



Test report No.: 2380907R-RFUSV03S-C

TEST REPORT

Product Name	Set Back Box with Wi-Fi6E, BT & PoE
Trademark	ADB, Charter
Model and /or type reference	ADB-2682WF
FCC ID	2BBO4-ADB-SG23004A
Applicant's name / address	ADB SA Route de Lausanne 319, CH-1293 Bellevue, Switzerland
Manufacturer's name	ADB SA
Test method requested, standard	FCC CFR Title 47 Part 15 Subpart E ANSI C63.4: 2014, ANSI C63.10: 2013 KDB Publication 987594
Verdict Summary	IN COMPLIANCE
Documented By (Senior Project Specialist / Joanne)	Joanne Lin
Tested By (Senior Engineer / Ivan Chuang)	Ivan Chuang
Approved By (Senior Engineer / Alan Chen)	Alan Chen
Date of Receipt	2023/08/30
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Report Version	V1.0

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Appendix 1: EUT Test Photographs

Appendix 2: Product Photos-Please refer to the file: 2380907R-Product Photos

Competences and Guarantees

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

General conditions

1. The test results relate only to the samples tested.
2. The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
3. This report must not be used to claim product endorsement by TAF or any agency of the government.
4. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
5. Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Revision History

Report No.	Version	Description	Issued Date
2380907R-RFUSV03S-C	V1.0	Initial issue of report.	2023/11/21

1. General Information

1.1. EUT Description

Product Name	Set Back Box with Wi-Fi6E, BT & PoE
Trademark	ADB, Charter
Model and /or type reference	ADB-2682WF
EUT Rated Voltage	AC 100-240 V, 50-60 Hz
EUT Test Voltage	AC 120V/60 Hz
Frequency Range	802.11a/ax-20 MHz: 5955-6415 MHz, 6435-6515 MHz, 6535-6855 MHz, 6875-7115 MHz 802.11ax-40 MHz: 5965-6405 MHz, 6445-6485 MHz, 6525-6845 MHz, 6885-7085 MHz 802.11ax-80 MHz: 5985-6385 MHz, 6465-6545 MHz, 6625-6785 MHz, 6865-7025 MHz 802.11ax-160 MHz: 6025-6345 MHz, 6505 MHz, 6665 MHz, 6985 MHz
Number of Channels	802.11a/ax-20 MHz: 59CH 802.11ax-40 MHz: 29CH 802.11ax-80 MHz: 14CH 802.11ax-160 MHz: 7CH
Data Rate	802.11a/ax: up to 2402Mbps
Type of Modulation	802.11a/ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Channel Control	Auto
HDMI Cable	Shielded, 1m
PSU_1	MFR: Mass Power, M/N: S042-1A120300VU Input: AC 100-240V~, 50/60Hz, 1.0A Output: 12.0V=3.0A, 36.0W Cable out: Non-shielded, 1.5m
PSU_2	MFR: Atech OEM, M/N: A3603PU-120030 Input: AC 100-240V~50-60Hz, 1.0A Output: 12.0V=3.0A, 36.0W Cable out: Non-shielded, 1.5m
For any other product variant refer to compliance ID	
SW Compliance ID	M.U.01.01_0001

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	HONGBO	49031-01103-HB (Main)	PCB	3.44 dBi for 5925-6425 MHz 2.28 dBi for 6425-6525 MHz 2.48 dBi for 6525-6875 MHz 2.59 dBi for 6875-7125 MHz
		49031-01104-HB (Aux)	PCB	3.56 dBi for 5925-6425 MHz 3.56 dBi for 6425-6525 MHz 3.44 dBi for 6525-6875 MHz 3.19 dBi for 6875-7125 MHz

Note:

1. The antenna of EUT is conforming to FCC 15.203.
2. The antenna gain as by the manufacturer provided.
3. Each antenna has been evaluated and only the worst case (higher gain antenna) is presented in the report.

802.11a/ax-20 MHz Center Working Frequency of Each Channel:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	5955	05	5975	09	5995	13	6015
17	6035	21	6055	25	6075	29	6095
33	6115	37	6135	41	6155	45	6175
49	6195	53	6215	57	6235	61	6255
65	6275	69	6295	73	6315	77	6335
81	6355	85	6375	89	6395	93	6415
97	6435	101	6455	105	6475	109	6495
113	6515	117	6535	121	6555	125	6575
129	6595	133	6615	137	6635	141	6655
145	6675	149	6695	153	6715	157	6735
161	6755	165	6775	169	6795	173	6815
177	6835	181	6855	185	6875	189	6895
193	6915	197	6935	201	6955	205	6975
209	6995	213	7015	217	7035	221	7055
225	7075	229	7095	223	7115	--	--

802.11ax-40 MHz Center Working Frequency of Each Channel:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
03	5965	11	6005	19	6045	27	6085
35	6125	43	6165	51	6205	59	6245
67	6285	75	6325	83	6365	91	6405
99	6445	107	6485	115	6525	123	6565
131	6605	139	6645	147	6685	155	6725
163	6765	171	6805	179	6845	187	6885
195	6925	203	6965	211	7005	219	7045
227	7085	--	--	--	--	--	--

802.11ax-80 MHz Center Working Frequency of Each Channel:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
07	5985	23	6065	39	6145	55	6225
71	6305	87	6385	103	6465	119	6545
135	6625	151	6705	167	6785	183	6865
199	6945	215	7025	--	--	--	--

802.11ax-160 MHz Center Working Frequency of Each Channel:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
15	6025	47	6185	79	6345	111	6505
143	6665	175	6825	207	6985	--	--

Note:

1. This device is a Set Back Box with Wi-Fi6E, BT & PoE with built-in WLAN and Bluetooth transceiver, this report for WLAN 6GHz.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. Lowest and highest data rates are tested in each mode. Only worst case is shown in the report. (802.11a is MCS0) (802.11ax is MCS0)
4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
5. The spectrum plot against conducted item only shows the worst case.
6. This device does not support partial RU function and channel puncturing function.
7. DEKRA has evaluated each test mode. Only the worst case is shown in the report.
8. These tests were conducted on a sample for the purpose of demonstrating compliance of 802.11ax transmitter with Part 15 Subpart E for Unlicensed National Information Infrastructure devices.

Test Mode	Mode 1	Transmit (802.11a) Transmit (802.11ax-20 MHz) Transmit (802.11ax-40 MHz) Transmit (802.11ax-80 MHz) Transmit (802.11ax-160 MHz)
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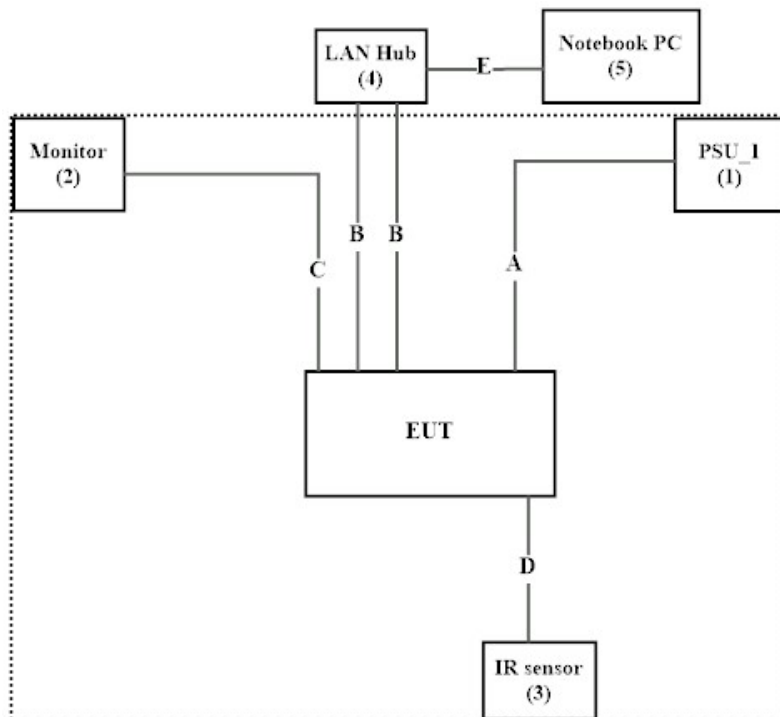
1.2. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 PSU_1	Mass Power	S042-1A120300VU	N/A	N/A
2 Monitor	DELL	S2817Qt	CN-0GD45P-74445-6CR-002M-A01	Non-shielded, 1.8m
3 IR sensor	N/A	N/A	N/A	N/A
4 LAN Hub	TP-LINK	TL-SG108	2161597000480	Non-shielded, 1.5m
5 Notebook PC	ASUS	P5430U	G8NXCV07J11032C	N/A

Cable Type	Cable Description
A Power Cable	Non-shielded, 1.5m
B LAN Cable	Non-shielded, 2m, two PCS.
C HDMI Cable	Shielded, 1m
D IR Cable	Non-shielded, 0.9m
E LAN Cable	Non-shielded, 2m

1.3. Configuration of tested System



1.4. EUT Exercise Software

1	Setup the EUT as shown in Section 1.3.
2	Execute software “QRCT version 4.00203.0” on the Notebook PC.
3	Configure the test mode, the test channel, and the data rate.
4	Press “OK” to start the continuous Transmit.
5	Verify that the EUT works properly.

1.5. Test Facility

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual
Conducted Emission	Temperature (°C)	10~40 °C	25.7 °C
	Humidity (%RH)	10~90 %	58.0 %
Radiated Emission	Temperature (°C)	10~40 °C	25.3 °C
	Humidity (%RH)	10~90 %	64.3 %
Conductive	Temperature (°C)	10~40 °C	22.0 °C
	Humidity (%RH)	10~90 %	55.0 %

USA	FCC Registration Number: TW0033
Canada	CAB Identifier Number: TW3023 / Company Number: 26930

Site Description	Accredited by TAF
	Accredited Number: 3023

Test Laboratory	DEKRA Testing and Certification Co., Ltd.
	Linkou Laboratory
Address	No.5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan, R.O.C.
Performed Location	No. 26, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan, R.O.C.
Phone Number	+886-3-275-7255
Fax Number	+886-3-327-8031

1.6. List of Test Equipment

For Conduction Measurements / HY-SR01

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	EMI Test Receiver	R&S	ESR7	101601	2023/06/20	2024/06/19
V	Two-Line V-Network	R&S	ENV216	101306	2023/03/16	2024/03/15
V	Two-Line V-Network	R&S	ENV216	101307	2023/08/17	2024/08/16
V	Coaxial Cable	SUHNER	RG400 BNC	RF001	2023/01/10	2024/01/09

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “V” are used to measure the final test results.
3. Test Software Version: e3 230303 dekra V9.

For Conducted Measurements / HY-SR02

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	Spectrum Analyzer	R&S	FSV30	103466	2022/12/22	2023/12/21
V	Spectrum Analyzer	KEYSIGHT	N9010A	MY53470892	2022/11/07	2023/11/06
V	Peak Power Analyzer	KEYSIGHT	8990B	MY51000539	2023/05/15	2024/05/14
V	Wideband Power Sensor	KEYSIGHT	N1923A	MY59240002	2023/05/18	2024/05/18
V	Wideband Power Sensor	KEYSIGHT	N1923A	MY59240003	2023/05/18	2024/05/17

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked with “V” are used to measure the final test results.
3. Test Software Version: RF Conducted Test Tools R3 V3.0.0.14.

For Radiated Measurements / HY-CB03

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	Loop Antenna	AMETEK	HLA6121	49611	2023/02/21	2024/02/20
V	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-0675	2023/08/09	2025/08/08
V	Horn Antenna	Com-Power	AH-840	101101	2021/11/30	2023/11/29
V	Horn Antenna	RF SPIN	DRH18-E	210507A18ES	2023/05/11	2024/05/10
V	Pre-Amplifier	SGH	SGH0301-9	20211007-11	2023/01/10	2024/01/09
V	Pre-Amplifier	SGH	PRAMP118	20200701	2023/01/10	2024/01/09
V	Pre-Amplifier	EMCI	EMC05820SE	980310	2023/01/10	2024/01/09
V	Pre-Amplifier	EMCI	EMC184045SE	980369	2023/01/10	2024/01/09
	Coaxial Cable	EMCI	EMC102-KM-KM-600	1160314		
	Coaxial Cable	EMCI	EMC102-KM-KM-7000	170242		
	Filter	MICRO TRONICS	BRM50702	G269	2023/01/05	2024/01/04
	Filter	MICRO TRONICS	BRM50716	G196	2023/01/05	2024/01/04
V	WIFI 6E Filter	MVE	MFN-5850/5895/S1	A80006N	2023/01/05	2024/01/04
V	WIFI 6E Filter	MVE	MFN-5925/6425/S1	A80007N	2023/01/05	2024/01/04
V	WIFI 6E Filter	MVE	MFN-6425/6525/S1	A80008N	2023/01/05	2024/01/04
V	WIFI 6E Filter	MVE	MFN-6525/6875/S1	A80009N	2023/01/05	2024/01/04
V	WIFI 6E Filter	MVE	MFN-6875/7125/S1	A80010N	2023/01/05	2024/01/04
V	EMI Test Receiver	R&S	ESR3	102793	2022/12/05	2023/12/04
V	Spectrum Analyzer	R&S	FSV3044	101113	2023/02/04	2024/02/03
V	Coaxial Cable	SGH	SGH18	2021005-1	2023/01/10	2024/01/09
	Coaxial Cable	SGH	SGH18	202108-4		
	Coaxial Cable	SGH	HA800	GD20110223-1		
	Coaxial Cable	SGH	HA800	GD20110222-3		

Note:

1. Bi-Log Antenna and Horn Antenna(AH-840) is calibrated every two years, the other equipments are calibrated every one year.
2. The test instruments marked with “V” are used to measure the final test results.
3. Test Software Version: e3 230303 dekra V9.

1.7. Uncertainty

Uncertainties have been calculated according to the DEKRA internal document.

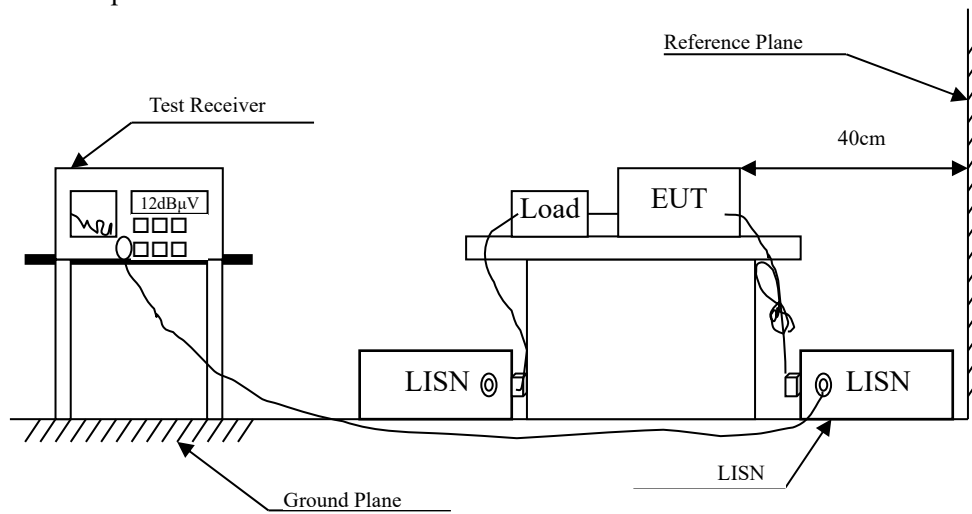
The reported expanded uncertainties are based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Test Item	Uncertainty
Conducted Emission	± 3.50 dB
99% & 26dB Bandwidth	± 1580.61 Hz
Transmit Output	Spectrum Analyzer: ± 2.14 dB Power Meter: ± 1.05 dB
Maximum Power Spectrum Density	± 2.14 dB
Radiated Emission	9 kHz~30 MHz: ± 3.88 dB 30 MHz~1 GHz: ± 4.42 dB 1 GHz~18 GHz: ± 4.28 dB 18 GHz~40 GHz: ± 3.90 dB
Band Edge	9 kHz~30 MHz: ± 3.88 dB 30 MHz~1 GHz: ± 4.42 dB 1 GHz~18 GHz: ± 4.28 dB 18 GHz~40 GHz: ± 3.90 dB
In-Band Emission (Mask)	± 2.14 dB
Contention Based Protocol	± 2.14 dB
Duty Cycle	± 0.53 %

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC CFR Title 47 Part 15 Subpart C Paragraph 15.207 Limits (dBμV)		
Frequency MHz	QP	AV
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Remark: In the above table, the tighter Limit applies at the band edges.

2.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs.)

Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

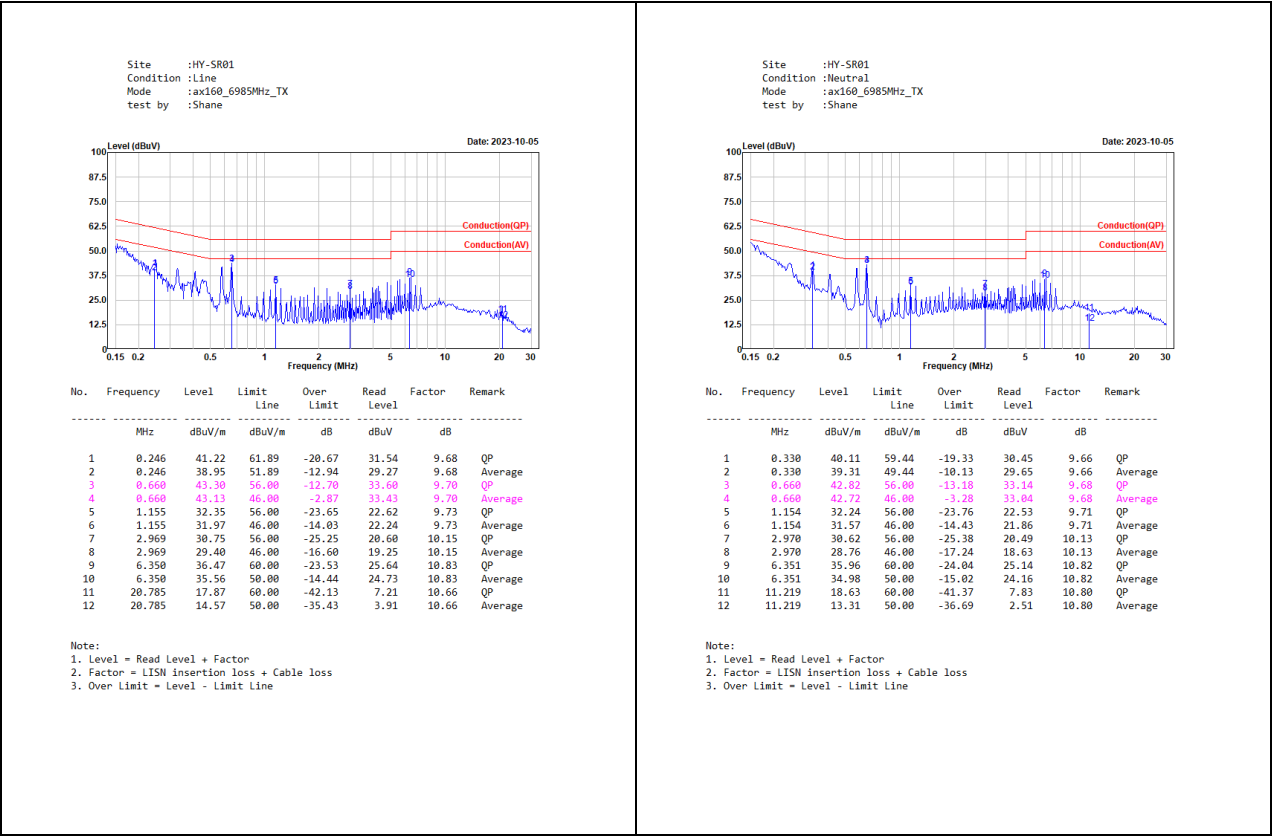
The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

2.4. Test Specification

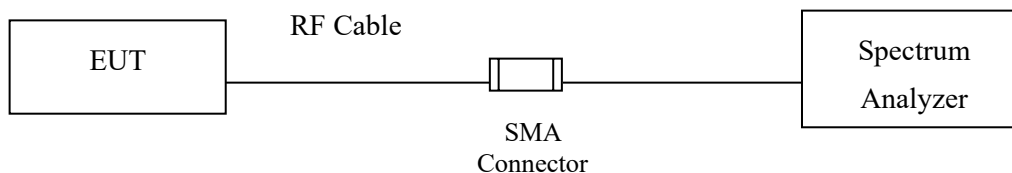
According to FCC CFR Title 47 Part 15 Subpart C Paragraph 15.207.

2.5. Test Result of Conducted Emission



3. 99% & 26dB Bandwidth

3.1. Test Setup



3.2. Limits

No Required

3.3. Test Procedure

The EUT was tested according to U-NII test procedure of KDB 789033.D02 V02r01

Set RBW 1% of the emission bandwidth, VBW equal to 3 times the RBW.

3.4. Test Result of 99% & 26dB Bandwidth

Product : Set Back Box with Wi-Fi6E, BT & PoE
 Test Item : 99% & 26dB Bandwidth
 Test Mode : Transmit (802.11a)
 Test Date : 2023/10/03

Channel No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Limit (MHz)	26dB Bandwidth (MHz)		Limit (MHz)	Result
		Chain A	Chain B		Chain A	Chain B		
01	5955	16.583	16.424	--	19.181	18.901	320	Pass
45	6175	16.464	16.583	--	19.061	18.462	320	Pass
93	6415	16.543	16.543	--	18.462	19.021	320	Pass
97	6435	16.464	16.543	--	19.061	18.542	320	Pass
105	6475	16.464	16.503	--	18.741	18.182	320	Pass
113	6515	16.543	16.464	--	18.701	18.422	320	Pass
117	6535	16.503	16.464	--	19.061	19.381	320	Pass
149	6695	16.543	16.543	--	18.661	19.341	320	Pass
181	6855	16.583	16.543	--	18.542	18.502	320	Pass
189	6895	16.464	16.464	--	18.502	18.941	320	Pass
213	7015	16.583	16.464	--	18.621	19.061	320	Pass
233	7115	16.583	16.464	--	18.901	18.781	320	Pass

Product : Set Back Box with Wi-Fi6E, BT & PoE
 Test Item : 99% & 26dB Bandwidth
 Test Mode : Transmit (802.11ax-20 MHz)
 Test Date : 2023/10/04

Channel No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Limit (MHz)	26dB Bandwidth (MHz)		Limit (MHz)	Result
		Chain A	Chain B		Chain A	Chain B		
01	5955	18.981	19.021	--	20.299	20.340	320	Pass
45	6175	19.021	19.021	--	20.659	20.859	320	Pass
93	6415	18.981	18.861	--	20.540	20.300	320	Pass
97	6435	18.941	18.941	--	20.500	20.540	320	Pass
105	6475	18.941	18.981	--	20.340	20.619	320	Pass
113	6515	18.981	18.981	--	20.819	20.300	320	Pass
117	6535	18.981	18.981	--	20.460	20.619	320	Pass
149	6695	19.021	18.981	--	20.300	20.540	320	Pass
181	6855	18.941	19.021	--	20.579	20.420	320	Pass
189	6895	18.901	18.941	--	20.540	20.540	320	Pass
213	7015	18.901	18.981	--	20.619	20.659	320	Pass
233	7115	18.981	19.021	--	20.899	20.420	320	Pass

Product : Set Back Box with Wi-Fi6E, BT & PoE
 Test Item : 99% & 26dB Bandwidth
 Test Mode : Transmit (802.11ax-40 MHz)
 Test Date : 2023/10/04

Channel No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Limit (MHz)	26dB Bandwidth (MHz)		Limit (MHz)	Result
		Chain A	Chain B		Chain A	Chain B		
03	5965	37.802	37.722	--	40.040	39.800	320	Pass
51	6205	37.722	37.642	--	40.360	40.280	320	Pass
91	6405	37.722	37.562	--	40.200	40.120	320	Pass
99	6445	37.722	37.562	--	39.880	40.040	320	Pass
107	6485	37.562	37.722	--	40.040	39.880	320	Pass
123	6565	37.722	37.642	--	40.280	39.960	320	Pass
155	6725	37.642	37.562	--	40.440	40.040	320	Pass
179	6845	37.642	37.642	--	40.120	40.120	320	Pass
195	6925	37.642	37.722	--	40.200	40.520	320	Pass
211	7005	37.642	37.642	--	40.360	40.200	320	Pass
227	7085	37.562	37.642	--	40.520	40.599	320	Pass

Product : Set Back Box with Wi-Fi6E, BT & PoE
Test Item : 99% & 26dB Bandwidth
Test Mode : Transmit (802.11ax-80 MHz)
Test Date : 2023/10/04

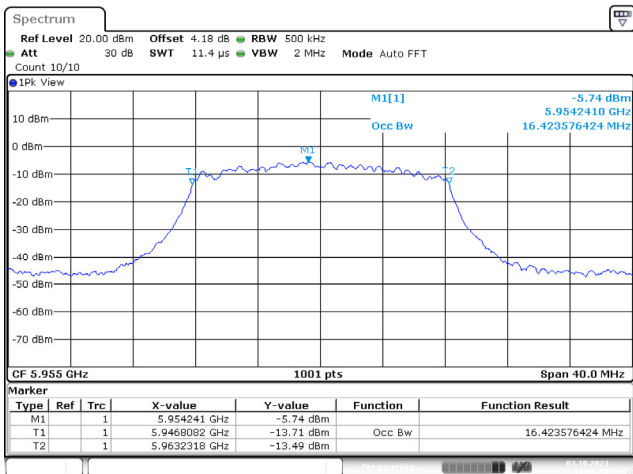
Channel No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Limit (MHz)	26dB Bandwidth (MHz)		Limit (MHz)	Result
		Chain A	Chain B		Chain A	Chain B		
07	5985	77.043	76.883	--	81.518	80.559	320	Pass
55	6225	76.563	76.723	--	79.920	80.400	320	Pass
87	6385	77.043	77.043	--	82.478	81.039	320	Pass
103	6465	76.883	76.563	--	81.359	80.879	320	Pass
135	6625	77.043	76.563	--	81.518	80.879	320	Pass
151	6705	76.723	76.563	--	79.920	80.879	320	Pass
167	6785	76.883	76.723	--	80.719	80.719	320	Pass
199	6945	76.404	76.883	--	80.400	80.559	320	Pass
215	7025	76.723	77.043	--	80.400	80.719	320	Pass

Product : Set Back Box with Wi-Fi6E, BT & PoE
Test Item : 99% & 26dB Bandwidth
Test Mode : Transmit (802.11ax-160 MHz)
Test Date : 2023/10/04

Channel No.	Frequency (MHz)	99% Occupied Bandwidth (MHz)		Limit (MHz)	26dB Bandwidth (MHz)		Limit (MHz)	Result
		Chain A	Chain B		Chain A	Chain B		
15	6025	154.086	154.406	--	162.078	162.398	320	Pass
47	6185	155.045	155.045	--	162.078	162.398	320	Pass
79	6345	155.045	155.684	--	163.676	161.758	320	Pass
143	6665	154.725	155.045	--	162.398	161.758	320	Pass
207	6985	155.684	155.045	--	163.357	161.439	320	Pass

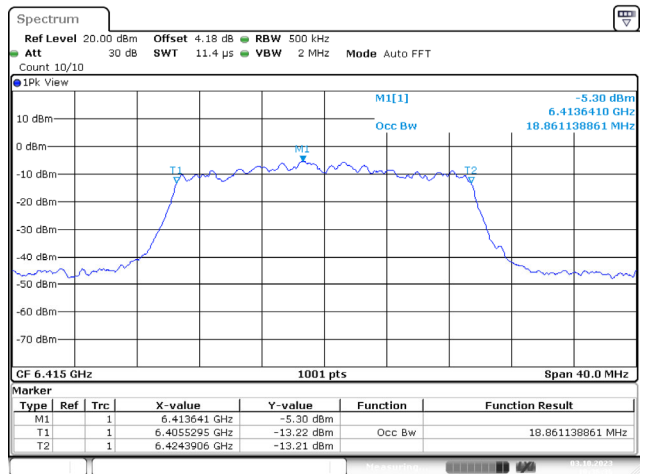
Spectrum plot of worst value (99% Occupied Bandwidth)

802.11a / 5955 MHz



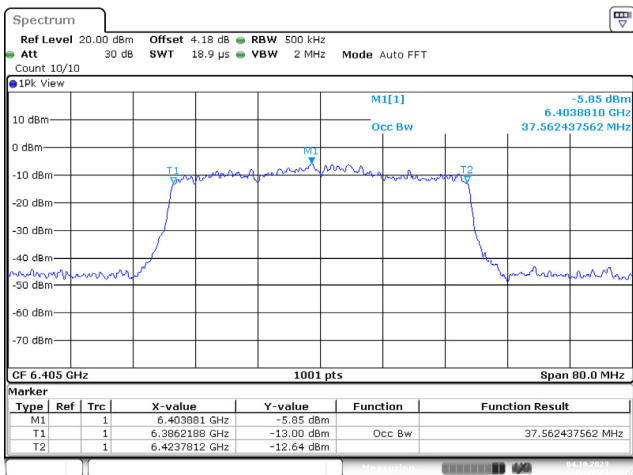
Date: 3.OCT.2023 18:15:58

802.11ax-20 MHz / 6415 MHz



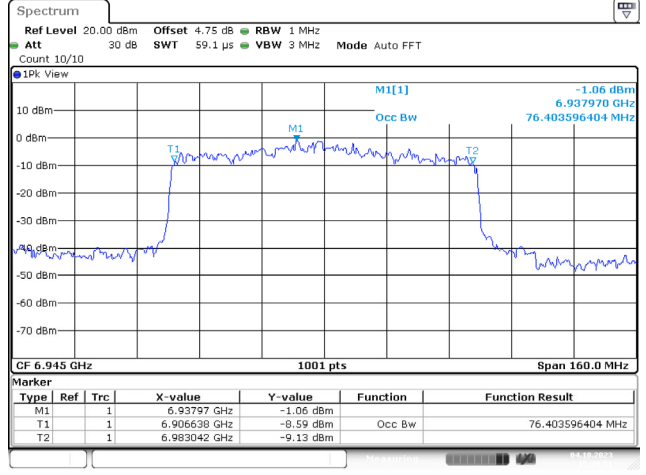
Date: 3.OCT.2023 19:38:36

802.11ax-40 MHz / 6405 MHz



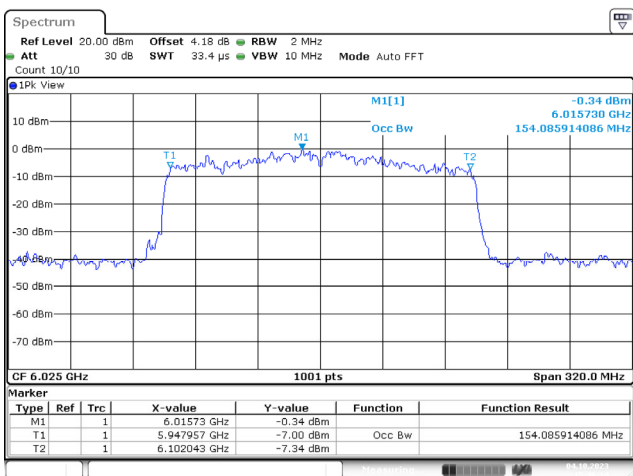
Date: 4.OCT.2023 13:20:01

802.11ax-80 MHz / 6945 MHz



Date: 4.OCT.2023 15:39:51

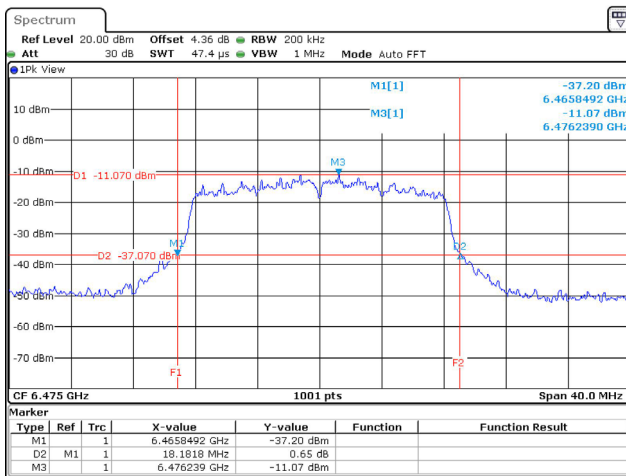
802.11ax-160 MHz / 6025 MHz



Date: 4.OCT.2023 15:46:14

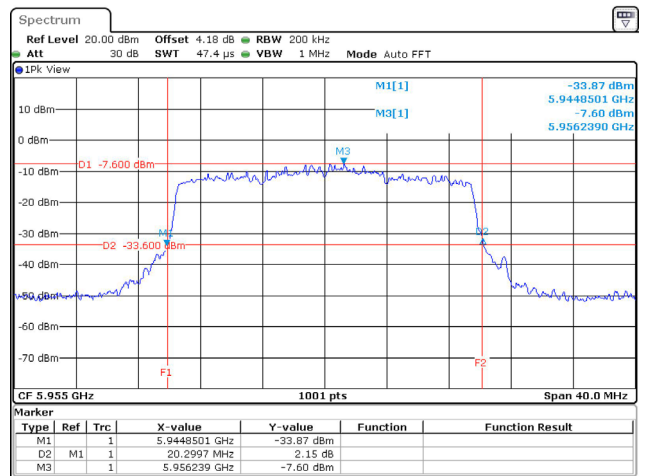
Spectrum plot of worst value (26dB Bandwidth)

802.11a / 6475 MHz



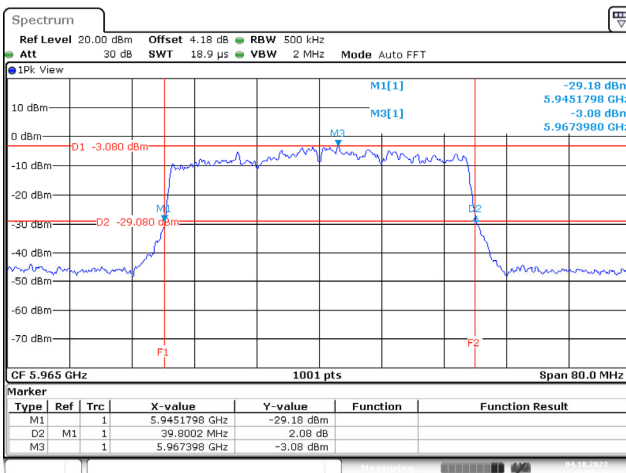
Date: 1.DEC.2023 16:25:22

802.11ax-20 MHz / 5955 MHz



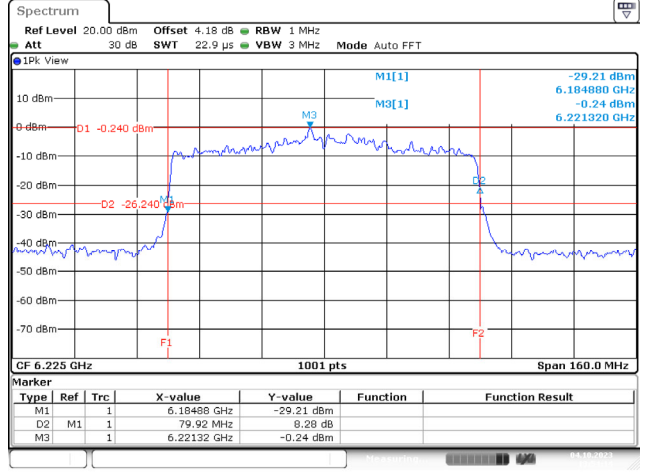
Date: 1.DEC.2023 17:07:50

802.11ax-40 MHz / 5965 MHz



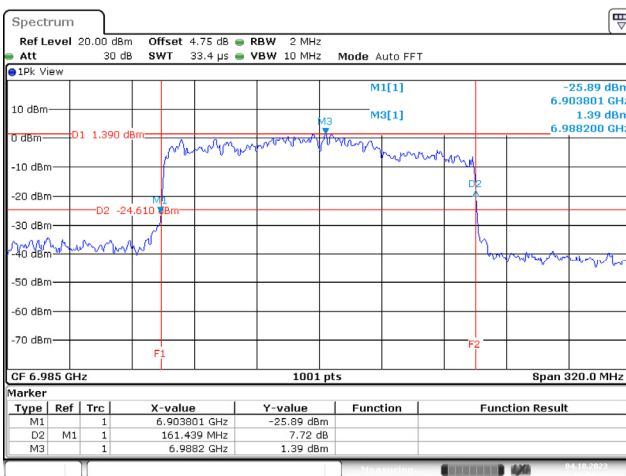
Date: 4.OCT.2023 12:36:29

802.11ax-80 MHz / 6225 MHz



Date: 4.OCT.2023 13:54:15

802.11ax-160 MHz / 6985 MHz

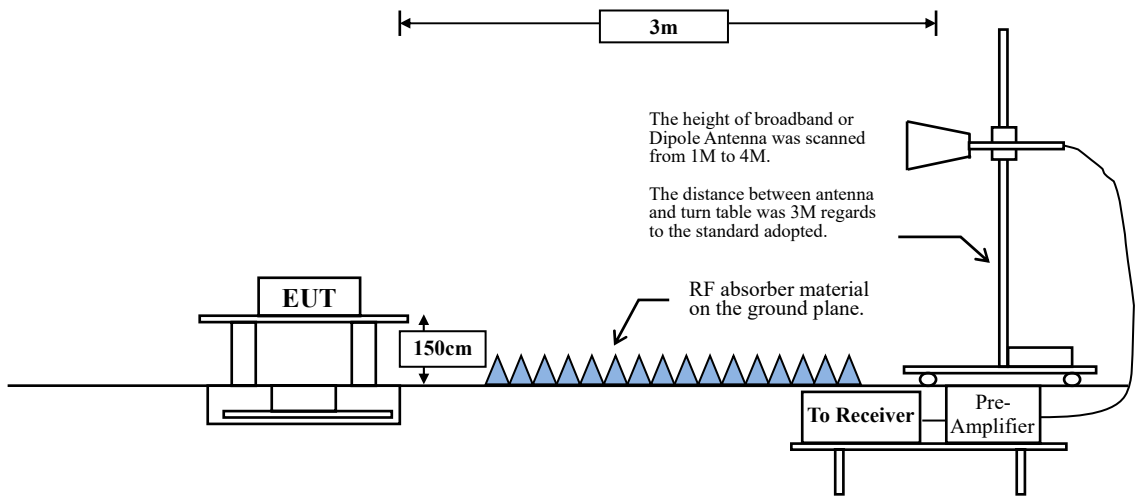


Date: 4.OCT.2023 16:04:35

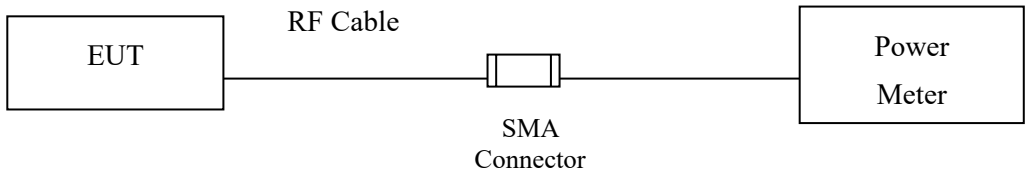
4. Transmit Output

4.1. Test Setup

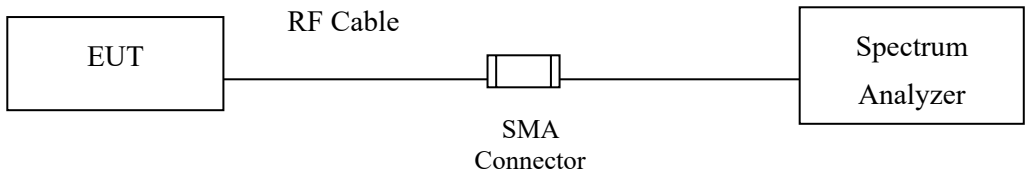
Radiated Power Measurement



Conducted Power Measurement



Conducted Power Measurement



4.2. Limits

1. For the 5.925~6.425 GHz band:

For standard power access point and fixed client device : e.i.r.p < 36 dBm , For outdoor devices, the maximum e.i.r.p. at any elevation angle above 30 degrees not exceed 125 mW (21 dBm).

For indoor access point : e.i.r.p < 30 dBm.

For subordinate device control of an indoor access point : e.i.r.p < 30 dBm.

For client device control of a standard power access point : e.i.r.p < 30 dBm.

For client device control of an indoor access point : e.i.r.p < 24 dBm.

2. For the 6.425~6.525 GHz band:

For indoor access point : e.i.r.p < 30 dBm.

For client device control of an indoor access point : e.i.r.p < 24 dBm.

3. For the 6.525~6.875 GHz band:

For standard power access point and fixed client device : e.i.r.p < 36 dBm , For outdoor devices, the maximum e.i.r.p. at any elevation angle above 30 degrees not exceed 125 mW (21 dBm).

For indoor access point : e.i.r.p < 30 dBm.

For subordinate device control of an indoor access point : e.i.r.p < 30 dBm.

For client device control of a standard power access point : e.i.r.p < 30 dBm.

For client device control of an indoor access point : e.i.r.p < 24 dBm.

4. For the 6.87~7.125 GHz band:

For indoor access point : e.i.r.p < 30 dBm.

For client device control of an indoor access point : e.i.r.p < 24 dBm.

4.3. Test Procedure

☒ Radiated

1. The EUT was setup to ANSI C63.10: 2013; tested to U-NII test procedure of KDB 789033 D02 v02r01 Method SA-2 for compliance to FCC CFR Title 47 Part 15 Subpart E requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground and the turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level.
3. Perform a field strength measurement following ANSI C63.10 and record the worse field strength value via spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then convert the measured field strength level to EIRP level.
4. Following ANSI C63.10 and KDB 412172 D01 v01r01,

$$\text{EIRP value (dBm)} = \text{Field strength value (dB}\mu\text{V/m)} + \text{Correction factor (dB) @3m}$$

$$\text{Correction factor (dB) @3m} = 20 * \log(3) - 104.77 = -95.23\text{dB}$$

☐ Conducted

As an alternative to FCC KDB-789033, the EUT maximum conducted output power was measured with an average power meter employing a video bandwidth greater than the 6dB BW of the emission under test. Maximum conducted output power was read directly from the meter across all data rates, and across three channels within each sub-band. Special care was used to make sure that the EUT was transmitting in continuous mode. This method exceeds the Limitations of FCC KDB-789033, and provides more accurate measurements.

802.11an (BW $\leq$ 160MHz) Maximum conducted output power using KDB 789033 section E)3)b) Method PM-G (Measurement using a gated RF average power meter)

Note: the power meter have a video bandwidth that is greater than or equal to the measurement bandwidth. (KEYSIGHT / 8990B video bandwidth: 160MHz)

802.11ac/ax (BW $\geq$ 160MHz) Maximum conducted output power using KDB 789033 section E)2)b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep).

When transmitted signals consist of two or more non-contiguous spectrum segments (e.g., 80+80 MHz mode) or when a single spectrum segment of a transmission crosses the boundary between two adjacent U-NII bands, KDB 644545 D03 section D) procedure is used for measurements.

4.4. Test Result of Transmit Output

Product : Set Back Box with Wi-Fi6E, BT & PoE
 Test Item : Transmit Output
 Test Mode : Transmit (802.11a)
 Test Date : 2023/10/04

Channel No.	Frequency (MHz)	Reading Level (dBμV/m)	Path Loss (dB)	Field Strength (dBμV/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm)	EIRP limit (dBm)	Result
01	5955	80.21	17.78	97.99	3.06	-95.23	5.82	24	Pass
45	6175	78.89	18.96	97.85	3.06	-95.23	5.68	24	Pass
93	6415	77.37	20.51	97.88	3.06	-95.23	5.71	24	Pass
97	6435	77.65	20.59	98.24	3.06	-95.23	6.07	24	Pass
105	6475	77.53	20.61	98.14	3.06	-95.23	5.97	24	Pass
113	6515	77.51	20.59	98.10	3.06	-95.23	5.93	24	Pass
117	6535	77.78	20.54	98.32	3.06	-95.23	6.15	24	Pass
149	6695	76.77	21.03	97.80	3.06	-95.23	5.63	24	Pass
181	6855	76.78	21.02	97.80	3.06	-95.23	5.63	24	Pass
189	6895	77.17	20.95	98.12	3.06	-95.23	5.95	24	Pass
213	7015	77.67	20.94	98.61	3.06	-95.23	6.44	24	Pass
233	7115	77.74	21.04	98.78	3.06	-95.23	6.61	24	Pass

Product : Set Back Box with Wi-Fi6E, BT & PoE
 Test Item : Transmit Output
 Test Mode : Transmit (802.11ax-20 MHz)
 Test Date : 2023/10/04

Channel No.	Frequency (MHz)	Reading Level (dBμV/m)	Path Loss (dB)	Field Strength (dBμV/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm)	EIRP limit (dBm)	Result
01	5955	82.80	17.78	100.58	1.01	-95.23	6.36	24	Pass
45	6175	81.47	18.96	100.43	1.01	-95.23	6.21	24	Pass
93	6415	79.88	20.51	100.39	1.01	-95.23	6.17	24	Pass
97	6435	80.59	20.59	101.18	1.01	-95.23	6.96	24	Pass
105	6475	79.70	20.61	100.31	1.01	-95.23	6.09	24	Pass
113	6515	80.26	20.59	100.85	1.01	-95.23	6.63	24	Pass
117	6535	80.29	20.54	100.83	1.01	-95.23	6.61	24	Pass
149	6695	79.36	21.03	100.39	1.01	-95.23	6.17	24	Pass
181	6855	79.49	21.02	100.51	1.01	-95.23	6.29	24	Pass
189	6895	79.72	20.95	100.67	1.01	-95.23	6.45	24	Pass
213	7015	79.50	20.94	100.44	1.01	-95.23	6.22	24	Pass
233	7115	65.60	21.04	86.64	1.01	-95.23	-7.58	24	Pass

Product : Set Back Box with Wi-Fi6E, BT & PoE
 Test Item : Transmit Output
 Test Mode : Transmit (802.11ax-40 MHz)
 Test Date : 2023/10/04

Channel No.	Frequency (MHz)	Reading Level (dBμV/m)	Path Loss (dB)	Field Strength (dBμV/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm)	EIRP limit (dBm)	Result
03	5965	86.46	17.78	104.24	0.54	-95.23	9.55	24	Pass
51	6205	84.52	19.17	103.69	0.54	-95.23	9.00	24	Pass
91	6405	83.03	20.48	103.51	0.54	-95.23	8.82	24	Pass
99	6445	82.88	20.60	103.48	0.54	-95.23	8.79	24	Pass
107	6485	82.87	20.62	103.49	0.54	-95.23	8.80	24	Pass
123	6565	82.91	20.58	103.49	0.54	-95.23	8.80	24	Pass
155	6725	82.29	21.39	103.68	0.54	-95.23	8.99	24	Pass
179	6845	82.32	21.16	103.48	0.54	-95.23	8.79	24	Pass
195	6925	82.39	20.97	103.36	0.54	-95.23	8.67	24	Pass
211	7005	82.73	20.90	103.63	0.54	-95.23	8.94	24	Pass
227	7085	82.92	21.04	103.96	0.54	-95.23	9.27	24	Pass

Product : Set Back Box with Wi-Fi6E, BT & PoE
Test Item : Transmit Output
Test Mode : Transmit (802.11ax-80 MHz)
Test Date : 2023/10/04

Channel No.	Frequency (MHz)	Reading Level (dBμV/m)	Path Loss (dB)	Field Strength (dBμV/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm)	EIRP limit (dBm)	Result
07	5985	88.43	17.78	106.21	0.57	-95.23	11.55	24	Pass
55	6225	86.56	19.32	105.88	0.57	-95.23	11.22	24	Pass
87	6385	85.57	20.32	105.89	0.57	-95.23	11.23	24	Pass
103	6465	85.84	20.60	106.44	0.57	-95.23	11.78	24	Pass
135	6625	85.16	20.70	105.86	0.57	-95.23	11.20	24	Pass
151	6705	85.47	21.16	106.63	0.57	-95.23	11.97	24	Pass
167	6785	84.07	22.01	106.08	0.57	-95.23	11.42	24	Pass
199	6945	85.07	20.97	106.04	0.57	-95.23	11.38	24	Pass
215	7025	85.32	20.98	106.30	0.57	-95.23	11.64	24	Pass

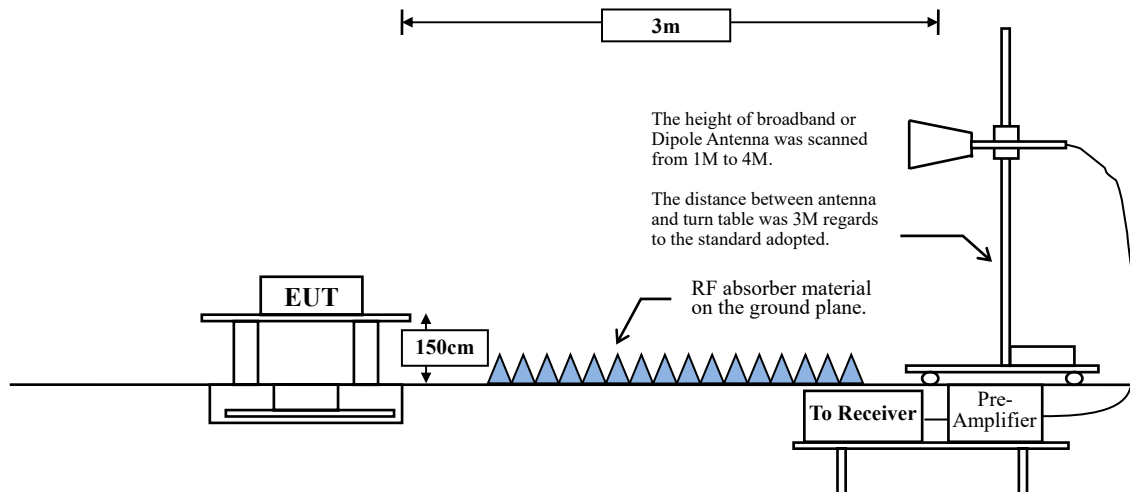
Product : Set Back Box with Wi-Fi6E, BT & PoE
Test Item : Transmit Output
Test Mode : Transmit (802.11ax-160 MHz)
Test Date : 2023/10/04

Channel No.	Frequency (MHz)	Reading Level (dBμV/m)	Path Loss (dB)	Field Strength (dBμV/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm)	EIRP limit (dBm)	Result
15	6025	89.92	17.91	107.83	0.90	-95.23	13.50	24	Pass
47	6185	89.49	19.03	108.52	0.90	-95.23	14.19	24	Pass
79	6345	89.08	19.99	109.07	0.90	-95.23	14.74	24	Pass
143	6665	88.08	20.89	108.97	0.90	-95.23	14.64	24	Pass
207	6985	88.42	20.91	109.33	0.90	-95.23	15.00	24	Pass

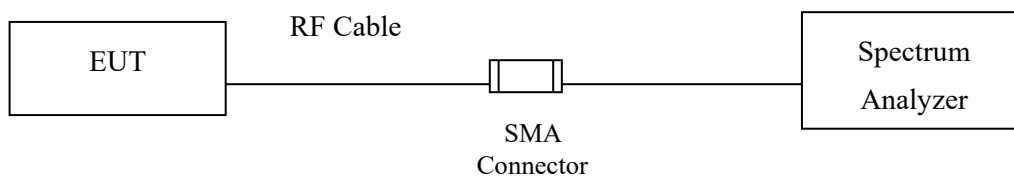
5. Maximum Power Spectrum Density

5.1. Test Setup

Radiated PSD Measurement



Conducted PSD Measurement



5.2. Limits

1. For the 5.925~6.425 GHz band:

For standard power access point and fixed client device : e.i.r.p PSD < 23 dBm/MHz.

For indoor access point : e.i.r.p PSD < 5 dBm/MHz.

For subordinate device control of an indoor access point : e.i.r.p PSD < 5 dBm/MHz.

For client device control of a standard power access point : e.i.r.p PSD < 17 dBm/MHz.

For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.

2. For the 6.425~6.525 GHz band:

For indoor access point : e.i.r.p PSD < 5 dBm/MHz.

For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.

3. For the 6.525~6.875 GHz band:

For standard power access point and fixed client device : e.i.r.p PSD < 23 dBm/MHz.

For indoor access point : e.i.r.p PSD < 5 dBm/MHz.

For subordinate device control of an indoor access point : e.i.r.p PSD < 5 dBm/MHz.

For client device control of a standard power access point : e.i.r.p PSD < 17 dBm/MHz.

For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.

4. For the 6.875~7.125 GHz band:

For indoor access point : e.i.r.p PSD < 5 dBm/MHz.

For client device control of an indoor access point : e.i.r.p PSD < -1 dBm/MHz.

5.3. Test Procedure

☒ Radiated

1. The EUT was setup to ANSI C63.10: 2013; tested to U-NII test procedure of KDB 789033 D02 v02r01 Method SA-2 for compliance to FCC CFR Title 47 Part 15 Subpart E requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground and the turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters. The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level.
3. Perform a field strength measurement following ANSI C63.10 and record the worse field strength value via spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then convert the measured field strength level to EIRP level.
4. Following ANSI C63.10 and KDB 412172 D01 v01r01,
$$\text{EIRP value (dBm)} = \text{Field strength value (dB}\mu\text{V/m)} + \text{Correction factor (dB) @3m}$$
$$\text{Correction factor (dB) @3m} = 20 \cdot \log(3) - 104.77 = -95.23\text{dB}$$

☐ Conducted

The EUT was setup to ANSI C63.10, 2013; tested to UNII test procedure of FCC KDB-789033 for compliance to FCC 47CFR Subpart E requirements.

The Peak Power Spectral Density using KDB 789033 section F) procedure, Create an average power spectrum for the EUT operating mode being tested by following the instructions in section E)2) for measuring maximum conducted output power using a spectrum analyzer.

SA-1 method is selected to run the test.

5.4. Test Result of Maximum Power Spectral Density

Product : Set Back Box with Wi-Fi6E, BT & PoE
 Test Item : Maximum Power Spectral Density
 Test Mode : Transmit (802.11a)
 Test Date : 2023/10/04

Channel No.	Frequency (MHz)	Reading Level (dBμV/m)	Path Loss (dB)	Field Strength (dBμV/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm/m)	EIRP limit (dBm)	Result
01	5955	73.25	17.78	91.03	3.06	-95.23	-1.14	-1	Pass
45	6175	71.84	18.96	90.80	3.06	-95.23	-1.37	-1	Pass
93	6415	70.41	20.51	90.92	3.06	-95.23	-1.25	-1	Pass
97	6435	70.26	20.59	90.85	3.06	-95.23	-1.32	-1	Pass
105	6475	70.50	20.61	91.11	3.06	-95.23	-1.06	-1	Pass
113	6515	70.56	20.59	91.15	3.06	-95.23	-1.02	-1	Pass
117	6535	70.47	20.54	91.01	3.06	-95.23	-1.16	-1	Pass
149	6695	70.12	21.03	91.15	3.06	-95.23	-1.02	-1	Pass
181	6555	70.04	21.02	91.06	3.06	-95.23	-1.11	-1	Pass
189	6895	70.05	20.95	91.00	3.06	-95.23	-1.17	-1	Pass
213	7015	70.08	20.94	91.02	3.06	-95.23	-1.15	-1	Pass
233	7115	70.07	21.04	91.11	3.06	-95.23	-1.06	-1	Pass

Product : Set Back Box with Wi-Fi6E, BT & PoE
 Test Item : Maximum Power Spectral Density
 Test Mode : Transmit (802.11ax-20 MHz)
 Test Date : 2023/10/04

Channel No.	Frequency (MHz)	Reading Level (dBμV/m)	Path Loss (dB)	Field Strength (dBμV/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm/m)	EIRP limit (dBm)	Result
01	5955	75.21	17.78	92.99	1.01	-95.23	-1.23	-1	Pass
45	6175	73.95	18.96	92.91	1.01	-95.23	-1.31	-1	Pass
93	6415	72.59	20.51	93.10	1.01	-95.23	-1.12	-1	Pass
97	6435	72.55	20.59	93.14	1.01	-95.23	-1.08	-1	Pass
105	6475	72.36	20.61	92.97	1.01	-95.23	-1.25	-1	Pass
113	6515	72.53	20.59	93.12	1.01	-95.23	-1.10	-1	Pass
117	6535	72.56	20.54	93.10	1.01	-95.23	-1.12	-1	Pass
149	6695	71.93	21.03	92.96	1.01	-95.23	-1.26	-1	Pass
181	6555	71.96	21.02	92.98	1.01	-95.23	-1.24	-1	Pass
189	6895	72.00	20.95	92.95	1.01	-95.23	-1.27	-1	Pass
213	7015	72.23	20.94	93.17	1.01	-95.23	-1.05	-1	Pass
233	7115	57.67	21.04	78.71	1.01	-95.23	-15.51	-1	Pass

Product : Set Back Box with Wi-Fi6E, BT & PoE
 Test Item : Maximum Power Spectral Density
 Test Mode : Transmit (802.11ax-40 MHz)
 Test Date : 2023/10/04

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm/m)	EIRP limit (dBm)	Result
03	5965	75.76	17.78	93.54	0.54	-95.23	-1.15	-1	Pass
51	6205	74.49	19.17	93.66	0.54	-95.23	-1.03	-1	Pass
91	6405	73.19	20.48	93.67	0.54	-95.23	-1.02	-1	Pass
99	6445	72.90	20.60	93.50	0.54	-95.23	-1.19	-1	Pass
107	6485	72.86	20.62	93.48	0.54	-95.23	-1.21	-1	Pass
123	6565	72.94	20.58	93.52	0.54	-95.23	-1.17	-1	Pass
155	6725	72.26	21.39	93.65	0.54	-95.23	-1.04	-1	Pass
179	6845	72.36	21.16	93.52	0.54	-95.23	-1.17	-1	Pass
195	6925	72.61	20.97	93.58	0.54	-95.23	-1.11	-1	Pass
211	7005	72.73	20.90	93.63	0.54	-95.23	-1.06	-1	Pass
227	7085	72.56	21.04	93.60	0.54	-95.23	-1.09	-1	Pass

Product : Set Back Box with Wi-Fi6E, BT & PoE
Test Item : Maximum Power Spectral Density
Test Mode : Transmit (802.11ax-80 MHz)
Test Date : 2023/10/04

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm/m)	EIRP limit (dBm)	Result
07	5985	75.85	17.78	93.63	0.57	-95.23	-1.03	-1	Pass
55	6225	74.23	19.32	93.55	0.57	-95.23	-1.11	-1	Pass
87	6385	73.26	20.32	93.58	0.57	-95.23	-1.08	-1	Pass
103	6465	72.92	20.60	93.52	0.57	-95.23	-1.14	-1	Pass
135	6625	72.77	20.70	93.47	0.57	-95.23	-1.19	-1	Pass
151	6705	72.42	21.16	93.58	0.57	-95.23	-1.08	-1	Pass
167	6785	71.46	22.01	93.47	0.57	-95.23	-1.19	-1	Pass
199	6945	72.40	20.97	93.37	0.57	-95.23	-1.29	-1	Pass
215	7025	72.60	20.98	93.58	0.57	-95.23	-1.08	-1	Pass

Product : Set Back Box with Wi-Fi6E, BT & PoE
Test Item : Maximum Power Spectral Density
Test Mode : Transmit (802.11ax-160 MHz)
Test Date : 2023/10/04

Channel No.	Frequency (MHz)	Reading Level (dB μ V/m)	Path Loss (dB)	Field Strength (dB μ V/m)	Duty Factor (dB)	Correction Factor (dB)	EIRP (dBm/m)	EIRP limit (dBm)	Result
15	6025	75.39	17.91	93.30	0.90	-95.23	-1.03	-1	Pass
47	6185	74.08	19.03	93.11	0.90	-95.23	-1.22	-1	Pass
79	6345	73.25	19.99	93.24	0.90	-95.23	-1.09	-1	Pass
143	6665	72.4	20.89	93.29	0.90	-95.23	-1.04	-1	Pass
207	6985	72.4	20.91	93.31	0.90	-95.23	-1.02	-1	Pass

Spectrum plot of worst value

