Element Materials Technology
(formerly PCTEST)
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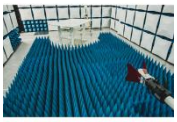

MEASUREMENT REPORT
FCC PART 15.407 / ISED RSS-247 UNII 802.11a/n

Applicant Name:
Apple Inc.
One Apple Park Way
Cupertino, CA 95014
United States

Date of Testing:
6/10/2025 - 07/29/2025
Test Report Issue Date:
8/4/2025
Test Site/Location:
Element Materials Technology, Morgan Hill, CA, USA
Test Report Serial No.:
1C2503270033-12.BCG

FCC ID:	**BCG-A3337**
IC:	**579C-A3337**
APPLICANT:	**Apple Inc.**

Application Type:	Certification
Model/HVIN:	A3337, A3453
EUT Type:	Watch
Frequency Range:	5180 – 5825MHz
Modulation Type:	OFDM
FCC Classification:	Unlicensed National Information Infrastructure (UNII)
FCC Rule Part(s):	Part 15 Subpart E (15.407)
ISED Specification:	RSS-247 Issue 3
Test Procedure(s):	ANSI C63.10-2020, KDB 789033 D02 v02r01

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2020 and KDB 789033 D02 v02r01. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

RJ Ortanez
Executive Vice President

ACCREDITED
CERT #2041.02

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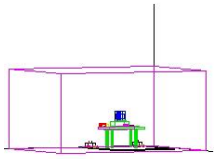
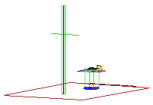


MEASUREMENT REPORT



UNII Band	Channel Bandwidth (MHz)	Mode	Tx Frequency (MHz)	FCM	
				Max. Power (mW)	Max. Power (dBm)
1	20	802.11a	5180 - 5240	49.317	16.93
		802.11n (MCS0)		49.774	16.97
		802.11n (MCS7)		30.620	14.86
2A		802.11a	5260-5320	45.814	16.61
		802.11n (MCS0)		49.091	16.91
		802.11n (MCS7)		31.477	14.98
2C		802.11a	5500-5720	47.753	16.79
		802.11n (MCS0)		49.545	16.95
		802.11n (MCS7)		30.339	14.82
3		802.11a	5745-5825	49.317	16.93
		802.11n (MCS0)		49.888	16.98
		802.11n (MCS7)		30.130	14.79

FCC EUT Overview

UNII Band	Channel Bandwidth (MHz)	Mode	Tx Frequency (MHz)	FCM	
				Max. Power (mW)	Max. Power (dBm)
1	20	802.11a	5180 - 5240	39.174	15.93
		802.11n (MCS0)		35.156	15.46
		802.11n (MCS7)		31.333	14.96
2A		802.11a	5260-5320	45.814	16.61
		802.11n (MCS0)		49.091	16.91
		802.11n (MCS7)		31.477	14.98
2C		802.11a	5500-5720	47.753	16.79
		802.11n (MCS0)		49.545	16.95
		802.11n (MCS7)		30.339	14.82
3		802.11a	5745-5825	49.317	16.93
		802.11n (MCS0)		49.888	16.98
		802.11n (MCS7)		30.130	14.79

ISED EUT Overview

1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

1.2 Element Materials Technology Test Location

These measurement tests were conducted at the Element facility located at 18855 Adams Court, Morgan Hill, CA 95037. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014 and KDB 414788 D01 v01r01.

1.3 Test Facility / Accreditations

Measurements were performed at Element Materials Technology.

- Element Materials Technology is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.02 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.

- Element Washington DC LLC TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).

- Element Materials Technology facility is a registered (22831) test laboratory with the site description on file with ISED.

- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB # US0110) for ISED Canada as designated by NIST under the U.S. and Canada Mutual Recognition Agreements (MRAs).

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Apple Watch FCC ID: BCG-A3337** and **IC: 579C-A3337**. The test data contained in this report pertains only to the emissions due to the EUT's UNII 802.11a/n transmitter.

Test Device Serial No.: HPM424T49Y, JQ20QY4HMH, H4JH7GFJ7M, DLCHG1000VY0000TX8

2.2 Device Capabilities

This device contains the following capabilities:

Multi-band LTE, 5G NR (FR1), 802.11b/g/n WLAN, 802.11a/n UNII, 802.15.4 ab-NB, Bluetooth (1x, EDR, HDR4, HDR8, LE1M, LE2M), NFC, UWB, 60.5GHz Transmitter

Band 1	
Ch.	**Frequency (MHz)**
36	5180
:	:
44	5220
:	:
48	5240

Band 2A	
Ch.	**Frequency (MHz)**
52	5260
:	:
56	5280
:	:
64	5320

Band 2C	
Ch.	**Frequency (MHz)**
100	5500
:	:
116	5580
:	:
144	5720

Band 3	
Ch.	**Frequency (MHz)**
149	5745
:	:
157	5785
:	:
165	5825

Table 2-1. 802.11a / 802.11n / Channel Operations

Notes:

1. 5GHz NII operation is possible in 20MHz channel bandwidth. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = peak per the guidance of Section B)2)b) KDB 789033 D02 v02r01 and ANSI C63.10-2020. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Measured Duty Cycles			
802.11 Mode/Band		**FCM**	
		Duty Cycle [%]	**DCCF [dB]**
5GHz	a	98.51	0.07
	n (HT20) (MCS0)	98.91	0.05
	n (HT20) (MCS7)	73.25	1.35

Table 2-2. Measured Duty Cycles

Data Rate(s) Tested: 6, 9, 12, 18, 24, 36, 48, 54Mbps (802.11a)
6.5/7.2, 13/14.4, 19.5/21.7, 26/28.9, 39/43.3, 52/57.8, 58.5/65, 65/72.2Mbps (802.11n – 20MHz)

2. This device supports simultaneous transmission operations, which allows for multiple transmitters to transmit simultaneously on the same antenna. The table below shows all configurations possible.

Simultaneous Tx Config	Antenna FCM					
	WLAN	Bluetooth	802.15.4ab - NB	LTE/FR1	UNII	UWB
	802.11 b/g/n	BDR, EDR, HDR4/8, LE1/2M	O-QPSK	Mid/High Band	802.11 a/n	Ch.5/Ch.9
Config 1	✓	×	×	✓	×	✓
Config 2	×	✓	×	✓	×	✓
Config 3	×	✓	✓	✓	×	×
Config 4	✓	×	✓	✓	×	×
Config 5	×	✓	×	✓	✓	×
Config 6	×	✓	×	✓	×	✓
Config 7	✓	×	×	✓	×	×
Config 8	✓	×	✓	×	×	×
Config 9	✓	×	×	×	×	✓
Config 10	×	✓	×	×	✓	×
Config 11	×	✓	×	✓	×	×
Config 12	×	✓	✓	×	×	×
Config 13	×	✓	×	×	×	✓
Config 14	×	×	✓	✓	×	×
Config 15	×	×	×	✓	✓	×
Config 16	×	×	×	✓	×	✓

Table 2-3. Simultaneous Table Configurations

✓ = Support; × = Not Support

2.3 Antenna Description

Following antenna gains provided by manufacturer were used for the testing.

Frequency [GHz]	Antenna Gain (dBi)
	FCM
5.150 – 5.250	-6.5
5.250 – 5.350	-4.5
5.470 – 5.725	-2.2
5725 – 5.850	-2.4

Table 2-4. Highest Antenna Gain

2.4 Test Support Equipment

1	Apple Macbook	Model:	A1398	S/N:	FVFDHG8TP3XY
	w/AC/DC Adapter	Model:	A1435	S/N:	N/A
2	Apple USB-C cable	Model:	N/A	S/N:	N/A
	w/ Charging Dock	Model:	A3276	S/N:	DQ84112016A08V22V
	w/ Cradle	Model:	N/A	S/N:	CYV4225004D23LE01MEVR
3	Apple Magnetic Charger	Model:	A2515	S/N:	DLC313306ZQ1NR1A7
	Apple Magnetic Charger	Model:	A2879	S/N:	DLCH5T0012A00000WB
4	Pathfinder Davenport	Model:	920-15901-01	S/N:	DLCH640006H0000QA0
	SiP Socket	Model:	P1 N22X B PF 196	S/N:	DLCH8J000LH0000WXE
5	DC Power Supply	Model:	KPS3010D	S/N:	N/A

Table 2-5. Test Support Equipment List

2.5 Test Configuration

The EUT was tested per the guidance of ANSI C63.10-2020 and KDB 789033 D02 v02r01. ANSI C63.10-2020 was used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. See Sections 3.2 for AC line conducted emissions test setups, 3.3 for radiated emissions test setups, and 7.2, 7.3, 7.4, and 7.5 for antenna port conducted emissions test setups.

The worst case configuration was investigated for all combinations of the two materials, aluminum, and titanium, and various types of wristbands, metal and non-metal wristbands. The EUT was also investigated with and without wireless charger. The worst case configuration found was used for all testing.

For emissions from 1GHz – 18GHz, low, mid, and high channels were tested with highest power and worst case configuration. The emissions below 1GHz and above 18GHz were tested with the highest transmitting power and the worst case channel.

The EUT was manipulated through three orthogonal planes of X-orientation (flatbed), Y-orientation (landscape), and Z-orientation (portrait) during the testing. Only the worst case emissions were reported in this test report.

For AC line conducted and radiated test below 1GHz, following configuration were investigated and EUT powered by AC/DC was the worst case.

- EUT powered by AC/DC adaptor via USB-C cable with magnetic charger
- EUT powered by host PC via USB-C cable with magnetic charger

All possible simultaneous transmission configurations have been investigated and the worst case config has been Reported

Description	Bluetooth	FR1 (Band n41)	UNII
Antenna	FCM	FCM	FCM
Channel	78	518600	36
Operating Frequency (MHz)	2480	2593	5180
Mode/Modulation	GFSK ePA	QPSK/1RB/10MHz	802.11n

Table 2-6. Worst Case Simultaneous Configuration

2.6 Software and Firmware

The test was conducted with firmware version watchOS 26 installed on the EUT.

2.7 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2020) and the guidance provided in KDB 789033 D02 v02r01 were used in the measurement of the EUT.

Deviation from measurement procedure……..…….....None

3.2 AC Line Conducted Emissions

The line-conducted facility is located inside a 7m x 3.66m x 2.7m shielded enclosure. The shielded enclosure is manufactured by AP Americas. The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-6. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50µH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. The external power line filter is EPCOS 2X60A Power Line Filter (100dB Attenuation, 14kHz-18GHz) and the two EPCOs 2X48A filters (100dB Minimum Insertion Loss, 14kHz - 10GHz). These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference ground plane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

Line conducted emissions test results are shown in Section 7.8. Automated test software was used to perform the AC line conducted emissions testing. Automated measurement software utilized is Rohde & Schwarz EMC32, Version 10.50.40.

3.3 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. An 80cm tall test table made of Styrodur is placed on top of the turn table. For measurements above 1GHz, an additional Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

Per KDB 414788, radiated emission test sites other than open-field test sites (e.g., shielded anechoic chambers), may be employed for emission measurements below 30MHz if characterized so that the measurements correspond to those obtained at an open-field test site. To determine test site equivalency, a reference sample transmitting at 149kHz was measured on an open field test site (asphalt with no ground plane) and then measured in the 3m semi-anechoic chamber. A calibrated 60cm loop antenna was used while the reference device was rotated through the X, Y and Z axis in order to capture the worst case level. A maximum deviation of 2.77dB at 149kHz was measured when comparing the 3 meter semi-anechoic chamber to the open field site.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33 depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

3.4 Environmental Conditions

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

4.0 ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:
"An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can 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 shall be considered sufficient to comply with the provisions of this section."

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

Conclusion:

The EUT complies with the requirement of §15.203.

5.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.23-2012. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty (±dB)
Conducted Bench Top Measurements	2.07
Line Conducted Disturbance	1.91
Radiated Disturbance (<30MHz)	4.12
Radiated Disturbance (30MHz - 1GHz)	4.85
Radiated Disturbance (1 - 18GHz)	5.08
Radiated Disturbance (>18GHz)	5.22

6.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent Technologies	N9030A	3Hz-26.5GHz PXA Signal Analyzer	10/31/2024	Annual	10/31/2025	MY55330128
Anritsu	ML2495A	Power Meter	7/3/2025	Annual	7/3/2026	1039008
Anritsu	MA2411B	Pulse Power Sensor	9/5/2024	Annual	9/5/2025	1726262
Anritsu	MA2411B	Pulse Power Sensor	10/21/2024	Annual	10/21/2025	1027293
ATM	180-442-KF	20dB Nominal Gain Horn Antenna	3/24/2025	Annual	3/24/2026	T058601-2
ETS-Lindgren	3117	Double Ridged Guide Antenna (1-18 GHz)	9/25/2024	Annual	9/25/2025	240109
Fairview Microwave	M2CP1122-10	30MHz-40GHz Conducted Coupler *	6/17/2025	Annual	6/17/2026	1946
Fairview Microwave	FMCA1975-36	30MHz-40GHz Conducted Cable *	6/17/2025	Annual	6/17/2026	-
Keysight Technology	N9040B	UXA Signal Analyzer	6/9/2025	Annual	6/9/2026	MY57212015
MCL	BW-K10-2W44+	Attenuator *	6/17/2025	Annual	6/17/2026	-
Rohde & Schwarz	FSW67	Signal and Spectrum Analyzer (2Hz-67GHz)	1/7/2025	Annual	1/7/2026	101366
Rohde & Schwarz	TS-PR18	Pre-Amplifier (1GHz - 18GHz)	8/14/2024	Annual	8/14/2025	101648
Rohde & Schwarz	FSV40	Signal Analyzer (10Hz-40GHz)	5/20/2025	Annual	5/20/2026	101619
Rohde & Schwarz	ESW44	EMI Test Receiver	10/17/2024	Annual	10/17/2025	101668
Rohde & Schwarz	TS-PR8	Pre-Amplifier (30MHz - 8GHz)	11/15/2024	Annual	11/15/2025	102326
Rohde & Schwarz	TS-PR1840	Pre-Amplifier (18GHz - 40GHz)	6/3/2025	Annual	6/3/2026	100052
Rohde & Schwarz	HFH2-Z2	Loop Antenna	5/12/2025	Annual	5/12/2026	100546
Rohde & Schwarz	ENV216	Two-Line V-Network	4/25/2025	Annual	4/25/2026	101364
Rohde & Schwarz	FSW43	Signal and Spectrum Analyzer (2Hz-43.5GHz)	11/21/2024	Annual	11/21/2025	104093
Schwarzbeck	VULB 9162	Bilog Antenna (30MHz - 6GHz)	9/18/2024	Annual	9/18/2025	358

Table 6-1. Test Equipment List

Note:

1. For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

2. * Denotes passive equipment that have been internally verified/calibrated.

7.0 TEST RESULTS

7.1 Summary

Company Name: Apple Inc.
FCC ID: BCG-A3337
IC: 579C-A3337
FCC Classification: Unlicensed National Information Infrastructure (UNII)

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.407	RSS-Gen [6.7]	26dB Bandwidth	N/A	CONDUCTED	N/A	Section 7.2
15.407(e)	RSS-Gen [6.7]	6dB Bandwidth	>500kHz(5725-5850MHz)		PASS	Section 7.3
2.1049	RSS-Gen [6.7]	Occupied Bandwidth	N/A		PASS	Section 7.2, Section 7.3
15.407 (a.1.iv), (a.2), (a.3)	RSS-Gen [6.2]	Maximum Conducted Output Power	Maximum conducted powers must meet the limits detailed in 15.407 (a) (RSS-247 [6.2])		PASS	Section 7.4
15.407 (a.1.iv), (a.2), (a.3)	RSS-Gen [6.2]	Maximum Power Spectral Density	Maximum power spectral density must meet the limits detailed in 15.407 (a) (RSS-247 [6.2])		PASS	Section 7.5
15.407(h)	RSS-Gen [6.3]	Dynamic Frequency Selection	See DFS Test Report	RADIATED	PASS	See DFS Test Report (1C2503270033-10.BCG)
15.407(b.1), (2), (3), (4)	RSS-Gen [6.2]	Undesirable Emissions	Undesirable emissions must meet the limits detailed in 15.407(b) (RSS-247 [6.2])		PASS	Section 7.6
15.205, 15.407(b.1), (2), (3), (4)	RSS-Gen [8.9]	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Emissions in restricted bands must meet the radiated limits detailed in 15.209 (RSS-Gen [8.9])		PASS	Section 7.6, 7.7
15.207	RSS-Gen [8.8]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 (RSS-Gen [8.8]) limits	LINE CONDUCTED	PASS	Section 7.8

Table 7-1. Summary of Test Results

Notes:

1) All channels, modes, and modulations/data rates were investigated among all UNII bands. The test results shown in the following sections represent the worst case emissions.
2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.
4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is Element "Conducted Automation Software," Version 1.4.0.
5) For radiated testing, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is Element "Chamber Automation," Version 3.4.2.
6) Per RSS-247 Section 6.2.3, transmission on the channels which overlap the 5600-5650MHz is prohibited. This device operates under these frequencies only under the control of a certified master device and does not support active scanning on these channels. This device does not transmit any beacons or initiate any transmissions in UNII Bands 2A or 2C.

7.2 26dB & 99% Bandwidth Measurement

§2.1049; §15.407; RSS-Gen [6.7]

Test Overview and Limit

The bandwidth at 26dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2020 and KDB 789033 D02 v02r01, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26dB bandwidth.

The 26dB bandwidth is used to determine the conducted power limits.

Test Procedure Used

ANSI C63.10-2020 – Section 12.5.2
KDB 789033 D02 v02r01 – Section C

Test Settings

1. The signal analyzers' automatic bandwidth measurement capability was used to perform the 26dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 26. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = approximately 1% of the emission bandwidth
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

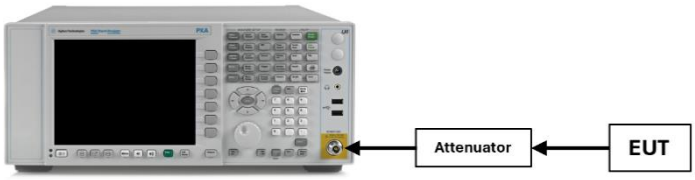


Figure 7-1. Test Instrument & Measurement Setup

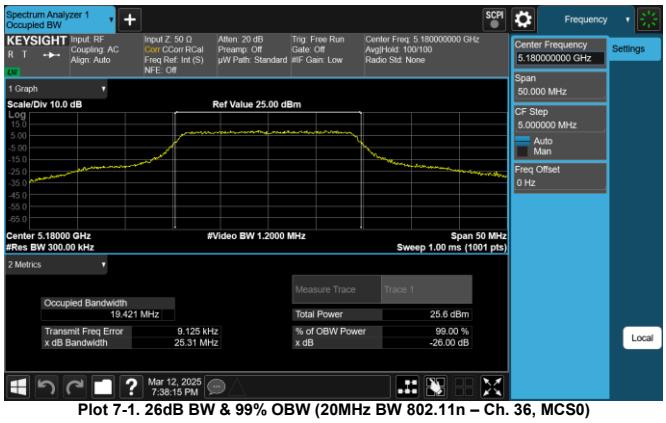
Test Notes

1. All modes were investigated and only the worst case are reported.

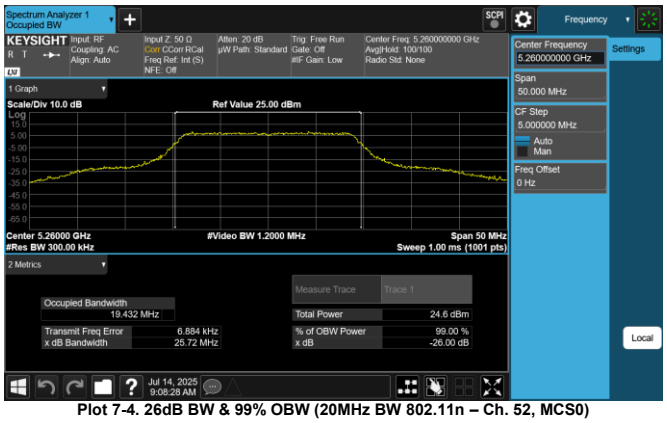
7.2.1 26dB & 99% Bandwidth Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 26dB Bandwidth [MHz]
Band 1	5180	36	n (20MHz)	6.5/7.2 (MCS0)	19.42	25.31
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	19.43	25.30
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	19.48	25.19
Band 2A	5260	52	n (20MHz)	6.5/7.2 (MCS0)	19.43	25.72
	5300	60	n (20MHz)	6.5/7.2 (MCS0)	19.44	25.58
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	19.47	25.58
Band 2C	5500	100	n (20MHz)	6.5/7.2 (MCS0)	19.46	25.32
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	19.35	25.53
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	19.36	24.74

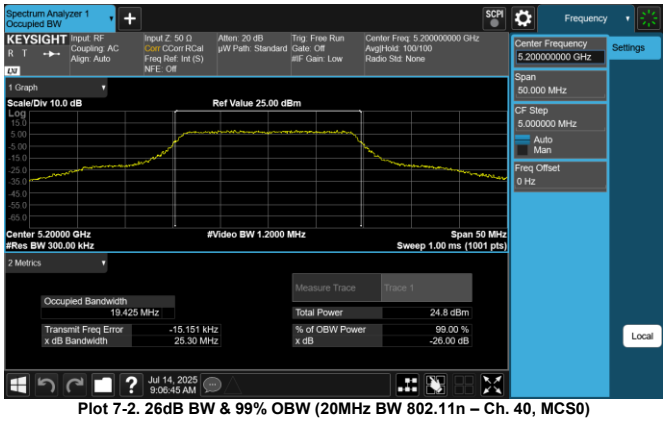
Table 7-2. Conducted Bandwidth Measurements



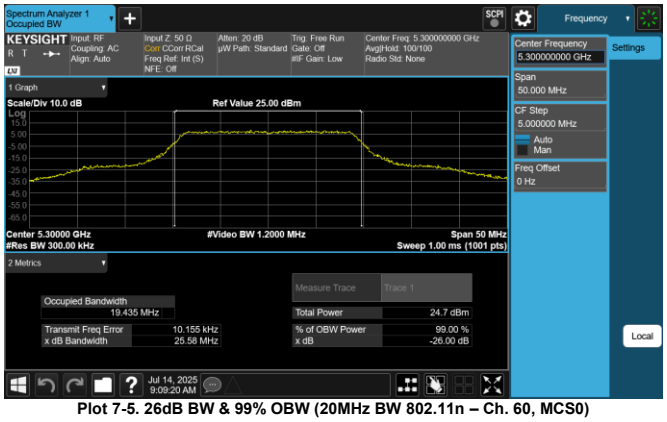
Plot 7-1. 26dB BW & 99% OBW (20MHz BW 802.11n – Ch. 36, MCS0)



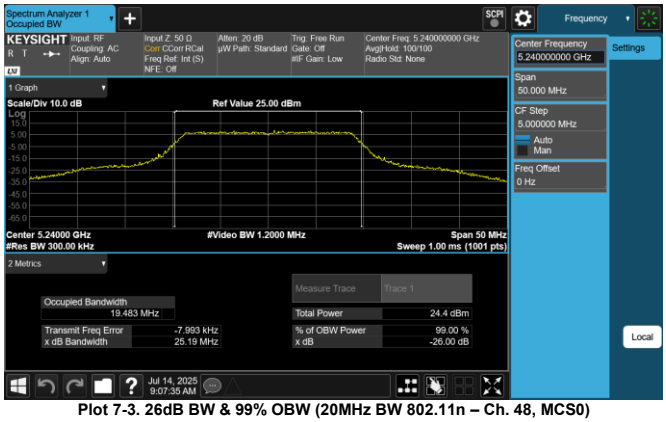
Plot 7-4. 26dB BW & 99% OBW (20MHz BW 802.11n – Ch. 52, MCS0)



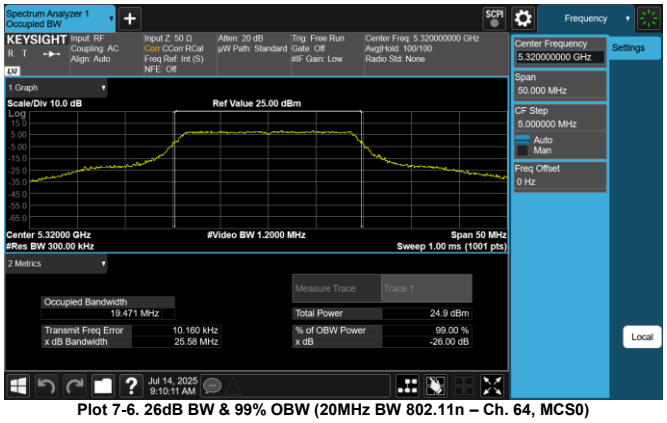
Plot 7-2. 26dB BW & 99% OBW (20MHz BW 802.11n – Ch. 40, MCS0)



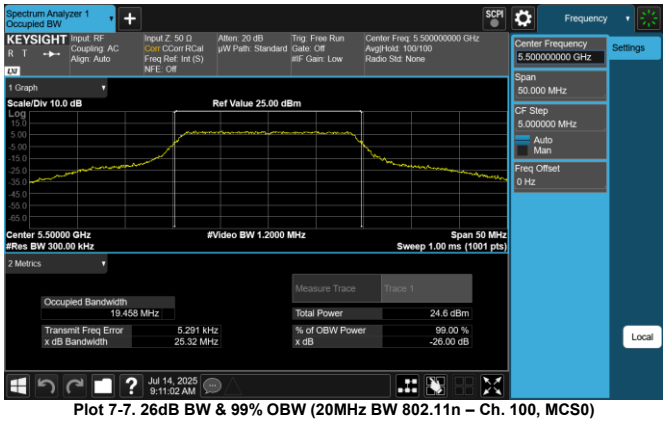
Plot 7-5. 26dB BW & 99% OBW (20MHz BW 802.11n – Ch. 60, MCS0)



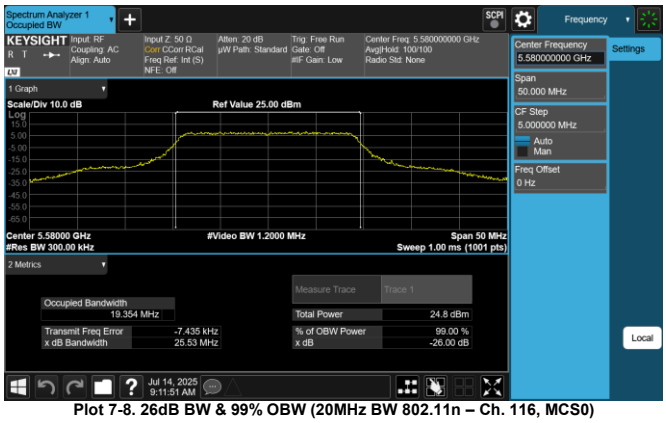
Plot 7-3. 26dB BW & 99% OBW (20MHz BW 802.11n – Ch. 48, MCS0)



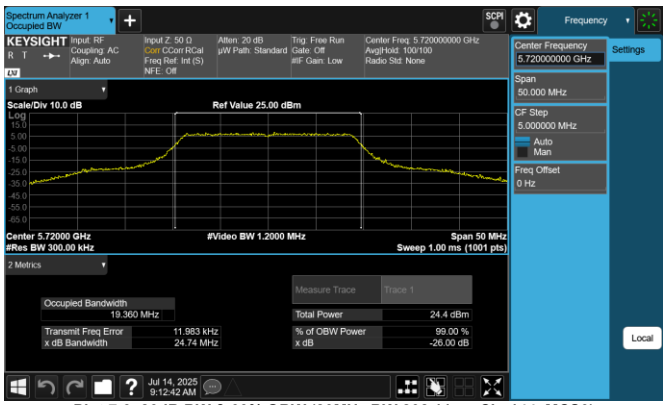
Plot 7-6. 26dB BW & 99% OBW (20MHz BW 802.11n – Ch. 64, MCS0)



Plot 7-7. 26dB BW & 99% OBW (20MHz BW 802.11n – Ch. 100, MCS0)



Plot 7-8. 26dB BW & 99% OBW (20MHz BW 802.11n – Ch. 116, MCS0)



Plot 7-9. 26dB BW & 99% OBW (20MHz BW 802.11n – Ch. 144, MCS0)

7.3 6dB & 99% Bandwidth Measurement

§2.1049; §15.407 (e); RSS-Gen [6.7]; RSS-247 [6.7]

Test Overview and Limit

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2020 and KDB 789033 D02 v02r01, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 6dB bandwidth.

In the 5.725 – 5.850GHz band, the 6dB bandwidth must be ≥ 500 kHz.

Test Procedure Used

ANSI C63.10-2020 – Section 12.5.1
KDB 789033 D02 v02r01 – Section C

Test Settings

1. The signal analyzers' automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to X = 6. The automatic bandwidth measurement function also has the capability of simultaneously measuring the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 100 kHz
3. VBW ≥ 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

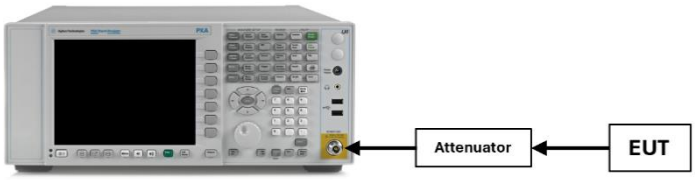


Figure 7-2. Test Instrument & Measurement Setup

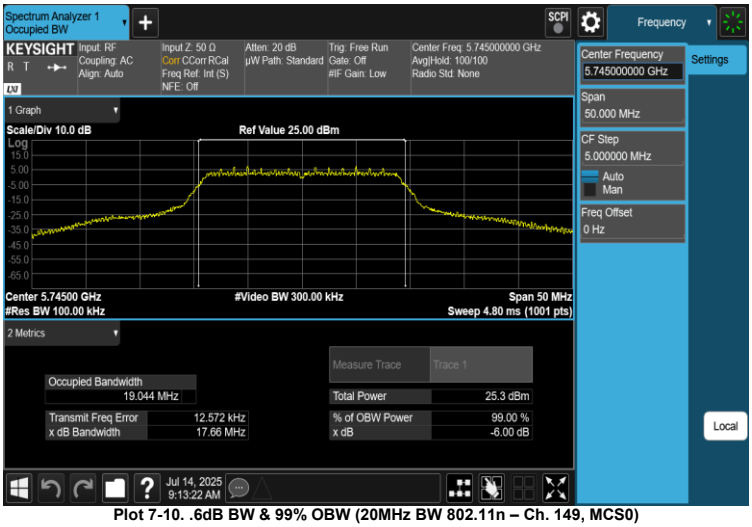
Test Notes

1. All modes were investigated and only the worst case are reported.

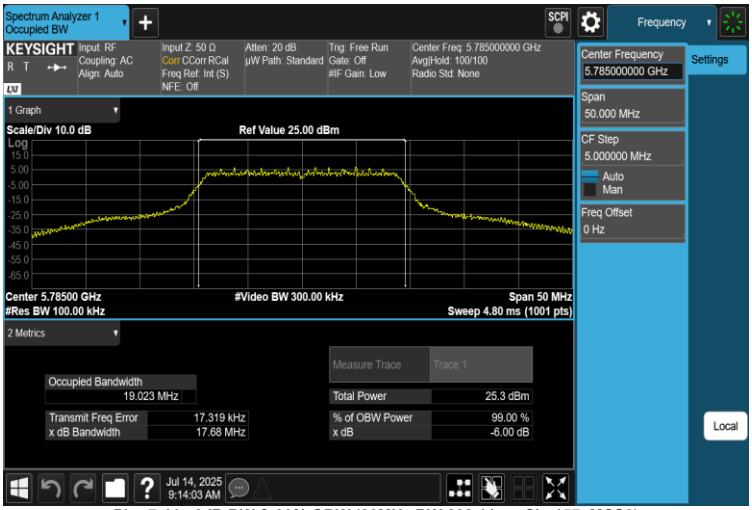
7.3.1 6dB & 99% Bandwidth Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured 99% Occupied Bandwidth [MHz]	Measured 6dB Bandwidth [MHz]	Minimum 6dB Bandwidth [MHz]	Pass / Fail
Band 3	5745	149	n (20MHz)	6.5/7.2 (MCS0)	19.04	17.66	0.50	Pass
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	19.02	17.68	0.50	Pass
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	19.05	17.67	0.50	Pass

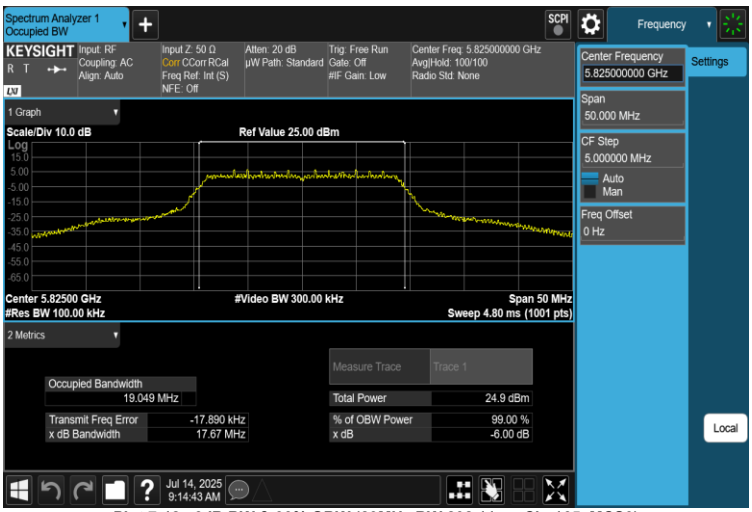
Table 7-3. Conducted Bandwidth Measurements



Plot 7-10. .6dB BW & 99% OBW (20MHz BW 802.11n – Ch. 149, MCS0)



Plot 7-11. .6dB BW & 99% OBW (20MHz BW 802.11n – Ch. 157, MCS0)



Plot 7-12. .6dB BW & 99% OBW (20MHz BW 802.11n – Ch. 165, MCS0)

7.4 Conducted Output Power and Max EIRP Measurement

§15.407(a.1.iv) §15.407(a.2) §15.407(a.3); RSS-247 [6.2]

Test Overview and Limits

A transmitter antenna terminal of the EUT is connected to the input of an RF pulse power sensor. Measurement is made using a broadband average power meter while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2020 and KDB 789033 D02 v02r01, and at the appropriate frequencies. B is the 99% OBW per ISED RSS-247 and 26dB BW is per FCC 15.407.

In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is 250mW (23.98dBm). The maximum e.i.r.p. shall not exceed the lesser of 200 mW or 10 + 10 log$_{10}$B, dBm.

In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) or 11 dBm + 10log$_{10}$ (B). The maximum e.i.r.p. shall not exceed the lesser of 1.0 W or 17 + 10 log$_{10}$(B), dBm.

In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) or 11 dBm + 10log$_{10}$(B). The maximum e.i.r.p. shall not exceed the lesser of 1.0 W or 17 + 10 log$_{10}$(B), dBm.

In the 5.725 – 5.850GHz band, the maximum permissible conducted output power is 1W (30dBm). The maximum e.i.r.p. is 36 dBm.

Test Procedure Used

ANSI C63.10-2020 – Section 12.4.3.2 Method PM-G
KDB 789033 D02 v02r01 – Section E)3)b) Method PM-G

Test Settings

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

Figure 7-3. Test Instrument & Measurement Setup for Power Meter Measurements

Test Notes

1. Per RSS-247 Section 6.2.3, transmission on channels which overlap the 5600-5650 MHz is prohibited. This device operates under these frequencies only under the control of a certified master device and does not support active scanning on these channels. This device does not transmit any beacons or initiate any transmissions in UNII Bands 2A or 2C.

Conducted Output Power Measurements

5GHz (20MHz Bandwidth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]
				802.11a	802.11n (MCS0)	802.11n (MCS7)		
	5180	36	AVG	16.63	16.56	14.86	23.98	-7.35
	5220	44	AVG	16.93	16.97	14.74	23.98	-7.01
	5240	48	AVG	16.55	16.76	14.79	23.98	-7.22
	5260	52	AVG	16.61	16.86	14.95	23.98	-7.12
	5300	60	AVG	16.61	16.91	14.98	23.98	-7.07
	5320	64	AVG	16.60	16.85	14.84	23.98	-7.13
	5500	100	AVG	16.65	16.64	14.79	23.98	-7.33
	5580	116	AVG	16.57	16.95	14.66	23.98	-7.03
	5660	132	AVG	16.79	16.90	14.82	23.98	-7.08
	5680	136	AVG	15.94	15.94	14.78	23.98	-8.04
	5700	140	AVG	13.11	13.34	13.29	23.98	-10.64
	5720	144	AVG	16.76	16.59	14.71	23.98	-7.22
	5745	149	AVG	16.71	16.88	14.68	30.00	-13.12
	5785	157	AVG	16.93	16.98	14.70	30.00	-13.02
	5825	165	AVG	16.63	16.65	14.79	30.00	-13.36

Table 7-4. FCC 20MHz BW (UNII) Maximum Conducted Output Power

5GHz (20MHz Bandwidth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit [dBm]	Conducted Power Margin [dB]	Ant. Gain [dBi]	Max e.i.r.p. [dBm]	Max e.i.r.p. Limit [dBm]	e.i.r.p. Margin [dB]
				802.11a	802.11n (MCS0)	802.11n (MCS7)						
	5180	36	AVG	15.93	15.46	14.92	-	-	-6.50	9.43	23.01	-13.58
	5220	44	AVG	15.82	15.33	14.85	-	-	-6.50	9.32	23.01	-13.69
	5240	48	AVG	15.86	15.40	14.96	-	-	-6.50	9.36	23.01	-13.65
	5260	52	AVG	16.61	16.86	14.95	23.98	-7.12	-4.50	12.36	30.00	-17.64
	5300	60	AVG	16.61	16.91	14.98	23.98	-7.07	-4.50	12.41	30.00	-17.59
	5320	64	AVG	16.60	16.85	14.84	23.98	-7.13	-4.50	12.35	30.00	-17.65
	5500	100	AVG	16.65	16.64	14.79	23.98	-7.33	-2.20	14.45	30.00	-15.55
	5580	116	AVG	16.57	16.95	14.66	23.98	-7.03	-2.20	14.75	30.00	-15.25
	5660	132	AVG	16.79	16.90	14.82	23.98	-7.08	-2.20	14.70	30.00	-15.30
	5680	136	AVG	15.94	15.94	14.78	23.98	-8.04	-2.20	13.74	30.00	-16.26
	5700	140	AVG	13.11	13.34	13.29	23.98	-10.64	-2.20	11.14	30.00	-18.86
	5720	144	AVG	16.76	16.59	14.71	23.98	-7.22	-2.20	14.56	30.00	-15.44
	5745	149	AVG	16.71	16.88	14.68	30.00	-13.12	-2.40	14.48	-	-
	5785	157	AVG	16.93	16.98	14.70	30.00	-13.02	-2.40	14.58	-	-
	5825	165	AVG	16.63	16.65	14.79	30.00	-13.36	-2.40	14.25	-	-

Table 7-5. ISED 20MHz BW (UNII) Maximum Conducted Output Power and Max EIRP

Sample EIRP Calculation:

At 5180MHz in 802.11a (20MHz BW) mode, the average conducted output power was measured to be 15.93dBm with antenna gain of -6.50dBi.

e.i.r.p. (dBm) = Conducted Power (dBm) + Ant gain (dBi)

15.93 dBm + (-6.50) dBi = 9.43 dBm

7.5 Maximum Power Spectral Density

§15.407(a.1.iv) §15.407(a.2) §15.407(a.3); RSS-247 [6.2]

Test Overview and Limit

The spectrum analyzer was connected to the antenna terminal while the EUT was operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2020 and KDB 789033 D02 v02r01, and at the appropriate frequencies. Method SA-1, as defined in ANSI C63.10-2020 and KDB 789033 D02 v02r01, was used to measure the power spectral density.

In the 5.15 – 5.25GHz, 5.25 – 5.35GHz, 5.47 – 5.725GHz bands, the maximum permissible power spectral density is 11dBm/MHz.

In the 5.15 – 5.25GHz band, the e.i.r.p. spectral density shall not exceed 10 dBm in any 1 MHz band.

In the 5.725 – 5.850GHz band, the maximum permissible power spectral density is 30dBm/500kHz.

Test Procedure Used

ANSI C63.10-2020 - Section 12.4.2.2
KDB 789033 D02 v02r01 – Section F

Test 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, 500kHz for U-NII 3
4. VBW ≥ 3MHz for U-NII 1, ≥ 3 x RBW for U-NII 3
5. Number of sweep points ≥ 2 x (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.

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

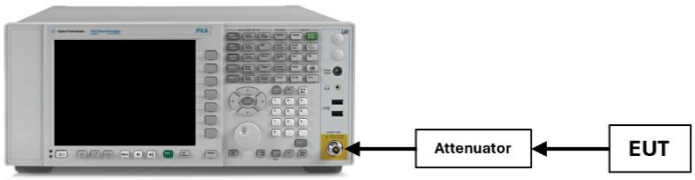


Figure 7-4. Test Instrument & Measurement Setup

Test Notes

1. All modes were investigated and only the worst case are reported.

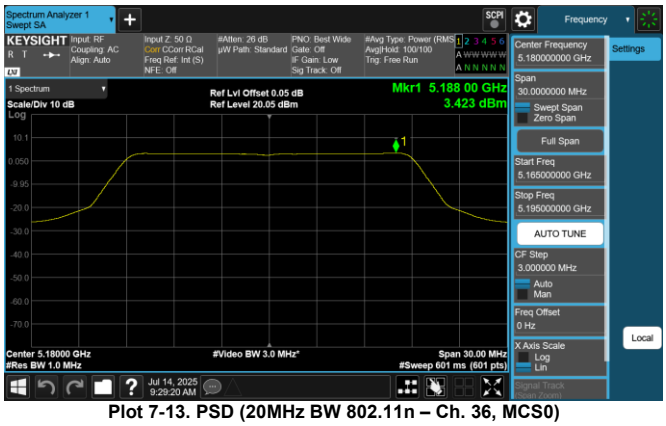
7.5.1 Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm/MHz]	Max Power Density [dBm/MHz]	Margin [dB]
Band 1	5180	36	n (20MHz)	6.5/7.2 (MCS0)	3.42	11.0	-7.58
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	3.33	11.0	-7.67
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	3.39	11.0	-7.61
Band 2A	5260	52	n (20MHz)	6.5/7.2 (MCS0)	5.10	11.0	-5.91
	5300	60	n (20MHz)	6.5/7.2 (MCS0)	5.07	11.0	-5.94
	5320	64	n (20MHz)	6.5/7.2 (MCS0)	5.09	11.0	-5.92
Band 2C	5500	100	n (20MHz)	6.5/7.2 (MCS0)	4.88	11.0	-6.12
	5580	116	n (20MHz)	6.5/7.2 (MCS0)	5.04	11.0	-5.96
	5720	144	n (20MHz)	6.5/7.2 (MCS0)	4.69	11.0	-6.31

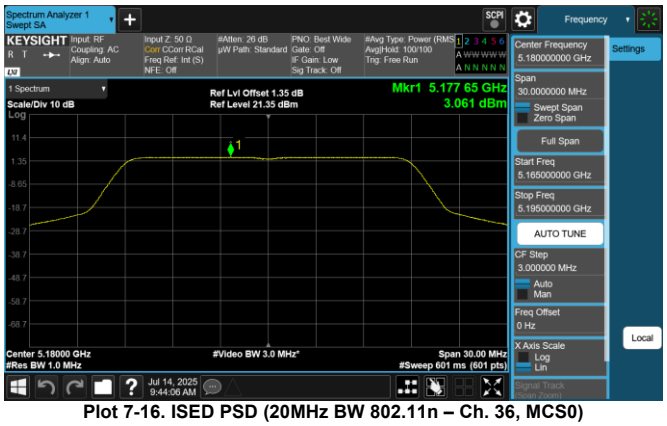
Table 7-6. FCC Bands 1, 2A, 2C Power Spectral Density Measurements

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm/MHz]	Antenna Gain [dBi]	e.i.r.p. Power Density [dBm/MHz]	ISED Max e.i.r.p. Power Density [dBm/MHz]	Margin [dB]
Band 1	5180	36	n (20MHz)	6.5/7.2 (MCS0)	3.06	-6.50	-3.44	10.0	-13.44
	5200	40	n (20MHz)	6.5/7.2 (MCS0)	2.78	-6.50	-3.72	10.0	-13.72
	5240	48	n (20MHz)	6.5/7.2 (MCS0)	3.00	-6.50	-3.50	10.0	-13.50

Table 7-7. ISED Band 1 Power Spectral Density Measurements



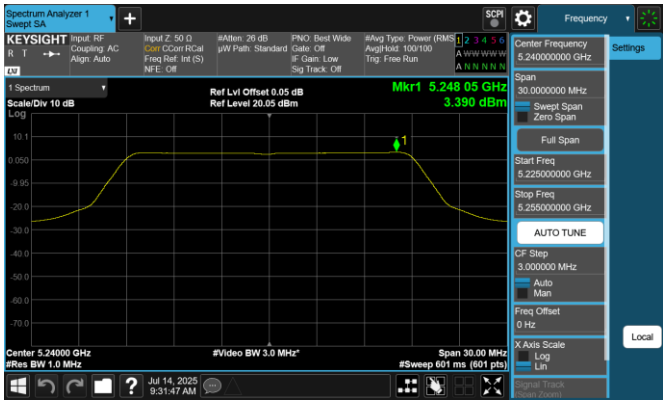
Plot 7-13. PSD (20MHz BW 802.11n – Ch. 36, MCS0)



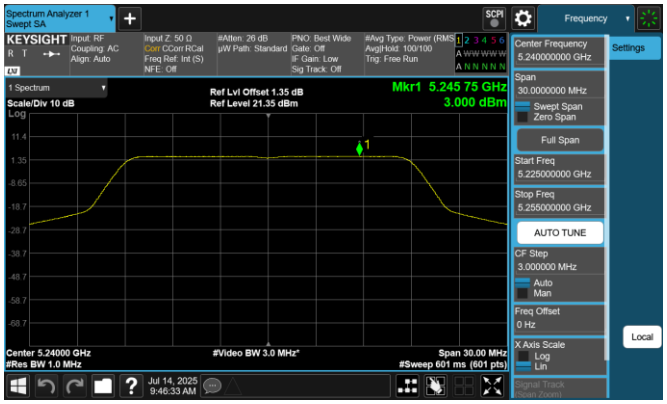
Plot 7-16. ISED PSD (20MHz BW 802.11n – Ch. 36, MCS0)

Plot 7-14. PSD (20MHz BW 802.11n – Ch. 40, MCS0)

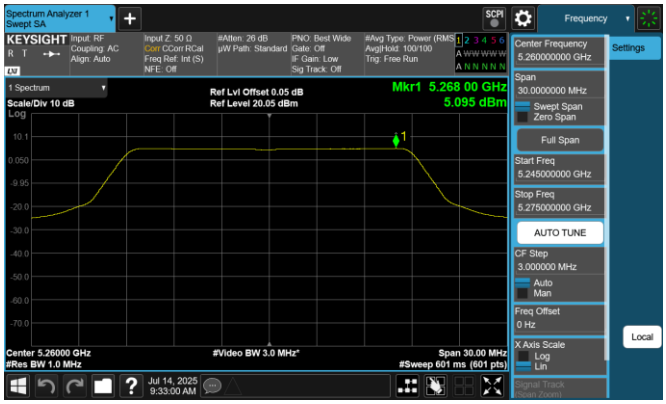
Plot 7-17. ISED PSD (20MHz BW 802.11n – Ch. 40, MCS0)



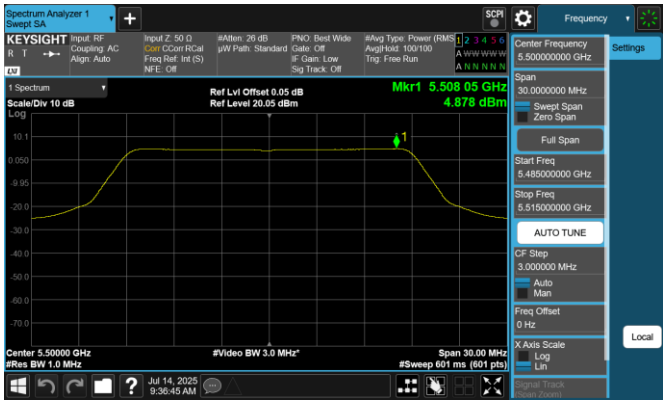
Plot 7-15. PSD (20MHz BW 802.11n – Ch. 48, MCS0)



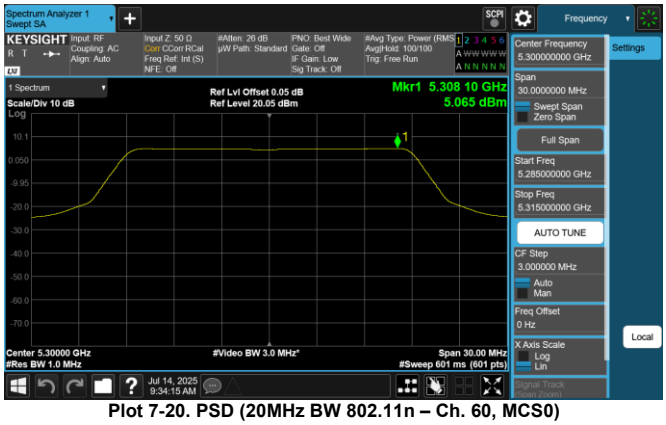
Plot 7-18. ISED PSD (20MHz BW 802.11n – Ch. 48, MCS0)



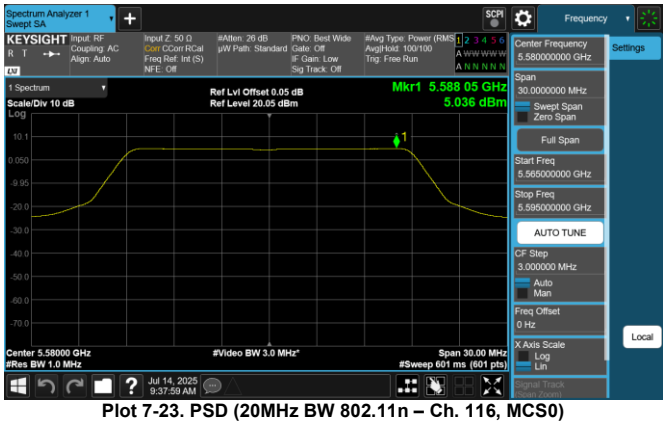
Plot 7-19. PSD (20MHz BW 802.11n – Ch. 52, MCS0)



Plot 7-22. PSD (20MHz BW 802.11n – Ch. 100, MCS0)

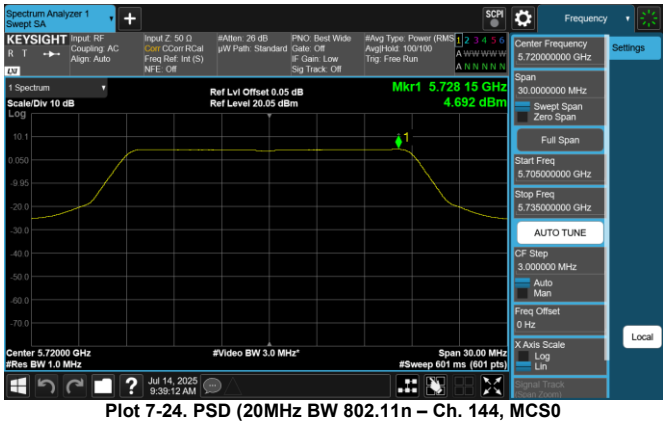


Plot 7-20. PSD (20MHz BW 802.11n – Ch. 60, MCS0)



Plot 7-23. PSD (20MHz BW 802.11n – Ch. 116, MCS0)

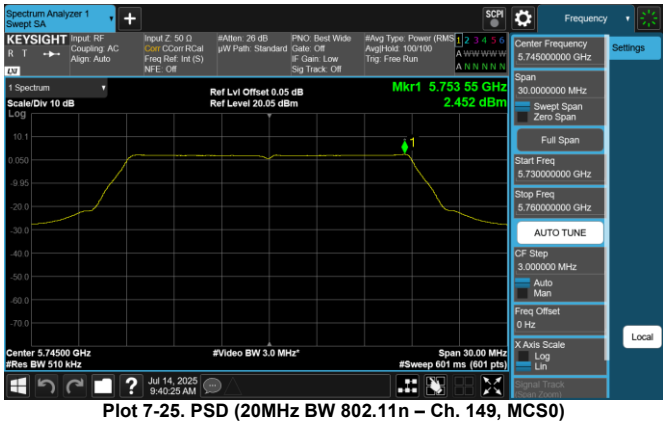
Plot 7-21. PSD (20MHz BW 802.11n – Ch. 64, MCS0)



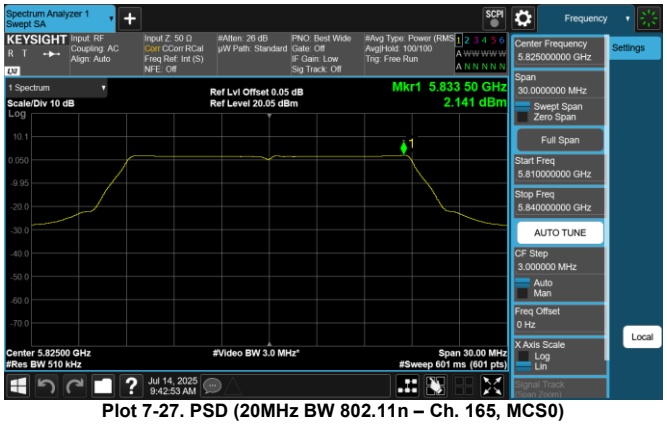
Plot 7-24. PSD (20MHz BW 802.11n – Ch. 144, MCS0

	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Measured Power Density [dBm/500kHz]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]
Band 3	5745	149	n (20MHz)	6.5/7.2 (MCS0)	2.45	30.0	-27.55
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	2.13	30.0	-27.87
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	2.14	30.0	-27.86

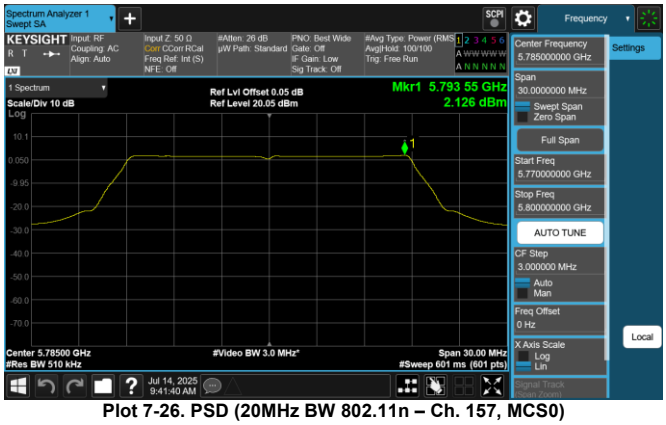
Table 7-8. Band 3 Power Spectral Density Measurements



Plot 7-25. PSD (20MHz BW 802.11n – Ch. 149, MCS0)



Plot 7-27. PSD (20MHz BW 802.11n – Ch. 165, MCS0)



Plot 7-26. PSD (20MHz BW 802.11n – Ch. 157, MCS0)

Note:

Sample e.i.r.p Power Spectral Density Calculation:

At 5180MHz in 802.11n (20MHz BW) mode, the average power density was calculated to be 3.06dBm with antenna gain of -6.50 dBi.

e.i.r.p. Power Spectral Density(dBm) = Power Spectral Density (dBm) + Ant gain (dBi)

3.06 dBm + (-6.50) dBi = -3.44dBm

7.6 Radiated Spurious Emissions – Above 1GHz

§15.407(b) §15.205 §15.209; RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2020 and KDB 789033 D02 v02r01, and at the appropriate frequencies. All channels, modes (e.g. 802.11a, 802.11n, (20MHz BW), and modulations/data rates were investigated among all UNII bands. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

For transmitters operating in the 5.15-5.25 GHz and 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of −27 dBm/MHz.

For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 7 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-9 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [μV/m]	Measured Distance [Meters]
Above 960.0 MHz	500	3

Table 7-9. Radiated Limits

Test Procedures Used

ANSI C63.10-2020 – Sections 12.7.7.2, 12.7.6
KDB 789033 D02 v02r01 – Section G

Test Settings

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = power average (RMS)
5. Number of measurement points = 1001 (Number of points must be ≥ 2 x span/RBW)
6. Averaging type = power (RMS)
7. Sweep time = auto couple
8. Trace was averaged over 100 sweeps

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

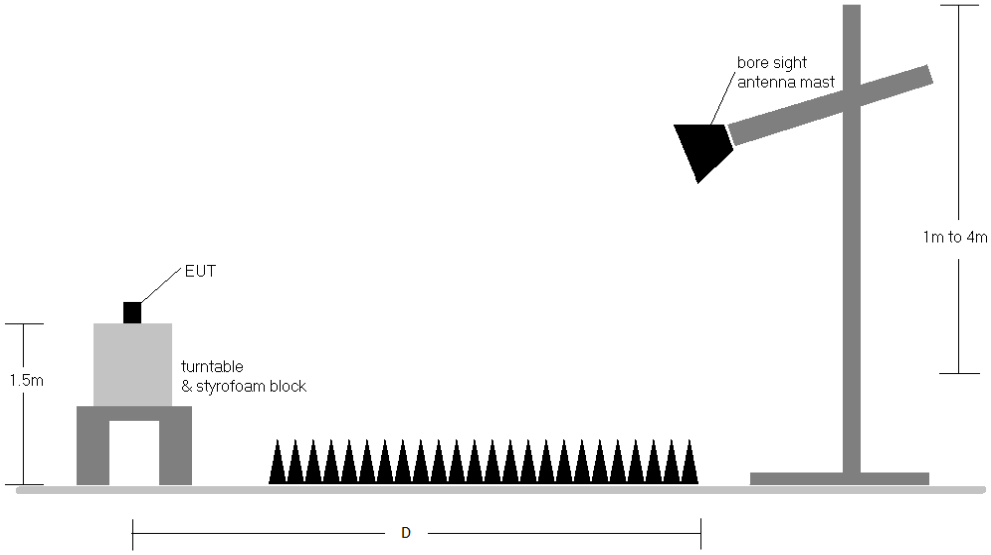


Figure 7-5. Test Instrument & Measurement Setup

Test Notes

1. All emissions that lie in the restricted bands (denoted by a * next to the frequency) specified in §15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-9.
2. All spurious emissions lying in restricted bands specified in §15.205 and Section 8.10 of RSS-Gen are below the limit shown in Table 7-9. All spurious emissions that do not lie in a restricted band are subject to a peak limit of -27dBm/MHz. At a distance of 3 meters, the field strength limit in dBμV/m can be determined by adding a "conversion" factor of 95.2dB to the EIRP limit of -27dBm/MHz to obtain the limit for out of band spurious emissions of 68.2dBμV/m.
3. The antenna is manipulated through typical positions, polarity and length during the tests. The EUT is manipulated through three orthogonal planes.
4. This unit was tested with its standard battery.
5. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, average and peak measurements were taken using linearly polarized horn antennas.
6. D is the measurement test distance and emissions 1-18GHz were measured at a 3 meters test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
7. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section.
8. All data rates were investigated and only the worse case is reported
9. The unit was tested with all possible modes and only the highest emission is reported.
10. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

Sample Calculations

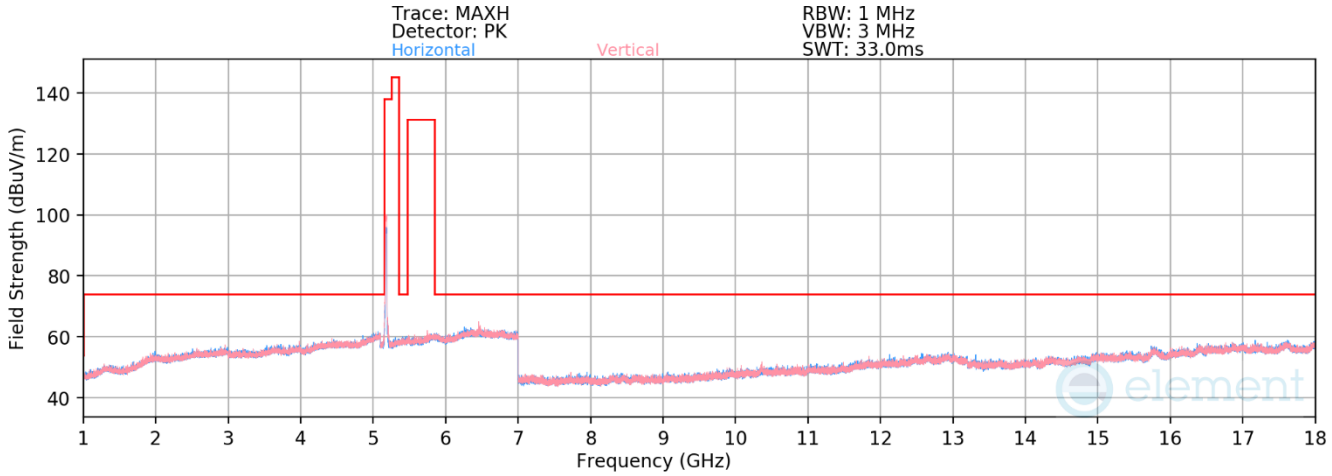
Determining Spurious Emissions Levels

- Field Strength Level $_{[dB\mu V/m]}$ = Analyzer Level $_{[dBm]}$ + 107 + AFCL $_{[dB/m]}$
- AFCL $_{[dB/m]}$ = Antenna Factor $_{[dB/m]}$ + Cable Loss $_{[dB]}$ – Preamplifier Gain $_{[dB]}$
- Margin $_{[dB]}$ = Field Strength Level $_{[dB\mu V/m]}$ – Limit $_{[dB\mu V/m]}$

Radiated Band Edge Measurement Offset

- The amplitude offset shown in the radiated restricted band edge plots in Section 7.6.2 was calculated using the formula:
  Offset (dB) = (Antenna Factor + Cable Loss + Attenuator) – Preamplifier Gain

7.6.1 Radiated Spurious Emission

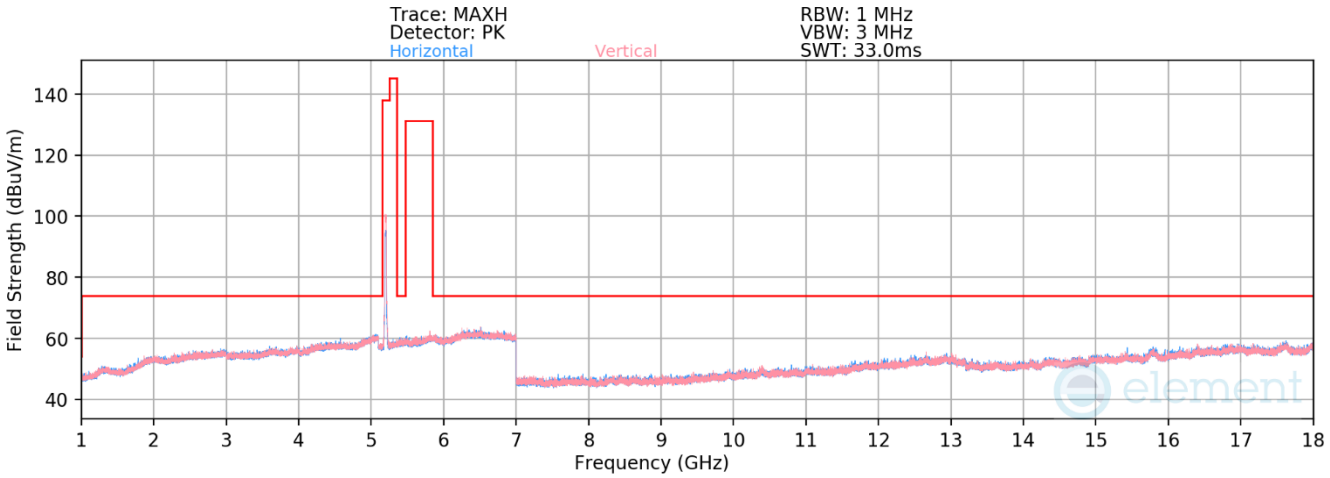


Plot 7-28. Radiated Spurious Emissions above (802.11n – Ch. 36)

Mode:	802.11n
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5180MHz
Channel:	36

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10360.00	Peak	V	262	133	-68.13	14.92	53.79	68.23	-14.44
*	15540.00	Average	-	-	-	-84.09	21.75	44.66	53.98	-9.32
*	15540.00	Peak	-	-	-	-73.08	21.75	55.67	73.98	-18.31

Table 7-10. Radiated Measurements

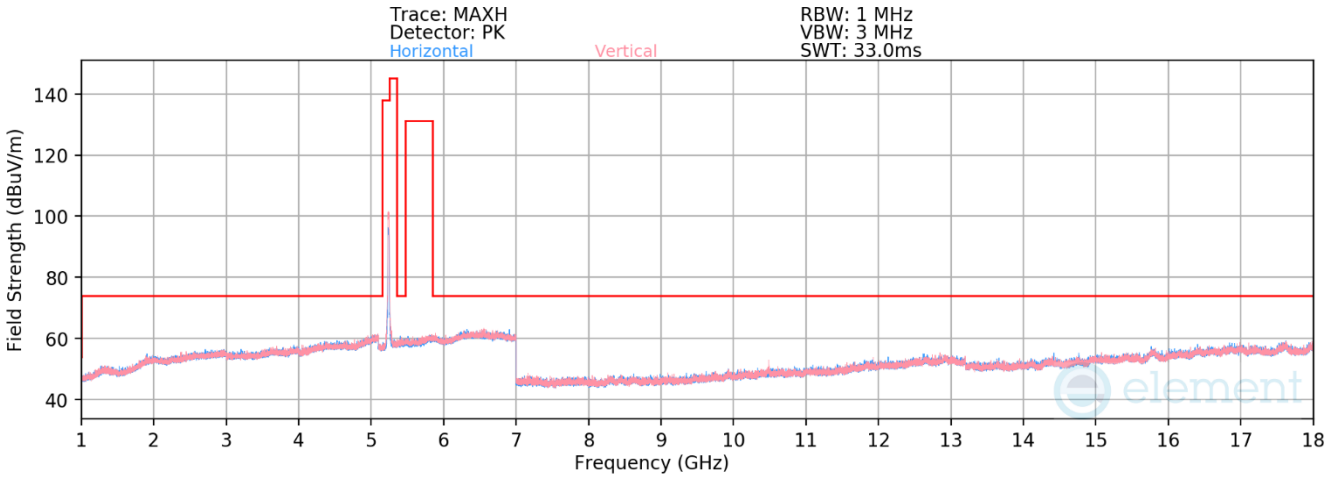


Plot 7-29. Radiated Spurious Emissions above 1GHz (802.11n – Ch. 40)

Mode:	802.11n
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5200MHz
Channel:	40

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10400.00	Peak	V	371	54	-69.76	14.91	52.15	68.23	-16.08
*	15600.00	Average	-	-	-	-84.08	22.04	44.96	53.98	-9.02
*	15600.00	Peak	-	-	-	-72.42	22.30	56.88	73.98	-17.10

Table 7-11. Radiated Measurements

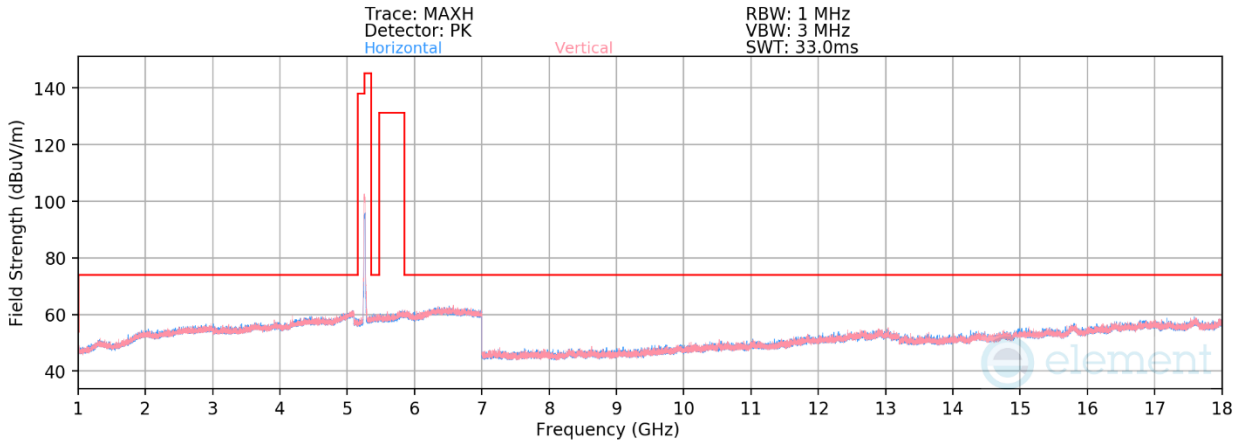


Plot 7-30. Radiated Spurious Emissions above 1GHz (802.11n – Ch. 48)

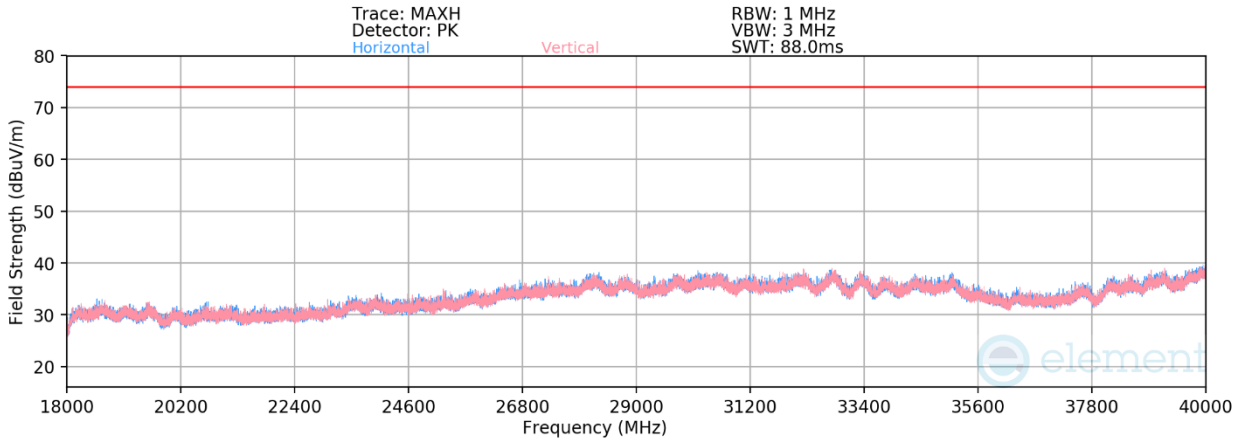
Mode:	802.11n
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5240MHz
Channel:	48

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10480.00	Peak	V	264	135	-71.80	15.24	50.44	68.23	-17.79
*	15720.00	Average	-	-	-	-84.06	22.49	45.43	53.98	-8.55
*	15720.00	Peak	-	-	-	-72.37	22.19	56.82	73.98	-17.16

Table 7-12. Radiated Measurements



Plot 7-31. Radiated Spurious Emissions above 1GHz (802.11n – Ch. 52)

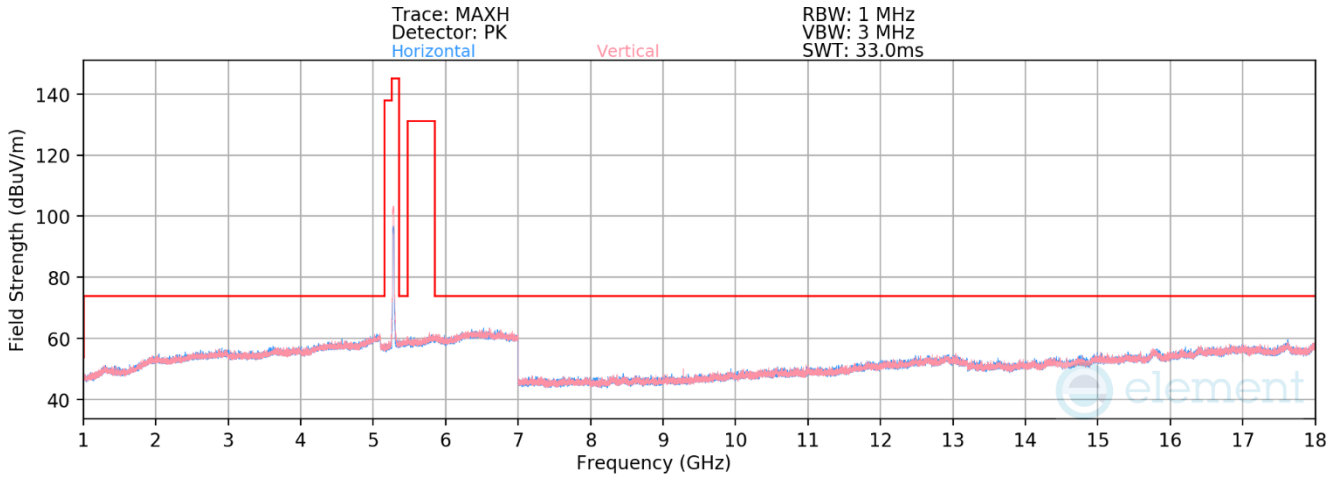


Plot 7-32. Radiated Emissions Above 18GHz (802.11n – Ch. 52)

Mode:	802.11n
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5260MHz
Channel:	52

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10520.00	Peak	-	-	-	-70.13	14.59	51.46	68.23	-16.77
*	15780.00	Average	-	-	-	-84.07	22.88	45.81	53.98	-8.17
*	15780.00	Peak	-	-	-	-72.53	22.89	57.36	73.98	-16.62

Table 7-13. Radiated Measurements

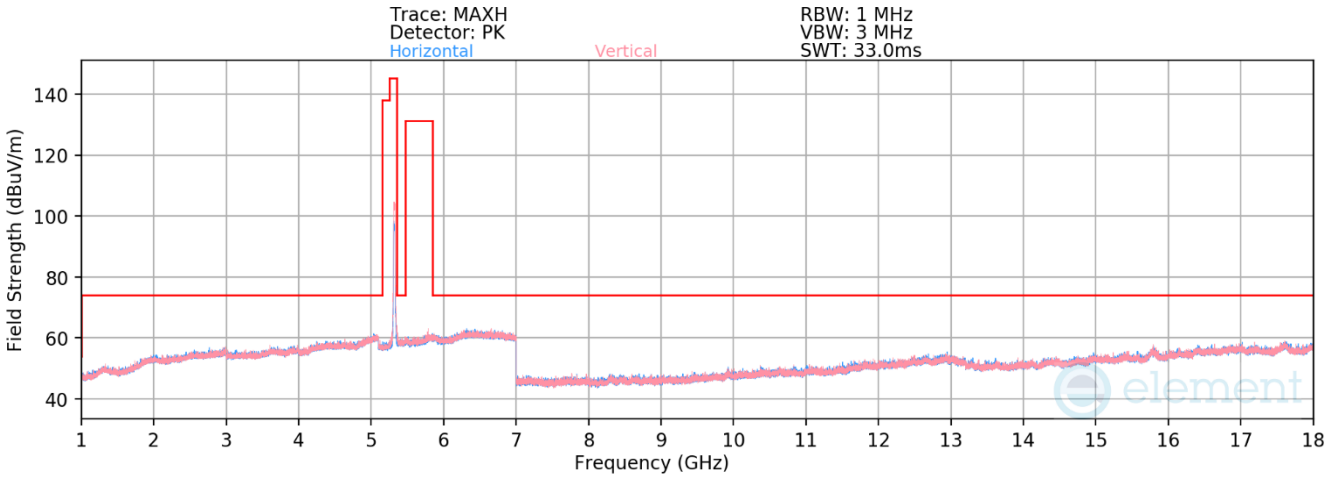


Plot 7-33. Radiated Spurious Emissions above 1GHz (802.11n – Ch. 56)

Mode:	802.11n
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5280MHz
Channel:	56

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	10560.00	Peak	-	-	-	-70.35	15.02	51.67	68.23	-16.56
*	15840.00	Average	-	-	-	-84.13	22.67	45.54	53.98	-8.44
*	15840.00	Peak	-	-	-	-72.94	22.34	56.40	73.98	-17.58

Table 7-14. Radiated Measurements

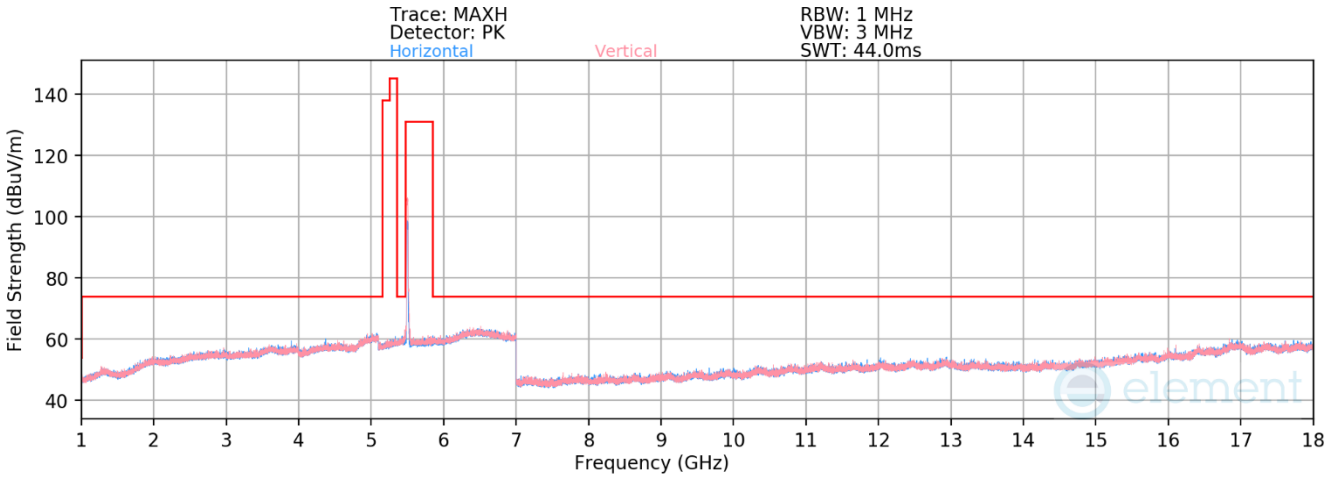


Plot 7-34. Radiated Spurious Emissions above 1GHz (802.11n – Ch. 64)

Mode:	802.11n
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5320MHz
Channel:	64

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	10640.00	Average	-	-	-	-82.90	15.14	39.24	53.98	-14.74
*	10640.00	Peak	-	-	-	-71.56	15.12	50.56	73.98	-23.42
*	15960.00	Average	-	-	-	-84.95	22.98	45.03	53.98	-8.95
*	15960.00	Peak	-	-	-	-74.17	22.98	55.81	73.98	-18.17

Table 7-15. Radiated Measurements

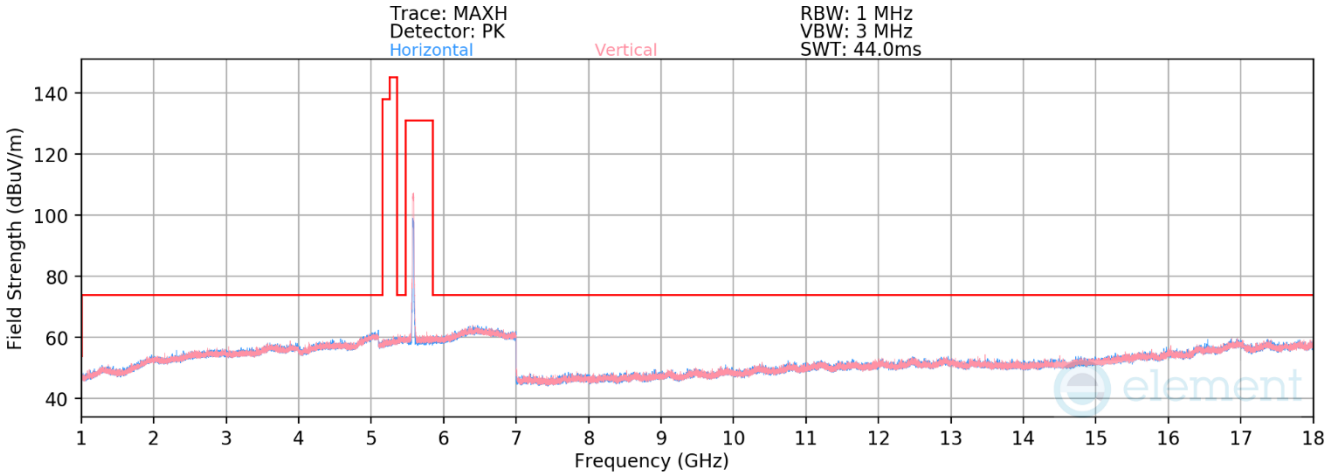


Plot 7-35. Radiated Spurious Emissions above 1GHz (802.11n – Ch. 100)

Mode:	802.11n
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5500MHz
Channel:	100

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11000.00	Average	-	-	-	-82.84	16.10	40.25	53.98	-13.73
*	11000.00	Peak	-	-	-	-71.47	15.94	51.47	73.98	-22.51
	16500.00	Peak	-	-	-	-73.24	23.30	57.06	68.23	-11.17

Table 7-16. Radiated Measurements

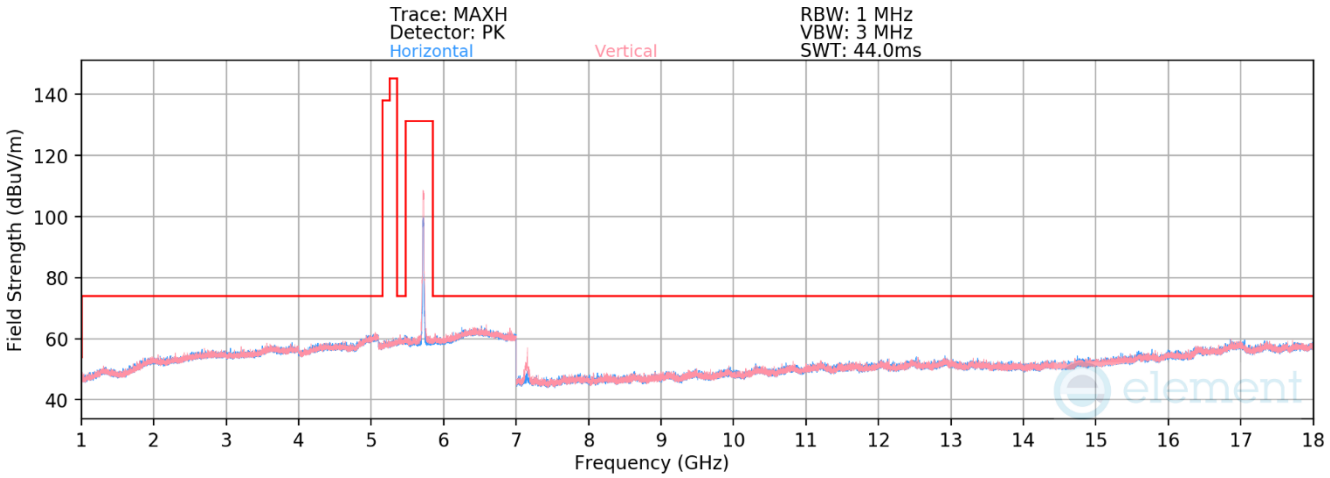


Plot 7-36. Radiated Spurious Emissions above 1GHz (802.11n – Ch. 116)

Mode:	802.11n
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5580Hz
Channel:	116

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	11160.00	Average	-	-	-	-82.25	15.53	40.29	53.98	-13.69
*	11160.00	Peak	-	-	-	-70.70	15.62	51.92	73.98	-22.06
	16740.00	Peak	-	-	-	-73.90	24.58	57.67	68.23	-10.56

Table 7-17. Radiated Measurements

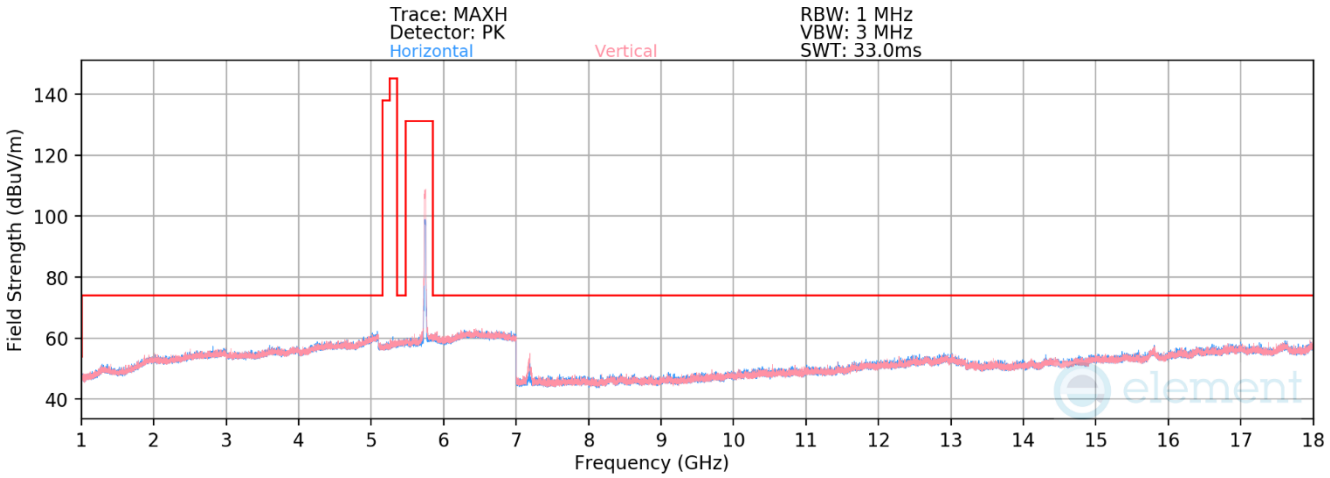


Plot 7-37. Radiated Spurious Emissions above 1GHz (802.11n – Ch. 144)

Mode:	802.11n
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5720
Channel:	144

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	7157.50	Peak	V	103	230	-60.57	11.69	58.12	68.23	-10.11
*	11440.00	Average	-	-	-	-83.45	16.52	40.07	53.98	-13.91
*	11440.00	Peak	-	-	-	-71.20	15.86	51.66	73.98	-22.32
	17160.00	Peak	-	-	-	-73.32	24.50	58.17	68.23	-10.06

Table 7-18. Radiated Measurements

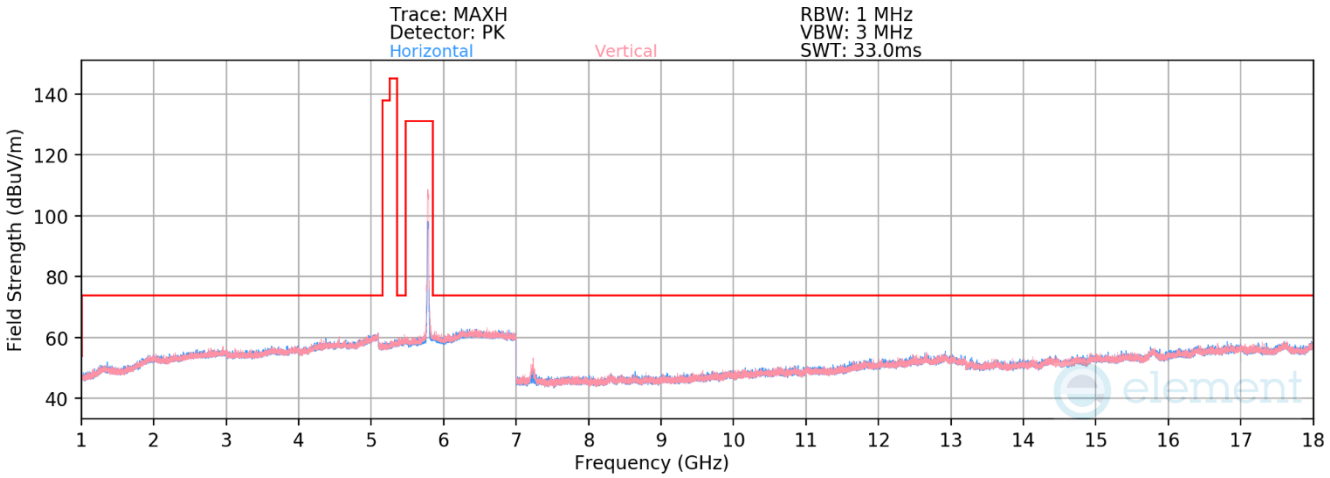


Plot 7-38. Radiated Spurious Emissions above 1GHz (802.11n – Ch. 149)

Mode:	802.11n
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5745MHz
Channel:	149

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	7189.00	Peak	V	315	230	-61.64	11.87	57.23	68.23	-11.00
*	11490.00	Average	-	-	-	-83.74	16.50	39.76	53.98	-14.22
*	11490.00	Peak	-	-	-	-71.97	16.52	51.55	73.98	-22.43
	17235.00	Peak	-	-	-	-73.63	24.50	57.87	68.23	-10.36

Table 7-19. Radiated Measurements

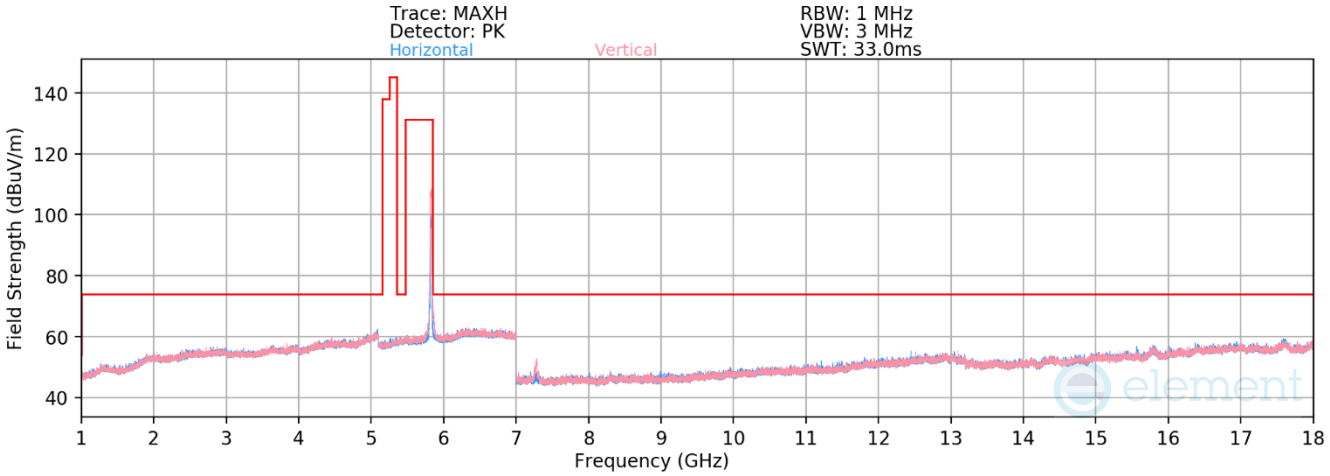


Plot 7-39. Radiated Spurious Emissions above 1GHz(802.11n – Ch. 157)

Mode:	802.11n
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5785MHz
Channel:	157

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	7238.00	Peak	V	349	148	-65.73	12.13	53.40	68.23	-14.83
*	11570.00	Average	-	-	-	-83.32	16.27	39.95	53.98	-14.03
*	11570.00	Peak	-	-	-	-71.91	16.13	51.22	73.98	-22.76
	17355.00	Peak	-	-	-	-74.25	24.84	57.59	68.23	-10.64

Table 7-20. Radiated Measurements



Plot 7-40. Radiated Spurious Emissions above 1GHz (802.11n – Ch. 165)

Mode:	802.11n
Data Rate:	MCS0
Distance of Measurements:	3 Meters
Operating Frequency:	5825MHz
Channel:	165

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
*	7290.00	Average	V	375	131	-73.13	11.96	45.83	53.98	-8.15
*	7290.00	Peak	V	375	131	-62.69	11.96	56.27	73.98	-17.71
*	11650.00	Average	-	-	-	-83.31	16.58	40.27	53.98	-13.71
*	11650.00	Peak	-	-	-	-72.11	16.69	51.58	73.98	-22.40
	17475.00	Peak	-	-	-	-73.73	24.48	57.75	68.23	-10.48

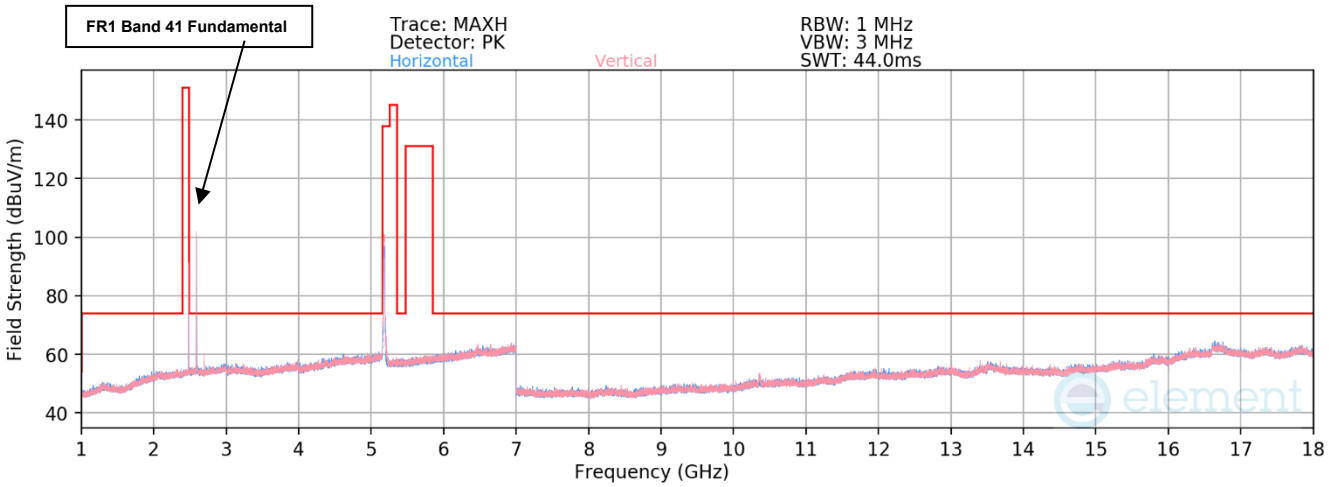
Table 7-21. Radiated Measurements

Simultaneous Tx Radiated Spurious Emissions Measurements – Above 1GHz

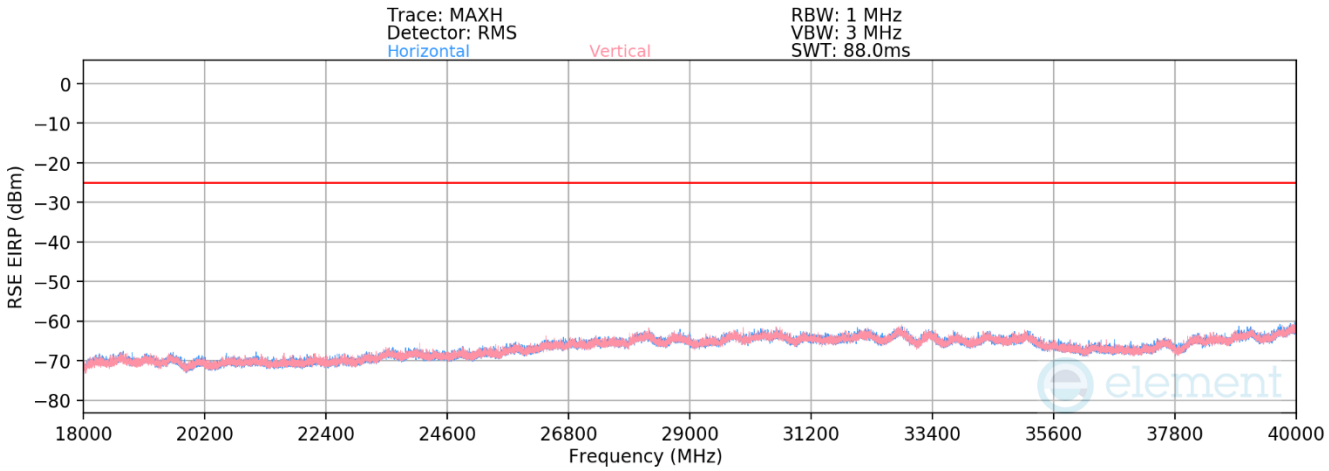
§15.205 §15.209 §15.247 (d); RSS-Gen [8.9]

Description	Bluetooth	FR1 (Band n41)	UNII
Antenna	FCM	FCM	FCM
Channel	78	518600	36
Operating Frequency (MHz)	2480	2593	5180
Mode/Modulation	GFSK ePA	QPSK/1RB/10MHz	802.11n

Table 7-22. Worst Case Simultaneous Transmission Configuration



Plot 7-41. Radiated Spurious Emissions 1 - 18GHz – Simultaneous Transmission



Plot 7-42. Radiated Spurious Emissions above 18GHz Simultaneous Transmission

	Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
	4960.00	Peak	-	-	-	-69.05	15.88	53.83	73.98	-20.15
	7440.00	Peak	-	-	-	-72.49	13.10	47.61	73.98	-26.37
	12400.00	Peak	-	-	-	-76.00	19.93	50.93	73.98	-23.05
	10360.00	Peak	V	259	106	-66.50	17.41	57.91	68.20	-10.29
*	15540.00	Avg	-	-	-	-85.94	25.95	47.01	53.98	-6.97
*	15540.00	Peak	-	-	-	-73.64	25.77	59.13	73.98	-14.85

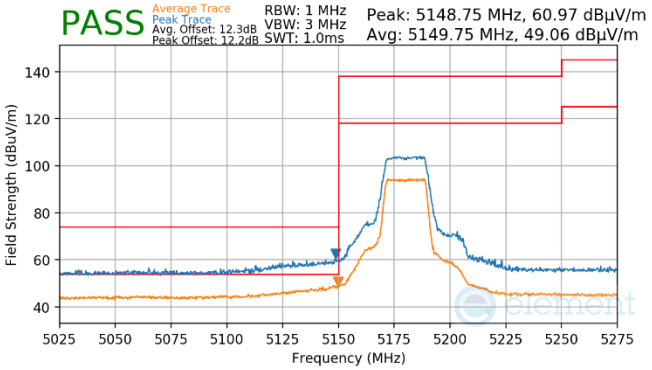
Table 7-23. Bluetooth and UNII Harmonics Emission Measurements – Simultaneous Transmission

	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
	5178.0	-	-	-	-80.79	16.63	42.84	-52.42	-25.00	-27.42
	7767.0	V	354	130	-79.21	13.38	41.17	-54.09	-25.00	-29.09
	10356.0	-	-	-	-84.91	16.35	38.44	-56.82	-25.00	-31.82
	12945.0	-	-	-	-85.94	21.14	42.20	-53.06	-25.00	-28.06
*	2371.0	-	-	-	-70.16	10.81	47.65	-47.61	-25.00	-22.61
*	2698.0	V	348	311	-64.88	18.34	60.46	-34.80	-25.00	-9.80

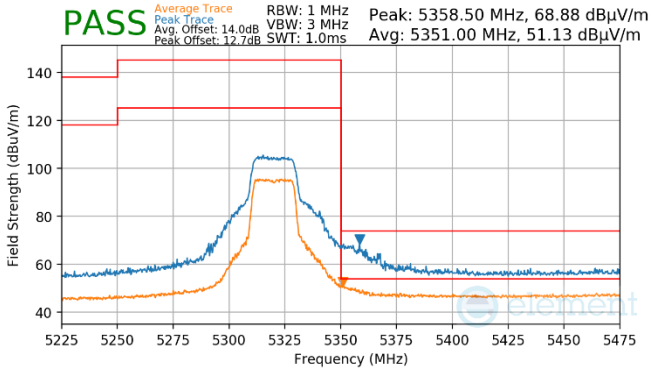
Table 7-24. FR1 Harmonics and Intermodulation (*) Emission Measurements – Simultaneous Transmission

7.6.2 Radiated Band Edge Measurements (20MHz BW)

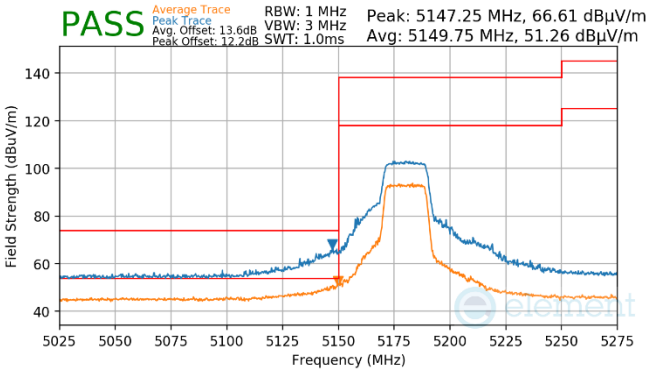
§15.407(b.1)(b.2) §15.205 §15.209; RSS-Gen [8.9]



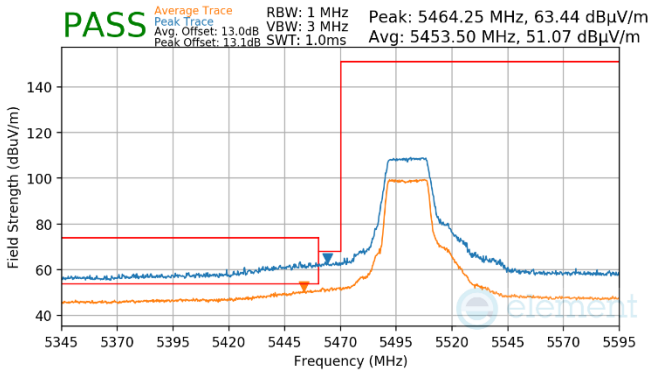
Plot 7-43. (Pk & Avg, Ch.36, 802.11n, MCS0)



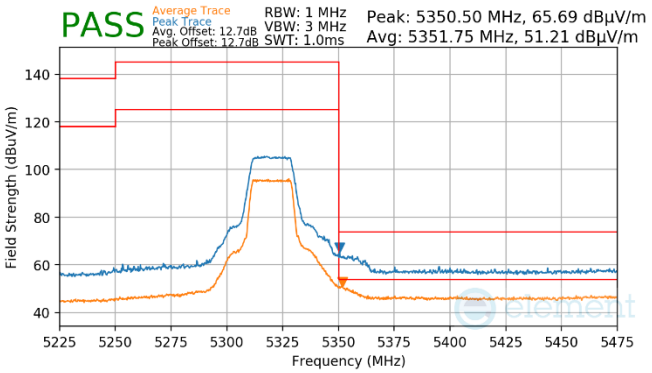
Plot 7-46. (Pk & Avg, Ch.64, 802.11n, MCS7)



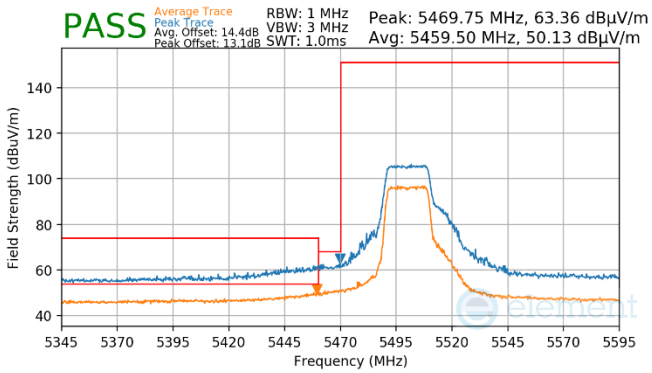
Plot 7-44. (Pk & Avg, Ch.36, 802.11n, MCS7)



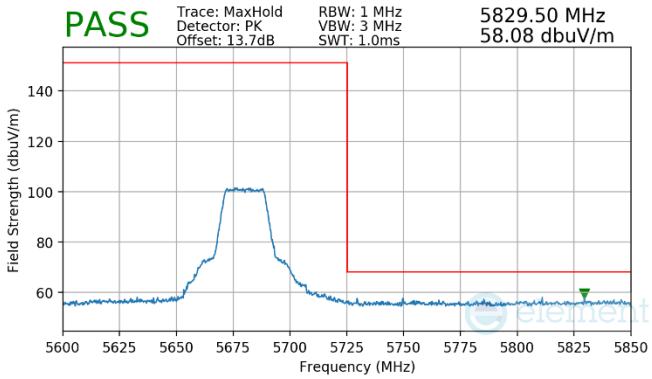
Plot 7-47. (Pk & Avg, Ch.100, 802.11n, MCS0)



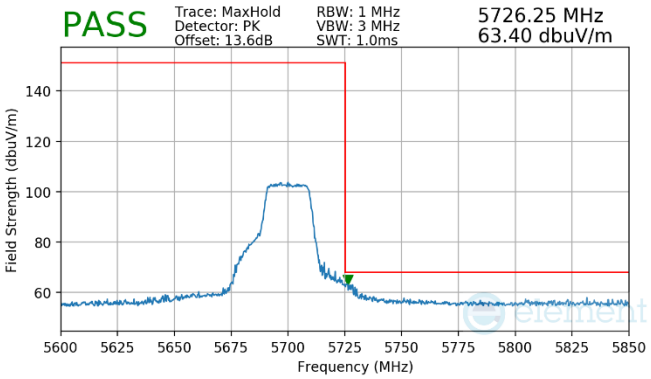
Plot 7-45. (Pk & Avg, Ch.64, 802.11n, MCS0)



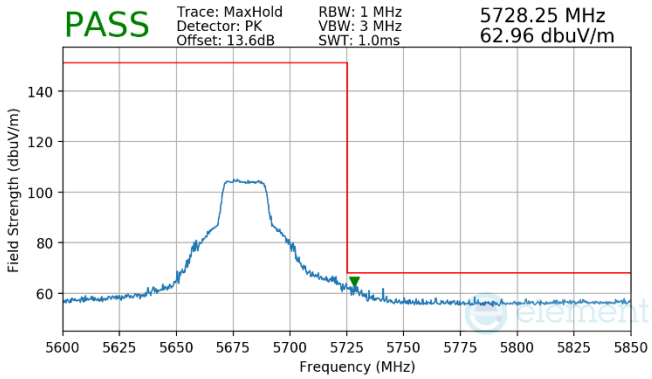
Plot 7-48. (Pk & Avg, Ch.100, 802.11n, MCS7)



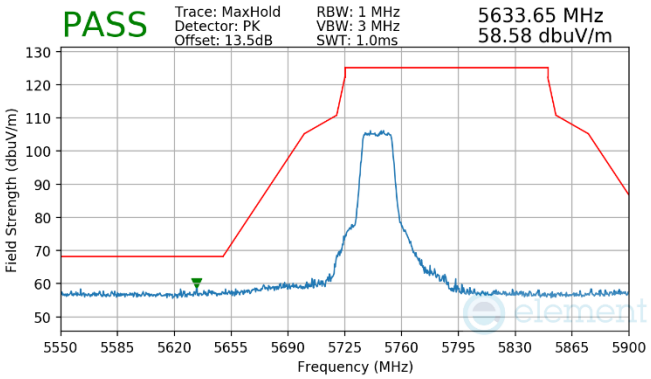
Plot 7-49. (Pk & Avg, Ch.136, 802.11n, MCS0)



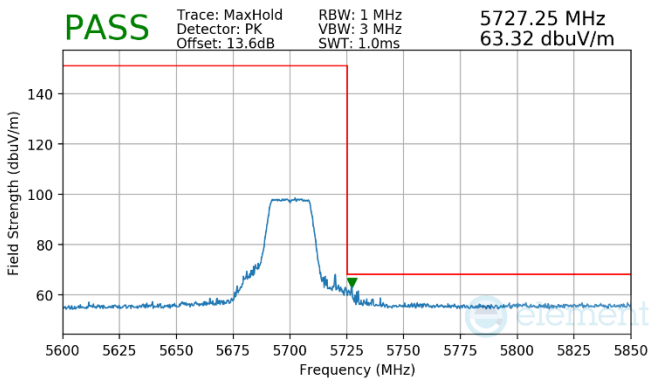
Plot 7-52. (Pk & Avg, Ch.140, 802.11n, MCS7)



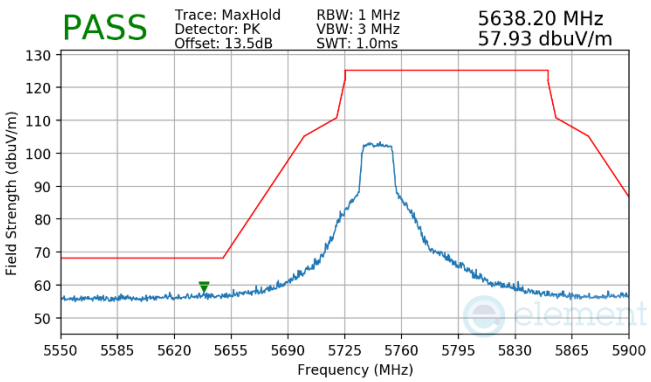
Plot 7-50. (Pk & Avg, Ch.136, 802.11n, MCS7)



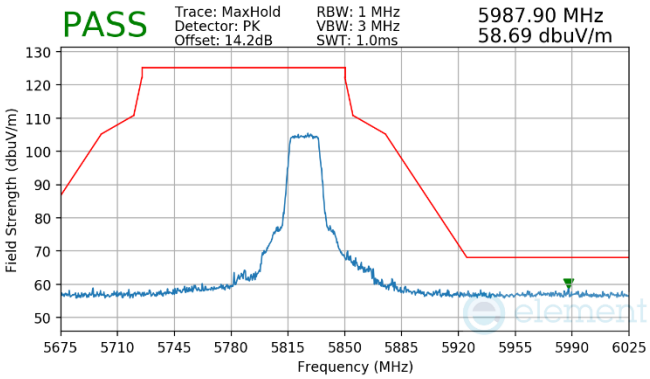
Plot 7-53. (Pk & Avg, Ch.149, 802.11n, MCS0)



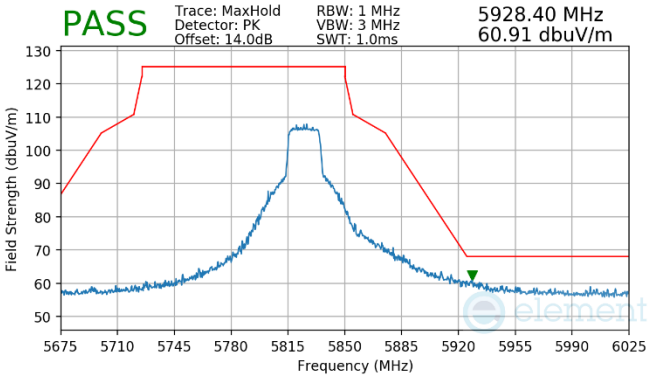
Plot 7-51. (Pk & Avg, Ch.140, 802.11n, MCS0)



Plot 7-54. (Pk & Avg, Ch.149, 802.11n, MCS7)



Plot 7-55. (Pk & Avg, Ch.165, 802.11n, MCS0)



Plot 7-56. (Pk & Avg, Ch.165, 802.11n, MCS7)

7.7 Radiated Spurious Emissions – Below 1GHz

§15.209; RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 7 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-25 per Section 15.209 and RSS-Gen (8.9).

Frequency	Field Strength [µV/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 7-25. Radiated Limits

Test Procedures Used

ANSI C63.10-2020

Test Settings

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 120kHz (for emissions from 30MHz – 1GHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 120kHz (for emissions from 30MHz – 1GHz)
3. VBW = 300kHz
4. Detector = quasi-peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagrams below.

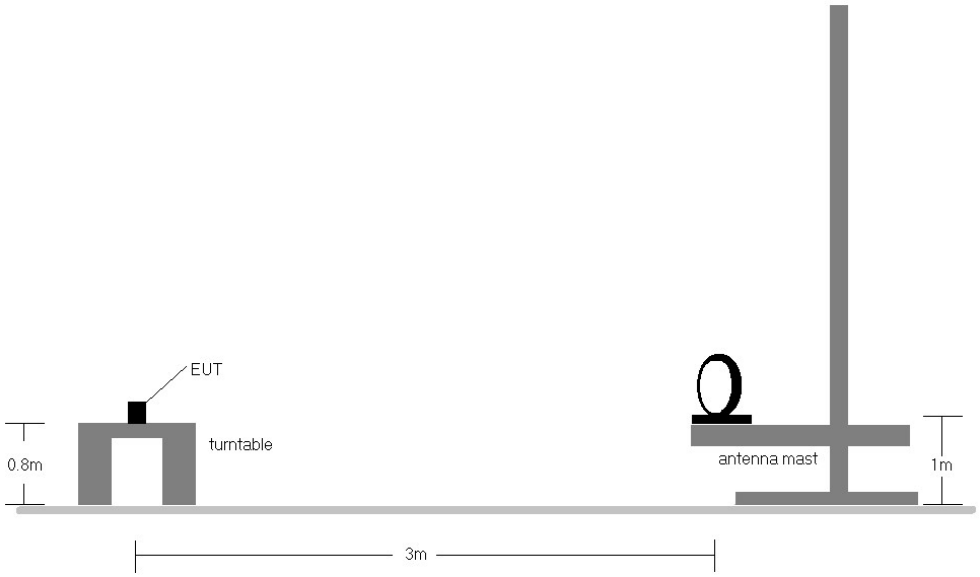


Figure 7-6. Radiated Test Setup < 30MHz

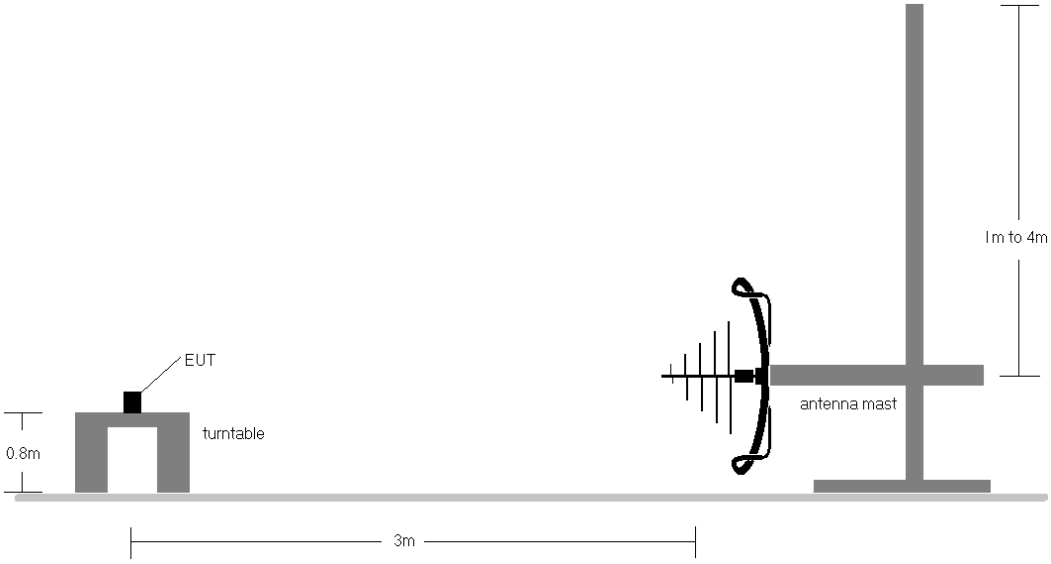


Figure 7-7. Radiated Test Setup < 1GHz

Test Notes

1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen (8.10) are below the limit shown in Table 7-25.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes. For below 30MHz the loop antenna was positioned in 3 orthogonal planes (X front, Y side, Z top) to determine the orientation resulting in the worst case emissions.
3. This unit was tested with its standard battery.
4. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector on emissions that were within 6dB of the limit.
5. Emissions were measured at a 3 meter test distance.
6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
7. No spurious emissions were detected within 20dB of the limit below 30MHz.
8. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
9. Both configurations below were investigated, and the worst case has been reported.
    a. EUT powered by AC/DC adaptor via USB-C cable with magnetic charger
    b. EUT powered by host PC via USB-C cable with magnetic charger
10. The unit was tested with all possible modes and only the highest emission is reported.

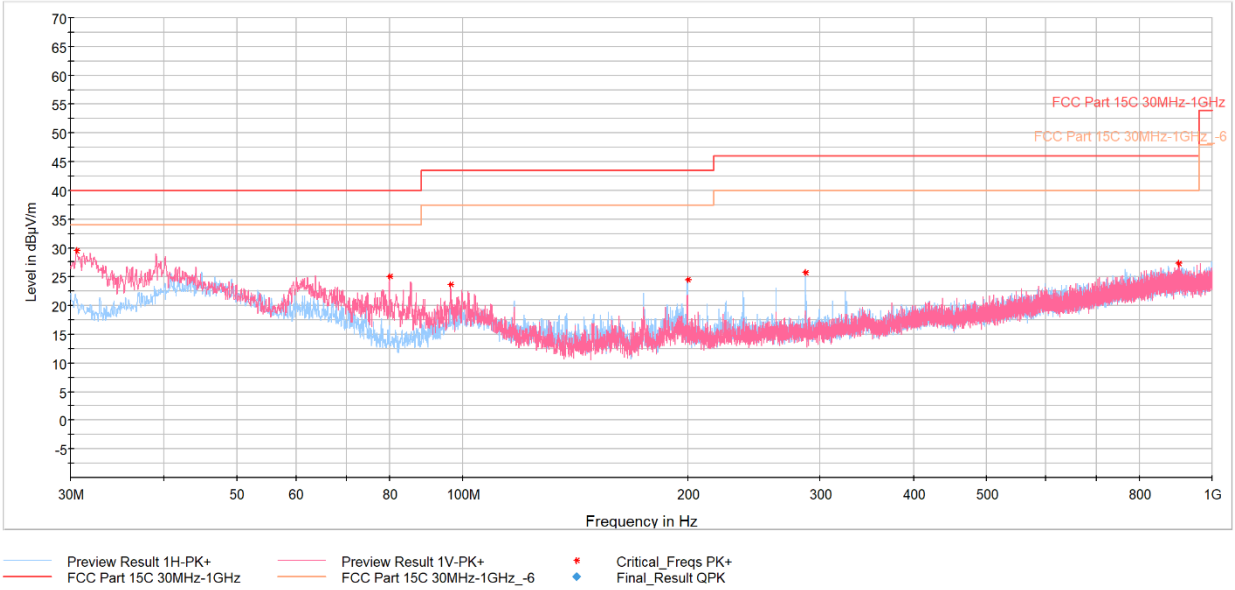
Sample Calculations

Determining Spurious Emissions Levels

- Field Strength Level $_{[dB\mu V/m]}$ = Analyzer Level $_{[dBm]}$ + 107 + AFCL $_{[dB/m]}$
- AFCL $_{[dB/m]}$ = Antenna Factor $_{[dB/m]}$ + Cable Loss $_{[dB]}$ - Preamp Gain $_{[dB]}$
- Margin $_{[dB]}$ = Field Strength Level $_{[dB\mu V/m]}$ – Limit $_{[dB\mu V/m]}$

7.7.1 Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209; RSS-Gen [8.9]



Plot 7-57. Radiated Spurious Emissions below 1GHz, 802.11n, Ch. 52 with AC/DC Adapter & magnetic charger

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
30.58	Max-Peak	V	100	286	-58.11	-19.34	29.55	40.00	-10.45
79.96	Max-Peak	V	100	277	-59.14	-22.86	25.00	40.00	-15.00
96.49	Max-Peak	V	100	291	-64.82	-18.47	23.71	43.52	-19.81
199.56	Max-Peak	H	100	262	-64.55	-17.99	24.46	43.52	-19.06
286.76	Max-Peak	H	100	305	-65.41	-15.83	25.76	46.02	-20.26
902.18	Max-Peak	V	300	69	-75.25	-4.46	27.29	46.02	-18.73

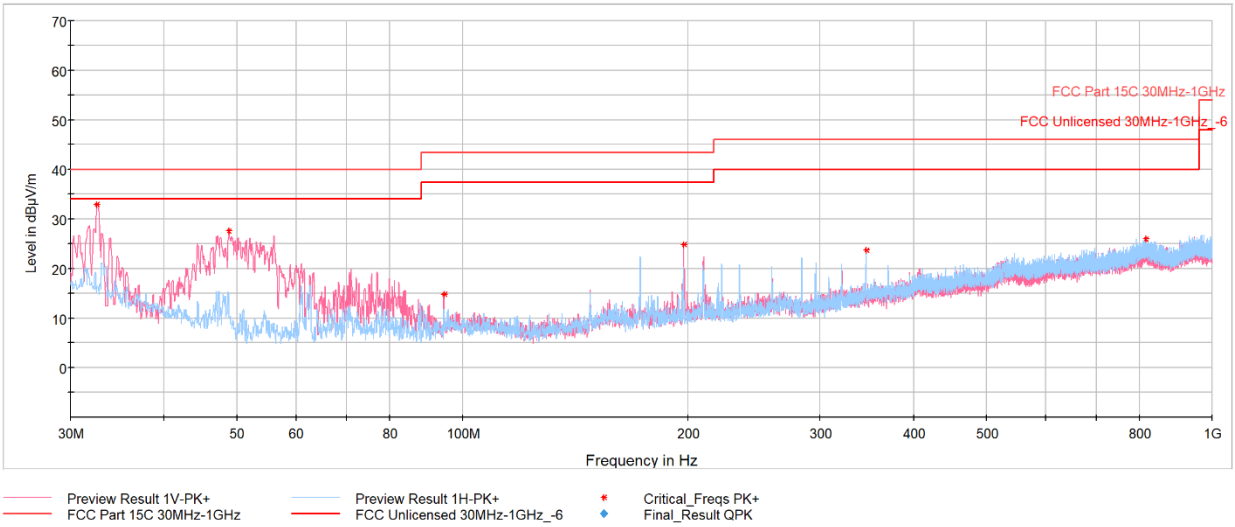
Table 7-26. Radiated Spurious Emissions below 1GHz, 802.11n, Ch.52 with AC/DC Adapter & magnetic charger

7.7.2 Simultaneous TX Radiated Spurious Emissions Measurements (Below 1GHz)

§15.209; RSS-Gen [8.9]

Description	Bluetooth	FR1 (Band n41)	UNII
Antenna	FCM	FCM	FCM
Channel	78	518600	36
Operating Frequency (MHz)	2480	2593	5180
Mode/Modulation	GFSK ePA	QPSK/1RB/10MHz	802.11n

Table 7-27. Worst Case Simultaneous Transmission Configuration



Plot 7-58. Radiated Spurious Emissions Below 1GHz – Simultaneous Transmission

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB]	Field Strength [dBm]	Limit [dBµV/m]	Margin [dB]
32.57	Max-Peak	V	100	73	-56.44	-17.59	32.97	40.00	-7.03
48.82	Max-Peak	V	100	350	-56.03	-23.33	27.64	40.00	-12.36
94.55	Max-Peak	V	100	9	-70.72	-21.54	14.74	43.52	-28.78
197.33	Max-Peak	V	100	139	-64.05	-18.13	24.82	43.52	-18.70
345.30	Max-Peak	H	100	324	-70.33	-13.04	23.63	46.02	-22.39
814.54	Max-Peak	H	200	301	-77.72	-3.38	25.90	46.02	-20.12

Table 7-28. Radiated Spurious Emissions Measurements – Simultaneous Transmission

7.8 AC Line-Conducted Emissions Measurement

§15.407; RSS-Gen [8.8]

Test Overview and Limit

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for AC Line conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.

All conducted emissions must not exceed the limits shown in the table below, per Section 15.207 and RSS-Gen (8.8).

Frequency of emission (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

Table 7-29. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2020, Section 6.2

Test Settings

Quasi-Peak Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Average Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = RMS
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

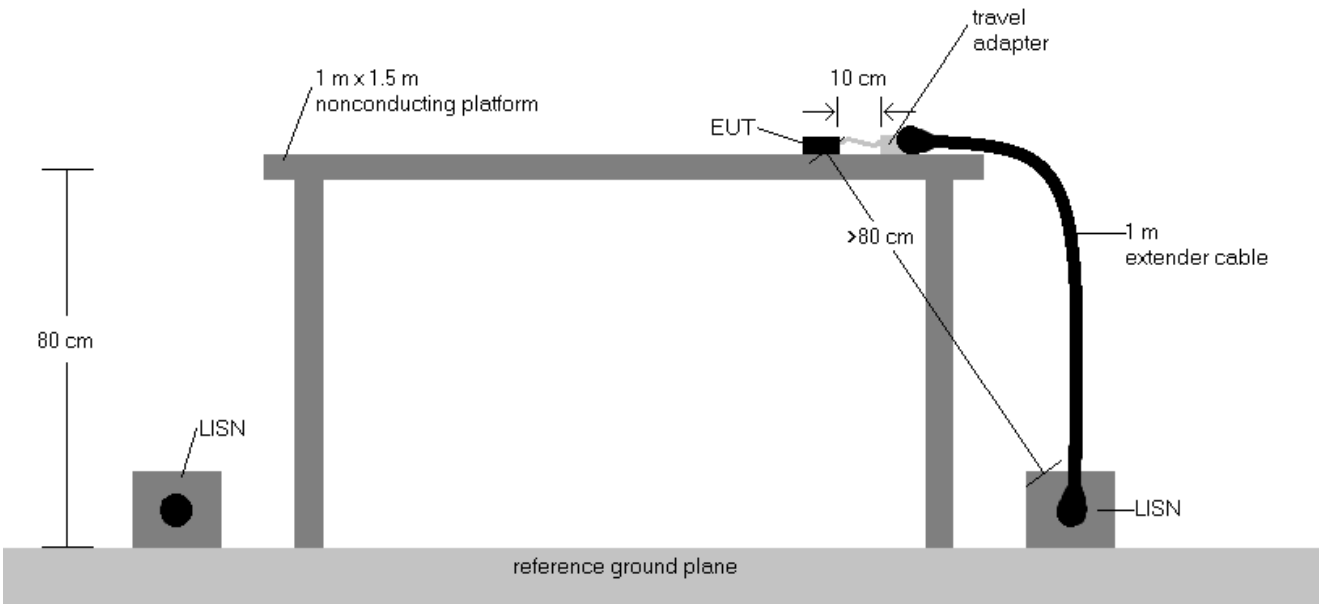
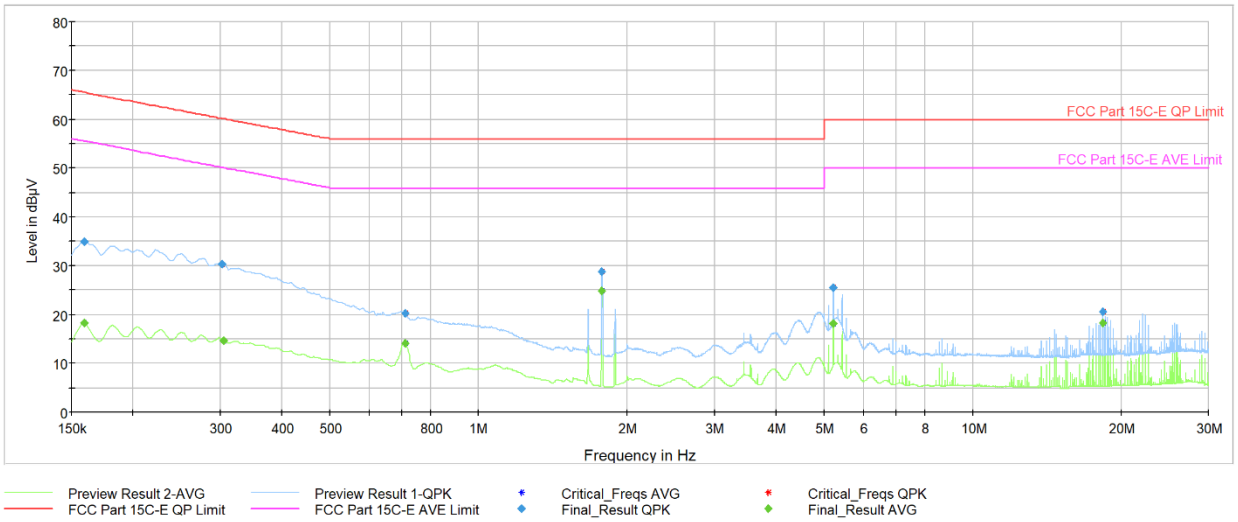


Figure 7-8. Test Instrument & Measurement Setup

Test Notes

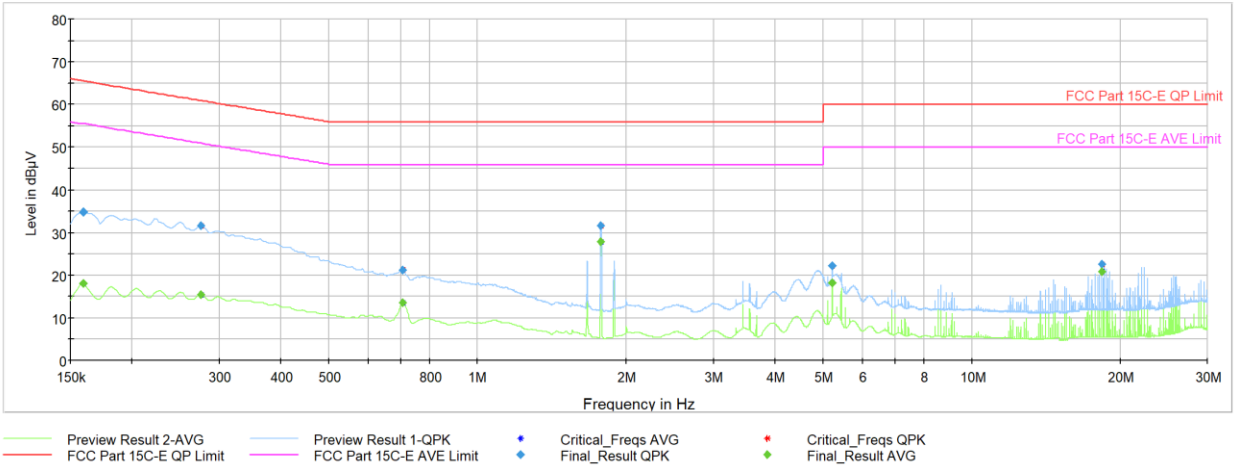
1. All modes of operation were investigated and the worst-case emissions are reported. The emissions found were not affected by the choice of channel used during testing.
2. Both configurations below were investigated, and the worst case has been reported.
    a. EUT powered by AC/DC adaptor via USB-C cable with magnetic charger
    b. EUT powered by host PC via USB-C cable with magnetic charger
3. The limit for an intentional radiator from 150kHz to 30MHz are specified in 15.207 and RSS-Gen (8.8).
4. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBμV) = QP/AV Analyzer/Receiver Level (dBμV) + Correction Factor (dB)
6. Margin (dB) = QP/AV Level (dBμV) - QP/AV Limit (dBμV)
7. Traces shown in plots are made using quasi-peak and average detectors.
8. Deviations to the Specifications: None.



Plot 7-59. AC Line Conducted Plot with 802.11n Ch.52 (L1), with AC/DC adapter & magnetic charger

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.159	FINAL	---	18.26	55.52	-37.25	L1	GND
0.159	FINAL	34.9	---	65.52	-30.64	L1	GND
0.303	FINAL	30.3	---	60.16	-29.83	L1	GND
0.305	FINAL	---	14.73	50.10	-35.37	L1	GND
0.710	FINAL	---	14.22	46.00	-31.78	L1	GND
0.710	FINAL	20.3	---	56.00	-35.71	L1	GND
1.777	FINAL	28.7	---	56.00	-27.26	L1	GND
1.777	FINAL	---	24.81	46.00	-21.19	L1	GND
5.222	FINAL	25.6	---	60.00	-34.43	L1	GND
5.222	FINAL	---	18.08	50.00	-31.92	L1	GND
18.332	FINAL	---	18.29	50.00	-31.71	L1	GND
18.332	FINAL	20.6	---	60.00	-39.42	L1	GND

Table 7-30. AC Line Conducted Data with 802.11n Ch.52 (L1) with AC/DC adapter & magnetic charger



Plot 7-60. AC Line Conducted Plot with 802.11n Ch.52 (N), with AC/DC adapter & magnetic charger

Frequency [MHz]	Process State	QuasiPeak [dBµV]	Average [dBµV]	Limit [dBµV]	Margin [dB]	Line	PE
0.159	FINAL	—	18.01	55.52	-37.51	N	GND
0.159	FINAL	34.8	—	65.52	-30.69	N	GND
0.276	FINAL	—	15.50	50.94	-35.44	N	GND
0.276	FINAL	31.5	—	60.94	-29.40	N	GND
0.706	FINAL	—	13.63	46.00	-32.37	N	GND
0.706	FINAL	21.3	—	56.00	-34.74	N	GND
1.777	FINAL	31.6	—	56.00	-24.45	N	GND
1.777	FINAL	—	27.93	46.00	-18.07	N	GND
5.222	FINAL	22.2	—	60.00	-37.81	N	GND
5.222	FINAL	—	18.26	50.00	-31.74	N	GND
18.335	FINAL	—	20.98	50.00	-29.02	N	GND
18.335	FINAL	22.6	—	60.00	-37.37	N	GND

Table 7-31. AC Line Conducted Data Ch.52 (N), with AC/DC adapter and magnetic charger.

8.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Apple Watch FCC ID: BCG-A3337** and **IC: 579C-A3337** is in compliance with Part 15 Subpart E (15.407) of the FCC Rules and RSS-247 of the Innovation, Science and Economic Development Canada Rules.