



Test Report No:
23A0149R-RFUSV03S-A

TEST REPORT

FCC Rules&Regulations

Product Name	Mesh Wi-Fi Router
Brand Name	Castlenet
Model No.	EBM522CUP, EBM522C, EBM522, EBM522CP, EBM522CU
FCC ID	RK9-EBM522C
Applicant's Name / Address	CastleNet Technology Inc. No. 14, Ln. 141, Sec. 3, Beishen Rd., Shenkeng Dist., New Taipei City 22244, Taiwan (R.O.C.)
Manufacturer's Name / Address	CastleNet Technology Inc. No. 14, Ln. 141, Sec. 3, Beishen Rd., Shenkeng Dist., New Taipei City 22244, Taiwan (R.O.C.)
Test Method Requested, Standard	FCC CFR Title 47 Part 15 Subpart E Section 15.407 ANSI C63.10-2013
Verdict Summary	IN COMPLIANCE
Documented By	<i>Amelia Wu</i> Amelia Wu
Approved By	<i>Rueyuan Lin</i> Rueyuan Lin
Date of Receipt	Oct. 06, 2023
Date of Issue	Dec. 07, 2023
Report Version	V1.0

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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

Version	Description	Issued Date
V1.0	Initial issue of report	Dec. 07, 2023

Summary of Test Result

Report Clause	Test Items	Result (PASS/FAIL)	Remark
3	AC Power Line Conducted Emission	PASS	-
4	Emission Bandwidth	PASS	-
5	Maximum Conducted Output Power	PASS	-
6	Maximum Power Spectral Density	PASS	-
7	Transmitter Radiated Spurious Emission	PASS	-

Comments and Explanations

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Comments and Remarks

The product specification and testing instructions for the EUT declared in the report are provided by the manufacturer who will take all responsibilities for the accuracy.

1. General Information

1.1. EUT Description

Frequency Range	5150 ~ 5250 MHz 5250 ~ 5350 MHz 5470 ~ 5725 MHz 5725 ~ 5850 MHz	
Operating Frequency / Channel Number	IEEE 802.11a IEEE 802.11n/ac/ax (20 MHz)	5180 ~ 5240 MHz / 4 Channels 5260 ~ 5320 MHz / 4 Channels 5500 ~ 5720 MHz / 12 Channels 5745 ~ 5825 MHz / 5 Channels
	IEEE 802.11n/ac/ax (40 MHz)	5190 ~ 5230 MHz / 2 Channels 5270 ~ 5310 MHz / 2 Channels 5510 ~ 5710 MHz / 6 Channels 5755 ~ 5795 MHz / 2 Channels
	IEEE 802.11ac/ax (80 MHz)	5210 MHz / 1 Channel 5290 MHz / 1 Channel 5530 ~ 5690 MHz / 3 Channels 5775 MHz / 1 Channel
	IEEE 802.11ac/ax (160 MHz)	5250 MHz / 1 Channel 5570 MHz / 1 Channel
Type of Modulation	IEEE 802.11a/n	OFDM-BPSK, QPSK, 16QAM, 64QAM
	IEEE 802.11ac	OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM
	IEEE 802.11ax	OFDMA-BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM

Accessories Information				
No.	Equipment Name	Brand Name	Model No.	Rating
1	Adapter 1	MOSO	MS-V1500R120-018H0-US(SC411-U0)	INPUT:AC100 ~ 240V, 50/60Hz, 0.6A Max OUTPUT: DC12.0V, 1.5A
2	Adapter 2	Chenyang	CYAPYL18-120150U	INPUT:AC100 ~ 240V, 50/60Hz, 0.6A Max OUTPUT: DC12.0V, 1.5A
No.	Equipment Name	Brand Name	Model No.	Description
3	RJ-45 Cable 1	EEK SONG	PF01-C111	Non-Shielded, 1.0m
4	RJ-45 Cable 2	EEK SONG	PF01-C122	Non-Shielded, 1.8m
5	RJ-45 Cable 3	HOP	G-HOP802-223-001	Non-Shielded, 1.8m

The difference for each model is shown as below:

Configuration	Model No.	USB port	Power button
1	EBM522C, EBM522	X	X
2	EBM522CP	X	V
3	EBM522CU	V	X
4	EBM522CUP	V	V

From the above models, model: EBM522CUP was selected as representative model for the test and its data was recorded in this report.

EBM522 and EBM522C are the same, just for marketing purpose.

Antenna Information											
Ant.	Brand Name	Model No.	Type	Antenna Gain (dBi)				Directional Gain (dBi)			
				U-NII 1	U-NII 2A	U-NII 2C	U-NII 3	U-NII 1	U-NII 2A	U-NII 2C	U-NII 3
0	Lynwave	ALX22P-221AA2-00	Dipole	2.4	2.5	2.5	2.3	9.293	9.467	9.467	9.250
1	Lynwave	ALX21P-221AAH-00	Dipole	2.3	2.5	2.5	2.2				
2	Lynwave	ALX21P-091AAJ-00	Dipole	3.8	4.3	4.3	3.7				
3	Lynwave	ALX21P-091AAJ-01	Dipole	4.4	4.3	4.3	4.5				

$$\text{Directional Gain} = 10 \log [(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{\text{Ant}}]$$

For IEEE 802.11a/n/ac/ax Mode: (4TX, 4RX)

Above antennas can be used as transmitting/receiving antennas, and they can transmit/receive signal simultaneously.

1.2. EUT Information

EUT Power Type	From Adapter			
EUT Function	<input checked="" type="checkbox"/>	Point-to-multipoint	<input type="checkbox"/>	Point-to-point
TPC Function	<input checked="" type="checkbox"/>	With TPC Function	<input type="checkbox"/>	Without TPC Function
Weather Band (5600 ~ 5650 MHz)	<input checked="" type="checkbox"/>	With 5600 ~ 5650 MHz	<input type="checkbox"/>	Without 5600 ~ 5650 MHz
Beamforming Function	<input checked="" type="checkbox"/>	With beamforming	<input type="checkbox"/>	Without beamforming
Resource Unit of 802.11ax	<input checked="" type="checkbox"/>	Full RU	<input type="checkbox"/>	Partial RU
Product Type	<input type="checkbox"/>	Outdoor AP	<input checked="" type="checkbox"/>	Indoor AP
	<input type="checkbox"/>	Fixed P2P AP	<input type="checkbox"/>	Client

1.3. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ◆ 47 CFR FCC Part 15
- ◆ ANSI C63.10-2013
- ◆ KDB 789033 D02 v02r01

The following reference test guidance is not within the scope of accreditation of TAF.

- ◆ KDB 662911 D01 v02r01
- ◆ KDB 412172 D01 v01r01
- ◆ KDB 414788 D01 v01r01

1.4. Testing Location Information

Testing Location Information	
Test Laboratory : DEKRA Testing and Certification Co., Ltd.	
1 (TAF: 3024)	ADD: No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. TEL: +886-3-582-8001 FAX: +886-3-582-8958
2 (TAF: 3024)	ADD: No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. TEL: +886-3-582-8001 FAX: +886-3-582-8958
Test site number for address 1 includes HC-SR02. Test site number for address 2 includes HC-CB02, HC-CB03, HC-CB04, HC-SR10 and HC-SR12.	

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
AC Conduction Emission	HC-SR02	Igor Tseng	21.2 / 56	2023/11/02
RF Conducted Emission	HC-SR12	Scott Chang	25~25.3 / 58~61	2023/11/03~2023/11/14
Radiated Emission	HC-CB04	Ling Chen Gary Liao	21.5~25 / 60~63	2023/10/23~2023/10/27

1.5. Measurement Uncertainty

Uncertainties have been calculated according to the DEKRA internal document with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)).

Test Item	Uncertainty
AC Power Line Conducted Emission	± 2.34 dB
Emission Bandwidth	± 636.54 Hz
Maximum Conducted Output Power	± 1.16 dB
Maximum Power Spectral Density	± 2.47 dB
Transmitter Radiated Spurious Emission	± 3.52 dB below 1 GHz ± 3.56 dB above 1 GHz

1.6. List of Test Equipment

HC-SR02

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal. Date	Next Cal. Date
Artificial Mains Network	R&S	ENV4200	848411/010	9kHz-30MHz, 4line/100A	2022/12/19	2023/12/18
EMI Test Receiver	R&S	ESR3	102608	9 kHz - 3.6 GHz	2023/09/19	2024/09/18
LISN	R&S	ENV216	100096	9kHz-30MHz	2023/06/02	2024/06/01
Coaxial Cable(9m)	Harbour	RG-400	HC-SR02	9 kHz-2500 MHz	2023/08/04	2024/08/03
DEKRA Testing System	AUDIX	e3 210616 dekra V9	HC-SR02	N/A	N/A	N/A

HC-SR12

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal. Date	Next Cal. Date
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	0.3-40 GHz	2023/10/25	2024/10/24
Pulse Power Sensor	Anritsu	MA2411B	1531043	0.3-40 GHz	2023/10/25	2024/10/24
Pulse Power Sensor	Anritsu	MA2411B	1531044	0.3-40 GHz	2023/10/25	2024/10/24
Signal & Spectrum Analyzer	R&S	FSV40	101869	10Hz-40GHz	2023/07/03	2024/07/02

HC-CB04

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Cal. Date	Next Cal. Date
Signal and Spectrum Analyzer	R&S	FSVA40	101435	10 Hz-40 GHz	2023/05/29	2024/05/28
EXA Signal Analyzer	Keysight	N9010A	MY51440132	10 Hz-44 GHz	2022/12/13	2023/12/12
Trilog Broadband Antenna	Schwarzbeck	VULB 9168	1209	30 MHz-2 GHz	2023/06/13	2024/06/12
Double Ridged Horn Antenna	RF SPIN	DRH18-E	211212A18EN	1G-18GHz	2022/11/15	2023/11/14
Pre-Amplifier	EMCI	EMC01820I	980364	30M-8 GHz,20 dB	2023/06/06	2024/06/05
Pre-Amplifier	EMEC	EM01G18GA	060835	1-18 GHz,50 dB	2023/07/24	2024/07/23
Pre-Amplifier	DEKRA	AP-400C	201801231	18G-40 GHz,48 dB	2023/10/03	2024/10/02
Coaxial Cable(11m)	Suhner	SF102_SF104	HC-CB04	30M-18 GHz	2023/08/08	2024/08/07
Coaxial Cable(3m)	Suhner,Rosnol	SF102_UP0264	HC-CB04-1	18G-40 GHz	2023/08/14	2024/08/13
EMI Test Receiver	R&S	ESR7	102260	10 Hz-7 GHz	2022/12/01	2023/11/30
Magnetic Loop Antenna	Teseq	HLA 6121	44287	0.01-30 MHz	2023/10/13	2024/10/12
Radiated Software	AUDIX	e3 V9	HC-CB04_1	N/A	N/A	N/A

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2. Test Configuration of EUT

2.1. Test Condition

EUT Operational Condition	
Testing Voltage	AC 120V/60Hz

2.2. Test Frequency Mode

Test Software Version	M Tool 3.1.0.6
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<Non-beamforming mode>

Modulation	Frequency (MHz)	Power Setting
802.11a	5180	84.0
	5220	81.0
	5240	80.0
	5260	54.0
	5300	54.0
	5320	58.0
	5500	56.0
	5580	54.0
	5700	55.0
	5720	55.0
	5745	71.0
	5785	71.0
802.11ax (20 MHz)	5180	82.0
	5220	79.0
	5240	82.0
	5260	58.0
	5300	58.0
	5320	60.0
	5500	58.0
	5580	57.0
	5700	58.0
	5720	56.0
	5745	69.0
	5785	67.0
802.11ax (40 MHz)	5190	78.0
	5230	90.0
	5270	68.0
	5310	69.0
	5510	70.0
	5550	68.0
	5670	69.0
	5710	68.0
	5755	86.0
	5795	84.0

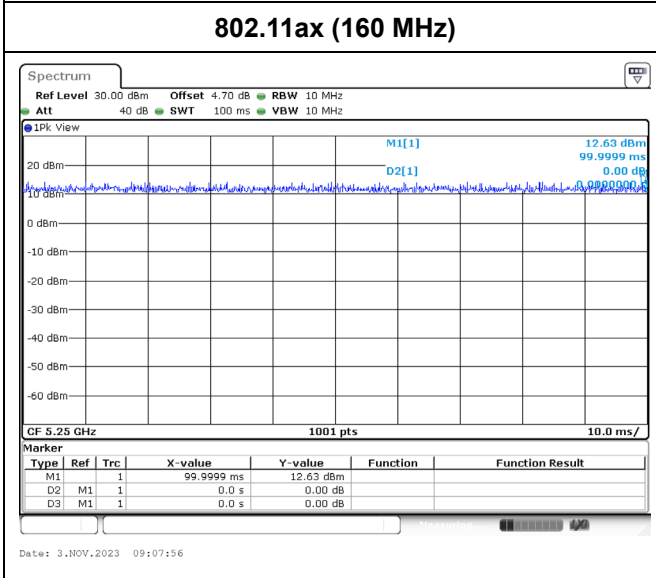
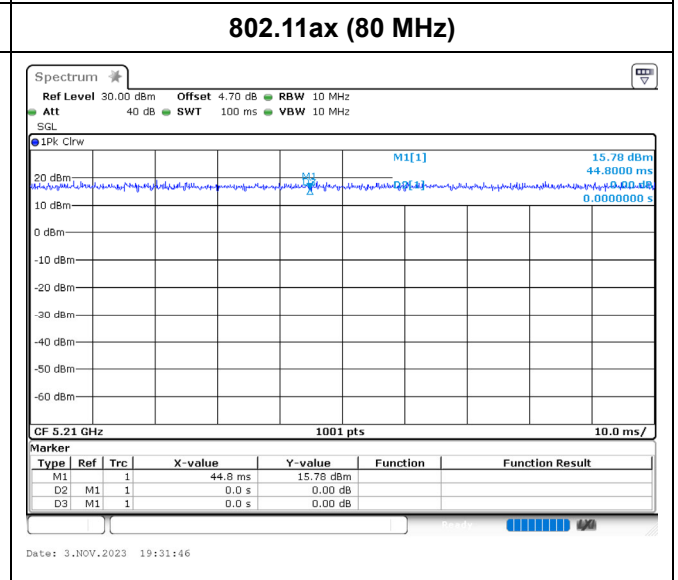
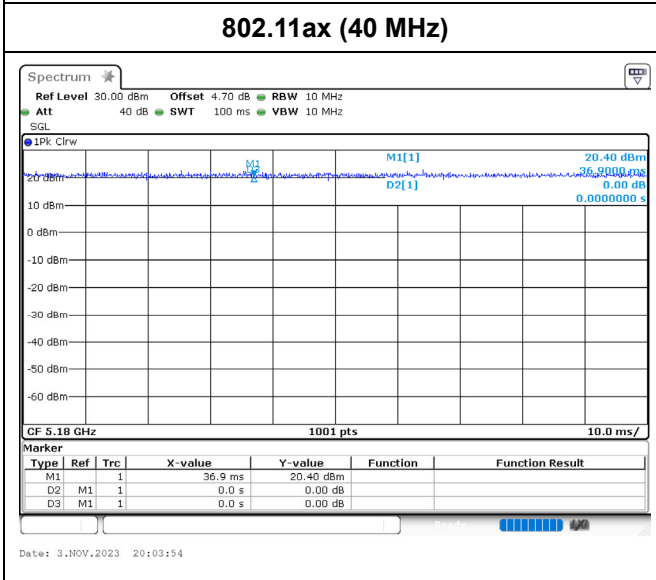
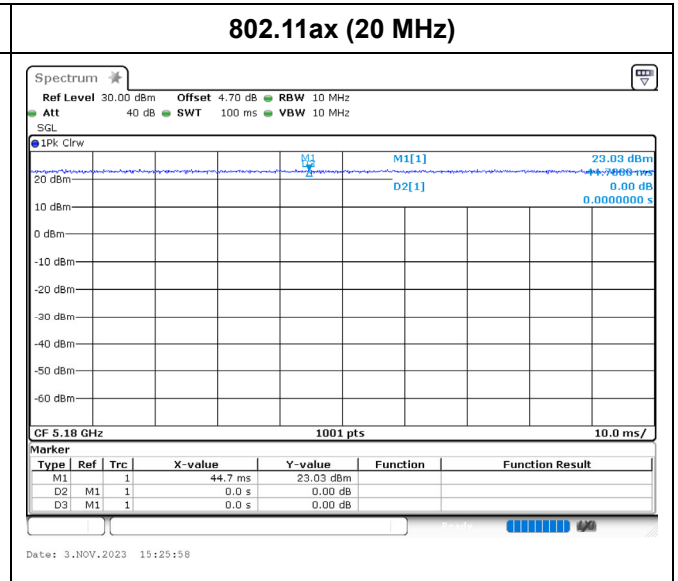
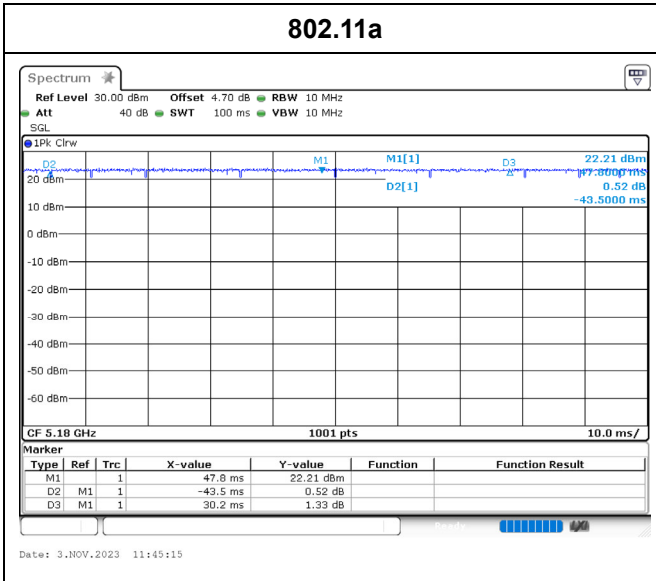
Modulation	Frequency (MHz)	Power Setting
802.11ax (80 MHz)	5210	74.0
	5290	74.0
	5530	76.0
	5610	74.0
	5690	78.0
	5775	94.0
802.11ax (160 MHz)	5250	68.0
	5570	70.0

<Beamforming mode>

Modulation	Frequency (MHz)	Power Setting
802.11ax (20 MHz)	5180	58.0
	5220	55.0
	5240	58.0
	5260	34.0
	5300	34.0
	5320	36.0
	5500	34.0
	5580	33.0
	5700	34.0
	5720	32.0
	5745	45.0
	5785	43.0
802.11ax (40 MHz)	5825	43.0
	5190	54.0
	5230	66.0
	5270	44.0
	5310	45.0
	5510	46.0
	5550	44.0
	5670	45.0
	5710	44.0
5755	62.0	
802.11ax (80 MHz)	5795	60.0
	5210	50.0
	5290	50.0
	5530	52.0
	5610	50.0
	5690	54.0
802.11ax (160 MHz)	5775	70.0
	5250	44.0
	5570	46.0

2.3. Duty Cycle

Modulation	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	-	-	100.00	0.000	0.010
802.11ax (20 MHz)	-	-	100.00	0.000	0.010
802.11ax (40 MHz)	-	-	100.00	0.000	0.010
802.11ax (80 MHz)	-	-	100.00	0.000	0.010
802.11ax (160 MHz)	-	-	100.00	0.000	0.010



2.4. The Worst Case Measurement Configuration

Tests Item	AC Power Line Conducted Emission
Test Condition	AC power line conducted measurement for line and neutral
Operating Mode	Transmit
1	EUT + Adapter 1
2	EUT + Adapter 2

Tests Item	Emission Bandwidth Maximum Conducted Output Power Maximum Power Spectral Density
Test Condition	Conducted measurement at transmit chains

Tests Item	Transmitter Radiated Spurious Emission
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.
Operating Mode < 1GHz	Transmit
1	EUT + Adapter 1
2	EUT + Adapter 2
Operating Mode > 1GHz	Transmit

The EUT was performed at X axis, Y axis and Z axis position for transmitter radiated spurious emission test. The worst case was found at Y axis, so the measurement will follow this same test configuration.

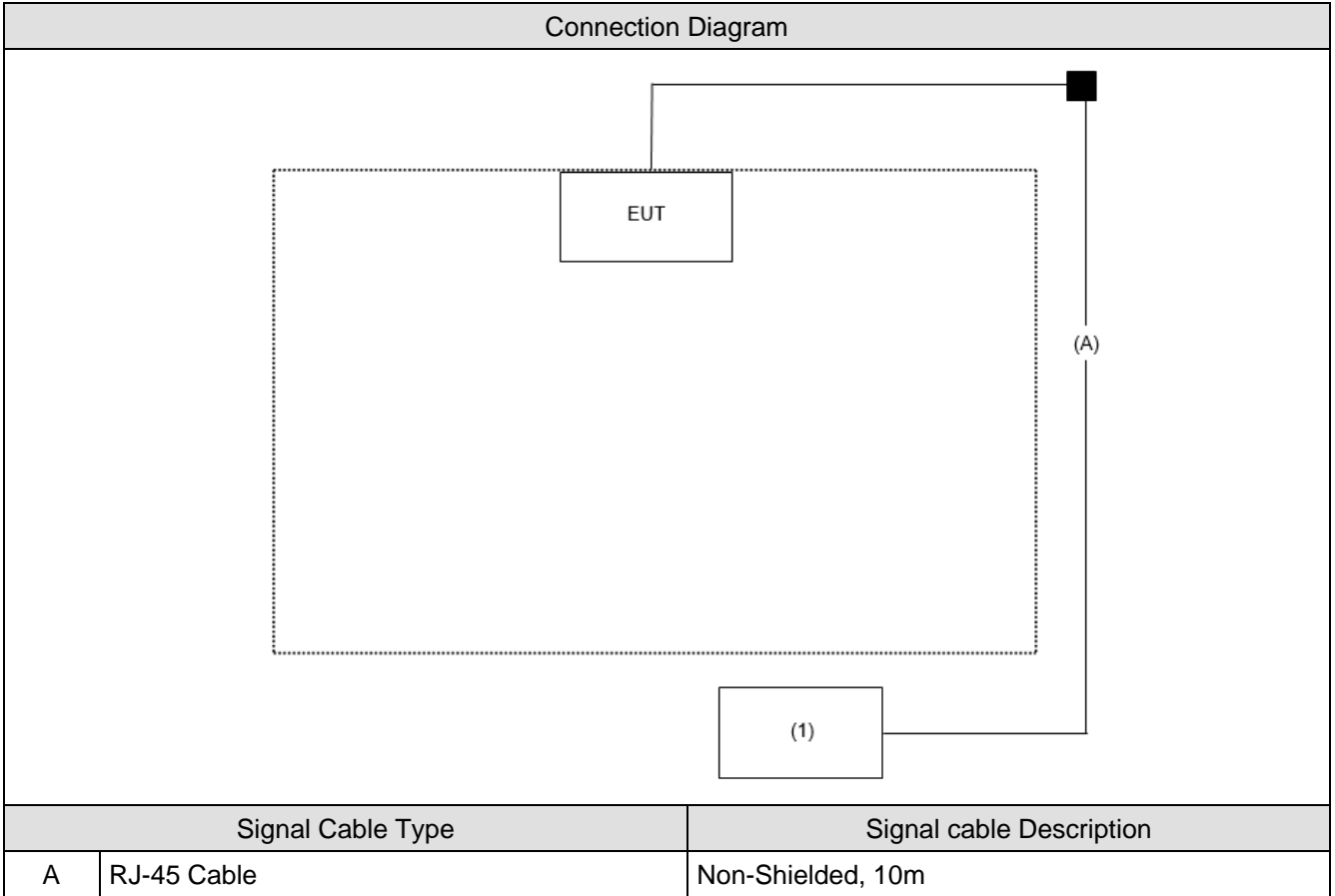
Note:

1. Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. For radiated emission below 1 GHz and AC power line conducted emission have performed all modes of operation were investigated and the worst-case emissions are reported.
3. The device was evaluated and the total power of the 802.11n mode and 802.11ac mode does not exceed that of the 802.11ax mode, so the outcome of the 802.11ax mode is reported in this report.
4. This device does not support "802.11ax Channel Puncturing" function.

2.5. Tested System Details

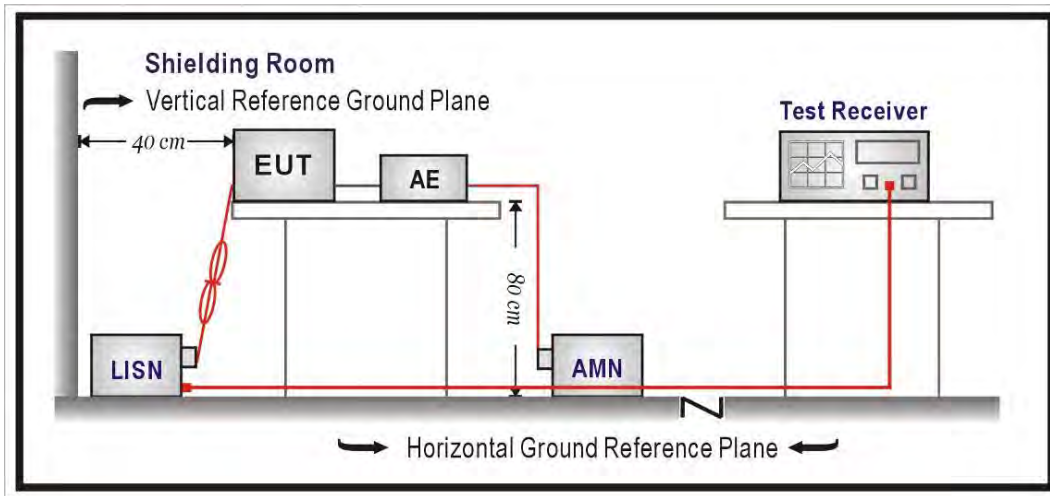
No.	Equipment	Brand Name	Model No.	Serial No.
1	Notebook	ASUS	E402S	GBN0CV14W224476

2.6. Configuration of tested System



3. AC Power Line Conducted Emission

3.1. Test Setup



3.2. Test Limit

Frequency (MHz)	QP (dBuV)	AV (dBuV)
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.

3.3. 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.

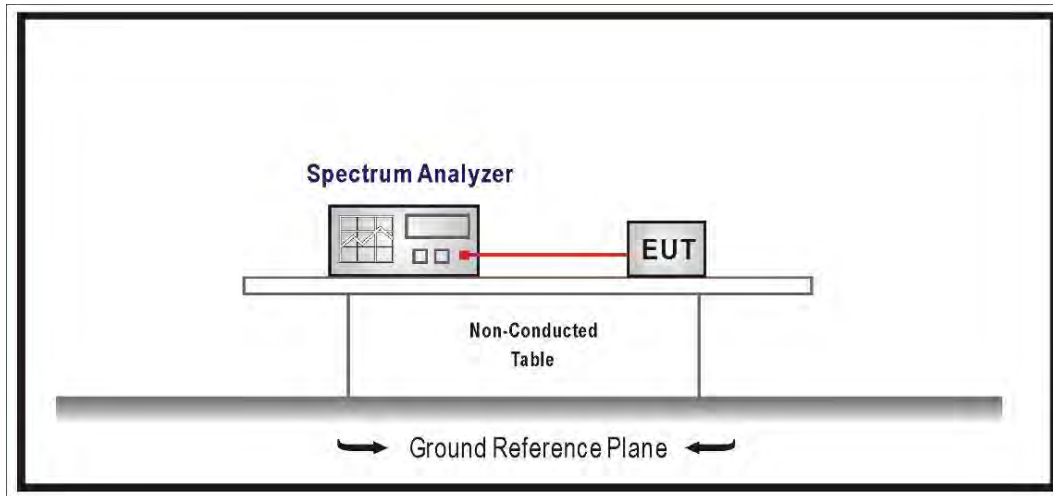
Conducted emissions were investigated over the frequency range from 0.15 MHz to 30 MHz using a receiver bandwidth of 9 kHz.

3.4. Test Result of AC Power Line Conducted Emission

Refer as Appendix A

4. Emission Bandwidth

4.1. Test Setup



4.2. Test Limit

99% & 26dB Bandwidth : No Required

6dB Bandwidth \geq 500kHz

4.3. Test Procedure

99% & 26dB Bandwidth :

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

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

DTS Bandwidth :

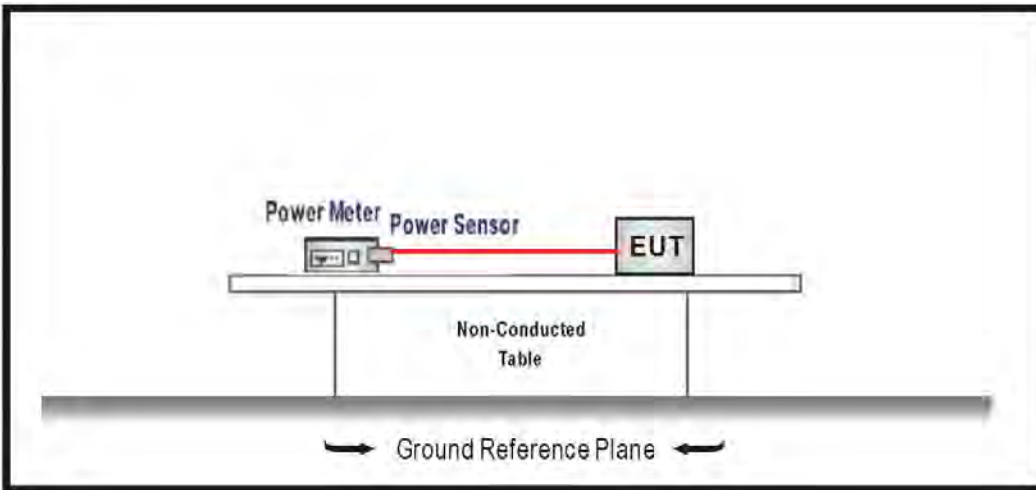
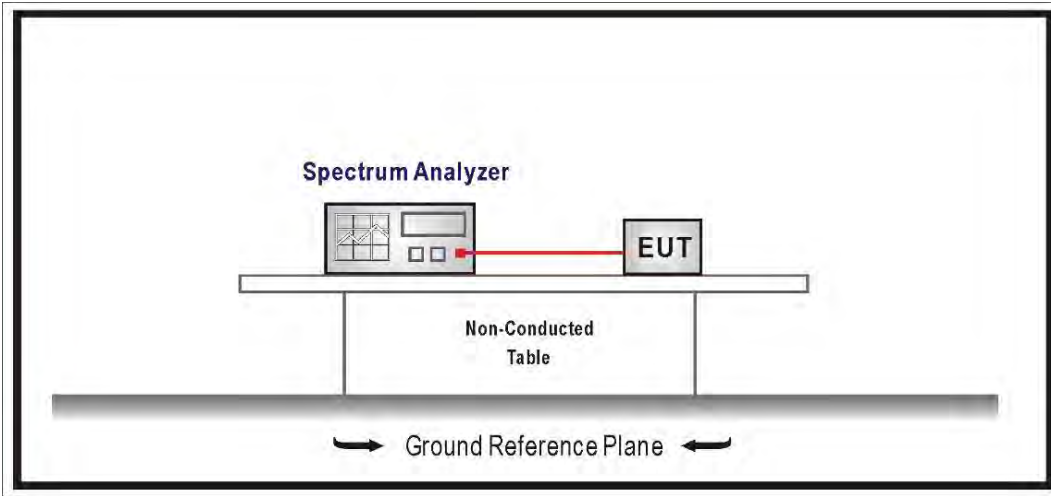
Set RBW = 100kHz, VBW \geq 3xRBW, Sweep time=Auto, Set Peak detector.

4.4. Test Result of Emission Bandwidth

Refer as Appendix B

5. Maximum Conducted Output Power

5.1. Test Setup



5.2. Test Limit

1. For an outdoor access point and an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
3. For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
4. For the band 5.850–5.895 GHz:
For an indoor access point, the maximum e.i.r.p. over the frequency band of operation must not exceed 36 dBm. Indoor access points operating on a channel that spans the 5.725–5.850 GHz and 5.850–5.895 GHz bands must not exceed an e.i.r.p. of 36 dBm.
For client devices, the maximum e.i.r.p. over the frequency band of operation must not exceed 30 dBm. Client devices operating on a channel that spans the 5.725–5.850 GHz and 5.850–5.895 GHz bands must not exceed an e.i.r.p. of 30 dBm.
For a subordinate device, the maximum e.i.r.p. over the frequency band of operation must not exceed 36 dBm.

5.3. Test Procedure

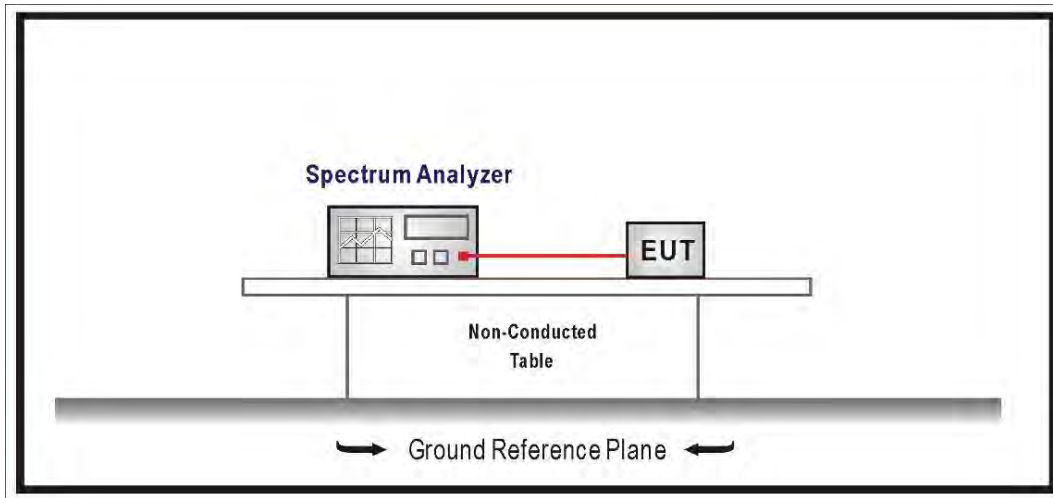
The EUT was setup to ANSI C63.10: 2013; tested according to U-NII test procedure of KDB 789033.

5.4. Test Result of Maximum Conducted Output Power

Refer as Appendix C

6. Maximum Power Spectral Density

6.1. Test Setup



6.2. Test Limit

1. For the band 5.15 ~ 5.25 GHz, the peak power spectral density shall not exceed 17 dBm in any 1 MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
2. For client devices in the 5.15 ~ 5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi
3. For the 5.25 ~ 5.35 GHz ,5470 ~ 5600 MHz and 5650 ~ 5725 MHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
4. For the band 5.725 ~ 5.850 GHz, the peak power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antenna of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that directional gain of the antenna exceeds 6 dBi.
5. The frequency band 5.850 ~ 5.895 GHz:
For an indoor access point operating in the 5.850–5.895 GHz band, the maximum power spectral density must not exceed 20 dBm e.i.r.p. in any 1–megahertz band.
For client devices operating under the control of an indoor access point in the 5.850–5.895 GHz band, the maximum power spectral density must not exceed 14 dBm e.i.r.p. in any 1-megahertz band.
For a subordinate device operating under the control of an indoor access point in the 5.850–5.895 GHz band, the maximum power spectral density must not exceed 20 dBm e.i.r.p in any 1–megahertz band.

6.3. Test Procedure

The EUT was setup to ANSI C63.10: 2013; tested to U-NII test procedure of KDB 789033.

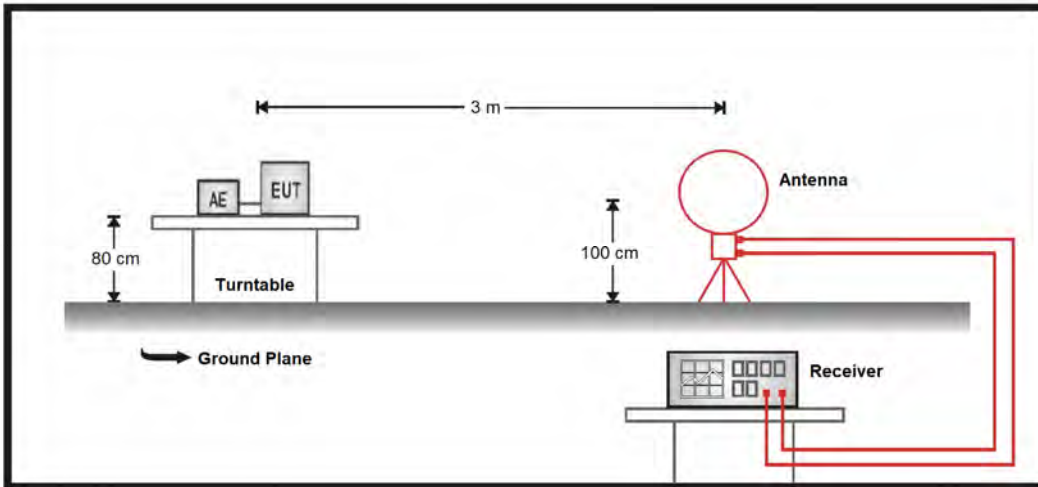
6.4. Test Result of Maximum Power Spectral Density

Refer as Appendix D

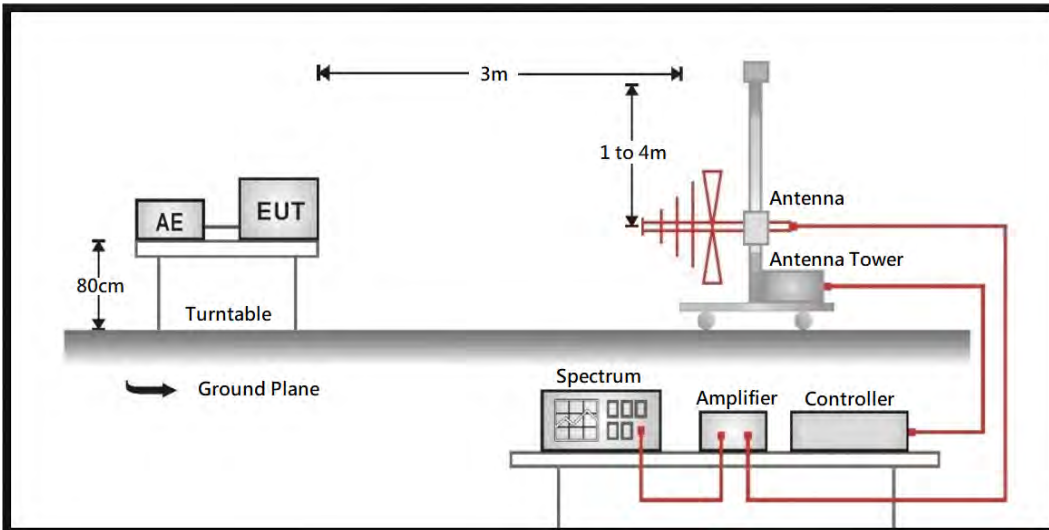
7. Transmitter Radiated Spurious Emission

7.1. Test Setup

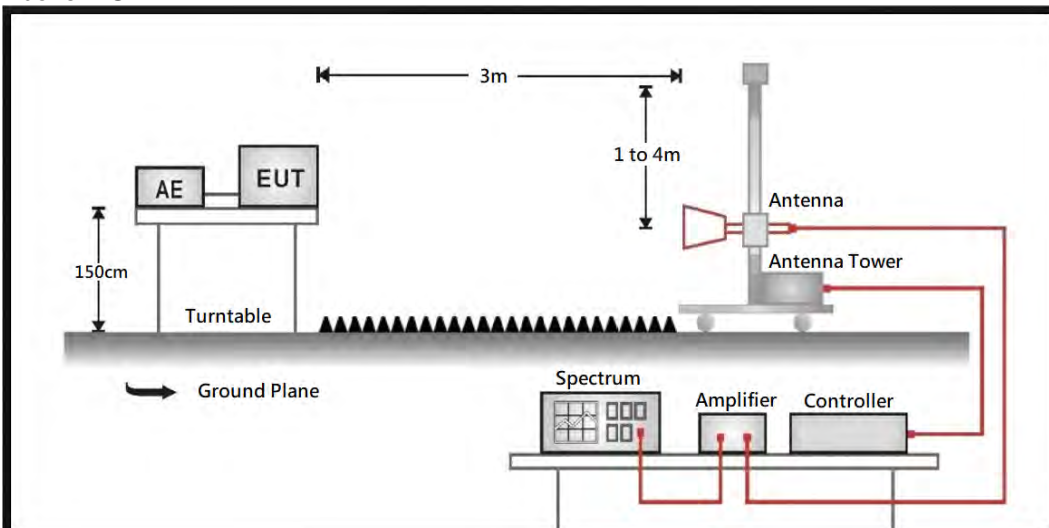
9 kHz ~ 30 MHz



30 MHz ~ 1 GHz



Above 1 GHz



7.2. Test Limit

Frequency (MHz)	Field strength (uV/m)	Field strength (dBuV/m)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	20 log (2400/F(kHz))	300
0.490 – 1.705	24000/F(kHz)	20 log (24000/F(kHz))	30
1.705 - 30	30	29.5	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

Remarks:

1. Field strength (dBuV/m) = 20 log Field strength (uV/m)
2. In the Above Table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Unwanted Emission out of the restricted bands Test Limit

Frequency (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength (dBuV/m@3m)
5150 – 5250	-27	68.2
5250 – 5350	-27	68.2
5470 – 5725	-27	68.2
5725 – 5850	-27 ^{*1}	68.2 ^{*1}
	10 ^{*2}	105.2 ^{*2}
	15.6 ^{*3}	110.8 ^{*3}
	27 ^{*4}	122.2 ^{*4}
5850 – 5895	(i) For an indoor access point or subordinate device, all emissions at or above 5.895 GHz shall not exceed an e.i.r.p. of 15 dBm/MHz and shall decrease linearly to an e.i.r.p. of -7 dBm/MHz at or above 5.925 GHz. (ii) For a client device, all emissions at or above 5.895 GHz shall not exceed an e.i.r.p. of -5 dBm/MHz and shall decrease linearly to an e.i.r.p. of -27 dBm/MHz at or above 5.925 GHz. (iii) For a client device or indoor access point or subordinate device, all emissions below 5.725 GHz shall not exceed an e.i.r.p. of -27 dBm/MHz at 5.65 GHz increasing linearly to 10 dBm/MHz at 5.7 GHz, and from 5.7 GHz increasing linearly to a level of 15.6 dBm/MHz at 5.72 GHz, and from 5.72 GHz increasing linearly to a level of 27 dBm/MHz at 5.725 GHz.	
^{*1} beyond 75 MHz or more above of the band edge. ^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above. ^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above. ^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.		

Remark:

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \text{ uV/m, where P is the eirp (Watts).}$$

7.3. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 or 1.5 meter above ground. The turn table can rotate 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 can move up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

The additional latch filter below 1 GHz was used to measure the level of harmonics radiated emission during field strength of harmonics measurement.

The bandwidth below 1 GHz setting on the field strength meter is 120 kHz, above 1 GHz are 1 MHz.

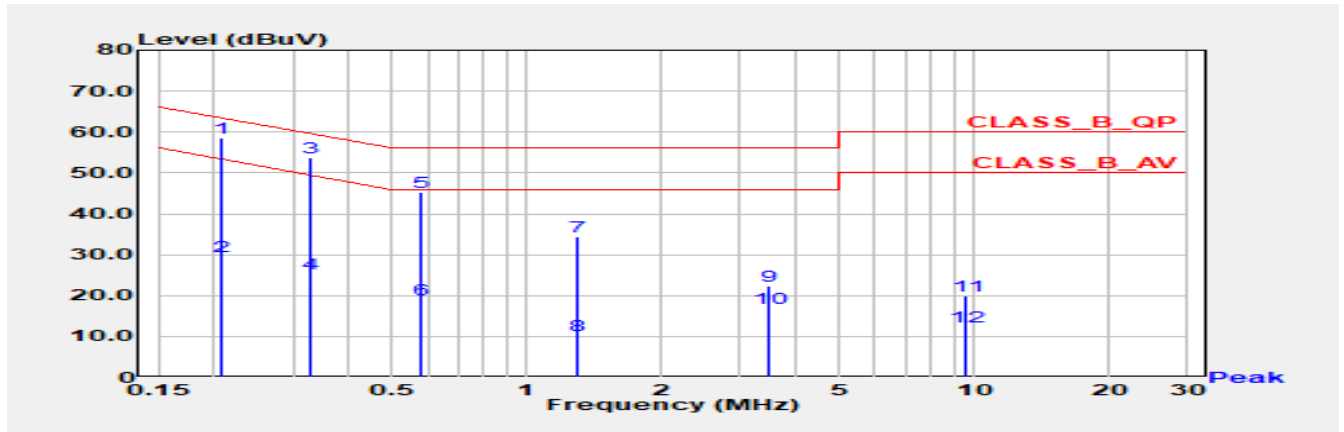
The frequency range from 9 kHz to 10th harmonics and included The frequency range from the lowest oscillator frequency generated within the device up to the 10th harmonic was checked is checked.

7.4. Test Result of Transmitter Radiated Spurious Emission

Refer as Appendix E

Appendix A. Test Result of AC Power Line Conducted Emission

Test Mode	Mode 1: EUT + Adapter 1	Phase	Line
Test Condition	802.11ax (40 MHz) / Ant. 0 + Ant. 1 + Ant. 2 + Ant. 3 / 5220 MHz		

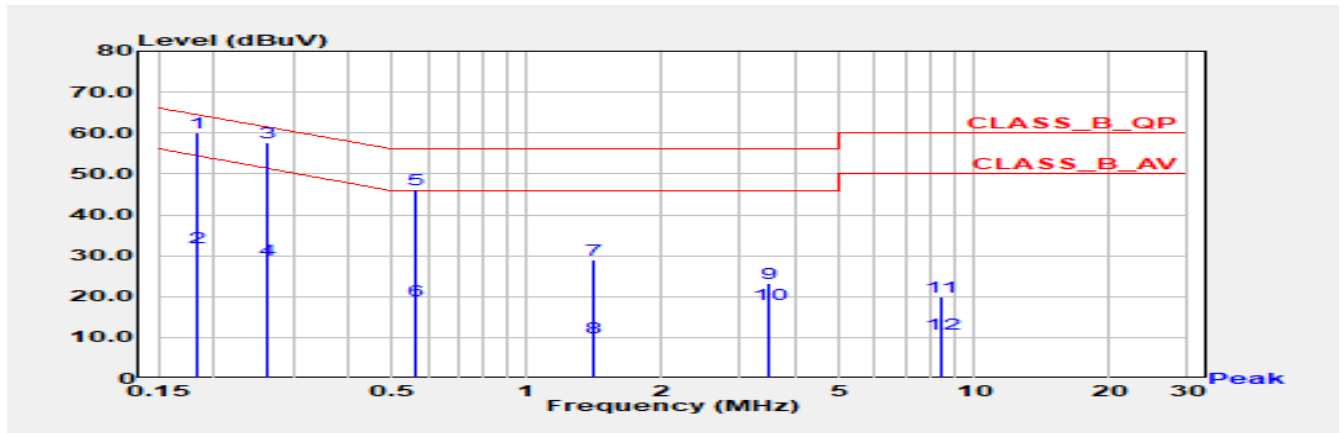


No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
*1	0.208	58.64	63.30	-4.66	49.03	9.62	QP
*2	0.208	29.56	53.30	-23.74	19.95	9.62	AV
3	0.329	53.65	59.46	-5.82	44.02	9.63	QP
4	0.329	25.30	49.46	-24.16	15.67	9.63	AV
5	0.577	45.34	56.00	-10.66	35.68	9.66	QP
6	0.577	19.02	46.00	-26.98	9.36	9.66	AV
7	1.292	34.30	56.00	-21.70	24.59	9.71	QP
8	1.292	10.38	46.00	-35.62	0.67	9.71	AV
9	3.493	22.45	56.00	-33.55	12.63	9.82	QP
10	3.493	16.81	46.00	-29.19	6.99	9.82	AV
11	9.596	19.87	60.00	-40.13	9.79	10.07	QP
12	9.596	12.33	50.00	-37.67	2.25	10.07	AV

Remark:

1. "*" means this data is the worst emission level.
2. Emission Level = Reading Level + Correct Factor (Correct Factor = LISN Insertion Loss + Cable Loss).
3. Margin = Emission Level - Limit.

Test Mode	Mode 1: EUT + Adapter 1	Phase	Neutral
Test Condition	802.11ax (40 MHz) / Ant. 0 + Ant. 1 + Ant. 2 + Ant. 3 / 5220 MHz		

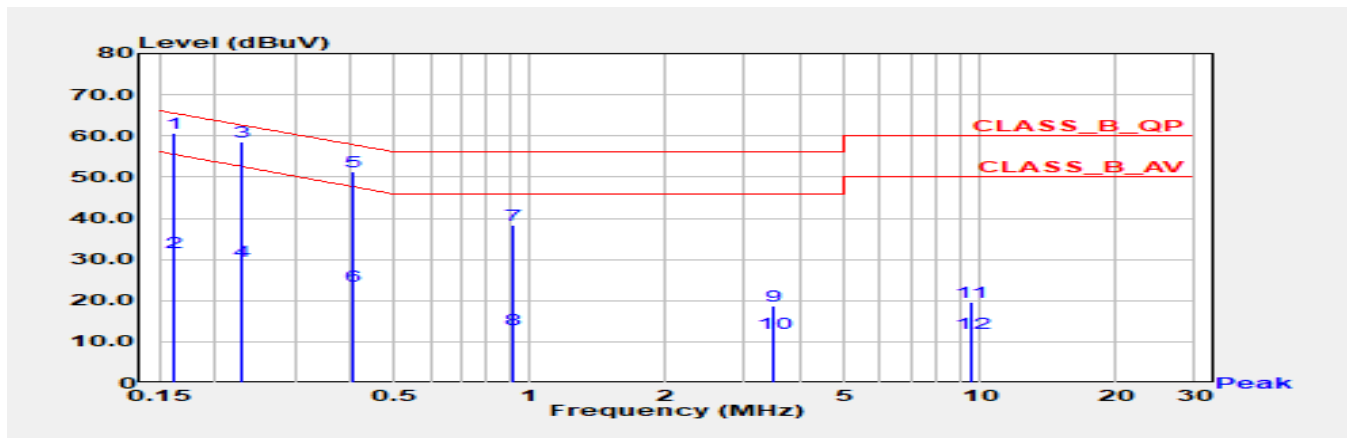


No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.184	60.08	64.29	-4.21	50.46	9.62	QP
2	0.184	31.88	54.29	-22.41	22.27	9.62	AV
*3	0.264	57.70	61.30	-3.60	48.08	9.62	QP
*4	0.264	29.11	51.30	-22.19	19.49	9.62	AV
5	0.566	46.04	56.00	-9.96	36.38	9.66	QP
6	0.566	19.13	46.00	-26.87	9.47	9.66	AV
7	1.404	28.95	56.00	-27.05	19.23	9.72	QP
8	1.404	9.88	46.00	-36.12	0.16	9.72	AV
9	3.491	23.40	56.00	-32.60	13.58	9.82	QP
10	3.491	17.97	46.00	-28.03	8.15	9.82	AV
11	8.451	19.97	60.00	-40.03	9.94	10.03	QP
12	8.451	10.73	50.00	-39.27	0.70	10.03	AV

Remark:

1. "*" means this data is the worst emission level.
2. Emission Level = Reading Level + Correct Factor (Correct Factor = LISN Insertion Loss + Cable Loss).
3. Margin = Emission Level - Limit.

Test Mode	Mode 2: EUT + Adapter 2	Phase	Line
Test Condition	802.11ax (40 MHz) / Ant. 0 + Ant. 1 + Ant. 2 + Ant. 3 / 5220 MHz		

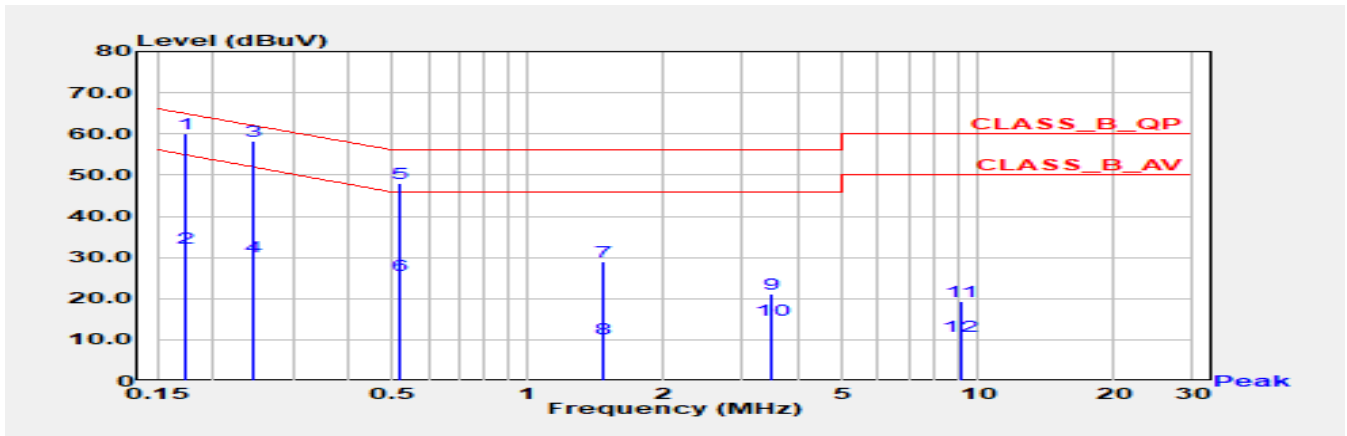


No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.161	60.62	65.41	-4.79	51.00	9.62	QP
2	0.161	31.74	55.41	-23.66	22.12	9.62	AV
*3	0.230	58.67	62.45	-3.78	49.05	9.62	QP
*4	0.230	29.49	52.45	-22.96	19.88	9.62	AV
5	0.406	51.26	57.73	-6.47	41.62	9.64	QP
6	0.406	23.54	47.73	-24.19	13.90	9.64	AV
7	0.915	38.23	56.00	-17.77	28.54	9.69	QP
8	0.915	12.83	46.00	-33.17	3.14	9.69	AV
9	3.477	18.73	56.00	-37.27	8.91	9.82	QP
10	3.477	12.04	46.00	-33.96	2.22	9.82	AV
11	9.577	19.77	60.00	-40.23	9.70	10.07	QP
12	9.577	12.14	50.00	-37.86	2.07	10.07	AV

Remark:

1. "*" means this data is the worst emission level.
2. Emission Level = Reading Level + Correct Factor (Correct Factor = LISN Insertion Loss + Cable Loss).
3. Margin = Emission Level - Limit.

Test Mode	Mode 2: EUT + Adapter 2	Phase	Neutral
Test Condition	802.11ax (40 MHz) / Ant. 0 + Ant. 1 + Ant. 2 + Ant. 3 / 5220 MHz		



No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading Level (dBuV)	Correct Factor (dB)	Detector Type
1	0.172	60.20	64.84	-4.65	50.58	9.62	QP
2	0.172	32.24	54.84	-22.61	22.62	9.62	AV
*3	0.246	58.33	61.89	-3.56	48.71	9.62	QP
4	0.246	30.09	51.89	-21.80	20.47	9.62	AV
5	0.519	47.93	56.00	-8.07	38.27	9.65	QP
*6	0.519	25.57	46.00	-20.43	15.92	9.65	AV
7	1.467	28.89	56.00	-27.11	19.16	9.72	QP
8	1.467	10.25	46.00	-35.75	0.52	9.72	AV
9	3.488	21.13	56.00	-34.87	11.31	9.82	QP
10	3.488	14.93	46.00	-31.07	5.11	9.82	AV
11	9.119	19.28	60.00	-40.72	9.23	10.06	QP
12	9.119	10.92	50.00	-39.08	0.86	10.06	AV

Remark:

1. "*" means this data is the worst emission level.
2. Emission Level = Reading Level + Correct Factor (Correct Factor = LISN Insertion Loss + Cable Loss).
3. Margin = Emission Level - Limit.

Appendix B. Test Result of Emission Bandwidth

Modulation	Frequency (MHz)	99% Bandwidth (MHz)				26dB Bandwidth (MHz)				Limit (MHz)	
		Ant. 0	Ant. 1	Ant. 2	Ant. 3	Ant. 0	Ant. 1	Ant. 2	Ant. 3	99% & 26dB Bandwidth	
802.11a	5180	18.021	18.101	18.021	18.061	22.577	22.737	26.493	23.576	-	
	5220	17.662	17.742	17.502	17.622	21.938	22.257	21.978	22.057	-	
	5240	17.382	17.502	17.422	17.862	21.818	21.858	22.057	21.858	-	
	5260	17.542	17.622	17.662	17.862	21.738	21.698	22.257	22.057	-	
	5300	17.462	17.422	17.702	17.622	21.738	21.818	21.738	22.018	-	
	5320	17.942	17.862	17.862	17.742	24.016	25.414	26.453	22.657	-	
	5500	17.822	17.862	18.061	18.421	22.137	23.776	27.332	25.734	-	
	5580	17.542	17.542	17.502	17.662	21.578	21.818	21.898	21.898	-	
	5700	17.462	17.542	17.862	17.582	21.578	21.618	22.018	22.018	-	
	5720 (U-NII-2C)	13.552	13.672	13.792	13.792	15.830	15.790	15.950	15.910	-	
Modulation	Frequency (MHz)	99% Bandwidth (MHz)				DTS Bandwidth (MHz)				Limit (MHz)	
		Ant. 0	Ant. 1	Ant. 2	Ant. 3	Ant. 0	Ant. 1	Ant. 2	Ant. 3	99% Bandwidth	DTS Bandwidth
802.11a	5720 (U-NII-3)	3.670	3.790	3.790	3.870	3.151	3.151	3.151	3.151	-	0.50
	5745	17.902	17.702	17.902	17.822	16.343	16.343	16.343	16.343	-	0.50
	5785	17.782	17.702	17.702	17.702	16.343	16.343	16.343	16.343	-	0.50
	5825	17.422	17.582	17.822	17.782	16.343	16.343	16.343	16.343	-	0.50

Modulation	Frequency (MHz)	99% Bandwidth (MHz)				26dB Bandwidth (MHz)				Limit (MHz)	
		Ant. 0	Ant. 1	Ant. 2	Ant. 3	Ant. 0	Ant. 1	Ant. 2	Ant. 3	99% & 26dB Bandwidth	
802.11ax (20 MHz)	5180	19.380	19.580	19.500	19.460	24.495	22.497	22.257	26.933	-	
	5220	19.340	19.300	19.180	19.340	21.978	22.057	22.097	22.057	-	
	5240	19.380	19.540	19.220	19.260	22.018	21.938	21.898	21.938	-	
	5260	19.380	19.260	19.220	19.420	21.898	21.978	22.097	22.137	-	
	5300	19.300	19.220	19.220	19.260	21.938	22.018	22.177	22.137	-	
	5320	19.420	19.420	19.380	19.780	23.336	26.653	29.210	23.336	-	
	5500	19.460	19.380	19.420	19.540	23.216	22.937	24.016	24.055	-	
	5580	19.420	19.260	19.260	19.500	21.978	22.417	21.978	21.978	-	
	5700	19.140	19.420	19.380	19.420	22.097	22.018	21.938	22.457	-	
	5720 (U-NII-2C)	14.671	14.591	14.711	14.591	15.989	15.950	16.069	15.989	-	
Modulation	Frequency (MHz)	99% Bandwidth (MHz)				DTS Bandwidth (MHz)				Limit (MHz)	
		Ant. 0	Ant. 1	Ant. 2	Ant. 3	Ant. 0	Ant. 1	Ant. 2	Ant. 3	99% Bandwidth	DTS Bandwidth
802.11ax (20 MHz)	5720 (U-NII-3)	4.669	4.669	4.629	4.829	4.509	4.470	4.470	4.510	-	0.50
	5745	19.380	19.620	19.380	19.380	18.861	18.941	18.861	18.941	-	0.50
	5785	19.300	19.300	19.180	19.340	19.021	19.021	18.941	19.021	-	0.50
	5825	19.180	19.260	19.300	19.420	18.981	18.941	18.981	18.981	-	0.50

Modulation	Frequency (MHz)	99% Bandwidth (MHz)				26dB Bandwidth (MHz)				Limit (MHz)	
		Ant. 0	Ant. 1	Ant. 2	Ant. 3	Ant. 0	Ant. 1	Ant. 2	Ant. 3	99% & 26dB Bandwidth	
802.11ax (40 MHz)	5190	37.962	37.882	37.962	37.882	46.273	42.437	44.755	42.277	-	
	5230	37.802	37.802	37.882	37.802	49.710	40.519	40.439	40.519	-	
	5270	37.882	37.722	37.882	37.802	40.359	40.439	40.439	40.439	-	
	5310	37.962	37.802	37.882	37.882	48.241	46.193	41.878	42.117	-	
	5510	37.882	37.882	37.962	37.802	42.597	42.038	41.478	42.277	-	
	5550	37.802	37.802	37.642	37.802	40.279	40.279	40.519	40.679	-	
	5670	37.722	37.802	37.722	37.802	40.679	40.519	40.759	40.199	-	
	5710 (U-NII-2C)	33.862	33.862	33.862	33.862	35.220	35.540	35.460	35.140	-	
Modulation	Frequency (MHz)	99% Bandwidth (MHz)				DTS Bandwidth (MHz)				Limit (MHz)	
		Ant. 0	Ant. 1	Ant. 2	Ant. 3	Ant. 0	Ant. 1	Ant. 2	Ant. 3	99% Bandwidth	DTS Bandwidth
802.11ax (40 MHz)	5710 (U-NII-3)	3.940	3.860	3.860	3.940	3.941	3.781	3.940	3.861	-	0.50
	5755	37.882	37.882	37.882	37.882	37.642	37.722	37.642	37.962	-	0.50
	5795	37.722	37.722	37.722	37.802	37.802	37.802	37.642	37.882	-	0.50

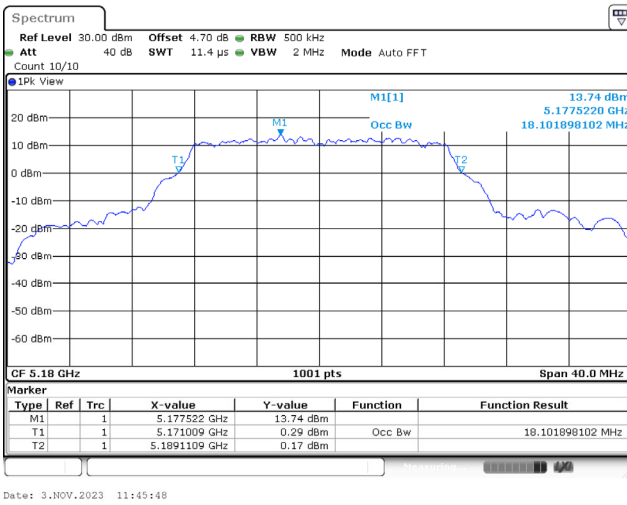
Modulation	Frequency (MHz)	99% Bandwidth (MHz)				26dB Bandwidth (MHz)				Limit (MHz)	
		Ant. 0	Ant. 1	Ant. 2	Ant. 3	Ant. 0	Ant. 1	Ant. 2	Ant. 3	99% & 26dB Bandwidth	
802.11ax (80 MHz)	5210	77.362	77.362	77.682	77.042	88.072	84.555	83.756	82.957	-	
	5290	77.362	77.522	77.362	77.202	83.437	84.875	83.437	82.158	-	
	5530	77.682	77.202	77.522	77.362	82.158	84.396	81.838	85.035	-	
	5610	77.362	77.202	77.420	77.202	81.518	81.359	81.359	81.518	-	
	5690 (U-NII-2C)	73.521	73.681	73.521	73.521	75.759	75.919	75.919	75.919	-	
Modulation	Frequency (MHz)	99% Bandwidth (MHz)				DTS Bandwidth (MHz)				Limit (MHz)	
		Ant. 0	Ant. 1	Ant. 2	Ant. 3	Ant. 0	Ant. 1	Ant. 2	Ant. 3	99% Bandwidth	DTS Bandwidth
802.11ax (80 MHz)	5690 (U-NII-3)	3.521	3.521	3.521	3.841	3.522	3.841	3.681	3.522	-	0.50
	5755	77.360	77.360	77.200	77.360	77.680	77.360	76.880	77.200	-	0.50

Modulation	Frequency (MHz)	99% Bandwidth (MHz)				26dB Bandwidth (MHz)				Limit (MHz)	
		Ant. 0	Ant. 1	Ant. 2	Ant. 3	Ant. 0	Ant. 1	Ant. 2	Ant. 3	99% & 26dB Bandwidth	
802.11ax (160 MHz)	5250 (U-NII-2C)	78.322	78.322	78.641	78.322	82.158	81.199	81.838	82.478	-	
	5250 (U-NII-3)	77.681	78.641	78.002	78.321	81.199	80.879	81.199	81.198	-	
	5570	156.000	157.282	156.643	156.003	163.996	163.357	163.357	162.717	-	

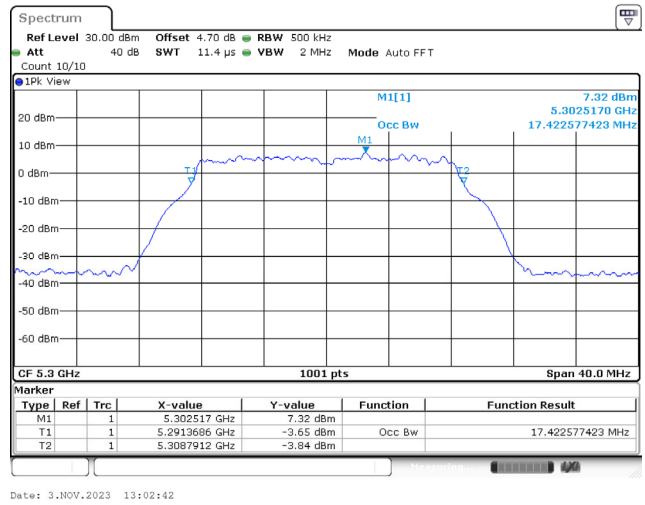
For 99% Bandwidth:

Spectrum plot of worst value

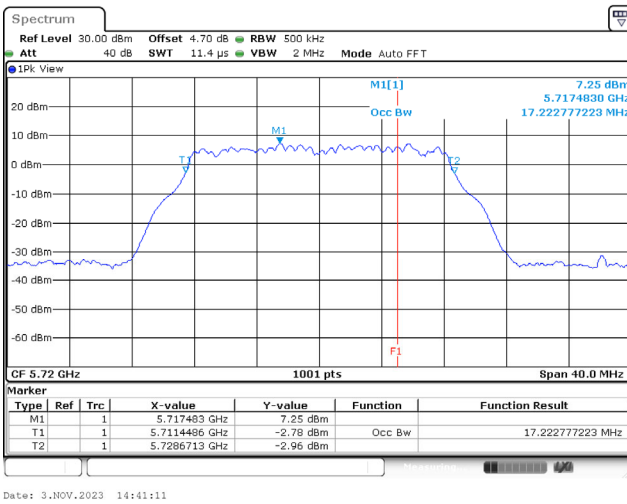
802.11a / Ant. 1 / 5180 MHz (U-NII-1)



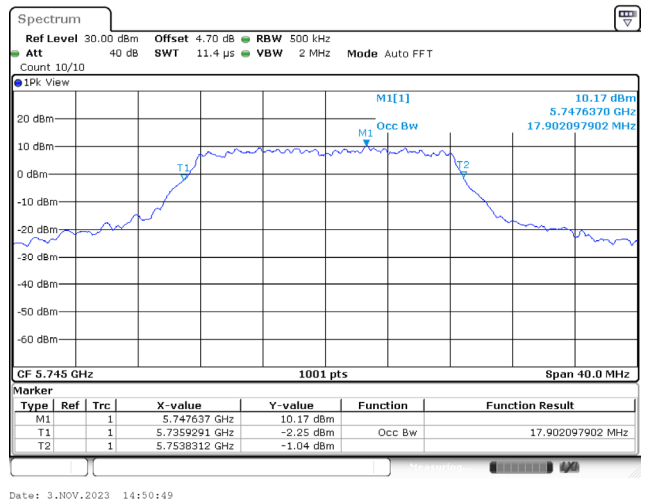
802.11a / Ant. 1 / 5300 MHz (U-NII-2A)



802.11a / Ant. 0 / 5720 MHz (U-NII-2C)

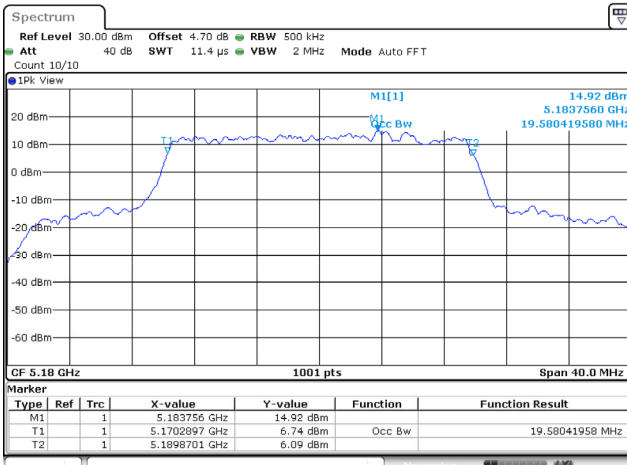


802.11a / Ant. 0 / 5745 MHz (U-NII-3)

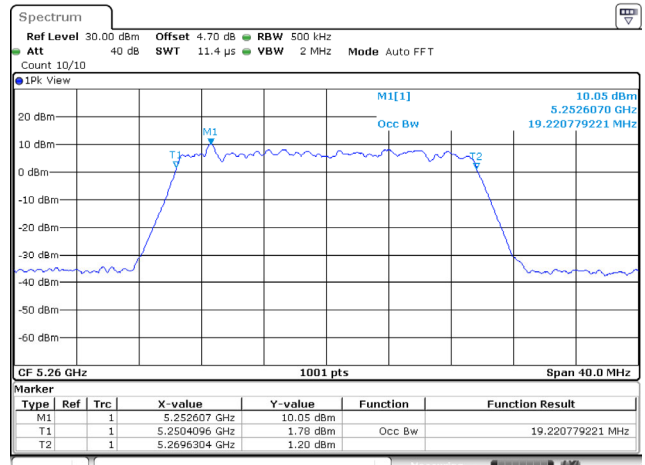


Spectrum plot of worst value

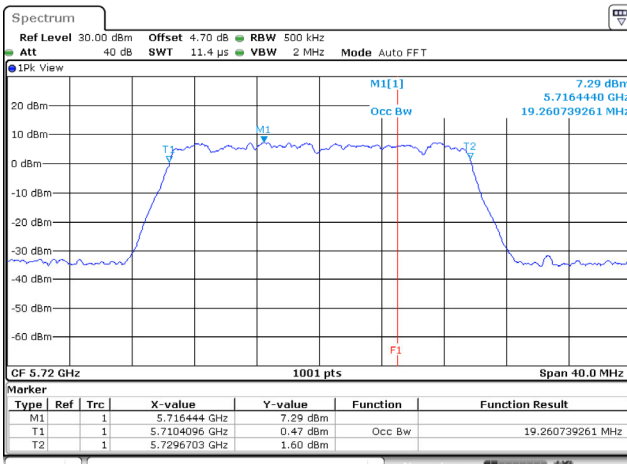
802.11ax (20 MHz) / Ant. 1 / 5180 MHz (U-NII-1)



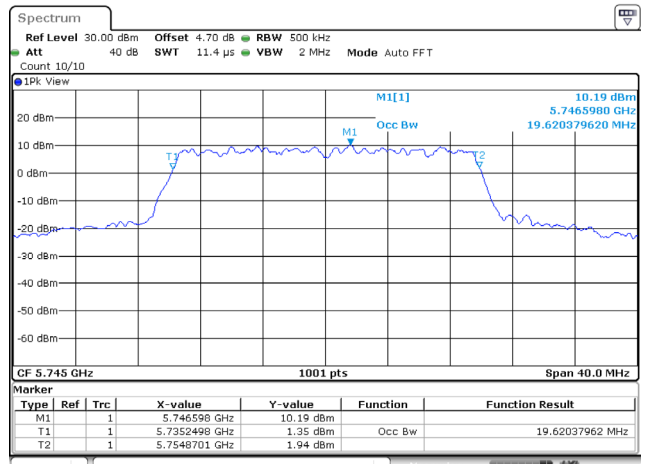
802.11ax (20 MHz) / Ant. 2 / 5260 MHz (U-NII-2A)



802.11ax (20 MHz) / Ant. 1 / 5720 MHz (U-NII-2C)



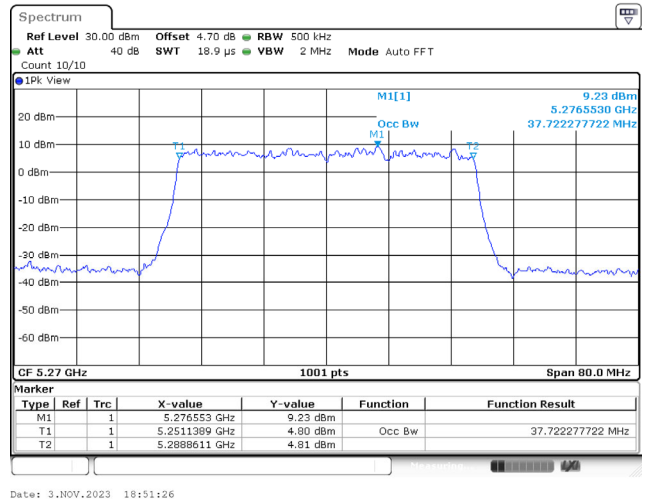
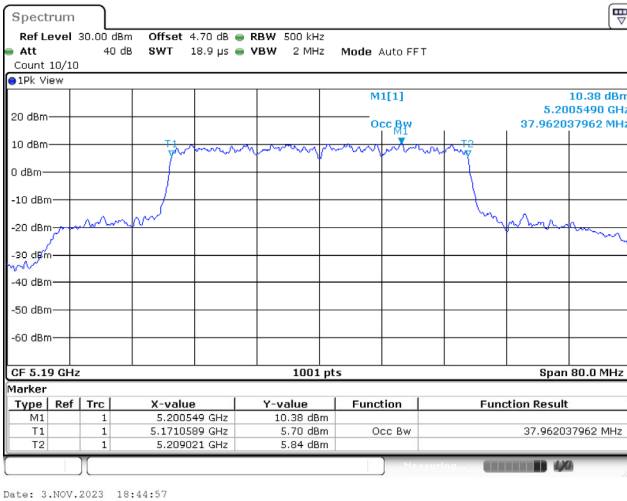
802.11ax (20 MHz) / Ant. 1 / 5745 MHz (U-NII-3)



Spectrum plot of worst value

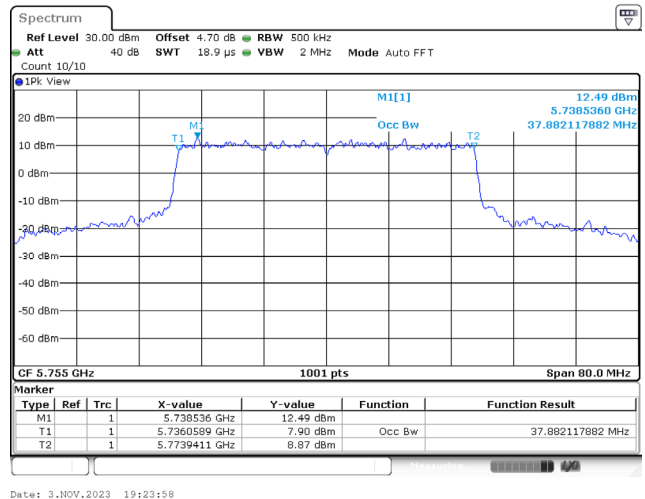
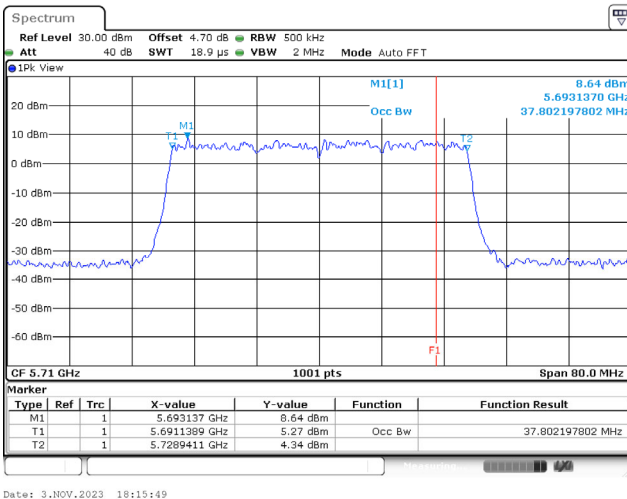
802.11ax (40 MHz) / Ant. 0 / 5190 MHz (U-NII-1)

802.11ax (40 MHz) / Ant. 1 / 5270 MHz (U-NII-2A)



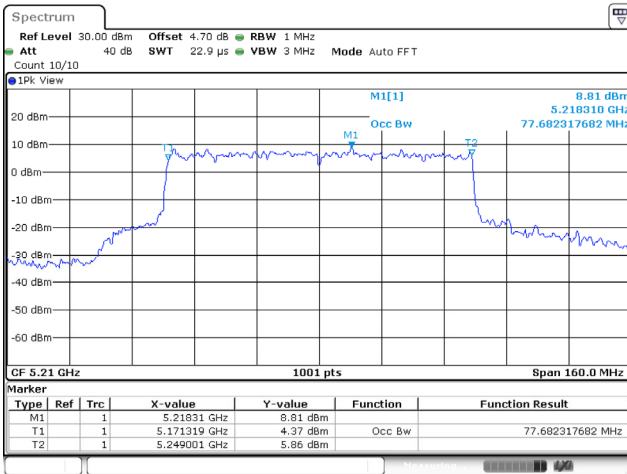
802.11ax (40 MHz) / Ant. 0 / 5710 MHz (U-NII-2C)

802.11ax (40 MHz) / Ant. 0 / 5755MHz (U-NII-3)



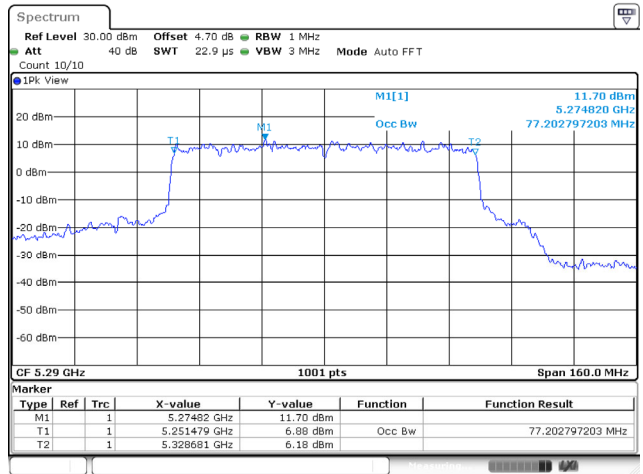
Spectrum plot of worst value

802.11ax (80 MHz) / Ant. 2 / 5210 MHz (U-NII-1)



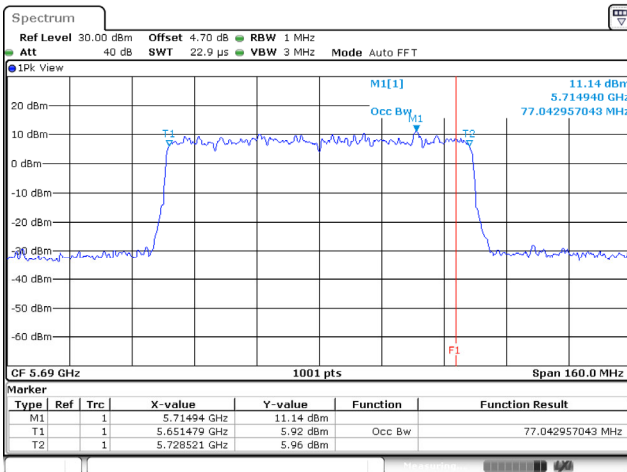
Date: 3.NOV.2023 19:33:34

802.11ax (80 MHz) / Ant. 3 / 5290 MHz (U-NII-2A)



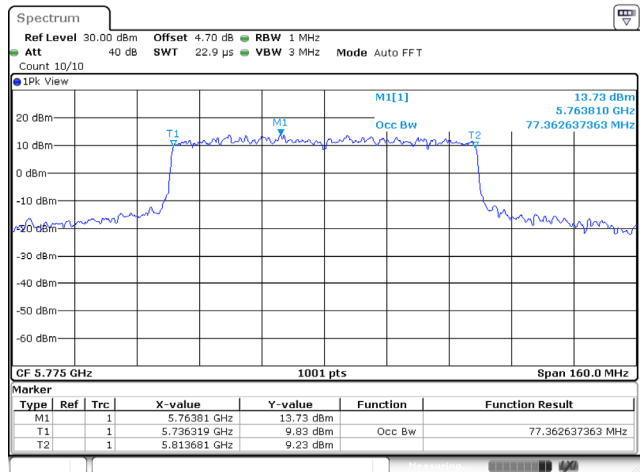
Date: 3.NOV.2023 19:35:32

802.11ax (80 MHz) / Ant. 0 / 5690 MHz (U-NII-2C)



Date: 8.NOV.2023 15:43:14

802.11ax (80 MHz) / Ant. 0 / 5775 MHz (U-NII-3)

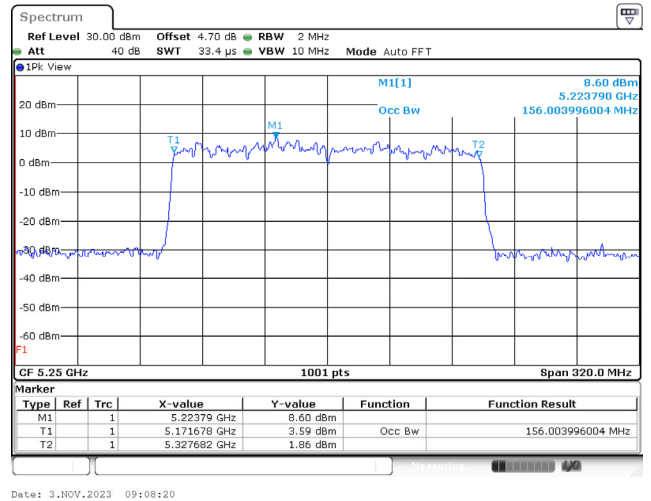
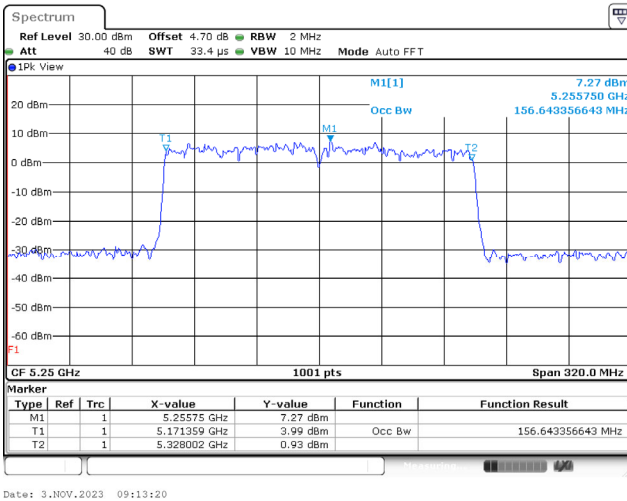


Date: 14.NOV.2023 15:02:01

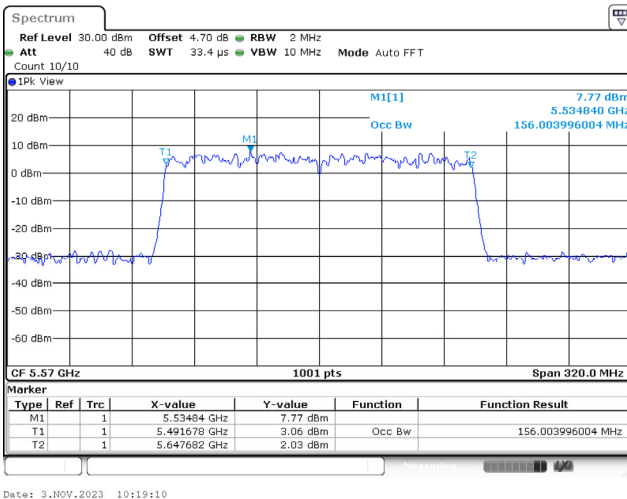
Spectrum plot of worst value

802.11ax (160 MHz) / Ant. 2 / 5250 MHz (U-NII-1)

802.11ax (160 MHz) / Ant. 0 / 5250 MHz (U-NII-2A)



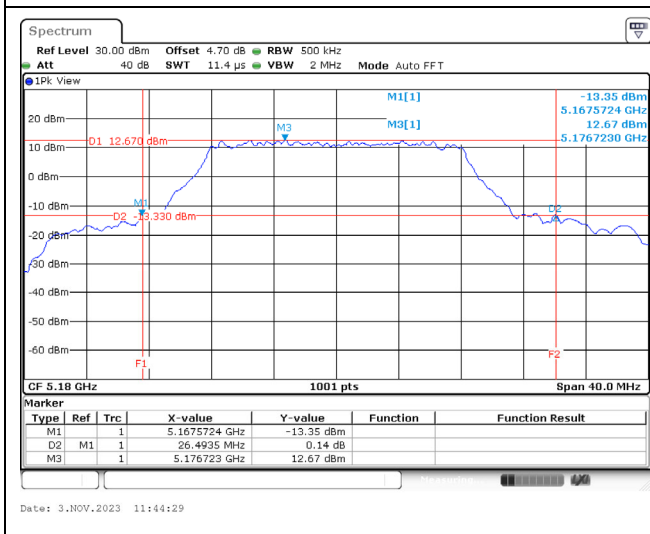
802.11ax (160 MHz) / Ant. 0 / 5570 MHz (U-NII-2C)



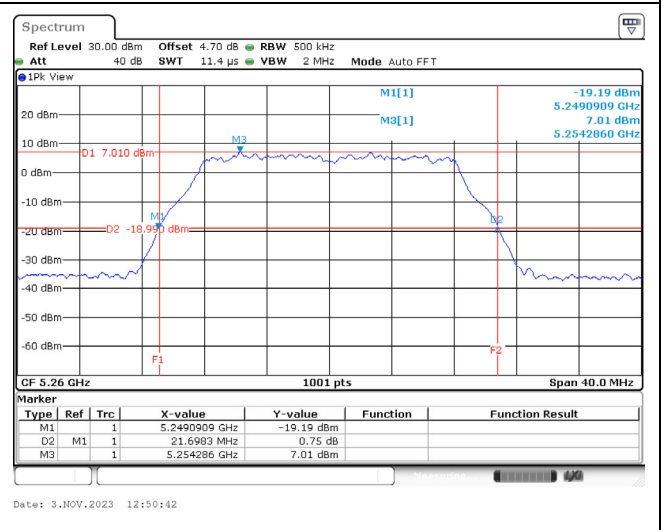
For 26dB Bandwidth:

Spectrum plot of worst value

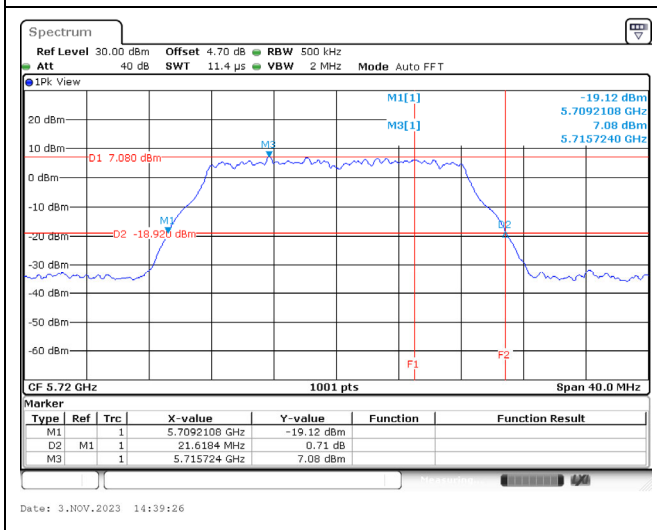
802.11a / Ant. 2 / 5180 MHz (U-NII-1)



802.11a / Ant. 1 / 5260 MHz (U-NII-2A)



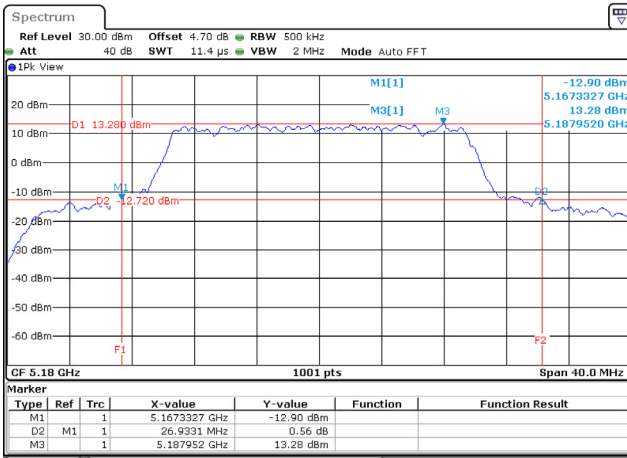
802.11a / Ant. 1 / 5720 MHz (U-NII-2C)



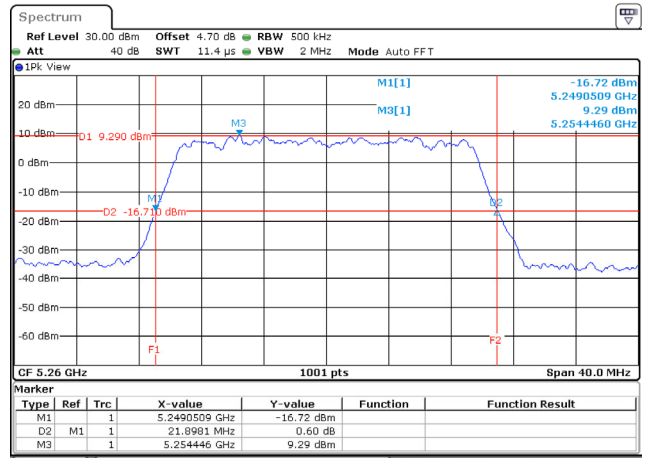
Spectrum plot of worst value

802.11ax (20 MHz) / Ant. 3 / 5180 MHz (U-NII-1)

802.11ax (20 MHz) / Ant. 0 / 5260 MHz (U-NII-2A)

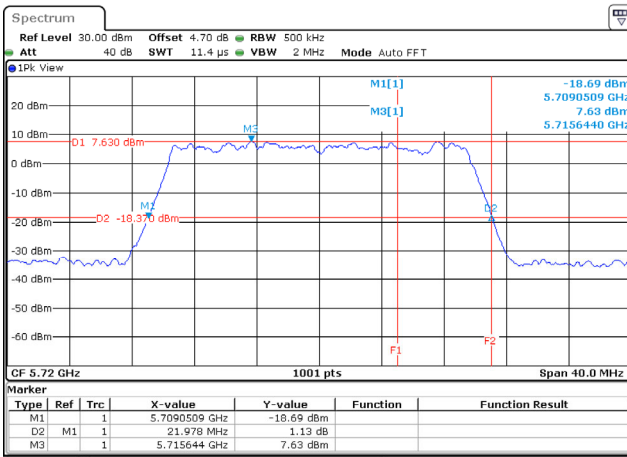


Date: 3.NOV.2023 15:32:58



Date: 3.NOV.2023 15:48:55

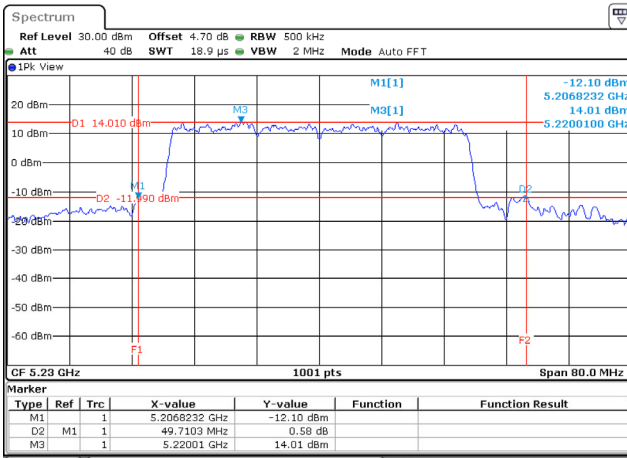
802.11ax (20 MHz) / Ant. 1 / 5720 MHz (U-NII-2C)



Date: 3.NOV.2023 17:09:55

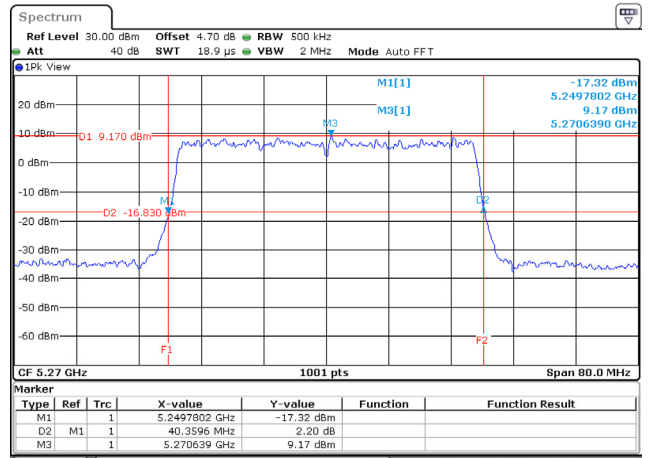
Spectrum plot of worst value

802.11ax (40 MHz) / Ant. 0 / 5230 MHz (U-NII-1)



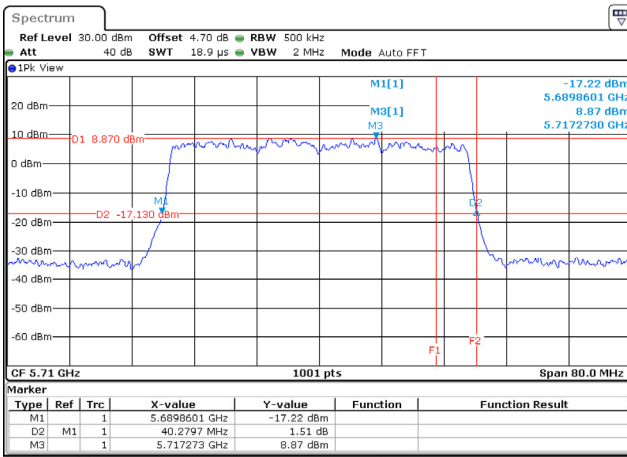
Date: 3.NOV.2023 18:45:44

802.11ax (40 MHz) / Ant. 0 / 5270 MHz (U-NII-2A)



Date: 3.NOV.2023 18:51:55

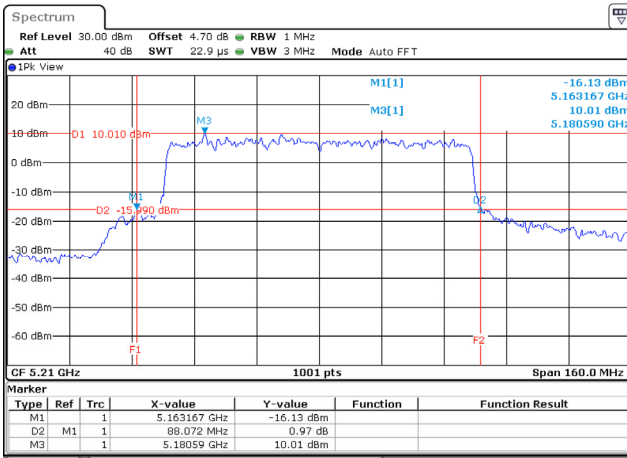
802.11ax (40 MHz) / Ant. 3 / 5710 MHz (U-NII-2C)



Date: 3.NOV.2023 18:19:39

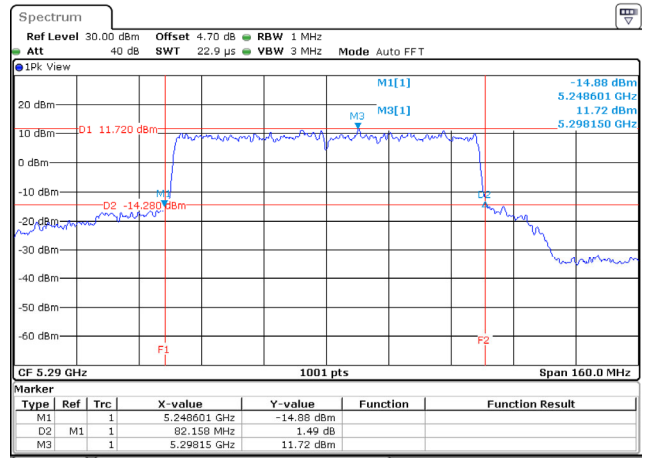
Spectrum plot of worst value

802.11ax (80 MHz) / Ant. 0 / 5210 MHz (U-NII-1)



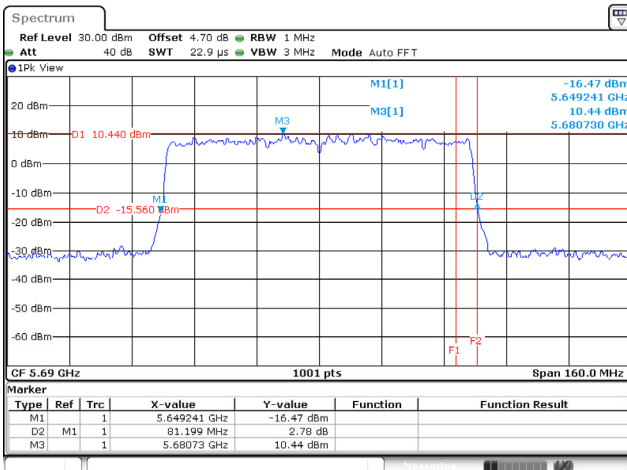
Date: 3.NOV.2023 19:32:04

802.11ax (80 MHz) / Ant. 3 / 5290 MHz (U-NII-2A)



Date: 3.NOV.2023 19:35:24

802.11ax (80 MHz) / Ant. 0 / 5690 MHz (U-NII-2C)



Date: 8.NOV.2023 19:43:05