

FCC TEST REPORT

Product Name: Tablet
Trade Mark: BLU
Model No.: M10L PLUS
Report Number: 2309056740RFC-4
Test Standards: FCC 47 CFR Part 15 Subpart E
FCC ID: YHLBLUM10LP224
Test Result: PASS
Date of Issue: November 6, 2023

Prepared for:

BLU Products, Inc.
8600 NW 36th Street, Suite #200 Doral, FL 33166

Prepared by:

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November 6, 2023

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Version

Version No.	Date	Description
V1.0	November 6, 2023	Original



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1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	BLU Products, Inc.
Address of Applicant:	8600 NW 36th Street, Suite #200 Doral, FL 33166
Manufacturer:	BLU Products, Inc.
Address of Manufacturer:	8600 NW 36th Street, Suite #200 Doral, FL 33166

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	Tablet		
Model No.:	M10L PLUS		
Trade Mark:	BLU		
DUT Stage:	Identical Prototype		
EUT Supports Function: (Provided by the customer)	GSM Bands:	GSM850/PCS 1900	
	UTRA Bands:	WCDMA Band II/ Band IV/ Band V	
	E-UTRA Bands:	FDD Band 2/ Band 4/ Band 5/ Band 12/ Band 17/ Band 25 / Band 26 / Band 66/ Band 71	
		TDD Band 41	
	2.4 GHz ISM Band:	IEEE 802.11b/g/n	
		Bluetooth 5.0	
	5 GHz U-NII Bands:	5 150 MHz to 5 250 MHz	IEEE 802.11a/n/ac
		5 250 MHz to 5 350 MHz	IEEE 802.11a/n/ac
		5 725 MHz to 5 850 MHz	IEEE 802.11a/n/ac
	RNSS Band:	1559 MHz to 1610 MHz	GPS/ GLONASS / Galileo/ BDS
	BSR:	VHF Band II	FM
Software Version:	BLU_M0224_ND_V13.0.04.03_GENERIC (Provided by the customer)		
Hardware Version:	P612D2-V1 (Provided by the customer)		
Sample Received Date:	September 5, 2023		
Sample Tested Date:	September 11, 2023 to September 26, 2023		
Remark:	The above EUT's information was provided by customer. Please refer to the specifications or user's manual for more detailed description.		

1.2.2 Description of Accessories

Adapter	
Model No.:	US-HY-2000
Input:	100-240 V~50/60 Hz 0.3 A
Output:	5.0 V $\equiv$ 2000 mA

Cable	
Connector:	USB Cable
Cable Type:	Unshielded without ferrite
Length:	0.5 Meter

Battery	
Model No.:	C1279829500P
Battery Type:	Lithium-ion Polymer Battery
Rated Voltage:	3.8 Vdc
Rated Capacity:	5000 mAh

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1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

Frequency Bands:	5150 MHz to 5250 MHz (U-NII-1)			
	5250 MHz to 5350 MHz (U-NII-2A)			
	5725 MHz to 5850 MHz (U-NII-3)			
Frequency Ranges:	5180 MHz to 5240 MHz			
	5260 MHz to 5320 MHz			
	5745 MHz to 5825 MHz			
Support Standards:	IEEE 802.11a/n/ac			
TPC Function:	Not Support			
DFS Operational mode:	Slave without radar Interference detection function			
Type of Modulation:	IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK)			
	IEEE 802.11n: OFDM(64QAM, 16QAM, QPSK, BPSK)			
	IEEE 802.11ac: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK)			
Channel Spacing:	IEEE 802.11a/n-HT20/ac-VHT20: 20 MHz			
	IEEE 802.11n-HT40/ac-VHT40: 40 MHz			
	IEEE 802.11ac-VHT80: 80 MHz			
Data Rate:	IEEE 802.11a: Up to 54 Mbps			
	IEEE 802.11n-HT20: Up to MCS7			
	IEEE 802.11n-HT40: Up to MCS7			
	IEEE 802.11ac-VHT20: Up to MCS8			
	IEEE 802.11ac-VHT40: Up to MCS9			
	IEEE 802.11ac-VHT80: Up to MCS9			
Number of Channels:	5150 MHz to 5250 MHz: 4 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40/ac-VHT40 1 for IEEE 802.11acVHT80			
	5250 MHz to 5350 MHz: 4 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40/ac-VHT40 1 for IEEE 802.11acVHT80			
	5725 MHz to 5850 MHz: 5 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40/ac-VHT40 1 for IEEE 802.11ac-VHT80			
Antenna Type:	FPCB Antenna			
Antenna Gain: (Provided by the customer)	5150 MHz to 5250 MHz	1.5 dBi		
	5250 MHz to 5350 MHz	1.5 dBi		
	5725 MHz to 5850 MHz	1.5 dBi		
Maximum conducted output power (dBm):		U-NII-1	U-NII-2A	U-NII-3
	IEEE 802.11a:	8.37	8.66	8.87
	IEEE 802.11n-HT20:	7.88	7.87	7.72
	IEEE 802.11n-HT40:	7.78	7.94	7.66
	IEEE 802.11ac-VHT20:	3.94	3.89	3.60
	IEEE 802.11ac-VHT40:	3.73	3.83	3.86
	IEEE 802.11ac-VHT80:	4.04	4.23	4.46
Normal Test Voltage:	3.7 Vdc			

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1.4 OTHER INFORMATION

Operation Frequency Each of Channel					
	U-NII-1		U-NII-2A		U-NII-3
IEEE 802.11a, IEEE 802.11n-HT20, IEEE 802.11ac-VHT20	f = 5000 + 5k, k = 32 + 4n				f = 5000 + 5k, k = 145 + 4n
	n = 1,..., 4	n = 5,..., 8	n = 17,..., 27		n = 1,..., 5
IEEE 802.11n-HT40, IEEE 802.11ac-VHT40	f = 5000 + 5k, k = 30 + 8n				f = 5000 + 5k, k = 143 + 8n
	n = 1, 2	n = 1,..., 5	n = 9,..., 13		n = 1, 2
IEEE 802.11ac-VHT80	f = 5000 + 5k, k = 26 + 16n				f = 5000 + 5k, k = 155
	n = 1	n = 1, 2	n = 5, 6		
Note: f is the operating frequency (MHz); k is the operating channel.					

1.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	Supplied by
Notebook	DELL	Inspiron 5409	N/A	Notebook
Mouse	DELL	MS111	CN-011D3V-738	UnionTrust
Wireless Home Router	SAGEMCOM	FAST5280	253703944	UnionTrust
Key-Press Attenuator	Huaxin	KT2.5-90/1S-2S	N/A	UnionTrust
2 Way Divider	WOKEN	N/A	N/A	UnionTrust
Directional coupler	Talent Microwave	TC-05180-10S	220706036	UnionTrust

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Antenna Cable	SMA	0.1 Meter	Applicant

1.6 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

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1.7 TEST FACILITY

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

CNAS-Lab Code: L9069

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC 17025 to

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international or national standards. Equipment has been calibrated by accredited calibration laboratories.

A2LA-Lab Certificate No.: 4312.01

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Wireless Device Testing Laboratories

CAB identifier: CN0032

FCC Accredited Lab.

Designation Number: CN1194

Test Firm Registration Number: 259480

1.8 DEVIATION FROM STANDARDS

None.

1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

1.11 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted emission 9kHz-150kHz	±3.2 dB
2	Conducted emission 150kHz-30MHz	±2.7 dB
3	Radiated emission 9kHz-30MHz	± 4.7 dB
4	Radiated emission 30MHz-1GHz	± 4.9 dB
5	Radiated emission 1GHz-18GHz	± 4.8 dB
6	Radiated emission 18GHz-26GHz	± 5.1 dB
7	Radiated emission 26GHz-40GHz	± 5.1 dB
8	Conducted spurious emissions	± 2.7 dB
9	RF Power, Conducted	± 0.68 dB
10	Occupied Bandwidth	± 1.86 %
11	Radio Frequency	5.6 GHz: ± 6.4 x 10 ⁻⁸
12	Transmission Time	± 0.19 %

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2. TEST SUMMARY

FCC 47 CFR Part 15 Subpart E Test Cases			
Test Item	Test Requirement	Test Method	Result
Antenna Requirement	FCC 47 CFR Part 15 Subpart C Section 15.203 FCC 47 CFR Part 15 Subpart E Section 15.407(a)(1) (2)	N/A	PASS
26 dB emission bandwidth	FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(2)(5)	KDB 789033 D02 v02r01 Section C.1	PASS
6 dB bandwidth	FCC 47 CFR Part 15 Subpart E Section 15.407 (e)	KDB 789033 D02 v02r01 Section C.2	PASS
Maximum conducted output power	FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)	KDB 789033 D02 v02r01 Section E.3.a (Method PM)	PASS
Peak Power Spectral Density	FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)	KDB 789033 D02 v02r01 Section F	PASS
Radiated Emissions and Band Edge Measurement	FCC 47 CFR Part 15 Subpart E Section 15.407 (b)(1)(2)(3)(4)(6) FCC 47 CFR Part 15 Subpart C Section 15.209/205	KDB 789033 D02 v02r01 Section G.3, G.4, G.5, and G.6	PASS
Dynamic Frequency Selection	FCC 47 CFR Part 15 Subpart E Section 15.407 (h)	KDB 905462 D03 Client Without DFS New Rules v01r02	N/A (Note 1, 2)
AC Power Line Conducted Emission	FCC 47 CFR Part 15 Subpart E Section 15.407 (b)(6) FCC 47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013, Section 6.2.	PASS
Note: 1) N/A: In this whole report not applicable. 2) This EUT does not support U-NII-2C frequency bands.			
Disclaimer and Explanations: The declared of product specification and data (e.g., antenna gain, RF specification, etc) for EUT presented in the report are provided by the customer, and the customer takes all the responsibilities for the accuracy of product specification.			

3. EQUIPMENT LIST

Radiated Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
☒	3m SAC	ETS-LINDGREN	3M	Euroshiedpn-CT001270-1317	22-Jan-2021	21-Jan-2024
☒	Receiver	R&S	ESIB26	100114	3-Nov-2022	2-Nov-2023
☒	EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY51440197	14-Apr-2023	13-Apr-2024
☒	Loop Antenna	ETS-LINDGREN	6502	00202525	21-Nov-2022	20-Nov-2023
☒	Broadband Antenna	ETS-LINDGREN	3142E	00201566	13-Dec-2022	12-Dec-2023
☒	6dB Attenuator	Talent	RA6A5-N-18	18103001	13-Dec-2022	12-Dec-2023
☒	Preamplifier	HP	8447F	2805A02960	1-Nov-2022	31-Oct-2023
☒	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201541	16-Apr-2023	15-Apr-2025
☒	Pre-amplifier	ETS-LINDGREN	00118385	00201874	1-Nov-2022	31-Oct-2023
☒	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3116C-PA	00202652	21-Nov-2022	20-Nov-2023
☒	Pre-amplifier	ETS-LINDGREN	00118384	00202652	21-Nov-2022	20-Nov-2023
☒	Band Rejection Filter (5150MHz~5880MHz)	Micro-Tronics	BRM50716	G186	2-Nov-2022	1-Nov-2023
☒	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A
☒	Test Software	Audix	e3	Software Version: 9.160323		

Conducted Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
☒	Receiver	R&S	ESR7	101181	1-Nov-2022	31-Oct-2023
☒	Pulse Limiter	R&S	ESH3-Z2	0357.8810.54	1-Nov-2022	31-Oct-2023
☒	LISN	R&S	ESH2-Z5	860014/024	1-Nov-2022	31-Oct-2023
☐	LISN	ETS-Lindgren	3816/2SH	00201088	1-Nov-2022	31-Oct-2023
☒	Test Software	Audix	e3	Software Version: 9 20151119i		

RF Conducted Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
☒	EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY51440197	14-Apr-2023	13-Apr-2024
☒	USB Wideband Power Sensor	KEYSIGHT	U2021XA	MY55430035	3-Nov-2022	2-Nov-2023
☐	EXG-B RF Analog Signal Generator	KEYSIGHT	N5171B	MY53051777	1-Nov-2022	31-Oct-2023
☐	MXG X-Series RF Vector Signal Generator	KEYSIGHT	N5182B	MY51350267	1-Nov-2022	31-Oct-2023

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4. TEST CONFIGURATION

4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

4.1.1 Normal or Extreme Test Conditions

Environment Parameter	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage	Relative Humidity (%)
NT/NV	+15 to +35	3.7 Vdc	20 to 75
Remark: 1) NV: Normal Voltage; NT: Normal Temperature			

4.1.2 Record of Normal Environment and Test Sample

Test Item	Temp. (°C)	Relative Humidity (%)	Pressure (kPa)	Sample No.	Tested by
AC Power Line Conducted Emission	25.0	61.5	99.7	S202309012055-ZJA05/6	Lucas Ouyang
26 dB emission bandwidth	24.1	54.2	99.6	S202309012055-ZJA01/6	Rain Wang
Maximum conducted output power					
Peak Power Spectral Density					
6 dB bandwidth	24.7	59.7	99.2	S202309012055-ZJA05/6	Fire Huo
Radiated Emissions and Band Edge Measurement					

4.2 TEST CHANNELS

Mode	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
IEEE 802.11a IEEE 802.11n-HT20 IEEE 802.11ac-VHT20	5150 MHz to 5250 MHz	Channel 36	Channel 44	Channel 48
		5180 MHz	5220 MHz	5240 MHz
	5250 MHz to 5350 MHz	Channel 52	Channel 60	Channel 64
		5260 MHz	5300 MHz	5320 MHz
	5725 MHz to 5850 MHz	Channel 149	Channel 157	Channel 165
		5745 MHz	5785 MHz	5825 MHz
IEEE 802.11n-HT40 IEEE 802.11ac-VHT40	5150 MHz to 5250 MHz	Channel 38	--	Channel 46
		5190 MHz	--	5230 MHz
	5250 MHz to 5350 MHz	Channel 54	--	Channel 62
		5270 MHz	--	5310 MHz
	5725 MHz to 5850 MHz	Channel 151	--	Channel 159
		5755 MHz	--	5795 MHz
IEEE 802.11ac-VHT80	5150 MHz to 5250 MHz	--	Channel 42	--
		--	5210 MHz	--
	5250 MHz to 5350 MHz	--	Channel 58	--
		--	5290 MHz	--
	5725 MHz to 5850 MHz	--	Channel 155	--
		--	5775 MHz	--

4.3 EUT TEST STATUS

Mode	Tx/Rx Function	Description
IEEE 802.11a/n/ac	1Tx/1Rx	1. Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.

Power Setting (Provided by the customer)			
Mode	U-NII-1	U-NII-2A	U-NII-3
IEEE 802.11a	10.50	10.50	10.50
IEEE 802.11n-HT20	10.00	10.00	9.50
IEEE 802.11n-HT40	10.00	10.00	9.50
IEEE 802.11ac-VHT20	6.50	6.00	5.50
IEEE 802.11ac-VHT40	6.00	6.00	6.00
IEEE 802.11ac-VHT80	6.50	6.50	6.50
Test Software (Provided by the customer)			
Engineering mode: *## 3646633##*			

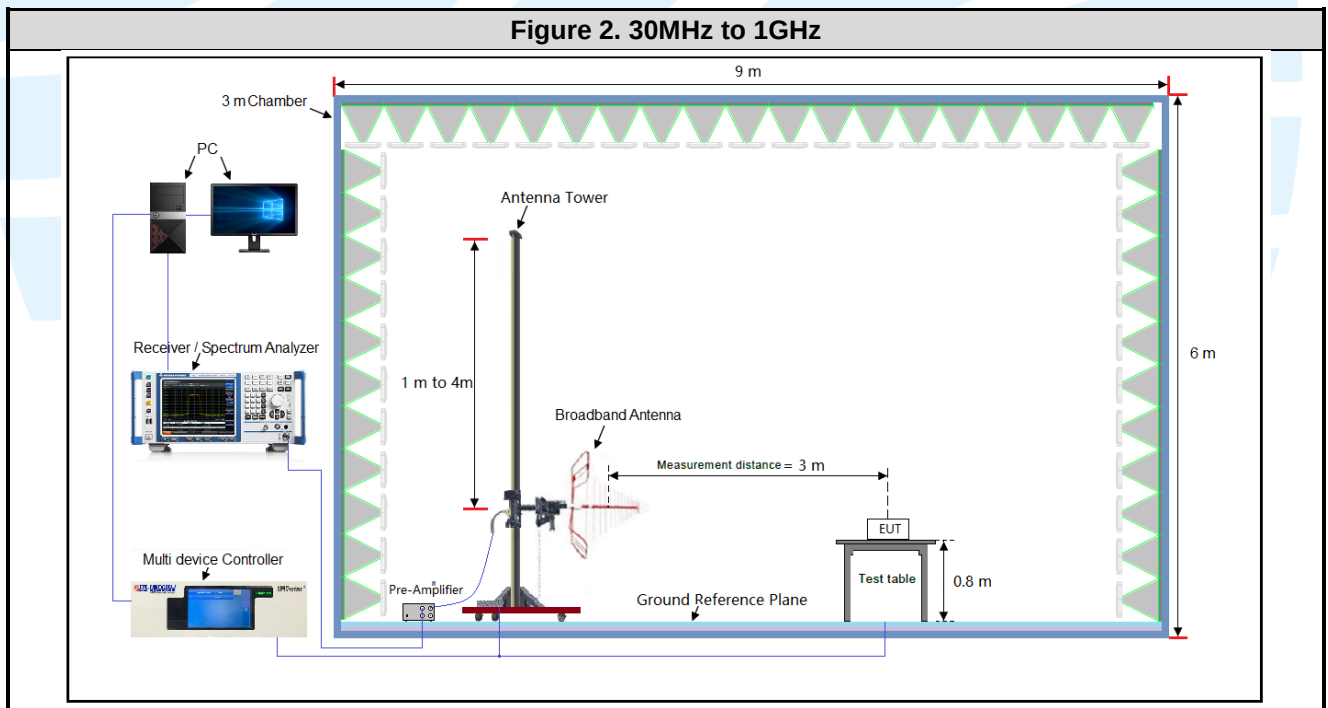
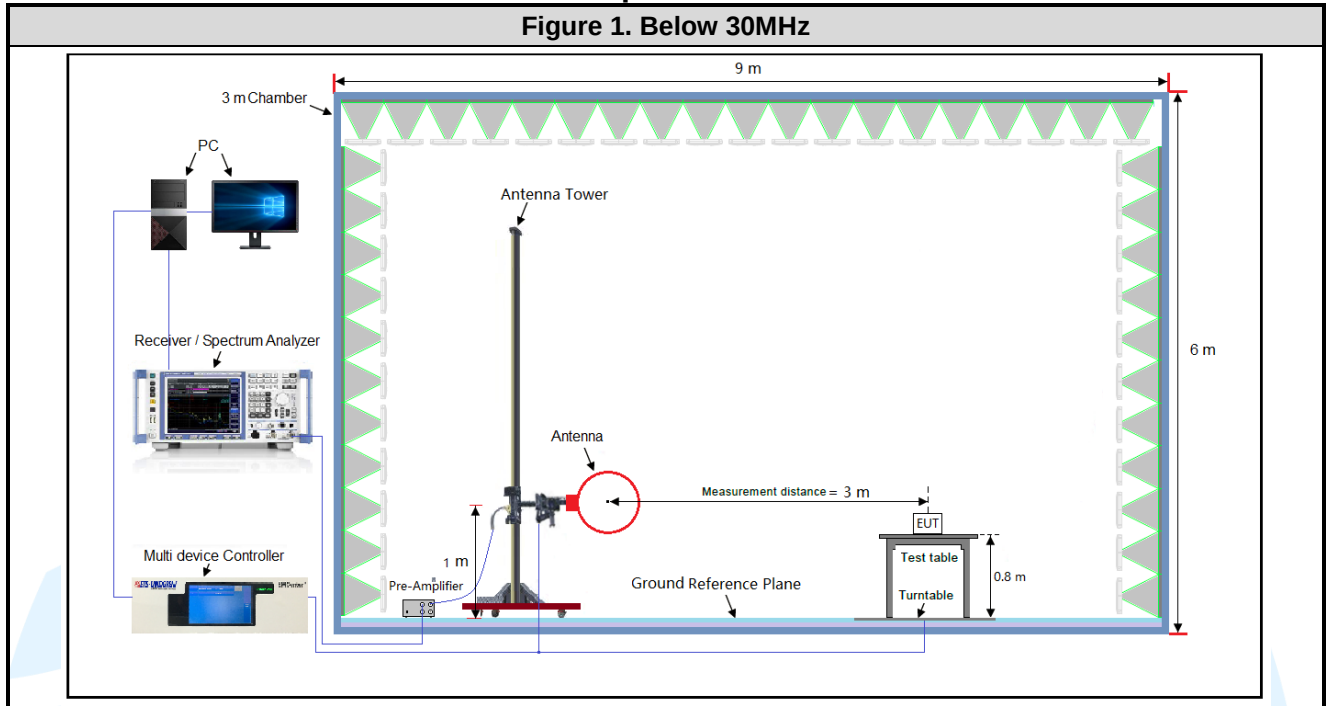
4.4 PRE-SCAN

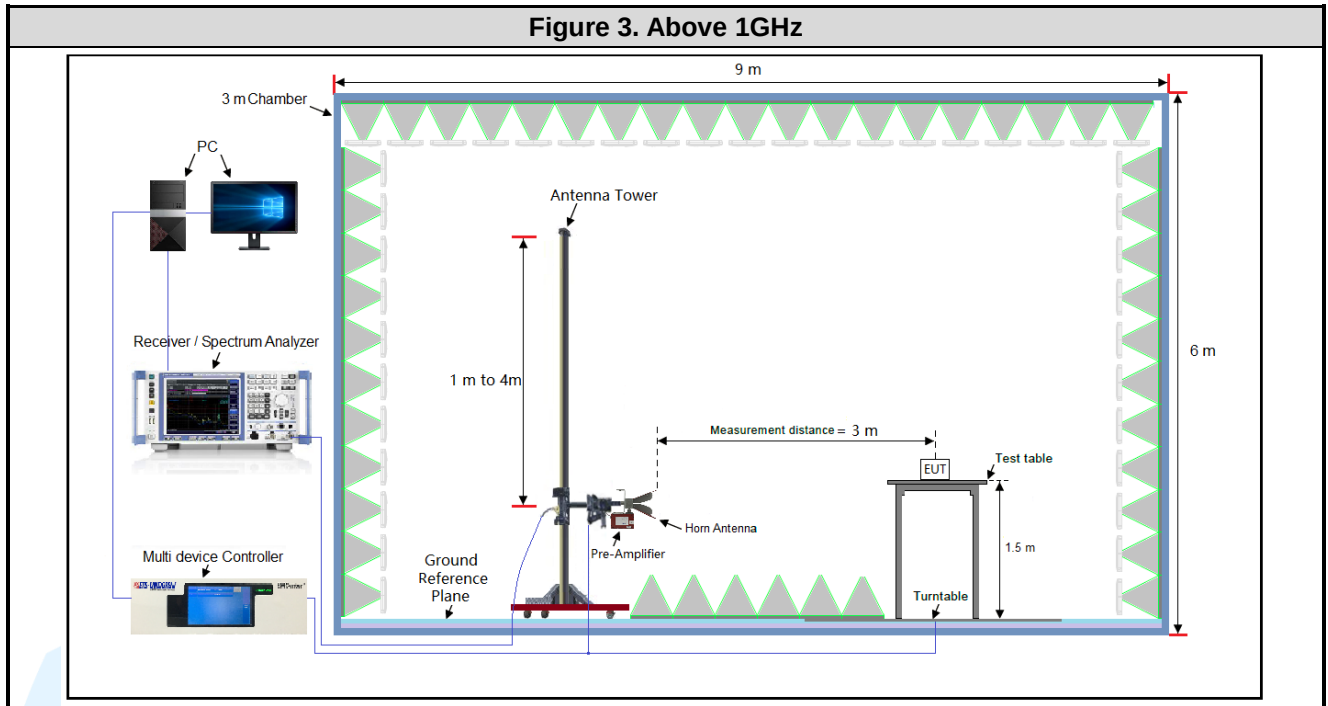
Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and data rate. Following data rate was (were) selected for the final test as listed below

Mode	Worst-case data rates
IEEE 802.11a	6 Mbps
IEEE 802.11n-HT20	MCS0
IEEE 802.11n-HT40	MCS0
IEEE 802.11ac-VHT20	MCS0
IEEE 802.11ac-VHT40	MCS0
IEEE 802.11ac-VHT80	MCS0

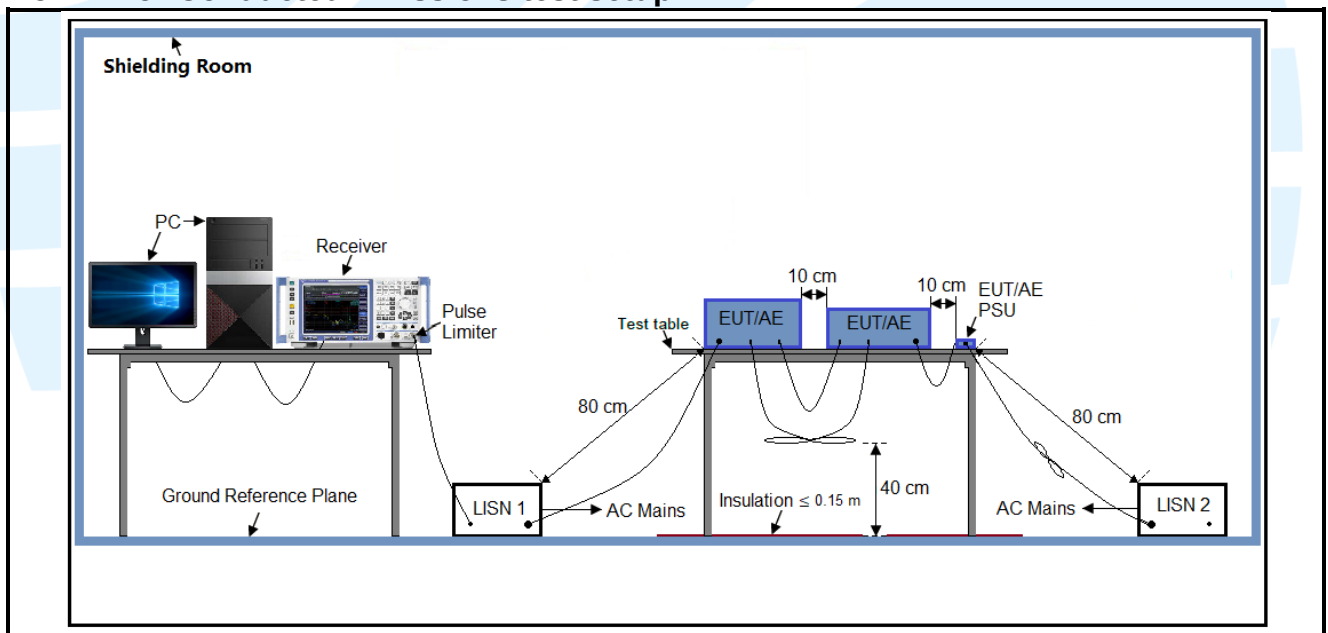
4.5 TEST SETUP

4.5.1 For Radiated Emissions test setup

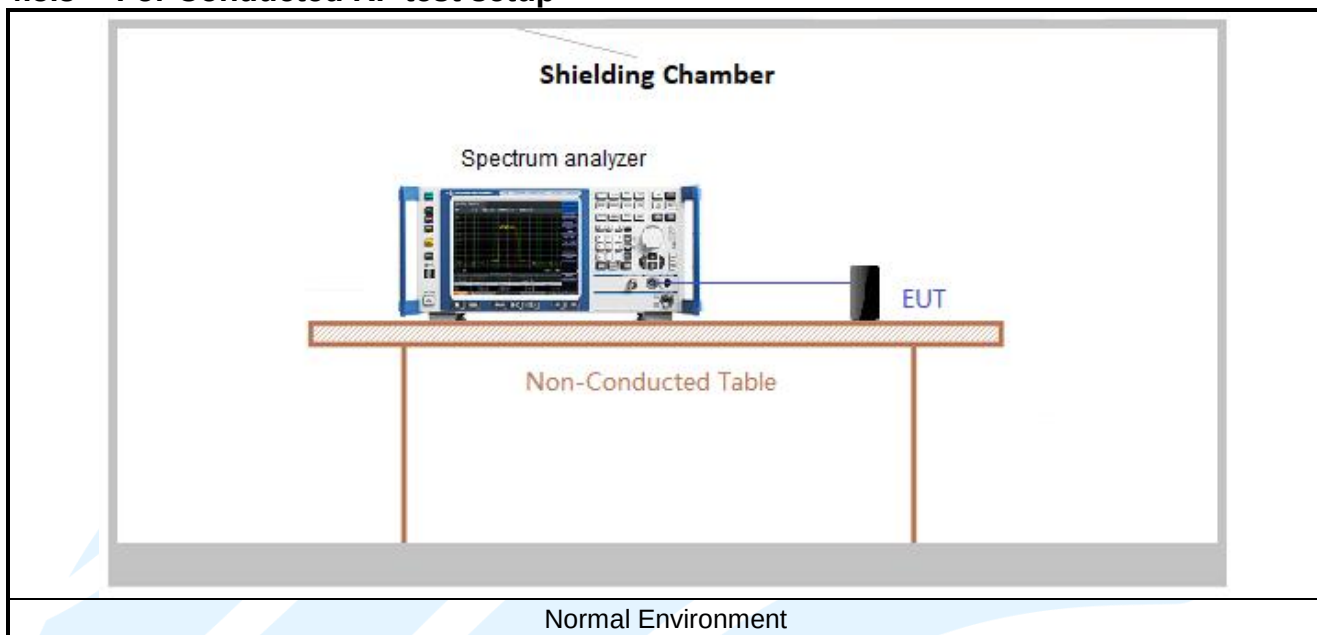




4.5.2 For Conducted Emissions test setup



4.5.3 For Conducted RF test setup



4.6 SYSTEM TEST CONFIGURATION

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by a 3.7V battery. Only the worst case data were recorded in this test report.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Therefore, all final radiated testing was performed with the EUT in orientation.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

4.7 DUTY CYCLE

Test Procedure: ANSI C63.10-2013 Clause 12.2.

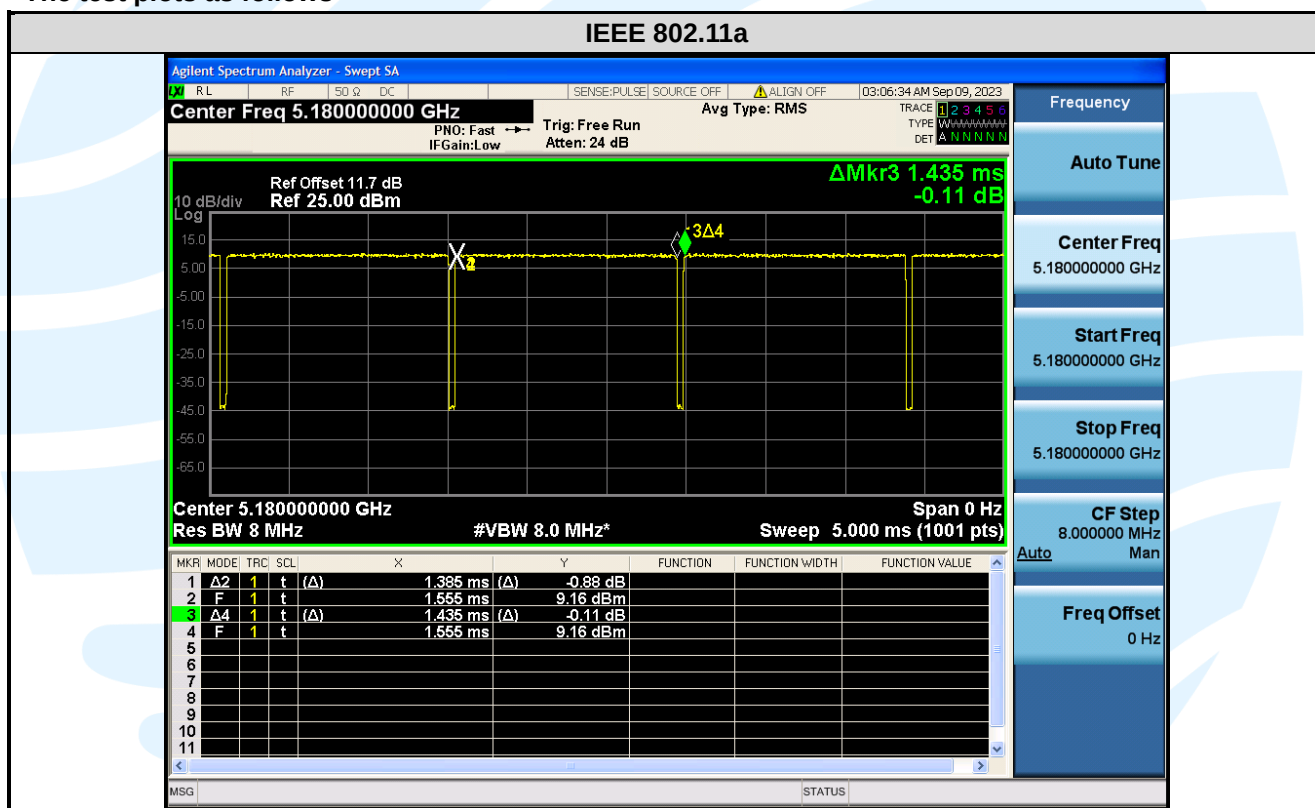
Test Results

Mode	Data Rates	On Time (msec)	Period (msec)	Duty Cycle (linear)	Duty Cycle (%)	Duty Cycle Factor (dB)	1/T Minimum VBW (kHz)
IEEE 802.11a	6 Mbps	1.385	1.435	0.97	96.52	0.15	0.72
IEEE 802.11n-HT20	MCS 0	1.295	1.345	0.96	96.28	0.16	0.77
IEEE 802.11n-HT40	MCS 0	0.640	0.690	0.93	92.75	0.33	1.56
IEEE 802.11ac-VHT20	MCS 0	1.305	1.355	0.96	96.31	0.16	0.77
IEEE 802.11ac-VHT40	MCS 0	0.645	0.695	0.93	92.81	0.32	1.55
IEEE 802.11ac-VHT80	MCS 0	0.321	0.369	0.87	86.99	0.61	3.12

Remark:

- 1) Duty cycle= On Time/ Period;
- 2) Duty Cycle factor = $10 * \log(1/ \text{Duty cycle})$;

The test plots as follows



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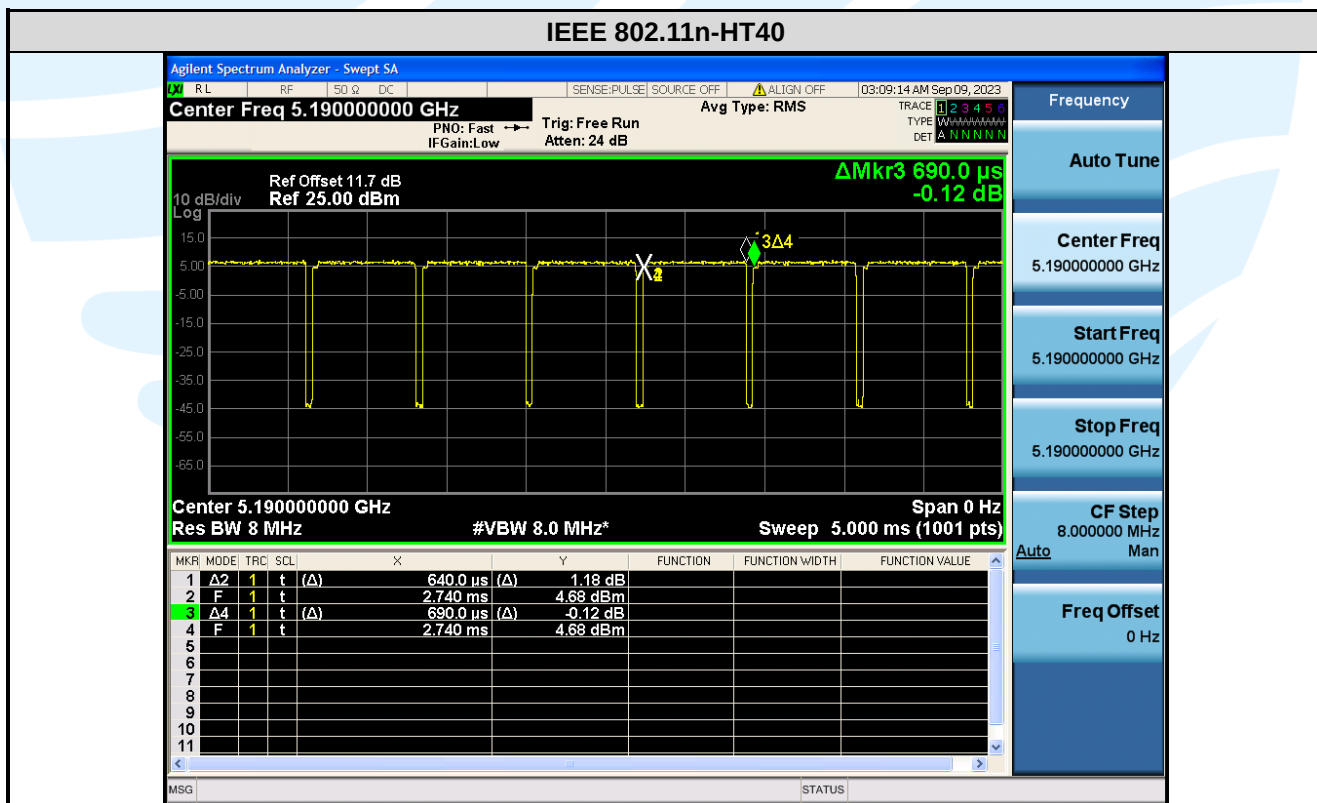
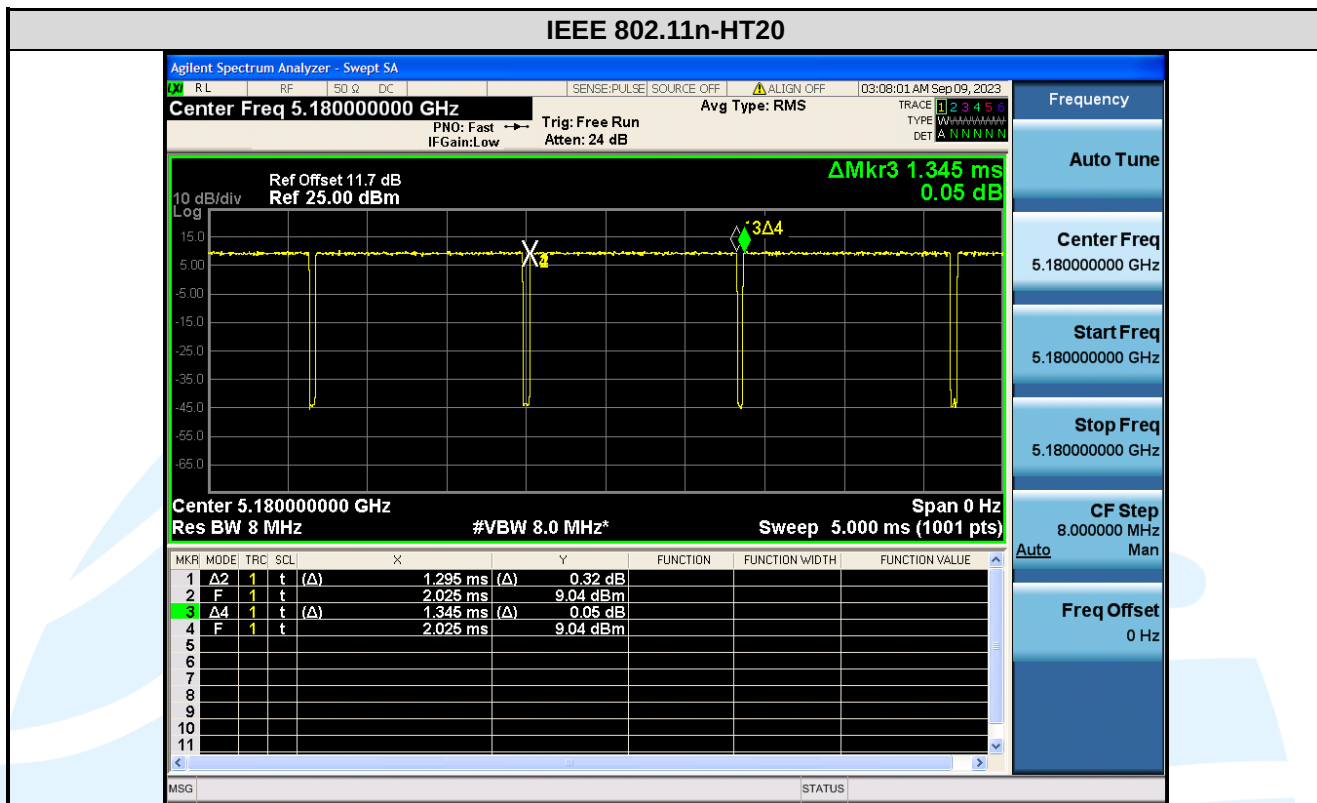
Tel: +86-755-28230888

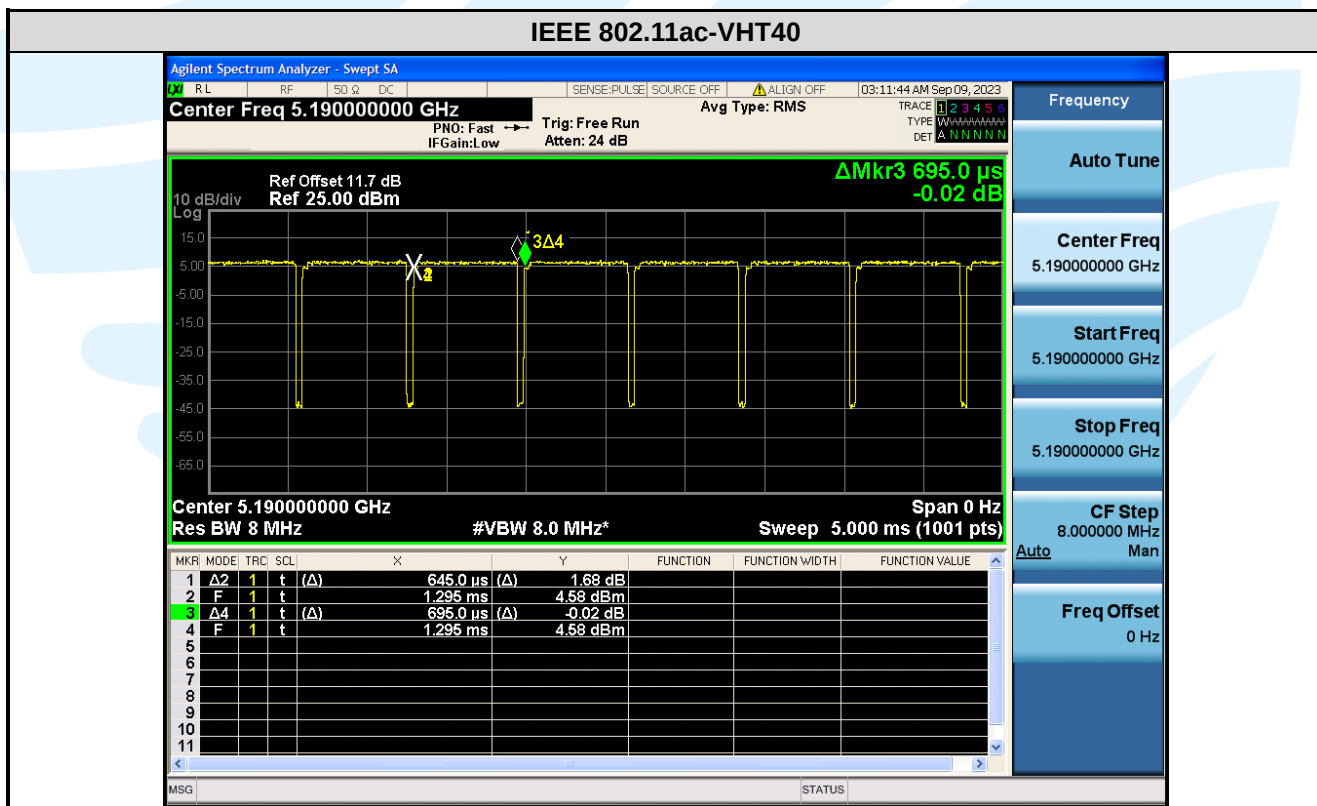
Fax: +86-755-28230886

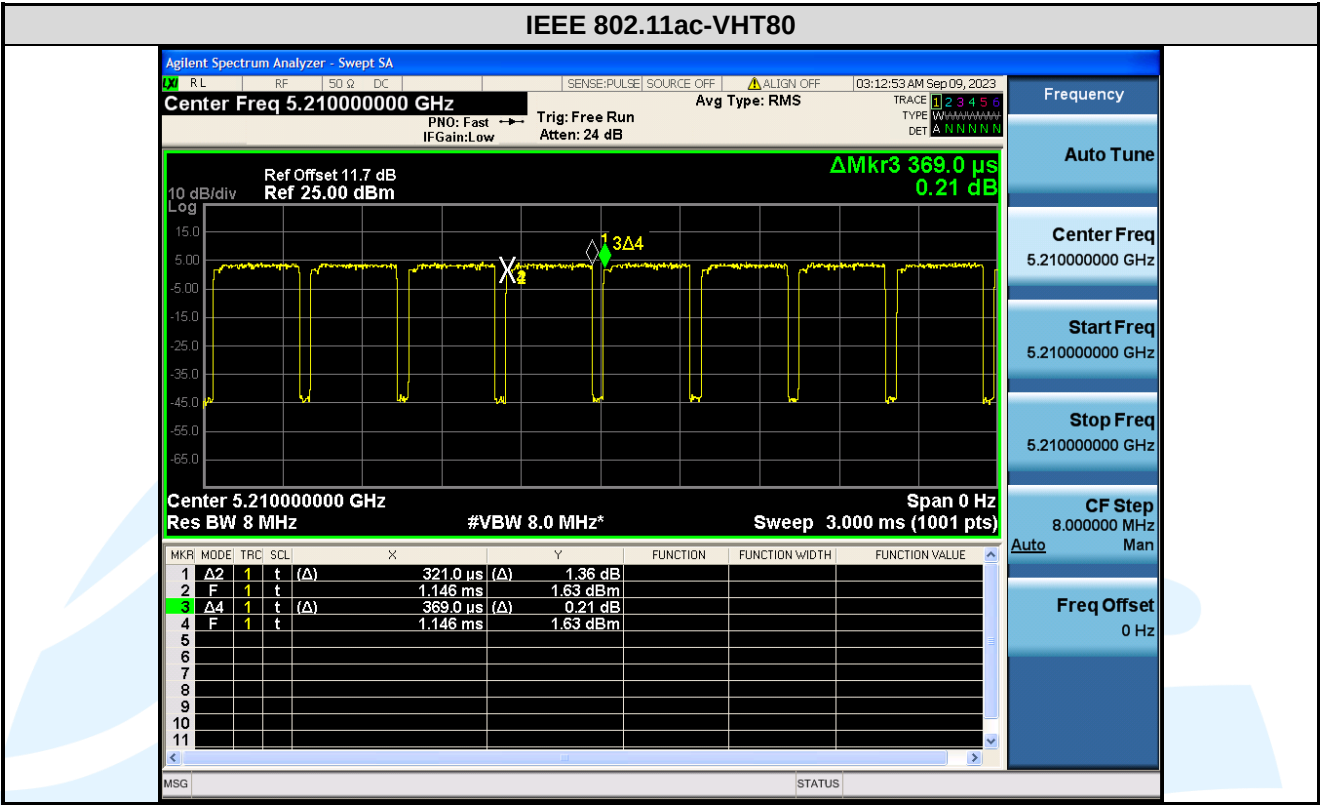
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5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION

5.1 REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 15	Radio Frequency Devices
3	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
4	KDB 789033 D02 General UNII Test Procedures New Rules v02r01	Guidelines for compliance testing of unlicensed national information infrastructure (U-NII) device part 15, subpart E
5	KDB 905462 D06 802.11 Channel Plans New Rules v02	Operation in U-NII bands -802.11 channel PLAN(\$15.407)
6	KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02	Compliance measurement procedures for Unlicensed –National Information Infrastructure devices operates in the frequency bands 5250 MHz to 5350 MHz and 5470 MHz to 5725 MHz bands incorporating dynamic frequency selection

5.2 ANTENNA REQUIREMENT

Standard Requirement
15.203 requirement: 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. 15.407(a)(1) (2) requirement: The conducted output power limit specified in paragraph (a) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (a) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power and the peak power spectral density shall be reduced by the by the amount in dB that the directional gain of the antenna exceeds 6 dBi. EUT Antenna: Antenna in the interior of the equipment and no consideration of replacement. The max gain of the antenna is 1.5 dBi.

5.326 DB BANDWIDTH

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a) (2)(5)

Test Method: KDB 789033 D02 v02r01 Section C.1

Limit: None; for reporting purposes only.

Test Procedure:

The output from the transmitter was connected to an attenuator and then to the input of the RF Spectrum analyzer.

Spectrum analyzer according to the following Settings:

a) Set RBW = approximately 1 % of the emission bandwidth.

b) Set the VBW > RBW.

c) Detector = Peak.

d) Trace mode = max hold.

e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Please refer to Appendix A

5.46 DB BANDWIDTH

Test Requirement: FCC 47 CFR Part 15 Subpart C Section 15.407 (e)

Test Method: KDB 789033 D02 v02r01Section C.2

Limit: Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Test Procedure:

The output from the transmitter was connected to an attenuator and then to the input of the RF Spectrum Analyzer.

Spectrum analyzer according to the following Settings:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 * \text{RBW}$.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Please refer to Appendix A

5.5 MAXIMUM CONDUCTED OUTPUT POWER

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)

Test Method: KDB 789033 D02 v02r01 Section E.3.a(Method PM)

Limits:

1. For the band 5.15-5.25 GHz.
 - (i) For an outdoor 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. In addition, the maximum power spectral density shall not exceed 17 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. 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).
 - (ii) For 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. In addition, the maximum power spectral density shall not exceed 17 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.
 - (iii) For fixed point-to-point access points 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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
 - (iv) 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. In addition, 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.
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. In addition, 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 band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz 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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Test Procedure:

1. Connected the EUT's antenna port to measure device by 10dB attenuator.
2. Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of Tx on burst.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Transmitter mode

Test Results: Pass

Test Data:

Antenna gain and the maximum output power limit.

Frequency Band	Antenna Gain (dBi)	Peak Power Limits (dBm)
U-NII-1	1.5	24.0
U-NII-2A	1.5	24.0
U-NII-3	1.5	30.0

For U-NII-1 Band:

Mode	Channel/ Frequency (MHz)	Maximum conducted output power (dBm)		Limit (dBm)	Result
		Meas Power	Corr'd Power		
IEEE 802.11a	36 (5180)	8.12	8.27	24	Pass
	44 (5220)	8.21	8.36	24	Pass
	48 (5240)	8.22	8.37	24	Pass
IEEE 802.11n-HT20	36 (5180)	7.61	7.77	24	Pass
	44 (5220)	7.63	7.79	24	Pass
	48 (5240)	7.72	7.88	24	Pass
IEEE 802.11n-HT40	38 (5190)	7.41	7.74	24	Pass
	46 (5230)	7.45	7.78	24	Pass
IEEE 802.11ac-VHT20	36 (5180)	3.65	3.81	24	Pass
	44 (5220)	3.78	3.94	24	Pass
	48 (5240)	3.77	3.93	24	Pass
IEEE 802.11ac-VHT40	38 (5190)	3.41	3.73	24	Pass
	46 (5230)	3.32	3.64	24	Pass
IEEE 802.11ac-VHT80	42 (5210)	3.43	4.04	24	Pass

Remark:

1. Corr'd Power = Meas Power + Duty Cycle Factor

For U-NII-2A Band:

Mode	Channel/ Frequency (MHz)	Maximum conducted output power (dBm)		Limit (dBm)	Pass / Fail
		Meas Power	Corr'd Power		
IEEE 802.11a	52 (5260)	8.33	8.48	23.94	Pass
	60 (5300)	8.41	8.56	23.94	Pass
	64 (5320)	8.51	8.66	23.94	Pass
IEEE 802.11n-HT20	52 (5260)	7.71	7.87	23.94	Pass
	60 (5300)	7.53	7.69	23.94	Pass
	64 (5320)	7.62	7.78	23.94	Pass
IEEE 802.11n-HT40	54 (5270)	7.51	7.84	23.94	Pass
	62 (5310)	7.61	7.94	23.94	Pass
IEEE 802.11ac-VHT20	52 (5260)	3.73	3.89	23.94	Pass
	60 (5300)	3.71	3.87	23.94	Pass
	64 (5320)	3.63	3.79	23.94	Pass
IEEE 802.11ac-VHT40	54 (5270)	3.51	3.83	23.94	Pass
	62 (5310)	3.49	3.81	23.94	Pass
IEEE 802.11ac-VHT80	58 (5290)	3.62	4.23	23.94	Pass

Remark:

1. Corr'd Power = Meas Power + Duty Cycle Factor

Note:

For IEEE 802.11 a/n/ac, the minimum 26 dB emission bandwidth is 19.67 MHz
 $11 \text{ dBm} + 10\log_{10}(19.67) = 23.94 \text{ dBm} < 24 \text{ dBm (250mW)}$
 So the 24 dB limit applicable

For U-NII-3 Band:

Mode	Channel/ Frequency (MHz)	Maximum conducted output power (dBm)		Limit (dBm)	Result
		Meas Power	Corr'd Power		
IEEE 802.11a	149 (5745)	8.72	8.87	30	Pass
	157 (5785)	8.66	8.81	30	Pass
	165 (5825)	8.65	8.80	30	Pass
IEEE 802.11n-HT20	149 (5745)	7.55	7.71	30	Pass
	157 (5785)	7.44	7.60	30	Pass
	165 (5825)	7.56	7.72	30	Pass
IEEE 802.11n-HT40	151 (5755)	7.32	7.65	30	Pass
	159 (5795)	7.33	7.66	30	Pass
IEEE 802.11ac-VHT20	149 (5745)	3.41	3.57	30	Pass
	157 (5785)	3.44	3.60	30	Pass
	165 (5825)	3.38	3.54	30	Pass
IEEE 802.11ac-VHT40	151 (5755)	3.39	3.71	30	Pass
	159 (5795)	3.54	3.86	30	Pass
IEEE 802.11ac-VHT80	155 (5775)	3.85	4.46	30	Pass

Remark:

1. Corr'd Power = Meas Power + Duty Cycle Factor

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5.6 PEAK POWER SPECTRAL DENSITY

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3)

Test Method: KDB 789033 D02 v02r01 Section F

Limits:

1. For the band 5.15-5.25 GHz.
 - (i) For an outdoor 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. In addition, the maximum power spectral density shall not exceed 17 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. 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).
 - (ii) For 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. In addition, the maximum power spectral density shall not exceed 17 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.
 - (iii) For fixed point-to-point access points 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. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple colocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.
 - (iv) 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. In addition, 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.
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. In addition, 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 band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz 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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple colocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Test Procedure:

The output from the transmitter was connected to an attenuator and then to the input of the RF Spectrum Analyzer.

Spectrum analyzer according to the following Settings:

1. For U-NII-1, U-NII-2A band:

Using method SA-2

- a) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- b) Set RBW = 1 MHz, Set VBW $\geq$ 3 RBW, Detector = RMS
- c) Sweep time = auto, trigger set to "free run".
- d) Trace average at least 100 traces in power averaging mode.
- e) Record the max value and add 10 log (1/duty cycle)

2. For U-NII-3 band:

- a) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- b) Set RBW = 500 kHz, Set VBW $\geq$ 3 RBW, Detector = RMS
- c) Use the peak marker function to determine the maximum power level in any 500 kHz band segment within the fundamental EBW.
- d) Sweep time = auto, trigger set to "free run".
- e) Trace average at least 100 traces in power averaging mode.
- f) Record the max value and add 10 log (1/duty cycle)

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

Test Setup: Refer to section 4.5.3 for details.

Instruments Used: Refer to section 3 for details

Test Mode: Link mode

Test Results: Please refer to Appendix A

Antenna gain and the maximum output power limit.

Frequency Band	Antenna Gain (dBi)	PSD Limits (dBm/MHz or dBm/500kHz)
U-NII-1	1.5	11.0
U-NII-2A	1.5	11.0
U-NII-3	1.5	30.0

5.7 RADIATED EMISSIONS AND BAND EDGE MEASUREMENT

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (b)(1)(2)(3)(4)(6)
FCC 47 CFR Part 15 Subpart C Section 15.209/205

Test Method: KDB 789033 D02 v02r01 Section G.3, G.4, G.5, and G.6

Receiver Setup:

Frequency	RBW
0.009 MHz-0.150 MHz	200/300 kHz
0.150 MHz -30 MHz	9/10 kHz
30 MHz-1 GHz	100/120 kHz
Above 1 GHz	1 MHz

Limits:

1. Limits of Radiated Emission and Band edge Measurement

Radiated emissions that fall in the restricted bands must comply with the general emissions limits in 15.209(a) as below table. Other emissions shall be at least 20 dB below the highest level of the desired power.

Frequency	Field strength (microvolt/meter)	Limit (dBμV/m)	Remark	Measurement distance (m)
0.009 MHz-0.490 MHz	2400/F(kHz)	--	--	300
0.490 MHz-1.705 MHz	24000/F(kHz)	--	--	30
1.705 MHz-30 MHz	30	--	--	30
30 MHz-88 MHz	100	40.0	Quasi-peak	3
88 MHz-216 MHz	150	43.5	Quasi-peak	3
216 MHz-960 MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1 GHz	500	54.0	Average	3

Remark:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

2. Limits of Unwanted Emission Out of the Restricted Bands

Applicable To	Limit	
789033 D02 General U-NII Test Procedures New Rules v01r04	Field Strength at 3 m	
	PK: 74 (dBμV/m)	AV: 54 (dBμV/m)
Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
FCC Part 15.407 (b)(1)	PK: -27 (dBm/MHz)	PK: 74 (dBμV/m)
FCC Part 15.407 (b)(2)	PK: -27 (dBm/MHz)	PK: 74 (dBμV/m)
FCC Part 15.407 (b)(3)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m)
FCC Part 15.407 (b)(4)	27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;	PK: 68.2 (dBμV/m)
	15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;	
	10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges;	
	-27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.	

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Test Setup: Refer to section 4.5.1 for details.

Test Procedures:

1. The EUT was placed on the top of a rotating table 0.8 meters (for below 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
6. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Remark:

- a) The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
- b) The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
- c) The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for RMS Average (Duty cycle < 98 %) for Average detection (AV) at frequency above 1 GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
- d) The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz (Duty cycle $\geq 98 \%$) or $\geq 1/T$ (duty cycle is < 98%) for Average detection (AV) at frequency above 1 GHz.
- e) All modes of operation were investigated and the worst-case emissions are reported.

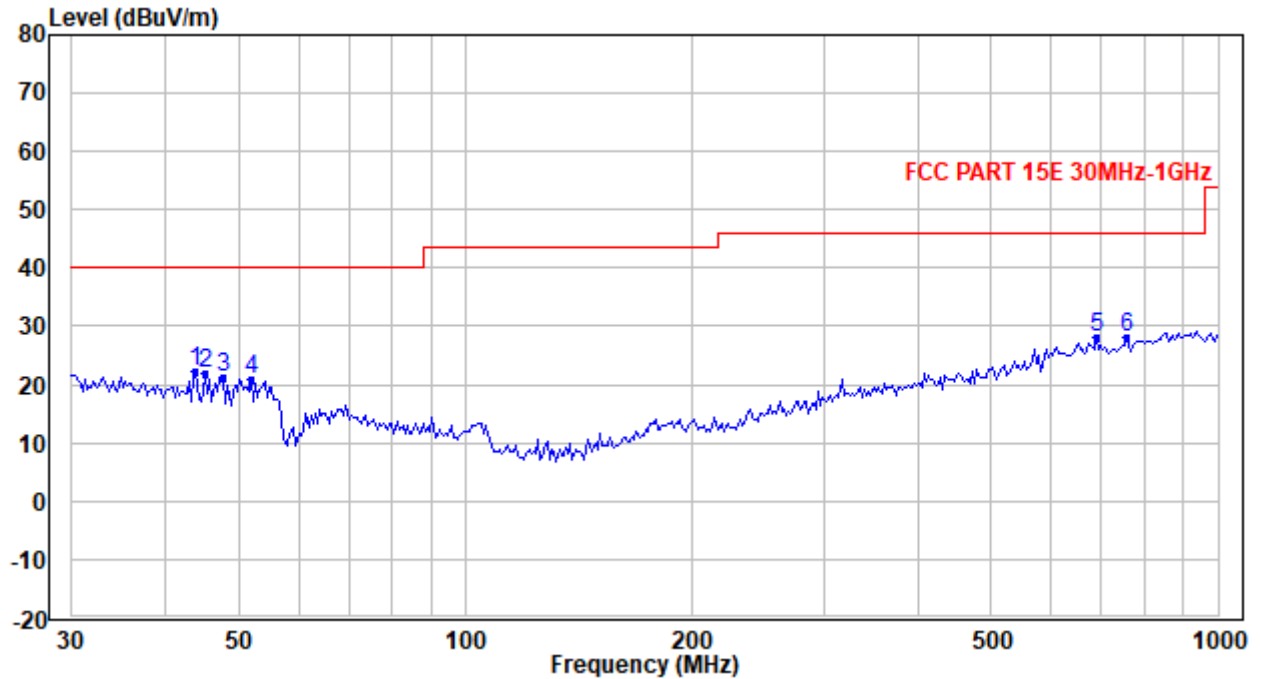
Equipment Used: Refer to section 3 for details.

Test Result: Pass

The measurement data as follows:

Radiated Emission Test Data (9 kHz ~ 30 MHz):

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

Radiated Emission Test Data (30 MHz ~ 1 GHz):**Worst-Case Configuration****Horizontal**

No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	43.845	32.6	-10.5	22.1	40.0	-17.9	QP
2	45.095	33.5	-11.5	22.0	40.0	-18.0	QP
3	47.703	34.7	-13.3	21.4	40.0	-18.6	QP
4	51.900	36.7	-15.6	21.1	40.0	-19.0	QP
5	689.051	26.0	2.0	28.0	46.0	-18.0	QP
6	754.963	25.7	2.5	28.2	46.0	-17.8	QP

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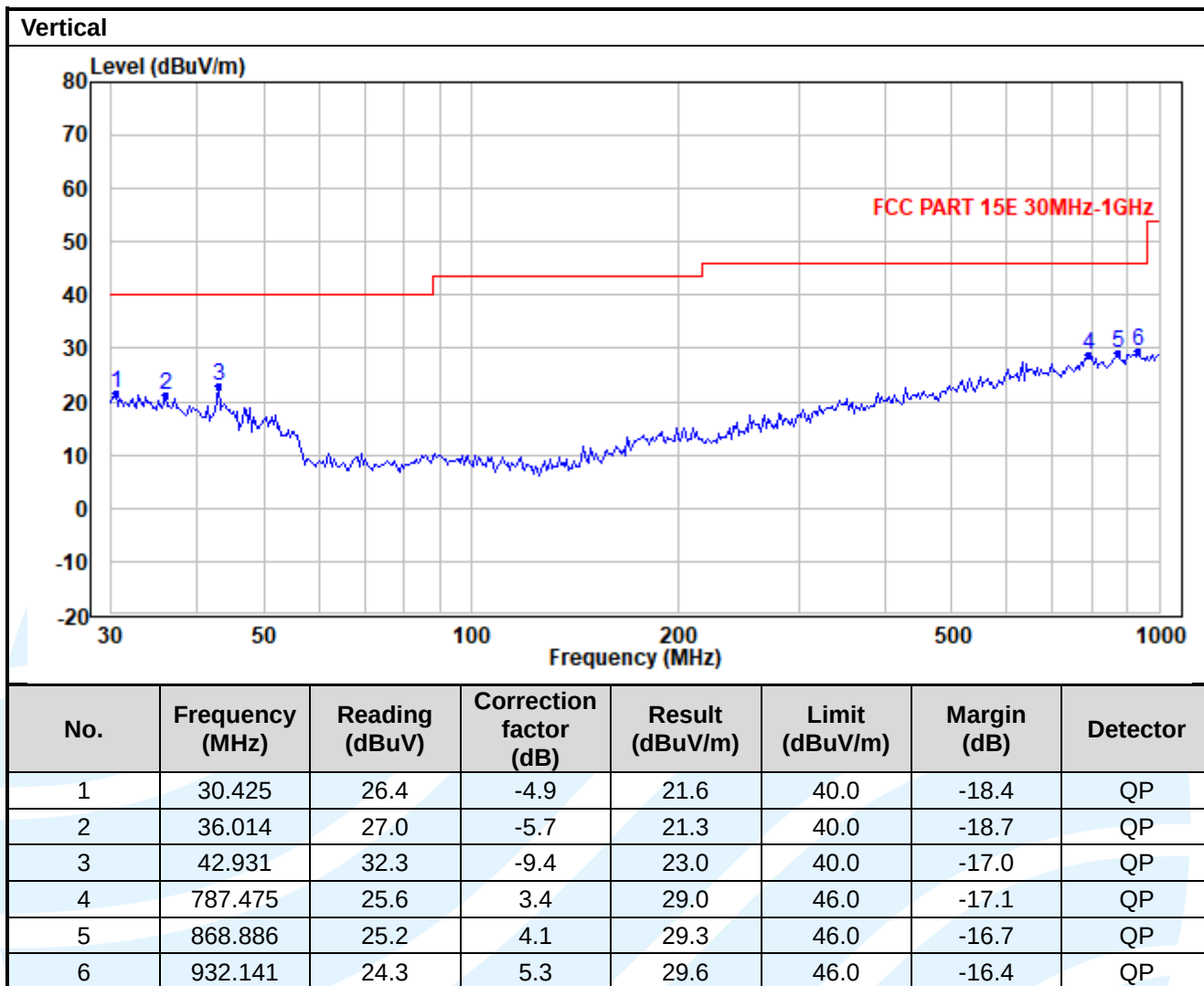
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UTTR-RF-FCCPART15.407-V1.2



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Radiated Emission Test Data (Above 1GHz):								
No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
IEEE 802.11a_Channel 36								
1	10360	36.6	7.2	43.8	68.2	-24.4	Peak	Horizontal
2	10360	25.1	7.2	32.3	54	-21.7	Average	Horizontal
3	15540	31.9	11.9	43.8	74	-30.2	Peak	Horizontal
4	15540	20.4	11.9	32.3	54	-21.7	Average	Horizontal
5	10360	36.8	7.2	44.0	68.2	-24.2	Peak	Vertical
6	10360	25.2	7.2	32.4	54	-21.6	Average	Vertical
7	15540	33.6	11.9	45.5	74	-28.5	Peak	Vertical
8	15540	20.5	11.9	32.4	54	-21.6	Average	Vertical
IEEE 802.11a_Channel 44								
1	10440	38.3	7.2	45.5	68.2	-22.7	Peak	Horizontal
2	10440	25.8	7.2	33.0	54	-21.0	Average	Horizontal
3	15660	33.3	11.9	45.3	74	-28.7	Peak	Horizontal
4	15660	21.4	11.9	33.3	54	-20.7	Average	Horizontal
5	10440	36.6	7.2	43.8	68.2	-24.4	Peak	Vertical
6	10440	24.8	7.2	32.0	54	-22.0	Average	Vertical
7	15660	34.3	11.9	46.2	74	-27.8	Peak	Vertical
8	15660	21.6	11.9	33.5	54	-20.5	Average	Vertical
IEEE 802.11a_Channel 48								
1	10480	35.9	7.2	43.1	68.2	-25.1	Peak	Horizontal
2	10480	24.6	7.2	31.8	54	-22.2	Average	Horizontal
3	15720	33.0	12.0	45.0	74	-29.0	Peak	Horizontal
4	15720	21.5	12.0	33.5	54	-20.5	Average	Horizontal
5	10480	37.1	7.2	44.4	68.2	-23.8	Peak	Vertical
6	10480	24.6	7.2	31.8	54	-22.2	Average	Vertical
7	15720	34.4	12.0	46.3	74	-27.7	Peak	Vertical
8	15720	21.6	12.0	33.6	54	-20.4	Average	Vertical
IEEE 802.11a_Channel 52								
1	10520	40.2	6.4	46.6	68.2	-21.6	Peak	Horizontal
2	10520	28.1	6.4	34.5	54	-19.5	Average	Horizontal
3	15780	37.7	11.6	49.3	74	-24.7	Peak	Horizontal
4	15780	23.3	11.6	34.9	54	-19.1	Average	Horizontal
5	10520	40.4	6.4	46.8	68.2	-21.4	Peak	Vertical
6	10520	27.2	6.4	33.6	54	-20.4	Average	Vertical
7	15780	36.0	11.6	47.5	74	-26.5	Peak	Vertical
8	15780	23.3	11.6	34.9	54	-19.1	Average	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
IEEE 802.11a_Channel 60								
1	10600	39.6	6.6	46.1	74	-27.9	Peak	Horizontal
2	10600	27.7	6.6	34.2	54	-19.8	Average	Horizontal
3	15900	34.1	11.7	45.8	74	-28.2	Peak	Horizontal
4	15900	22.9	11.7	34.6	54	-19.4	Average	Horizontal
5	10600	39.0	6.6	45.6	74	-28.4	Peak	Vertical
6	10600	27.7	6.6	34.2	54	-19.8	Average	Vertical
7	15900	33.2	11.7	44.9	74	-29.1	Peak	Vertical
8	15900	22.9	11.7	34.6	54	-19.4	Average	Vertical
IEEE 802.11a_Channel 64								
1	10640	39.1	6.6	45.8	74	-28.2	Peak	Horizontal
2	10640	27.7	6.6	34.3	54	-19.7	Average	Horizontal
3	15960	34.3	11.8	46.0	74	-28.0	Peak	Horizontal
4	15960	22.9	11.8	34.7	54	-19.3	Average	Horizontal
5	10640	39.5	6.6	46.2	74	-27.8	Peak	Vertical
6	10640	27.6	6.6	34.2	54	-19.8	Average	Vertical
7	15960	36.4	11.8	48.2	74	-25.8	Peak	Vertical
8	15960	22.8	11.8	34.6	54	-19.4	Average	Vertical
IEEE 802.11a_Channel 149								
1	11490	37.4	7.7	45.1	74	-28.9	Peak	Horizontal
2	11490	24.7	7.7	32.4	54	-21.6	Average	Horizontal
3	17235	30.8	13.7	44.4	68.2	-23.8	Peak	Horizontal
4	17235	19.1	13.7	32.8	54	-21.2	Average	Horizontal
5	11490	35.9	7.7	43.6	74	-30.4	Peak	Vertical
6	11490	23.8	7.7	31.5	54	-22.5	Average	Vertical
7	17235	33.7	13.7	47.3	68.2	-20.9	Peak	Vertical
8	17235	21.3	13.7	35.0	54	-19.0	Average	Vertical
IEEE 802.11a_Channel 157								
1	11570	36.4	7.8	44.2	74	-29.8	Peak	Horizontal
2	11570	24.6	7.8	32.4	54	-21.6	Average	Horizontal
3	17355	32.3	14.0	46.3	68.2	-21.9	Peak	Horizontal
4	17355	19.1	14.0	33.1	54	-20.9	Average	Horizontal
5	11570	36.3	7.8	44.0	74	-30.0	Peak	Vertical
6	11570	24.7	7.8	32.5	54	-21.5	Average	Vertical
7	17355	31.1	14.0	45.1	68.2	-23.1	Peak	Vertical
8	17355	19.4	14.0	33.4	54	-20.6	Average	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
IEEE 802.11a_Channel 165								
1	11650	37.2	7.9	45.1	74	-28.9	Peak	Horizontal
2	11650	23.2	7.9	31.1	54	-22.9	Average	Horizontal
3	17475	32.8	14.3	47.1	68.2	-21.1	Peak	Horizontal
4	17475	18.2	14.3	32.5	54	-21.5	Average	Horizontal
5	11650	36.1	7.9	44.0	74	-30.0	Peak	Vertical
6	11650	23.2	7.9	31.1	54	-22.9	Average	Vertical
7	17475	31.6	14.3	46.0	68.2	-22.2	Peak	Vertical
8	17475	18.3	14.3	32.6	54	-21.4	Average	Vertical

Radiated Emission Test Data (Above 1GHz):								
No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
IEEE 802.11n-HT20_Channel 36								
1	10360	37.4	7.2	44.6	68.2	-23.6	Peak	Horizontal
2	10360	25.2	7.2	32.4	54	-21.6	Average	Horizontal
3	15540	34.2	11.9	46.1	74	-27.9	Peak	Horizontal
4	15540	22.4	11.9	34.3	54	-19.7	Average	Horizontal
5	10360	36.5	7.2	43.7	68.2	-24.5	Peak	Vertical
6	10360	25.3	7.2	32.5	54	-21.5	Average	Vertical
7	15540	34.5	11.9	46.4	74	-27.6	Peak	Vertical
8	15540	20.7	11.9	32.6	54	-21.4	Average	Vertical
IEEE 802.11n-HT20_Channel 44								
1	10440	37.4	7.2	44.7	68.2	-23.5	Peak	Horizontal
2	10440	24.8	7.2	32.0	54	-22.0	Average	Horizontal
3	15660	35.5	11.9	47.5	74	-26.5	Peak	Horizontal
4	15660	21.5	11.9	33.4	54	-20.6	Average	Horizontal
5	10440	37.1	7.2	44.3	68.2	-23.9	Peak	Vertical
6	10440	25.8	7.2	33.0	54	-21.0	Average	Vertical
7	15660	33.0	11.9	44.9	74	-29.1	Peak	Vertical
8	15660	21.6	11.9	33.5	54	-20.5	Average	Vertical
IEEE 802.11n-HT20_Channel 48								
1	10480	36.1	7.2	43.4	68.2	-24.8	Peak	Horizontal
2	10480	24.5	7.2	31.7	54	-22.3	Average	Horizontal
3	15720	33.0	12.0	44.9	74	-29.1	Peak	Horizontal
4	15720	21.5	12.0	33.5	54	-20.5	Average	Horizontal
5	10480	36.1	7.2	43.3	68.2	-24.9	Peak	Vertical
6	10480	24.7	7.2	31.9	54	-22.1	Average	Vertical
7	15720	34.5	12.0	46.5	74	-27.5	Peak	Vertical
8	15720	21.6	12.0	33.6	54	-20.4	Average	Vertical

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No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
IEEE 802.11n-HT20_Channel 52								
1	10520	39.8	6.4	46.2	68.2	-22.0	Peak	Horizontal
2	10520	27.1	6.4	33.5	54	-20.5	Average	Horizontal
3	15780	35.4	11.6	47.0	74	-27.0	Peak	Horizontal
4	15780	23.4	11.6	35.0	54	-19.0	Average	Horizontal
5	10520	38.1	6.4	44.5	68.2	-23.7	Peak	Vertical
6	10520	27.0	6.4	33.4	54	-20.6	Average	Vertical
7	15780	33.9	11.6	45.5	74	-28.5	Peak	Vertical
8	15780	23.4	11.6	35.0	54	-19.0	Average	Vertical
IEEE 802.11n-HT20_Channel 60								
1	10600	39.0	6.6	45.6	74	-28.4	Peak	Horizontal
2	10600	26.8	6.6	33.3	54	-20.7	Average	Horizontal
3	15900	35.4	11.7	47.1	74	-26.9	Peak	Horizontal
4	15900	23.0	11.7	34.7	54	-19.3	Average	Horizontal
5	10600	40.1	6.6	46.6	74	-27.4	Peak	Vertical
6	10600	27.7	6.6	34.2	54	-19.8	Average	Vertical
7	15900	36.9	11.7	48.6	74	-25.4	Peak	Vertical
8	15900	23.0	11.7	34.7	54	-19.3	Average	Vertical
IEEE 802.11n-HT20_Channel 64								
1	10640	38.4	6.6	45.1	74	-28.9	Peak	Horizontal
2	10640	27.5	6.6	34.1	54	-19.9	Average	Horizontal
3	15960	34.7	11.8	46.4	74	-27.6	Peak	Horizontal
4	15960	22.9	11.8	34.7	54	-19.3	Average	Horizontal
5	10640	38.4	6.6	45.0	74	-29.0	Peak	Vertical
6	10640	27.6	6.6	34.2	54	-19.8	Average	Vertical
7	15960	35.9	11.8	47.7	74	-26.3	Peak	Vertical
8	15960	22.8	11.8	34.6	54	-19.4	Average	Vertical
IEEE 802.11n-HT20_Channel 149								
1	11490	36.8	7.7	44.5	74	-29.5	Peak	Horizontal
2	11490	23.7	7.7	31.4	54	-22.6	Average	Horizontal
3	17235	33.3	13.7	47.0	68.2	-21.2	Peak	Horizontal
4	17235	19.0	13.7	32.7	54	-21.3	Average	Horizontal
5	11490	36.0	7.7	43.7	74	-30.3	Peak	Vertical
6	11490	23.7	7.7	31.4	54	-22.6	Average	Vertical
7	17235	30.3	13.7	44.0	68.2	-24.2	Peak	Vertical
8	17235	19.1	13.7	32.8	54	-21.2	Average	Vertical

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No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
IEEE 802.11n-HT20_Channel 157								
1	11570	36.2	7.8	44.0	74	-30.0	Peak	Horizontal
2	11570	24.5	7.8	32.3	54	-21.7	Average	Horizontal
3	17355	32.4	14.0	46.4	68.2	-21.8	Peak	Horizontal
4	17355	19.2	14.0	33.2	54	-20.8	Average	Horizontal
5	11570	36.6	7.8	44.4	74	-29.6	Peak	Vertical
6	11570	22.6	7.8	30.4	54	-23.6	Average	Vertical
7	17355	31.0	14.0	45.0	68.2	-23.2	Peak	Vertical
8	17355	19.2	14.0	33.2	54	-20.8	Average	Vertical
IEEE 802.11n-HT20_Channel 165								
1	11650	37.5	7.9	45.5	74	-28.5	Peak	Horizontal
2	11650	23.1	7.9	31.0	54	-23.0	Average	Horizontal
3	17475	29.7	14.3	44.1	68.2	-24.1	Peak	Horizontal
4	17475	18.1	14.3	32.4	54	-21.6	Average	Horizontal
5	11650	36.1	7.9	44.0	74	-30.0	Peak	Vertical
6	11650	23.1	7.9	31.0	54	-23.0	Average	Vertical
7	17475	32.6	14.3	47.0	68.2	-21.2	Peak	Vertical
8	17475	18.2	14.3	32.5	54	-21.5	Average	Vertical

Radiated Emission Test Data (Above 1GHz):								
No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
IEEE 802.11n-HT40_Channel 38								
1	10380	38.5	7.2	45.7	68.2	-22.5	Peak	Horizontal
2	10380	25.1	7.2	32.3	54	-21.7	Average	Horizontal
3	15570	31.6	11.9	43.6	74	-30.4	Peak	Horizontal
4	15570	20.5	11.9	32.4	54	-21.6	Average	Horizontal
5	10380	36.6	7.2	43.8	68.2	-24.4	Peak	Vertical
6	10380	25.2	7.2	32.4	54	-21.6	Average	Vertical
7	15570	35.1	11.9	47.0	74	-27.0	Peak	Vertical
8	15570	20.6	11.9	32.5	54	-21.5	Average	Vertical
IEEE 802.11n-HT40_Channel 46								
1	10460	37.3	7.2	44.6	68.2	-23.6	Peak	Horizontal
2	10460	25.7	7.2	32.9	54	-21.1	Average	Horizontal
3	15690	33.3	12.0	45.3	74	-28.7	Peak	Horizontal
4	15690	21.3	12.0	33.3	54	-20.7	Average	Horizontal
5	10460	37.4	7.2	44.6	68.2	-23.6	Peak	Vertical
6	10460	24.8	7.2	32.0	54	-22.0	Average	Vertical
7	15690	33.0	12.0	44.9	74	-29.1	Peak	Vertical
8	15690	21.5	12.0	33.5	54	-20.5	Average	Vertical

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No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
IEEE 802.11n-HT40_Channel 54								
1	10540	39.6	6.4	46.1	68.2	-22.1	Peak	Horizontal
2	10540	27.1	6.4	33.5	54	-20.5	Average	Horizontal
3	15810	36.8	11.6	48.4	74	-25.6	Peak	Horizontal
4	15810	24.0	11.6	35.6	54	-18.4	Average	Horizontal
5	10540	38.7	6.4	45.1	68.2	-23.1	Peak	Vertical
6	10540	27.1	6.4	33.5	54	-20.5	Average	Vertical
7	15810	34.8	11.6	46.4	74	-27.6	Peak	Vertical
8	15810	23.1	11.6	34.7	54	-19.3	Average	Vertical
IEEE 802.11n-HT40_Channel 62								
1	10620	37.4	6.6	44.0	74	-30.0	Peak	Horizontal
2	10620	27.5	6.6	34.1	54	-19.9	Average	Horizontal
3	15930	34.7	11.8	46.5	74	-27.5	Peak	Horizontal
4	15930	22.8	11.8	34.6	54	-19.4	Average	Horizontal
5	10620	38.7	6.6	45.3	74	-28.7	Peak	Vertical
6	10620	26.6	6.6	33.2	54	-20.8	Average	Vertical
7	15930	36.8	11.8	48.6	74	-25.4	Peak	Vertical
8	15930	22.8	11.8	34.6	54	-19.4	Average	Vertical
IEEE 802.11n-HT40_Channel 151								
1	11510	36.6	7.7	44.3	74	-29.7	Peak	Horizontal
2	11510	24.6	7.7	32.3	54	-21.7	Average	Horizontal
3	17265	31.0	13.7	44.7	68.2	-23.5	Peak	Horizontal
4	17265	18.9	13.7	32.6	54	-21.4	Average	Horizontal
5	11510	36.3	7.7	44.0	74	-30.0	Peak	Vertical
6	11510	24.8	7.7	32.5	54	-21.5	Average	Vertical
7	17265	30.5	13.7	44.2	68.2	-24.0	Peak	Vertical
8	17265	19.1	13.7	32.8	54	-21.2	Average	Vertical
IEEE 802.11n-HT40_Channel 159								
1	11590	36.7	7.8	44.5	74	-29.5	Peak	Horizontal
2	11590	24.4	7.8	32.2	54	-21.8	Average	Horizontal
3	17385	32.0	14.1	46.1	68.2	-22.1	Peak	Horizontal
4	17385	19.0	14.1	33.1	54	-20.9	Average	Horizontal
5	11590	36.2	7.8	44.0	74	-30.0	Peak	Vertical
6	11590	24.5	7.8	32.3	54	-21.7	Average	Vertical
7	17385	31.9	14.1	45.9	68.2	-22.3	Peak	Vertical
8	17385	19.0	14.1	33.1	54	-20.9	Average	Vertical

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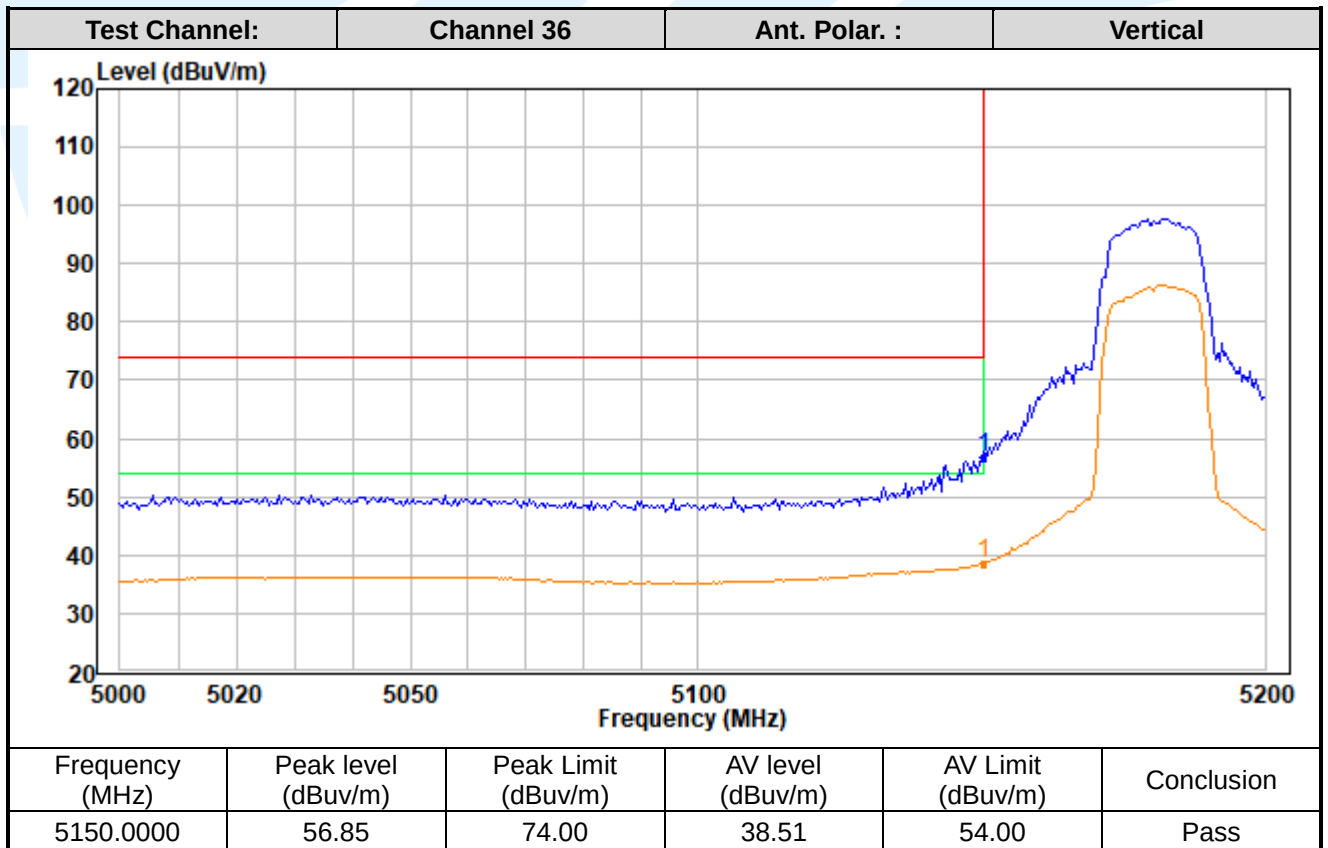
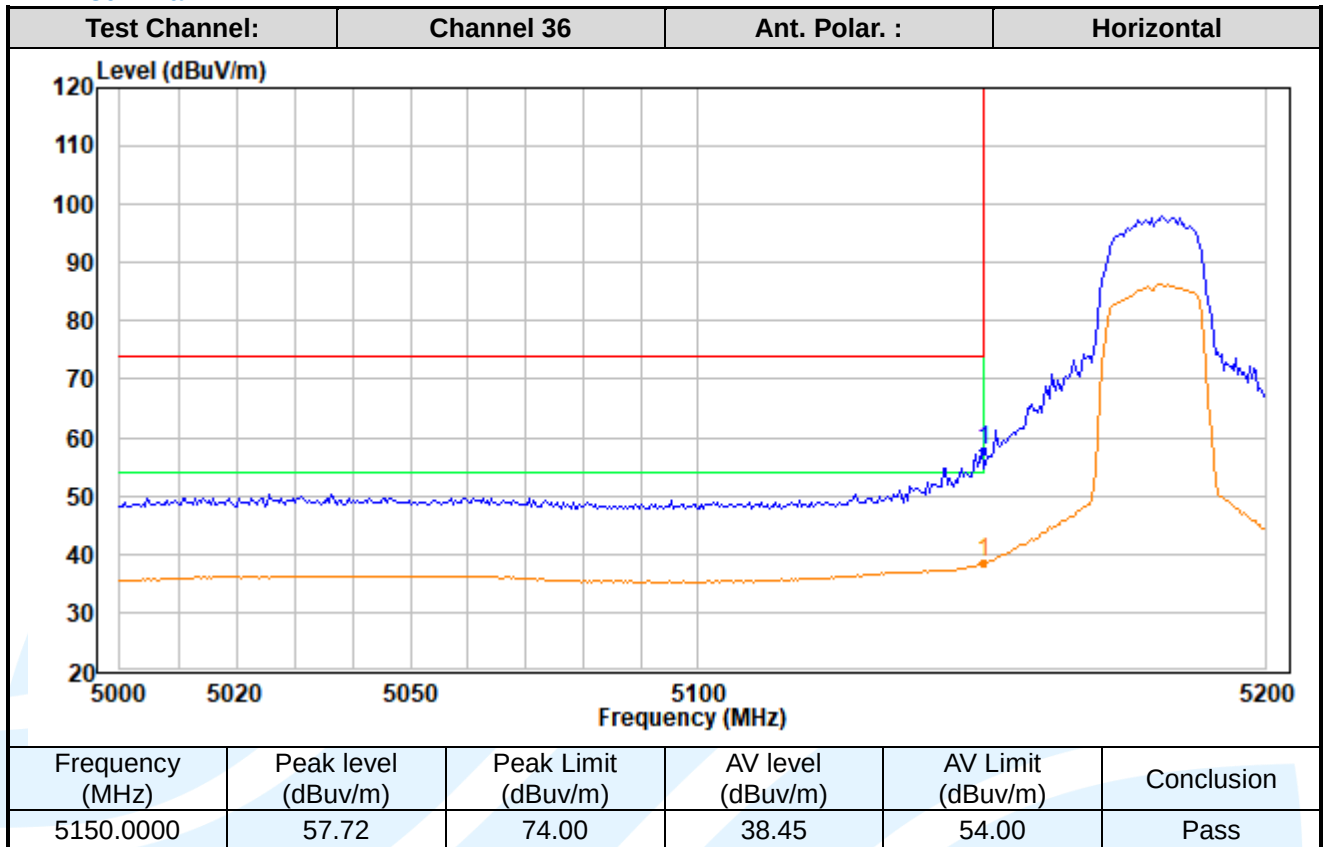
No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
IEEE 802.11n-HT80_Channel 42								
1	10420	36.6	7.2	43.8	68.2	-24.4	Peak	Horizontal
2	10420	24.7	7.2	31.9	54	-22.1	Average	Horizontal
3	15630	32.0	12.0	43.9	74	-30.1	Peak	Horizontal
4	15630	21.3	12.0	33.3	54	-20.7	Average	Horizontal
5	10420	36.3	7.2	43.5	68.2	-24.7	Peak	Vertical
6	10420	24.7	7.2	31.9	54	-22.1	Average	Vertical
7	15630	33.3	12.0	45.3	74	-28.7	Peak	Vertical
8	15630	21.4	12.0	33.4	54	-20.6	Average	Vertical
IEEE 802.11n-HT80_Channel 58								
1	10580	39.5	6.5	46.0	68.2	-22.2	Peak	Horizontal
2	10580	27.0	6.5	33.5	54	-20.5	Average	Horizontal
3	15870	36.6	11.7	48.3	74	-25.7	Peak	Horizontal
4	15870	22.9	11.7	34.6	54	-19.4	Average	Horizontal
5	10580	38.7	6.5	45.2	68.2	-23.0	Peak	Vertical
6	10580	27.0	6.5	33.5	54	-20.5	Average	Vertical
7	15870	35.4	11.7	47.1	74	-26.9	Peak	Vertical
8	15870	22.9	11.7	34.6	54	-19.4	Average	Vertical
IEEE 802.11n-HT80_Channel 155								
1	11550	35.0	7.8	42.7	74	-31.3	Peak	Horizontal
2	11550	23.5	7.8	31.3	54	-22.7	Average	Horizontal
3	17325	32.7	13.9	46.6	68.2	-21.6	Peak	Horizontal
4	17325	18.7	13.9	32.6	54	-21.4	Average	Horizontal
5	11550	36.0	7.8	43.7	74	-30.3	Peak	Vertical
6	11550	23.6	7.8	31.4	54	-22.6	Average	Vertical
7	17325	31.1	13.9	45.0	68.2	-23.2	Peak	Vertical
8	17325	18.9	13.9	32.8	54	-21.2	Average	Vertical

Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit

Band Edge Measurements (Radiated): Worst-Case Configuration

IEEE 802.11a



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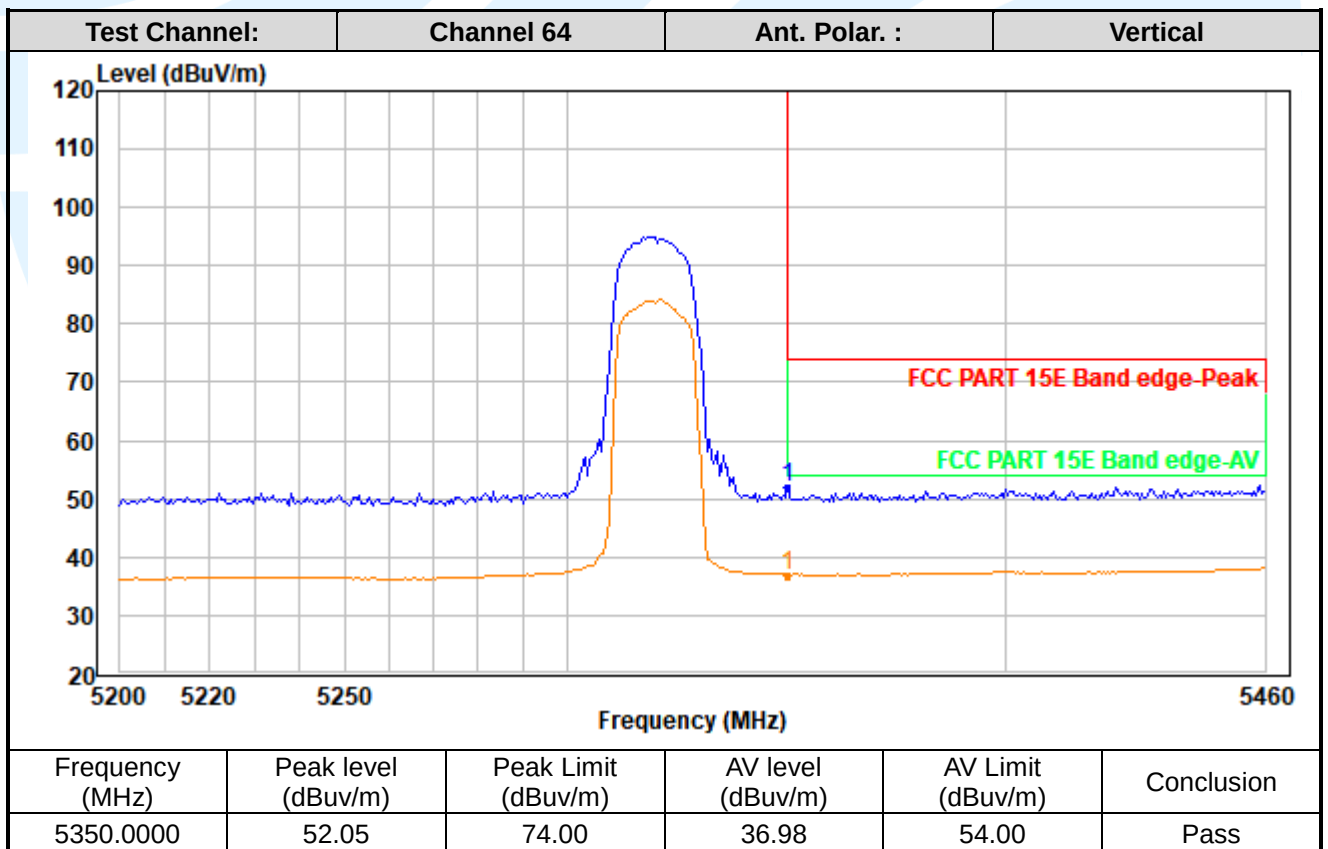
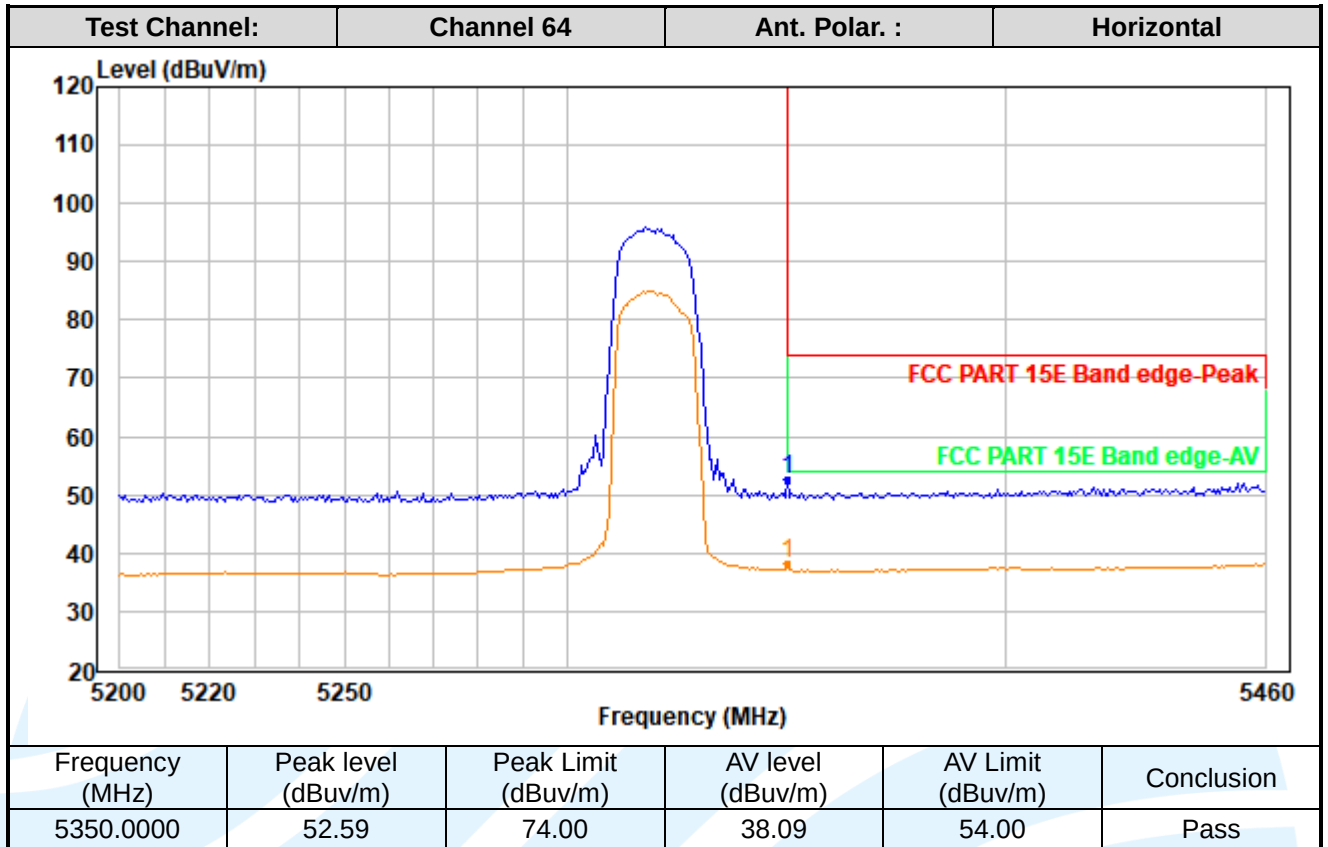
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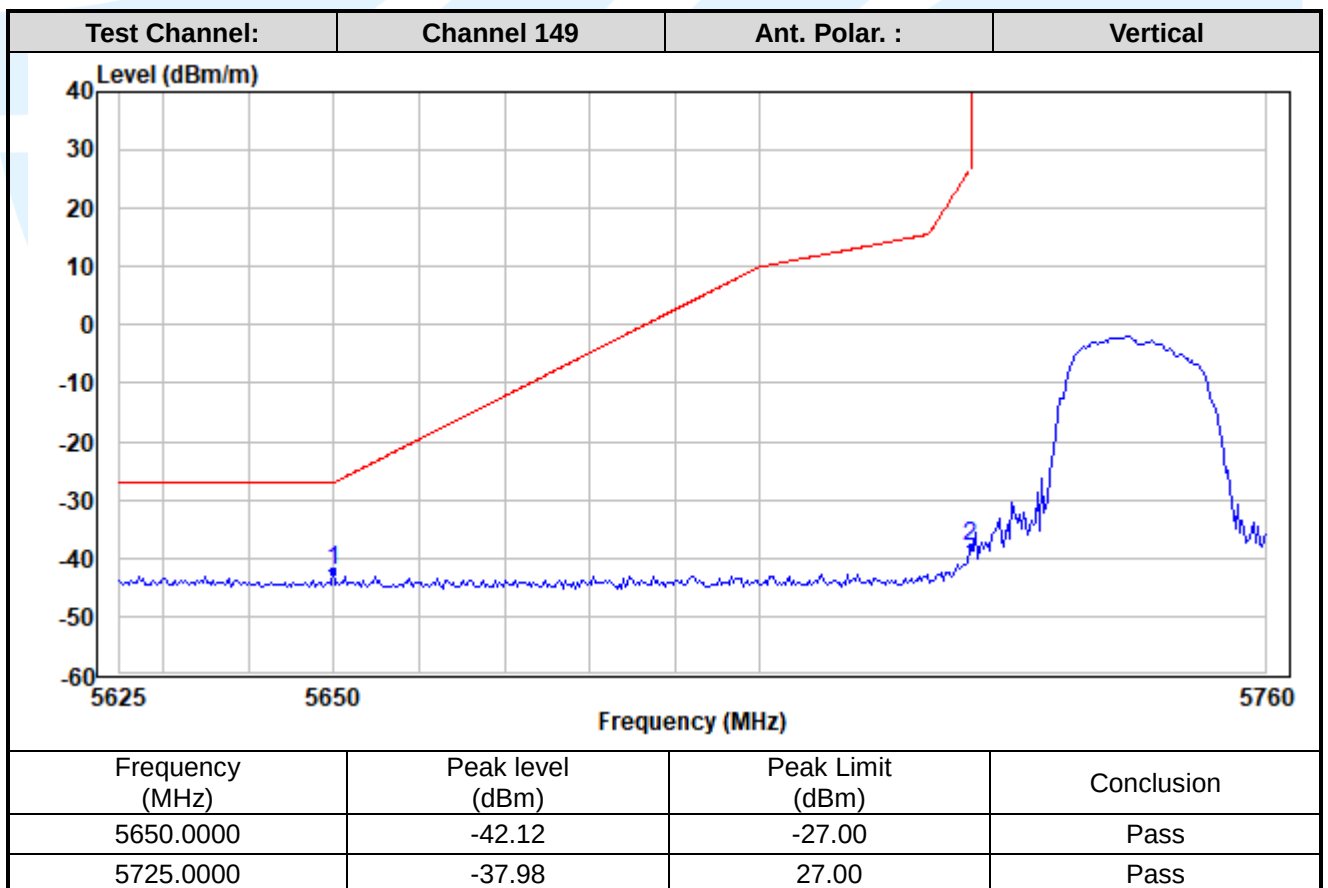
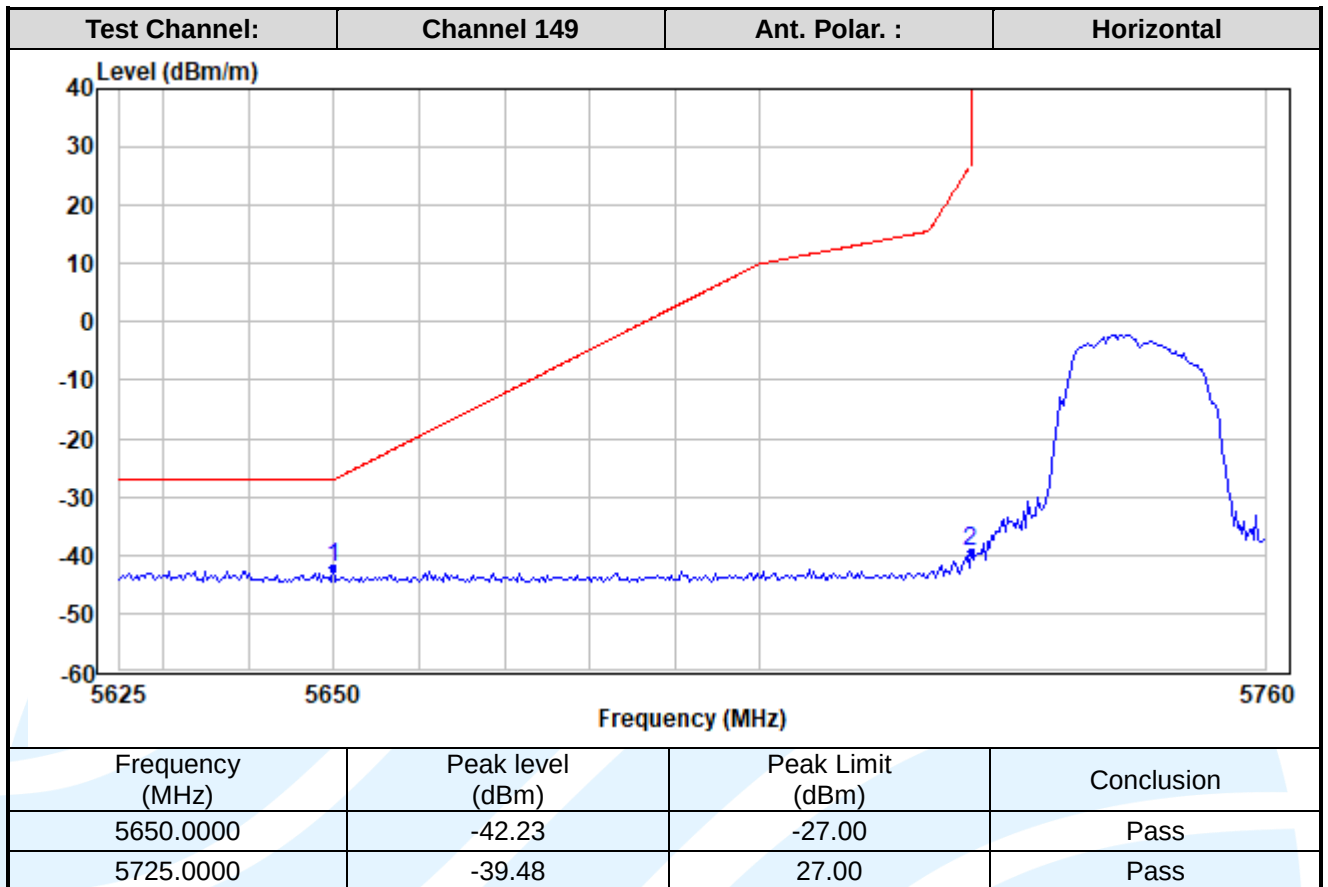
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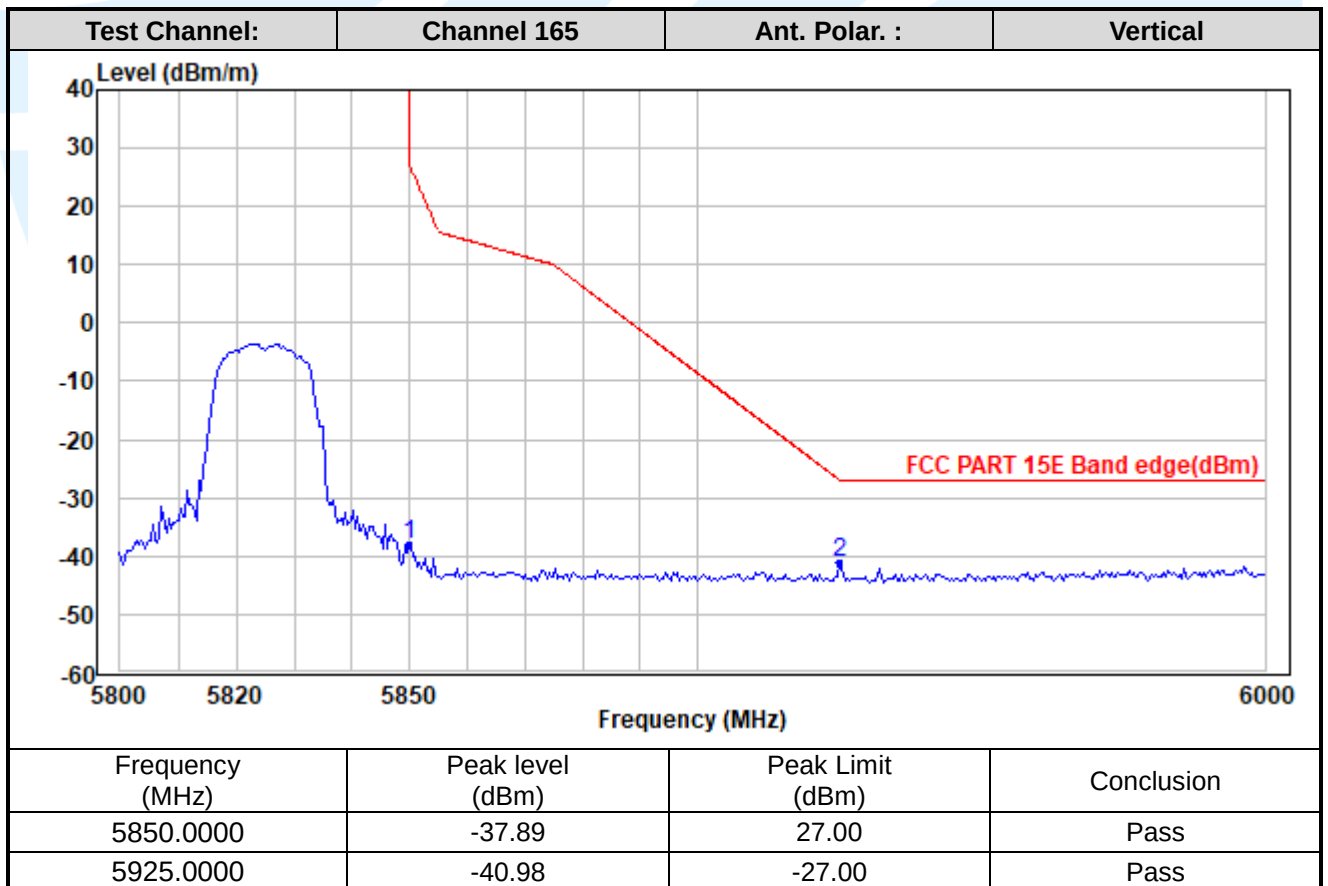
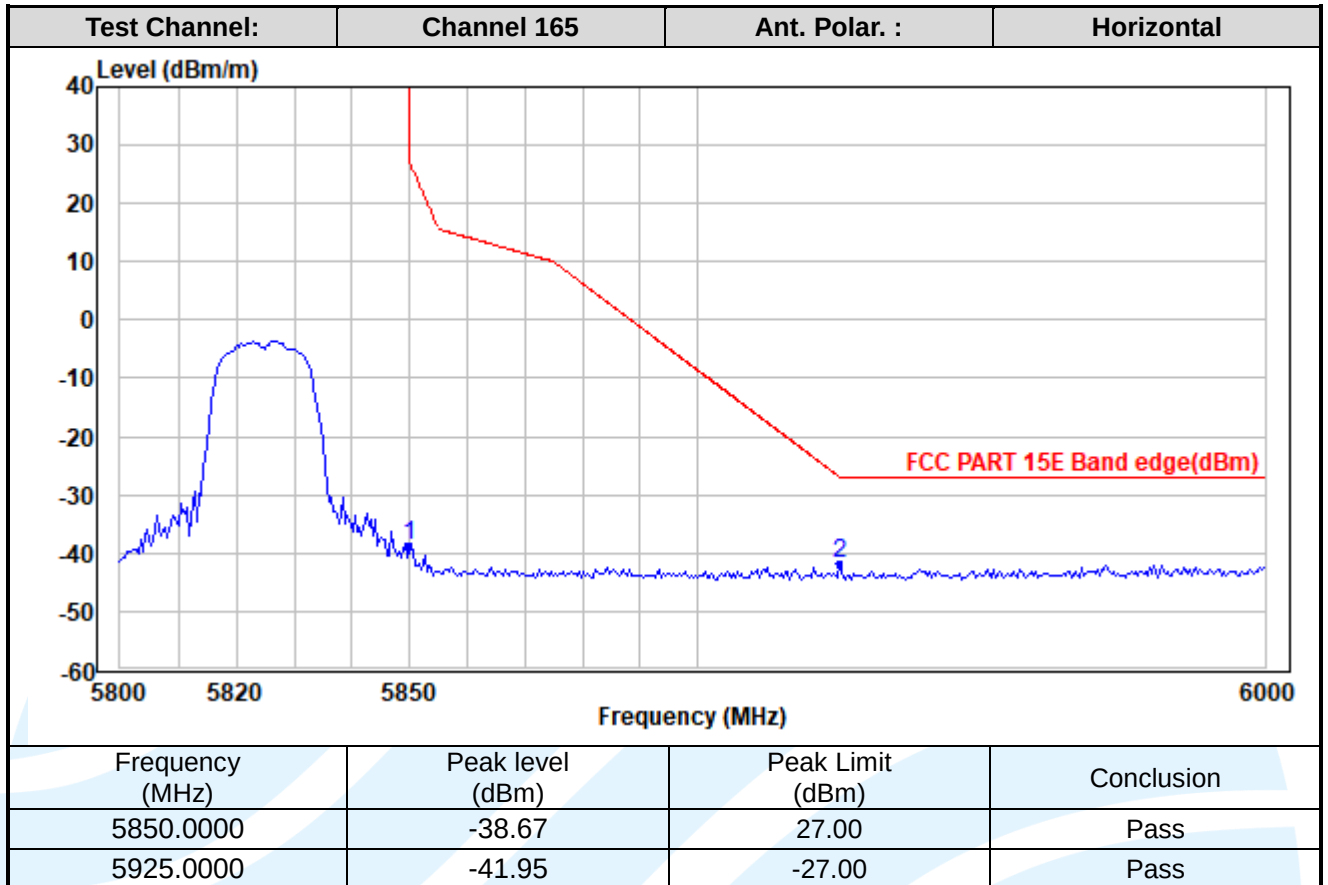
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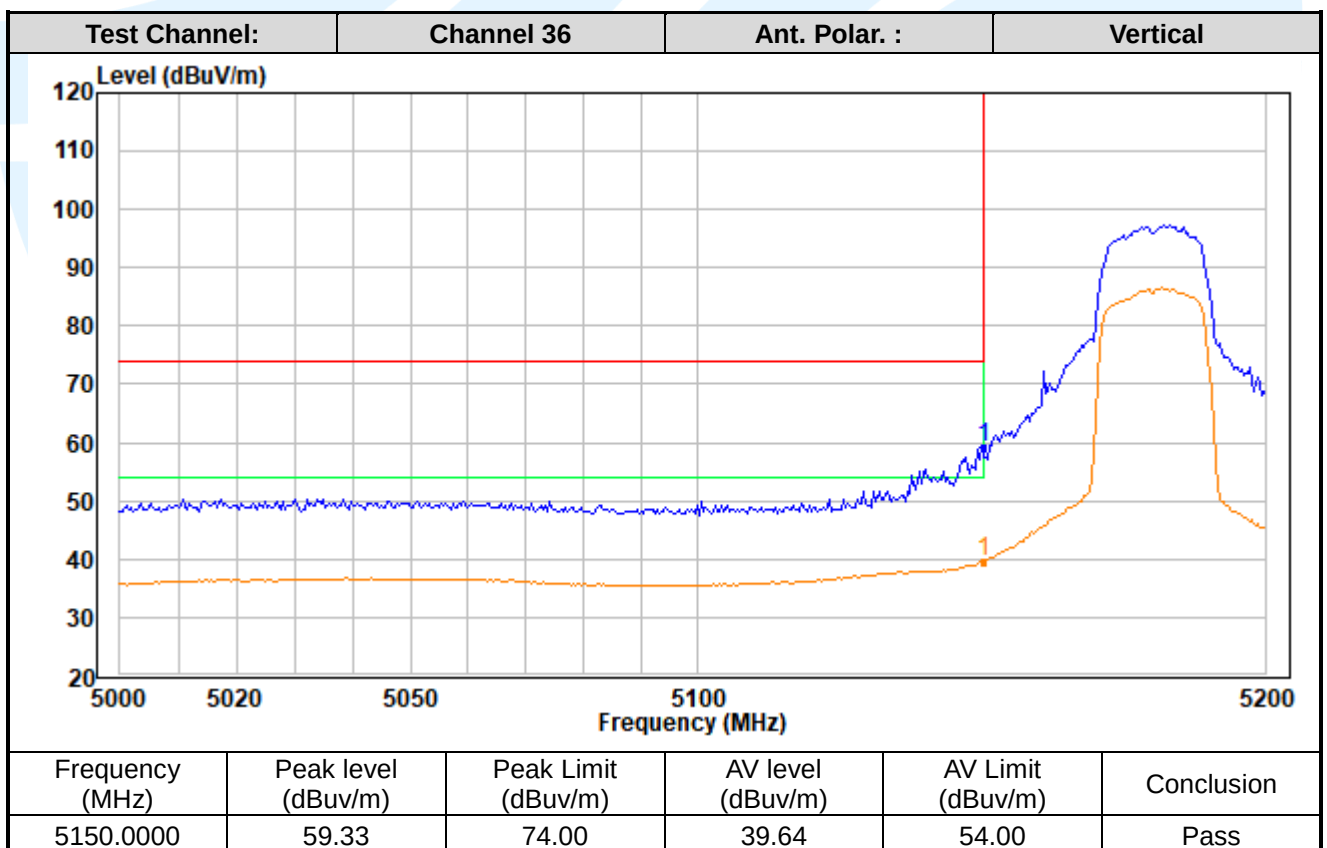
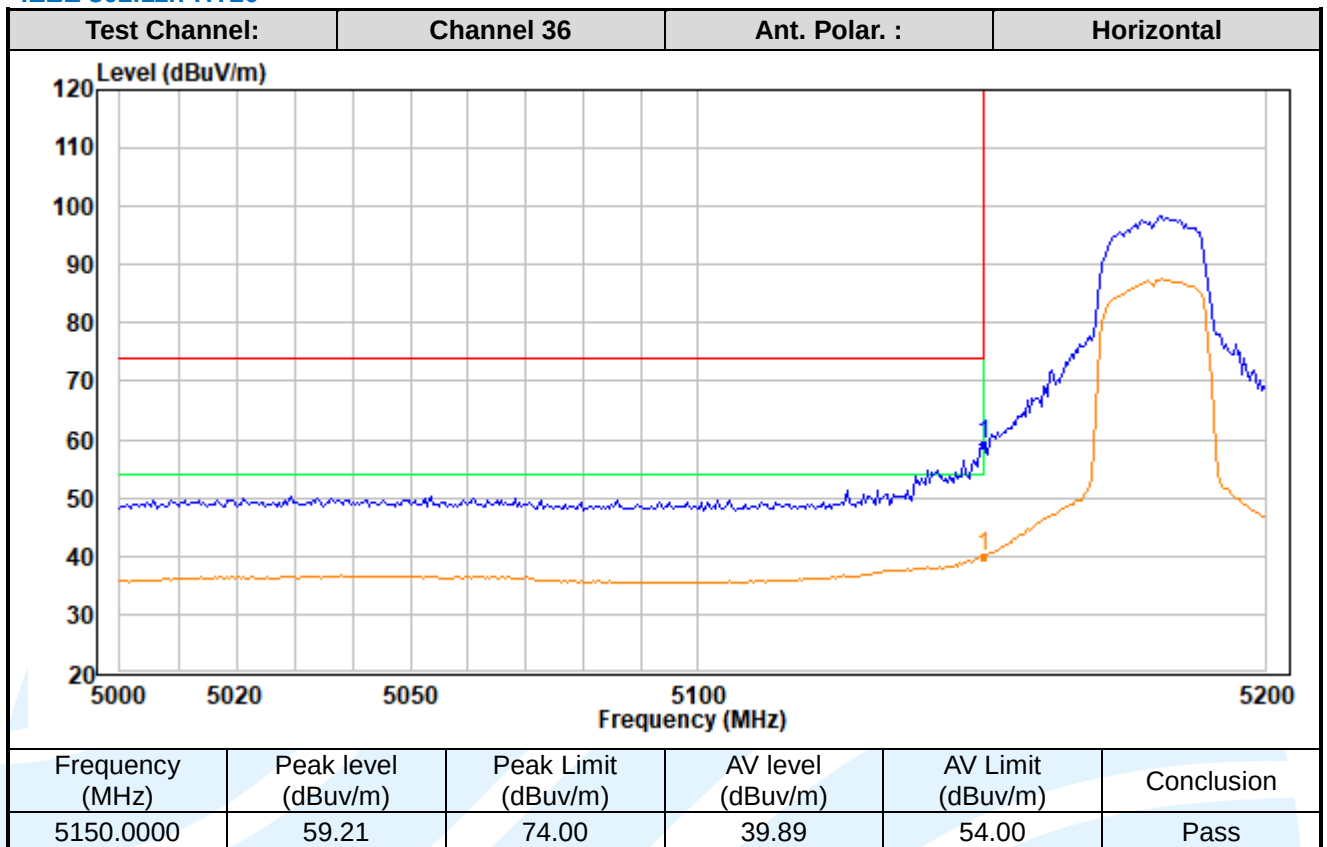
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IEEE 802.11n-HT20



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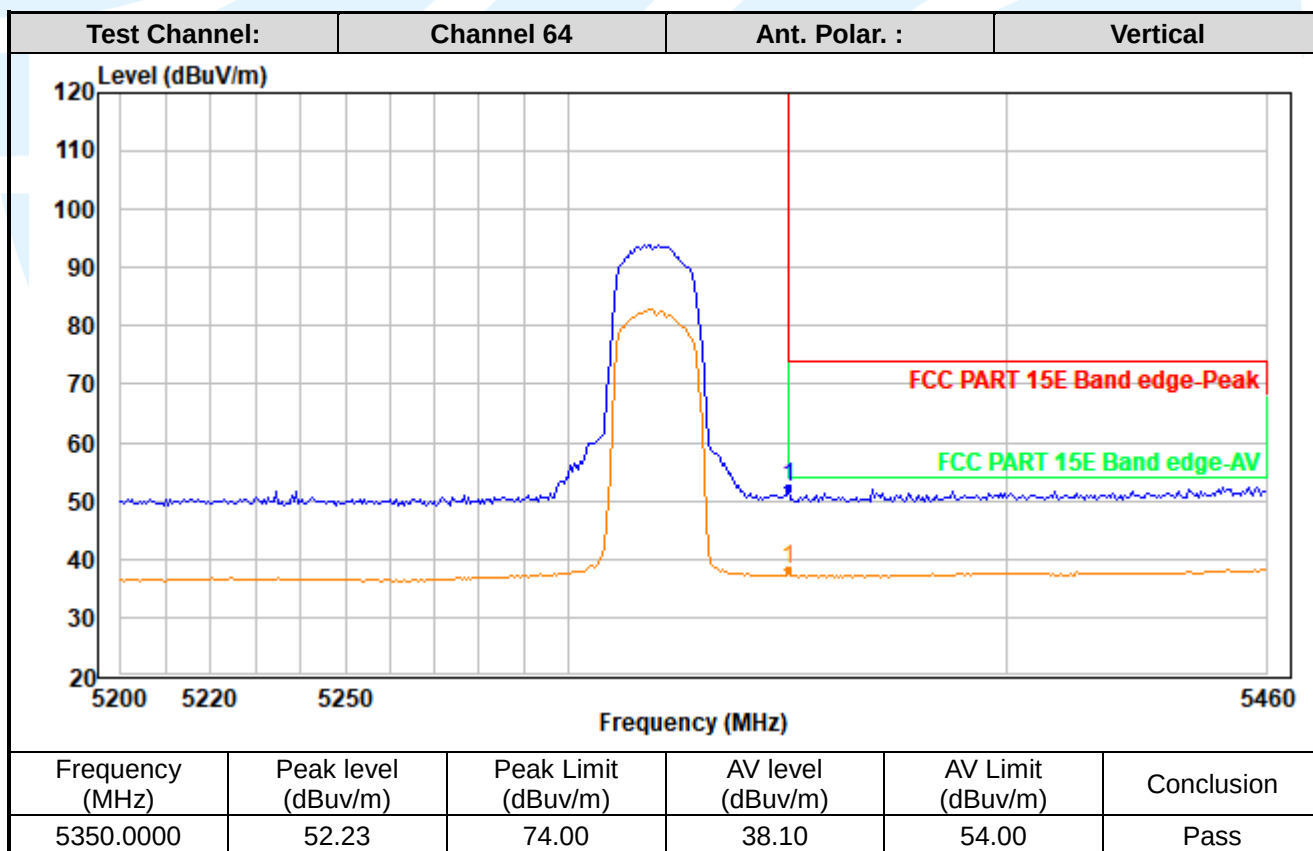
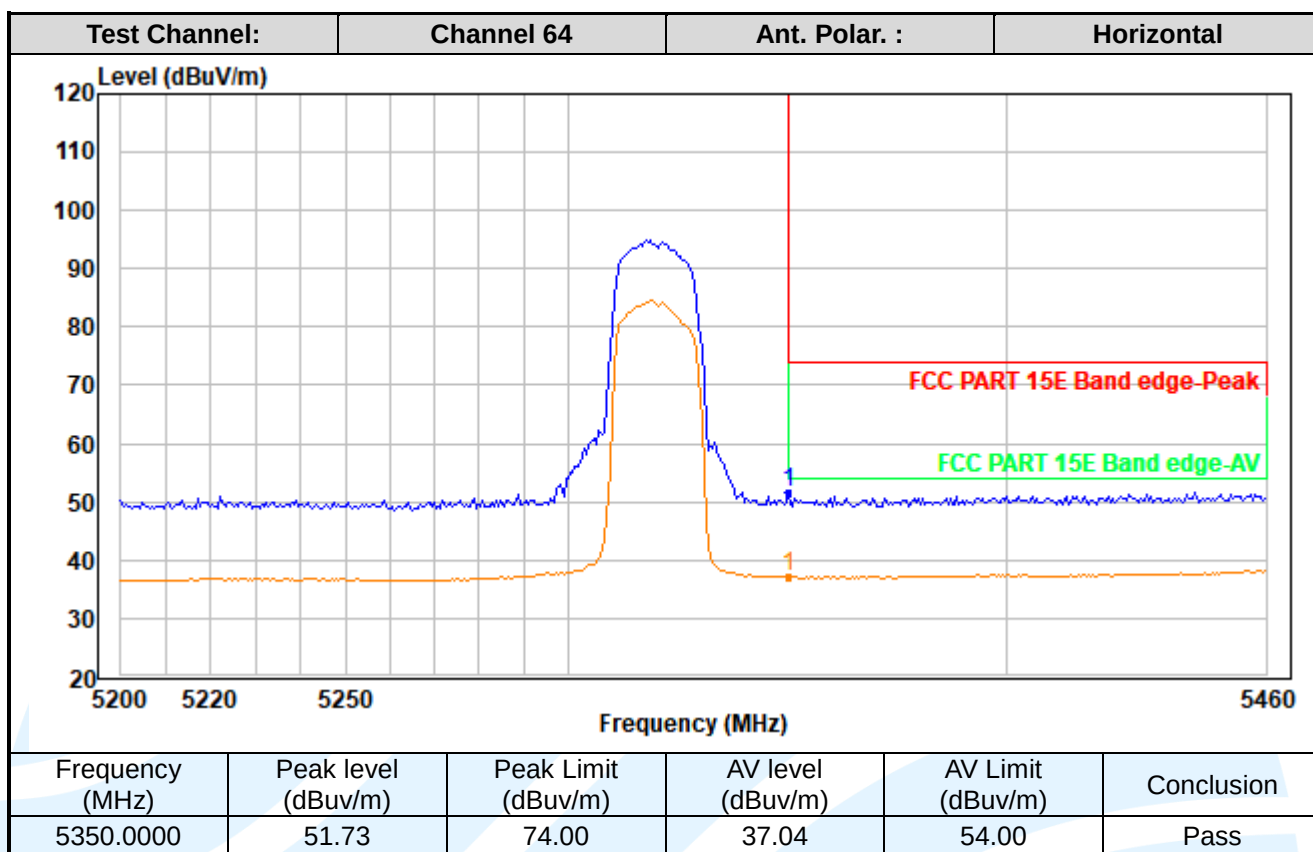
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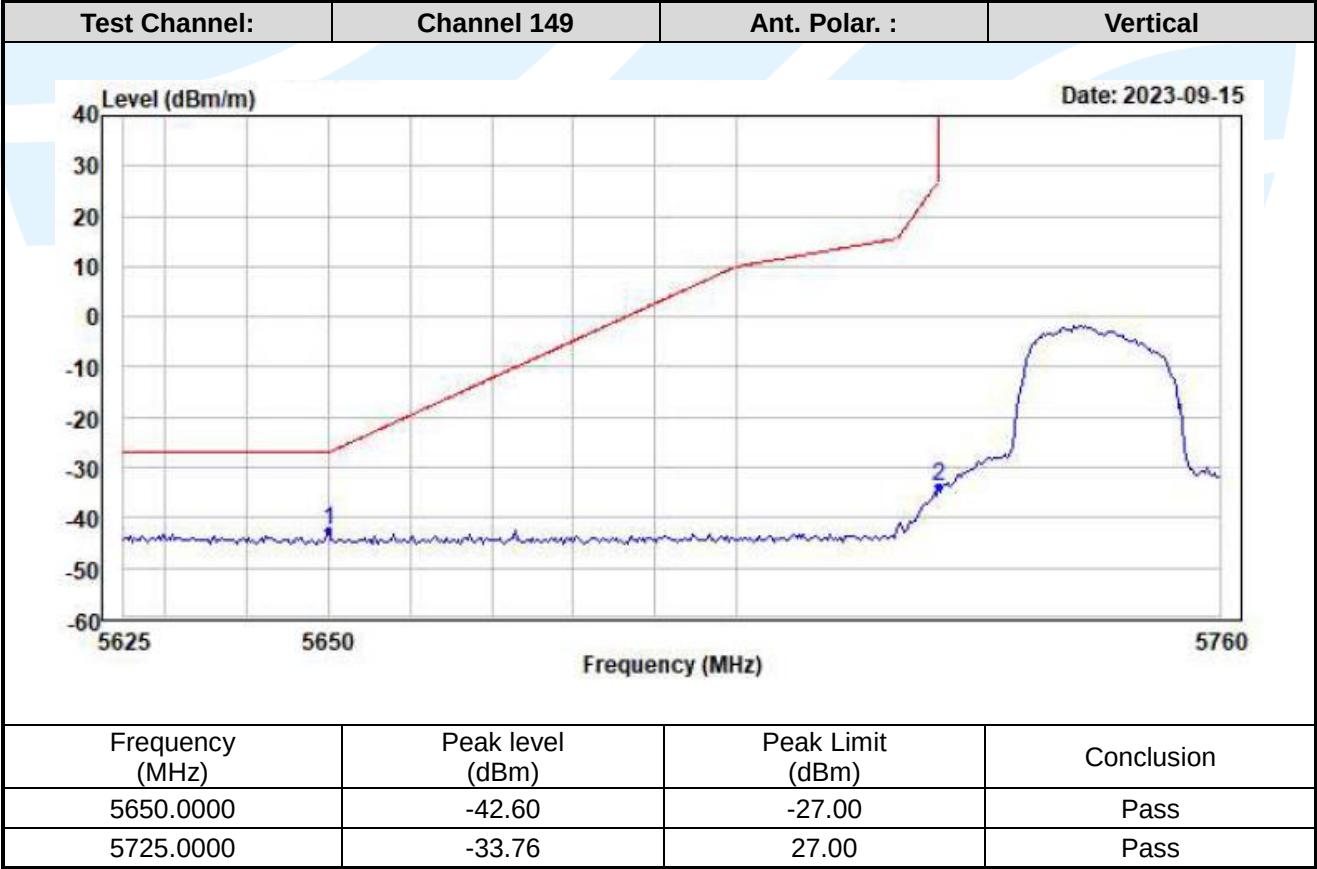
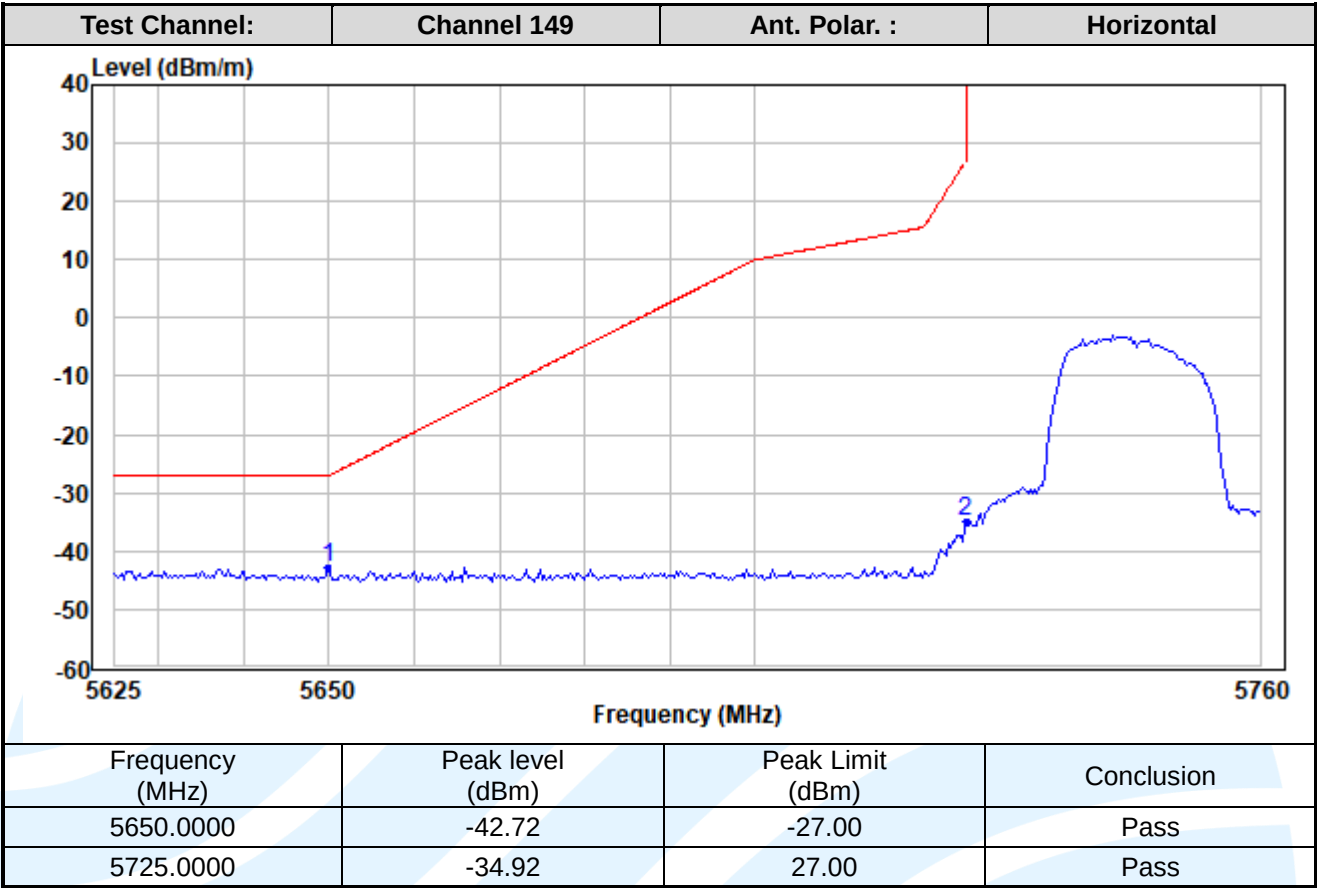
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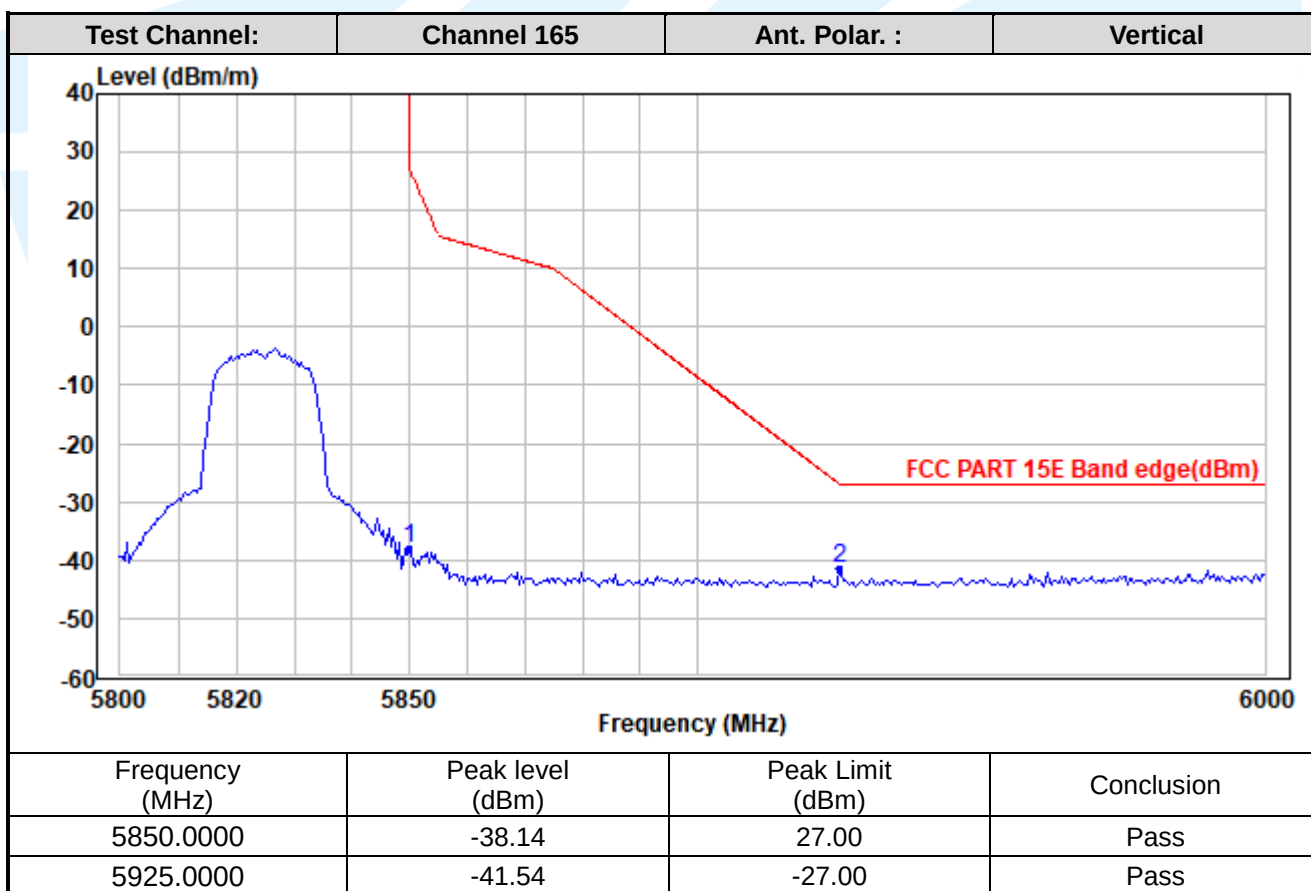
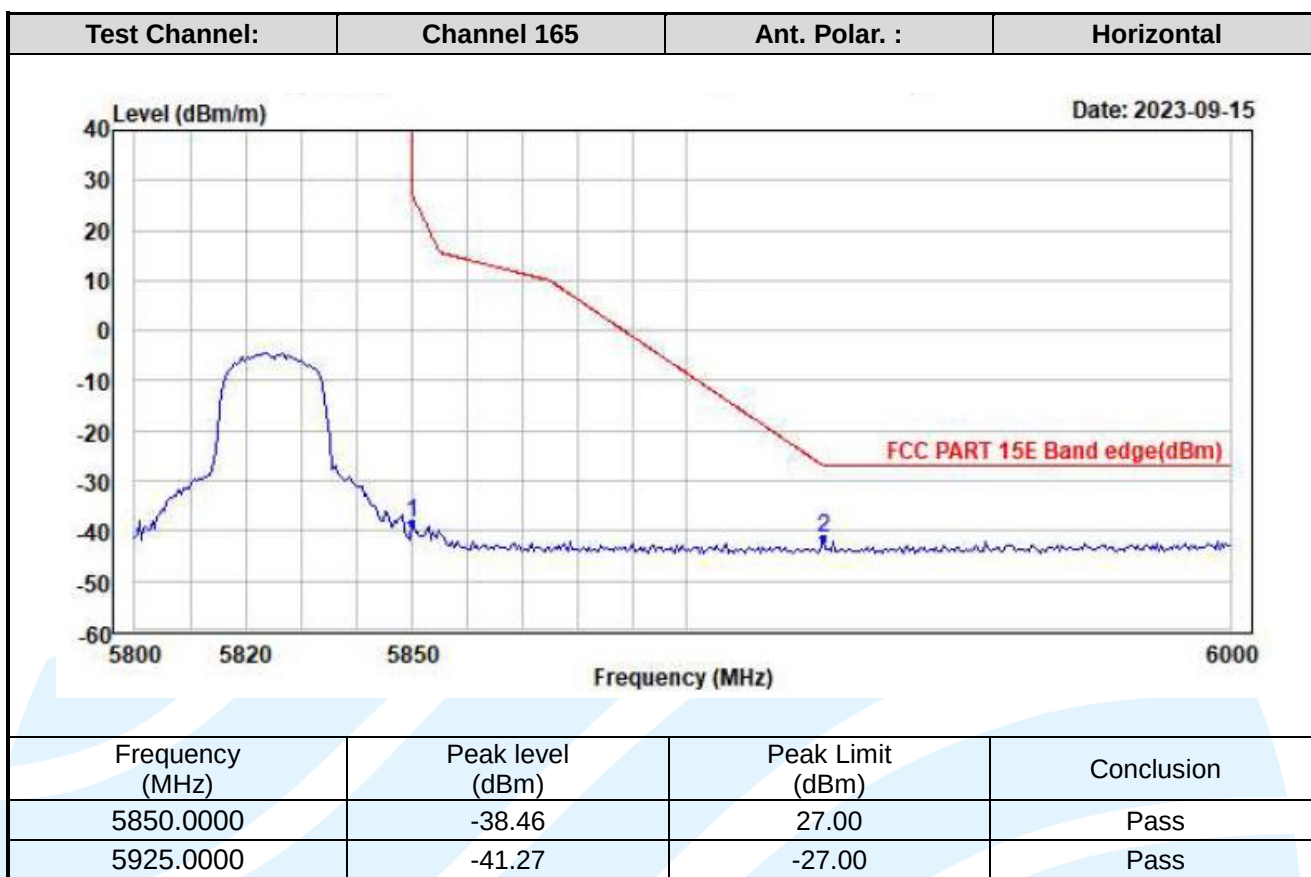
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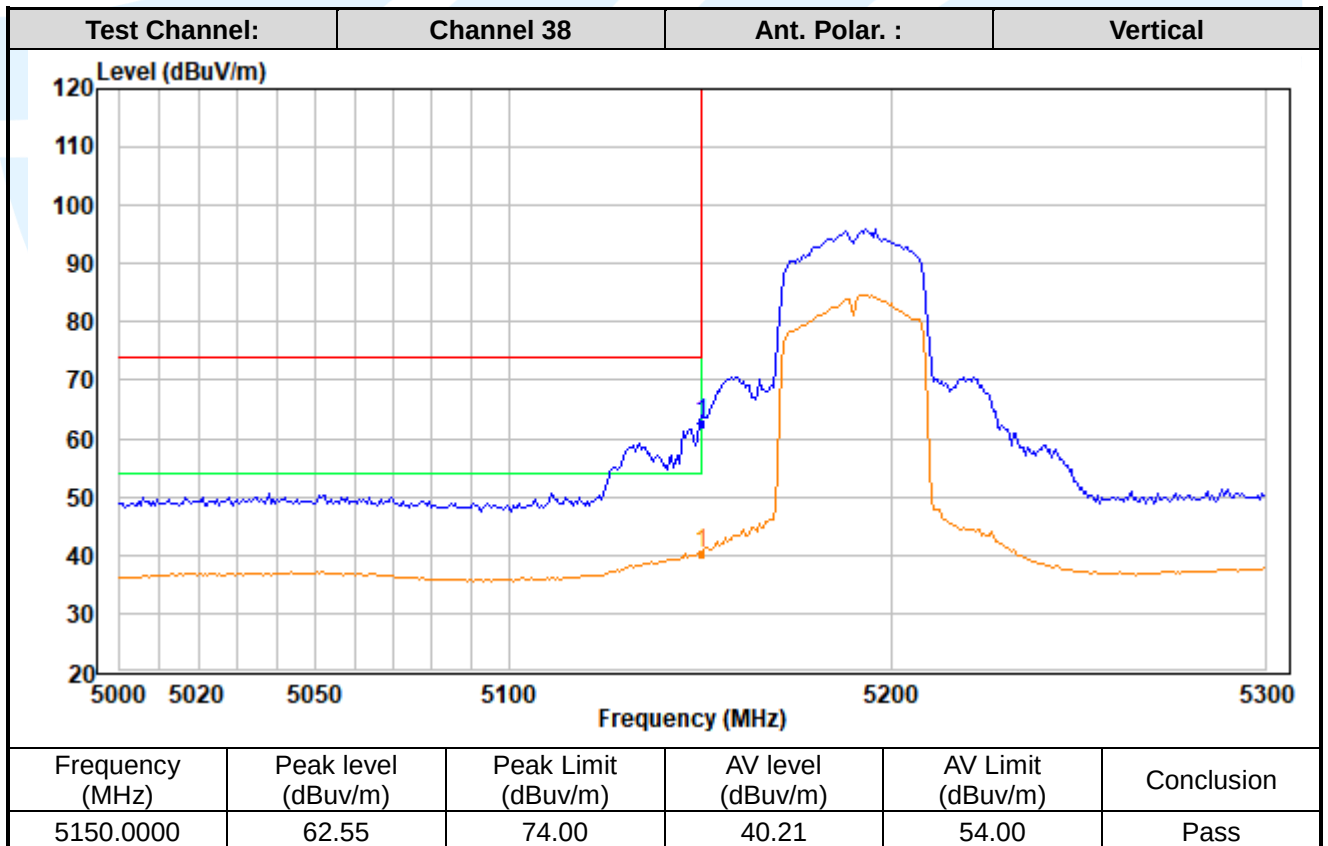
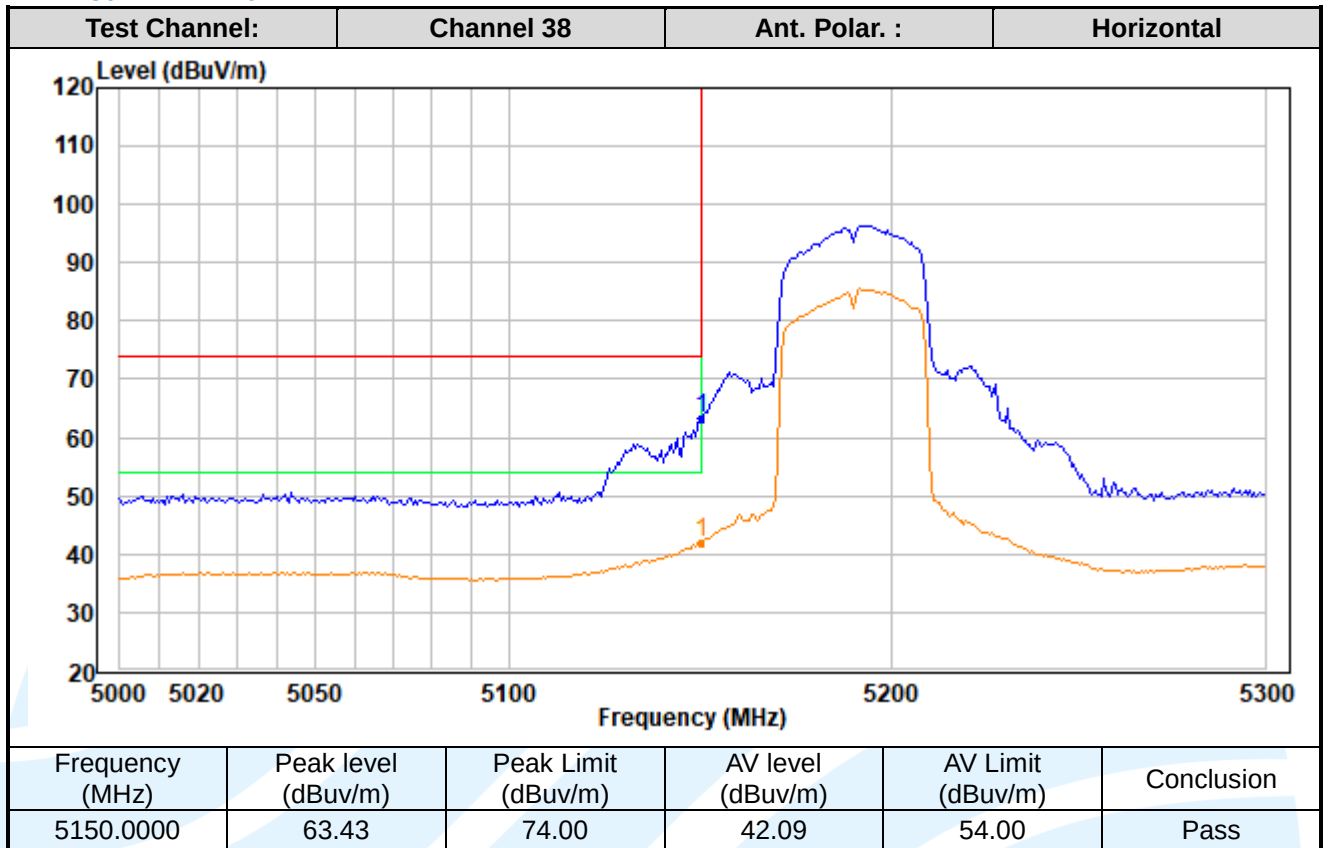
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IEEE 802.11n-HT40



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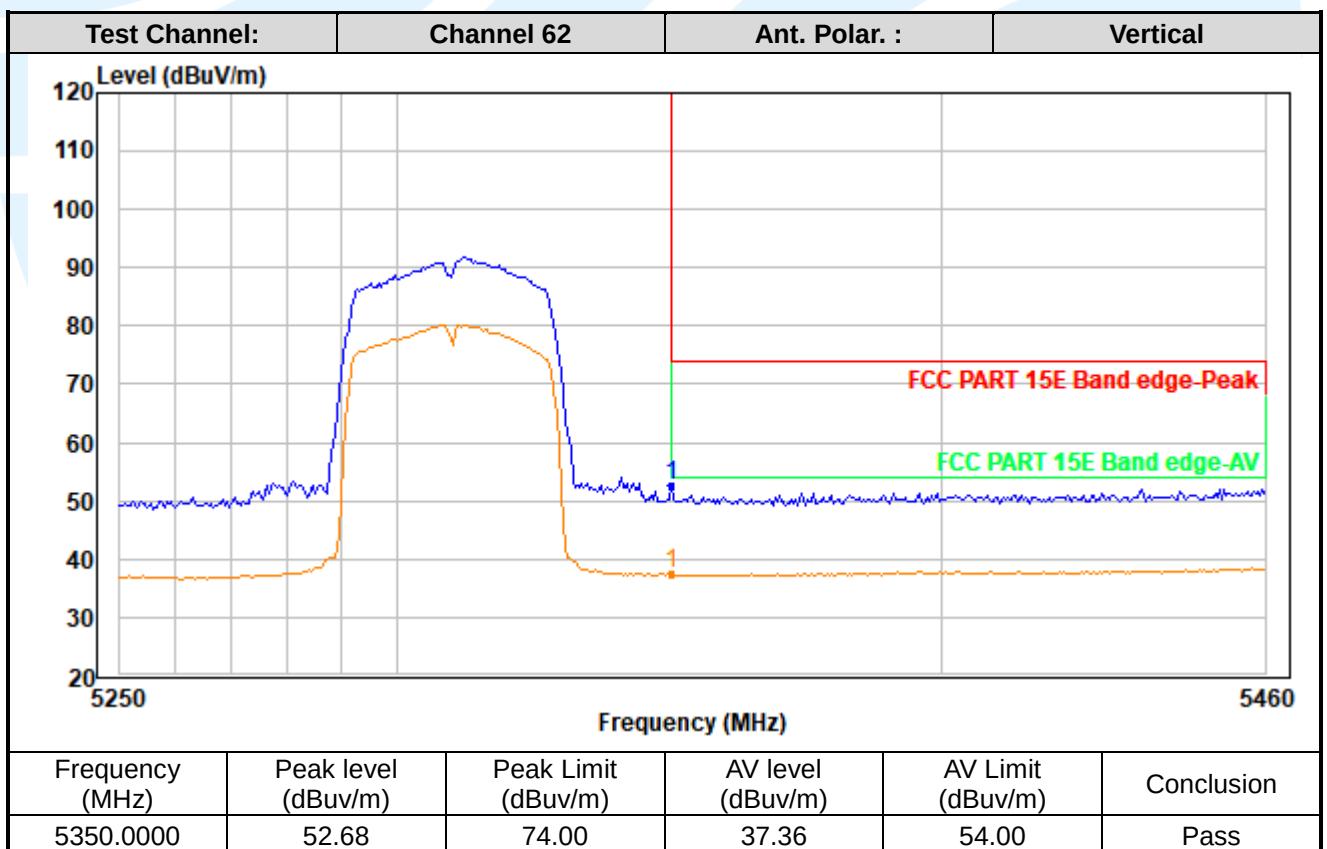
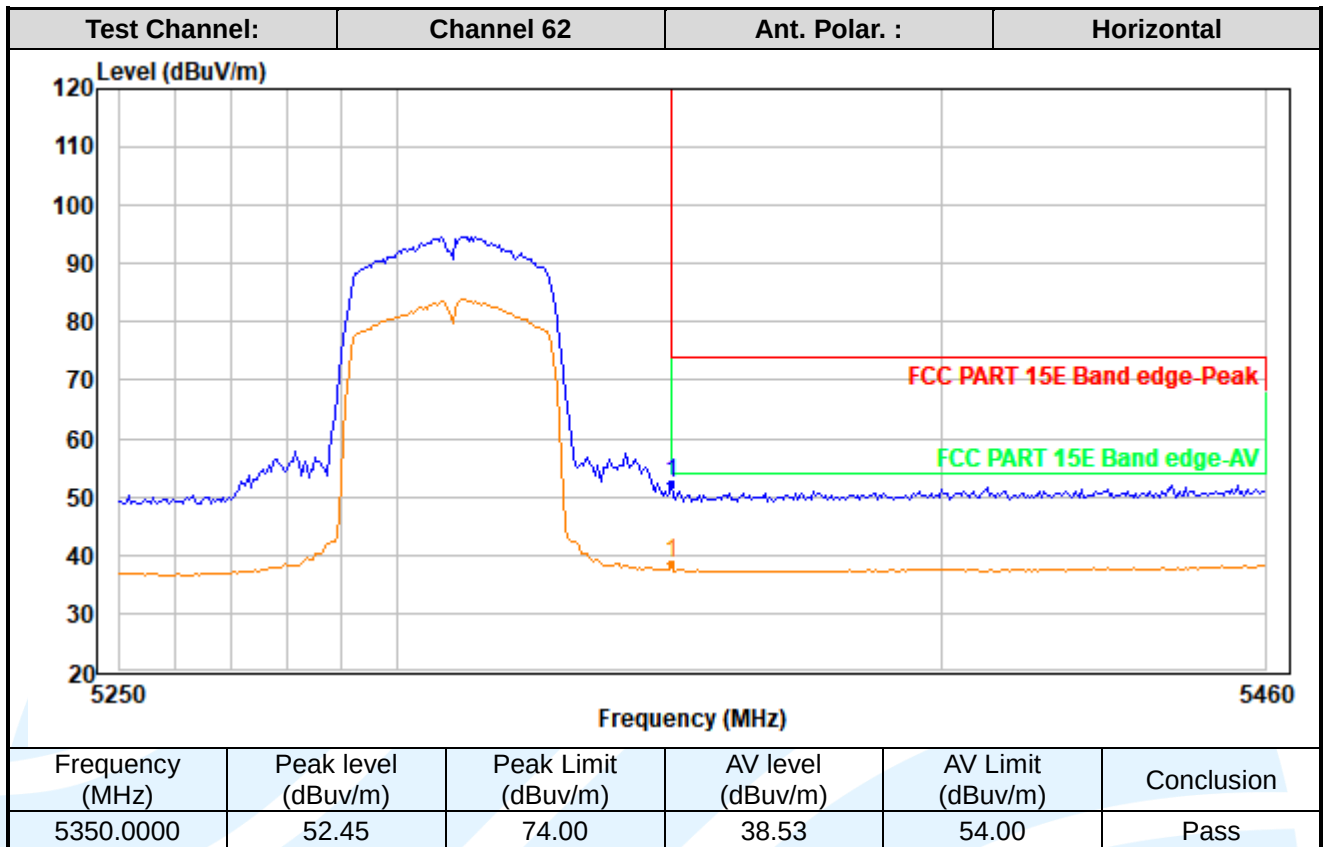
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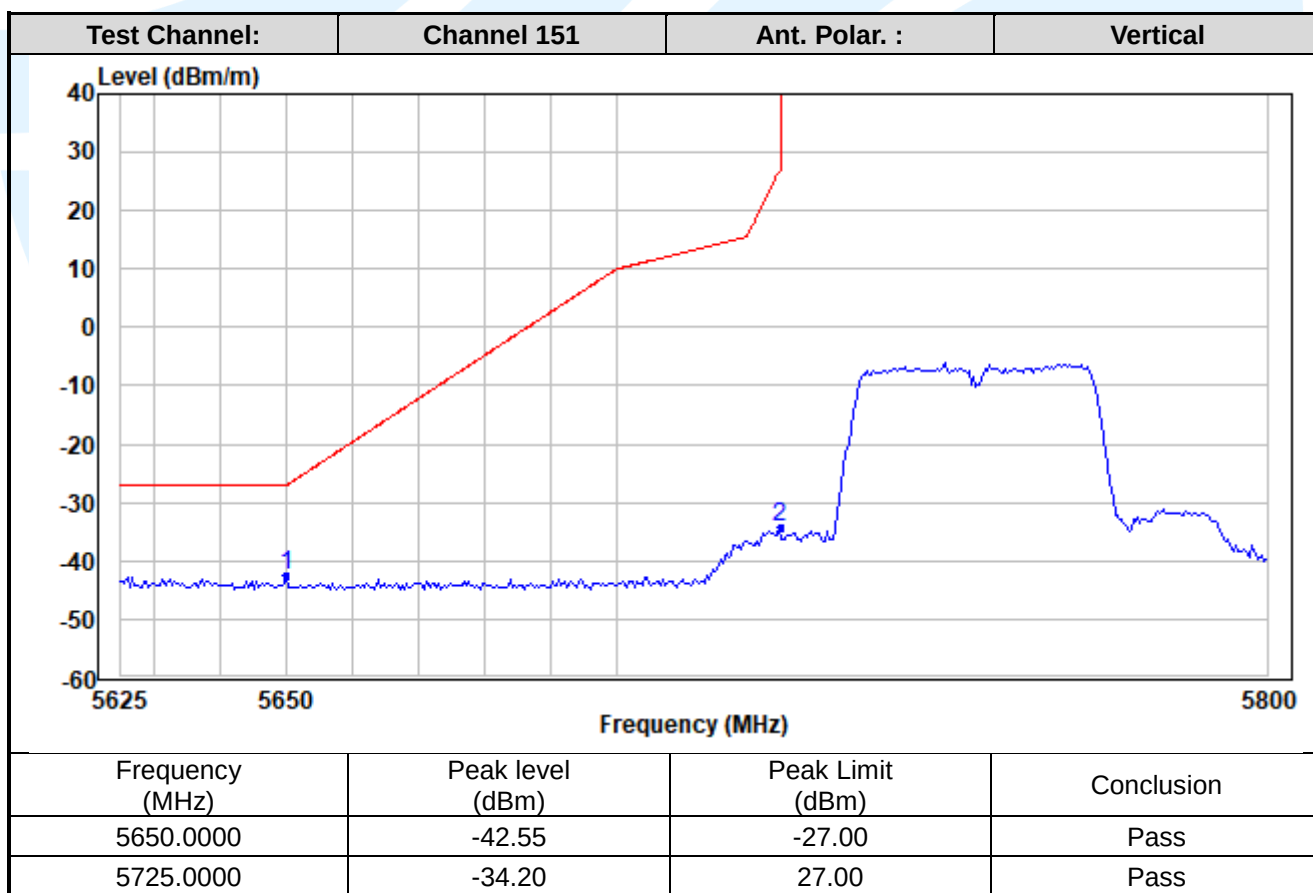
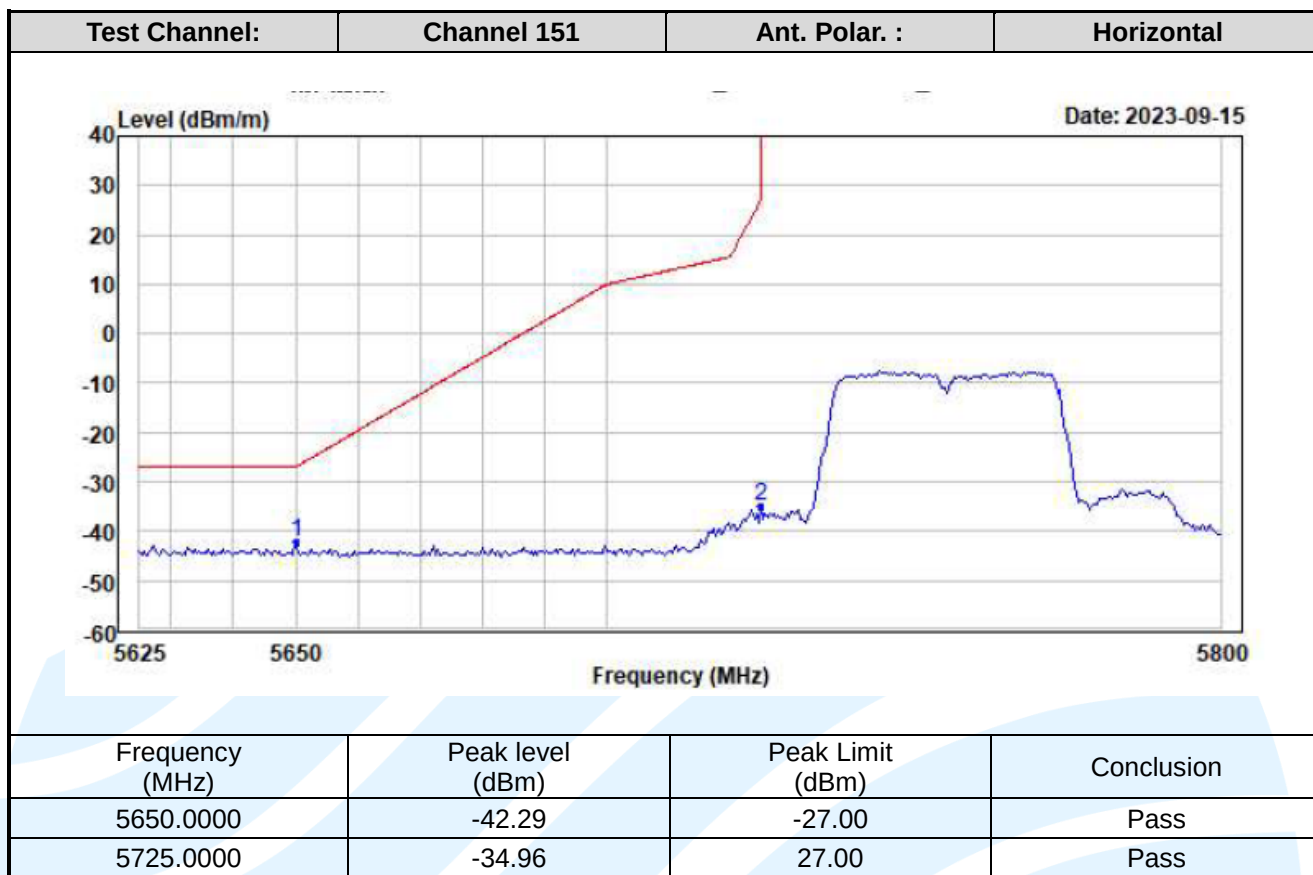
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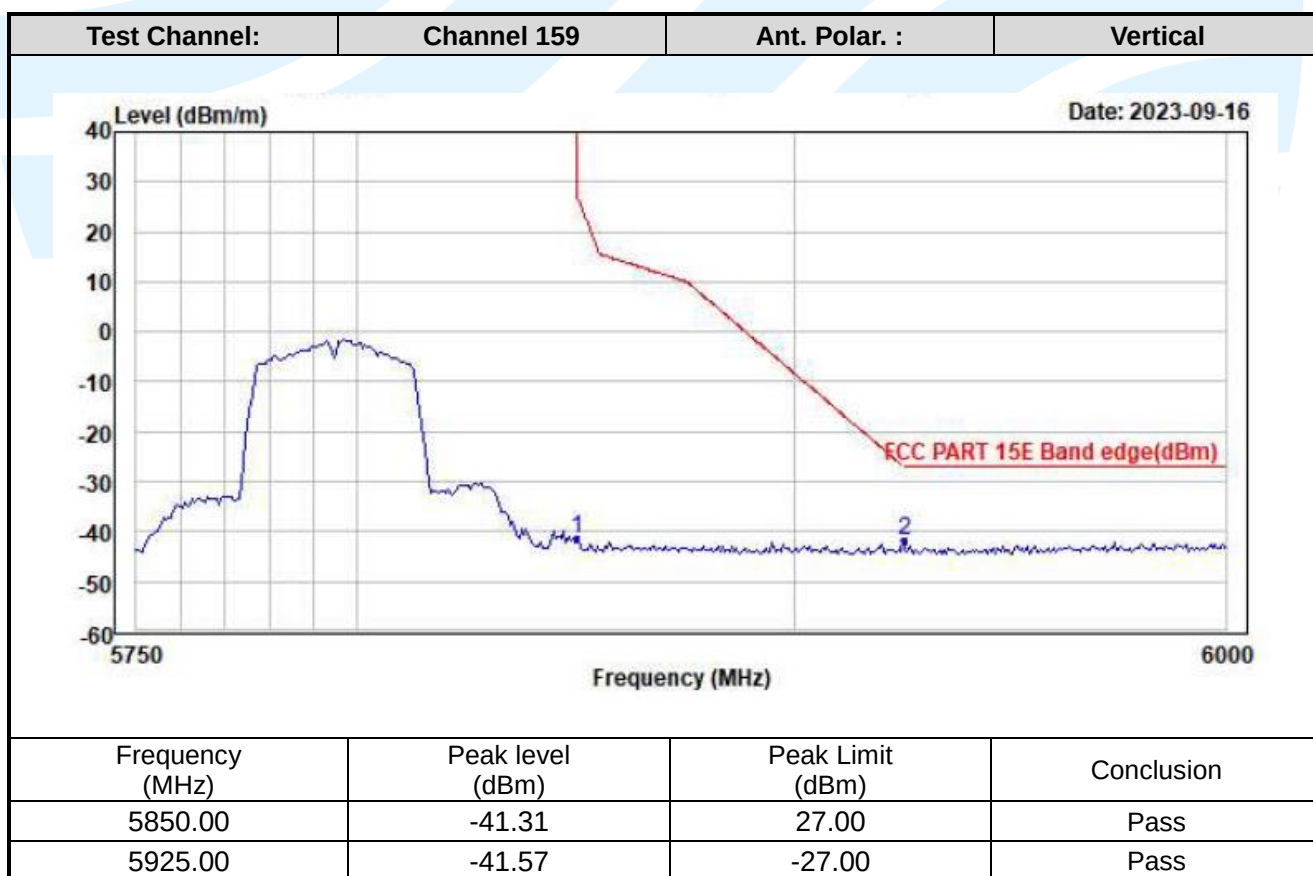
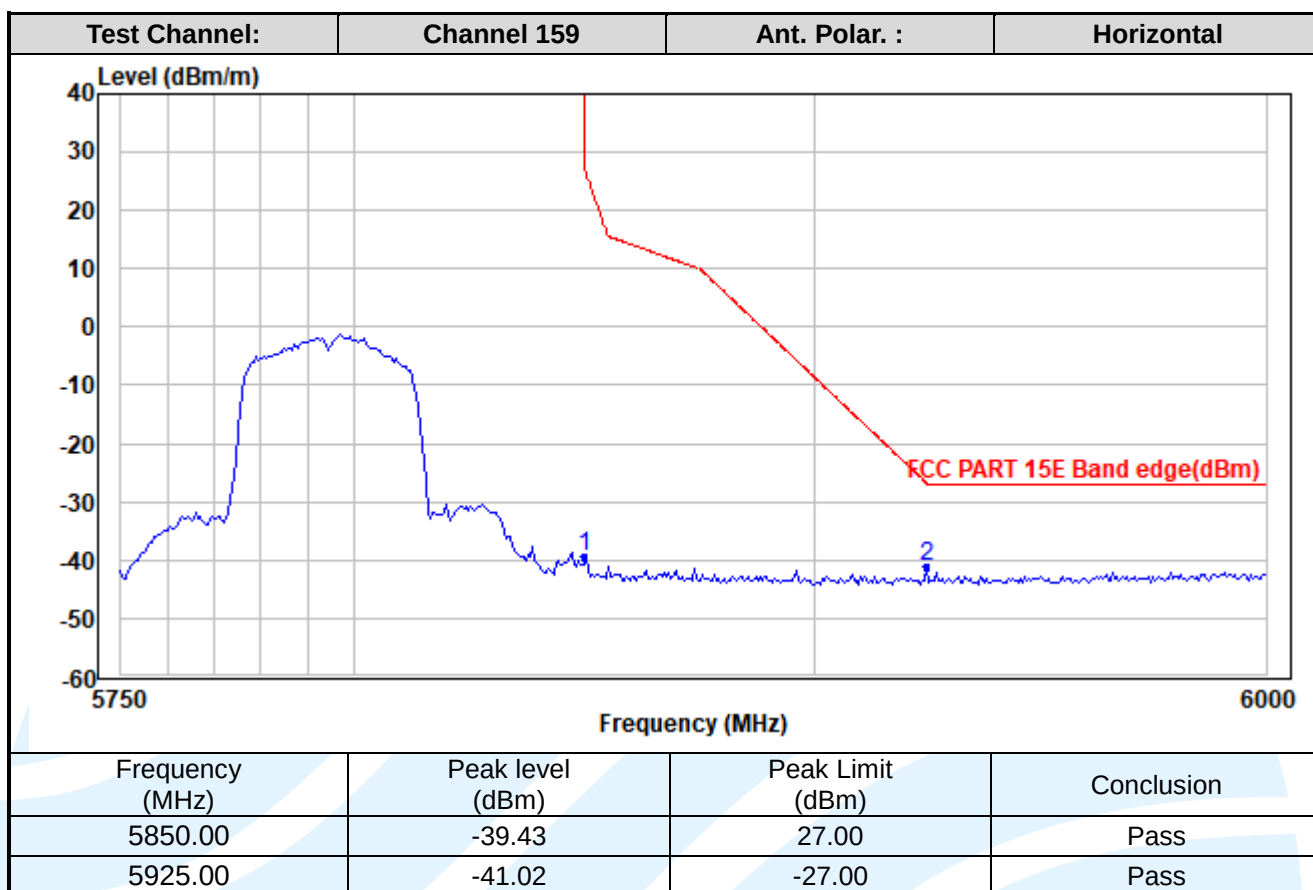
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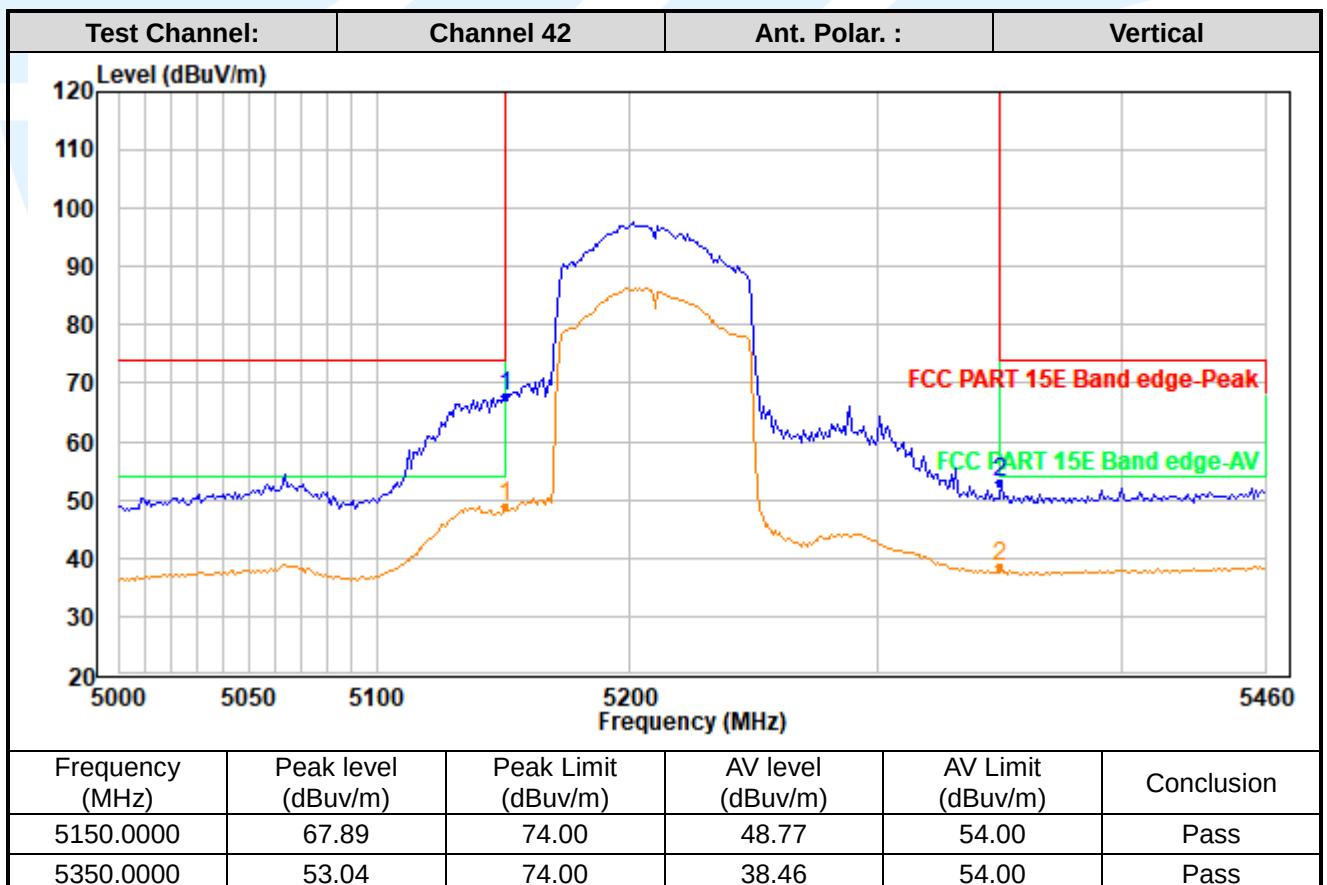
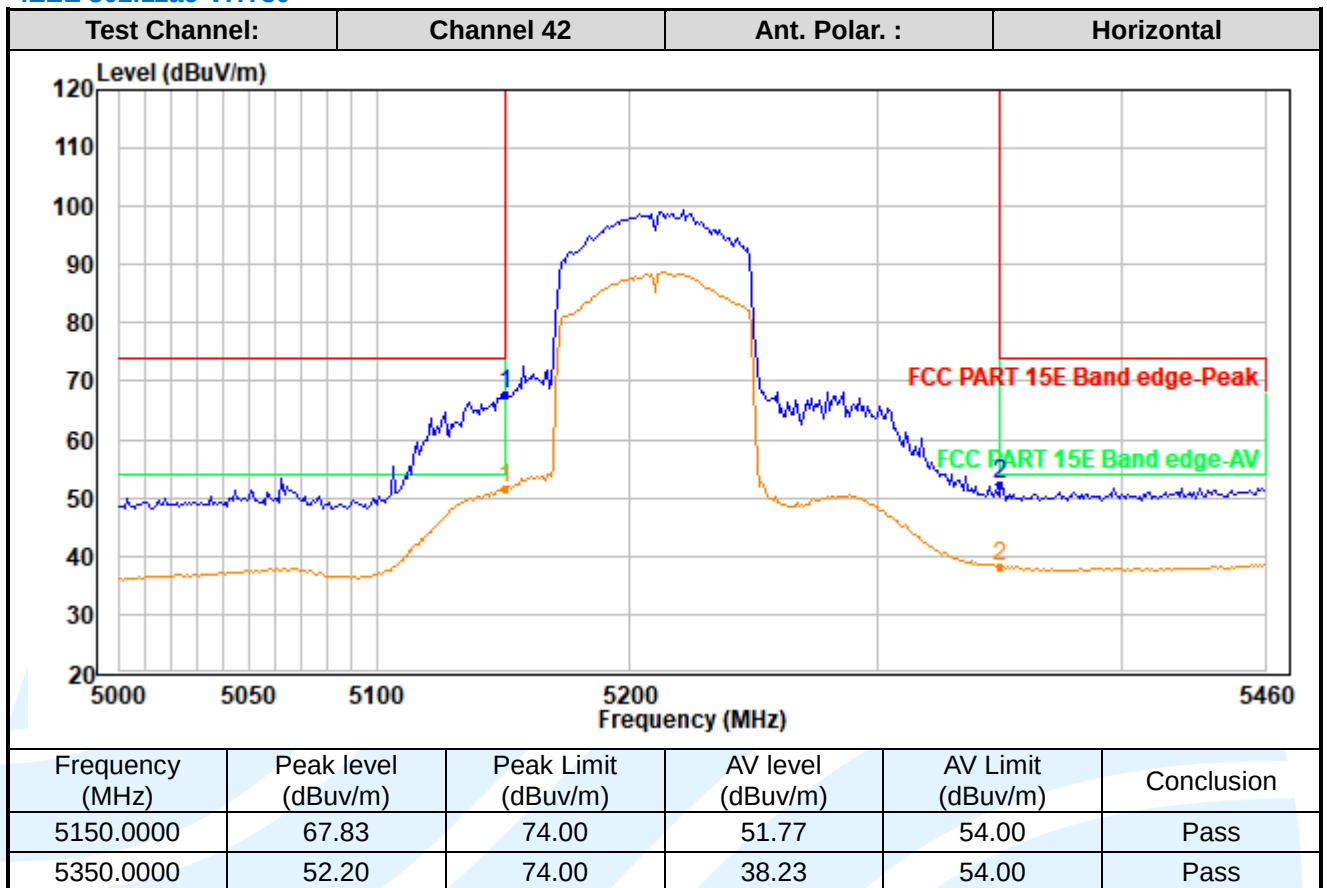
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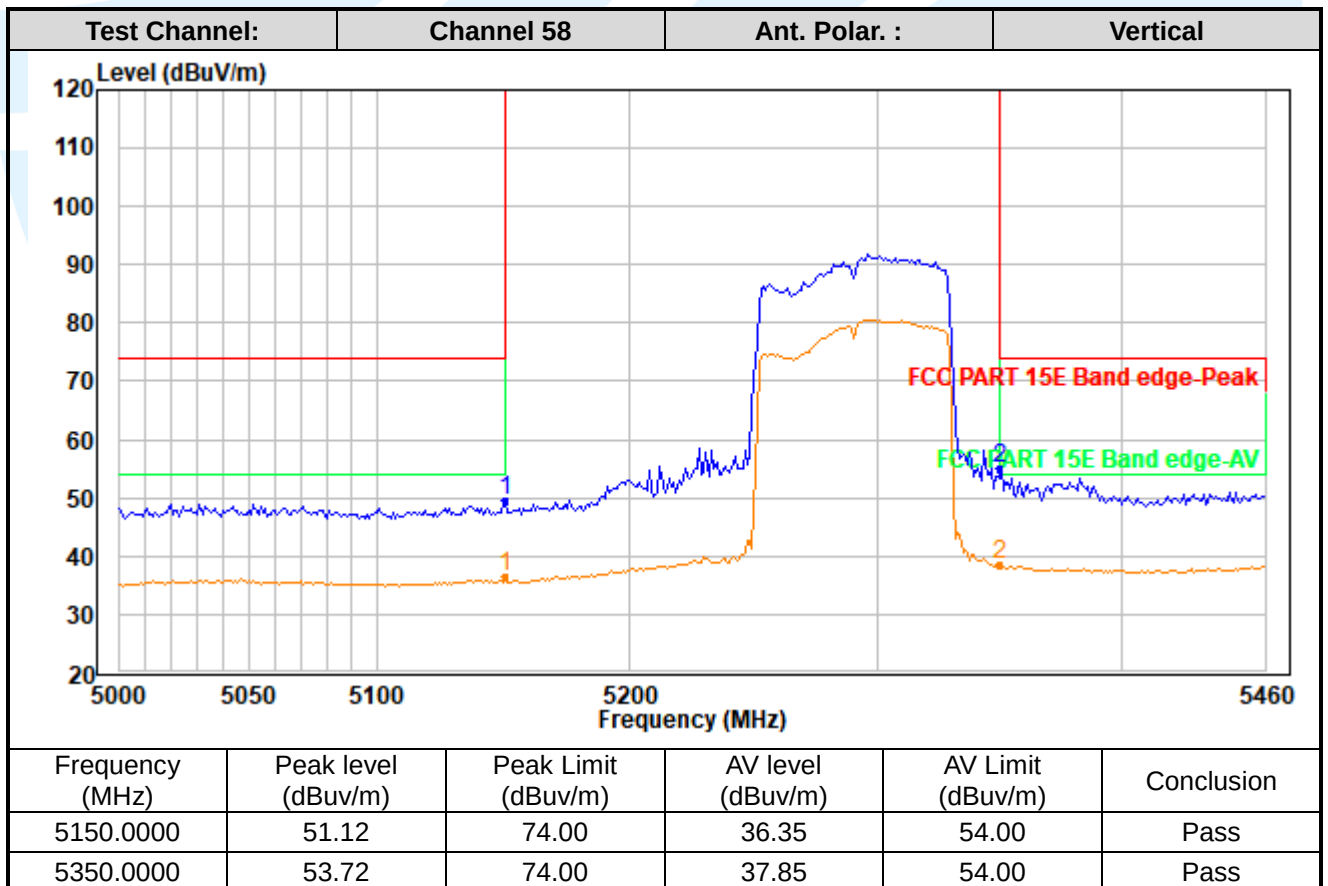
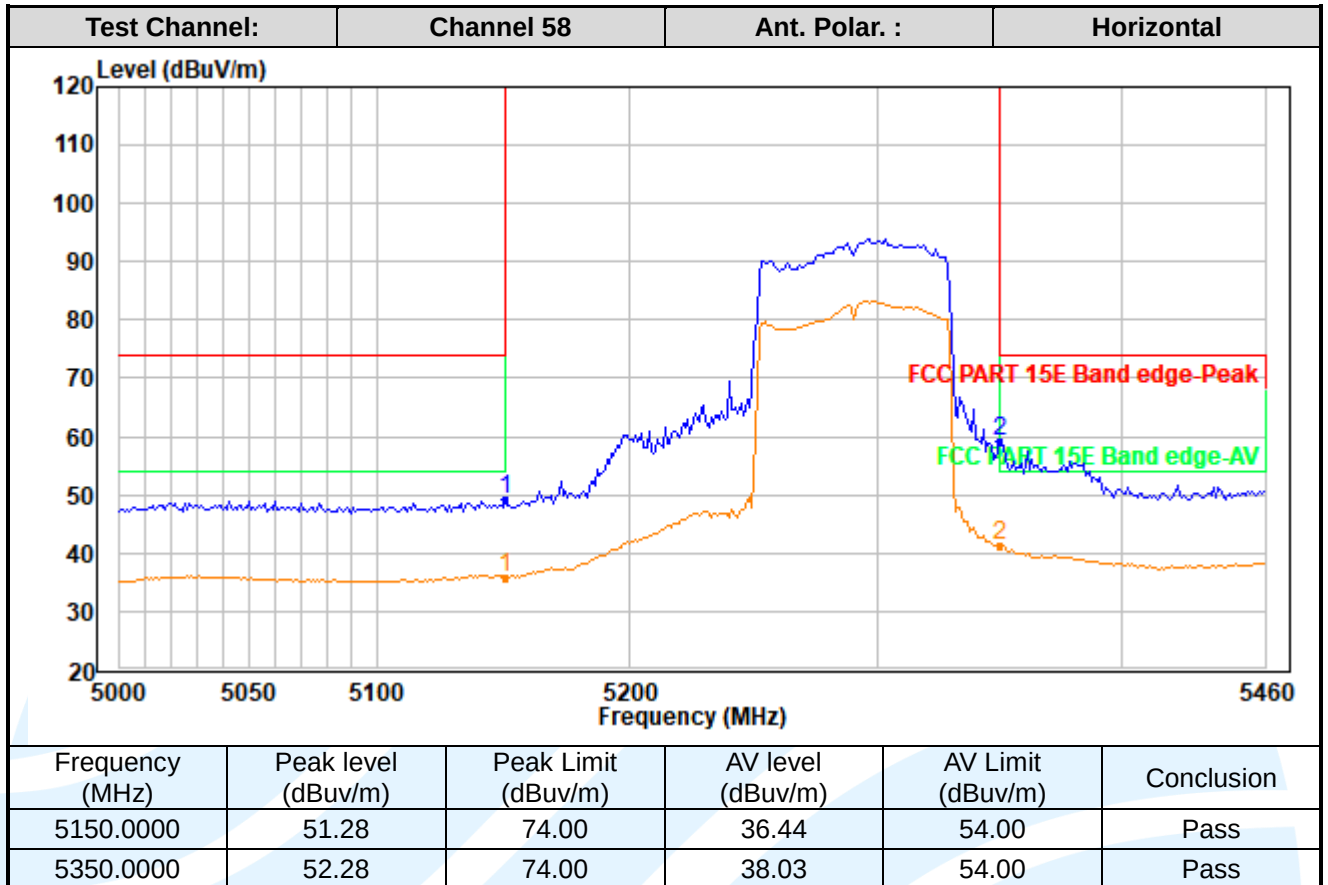
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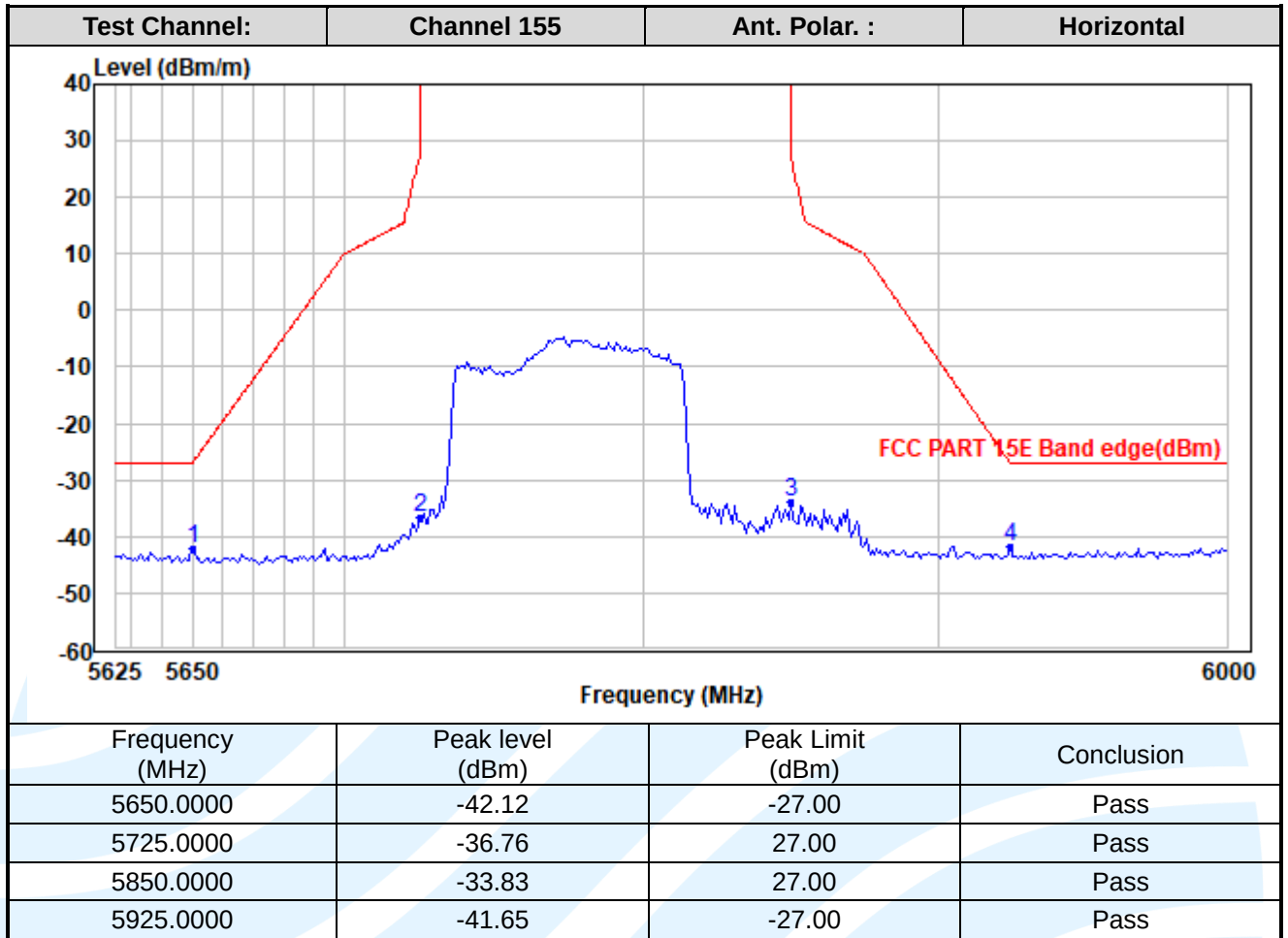
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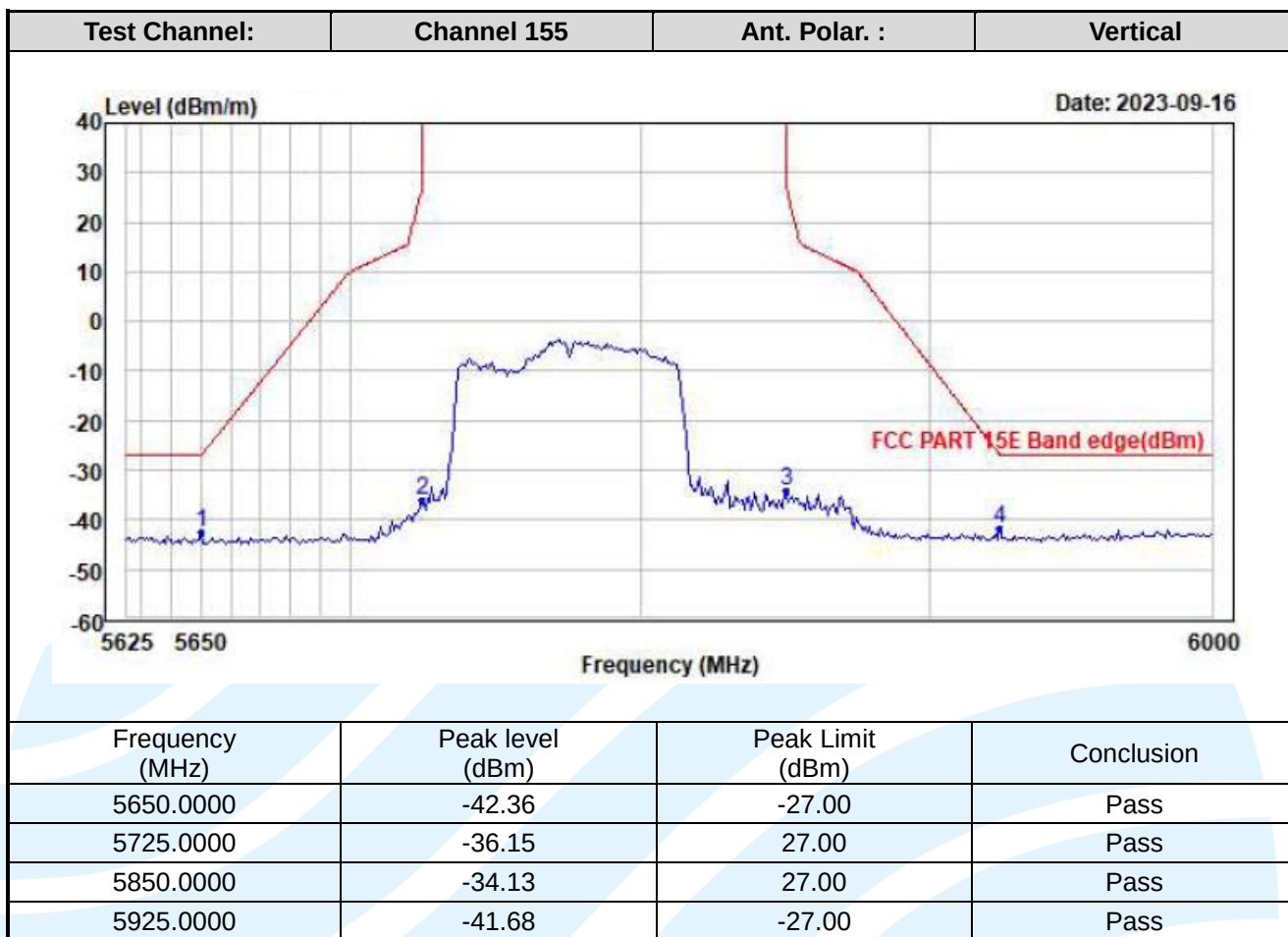
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5.8 DYNAMIC FREQUENCY SELECTION

Test Requirement: FCC 47 CFR Part 15 Subpart E Section 15.407 (h)

Test Method: KDB 905462 D03 Client Without DFS New Rules v01r02

EUT Operating Mode:

DFS Operational mode	Operating Frequency Range	
	5250 MHz to 5350 MHz	5470 MHz to 5725 MHz
Slave without radar Interference detection function	✓	x

Applicability:

The following table from KDB905462 and the lists of the applicable requirements for the DFS testing.

Applicability of DFS Requirements Prior to Use of a Channel:

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	✓	Not required	Yes
DFS Detection Threshold	✓	Not required	Yes
Channel Availability Check Time	✓	Not required	Not required
U-NII Detection Bandwidth	✓	Not required	Yes

Applicability of DFS requirements during normal operation:

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required
Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection:

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64dBm

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Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.

Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.

DFS Radar Signal Parameter Values:

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds (See Note 1.)
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. (See Notes 1 and 2.)
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. (See Note 3.)

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

DFS Radar Signal Parameter:

Radar Type 0 was used in the evaluation of the Client device for the purpose of measuring the Channel Move Time and the Channel Closing Transmission Time

Table 1-Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
0	1	1428	18	See Note 1.	See Note 1.
1	1	Test A Test B	$\text{Roundup} \left\{ \left(\frac{1}{\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}}} \right) \right\}$	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.

Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a

Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms.

If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B.

The aggregate is the average of the percentage of successful detections of short pulse radar types

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1-4

Table 2-Long Pulse Radar Test Waveform

Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

Table 3-Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	0.333	300	70%	30

In-Service Monitoring: Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period

Limit of In-Service Monitoring:

Reference to DFS Radar Signal Parameter Values.

Test Procedures:

- One frequency will be chosen from the Operating Channels of the EUT within the 5250-5350 MHz or 5470-5725 MHz bands. For 802.11 devices, the test frequency must contain control signals. This can be verified by disabling channel loading and monitoring the spectrum analyzer. If no control signals are detected, another frequency must be selected within the emission bandwidth where control signals are detected.
- In case the EUT is a Master Device, a U-NII device operating as a Client Device will be used and it is assumed that the Client will associate with the EUT (Master). For radiated tests, the emissions of the Radar Waveform generator will be directed towards the Master Device. If the Master Device has antenna gain, the main beam of the antenna will be directed toward the radar emitter. Vertical polarization is used for testing.
- The TCP protocol unicast data stream was generated by the iperf software command line with at least 17% activity ratio over any 100ms period.
- Timing plots are reported with calculations demonstrating a minimum channel loading of approximately 17% or greater. For example, channel loading can be estimated by setting the spectrum analyzer for zero span and approximate the Time On/ (Time On + Off Time).
- At time T_0 the Radar Waveform generator sends a Burst of pulses for one of the Short Pulse Radar Types 1-4 at DFS Detection Threshold levels on the Operating Channel. An additional 1 dB is added to the radar test signal to ensure it is at or above the DFS Detection Threshold, accounting for equipment variations/errors.
- Observe the transmissions of the EUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the EUT during the observation time (Channel Move Time). Measure and record the Channel Move Time and Channel Closing Transmission Time if radar detection occurs.
- When operating as a Master Device, monitor the EUT for more than 30 minutes following instant T_2 to verify that the EUT does not resume any transmissions on this Channel. Perform this test once and record the measurement result.

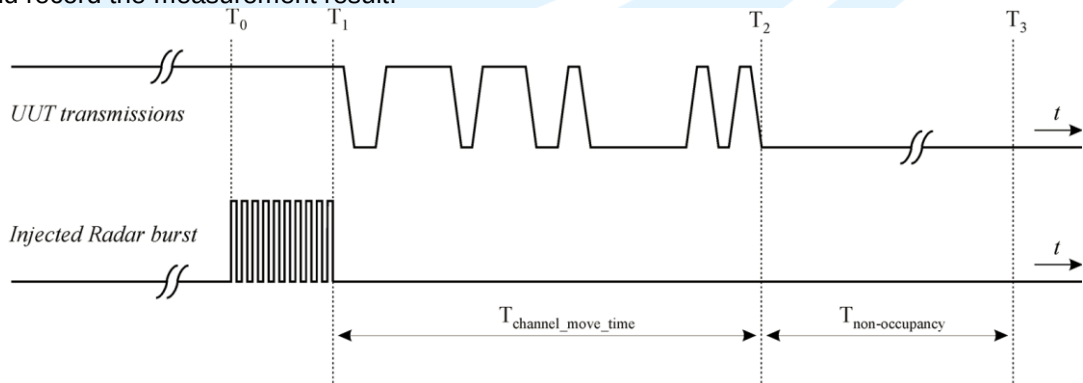


Figure 17: Channel Closing Transmission Time, Channel Move Time and Non-Occupancy Period

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