

TEST REPORT

Product Name : MINI PC
Brand Name : N/A
Model : MS-03-S386H
Series Model : See page 6
FCC ID : 2A49R-MS-03-S386H
Applicant : MICRO COMPUTER (HK) TECH LIMITED
Address : RM 18, 28/F, Shui On Centre, 6-8 Harbour Road, WaterfRont,
Wan Chai, HK
Manufacturer : MICRO COMPUTER (HK) TECH LIMITED
Address : RM 18, 28/F, Shui On Centre, 6-8 Harbour Road, WaterfRont,
Wan Chai, HK
Standard(s) : FCC CFR Title 47 Part 15 Subpart E Section 15.407
Date of Receipt : April 29, 2026
Date of Test : April 29, 2026~ June 22, 2026
Issued Date : June 23, 2026

Issued By: **Dongguan Yaxu (AiT) Technology Limited**
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Note: This device has been tested and found to comply with the standard(s) listed, this test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory. This report shall not be reproduced except in full, without the written approval of Dongguan Yaxu (AiT) Technology Limited. If there is a need to alter or revise this document, the right belongs to Dongguan Yaxu (AiT) Technology Limited, and it should give a prior written notice of the revision document. This test report must not be used by the client to claim product endorsement.



Report Revise Record

Report Version	Issued Date	Notes
M0	June 23, 2026	Initial Release

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1 TEST SUMMARY

1.1 Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15 Subpart E](#)—Unlicensed National Information Infrastructure Devices.

[ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024](#): American National Standard for Testing Unlicensed Wireless Devices

[KDB789033 D02](#): General UNII Test Procedures New Rules v02r01.

[KDB 987594 D02](#): U-NII 6GHz EMC Measurement v01r01

[KDB 662911 D01 Multiple Transmitter Output v02r01](#) is required to be used for this kind of FCC 15.407 UII device.

1.2 Test Summary

Test Item	Rules	Result
Antenna requirement	FCC 47 CFR Part 15.203/ 15.407(a)(1) (2) RSS-Gen 6.8	Pass
On Time and Duty Cycle	/	Pass
AC Power Line Conducted Emission	FCC 15.207 RSS-Gen 8.8	Pass
Conducted Peak Output Power & EIRP	FCC 15.407 (a) RSS-248 4.5	Pass*
26dB Bandwidth & 99%Bandwidth	FCC 15.407 (a) (11) RSS-248 4.4 RSS-Gen 6.7	Pass*
Power Spectral Density	FCC 15.407 (a) RSS-248 4.5	Pass*
In-Band Emissions (Mask)	FCC 15.407 (b) RSS-248 4.6	Pass*
Radiated Emissions And Band Edge Measurement	FCC 15.407 (b) FCC 15.209 FCC 15.205 RSS-248 4.6 RSS-GEN 8.9	Pass
Contention-based Protocol	FCC 15.407 (d) (6) RSS-248 4.7	Pass
Frequency Stability	FCC 15.407 (g)	Pass*
Note: * means that this item refers to module report for FCC ID:PD9BE211NGW.		

1.3 Test Facility

Test Laboratory: Dongguan Yaxu (AiT) Technology Limited

No.22, Jinqianling 3rd Street, Jitigang, Huangjiang, Dongguan, Guangdong, China

The test facility is recognized, certified or accredited by the following organizations:

CNAS-Registration No: L6177

Dongguan Yaxu (AiT) technology Limited is accredited to ISO/IEC 17025:2017 general Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the competence of testing and calibration laboratories) on April 18, 2022

FCC-Registration No.: 703111 Designation Number: CN1313

Dongguan Yaxu (AiT) Technology Limited has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

IC-Registration No.: 6819A CAB identifier: CN0122

The 3m Semi-anechoic chamber of Dongguan Yaxu (AiT) Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 6819A

A2LA-Lab Cert. No.: 6317.01

Dongguan Yaxu (AiT) Technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

1.4 Measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to CISPR 16 - 4"Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Dongguan Yaxu (AiT) Technology Limited's quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Yaxu (AiT) laboratory is reported:

Test	Measurement Uncertainty	Notes
Power Line Conducted Emission	9KHz~30MHz ± 1.20 dB	(1)
Radiated Emission	9KHz~30MHz ± 3.10 dB	(1)
Radiated Emission	30MHz~1GHz ± 3.75 dB	(1)
Radiated Emission	1GHz~18GHz ± 3.88 dB	(1)
Radiated Emission	18GHz-40GHz ± 3.88 dB	(1)
RF power, conducted	30MHz~7.5GHz ± 0.16 dB	(1)
RF power density, conducted	± 0.24 dB	(1)
Spurious emissions, conducted	± 0.21 dB	(1)
Temperature	$\pm 1^{\circ}\text{C}$	(1)
Humidity	$\pm 3\%$	(1)
DC and low frequency voltages	$\pm 1.5\%$	(1)
Time	$\pm 2\%$	(1)
Duty cycle	$\pm 2\%$	(1)

The report uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty Multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

2 GENERAL INFORMATION

2.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

2.2 General Description of EUT

Product Name:	MINI PC				
Model/Type reference:	MS-03-S386H				
Serial Model:	MS-03-S**** (where*="0-9","A-Z""a-z", ". ", blank space, no character difference between each model is only due to the different model naming methods for different sales regions, other circuit principles, safety structures and key components are all the same, and the difference not affect the safety and electromagnetic compatibility performance of the product.)				
Power Ratings:	Input: 19V=12.63A				
Adapter information:	Model: SOY-1901263-244-B Input: 100-240V~ 50/60Hz 3.0A Max. Output: 19.0V=12.63A 239.97W				
Hardware Version:	N/A				
Software Version:	N/A				
Sample(s) Status:	AiTDG-260429021-1(Normal sample) AiTDG-260429021-2(Engineer sample)				
6G WIFI:					
Supported type:	20MHz system	40MHz system	80MHz system	160MHz system	320MHz system
	802.11ax 802.11be	802.11ax 802.11be	802.11ax 802.11be	802.11ax 802.11be	802.11be
Operation frequency:	5955-6415MHz 6435-6515MHz 6535-6855MHz 6895-7115MHz	5965-6405MHz 6445-6485MHz 6525-6845MHz 6885-7085MHz	5985-6385MHz 6465MHz 6545-6865MHz 6945-7025MHz	6025-6985MHz	6105-6745MHz
Modulation:	OFDMA	OFDMA	OFDMA	OFDMA	OFDMA
Channel number:	59	29	13	7	3
Channel separation:	20MHz	40MHz	80MHz	160MHz	320MHz
MIMO	Support MIMO 2*2				
Antenna type:	FPC Antenna MIMO 2*2				
Antenna gain:	Antenna 1(A):3.55Bi, Antenna 2(B):3.58dBi				
Remark:					
1. The device used tow antenna and all transmit signals are completely uncorrelated with each other, Directional gain =10*log[(10 ^{G1/10} +10 ^{G2/10})/N _{ANT}]=10*log[(10 ^{3.36/10} +10 ^{3.73/10})/2]= 3.57dBi.					
2. The above DUT's information was declared by manufacturer. For more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.					

Operating band	20MHz		40MHz		80MHz		160MHz		320MHz	
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
U-NII 5 (5925MHz-6425MHz)	1	5955	3	5965	7	5985	15	6025	31	6105
	5	5975		11						
	9	5995								
	13	6015								
	17	6035	19	6045	39	6145				
	21	6055								
	25	6075								
	29	6095	27	6085			47	6185		
	33	6115								
	37	6135								
	41	6155	43	6165	55	6225				
	45	6175								
	49	6195	51	6205			71	6305		
	53	6215								
	57	6235								
	61	6255	59	6245	79	6345				
	65	6275								
	69	6295								
	73	6315	75	6325			87	6385		
	77	6335								
81	6355									
85	6375	83	6365	95*	6425					
89	6395									
93	6415									
U-NII 6 (6425MHz-6525MHz)	97	6435	99			6445	103	6465	111*	6505
	101	6455		107	6485					
	105	6475	115*			6525	119*	6545		
	109	6495		123	6565					
U-NII 7 (6525MHz-6875MHz)	117	6535	131			6605	135	6625	143	6665
	121	6555		139	6645					
	125	6575								
	129	6595	151			6705				
	133	6615		155	6725					
	137	6635					163	6765		
	141	6655							167	6785
	145	6675	171			6805				
	149	6695		179	6845					
	153	6715					183*	6865		
	157	6735							185	6875*
	161	6755	187*			6885				
	165	6775		195	6925					
	169	6795					199	6945		
	173	6815							207	6985
	177	6835	--			--				
	181	6855		--	--					
185	6875*									
U-NII 8 (6875MHz-7125MHz)	189	6895					193	6915		
193	6915	197	6935							
197	6935									

	201	6955	203	6965					--	--
	205	6975							--	--
	209	6995	211	7005	215	7025			--	--
	213	7015							--	--
	217	7035	219	7045					--	--
	221	7055							--	--
	225	7075	227	7085	--	--	--	--	--	--
	229	7095			--	--	--	--	--	--
	233	7115	--	--	--	--	--	--	--	--

Note:

1. "--"Means no channel(s) available any more.
2. The line display in grey is those Channels/Frequencies select to test in this report for each operation mode.
3. *Mean straddle channel

Data Rate Used:

All test items were preliminary test with different data rate to find the worst radiated emission. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Mode	Preliminary Data Rate	Worst-case Data Rate
802.11ax	MCS0~ MCS11	MCS0
802.11be	MCS0~ MCS13	MCS0

Power setting during the test:

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power Parameters:

Test Software Version	DRTU		
Test Frequency	Lowest	Middle	Highest
U-NII 5	Default	Default	Default
U-NII 6	Default	Default	Default
U-NII 7	Default	Default	Default
U-NII 8	Default	Default	Default

2.4 Special Accessories

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

Description	Manufacturer	Model	Serial No.	Provided by	Other
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/
/	/	/	/	/	/

2.5 Equipment List for the Test

Conducted Emission measurement						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
☒ 1	EMI Test Receiver	R&S	ESCI	100124	2025.09.25	2026.09.24
☒ 2	LISN	R&S	ESH3-Z5	892785/016	2025.09.26	2026.09.25
☒ 3	LISN	KYORITSU	KNW-242	8-837-4	2025.09.26	2026.09.25
☒ 4	Pulse Limiter	R&S	ESH3-Z2	03578810.54	2025.09.25	2026.09.24
☒ 5	CE Software	EZ	EZ-EMC_CE	Ver.AIT-03A	N/A	N/A

Radiation Emission measurement						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
☒ 1	Spectrum Analyzer	R&S	FSV40	101470	2025.09.26	2026.09.25
☒ 2	EMI Measuring Receiver	R&S	ESPI	100773	2025.09.25	2026.09.24
☒ 3	Low Noise Pre Amplifier	HP	HP8447E	1937A01855	2025.09.25	2026.09.24
☒ 4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2025.09.25	2026.09.24
☒ 5	Passive Loop	ETS	6512	00165355	2024.09.04	2026.09.03
☒ 6	TRILOG Super Broadband test Antenna	SCHWARZBEC K	VULB-9160	9160-3206	2024.08.29	2026.08.28
☒ 7	Broadband Horn Antenna	SCHWARZBEC K	BBHA 9120D	452	2024.08.29	2026.08.28
☒ 8	SHF-EHF Horn Antenna 15-40GHz	SCHWARZBEC K	BBHA9170	BBHA9170367	2023.09.12	2026.09.11
☒ 9	6dB Attenuator	JFW	50FPE-006	4360846-949-1	2025.09.23	2026.09.22
☒ 10	Filter	COM-MW	ZBSF6-C5945-6425-2536	2536	2025.09.23	2026.09.22
☒ 11	Filter	COM-MW	ZBSF6-C6425-7125-4168	4168	2025.09.23	2026.09.22
☒ 12	Radiated Cable(9K-1G)	HUBER+SUHN ER	9K-1G	001	2025.09.25	2026.09.24
☒ 13	Radiated Cable(1G-18G)	HUBER+SUHN ER	1G-18G	002	2025.09.25	2026.09.24
☒ 14	Radiated Cable(18G-40G)	HUBER+SUHN ER	18G-40G	003	2025.09.25	2026.09.24
☒ 15	RE Software	EZ	EZ-EMC_RE	Ver.AIT-03A	N/A	N/A

RF Conducted measurement						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
☐ 1	Spectrum Analyzer	Agilent	N9020A	MY53421570	2025.09.23	2026.09.22
☐ 2	Power Sensor	Agilent	U2021XA	MY54110007	2025.09.23	2026.09.22
☐ 3	Signal Generator	Agilent	N5182A	MY50143009	2025.09.26	2026.09.25
☐ 4	Analog signal generator	Agilent	E8257	MY51554256	2025.09.23	2026.09.22
☐ 5	Pro.Temp&Humi.chamber	MENTEK	MHP-150-1C	MAA08112501	2025.09.25	2026.09.24
☐ 6	Wideband Radio communication tester	R&S	CMW500	135866	2025.09.23	2026.09.22
☐ 7	DC power supply	ZHAOXIN	RXN-305D-2	28070002559	N/A	N/A
☐ 8	RF Test box	TST	TSTPASS	21033016	2025.09.23	2026.09.22
☐ 9	RF Software	TST	TSTPASS	Version 2.0	N/A	N/A

Note: ☐ is not applicable in this Test Report. ☒ is applicable in this Test Report.

3 TEST CONDITIONS AND RESULTS

3.1 Maximum Conducted Average Output Power

Limit

CFR 47 FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
Conducted Output Power	☐ Standard Power Access Point The maximum e.i.r.p. over the frequency band of operation must not exceed 36 dBm. For outdoor devices, the maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).	5.925-6.425 GHz 6.525-6.875 GHz
	☐ Indoor Access Point The maximum e.i.r.p. over the frequency band of operation must not exceed 30 dBm	5.925-7.125 GHz
	☐ Subordinate Device The maximum e.i.r.p. over the frequency band of operation must not exceed 30 dBm.	5.925-7.125 GHz
	☐ Client Devices, Operating Under The Control Of A Standard Power Access Point The maximum e.i.r.p. over the frequency band of operation must not exceed 30 dBm and the device must limit its power to no more than 6 dB below its associated standard power access point's authorized transmit power.	5.925-6.425 GHz 6.525-6.875 GHz
	☒ Client Devices, Operating Under The Control Of An Indoor Access Point The maximum e.i.r.p. over the frequency band of operation must not exceed 24 dBm.	5.925-7.125 GHz
	☐ For very low power the maximum e.i.r.p must not exceed 14 dBm.	5.925-7.125 GHz

Test Results

☒ **Pass**
☐ **Not Applicable**

EIRP:

UNII	Mode	BW [MHz]	Rate	Ch#	Freq [MHz]	RU config	Chain	Ouput Power [dBm]	Max ⁽¹⁾ Ouput Power [dBm]	Max ⁽¹⁾ EIRP [dBm]
UNII5	802.11ax/be	20	MCS0	1	5955	Full BW	SISO A	5.48	5.48	9.03
							SISO B	5.60	5.60	9.18
							MIMO A	2.36	2.36	5.94
							MIMO B	2.60	2.60	6.18
							Combined A+B	5.49	5.49	9.07
				SISO A	5.53		5.53	9.08		
				SISO B	5.50		5.50	9.08		
				MIMO A	2.59		2.59	6.17		
				MIMO B	2.42		2.42	6.00		
				Combined A+B	5.52		5.52	9.10		
				SISO A	5.53		5.53	9.08		
				SISO B	5.50		5.50	9.08		
				MIMO A	2.38		2.38	5.96		
				MIMO B	2.46		2.46	6.04		
				Combined A+B	5.43		5.43	9.01		
	802.11ax/be	40	MCS0	3	5965	Full BW	SISO A	8.55	8.55	12.10
							SISO B	8.44	8.44	12.02
							MIMO A	5.38	5.38	8.96
							MIMO B	5.30	5.30	8.88
							Combined A+B	8.35	8.35	11.93
				SISO A	8.46		8.46	12.01		
				SISO B	8.65		8.65	12.23		
				MIMO A	5.43		5.43	9.01		
				MIMO B	5.56		5.56	9.14		
				Combined A+B	8.51		8.51	12.09		
				SISO A	8.58		8.58	12.13		
				SISO B	8.54		8.54	12.12		
				MIMO A	5.37		5.37	8.95		
				MIMO B	5.33		5.33	8.91		
				Combined A+B	8.36		8.36	11.94		
802.11ax/be	80	MCS0	7	5985	Full BW	SISO A	11.59	11.59	15.14	
						SISO B	11.61	11.61	15.19	
						MIMO A	8.43	8.43	12.01	
						MIMO B	8.64	8.64	12.22	
						Combined A+B	11.55	11.55	15.13	
			SISO A	11.63		11.63	15.18			
			SISO B	11.67		11.67	15.25			
			MIMO A	8.58		8.58	12.16			
			MIMO B	8.82		8.82	12.40			
			Combined A+B	11.71		11.71	15.29			
			SISO A	11.48		11.48	15.03			
			SISO B	11.44		11.44	15.02			
			MIMO A	8.72		8.72	12.30			
			MIMO B	8.50		8.50	12.08			
			Combined A+B	11.62		11.62	15.20			

UNII	Mode	BW [MHz]	Rate	Ch#	Freq [MHz]	RU config	Chain	Ouput Power [dBm]	Max ⁽¹⁾ Ouput Power [dBm]	Max ⁽¹⁾ EIRP [dBm]
UNII5	802.11ax/be	160	MCS0	15	6025	Full BW	SISO A	14.44	14.44	17.99
							SISO B	14.50	14.50	18.08
							MIMO A	11.34	11.34	14.92
							MIMO B	11.22	11.22	14.80
							Combined A+B	14.29	14.29	17.87
				SISO A	14.69		14.69	18.24		
				SISO B	14.40		14.40	17.98		
				MIMO A	11.45		11.45	15.03		
				MIMO B	11.40		11.40	14.98		
				Combined A+B	14.44		14.44	18.02		
	802.11be	320	MCS0	31	6105	Full BW	SISO A	16.47	16.58	20.13
							SISO B	16.58	16.69	20.27
							MIMO A	13.70	13.81	17.39
							MIMO B	13.56	13.67	17.25
							Combined A+B	16.64	16.75	20.33
				SISO A	16.35		16.46	20.01		
				SISO B	16.16		16.27	19.85		
				MIMO A	13.59		13.70	17.28		
				MIMO B	13.24		13.35	16.93		
				Combined A+B	16.43		16.54	20.12		

(1)Value compensated with the duty cycle

Note1: Antenna Gain: Antenna 1(A): 3.55dBi, Antenna 2(B): 3.58dBi;

Note2: Directional Gain: Uncorrelated (Directional Gain = 3.57dBi)

Note3: E.I.R.P = Measured Power + Individual Antenna Gain for SISO mode, E.I.R.P = Measured Power + Directional Gain for MIMO mode.

Note4: For conservativeness, calculate for MIMO mode EIRP the Max. antenna gain 3.58dBi is used.

Note5: The Conducted Output power is quote form modular test report No. 250519-01.TR12.

UNII	Mode	BW [MHz]	Rate	Ch#	Freq [MHz]	RU config	Chain	Ouput Power [dBm]	Max ⁽¹⁾ Ouput Power [dBm]	Max ⁽¹⁾ EIRP [dBm]
UNII6	802.11ax/be	20	MCS0	97	6435	Full BW	SISO A	5.60	5.60	9.15
							SISO B	5.52	5.52	9.10
							MIMO A	2.49	2.49	6.07
							MIMO B	2.57	2.57	6.15
							Combined A+B	5.54	5.54	9.12
				SISO A	5.48		5.48	9.03		
				SISO B	5.37		5.37	8.95		
				MIMO A	2.34		2.34	5.92		
				MIMO B	2.33		2.33	5.91		
				Combined A+B	5.35		5.35	8.93		
				SISO A	5.50		5.50	9.05		
				SISO B	5.76		5.76	9.34		
				MIMO A	2.39		2.39	5.97		
				MIMO B	2.55		2.55	6.13		
				Combined A+B	5.48		5.48	9.06		
	802.11ax/be	40	MCS0	99	6445	Full BW	SISO A	8.63	8.63	12.18
							SISO B	8.60	8.60	12.18
							MIMO A	5.49	5.49	9.07
							MIMO B	5.49	5.49	9.07
							Combined A+B	8.50	8.50	12.08
				SISO A	8.35		8.35	11.90		
				SISO B	8.49		8.49	12.07		
				MIMO A	5.46		5.46	9.04		
				MIMO B	5.60		5.60	9.18		
				Combined A+B	8.54		8.54	12.12		
	802.11ax/be	80	MCS0	103	6465	Full BW	SISO A	11.72	11.72	15.27
							SISO B	11.86	11.86	15.44
							MIMO A	8.63	8.63	12.21
							MIMO B	8.68	8.68	12.26
							Combined A+B	11.67	11.67	15.25
SISO A				11.45	11.45	15.00				
SISO B				11.73	11.73	15.31				
MIMO A				8.70	8.70	12.28				
MIMO B				8.73	8.73	12.31				
Combined A+B				11.73	11.73	15.31				
802.11ax/be	160	MCS0	111	6505	Full BW	SISO A	14.13	14.13	17.68	
						SISO B	14.65	14.65	18.23	
						MIMO A	11.76	11.76	15.34	
						MIMO B	11.56	11.56	15.14	
						Combined A+B	14.67	14.67	18.25	

(1)Value compensated with the duty cycle

Note1: Antenna Gain: Antenna 1(A): 3.55dBi, Antenna 2(B): 3.58dBi;

Note2: Directional Gain: Uncorrelated (Directional Gain = 3.57dBi)

Note3: E.I.R.P = Measured Power + Individual Antenna Gain for SISO mode, E.I.R.P = Measured Power + Directional Gain for MIMO mode.

Note4: For conservativeness, calculate for MIMO mode EIRP the Max. antenna gain 3.58dBi is used.

Note5: The Conducted Output power is quote form modular test report No. 250519-01.TR12.

UNII	Mode	BW [MHz]	Rate	Ch#	Freq [MHz]	RU config	Chain	Ouput Power [dBm]	Max ⁽¹⁾ Ouput Power [dBm]	Max ⁽¹⁾ EIRP [dBm]
UNII7	802.11ax/be	20	MCS0	117	6535	Full BW	SISO A	5.55	5.55	9.10
							SISO B	5.56	5.56	9.14
							MIMO A	2.64	2.64	6.22
							MIMO B	2.46	2.46	6.04
							Combined A+B	5.56	5.56	9.14
				SISO A	5.41		5.41	8.96		
				SISO B	5.47		5.47	9.05		
				MIMO A	2.50		2.50	6.08		
				MIMO B	2.30		2.30	5.88		
				Combined A+B	5.41		5.41	8.99		
				SISO A	5.56		5.56	9.11		
				SISO B	5.51		5.51	9.09		
				MIMO A	2.40		2.40	5.98		
				MIMO B	2.37		2.37	5.95		
				Combined A+B	5.40		5.40	8.98		
		40	MCS0	115	6525	Full BW	SISO A	8.27	8.27	11.82
							SISO B	8.25	8.25	11.83
							MIMO A	5.46	5.46	9.04
							MIMO B	5.55	5.55	9.13
							Combined A+B	8.52	8.52	12.10
				SISO A	8.37		8.37	11.92		
				SISO B	8.39		8.39	11.97		
				MIMO A	5.14		5.14	8.72		
				MIMO B	5.48		5.48	9.06		
				Combined A+B	8.32		8.32	11.90		
				SISO A	8.33		8.33	11.88		
				SISO B	8.60		8.60	12.18		
				MIMO A	5.36		5.36	8.94		
				MIMO B	5.40		5.40	8.98		
				Combined A+B	8.39		8.39	11.97		
		80	MCS0	135	6625	Full BW	SISO A	11.76	11.76	15.31
							SISO B	11.59	11.59	15.17
							MIMO A	8.52	8.52	12.10
							MIMO B	8.88	8.88	12.46
							Combined A+B	11.71	11.71	15.29
				SISO A	11.77		11.77	15.32		
				SISO B	11.55		11.55	15.13		
				MIMO A	8.72		8.72	12.30		
				MIMO B	8.63		8.63	12.21		
				Combined A+B	11.69		11.69	15.27		
		160	MCS0	143	6665	Full BW	SISO A	14.63	14.63	18.18
							SISO B	14.54	14.54	18.12
							MIMO A	11.45	11.45	15.03
							MIMO B	11.26	11.26	14.84
							Combined A+B	14.37	14.37	17.95

UNII	Mode	BW [MHz]	Rate	Ch#	Freq [MHz]	RU config	Chain	Ouput Power [dBm]	Max ⁽¹⁾ Ouput Power [dBm]	Max ⁽¹⁾ EIRP [dBm]
UNII7	802.11be	320	MCS0	159	6745	Full BW	SISO A	16.93	17.04	20.59
							SISO B	16.72	16.83	20.41
							MIMO A	14.00	14.11	17.69
							MIMO B	13.85	13.96	17.54
							Combined A+B	16.94	17.05	20.63

(1)Value compensated with the duty cycle

Note1: Antenna Gain: Antenna 1(A): 3.55dBi, Antenna 2(B): 3.58dBi;

Note2: Directional Gain: Uncorrelated (Directional Gain = 3.57dBi)

Note3: E.I.R.P = Measured Power + Individual Antenna Gain for SISO mode, E.I.R.P = Measured Power + Directional Gain for MIMO mode.

Note4: For conservativeness, calculate for MIMO mode EIRP the Max. antenna gain 3.58dBi is used.

Note5: The Conducted Output power is quote form modular test report No. 250519-01.TR12.

UNII	Mode	BW [MHz]	Rate	Ch#	Freq [MHz]	RU config	Chain	Ouput Power [dBm]	Max(1) Ouput Power [dBm]	Max(1) EIRP [dBm]
UNII8	802.11ax/be	20	MCS0	185	6875	Full BW	SISO A	5.33	5.33	8.88
							SISO B	5.42	5.42	9.00
							MIMO A	2.43	2.43	6.01
							MIMO B	2.43	2.43	6.01
							Combined A+B	5.44	5.44	9.02
				SISO A	5.27		5.27	8.82		
				SISO B	5.43		5.43	9.01		
				MIMO A	2.53		2.53	6.11		
				MIMO B	2.26		2.26	5.84		
				Combined A+B	5.41		5.41	8.99		
				SISO A	5.55		5.55	9.10		
				SISO B	5.63		5.63	9.21		
				MIMO A	2.68		2.68	6.26		
				MIMO B	2.78		2.78	6.36		
				Combined A+B	5.74		5.74	9.32		
				SISO A	-1.22		-1.22	2.33		
				SISO B	-0.54		-0.54	3.04		
				MIMO A	-4.61		-4.61	-1.03		
	MIMO B	-4.61	-4.61	-1.03						
	Combined A+B	-1.60	-1.60	1.98						
	802.11ax/be	40	MCS0	187	6885	Full BW	SISO A	8.59	8.59	12.14
							SISO B	8.49	8.49	12.07
							MIMO A	5.44	5.44	9.02
							MIMO B	5.50	5.50	9.08
							Combined A+B	8.48	8.48	12.06
				SISO A	8.54		8.54	12.09		
				SISO B	8.76		8.76	12.34		
				MIMO A	5.67		5.67	9.25		
				MIMO B	5.69		5.69	9.27		
				Combined A+B	8.69		8.69	12.27		
802.11ax/be	80	MCS0	183	6865	Full BW	SISO A	11.69	11.69	15.24	
						SISO B	11.56	11.56	15.14	
						MIMO A	8.58	8.58	12.16	
						MIMO B	8.78	8.78	12.36	
						Combined A+B	11.69	11.69	15.27	
			SISO A	11.81		11.81	15.36			
			SISO B	11.84		11.84	15.42			
			MIMO A	8.74		8.74	12.32			
			MIMO B	8.72		8.72	12.30			
			Combined A+B	11.74		11.74	15.32			
			SISO A	11.70		11.70	15.25			
			SISO B	11.70		11.70	15.28			
MIMO A	8.54	8.54	12.12							
MIMO B	8.69	8.69	12.27							
Combined A+B	11.63	11.63	15.21							

UNII	Mode	BW [MHz]	Rate	Ch#	Freq [MHz]	RU config	Chain	Ouput Power [dBm]	Max(1) Ouput Power [dBm]	Max(1) EIRP [dBm]
UNII8	802.11a/b/e	160	MCS0	207	6985	Full BW	SISO A	14.66	14.66	18.21
							SISO B	14.62	14.62	18.20
							MIMO A	11.59	11.59	15.17
							MIMO B	11.44	11.44	15.02
							Combined A+B	14.53	14.53	18.11

(1)Value compensated with the duty cycle

Note1: Antenna Gain: Antenna 1(A): 3.55dBi, Antenna 2(B): 3.58dBi;

Note2: Directional Gain: Uncorrelated (Directional Gain = 3.57dBi)

Note3: E.I.R.P = Measured Power + Individual Antenna Gain for SISO mode, E.I.R.P = Measured Power + Directional Gain for MIMO mode.

Note4: For conservativeness, calculate for MIMO mode EIRP the Max. antenna gain 3.58dBi is used.

Note5: The Conducted Output power is quote form modular test report No. 250519-01.TR12.

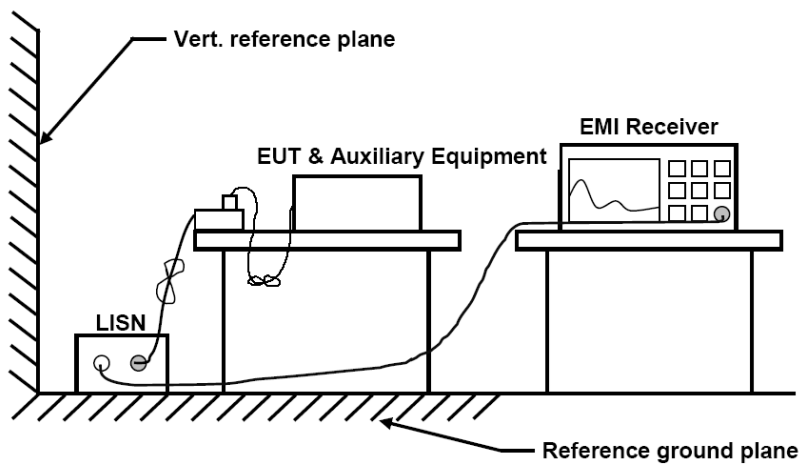
3.2 Conducted Emissions Test

LIMIT

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION

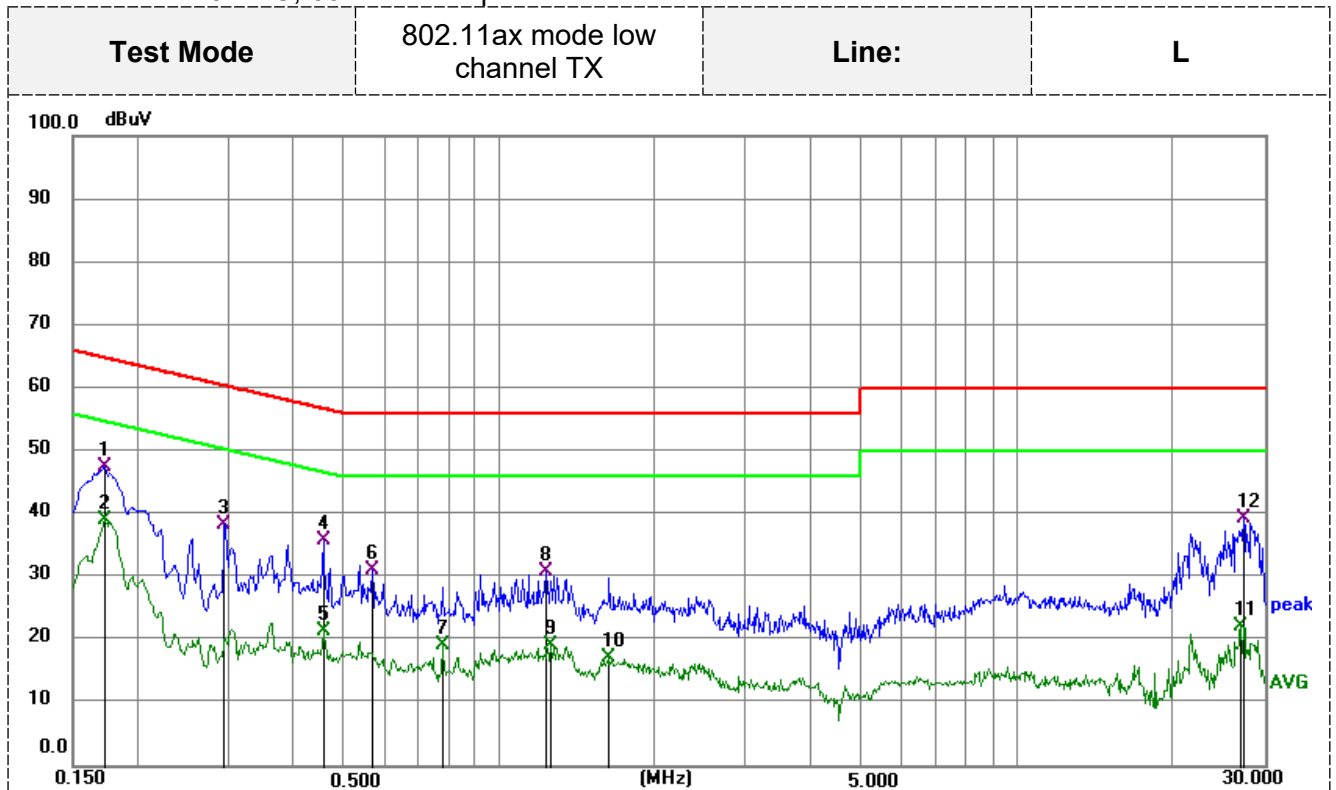


TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST RESULTS

1. Pre-scan all WIFI operation modes at Low, Middle, and High channel; only the worst result of UNII band 5 802.11ax MIMO mode low channel was reported as below:
2. Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:



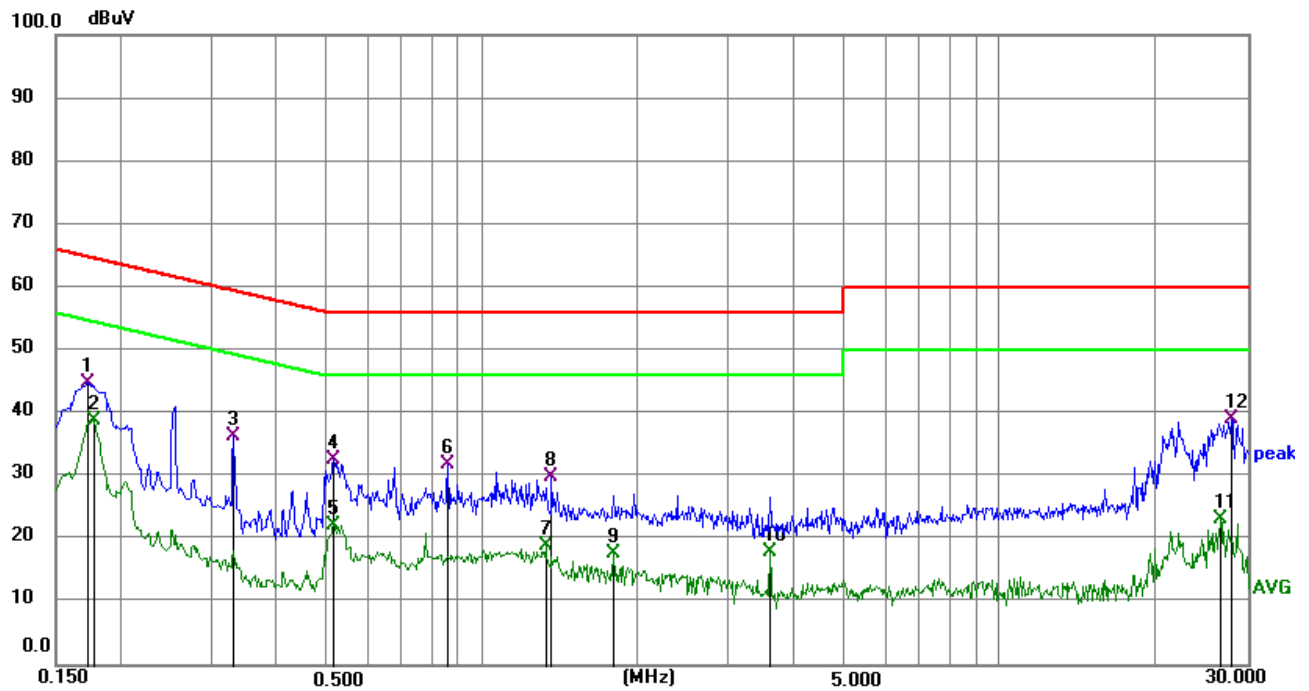
Remark: Correct Factor = Insertion loss of LISN + Cable loss + Insertion loss of Pulse Limiter;

Measurement Result = Reading Level + Correct Factor;

Margin = Measurement Result - Limit

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1723	36.51	11.09	47.60	64.85	-17.25	QP
2	0.1723	27.91	11.09	39.00	54.85	-15.85	AVG
3	0.2940	27.35	11.07	38.42	60.41	-21.99	QP
4	0.4560	24.91	11.06	35.97	56.77	-20.80	QP
5	0.4560	10.50	11.06	21.56	46.77	-25.21	AVG
6	0.5685	20.06	11.06	31.12	56.00	-24.88	QP
7	0.7752	8.29	11.04	19.33	46.00	-26.67	AVG
8	1.2300	19.79	11.06	30.85	56.00	-25.15	QP
9	1.2615	8.17	11.06	19.23	46.00	-26.77	AVG
10	1.6350	6.20	11.05	17.25	46.00	-28.75	AVG
11	27.0690	10.01	12.26	22.27	50.00	-27.73	AVG
12	27.3210	26.98	12.24	39.22	60.00	-20.78	QP

Test Mode	802.11ax mode low channel TX	Line:	N
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Remark: Correct Factor = Insertion loss of LISN + Cable loss + Insertion loss of Pulse Limiter;

Measurement Result = Reading Level + Correct Factor;

Margin = Measurement Result- Limit

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1723	33.76	10.99	44.75	64.85	-20.10	QP
2	0.1770	27.75	10.98	38.73	54.63	-15.90	AVG
3	0.3300	25.32	10.99	36.31	59.45	-23.14	QP
4	0.5142	21.71	11.00	32.71	56.00	-23.29	QP
5	0.5142	11.32	11.00	22.32	46.00	-23.68	AVG
6	0.8610	20.82	11.00	31.82	56.00	-24.18	QP
7	1.3290	8.03	10.99	19.02	46.00	-26.98	AVG
8	1.3650	18.82	10.99	29.81	56.00	-26.19	QP
9	1.7970	6.80	10.99	17.79	46.00	-28.21	AVG
10	3.5924	6.81	11.09	17.90	46.00	-28.10	AVG
11	26.5830	11.19	12.13	23.32	50.00	-26.68	AVG
12	27.8610	27.21	11.99	39.20	60.00	-20.80	QP

3.3 Radiated Emissions and Band Edge

Limit

(1) For transmitters operating within the 5.925-7.125 GHz band: Any emissions outside of the 5.925-7.125 GHz band must not exceed an e.i.r.p. of -27 dBm/MHz.

Undesirable emission limits

Requirement	Limit(EIRP)	Limit (Field strength at 3m) ^{Note1}
outside of the 5.925-7.125 GHz	PK:-27(dBm/MHz)	PK:68.2(dBμV/m)

Note1: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

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

(2) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209

Radiated emission limits

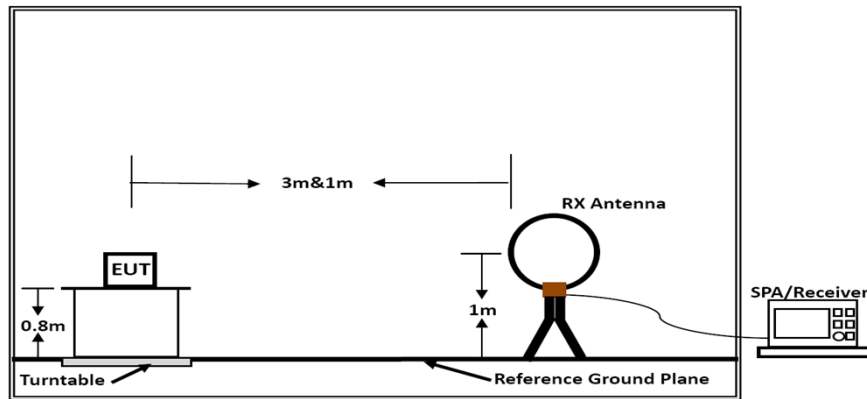
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

(3) In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
1.0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

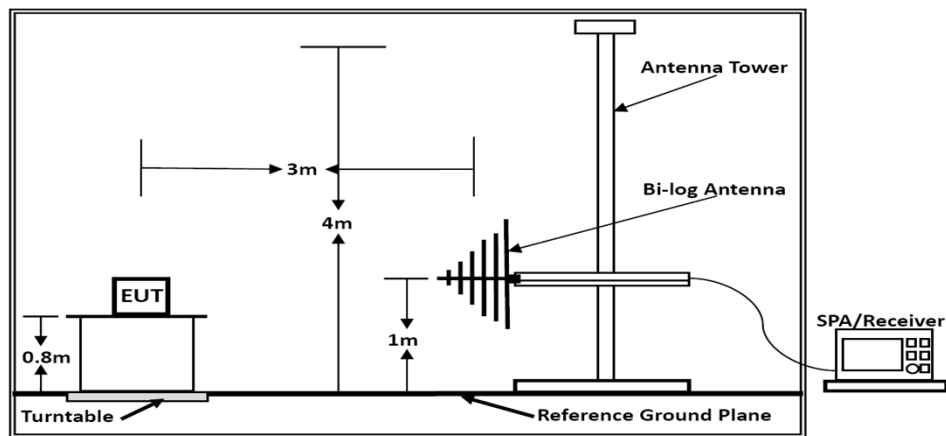
TEST CONFIGURATION

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



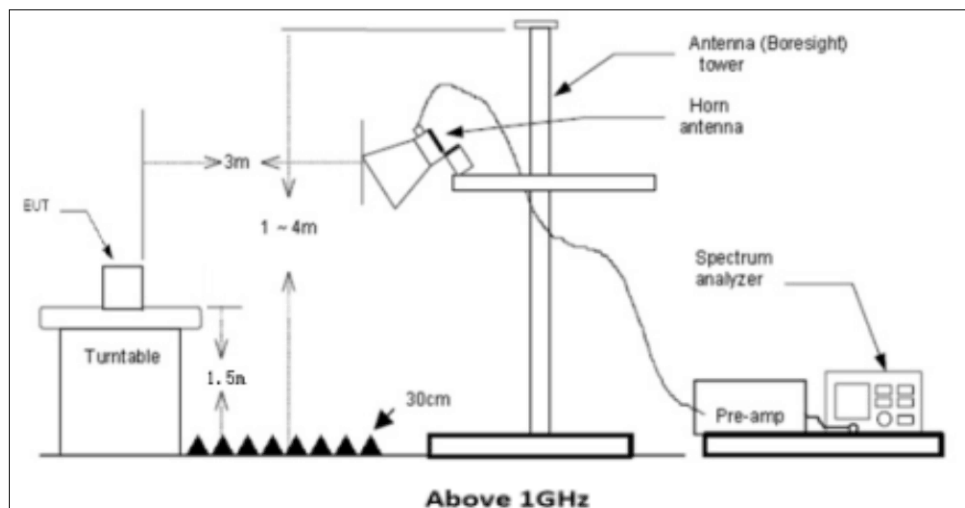
Below 30MHz

(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



Below 1GHz

(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



Above 1GHz

Test Procedure

- Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
- Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT
- And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- Repeat above procedures until all frequency measurements have been completed.
- Radiated emission test frequency band from 9KHz to 40GHz.
- The distance between test antenna and EUT as following table states:

Test Frequency range	Test Antenna Type	Test Distance
9KHz-30MHz	Active Loop Antenna	3
30MHz-1GHz	Bilog Antenna	3
1GHz-18GHz	Horn Antenna	3
18GHz-40GHz	Horn Antenna	1

- Setting test receiver/spectrum as following table states:

Test Frequency range	Test Receiver/Spectrum Setting	Detector
9KHz-150KHz	RBW=200Hz/VBW=3KHz, Sweep time=Auto	QP
150KHz-30MHz	RBW=9KHz/VBW=100KHz, Sweep time=Auto	QP
30MHz-1GHz	RBW=120KHz/VBW=1000KHz, Sweep time=Auto	QP
1GHz-40GHz	Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto	Peak

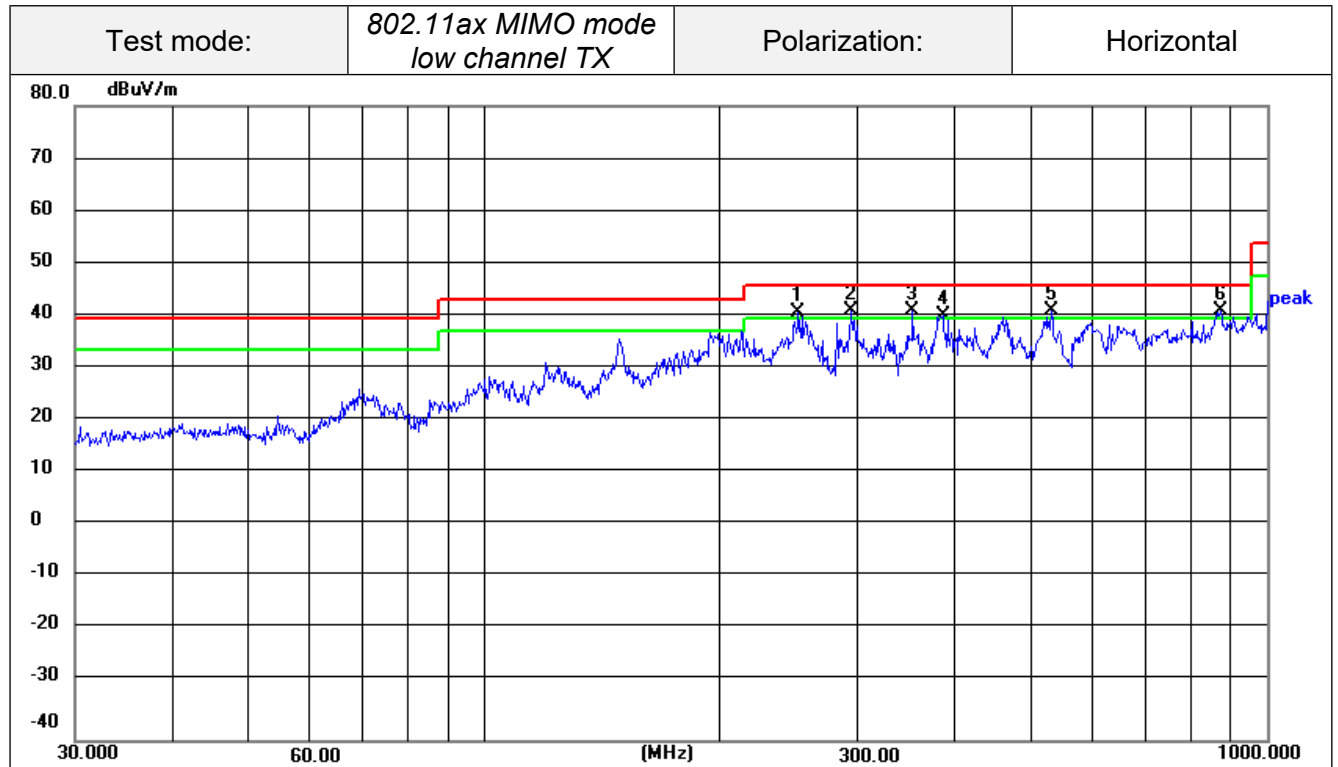
TEST RESULTS

Remark:

- Pre-scan all operation modes for below 1GHz test, only the worst case 802.11a Ant1 low channel of U-NII 1 band was recorded.
- Pre-scan all operation modes for above 1GHz test, only the worst case 802.11a Ant1 was recorded.
- Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

For 30MHz-1GHz

Note: Pre-scan all WIFI operation modes for below 1GHz test, only the worst case 802.11ax MIMO mode low channel of U-NII 5 band was recorded.



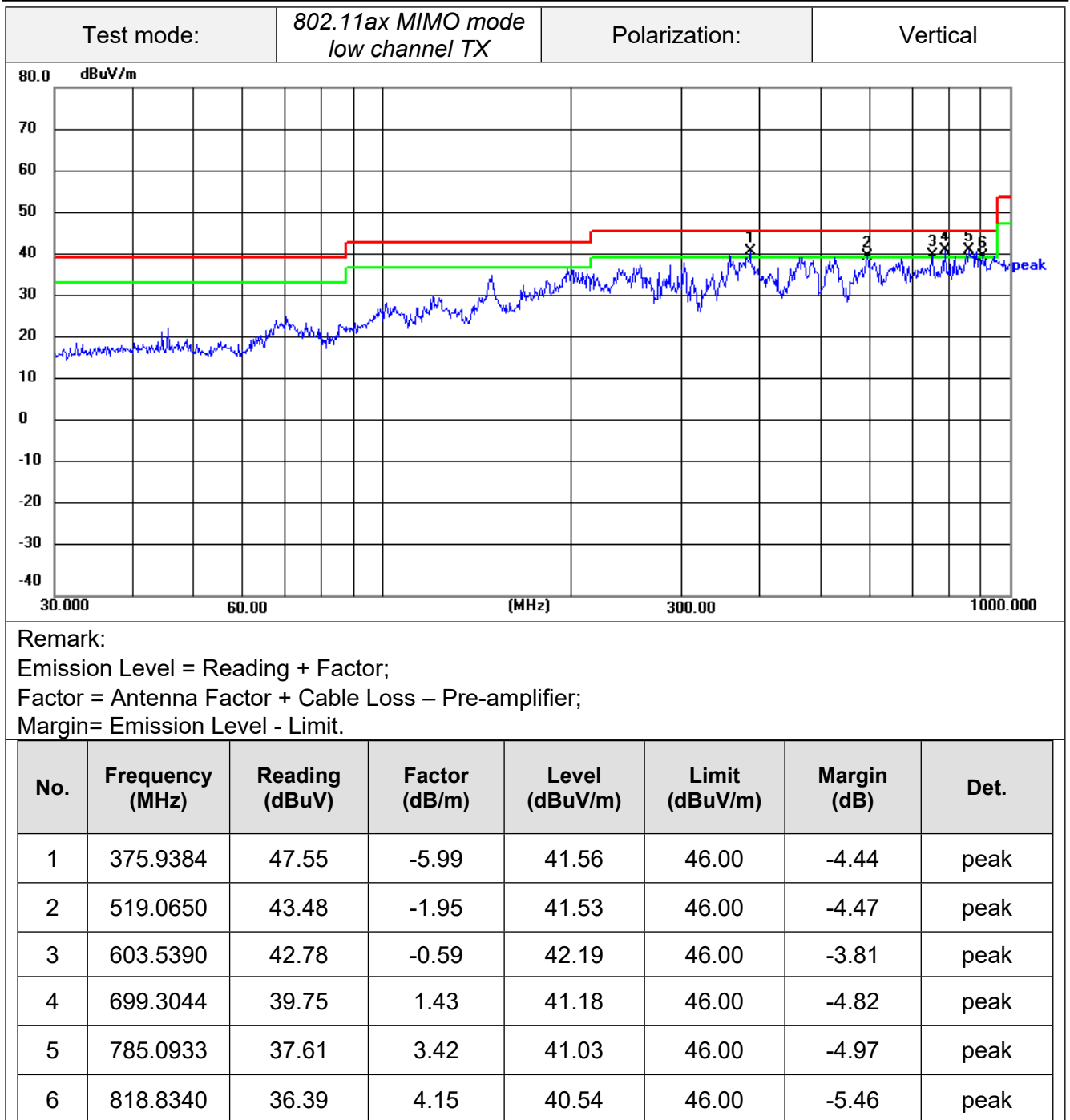
Remark:

Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

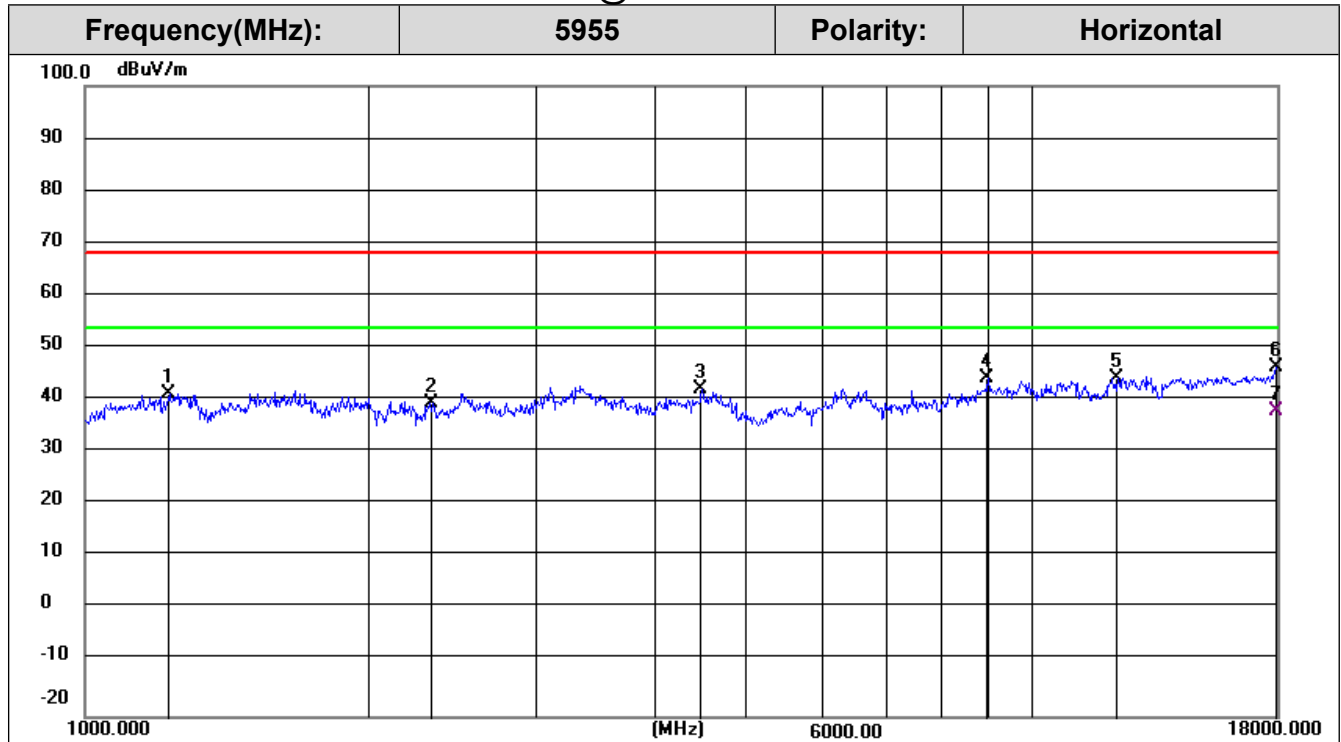
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	252.0627	50.50	-9.34	41.16	46.00	-4.84	peak
2	294.1136	49.35	-7.99	41.36	46.00	-4.64	peak
3	352.9433	47.78	-6.42	41.36	46.00	-4.64	peak
4	385.2803	46.17	-5.73	40.44	46.00	-5.56	peak
5	530.1013	43.43	-2.09	41.34	46.00	-4.66	peak
6	872.1832	36.36	5.06	41.42	46.00	-4.58	peak



For 1GHz to 18GHz

Remark: All WIFI operation modes have been tested for above 1GHz test, only the worst case 802.11ax20 MIMO mode was recorded as below:

U-NII band 5 @ 802.11ax MIMO mode



Remark:

Filter is used

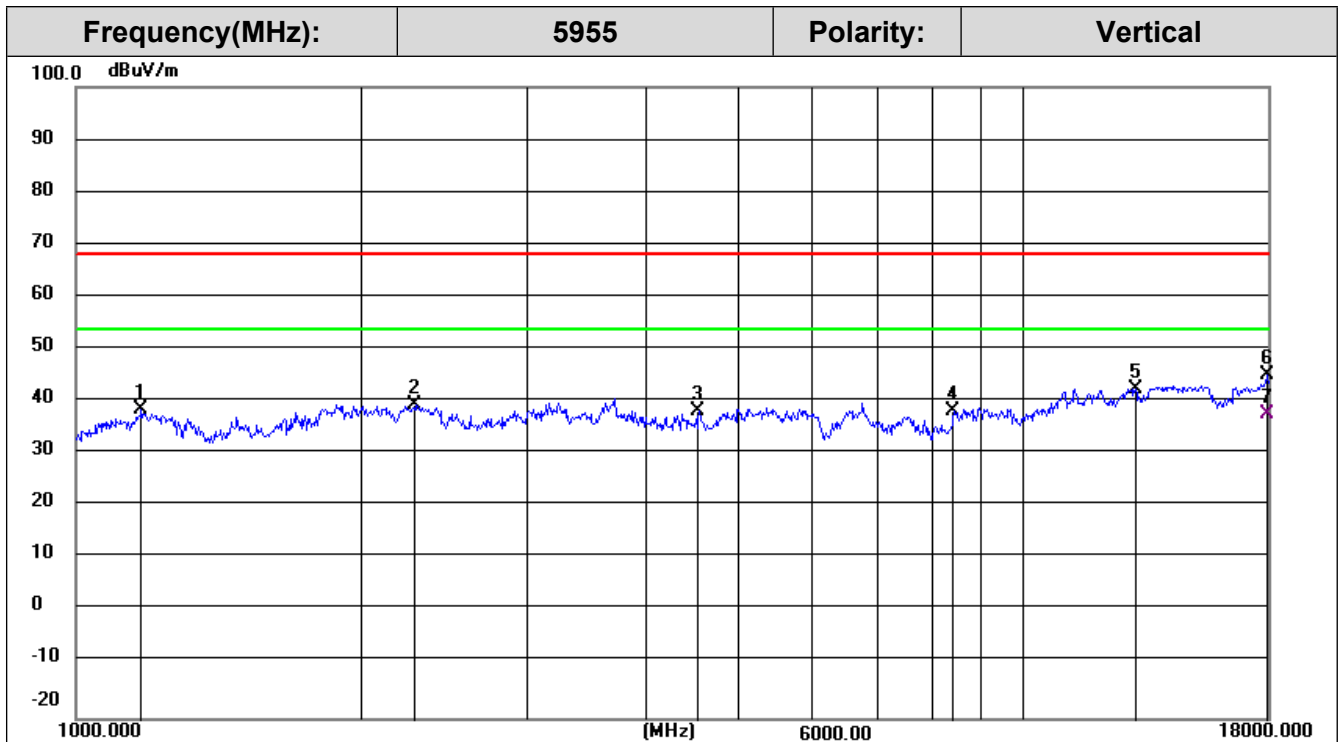
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1229.566	67.16	-25.73	41.43	68.20	-26.77	peak
2	2333.030	61.75	-22.03	39.72	68.20	-28.48	peak
3	4483.446	58.16	-15.65	42.51	68.20	-25.69	peak
4	8956.208	48.61	-4.24	44.37	68.20	-23.83	peak
5	12269.401	46.52	-2.08	44.44	68.20	-23.76	peak
6	17994.798	37.23	9.41	46.64	68.20	-21.56	peak
7	17994.798	28.95	9.41	38.36	68.20	-29.84	QP

Note:A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

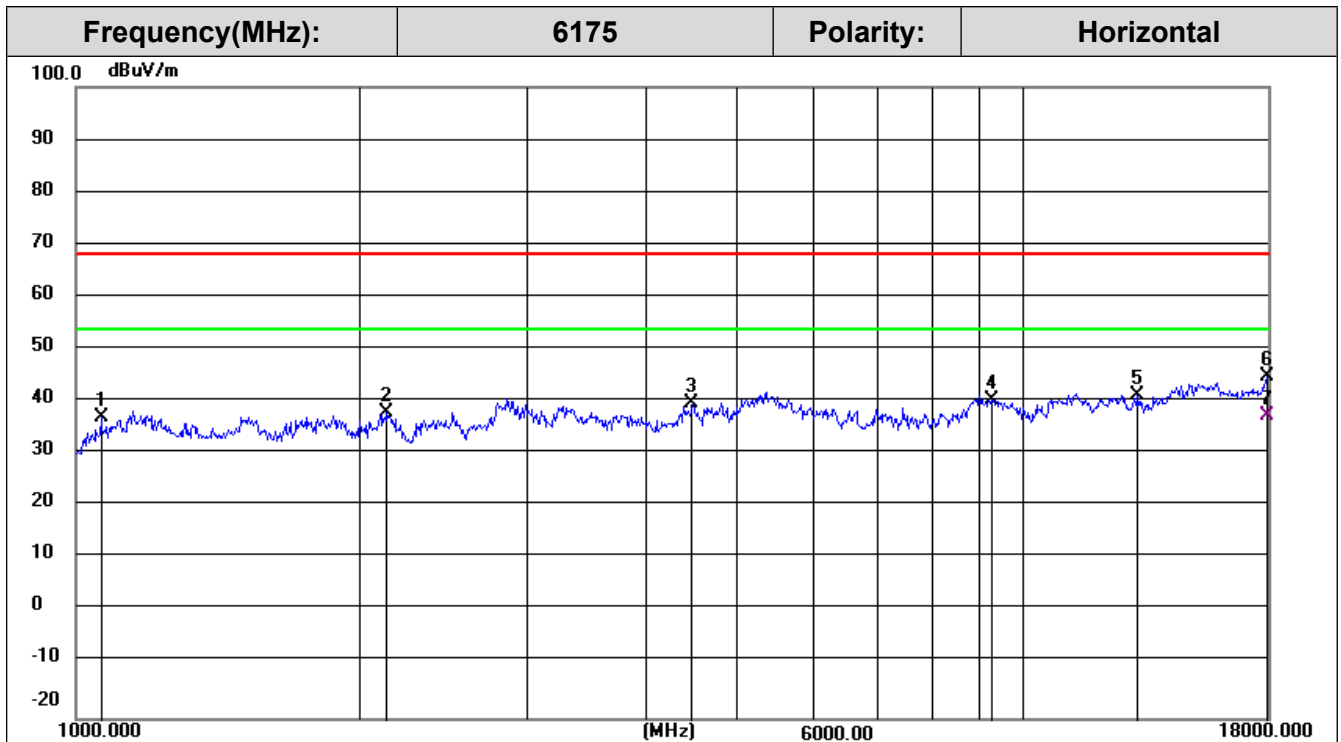
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1173.999	64.61	-25.69	38.92	68.20	-29.28	peak
2	2287.623	61.83	-22.17	39.66	68.20	-28.54	peak
3	4550.025	53.79	-15.38	38.41	68.20	-29.79	peak
4	8431.192	44.79	-6.35	38.44	68.20	-29.76	peak
5	13090.055	44.83	-2.07	42.76	68.20	-25.44	peak
6	17994.798	35.90	9.41	45.31	68.20	-22.89	peak
7	17994.798	28.36	9.41	37.77	68.20	-30.43	QP

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

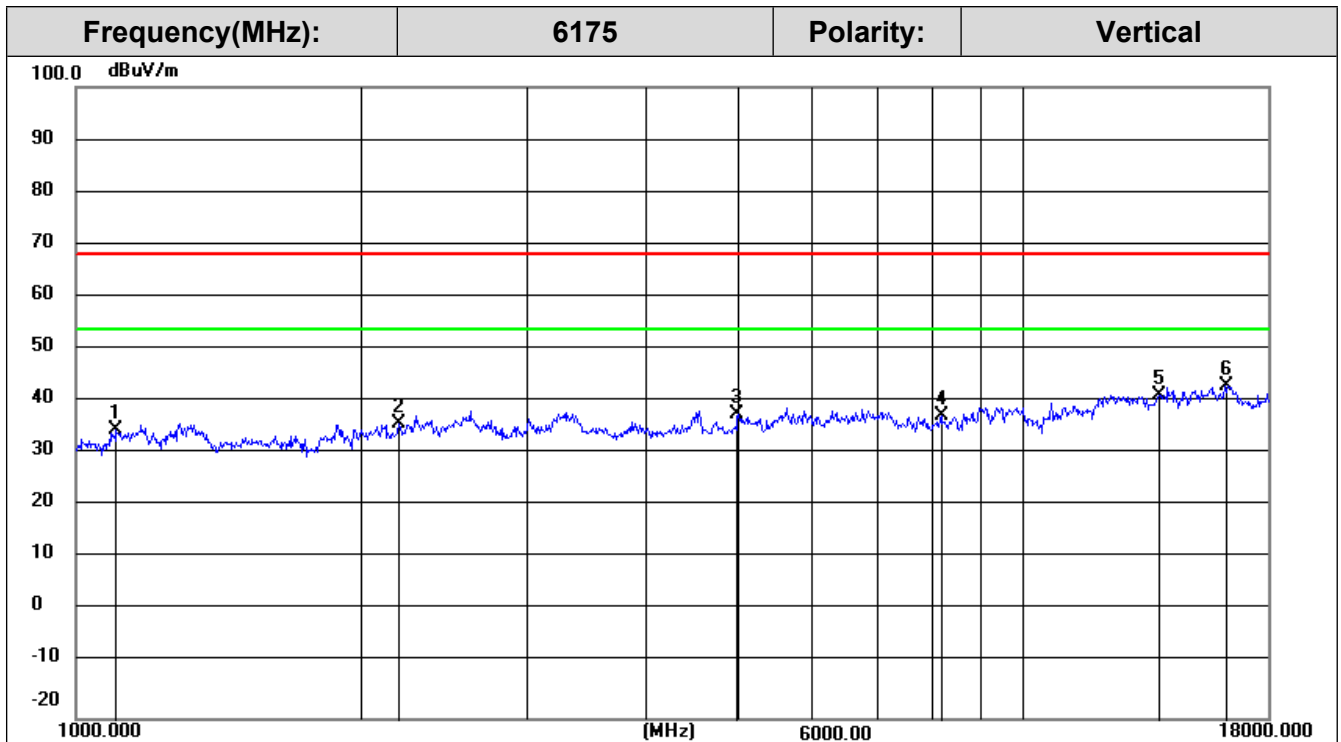
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1063.499	63.04	-25.65	37.39	68.20	-30.81	peak
2	2131.846	60.87	-22.60	38.27	68.20	-29.93	peak
3	4483.446	55.66	-15.65	40.01	68.20	-28.19	peak
4	9237.525	44.44	-3.81	40.63	68.20	-27.57	peak
5	13181.175	43.25	-1.90	41.35	68.20	-26.85	peak
6	17994.798	35.73	9.41	45.14	68.20	-23.06	peak
7	17994.798	28.30	9.41	37.71	68.20	-30.49	QP

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

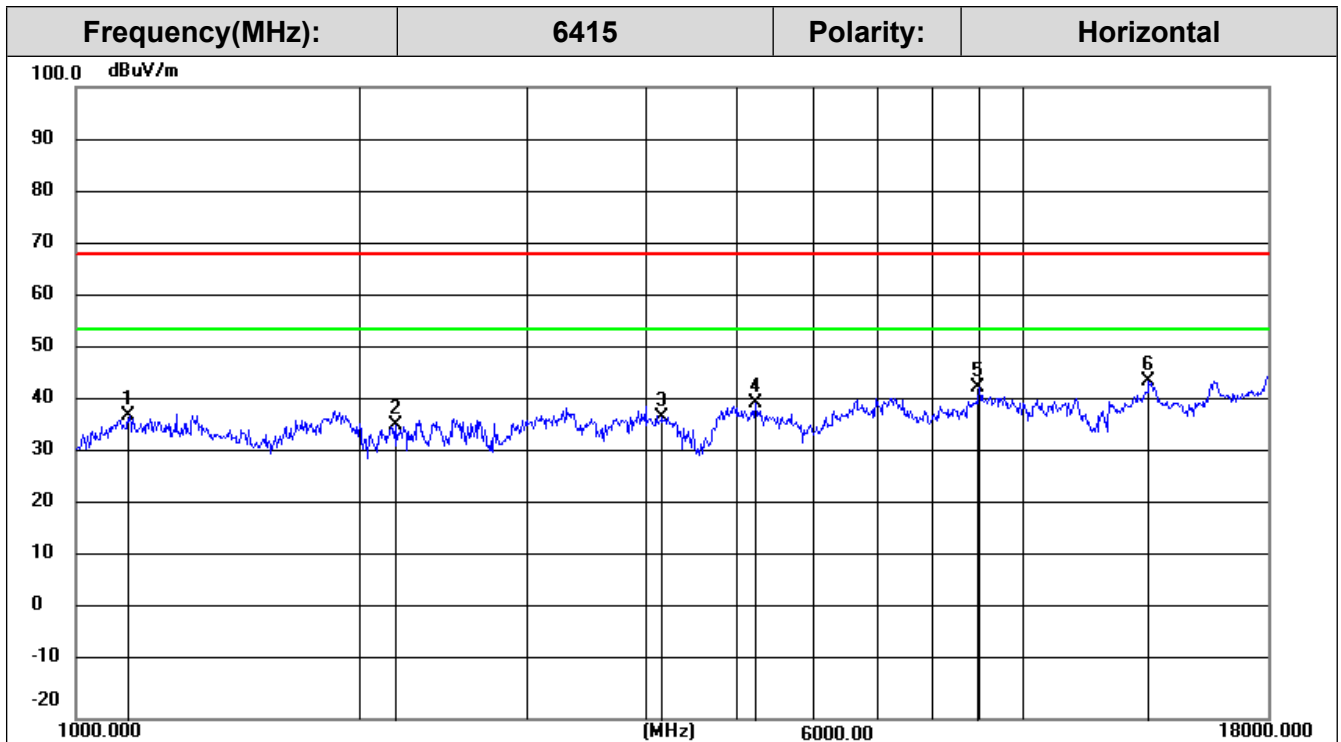
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1108.378	60.59	-25.66	34.93	68.20	-33.27	peak
2	2191.195	58.47	-22.43	36.04	68.20	-32.16	peak
3	4999.605	51.23	-13.38	37.85	68.20	-30.35	peak
4	8174.432	45.09	-7.34	37.75	68.20	-30.45	peak
5	13921.267	41.68	-0.13	41.55	68.20	-26.65	peak
6	16357.728	43.84	-0.59	43.25	68.20	-24.95	peak

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

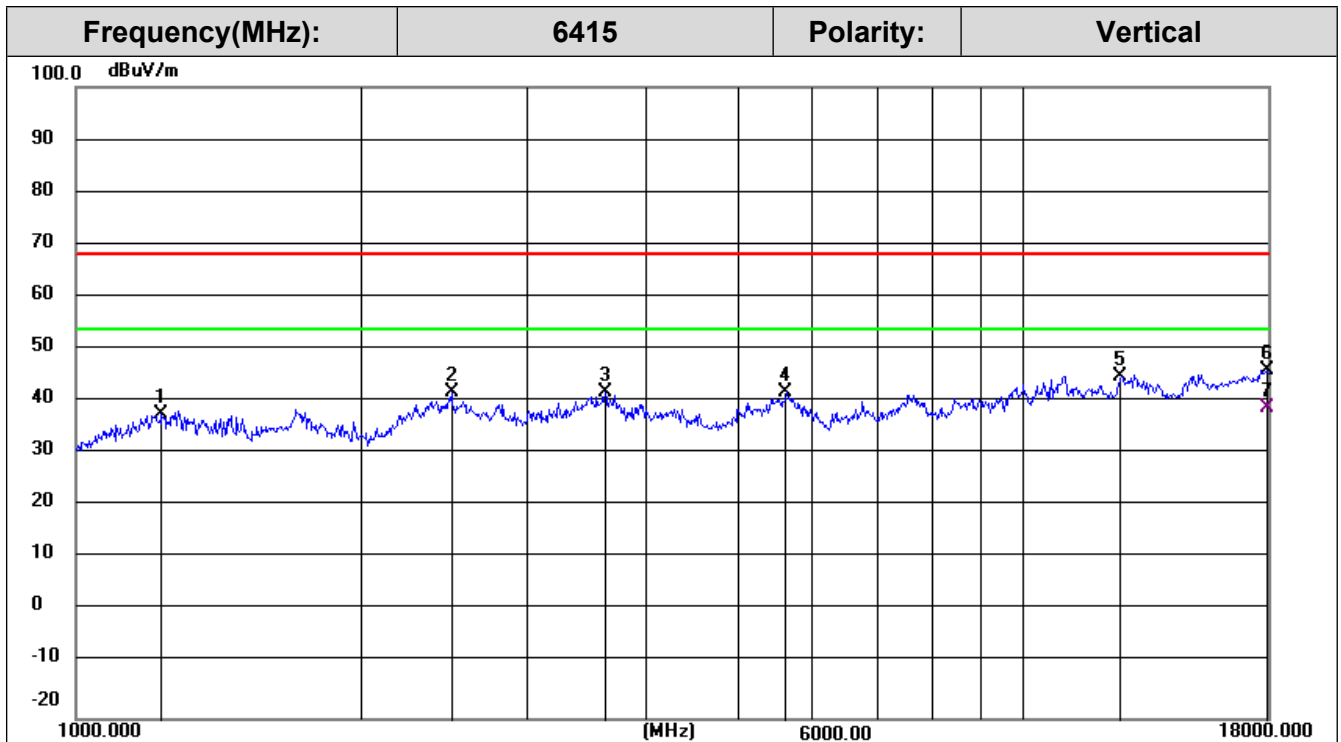
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1140.881	63.29	-25.68	37.61	68.20	-30.59	peak
2	2174.161	58.46	-22.48	35.98	68.20	-32.22	peak
3	4151.659	54.07	-16.65	37.42	68.20	-30.78	peak
4	5210.581	52.97	-12.92	40.05	68.20	-28.15	peak
5	8956.208	47.11	-4.24	42.87	68.20	-25.33	peak
6	13516.835	45.31	-1.23	44.08	68.20	-24.12	peak

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

Emission Level = Reading + Factor;

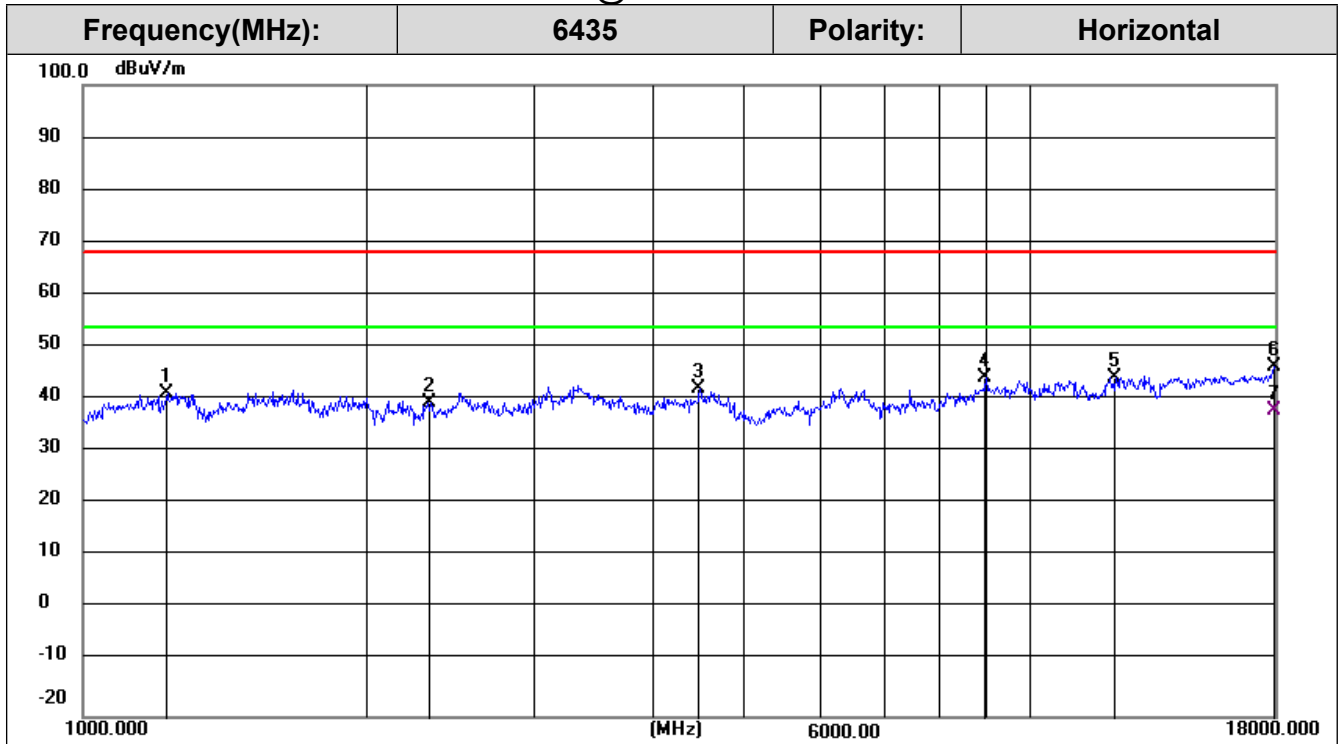
Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1235.265	63.67	-25.75	37.92	68.20	-30.28	peak
2	2494.840	63.53	-21.57	41.96	68.20	-26.24	peak
3	3609.662	60.50	-18.39	42.11	68.20	-26.09	peak
4	5605.889	54.17	-12.15	42.02	68.20	-26.18	peak
5	12647.472	47.09	-2.13	44.96	68.20	-23.24	peak
6	17994.798	36.90	9.41	46.31	68.20	-21.89	peak
7	17994.798	29.70	9.41	39.11	68.20	-29.09	QP

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.

U-NII band 6 @ 802.11ax MIMO mode



Remark:

Filter is used

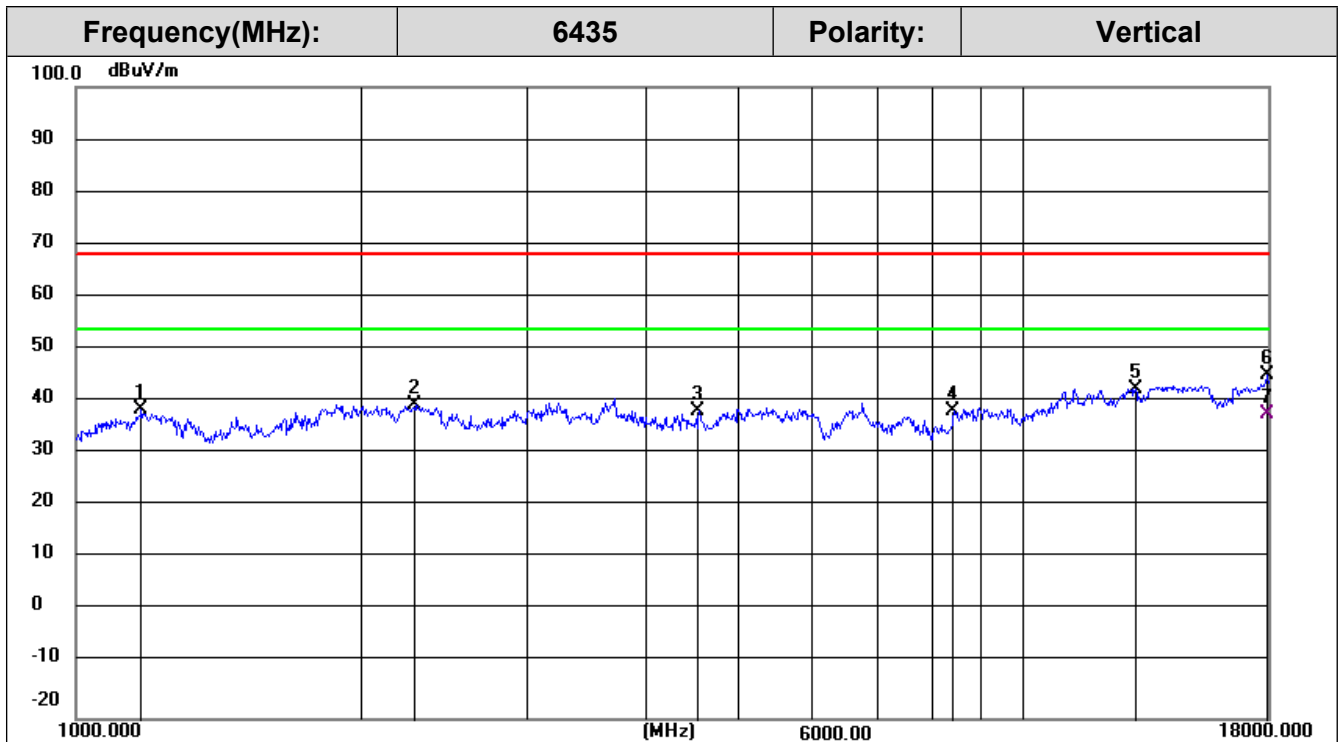
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1229.566	67.16	-25.73	41.43	68.20	-26.77	peak
2	2333.030	61.75	-22.03	39.72	68.20	-28.48	peak
3	4483.446	58.16	-15.65	42.51	68.20	-25.69	peak
4	8956.208	48.61	-4.24	44.37	68.20	-23.83	peak
5	12269.401	46.52	-2.08	44.44	68.20	-23.76	peak
6	17994.798	37.23	9.41	46.64	68.20	-21.56	peak
7	17994.798	28.95	9.41	38.36	68.20	-29.84	QP

Note:A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

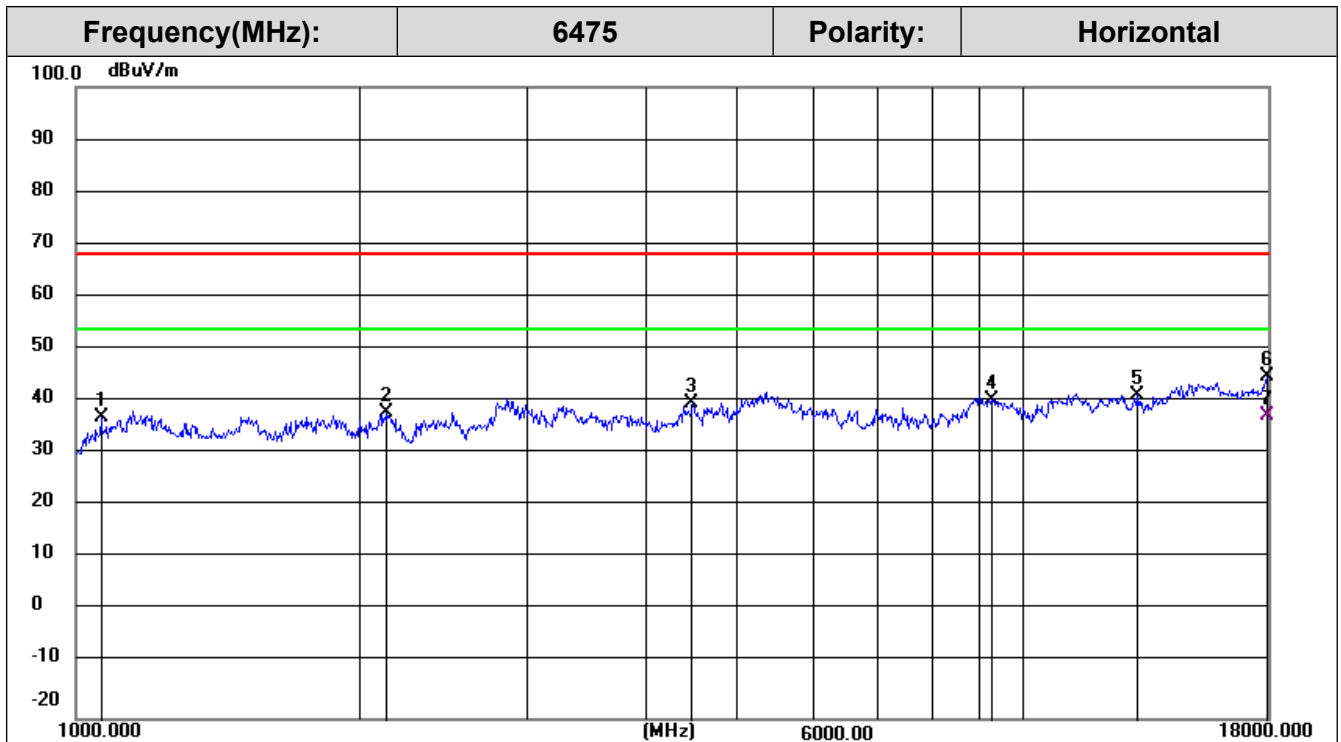
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1173.999	64.61	-25.69	38.92	68.20	-29.28	peak
2	2287.623	61.83	-22.17	39.66	68.20	-28.54	peak
3	4550.025	53.79	-15.38	38.41	68.20	-29.79	peak
4	8431.192	44.79	-6.35	38.44	68.20	-29.76	peak
5	13090.055	44.83	-2.07	42.76	68.20	-25.44	peak
6	17994.798	35.90	9.41	45.31	68.20	-22.89	peak
7	17994.798	28.36	9.41	37.77	68.20	-30.43	QP

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

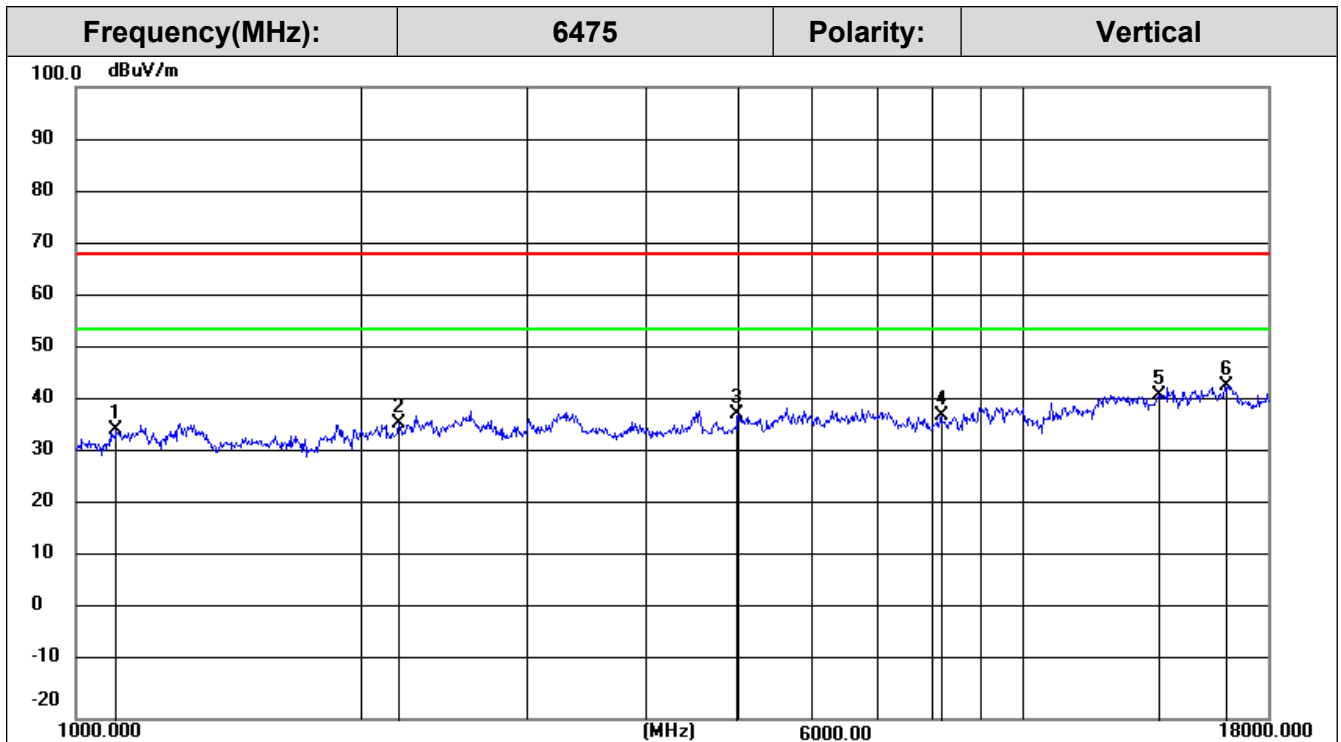
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1063.499	63.04	-25.65	37.39	68.20	-30.81	peak
2	2131.846	60.87	-22.60	38.27	68.20	-29.93	peak
3	4483.446	55.66	-15.65	40.01	68.20	-28.19	peak
4	9237.525	44.44	-3.81	40.63	68.20	-27.57	peak
5	13181.175	43.25	-1.90	41.35	68.20	-26.85	peak
6	17994.798	35.73	9.41	45.14	68.20	-23.06	peak
7	17994.798	28.30	9.41	37.71	68.20	-30.49	QP

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

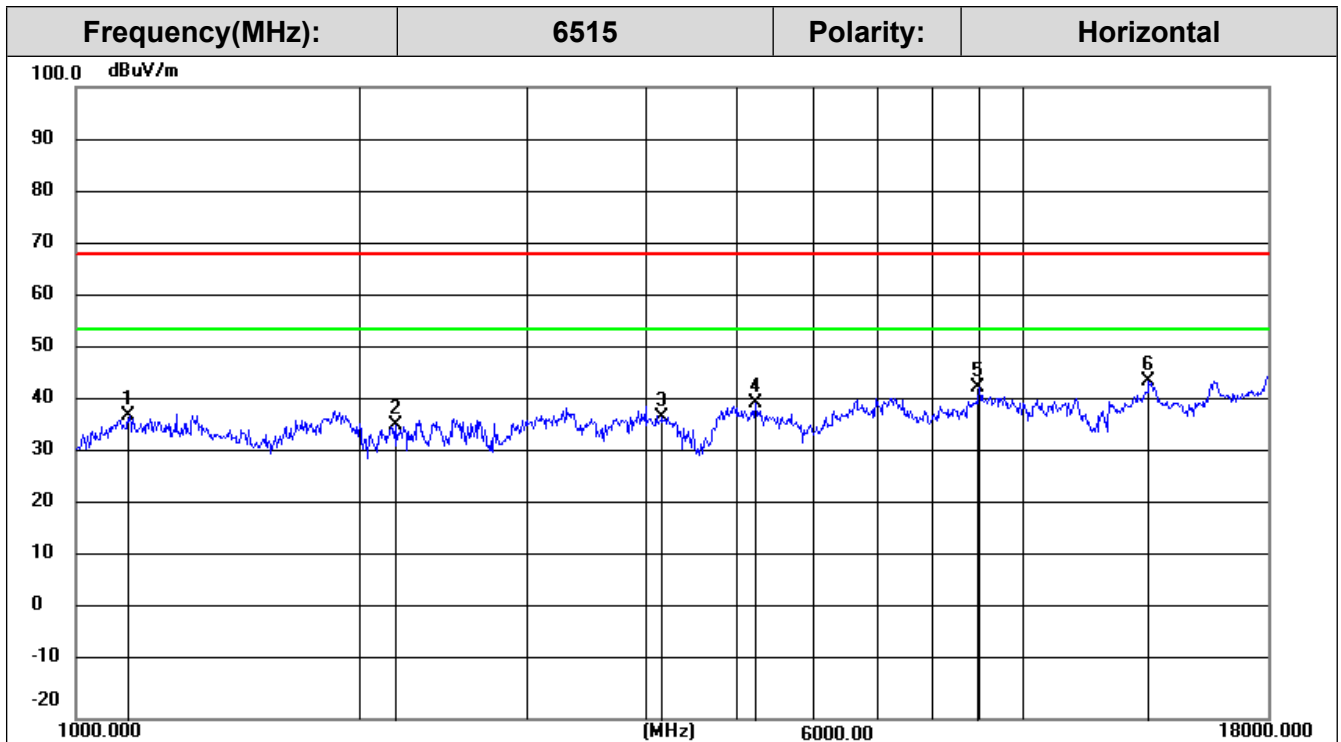
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1108.378	60.59	-25.66	34.93	68.20	-33.27	peak
2	2191.195	58.47	-22.43	36.04	68.20	-32.16	peak
3	4999.605	51.23	-13.38	37.85	68.20	-30.35	peak
4	8174.432	45.09	-7.34	37.75	68.20	-30.45	peak
5	13921.267	41.68	-0.13	41.55	68.20	-26.65	peak
6	16357.728	43.84	-0.59	43.25	68.20	-24.95	peak

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

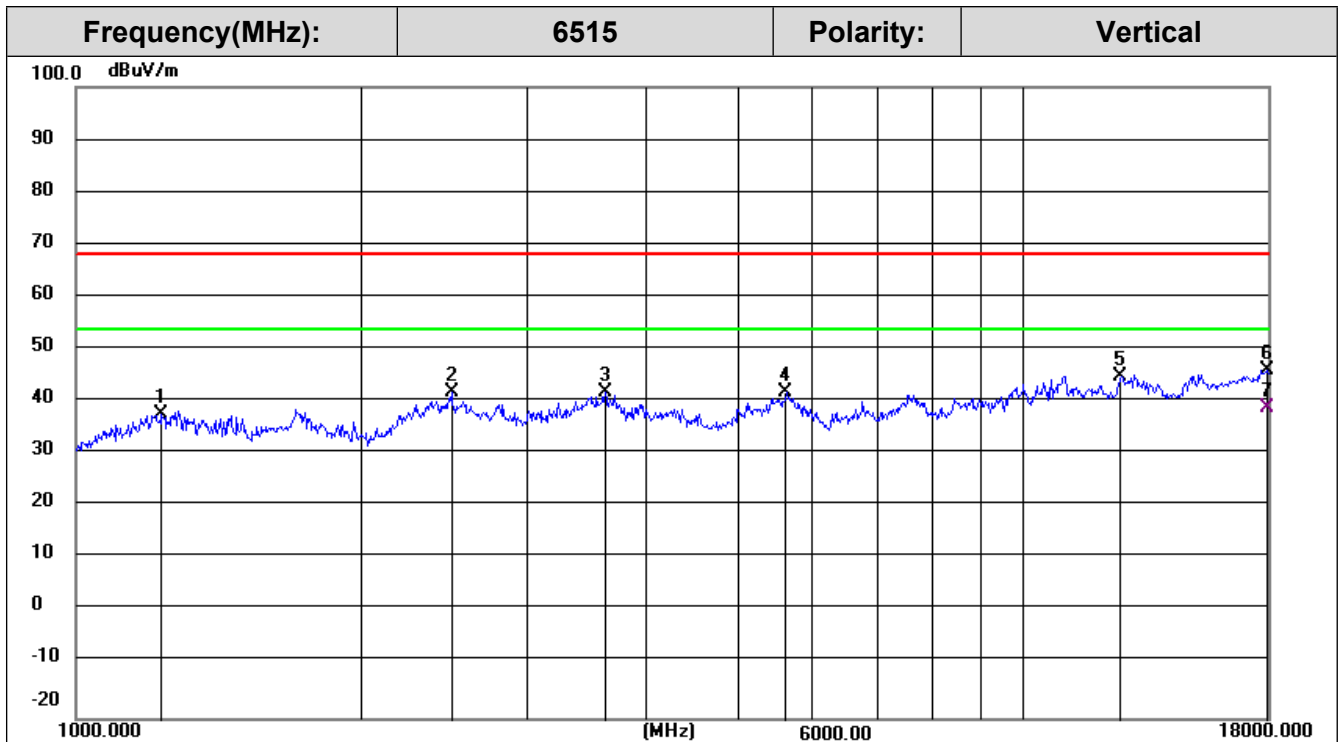
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1140.881	63.29	-25.68	37.61	68.20	-30.59	peak
2	2174.161	58.46	-22.48	35.98	68.20	-32.22	peak
3	4151.659	54.07	-16.65	37.42	68.20	-30.78	peak
4	5210.581	52.97	-12.92	40.05	68.20	-28.15	peak
5	8956.208	47.11	-4.24	42.87	68.20	-25.33	peak
6	13516.835	45.31	-1.23	44.08	68.20	-24.12	peak

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

Emission Level = Reading + Factor;

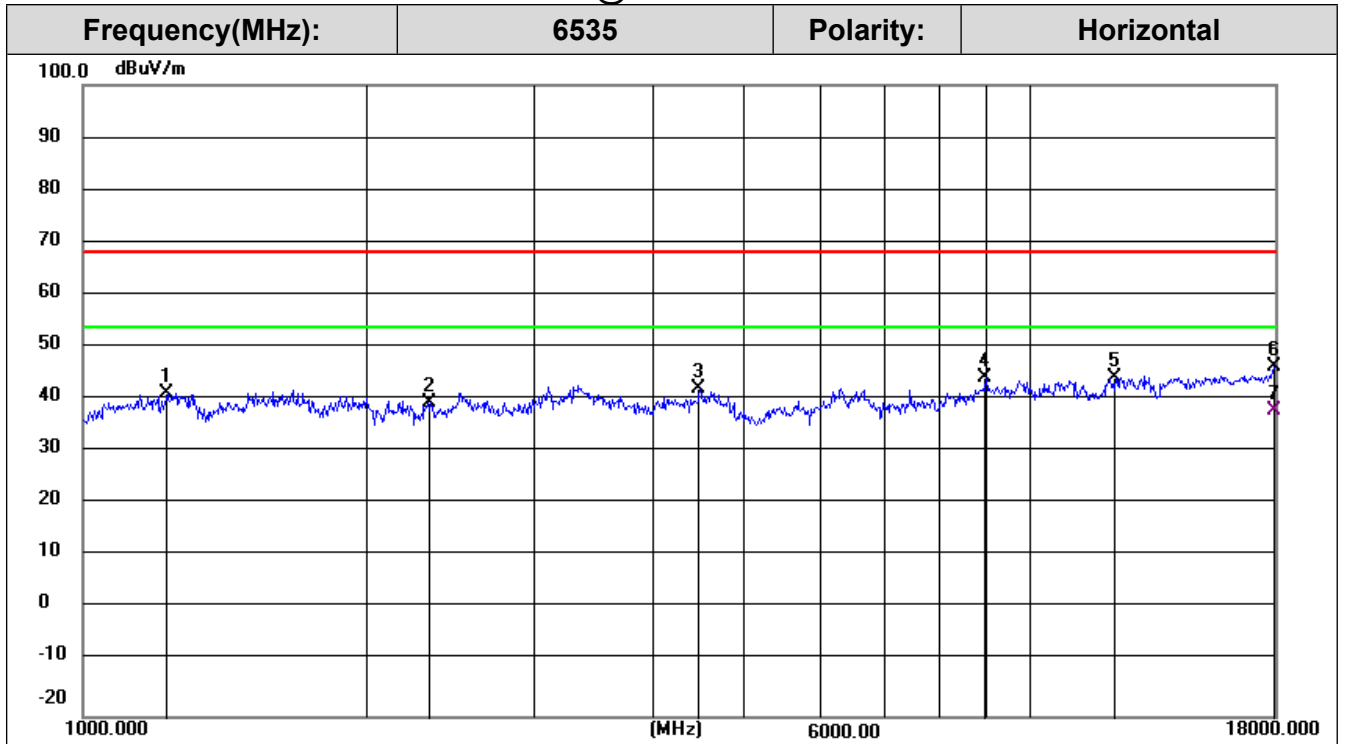
Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1235.265	63.67	-25.75	37.92	68.20	-30.28	peak
2	2494.840	63.53	-21.57	41.96	68.20	-26.24	peak
3	3609.662	60.50	-18.39	42.11	68.20	-26.09	peak
4	5605.889	54.17	-12.15	42.02	68.20	-26.18	peak
5	12647.472	47.09	-2.13	44.96	68.20	-23.24	peak
6	17994.798	36.90	9.41	46.31	68.20	-21.89	peak
7	17994.798	29.70	9.41	39.11	68.20	-29.09	QP

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.

U-NII band 7 @ 802.11ax MIMO mode



Remark:

Filter is used

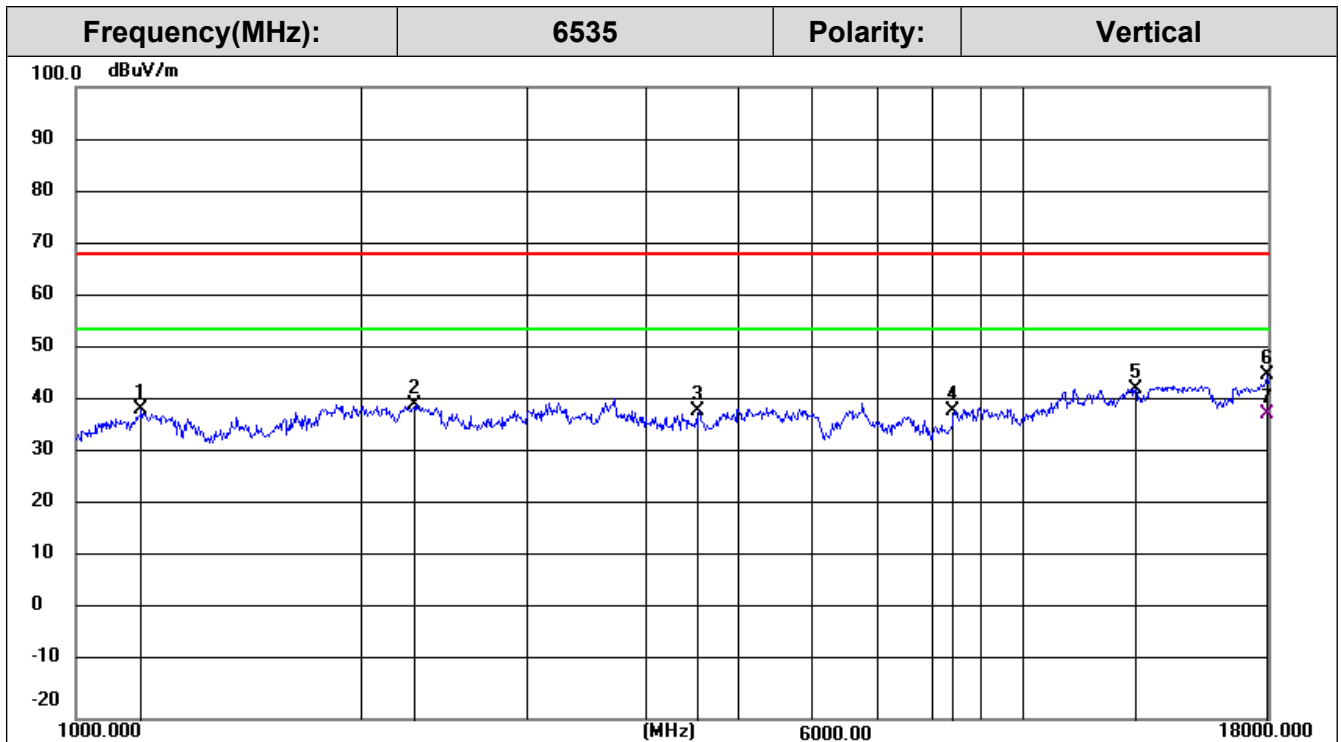
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1229.566	67.16	-25.73	41.43	68.20	-26.77	peak
2	2333.030	61.75	-22.03	39.72	68.20	-28.48	peak
3	4483.446	58.16	-15.65	42.51	68.20	-25.69	peak
4	8956.208	48.61	-4.24	44.37	68.20	-23.83	peak
5	12269.401	46.52	-2.08	44.44	68.20	-23.76	peak
6	17994.798	37.23	9.41	46.64	68.20	-21.56	peak
7	17994.798	28.95	9.41	38.36	68.20	-29.84	QP

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

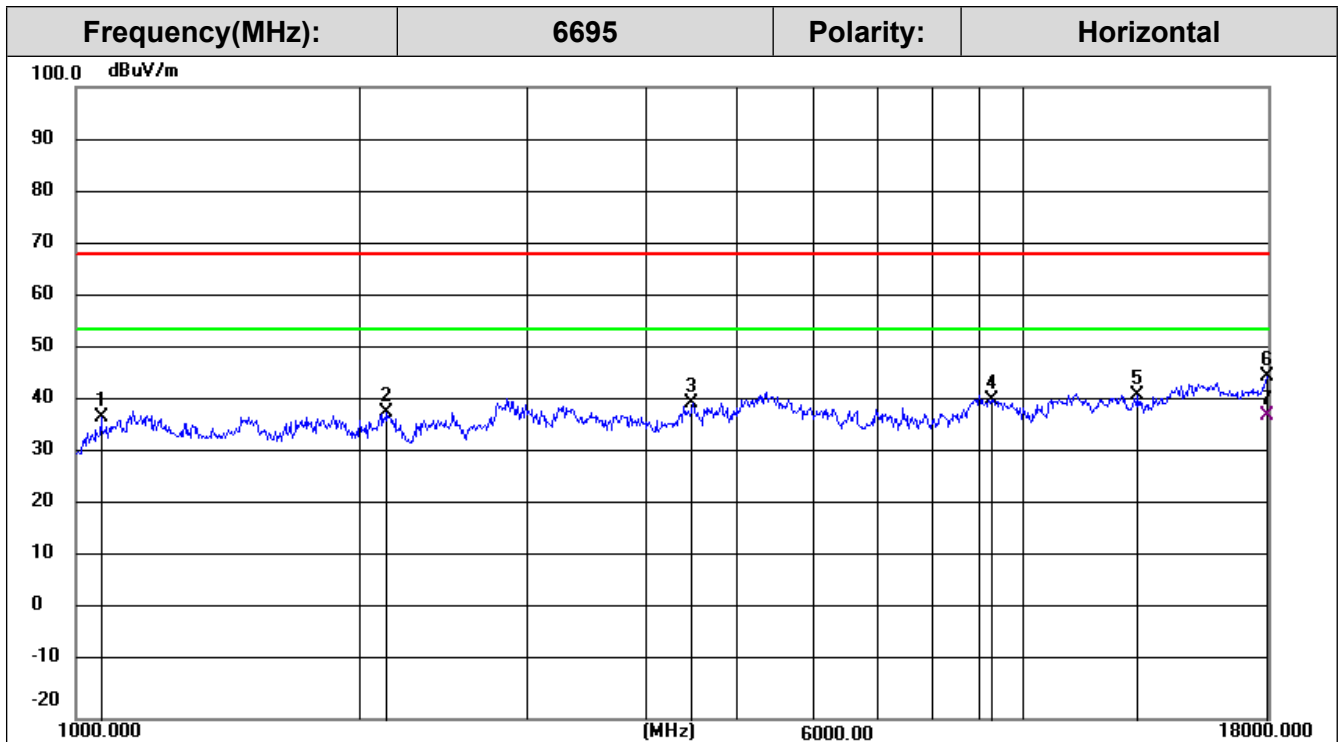
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1173.999	64.61	-25.69	38.92	68.20	-29.28	peak
2	2287.623	61.83	-22.17	39.66	68.20	-28.54	peak
3	4550.025	53.79	-15.38	38.41	68.20	-29.79	peak
4	8431.192	44.79	-6.35	38.44	68.20	-29.76	peak
5	13090.055	44.83	-2.07	42.76	68.20	-25.44	peak
6	17994.798	35.90	9.41	45.31	68.20	-22.89	peak
7	17994.798	28.36	9.41	37.77	68.20	-30.43	QP

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

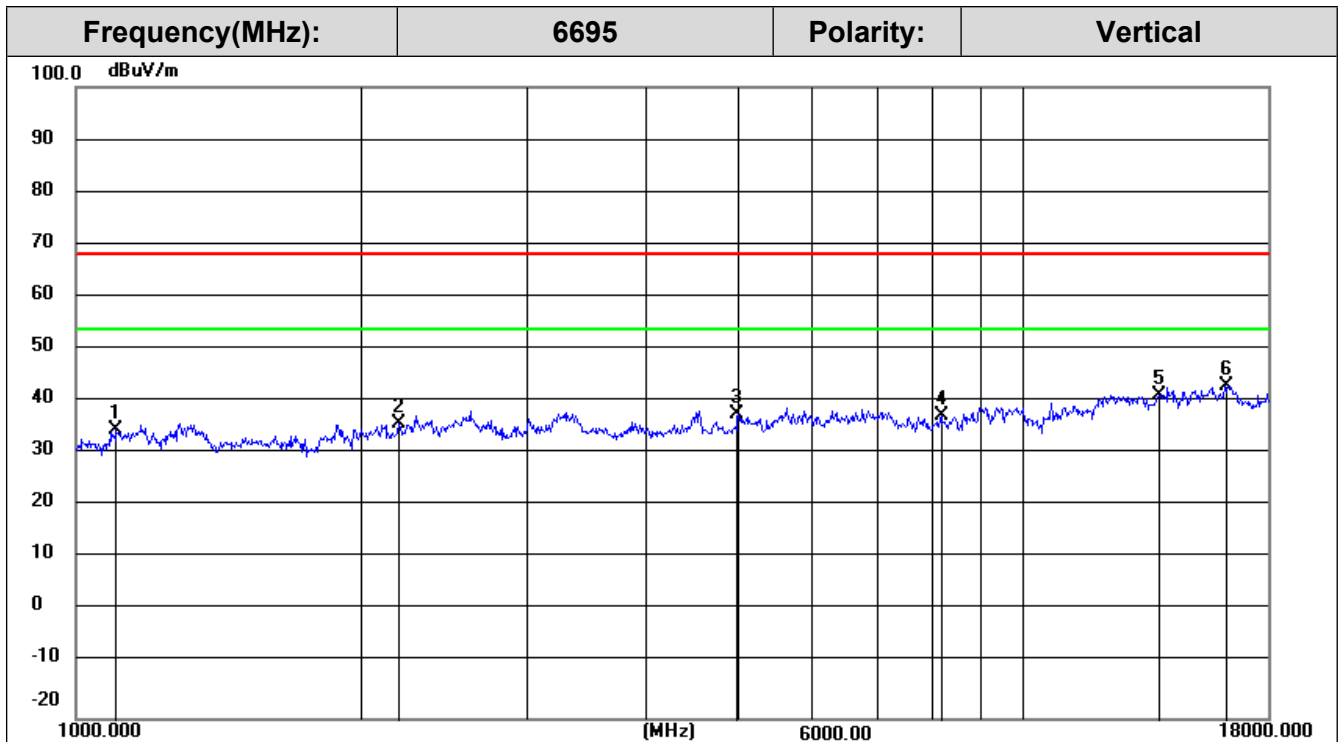
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1063.499	63.04	-25.65	37.39	68.20	-30.81	peak
2	2131.846	60.87	-22.60	38.27	68.20	-29.93	peak
3	4483.446	55.66	-15.65	40.01	68.20	-28.19	peak
4	9237.525	44.44	-3.81	40.63	68.20	-27.57	peak
5	13181.175	43.25	-1.90	41.35	68.20	-26.85	peak
6	17994.798	35.73	9.41	45.14	68.20	-23.06	peak
7	17994.798	28.30	9.41	37.71	68.20	-30.49	QP

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

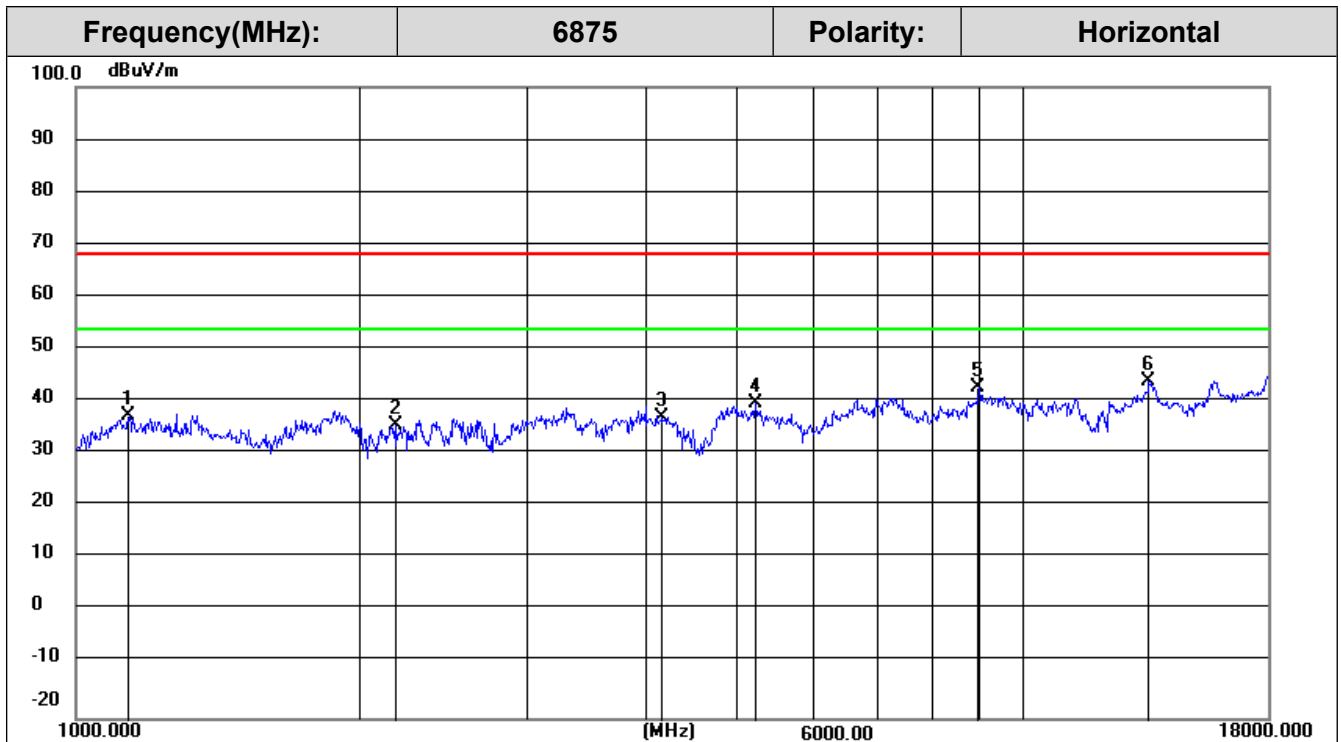
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1108.378	60.59	-25.66	34.93	68.20	-33.27	peak
2	2191.195	58.47	-22.43	36.04	68.20	-32.16	peak
3	4999.605	51.23	-13.38	37.85	68.20	-30.35	peak
4	8174.432	45.09	-7.34	37.75	68.20	-30.45	peak
5	13921.267	41.68	-0.13	41.55	68.20	-26.65	peak
6	16357.728	43.84	-0.59	43.25	68.20	-24.95	peak

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

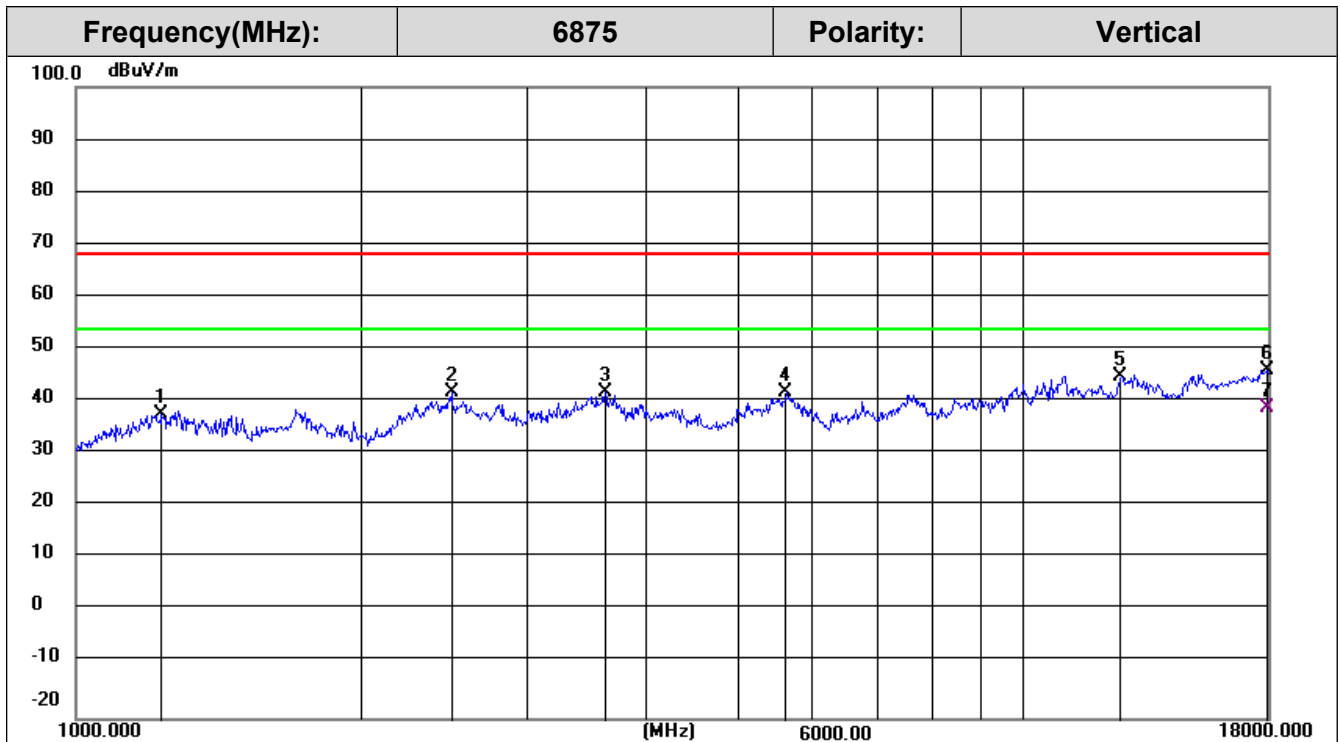
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1140.881	63.29	-25.68	37.61	68.20	-30.59	peak
2	2174.161	58.46	-22.48	35.98	68.20	-32.22	peak
3	4151.659	54.07	-16.65	37.42	68.20	-30.78	peak
4	5210.581	52.97	-12.92	40.05	68.20	-28.15	peak
5	8956.208	47.11	-4.24	42.87	68.20	-25.33	peak
6	13516.835	45.31	-1.23	44.08	68.20	-24.12	peak

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

Emission Level = Reading + Factor;

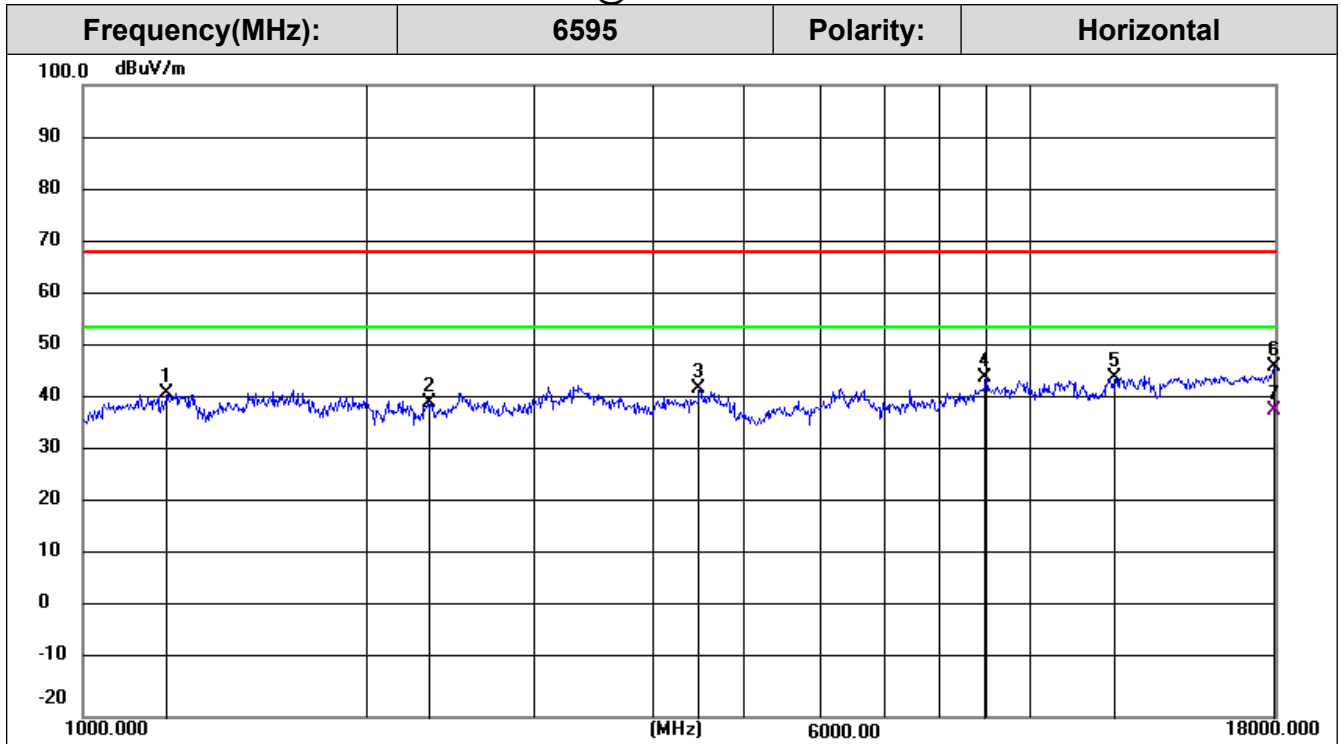
Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1235.265	63.67	-25.75	37.92	68.20	-30.28	peak
2	2494.840	63.53	-21.57	41.96	68.20	-26.24	peak
3	3609.662	60.50	-18.39	42.11	68.20	-26.09	peak
4	5605.889	54.17	-12.15	42.02	68.20	-26.18	peak
5	12647.472	47.09	-2.13	44.96	68.20	-23.24	peak
6	17994.798	36.90	9.41	46.31	68.20	-21.89	peak
7	17994.798	29.70	9.41	39.11	68.20	-29.09	QP

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.

U-NII band 8 @ 802.11ax MIMO mode



Remark:

Filter is used

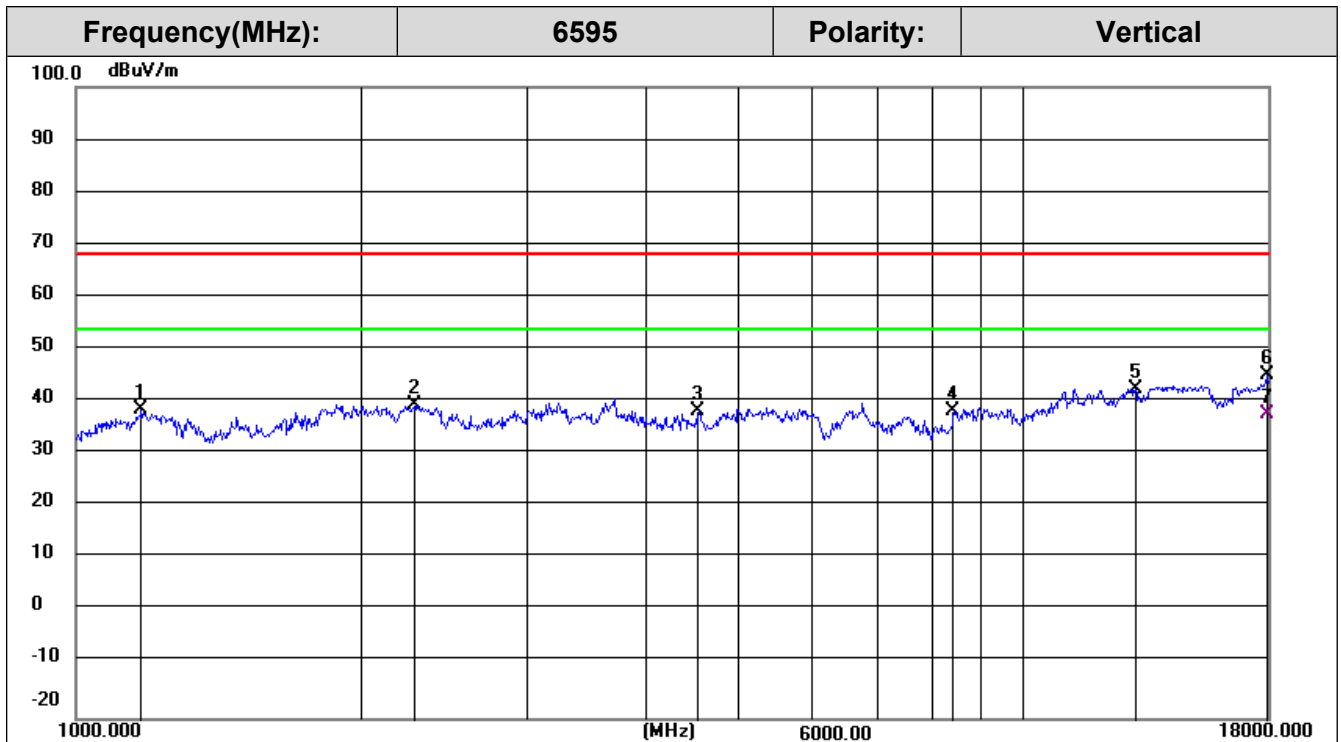
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1229.566	67.16	-25.73	41.43	68.20	-26.77	peak
2	2333.030	61.75	-22.03	39.72	68.20	-28.48	peak
3	4483.446	58.16	-15.65	42.51	68.20	-25.69	peak
4	8956.208	48.61	-4.24	44.37	68.20	-23.83	peak
5	12269.401	46.52	-2.08	44.44	68.20	-23.76	peak
6	17994.798	37.23	9.41	46.64	68.20	-21.56	peak
7	17994.798	28.95	9.41	38.36	68.20	-29.84	QP

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

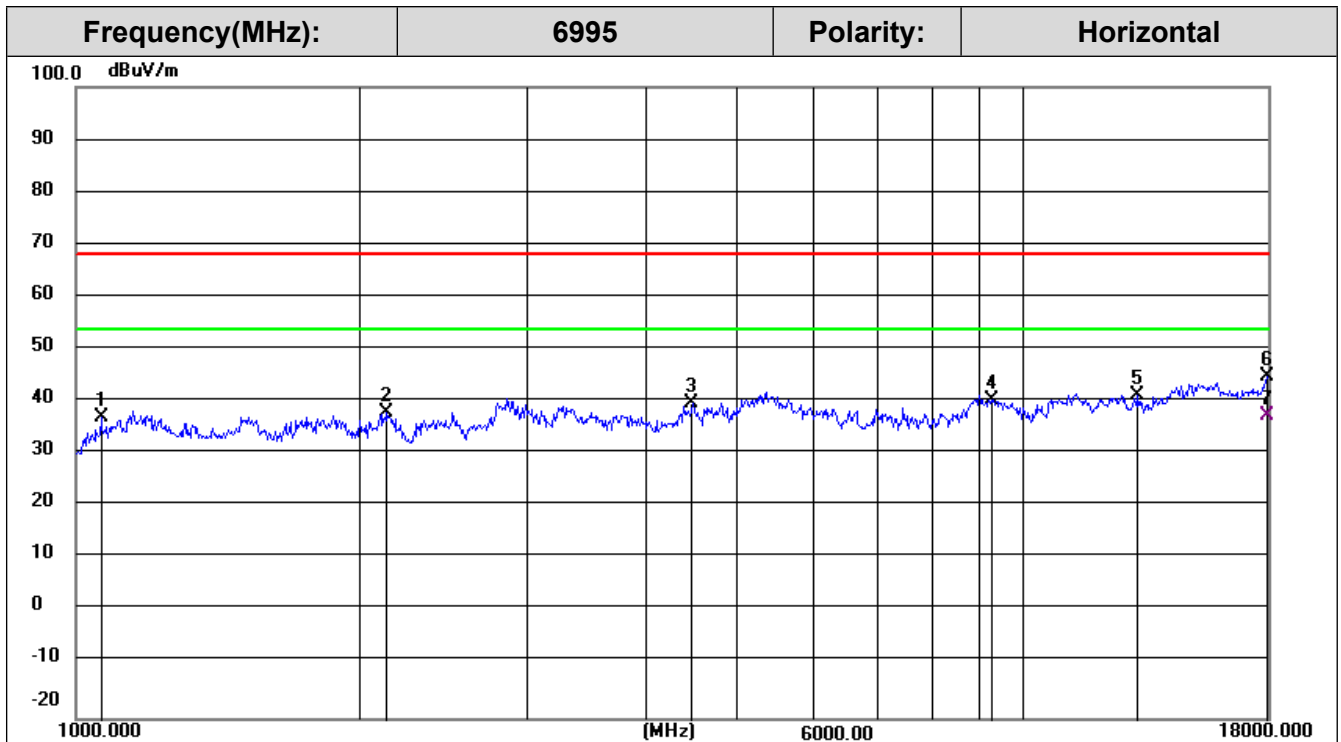
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1173.999	64.61	-25.69	38.92	68.20	-29.28	peak
2	2287.623	61.83	-22.17	39.66	68.20	-28.54	peak
3	4550.025	53.79	-15.38	38.41	68.20	-29.79	peak
4	8431.192	44.79	-6.35	38.44	68.20	-29.76	peak
5	13090.055	44.83	-2.07	42.76	68.20	-25.44	peak
6	17994.798	35.90	9.41	45.31	68.20	-22.89	peak
7	17994.798	28.36	9.41	37.77	68.20	-30.43	QP

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

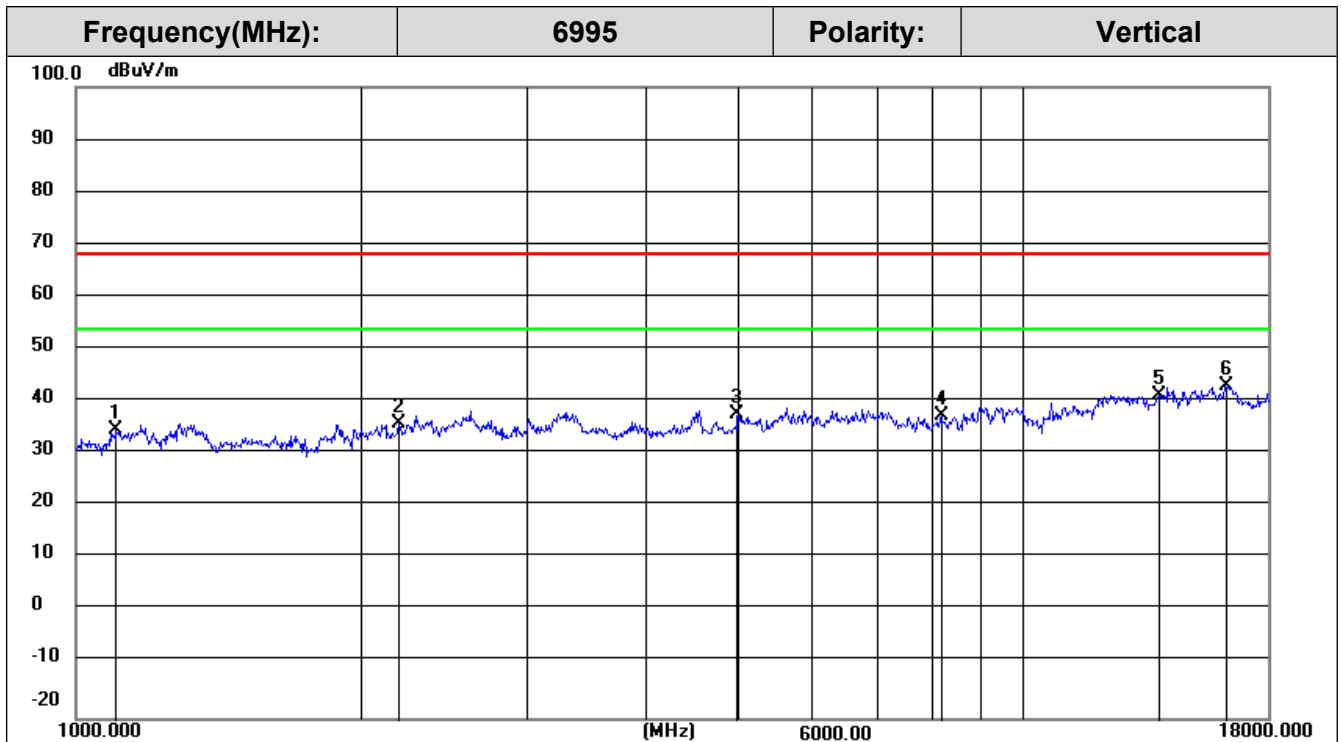
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1063.499	63.04	-25.65	37.39	68.20	-30.81	peak
2	2131.846	60.87	-22.60	38.27	68.20	-29.93	peak
3	4483.446	55.66	-15.65	40.01	68.20	-28.19	peak
4	9237.525	44.44	-3.81	40.63	68.20	-27.57	peak
5	13181.175	43.25	-1.90	41.35	68.20	-26.85	peak
6	17994.798	35.73	9.41	45.14	68.20	-23.06	peak
7	17994.798	28.30	9.41	37.71	68.20	-30.49	QP

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

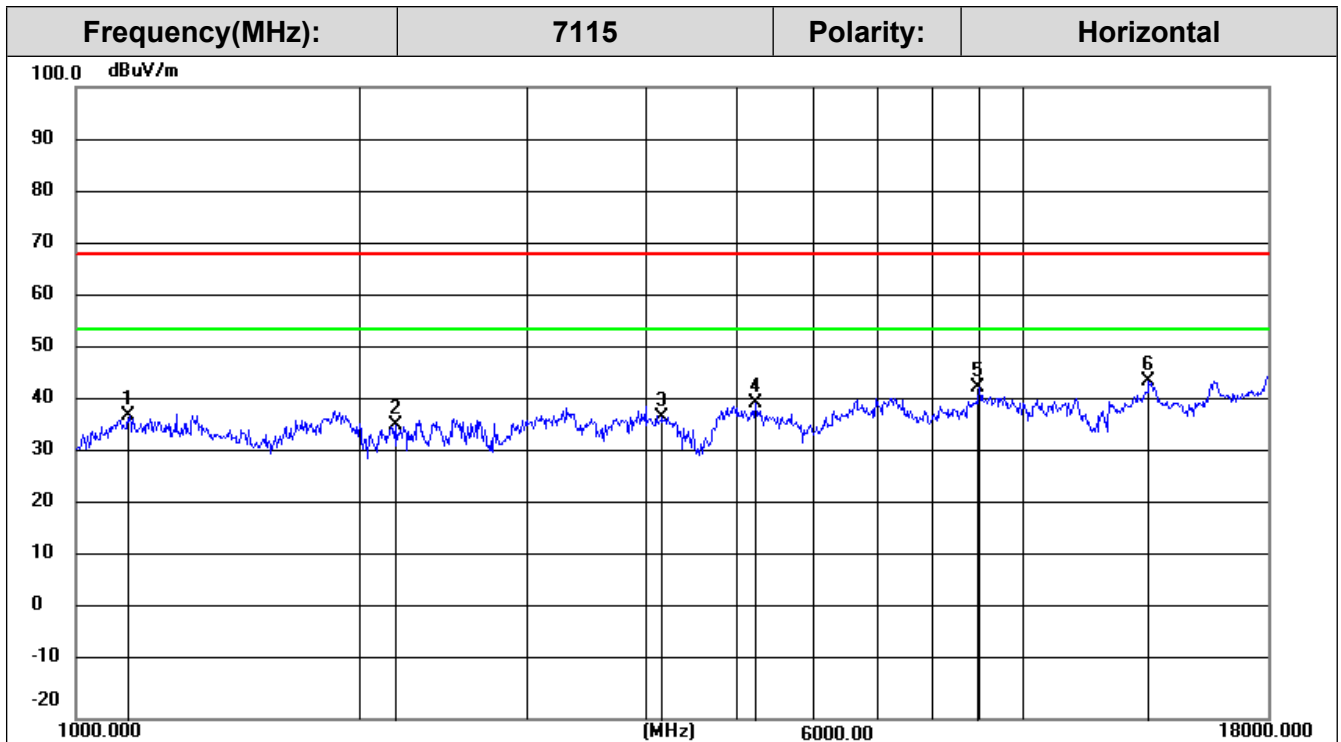
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1108.378	60.59	-25.66	34.93	68.20	-33.27	peak
2	2191.195	58.47	-22.43	36.04	68.20	-32.16	peak
3	4999.605	51.23	-13.38	37.85	68.20	-30.35	peak
4	8174.432	45.09	-7.34	37.75	68.20	-30.45	peak
5	13921.267	41.68	-0.13	41.55	68.20	-26.65	peak
6	16357.728	43.84	-0.59	43.25	68.20	-24.95	peak

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

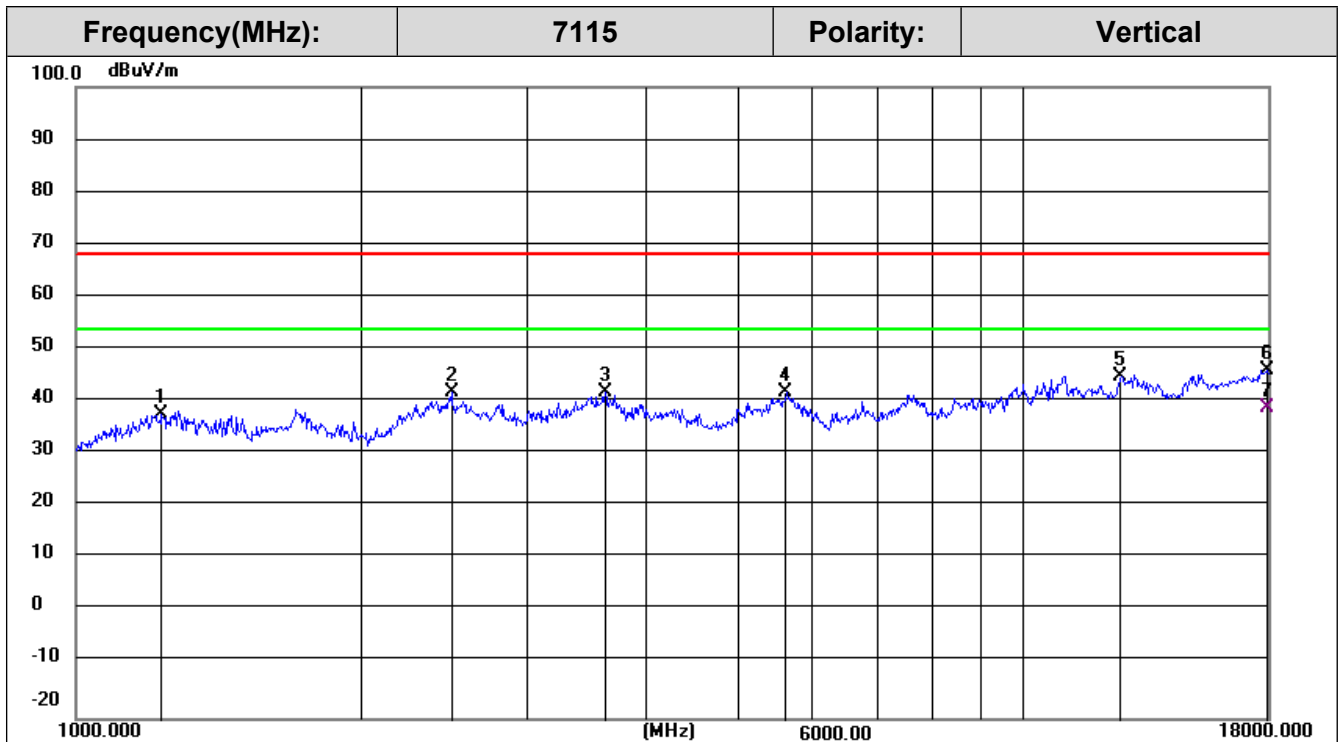
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1140.881	63.29	-25.68	37.61	68.20	-30.59	peak
2	2174.161	58.46	-22.48	35.98	68.20	-32.22	peak
3	4151.659	54.07	-16.65	37.42	68.20	-30.78	peak
4	5210.581	52.97	-12.92	40.05	68.20	-28.15	peak
5	8956.208	47.11	-4.24	42.87	68.20	-25.33	peak
6	13516.835	45.31	-1.23	44.08	68.20	-24.12	peak

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.



Remark:

Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

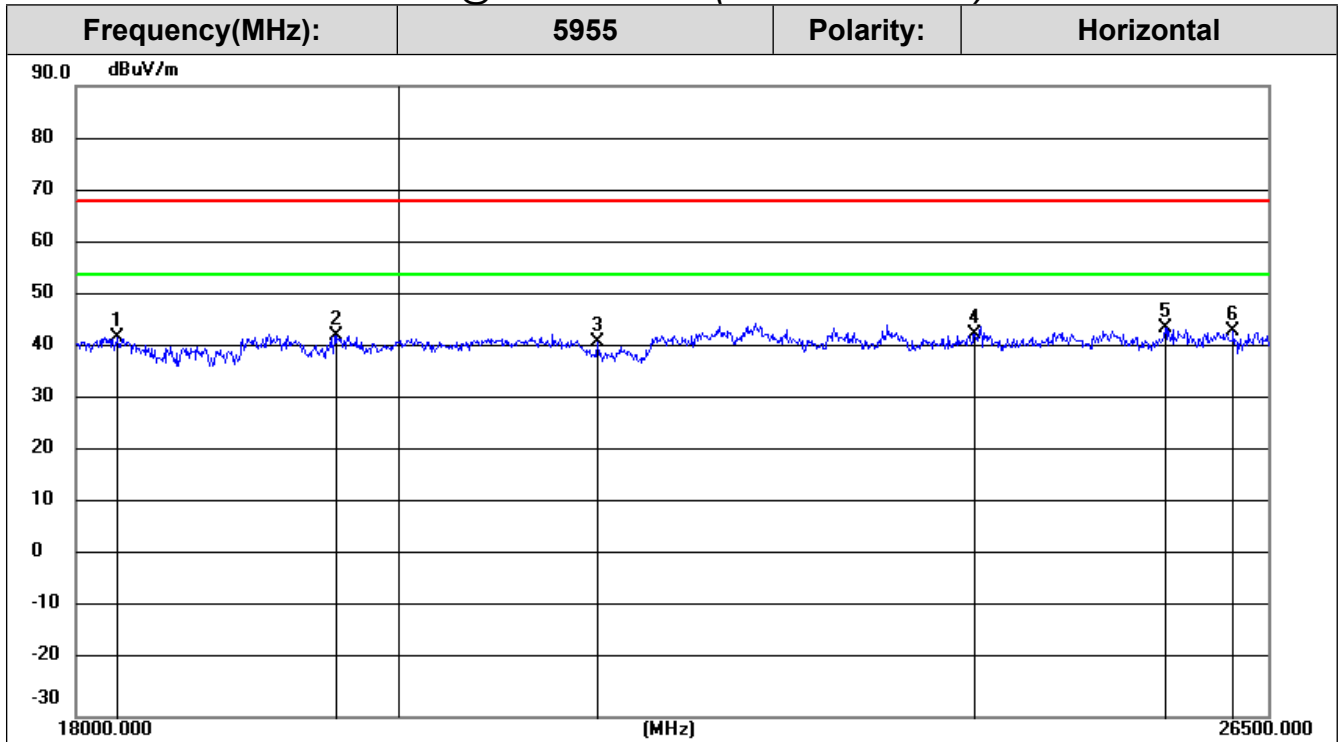
No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1235.265	63.67	-25.75	37.92	68.20	-30.28	peak
2	2494.840	63.53	-21.57	41.96	68.20	-26.24	peak
3	3609.662	60.50	-18.39	42.11	68.20	-26.09	peak
4	5605.889	54.17	-12.15	42.02	68.20	-26.18	peak
5	12647.472	47.09	-2.13	44.96	68.20	-23.24	peak
6	17994.798	36.90	9.41	46.31	68.20	-21.89	peak
7	17994.798	29.70	9.41	39.11	68.20	-29.09	QP

Note: A filter was used to exclude fundamental during the test to prevent overloading the testing equipment.

For above 18GHz

Remark: Pre-scan all WIFI operation modes, and no spurious found, only one channel plots recorded below represent the worst scenario.

U-NII 5 @ 802.11ax MIMO (above 18-26.5GHz)



Remark:

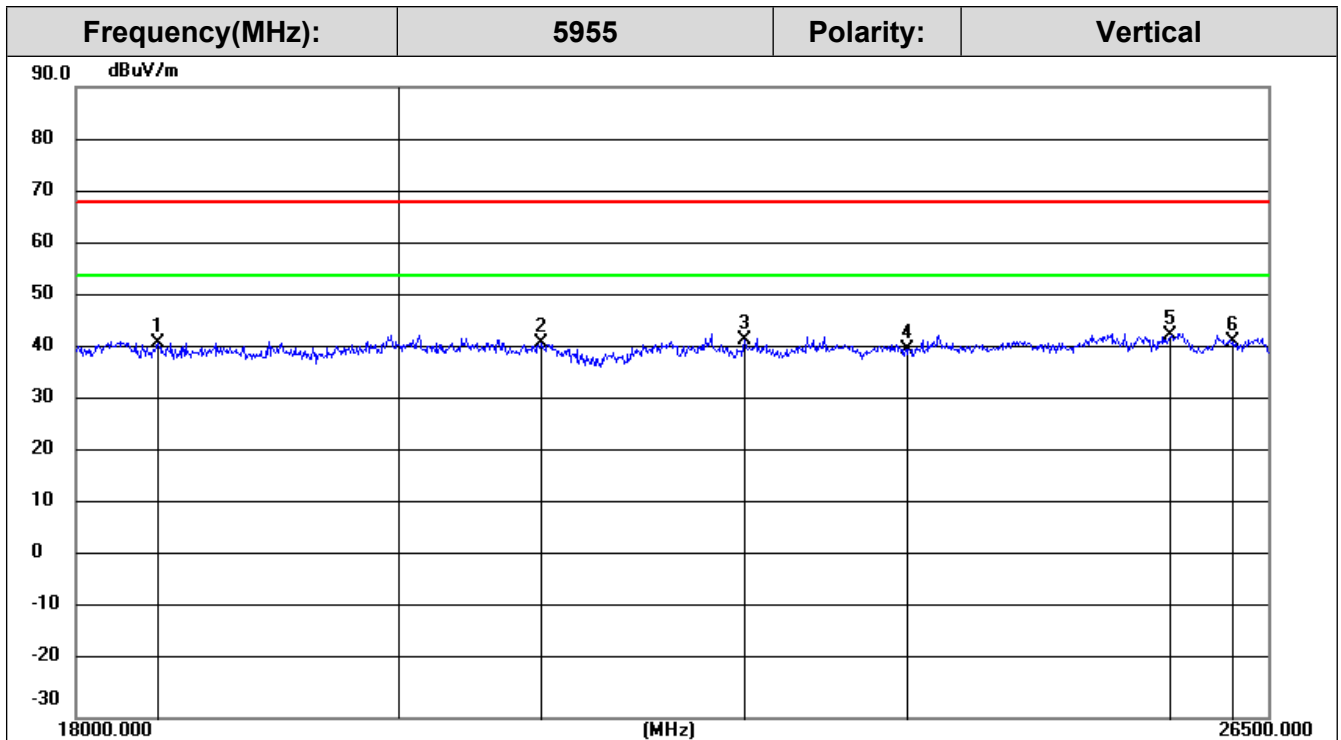
Filter is used

Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18248.147	60.63	-18.36	42.27	68.20	-25.93	peak
2	19589.578	59.82	-17.22	42.60	68.20	-25.60	peak
3	21329.429	58.29	-16.89	41.40	68.20	-26.80	peak
4	24097.657	58.49	-15.58	42.91	68.20	-25.29	peak
5	25638.992	60.20	-16.13	44.07	68.20	-24.13	peak
6	26205.439	58.77	-15.39	43.38	68.20	-24.82	peak



Remark:

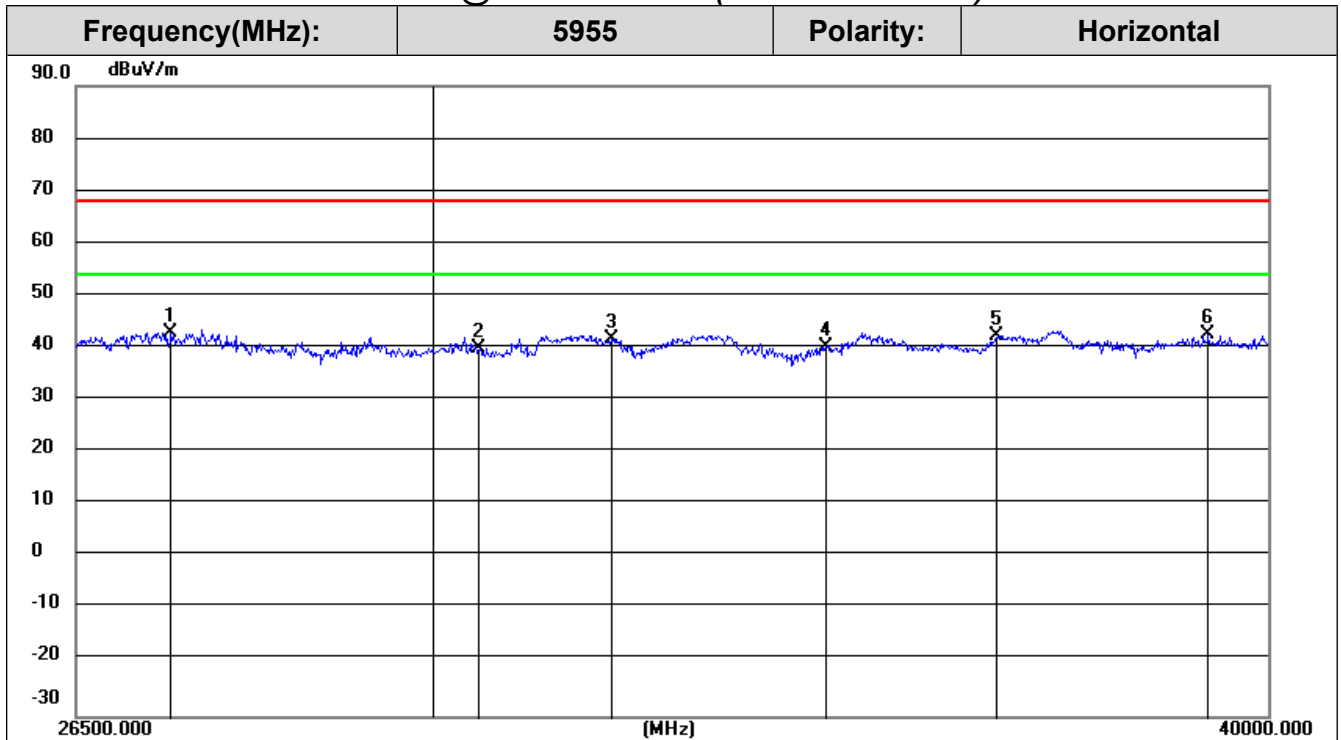
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18493.991	59.43	-18.23	41.20	68.20	-27.00	peak
2	20939.528	57.80	-16.39	41.41	68.20	-26.79	peak
3	22368.659	59.23	-17.19	42.04	68.20	-26.16	peak
4	23588.628	56.29	-16.07	40.22	68.20	-27.98	peak
5	25690.609	58.88	-16.05	42.83	68.20	-25.37	peak
6	26208.480	57.08	-15.38	41.70	68.20	-26.50	peak

U-NII 5 @ 802.11ax MIMO (above 18-26.5GHz)



Remark:

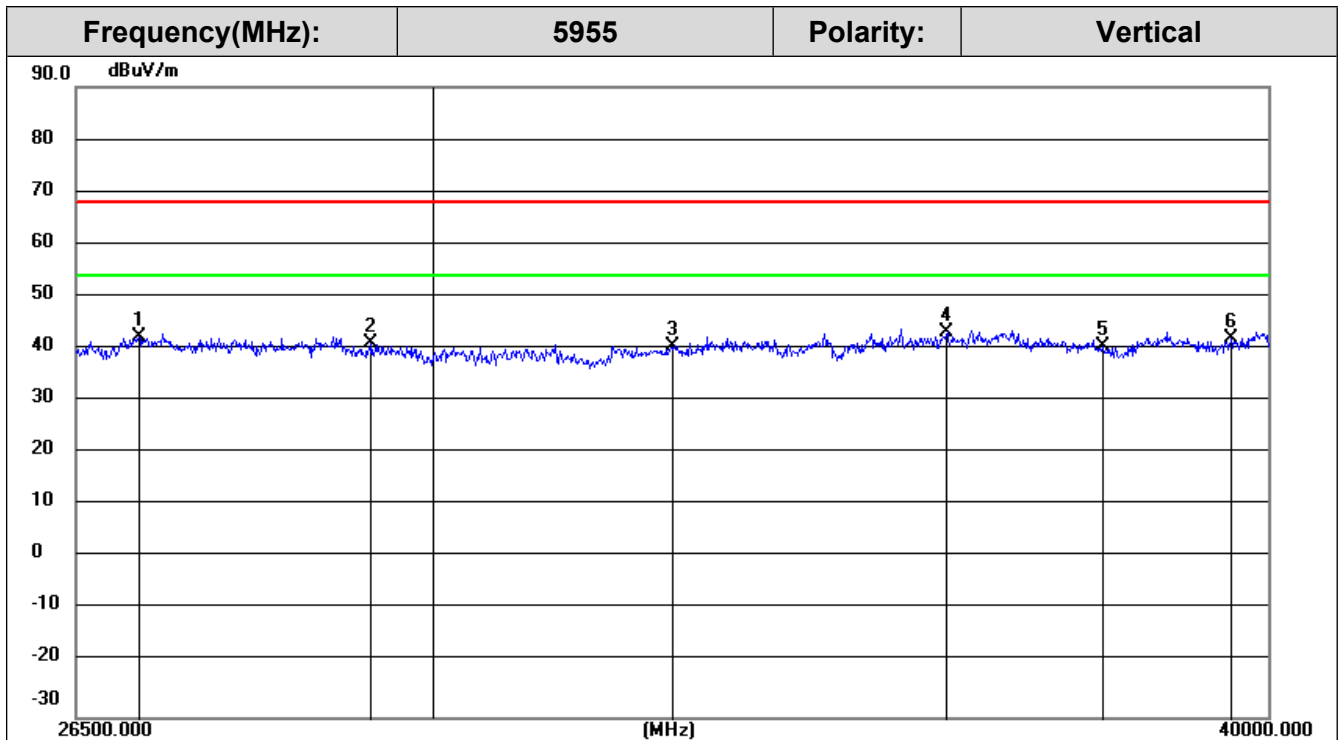
Filter is used

Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	27393.051	57.57	-14.61	42.96	68.20	-25.24	peak
2	30470.651	54.81	-14.58	40.23	68.20	-27.97	peak
3	31892.925	56.21	-14.19	42.02	68.20	-26.18	peak
4	34336.476	53.19	-12.85	40.34	68.20	-27.86	peak
5	36436.840	55.77	-13.23	42.54	68.20	-25.66	peak
6	39186.562	54.84	-12.11	42.73	68.20	-25.47	peak



Remark:

Emission Level = Reading + Factor;

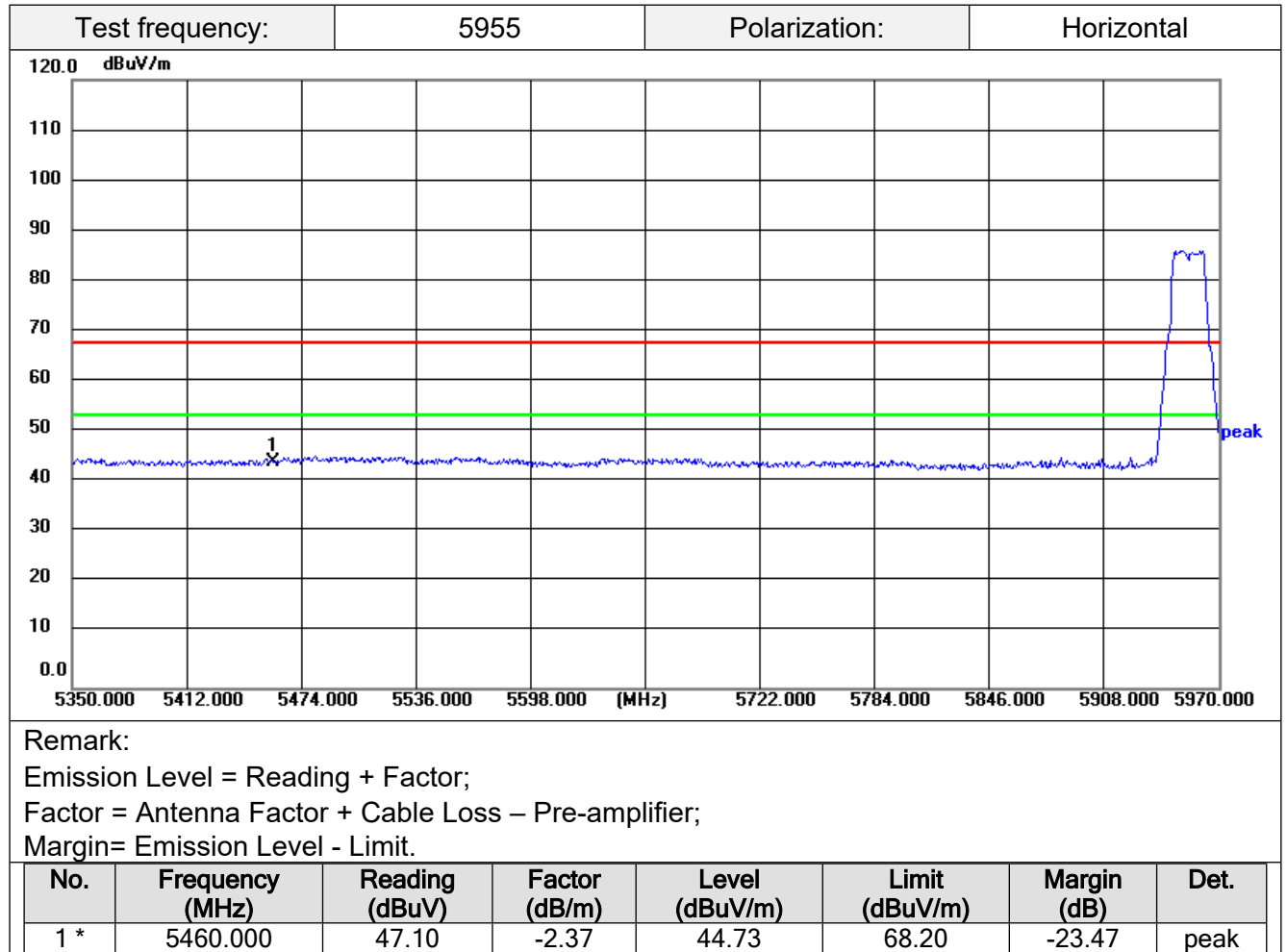
Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	27086.868	57.23	-14.73	42.50	68.20	-25.70	peak
2	29350.105	56.28	-14.98	41.30	68.20	-26.90	peak
3	32592.513	54.67	-13.90	40.77	68.20	-27.43	peak
4	35819.533	56.47	-13.11	43.36	68.20	-24.84	peak
5	37796.812	53.35	-12.75	40.60	68.20	-27.60	peak
6	39500.825	54.28	-12.05	42.23	68.20	-25.97	peak

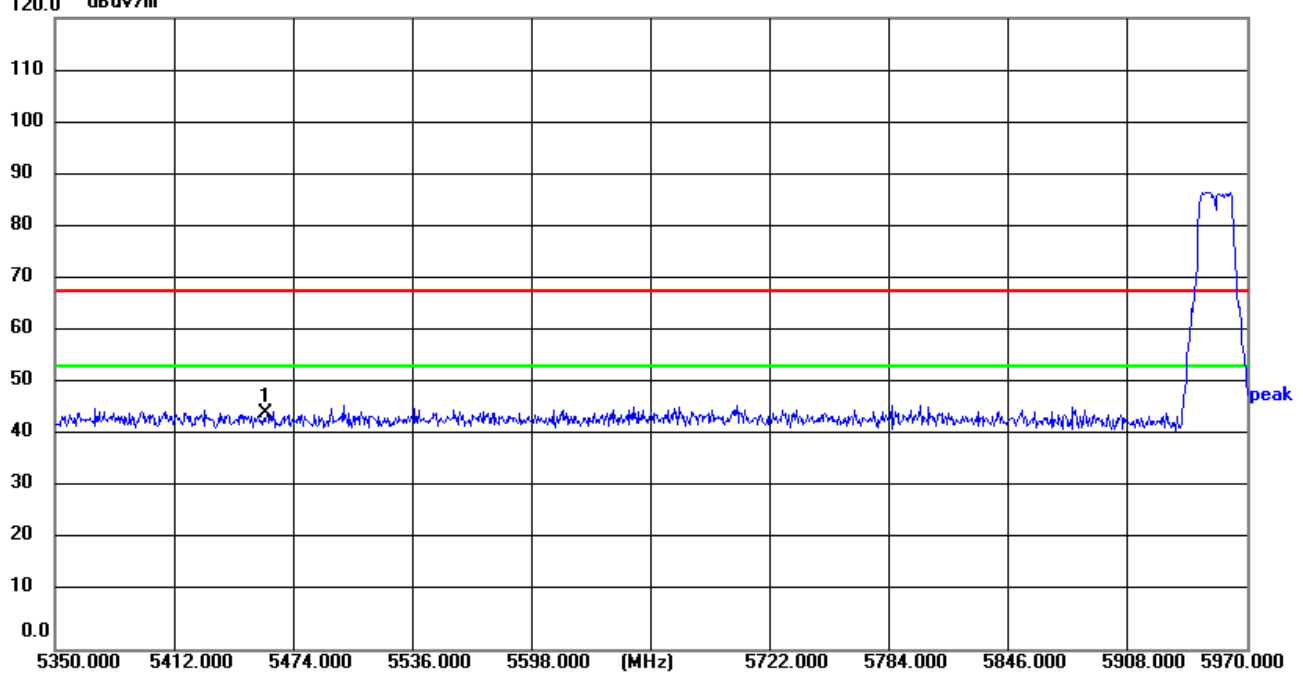
Radiated Emission Band Edge Test Plots

802.11ax(HE20) MIMO mode



Test frequency:	5955	Polarization:	Vertical
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120.0 dBuV/m



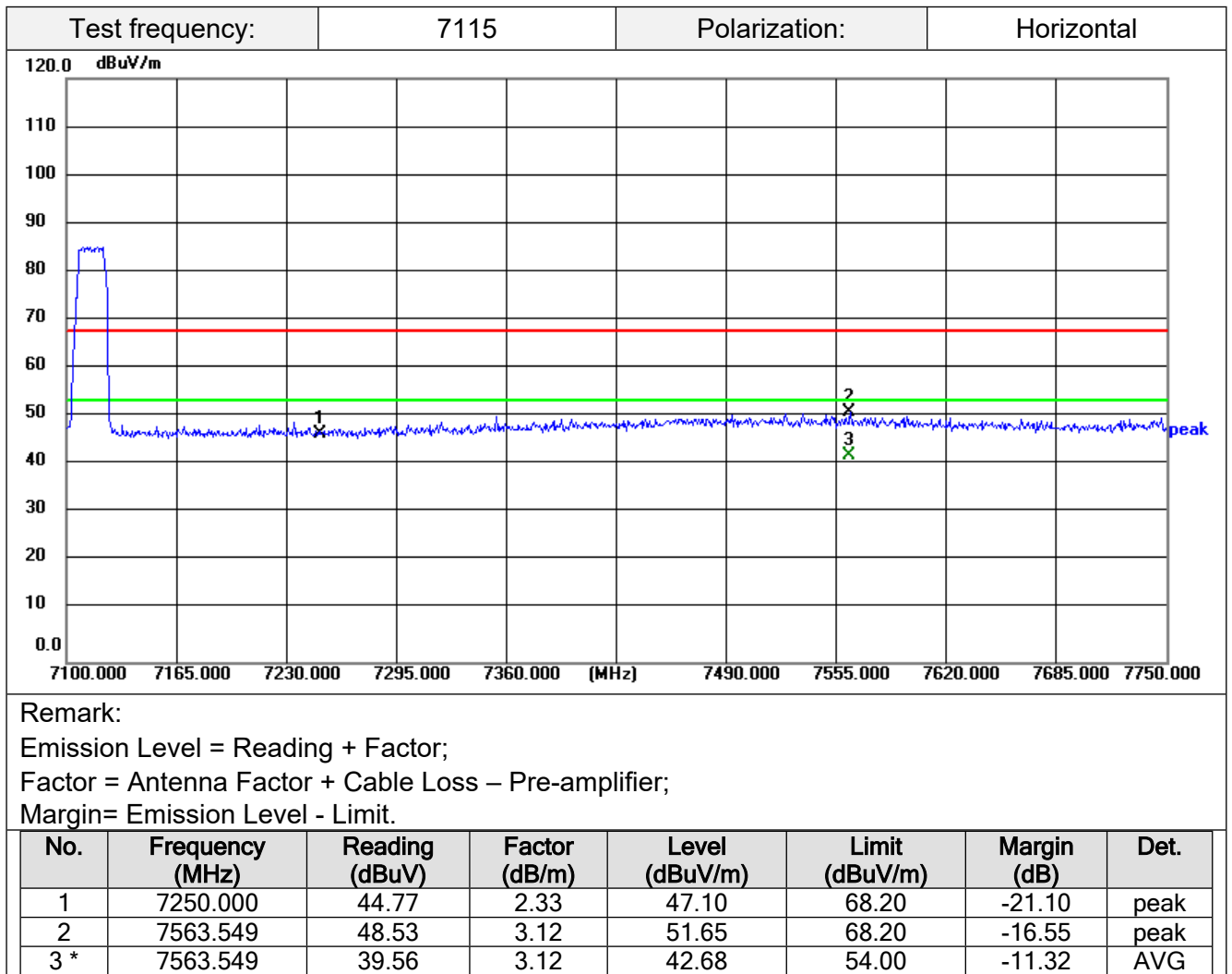
Remark:

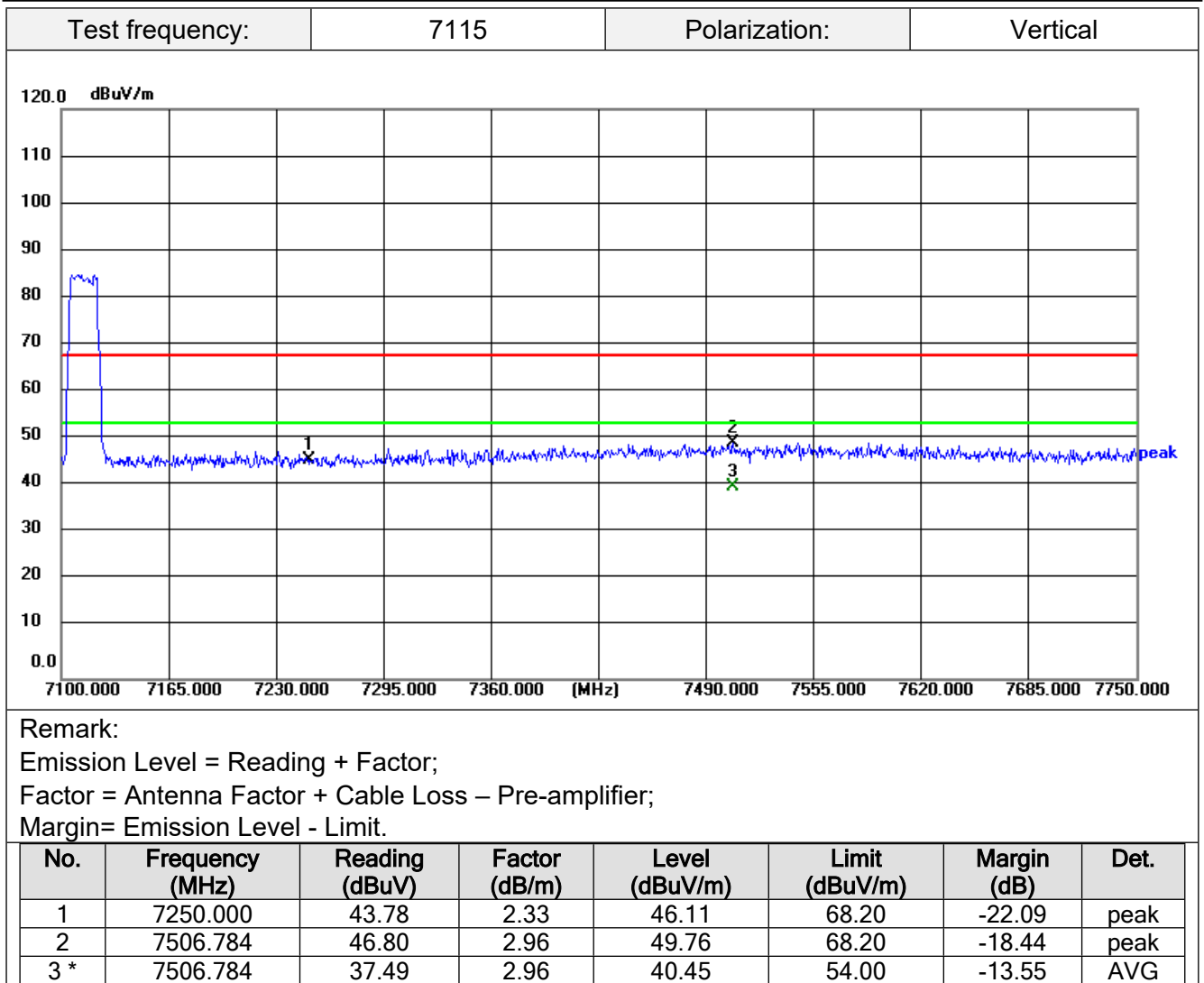
Emission Level = Reading + Factor;

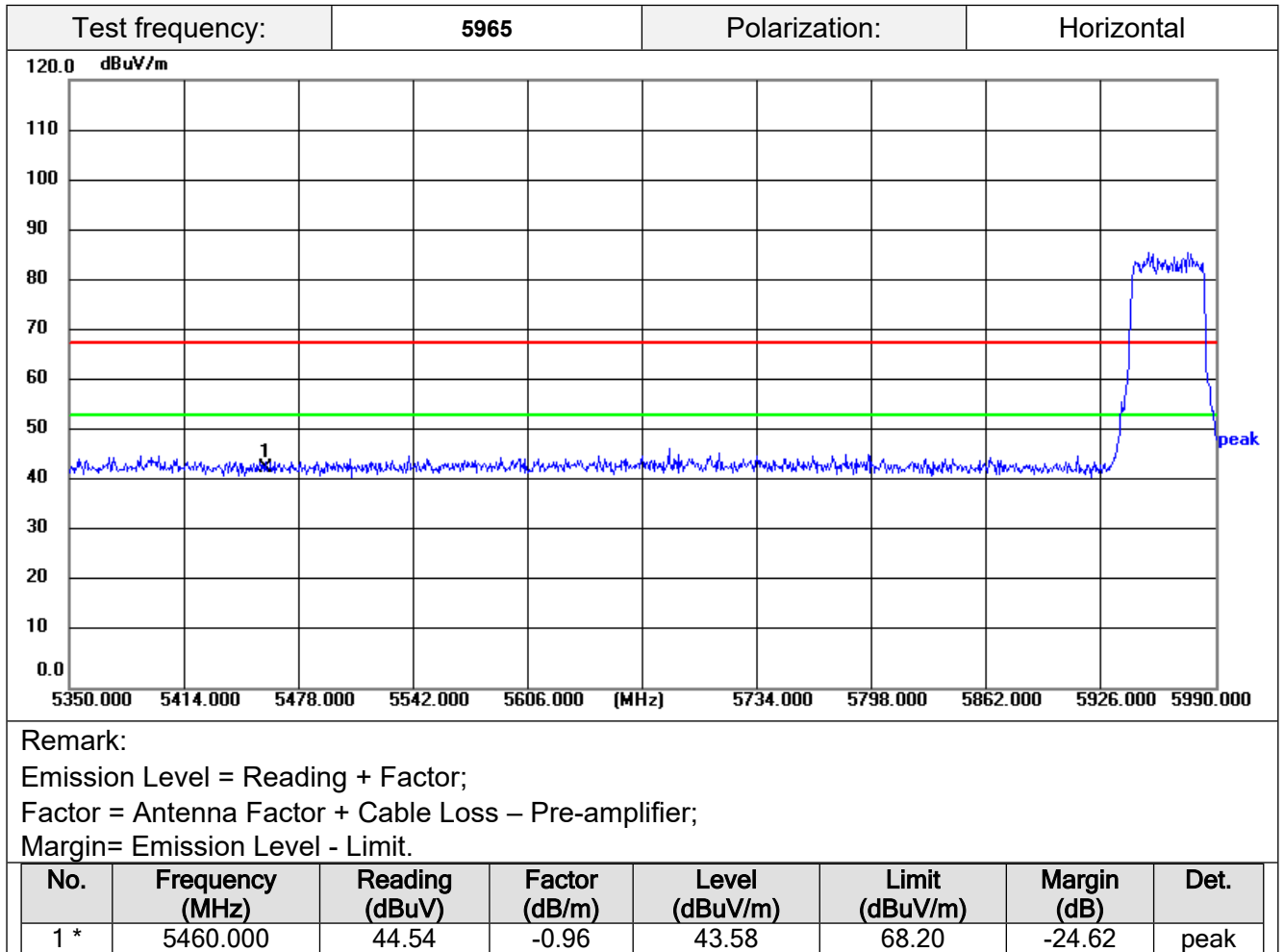
Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1 *	5460.000	45.84	-0.96	44.88	68.20	-23.32	peak

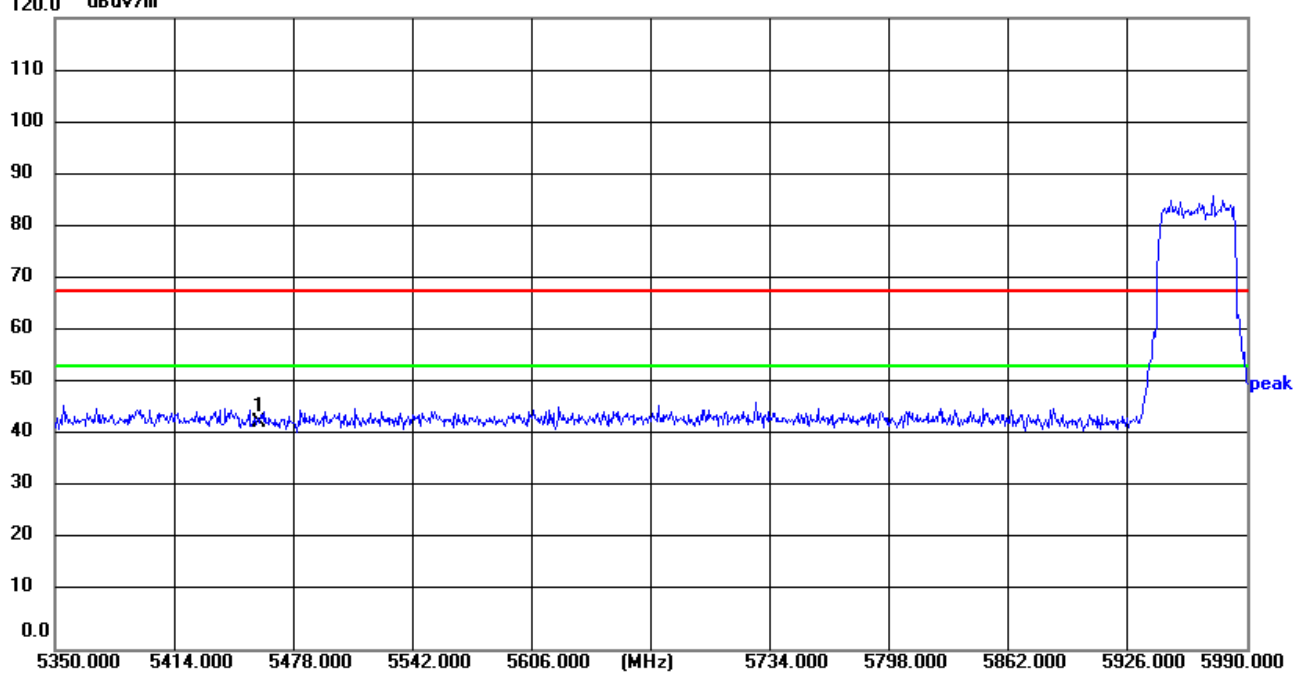




802.11ax(HE40) MIMO mode


Test frequency:		5965		Polarization:		Vertical	
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120.0 dBuV/m



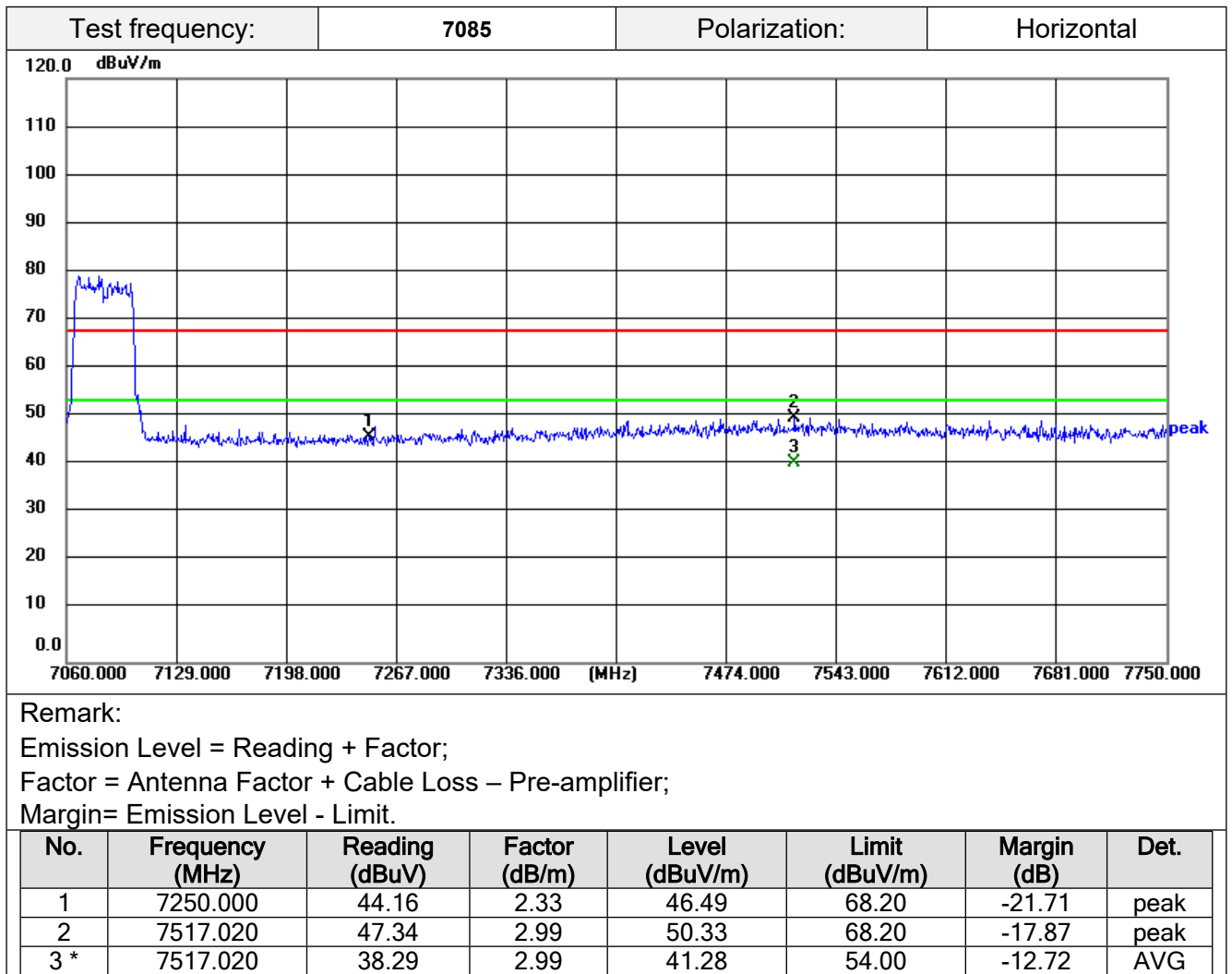
Remark:

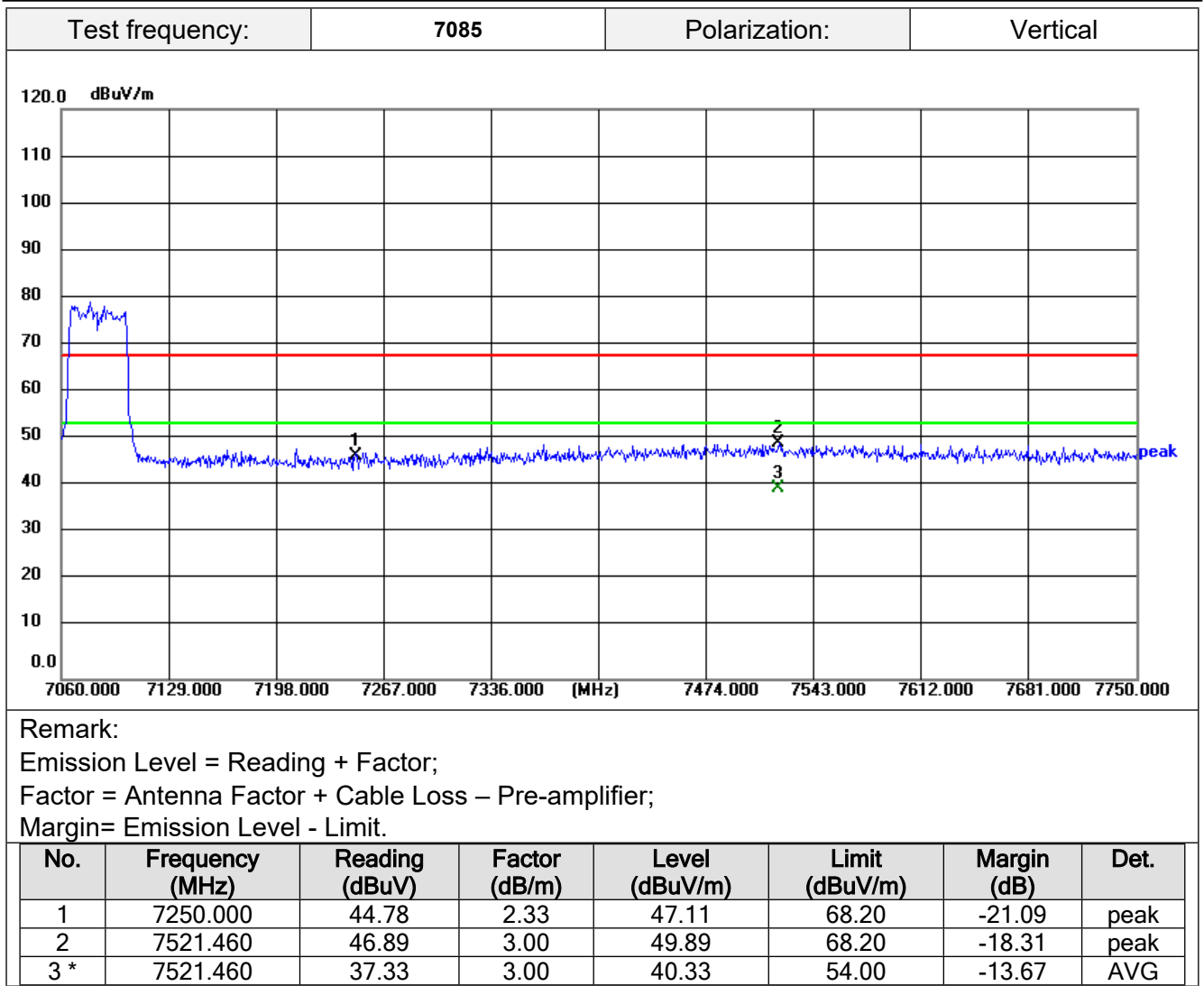
Emission Level = Reading + Factor;

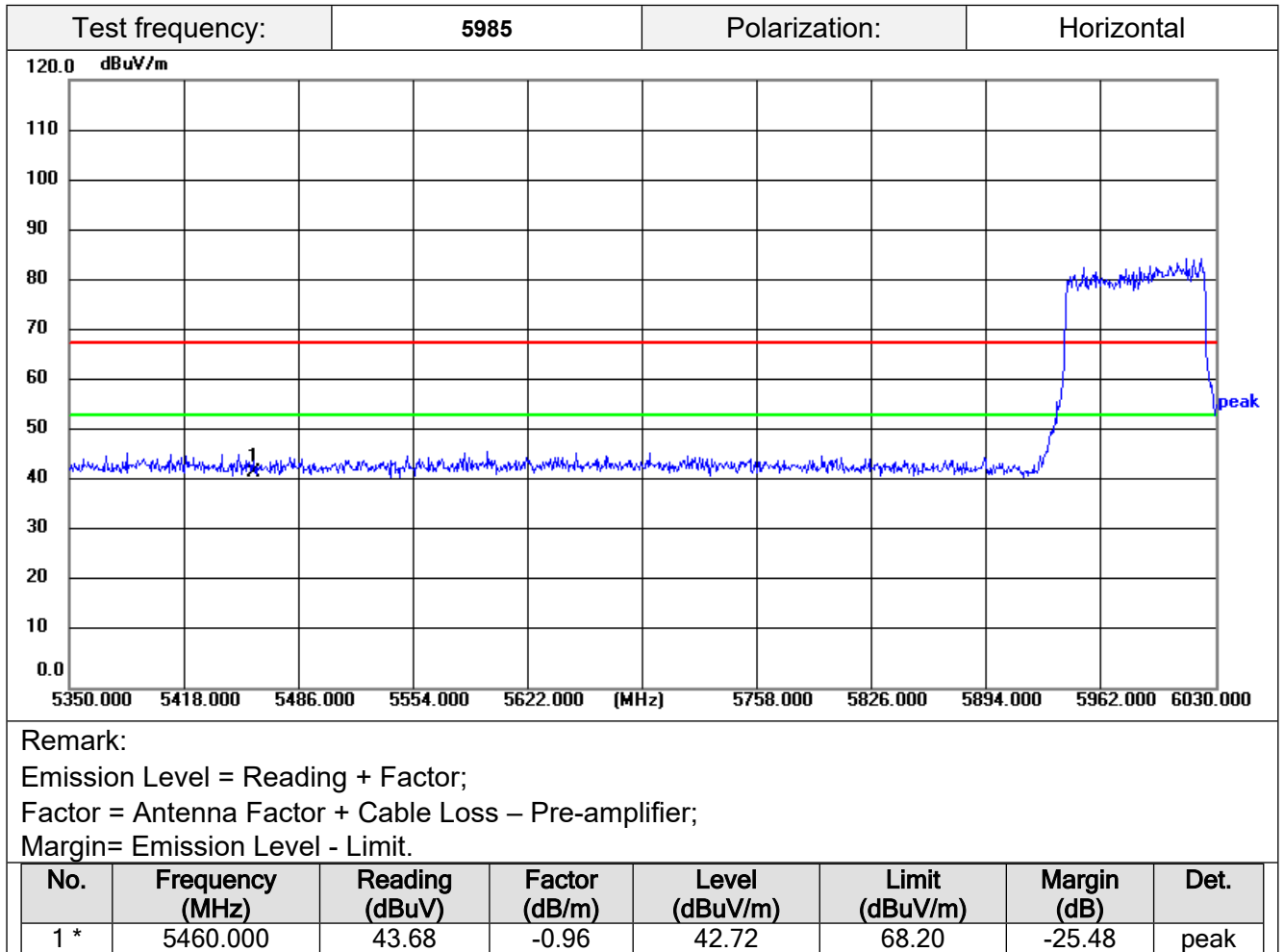
Factor = Antenna Factor + Cable Loss – Pre-amplifier;

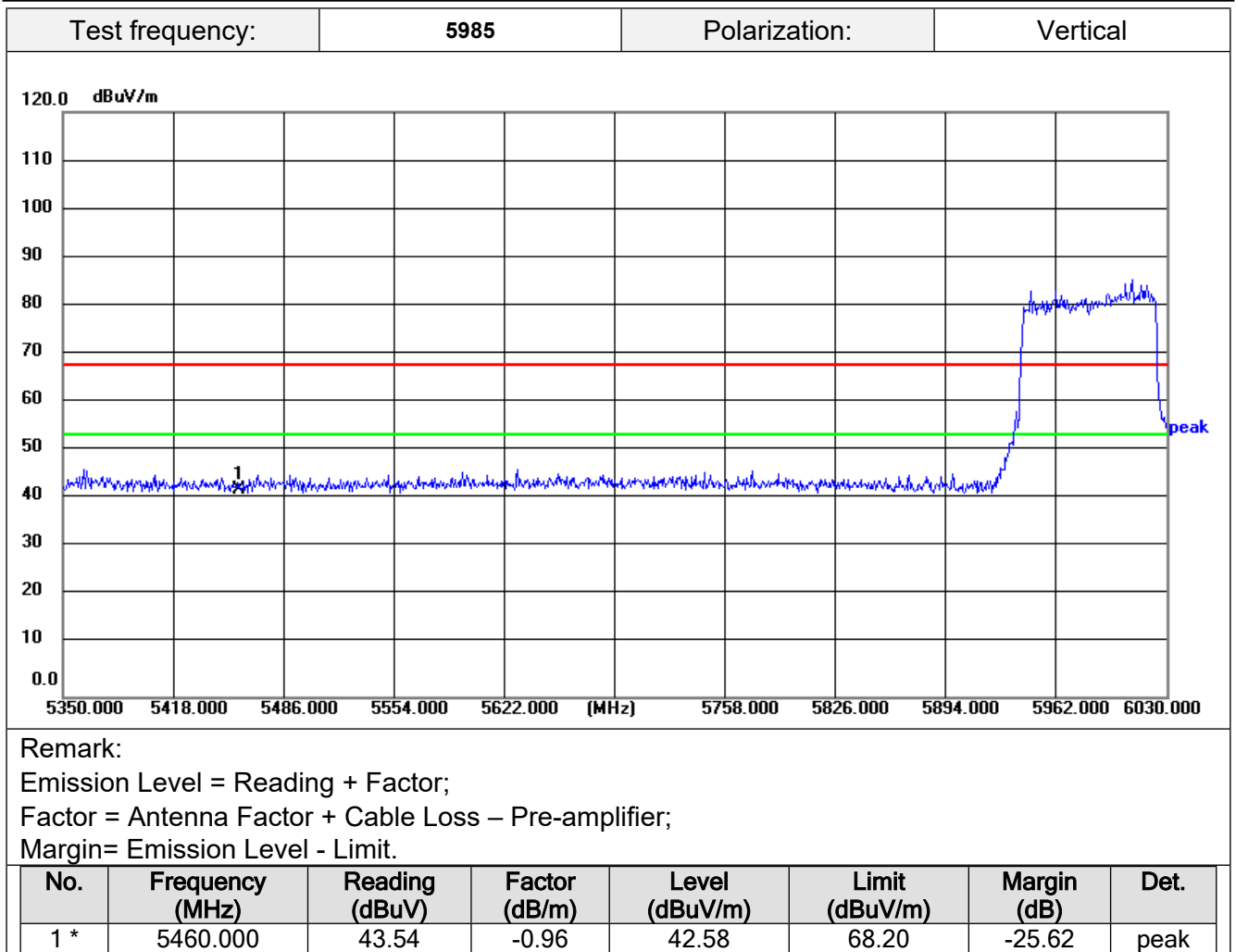
Margin= Emission Level - Limit.

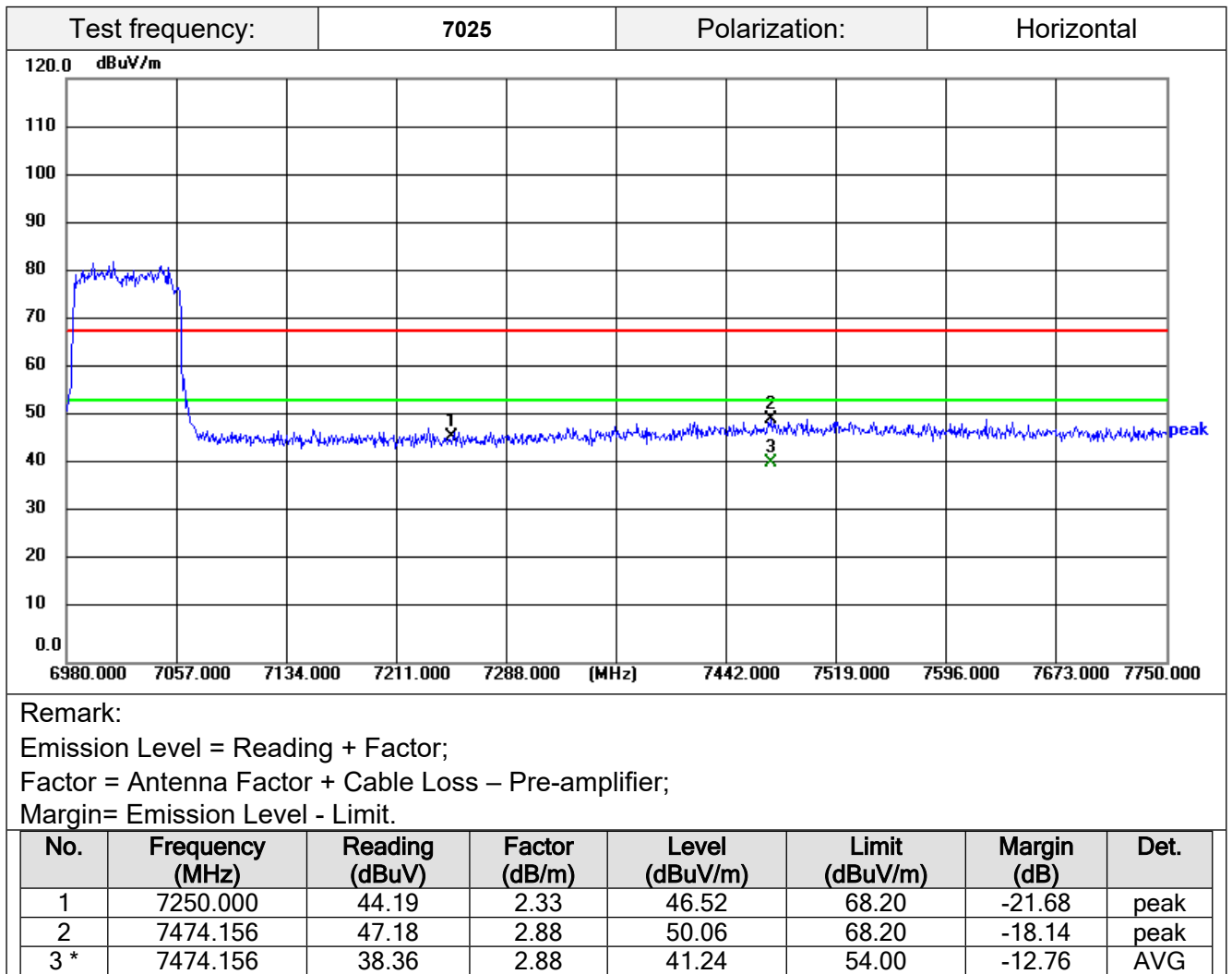
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1 *	5460.000	44.08	-0.96	43.12	68.20	-25.08	peak

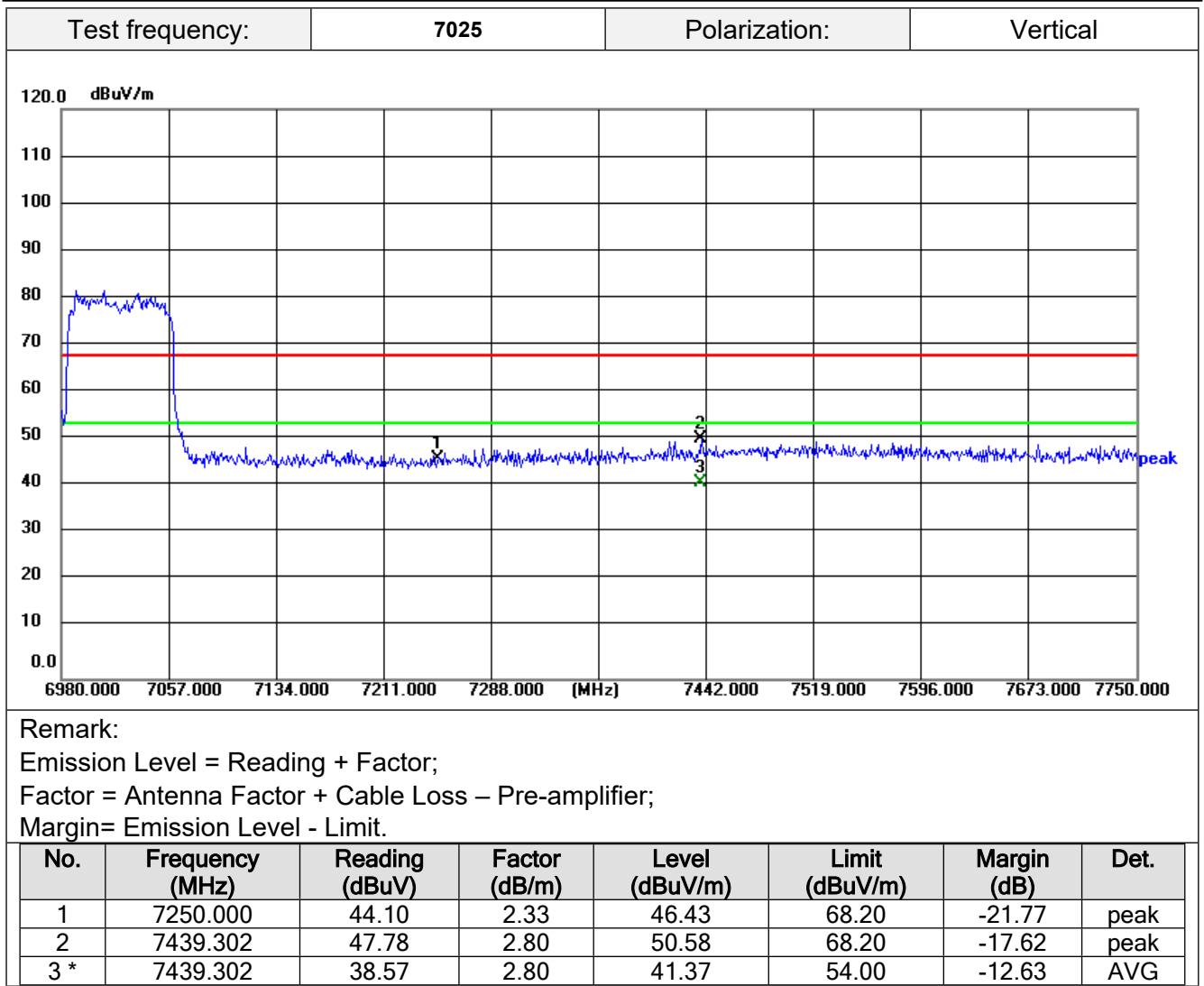


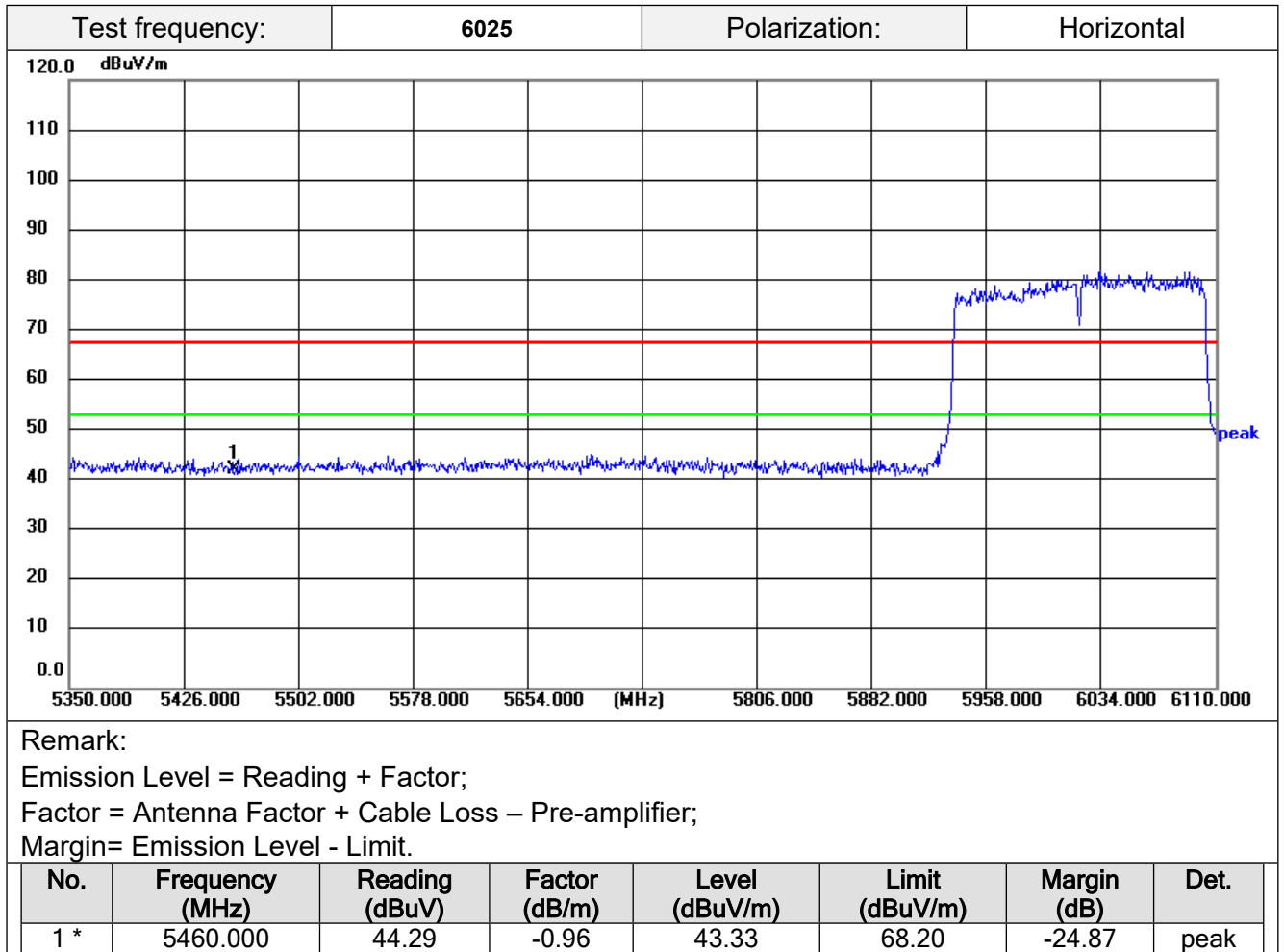


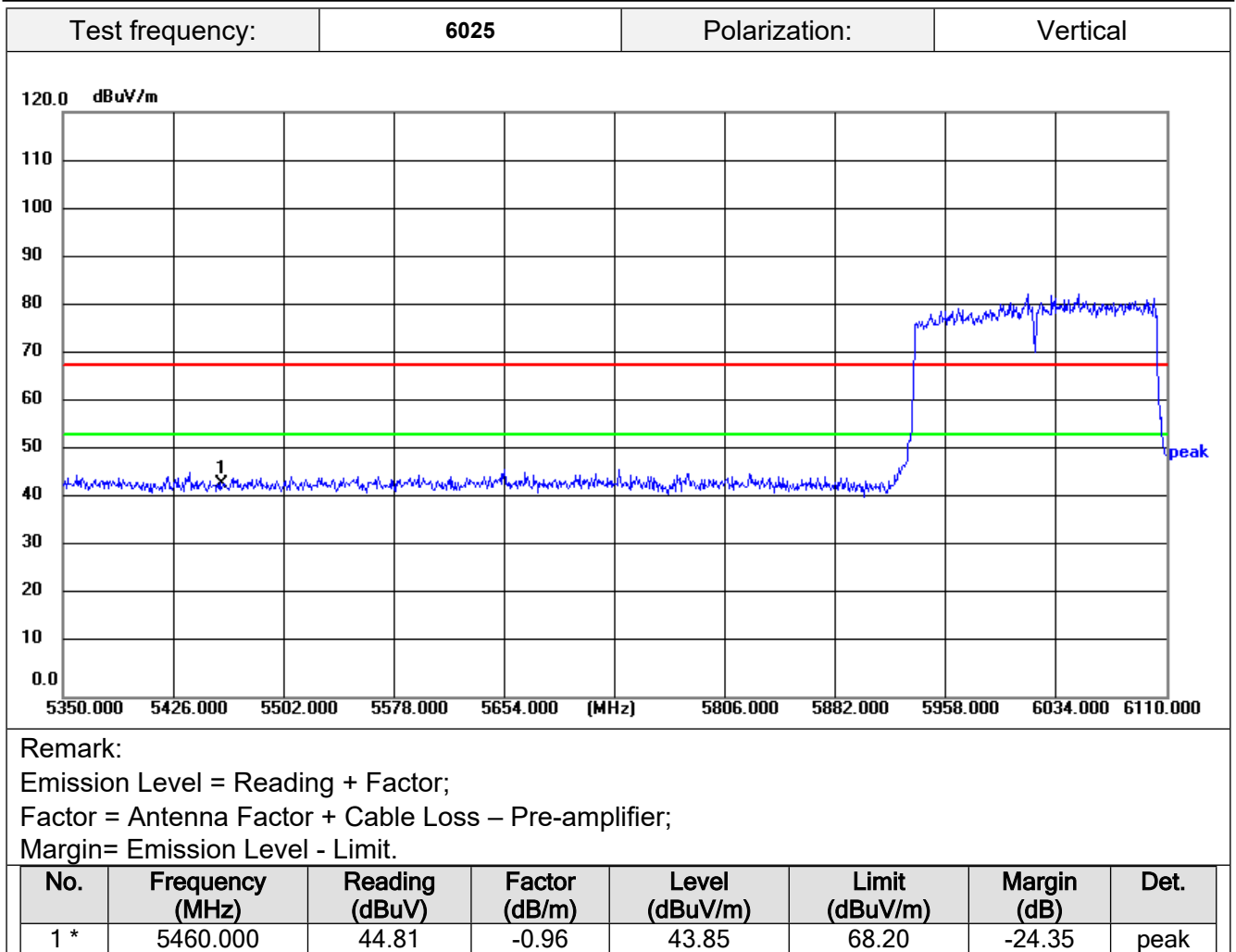
802.11ax(HE80) MIMO mode


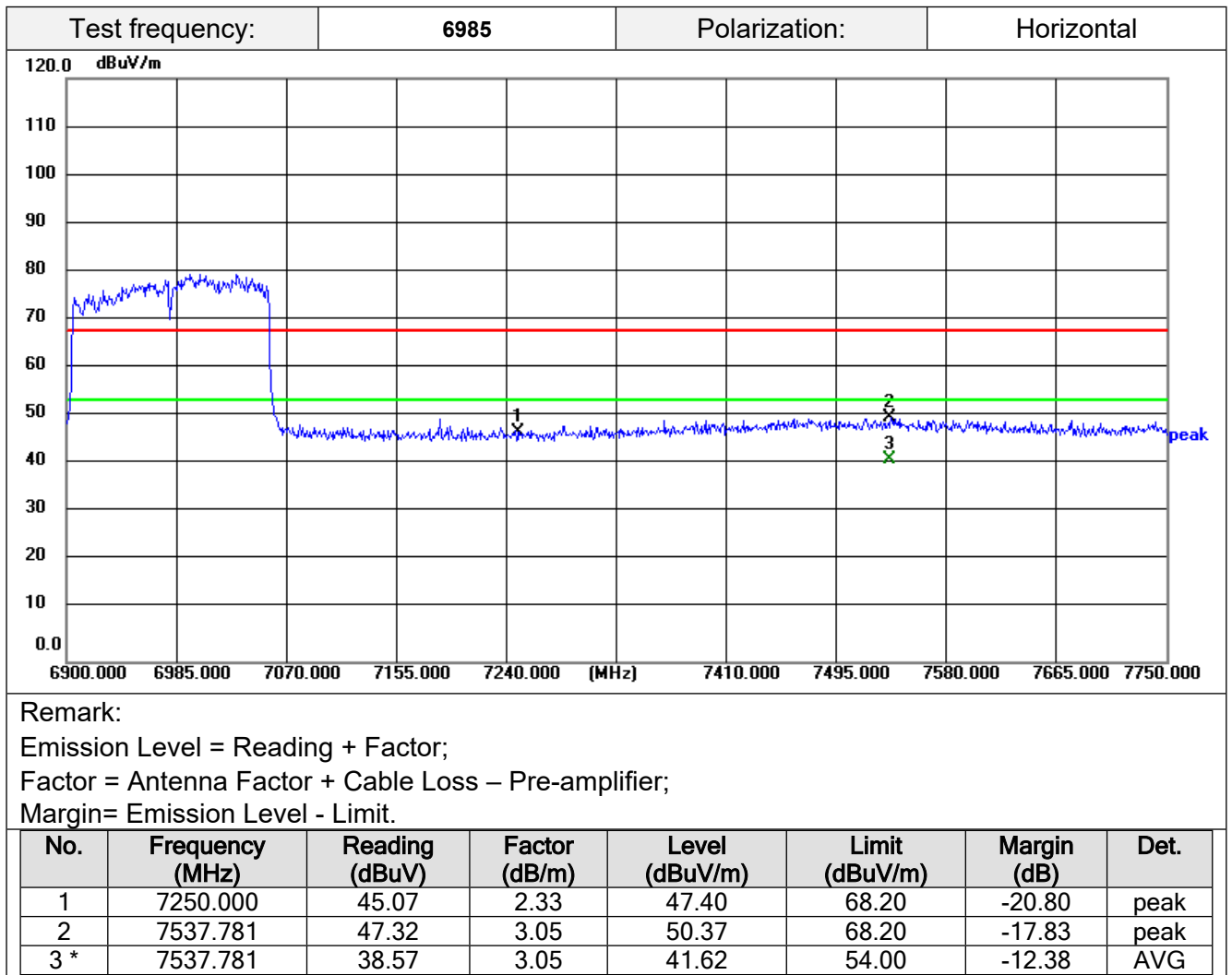


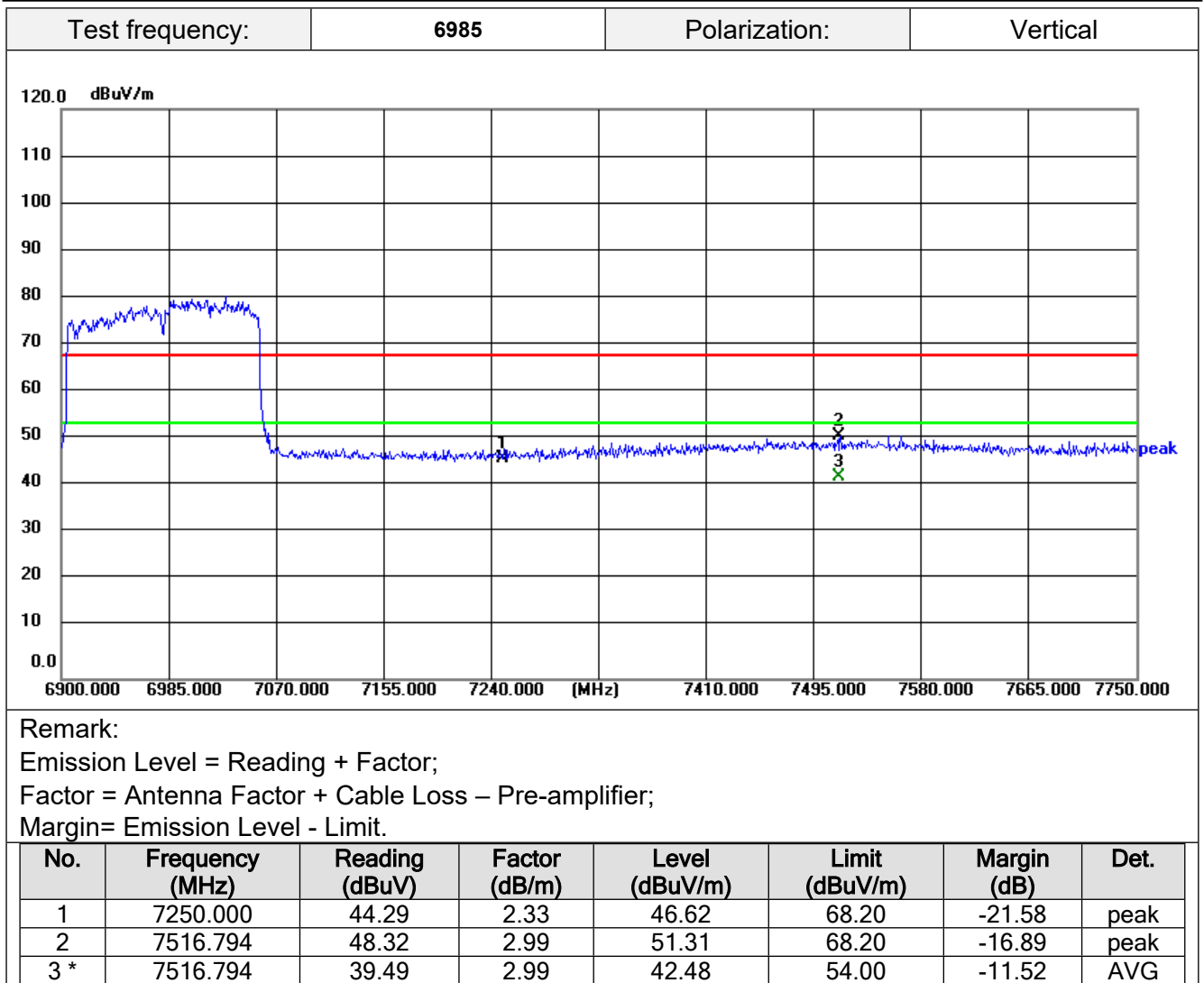


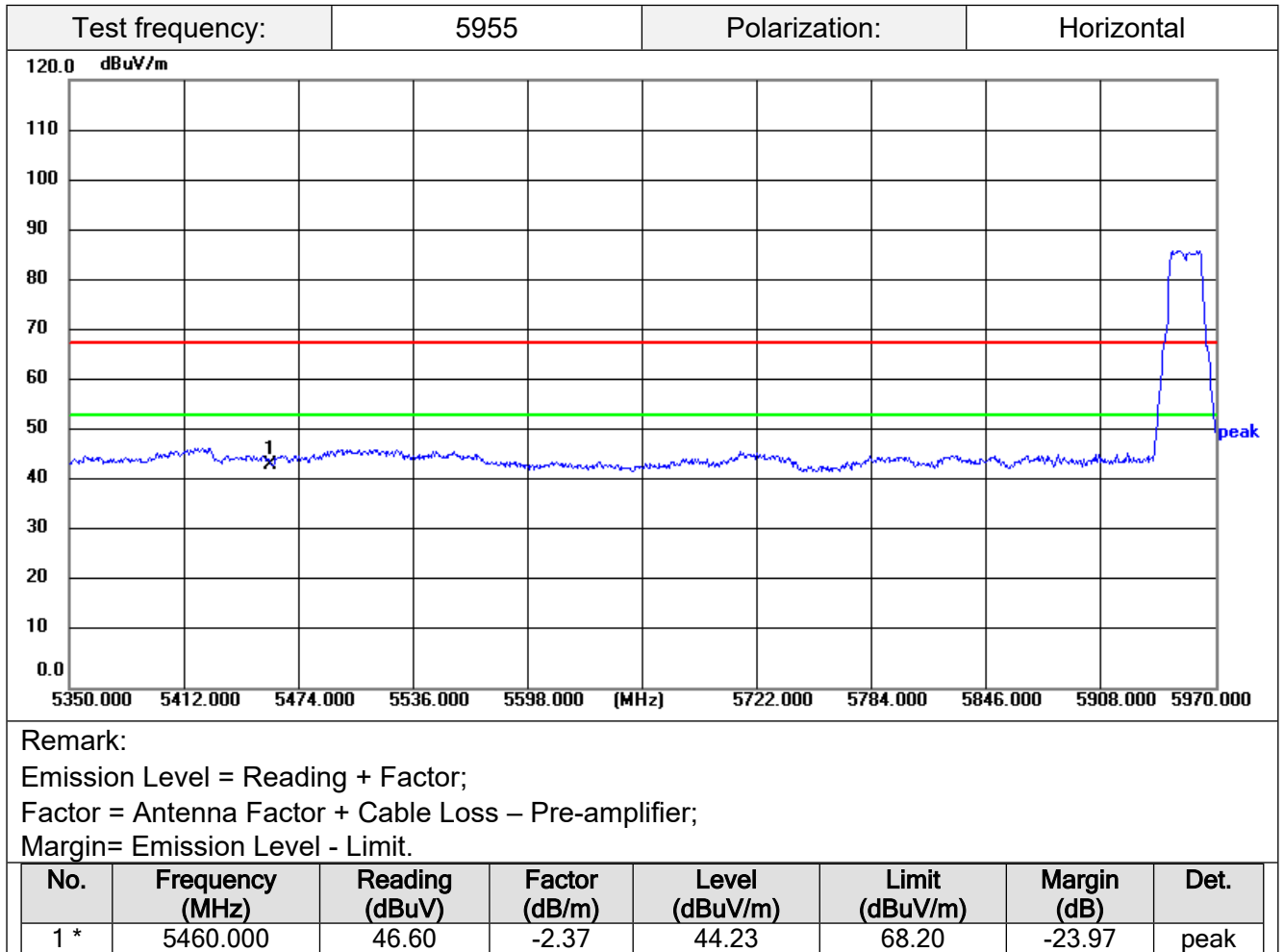


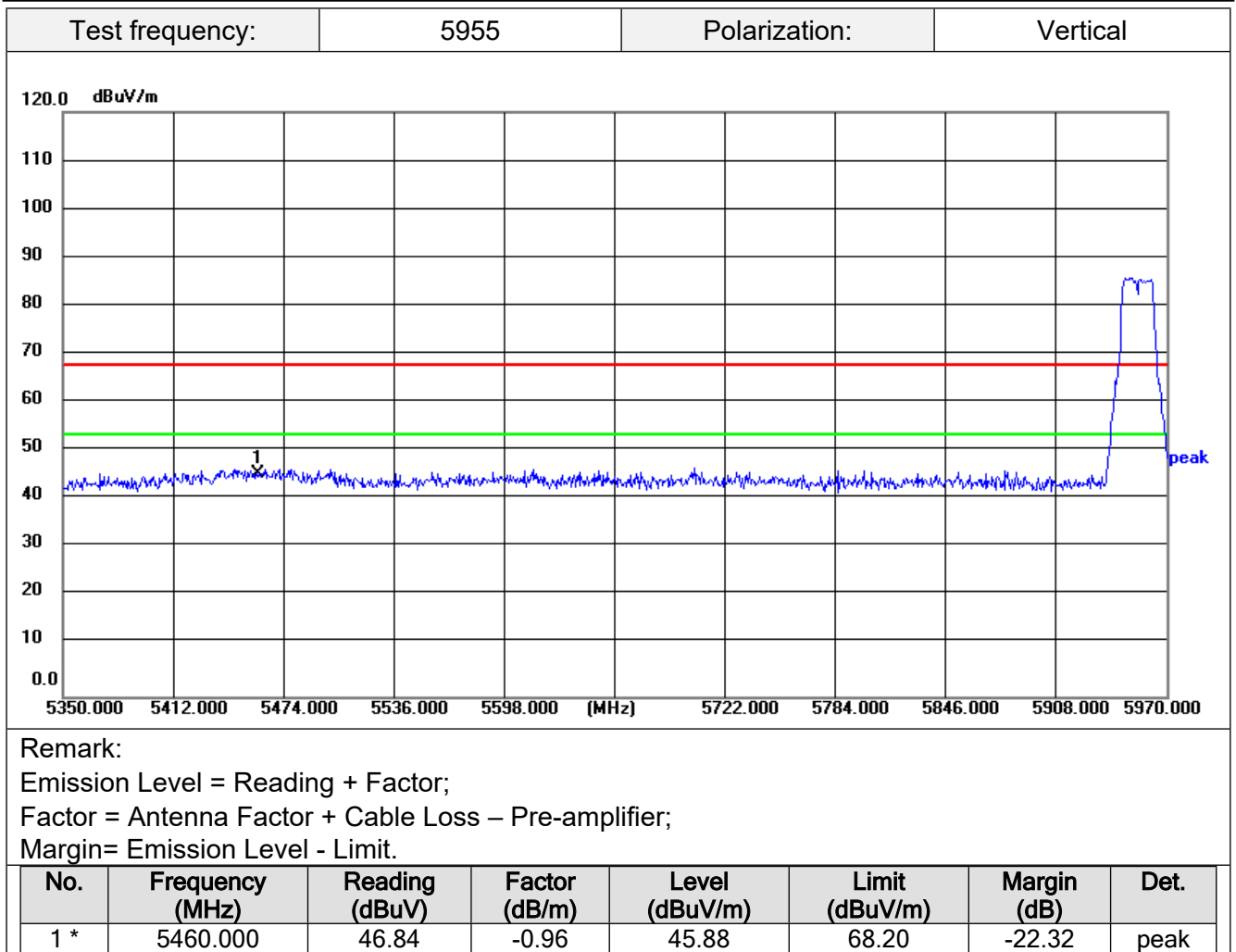
802.11ax(HE160) MIMO mode


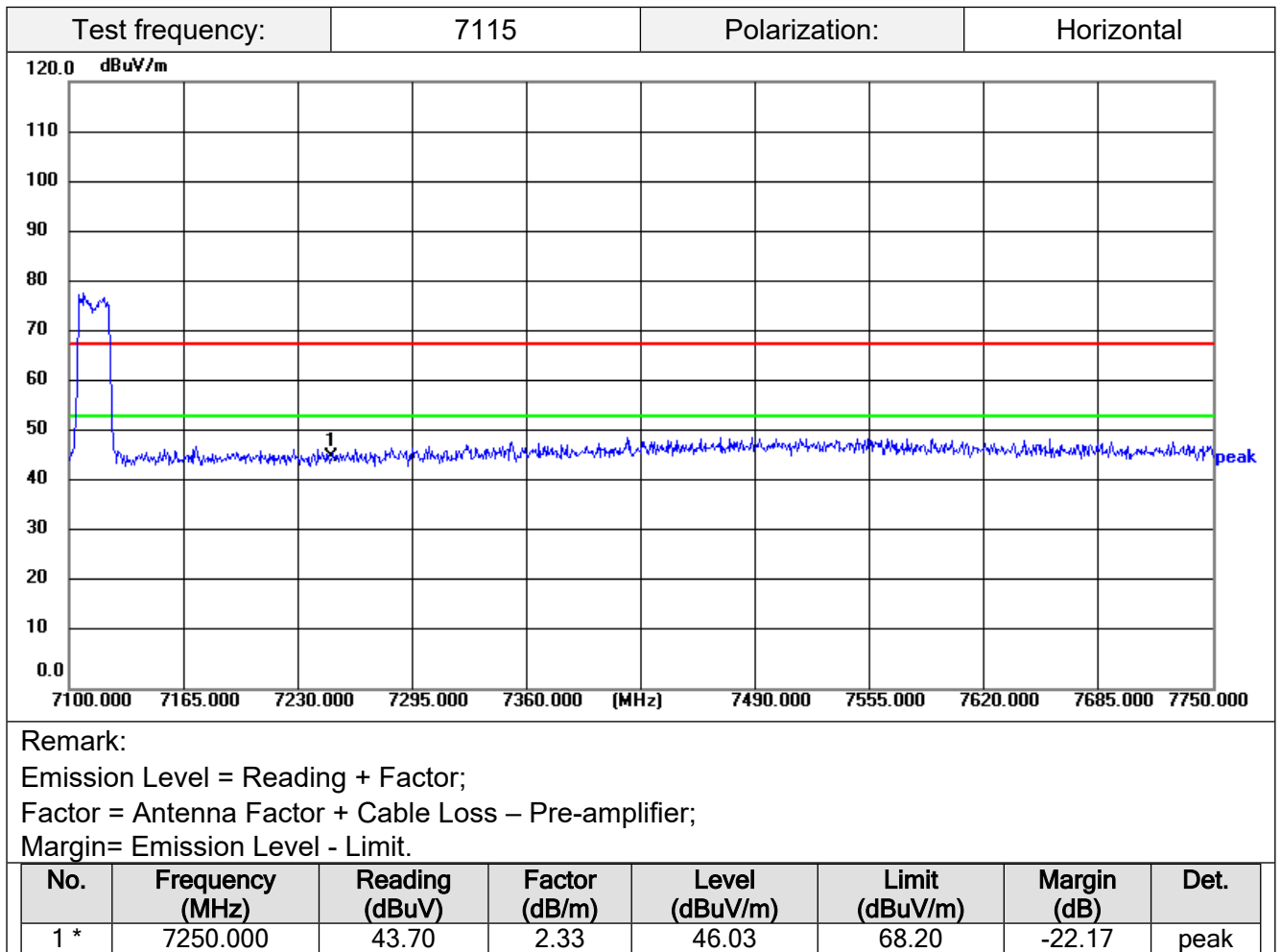




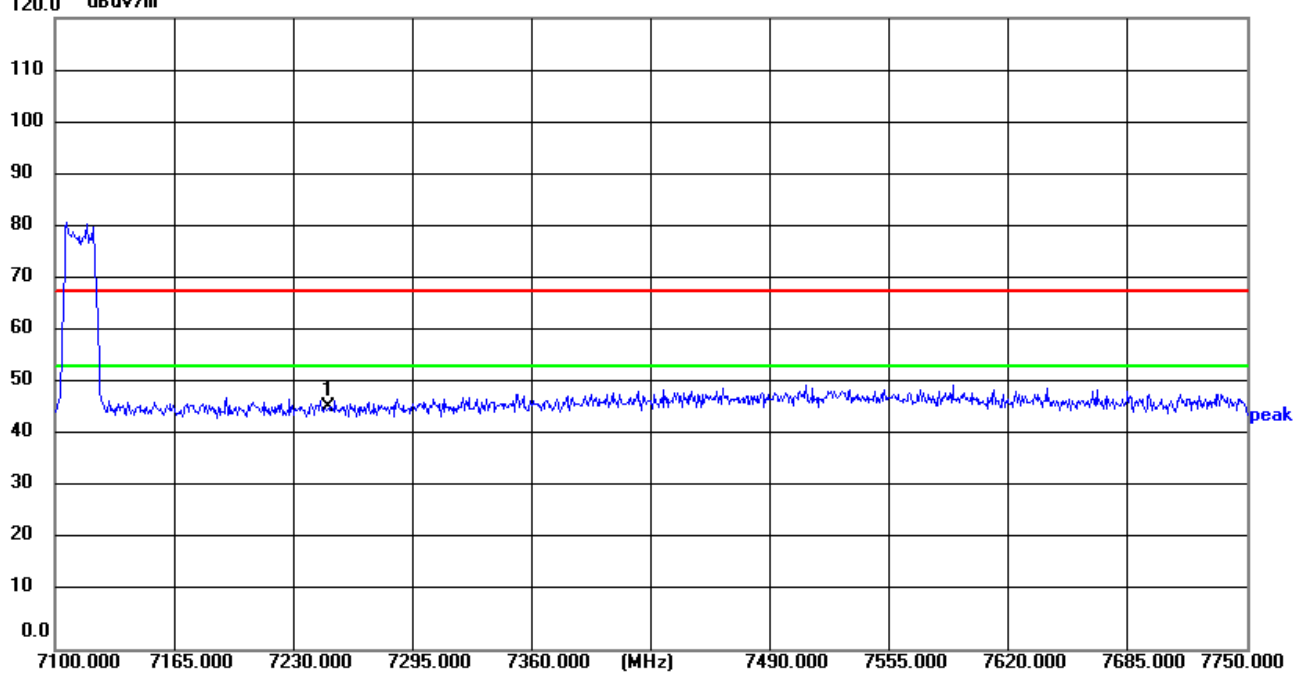


802.11be(EHT20) MIMO mode






Test frequency:		7115		Polarization:		Vertical	
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120.0 dBuV/m


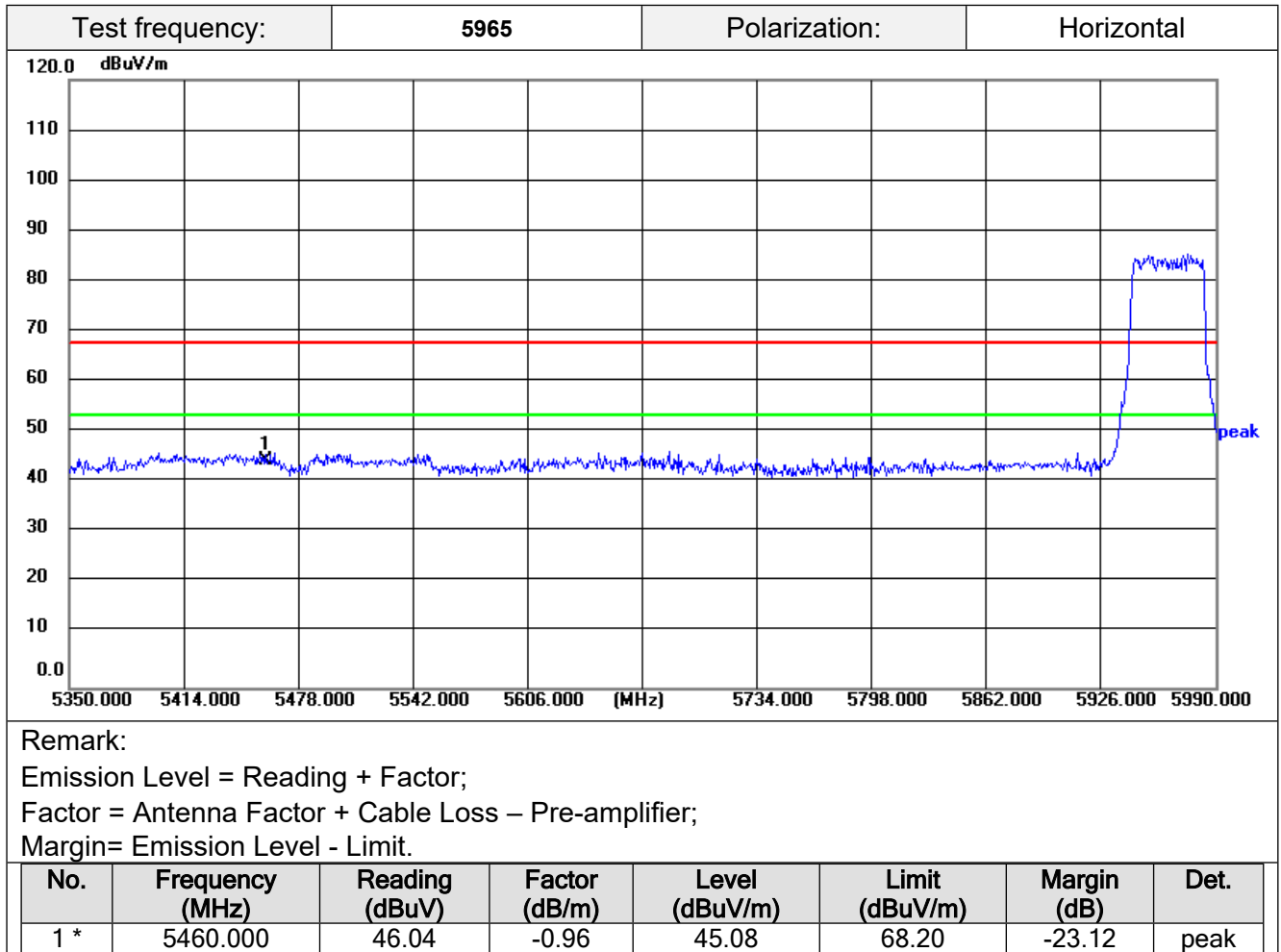
Remark:

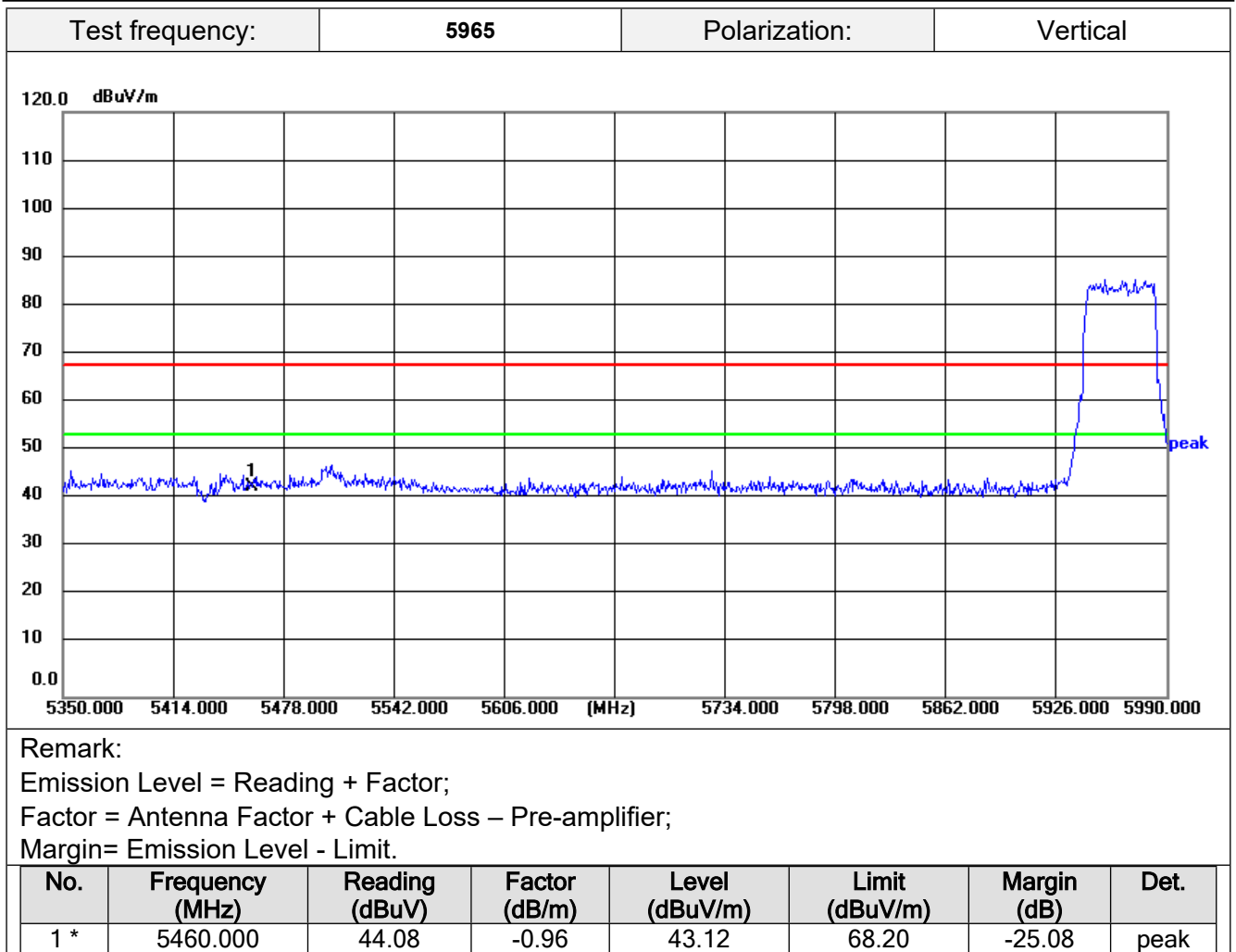
Emission Level = Reading + Factor;

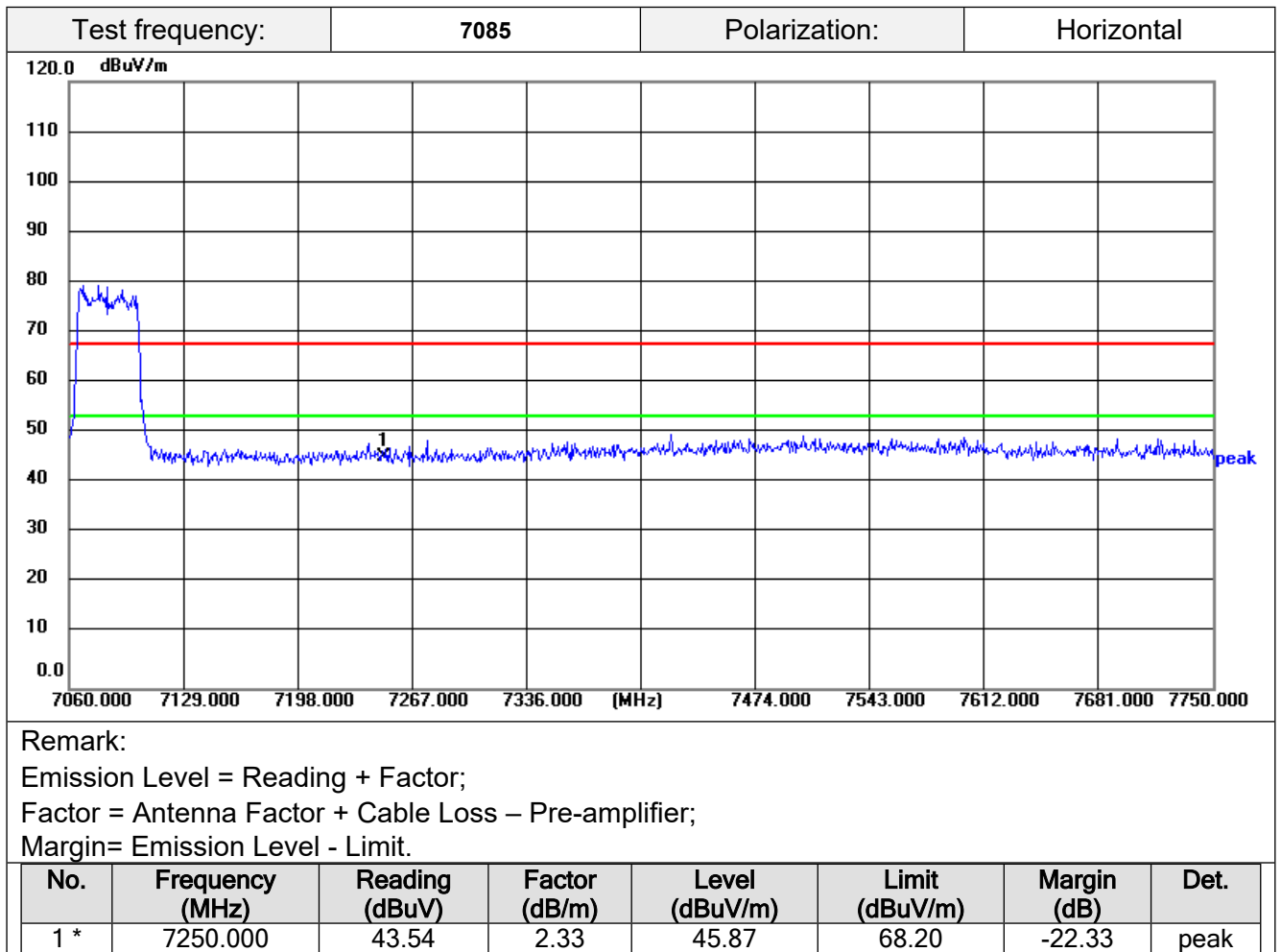
Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

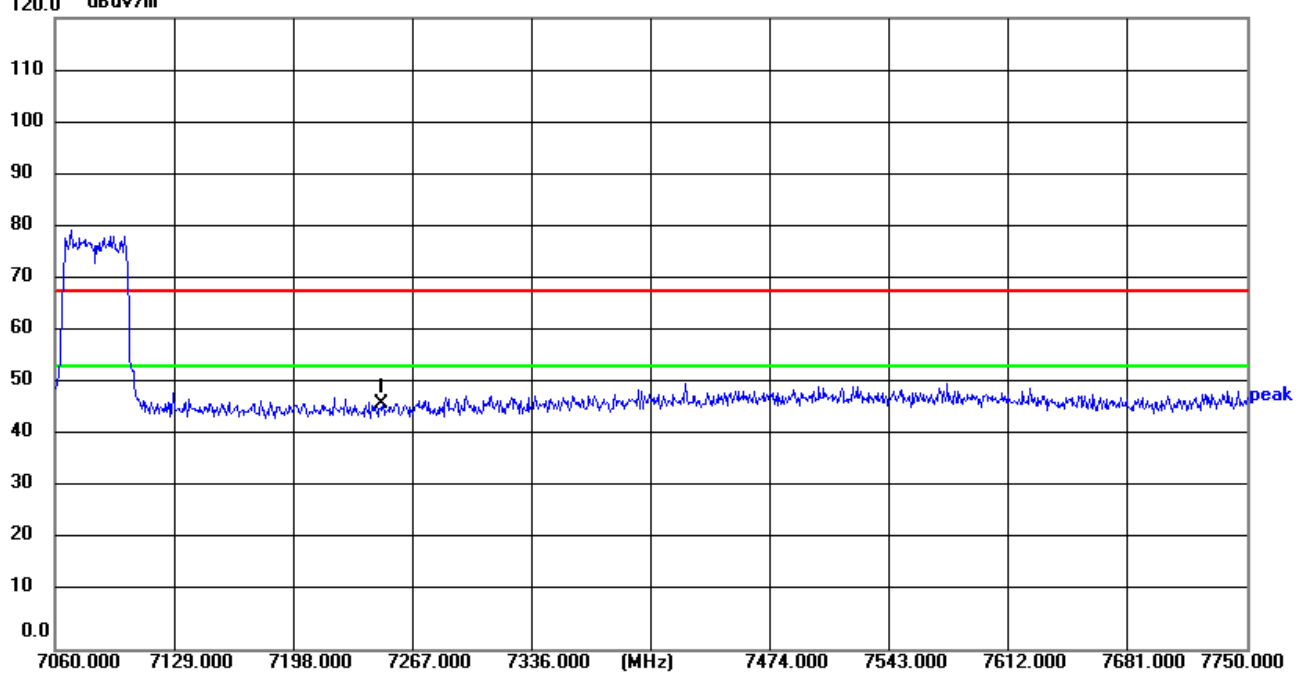
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1 *	7250.000	43.79	2.33	46.12	68.20	-22.08	peak

802.11be(EHT40) MIMO mode




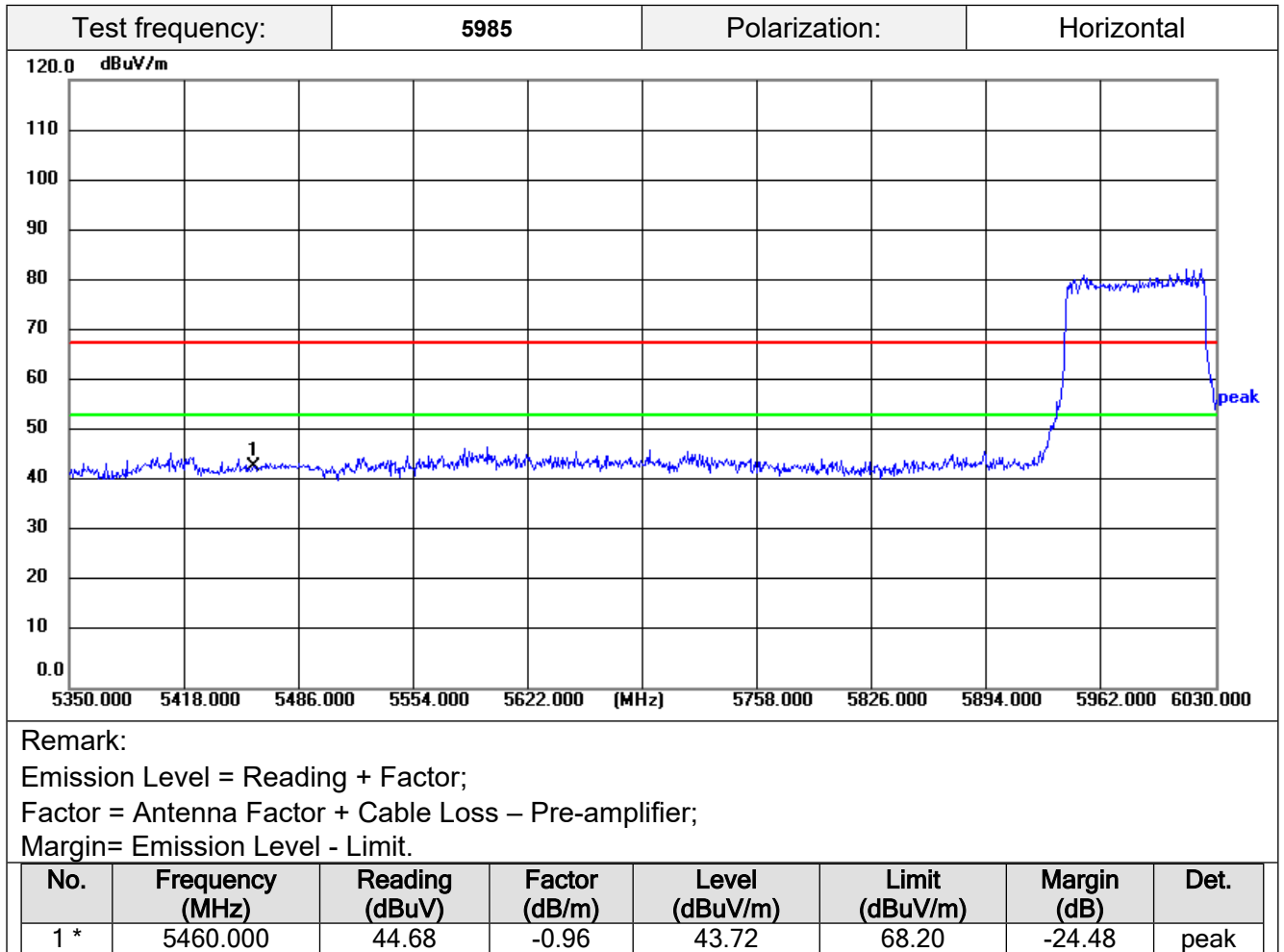


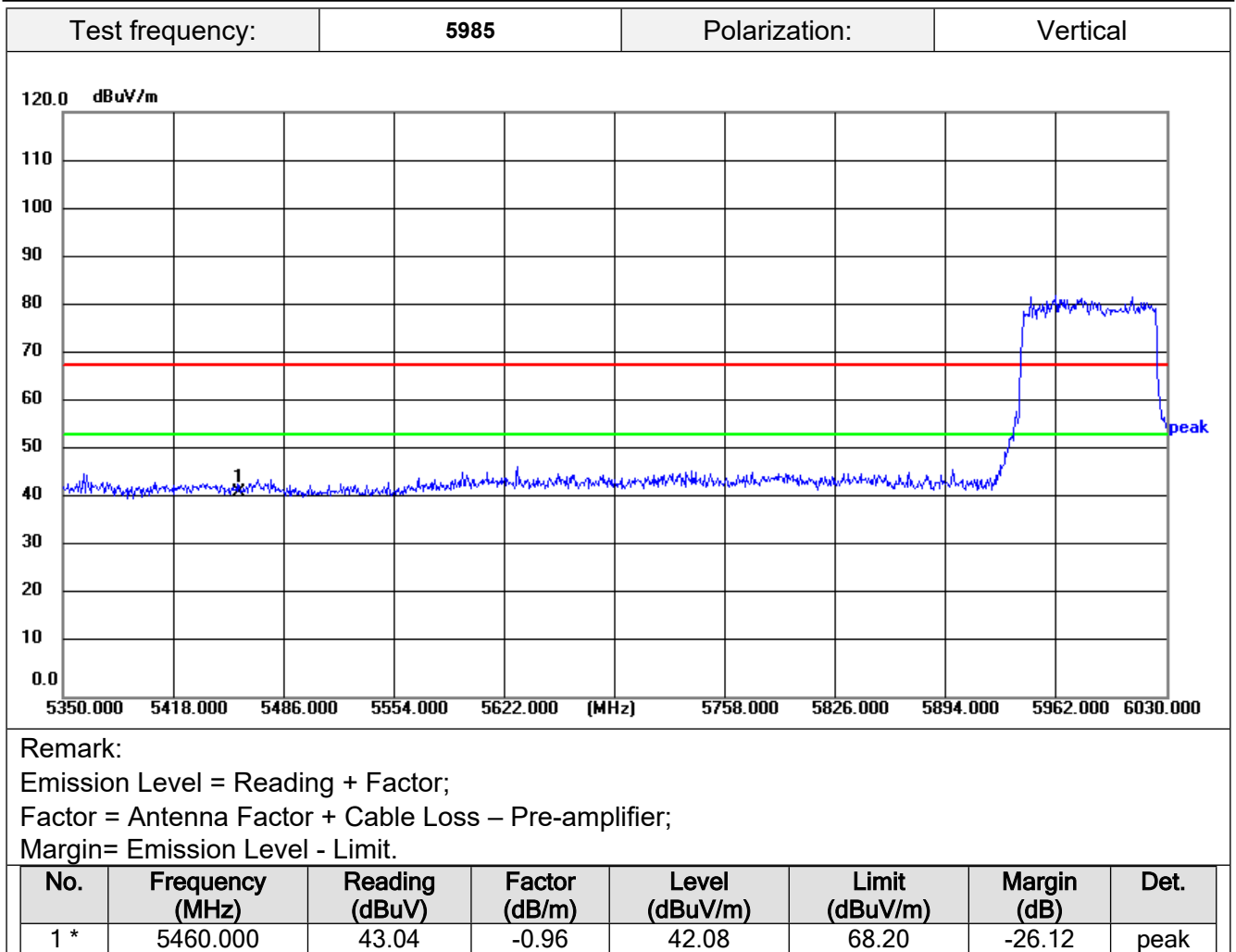
Test frequency:		7085	Polarization:		Vertical		
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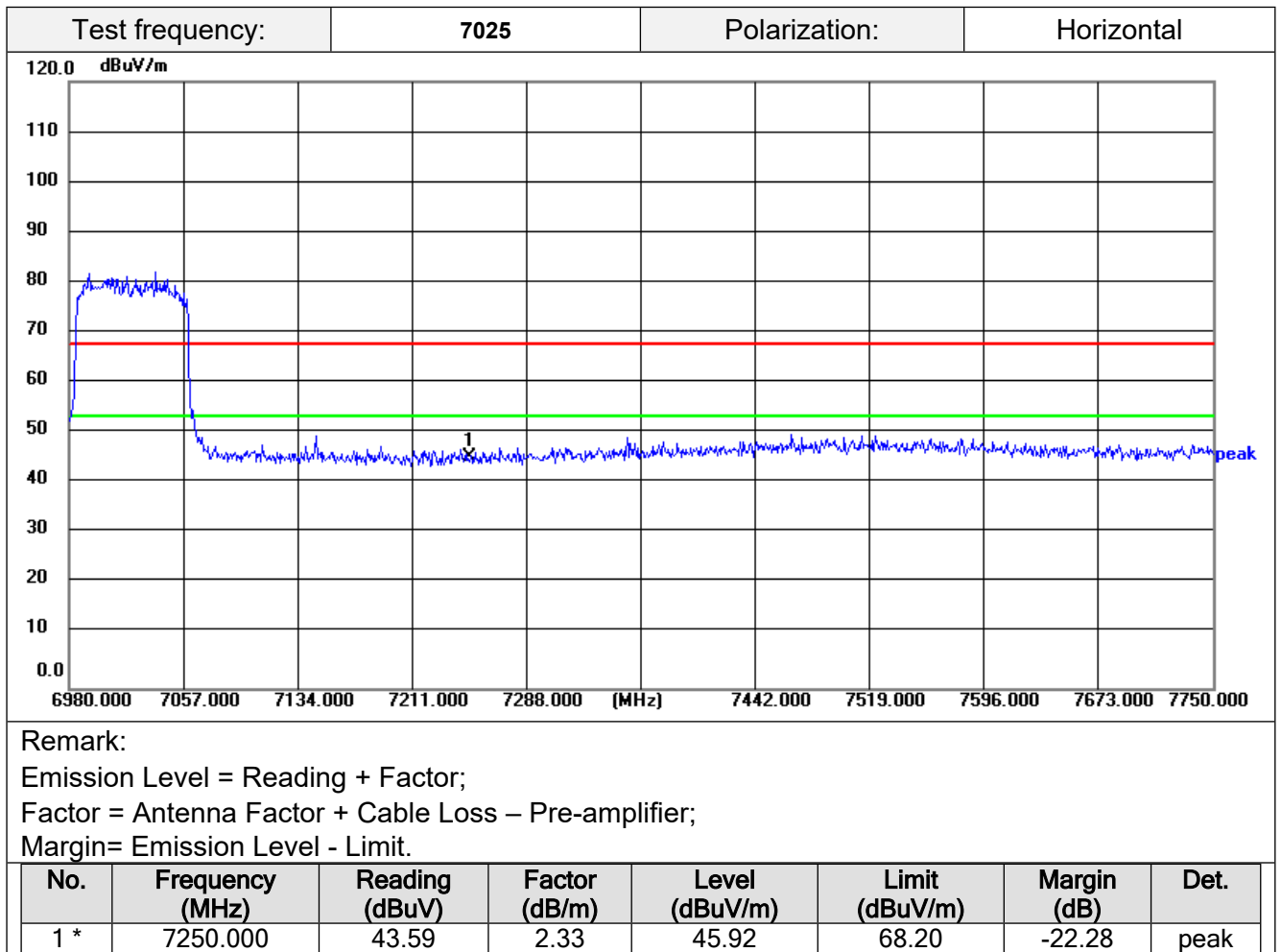
120.0 dBuV/m


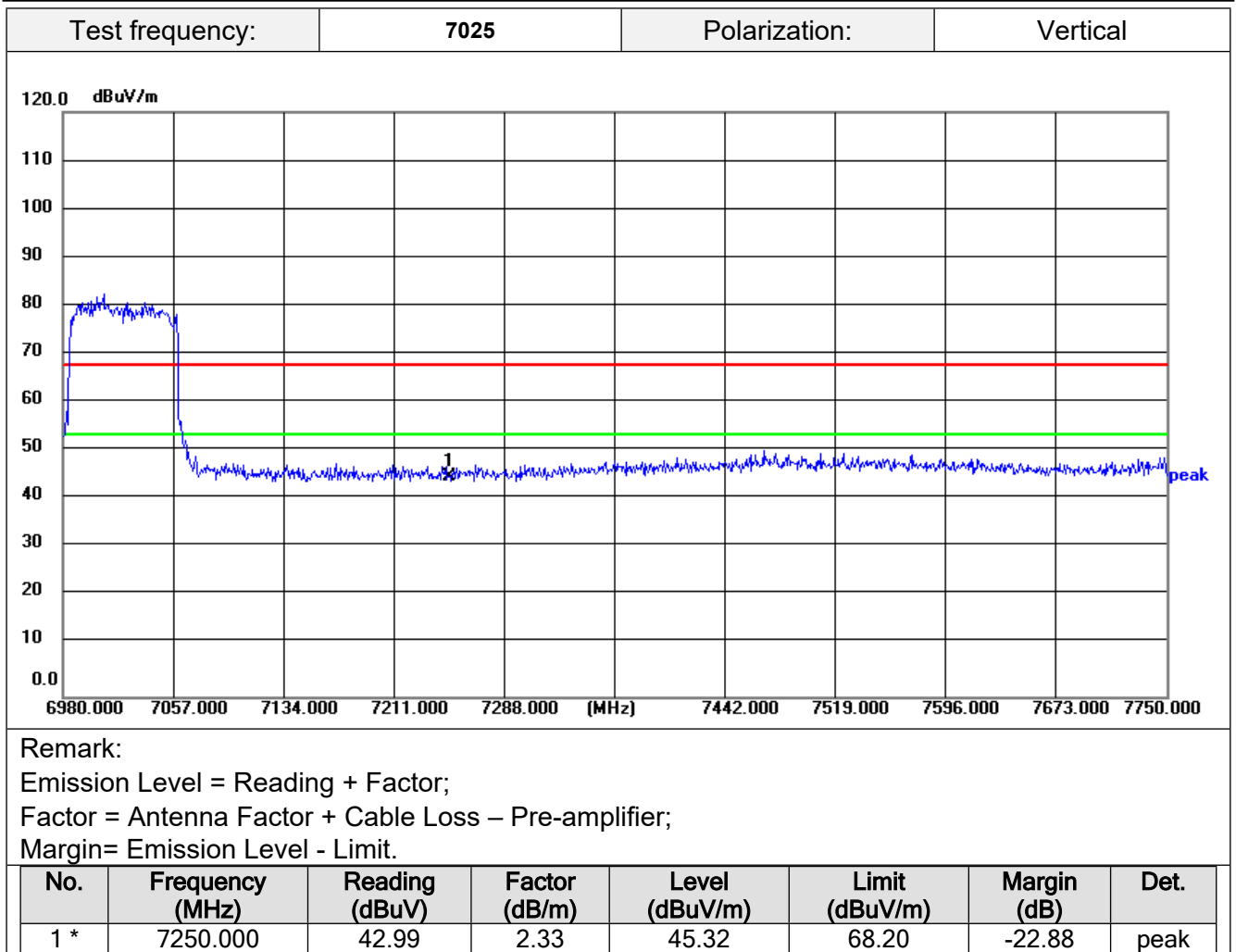
Remark:
Emission Level = Reading + Factor;
Factor = Antenna Factor + Cable Loss – Pre-amplifier;
Margin= Emission Level - Limit.

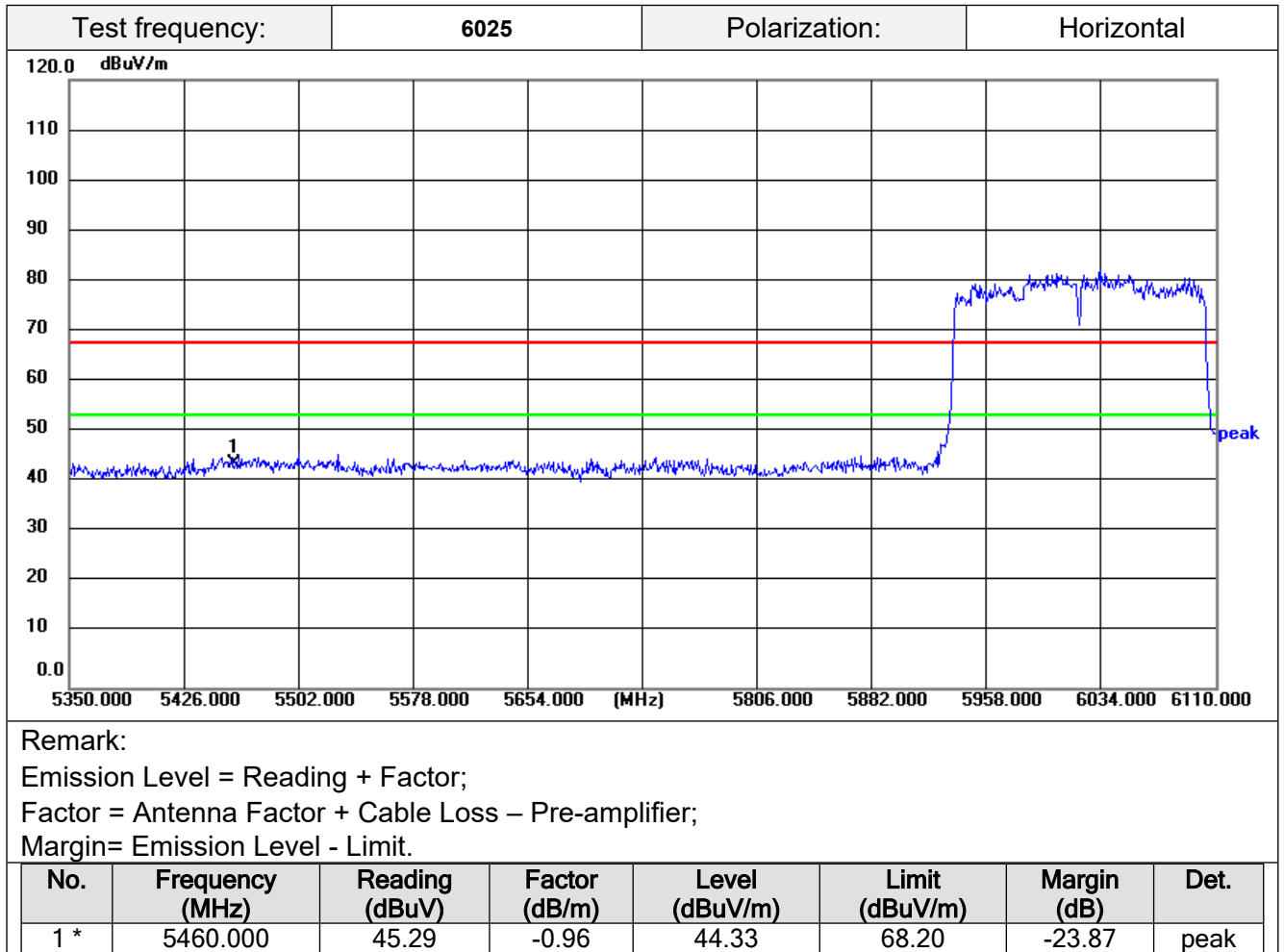
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1 *	7250.000	44.41	2.33	46.74	68.20	-21.46	peak

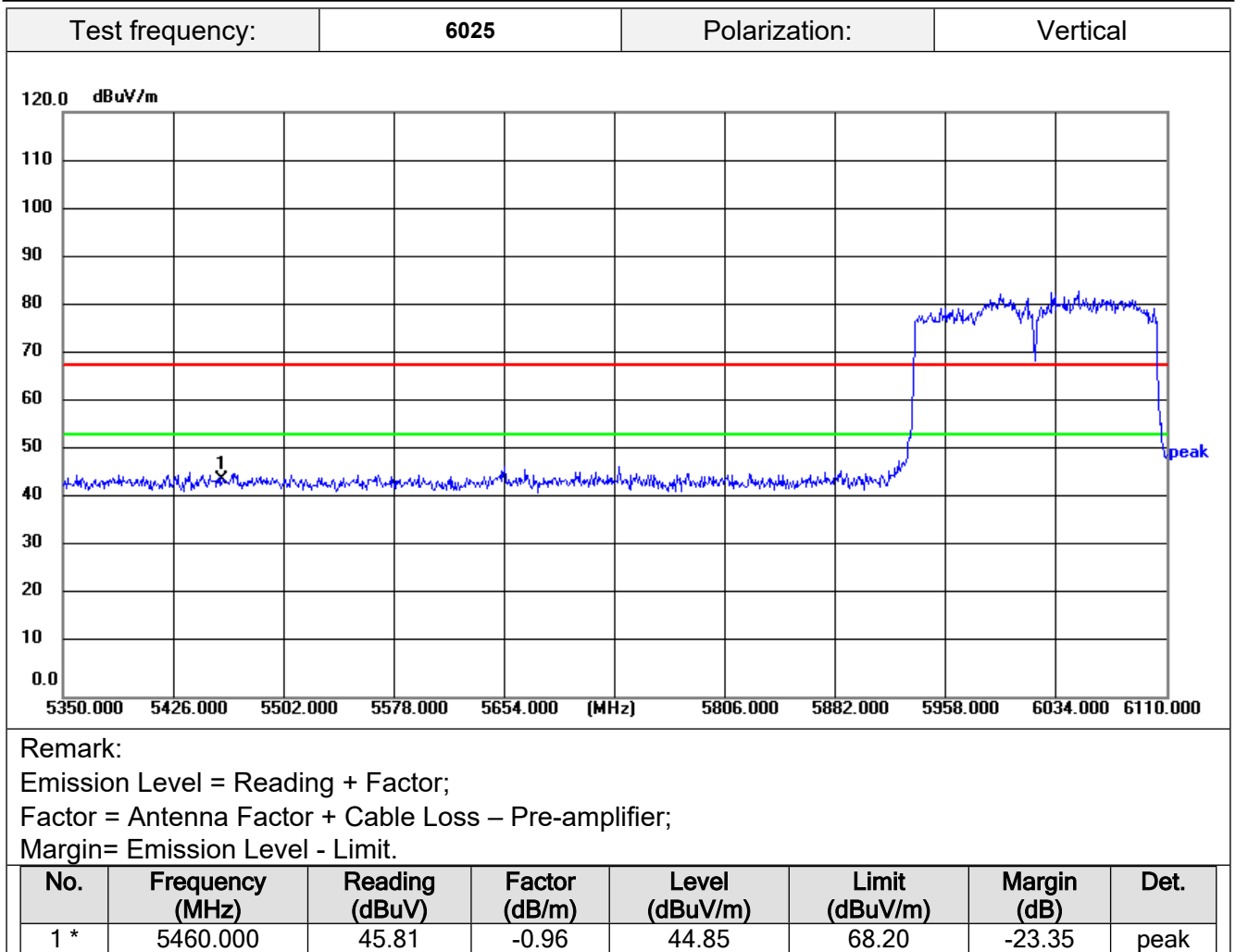
802.11be(EHT80) MIMO mode


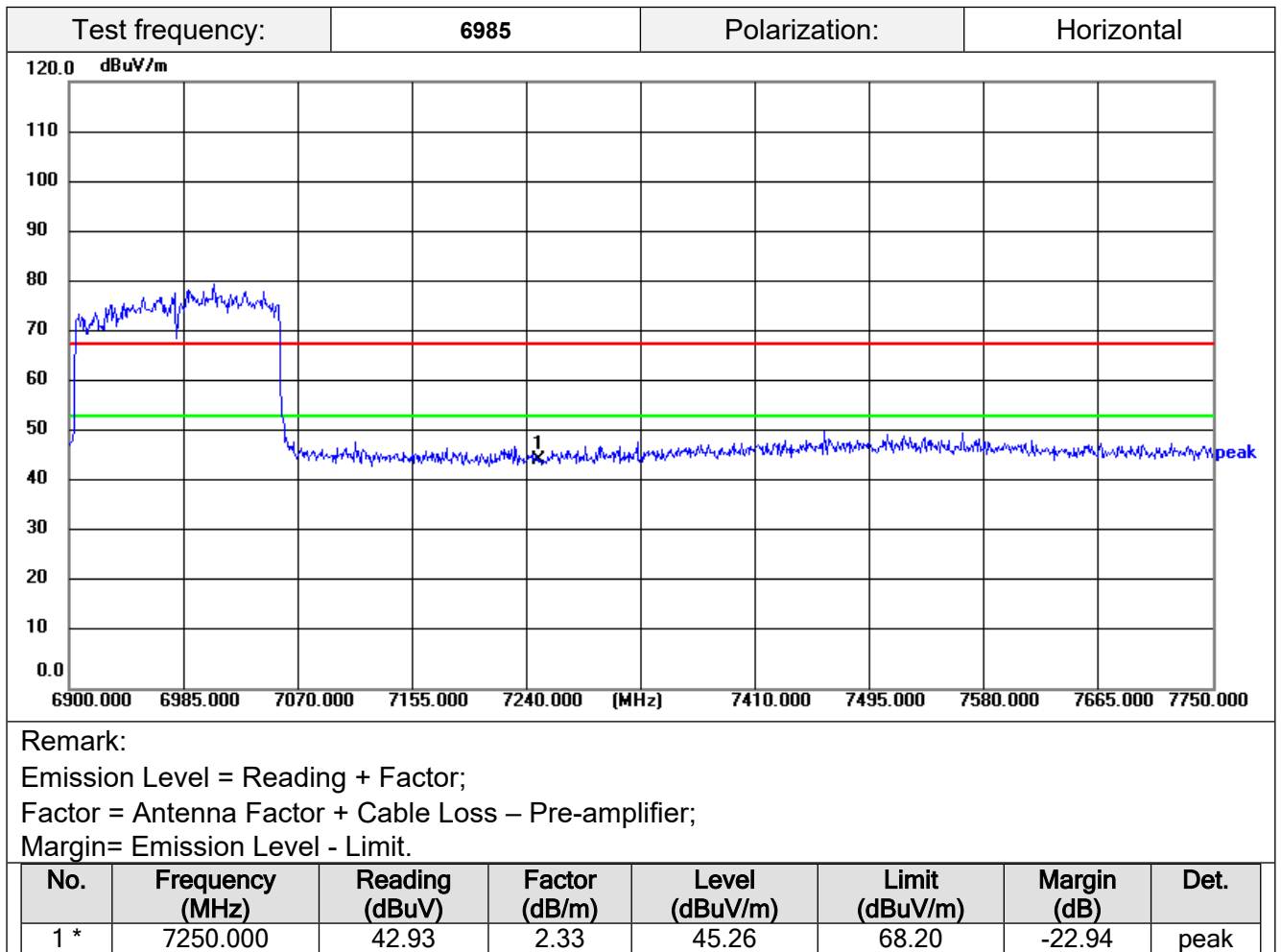






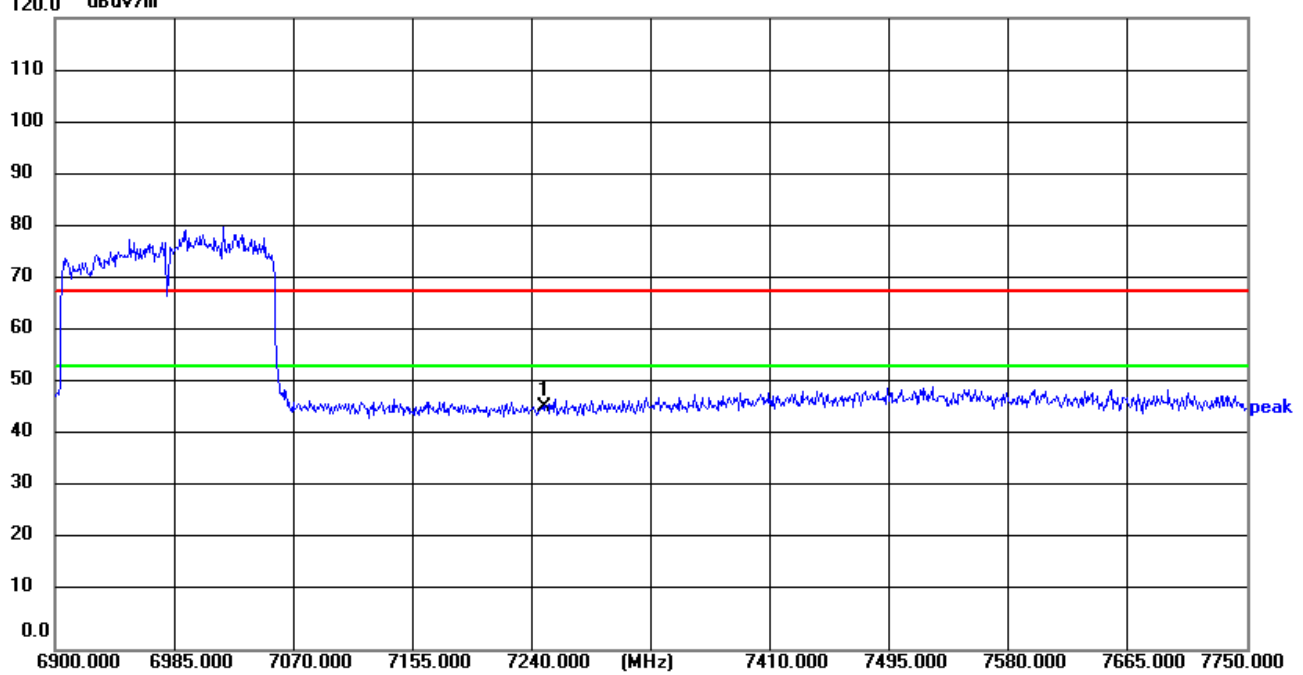
802.11be(EHT160) MIMO mode






Test frequency:		6985	Polarization:		Vertical		
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120.0 dBuV/m



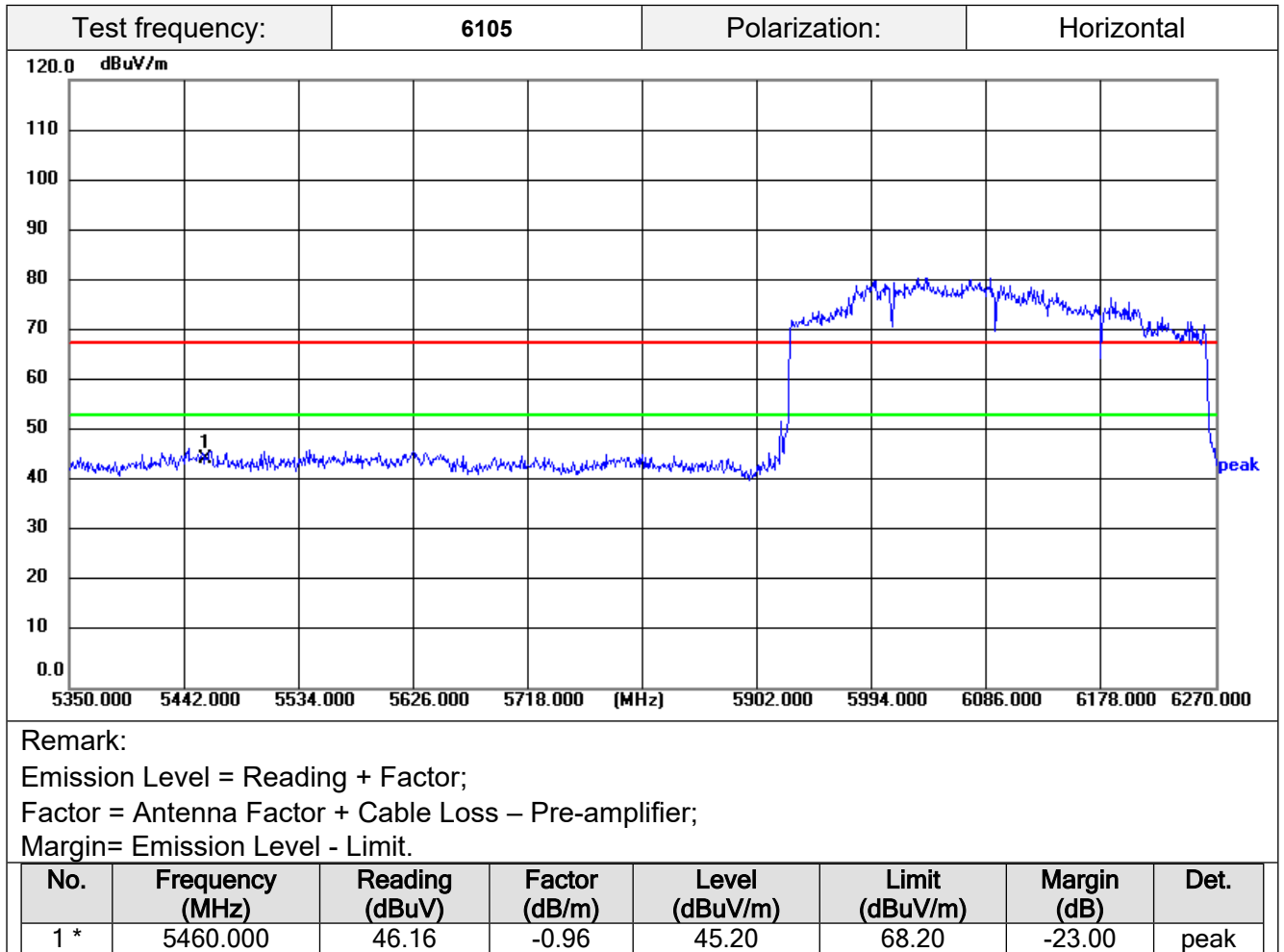
Remark:

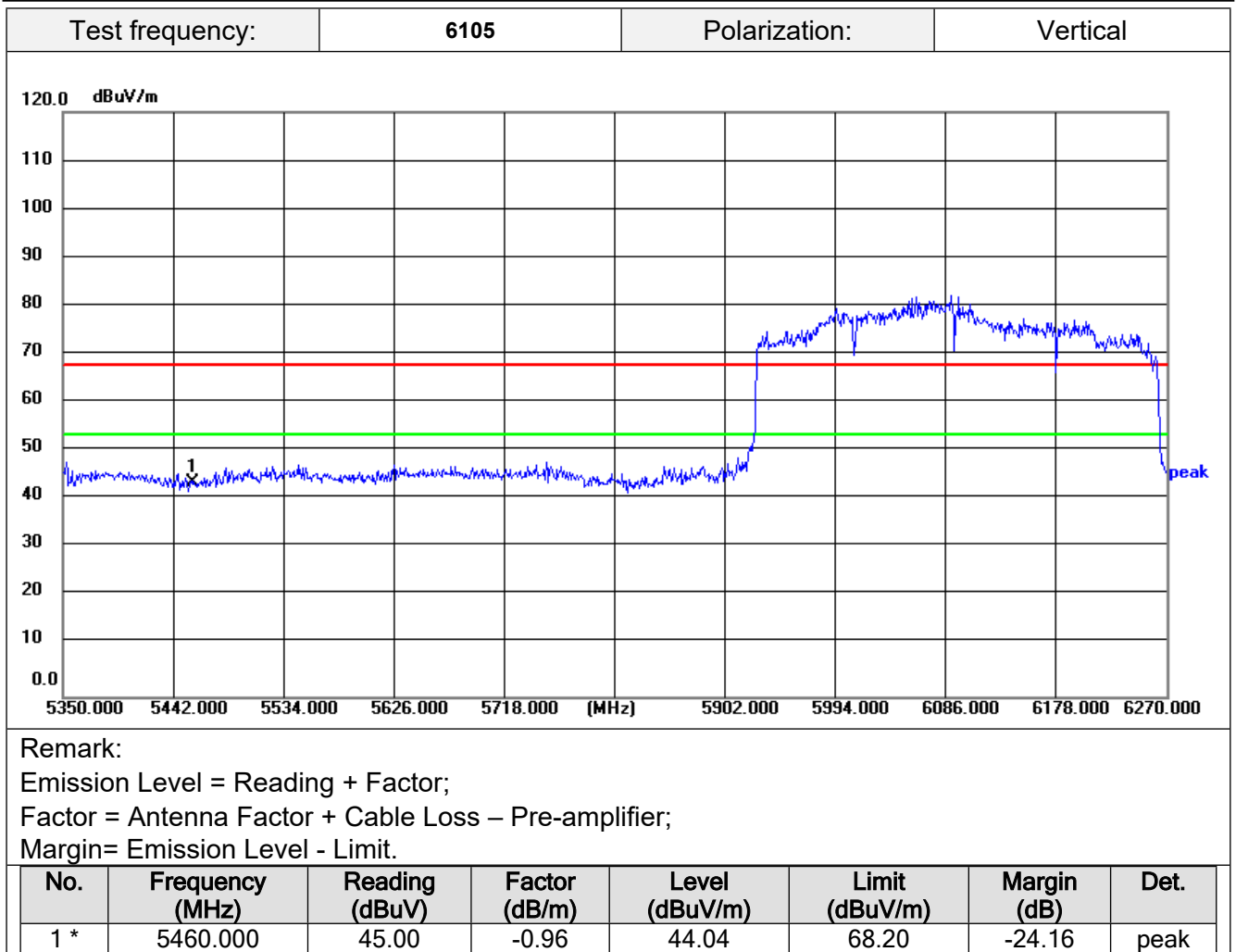
Emission Level = Reading + Factor;

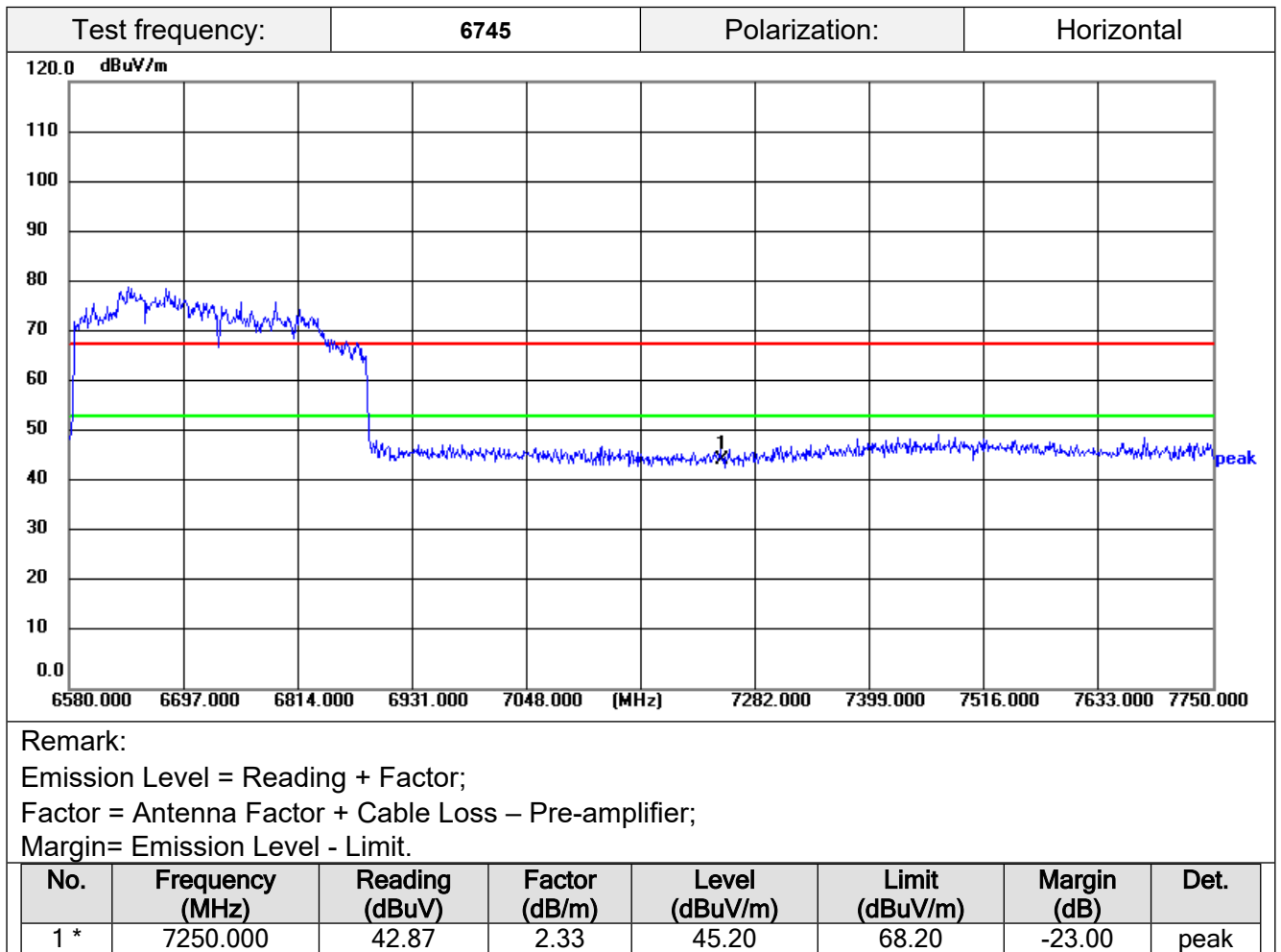
Factor = Antenna Factor + Cable Loss – Pre-amplifier;

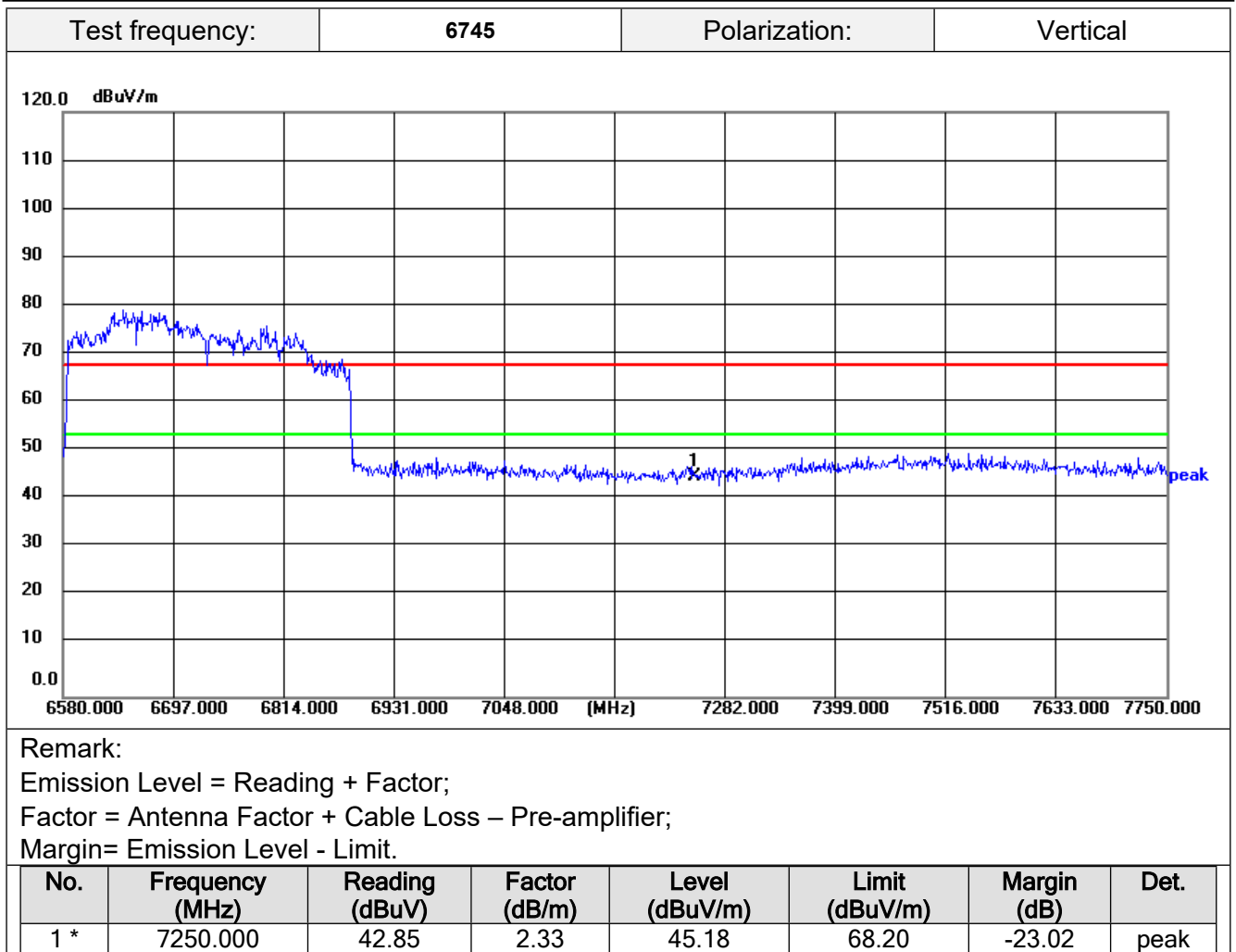
Margin= Emission Level - Limit.

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1 *	7250.000	43.85	2.33	46.18	68.20	-22.02	peak

802.11be(EHT320) MIMO mode








3.4 Contention-Based Protocol

Applicability of Contention-Based Protocol Requirements

Indoor access points, subordinate devices and client devices operating in the 5.925-7.125 GHz band (herein referred to as unlicensed devices) are required to use technologies that include a contention-based protocol to avoid co-channel interference with incumbent devices sharing the band. To ensure incumbent co-channel operations are detected in a technology-agnostic manner, unlicensed devices are required to detect co-channel radio frequency energy (energy detect) and avoid simultaneous transmission. Unlicensed low-power indoor devices must detect co-channel radio frequency power that is at least -62 dBm or lower. Upon detection of energy in the band, unlicensed low power indoor devices must vacate the channel (in which incumbent signal is transmitted) and stay off the incumbent channel as long as detected radio frequency power is equal to or greater than the threshold (-62 dBm)¹. The -62 dBm (or lower) threshold is referenced to a 0 dBi antenna gain. To ensure incumbent operations are reliably detected in the band, low power indoor devices must detect RF energy throughout their intended operating channel. For example, an 802.11 device that plans to transmit a 40 MHz- wide signal (on a primary 20 MHz channel and a secondary 20 MHz channel) must detect energy throughout the entire 40 MHz channel. Additionally, low-power indoor devices must detect co-channel energy with 90% or greater certainty.

a) Simulating Incumbent Signal The incumbent signal is assumed to be noise-like. One example of such transmission could be Digital Video Broadcasting (DVB) systems that use Orthogonal Frequency Division Multiplexing (OFDM). Incumbent systems may also use different bandwidths for their transmissions. A 10 MHz-wide additive white Gaussian noise (AWGN) signal is selected to simulate and represent incumbent transmission.

b) Required number of tests

Incumbent and EUT (access point, subordinate or client) signals may occupy different portions of the channel. Depending on the EUT transmission bandwidth and incumbent signal center frequency (simulated by a 10 MHz-wide AWGN signal), the center frequency of the EUT signal f_{cc1} may fall within the incumbent's occupied bandwidth (Figure 1.a), or outside of it (Figure 1.b).

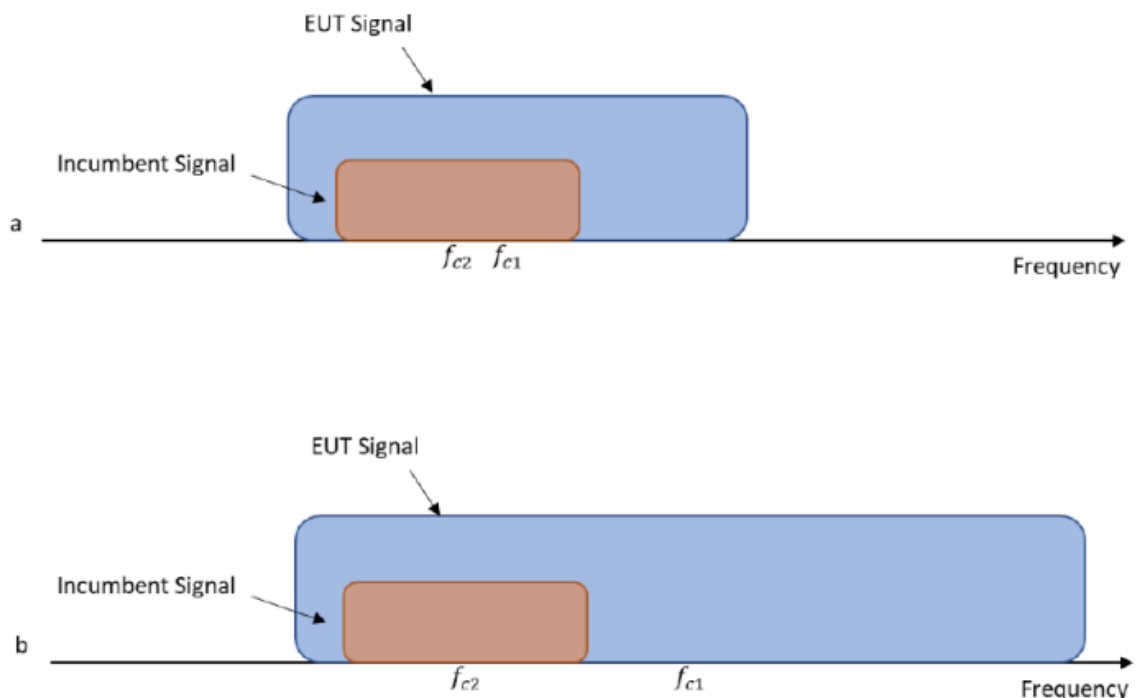


Figure 1. Two possible scenarios where a) center frequency of EUT transmission falls within incumbent's bandwidth, or b) outside of it

To ensure EUT reliably detects an incumbent signal in both scenarios shown in Figure 1, the detection threshold test may be repeated more than once with the incumbent signal (having center frequency f_{cc2}) tuned to different center frequencies within the UT transmission bandwidth. The criteria specified in Table 1 determines how many times the detection threshold test must be performed;

Table 1. Criteria to determine number of times detection threshold test may be performed

If	Number of Tests	Placement of Incumbent Transmission
$BW_{EUT} \leq BW_{Inc}$	Once	Tune incumbent and EUT transmissions ($f_{c1} = f_{c2}$)
$BW_{Inc} < BW_{EUT} \leq 2BW_{Inc}$	Once	Incumbent transmission is contained within BW_{EUT}
$2BW_{Inc} < BW_{EUT} \leq 4BW_{Inc}$	Twice. Incumbent transmission is contained within BW_{EUT}	Incumbent transmission is located as closely as possible to the lower edge and upper edge, respectively, of the EUT channel
$BW_{EUT} > 4BW_{Inc}$	Three times	Incumbent transmission is located as closely as possible to the lower edge of the EUT channel, in the middle of EUT channel, and as closely as possible to the upper edge of the EUT channel

where:

BW_{EUT} : Transmission bandwidth of EUT signal

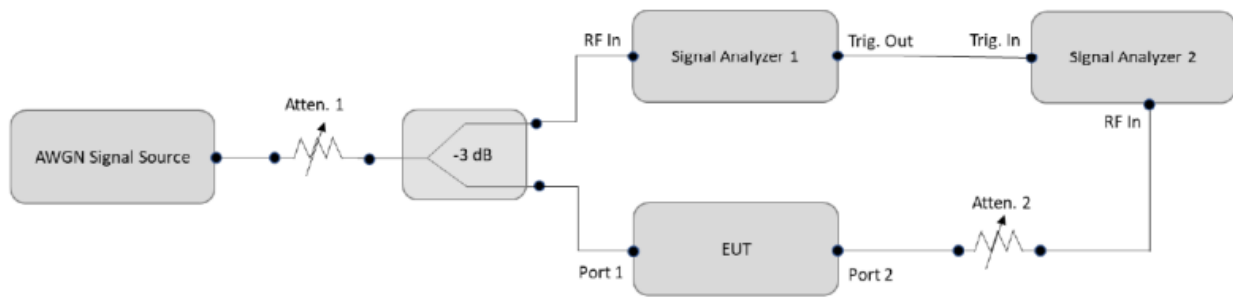
BW_{Inc} : Transmission bandwidth of the simulated incumbent signal (10 MHz wide AWGN signal)

f_{c1} : Center frequency of EUT transmission

f_{c2} : Center frequency of simulated incumbent signal

Test Setup and procedure

To ensure the EUT is capable of detecting co-channel energy, the first step is to configure the EUT to transmit with a constant duty cycle.² To simulate an incumbent signal, a signal generator (or similar source) that is capable of generating band-limited additive white Gaussian noise (AWGN) is required. Depending on the EUT antenna configuration, the AWGN signal can be provided to the EUT receiver via a conducted method (Figure 2) or a radiated method (Figure 3). Figure 2 shows the conducted test setup where a band-limited AWGN signal is generated at a very low power level and injected into the EUT's antenna port. The AWGN signal power level is then incrementally increased while the EUT transmission is monitored on a signal analyzer 2 to verify if the EUT can sense the AWGN signal and can subsequently cease its transmission. A triggered measurement, as shown in Figure 2, is optional, and assists with determining the time it takes the EUT to cease transmission (or vacate the channel) upon detecting RF energy. If the EUT has only one antenna port, then an AWGN signal source can be connected to the same antenna port.



1. Configure the EUT to transmit with a constant duty cycle.
2. Set the operating parameters of the EUT including power level, operating frequency, modulation and bandwidth.
3. Set the signal analyzer center frequency to the nominal EUT channel center frequency. The span range of the signal analyzer shall be between two times and five times the OBW of the EUT. Connect the output port of the EUT to the signal analyzer 2, as shown in Figure 2. Ensure that the attenuator 2 provides enough attenuation to not overload the signal analyzer 2 receiver.
4. Monitoring the signal analyzer 2, verify the EUT is operating and transmitting with the parameters set at step two.
5. Using an AWGN signal source, generate (but do not transmit, i.e., RF OFF) a 10 MHz-wide AWGN signal. Use Table 1 to determine the center frequency of the 10 MHz AWGN signal relative to the EUT's channel bandwidth and center frequency.
6. Set the AWGN signal power to an extremely low level (more than 20 dB below the -62 dBm threshold). Connect the AWGN signal source, via a 3-dB splitter, to the signal analyzer 1 and the EUT as shown in Figure 2.
7. Transmit the AWGN signal (RF ON) and verify its characteristics on the signal analyzer 1.
8. Monitor the signal analyzer 2 to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.
9. (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.
10. Refer to Table 1 to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step 5, choose a different center frequency for the AWGN signal and repeat the process.

Test Results

Remark: Worst result was reported as below:

Contention Based Protocol Measurement											
Operation Band	Operation Mode	Channel Bandwidth	Channel number	Channel Frequency (MHz)	AWGN Signal Frequency (MHz)		Antenna Gain (dBi)	Adjusted Power (dBm)	Detection Limit (dBm)	EUT TX Status	Test Result
					Freq. (MHz)	Power (dBm)					
U-NII-5	802.11ax	20	45	6175	6175	-66.21	3.55	-69.76	-62	OFF	Pass
						-67.71	3.55	-71.26	-62	Minimal	Pass
						-69.82	3.55	-73.37	-62	ON	Pass
		160	47	6185	6110	-61.79	3.55	-65.34	-62	OFF	Pass
						-63.96	3.55	-67.51	-62	Minimal	Pass
						-66.76	3.55	-70.31	-62	ON	Pass
					6185	-62.63	3.55	-66.18	-62	OFF	Pass
						-64.91	3.55	-68.46	-62	Minimal	Pass
						-66.82	3.55	-70.37	-62	ON	Pass
					6260	-63.14	3.55	-66.69	-62	OFF	Pass
						-64.78	3.55	-68.33	-62	Minimal	Pass
						-67.43	3.55	-70.98	-62	ON	Pass

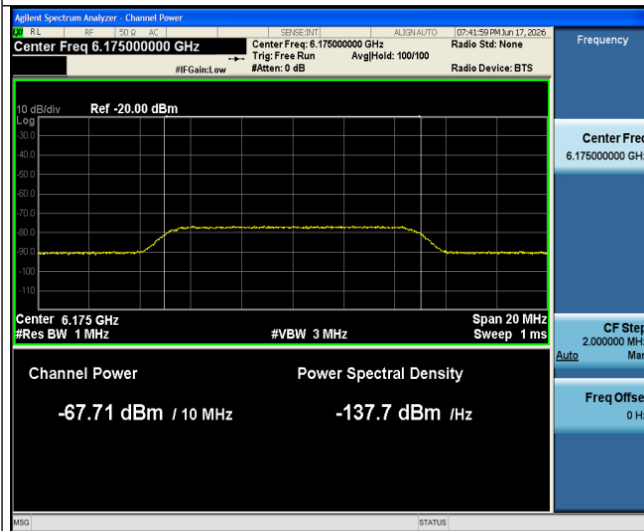
Note: Adjusted Power (dBm)= Injected AWGN Level (dBm) - Antenna Gain (dBi)

Contention Based Protocol Detection Probability															
Operation Mode	Channel Bandwidth (MHz)	AWGN Signal Freq. (MHz)	#01	#02	#03	#04	#05	#06	#07	#08	#09	#10	Detection Probability	Detection Limit	Test Result
802.11ax	20	6175	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	90%	90%	Pass
	160	6110	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	90%	90%	Pass
		6185	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	90%	90%	Pass
		6260	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	90%	90%	Pass

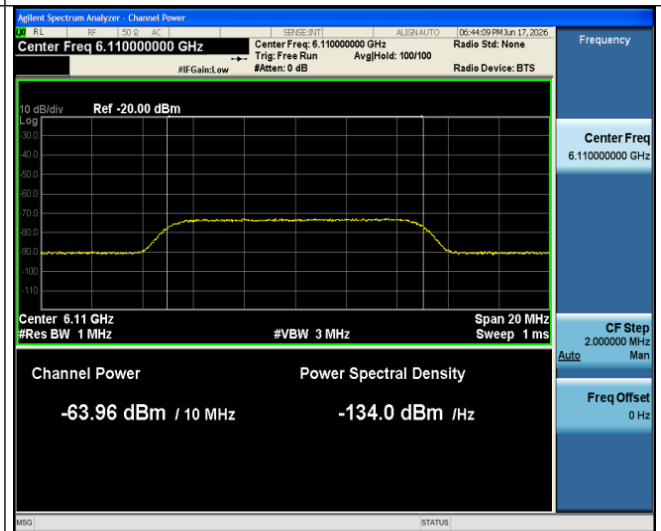
Note: Y means Detected, N means not Detected

Plots of Incumbent Signal (AWGN) Level

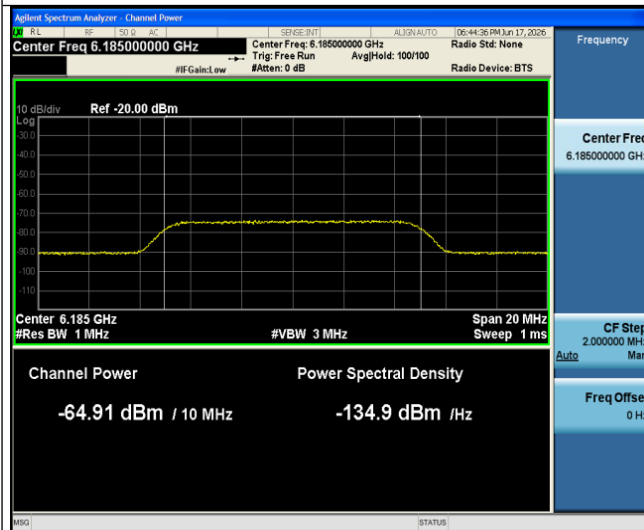
802.11ax (HEW20) / CH45



802.11ax (HEW160) / CH47 (Low Edge)



802.11ax (HEW160) / CH47 (Middle Edge)



802.11ax (HEW160) / CH47 (High Edge)



Plots of EUT Ceased Transmission In The Time Domain

802.11ax (HEW20) / CH45



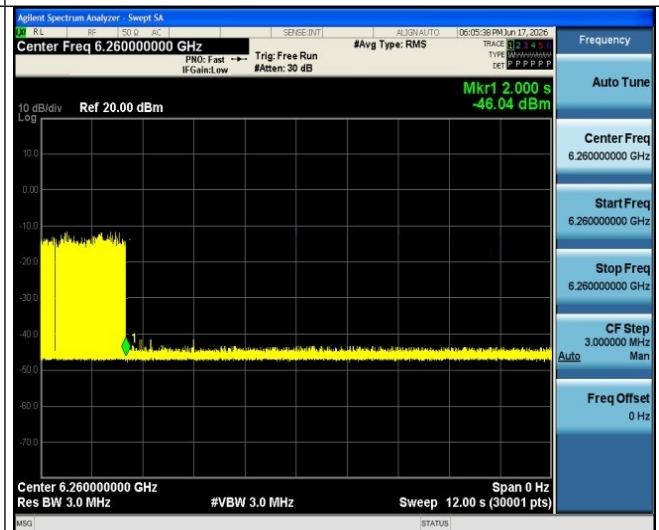
802.11ax (HEW160) / CH47 (Low Edge)



802.11ax (HEW160) / CH47 (Middle Edge)



802.11ax (HEW160) / CH47 (High Edge)



Contention Based Protocol Measurement											
Operation Band	Operation Mode	Channel Bandwidth	Channel number	Channel Frequency (MHz)	AWGN Signal Frequency (MHz)		Antenna Gain (dBi)	Adjusted Power (dBm)	Detection Limit (dBm)	EUT TX Status	Test Result
					Freq. (MHz)	Power (dBm)					
U-NII-6	802.11ax	20	105	6475	6475	-61.51	3.55	-65.06	-62	OFF	Pass
						-63.90	3.55	-67.45	-62	Minimal	Pass
						-65.91	3.55	-69.46	-62	ON	Pass
		160	111	6430	6430	-67.15	3.55	-70.70	-62	OFF	Pass
						-69.65	3.55	-73.20	-62	Minimal	Pass
						-71.68	3.55	-75.23	-62	ON	Pass
				6505	6505	-63.16	3.55	-66.71	-62	OFF	Pass
						-65.84	3.55	-69.39	-62	Minimal	Pass
						-67.54	3.55	-71.09	-62	ON	Pass
				6580	6580	-64.41	3.55	-67.96	-62	OFF	Pass
						-66.82	3.55	-70.37	-62	Minimal	Pass
						-69.53	3.55	-73.08	-62	ON	Pass

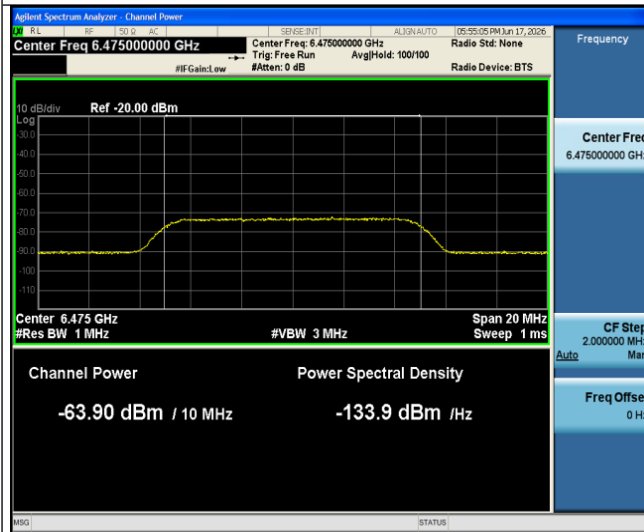
Note: Adjusted Power (dBm)= Injected AWGN Level (dBm) - Antenna Gain (dBi)

Contention Based Protocol Detection Probability															
Operation Mode	Channel Bandwidth (MHz)	AWGN Signal Freq. (MHz)	#01	#02	#03	#04	#05	#06	#07	#08	#09	#10	Detection Probability	Detection Limit	Test Result
802.11ax	20	6475	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	90%	90%	Pass
	160	6430	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	90%	90%	Pass
		6505	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	90%	90%	Pass
		6580	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	90%	90%	Pass

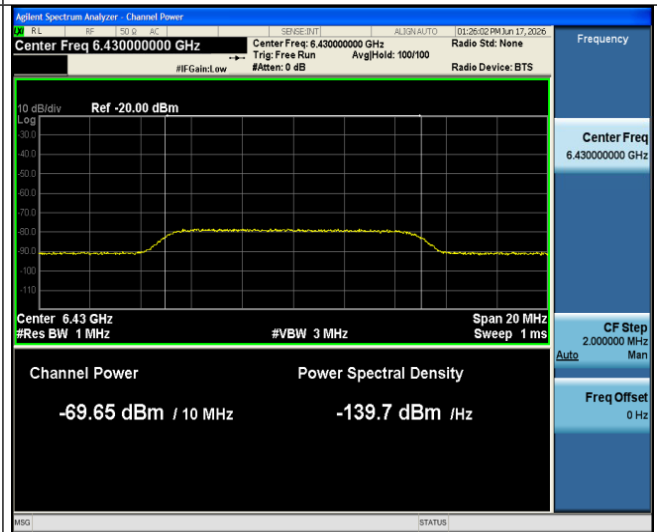
Note: Y means Detected, N means not Detected

Plots of Incumbent Signal (AWGN) Level

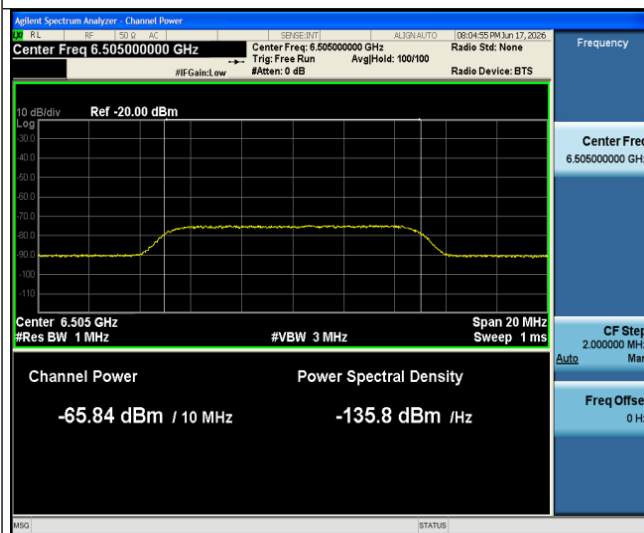
802.11ax (HEW20) / CH105



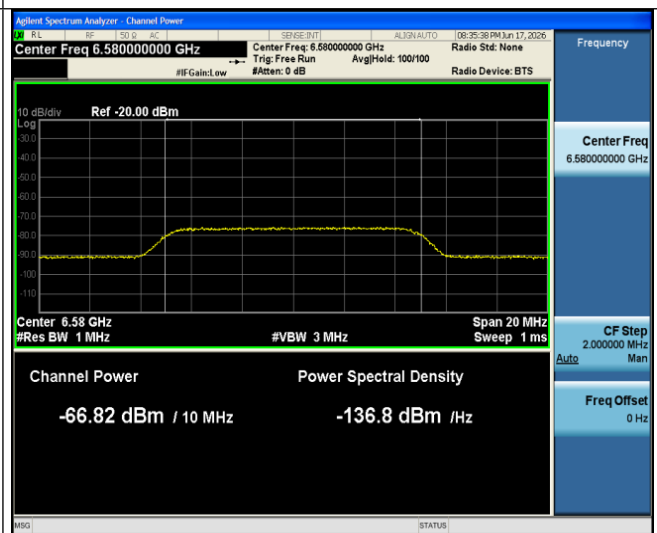
802.11ax (HEW160) / CH111 (Low Edge)



802.11ax (HEW160) / CH111 (Middle Edge)



802.11ax (HEW160) / CH111 (High Edge)

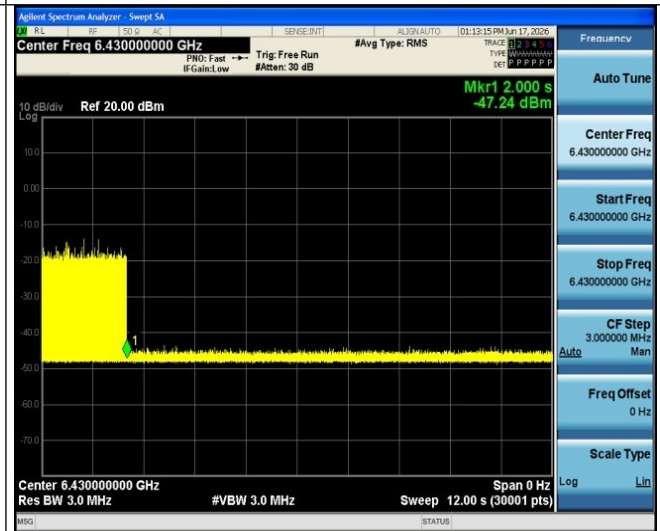


Plots of EUT Ceased Transmission In The Time Domain

802.11ax (HEW20) / CH105



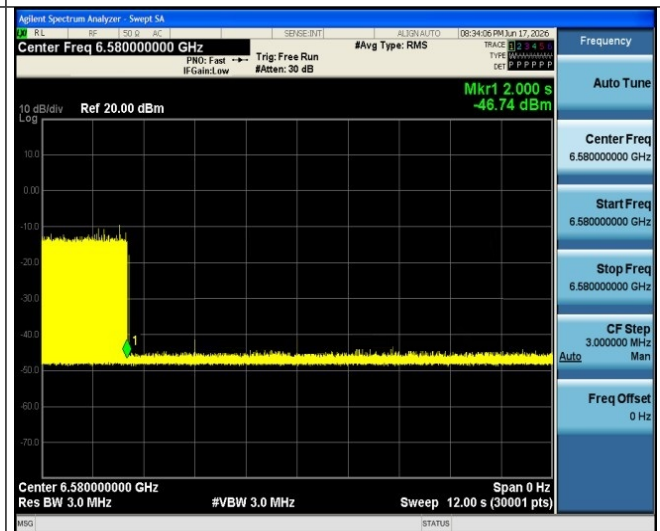
802.11ax (HEW160) / CH111 (Low Edge)



802.11ax (HEW160) / CH111 (Middle Edge)



802.11ax (HEW160) / CH111 (High Edge)



Contention Based Protocol Measurement											
Operation Band	Operation Mode	Channel Bandwidth	Channel number	Channel Frequency (MHz)	AWGN Signal Frequency (MHz)		Antenna Gain (dBi)	Adjusted Power (dBm)	Detection Limit (dBm)	EUT TX Status	Test Result
					Freq. (MHz)	Power (dBm)					
U-NII-7	802.11ax	20	149	6695	6695	-65.34	3.55	-68.89	-62	OFF	Pass
						-67.48	3.55	-71.03	-62	Minimal	Pass
						-69.46	3.55	-73.01	-62	ON	Pass
		160	143	6665	6590	-64.79	3.55	-68.34	-62	OFF	Pass
						-66.71	3.55	-70.26	-62	Minimal	Pass
						-68.80	3.55	-72.35	-62	ON	Pass
					6665	-60.64	3.55	-64.19	-62	OFF	Pass
						-63.01	3.55	-66.56	-62	Minimal	Pass
						-65.84	3.55	-69.39	-62	ON	Pass
					6740	-61.40	3.55	-64.95	-62	OFF	Pass
						-62.93	3.55	-66.48	-62	Minimal	Pass
						-65.06	3.55	-68.61	-62	ON	Pass

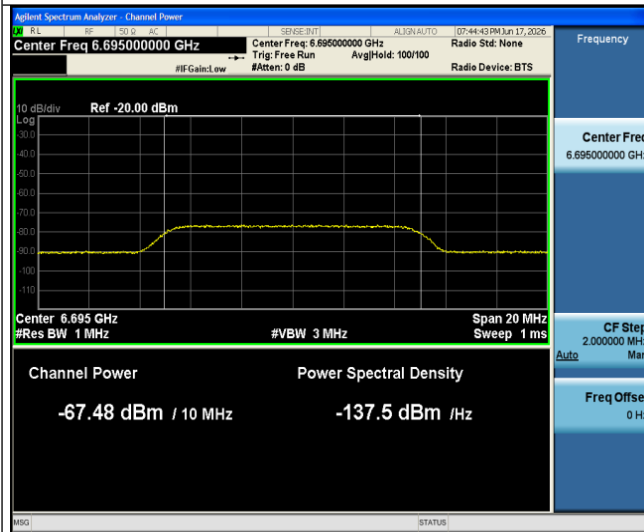
Note: Adjusted Power (dBm)= Injected AWGN Level (dBm) - Antenna Gain (dBi)

Contention Based Protocol Detection Probability															
Operation Mode	Channel Bandwidth (MHz)	AWGN Signal Freq. (MHz)	#01	#02	#03	#04	#05	#06	#07	#08	#09	#10	Detection Probability	Detection Limit	Test Result
802.11ax	20	6695	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	90%	90%	Pass
	160	6590	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	90%	90%	Pass
		6665	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	90%	90%	Pass
		6740	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	90%	90%	Pass

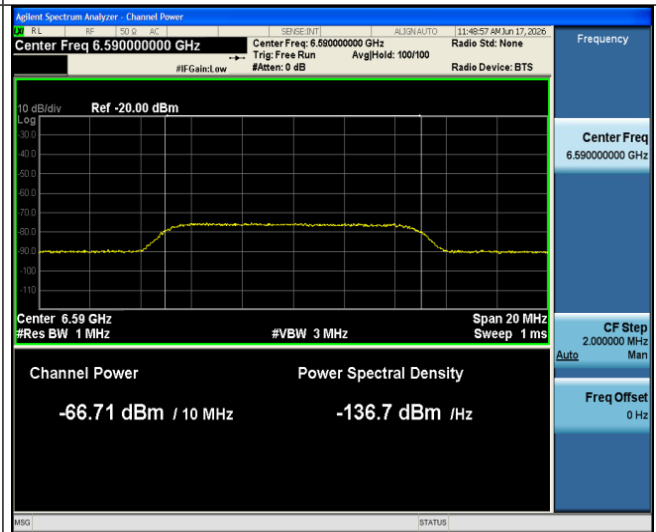
Note: Y means Detected, N means not Detected

Plots of Incumbent Signal (AWGN) Level

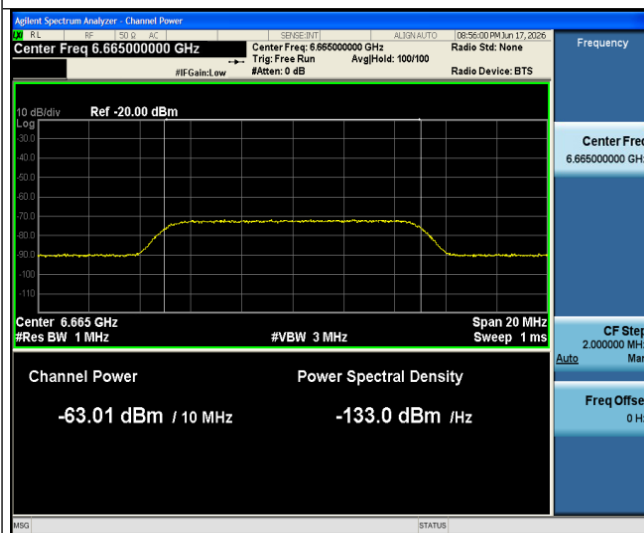
802.11ax (HEW20) / CH149



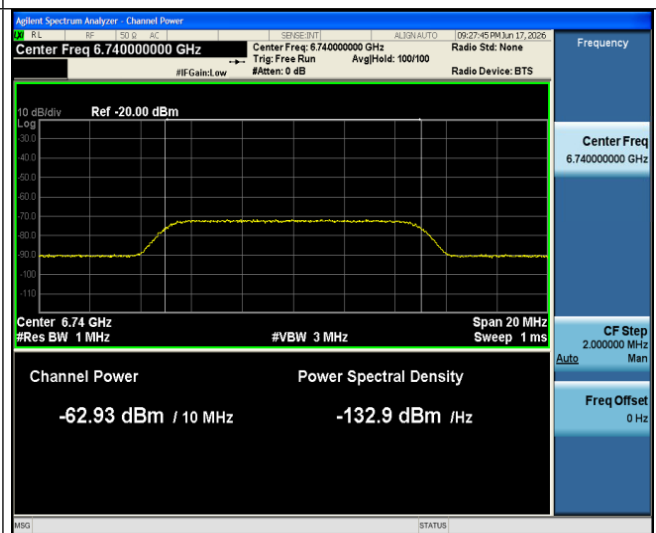
802.11ax (HEW160) / CH143 (Low Edge)



802.11ax (HEW160) / CH143 (Middle Edge)

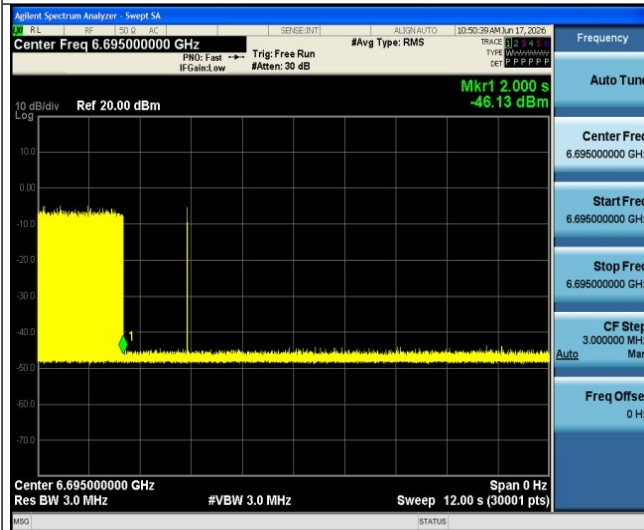


802.11ax (HEW160) / CH143 (High Edge)

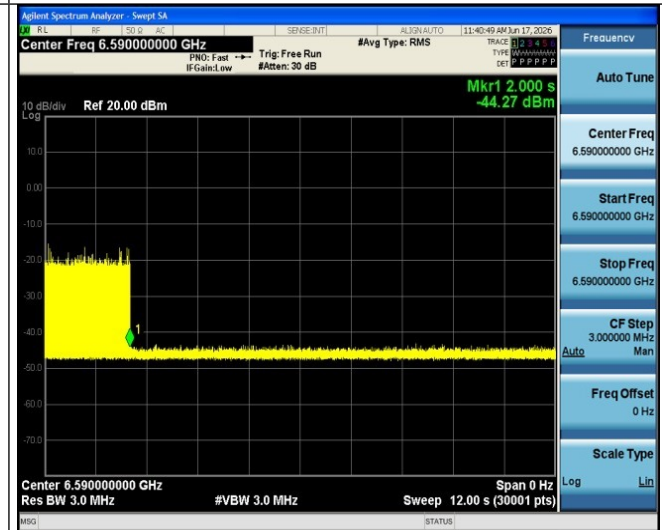


Plots of EUT Ceased Transmission In The Time Domain

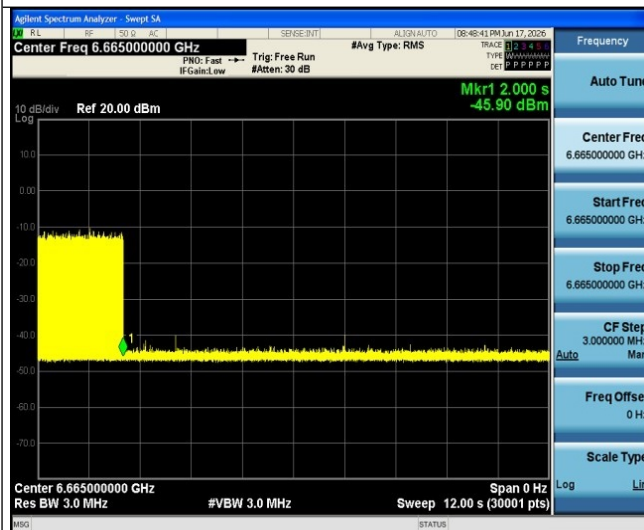
802.11ax (HEW20)/ CH149



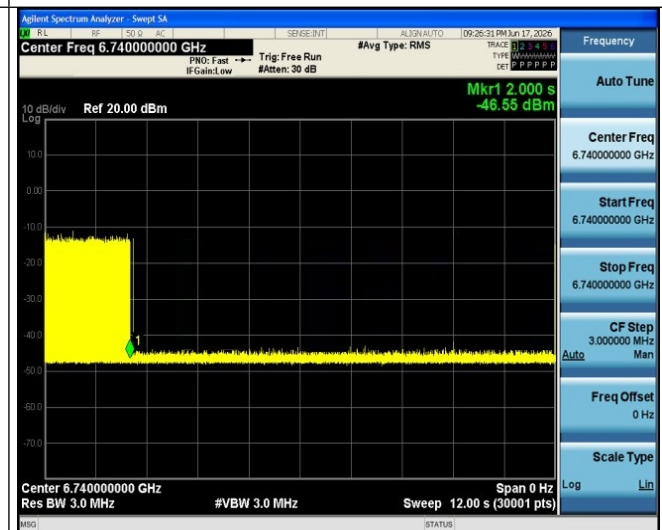
802.11ax (HEW160) / CH143 (Low Edge)



802.11ax (HEW160) / CH143 (Middle Edge)



802.11ax (HEW160) / CH143 (High Edge)



Contention Based Protocol Measurement											
Operation Band	Operation Mode	Channel Bandwidth	Channel number	Channel Frequency (MHz)	AWGN Signal Frequency (MHz)		Antenna Gain (dBi)	Adjusted Power (dBm)	Detection Limit (dBm)	EUT TX Status	Test Result
					Freq. (MHz)	Power (dBm)					
U-NII-8	802.11ax	20	209	6995	6995	-63.91	3.55	-67.46	-62	OFF	Pass
						-65.69	3.55	-69.24	-62	Minimal	Pass
						-67.81	3.55	-71.36	-62	ON	Pass
		160	207	6910	6910	-62.92	3.55	-66.47	-62	OFF	Pass
						-64.77	3.55	-68.32	-62	Minimal	Pass
						-67.46	3.55	-71.01	-62	ON	Pass
				6985	6985	-60.05	3.55	-63.60	-62	OFF	Pass
						-63.00	3.55	-66.55	-62	Minimal	Pass
						-65.55	3.55	-69.10	-62	ON	Pass
				7060	7060	-61.24	3.55	-64.79	-62	OFF	Pass
						-64.03	3.55	-67.58	-62	Minimal	Pass
						-65.56	3.55	-69.11	-62	ON	Pass

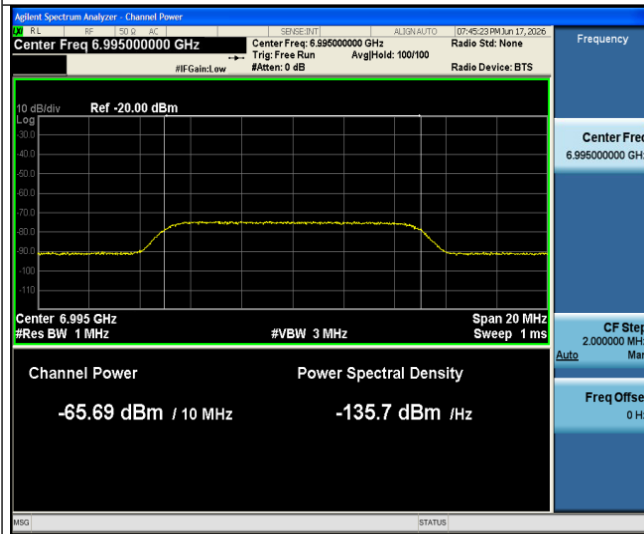
Note: Adjusted Power (dBm)= Injected AWGN Level (dBm) - Antenna Gain (dBi)

Contention Based Protocol Detection Probability															
Operation Mode	Channel Bandwidth (MHz)	AWGN Signal Freq. (MHz)	#01	#02	#03	#04	#05	#06	#07	#08	#09	#10	Detection Probability	Detection Limit	Test Result
802.11ax	20	6995	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	90%	90%	Pass
	160	6910	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	90%	90%	Pass
		6985	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	100%	90%	Pass
		7060	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	90%	90%	Pass

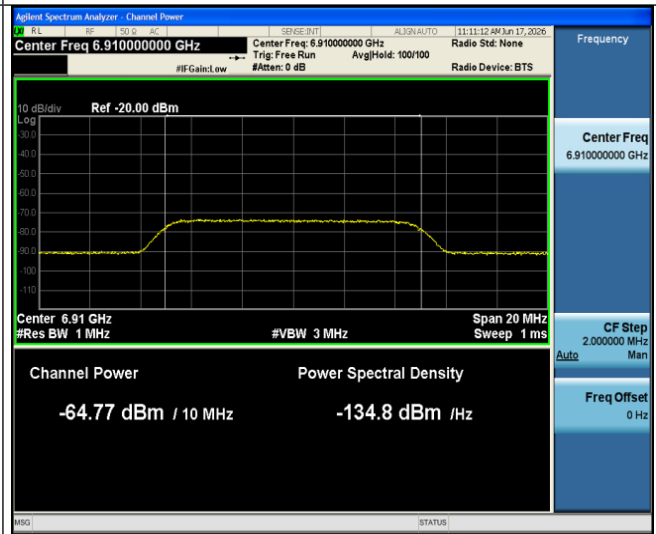
Note: Y means Detected, N means not Detected

Plots of Incumbent Signal (AWGN) Level

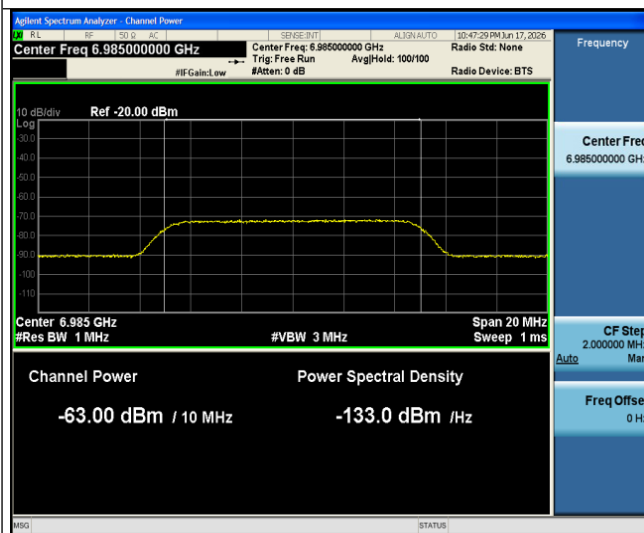
802.11ax (HEW20) / CH209



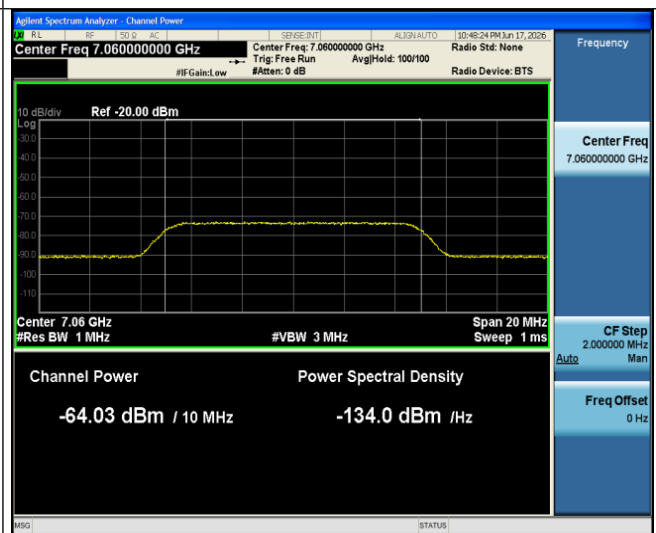
802.11ax (HEW160) / CH207 (Low Edge)



802.11ax (HEW160) / CH207 (Middle Edge)



802.11ax (HEW160) / CH207 (High Edge)



Plots of EUT Ceased Transmission In The Time Domain

802.11ax (HEW20) / CH209



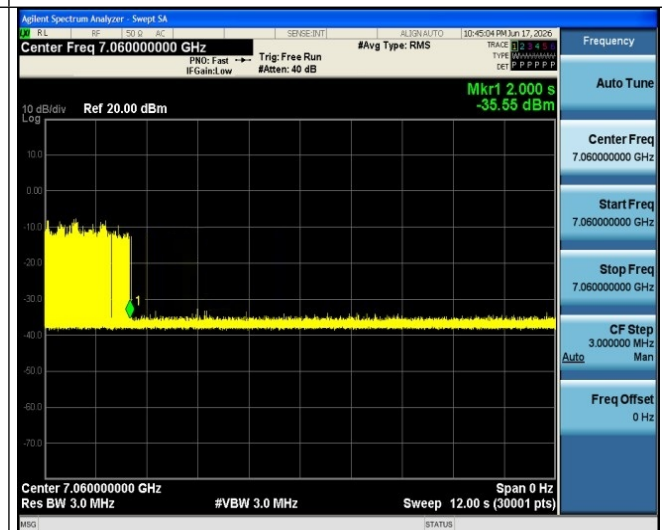
802.11ax (HEW160) / CH207 (Low Edge)



802.11ax (HEW160) / CH207 (Middle Edge)



802.11ax (HEW160) / CH207 (High Edge)



3.5 Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Test Result:

The device used 50 Ω FPC Antenna, the maximum gain of antenna is 3.58dBi. There is no consideration of replacement the antenna.

4 Test Setup Photographs of EUT

Please refer to separated files for Test Setup Photos of the EUT.

5 External Photographs of EUT

Please refer to separated files for External Photos of the EUT.

6 Internal Photographs of EUT

Please refer to separated files for Internal Photos of the EUT.

***** **End of Report** *****