AVG	35.3	45.6			46.0	-0.4
4	3.882MHz	9.6	0.7		C_AVG	34.7	45.0			46.0	-1.0
6	3.066MHz	9.6	0.8		C_AVG	34.3	44.6			46.0	-1.4
7	2.451MHz	9.5	0.8		C_AVG	33.9	44.2			46.0	-1.8

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)	Emissions 26 dB Bandwidth (MHz)
OFDM 20	5180	16.70	25.00
OFDM 20	5200	32.60	45.20
OFDM 20	5240	33.20	55.80
VHT 20	5180	17.70	20.60
VHT 20	5200	25.70	41.90
VHT 20	5240	33.90	58.30
VHT 40	5190	36.25	46.20
VHT 40	5230	56.50	84.00
VHT 80	5210	75.50	80.50
HE 20	5180	19.00	22.90
HE 20	5200	23.30	40.80
HE 20	5240	31.80	48.50
HE 40	5190	37.75	39.75
HE 40	5230	48.75	83.10
HE 80	5210	77.00	81.00
HT 20	5180	17.70	21.30
HT 20	5200	29.90	43.10
HT 20	5240	33.90	59.70
HT 40	5190	5190	39.15
HT 40	5230	45.75	78.15

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 §15.407(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 29.62 dBm or 912.22 mW. The limit is 30 dBm, or 1 Watt when using an antenna with 6 dBi or less gain. The antenna has a gain of 6 dBi.

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured EIRP	Measured PSD
OFDM 20	5180	Mcs0	20	26.05	32.05	12.02
OFDM 20	5210	Mcs0	25	29.52	35.52	15.43
OFDM 20	5240	Mcs0	30	29.55	35.55	15.28
HT 20	5180	Mcs0	20	25.83	31.83	11.52
HT 20	5210	Mcs0	23.5	28.60	34.60	14.39
HT 20	5240	Mcs0	30	29.61	35.61	15.05
HT 40	5190	Mcs0	19	25.18	31.18	8.99
HT 40	5230	Mcs0	22.5	28.47	34.47	12.01
VHT 20	5180	Mcs0	20	25.76	31.76	11.66
VHT 20	5210	Mcs0	23	28.45	34.45	14.36
VHT 20	5240	Mcs0	30	29.62	35.62	15.30
VHT 40	5190	Mcs0	20	26.33	32.33	10.39
VHT 40	5230	Mcs0	22.5	28.61	34.61	12.40
VHT 80	5210	Mcs0	18	24.17	30.17	4.39
HE 20	5180	Mcs0	20	25.08	31.08	10.31
HE 20	5210	Mcs0	23.5	28.19	34.19	13.41
HE 20	5240	Mcs0	30	28.84	34.84	13.83
HE 40	5190	Mcs0	19.5	24.90	30.90	8.45
HE 40	5230	Mcs0	23	28.45	34.56	11.74
HE 80	5210	Mcs0	19	24.38	30.38	4.49

Result

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

5.5 §15.407(b) 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 below are plots with the EUT turned to the upper and lower channels with the antenna gain of 6 dBi accounted for. These demonstrate compliance with the provisions of this section at the band edges.

The emissions must remain below -27 dBm EIRP.

Result

Conducted spurious emissions were below -27 dBm; therefore, the EUT complies with the specification.

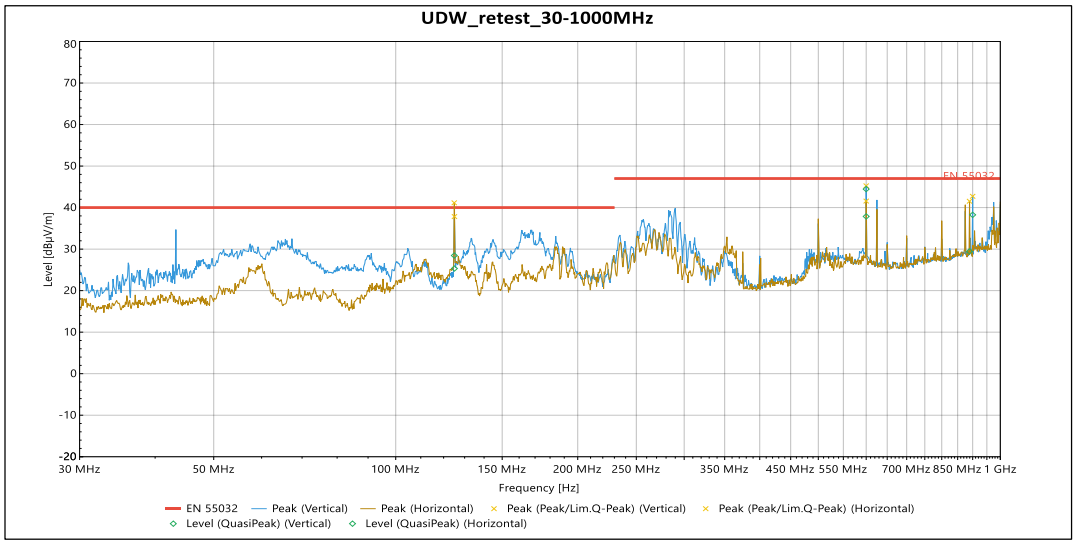
5.5.2 Radiated Spurious Emissions in the Restricted Bands of § 15.205

The EUT uses various power settings based on the channel in use. To reduce test time, the radiated spurious emissions at the lowest, middle, and highest channel were measured at the maximum power of TP30, 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 ending at 5150 MHz was measured using radiated measurement at the antenna port methods. 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-Amplifier Gain, and is added to the Receiver reading.

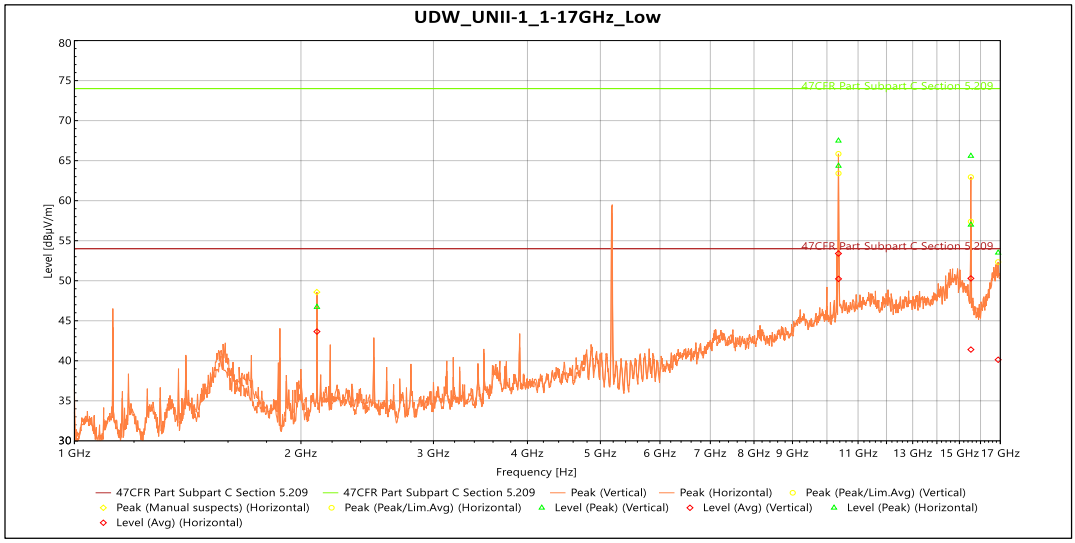
Result

All emissions in the restricted bands of § 15.205 met the limits specified in § 15.209; therefore, the EUT complies with the specification. All emissions me the limits specified in § 15.407(b). Representative band edge plots are included in this report.



Frequency	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Correction (dB)
125 MHz	QP	28.455	40	-11.545	182	1.151	Vertical	-15.927
600 MHz	QP	44.461	47	-2.539	341	3.635	Vertical	-4.383
899.95 MHz	QP	38.246	47	-8.754	219	2.161	Vertical	-0.127
125.05 MHz	QP	25.335	40	-14.665	330	2.853	Horizontal	-15.931
600 MHz	QP	37.868	47	-9.132	77	1.331	Horizontal	-4.383
889.34 MHz	QP	29.449	47	-17.551	358	1.132	Horizontal	-0.575

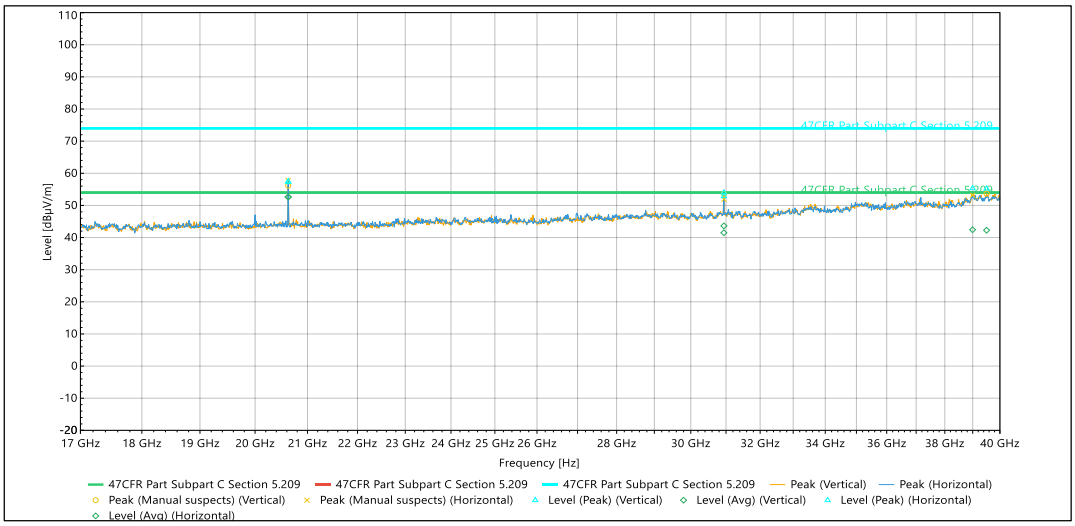
Table 4: Radiated Emissions within 30MHz - 1GHz



Frequency	Peak	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
10.361 GHz	Peak	64.352	74	-9.648	5	2.325	Vertical	0.553
15.536 GHz	Peak	56.987	74	-17.013	280	2.654	Vertical	3.442
16.888 GHz	Peak	53.5	74	-20.5	45	3.153	Vertical	9.393
10.361 GHz	AVG	50.228	54	-3.772	5	2.325	Vertical	0.553
15.536 GHz	AVG	41.403	54	-12.597	280	2.654	Vertical	3.442
16.888 GHz	AVG	40.132	54	-13.868	45	3.153	Vertical	9.393

Frequency	Peak	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
2.1003 GHz	Peak	46.719	74	-27.281	19	2.65	Horizontal	-18.298
10.359 GHz	Peak	67.495	74	-6.505	19	1.834	Horizontal	0.57
15.535 GHz	Peak	65.59	74	-8.41	22	2.146	Horizontal	3.445
2.1003 GHz	AVG	43.645	54	-10.355	19	2.65	Horizontal	-18.298
10.359 GHz	AVG	53.405	54	-0.595	19	1.834	Horizontal	0.57
15.535 GHz	AVG	50.288	54	-3.712	22	2.146	Horizontal	3.445

Table 5: Radiated Emissions within 1-17GHz Transmitting on 5180 MHz



Frequency	SR #	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
20.626 GHz	Peak	57.281	74	-16.719	36	Vertical	-5.625
30.939 GHz	Peak	53.989	74	-20.011	330	Vertical	-0.682
39.507 GHz	Peak	55.207	74	-18.793	177	Vertical	3.428
20.626 GHz	AVG	52.698	54	-1.302	36	Vertical	-5.625
30.939 GHz	AVG	43.625	54	-10.375	330	Vertical	-0.682
39.507 GHz	AVG	42.265	54	-11.735	177	Vertical	3.428
20.626 GHz	Peak	57.46	74	-16.54	32	Horizontal	-5.625
30.938 GHz	Peak	52.845	74	-21.155	24	Horizontal	-0.69
38.996 GHz	Peak	55.317	74	-18.683	37	Horizontal	3.367
20.626 GHz	AVG	52.559	54	-1.441	32	Horizontal	-5.625
30.938 GHz	AVG	41.499	54	-12.501	24	Horizontal	-0.69
38.996 GHz	AVG	42.429	54	-11.571	37	Horizontal	3.367

Table 6: Radiated Emissions Transmitting on 5180 MHz

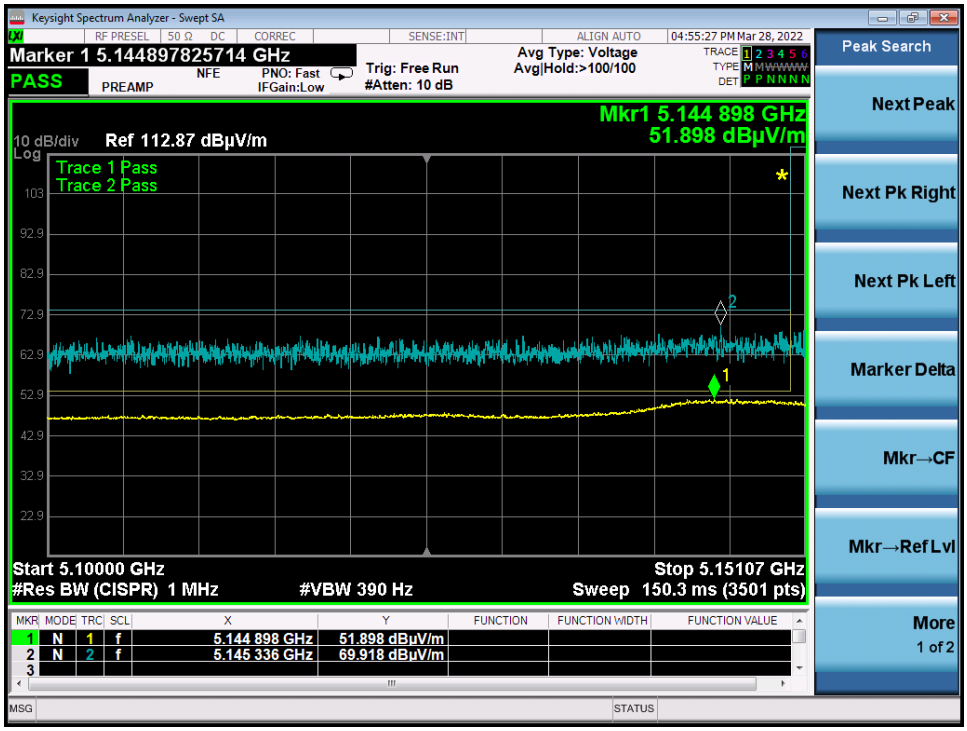


Figure 5: Band Edge Plot OFDM20 5180 MHz

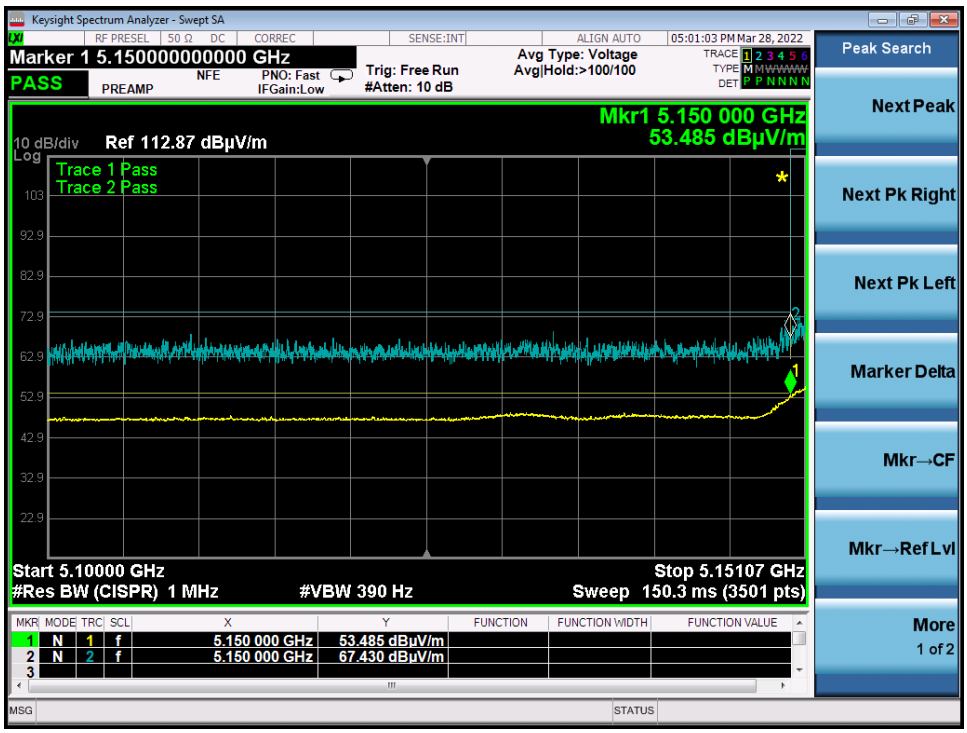


Figure 6: Band Edge OFDM20 5200MHz

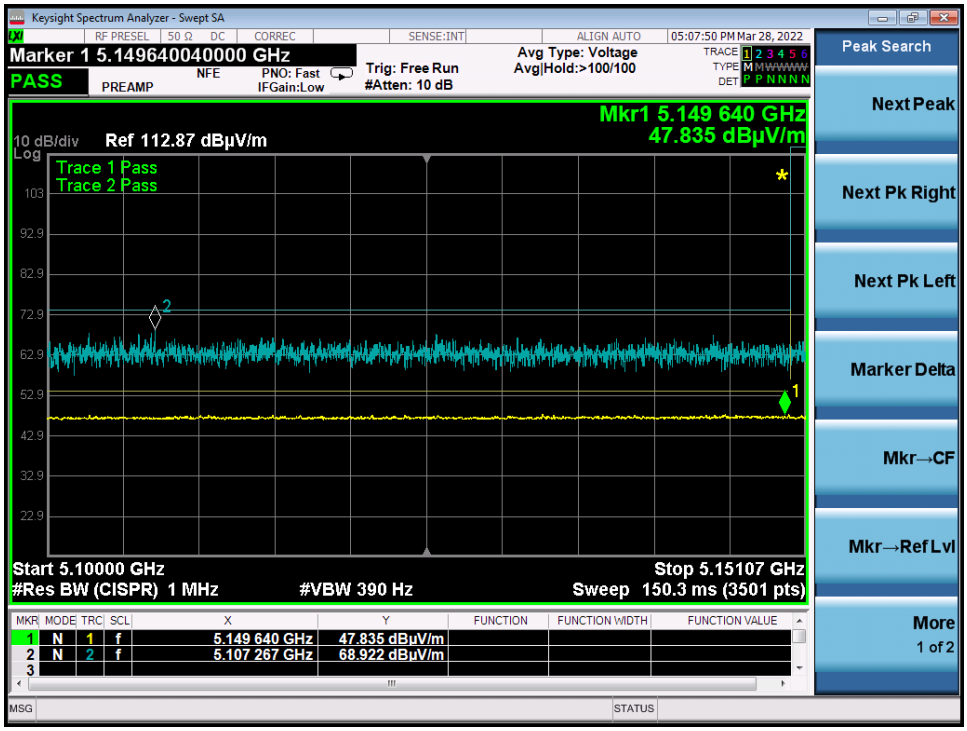


Figure 7: Band Edge OFDM20 5240MHz

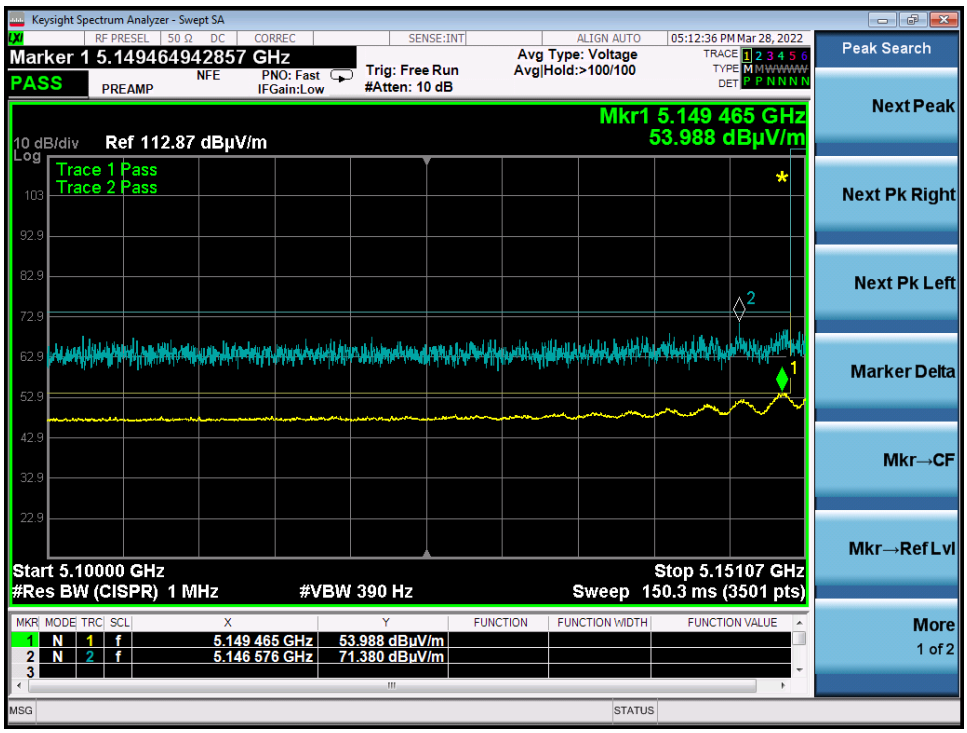


Figure 8: Band Edge HT20 5180MHz

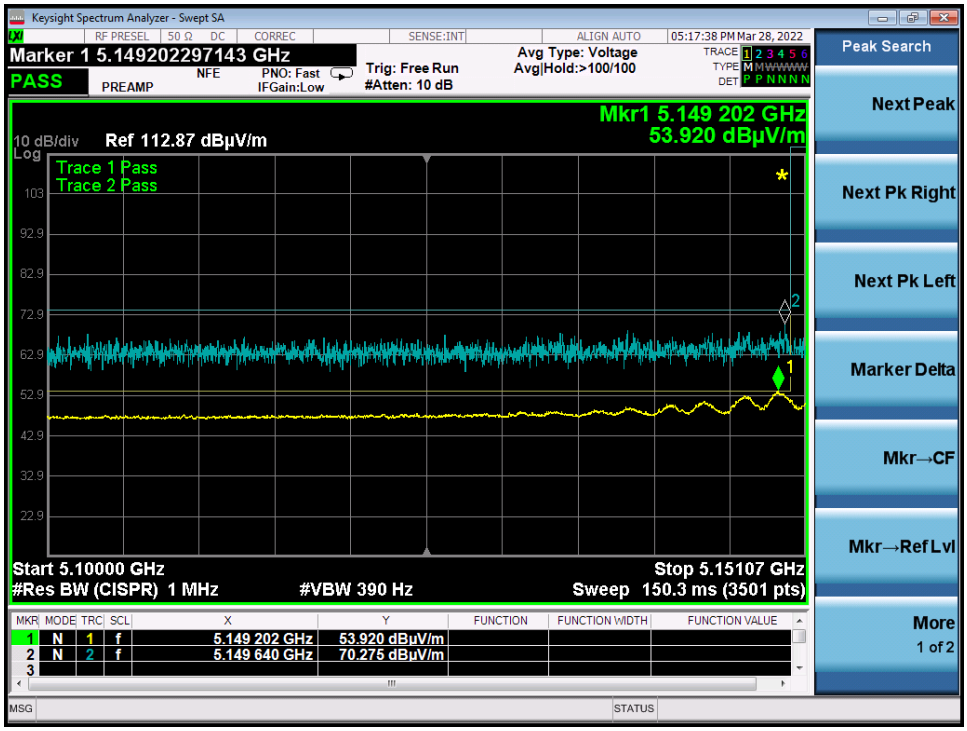


Figure 9: Band Edge HT20 5200MHz

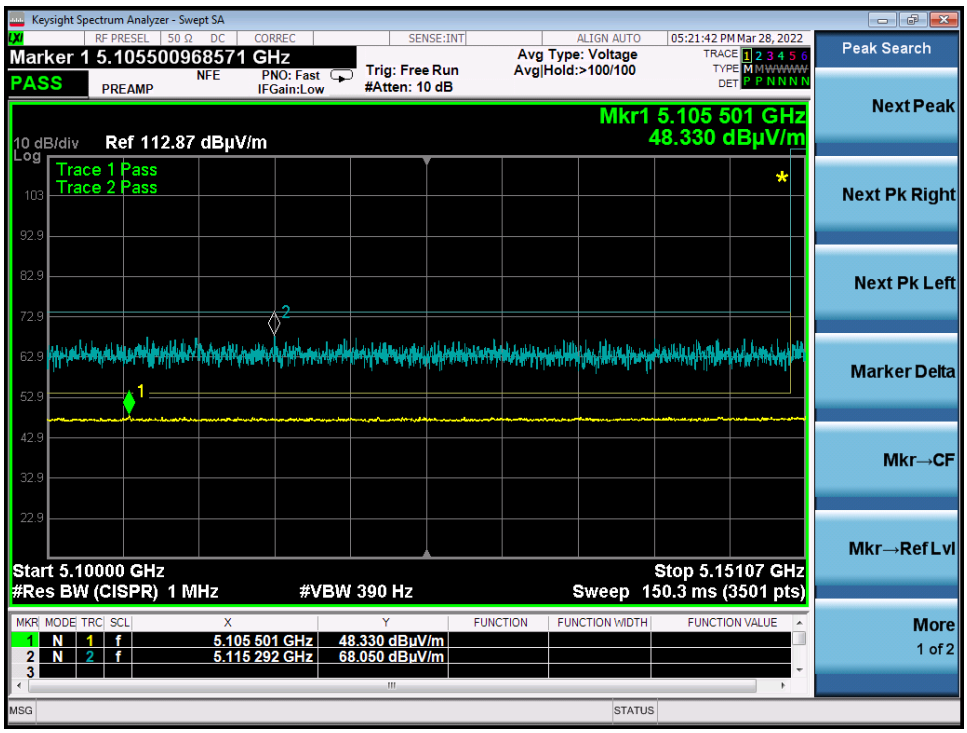


Figure 10: Band Edge HT20 5240MHz

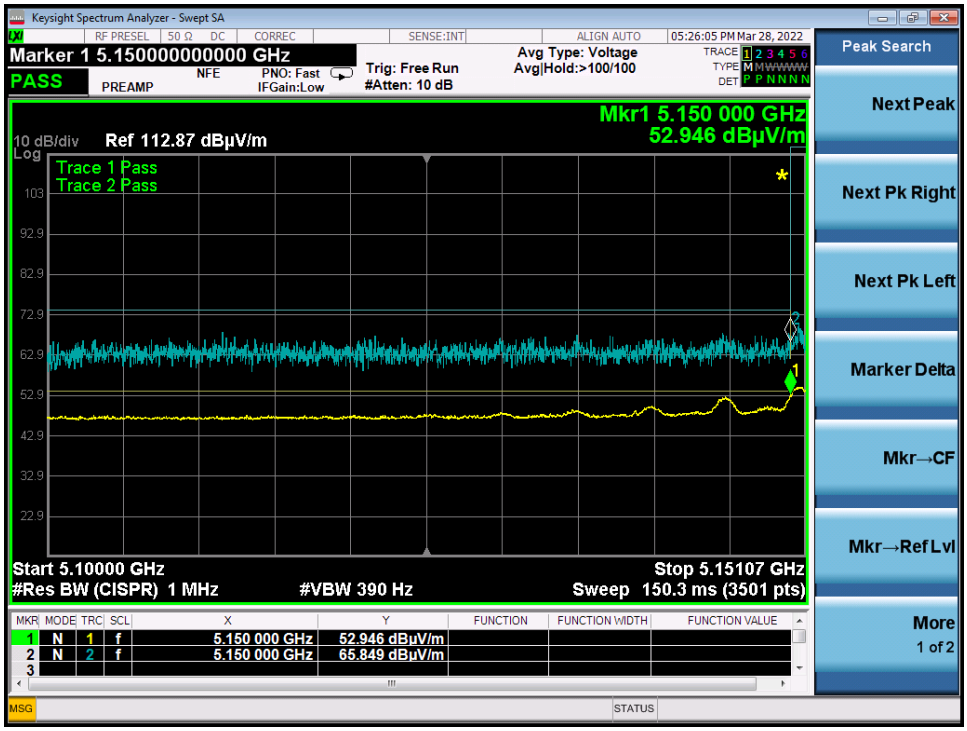


Figure 11: Band Edge HT40 5190MHz

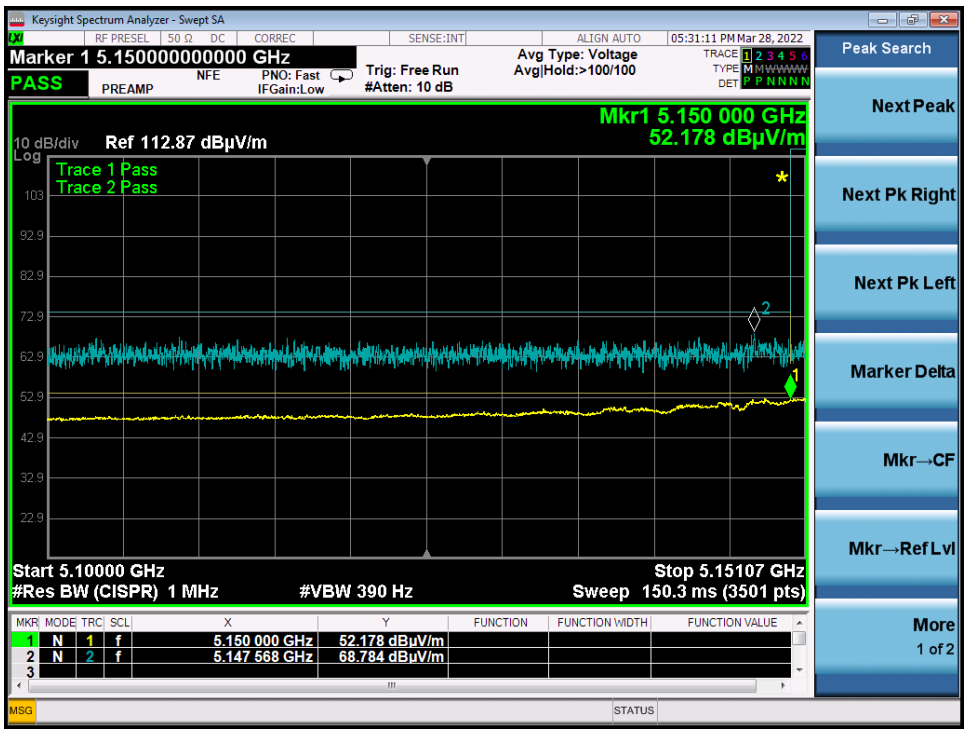


Figure 12: Band Edge HT40 5230MHz

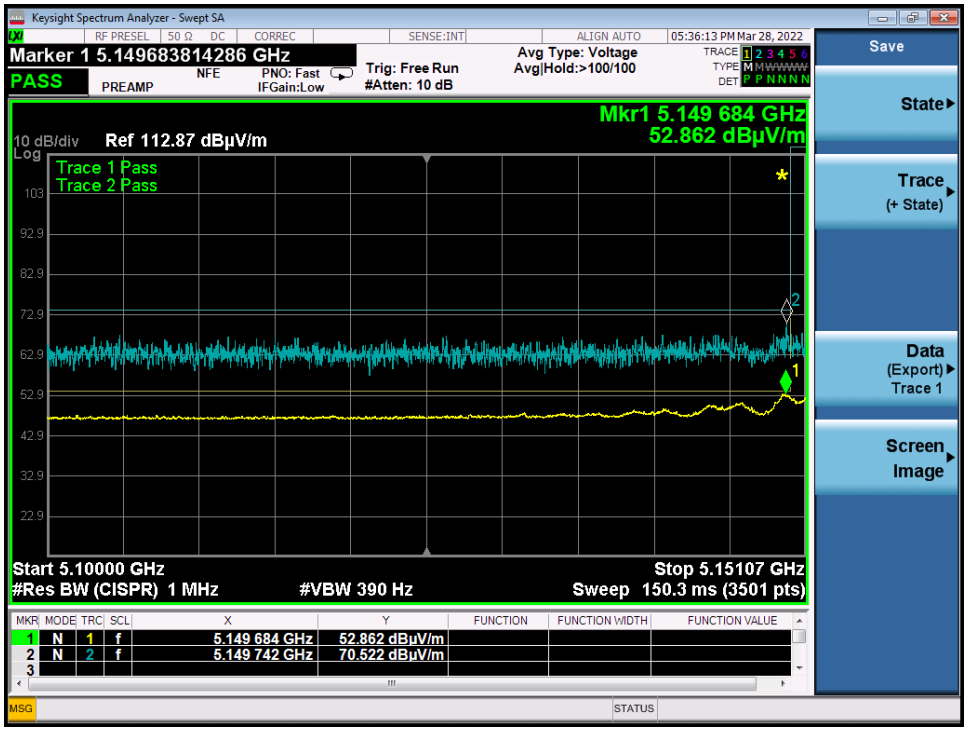


Figure 13: Band Edge VHT20 5180MHz

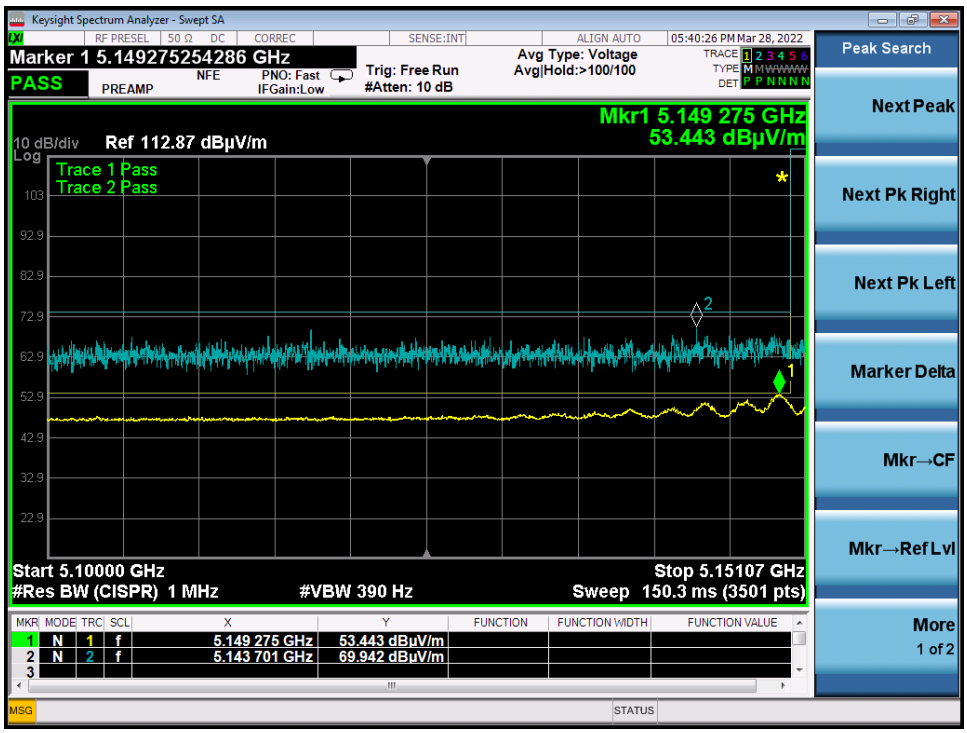


Figure 14: Band Edge VHT20 5200MHz

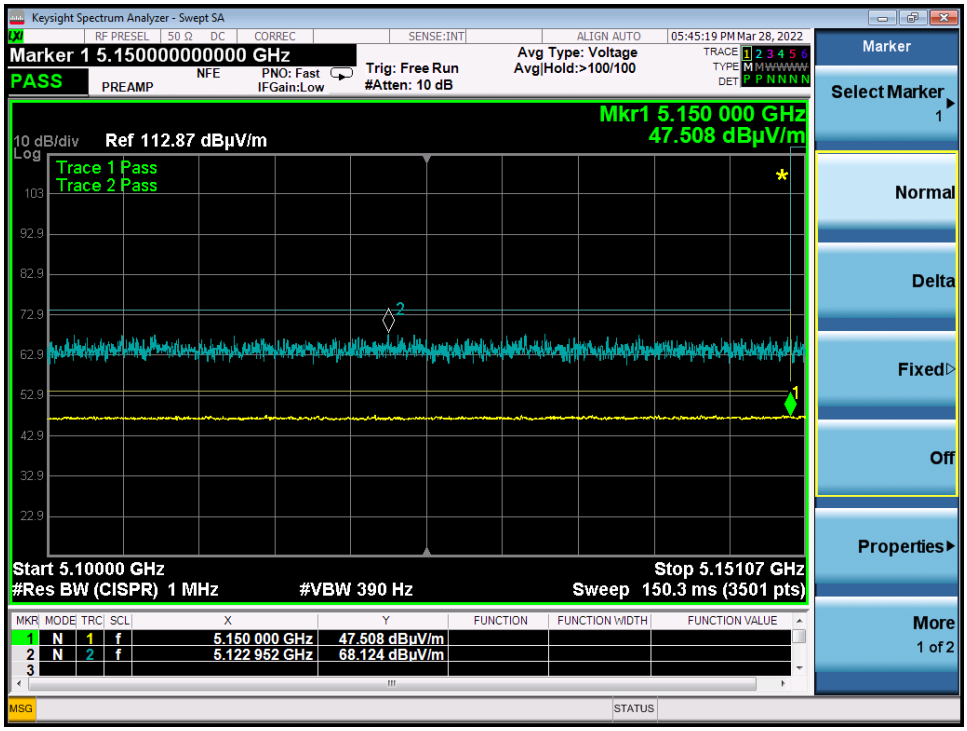


Figure 15: Band Edge VHT20 5240MHz

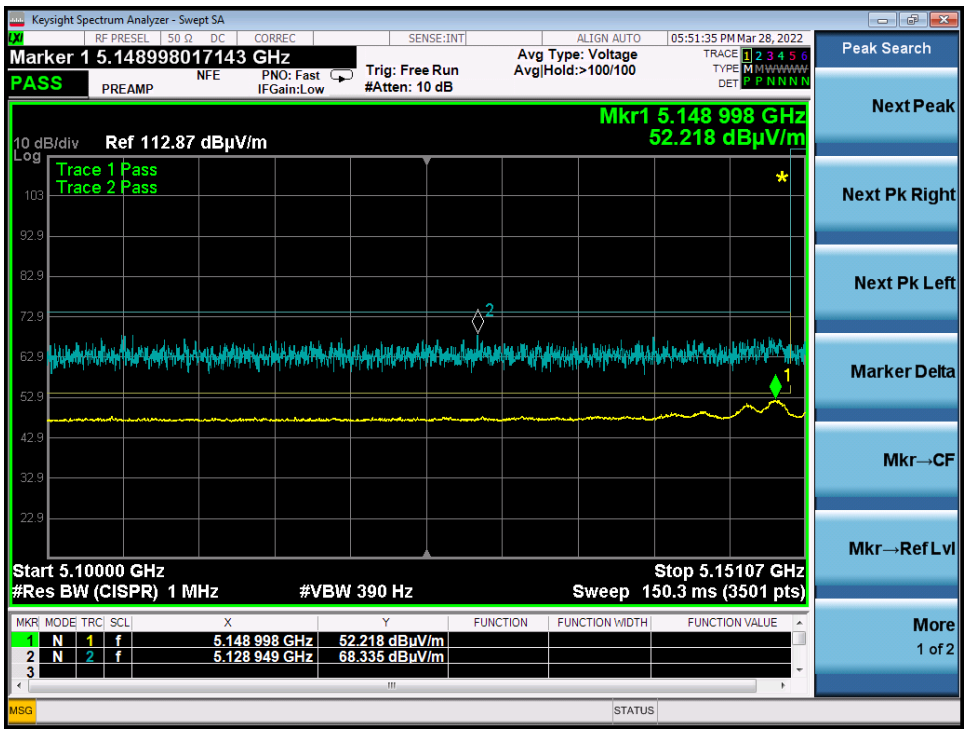


Figure 16: Band Edge VHT40 5190MHz

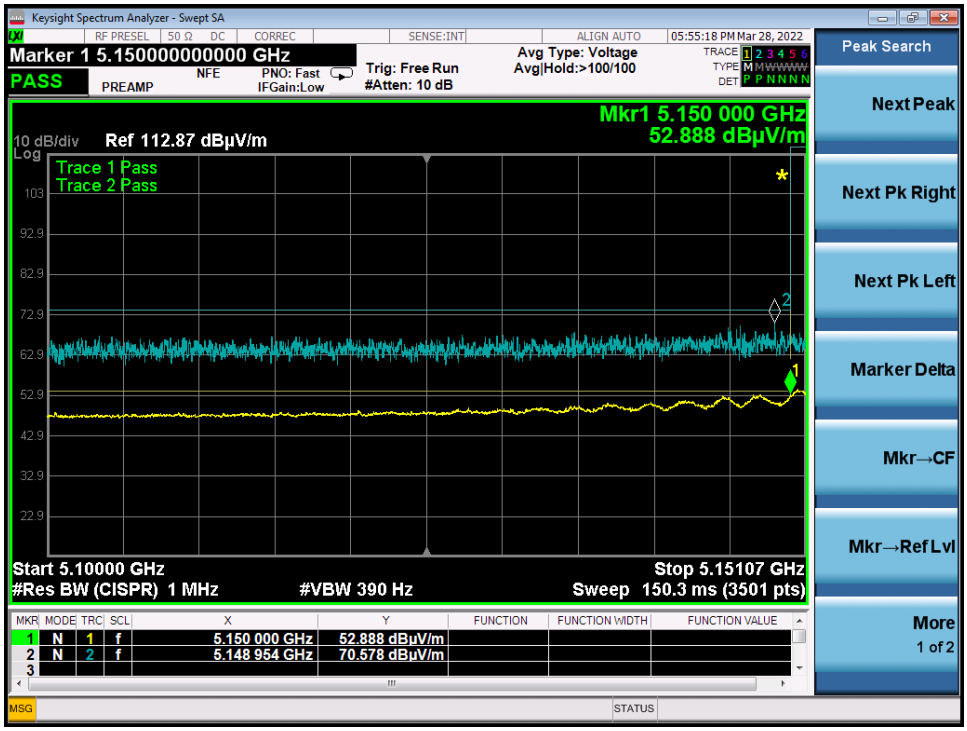


Figure 17: Band Edge VHT40 5230MHz

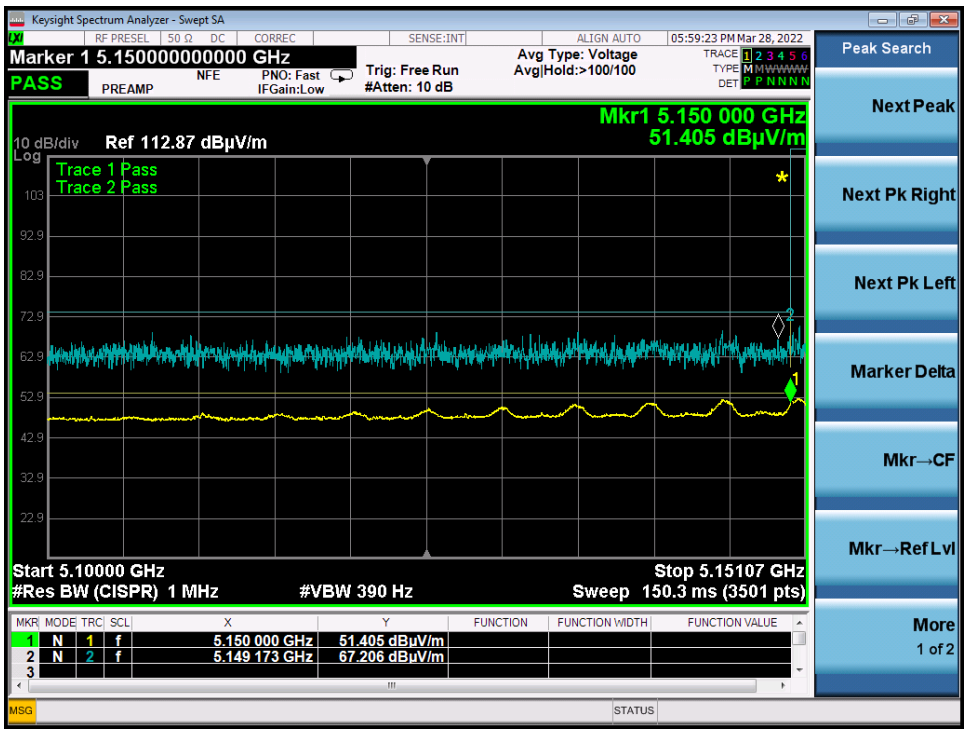


Figure 18: Band Edge VHT80 5210MHz

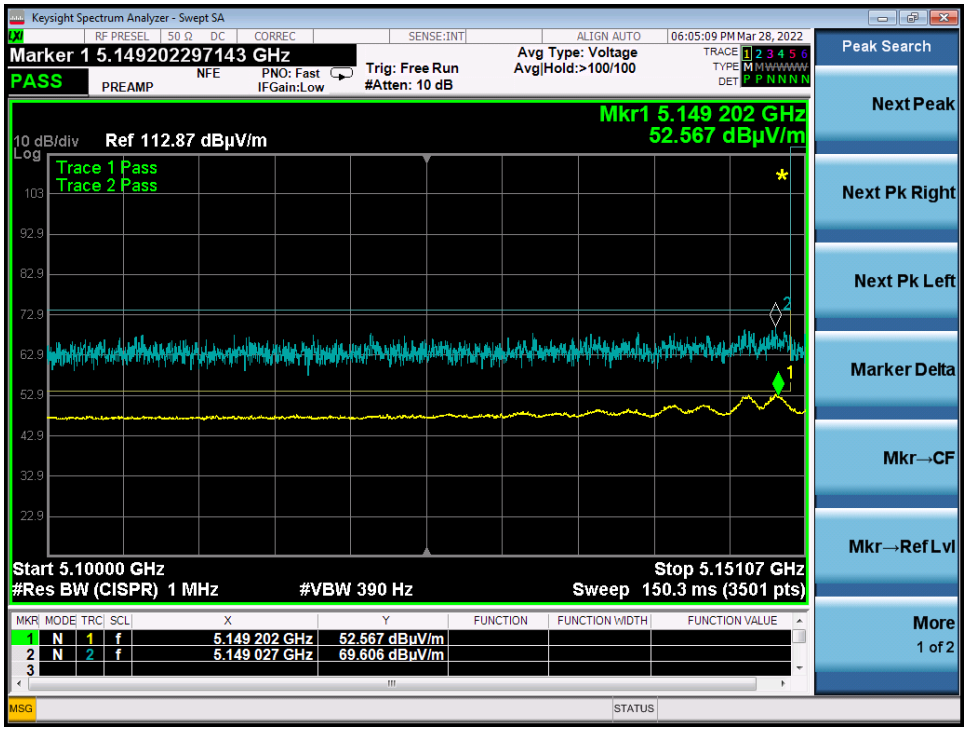


Figure 19: Band Edge HE20 5180MHz

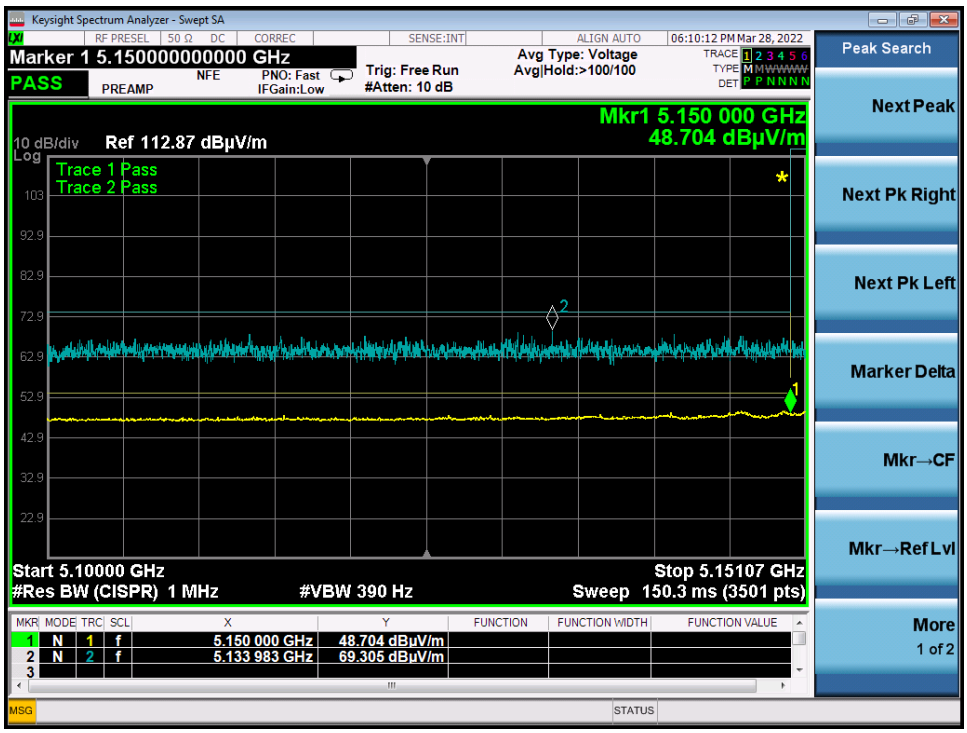


Figure 20: Band Edge HE20 5200MHz

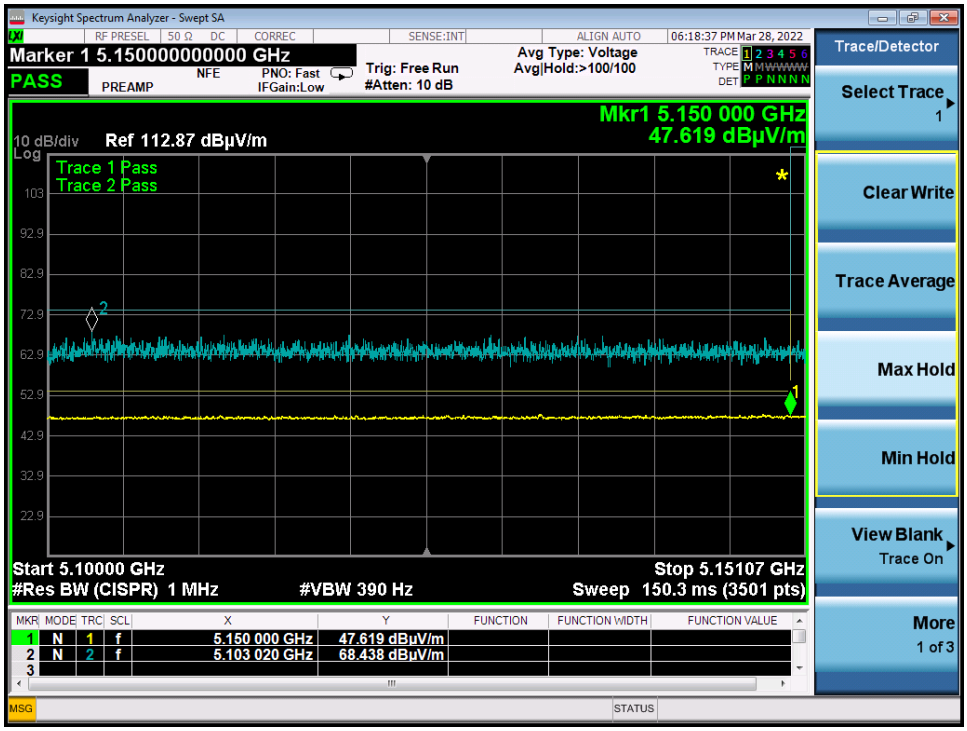


Figure 21: Band Edge HE20 5240MHz

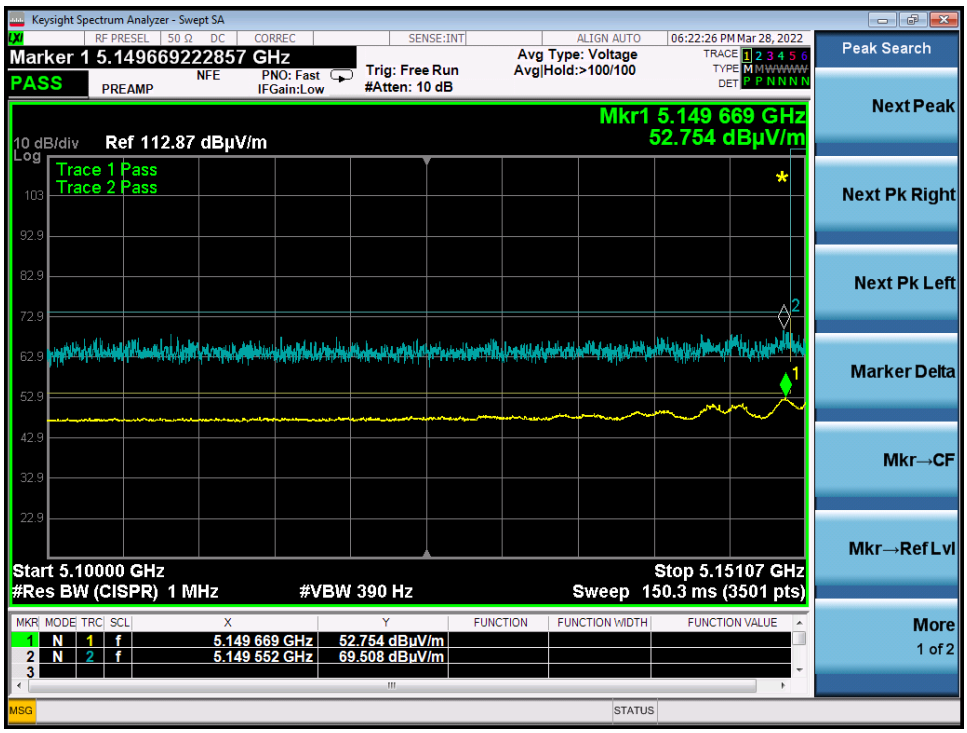


Figure 22: Band Edge HE40 5190MHz

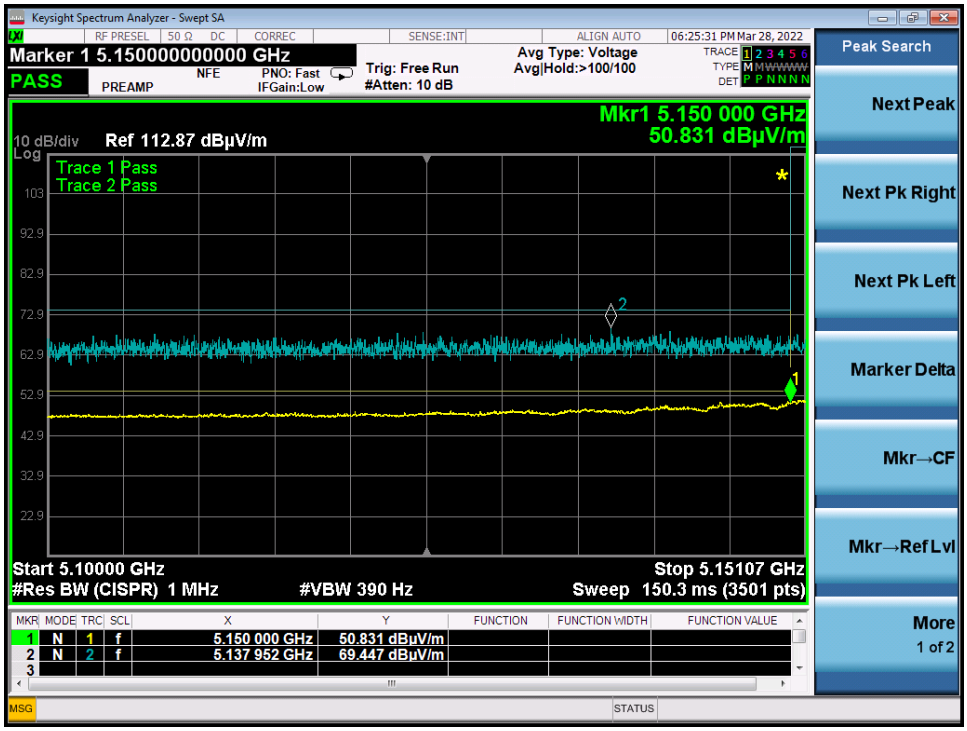


Figure 23: Band Edge HE40 5230MHz

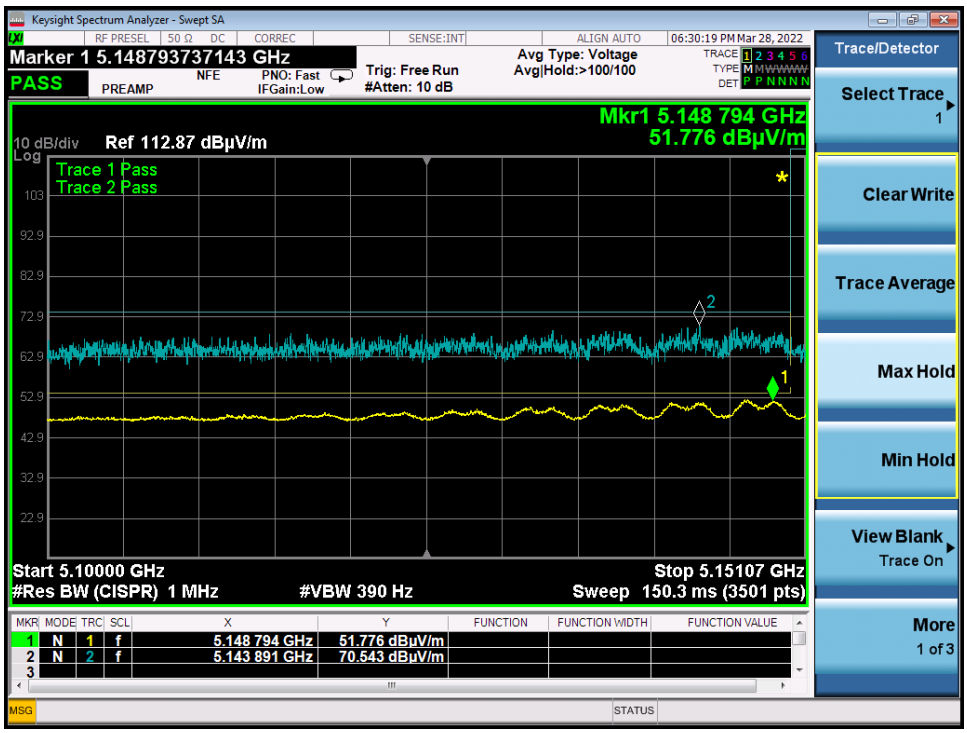


Figure 24: Band Edge HE80 5210MHz

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 17 dBm in any 1 MHz band during any time interval of continuous transmission. As per KDB 662911, when the EUT is using spatial-multiplexing in HT to HE modes, there is not additional array gain to accommodate. When the EUT uses Nss=1 data rates, the antenna gain is 6 dBi + Array gain of 6.02 dB which is a total of 12.02 dBi.

Results of this testing are summarized.

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Measured PSD
OFDM 20	5180	Mcs0_Nss4	20	12.02
OFDM 20	5210	Mcs0_Nss4	25	15.43
OFDM 20	5240	Mcs0_Nss4	30	15.28
HT 20	5180	Mcs0_Nss4	20	11.52
HT 20	5210	Mcs0_Nss4	23.5	14.39
HT 20	5240	Mcs0_Nss4	30	15.05
HT 40	5190	Mcs0_Nss4	19	8.99
HT 40	5230	Mcs0_Nss4	22.5	12.01
VHT 20	5180	Mcs0_Nss4	20	11.66
VHT 20	5210	Mcs0_Nss4	23	14.36
VHT 20	5240	Mcs0_Nss4	30	15.30
VHT 40	5190	Mcs0_Nss4	20	10.39
VHT 40	5230	Mcs0_Nss4	22.5	12.40
VHT 80	5210	Mcs0_Nss4	18	4.39
HE 20	5180	Mcs0_Nss4	20	10.31
HE 20	5210	Mcs0_Nss4	23.5	13.41
HE 20	5240	Mcs0_Nss4	30	13.83
HE 40	5190	Mcs0_Nss4	19.5	8.45
HE 40	5230	Mcs0_Nss4	23	11.74
HE 80	5210	Mcs0_Nss4	19	4.49

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Measured PSD
OFDM 20	5180	Mcs0_Nss1	20	12.02
OFDM 20	5210	Mcs0_Nss1	25	15.43
OFDM 20	5240	Mcs0_Nss1	30	15.28
HT 20	5180	Mcs0_Nss1	20	11.52
HT 20	5210	Mcs0_Nss1	23.5	14.39
HT 20	5240	Mcs0_Nss1	30	15.05
HT 40	5190	Mcs0_Nss1	19	8.99
HT 40	5230	Mcs0_Nss1	22.5	12.01
VHT 20	5180	Mcs0_Nss1	20	11.66
VHT 20	5210	Mcs0_Nss1	23	14.36
VHT 20	5240	Mcs0_Nss1	30	15.30
VHT 40	5190	Mcs0_Nss1	20	10.39
VHT 40	5230	Mcs0_Nss1	22.5	12.40
VHT 80	5210	Mcs0_Nss1	18	4.39
HE 20	5180	Mcs0_Nss1	20	10.31
HE 20	5210	Mcs0_Nss1	23.5	13.41
HE 20	5240	Mcs0_Nss1	30	13.83
HE 40	5190	Mcs0_Nss1	19.5	8.45
HE 40	5230	Mcs0_Nss1	23	11.74
HE 80	5210	Mcs0_Nss1	19	4.49

Result

The maximum summed average power spectral density was less than the limit of 17dBm; therefore, the EUT complies with the specification.

-- End of Test Report --