UNIFIED COMPLIANCE LABORATORY

427 West 12800 South
Draper, UT 84020

Test Report

Certification

FCC ID	SWX-LBE5ACXR
ISED ID	6545A-LBE5ACXR
Equipment Under Test	LBE-5AC-XR
Test Report Serial Number	TR6348_02
Date of Test(s)	23 – 25, 29 June 1, 9 July and 12 August 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 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	airMAX
Model Number	LBE-5AC-XR
FCC ID	SWX-LBE5ACXR
ISED ID	6545A-LBE5ACXR

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.

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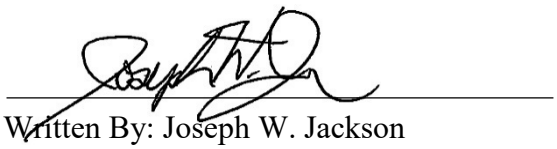
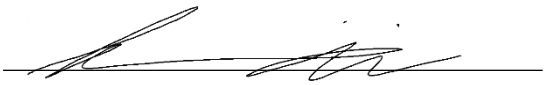
Unified Compliance Laboratory



Written By: Joseph W. Jackson



Reviewed By: Alex Macon

Revision History		
Revision	**Description**	**Date**
01	Original Report Release	5 August 2021
02	Amended Test Results in Sections 5.3 and 5.6 - Added information in Sections 2.6, 4.2, 5.1, 5.3, 5.4, 5.5 and 5.6 Added elevation data	13 August 2021

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	airMAX
Model Number	LBE-5AC-XR
Serial Number	0418D6A2AFB9
Dimensions (cm)	74.7 x 52.5 x 34.7

2.2 Description of EUT

The LBE-5AC-XR is a point-to-point transceiver, intended for outdoor use, operating in the 5 GHz WiFi, UNII-1, UNII-2A/2C and UNII-3 frequency bands. The LBE-5AC-XR is designed to the lightweight and aimed to create extremely long-distance wireless links. The LBE-5AC-XR also has a Bluetooth LE transceiver for device management. An Ethernet port is used for data transfer and to provide power using a POE-24V-24W POE power supply.

Band	WiFi Mode	Modulation Bandwidth	Modulation Type	Frequency (MHz)
UNII-1	n	10 MHz	HT	5160, 5170, 5180, 5190, 5200, 5210, 5220, 5230, 5245
	n	20 MHz	HT	5165, 5175, 5185, 5200, 5210, 5220, 5230, 5240
	n	30 MHz	HT	5170, 5180, 5190, 5200, 5210, 5220, 5235
	ac	40 MHz	VHT	5175, 5185, 5200, 5215, 5230
	ac	50 MHz	VHT	5180, 5190, 5200, 5215, 5225
	ac	60 MHz	VHT	5185, 5190, 5200, 5210, 5220
	ac	80 MHz	VHT	5195, 5200, 5205, 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: airMAX MN: LBE5AC-XR (Note 1) SN: 0418D6A2AFB9	Wireless Transceiver	See Section 2.4
BN: Ubiquiti Inc.	POE Supply	POE Port See Section 2.4

MN: POE-24-24W (Note 1) SN: None		
BN: Dell MN: XPS 13 SN: None	Laptop PC	LAN Port / Shielded or Unshielded Cat 5e cable (Note 2)
BN: HP MN: Spectre SN: None	Laptop PC	LAN Port / Shielded or Unshielded 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

Name of Ports	No. of Ports Fitted to EUT	Cable Description/Length
AC (PoE Injector)	1	3 conductor power cord/80cm
LAN (PoE Injector)	1	Shielded or Unshielded Cat 5e cable/1 meter
Data	1	Shielded or Unshielded Cat 5e cable/8meters

2.5 Operating Environment

Power Supply	120 Vac to 24 Volt PoE Power
AC Mains Frequency	60 Hz
Temperature	20.6 – 26.6 °C
Humidity	31.0 – 52.4 %
Barometric Pressure	1019 mBar

2.6 Operating Modes

The LBE-5AC-XR 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 n/ac were investigated. All measurements are reported with the worst-case mode (802.11ac) unless otherwise stated.

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

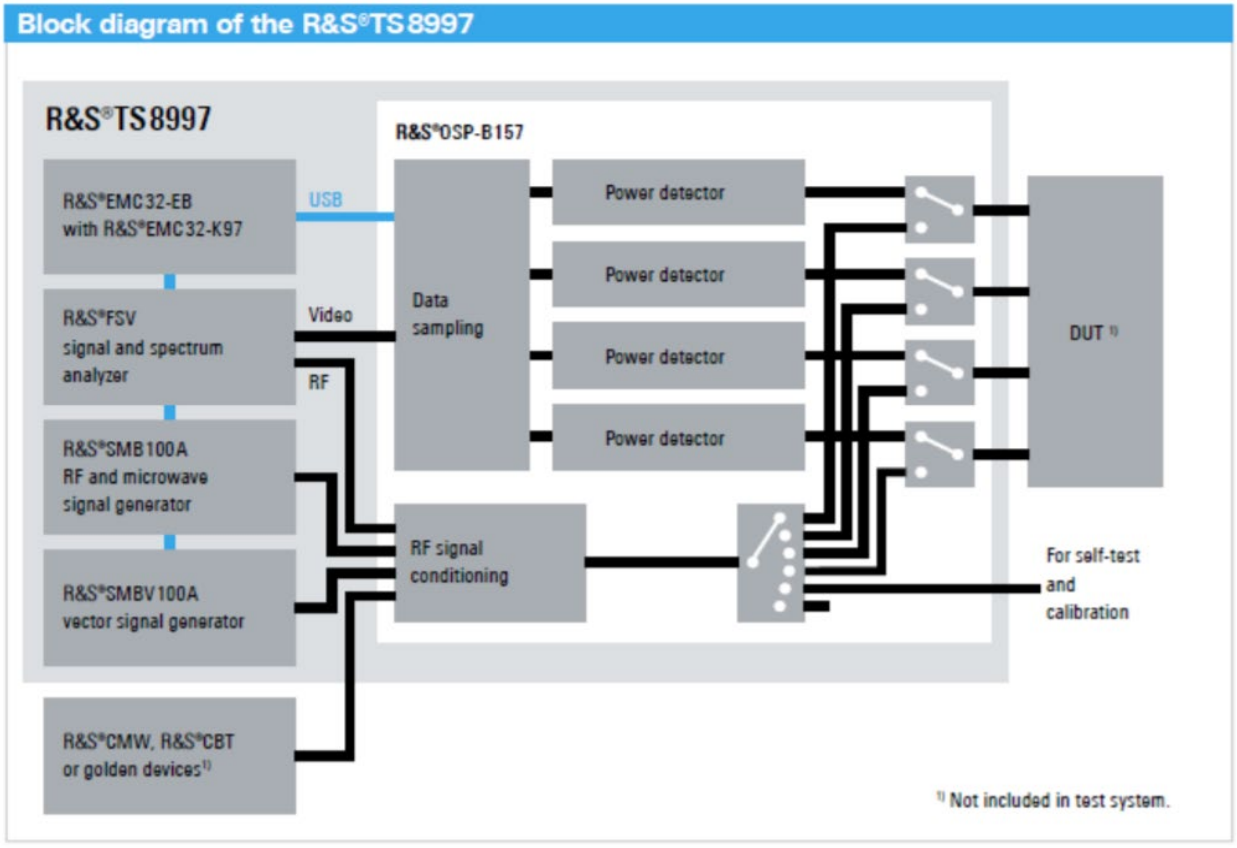


Diagram 1: Test Configuration Block Diagram

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	5160 to 5245	Compliant
15.407(e)	RSS-247 §6.2.2, §6.2.3	Peak Output Power	5160 to 5245	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	5160 to 5245	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-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

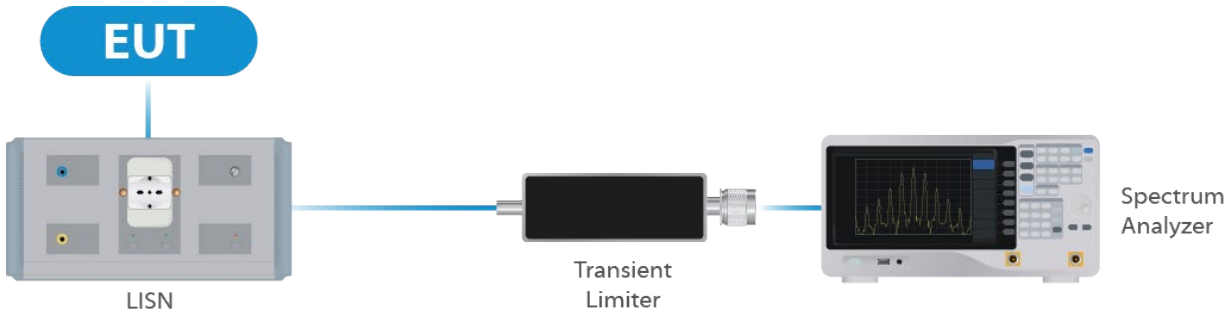


Figure 1: Conducted Emissions Test

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

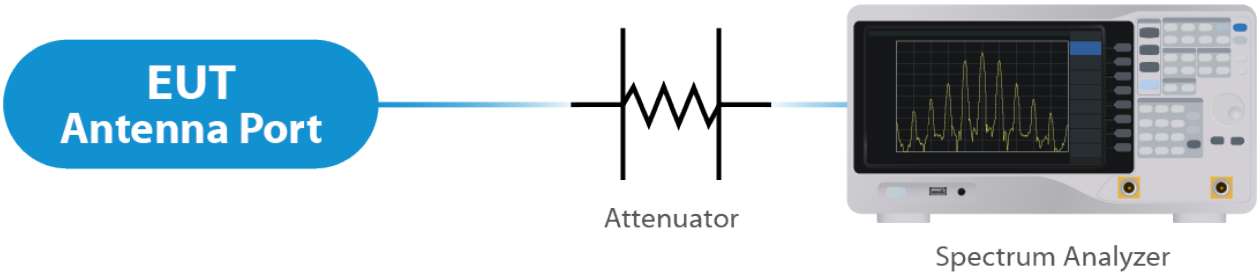


Figure 2: Direct Connect at the Antenna Port Test

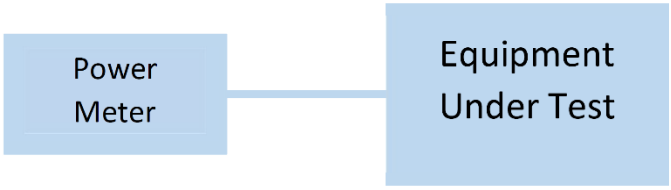


Figure 3: Output Power Measurement

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

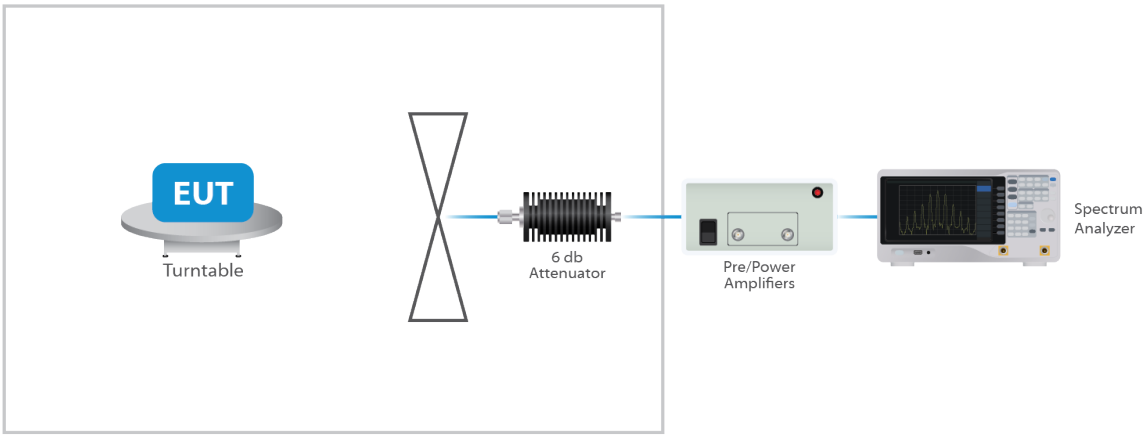


Figure 4: Radiated Emissions Test

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 (± 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 29 dBi. The integral antenna is not user replaceable while the optional dish antenna is user replaceable.

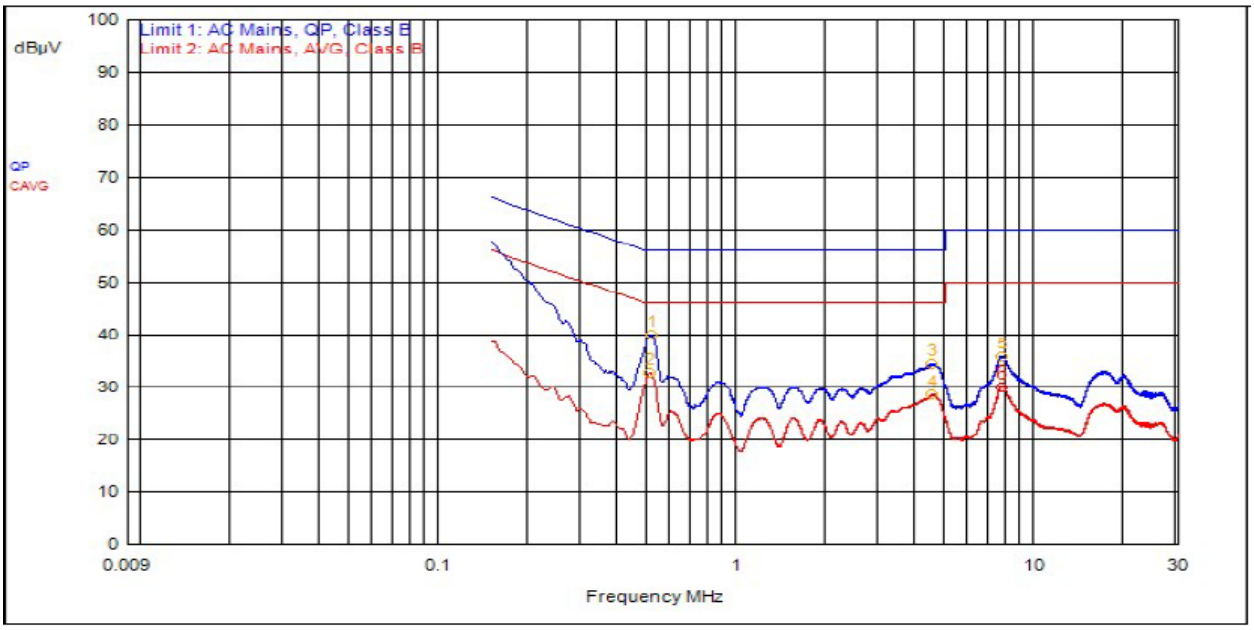
The transmitter chains are cross polarized.

Results

The EUT complied with the specification

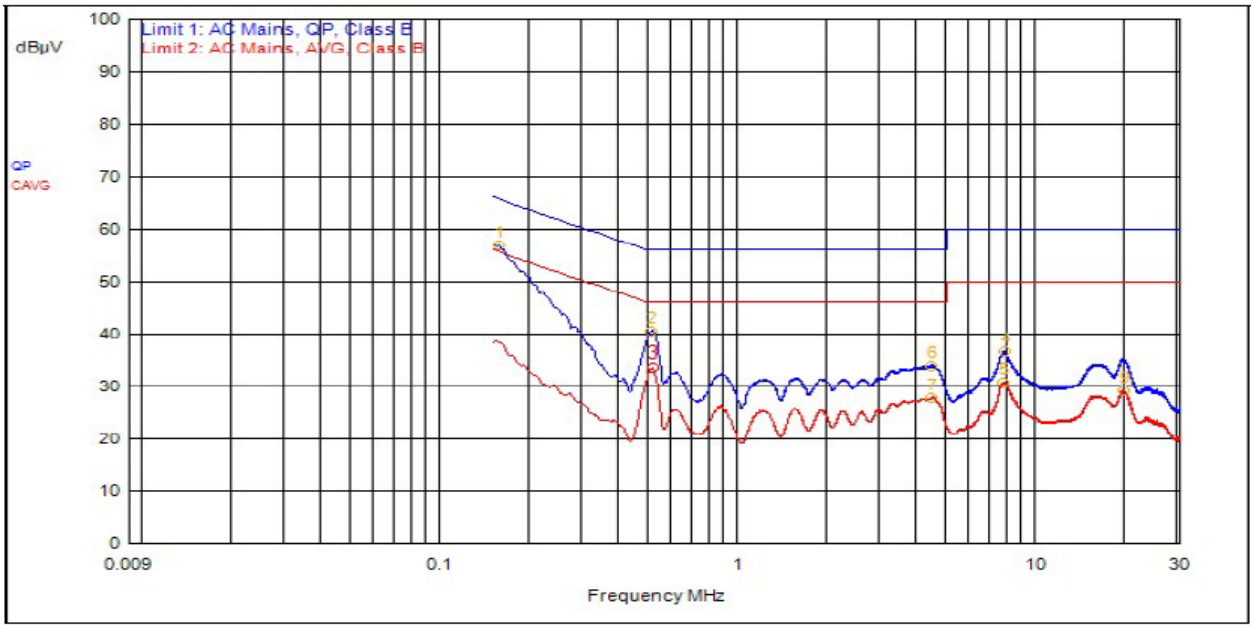
5.2 Conducted Emissions at Mains Ports Data

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	510,000kHz	12.4	0.0		QPeak	27.5	39.9	56.0	-16.1		
3	4.437MHz	12.3	0.1		QPeak	22.0	34.4	56.0	-21.6		
5	7.686MHz	12.3	0.2		QPeak	23.4	35.9	60.0	-24.1		
2	507,000kHz	12.4	0.0		C_AVG	20.4	32.8			46.0	-13.2
4	4.467MHz	12.3	0.1		C_AVG	16.1	28.5			46.0	-17.5
6	7.611MHz	12.3	0.2		C_AVG	17.6	30.1			50.0	-19.9

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	156,000kHz	12.4	0.0		QPeak	44.5	56.9	65.7	-8.8		
2	507,000kHz	12.4	0.0		QPeak	28.2	40.6	56.0	-15.4		
6	4.407MHz	12.3	0.1		QPeak	21.6	34.0	56.0	-22.0		
4	7.719MHz	12.3	0.2		QPeak	24.1	36.6	60.0	-23.4		
3	510,000kHz	12.4	0.0		C_AVG	21.0	33.5			46.0	-12.5
5	7.686MHz	12.3	0.2		C_AVG	18.3	30.8			50.0	-19.2
7	4.419MHz	12.3	0.1		C_AVG	15.5	27.9			46.0	-18.1
9	19.401MHz	12.2	0.2		C_AVG	16.8	29.2			50.0	-20.8

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)
HT 10	5160	9.05	12.55
HT 10	5200	9.1	13.8
HT 10	5245	11.35	18.4
HT 20	5165	17.9	24.1
HT 20	5200	17.9	23.0
HT 20	5240	18.0	25.1
HT 30	5170	26.85	35.4
HT 30	5200	27.15	34.8
HT 30	5235	27.0	37.5
VHT 40	5175	36.75	48.45
VHT 40	5200	37.0	46.35
VHT 40	5230	36.5	48.3
VHT 50	5180	44.75	57.25
VHT 50	5200	44.75	57.25
VHT 50	5225	45.0	58.0
VHT 60	5185	55.0	69.5
VHT 60	5200	55.5	69.0
VHT 60	5220	55.5	72.5
VHT 80	5195	76.5	99.5
VHT 80	5200	76.0	95.0
VHT 80	5210	76.0	90.0

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)(1) 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.

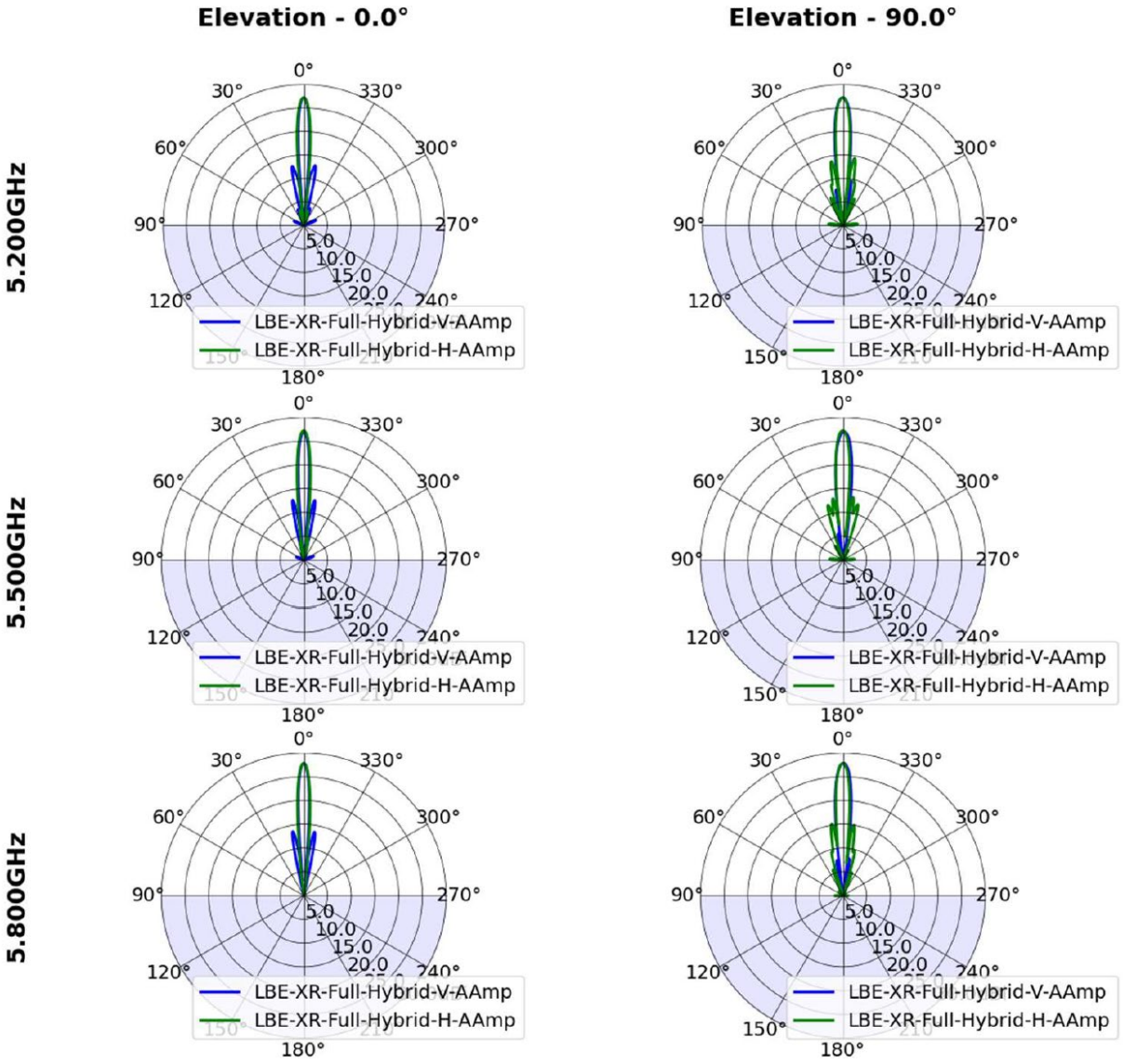
The maximum average RF conducted output power measured for this device was 25.27 dBm or 336.51 mW. The limit is 30 dBm, or 1 Watt when using an antenna with 23 dBi (Fixed point to point) or less gain. The integral antenna has a gain of 3 dBi with the dish antenna having a gain of 29 dBi. TP settings reflected are with the 3 dBi antenna.

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured EIRP	Measured PSD
HT 10	5160	Mcs0	12	12.21	15.21	0.54
HT 10	5200	Mcs0	22	22.67	25.67	0.83
HT 10	5245	Mcs0	25	25.27	28.27	13.33
HT 20	5165	Mcs0	7.5	7.31	10.31	-7.43
HT 20	5200	Mcs0	16	17.32	20.32	2.54
HT 20	5240	Mcs0	22	23.15	26.15	8.25
HT 30	5170	Mcs0	14	14.52	17.52	-2.12
HT 30	5200	Mcs0	16	17.35	20.35	0.58
HT 30	5235	Mcs0	21	22.32	25.32	6.07
VHT 40	5175	Mcs0	5.5	5.24	8.24	-12.66
VHT 40	5200	Mcs0	12.5	12.94	15.94	-4.86
VHT 40	5230	Mcs0	16	17.42	20.42	-0.48
VHT 50	5180	Mcs0	13.5	13.57	16.57	-5.06
VHT 50	5200	Mcs0	12	13.02	16.02	-5.74
VHT 50	5225	Mcs0	15	16.38	19.38	-1.96
VHT 60	5185	Mcs0	16	16.79	19.79	-2.44
VHT 60	5200	Mcs0	12	13.0	16.0	-6.55
VHT 60	5220	Mcs0	14.5	15.45	18.45	-3.75
VHT 80	5195	Mcs0	5.5	5.49	8.49	-15.65
VHT 80	5200	Mcs0	3	3.66	6.66	-17.15
VHT 80	5210	Mcs0	9.5	9.9	12.9	-11.31

Table 4: 3 dBi Antenna

Modulation (BW)	Frequency (MHz)	Data Rate	Conducted Output Power
HT 10	5160	Mcs0	-13.79
HT 10	5200	Mcs0	-3.33
HT 10	5245	Mcs0	-0.73
HT 20	5165	Mcs0	-18.69
HT 20	5200	Mcs0	-8.68
HT 20	5240	Mcs0	-2.85
HT 30	5170	Mcs0	-11.48
HT 30	5200	Mcs0	-8.65
HT 30	5235	Mcs0	-3.68
VHT 40	5175	Mcs0	-20.76
VHT 40	5200	Mcs0	-13.06
VHT 40	5230	Mcs0	-8.58
VHT 50	5180	Mcs0	-12.43
VHT 50	5200	Mcs0	-12.98
VHT 50	5225	Mcs0	-9.62
VHT 60	5185	Mcs0	-9.21
VHT 60	5200	Mcs0	-13.0
VHT 60	5220	Mcs0	-10.55
VHT 80	5195	Mcs0	-20.51
VHT 80	5200	Mcs0	-22.34
VHT 80	5210	Mcs0	-16.10

Table 5: 29 dBi Antenna



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). When utilizing the dish antenna, the e.i.r.p. at an elevation angle above 30 degrees as measured from the horizon does not exceed 125 mW (21 dBm)

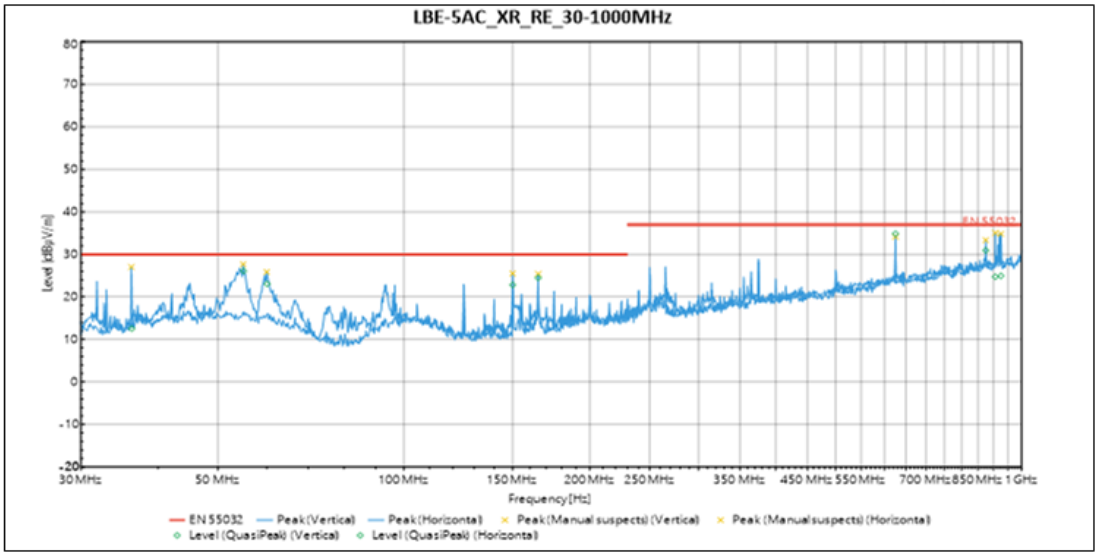
5.5 §15.407(b) Spurious Emissions

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. In order to reduce test time, the radiated spurious emissions at the lowest, middle, and highest channel were measured at the maximum power of TP25, 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 5210 MHz 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

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.



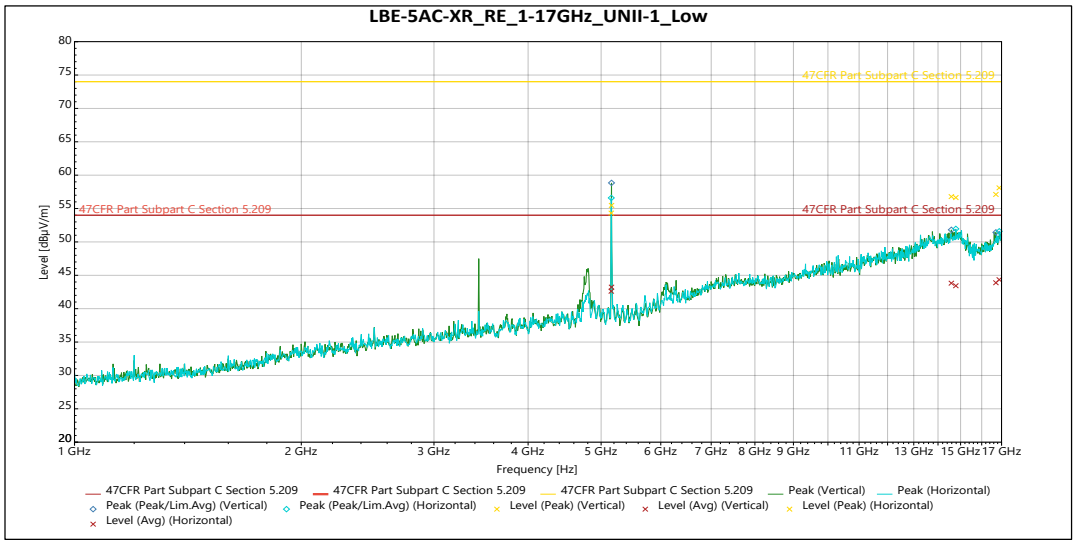
Vertical

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Correction (dB)
QuasiPeak	36.268 MHz	12.547	30	-17.453	246	0.995	Vertical	-14.359
QuasiPeak	55.037 MHz	26.11	30	-3.89	31	3.661	Vertical	-12.734
QuasiPeak	60.067 MHz	23.037	30	-6.963	110	3.442	Vertical	-13.432
QuasiPeak	150.02 MHz	22.839	30	-7.161	59	1.167	Vertical	-17.799
QuasiPeak	164.98 MHz	24.483	30	-5.517	213	1.034	Vertical	-16.827
QuasiPeak	906.67 MHz	24.727	37	-12.273	328	3.059	Vertical	-0.573
QuasiPeak	925.77 MHz	24.963	37	-12.037	309	1.735	Vertical	0.037

Horizontal

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin	Azimuth (°)	Height	Pol.	Correction (dB)
QuasiPeak	625 MHz	34.856	37	-2.144	153	1.362	Horizontal	-4.944
QuasiPeak	875.04 MHz	30.931	37	-6.069	133	1.125	Horizontal	-1.207

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	14.583 GHz	56.793	74	-17.207	113	3.317	Vertical	14.583
Peak	16.71 GHz	57.115	74	-16.885	210	1.5	Vertical	15.567

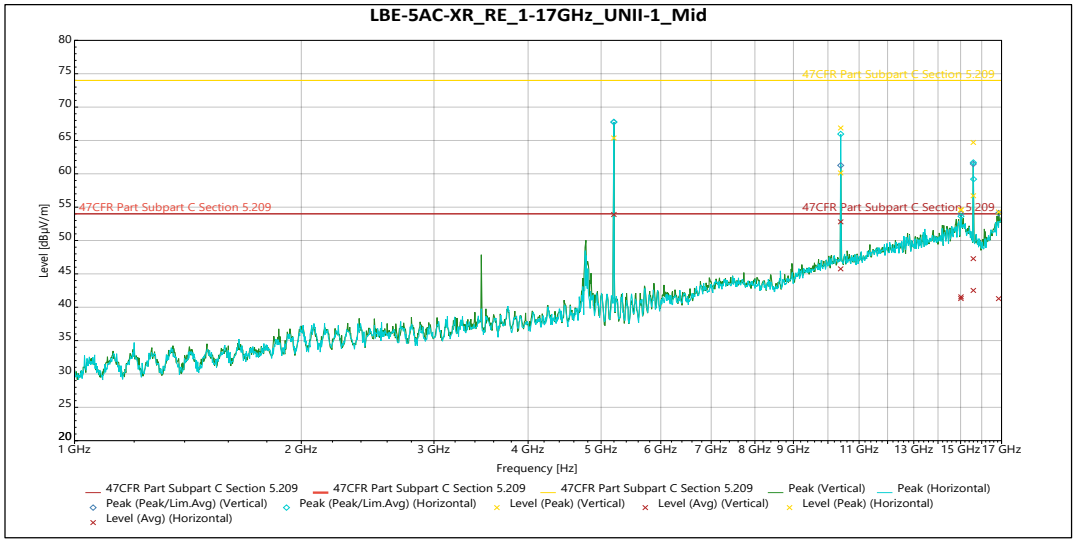
Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Avg	14.583 GHz	43.82	54	-10.18	113	3.317	Vertical	14.583
Avg	16.71 GHz	43.882	54	-10.118	210	1.5	Vertical	15.567

Horizontal

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Peak	14.784 GHz	56.638	74	-17.362	212	1.842	Horizontal	14.094
Peak	16.881 GHz	58.1	74	-15.9	153	2.648	Horizontal	16.281

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Avg	14.784 GHz	43.433	54	-10.567	212	1.842	Horizontal	14.094
Avg	16.881 GHz	44.344	54	-9.656	153	2.648	Horizontal	16.281

Table 7: Transmitting on the Lowest Frequency 5160 MHz 1 – 17 GHz



Vertical

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Peak	10.398 GHz	60.126	74	-13.874	81	1.632	Vertical	0.677
Peak	15.016 GHz	54.595	74	-19.405	176	2.687	Vertical	6.576
Peak	15.595 GHz	64.703	74	-9.297	135	1.634	Vertical	3.627
Peak	16.853 GHz	54.267	74	-19.733	317	4	Vertical	7.452

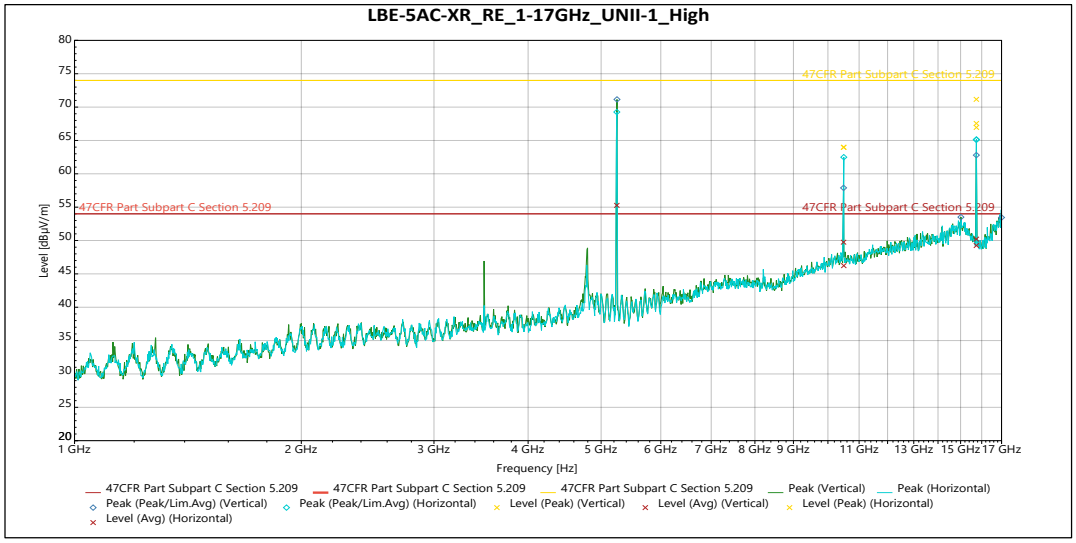
Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Avg	10.398 GHz	45.747	54	-8.253	81	1.632	Vertical	0.677
Avg	15.016 GHz	41.297	54	-12.703	176	2.687	Vertical	6.576
Avg	15.595 GHz	47.275	54	-6.725	135	1.634	Vertical	3.627
Avg	16.853 GHz	41.286	54	-12.714	317	4	Vertical	7.452

Horizontal

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Peak	10.399 GHz	66.869	74	-7.131	81	2.135	Horizontal	0.68
Peak	15.02 GHz	54.574	74	-19.426	47	1.673	Horizontal	6.776
Peak	15.596 GHz	56.706	74	-17.294	70	2.138	Horizontal	3.649

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Avg	10.399 GHz	52.802	54	-1.198	81	2.135	Horizontal	0.68
Avg	15.02 GHz	41.559	54	-12.441	47	1.673	Horizontal	6.776
Avg	15.596 GHz	42.518	54	-11.482	70	2.138	Horizontal	3.649

Table 8: Transmitting on the Middle Frequency 5200 MHz 1 – 17 GHz



Vertical

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Peak	10.49 GHz	63.958	74	-10.042	1	2.641	Vertical	0.425
Peak	15.742 GHz	67.554	74	-6.446	135	2.138	Vertical	3.66

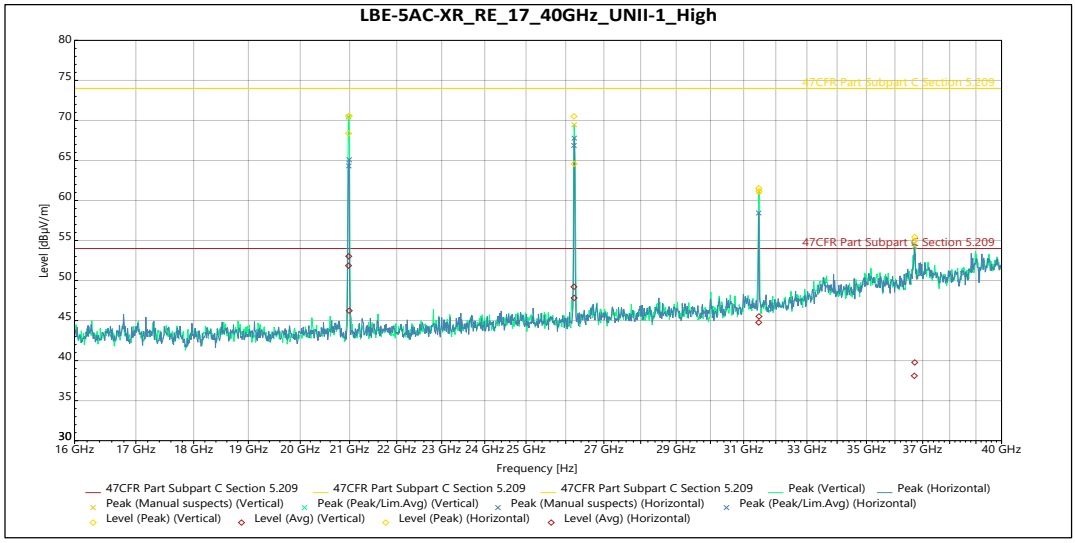
Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Avg	10.49 GHz	49.747	54	-4.253	1	2.641	Vertical	0.425
Avg	15.742 GHz	50.211	54	-3.789	135	2.138	Vertical	3.66

Horizontal

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Avg	10.497 GHz	46.228	54	-7.772	83	2.138	Horizontal	0.704
Avg	15.743 GHz	49.246	54	-4.754	139	2.641	Horizontal	3.649

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Height (m)	Pol.	Correction (dB)
Peak	10.497 GHz	63.99	74	-10.01	83	2.138	Horizontal	0.704
Peak	15.743 GHz	66.95	74	-7.05	139	2.641	Horizontal	3.649

Table 9: Transmitting on the Highest Frequency 5245 MHz 1 – 17 GHz



Vertical

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
Peak	20.977 GHz	68.376	74	-5.624	96	Vertical	-5.467
Peak	26.218 GHz	64.579	74	-9.421	83	Vertical	-5.584
Peak	31.473 GHz	61.142	74	-12.858	62	Vertical	-0.211
Peak	36.711 GHz	55.427	74	-18.573	135	Vertical	0.803

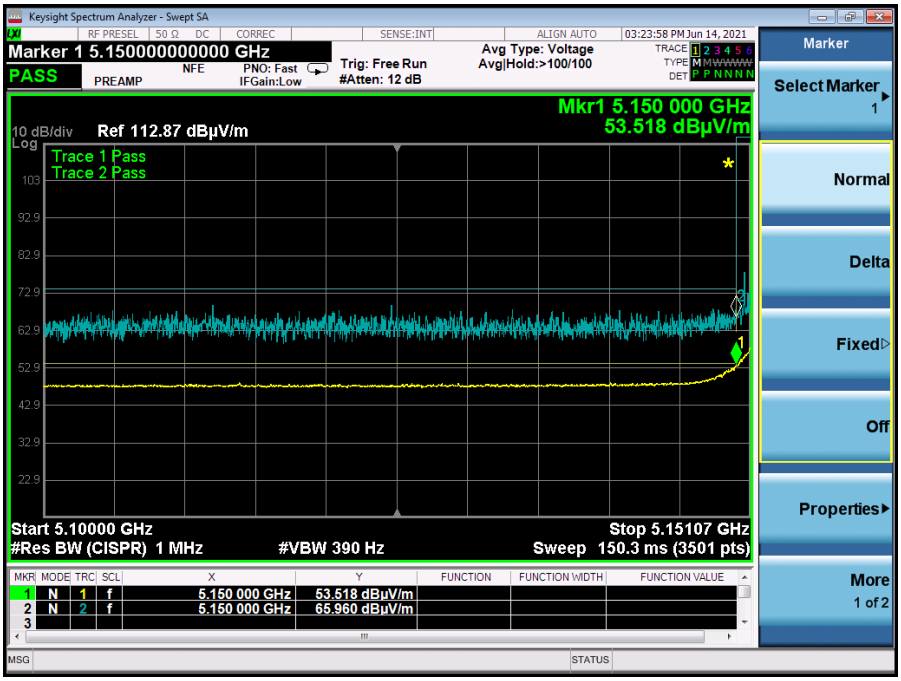
Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
Avg	20.977 GHz	51.859	54	-2.141	96	Vertical	-5.467
Avg	26.218 GHz	47.831	54	-6.169	83	Vertical	-5.584
Avg	31.473 GHz	45.523	54	-8.477	62	Vertical	-0.211
Avg	36.711 GHz	39.766	54	-14.234	135	Vertical	0.803

Horizontal

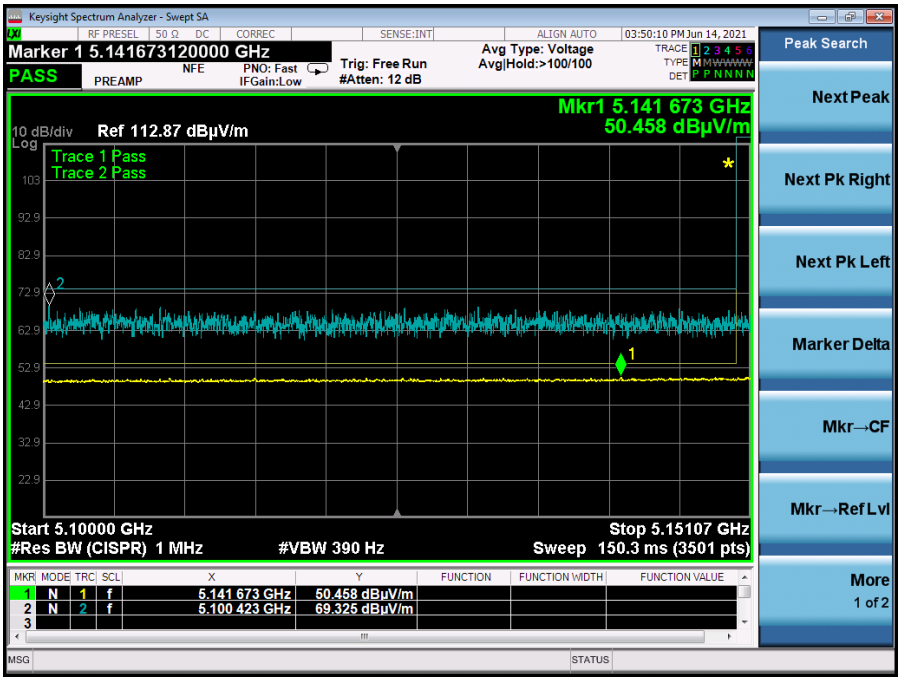
Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
Peak	20.982 GHz	70.551	74	-3.449	59	Horizontal	-5.431
Peak	20.992 GHz	70.541	74	-3.459	59	Horizontal	-5.436
Peak	26.213 GHz	70.51	74	-3.49	175	Horizontal	-5.514
Peak	31.465 GHz	61.534	74	-12.466	87	Horizontal	-0.412
Peak	36.697 GHz	54.953	74	-19.047	83	Horizontal	0.977

Source	Frequency	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Azimuth (°)	Pol.	Correction (dB)
Avg	20.982 GHz	53.03	54	-0.97	59	Horizontal	-5.431
Avg	20.992 GHz	46.227	54	-7.773	59	Horizontal	-5.436
Avg	26.213 GHz	49.222	54	-4.778	175	Horizontal	-5.514
Avg	31.465 GHz	44.755	54	-9.245	87	Horizontal	-0.412
Avg	36.697 GHz	38.097	54	-15.903	83	Horizontal	0.977

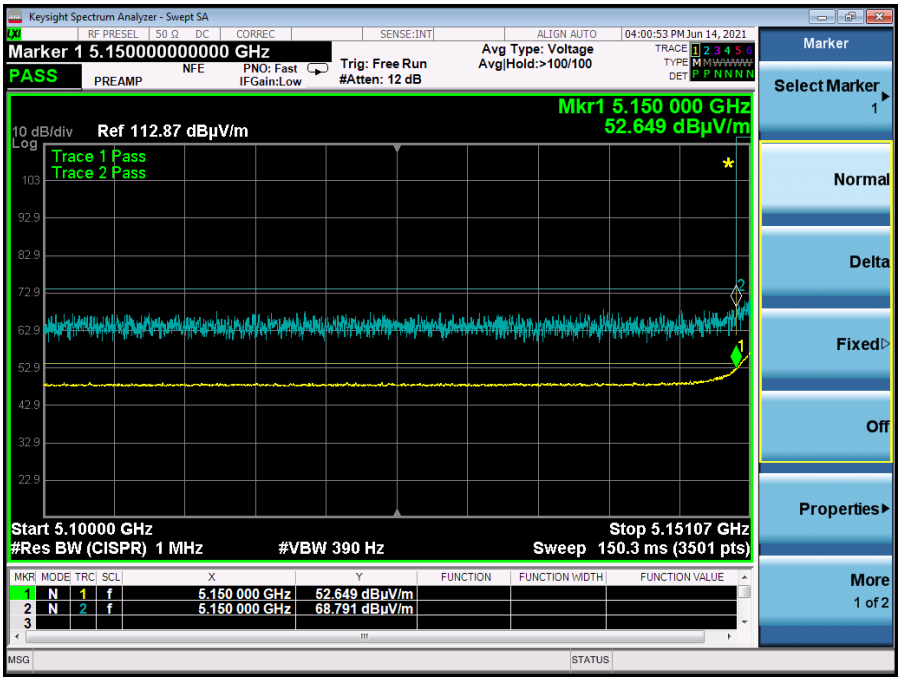
Table 10: Transmitting on the Highest Frequency 5245 MHz 1 – 40 GHZ (worse case)



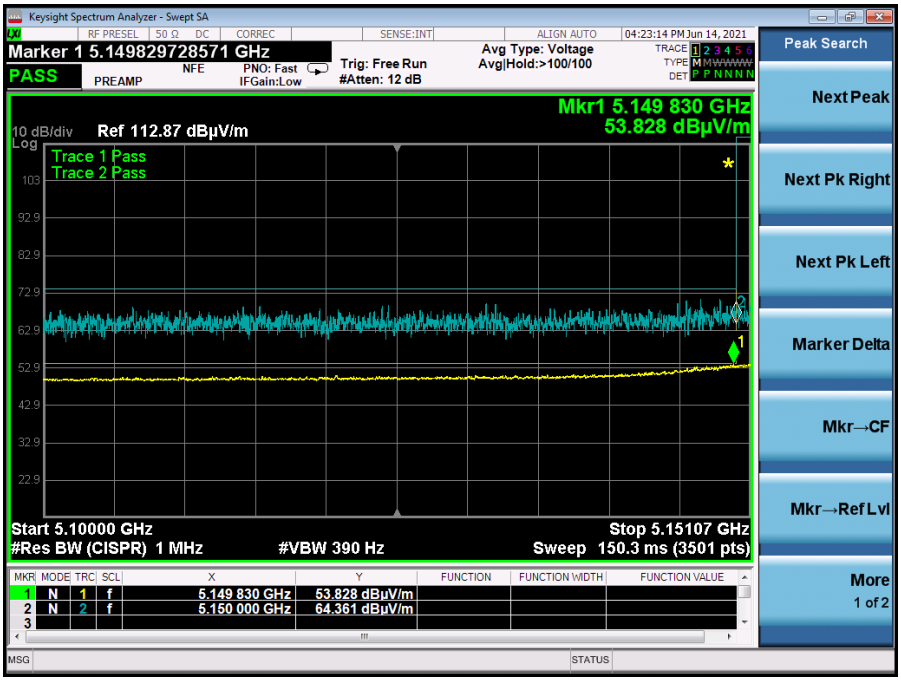
Graph 1: Band Edge HT10 – 5160 MHz



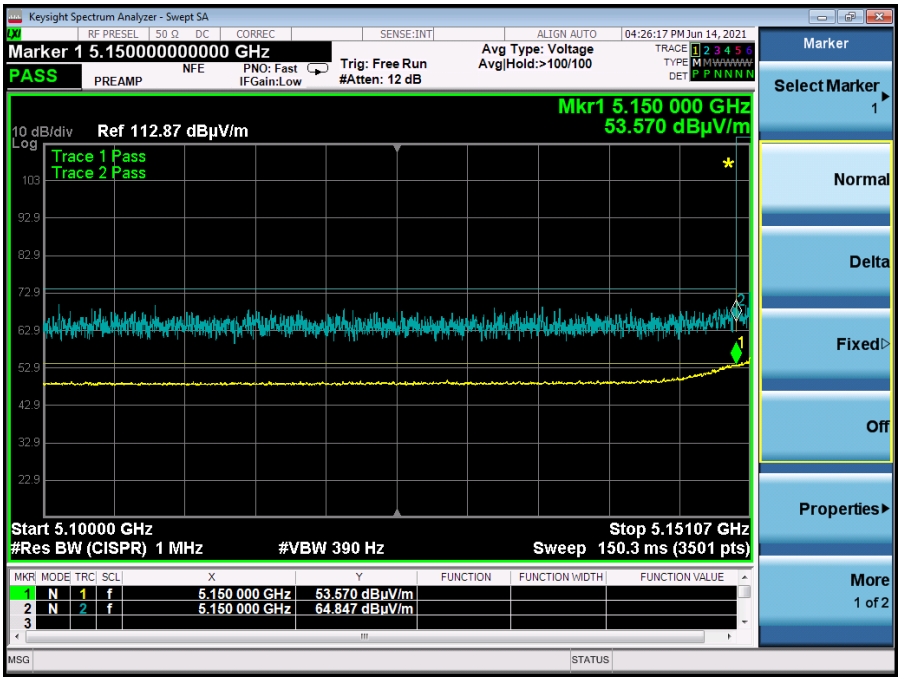
Graph 2: Band Edge HT10 – 5245 MHz



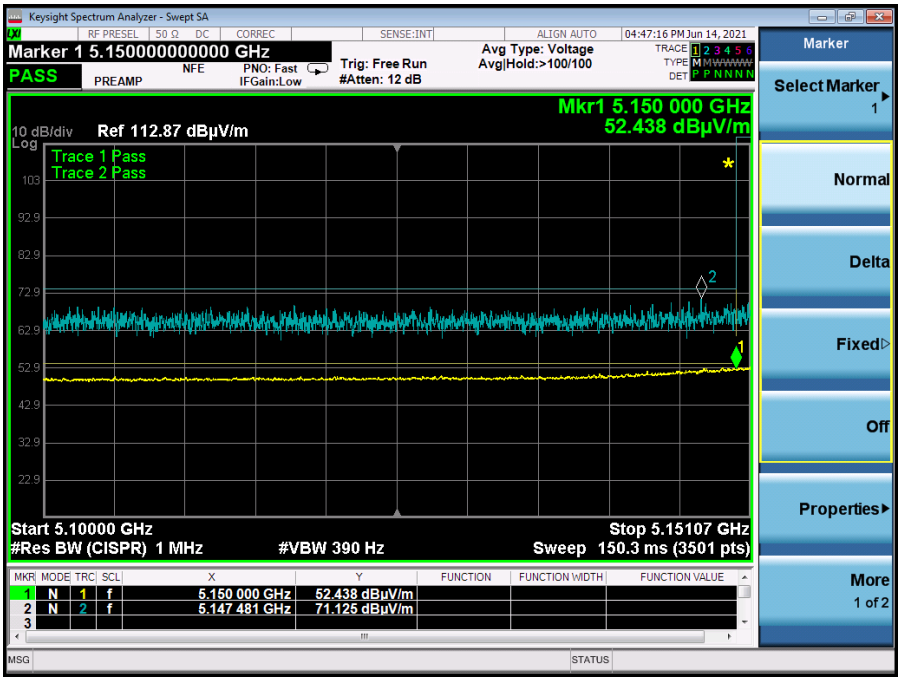
Graph 3: Band Edge HT20 – 5165 MHz



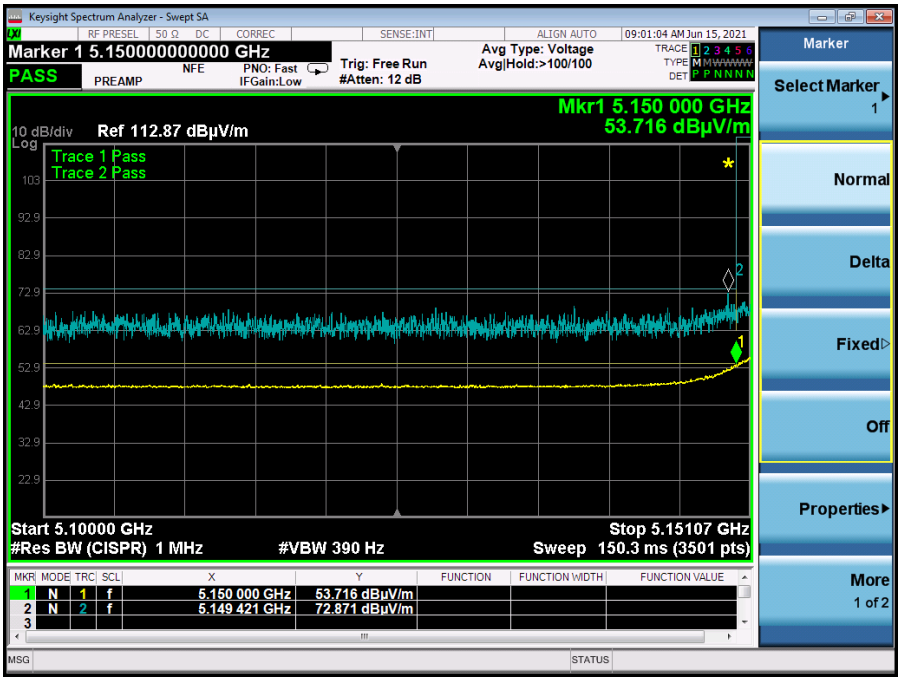
Graph 4: Band Edge HT20 – 5240 MHz



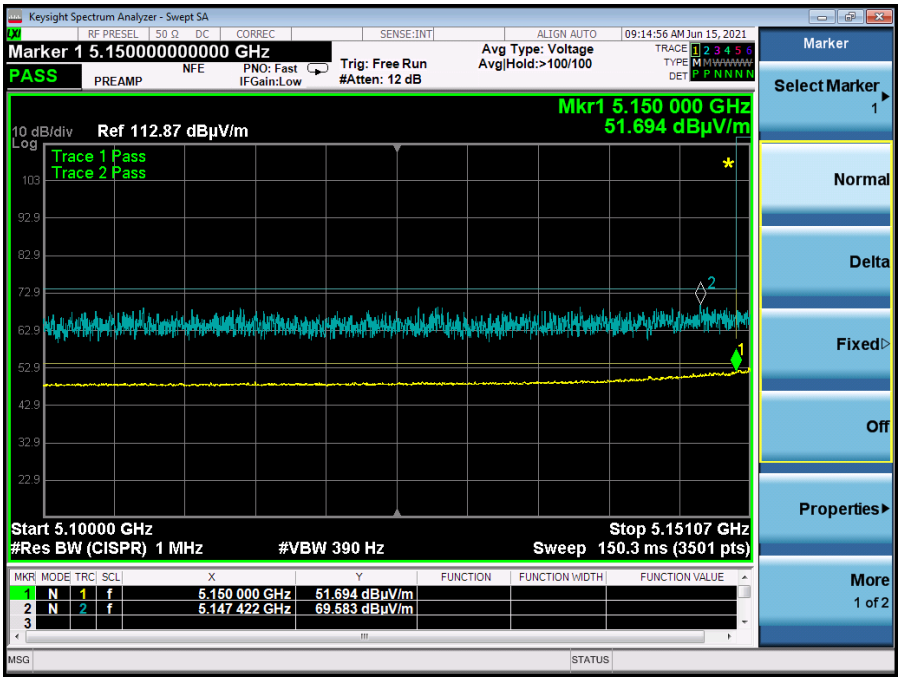
Graph 5: Band Edge HT30 – 5170 MHz



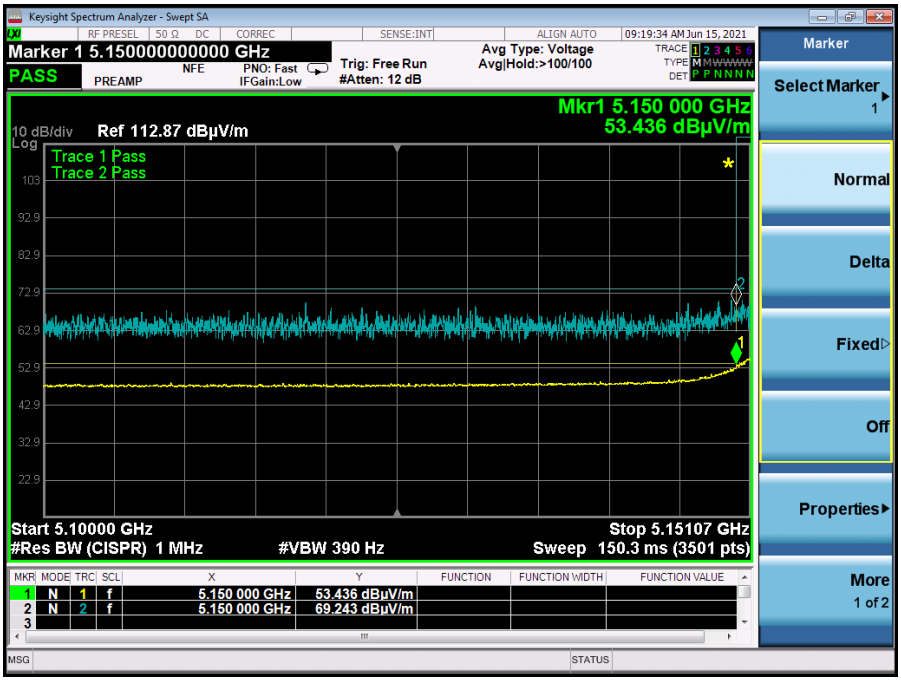
Graph 6: Band Edge HT30 – 5235 MHz



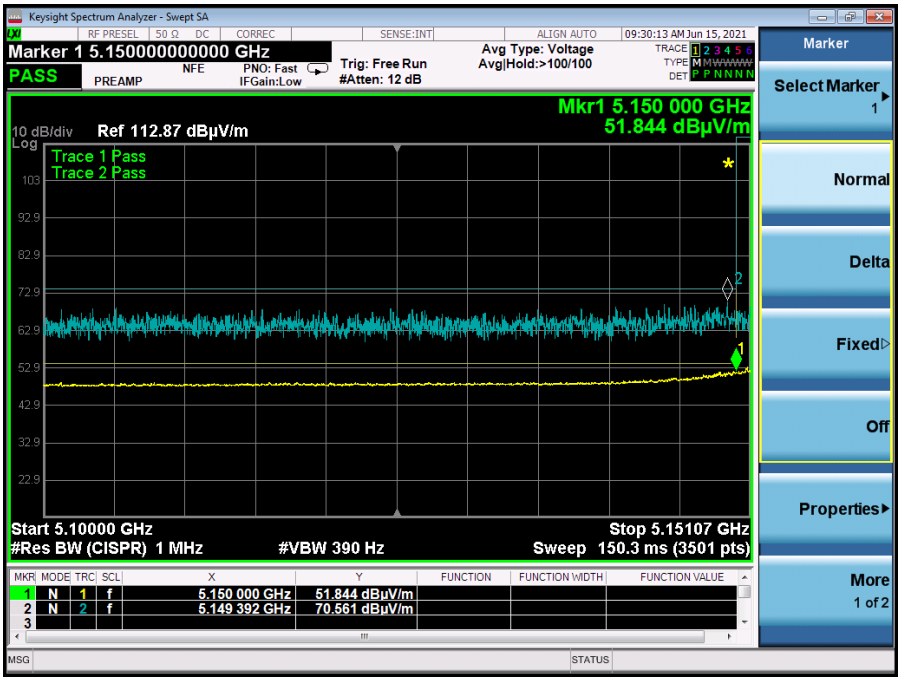
Graph 7: Band Edge VHT40 – 5175 MHz



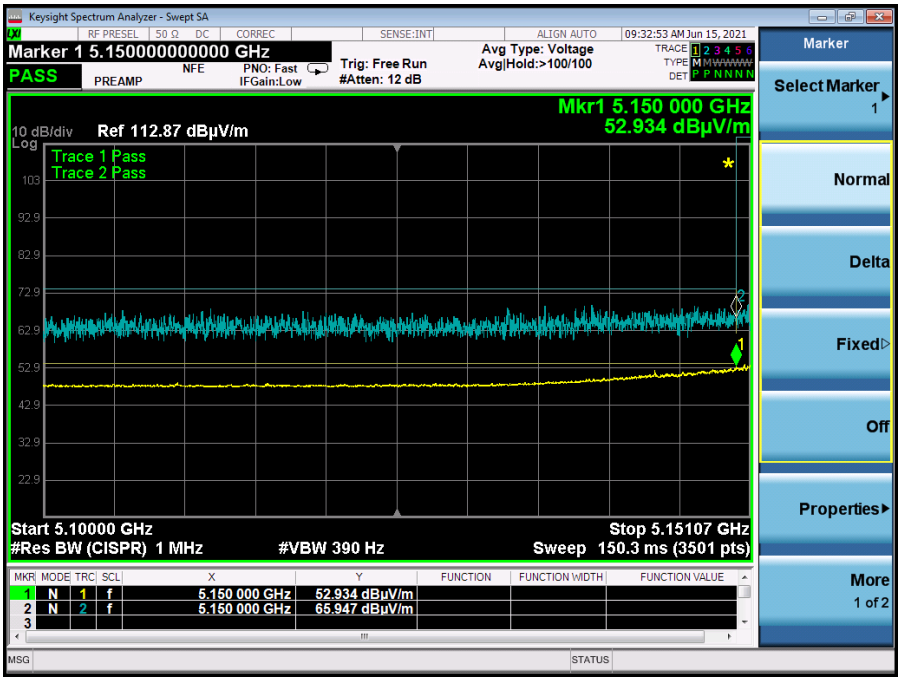
Graph 8: Band Edge VHT40 – 5230 MHz



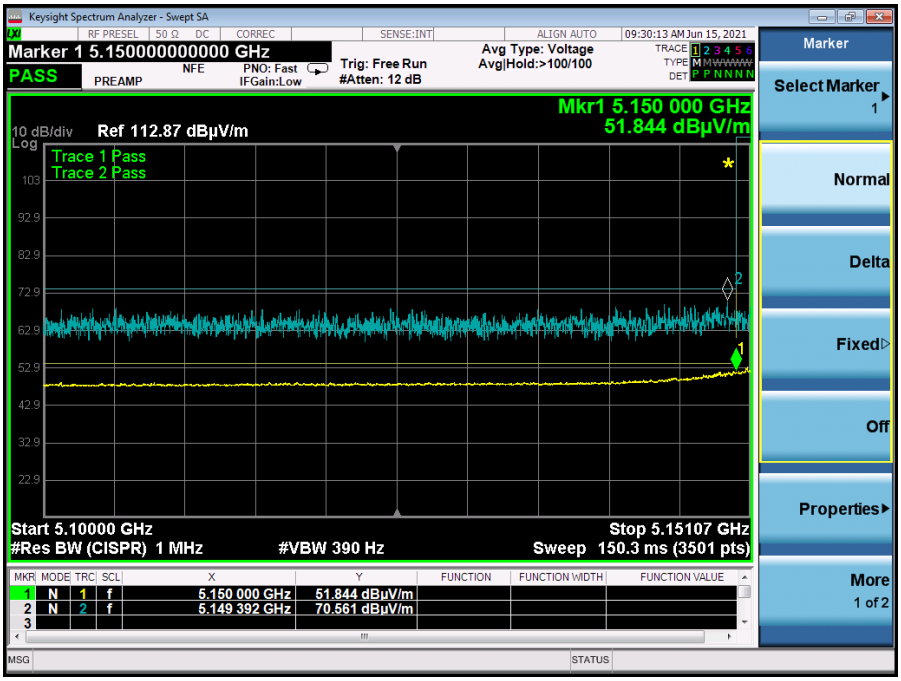
Graph 9: Band Edge VHT50 – 5180 MHz



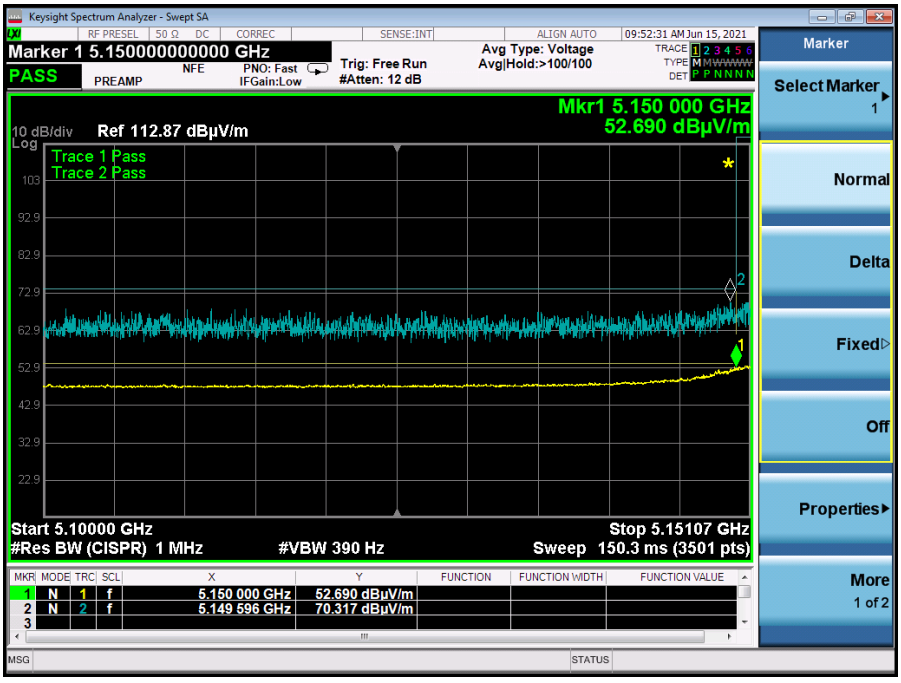
Graph 10: Band Edge VHT50 – 5225 MHz



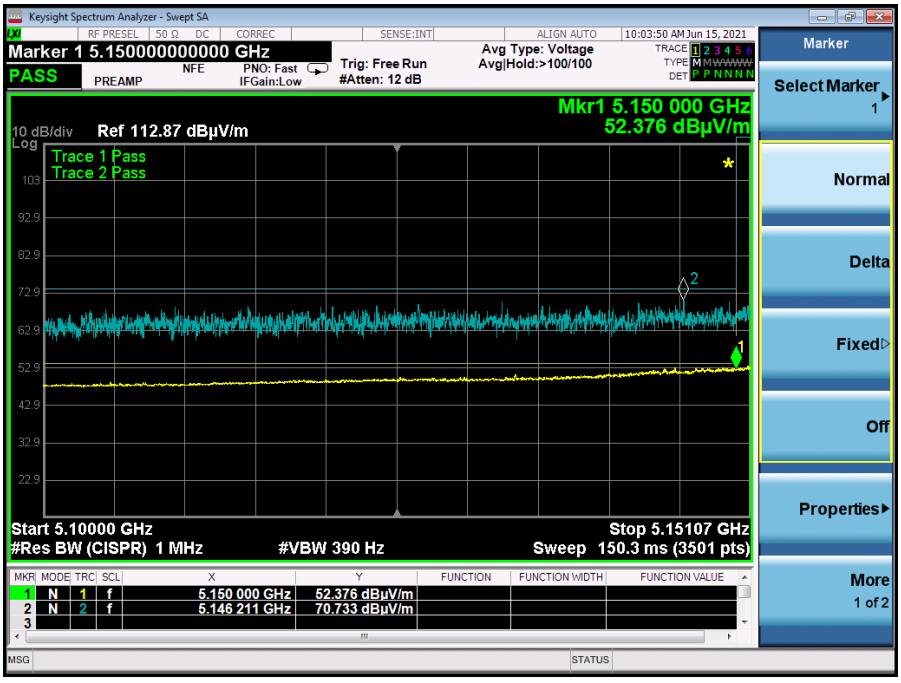
Graph 11: Band Edge VHT60 – 5185 MHz



Graph 12: Band Edge VHT60 – 5220 MHz



Graph 13: Band Edge VHT80 – 5195 MHz



Graph 14: Band Edge VHT80 – 5210 MHz

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. Results of this testing are summarized.

Modulation (BW)	Frequency (MHz)	Data Rate	TP Setting	Conducted Output Power	Measured EIRP	Measured PSD
HT 10	5160	Mcs0	12	12.21	15.21	0.54
HT 10	5200	Mcs0	22	22.67	25.67	0.83
HT 10	5245	Mcs0	25	25.27	28.27	13.33
HT 20	5165	Mcs0	7.5	7.31	10.31	-7.43
HT 20	5200	Mcs0	16	17.32	20.32	2.54
HT 20	5240	Mcs0	22	23.15	26.15	8.25
HT 30	5170	Mcs0	14	14.52	17.52	-2.12
HT 30	5200	Mcs0	16	17.35	20.35	0.58
HT 30	5235	Mcs0	21	22.32	25.32	6.07
VHT 40	5175	Mcs0	5.5	5.24	8.24	-12.66
VHT 40	5200	Mcs0	12.5	12.94	15.94	-4.86
VHT 40	5230	Mcs0	16	17.42	20.42	-0.48
VHT 50	5180	Mcs0	13.5	13.57	16.57	-5.06
VHT 50	5200	Mcs0	12	13.02	16.02	-5.74
VHT 50	5225	Mcs0	15	16.38	19.38	-1.96
VHT 60	5185	Mcs0	16	16.79	19.79	-2.44
VHT 60	5200	Mcs0	12	13.0	16.0	-6.55
VHT 60	5220	Mcs0	14.5	15.45	18.45	-3.75
VHT 80	5195	Mcs0	5.5	5.49	8.49	-15.65
VHT 80	5200	Mcs0	3	3.66	6.66	-17.15
VHT 80	5210	Mcs0	9.5	9.9	12.9	-11.31

Table 11: 3 dBi Antenna

Modulation (BW)	Frequency (MHz)	Data Rate	Measured PSD
HT 10	5160	Mcs0	-25.46
HT 10	5200	Mcs0	-25.17
HT 10	5245	Mcs0	-12.67
HT 20	5165	Mcs0	-33.43
HT 20	5200	Mcs0	-23.46
HT 20	5240	Mcs0	-17.75
HT 30	5170	Mcs0	-28.12
HT 30	5200	Mcs0	-25.42
HT 30	5235	Mcs0	-19.93
VHT 40	5175	Mcs0	-38.66
VHT 40	5200	Mcs0	-30.86
VHT 40	5230	Mcs0	-26.48
VHT 50	5180	Mcs0	-31.06
VHT 50	5200	Mcs0	-31.74
VHT 50	5225	Mcs0	-27.96
VHT 60	5185	Mcs0	-28.44
VHT 60	5200	Mcs0	-32.55
VHT 60	5220	Mcs0	-29.75
VHT 80	5195	Mcs0	-41.65
VHT 80	5200	Mcs0	-43.15
VHT 80	5210	Mcs0	-37.31

Table 12: 29 dBi Antenna

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 --