

Zhong Shan City Richsound Electronic Industrial Ltd

TEST REPORT

SCOPE OF WORK

FCC TESTING– 36025341

REPORT NUMBER

260723074SZN-004

ISSUE DATE

03 September 2026

[REVISED DATE]

[-----]

PAGES

63

DOCUMENT CONTROL NUMBER

FCC ID 247_b

© 2017 INTERTEK



RF Test Report

Applicant: Zhong Shan City Richsound Electronic Industrial Ltd

Address of Applicant: No.16, East ShaGang Road, GangKou Town ZhongShan City,
GuangDong, 528447, China

Equipment Under Test (EUT)

Product Name: Smart Speaker

Model No.: 36025341

Trademark: onn

FCC ID: Z8M-ONNSS

Applicable Standards: FCC CFR Title 47 Part 15E (§15.407)

Date of Test: Jul. 23, 2026 to Aug. 31, 2026

Test Result: PASS

Prepared and Checked by:



Mandy Chen
Engineer

Approved by:



Peter Kang
Senior Technical Supervisor
Date: 03 September 2026

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

Intertek Testing Service Shenzhen Ltd. Longhua Branch

101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen.

Tel: (86 755) 8601 6288 Fax: (86 755) 8601 6751

1 Revision History

Report No.	Version No.	Description	Issued Date
260723074SZN-004	01	Original	03 September 2026

2 Content

1	Revision History	2
2	Content.....	3
3	Summary of Test Result	4
4	General Information	5
5	Test Specifications	7
6	Antenna Requirement	13
7	Duty Cycle.....	14
8	26 dB Bandwidth & 99% Occupied Bandwidth.....	15
9	Minimum 6dB bandwidth	16
10	Maximum Conducted Output Power	17
11	Power spectrum density	19
12	Frequency Stability	20
14	Radiated Emission	21
15	AC Power line Conducted Emission.....	53
16	Dynamic Frequency Selection (DFS)	56

3 Summary of Test Result

TEST ITEM	FCC REFERENCE	RESULT
Antenna requirement	15.203	Pass
Duty Cycle	-	Pass
26 dB Bandwidth & 99% Occupied Bandwidth	15.407(a), 2.1049	Pass
Minimum 6dB Bandwidth	15.407(e)	Pass
Maximum Conducted Output Power	15.407(a)	Pass
Power spectral density	15.407(a)	Pass
Frequency Stability	15.407(g)	Pass
Radiated Emission and Band Edge	15.407(b), 15.205, 15.209	Pass
AC Power line conducted emission	15.207	Pass
Dynamic Frequency Selection	15.407(h)	Pass

4 General Information

4.1 Client Information

Applicant:	Zhong Shan City Richsound Electronic Industrial Ltd
Address:	No.16, East ShaGang Road, GangKou Town ZhongShan City, GuangDong, 528447, China
Manufacturer:	Zhong Shan City Richsound Electronic Industrial Ltd
Address:	No.16, East ShaGang Road, GangKou Town ZhongShan City, GuangDong, 528447, China

4.2 Description of Equipment Under Test (EUT)

Product Name:	Smart Speaker
Model No.:	36025341
Description of EUT:	The EUT contains Wi-Fi 2.4G, Wi-Fi 5G, Bluetooth (dual mode) functions. This report is for Wi-Fi 5G. The worst data is listed in the report.
Radio Technology:	IEEE 802.11a/n HT20/n HT40/ac VHT20/ac VHT40/ac VHT80
Operation Frequency:	U-NII-1: 5150 MHz - 5250 MHz
	U-NII-2A: 5250 MHz - 5350 MHz
	U-NII-2C: 5470 MHz - 5725 MHz
	U-NII-3: 5725 MHz - 5850 MHz
Channel Numbers:	U-NII-1, 2A: 4, U-NII-2C: 12, U-NII-3: 5 (802.11 a/n20/ac-VHT20)
	U-NII-1, 2A, 3: 2, U-NII-2C: 6 (802.11 n40/ac-VHT40)
	U-NII-1, 2A, 3: 1, U-NII-2C: 3 (802.11 ac-VHT80)
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)
Antenna Type:	Internal Antenna
Antenna Gain:	Ant: 7.5dBi (This information is provided by applicant, and the applicant is responsible for the authenticity of the provided information.)
DFS Operation Type:	☐ Master Device ☐ Slaver Device with Radar detection function ☒ Slaver Device without Radar detection function
Antenna Transmit Mode:	1TX, 1RX
Power Supply:	Input: DC 5V, 3A
AC Adapter:	Switching Power Adapter Model: FX18U-050300J Input: 100-240V~, 50/60Hz, 0.5A Max Output: 5.0V=3.0A 15.0W

Note:

- The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

4.3 Description of Test Facility

Name:	Intertek Testing Services Shenzhen Ltd. Longhua Branch
Address:	101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, ShenZhen.
The test facility is recognized, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L0327
	FCC Accredited Lab Designation Number: CN1188
	IC Registration Lab CAB identifier: CN0038

5 Test Specifications

5.1 Standards or Specification

FCC CFR 47 Part 15E

ANSI C63.10-2020+Cor 1-2023

KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02

5.2 Channels List

802.11a/n(HT20)/ac(VHT20)					
Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180 MHz	40	5200 MHz	44	5220 MHz
48	5240 MHz	52	5260 MHz	56	5280 MHz
60	5300 MHz	64	5320 MHz	100	5500 MHz
104	5520 MHz	108	5540 MHz	112	5560 MHz
116	5580 MHz	120	5600 MHz	124	5620 MHz
128	5640 MHz	132	5660 MHz	136	5680 MHz
140	5700 MHz	157	5785 MHz	149	5745 MHz
153	5765 MHz	161	5805 MHz	165	5825 MHz
802.11n(HT40)/ac(VHT40)					
Channel	Frequency	Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz	54	5270 MHz
62	5310 MHz	102	5510 MHz	110	5550 MHz
118	5590 MHz	126	5630 MHz	134	5670 MHz
151	5755 MHz	159	5795 MHz	-	-
802.11ac(VHT80)					
Channel	Frequency	Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz	155	5775 MHz
112	5610 MHz	106	5530 MHz	-	-

5.3 Test Channels

UNII-1 Test Channel Configuration		
Mode	Test Channel Number	Frequency
802.11a	CH 36(Low Channel), CH 40(MID Channel), CH 48(High Channel)	5180 MHz, 5200 MHz, 5240 MHz
802.11n HT20	CH 36(Low Channel), CH 40(MID Channel), CH 48(High Channel)	5180 MHz, 5200 MHz, 5240 MHz
802.11n HT40	CH 38(Low Channel), CH 46(High Channel)	5190 MHz, 5230 MHz
802.11ac VHE20	CH 36(Low Channel), CH 40(MID Channel), CH 48(High Channel)	5180 MHz, 5200 MHz, 5240 MHz
802.11ac VHE40	CH 38(Low Channel), CH 46(High Channel)	5190 MHz, 5230 MHz
802.11ac VHT80	CH 42(Low Channel)	5210 MHz

UNII-2A Test Channel Configuration		
Mode	Test Channel Number	Frequency
802.11a	CH 52(Low Channel), CH 56(MID Channel), CH 64(High Channel)	5260 MHz, 5280 MHz, 5320 MHz
802.11n HT20	CH 52(Low Channel), CH 56(MID Channel), CH 64(High Channel)	5260 MHz, 5280 MHz, 5320 MHz
802.11n HT40	CH 54(Low Channel), CH 62(High Channel)	5270 MHz, 5310 MHz
802.11ac VHT20	CH 52(Low Channel), CH 56(MID Channel), CH 64(High Channel)	5260 MHz, 5280 MHz, 5320 MHz
802.11ac VHT40	CH 54(Low Channel), CH 62(High Channel)	5270 MHz, 5310 MHz
802.11ac VHT80	CH 58(Low Channel)	5290 MHz

UNII-2C Test Channel Configuration		
Mode	Test Channel Number	Frequency
802.11a	CH 100(Low Channel), CH 116(MID Channel), CH 140(High Channel)	5500 MHz, 5580 MHz, 5700 MHz
802.11n HT20	CH 100(Low Channel), CH 116(MID Channel), CH 140(High Channel)	5500 MHz, 5580 MHz, 5700 MHz
802.11n HT40	CH 102(Low Channel), CH 110(MID Channel), CH 134(High Channel)	5510 MHz, 5550 MHz, 5670 MHz
802.11ac VHT20	CH 100(Low Channel), CH 116(MID Channel), CH 140(High Channel)	5500 MHz, 5580 MHz, 5700 MHz
802.11ac VHT40	CH 102(Low Channel), CH 110(MID Channel), CH 134(High Channel)	5510 MHz, 5550 MHz, 5670 MHz
802.11ac VHT80	CH 102(Low Channel), CH 122(High Channel)	5530 MHz, 5610 MHz

UNII-3 Test Channel Configuration		
Mode	Test Channel Number	Frequency
802.11a	CH 149(Low Channel), CH 157(MID Channel), CH 165(High Channel)	5745 MHz, 5785 MHz, 5825 MHz
802.11n HT20	CH 149(Low Channel), CH 157(MID Channel), CH 165(High Channel)	5745 MHz, 5785 MHz, 5825 MHz
802.11n HT40	CH 151(Low Channel), CH 159(High Channel)	5755MHz, 5795MHz
802.11ac VHT20	CH 149(Low Channel), CH 157(MID Channel), CH 165(High Channel)	5745 MHz, 5785 MHz, 5825 MHz
802.11ac VHT40	CH 151(Low Channel), CH 159(High Channel)	5755MHz, 5795MHz
802.11ac VHT80	CH 155(Low Channel)	5775 MHz

Data rate and Power setting:

The pre-scan for the conducted power with all rates in each modulation and bands was used, and the worst case was found and used in all test cases. After this pre-scan, we choose the following table of the data rate as the worst case.

Test software: adb, Version: N/A

Power Setting								
Mode	Freq (MHz)	ANT	Mode	Freq (MHz)	ANT	Mode	Freq (MHz)	ANT
802.11a	5180	default	802.11n 20M	5180	default	802.11ac 20M	5180	default
	5200	default		5200	default		5200	default
	5240	default		5240	default		5240	default
	5260	default		5260	default		5260	default
	5280	default		5280	default		5280	default
	5320	default		5320	default		5320	default
	5500	default		5500	default		5500	default
	5580	default		5580	default		5580	default
	5700	default		5700	default		5700	default
	5745	default		5745	default		5745	default
802.11n 40M	5785	default	802.11ac 40M	5785	default	802.11ac 80M	5785	default
	5825	default		5825	default		5825	default
	5190	default		5190	default		5210	default
	5230	default		5230	default		5290	default
	5270	default		5270	default		5530	default
	5310	default		5310	default		5610	default
	5670	default		5670	default		5775	default
	5755	default		5755	default			
	5795	default		5795	default			

5.4 Support Equipment List and Description

Description	Manufacturer	Model No.
Switching Power Adapter (Provided by Client)	Shenzhen Fangxin Technology Co., Ltd.	Model: FX18U-050300J INPUT: 100-240V~ 50/60Hz 0.5A Max OUTPUT: 5.0V/3.0A

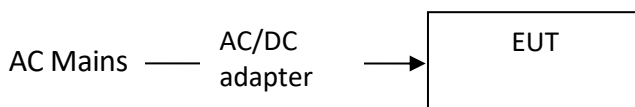
5.5 Test environment condition:

Operating Environment:	
Temperature:	Normal: 0°C ~ 45°C, Extreme: 0°C ~ 40°C
Humidity:	20 % ~ 75 % RH
Atmospheric Pressure:	1008 mbar
Voltage:	Nominal: 102Vac, Extreme: Low 120Vac, High 138Vac
Test Engineer:	Mandy Chen

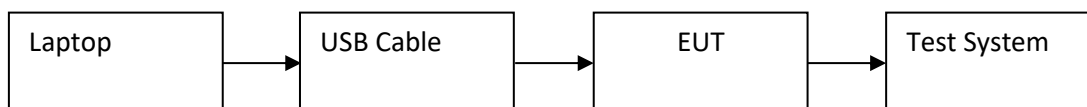
Environment Parameter	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage (V)	Relative Humidity (%)
NT/NV	0 to +45	120	20 to 75
Remark: 1) NV: Normal Voltage; NT: Normal Temperature			

5.6 Block Diagram Showing the Configuration of System Tested

Conducted Test & Radiated Test



Conducted Measurements Test



This example is connection diagram of EUT Test Setups.

For detail, please refer to test mode configuration and setup photographs for each test item.

5.7 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	2026-04-13	2027-04-13
SZ182-02-01	Pulse Power Sensor	Anritsu	MA2411B	1207429	2026-04-13	2027-04-13
SZ070-20	Combiner	Mini-Circuits	ZN2PD-63-S+	--	2026-04-13	2027-04-13
SZ070-21	Combiner	Mini-Circuits	ZN2PD-63-S+	--	2026-04-13	2027-04-13
SZ180-13	MXG Vector Signal Generator	Keysight	N5182B	MY53051328	2025-09-15	2026-09-15
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	2025-12-01	2026-12-01
SZ061-13	BiConiLog Antenna	ETS	3142E	00217919	2025-05-29	2028-05-29
SZ061-08	Horn Antenna	ETS	3115	00092346	2024-09-13	2027-09-13
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	2024-05-05	2027-05-05
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	2025-09-11	2028-09-11
SZ185-03	EMI Receiver	R&S	ESR7	101975	2026-04-10	2027-04-10
SZ056-05	Signal Analyzer	R&S	FSV 40	101101	2025-12-01	2026-12-01
SZ181-08	Microwave System Amplifier	keysight	83017A	MY57280108	2026-07-22	2027-07-22
SZ188-05	Anechoic Chamber	ETS	FACT 3-2.0	CT001880-Q13914102	2025-06-18	2028-06-18
SZ062-23	RF Cable	HUBER+SUHNER	SF104PE-1M	MY4262/4PE	2025-09-15	2026-09-15
SZ062-40	RF Cable	Talent Microwave	A50-3.5M3.5M-4.5M	22012932	2025-09-15	2026-09-15
SZ062-38	RF Cable	Talent Microwave	A50-3.5M3.5M-8M	21051695	2025-09-15	2026-09-15
SZ067-25	Notch Filter	Micro-Tronics	BRM50716	076	2026-02-08	2027-02-08
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	015	2026-04-13	2027-04-13
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	2026-06-04	2027-06-04
SZ187-01	Two-Line V-Network	R&S	ENV216	100073	2025-10-27	2026-10-27
SZ062-16	RF Cable	HUBER+SUHNER	CBL2-BN-1m	110127-2231000	2026-06-04	2027-06-04
SZ016-12	Programmable Temperature & Humidity Chamber	Taili	MHK-120NK	AB0105	2025-12-01	2026-12-01

Software Information			
Test Item	Software Name	Manufacturer	Version
Radiated Test	EMC32	R&S	V10.20.01
Conducted Test	EMC32	R&S	V10.60.20
Conducted RF	Tonscend RF TEST SYSTEM	Shenzhen JS tonscend co., Ltd	2.6.87.0615

5.8 Measurement uncertainty

The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Parameter	Expanded Uncertainty (Confidence of 95% ($U = 2Uc(y)$))
Channel Bandwidth	$\pm 3.46\%$
RF Output Power	$\pm 0.31\text{dB}$
Power Spectral Density	$\pm 1.19\text{dB}$
Frequency Stability	$\pm 0.64\text{kHz}$
Conducted Unwanted Emission	$\pm 0.55\text{dB}$
Spurious emission (above 18GHz)	$\pm 5.3\text{dB}$
Spurious emission (6GHz to 18GHz)	$\pm 5.1\text{dB}$
Radiated emission (1GHz to 6GHz)	$\pm 4.8\text{dB}$
Radiated emission (Up to 1GHz)	$\pm 4.8\text{dB}$
AC Power line conducted emission	$\pm 3.2\text{ dB}$
Temperature	$\pm 1^{\circ}\text{C}$
Humidity	$\pm 5\%$

6 Antenna Requirement

6.1 Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the party responsible is used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

1. The antennas of the EUT are permanently attached.
2. There are no provisions for connection to an external antenna.

6.2 Conclusion:

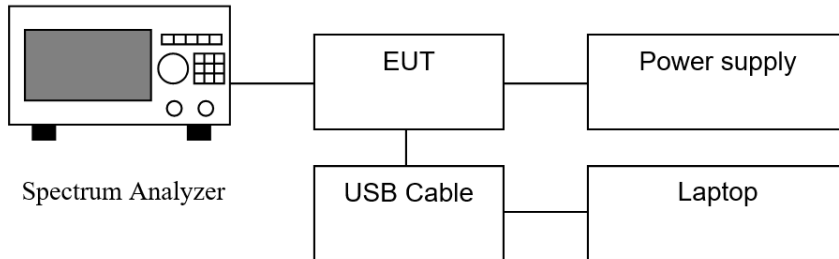
Therefore, this E.U.T complies with the requirement of Part 15.203

7 Duty Cycle

7.1 Limit

None; for reporting purposes only.

7.2 Test Setup



7.3 Test Procedure

Refer to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section II.B.

The zero-span mode on a spectrum analyzer or EMI receiver, if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set $RBW \geq EBW$ if possible; otherwise, set RBW to the largest available value. Set $VBW \geq RBW$. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are $> 50/T$, where T is defined in II.B.1.a), and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if $T \leq 16.7$ microseconds.).

7.4 Test Results of Duty Cycle

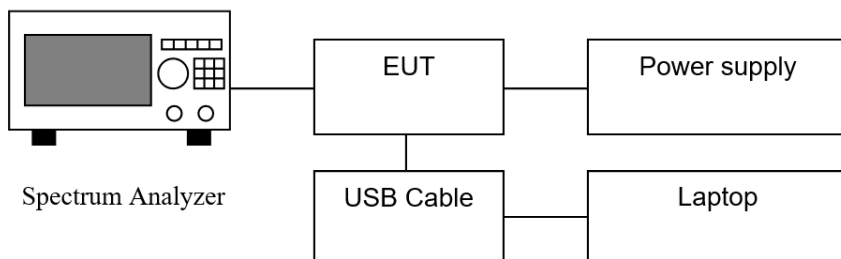
The more detail please refer to "Appendix of 260723074SZN-004".

8 26 dB Bandwidth & 99% Occupied Bandwidth

8.1 Limit

None

8.2 Test Setup



8.3 Test Procedure

Refer to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section II.C1. for 26 dB Emission Bandwidth; section II.D. for 99 %

26 dB Bandwidth

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- Measure the maximum width of the emission that is 26 dB down from the maximum 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%.

99% Occupied Bandwidth

- Set center frequency to the nominal EUT channel center frequency.
- Set span = 1.5 times to 5.0 times the OBW.
- Set RBW = 1 % to 5 % of the OBW
- Set VBW $\geq 3 \times$ RBW
- Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- Use the 99 % power bandwidth function of the instrument (if available).
- If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

Note: For devices that use channel aggregation refer to III.A and III.C for determining 99% bandwidth.

8.4 Test Results of 26 dB Bandwidth & 99% Occupied Bandwidth

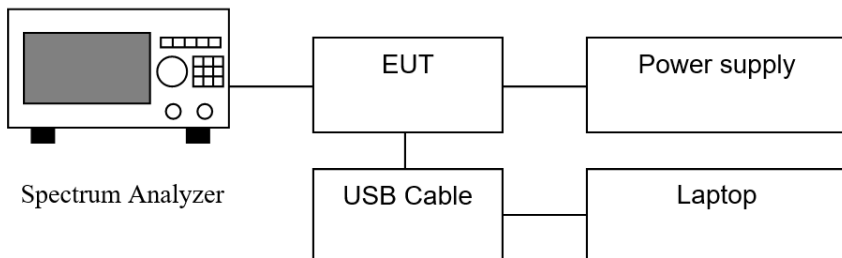
The more detail please refer to "Appendix of 260723074SZN-004".

9 Minimum 6dB bandwidth

9.1 Limit

For systems using digital modulation techniques that may operate in the 5725 - 5850 MHz band, the minimum 6 dB bandwidth shall be at least 500 kHz.

9.2 Test Setup



9.3 Test Procedure

Refer to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section II.C2. for 6 dB Emission Bandwidth

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- 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 automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

9.4 Test Results of Minimum 6dB bandwidth

The more detail please refer to "Appendix of 260723074SZN-004".

10 Maximum Conducted Output Power

10.1 Limit

Frequency range (MHz)	Max Conducted TX Power
5150~5250	30dBm (1W) for master device
	24dBm (250mW) for client device
5250~5350	24dBm (250mW) or 11dBm+ 10logB*
5470~5725	24dBm (250mW) or 11dBm+ 10logB*
5725~5850	30dBm (1W)

Remark:

- *Where B is the 26dB emission Bandwidth in MHz.
- The device was declared as Slave device.
- The above limits are based upon the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

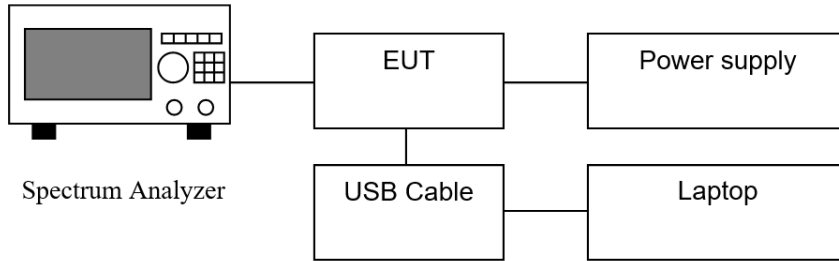
10.2 Test Procedure

Refer to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section II.E.

Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- Measure the duty cycle, x , of the transmitter output signal as described in II.B.
- Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- Set RBW = 1 MHz.
- Set VBW $\geq$ 3 MHz.
- Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$. (This ensures that bin-to-bin spacing is $\leq \text{RBW}/2$, so that narrowband signals are not lost between frequency bins.)
- Sweep time = auto.
- Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
- Do not use sweep triggering. Allow the sweep to "free run."
- Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.
- Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- Add $10 \log (1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times

10.3 Test Setup



10.4 Test Results of Maximum conducted output power

Max Conducted Average output power

The more detail please refer to “Appendix of 260723074SZN-004”.

11 Power spectrum density

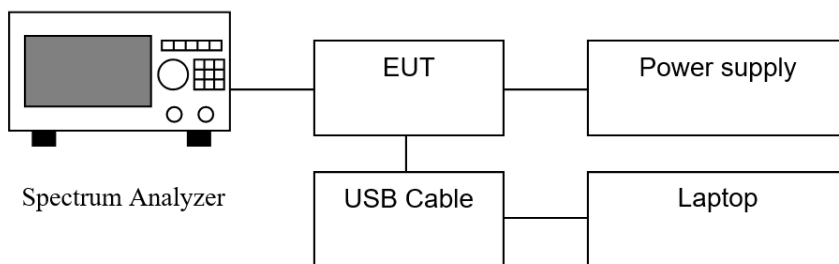
11.1 Limit

Frequency range (MHz)	Max Conducted Power Spectral Density
5150~5250	*17dBm/MHz for master device
	11dBm/MHz for mobile/portable client device
5250~5350	11dBm/MHz
5470~5725	11dBm/MHz
5725~5850	30dBm/500kHz

Remark:

- 1) *The device was declared as Slave device.
- 2) Tx Power Reduction (dBm-by-dBi) required when antenna exceeds 6dBi.

11.2 Test Setup



11.3 Test Procedure

Refer to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section II.F.

Connect the EUT to the spectrum analyzer and use the following settings:

1. Analyzer was set to the center frequency of the UNII channel under investigation
2. Span was set to encompass the entire emission bandwidth of the signal
3. RBW = 1MHz for U-NII 1, 2A, 2C, 500kHz for U-NII 3
4. VBW $\geq$ 3MHz for U-NII 1, 2A, 2C, $\geq 3 \times$ RBW for U-NII 3
5. Number of sweep points $> 2 \times$ (span/RBW)
6. Sweep time = auto
7. Detector = power averaging (RMS)
8. Trigger was set to free run for all modes
9. Trace was averaged over 100 sweeps
10. The peak search function of the spectrum analyzer was used to find the peak of the spectrum.

11.4 Test Results of Power spectrum density

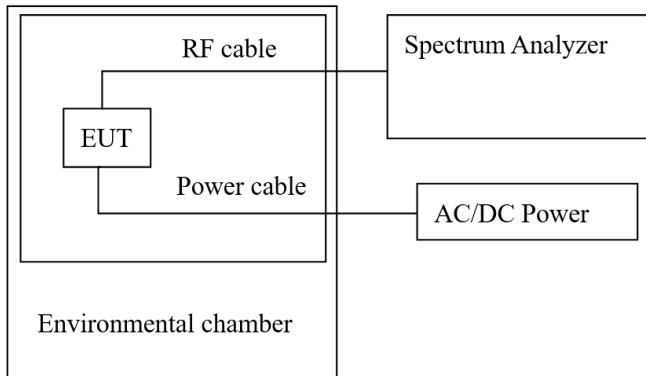
The more detail please refer to "Appendix of 260723074SZN-004".

12 Frequency Stability

12.1 Limit

The frequency stability shall be sufficient to ensure that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

12.2 Test Setup



12.3 Test Procedure

1. The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between 0 °C ~ 45 °C (declared by customer).
2. The temperature was incremented by 10 °C intervals and the unit allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.
3. The primary supply voltage is varied from 85 % to 115 % of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

12.4 Test Results of Frequency Stability

The more detail please refer to "Appendix of 260723074SZN-004".

14 Radiated Emission

14.1 Limit

Part 15.247(d), Part 15.205, Part 15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of Part 15.247 the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Part 15.209

Frequency (MHz)	FCC Limit (uV/m)	Measurement Distance (m)
0.009 – 0.490	2 400 / F (kHz)	300
0.490 – 1.705	24 000 / F (kHz)	30
1.705 – 30.0	30	30

Frequency (MHz)	FCC Limit (uV/m)	Measurement Distance (m)
30 ~ 88	100 **	3
88 ~ 216	150 **	3
216 ~ 960	200 **	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §15.231 and 15.241.

FCC Restricted bands of operation refer to FCC §15.205 (a):

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

Limits of unwanted/undesirable emission out of the restricted bands refer to CFR 47 FCC §15.407 (b)

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1GHz)		
Frequency Range (MHz)	EIRP Limit	Field Strength Limit (dBuV/m) at 3 m
5150~5250 MHz	PK: -27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz		
5470~5725 MHz		
5725~5850 MHz	PK: -27 (dBm/MHz) *1 PK: 10 (dBm/MHz) *2 PK: 15.6 (dBm/MHz) *3 PK: 27 (dBm/MHz) *4	PK: 68.2(dBμV/m) *1 PK: 105.2 (dBμV/m) *2 PK: 110.8(dBμV/m) *3 PK: 122.2 (dBμV/m) *4

Note:

*1 beyond 75 MHz or more above the band edge.

*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

14.2 Test Procedure

For Radiated emission below 30MHz:

- a) The EUT was placed on the top of a rotating table 0.8 meters (0.1 meters for floor-standing device) above the ground at a 3 meters chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b) The EUT was set 3 meters away from the interference-receiving antenna, the lowest height of the magnetic antenna was 1 m above the ground.
- c) Both X and Y axes of the antenna are set to make the measurement.
- d) For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e) The test-receiver system was set to peak or quasi-peak detect function and specified bandwidth with maximum hold mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz).

For Radiated emission above 30MHz:

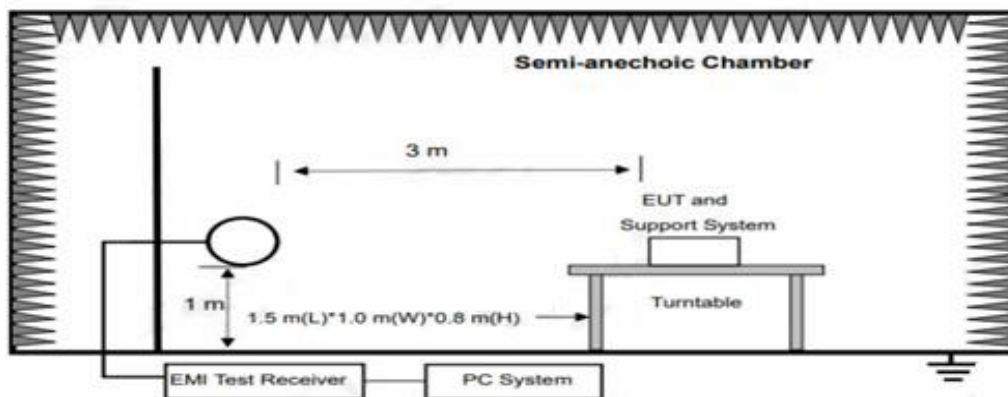
- a) The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) or 0.1 meters (for floor-standing device) above the ground at 3 meters chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c) 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.
- d) 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.
- e) The test-receiver system was set to peak or quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f) The test-receiver system was set to peak and average detect 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.

Note:

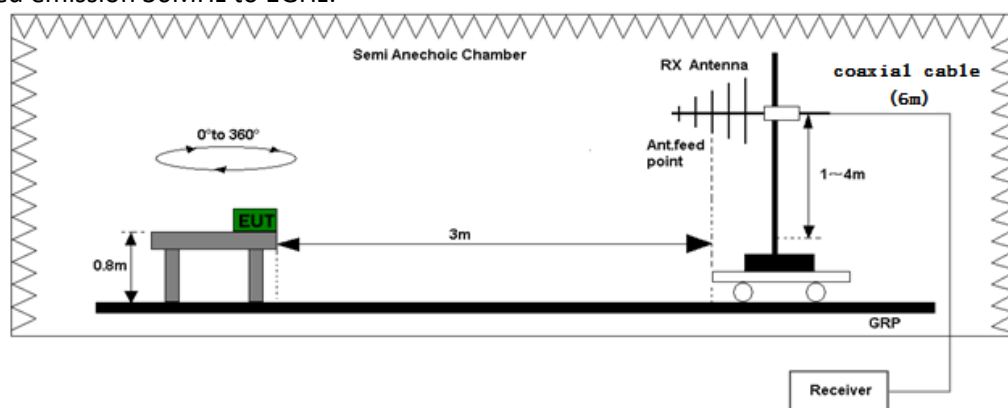
1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for peak or quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz at frequency above 1GHz for peak detection above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 3 x RBW (Duty cycle $\geq$ 98%) for average detection (AV) at frequency above 1GHz.
4. All modes(IEEE 802.11a/n HT20/n HT40/ac VHT20/ac VHT40/ac VHT80) have been tested, but only the worst data(IEEE 802.11n HT20) was recorded in the report.

14.3 Test Setup

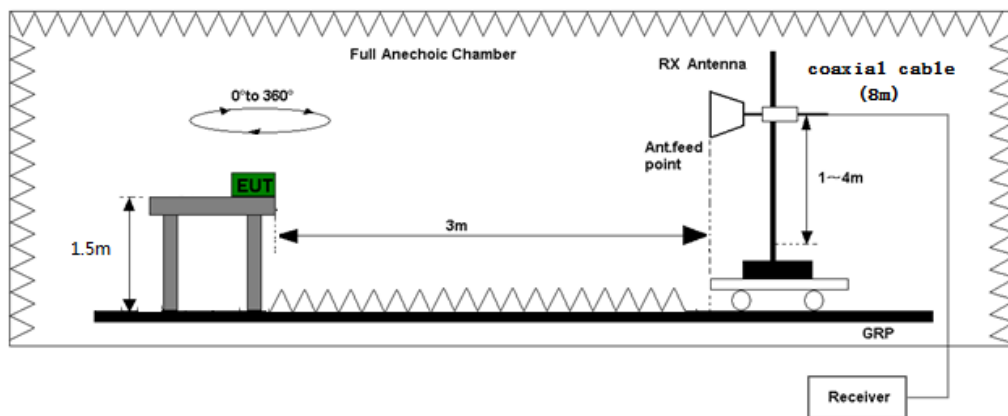
For Radiated emission below 30MHz:



For Radiated emission 30MHz to 1GHz:



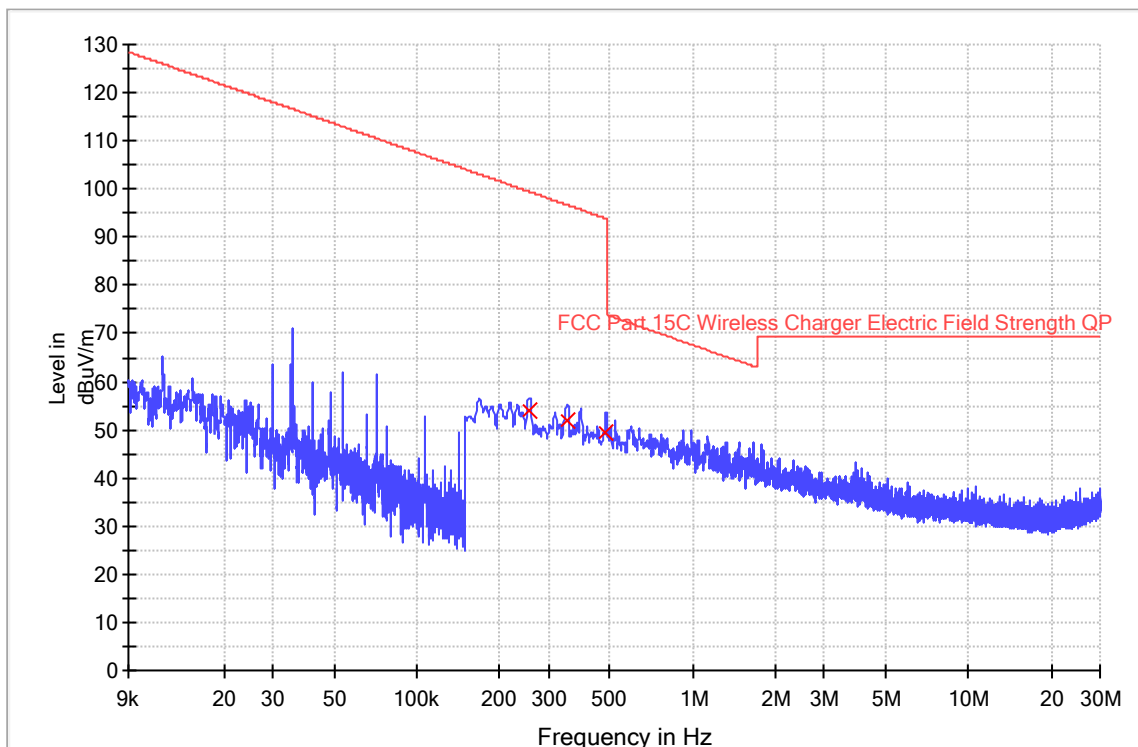
For Radiated emission above 1GHz:



14.4 Test Results of Radiated Emissions

Below 1GHz:

Product Name:	Smart Speaker	Product Model:	36025341
Test By:	Mandy Chen	Worst Test mode:	5G Wi-Fi mode (IEEE 802.11n HT20)
Test Frequency:	0.009 MHz ~ 30 MHz	Test Voltage:	AC 120V, 60Hz



Limit and Margin

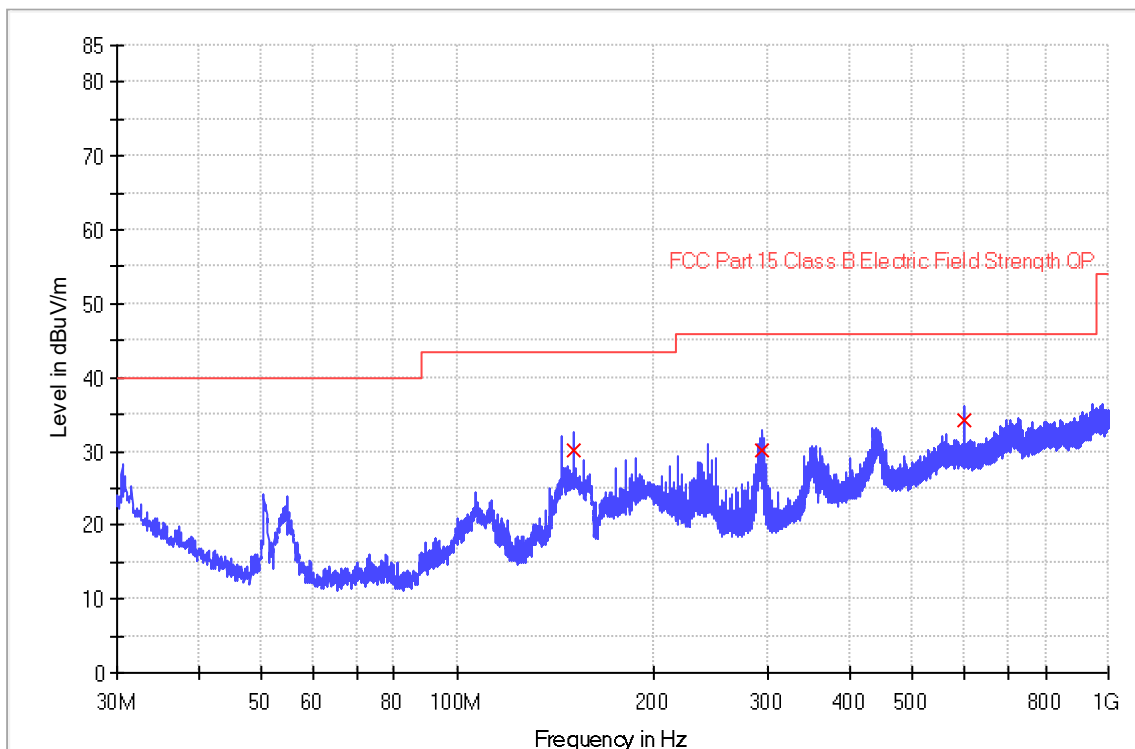
Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
0.254475	54.0	1000.0	9.000	17.6	45.5	99.5
0.349995	52.1	1000.0	9.000	17.3	44.6	96.7
0.484320	49.4	1000.0	9.000	17.1	44.5	93.9

Remark:

1. Corr. (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
2. Quasi Peak (dBuV/m) = Corr. (dB/m) + Read Level (dBuV)
3. Margin (dB) = Limit QPK (dBuV/m) – Quasi Peak (dBuV/m)

Product Name:	Smart Speaker	Product Model:	36025341
Test By:	Mandy Chen	Test mode:	5G Wi-Fi mode (IEEE 802.11n HT20)
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	AC 120V, 60Hz		

FCC Part 15 ClassB



Limit and Margin

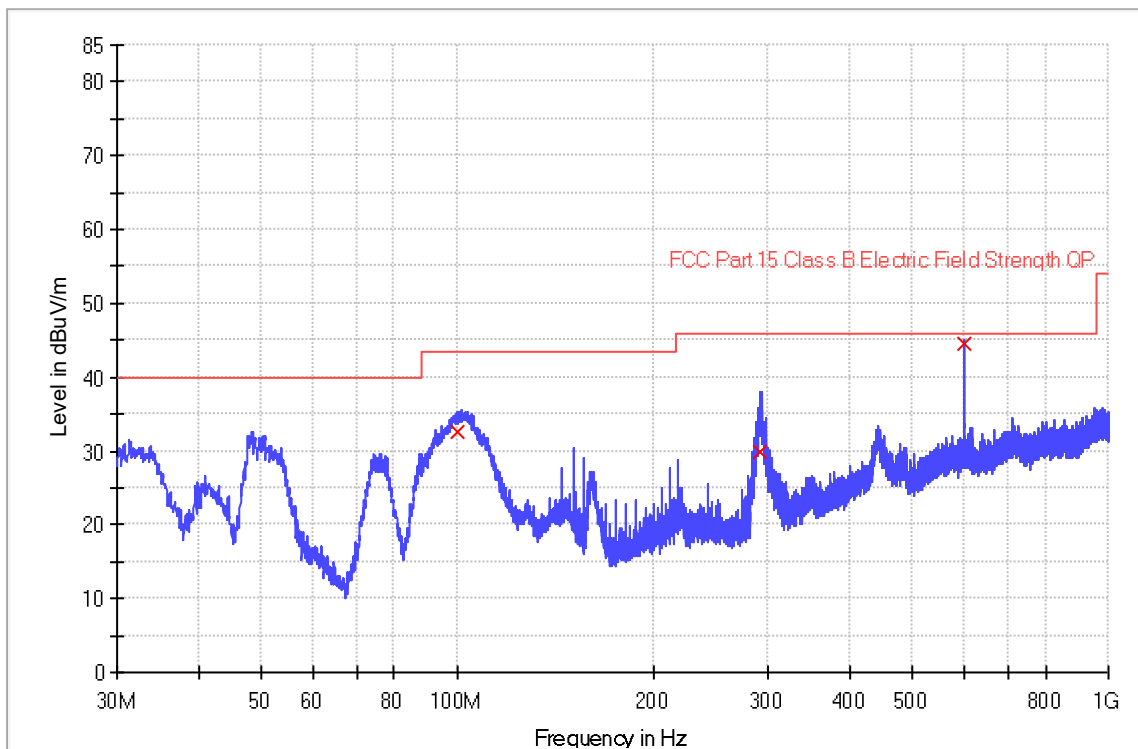
Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
150.506333	30.1	1000.0	120.000	H	16.5	13.4	43.5
293.710667	30.1	1000.0	120.000	H	20.2	15.9	46.0
600.004333	34.2	1000.0	120.000	H	29.0	11.8	46.0

Remark:

1. Corr. (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
2. Quasi Peak (dBμV/m) = Corr. (dB/m) + Read Level (dBμV)
3. Margin (dB) = Limit QPK (dBμV/m) – Quasi Peak (dBμV/m)

Product Name:	Smart Speaker	Product Model:	36025341
Test By:	Mandy Chen	Test mode:	5G Wi-Fi mode (IEEE 802.11n HT20)
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Vertical
Test Voltage:	AC 120V, 60Hz		

FCC Part 15 ClassB



Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
100.163333	32.7	1000.0	120.000	V	14.8	10.8	43.5
292.255667	29.9	1000.0	120.000	V	20.2	16.1	46.0
600.004333	44.5	1000.0	120.000	V	29.0	1.5	46.0

Remark:

1. Corr. (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
2. Quasi Peak (dBμV/m) = Corr. (dB/m) + Read Level (dBμV)
3. Margin (dB) = Limit QPK (dBμV/m) – Quasi Peak (dBμV/m)

Above 1GHz:

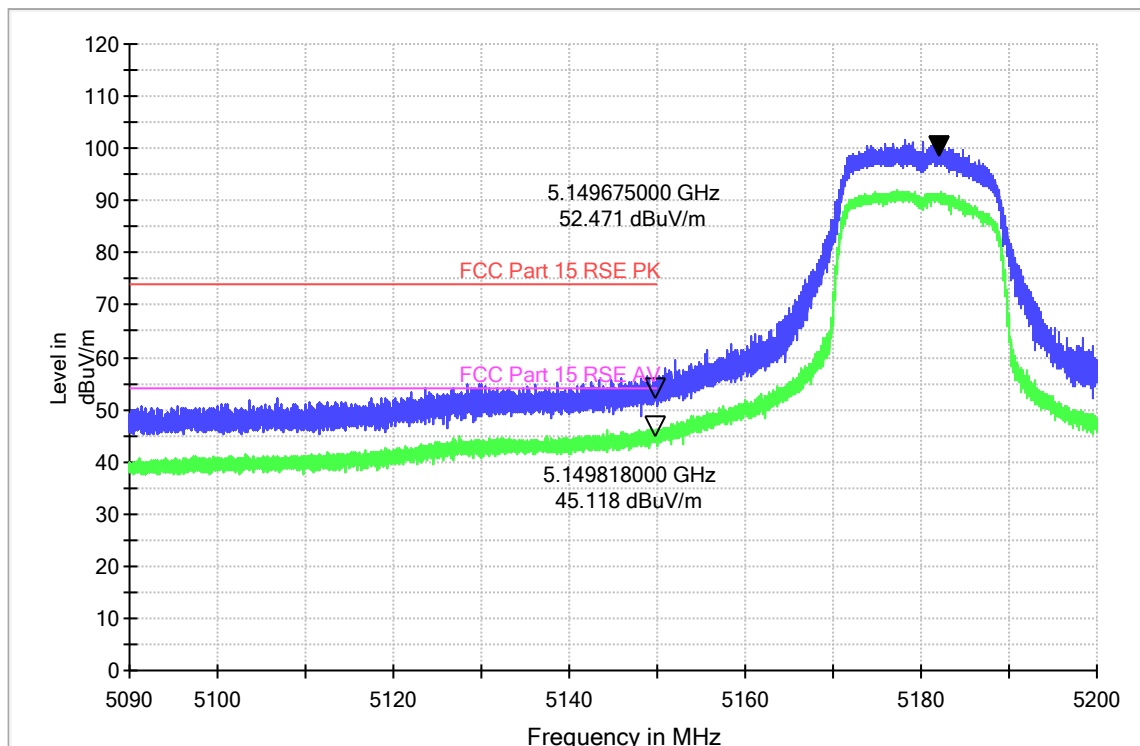
Worst-case Results:

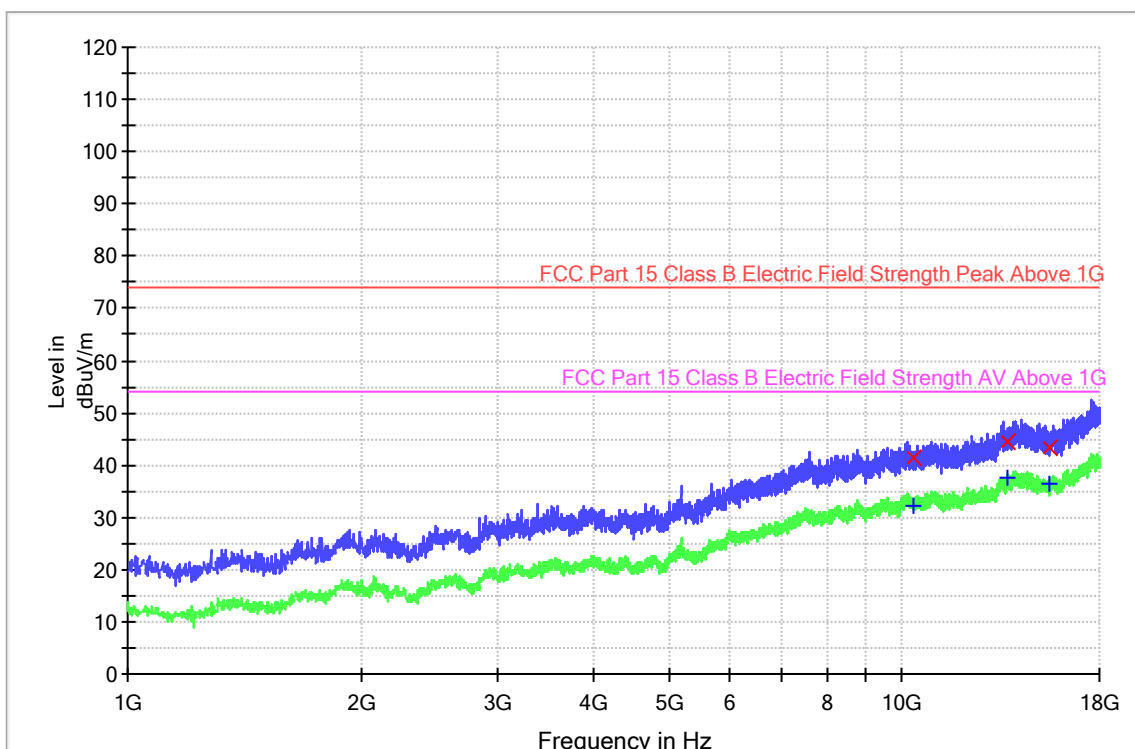
The worst case occurred at 802.11n-HT20

Channel 36

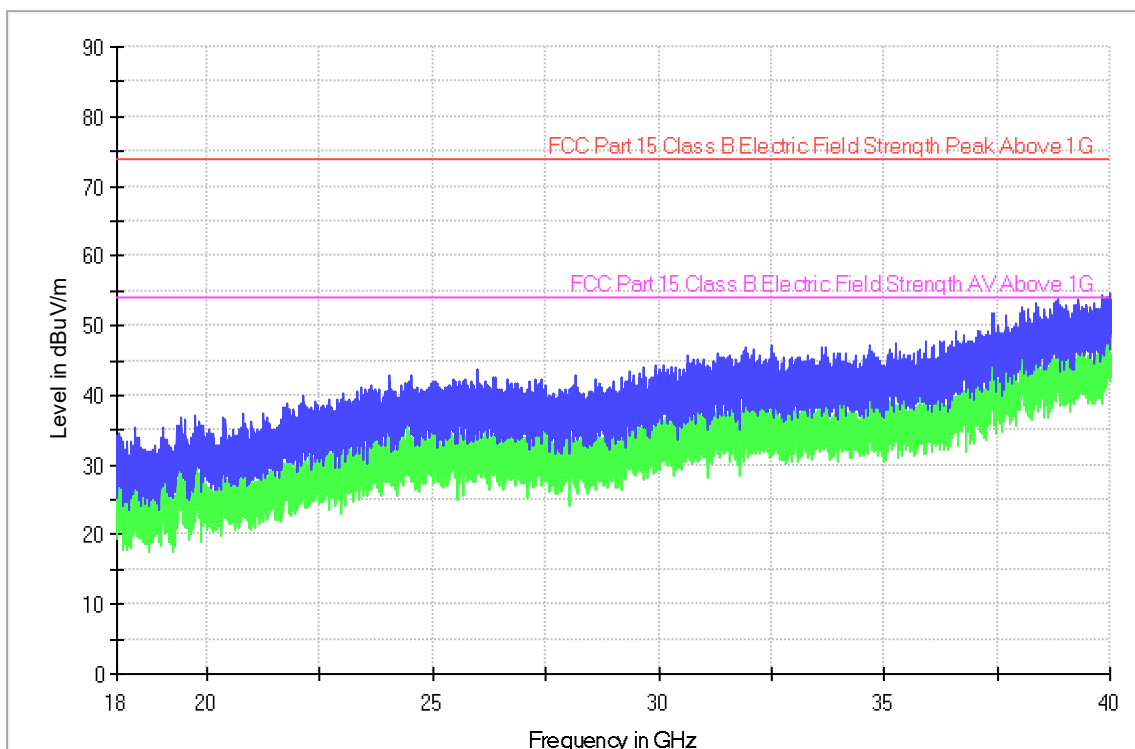
Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10360.000	33.5	30.8	38.7	41.4	68.2	26.8
Horizontal	14045.000	34.1	30.9	41.2	44.4	68.2	23.8
Horizontal	15540.000	35.8	31.1	38.8	43.5	74	30.5
Horizontal	5150.000	49.8	30.2	32.9	52.5	68.2	15.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10360.000	24.5	30.8	38.7	32.4	54.0	21.6
Horizontal	14045.000	27.1	30.9	41.2	37.4	54.0	16.6
Horizontal	15540.000	28.7	31.1	38.8	36.4	54.0	17.6
Horizontal	5150.000	42.4	30.2	32.9	45.1	54.0	8.9





Electric Field Strength 18-40 GdBuV



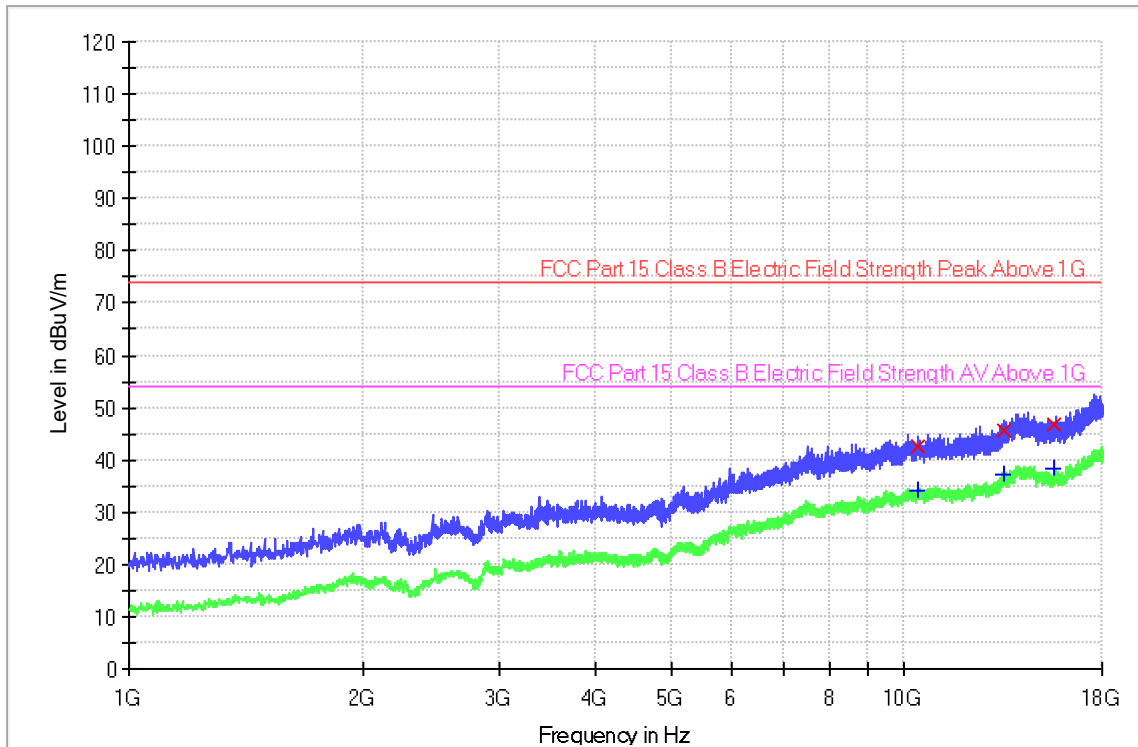
No emissions were significantly above the equipment noise floor.

Channel 40

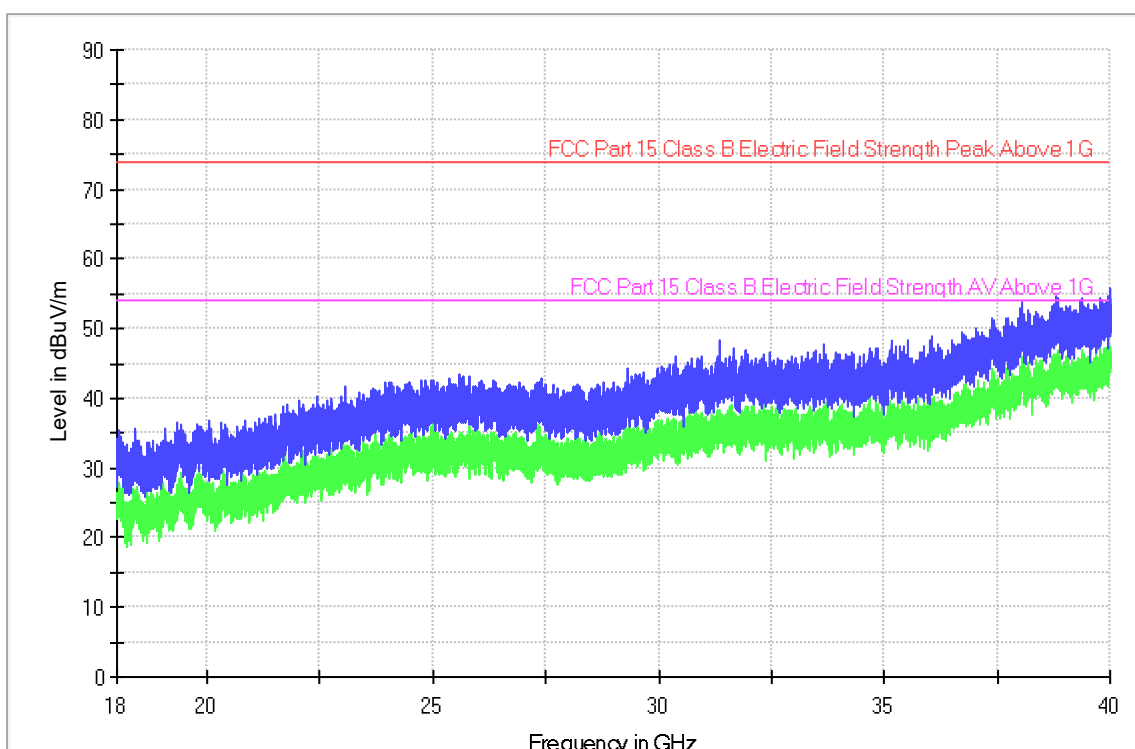
Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10400.000	34.5	30.8	38.7	42.4	68.2	25.8
Horizontal	13741.000	35.8	30.9	40.7	45.6	68.2	22.6
Horizontal	15600.000	39.0	31.1	38.7	46.6	74	27.4

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10400.000	26.4	30.8	38.7	34.3	54.0	19.7
Horizontal	13741.000	27.5	30.9	40.7	37.3	54.0	16.7
Horizontal	15600.000	30.7	31.1	38.7	38.3	54.0	15.7

Electric Field Strength 1-12.5GdBuV



Electric Field Strength 18-40 GdBuV

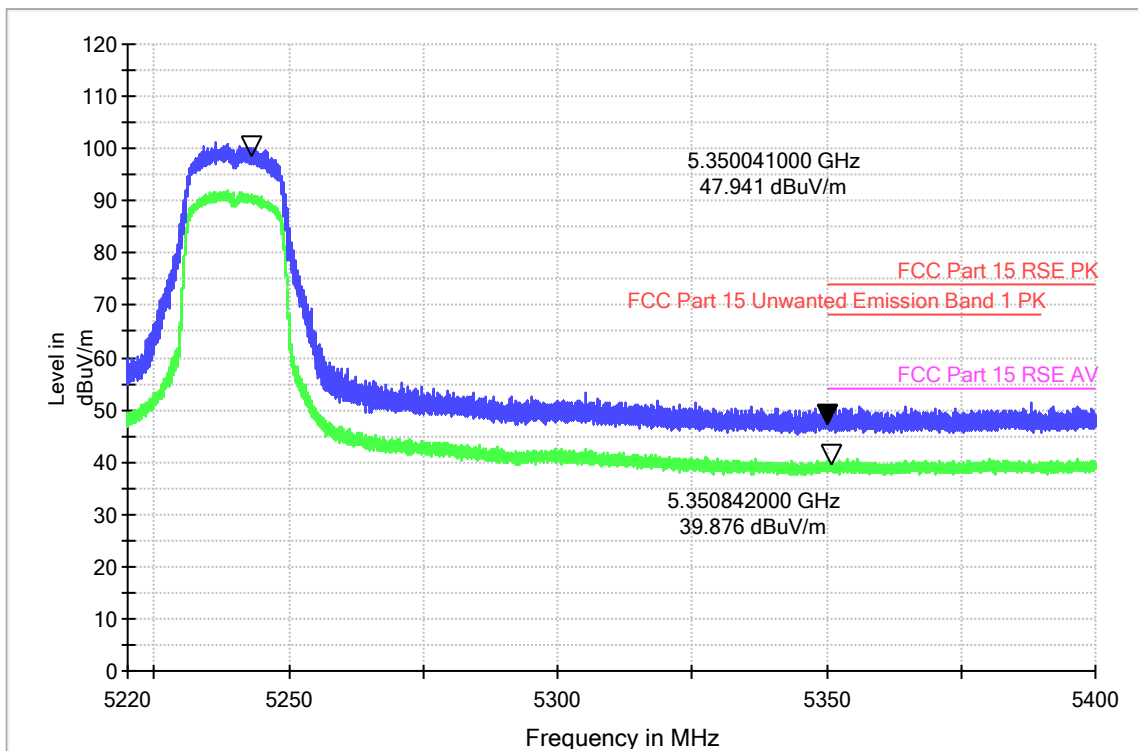


No emissions were significantly above the equipment noise floor.

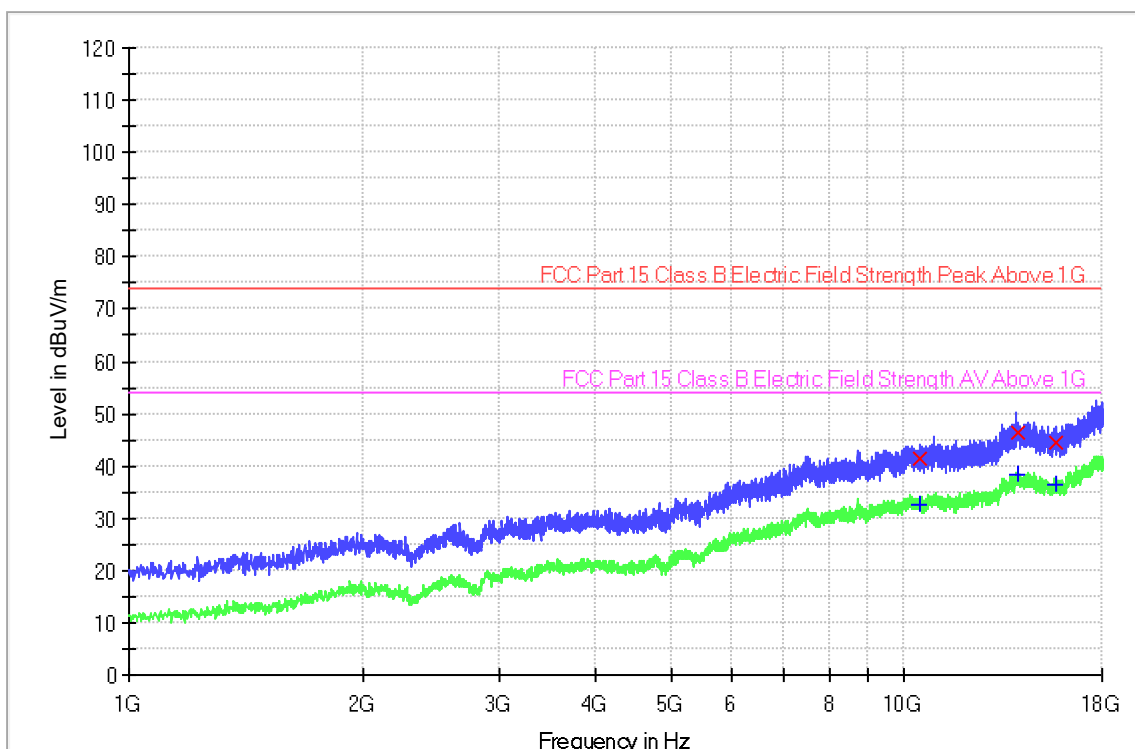
Channel 48

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10480.000	33.5	30.8	38.8	41.5	68.2	26.7
Horizontal	13839.000	36.5	30.9	40.9	46.5	68.2	21.7
Horizontal	15720.000	37.3	31.2	38.5	44.6	74	29.4
Horizontal	5350.000	44.6	30.1	33.4	47.9	74	26.1

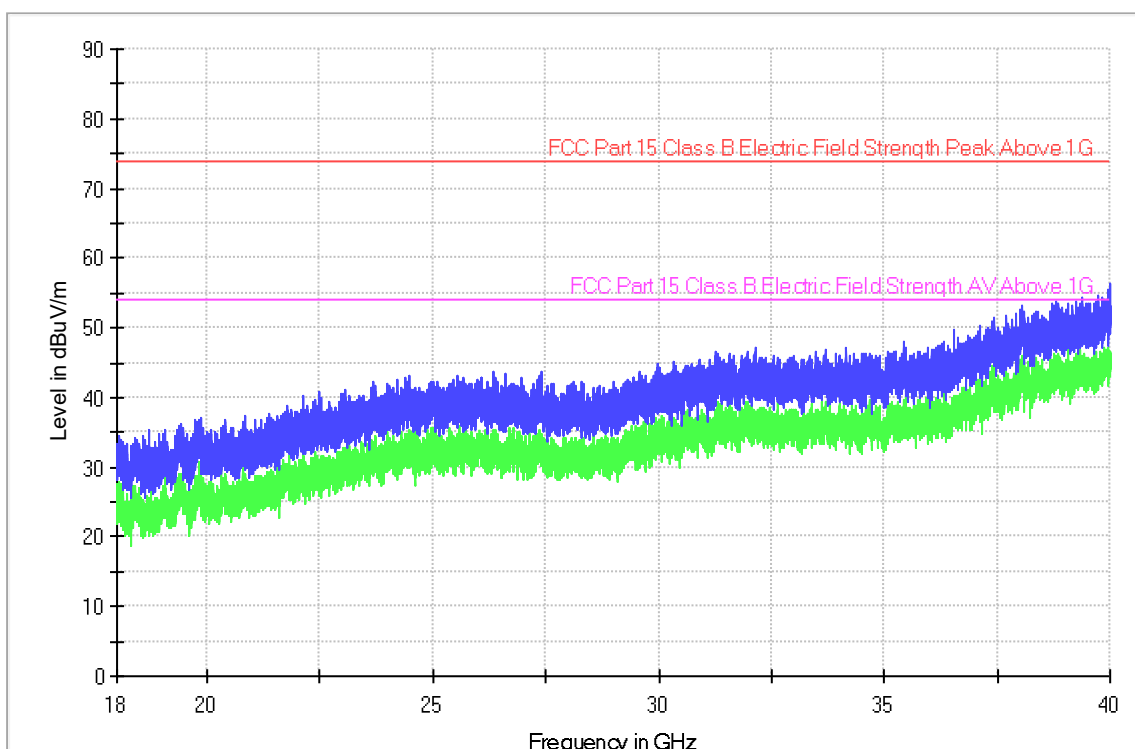
Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10480.000	24.5	30.8	38.8	32.5	54.0	21.5
Horizontal	13839.000	28.5	30.9	40.9	38.5	54.0	15.5
Horizontal	15720.000	29.2	31.2	38.5	36.5	54.0	17.5
Horizontal	5350.000	36.6	30.1	33.4	39.9	54.0	14.1



Electric Field Strength 1-12.5GdBuV



Electric Field Strength 18-40 GdBuV



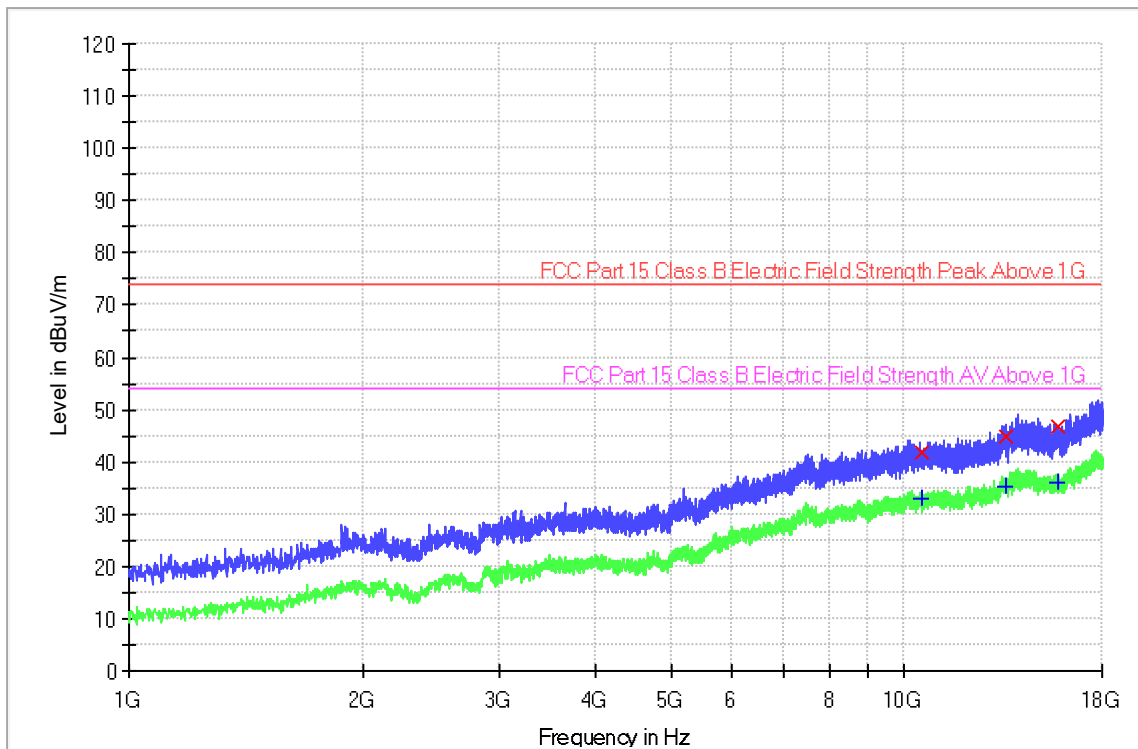
No emissions were significantly above the equipment noise floor.

Channel 52

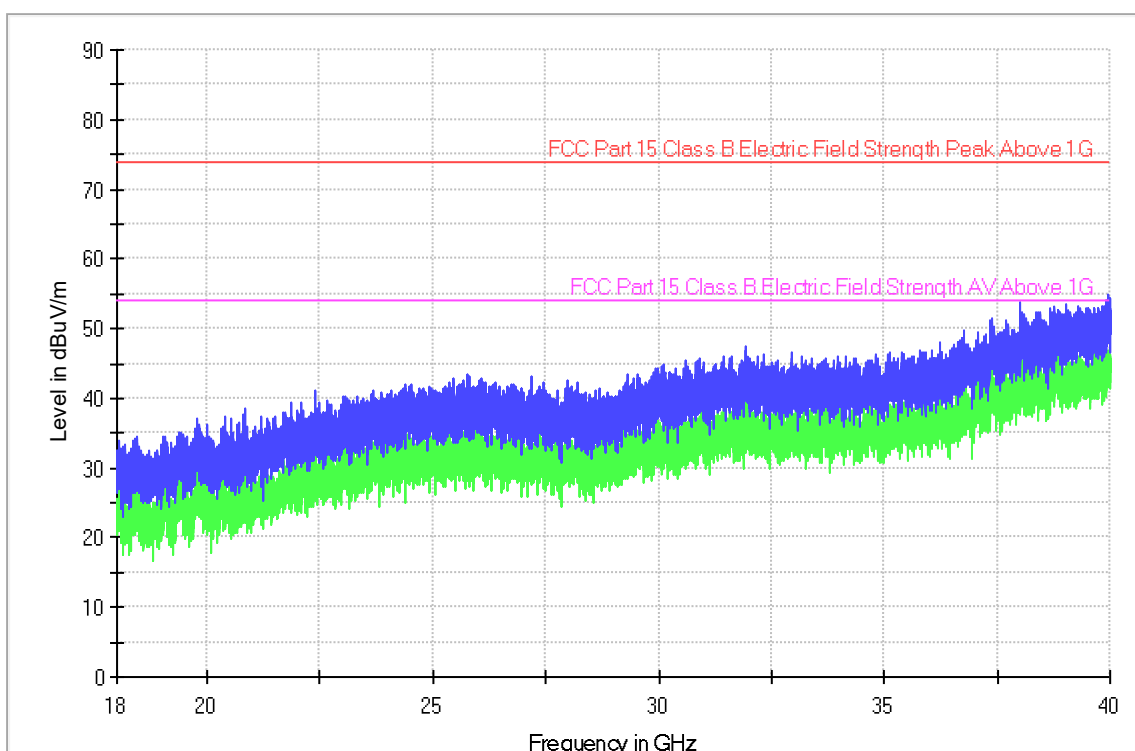
Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10520.000	33.7	30.8	38.8	41.7	68.2	26.5
Horizontal	13465.000	35.6	30.9	40.2	44.9	68.2	23.3
Horizontal	15780.000	39.4	31.2	38.4	46.6	74	27.4

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10520.000	25.1	30.8	38.8	33.1	54.0	20.9
Horizontal	13465.000	25.9	30.9	40.2	35.2	54.0	18.8
Horizontal	15780.000	29.0	31.2	38.4	36.2	54.0	17.8

Electric Field Strength 1-12.5GdBuV



Electric Field Strength 18-40 GdBuV

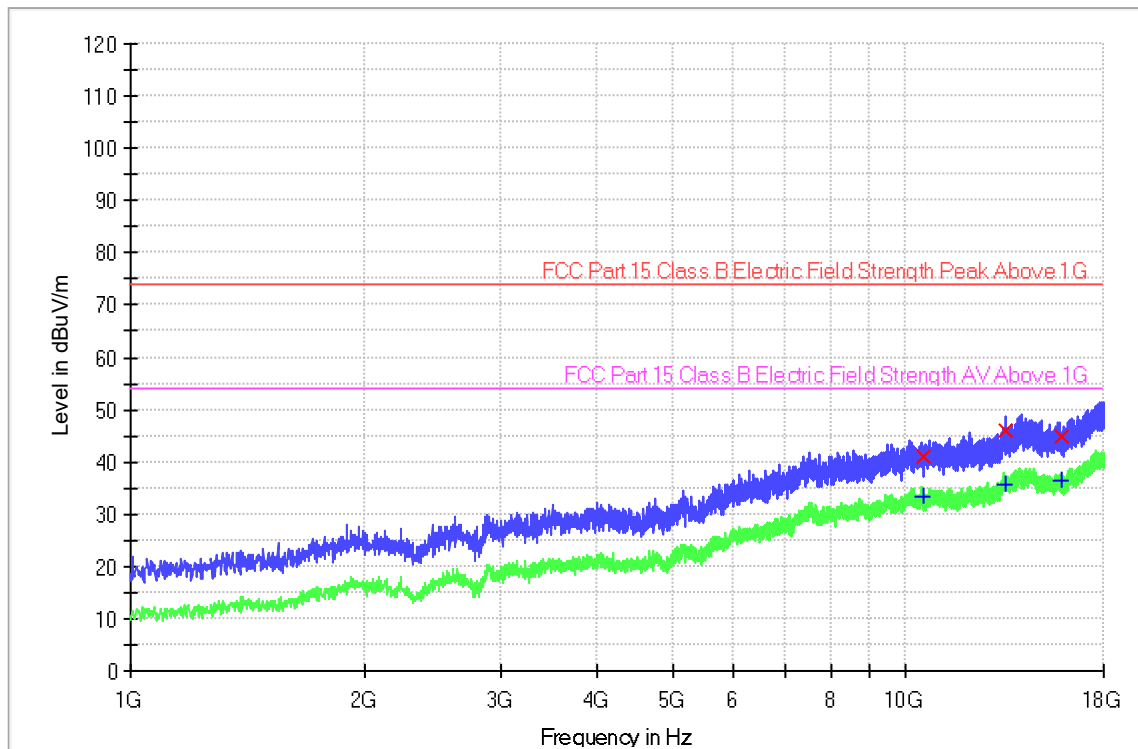


Channel 56

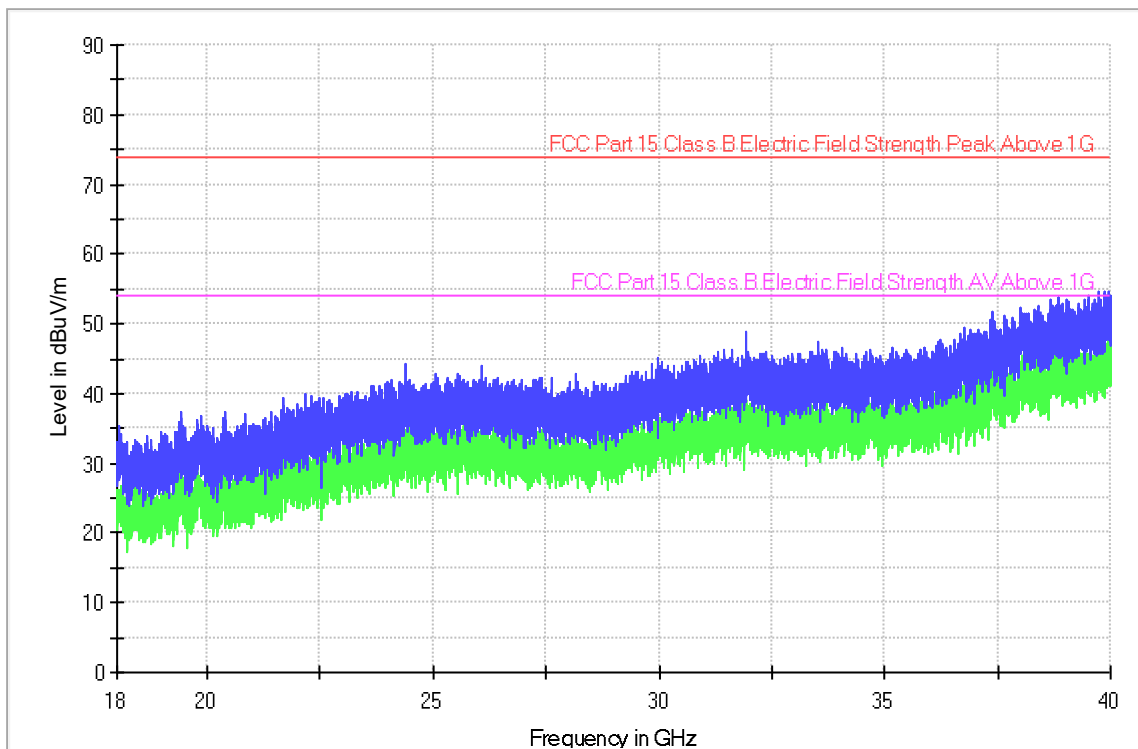
Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10560.000	32.9	30.8	38.8	40.9	68.2	27.3
Horizontal	13722.000	36.2	30.9	40.6	45.9	68.2	22.3
Horizontal	15840.000	37.7	31.2	38.4	44.9	74	29.1

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10560.000	25.5	30.8	38.8	33.5	54.0	20.5
Horizontal	13722.000	25.8	30.9	40.6	35.5	54.0	18.5
Horizontal	15840.000	29.3	31.2	38.4	36.5	54.0	17.5

Electric Field Strength 1-12.5GdBuV



Electric Field Strength 18-40 GdBuV

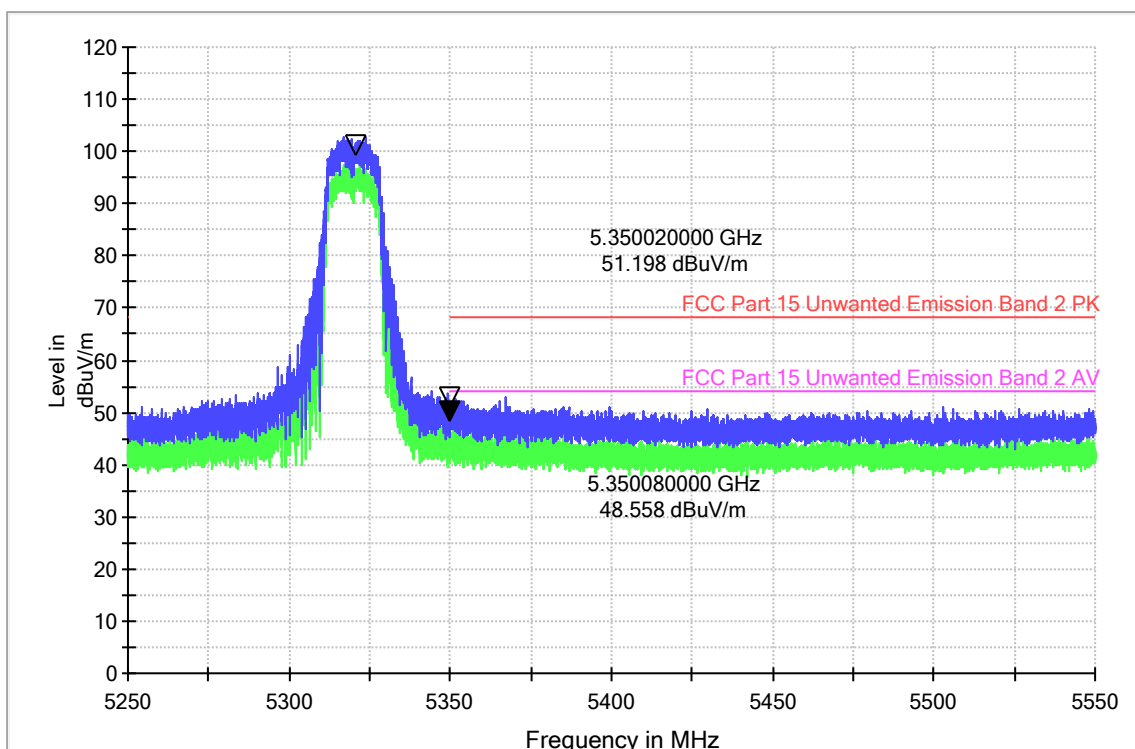


No emissions were significantly above the equipment noise floor.

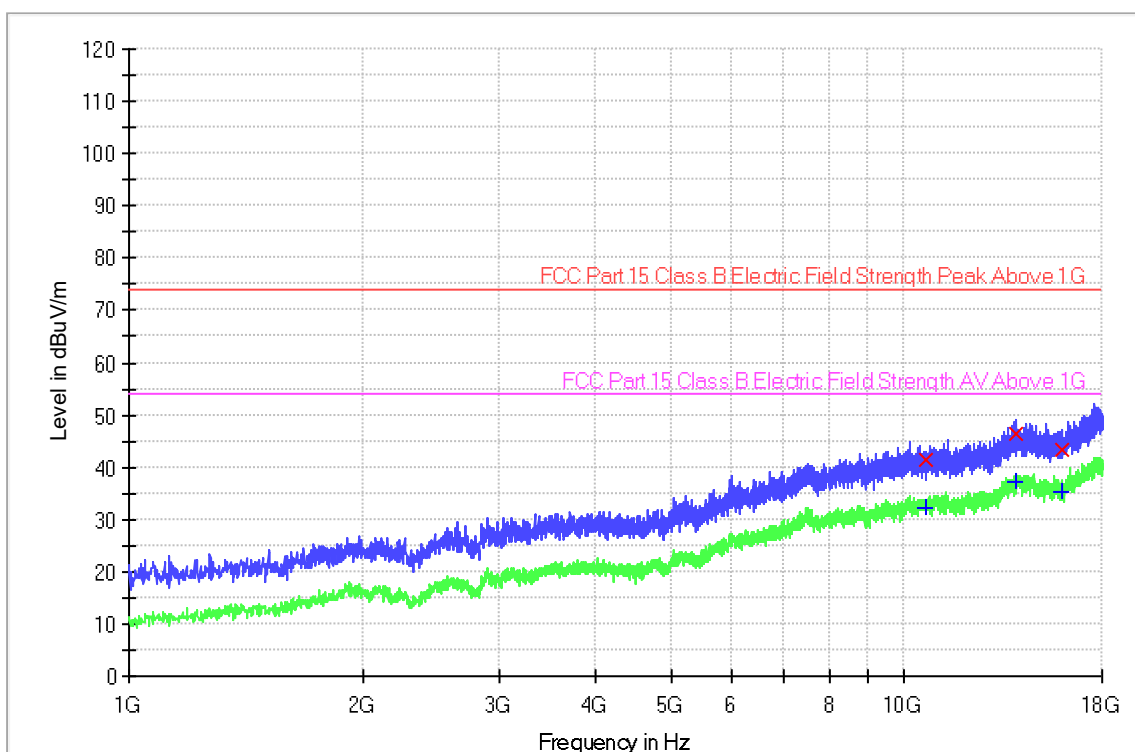
Channel 64

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10640.000	33.5	30.9	38.9	41.5	68.2	26.7
Horizontal	13482.000	37.2	30.9	40.2	46.5	68.2	21.7
Horizontal	15960.000	36.3	31.3	38.5	43.5	74	30.5
Horizontal	5350.000	47.9	30.1	33.4	51.2	74	22.8

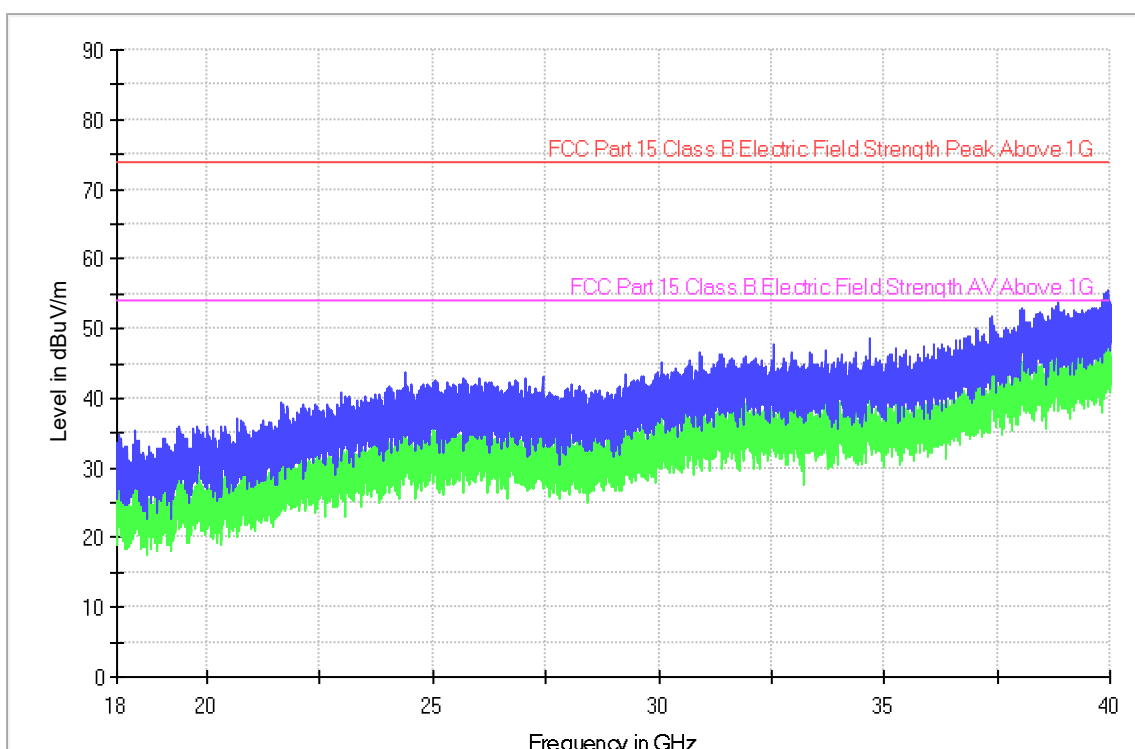
Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	10640.000	24.4	30.9	38.9	32.4	54.0	21.6
Horizontal	13482.000	28.1	30.9	40.2	37.4	54.0	16.6
Horizontal	15960.000	28.2	31.3	38.5	35.4	54.0	18.6
Horizontal	5350.000	45.3	30.1	33.4	48.6	54.0	5.4



Electric Field Strength 1-12.5GdBuV



Electric Field Strength 18-40 GdBuV

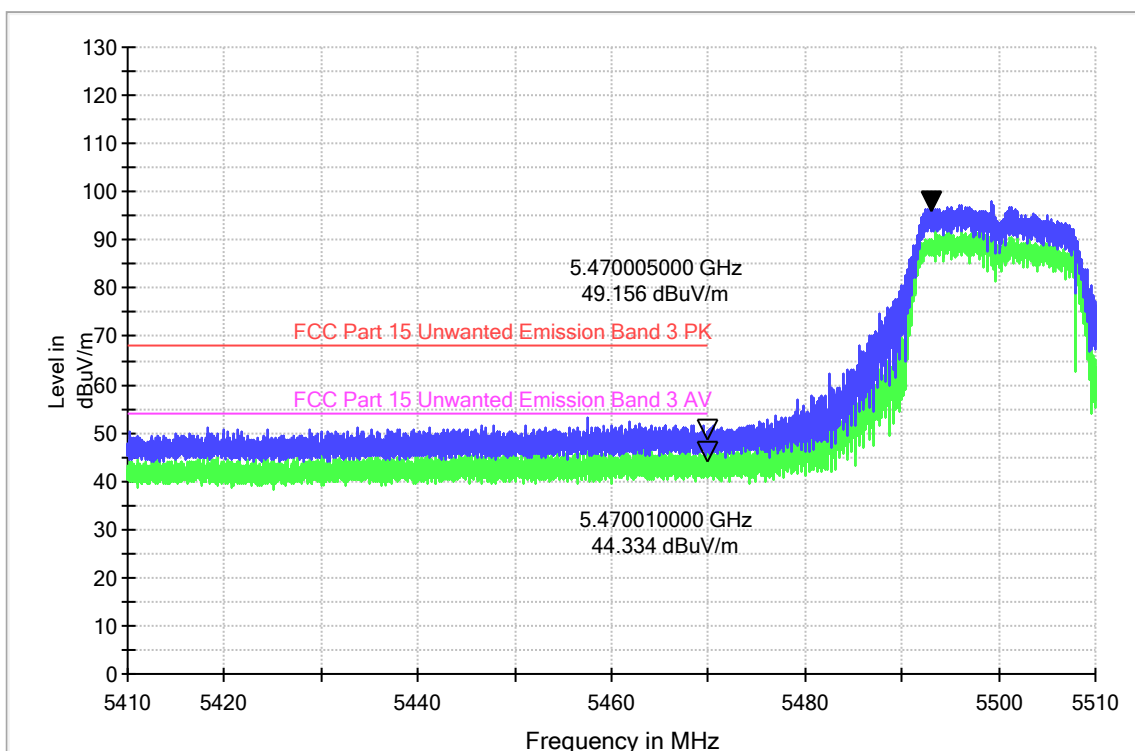


No emissions were significantly above the equipment noise floor.

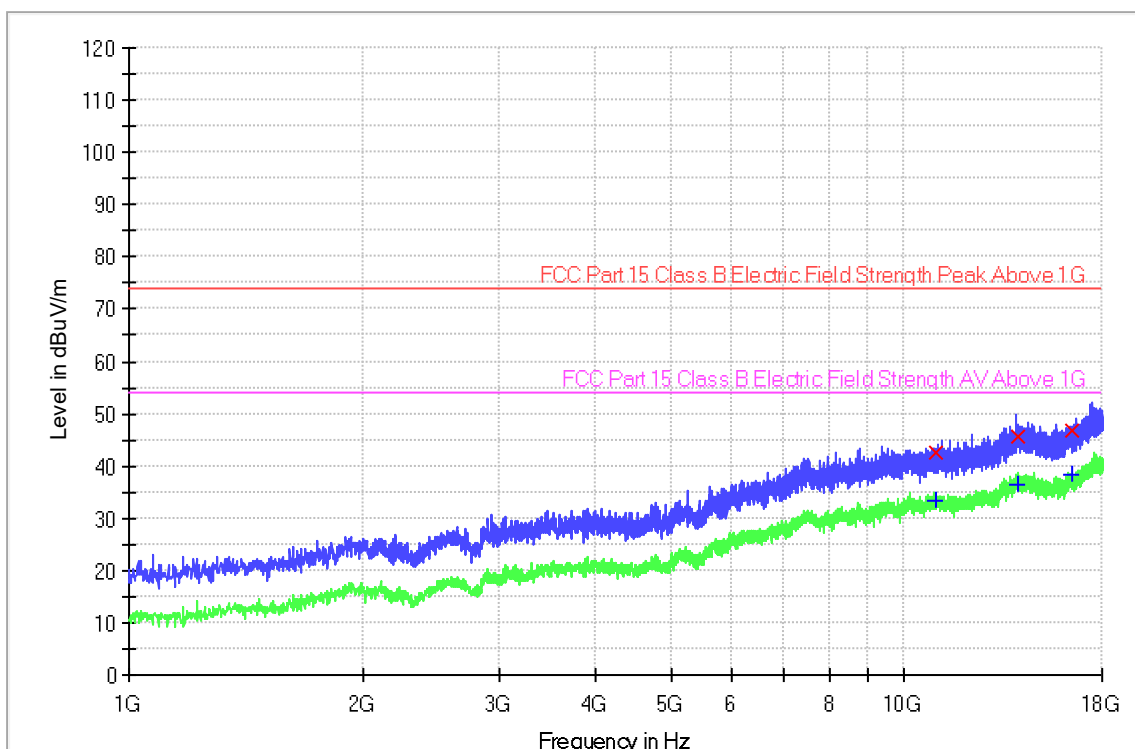
Channel 100

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11000.000	34.7	31.1	39.1	42.7	68.2	25.5
Horizontal	13454.625	36.4	30.9	40.2	45.7	68.2	22.5
Horizontal	16500.000	38.9	31.6	39.4	46.7	68.2	21.5
Horizontal	5470.000	45.4	30.1	33.9	49.2	68.2	19.0

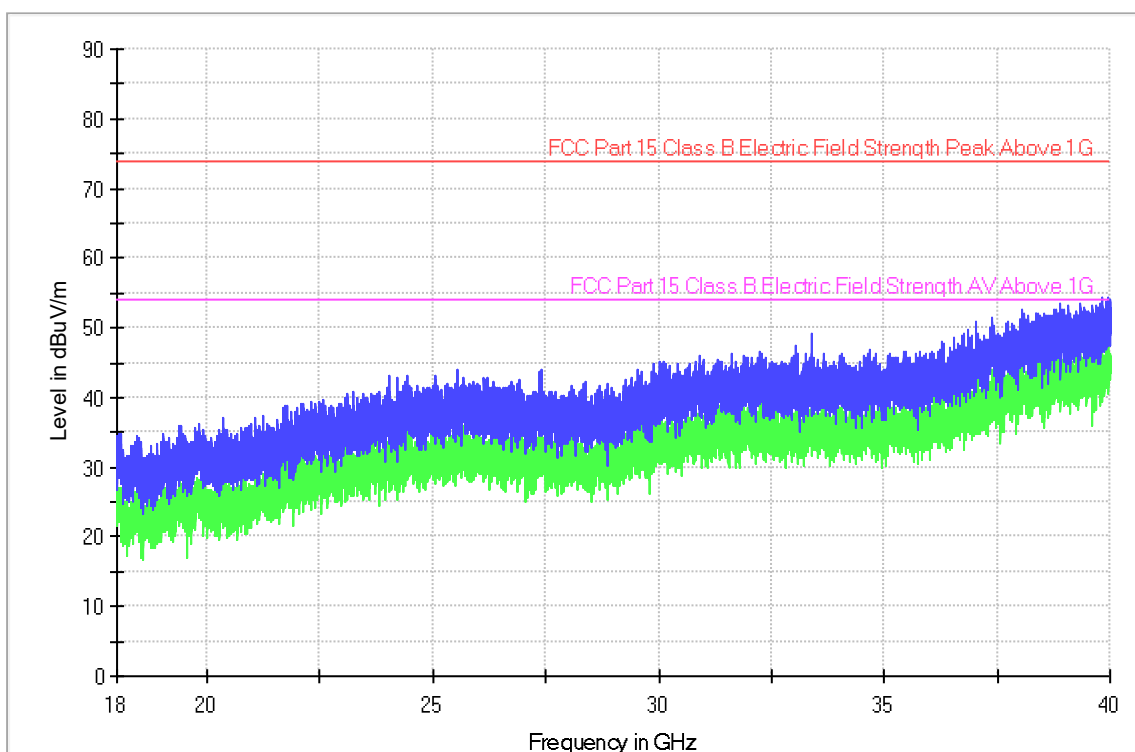
Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11000.000	25.3	31.1	39.1	33.3	54.0	20.7
Horizontal	13454.625	27.1	30.9	40.2	36.4	54.0	17.6
Horizontal	16500.000	30.6	31.6	39.4	38.4	54.0	15.6
Horizontal	5470.000	40.5	30.1	33.9	44.3	54.0	9.7



Electric Field Strength 1-12.5GdBuV



Electric Field Strength 18-40 GdBuV



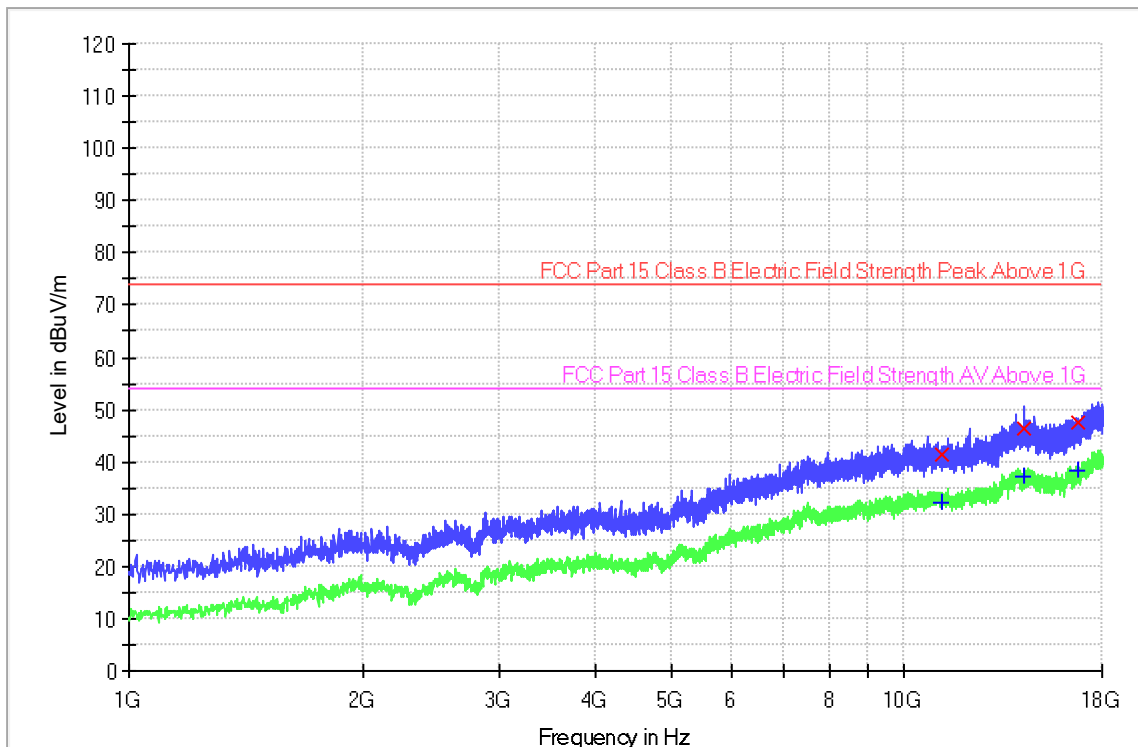
No emissions were significantly above the equipment noise floor.

Channel 116

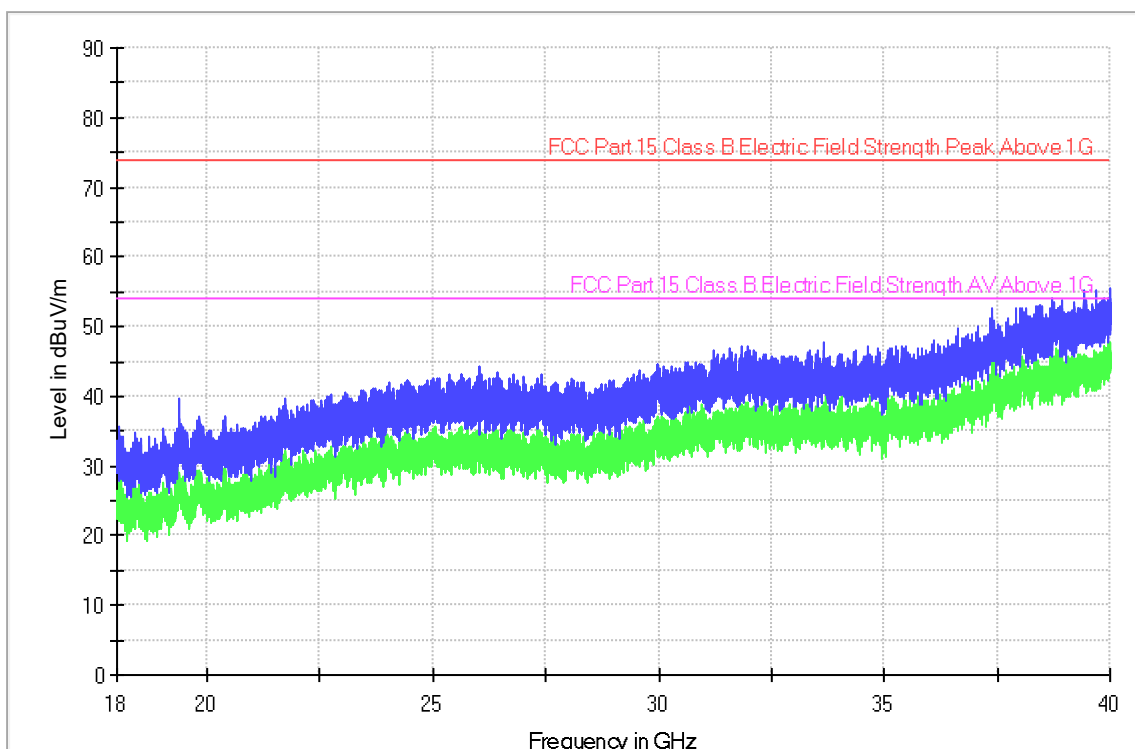
Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11160.000	33.7	31.2	38.9	41.4	68.2	26.8
Horizontal	14102.750	36.0	30.9	41.3	46.4	68.2	21.8
Horizontal	16740.000	39.2	31.6	39.9	47.5	68.2	20.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11160.000	24.5	31.2	38.9	32.2	54.0	21.8
Horizontal	14102.750	26.8	30.9	41.3	37.2	54.0	16.8
Horizontal	16740.000	29.9	31.6	39.9	38.2	54.0	15.8

Electric Field Strength 1-12.5GdBuV



Electric Field Strength 18-40 GdBuV

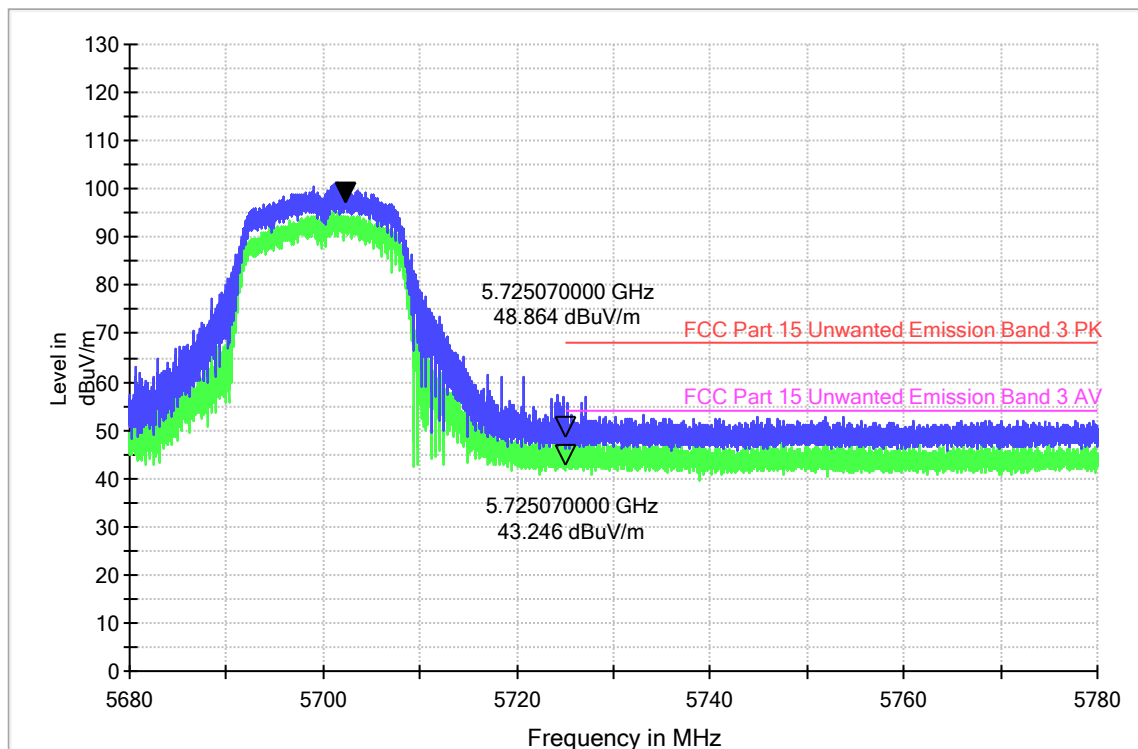


No emissions were significantly above the equipment noise floor.

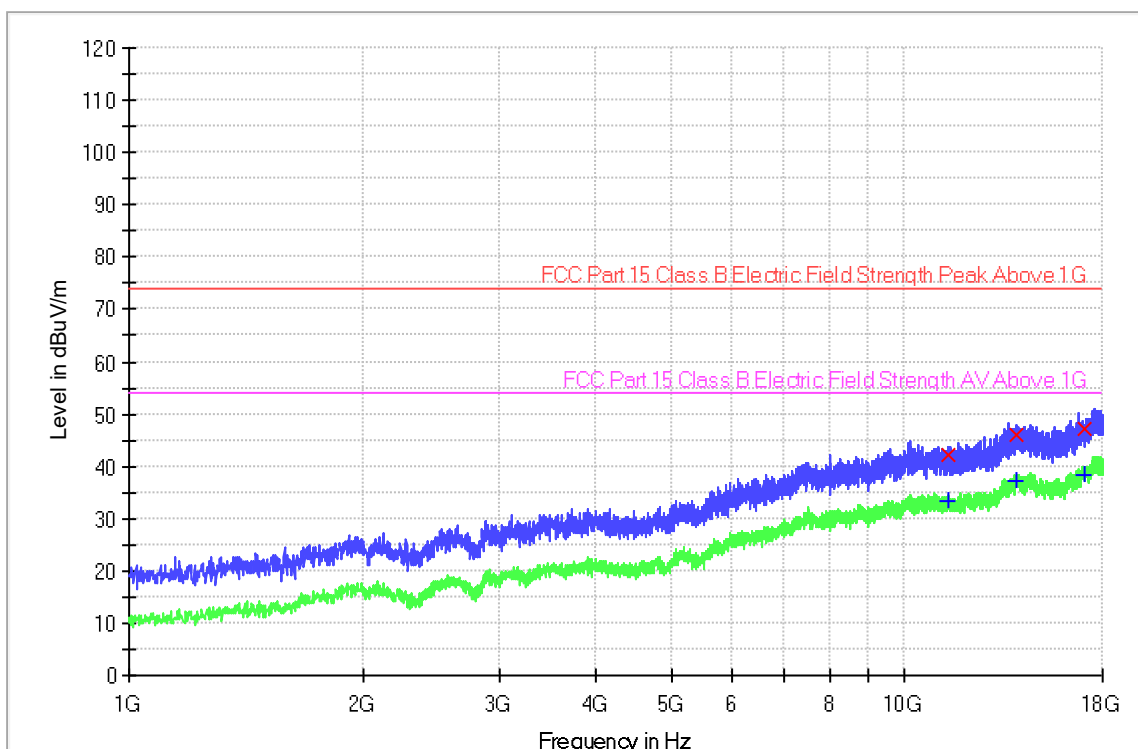
Channel 140

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11400.000	34.3	31.3	39.1	42.1	68.2	26.1
Horizontal	14177.125	35.7	30.9	41.3	46.1	68.2	22.1
Horizontal	17100.000	37.8	31.6	40.9	47.1	68.2	21.1
Horizontal	5725.000	44.7	30.1	34.3	48.9	68.2	19.3

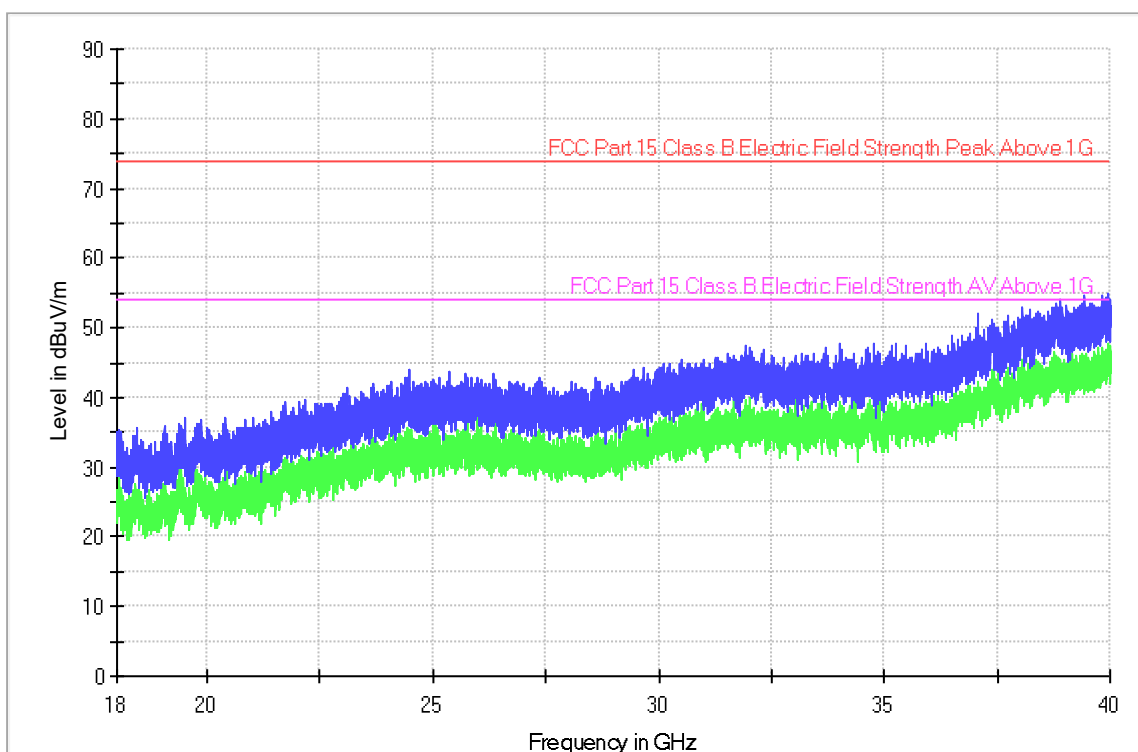
Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11400.000	25.5	31.3	39.1	33.3	54.0	20.7
Horizontal	14177.125	26.9	30.9	41.3	37.3	54.0	16.7
Horizontal	17100.000	29.0	31.6	40.9	38.3	54.0	15.7
Horizontal	5725.000	39.0	30.1	34.3	43.2	54.0	10.8



Electric Field Strength 1-12.5GdBuV



Electric Field Strength 18-40 GdBuV

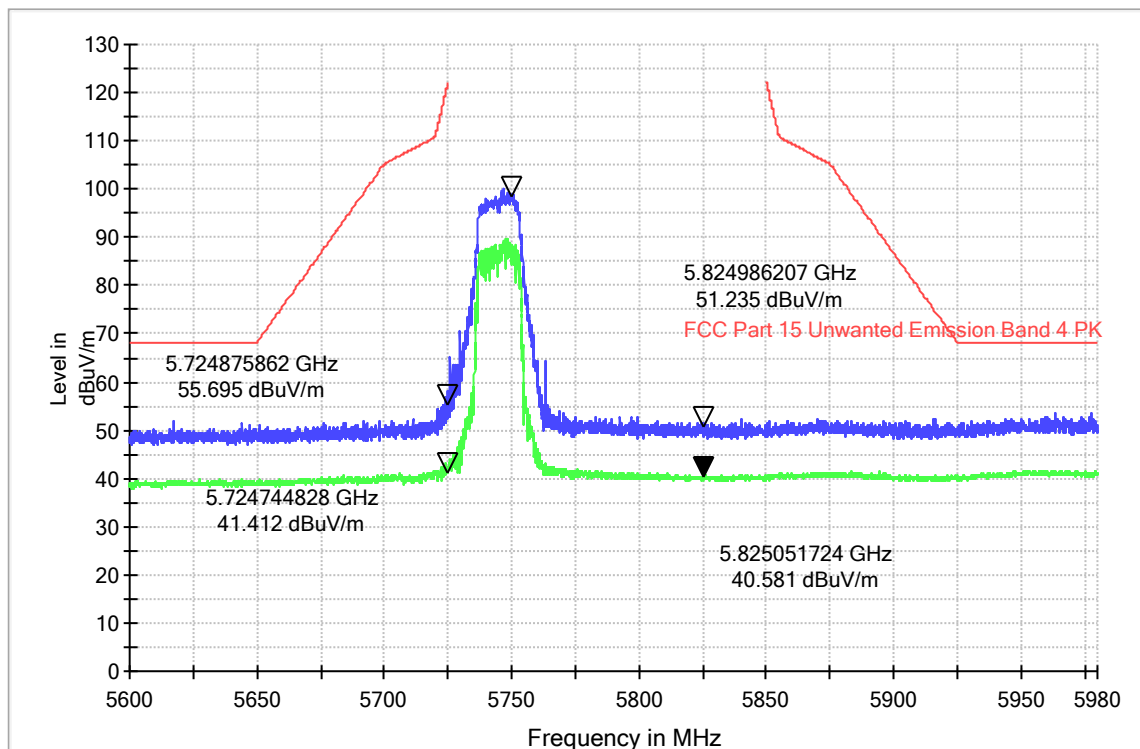


No emissions were significantly above the equipment noise floor.

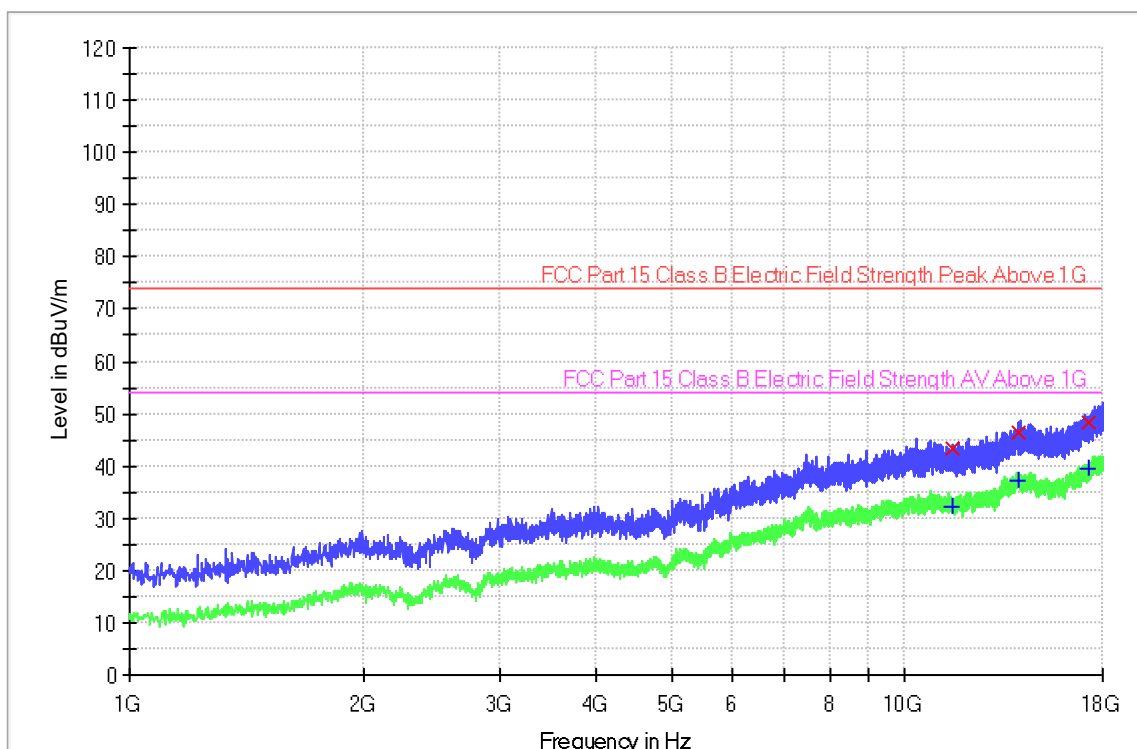
Channel 149

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11490.000	35.6	31.3	39.2	43.5	74	30.5
Horizontal	14113.375	36.1	30.9	41.3	46.5	68.2	21.7
Horizontal	17235.000	38.7	31.6	41.4	48.5	68.2	19.7
Horizontal	5725.000	51.5	30.1	34.3	55.7	122.2	66.5

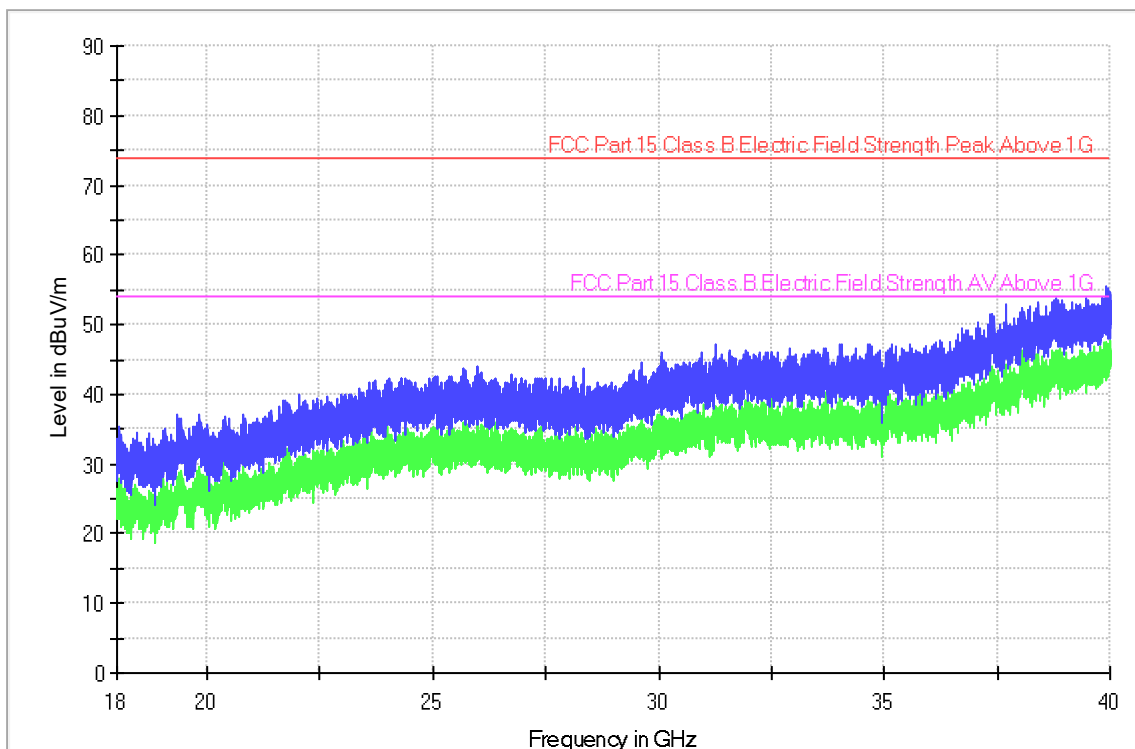
Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11490.000	24.5	31.3	39.2	32.4	54.0	21.6
Horizontal	14113.375	27.0	30.9	41.3	37.4	54.0	16.6
Horizontal	17235.000	29.6	31.6	41.4	39.4	54.0	14.6



Electric Field Strength 1-12.5GdBuV



Electric Field Strength 18-40 GdBuV



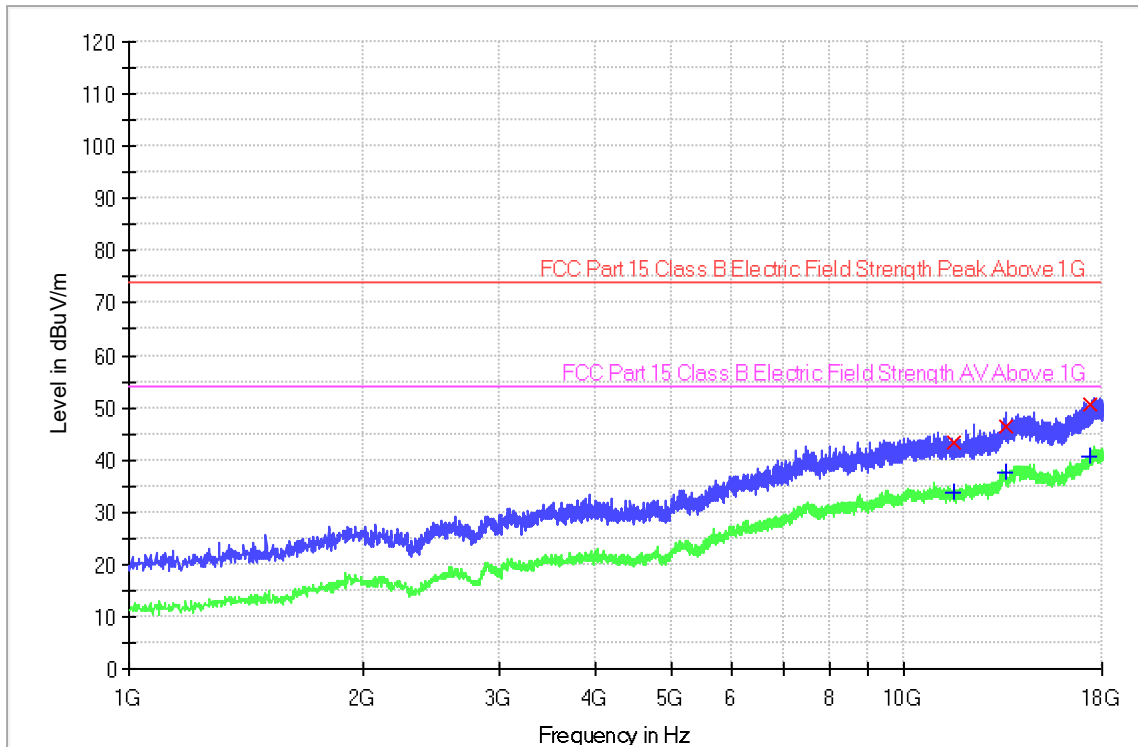
No emissions were significantly above the equipment noise floor.

Channel 157

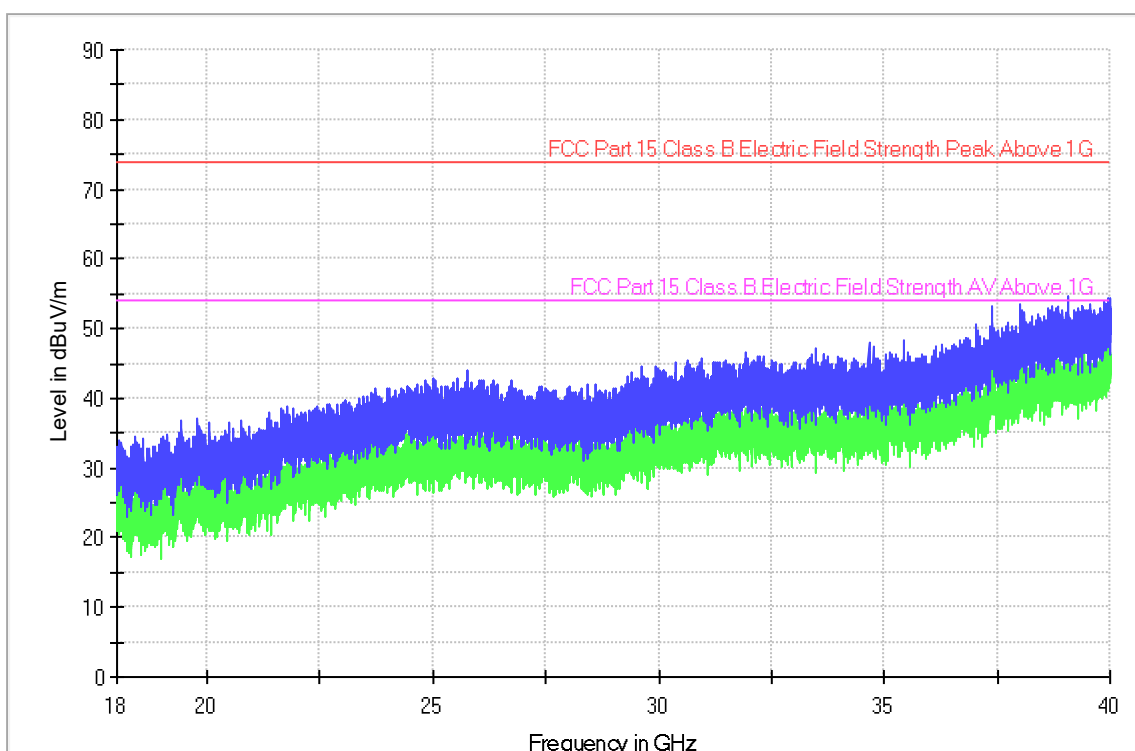
Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11570.000	35.6	31.3	39.2	43.5	74	30.5
Horizontal	13932.750	36.5	30.9	40.9	46.5	68.2	21.7
Horizontal	17355.000	40.2	31.6	41.9	50.5	68.2	17.7

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11570.000	25.8	31.3	39.2	33.7	54.0	20.3
Horizontal	13932.750	27.7	30.9	40.9	37.7	54.0	16.3
Horizontal	17355.000	30.4	31.6	41.9	40.7	54.0	13.3

Electric Field Strength 1-12.5GdBuV



Electric Field Strength 18-40 GdBuV

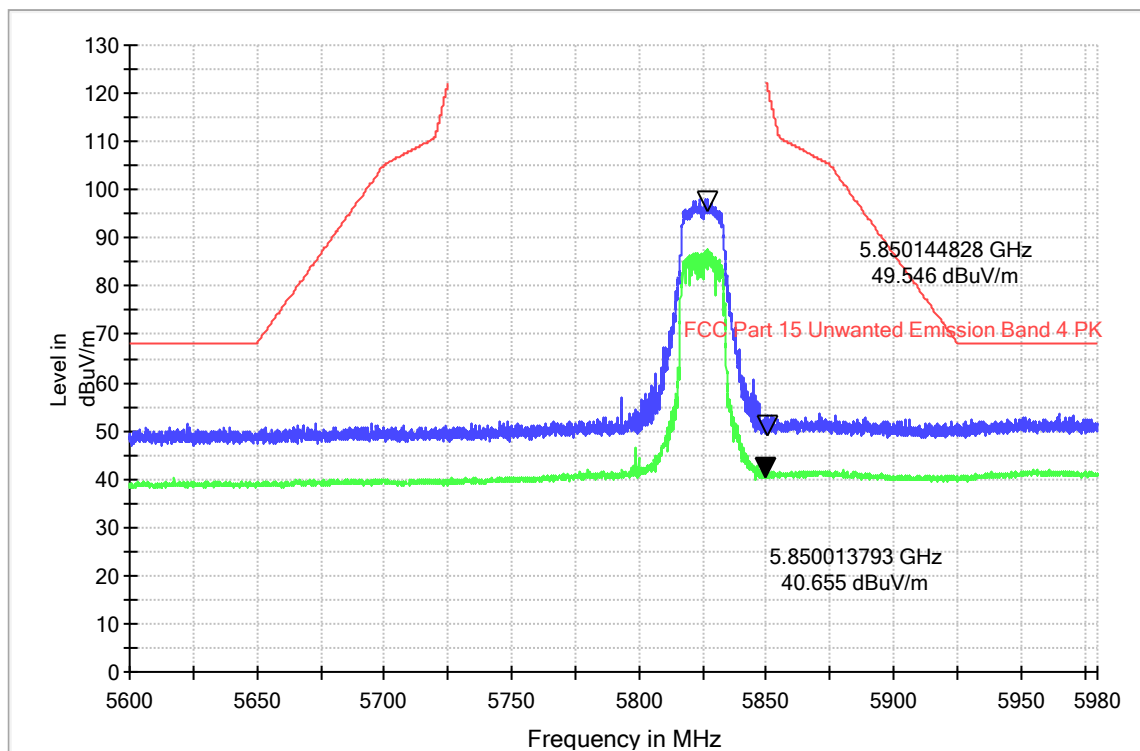


No emissions were significantly above the equipment noise floor.

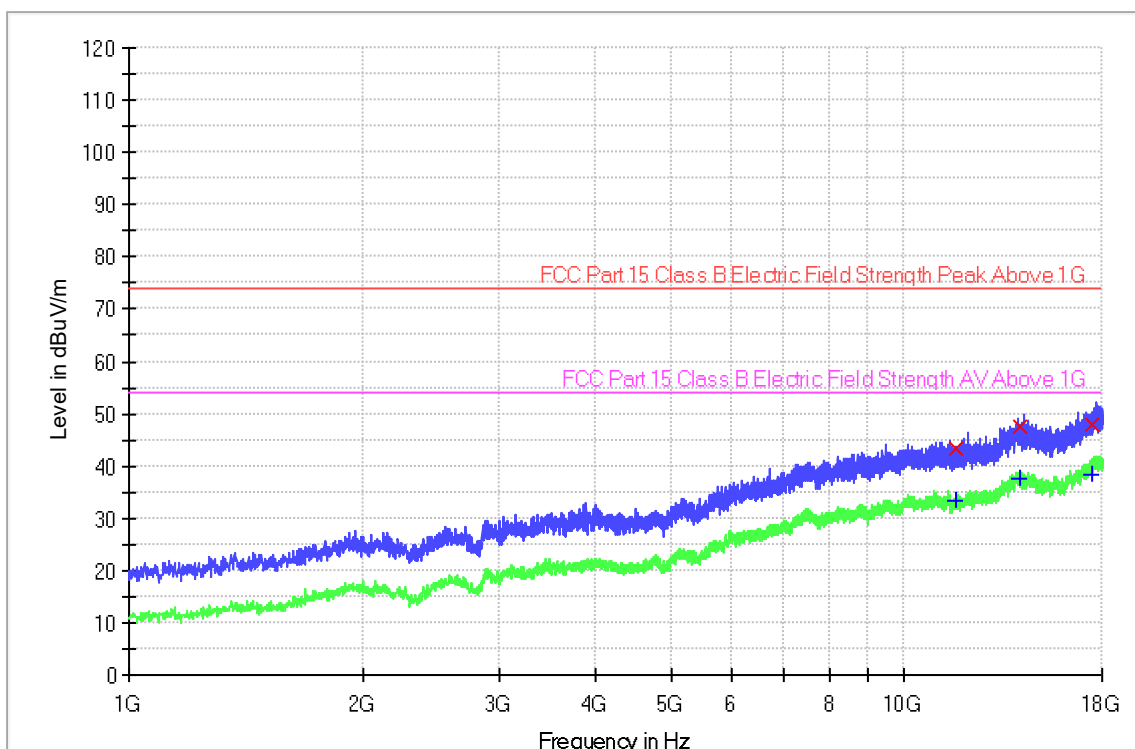
Channel 165

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Peak Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11650.000	35.7	31.3	39.0	43.4	74	30.6
Horizontal	13928.500	37.5	30.9	40.9	47.5	68.2	20.7
Horizontal	17475.000	37.3	31.6	42.3	48.0	68.2	20.2
Horizontal	5850.000	44.7	30.1	34.9	49.5	122.2	72.7

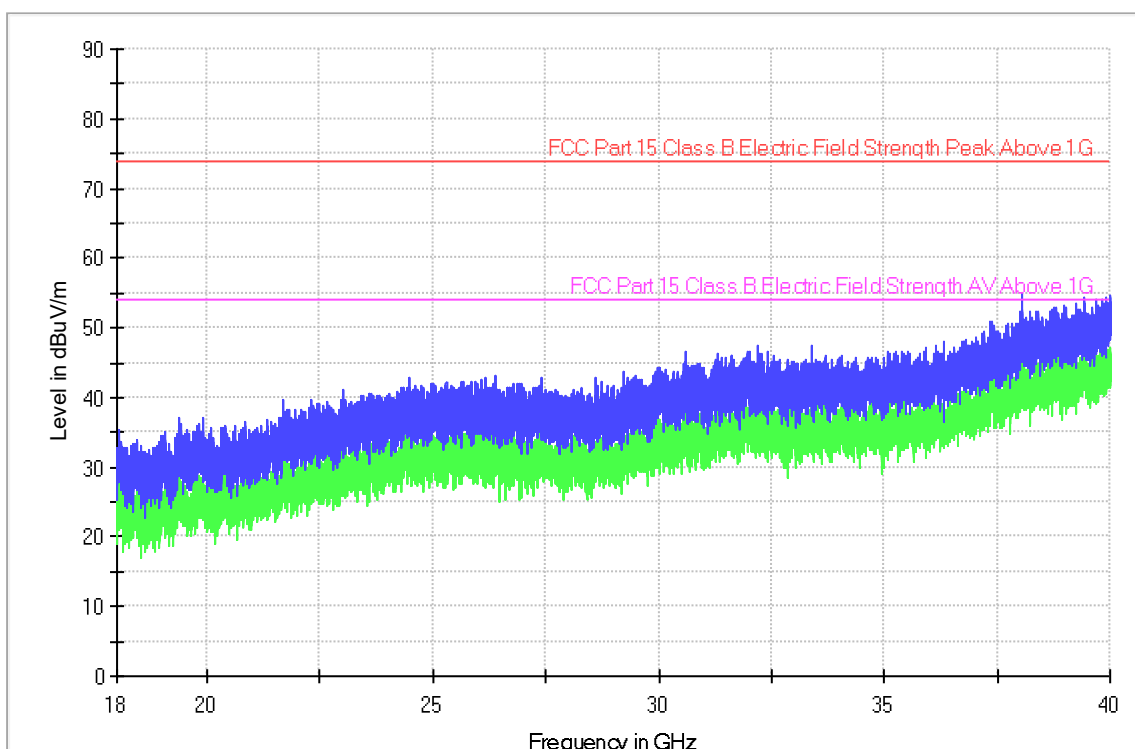
Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
Horizontal	11650.000	25.7	31.3	39.0	33.4	54.0	20.6
Horizontal	13928.500	27.4	30.9	40.9	37.4	54.0	16.6
Horizontal	17475.000	27.7	31.6	42.3	38.4	54.0	15.6



Electric Field Strength 1-12.5GdBuV



Electric Field Strength 18-40 GdBuV



No emissions were significantly above the equipment noise floor.

Note:

1. Horn antenna used for the emission over 1000MHz.
2. All supported modulation have been tested on the unit and only worst case configuration is reported.
3. Tests were conducted in both the horizontal and vertical directions, but only worst-case data record in report.

4. Emission within the restricted band meets the requirement. The corresponding limit are based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function. All unwanted emissions outside of the 5.15-5.35GHz & 5.47-5.725GHz & 5725-5850 bands are complied with the limit.

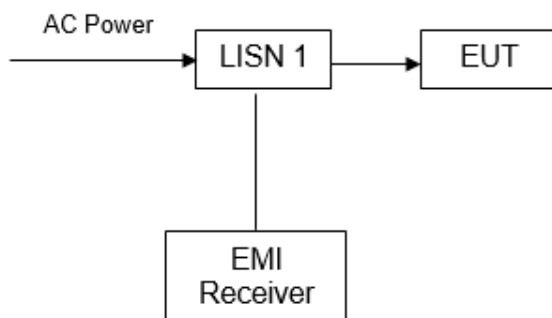
15 AC Power line Conducted Emission

15.1 Limit

Freq. (MHz)	Conducted Limit (dB μ V)	
	Q.P.	Ave.
0.15~0.5	66 – 56*	56 – 46*
0.50~5.0	56	46
5.00~30.0	60	50

* Decreases with the logarithm of the frequency.

15.2 Test Setup



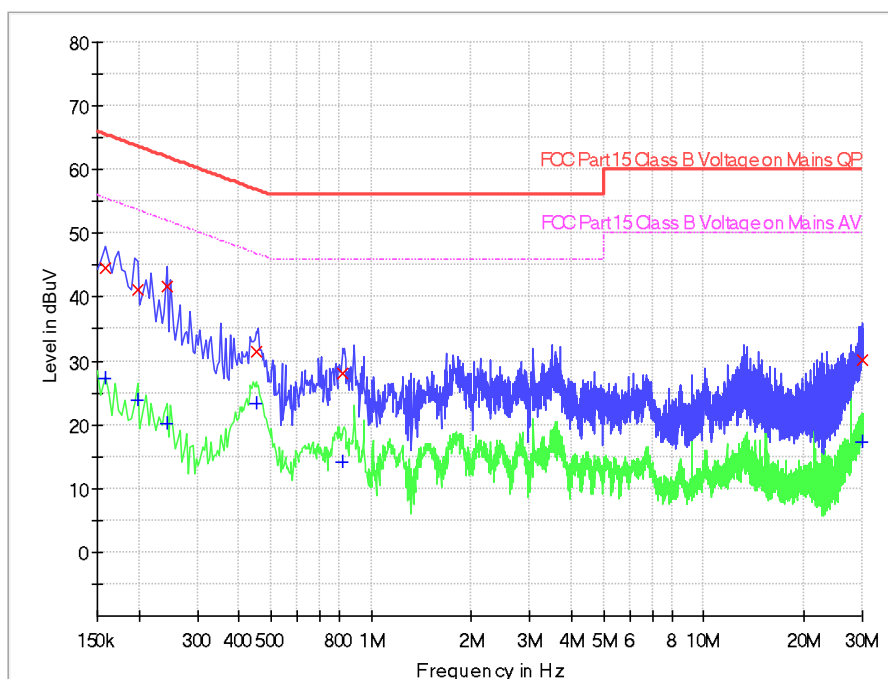
15.3 Test Procedure

The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESCI) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2020+Cor 1-2023. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

15.4 Test Results of AC Power line conducted emission

Product Name:	Smart Speaker	Product Model:	36025341
Test By:	Mandy Chen	Test mode:	5G Wi-Fi mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Line
Test voltage:	AC 120V, 60Hz		

Conducted Emission Test - FCC Part 15



Limit and Margin QP

Frequency (MHz)	Quasi Peak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	44.5	9.000	L1	9.7	21.1	65.6
0.198000	41.2	9.000	L1	9.7	22.5	63.7
0.242000	41.7	9.000	L1	9.7	20.3	62.0
0.450000	31.3	9.000	L1	9.7	25.6	56.9
0.822000	28.1	9.000	L1	9.7	27.9	56.0
29.910000	30.0	9.000	L1	12.4	30.0	60.0

Limit and Margin AV

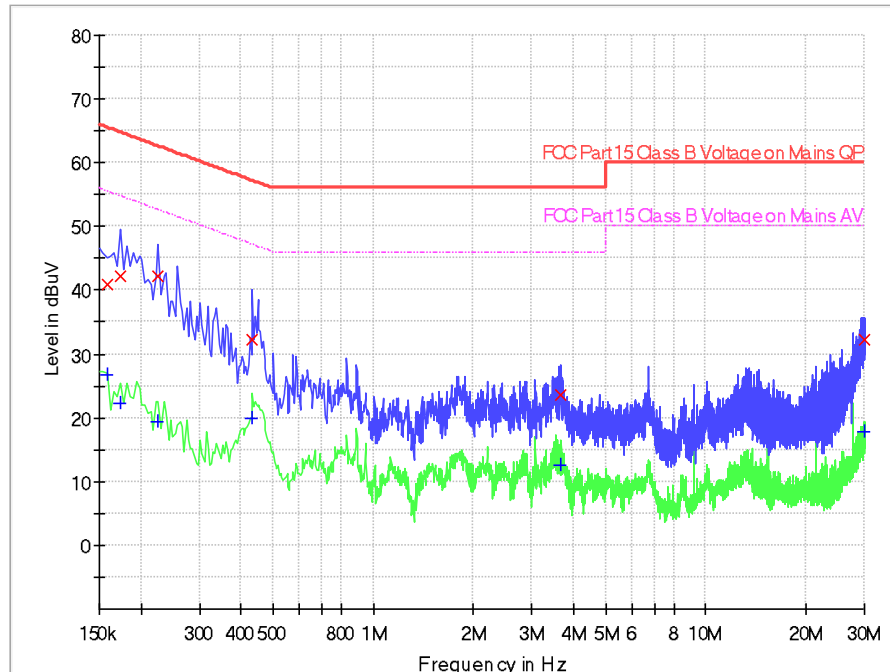
Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	27.1	9.000	L1	9.7	28.5	55.6
0.198000	23.7	9.000	L1	9.7	30.0	53.7
0.242000	20.1	9.000	L1	9.7	31.9	52.0
0.450000	23.3	9.000	L1	9.7	23.6	46.9
0.822000	14.1	9.000	L1	9.7	31.9	46.0
29.910000	17.4	9.000	L1	12.4	32.6	50.0

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBμV) – Quasi Peak/Average (dBμV)

Product Name:	Smart Speaker	Product Model:	36025341
Test By:	Mandy Chen	Test mode:	5G Wi-Fi mode
Test frequency:	150 kHz ~ 30 MHz	Phase:	Neutral
Test voltage:	AC 120V, 60Hz		

Conducted Emission Test - FCC Part 15



Limit and Margin QP

Frequency (MHz)	Quasi Peak (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.158000	40.8	9.000	N	9.7	24.8	65.6
0.174000	42.3	9.000	N	9.7	22.5	64.8
0.226000	42.1	9.000	N	9.7	20.5	62.6
0.434000	32.3	9.000	N	9.7	24.9	57.2
3.678000	23.7	9.000	N	9.9	32.3	56.0
29.910000	32.1	9.000	N	12.4	27.9	60.0

Limit and Margin AV

Frequency (MHz)	Average (dBμV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	26.8	9.000	N	9.7	28.8	55.6
0.174000	22.2	9.000	N	9.7	32.6	54.8
0.226000	19.4	9.000	N	9.7	33.2	52.6
0.434000	19.9	9.000	N	9.7	27.3	47.2
3.678000	12.5	9.000	N	9.9	33.5	46.0
29.910000	17.7	9.000	N	12.4	32.3	50.0

Remark:

1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBμV) – Quasi Peak/Average (dBμV)

16 Dynamic Frequency Selection (DFS)

16.1 LIMITS

DFS Detection Thresholds

Table 3: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

Maximum Transmit Power	Values (See Notes 1, 2, and 3)
EIRP $\geq$ 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	-64 dBm
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 Response Requirements

Table 4: DFS Response Requirement 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 ms + an aggregate of 60 ms over remaining 10 Second period. (see note 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.	

APPLICABILITY OF DFS REQUIREMENTS

A U-NII network will employ a DFS function to detect signals from radar systems and to avoid co-channel operation with these systems. This applies to the 5250-5350 MHz and/or 5470-5725 MHz bands.

Within the context of the operation of the DFS function, a U-NII device will operate in either Master Mode or Client Mode. U-NII devices operating in Client Mode can only operate in a network controlled by a U-NII device operating in Master Mode.

Table 1: 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	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: 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 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.

PARAMETERS OF RADAR TEST WAVEFORMS

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Table D.5: Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A Test B	Roundup $\left\{ \left(\frac{1}{360} \right) \cdot \left(\frac{19 \cdot 10^6}{\text{PRI}_{\mu\text{sec}}} \right) \right\}$	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.					

Table D.6: Long Pulse Radar Test Waveform

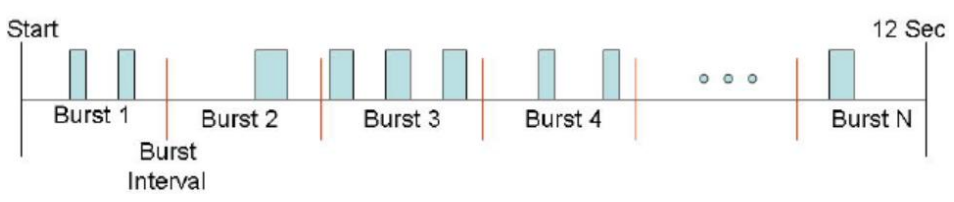
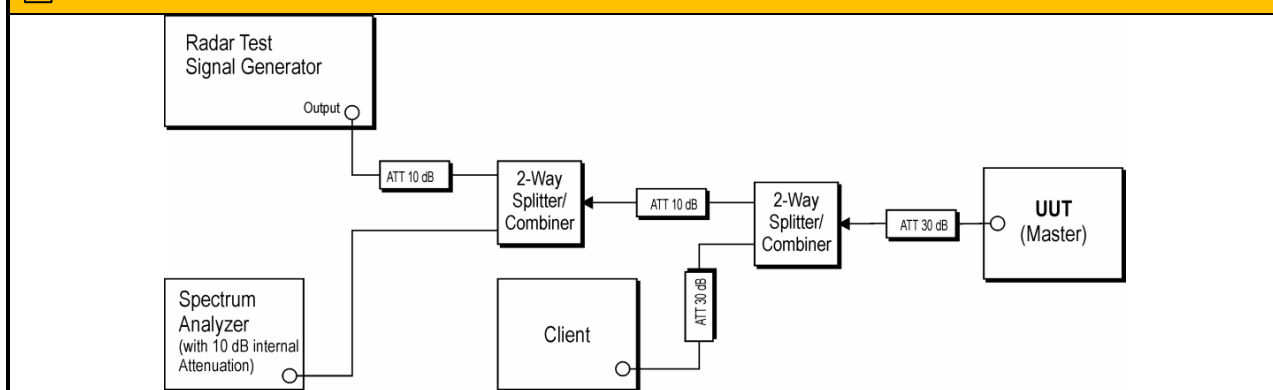
Radar Type	Pulse Width (μsec)	Chirp Width (MHz)	PRI (μsec)	Number of Pulses per Burst	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Number of Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30
Long Pulse Radar Test Signal Wave form 12 second transmission							
							

Table D.7: Frequency Hopping Radar Test Waveform

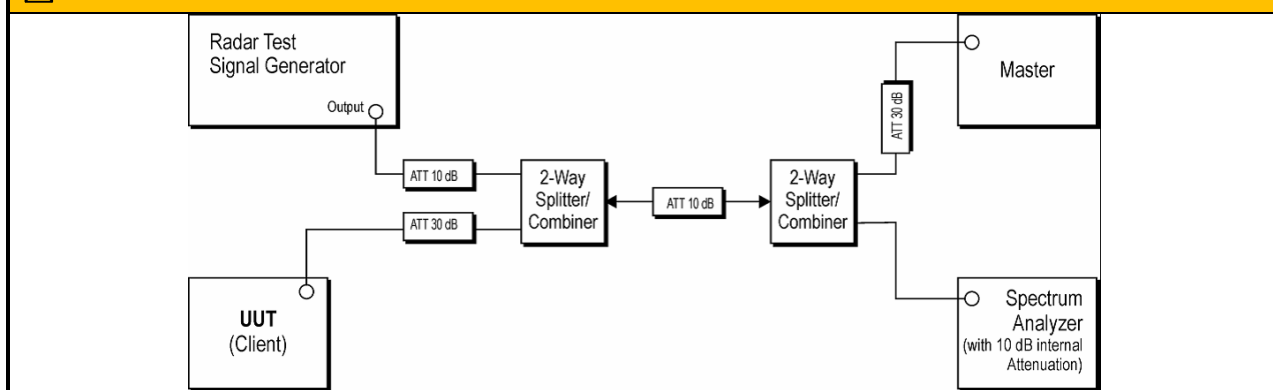
Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	0	0.333	300	70%	30

16.2 Test Procedure

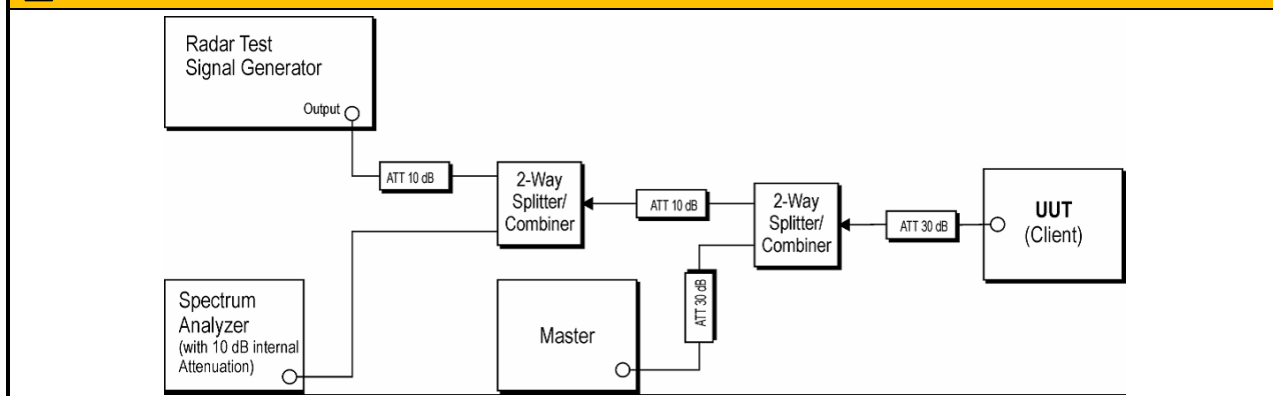
☐ For master device



☒ For Slaver without radar detection function device



☐ For Slaver with radar detection function device



DFS Device Requirements

With reference to KDB905462 D02, Section 8, the required information for the EUT is provided as follows:

1. Frequency Range of Operation:

U-NII-1 Band: 5150 - 5250 MHz, U-NII-2A Band: 5250 - 5350 MHz, U-NII-2C Band: 5470 - 5725 MHz,

U-NII-3 Band: 5725 - 5850 MHz

(Note: The operational channels tested are within these bands.)

2. Device Type and Operating Mode(s):

Device Type: Client Device (Slave) without Radar Detection Capability.

Operating Mode: The EUT operates as a client in a network. The Master Device (with Radar Detection), FCC ID: PY324100620, IC:4054A-24100620, Model: RS500, was used to control the EUT during DFS testing.

3. Maximum and Minimum EIRP:

Please refer to Section 10 & 11 of the test report for detailed conducted output power and power spectral density measurements.

The maximum antenna gain is 7.5dBi (The final EIRP values, incorporating this gain, are calculated and presented in the referenced section.

4. Channel Loading Method / Test Traffic:

The test traffic for channel loading was generated by streaming data from the Master Device to the EUT (Client Device). This method is consistent with the requirements for IP-based systems that dynamically manage traffic load.

5. Device Boot-Up & Initialization Time:

The total time required for the system (Master and Client) to fully boot up, synchronize, and be ready for normal operation is 120 seconds.

6. Manufacturer's Declaration on Radar Waveform Parameters:

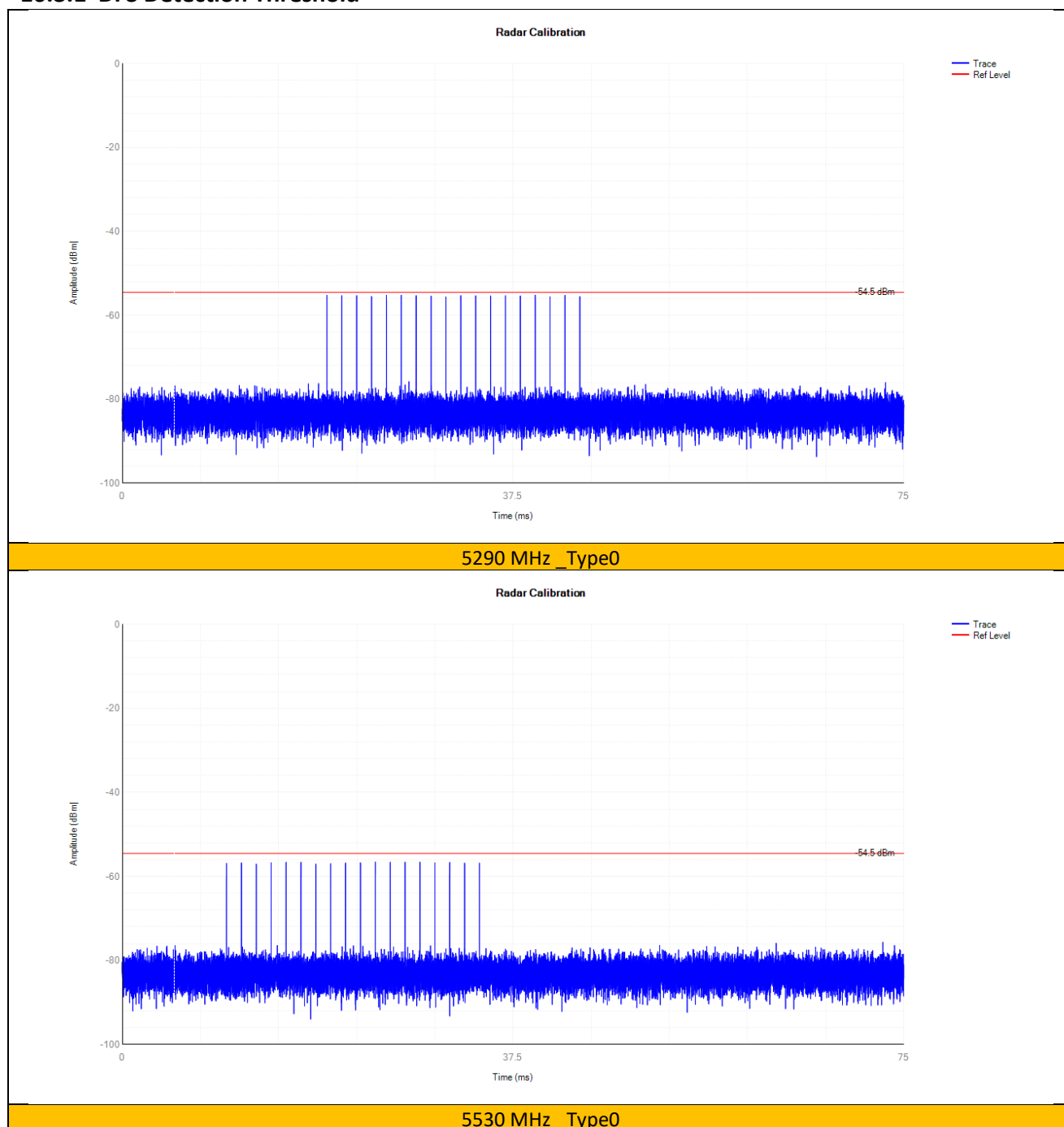
The manufacturer hereby confirms that information regarding the parameters of the detected radar waveforms is not available to the end user or any party outside the control of the manufacturer, in compliance with the relevant FCC rules.

7. Channel Selection Method:

The Master Device can be manually configured to select the initial operating channel. For testing purposes, the first channel was manually set to 5290 MHz.

16.3 Test Result

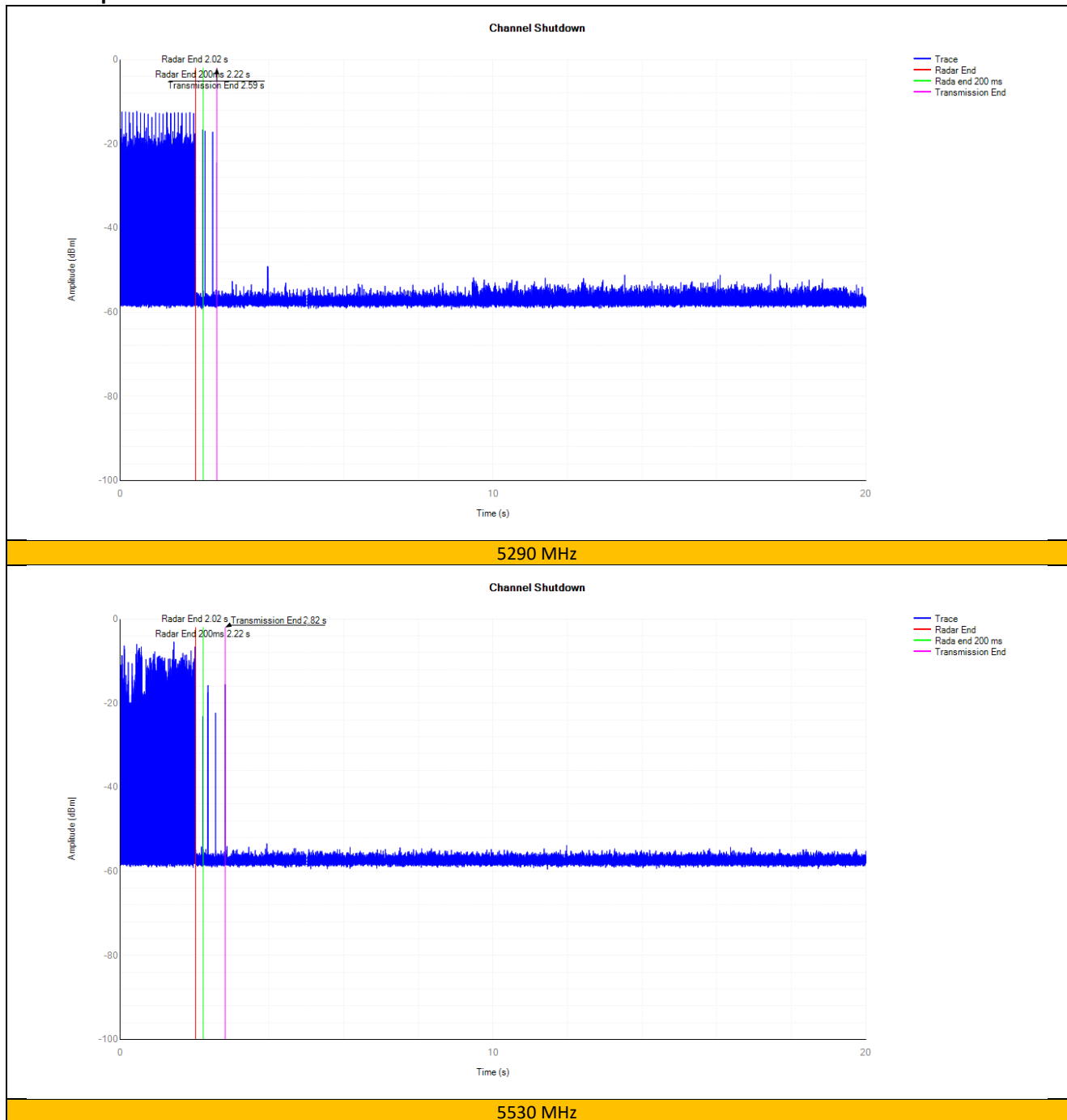
16.3.1 DFS Detection Threshold



16.3.2 Channel Move time and Channel Closing Transmission Time

Frequency (MHz)	Channel Move Time (s)	Limit Channel Move Time (s)	Close Transmission Time (s)	Limit Close Transmission Time (s)	Close Transmission Time after 200ms(s)	Limit Close Transmission Time after 200ms (s)	Verdict
5290	0.568	10	0.003	0.26	0.003	0.06	Pass
5530	0.792	10	0.005	0.26	0.004	0.06	Pass

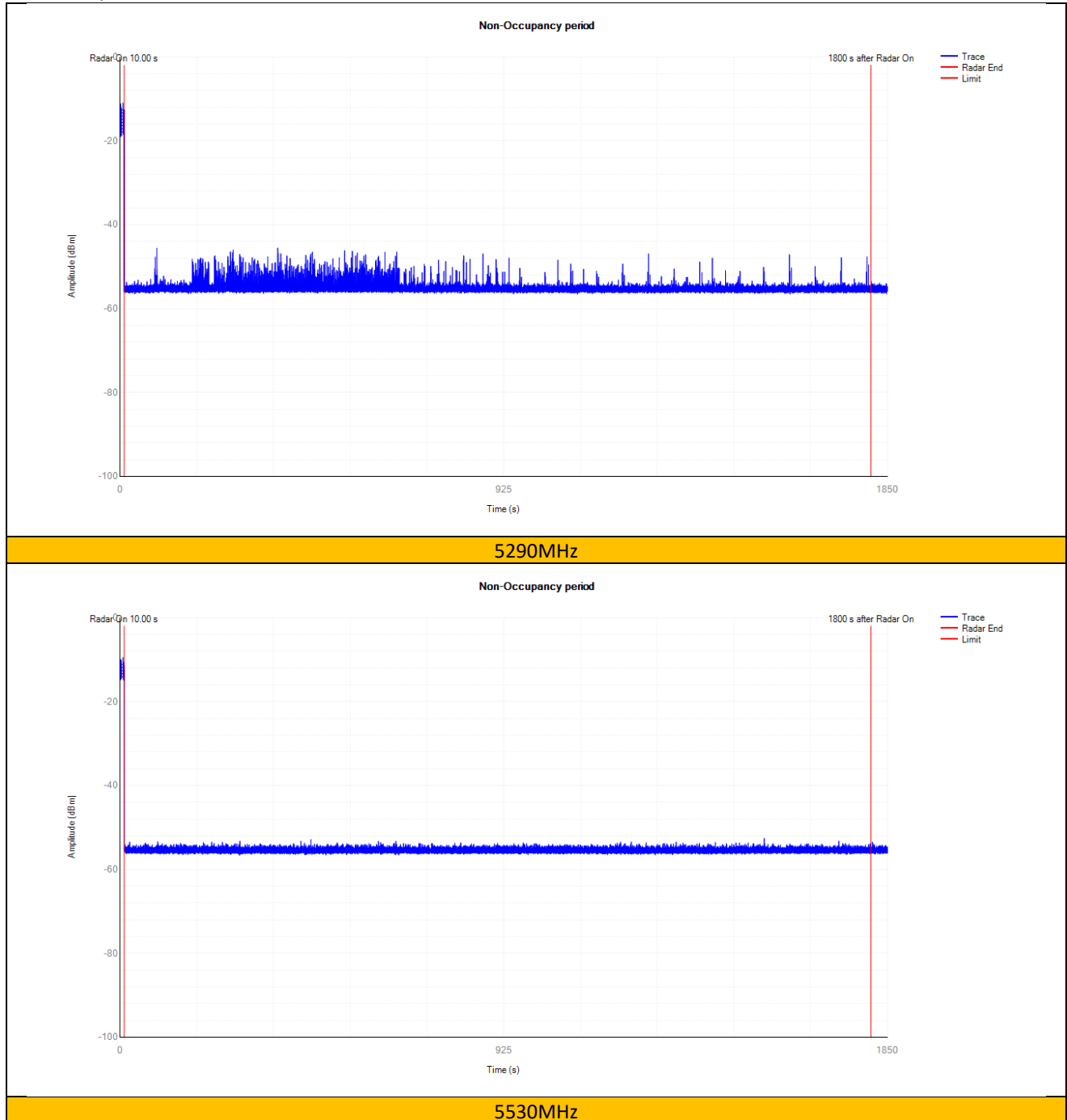
Test Graph:



16.3.3 Non-Occupancy Period Test Results

Frequency [MHz]	Result	Limit[s]	Verdict
5290	see test graph	≥ 1800	PASS
5530	see test graph	≥ 1800	PASS

Test Graph:



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