

FCC TEST REPORT

Product Name: WiFi/BT Module
Trade Mark: msi
Model No. / HVIN: MWH540S
Add. Model No. / HVIN: N/A
Report Number: 24112914988RFC-4
FCC 47 CFR Part 15 Subpart C
Test Standards: RSS-247 Issue 3
RSS-Gen Issue 5
FCC ID: I4L-MWH540S
IC: 3715A-MWH540S
Test Result: PASS
Date of Issue: January 7, 2025

Prepared for:

Micro-Star Int'l Co., Ltd.
No. 69, Lide St., Zhonghe Dist., New Taipei City 235, Taiwan

Prepared by:

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Version

Version No.	Date	Description
V1.0	January 7, 2025	Original



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1. GENERAL INFORMATION

1.1 CLIENT INFORMATION

Applicant:	Micro-Star Int'l Co., Ltd.
Address of Applicant:	No. 69, Lide St., Zhonghe Dist., New Taipei City 235, Taiwan
Manufacturer:	Micro-Star Int'l Co., Ltd.
Address of Manufacturer:	No. 69, Lide St., Zhonghe Dist., New Taipei City 235, Taiwan

1.2 EUT INFORMATION

1.2.1 General Description of EUT

Product Name:	WiFi/BT Module		
Model No.:	MWH540S		
Add. Model No.:	N/A		
Trade Mark:	msi		
DUT Stage:	Identical Prototype		
EUT Supports Function: (Provided by the customer)	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
		5 470 MHz to 5 725 MHz	IEEE 802.11a/n/ac
		5 725 MHz to 5 850 MHz	IEEE 802.11a/n/ac
Software Version:	N/A (Provided by the customer)		
Hardware Version:	V3.00 (Provided by the customer)		
Sample Received Date:	November 11, 2024		
Sample Tested Date:	December 11, 2024 to December 27, 2024		

1.2.2 Description of Accessories

None.

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)	
	5470 MHz to 5725 MHz (U-NII-2C)	
	5 725 MHz to 5 850 MHz (U-NII-3)	
Frequency Ranges:	5180 MHz to 5240 MHz	
	5260 MHz to 5320 MHz	
	5500 MHz to 5700 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 MCS15	
	IEEE 802.11n-HT40: Up to MCS15	
	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	
	5470 MHz to 5725 MHz: 11 for IEEE 802.11a/n-HT20/ac-VHT20 5 for IEEE 802.11n-HT40/ac-VHT40 2 for IEEE 802.11ac-VHT80	
	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:	Ant. 1	Tube Antenna
	Ant. 2	Tube Antenna
Antenna Gain: (Provided by the customer)	Ant. 1	5150 MHz to 5250 MHz: 3.19 dBi
		5250 MHz to 5350 MHz: 3.72 dBi
		5470 MHz to 5725 MHz: 3.98 dBi
		5725 MHz to 5850 MHz: 4.04 dBi
	Ant. 2	5150 MHz to 5250 MHz: 3.19 dBi
		5250 MHz to 5350 MHz: 3.72 dBi

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		5470 MHz to 5725 MHz: 3.98 dBi
		5725 MHz to 5850 MHz: 4.04 dBi
Normal Test Voltage:	3.3 Vdc	

1.4 OTHER INFORMATION

None.

1.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	FCC ID	Supplied by
Notebook	DELL	Inspiron 5593	N/A	N/A	UnionTrust
Mouse	DELL	MS111	CN-011D3V-738	N/A	UnionTrust

2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Antenna Cable	SMA	0.2 Meter	UnionTrust

1.6 TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F, Block A, Building 6th, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, China

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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 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

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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	±4.6 dB
5	Radiated emission 1GHz-18GHz	±4.4 dB
6	Radiated emission 18GHz-40GHz	±4.6 dB

2. TEST SUMMARY

FCC 47 CFR Part 15 Subpart C 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 C Section 15.407(a)(1) (2) RSS-Gen Issue 5, Section 6.8	N/A	PASS ^{NOTE 1}
26 dB emission bandwidth	FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(2)(5) RSS-247 Issue 3 Section 6.2.1.2	KDB 789033 D02 v02r01 Section C.1	VERIFIED ^{NOTE 1}
6 dB bandwidth	FCC 47 CFR Part 15 Subpart E Section 15.407 (e) RSS-247 Issue 3 Section 6.2.4.1	KDB 789033 D02 v02r01 Section C.2	VERIFIED ^{NOTE 1}
Occupied Bandwidth	RSS-Gen Issue 5, Section 6.7	KDB 789033 D02 v01r04 Section D	VERIFIED ^{NOTE 1}
Maximum conducted output power	FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3) RSS-247 Issue 3 Section 6.2.1.1/6.2.2.1/6.2.3.1/6.2.4.1	KDB 789033 D02 v02r01 Section E.3.a (Method PM)	VERIFIED ^{NOTE 1}
Peak Power Spectral Density	FCC 47 CFR Part 15 Subpart E Section 15.407 (a)(1)(2)(3) RSS-247 Issue 3 Section 6.2.1.1/6.2.2.1/6.2.3.1/6.2.4.1	KDB 789033 D02 v02r01 Section F	VERIFIED ^{NOTE 1}
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 RSS-247 Issue 3 Section 6.2.1.2/6.2.2.2/6.2.3.2/6.2.4.2	KDB 789033 D02 v02r01 Section G.3, G.4, G.5, and G.6	PASS ^{NOTE 1}
Dynamic Frequency Selection	FCC 47 CFR Part 15 Subpart E Section 15.407 (h) RSS-247 Issue 3 Section 6.3	KDB 905462 D03 Client Without DFS New Rules v01r02	VERIFIED ^{NOTE 1}
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 RSS-Gen Issue 5, Section 8.8	ANSI C63.10-2013, Section 6.2.	VERIFIED ^{NOTE 1}
Note: 1) This report base on previous reports no.: SRTC2024-9004(F)-24032606(G) Issued by The State Radio_monitoring_center Testing Center (SRTC). Change Antenna. After evaluation, all data refer to previous reports in addition to verifying the all Radiated Spurious Emissions and Band Edge Measurements (Radiated) tests.			

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	11-Nov-2023	10-Nov-2026
☒	Receiver	R&S	ESIB26	100114	25-Oct-2024	24-Oct-2025
☒	Loop Antenna	ETS-LINDGREN	6502	00202525	28-Oct-2024	27-Oct-2025
☒	Broadband Antenna	ETS-LINDGREN	3142E	00201566	29-Oct-2024	28-Oct-2025
☒	6dB Attenuator	Talent	RA6A5-N-18	18103001	29-Oct-2024	28-Oct-2025
☒	Preamplifier	HP	8447F	2805A02960	25-Oct-2024	24-Oct-2025
☒	Double-Ridged Waveguide Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201541	01-Apr-2024	31-Mar-2025
☒	Pre-amplifier	ETS-LINDGREN	00118385	00201874	01-Apr-2024	31-Mar-2025
☒	Double-Ridged Waveguide Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3116C-PA	00202652	28-Oct-2024	27-Oct-2025
☒	Pre-amplifier	ETS-LINDGREN	00118384	00202652	28-Oct-2024	27-Oct-2025
☒	Band Rejection Filter (2400MHz~2500MHz)	Micro-Tronics	BRM50702	G590	17-Jan-2024	16-Jan-2025
☒	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A
☒	Test Software	Audix	e3	Software Version: 9.160323		

RF Conducted Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date	Cal. Due date
☒	EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY51440197	29-Mar-2024	28-Mar-2025
☐	EXA Spectrum Analyzer	KEYSIGHT	N9020A	MY51286807	25-Oct-2024	24-Oct-2025
☒	USB Wideband Power Sensor	KEYSIGHT	U2021XA	MY55430035	25-Oct-2024	24-Oct-2025

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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	3.3	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
Radiated Emissions and Band Edge Measurement	21.1	31.6	100.6	S202410304552-PJA 01	Jackson Wu

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
	5470 MHz to 5725 MHz	Channel 100	Channel 116	Channel 140
		5500 MHz	5580 MHz	5700 MHz
	5725 MHz to 5850 MHz	Channel 144	Channel 157	Channel 165
		5720MHz	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
	5470 MHz to 5725 MHz	Channel 102	Channel 110	Channel 134
		5510 MHz	5550 MHz	5670 MHz
	5725 MHz to 5850 MHz	Channel 142	--	Channel 159
		5710MHz	--	5795 MHz
IEEE 802.11ac-VHT80	5150 MHz to 5250 MHz	--	Channel 42	--
		--	5210 MHz	--
	5250 MHz to 5350 MHz	--	Channel 58	--
		--	5290 MHz	--
	5470 MHz to 5725 MHz	Channel 106	--	Channel 122
		5530 MHz	--	5610 MHz
	5725 MHz to 5850 MHz	Channel 138	Channel 155	--
		5610 MHz/	5775 MHz	--

4.3 EUT TEST STATUS

Mode	Tx/Rx Function	Description
IEEE 802.11a/n/ac	1Tx/1Rx or 2Tx/2Rx	1. Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.

Test Software (Provided by the customer)

MPTool

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

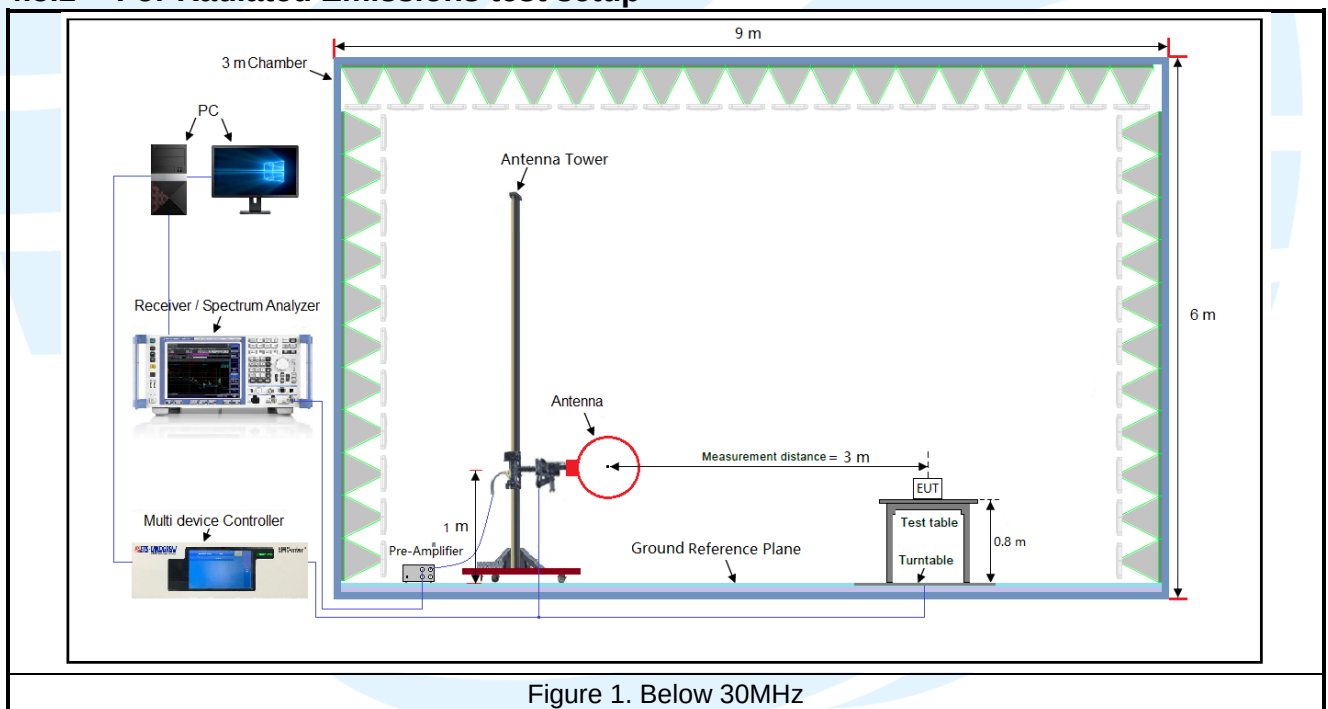


Figure 1. Below 30MHz

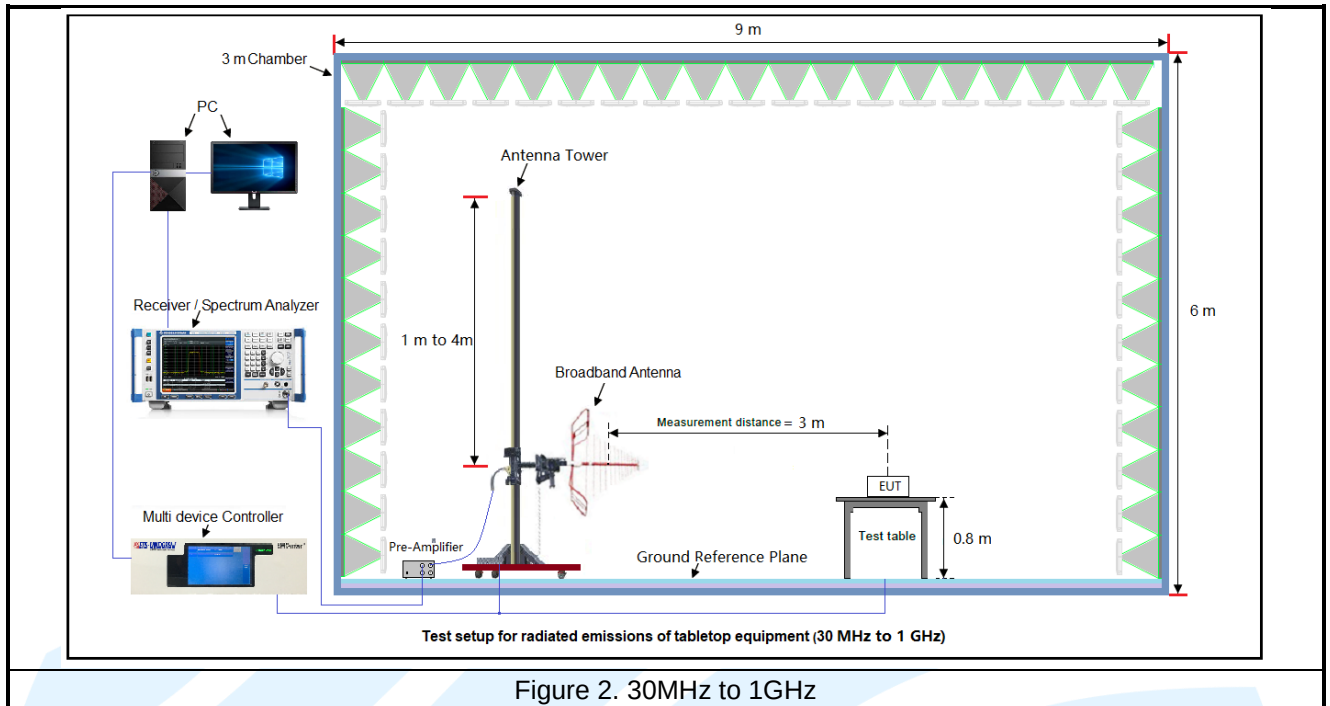


Figure 2. 30MHz to 1GHz

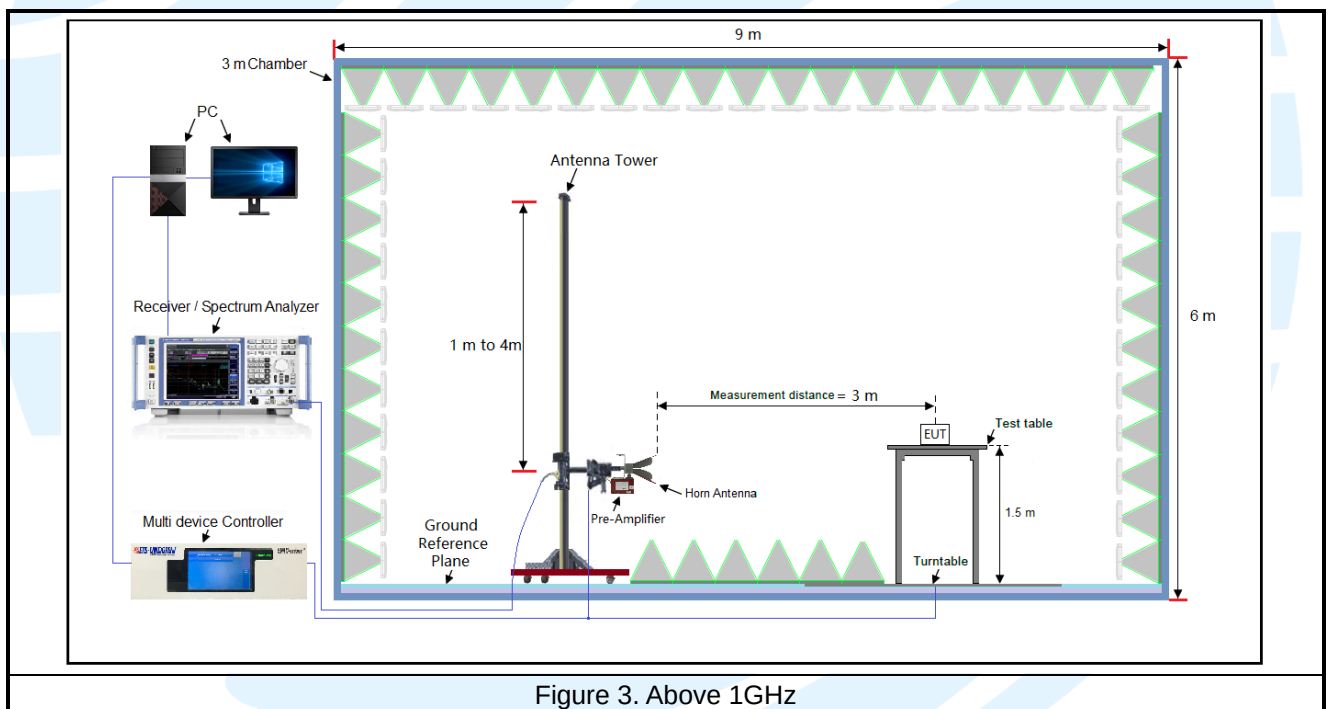
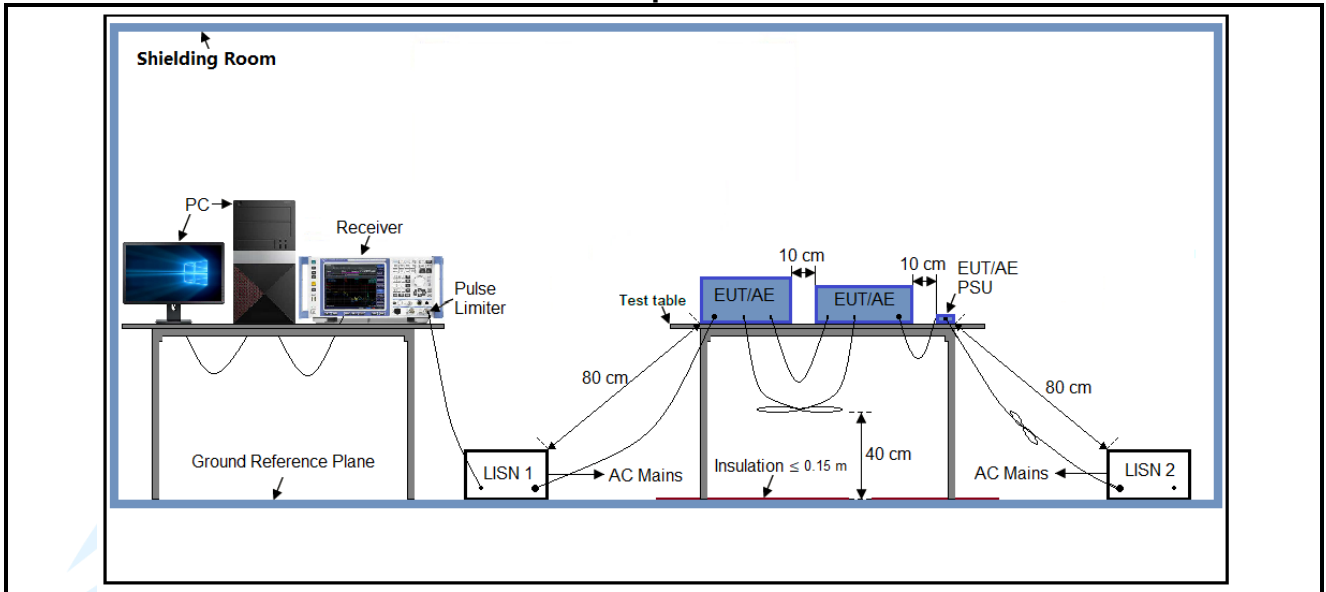
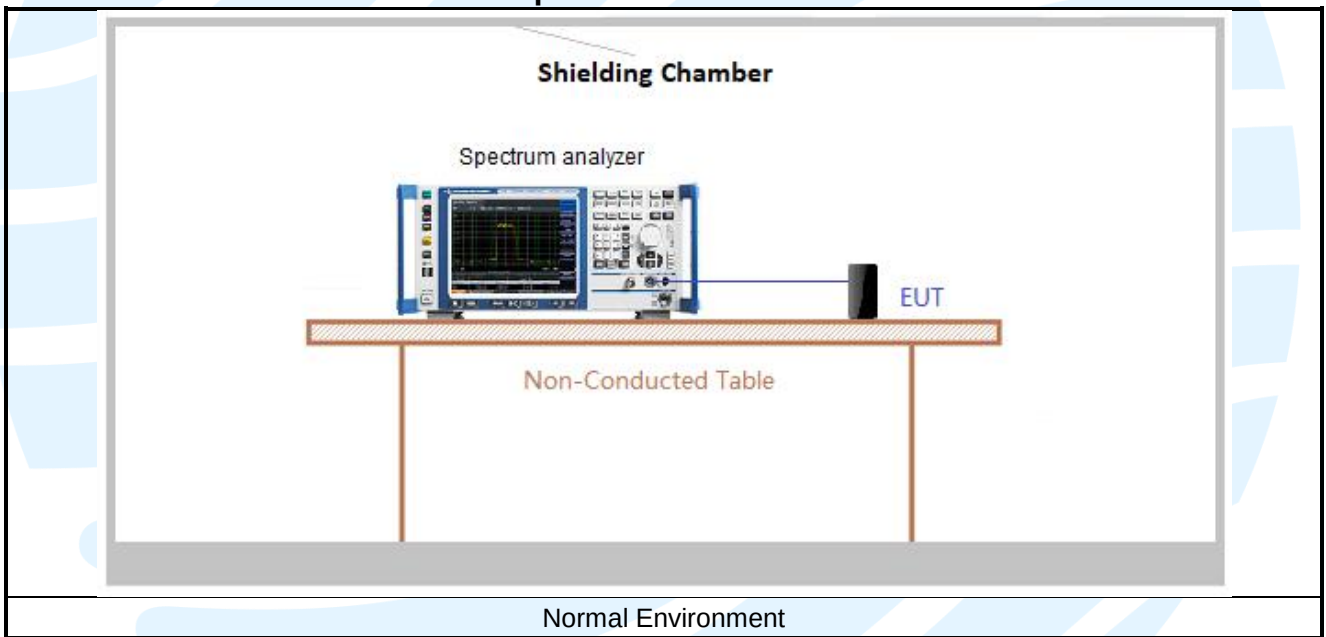


Figure 3. Above 1GHz

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 3.3 VDC. 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.

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
7	KDB 905462 D03 Client Without DFS New Rules v01r02	U-NII client devices without radar detection capability
8	KDB 662911 D01 Multiple Transmitter Output v02r01	Emissions Testing of Transmitters with Multiple Outputs in the Same Band
9	RSS-247 Issue 3	Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
10	RSS-Gen Issue 5	General Requirements for Compliance of Radio Apparatus

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. RSS-Gen Issue 5, Section 6.8 requirement: According to RSS-Gen Issue 5, Section 6.8, a transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. EUT Antenna: The antenna adopts IPEX interface and no consideration of replacement. The gain of the antenna is 4.04 dBi.

5.3 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:

Mode	Freq.	Antenna	Avg. Power	FCC Limit	ISED Limit	EIRP	ISED EIRP Limit
	(MHz)		(dBm)	(dBm)	(dBm)		(dBm)
802.11a	5180	Ant 1	13.41	24	--	16.60	23
802.11a	5180	Ant 2	15.32	24	--	18.51	23
802.11a	5220	Ant 1	13.41	24	--	16.60	23
802.11a	5220	Ant 2	15.39	24	--	18.58	23
802.11a	5240	Ant 1	13.59	24	--	16.78	23
802.11a	5240	Ant 2	15.55	24	--	18.74	23
802.11n HT20	5180	Ant 1	13.21	24	--	16.40	23
802.11n HT20	5180	Ant 2	15.56	24	--	18.75	23
802.11n HT20	5180	MIMO	17.55	24	--	20.74	23
802.11n HT20	5220	Ant 1	13.09	24	--	16.28	23
802.11n HT20	5220	Ant 2	15.44	24	--	18.63	23
802.11n HT20	5220	MIMO	17.43	24	--	20.62	23
802.11n HT20	5240	Ant 1	13.46	24	--	16.65	23
802.11n HT20	5240	Ant 2	14.7	24	--	17.89	23
802.11n HT20	5240	MIMO	17.13	24	--	20.32	23
802.11ac VHT20	5180	Ant 1	13.43	24	--	16.62	23
802.11ac VHT20	5180	Ant 2	15.18	24	--	18.37	23
802.11ac VHT20	5180	MIMO	17.40	24	--	20.59	23
802.11ac VHT20	5220	Ant 1	13.61	24	--	16.80	23
802.11ac VHT20	5220	Ant 2	14.46	24	--	17.65	23
802.11ac VHT20	5220	MIMO	17.07	24	--	20.26	23
802.11ac VHT20	5240	Ant 1	13.65	24	--	16.84	23
802.11ac VHT20	5240	Ant 2	15.13	24	--	18.32	23
802.11ac VHT20	5240	MIMO	17.46	24	--	20.65	23
802.11n HT40	5190	Ant 1	12.31	24	--	15.50	23
802.11n HT40	5190	Ant 2	13.92	24	--	17.11	23
802.11n HT40	5190	MIMO	16.20	24	--	19.39	23
802.11n HT40	5230	Ant 1	12.82	24	--	16.01	23
802.11n HT40	5230	Ant 2	14.51	24	--	17.70	23
802.11n HT40	5230	MIMO	16.76	24	--	19.95	23
802.11ac VHT40	5190	Ant 1	12.57	24	--	15.76	23
802.11ac VHT40	5190	Ant 2	13.87	24	--	17.06	23
802.11ac VHT40	5190	MIMO	16.28	24	--	19.47	23
802.11ac VHT40	5230	Ant 1	12.56	24	--	15.75	23
802.11ac VHT40	5230	Ant 2	14.23	24	--	17.42	23
802.11ac VHT40	5230	MIMO	16.49	24	--	19.68	23
802.11ac VHT80	5210	Ant 1	12.98	24	--	16.17	23
802.11ac VHT80	5210	Ant 2	12.73	24	--	15.92	23
802.11ac VHT80	5210	MIMO	15.87	24	--	19.06	23

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Mode	Freq.	Antenna	Avg. Power	FCC Limit	ISED Limit	EIRP	ISED EIRP Limit
	(MHz)		(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
802.11a	5260	Ant 1	13.86	24	24	17.58	27
802.11a	5260	Ant 2	14.96	24	24	18.68	27
802.11a	5280	Ant 1	13.91	24	24	17.63	27
802.11a	5280	Ant 2	14.63	24	24	18.35	27
802.11a	5320	Ant 1	14.4	24	24	18.12	27
802.11a	5320	Ant 2	15.08	24	24	18.80	27
802.11n HT20	5260	Ant 1	14.75	24	24	18.47	27
802.11n HT20	5260	Ant 2	14.89	24	24	18.61	27
802.11n HT20	5260	MIMO	17.83	24	24	21.55	27
802.11n HT20	5280	Ant 1	14.02	24	24	17.74	27
802.11n HT20	5280	Ant 2	14.63	24	24	18.35	27
802.11n HT20	5280	MIMO	17.35	24	24	21.07	27
802.11n HT20	5320	Ant 1	14.36	24	24	18.08	27
802.11n HT20	5320	Ant 2	14.78	24	24	18.50	27
802.11n HT20	5320	MIMO	17.59	24	24	21.31	27
802.11ac VHT20	5260	Ant 1	13.45	24	24	17.17	27
802.11ac VHT20	5260	Ant 2	14.39	24	24	18.11	27
802.11ac VHT20	5260	MIMO	16.96	24	24	20.68	27
802.11ac VHT20	5280	Ant 1	13.8	24	24	17.52	27
802.11ac VHT20	5280	Ant 2	14.82	24	24	18.54	27
802.11ac VHT20	5280	MIMO	17.35	24	24	21.07	27
802.11ac VHT20	5320	Ant 1	13.61	24	24	17.33	27
802.11ac VHT20	5320	Ant 2	14.2	24	24	17.92	27
802.11ac VHT20	5320	MIMO	16.93	24	24	20.65	27
802.11n HT40	5270	Ant 1	13.12	24	24	16.84	27
802.11n HT40	5270	Ant 2	13.55	24	24	17.27	27
802.11n HT40	5270	MIMO	16.35	24	24	20.07	27
802.11n HT40	5310	Ant 1	12.85	24	24	16.57	27
802.11n HT40	5310	Ant 2	13.49	24	24	17.21	27
802.11n HT40	5310	MIMO	16.19	24	24	19.91	27
802.11ac VHT40	5270	Ant 1	13.02	24	24	16.74	27
802.11ac VHT40	5270	Ant 2	13.74	24	24	17.46	27
802.11ac VHT40	5270	MIMO	16.41	24	24	20.13	27
802.11ac VHT40	5310	Ant 1	13.35	24	24	17.07	27
802.11ac VHT40	5310	Ant 2	13.89	24	24	17.61	27
802.11ac VHT40	5310	MIMO	16.64	24	24	20.36	27
802.11ac VHT80	5290	Ant 1	11.72	24	24	15.44	27
802.11ac VHT80	5290	Ant 2	12.25	24	24	15.97	27
802.11ac VHT80	5290	MIMO	15.00	24	24	18.72	27
802.11a	5500	Ant 1	14.87	24	24	18.85	27
802.11a	5500	Ant 2	14.92	24	24	18.90	27
802.11a	5580	Ant 1	14.43	24	24	18.41	27
802.11a	5580	Ant 2	14.33	24	24	18.31	27
802.11a	5700	Ant 1	13.1	24	24	17.08	27
802.11a	5700	Ant 2	13.25	24	24	17.23	27
802.11n HT20	5500	Ant 1	14.2	24	24	18.18	27
802.11n HT20	5500	Ant 2	13.81	24	24	17.79	27
802.11n HT20	5500	MIMO	17.02	24	24	21.00	27
802.11n HT20	5580	Ant 1	14.35	24	24	18.33	27
802.11n HT20	5580	Ant 2	14.06	24	24	18.04	27
802.11n HT20	5580	MIMO	17.22	24	24	21.20	27
802.11n HT20	5700	Ant 1	13	24	24	16.98	27

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Mode	Freq.	Antenna	Avg. Power	FCC Limit	ISED Limit	EIRP	ISED EIRP Limit
	(MHz)		(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
802.11n HT20	5700	Ant 2	13.39	24	24	17.37	27
802.11n HT20	5700	MIMO	16.21	24	24	20.19	27
802.11ac VHT20	5500	Ant 1	13.68	24	24	17.66	27
802.11ac VHT20	5500	Ant 2	13.17	24	24	17.15	27
802.11ac VHT20	5500	MIMO	16.44	24	24	20.42	27
802.11ac VHT20	5580	Ant 1	14.37	24	24	18.35	27
802.11ac VHT20	5580	Ant 2	14.17	24	24	18.15	27
802.11ac VHT20	5580	MIMO	17.28	24	24	21.26	27
802.11ac VHT20	5700	Ant 1	13.25	24	24	17.23	27
802.11ac VHT20	5700	Ant 2	13.42	24	24	17.40	27
802.11ac VHT20	5700	MIMO	16.35	24	24	20.33	27
802.11n HT40	5510	Ant 1	14.11	24	24	18.09	27
802.11n HT40	5510	Ant 2	14.67	24	24	18.65	27
802.11n HT40	5510	MIMO	17.41	24	24	21.39	27
802.11n HT40	5590	Ant 1	14.46	24	24	18.44	27
802.11n HT40	5590	Ant 2	13.92	24	24	17.90	27
802.11n HT40	5590	MIMO	17.21	24	24	21.19	27
802.11n HT40	5670	Ant 1	13.43	24	24	17.41	27
802.11n HT40	5670	Ant 2	14.08	24	24	18.06	27
802.11n HT40	5670	MIMO	16.78	24	24	20.76	27
802.11ac VHT40	5510	Ant 1	14.71	24	24	18.69	27
802.11ac VHT40	5510	Ant 2	14.18	24	24	18.16	27
802.11ac VHT40	5510	MIMO	17.46	24	24	21.44	27
802.11ac VHT40	5590	Ant 1	14.58	24	24	18.56	27
802.11ac VHT40	5590	Ant 2	14.37	24	24	18.35	27
802.11ac VHT40	5590	MIMO	17.49	24	24	21.47	27
802.11ac VHT40	5670	Ant 1	13.72	24	24	17.70	27
802.11ac VHT40	5670	Ant 2	13.88	24	24	17.86	27
802.11ac VHT40	5670	MIMO	16.81	24	24	20.79	27
802.11ac VHT80	5530	Ant 1	14.04	24	24	18.02	27
802.11ac VHT80	5530	Ant 2	14.14	24	24	18.12	27
802.11ac VHT80	5530	MIMO	17.10	24	24	21.08	27
802.11ac VHT80	5610	Ant 1	13.52	24	24	17.50	27
802.11ac VHT80	5610	Ant 2	12.98	24	24	16.96	27
802.11ac VHT80	5610	MIMO	16.27	24	24	20.25	27
802.11a	5745	Ant 1	13.29	30	30	17.33	36
802.11a	5745	Ant 2	13.56	30	30	17.60	36
802.11a	5785	Ant 1	12.24	30	30	16.28	36
802.11a	5785	Ant 2	13.03	30	30	17.07	36
802.11a	5825	Ant 1	12.44	30	30	16.48	36
802.11a	5825	Ant 2	13.19	30	30	17.23	36
802.11n HT20	5745	Ant 1	12.29	30	30	16.33	36
802.11n HT20	5745	Ant 2	14.41	30	30	18.45	36
802.11n HT20	5745	MIMO	16.49	30	30	20.53	36
802.11n HT20	5785	Ant 1	13.88	30	30	17.92	36
802.11n HT20	5785	Ant 2	13.95	30	30	17.99	36
802.11n HT20	5785	MIMO	16.93	30	30	20.97	36
802.11n HT20	5825	Ant 1	12.89	30	30	16.93	36
802.11n HT20	5825	Ant 2	14.09	30	30	18.13	36
802.11n HT20	5825	MIMO	16.54	30	30	20.58	36
802.11ac VHT20	5745	Ant 1	14.89	30	30	18.93	36
802.11ac VHT20	5745	Ant 2	14.57	30	30	18.61	36

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Mode	Freq.	Antenna	Avg. Power	FCC Limit	ISED Limit	EIRP	ISED EIRP Limit
	(MHz)		(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
802.11ac VHT20	5745	MIMO	17.74	30	30	21.78	36
802.11ac VHT20	5785	Ant 1	13.8	30	30	17.84	36
802.11ac VHT20	5785	Ant 2	14.81	30	30	18.85	36
802.11ac VHT20	5785	MIMO	17.34	30	30	21.38	36
802.11ac VHT20	5825	Ant 1	14.24	30	30	18.28	36
802.11ac VHT20	5825	Ant 2	13.88	30	30	17.92	36
802.11ac VHT20	5825	MIMO	17.07	30	30	21.11	36
802.11n HT40	5755	Ant 1	13.84	30	30	17.88	36
802.11n HT40	5755	Ant 2	14.67	30	30	18.71	36
802.11n HT40	5755	MIMO	17.29	30	30	21.33	36
802.11n HT40	5795	Ant 1	13.96	30	30	18.00	36
802.11n HT40	5795	Ant 2	14.57	30	30	18.61	36
802.11n HT40	5795	MIMO	17.29	30	30	21.33	36
802.11ac VHT40	5755	Ant 1	13.47	30	30	17.51	36
802.11ac VHT40	5755	Ant 2	13.75	30	30	17.79	36
802.11ac VHT40	5755	MIMO	16.62	30	30	20.66	36
802.11ac VHT40	5795	Ant 1	13.65	30	30	17.69	36
802.11ac VHT40	5795	Ant 2	13.45	30	30	17.49	36
802.11ac VHT40	5795	MIMO	16.56	30	30	20.60	36
802.11ac VHT80	5775	Ant 1	12.06	30	30	16.10	36
802.11ac VHT80	5775	Ant 2	12.02	30	30	16.06	36
802.11ac VHT80	5775	MIMO	15.05	30	30	19.09	36

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5.4 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	
	EIRP Limit	Equivalent Field Strength at 3 m
Applicable To	PK: 74 (dBμV/m)	AV: 54 (dBμV/m)
FCC Part 15.407 (b)(1)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m)
FCC Part 15.407 (b)(2)	PK: -27 (dBm/MHz)	PK: 68.2 (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.	

Test Setup: Refer to section 4.5.1 for details.

Test Procedures:

- 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.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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.
- 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.
- 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:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
- 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.
- 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/duty cycle)).
- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz (Duty cycle ≥ 98 %) or ≥ 1/T(duty cycle is < 98%) for Average detection (AV) at frequency above 1 GHz.
- All modes of operation were investigated and the worst-case emissions are reported.

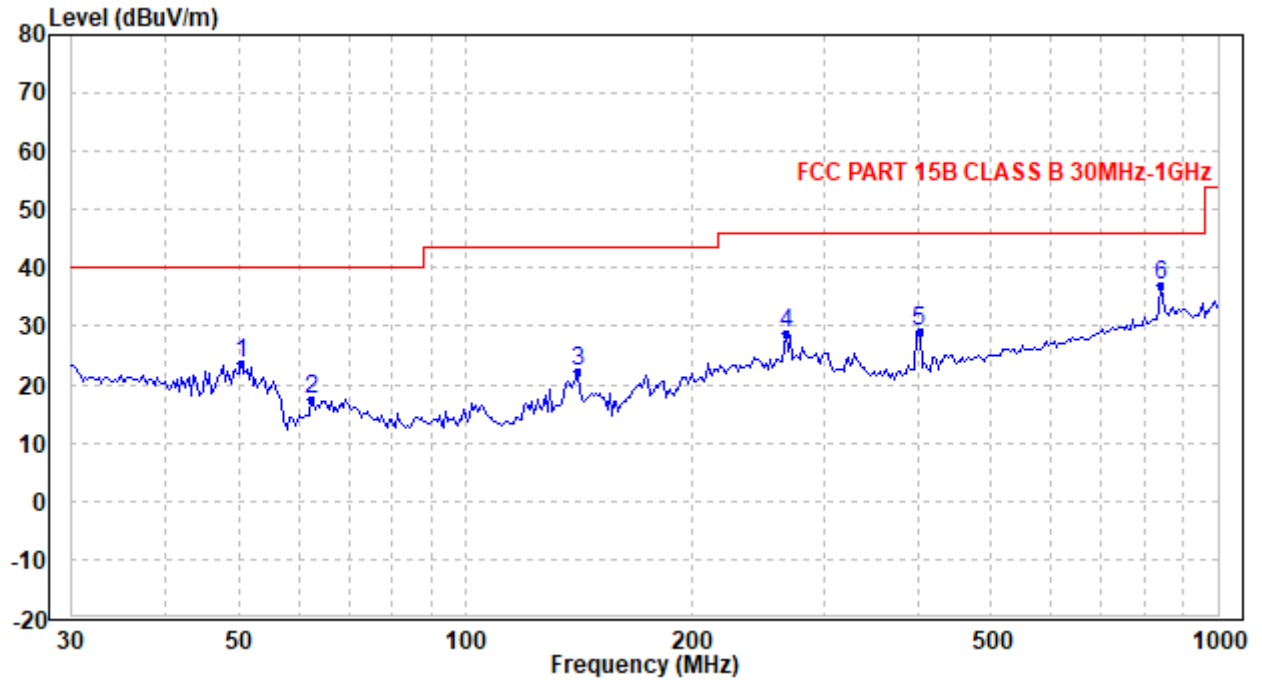
Equipment Used: Refer to section 3 for details.

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	50.461	37.46	-13.75	23.71	40.00	-16.29	QP
2	62.304	34.79	-17.22	17.57	40.00	-22.43	QP
3	140.777	37.59	-15.22	22.37	43.50	-21.13	QP
4	266.839	38.89	-10.12	28.77	46.00	-17.23	QP
5	401.105	33.83	-4.73	29.10	46.00	-16.90	QP
6	838.887	33.38	3.71	37.09	46.00	-8.91	QP

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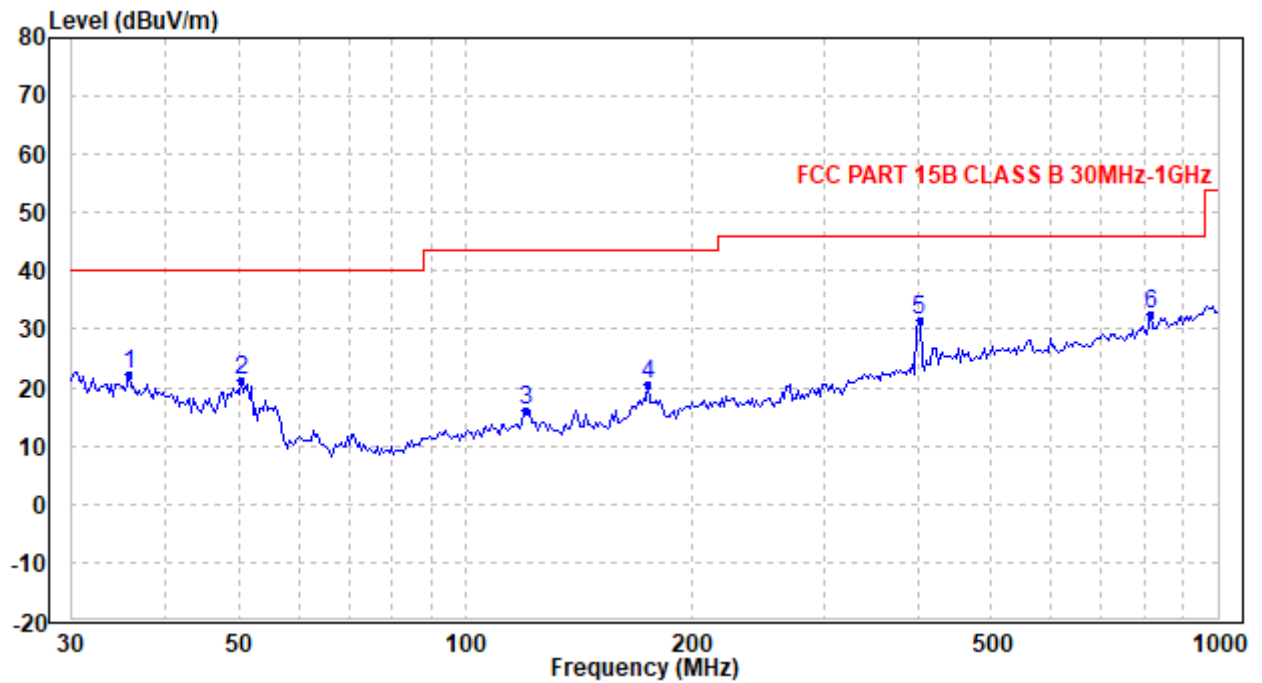
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UTTR-RF-FCCPART15.407-V1.3

Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	35.762	28.95	-6.73	22.22	40.00	-17.78	QP
2	50.461	35.01	-13.75	21.26	40.00	-18.74	QP
3	120.612	31.62	-15.41	16.21	43.50	-27.29	QP
4	175.040	32.07	-11.44	20.63	43.50	-22.87	QP
5	401.105	36.42	-4.73	31.69	46.00	-14.31	QP
6	815.635	29.10	3.45	32.55	46.00	-13.45	QP

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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
SISO_Ant. 0_IEEE 802.11a_Channel 36								
1	10360	34.8	3.4	38.2	54	-15.8	Average	Horizontal
2	10360	47.2	3.4	50.6	68.2	-17.6	Peak	Horizontal
3	15540	32.8	7.6	40.3	54	-13.7	Average	Horizontal
4	15540	45.5	7.6	53.1	74	-20.9	Peak	Horizontal
5	10360	34.9	3.4	38.2	54	-15.8	Average	Vertical
6	10360	47.5	3.4	50.9	68.2	-17.3	Peak	Vertical
7	15540	32.8	7.6	40.4	54	-13.6	Average	Vertical
8	15540	44.8	7.6	52.3	74	-21.7	Peak	Vertical
SISO_Ant. 0_IEEE 802.11a_Channel 44								
1	10440	34.7	3.4	38.1	54	-15.9	Average	Horizontal
2	10440	47.0	3.4	50.4	68.2	-17.9	Peak	Horizontal
3	15660	33.1	7.5	40.5	54	-13.5	Average	Horizontal
4	15660	46.0	7.5	53.4	74	-20.6	Peak	Horizontal
5	10440	34.7	3.4	38.0	54	-16.0	Average	Vertical
6	10440	47.3	3.4	50.7	68.2	-17.5	Peak	Vertical
7	15660	33.1	7.5	40.6	54	-13.5	Average	Vertical
8	15660	46.2	7.5	53.7	74	-20.3	Peak	Vertical
SISO_Ant. 0_IEEE 802.11a_Channel 48								
1	10480	33.7	3.4	37.1	54	-16.9	Average	Horizontal
2	10480	46.4	3.4	49.8	68.2	-18.4	Peak	Horizontal
3	15720	32.5	7.4	39.9	54	-14.1	Average	Horizontal
4	15720	45.0	7.4	52.4	74	-21.6	Peak	Horizontal
5	10480	33.7	3.4	37.0	54	-17.0	Average	Vertical
6	10480	46.8	3.4	50.2	68.2	-18.0	Peak	Vertical
7	15720	32.5	7.4	39.9	54	-14.1	Average	Vertical
8	15720	45.8	7.4	53.2	74	-20.9	Peak	Vertical
SISO_Ant. 0_IEEE 802.11a_Channel 52								
1	10520	33.8	3.4	37.1	54	-16.9	Average	Horizontal
2	10520	46.6	3.4	50.0	68.2	-18.2	Peak	Horizontal
3	15780	32.5	7.4	39.9	54	-14.1	Average	Horizontal
4	15780	44.9	7.4	52.2	74	-21.8	Peak	Horizontal
5	10520	33.7	3.4	37.1	54	-16.9	Average	Vertical
6	10520	45.8	3.4	49.2	68.2	-19.0	Peak	Vertical
7	15780	32.5	7.4	39.9	54	-14.1	Average	Vertical
8	15780	44.7	7.4	52.1	74	-21.9	Peak	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
SISO_Ant. 0_IEEE 802.11a_Channel 60								
1	10600	33.3	3.2	36.5	54	-17.5	Average	Horizontal
2	10600	45.4	3.2	48.6	74	-25.4	Peak	Horizontal
3	15900	31.3	7.2	38.5	54	-15.5	Average	Horizontal
4	15900	44.5	7.2	51.7	74	-22.3	Peak	Horizontal
5	10600	33.5	3.2	36.7	54	-17.3	Average	Vertical
6	10600	46.1	3.2	49.3	74	-24.7	Peak	Vertical
7	15900	31.3	7.2	38.5	54	-15.5	Average	Vertical
8	15900	44.5	7.2	51.7	74	-22.3	Peak	Vertical
SISO_Ant. 0_IEEE 802.11a_Channel 64								
1	10640	33.5	3.1	36.6	54	-17.4	Average	Horizontal
2	10640	45.4	3.1	48.5	74	-25.5	Peak	Horizontal
3	15960	31.4	7.2	38.6	54	-15.4	Average	Horizontal
4	15960	44.1	7.2	51.3	74	-22.7	Peak	Horizontal
5	10640	33.6	3.1	36.7	54	-17.3	Average	Vertical
6	10640	44.8	3.1	47.9	74	-26.1	Peak	Vertical
7	15960	31.3	7.2	38.5	54	-15.5	Average	Vertical
8	15960	44.6	7.2	51.8	74	-22.2	Peak	Vertical
SISO_Ant. 0_IEEE 802.11a_Channel 100								
1	11000	34.4	2.4	36.8	54	-17.2	Average	Horizontal
2	11000	46.8	2.4	49.1	74	-24.9	Peak	Horizontal
3	16500	32.0	8.0	40.0	54	-14.0	Average	Horizontal
4	16500	44.7	8.0	52.7	68.2	-15.5	Peak	Horizontal
5	11000	34.4	2.4	36.8	54	-17.2	Average	Vertical
6	11000	46.5	2.4	48.9	74	-25.1	Peak	Vertical
7	16500	32.1	8.0	40.1	54	-13.9	Average	Vertical
8	16500	44.6	8.0	52.6	68.2	-15.6	Peak	Vertical
SISO_Ant. 0_IEEE 802.11a_Channel 116								
1	11160	33.5	2.3	35.8	54	-18.2	Average	Horizontal
2	11160	46.4	2.3	48.6	74	-25.4	Peak	Horizontal
3	16740	31.3	8.3	39.7	54	-14.3	Average	Horizontal
4	16740	43.5	8.3	51.8	68.2	-16.4	Peak	Horizontal
5	11160	33.7	2.3	35.9	54	-18.1	Average	Vertical
6	11160	46.3	2.3	48.6	74	-25.4	Peak	Vertical
7	16740	31.4	8.3	39.7	54	-14.3	Average	Vertical
8	16740	45.0	8.3	53.3	68.2	-14.9	Peak	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
SISO_Ant. 0_IEEE 802.11a_Channel 140								
1	11400	35.17	2.11	37.28	54.00	-16.72	Average	Horizontal
2	11400	47.60	2.11	49.71	74.00	-24.29	Peak	Horizontal
3	17100	31.91	8.79	40.70	54.00	-13.30	Average	Horizontal
4	17100	44.23	8.79	53.02	74.00	-20.98	Peak	Horizontal
5	11400	35.20	2.11	37.31	54.00	-16.69	Average	Vertical
6	11400	46.63	2.11	48.74	74.00	-25.26	Peak	Vertical
7	17100	32.02	8.79	40.81	54.00	-13.19	Average	Vertical
8	17100	44.55	8.79	53.34	74.00	-20.66	Peak	Vertical
SISO_Ant. 0_IEEE 802.11a_Channel 149								
1	11490	33.2	2.1	35.2	54	-18.8	Average	Horizontal
2	11490	45.7	2.1	47.7	74	-26.3	Peak	Horizontal
3	17235	31.4	9.0	40.4	54	-13.6	Average	Horizontal
4	17235	44.1	9.0	53.1	68.2	-15.1	Peak	Horizontal
5	11490	33.2	2.1	35.2	54	-18.8	Average	Vertical
6	11490	46.0	2.1	48.1	74	-26.0	Peak	Vertical
7	17235	31.4	9.0	40.3	54	-13.7	Average	Vertical
8	17235	43.5	9.0	52.5	68.2	-15.7	Peak	Vertical
SISO_Ant. 0_IEEE 802.11a_Channel 157								
1	11570	33.1	2.1	35.2	54	-18.8	Average	Horizontal
2	11570	45.5	2.1	47.6	74	-26.5	Peak	Horizontal
3	17355	31.4	9.2	40.6	54	-13.4	Average	Horizontal
4	17355	43.8	9.2	53.0	68.2	-15.3	Peak	Horizontal
5	11570	33.0	2.1	35.1	54	-18.9	Average	Vertical
6	11570	45.8	2.1	47.8	74	-26.2	Peak	Vertical
7	17355	31.5	9.2	40.7	54	-13.3	Average	Vertical
8	17355	43.8	9.2	53.0	68.2	-15.2	Peak	Vertical
SISO_Ant. 0_IEEE 802.11a_Channel 165								
1	11650	34.0	2.1	36.1	54	-17.9	Average	Horizontal
2	11650	46.6	2.1	48.6	74	-25.4	Peak	Horizontal
3	17475	30.7	9.3	40.1	54	-13.9	Average	Horizontal
4	17475	43.4	9.3	52.8	68.2	-15.4	Peak	Horizontal
5	11650	34.0	2.1	36.0	54	-18.0	Average	Vertical
6	11650	47.8	2.1	49.8	74	-24.2	Peak	Vertical
7	17475	30.8	9.3	40.1	54	-13.9	Average	Vertical
8	17475	43.2	9.3	52.5	68.2	-15.7	Peak	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
SISO_Ant. 1_ IEEE 802.11a_Channel 36								
1	10360	34.7	3.4	38.1	54	-15.9	Average	Horizontal
2	10360	47.1	3.4	50.5	68.2	-17.7	Peak	Horizontal
3	15540	32.8	7.6	40.3	54	-13.7	Average	Horizontal
4	15540	45.8	7.6	53.3	74	-20.7	Peak	Horizontal
5	10360	34.8	3.4	38.2	54	-15.8	Average	Vertical
6	10360	47.1	3.4	50.5	68.2	-17.7	Peak	Vertical
7	15540	32.7	7.6	40.2	54	-13.8	Average	Vertical
8	15540	45.6	7.6	53.2	74	-20.8	Peak	Vertical
SISO_Ant. 1_ IEEE 802.11a_Channel 44								
1	10440	34.6	3.4	38.0	54	-16.0	Average	Horizontal
2	10440	46.4	3.4	49.8	68.2	-18.4	Peak	Horizontal
3	15660	33.0	7.5	40.5	54	-13.5	Average	Horizontal
4	15660	45.2	7.5	52.7	74	-21.3	Peak	Horizontal
5	10440	34.7	3.4	38.0	54	-16.0	Average	Vertical
6	10440	46.6	3.4	50.0	68.2	-18.2	Peak	Vertical
7	15660	33.1	7.5	40.5	54	-13.5	Average	Vertical
8	15660	45.5	7.5	53.0	74	-21.1	Peak	Vertical
SISO_Ant. 1_ IEEE 802.11a_Channel 48								
1	10480	33.7	3.4	37.0	54	-17.0	Average	Horizontal
2	10480	46.4	3.4	49.8	68.2	-18.4	Peak	Horizontal
3	15720	32.5	7.4	39.9	54	-14.1	Average	Horizontal
4	15720	45.0	7.4	52.4	74	-21.6	Peak	Horizontal
5	10480	33.7	3.4	37.1	54	-16.9	Average	Vertical
6	10480	47.4	3.4	50.8	68.2	-17.5	Peak	Vertical
7	15720	32.5	7.4	39.9	54	-14.1	Average	Vertical
8	15720	45.0	7.4	52.4	74	-21.6	Peak	Vertical
SISO_Ant. 1_ IEEE 802.11a_Channel 52								
1	10520	33.7	3.4	37.1	54	-16.9	Average	Horizontal
2	10520	46.2	3.4	49.5	68.2	-18.7	Peak	Horizontal
3	15780	32.5	7.4	39.8	54	-14.2	Average	Horizontal
4	15780	44.9	7.4	52.2	74	-21.8	Peak	Horizontal
5	10520	33.8	3.4	37.1	54	-16.9	Average	Vertical
6	10520	47.0	3.4	50.4	68.2	-17.8	Peak	Vertical
7	15780	32.5	7.4	39.9	54	-14.1	Average	Vertical
8	15780	45.3	7.4	52.7	74	-21.3	Peak	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
SISO_Ant. 1_ IEEE 802.11a_Channel 60								
1	10600	33.3	3.2	36.5	54	-17.5	Average	Horizontal
2	10600	45.6	3.2	48.8	74	-25.2	Peak	Horizontal
3	15900	31.3	7.2	38.5	54	-15.5	Average	Horizontal
4	15900	44.1	7.2	51.4	74	-22.6	Peak	Horizontal
5	10600	33.3	3.2	36.5	54	-17.5	Average	Vertical
6	10600	45.8	3.2	49.0	74	-25.0	Peak	Vertical
7	15900	31.3	7.2	38.6	54	-15.4	Average	Vertical
8	15900	44.0	7.2	51.2	74	-22.8	Peak	Vertical
SISO_Ant. 1_ IEEE 802.11a_Channel 64								
1	10640	33.4	3.1	36.5	54	-17.5	Average	Horizontal
2	10640	45.1	3.1	48.2	74	-25.8	Peak	Horizontal
3	15960	31.3	7.2	38.5	54	-15.5	Average	Horizontal
4	15960	44.9	7.2	52.1	74	-21.9	Peak	Horizontal
5	10640	33.4	3.1	36.5	54	-17.5	Average	Vertical
6	10640	45.7	3.1	48.8	74	-25.2	Peak	Vertical
7	15960	31.3	7.2	38.5	54	-15.5	Average	Vertical
8	15960	44.0	7.2	51.2	74	-22.8	Peak	Vertical
SISO_Ant. 1_ IEEE 802.11a_Channel 100								
1	11000	34.3	2.4	36.6	54	-17.4	Average	Horizontal
2	11000	46.3	2.4	48.7	74	-25.3	Peak	Horizontal
3	16500	32.0	8.0	40.0	54	-14.0	Average	Horizontal
4	16500	44.6	8.0	52.6	68.2	-15.6	Peak	Horizontal
5	11000	34.2	2.4	36.6	54	-17.4	Average	Vertical
6	11000	46.2	2.4	48.5	74	-25.5	Peak	Vertical
7	16500	32.1	8.0	40.1	54	-13.9	Average	Vertical
8	16500	45.2	8.0	53.2	68.2	-15.0	Peak	Vertical
SISO_Ant. 1_ IEEE 802.11a_Channel 116								
1	11160	33.5	2.3	35.7	54	-18.3	Average	Horizontal
2	11160	46.2	2.3	48.4	74	-25.6	Peak	Horizontal
3	16740	31.3	8.3	39.7	54	-14.4	Average	Horizontal
4	16740	43.7	8.3	52.0	68.2	-16.2	Peak	Horizontal
5	11160	33.6	2.3	35.8	54	-18.2	Average	Vertical
6	11160	46.1	2.3	48.3	74	-25.7	Peak	Vertical
7	16740	31.3	8.3	39.6	54	-14.4	Average	Vertical
8	16740	43.4	8.3	51.7	68.2	-16.5	Peak	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
SISO_Ant. 1_ IEEE 802.11a_Channel 140								
1	11400	33.2	2.1	35.3	54	-18.7	Average	Horizontal
2	11400	45.6	2.1	47.7	74	-26.3	Peak	Horizontal
3	17100	31.9	8.8	40.7	54	-13.3	Average	Horizontal
4	17100	44.0	8.8	52.8	68.2	-15.4	Peak	Horizontal
5	11400	33.2	2.1	35.3	54	-18.7	Average	Vertical
6	11400	45.6	2.1	47.7	74	-26.3	Peak	Vertical
7	17100	32.0	8.8	40.8	54	-13.2	Average	Vertical
8	17100	44.7	8.8	53.5	68.2	-14.8	Peak	Vertical
SISO_Ant. 1_ IEEE 802.11a_Channel 149								
1	11490	33.1	2.1	35.1	54	-18.9	Average	Horizontal
2	11490	45.2	2.1	47.3	74	-26.8	Peak	Horizontal
3	17235	31.4	9.0	40.3	54	-13.7	Average	Horizontal
4	17235	43.9	9.0	52.8	68.2	-15.4	Peak	Horizontal
5	11490	33.1	2.1	35.1	54	-18.9	Average	Vertical
6	11490	45.5	2.1	47.5	74	-26.5	Peak	Vertical
7	17235	31.3	9.0	40.3	54	-13.7	Average	Vertical
8	17235	43.2	9.0	52.2	68.2	-16.0	Peak	Vertical
SISO_Ant. 1_ IEEE 802.11a_Channel 157								
1	11570	33.0	2.1	35.0	54	-19.0	Average	Horizontal
2	11570	46.4	2.1	48.4	74	-25.6	Peak	Horizontal
3	17355	31.4	9.2	40.6	54	-13.4	Average	Horizontal
4	17355	43.8	9.2	52.9	68.2	-15.3	Peak	Horizontal
5	11570	33.0	2.1	35.0	54	-19.0	Average	Vertical
6	11570	46.2	2.1	48.2	74	-25.8	Peak	Vertical
7	17355	31.5	9.2	40.6	54	-13.4	Average	Vertical
8	17355	44.4	9.2	53.6	68.2	-14.6	Peak	Vertical
SISO_Ant. 1_ IEEE 802.11a_Channel 165								
1	11650	34.0	2.1	36.0	54	-18.0	Average	Horizontal
2	11650	46.3	2.1	48.4	74	-25.6	Peak	Horizontal
3	17475	30.8	9.3	40.1	54	-13.9	Average	Horizontal
4	17475	43.5	9.3	52.8	68.2	-15.4	Peak	Horizontal
5	11650	34.0	2.1	36.1	54	-17.9	Average	Vertical
6	11650	46.8	2.1	48.8	74	-25.2	Peak	Vertical
7	17475	30.7	9.3	40.1	54	-13.9	Average	Vertical
8	17475	43.3	9.3	52.6	68.2	-15.6	Peak	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
MIMO_Ant. 0+1 IEEE 802.11n-HT20_Channel 36								
1	10360	34.8	3.4	38.2	54	-15.8	Average	Horizontal
2	10360	46.8	3.4	50.2	68.2	-18.0	Peak	Horizontal
3	15540	32.7	7.6	40.3	54	-13.7	Average	Horizontal
4	15540	45.1	7.6	52.7	74	-21.3	Peak	Horizontal
5	10360	34.8	3.4	38.1	54	-15.9	Average	Vertical
6	10360	47.6	3.4	51.0	68.2	-17.2	Peak	Vertical
7	15540	32.7	7.6	40.2	54	-13.8	Average	Vertical
8	15540	45.3	7.6	52.9	74	-21.1	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT20_Channel 44								
1	10440	34.7	3.4	38.1	54	-15.9	Average	Horizontal
2	10440	47.1	3.4	50.5	68.2	-17.7	Peak	Horizontal
3	15660	33.0	7.5	40.5	54	-13.5	Average	Horizontal
4	15660	46.1	7.5	53.5	74	-20.5	Peak	Horizontal
5	10440	34.7	3.4	38.0	54	-16.0	Average	Vertical
6	10440	46.5	3.4	49.8	68.2	-18.4	Peak	Vertical
7	15660	33.1	7.5	40.6	54	-13.5	Average	Vertical
8	15660	46.3	7.5	53.7	74	-20.3	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT20_Channel 48								
1	10480	33.7	3.4	37.1	54	-16.9	Average	Horizontal
2	10480	46.0	3.4	49.4	68.2	-18.8	Peak	Horizontal
3	15720	32.5	7.4	39.9	54	-14.1	Average	Horizontal
4	15720	45.1	7.4	52.5	74	-21.5	Peak	Horizontal
5	10480	33.6	3.4	37.0	54	-17.0	Average	Vertical
6	10480	45.7	3.4	49.1	68.2	-19.1	Peak	Vertical
7	15720	32.5	7.4	39.9	54	-14.1	Average	Vertical
8	15720	46.2	7.4	53.6	74	-20.4	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT20_Channel 52								
1	10520	33.9	3.4	37.3	54	-16.8	Average	Horizontal
2	10520	46.2	3.4	49.5	68.2	-18.7	Peak	Horizontal
3	15780	32.5	7.4	39.8	54	-14.2	Average	Horizontal
4	15780	44.7	7.4	52.0	74	-22.0	Peak	Horizontal
5	10520	33.8	3.4	37.1	54	-16.9	Average	Vertical
6	10520	46.4	3.4	49.8	68.2	-18.5	Peak	Vertical
7	15780	32.5	7.4	39.9	54	-14.1	Average	Vertical
8	15780	44.8	7.4	52.2	74	-21.8	Peak	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
MIMO_Ant. 0+1 IEEE 802.11n-HT20_Channel 60								
1	10600	33.5	3.2	36.6	54	-17.4	Average	Horizontal
2	10600	45.4	3.2	48.6	74	-25.4	Peak	Horizontal
3	15900	31.3	7.2	38.5	54	-15.5	Average	Horizontal
4	15900	44.0	7.2	51.3	74	-22.8	Peak	Horizontal
5	10600	33.4	3.2	36.6	54	-17.4	Average	Vertical
6	10600	45.8	3.2	49.0	74	-25.0	Peak	Vertical
7	15900	31.4	7.2	38.6	54	-15.4	Average	Vertical
8	15900	44.5	7.2	51.8	74	-22.3	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT20_Channel 64								
1	10640	33.4	3.1	36.5	54	-17.5	Average	Horizontal
2	10640	46.3	3.1	49.4	74	-24.6	Peak	Horizontal
3	15960	31.4	7.2	38.6	54	-15.4	Average	Horizontal
4	15960	44.2	7.2	51.4	74	-22.6	Peak	Horizontal
5	10640	33.4	3.1	36.5	54	-17.5	Average	Vertical
6	10640	45.6	3.1	48.7	74	-25.3	Peak	Vertical
7	15960	31.4	7.2	38.6	54	-15.4	Average	Vertical
8	15960	44.5	7.2	51.7	74	-22.3	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT20_Channel 100								
1	11000	34.3	2.4	36.7	54	-17.4	Average	Horizontal
2	11000	46.5	2.4	48.8	74	-25.2	Peak	Horizontal
3	16500	32.0	8.0	40.0	54	-14.0	Average	Horizontal
4	16500	45.2	8.0	53.2	68.2	-15.0	Peak	Horizontal
5	11000	34.4	2.4	36.8	54	-17.2	Average	Vertical
6	11000	47.0	2.4	49.4	74	-24.6	Peak	Vertical
7	16500	32.1	8.0	40.1	54	-13.9	Average	Vertical
8	16500	45.4	8.0	53.4	68.2	-14.8	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT20_Channel 116								
1	11160	33.6	2.3	35.8	54	-18.2	Average	Horizontal
2	11160	46.9	2.3	49.1	74	-24.9	Peak	Horizontal
3	16740	31.4	8.3	39.7	54	-14.3	Average	Horizontal
4	16740	44.0	8.3	52.3	68.2	-15.9	Peak	Horizontal
5	11160	33.6	2.3	35.8	54	-18.2	Average	Vertical
6	11160	45.9	2.3	48.1	74	-25.9	Peak	Vertical
7	16740	31.3	8.3	39.7	54	-14.3	Average	Vertical
8	16740	43.5	8.3	51.8	68.2	-16.4	Peak	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
MIMO_Ant. 0+1 IEEE 802.11n-HT20_Channel 140								
1	11400	33.1	2.1	35.2	54	-18.8	Average	Horizontal
2	11400	46.1	2.1	48.2	74	-25.8	Peak	Horizontal
3	17100	32.0	8.8	40.7	54	-13.3	Average	Horizontal
4	17100	44.3	8.8	53.1	68.2	-15.1	Peak	Horizontal
5	11400	33.2	2.1	35.3	54	-18.7	Average	Vertical
6	11400	44.7	2.1	46.8	74	-27.2	Peak	Vertical
7	17100	32.0	8.8	40.8	54	-13.2	Average	Vertical
8	17100	44.4	8.8	53.2	68.2	-15.0	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT20_Channel 149								
1	11490	33.1	2.1	35.2	54	-18.8	Average	Horizontal
2	11490	45.1	2.1	47.2	74	-26.8	Peak	Horizontal
3	17235	31.4	9.0	40.4	54	-13.6	Average	Horizontal
4	17235	43.4	9.0	52.4	68.2	-15.8	Peak	Horizontal
5	11490	33.0	2.1	35.1	54	-18.9	Average	Vertical
6	11490	45.9	2.1	48.0	74	-26.0	Peak	Vertical
7	17235	31.4	9.0	40.4	54	-13.6	Average	Vertical
8	17235	44.0	9.0	52.9	68.2	-15.3	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT20_Channel 157								
1	11570	33.1	2.1	35.1	54	-18.9	Average	Horizontal
2	11570	44.8	2.1	46.8	74	-27.2	Peak	Horizontal
3	17355	31.4	9.2	40.6	54	-13.4	Average	Horizontal
4	17355	43.6	9.2	52.8	68.2	-15.4	Peak	Horizontal
5	11570	33.0	2.1	35.1	54	-18.9	Average	Vertical
6	11570	45.2	2.1	47.3	74	-26.7	Peak	Vertical
7	17355	31.5	9.2	40.6	54	-13.4	Average	Vertical
8	17355	44.3	9.2	53.4	68.2	-14.8	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT20_Channel 165								
1	11650	33.9	2.1	36.0	54	-18.0	Average	Horizontal
2	11650	46.4	2.1	48.5	74	-25.6	Peak	Horizontal
3	17475	30.7	9.3	40.0	54	-14.0	Average	Horizontal
4	17475	43.1	9.3	52.4	68.2	-15.8	Peak	Horizontal
5	11650	34.0	2.1	36.1	54	-17.9	Average	Vertical
6	11650	46.9	2.1	49.0	74	-25.0	Peak	Vertical
7	17475	30.7	9.3	40.1	54	-13.9	Average	Vertical
8	17475	42.9	9.3	52.2	68.2	-16.0	Peak	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
MIMO_Ant. 0+1 IEEE 802.11n-HT40_Channel 38								
1	10380	34.8	3.4	38.1	54	-15.9	Average	Horizontal
2	10380	47.2	3.4	50.5	68.2	-17.7	Peak	Horizontal
3	15570	32.8	7.5	40.3	54	-13.7	Average	Horizontal
4	15570	44.9	7.5	52.4	74	-21.6	Peak	Horizontal
5	10380	34.9	3.4	38.2	54	-15.8	Average	Vertical
6	10380	47.2	3.4	50.6	68.2	-17.6	Peak	Vertical
7	15570	32.8	7.5	40.3	54	-13.7	Average	Vertical
8	15570	44.8	7.5	52.3	74	-21.7	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT40_Channel 46								
1	10460	34.6	3.4	38.0	54	-16.0	Average	Horizontal
2	10460	46.6	3.4	50.0	68.2	-18.2	Peak	Horizontal
3	15690	33.1	7.4	40.5	54	-13.5	Average	Horizontal
4	15690	45.9	7.4	53.3	74	-20.7	Peak	Horizontal
5	10460	34.7	3.4	38.1	54	-15.9	Average	Vertical
6	10460	46.3	3.4	49.7	68.2	-18.5	Peak	Vertical
7	15690	33.1	7.4	40.5	54	-13.5	Average	Vertical
8	15690	45.6	7.4	53.0	74	-21.0	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT40_Channel 54								
1	10540	33.4	3.3	36.7	54	-17.3	Average	Horizontal
2	10540	45.2	3.3	48.5	68.2	-19.7	Peak	Horizontal
3	15810	31.7	7.3	39.0	54	-15.0	Average	Horizontal
4	15810	44.6	7.3	51.9	74	-22.1	Peak	Horizontal
5	10540	33.4	3.3	36.7	54	-17.3	Average	Vertical
6	10540	46.1	3.3	49.4	68.2	-18.8	Peak	Vertical
7	15810	31.8	7.3	39.1	54	-14.9	Average	Vertical
8	15810	43.9	7.3	51.2	74	-22.8	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT40_Channel 62								
1	10620	33.4	3.1	36.6	54	-17.4	Average	Horizontal
2	10620	45.9	3.1	49.0	74	-25.0	Peak	Horizontal
3	15930	31.3	7.2	38.5	54	-15.5	Average	Horizontal
4	15930	45.0	7.2	52.2	74	-21.8	Peak	Horizontal
5	10620	33.5	3.1	36.6	54	-17.4	Average	Vertical
6	10620	45.8	3.1	48.9	74	-25.1	Peak	Vertical
7	15930	31.4	7.2	38.6	54	-15.4	Average	Vertical
8	15930	43.9	7.2	51.1	74	-22.9	Peak	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
MIMO_Ant. 0+1 IEEE 802.11n-HT40_Channel 102								
1	11020	34.4	2.4	36.8	54	-17.2	Average	Horizontal
2	11020	46.2	2.4	48.6	74	-25.4	Peak	Horizontal
3	16530	32.0	8.0	40.1	54	-13.9	Average	Horizontal
4	16530	44.1	8.0	52.1	68.2	-16.1	Peak	Horizontal
5	11020	34.4	2.4	36.8	54	-17.2	Average	Vertical
6	11020	46.9	2.4	49.3	74	-24.7	Peak	Vertical
7	16530	32.1	8.0	40.1	54	-13.9	Average	Vertical
8	16530	44.9	8.0	52.9	68.2	-15.3	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT40_Channel 110								
1	11100	33.5	2.3	35.8	54	-18.3	Average	Horizontal
2	11100	46.2	2.3	48.5	74	-25.5	Peak	Horizontal
3	16650	31.4	8.2	39.6	54	-14.4	Average	Horizontal
4	16650	43.8	8.2	52.0	68.2	-16.2	Peak	Horizontal
5	11100	33.6	2.3	35.9	54	-18.1	Average	Vertical
6	11100	46.2	2.3	48.5	74	-25.5	Peak	Vertical
7	16650	31.4	8.2	39.6	54	-14.4	Average	Vertical
8	16650	43.9	8.2	52.1	68.2	-16.1	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT40_Channel 134								
1	11340	33.2	2.2	35.4	54	-18.6	Average	Horizontal
2	11340	46.0	2.2	48.1	74	-25.9	Peak	Horizontal
3	17010	31.9	8.7	40.6	54	-13.4	Average	Horizontal
4	17010	44.8	8.7	53.5	68.2	-14.7	Peak	Horizontal
5	11340	33.2	2.2	35.4	54	-18.6	Average	Vertical
6	11340	45.4	2.2	47.6	74	-26.4	Peak	Vertical
7	17010	31.9	8.7	40.6	54	-13.4	Average	Vertical
8	17010	44.5	8.7	53.2	68.2	-15.1	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11n-HT40_Channel 151								
1	11510	33.1	2.1	35.2	54	-18.9	Average	Horizontal
2	11510	45.3	2.1	47.3	74	-26.7	Peak	Horizontal
3	17265	31.4	9.0	40.4	54	-13.6	Average	Horizontal
4	17265	43.6	9.0	52.6	68.2	-15.6	Peak	Horizontal
5	11510	33.3	2.1	35.3	54	-18.7	Average	Vertical
6	11510	45.4	2.1	47.5	74	-26.5	Peak	Vertical
7	17265	31.4	9.0	40.4	54	-13.6	Average	Vertical
8	17265	44.5	9.0	53.5	68.2	-14.7	Peak	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
MIMO_Ant. 0+1_ IEEE 802.11n-HT40_Channel 159								
1	11590	33.1	2.1	35.1	54	-18.9	Average	Horizontal
2	11590	45.6	2.1	47.6	74	-26.4	Peak	Horizontal
3	17385	31.4	9.2	40.6	54	-13.4	Average	Horizontal
4	17385	44.4	9.2	53.6	68.2	-14.6	Peak	Horizontal
5	11590	33.1	2.1	35.2	54	-18.8	Average	Vertical
6	11590	45.2	2.1	47.2	74	-26.8	Peak	Vertical
7	17385	31.4	9.2	40.6	54	-13.4	Average	Vertical
8	17385	43.4	9.2	52.6	68.2	-15.6	Peak	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
MIMO_Ant. 0+1_ IEEE 802.11ac-VHT80_Channel 42								
1	10420	34.6	3.4	38.0	54	-16.0	Average	Horizontal
2	10420	46.4	3.4	49.8	68.2	-18.4	Peak	Horizontal
3	15630	32.9	7.5	40.4	54	-13.6	Average	Horizontal
4	15630	46.0	7.5	53.5	74	-20.5	Peak	Horizontal
5	10420	34.6	3.4	38.0	54	-16.0	Average	Vertical
6	10420	46.5	3.4	49.9	68.2	-18.3	Peak	Vertical
7	15630	33.0	7.5	40.5	54	-13.5	Average	Vertical
8	15630	45.8	7.5	53.3	74	-20.7	Peak	Vertical
MIMO_Ant. 0+1_ IEEE 802.11ac-VHT80_Channel 58								
1	10580	33.6	3.2	36.8	54	-17.2	Average	Horizontal
2	10580	45.9	3.2	49.1	68.2	-19.1	Peak	Horizontal
3	15870	31.9	7.3	39.1	54	-14.9	Average	Horizontal
4	15870	45.0	7.3	52.3	74	-21.8	Peak	Horizontal
5	10580	33.5	3.2	36.7	54	-17.3	Average	Vertical
6	10580	45.9	3.2	49.1	68.2	-19.1	Peak	Vertical
7	15870	31.8	7.3	39.1	54	-14.9	Average	Vertical
8	15870	44.1	7.3	51.4	74	-22.7	Peak	Vertical

No.	Frequency (MHz)	Reading (dBμV)	Correction factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Antenna Polaxis
MIMO_Ant. 0+1 IEEE 802.11ac-VHT80_Channel 106								
1	11060	34.2	2.3	36.5	54	-17.5	Average	Horizontal
2	11060	46.6	2.3	48.9	74	-25.1	Peak	Horizontal
3	16590	31.0	8.1	39.1	54	-14.9	Average	Horizontal
4	16590	43.8	8.1	51.9	68.2	-16.3	Peak	Horizontal
5	11060	34.2	2.3	36.5	54	-17.5	Average	Vertical
6	11060	46.9	2.3	49.2	74	-24.8	Peak	Vertical
7	16590	31.0	8.1	39.1	54	-14.9	Average	Vertical
8	16590	43.2	8.1	51.3	68.2	-16.9	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11ac-VHT80_Channel 122								
1	11220	33.7	2.2	35.9	54	-18.1	Average	Horizontal
2	11220	45.9	2.2	48.1	74	-25.9	Peak	Horizontal
3	16830	32.4	8.4	40.8	54	-13.2	Average	Horizontal
4	16830	45.1	8.4	53.5	68.2	-14.7	Peak	Horizontal
5	11220	33.6	2.2	35.9	54	-18.1	Average	Vertical
6	11220	46.4	2.2	48.6	74	-25.4	Peak	Vertical
7	16830	32.7	8.4	41.1	54	-12.9	Average	Vertical
8	16830	45.1	8.4	53.5	68.2	-14.7	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11ac-VHT80_Channel 138								
1	11550	33.1	2.1	35.2	54	-18.9	Average	Horizontal
2	11550	45.1	2.1	47.1	74	-26.9	Peak	Horizontal
3	17325	31.3	9.1	40.4	54	-13.6	Average	Horizontal
4	17325	44.1	9.1	53.2	68.2	-15.0	Peak	Horizontal
5	11550	33.1	2.1	35.2	54	-18.9	Average	Vertical
6	11550	45.2	2.1	47.2	74	-26.8	Peak	Vertical
7	17325	31.2	9.1	40.3	54	-13.7	Average	Vertical
8	17325	44.0	9.1	53.2	68.2	-15.0	Peak	Vertical
MIMO_Ant. 0+1 IEEE 802.11ac-VHT80_Channel 155								
1	11550	33.09	2.06	35.15	54.00	-18.85	Average	Horizontal
2	11550	45.05	2.06	47.11	74.00	-26.89	Peak	Horizontal
3	17325	31.26	9.12	40.38	54.00	-13.62	Average	Horizontal
4	17325	44.06	9.12	53.18	74.00	-20.82	Peak	Horizontal
5	11550	33.09	2.06	35.15	54.00	-18.85	Average	Vertical
6	11550	45.15	2.06	47.21	74.00	-26.79	Peak	Vertical
7	17325	31.18	9.12	40.30	54.00	-13.70	Average	Vertical
8	17325	44.04	9.12	53.16	74.00	-20.84	Peak	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

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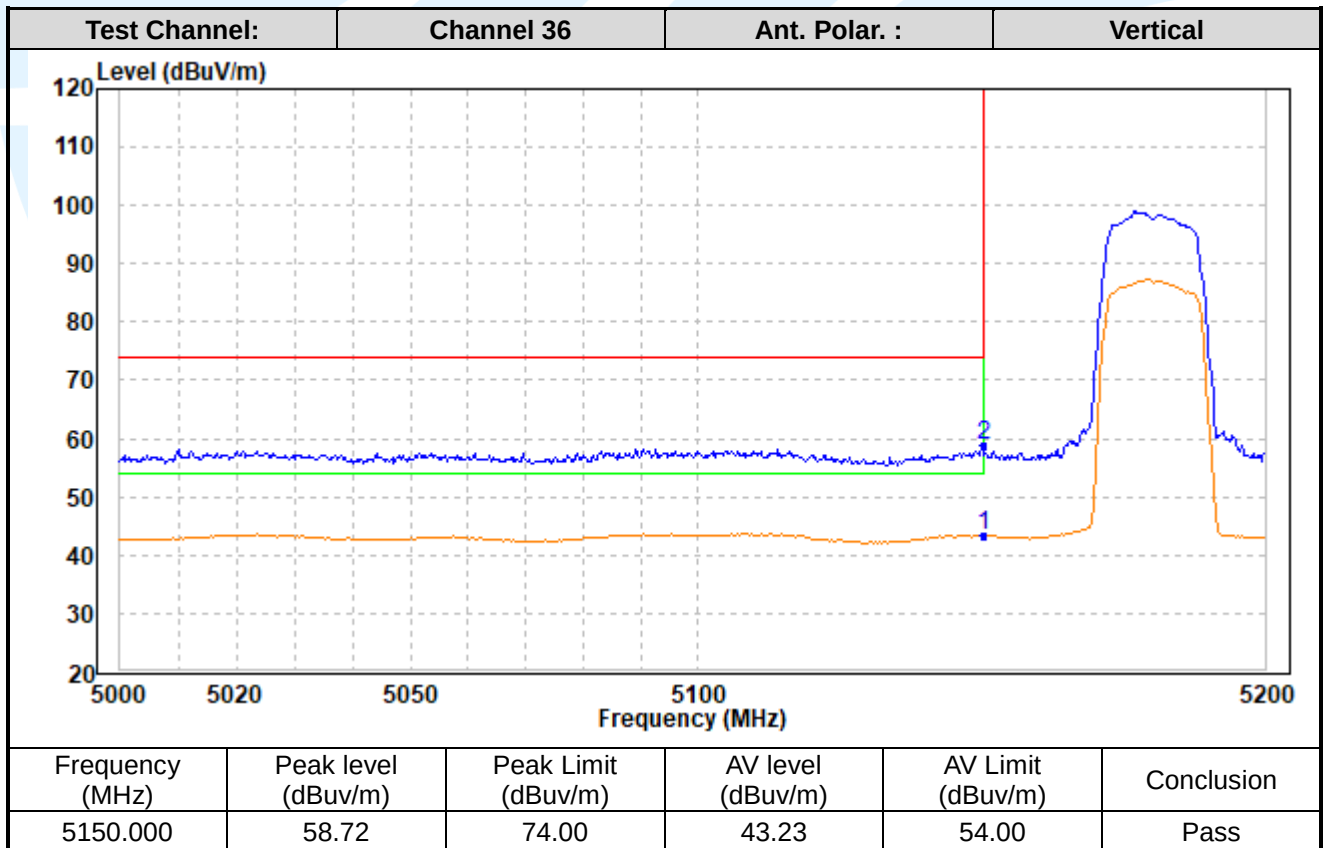
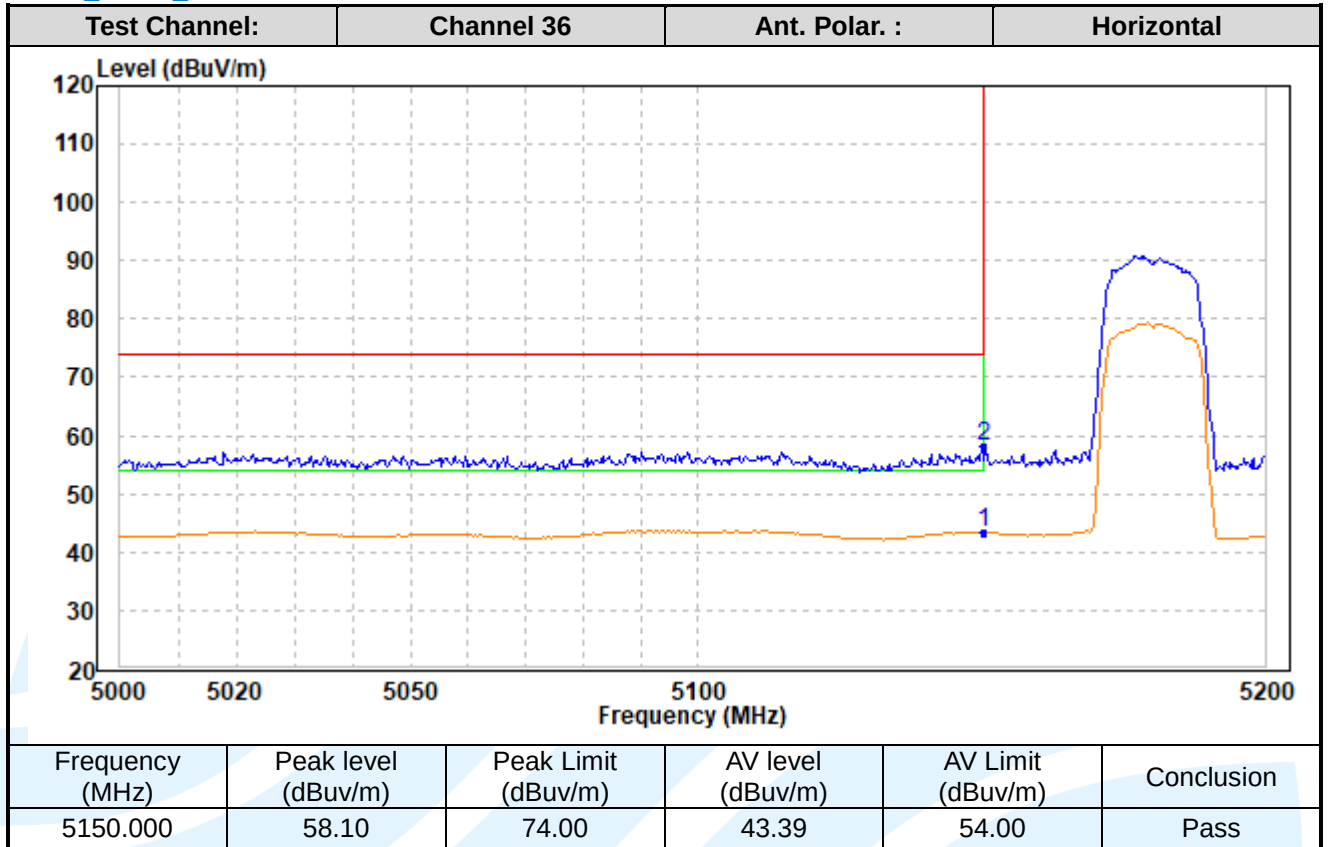
E-mail: info@uttlab.com

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Band Edge Measurements (Radiated)

SISO_Ant. 0 IEEE 802.11a



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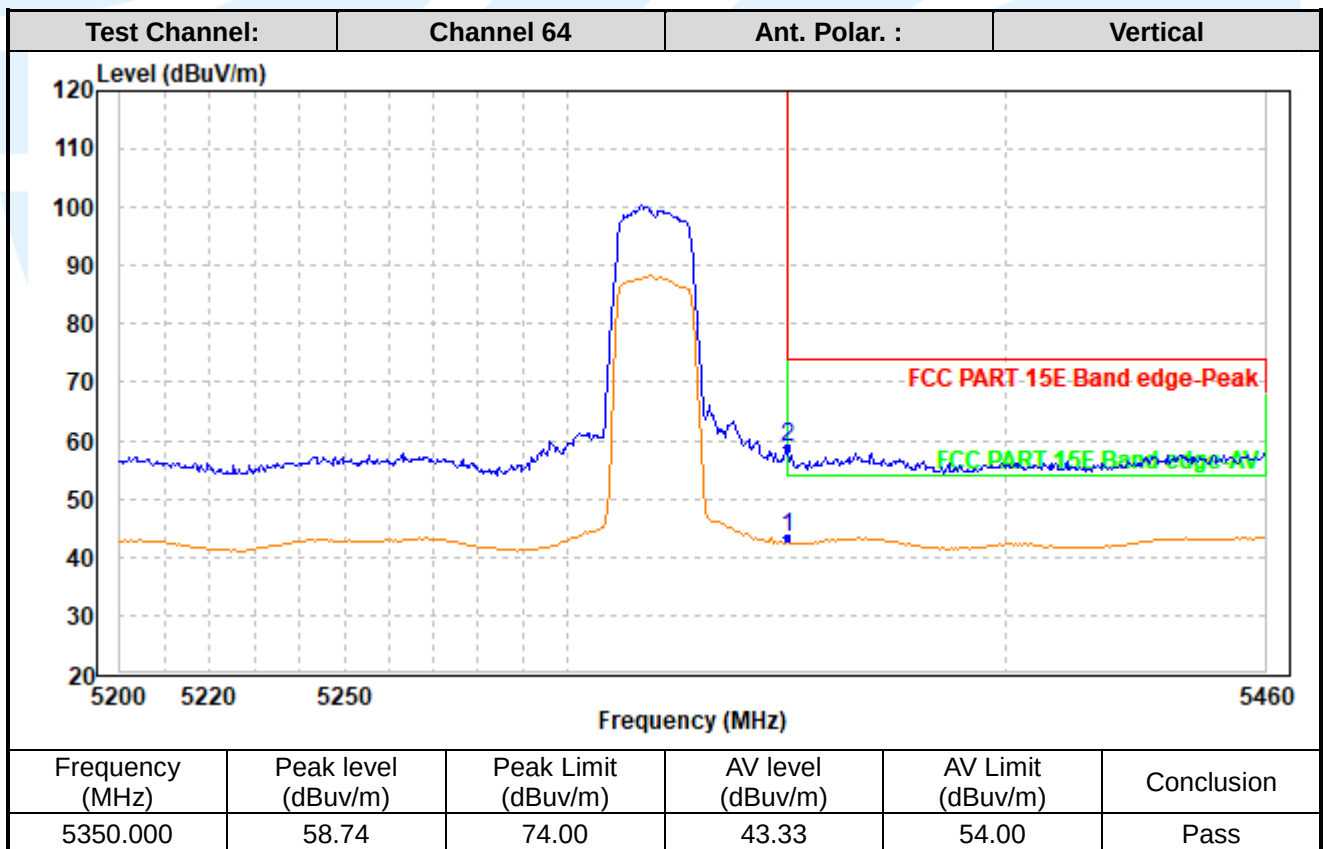
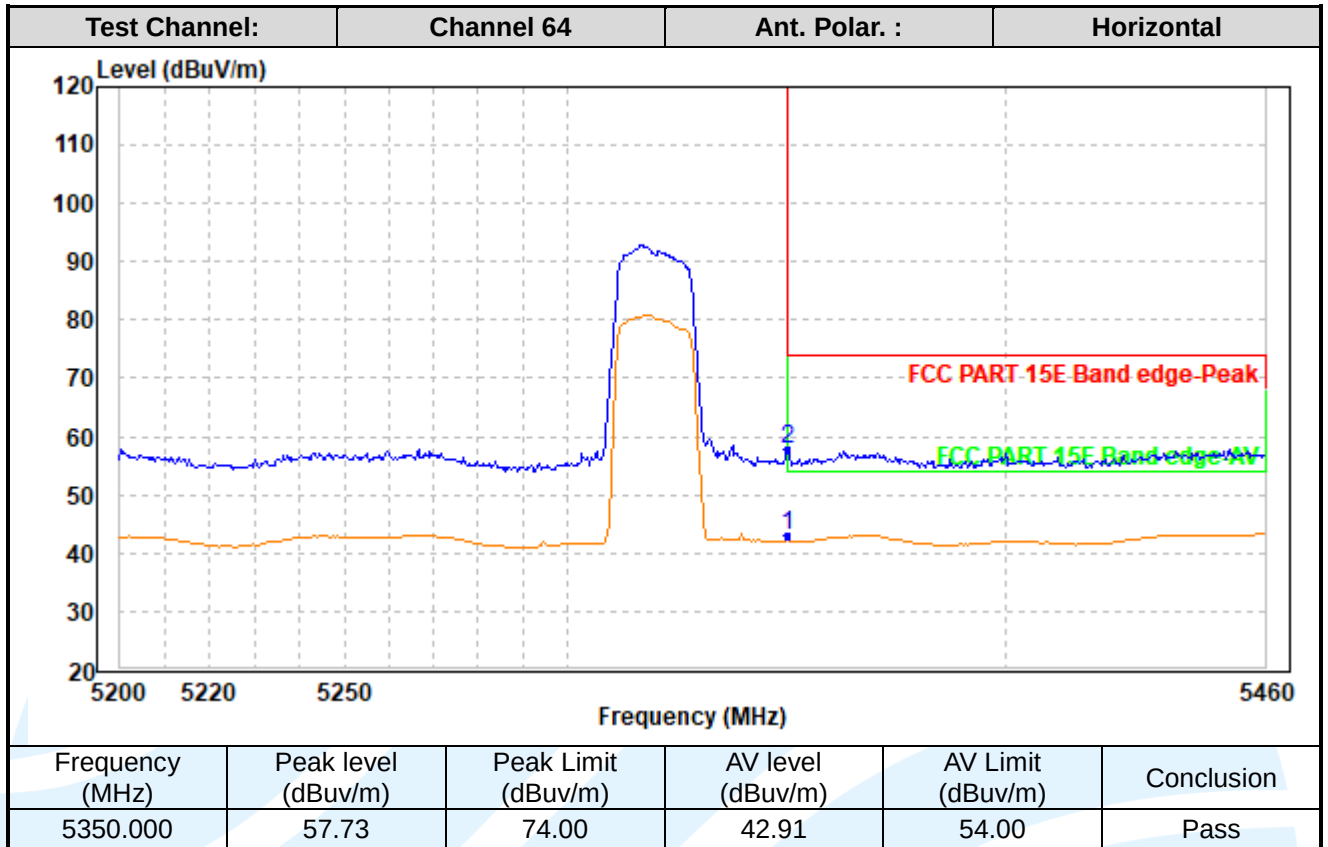
Tel: +86-755-28230888

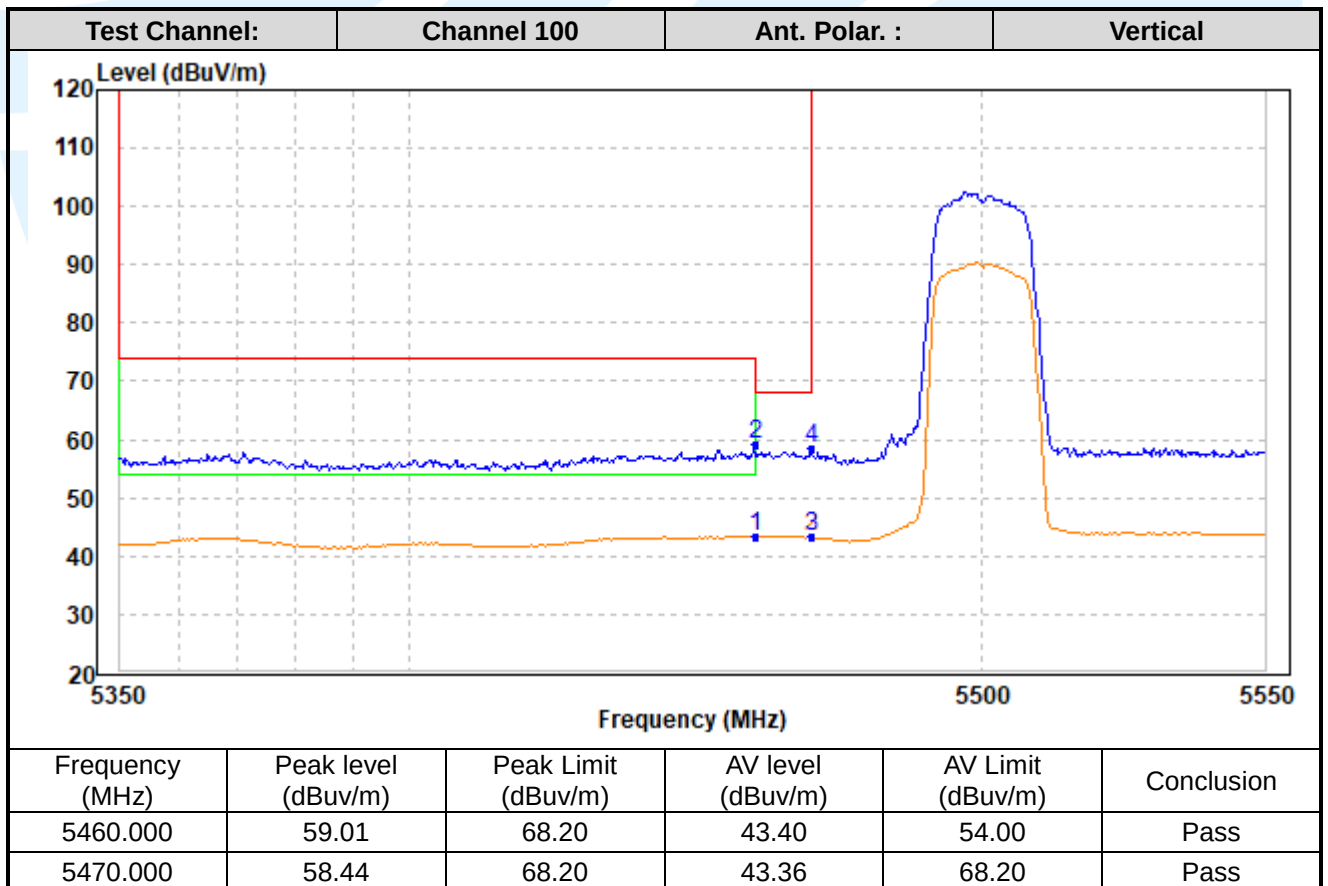
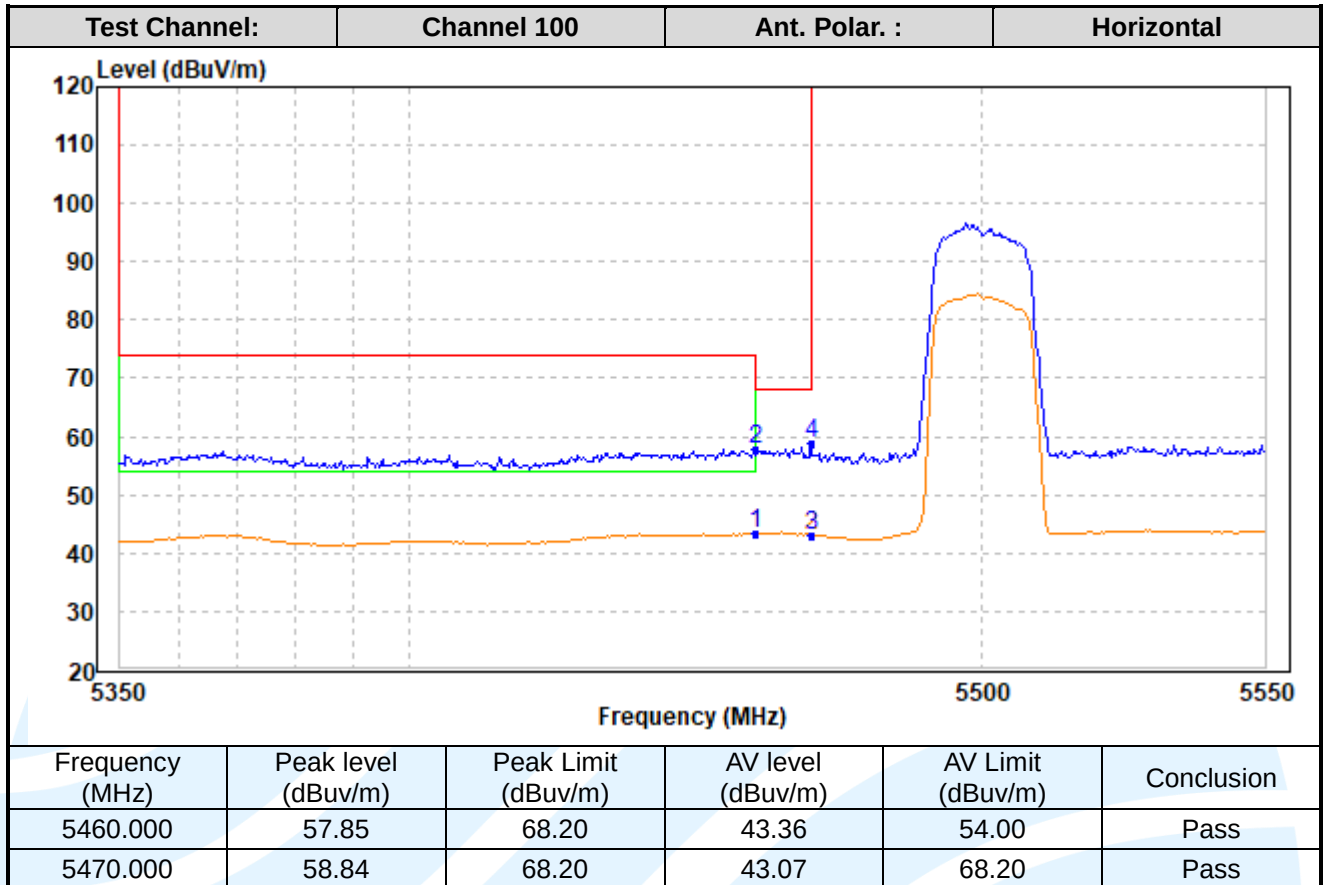
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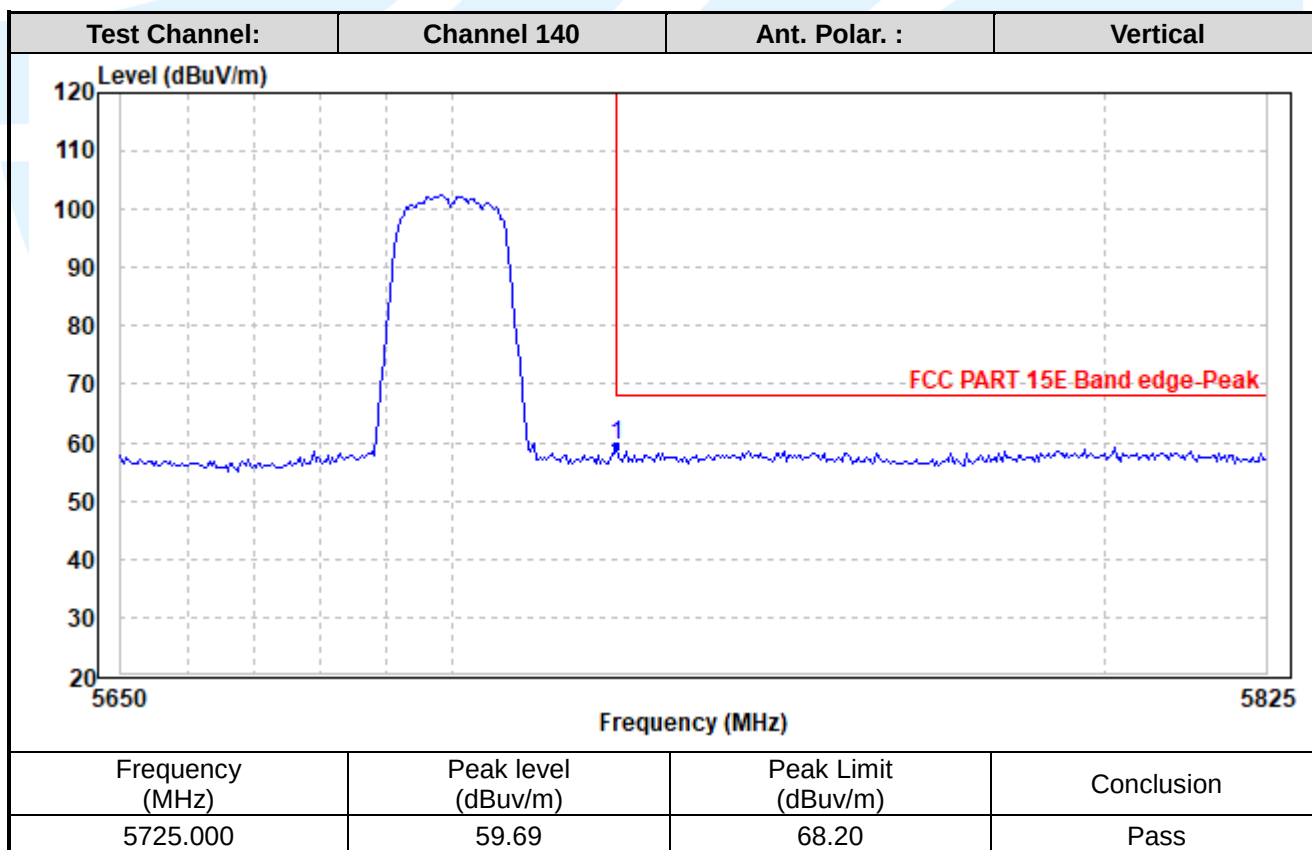
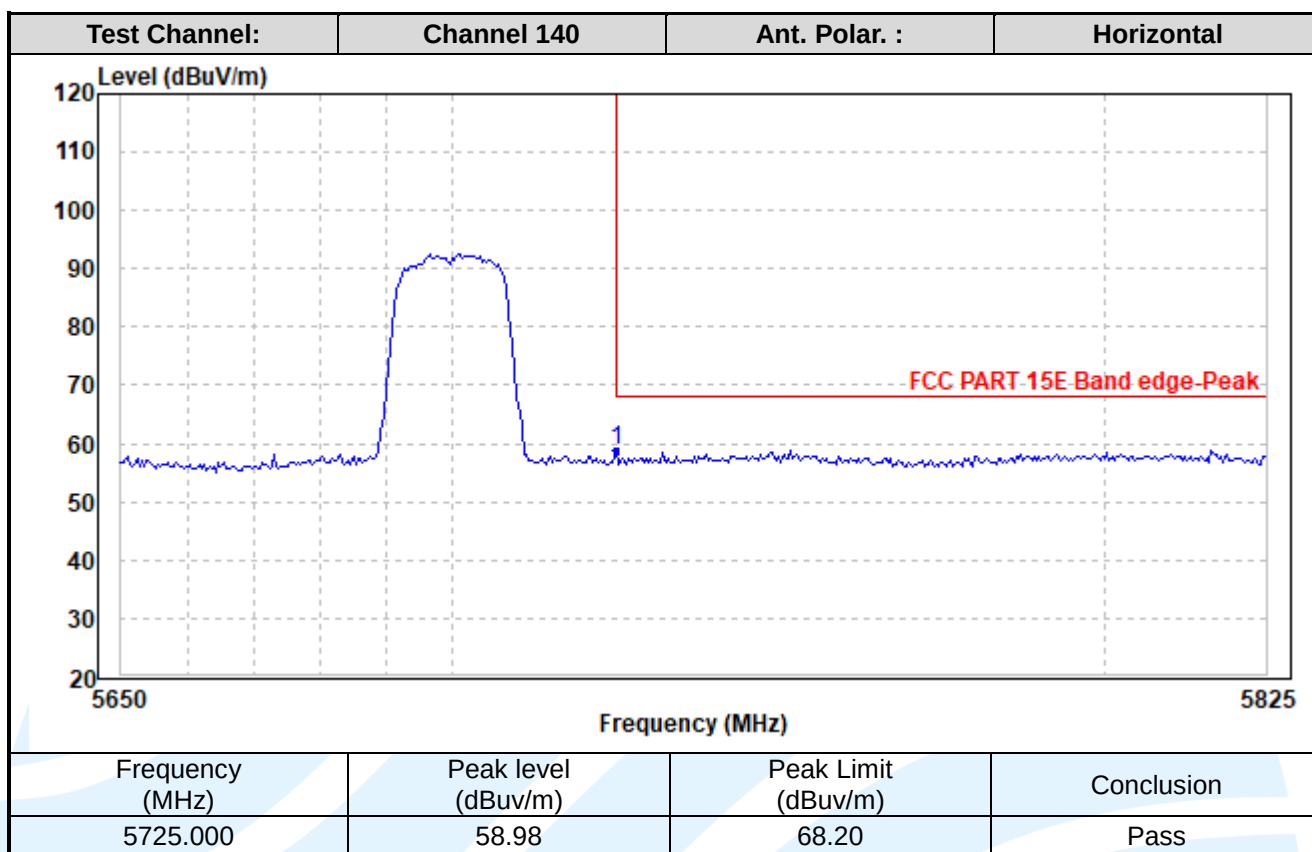
E-mail: info@uttlab.com

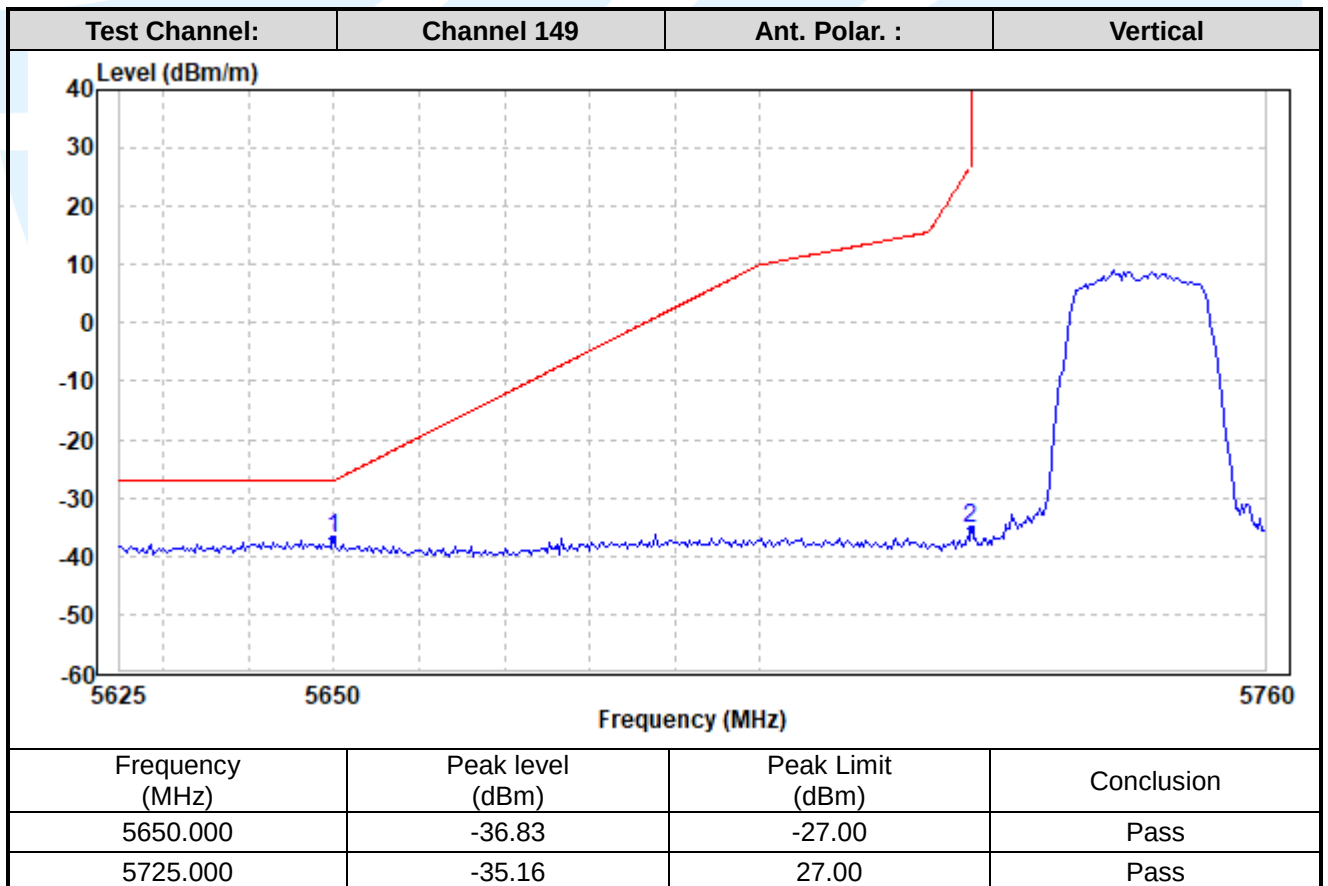
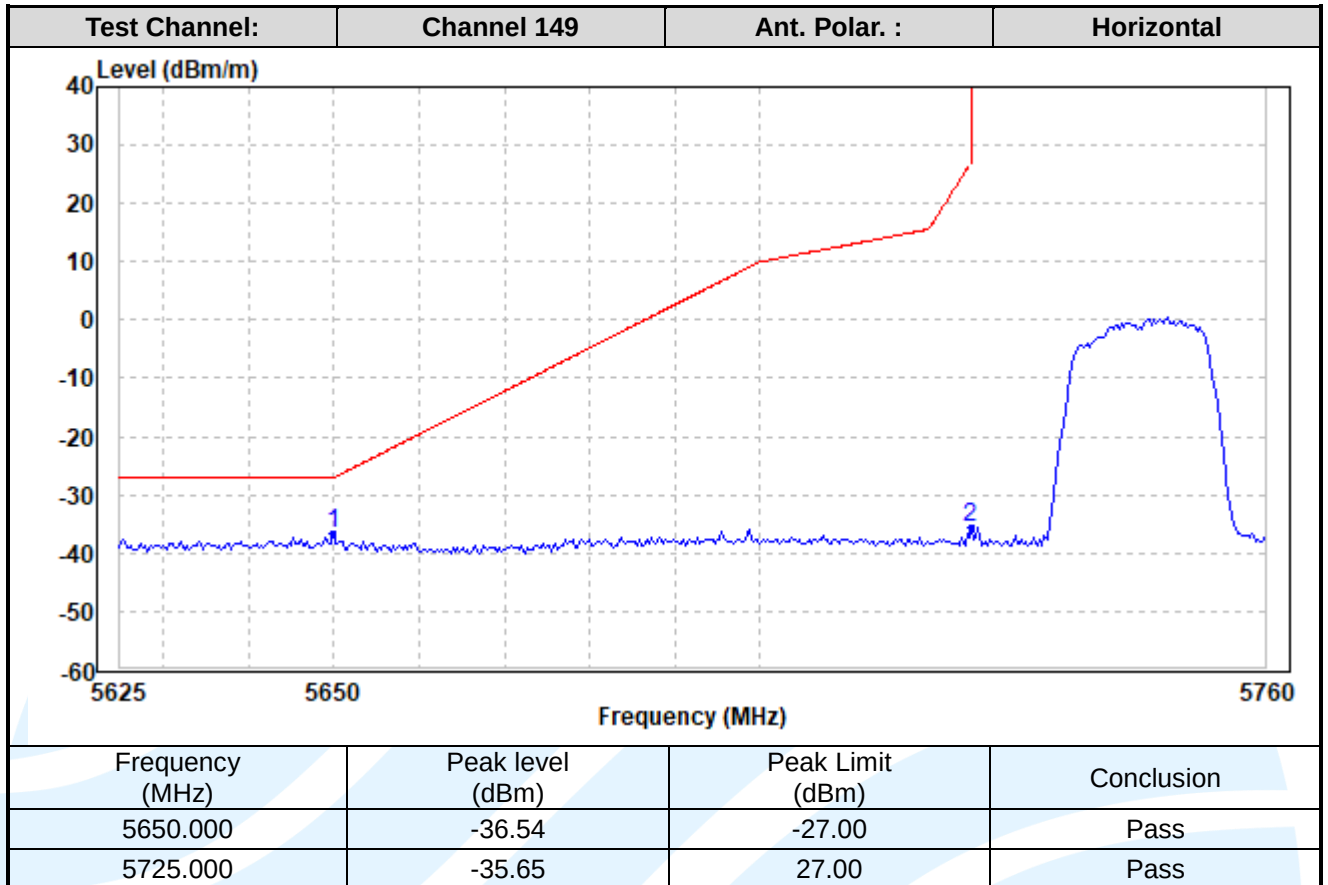
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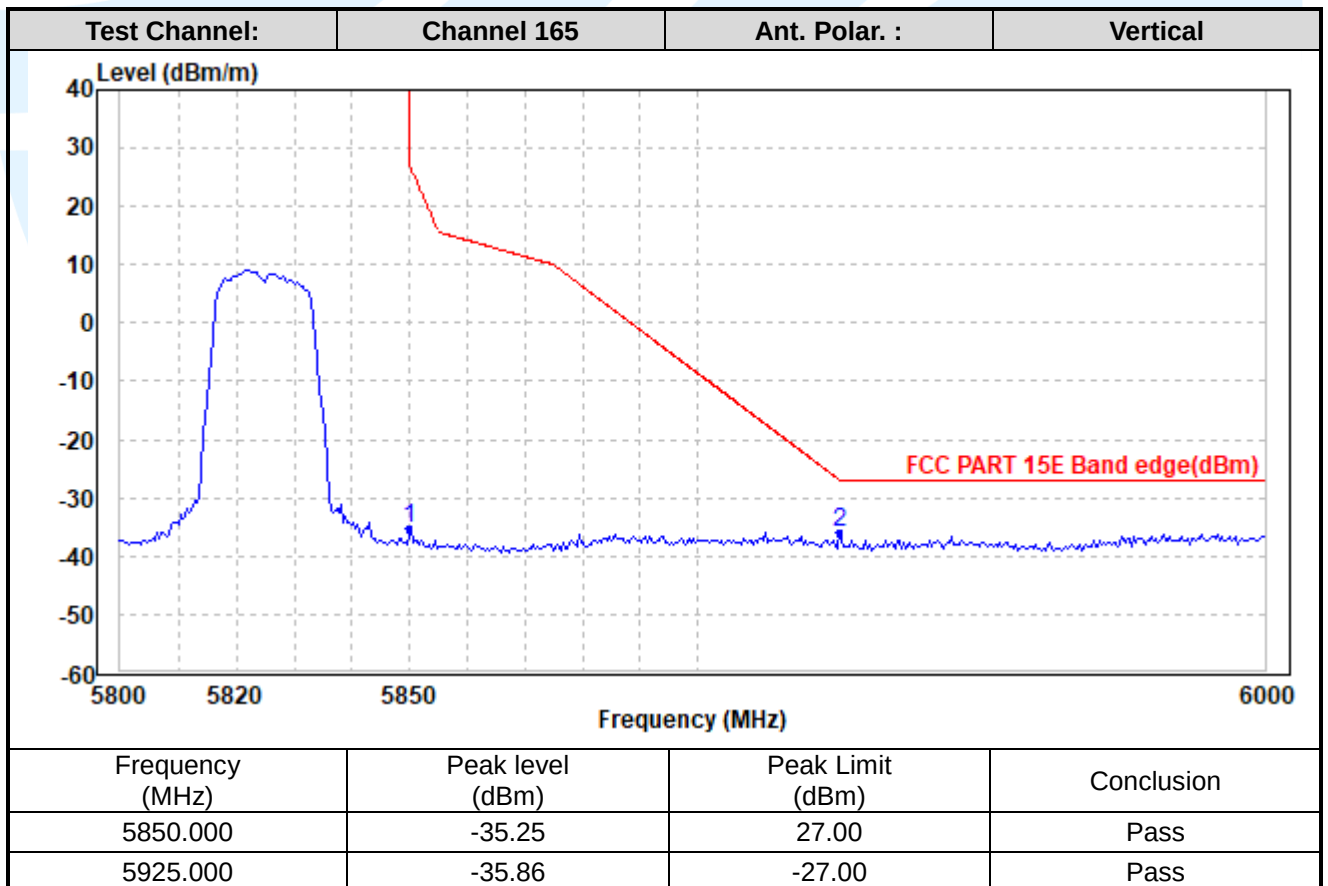
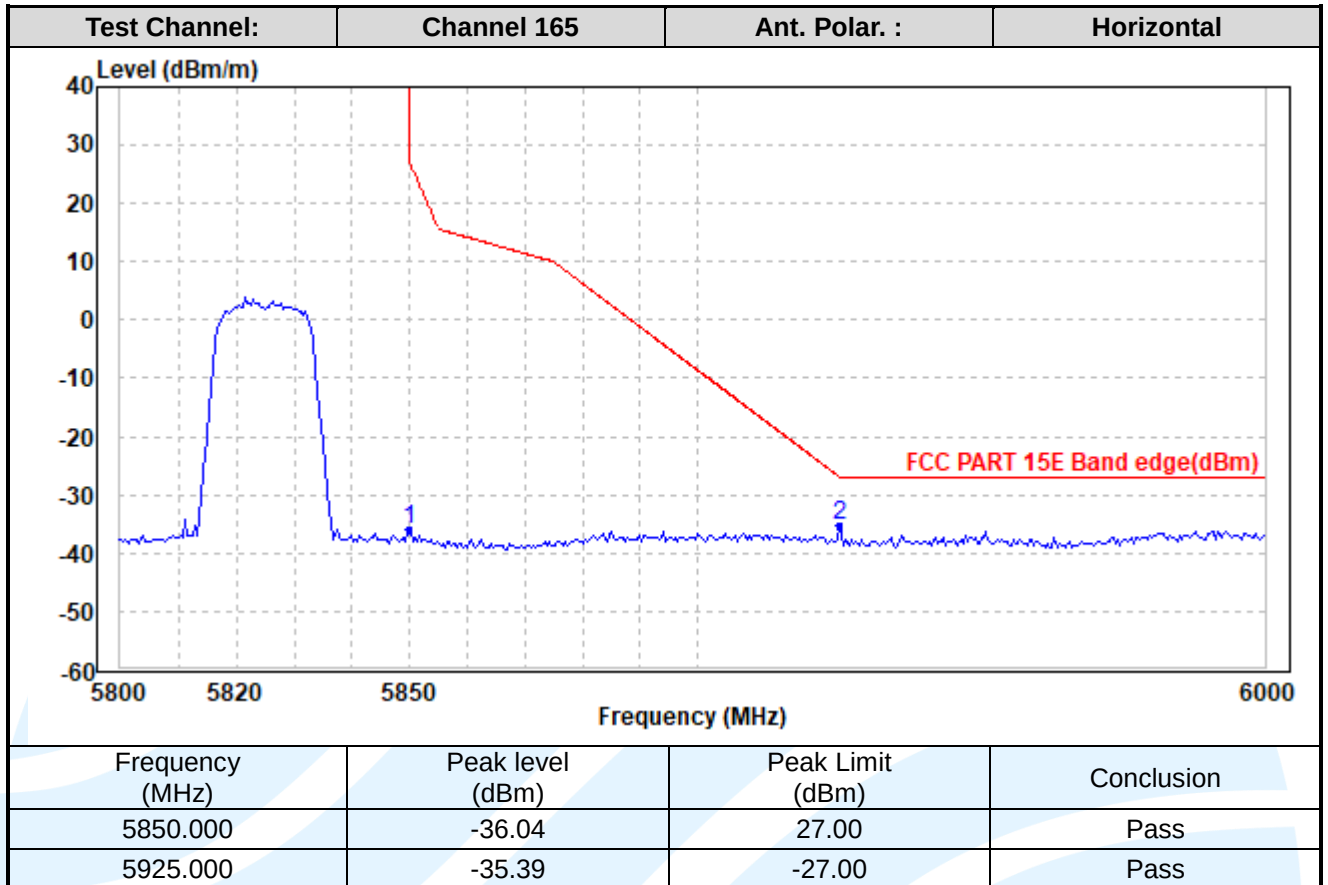
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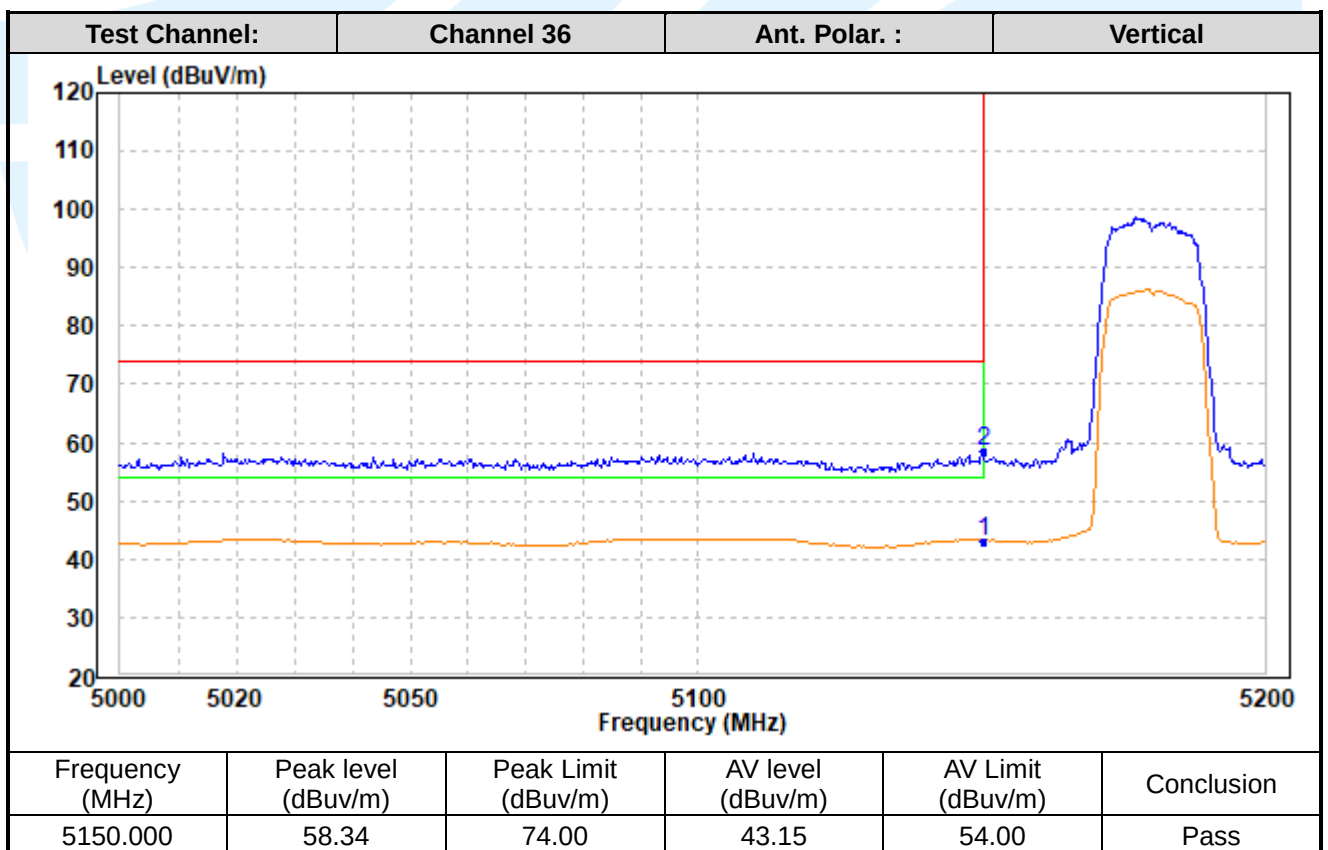
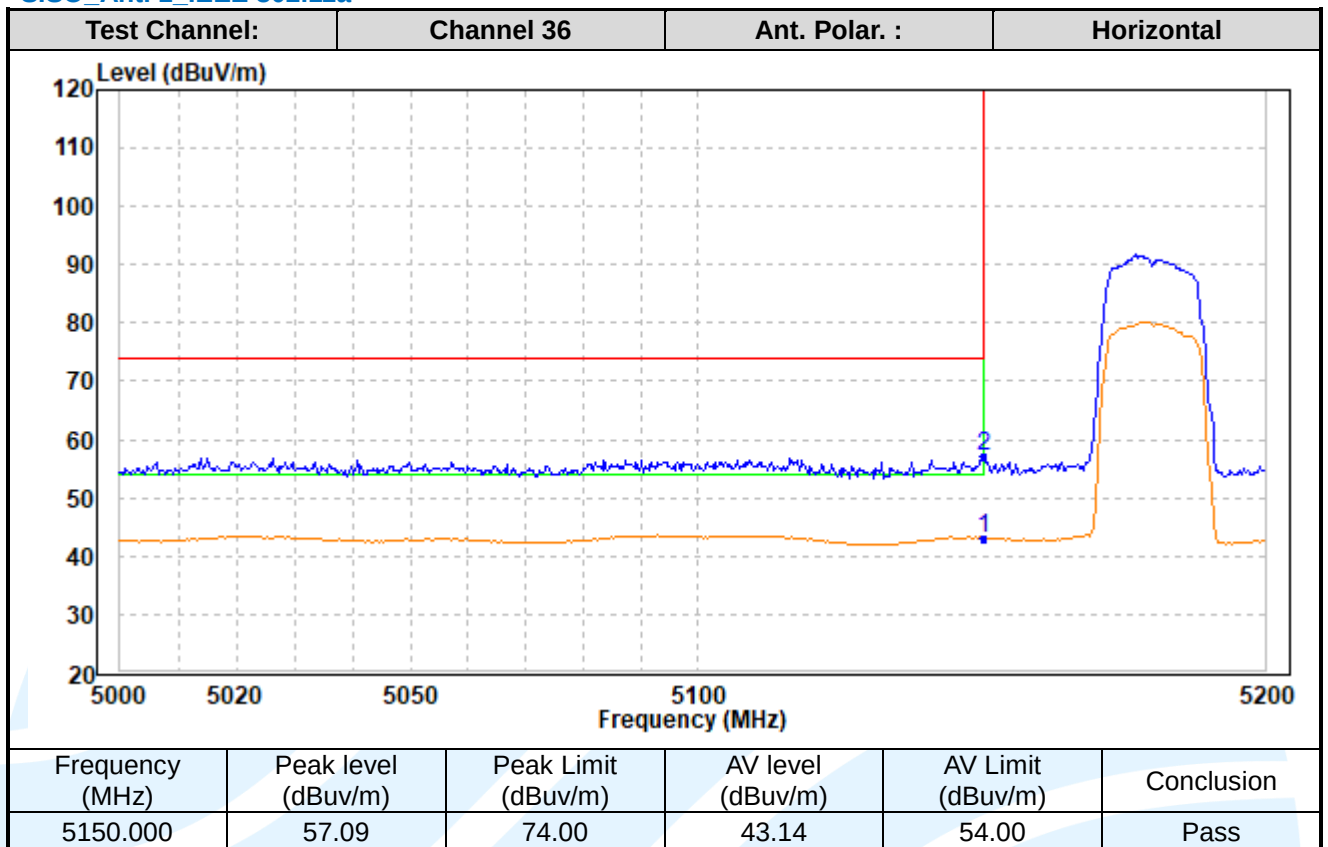
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SISO_Ant. 1_ IEEE 802.11a



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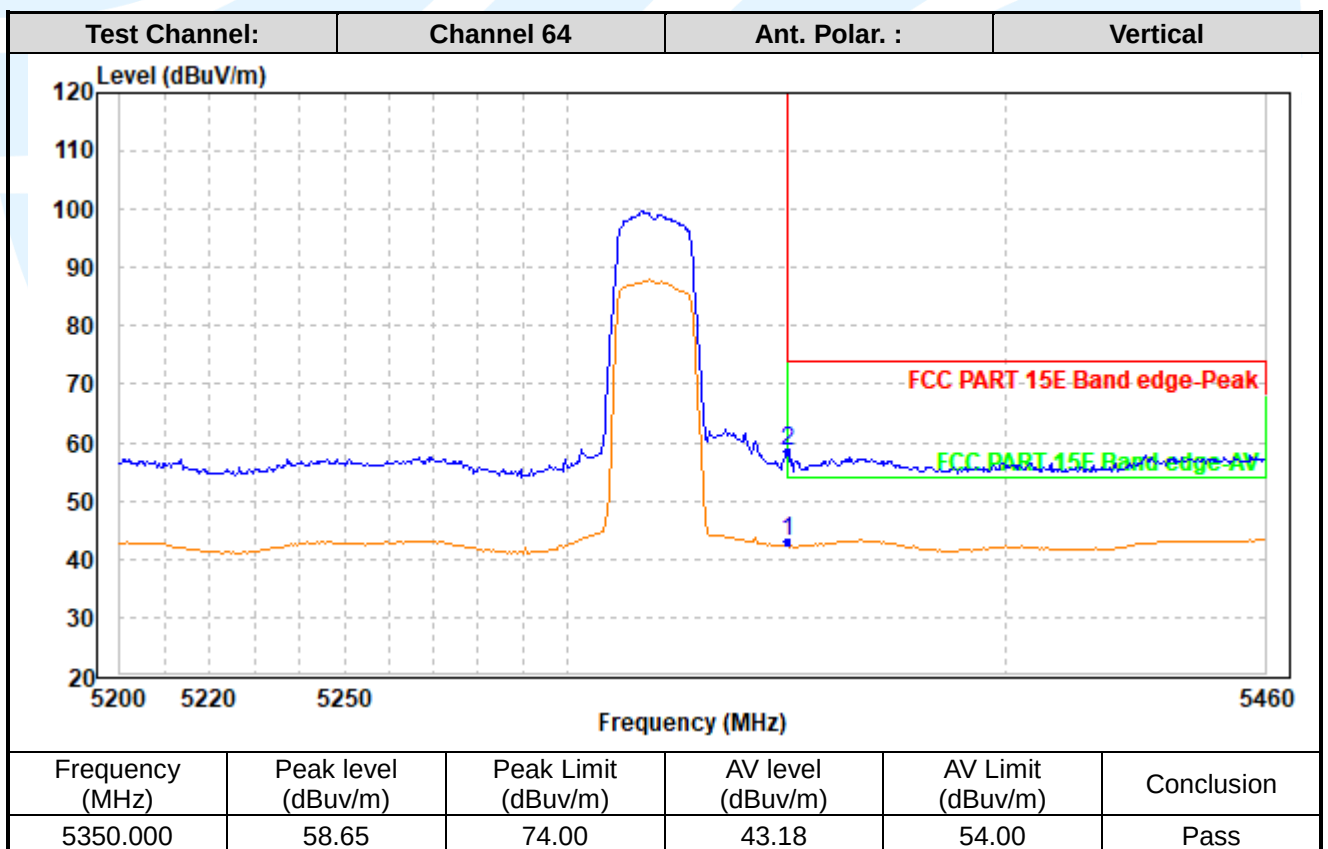
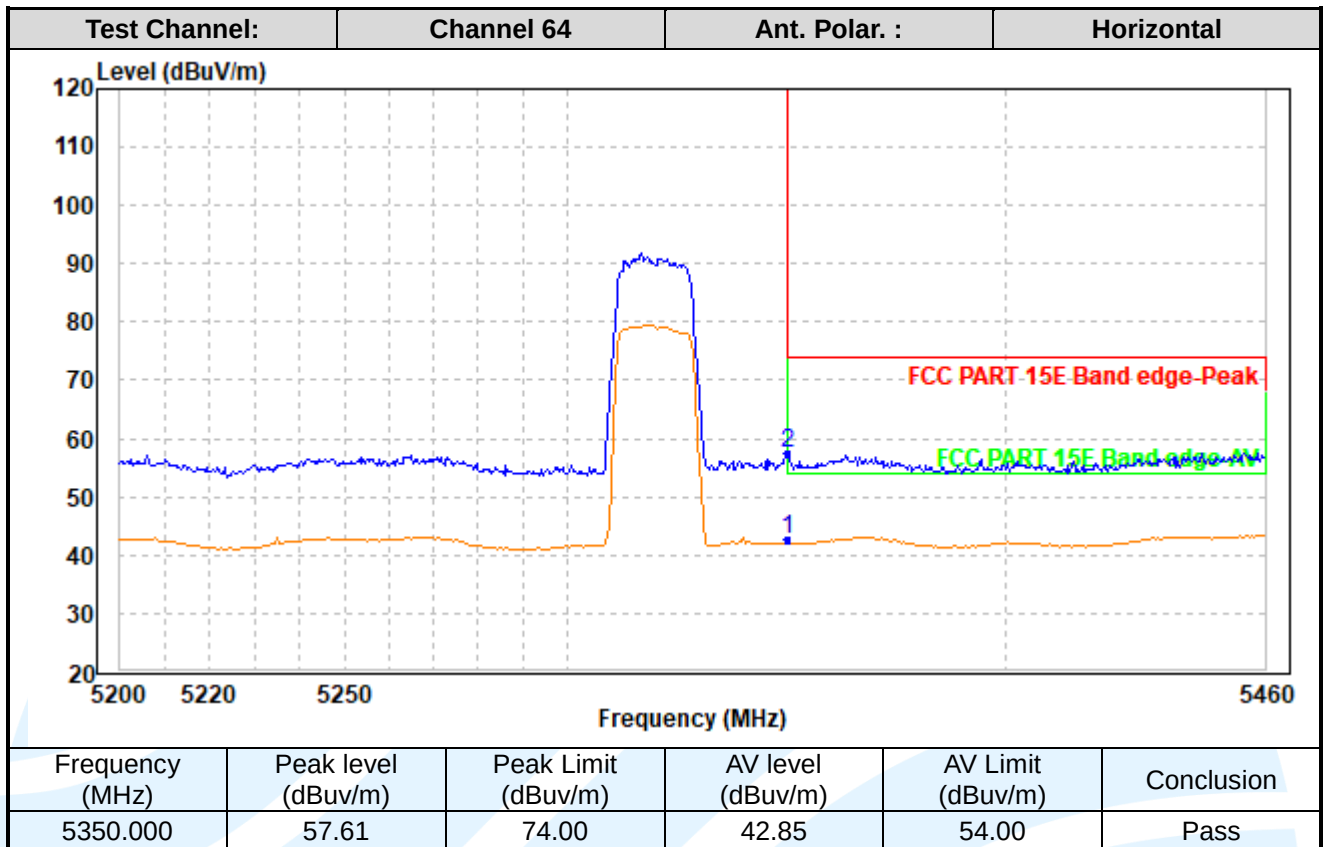
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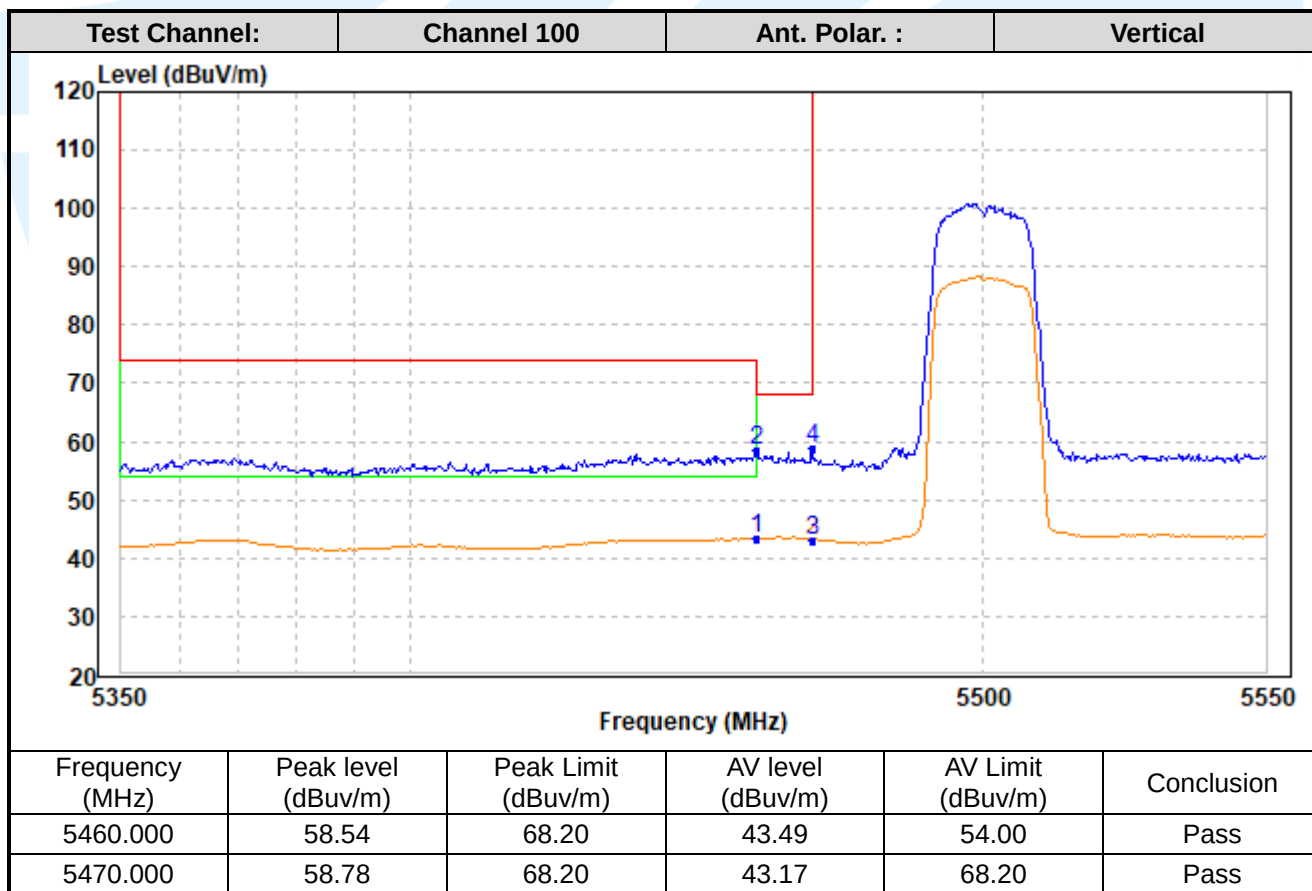
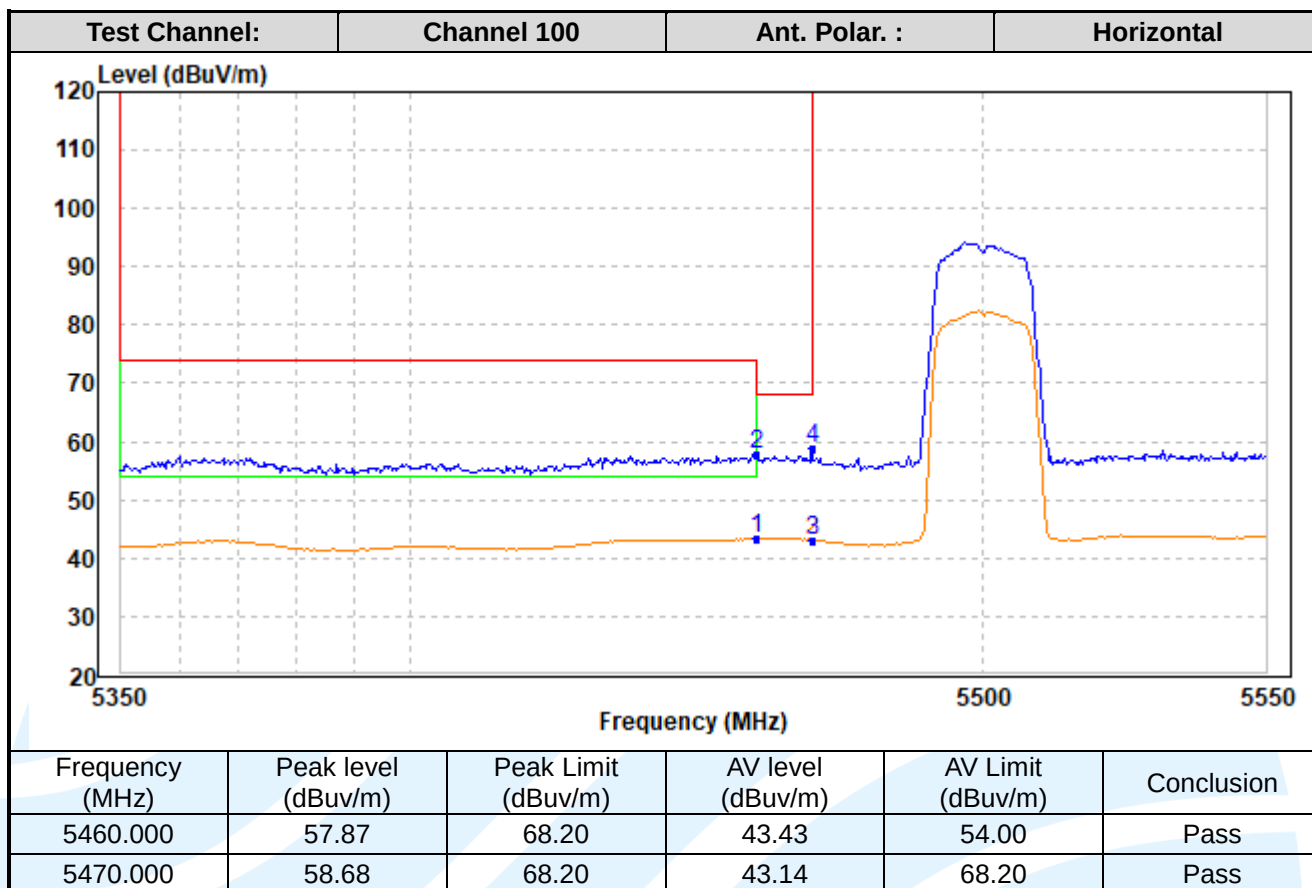
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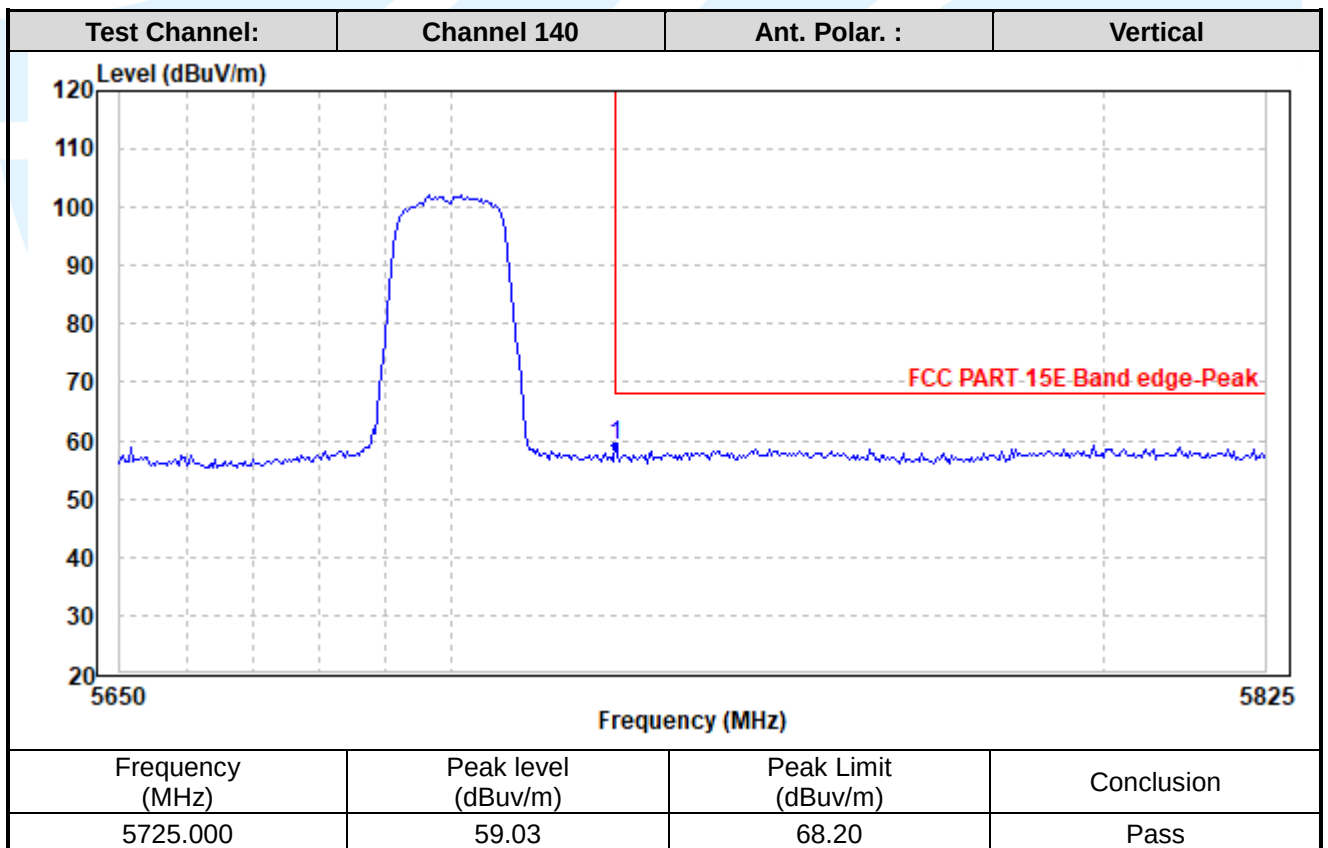
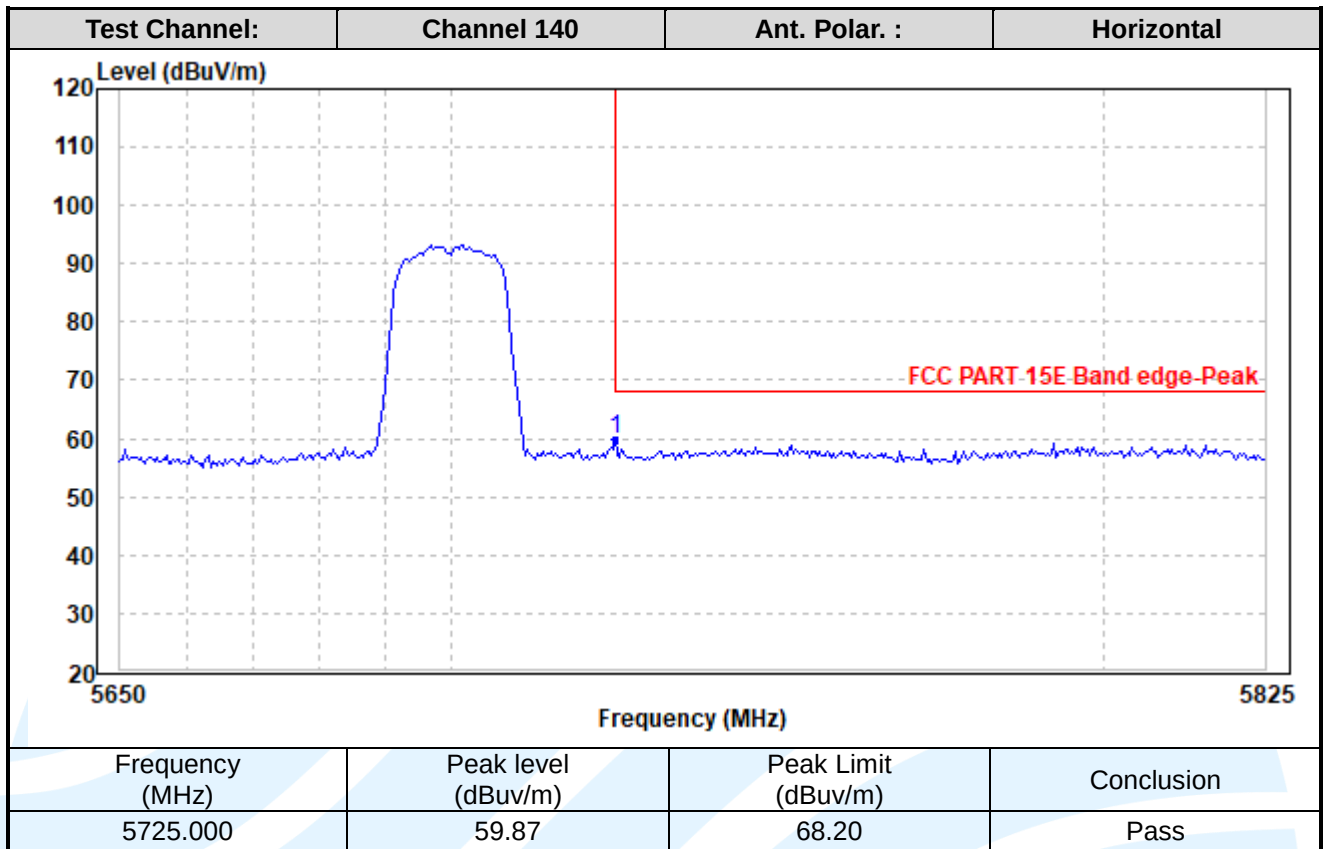
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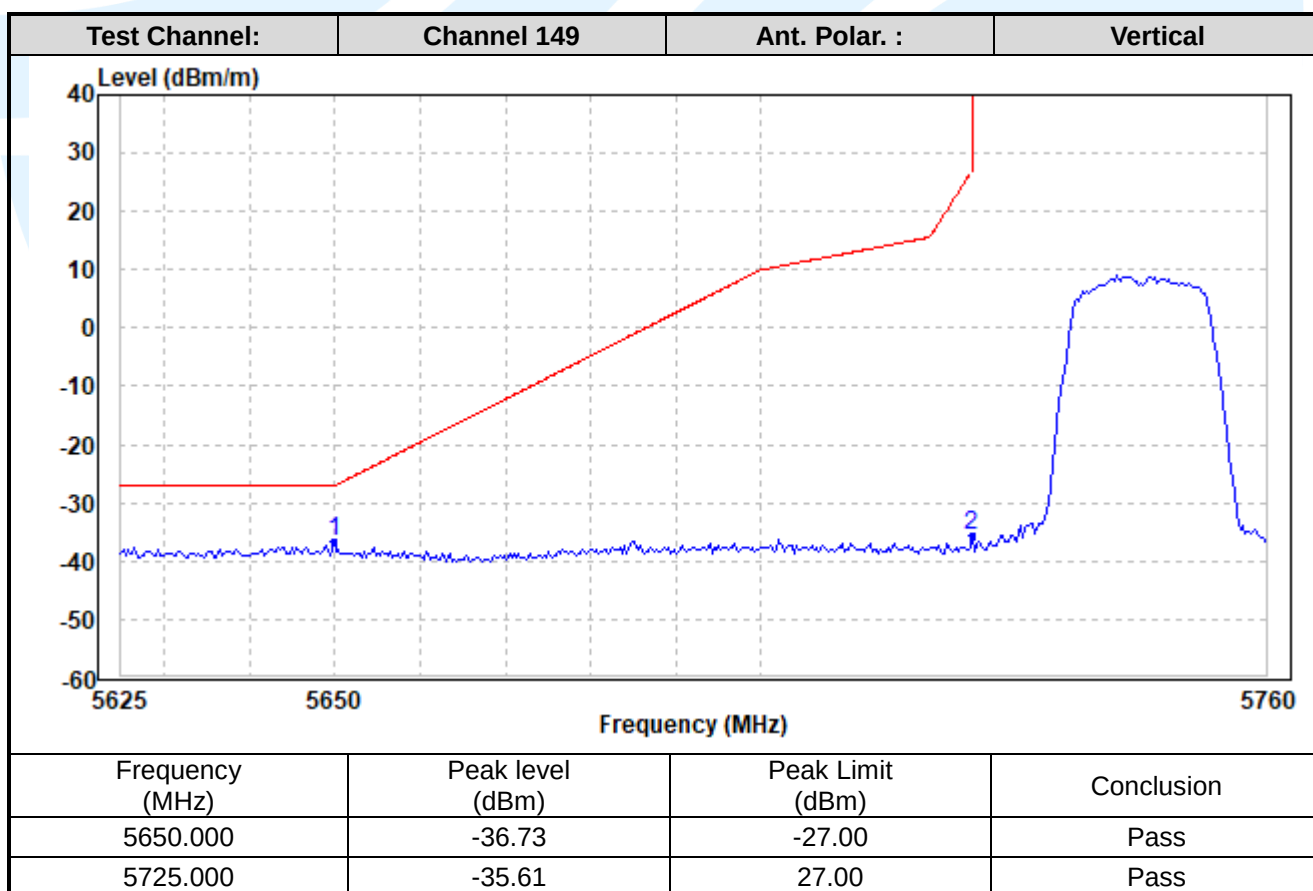
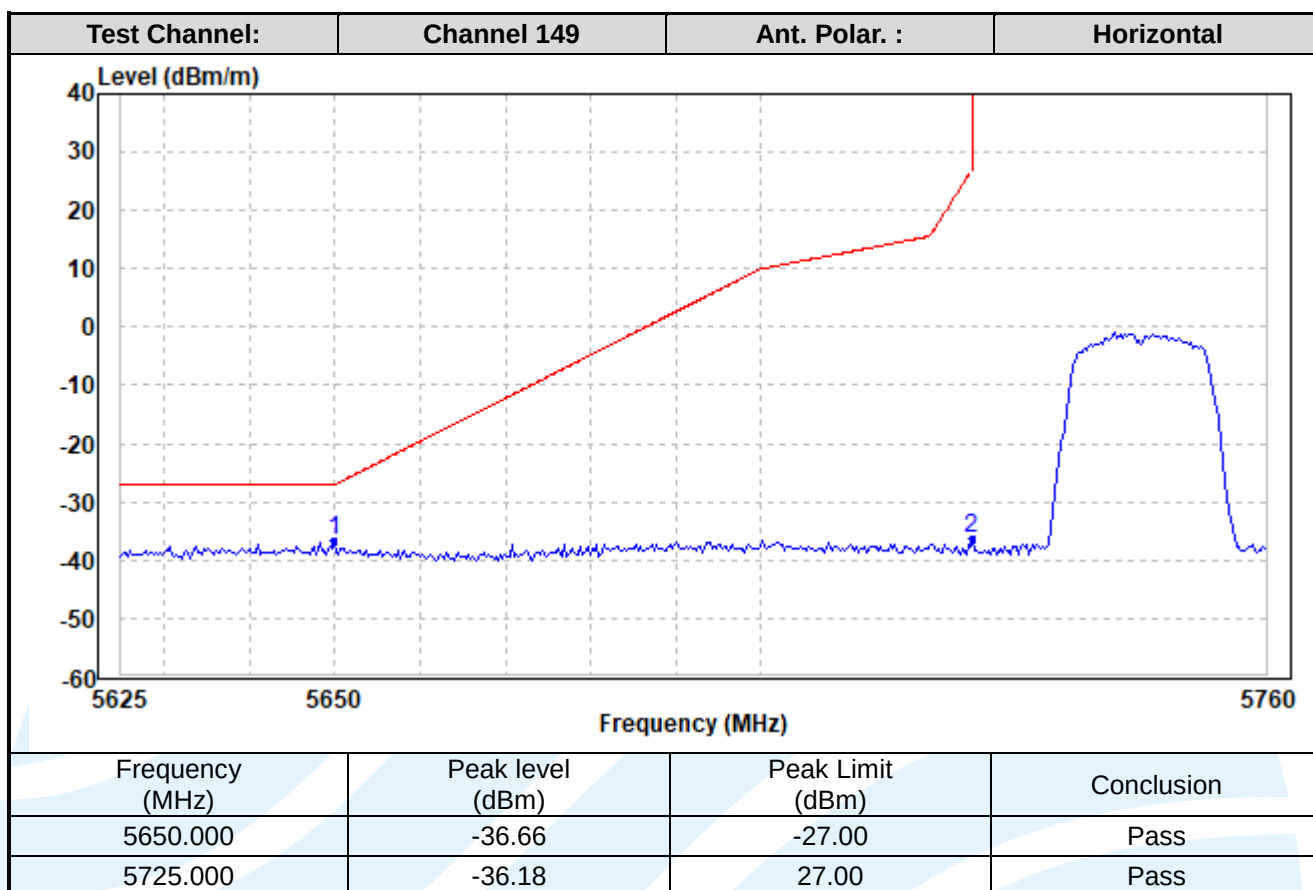
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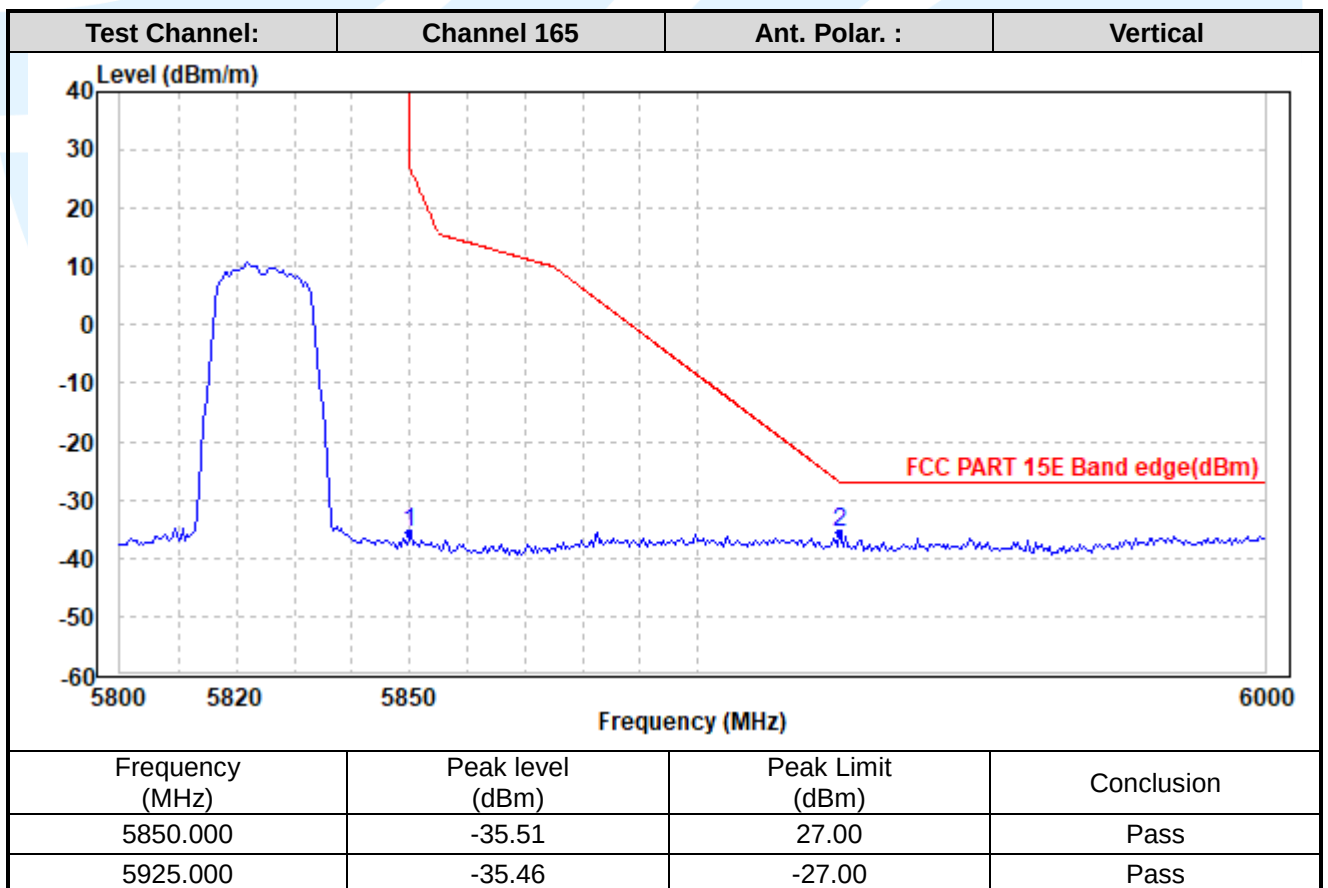
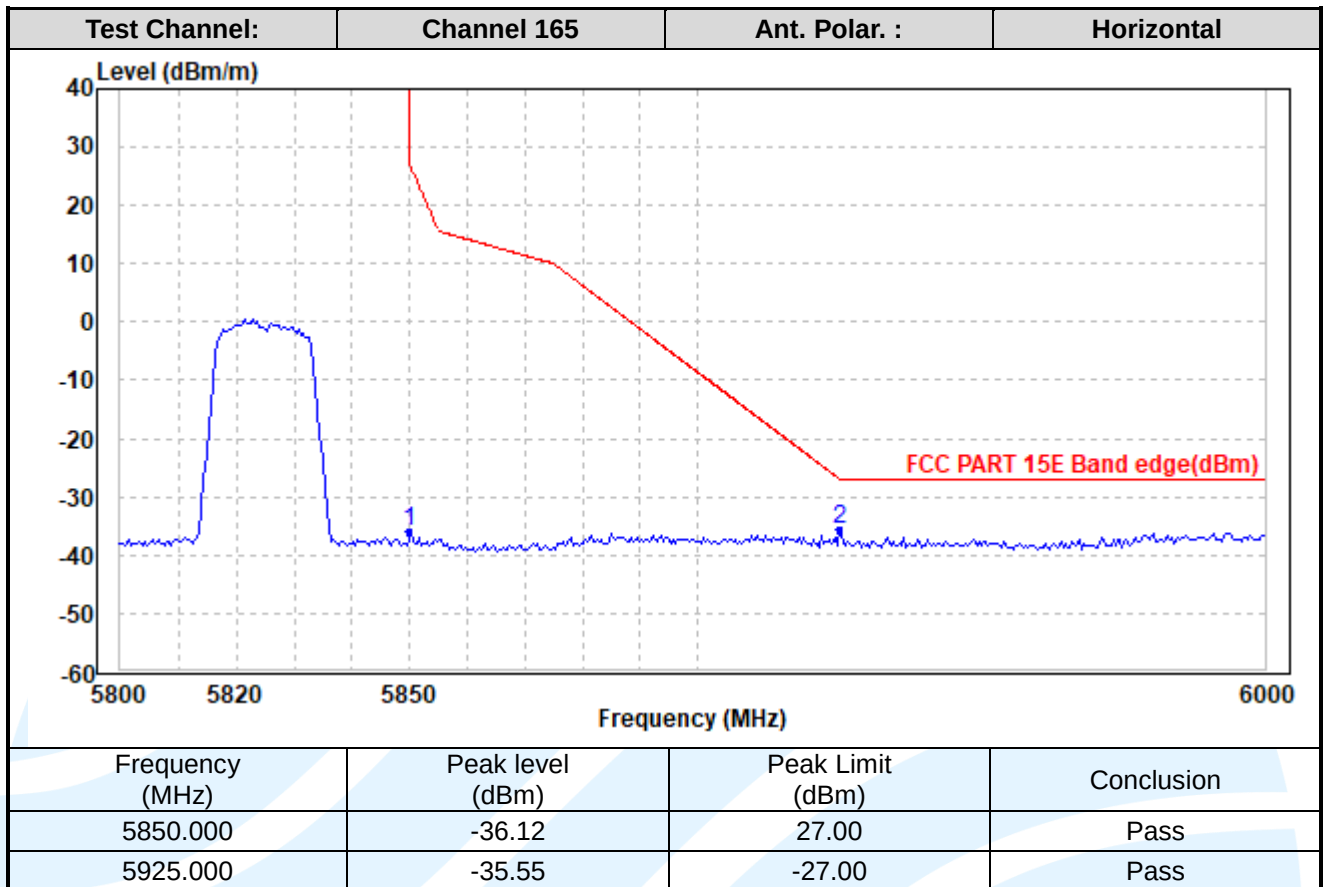
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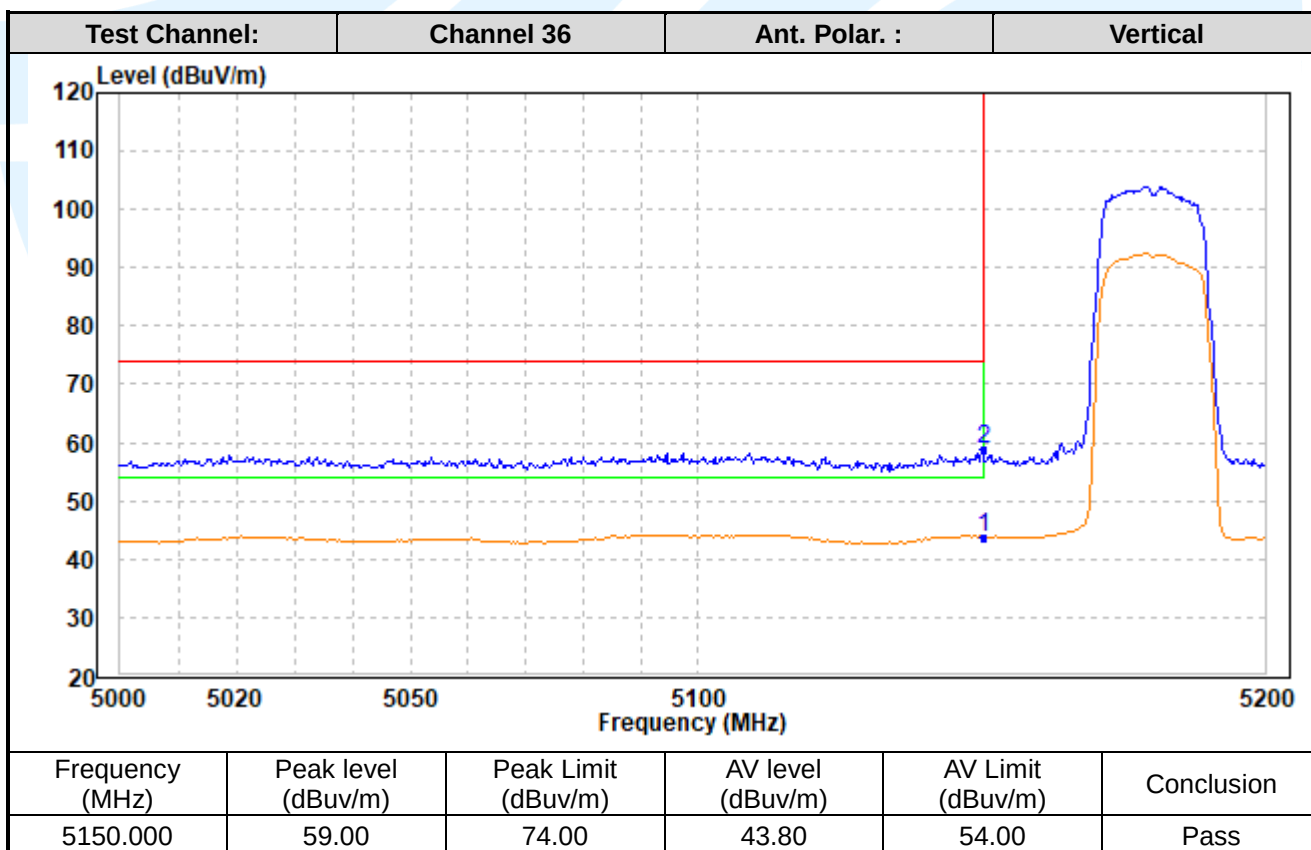
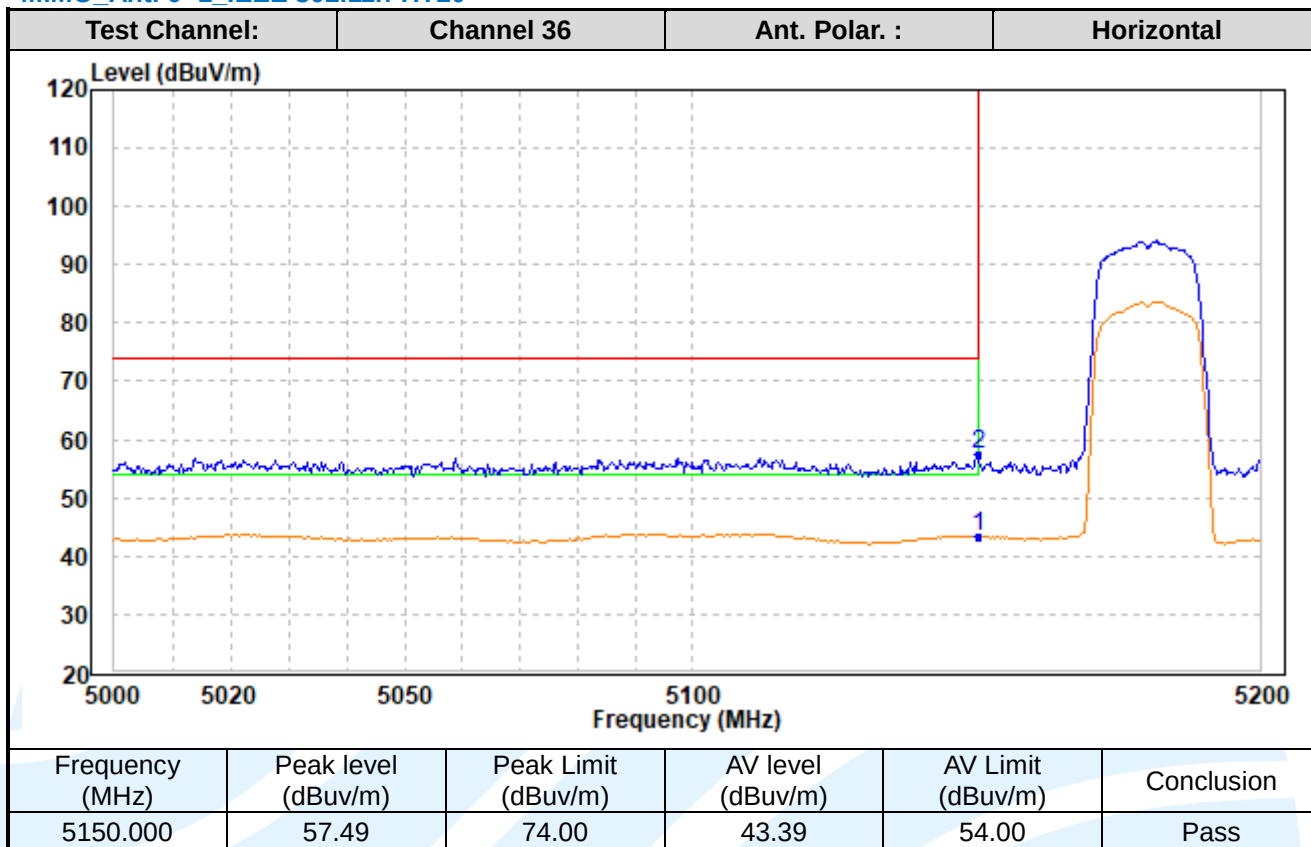
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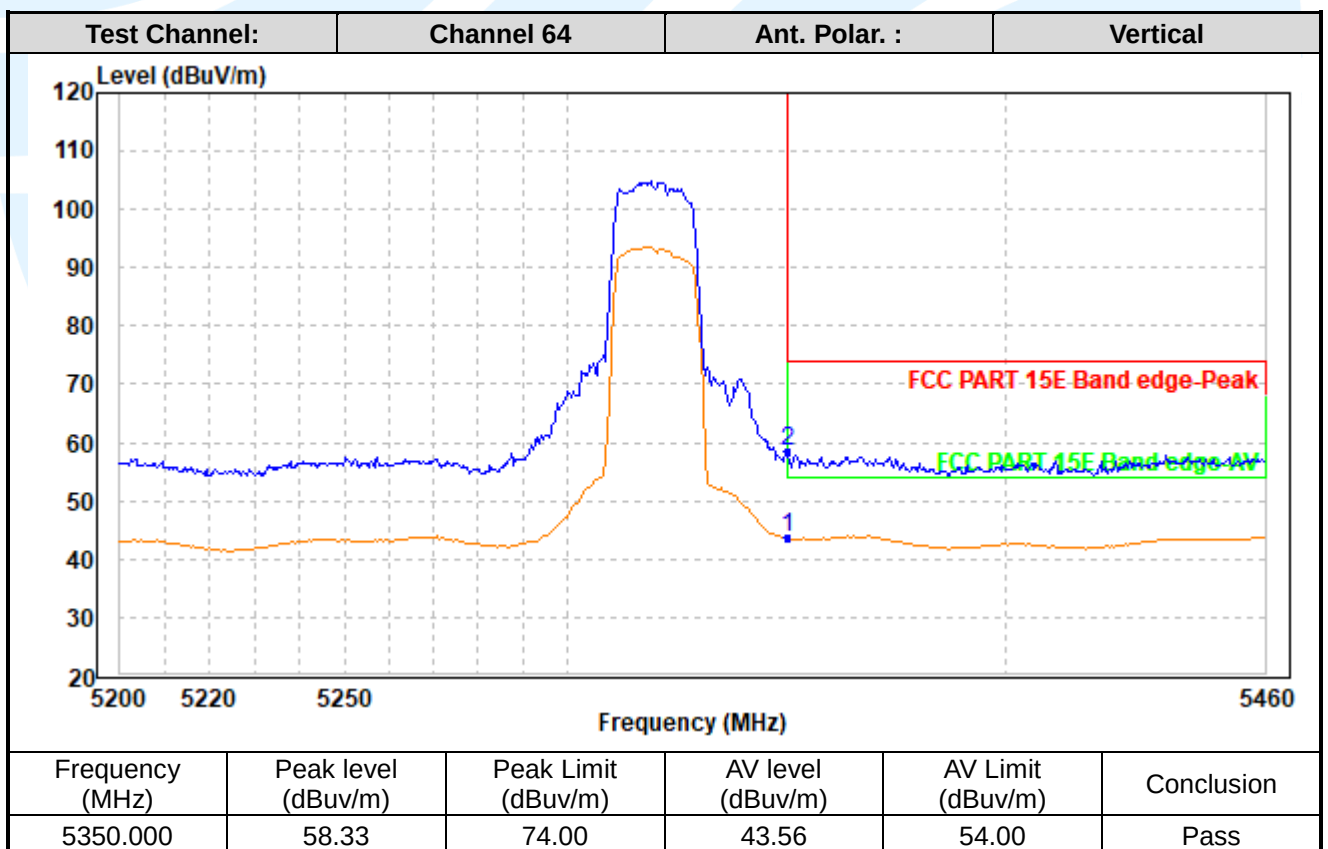
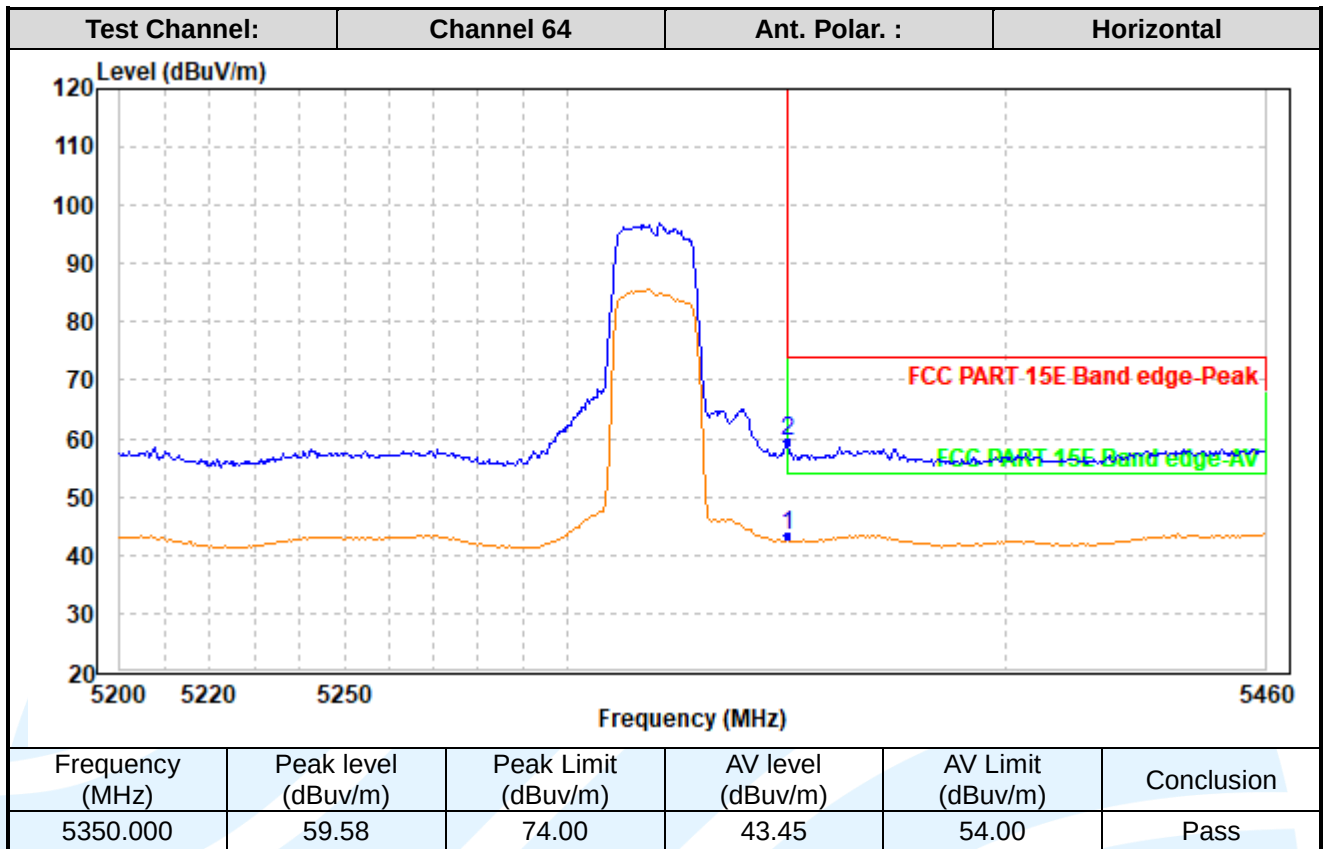
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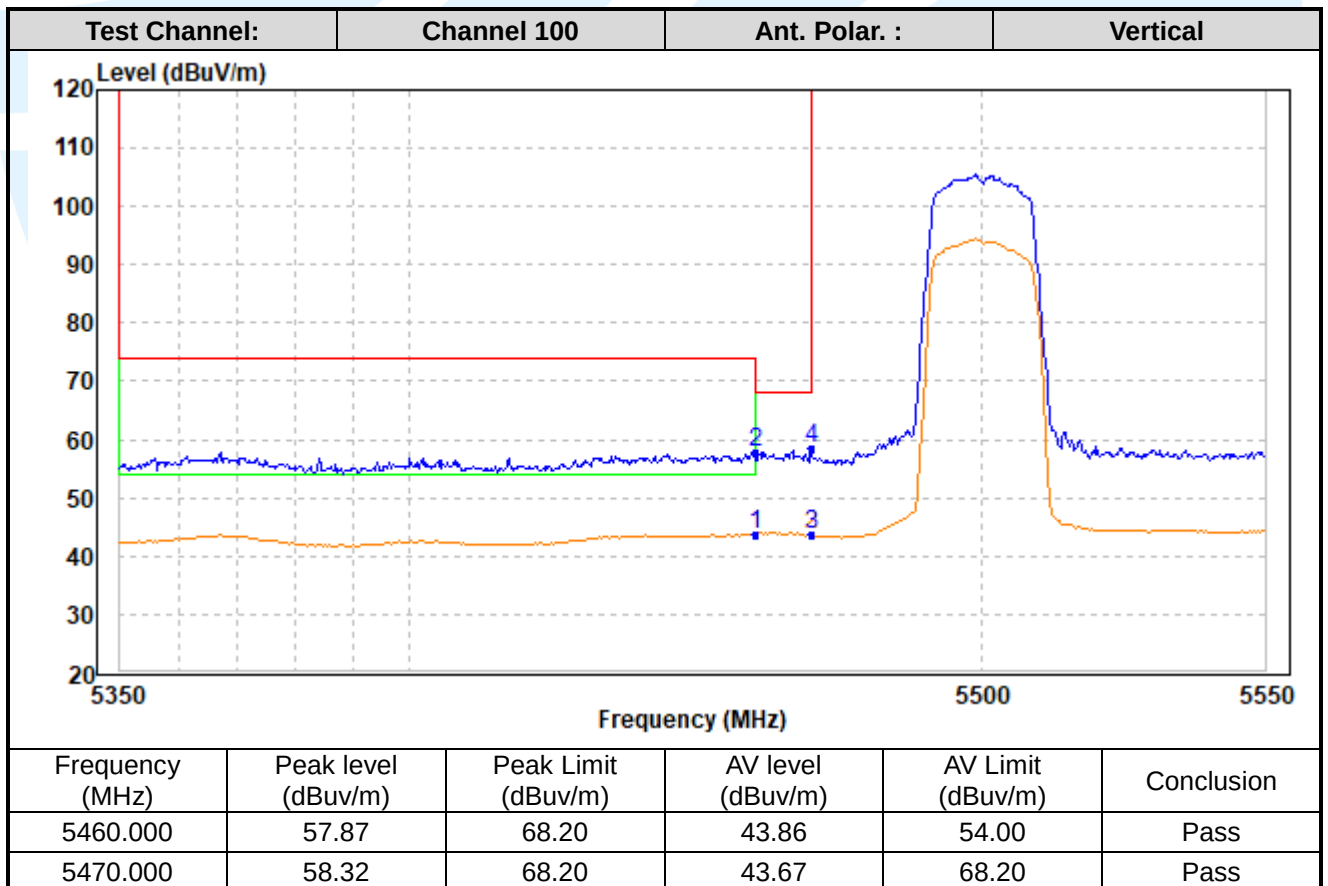
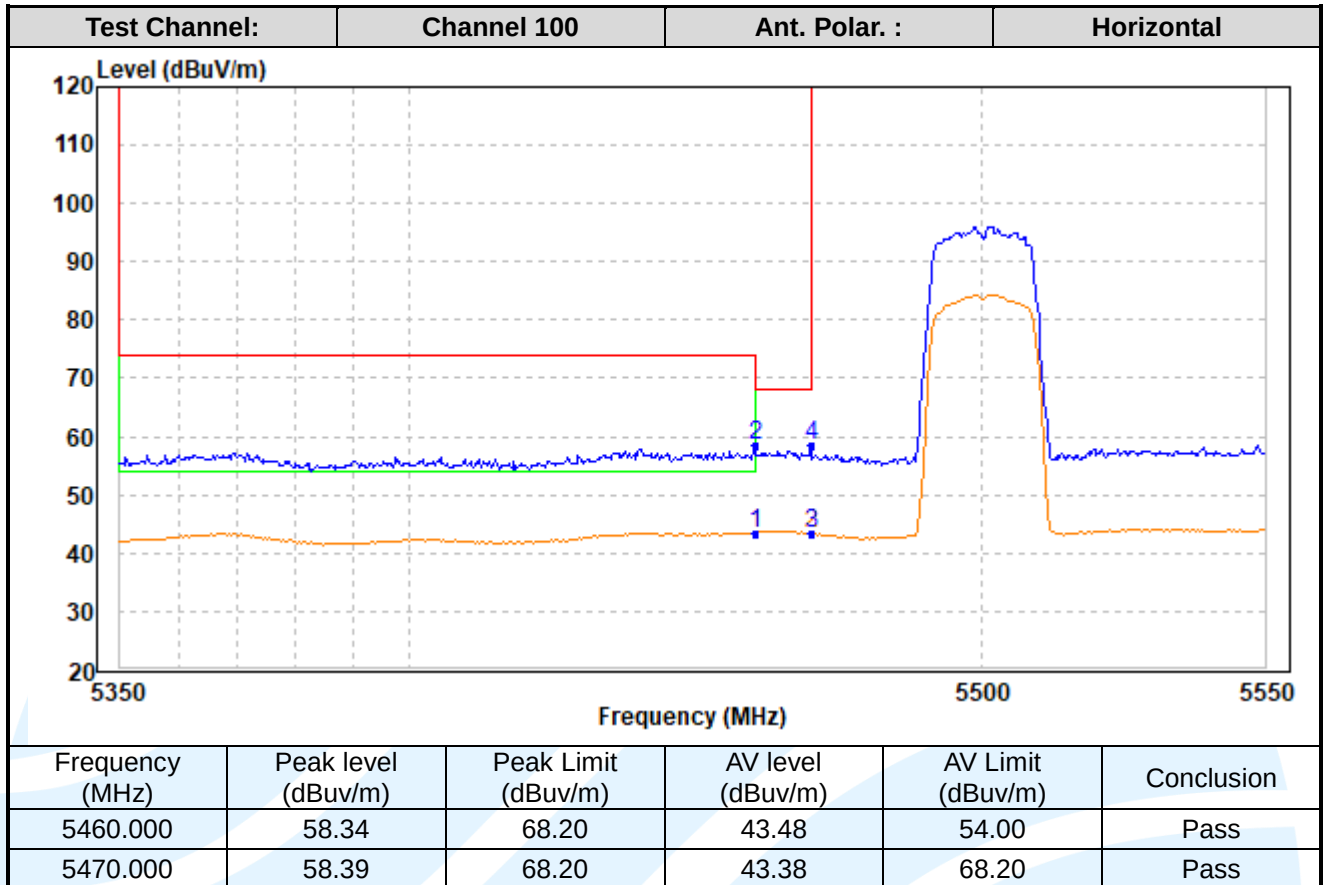
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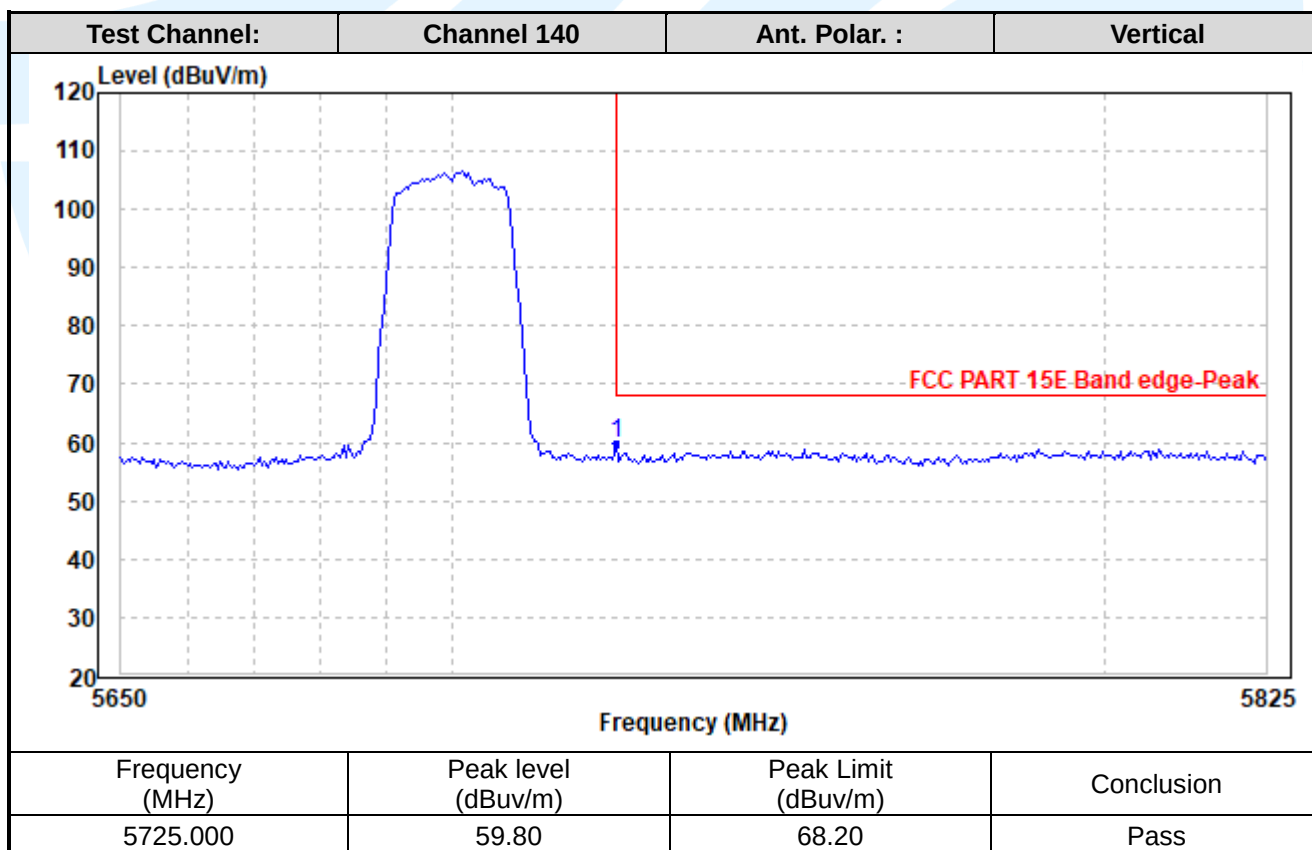
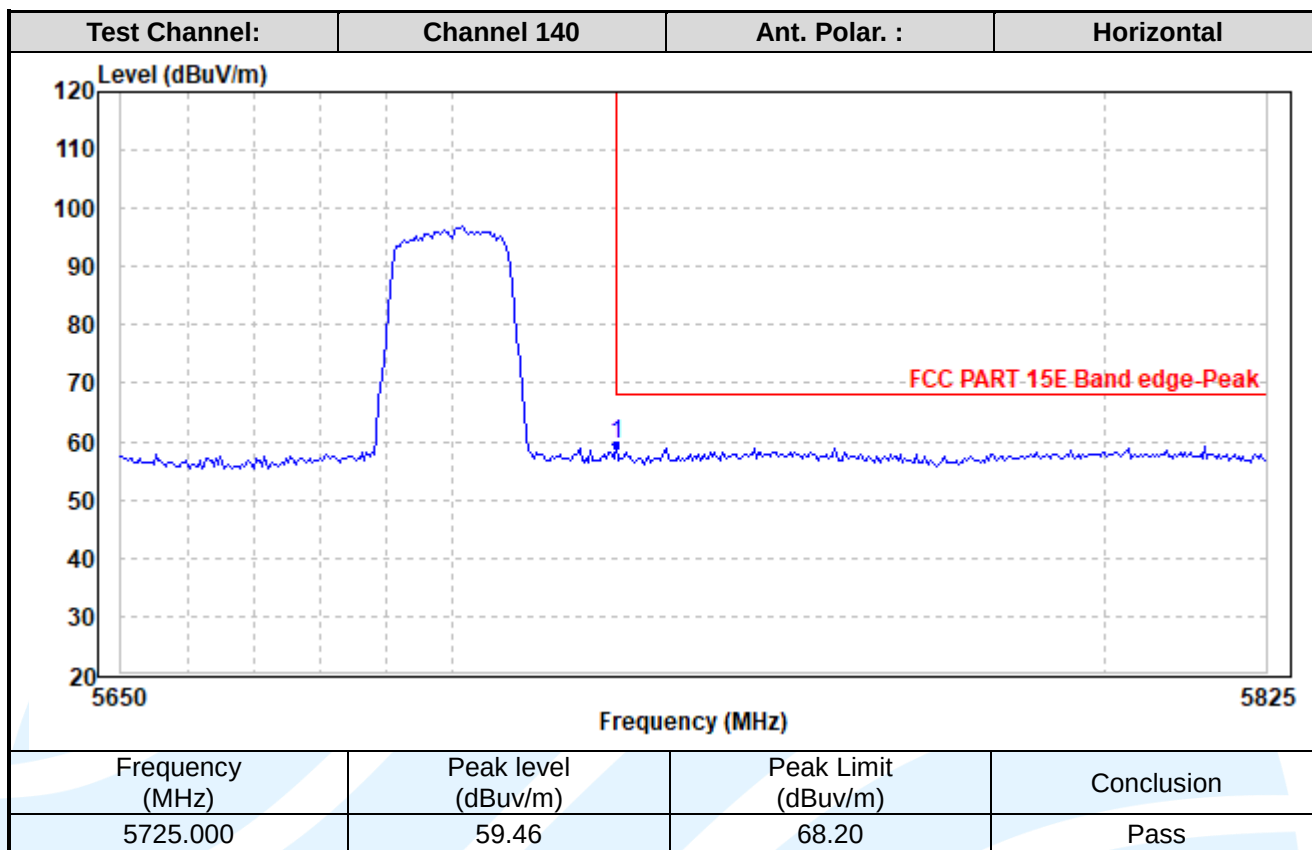
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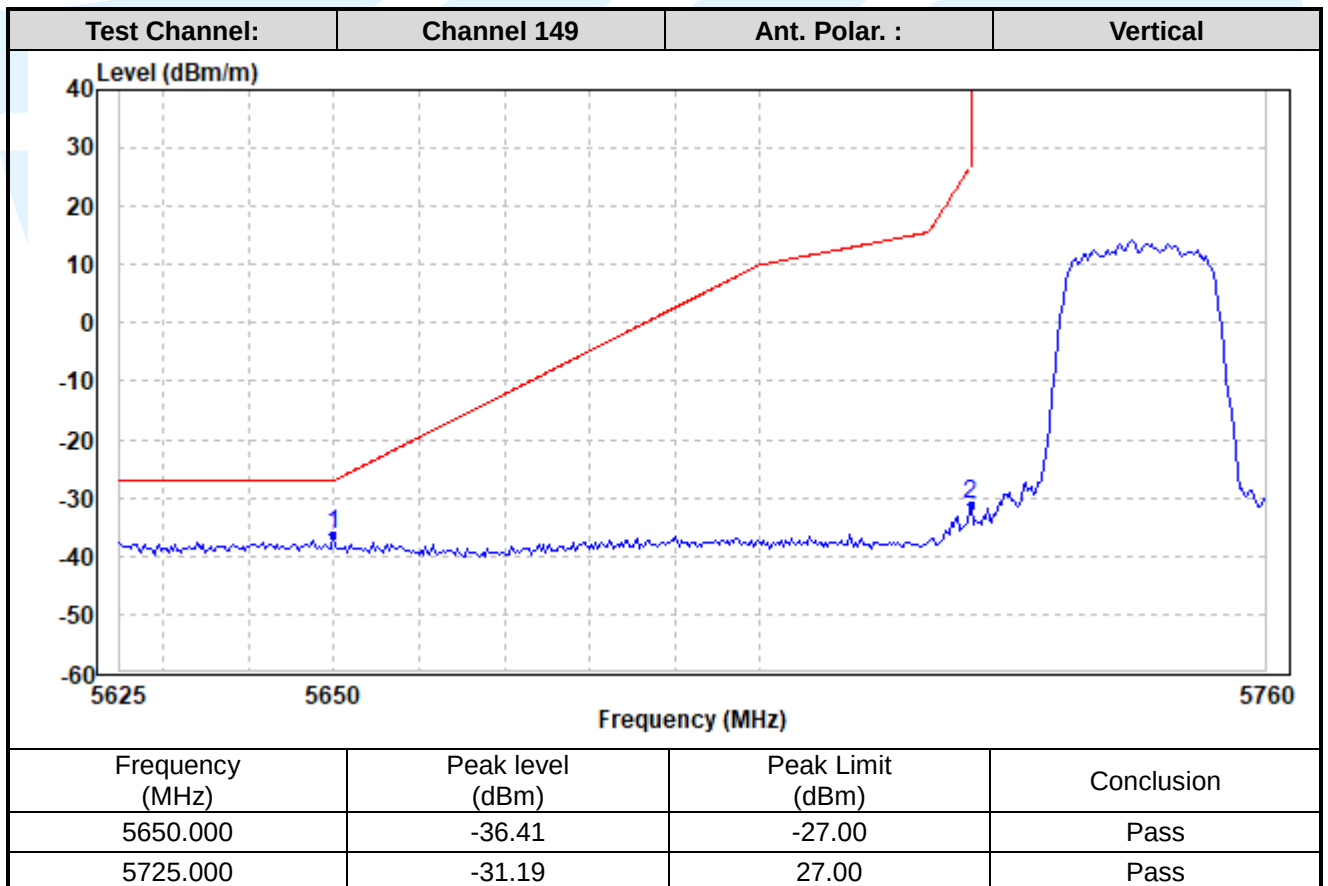
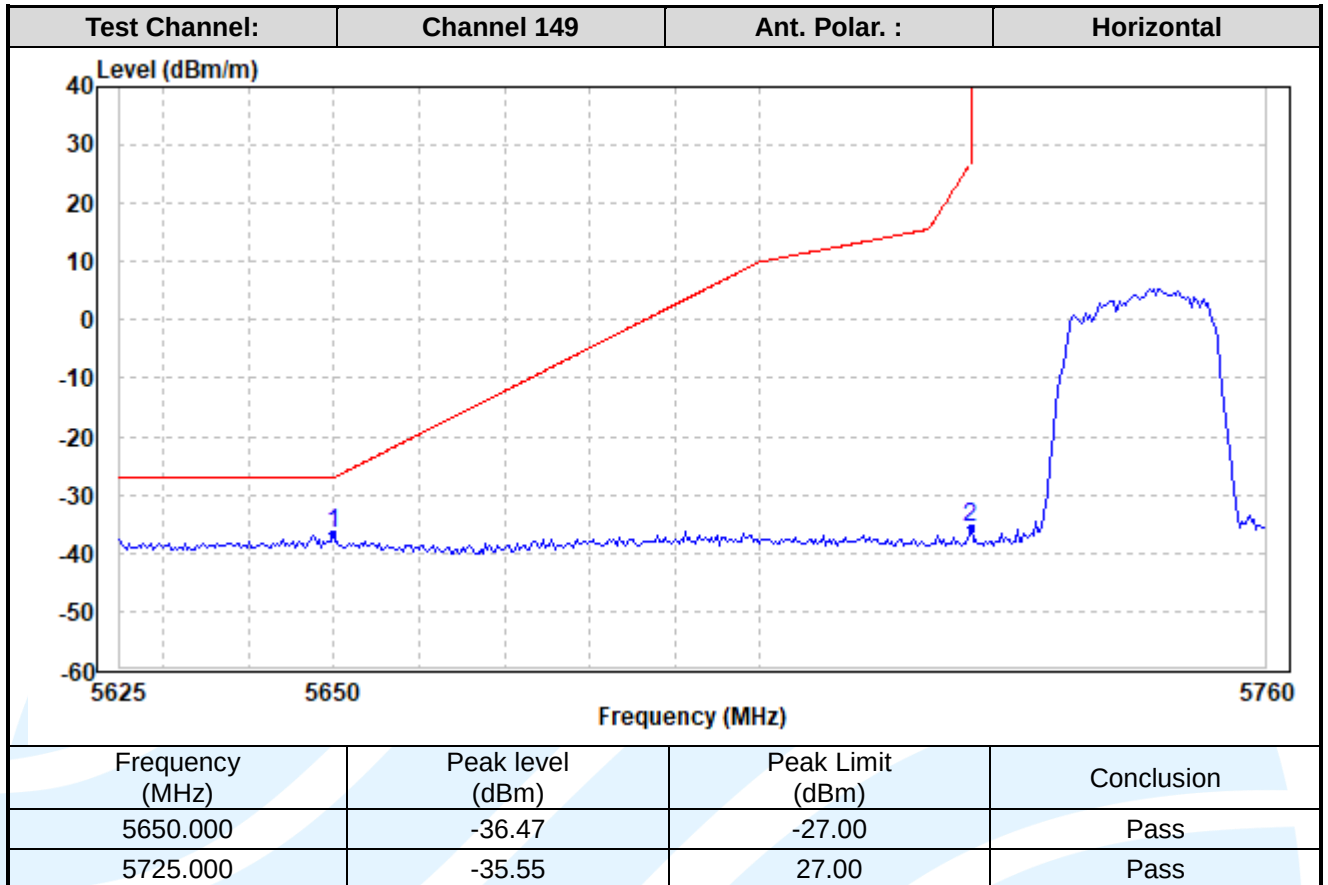
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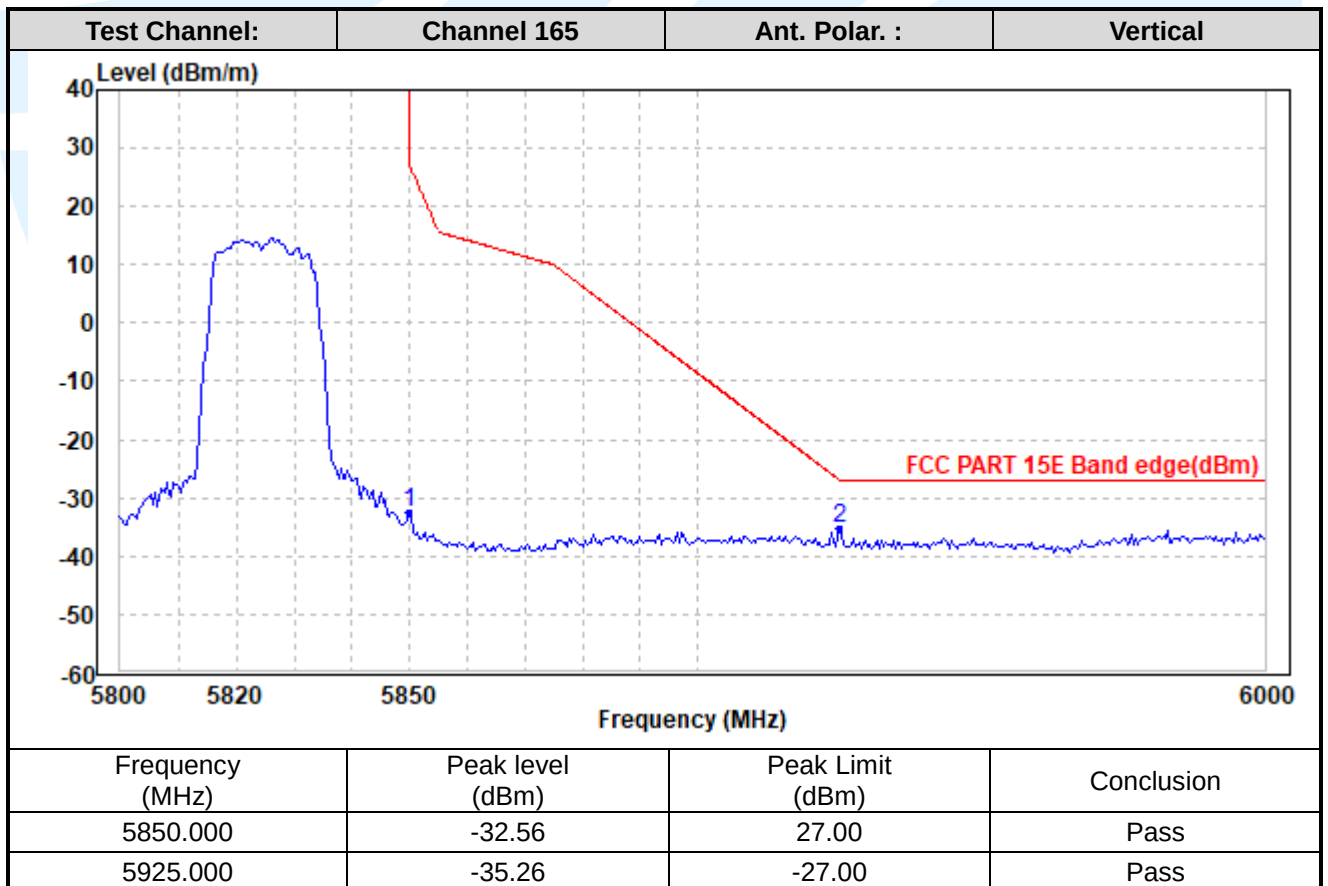
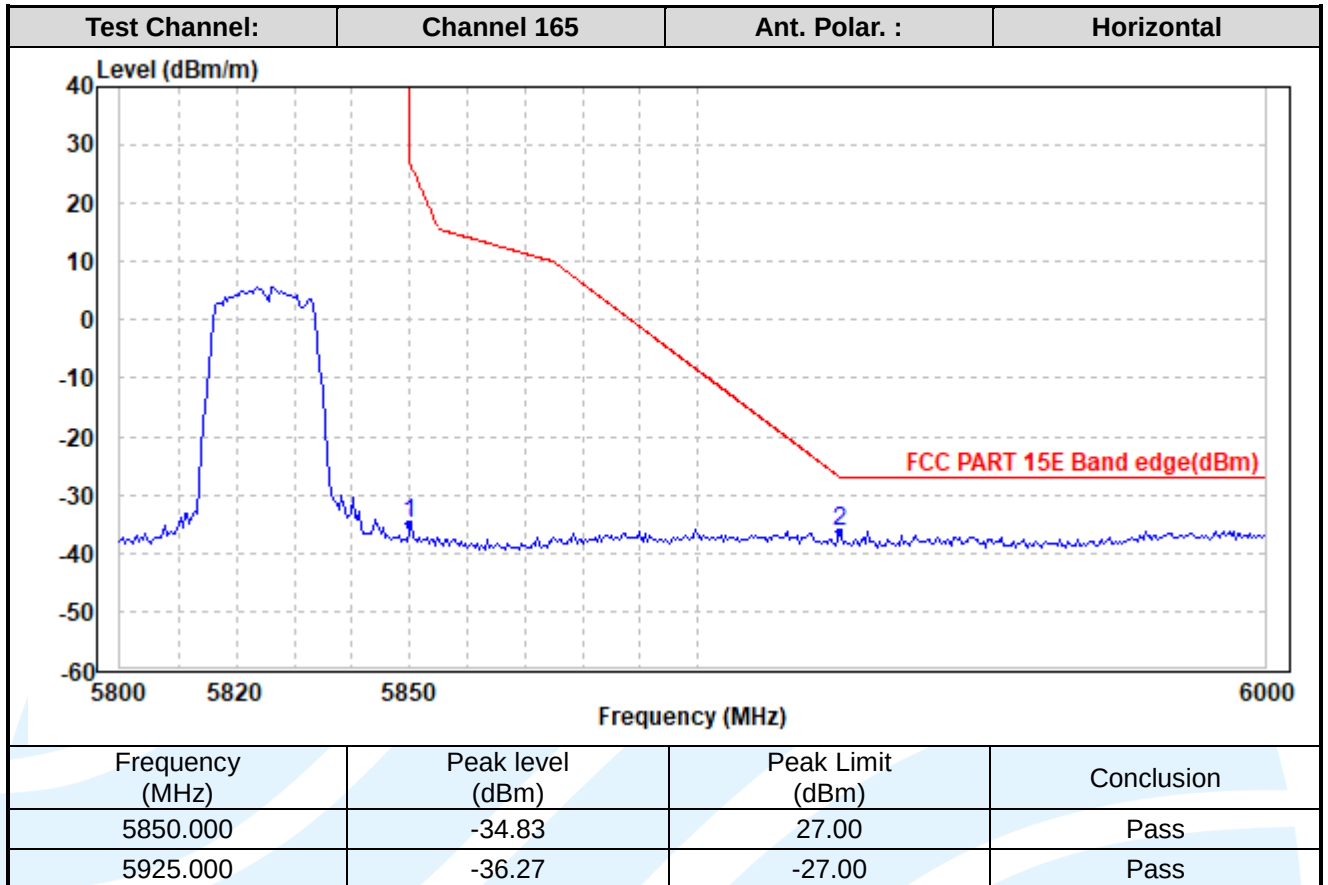
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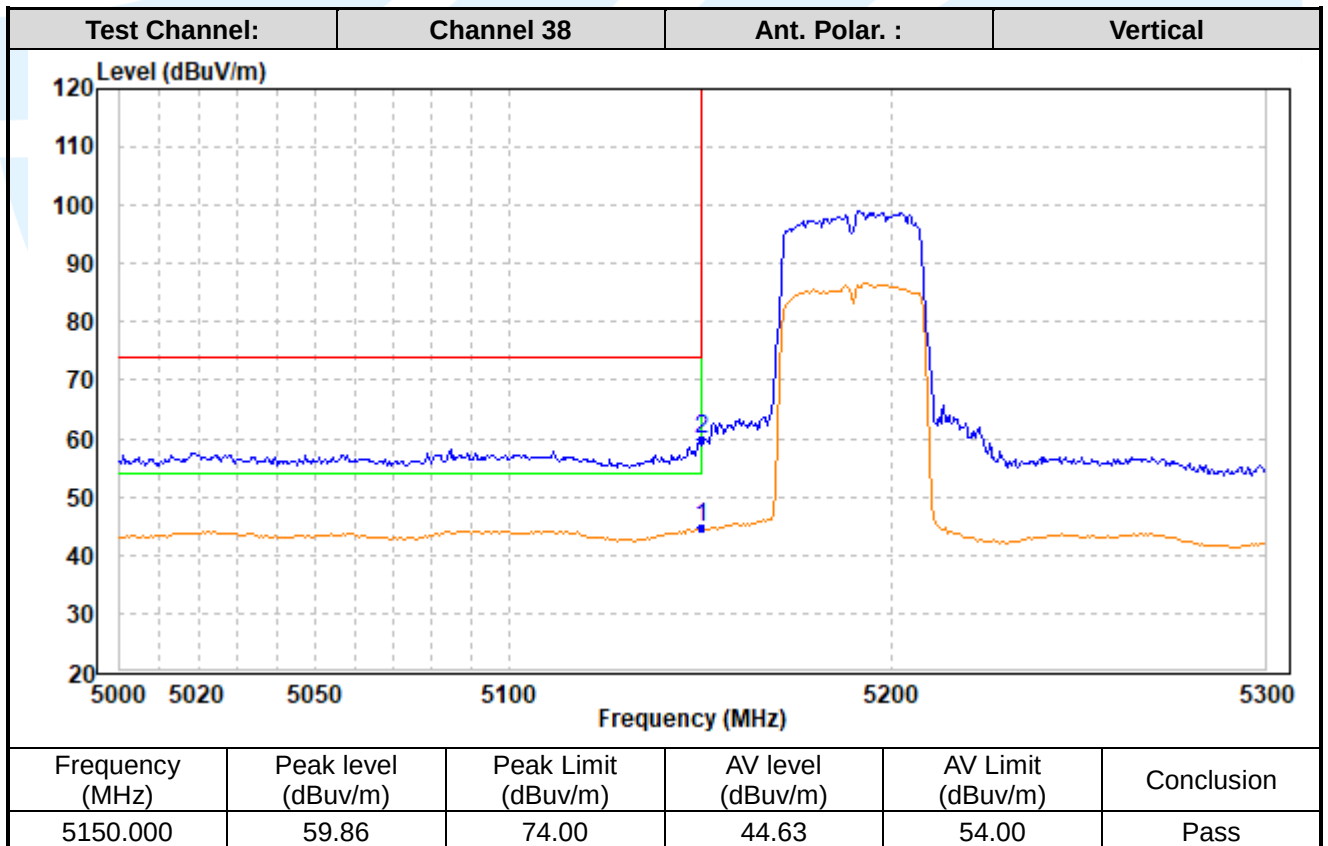
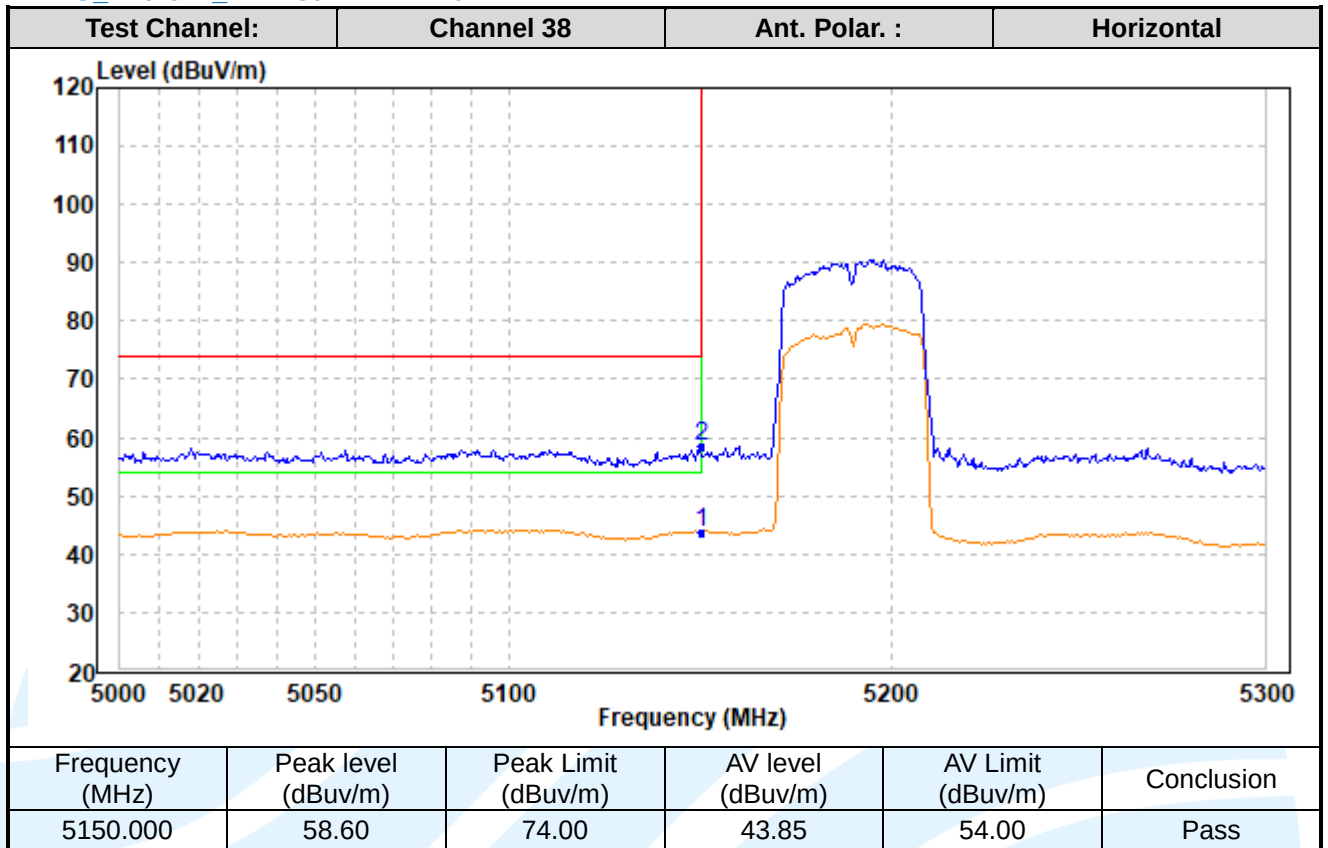
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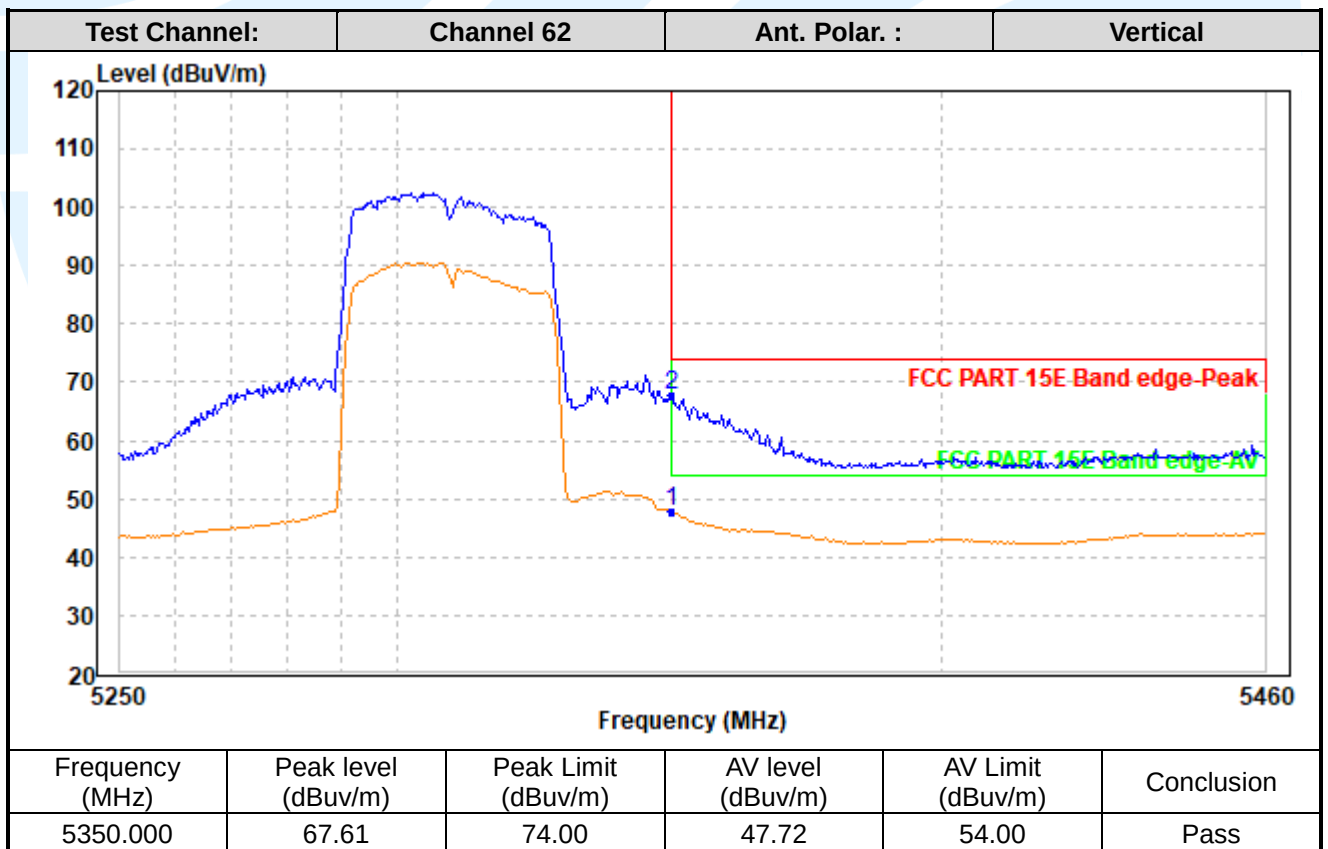
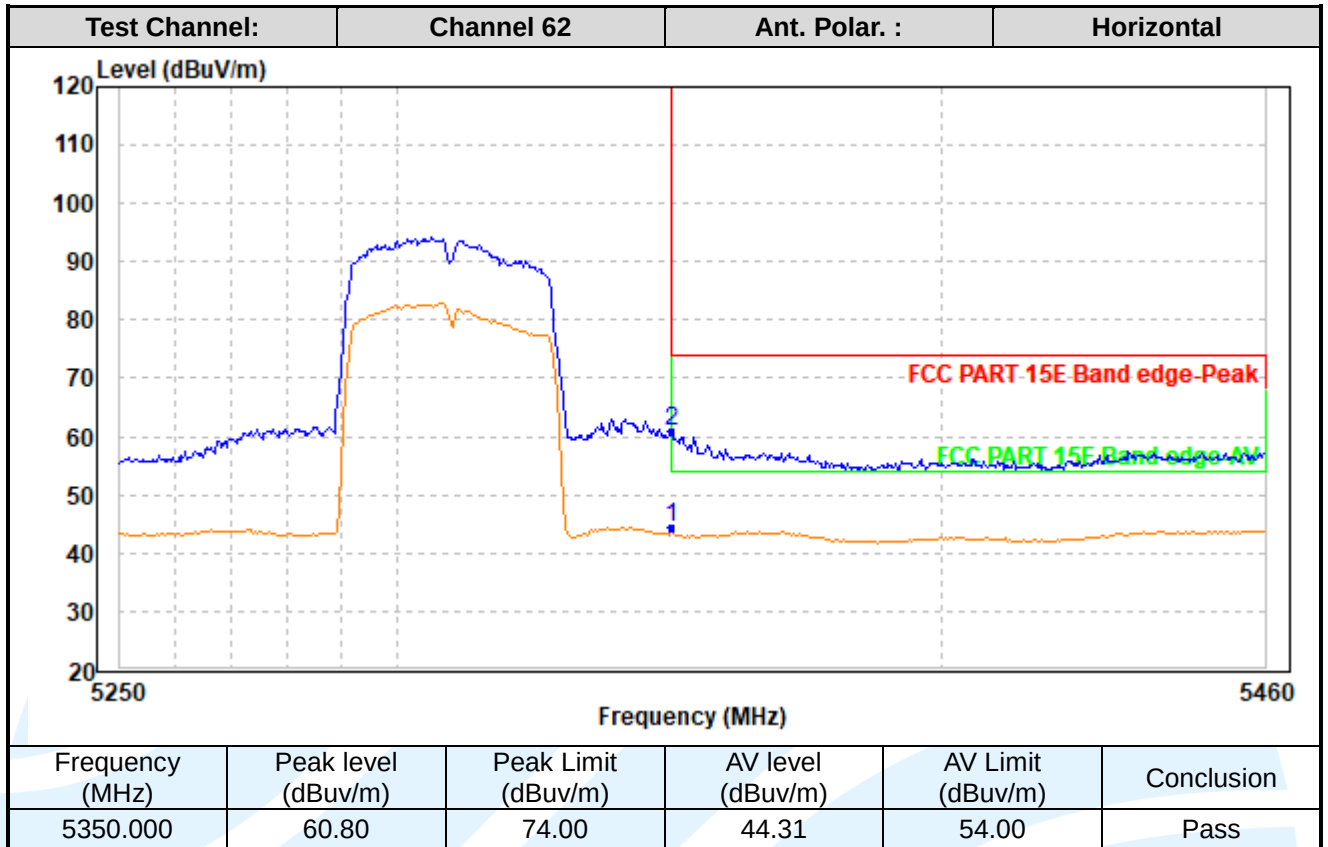
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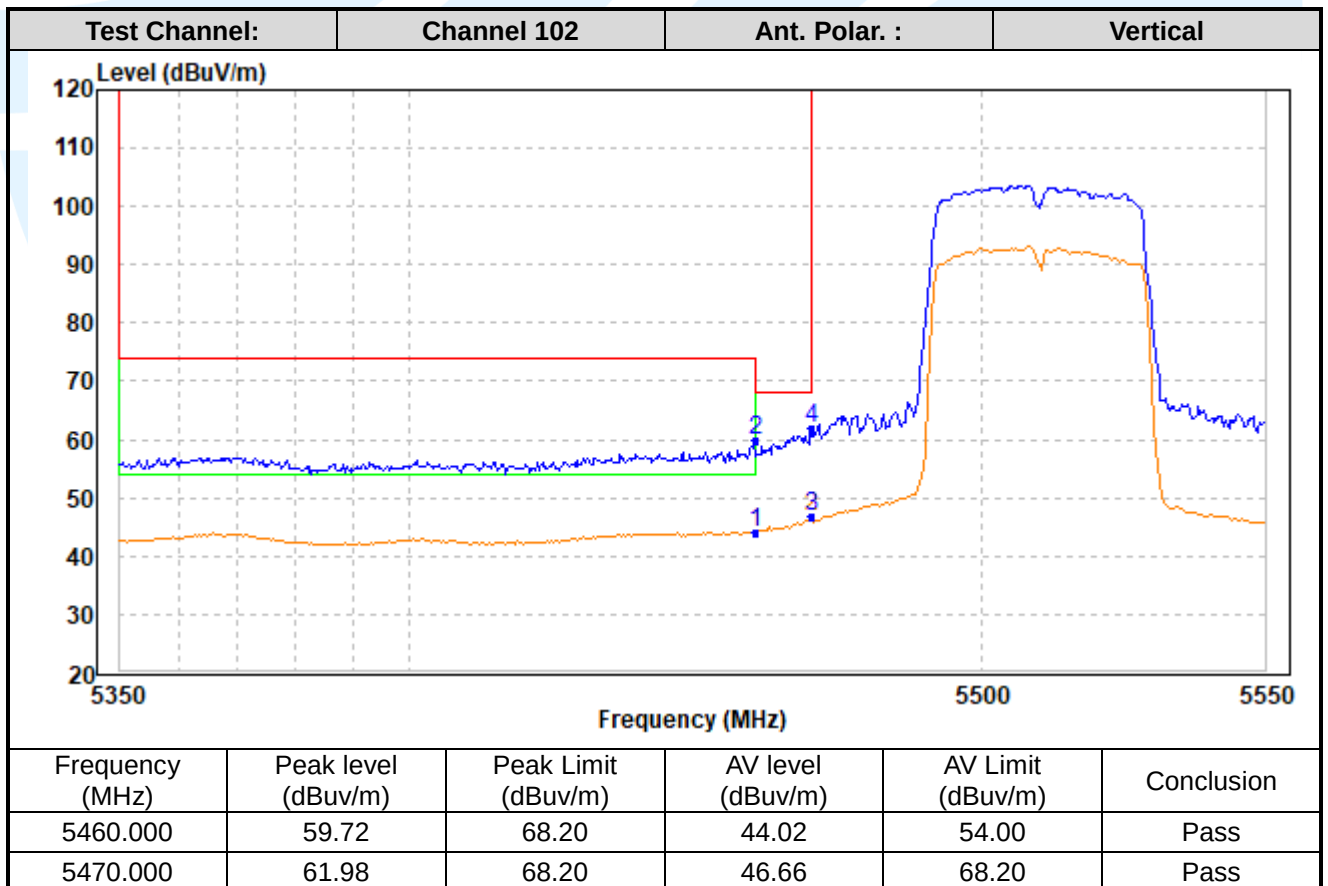
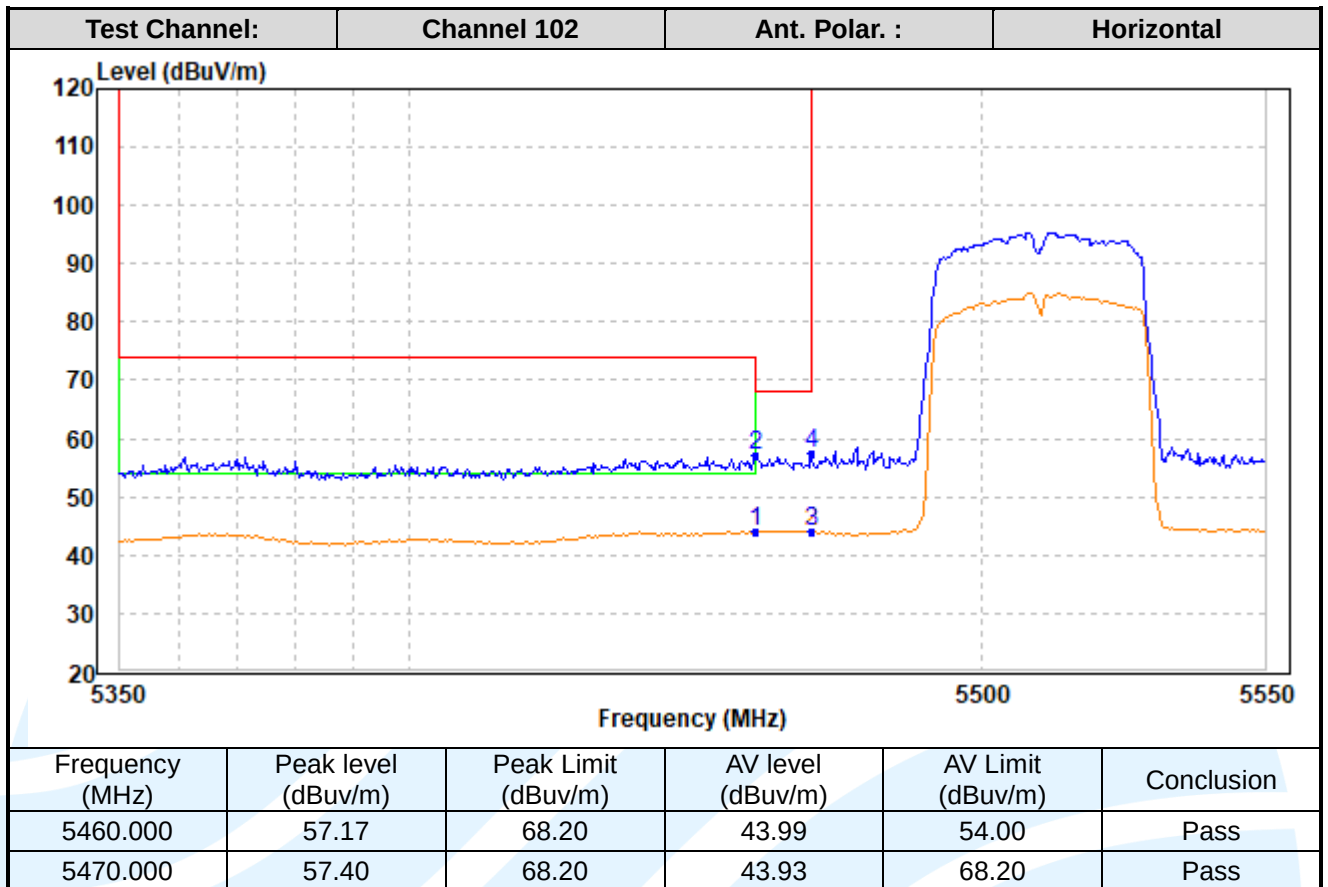
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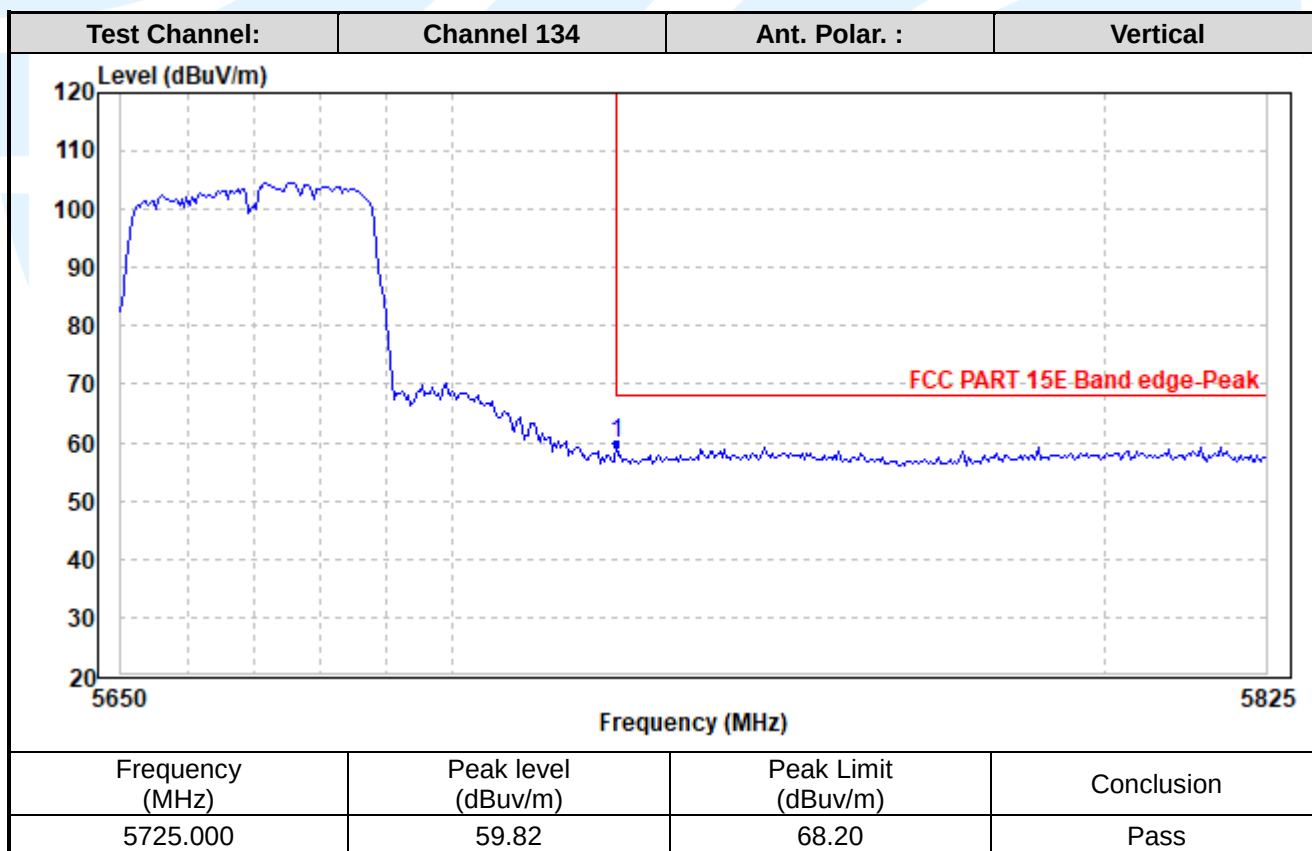
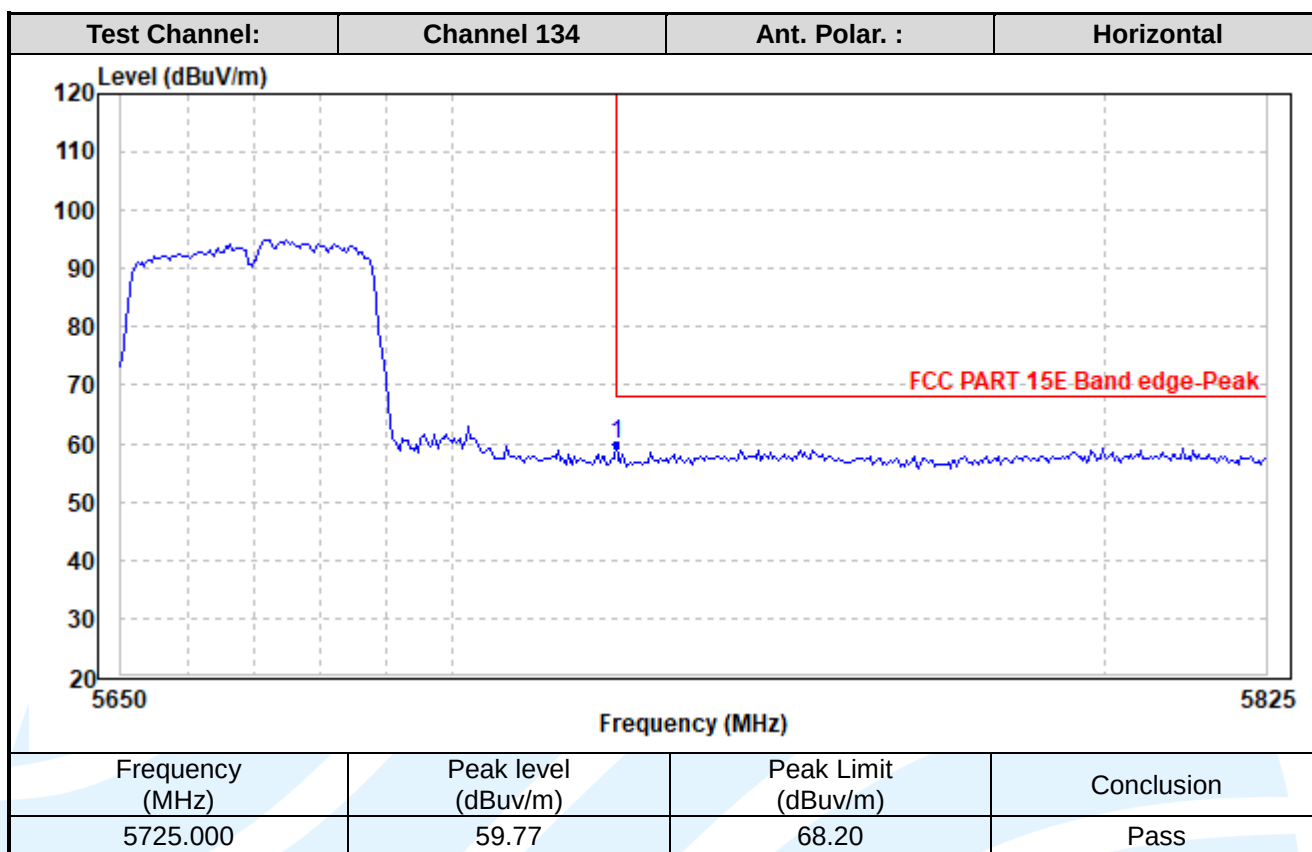
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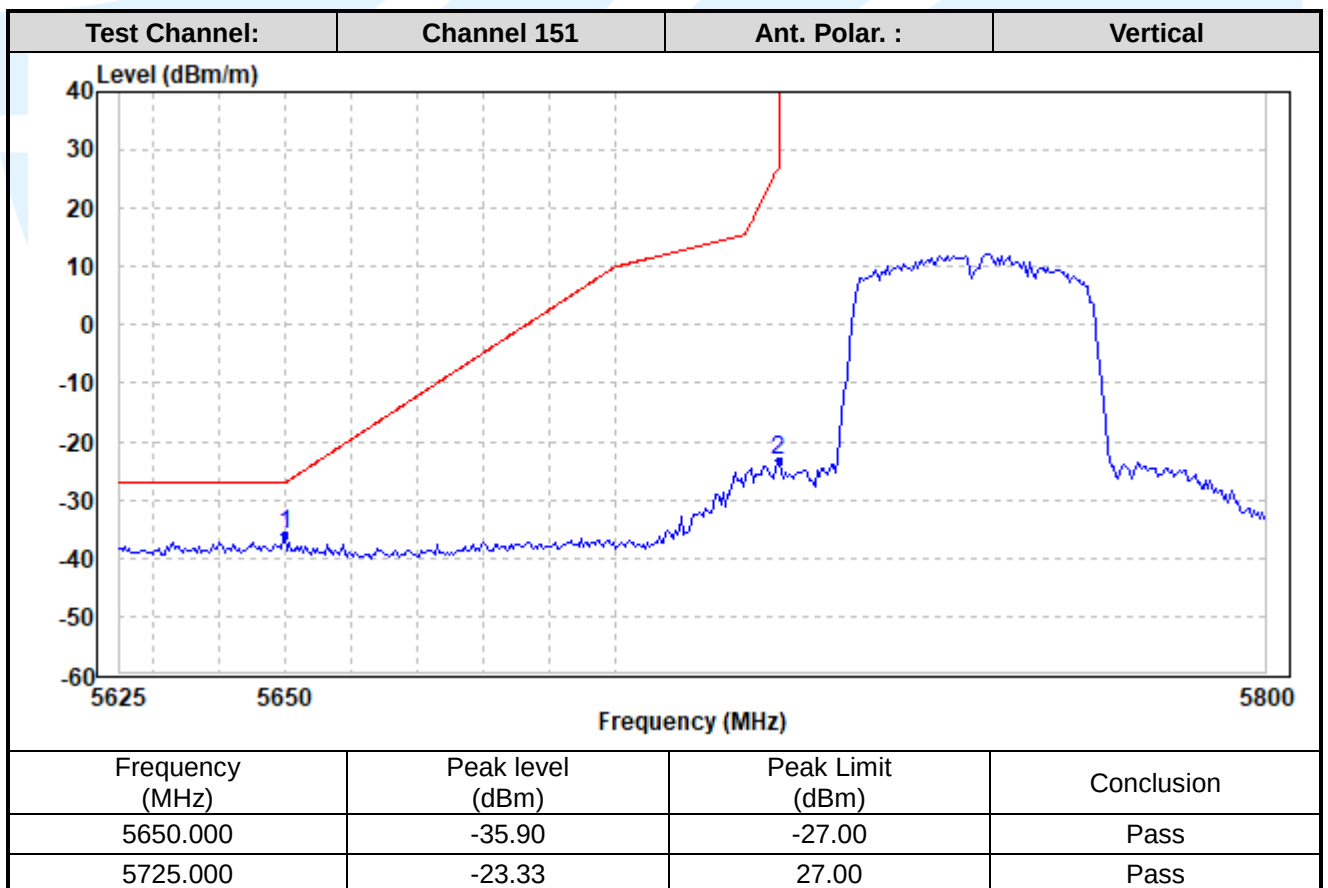
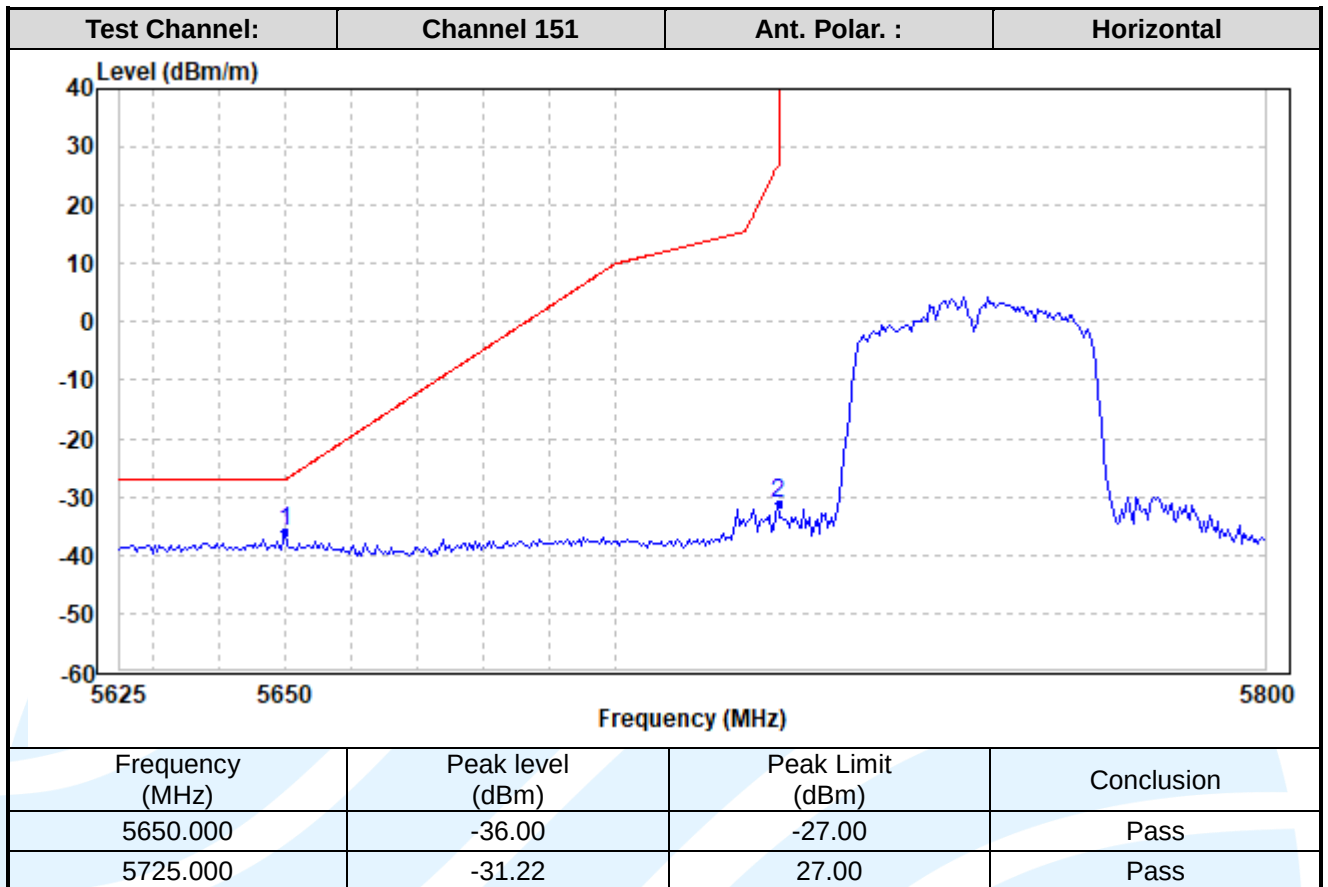
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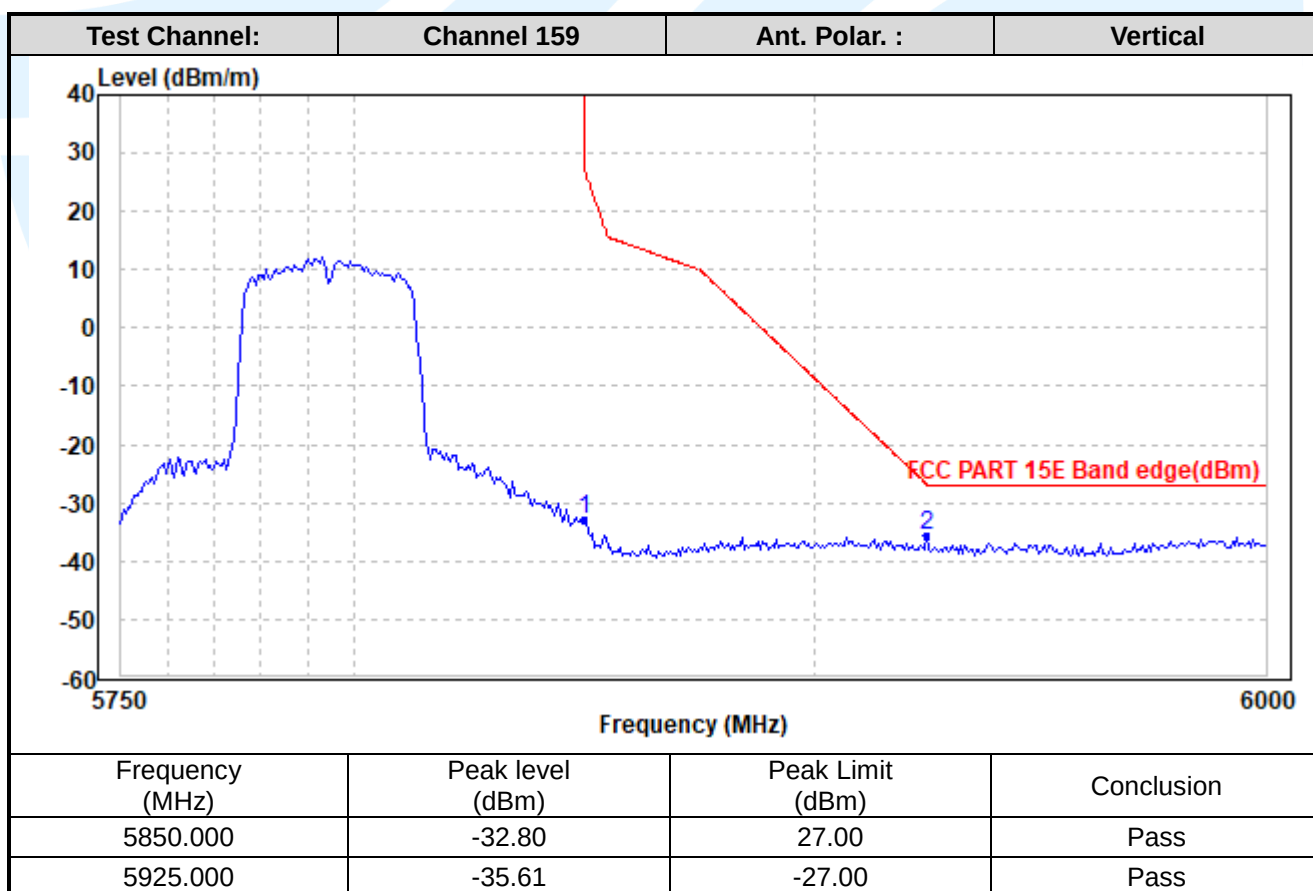
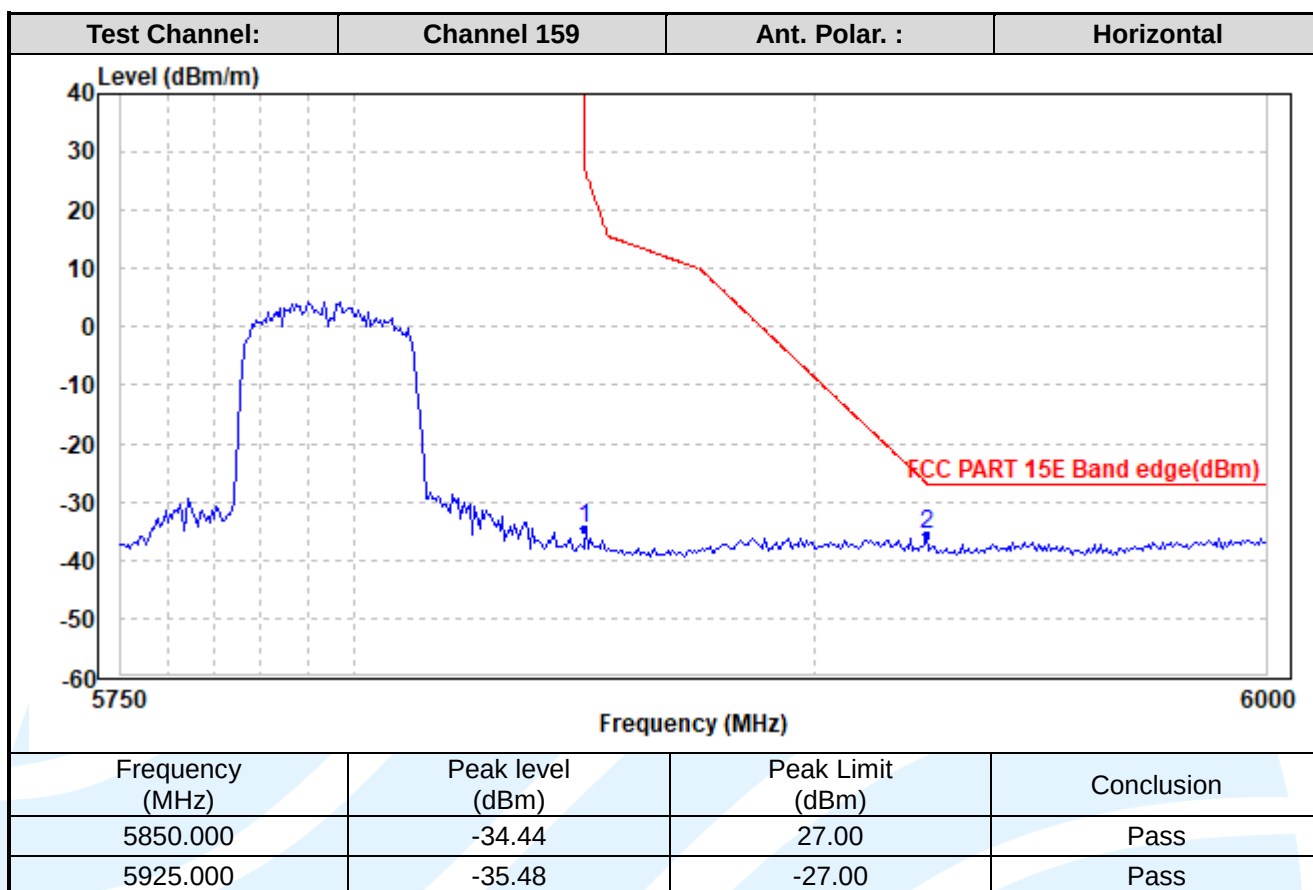
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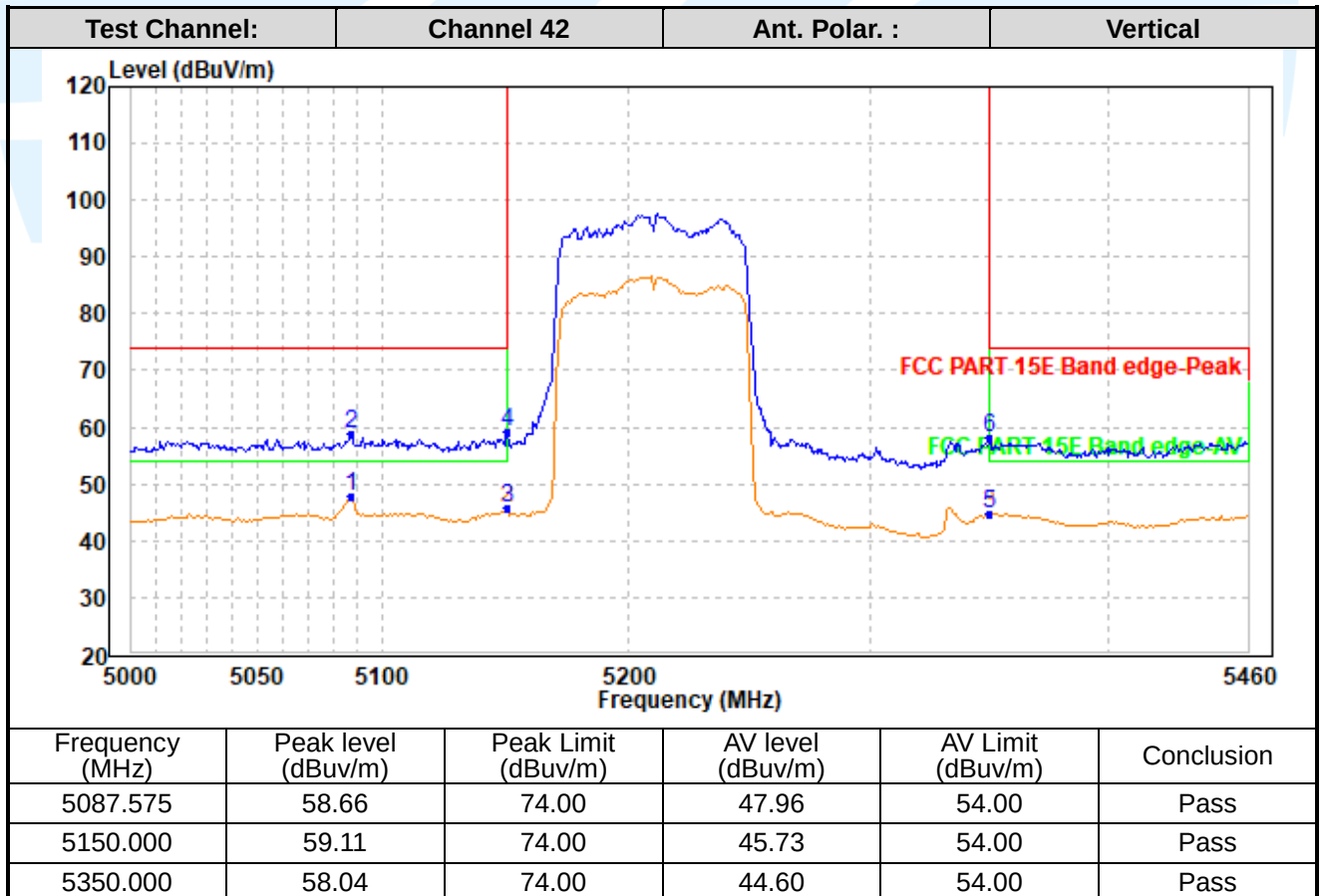
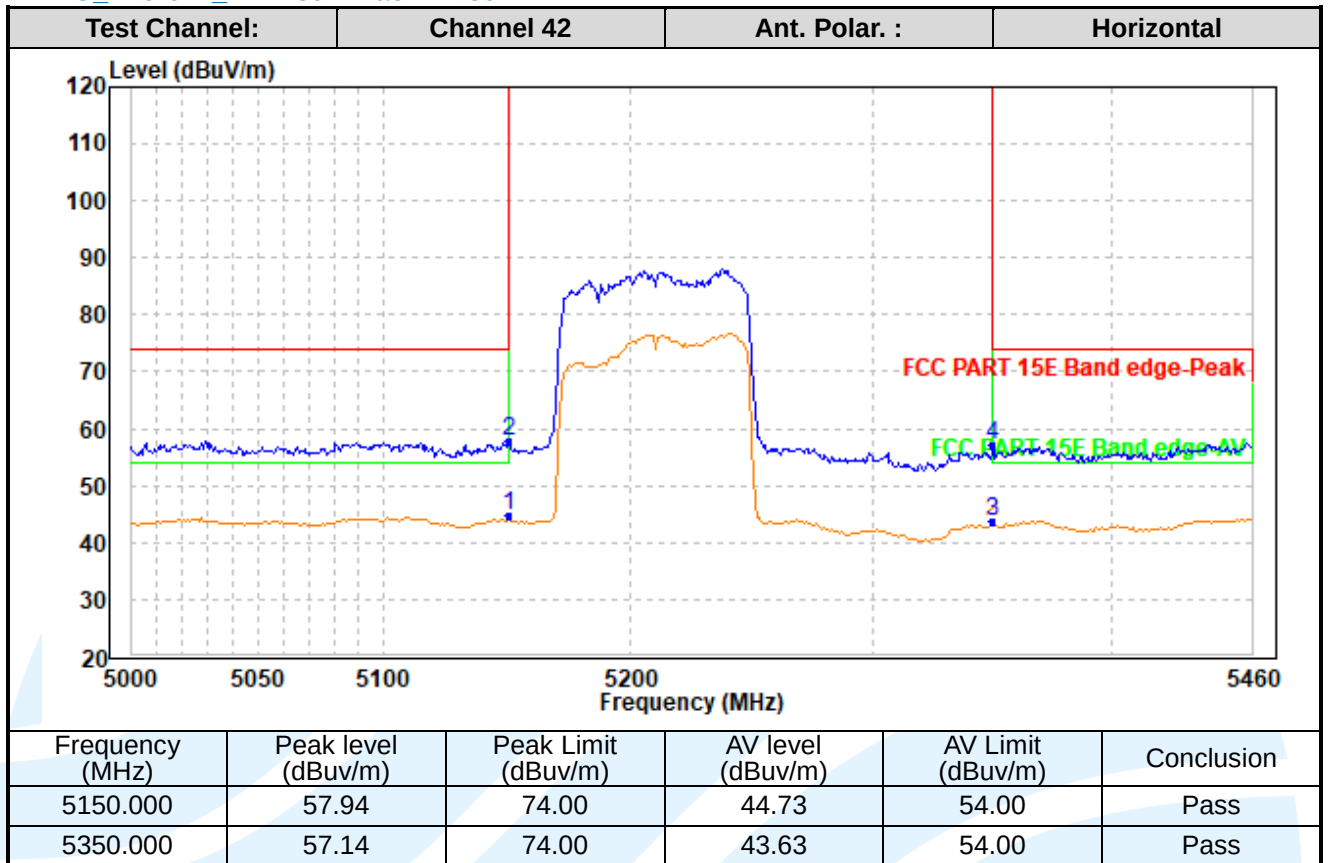
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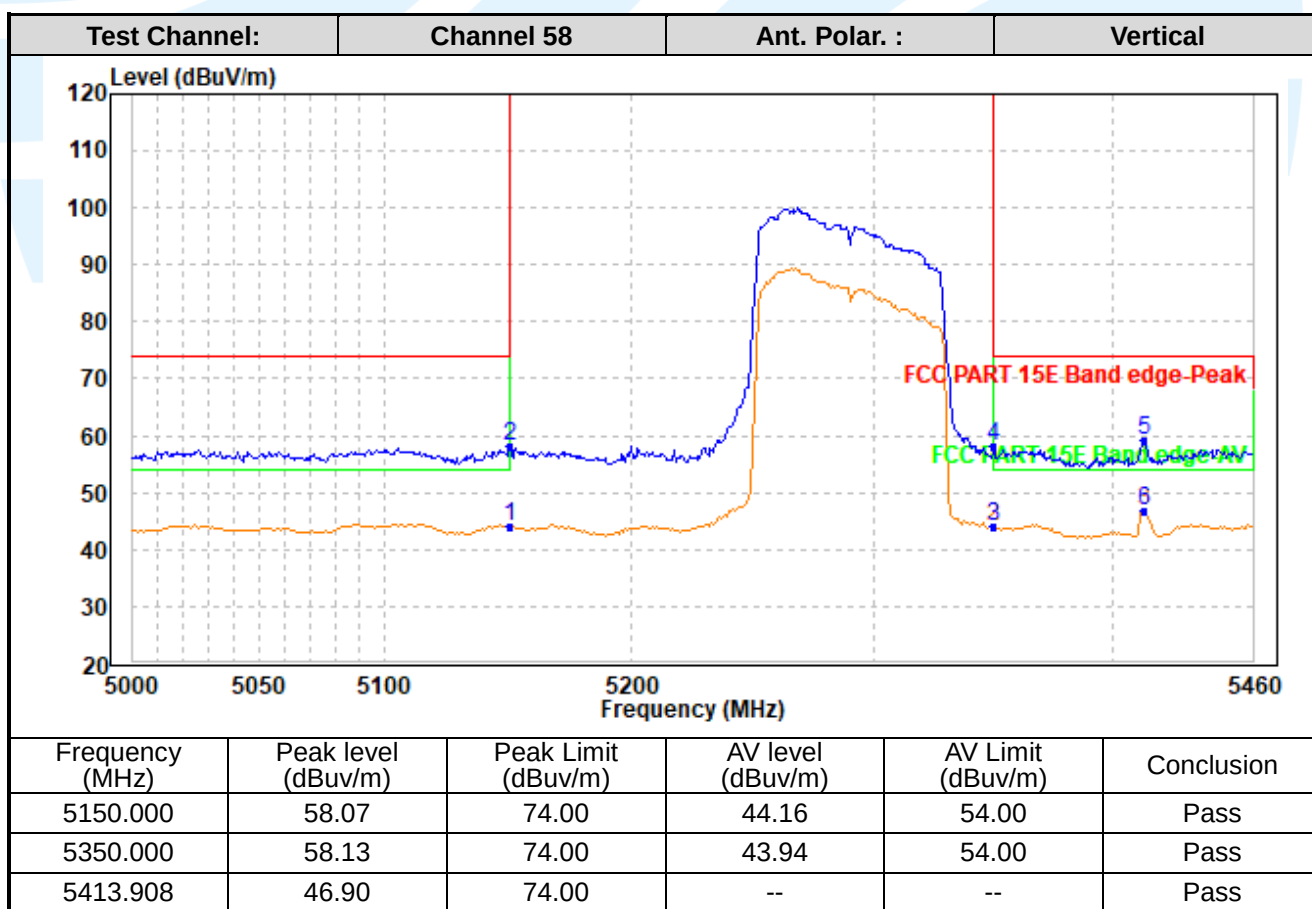
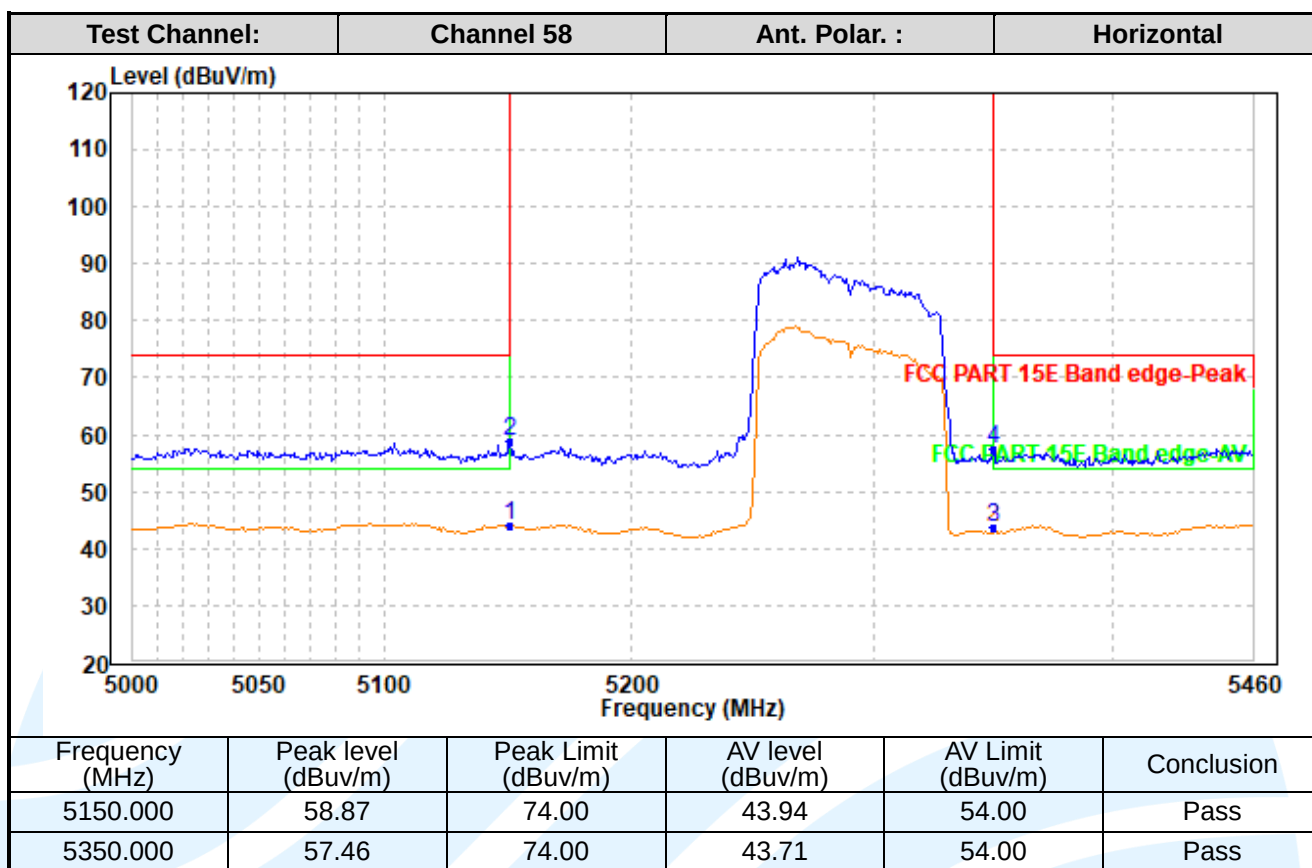
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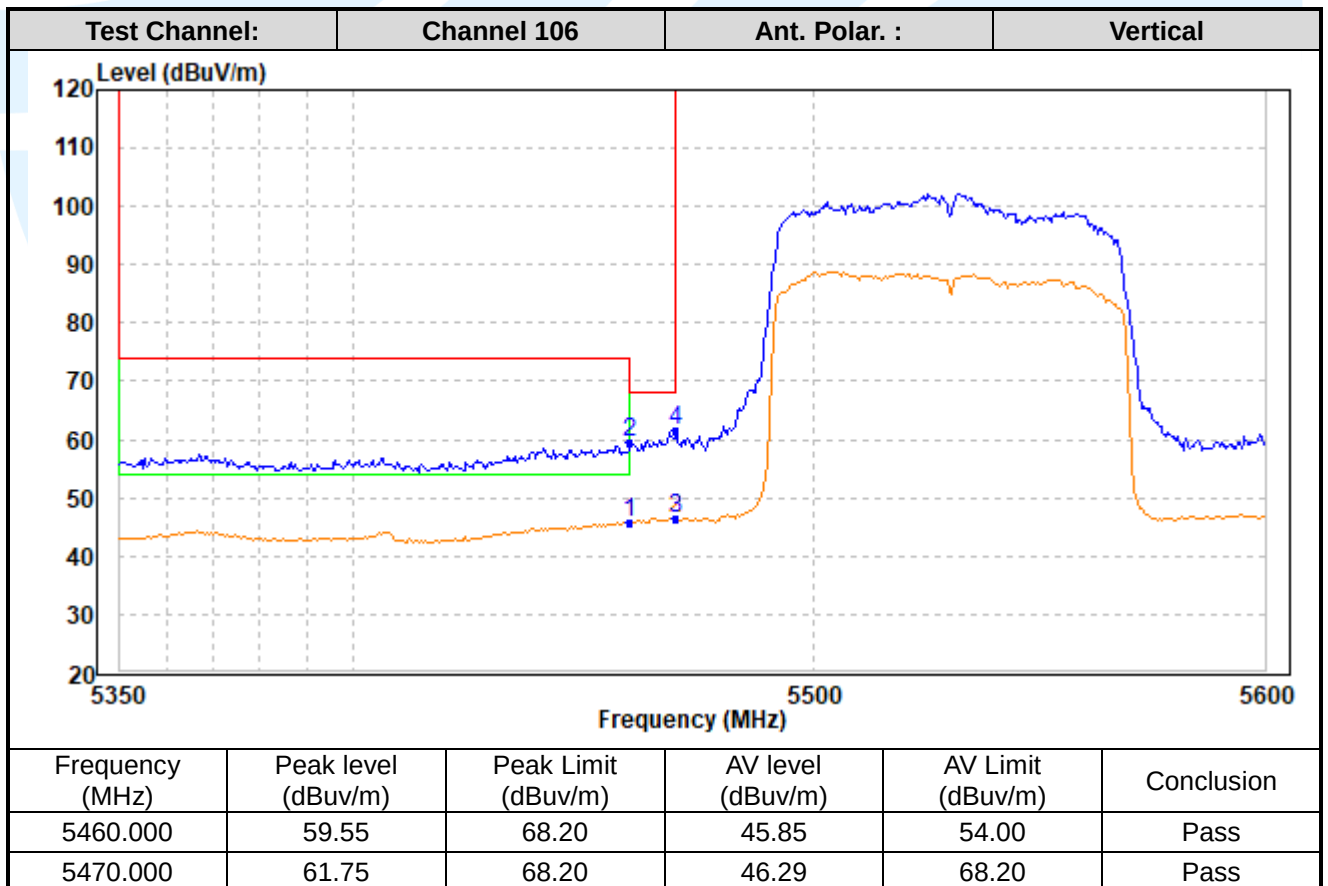
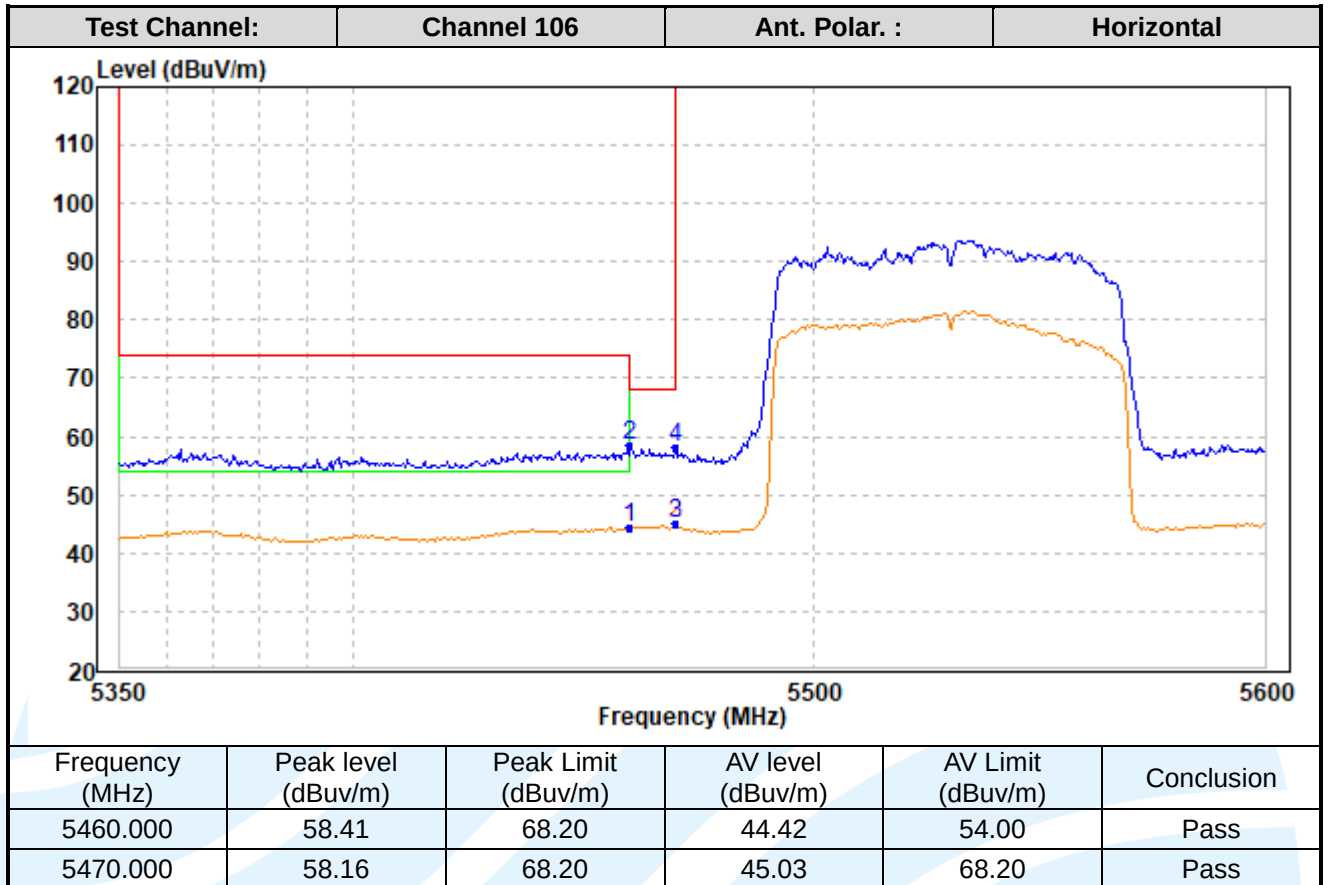
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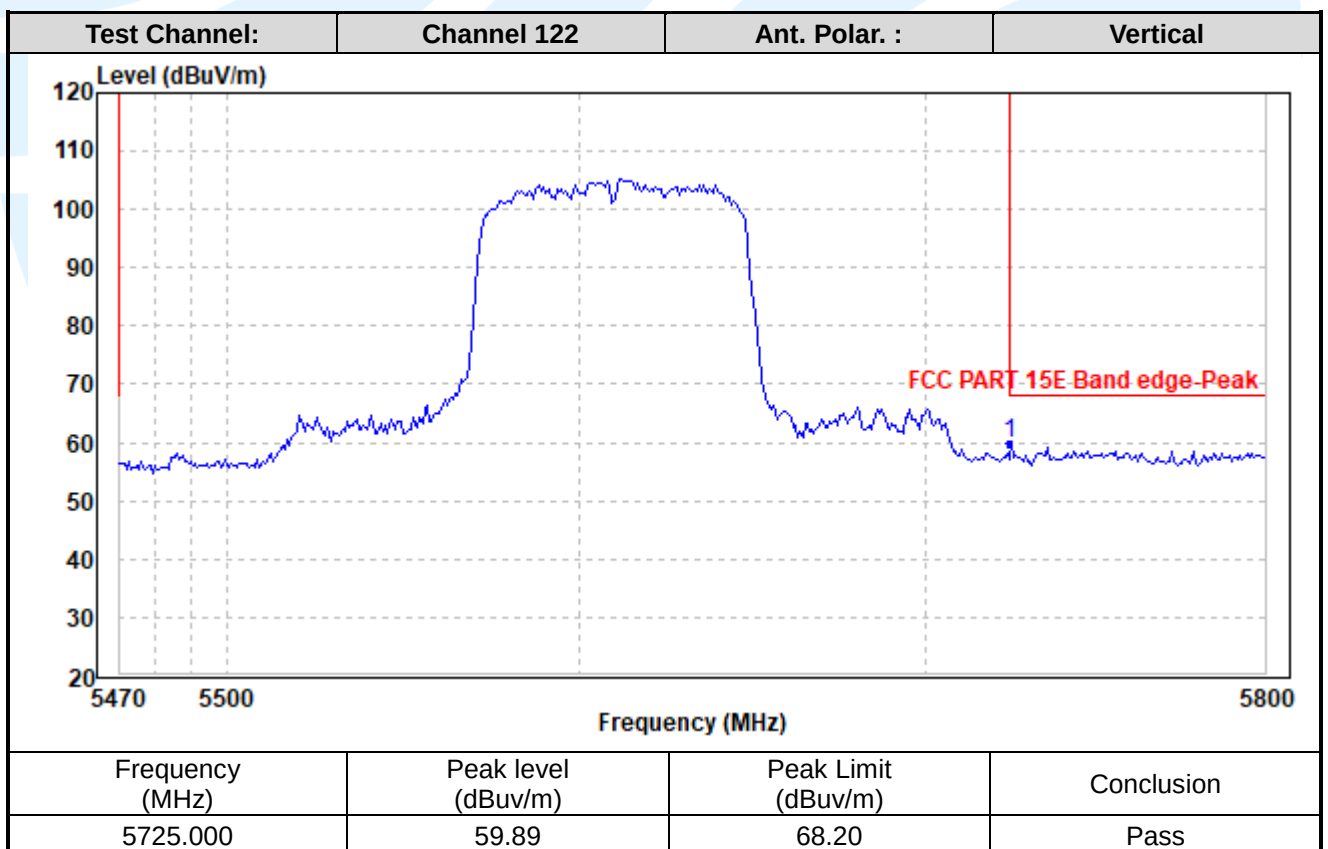
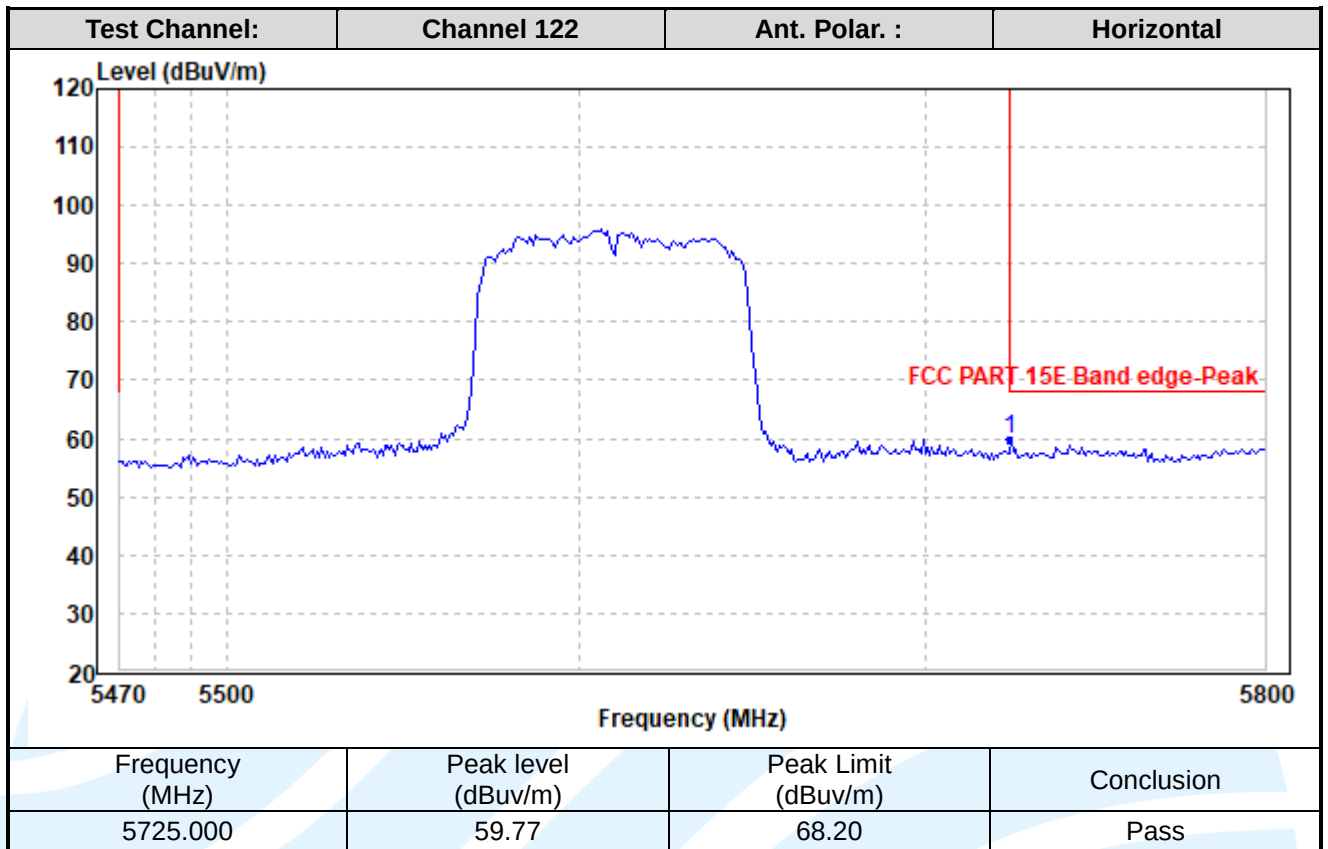
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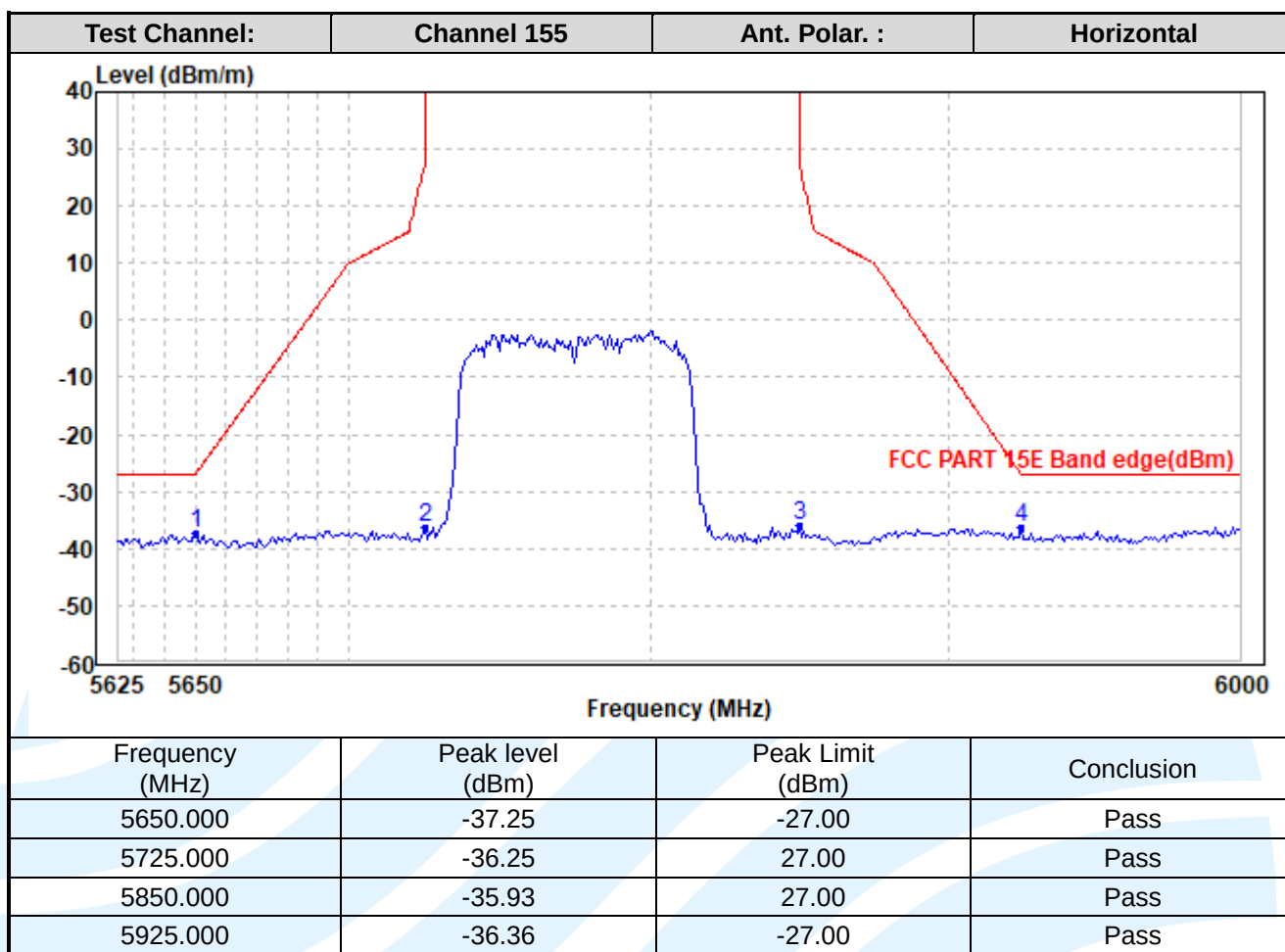
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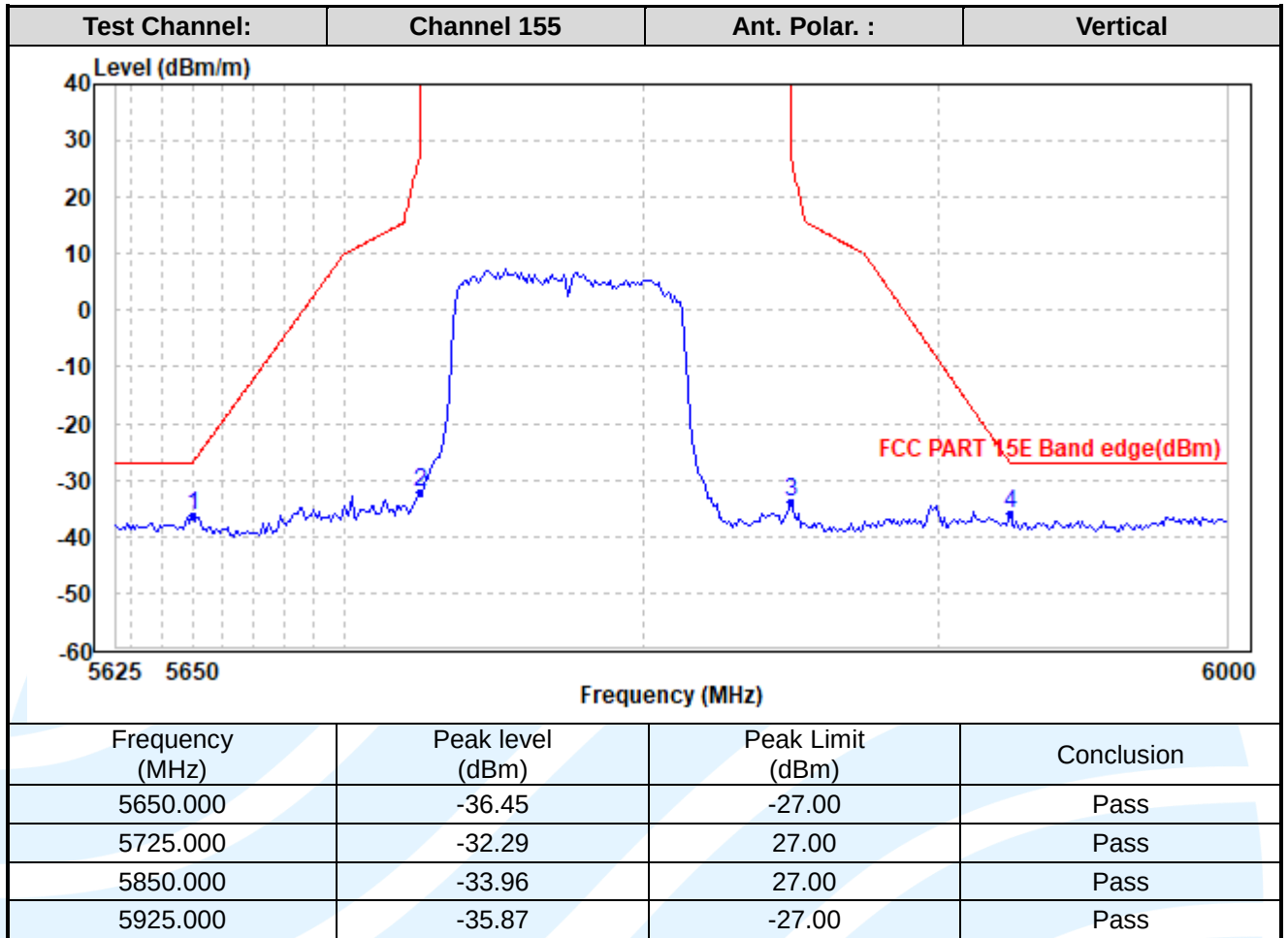
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APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***

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