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TEST REPORT

Report Number: 18101182HKG-001R3

Application for Original Grant of 47 CFR Part 15 Certification

Single New of RSS-247 Issue 2 Equipment

This report contains the data of 5GHz WLAN (WiFi) portion only.

FCC ID: AZ489FT7120

IC: 109U-89FT7120

This report supersedes previous report with report number 18101182HKG-001R2 dated April 02, 2019. Please refer HEE-S19-0020 Letter issued on April 08, 2019 for amendment/ supersede notification.

Tested, Prepared and Checked by:	**Approved by:**
Kelvin Liang Assistant Manager Shenzhen UnionTrust Quality and Technology Co., Ltd. Date: April 08, 2019	Digitally signed by Tim Lee Location: Intertek Testing Services Hong Kong Ltd. Lee Shui Tim, Tim Senior Lead Engineer Intertek Testing Services Hong Kong Date: April 08, 2019

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TEST REPORT

GENERAL INFORMATION

Applicant Name:	Motorola Solutions Inc.
Applicant Address:	8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322
FCC Specification Standard:	FCC Part 15, October 1, 2017 Edition
FCC ID:	AZ489FT7120
FCC Model(s):	Si200
Motorola Internal P/N:	HKUN4120A
IC Specification Standard:	RSS-247 Issue 2, February 2017 RSS-Gen Issue 5, April 2018
IC:	109U-89FT7120
PMN:	Si200
HVIN:	HKUN4120A
Type of EUT:	Unlicensed National Information Infrastructure Devices
Description of EUT:	Body Worn Camera
Serial Number:	N/A
Sample Receipt Date:	October 29, 2018
Date of Test:	December 08, 2018 to March 04, 2019
Place of Testing:	Shenzhen UnionTrust Quality and Technology Co., Ltd. 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China.
Report Date:	April 08, 2019
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%
Conclusion:	Test was conducted by client submitted sample. The submitted sample as received complied with the 47 CFR Part 15 / RSS-247 Issue 2 Certification.

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1.0 TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

1.1 Summary of Test Results

Test Items	FCC Part 15 Section	RSS-247/ RSS-Gen# Section	Results	Details See Section
Antenna Requirement	15.407(a)	6.2.1.1/ 6.2.2.1/ 6.2.3.1/ 6.2.4.1	Pass	2.1
Max. Conducted Output Power (Peak)	15.407(a)	6.2.1.1/ 6.2.2.1/ 6.2.3.1/ 6.2.4.1	Pass	4.1
Transmit Power Control (TPC)	15.407(h)	6.2.1.1/ 6.2.2.1/ 6.2.3.1/ 6.2.4.1	N/A	See Remark
Min. 6dB RF Bandwidth	15.407(e)	6.2.4.1	Pass	4.2
26 dB emission bandwidth	15.407(a)	6.2.1.2	Pass	4.3
Occupied Bandwidth	N/A	6.7	Pass	4.3
Max. Power Density (average)	15.407(a)	6.2.4.1	Pass	4.4
Radiated Emission in Restricted Bands and Spurious Emissions	15.407(b), 15.209 & 15.109	6.2.1.2/ 6.2.2.2/ 6.2.3.2/ 6.2.4.2	Pass	4.5
AC Power Line Conducted Emission	15.207 & 15.107	7.2.4#	Pass	4.7
Dynamic Frequency Selection(DFS)	15.407	6.3.1	Pass	4.8

Remark: not applicable if the EUT is <500mW (27dBm)

Note: Pursuant to FCC Part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over expected variations in temperature and supply voltage were considered.

1.2 Statement of Compliance

The equipment under test is found to be complying with the following standard:

FCC Part 15, October 1, 2017 Edition
RSS-247 Issue 2, February 2017
RSS-Gen Issue 5, April 2018

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2.0 GENERAL DESCRIPTION

2.1 Product Description

The Si200 (HKUN4120A) is a Body Worn Camera and a Law enforcement recorder. It is the with Wireless Wi-Fi (802.11a/ac/b/g/n) connectivity, Bluetooth connectivity, The EUT was powered by 120AC adaptor.

For the WLAN (WiFi) module:

For 5.15-5.25GHz:
The Equipment Under Test (EUT) operates at frequency range of 5180MHz to 5240MHz with 4 channels.
For 802.11a mode, it operates at frequency range of 5180.00MHz to 5250.000MHz with 4 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can be up to 54Mbps.
For 802.11n (with 20MHz bandwidth) mode, it operates at frequency range of 5180.00MHz to 5250.000MHz with 4 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 72.2Mbps.
For 802.11n (with 40MHz bandwidth) mode, it operates at frequency range of 5190.00MHz to 5230.000MHz with 2 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 150.0Mbps.
For 802.11ac (with 20MHz bandwidth) mode, it operates at frequency range of 5180.00MHz to 5250.000MHz with 4 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 86.7Mbps.
For 802.11ac (with 40MHz bandwidth) mode, it operates at frequency range of 5190.00MHz to 5230.000MHz with 2 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 200Mbps.
For 802.11ac (with 80MHz bandwidth) mode, it operates at frequency 5210MHz. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 433.3Mbps.

For 5.25-5.35GHz:
The Equipment Under Test (EUT) operates at frequency range of 5260MHz to 5320MHz with 4 channels.
For 802.11a mode, it operates at frequency range of 5260.00MHz to 5320.000MHz with 4 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can be up to 54Mbps.
For 802.11n (with 20MHz bandwidth) mode, it operates at frequency range of 5260MHz to 5320MHz with 4 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 72.2Mbps.
For 802.11n (with 40MHz bandwidth) mode, it operates at frequency range of 5270.00MHz to 5310.000MHz with 2 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 150Mbps.

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For 802.11ac (with 20MHz bandwidth) mode, it operates at frequency range of 5260MHz to 5320MHz with 4 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 86.7Mbps.
For 802.11ac (with 40MHz bandwidth) mode, it operates at frequency range of 5270.00MHz to 5310.000MHz with 2 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 200Mbps.
For 802.11ac (with 80MHz bandwidth) mode, it operates at frequency 5290MHz. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 433.3Mbps.

For 5.47-5.725GHz:
The Equipment Under Test (EUT) operates at frequency range of 5500MHz to 5720MHz with 12 channels.
For 802.11a mode, it operates at frequency range of 5500.00MHz to 5720.000MHz with 12 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can be up to 54Mbps.
For 802.11n (with 20MHz bandwidth) mode, it operates at frequency range of 5500MHz to 5720MHz with 12 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 72.2Mbps.
For 802.11n (with 40MHz bandwidth) mode, it operates at frequency range of 5510.00MHz to 5710.000MHz with 6 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 150Mbps.
For 802.11ac (with 20MHz bandwidth) mode, it operates at frequency range of 5500MHz to 5720MHz with 12 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 86.7Mbps.
For 802.11ac (with 40MHz bandwidth) mode, it operates at frequency range of 5510.00MHz to 5710.000MHz with 6 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 200Mbps.
For 802.11ac (with 80MHz bandwidth) mode, it operates at frequency range of 5530.00MHz to 5690.000MHz with 3 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 433.3Mbps.

For 5.725-5.850GHz:
The Equipment Under Test (EUT) operates at frequency range of 5745MHz to 5825MHz with 5 channels.
For 802.11a mode, it operates at frequency range of 5745.00MHz to 5825.000MHz with 5 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can be up to 54Mbps.
For 802.11n (with 20MHz bandwidth) mode, it operates at frequency range of 5745MHz to 5825MHz with 5 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 72.2Mbps.
For 802.11n (with 40MHz bandwidth) mode, it operates at frequency range of 5755.00MHz to 5795.000MHz with 2 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 150Mbps.
For 802.11ac (with 20MHz bandwidth) mode, it operates at frequency range of 5745MHz to 5825MHz with 5 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 86.7Mbps.

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For 802.11ac (with 40MHz bandwidth) mode, it operates at frequency range of 5755.00MHz to 5795.000MHz with 2 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 200Mbps.
For 802.11ac (with 80MHz bandwidth) mode, it operates at frequency 5775.00MHz with 1 channel. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 433.3Mbps.

DFS description for 5250MHz to 5350MHz and 5470MHz to 5725MHz:

The operating mode of this device is Client mode without radar detection function. (IP based system)
The Highest output power of this EUT is 10.82dBm.

This product equipped with single antenna in SISO mode and the antenna gain are stated as below:
5150-5250 MHz: Antenna Gain = 1.23 dBi
5250-5350 MHz: Antenna Gain = 3.01 dBi
5470-5725 MHz: Antenna Gain = 3.91 dBi
5725-5850 MHz: Antenna Gain = 2.99 dBi

2.2 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Preliminary radiated scans and all radiated measurements were performed in radiated emission test sites. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. Antenna port conducted measurements were performed according to ANSI C63.10 (2013) and KDB Publication No.789033 D02 v01r04 (02-May-2017) All other measurements were made in accordance with the procedures in 47 CFR Part 2 and RSS-Gen Issue 5 (2018).

2.3 Test Facility

The radiated emission test site and antenna port conducted measurement facility used to collect the radiated data and conductive data are at Shenzhen UnionTrust Quality and Technology Co., Ltd. (Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China). This test facility and site measurement data have been fully placed on file with the FCC and Industry Canada No.: 21600-1.

2.4 Related Submittal(s) Grants

This is a single application for certification of a transceiver (WiFi portion)

TEST REPORT

3.0 SYSTEM TEST CONFIGURATION

3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to transmit / receive continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst case emissions.

The EUT is power by 3.7VDC Li-ion battery (Motorola Internal P/N: PMNN4577A) and/or AC adaptor (100VAC to 240VAC, Model: MU15-X050300-C5) (Motorola Internal P/N: PS000277A01).

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable. If the base unit attached to peripherals, they were connected and operational (as typical as possible).

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

For any intentional radiator powered by AC power line, measurements of the radiated signal level of the fundamental frequency component of the emission was performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

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

Emission that are directly caused by digital circuits in the transmit path and transmitter portion were measured, and the limit are according to FCC Part 15 Section 15.209 / RSS-247 2.5. Digital circuitries used to control additional functions other than the operation of the transmitter are subject to FCC Part 15 Section 15.109 / RSS-247 Section 5.5 Limits.

TEST REPORT

3.1 Justification – Cont'd

Detector function for radiated emissions was in peak mode. Average readings, when required, were taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in section 4.8.3.

Determination of pulse desensitization was made according to *Hewlett Packard Application Note 150-2, Spectrum Analysis... Pulsed RF.* The effective period (Teff) was referred to Exhibit 4.8.3. With the resolution bandwidth 1MHz and spectrum analyzer IF bandwidth 3dB, the pulse desensitization factor was 0dB.

For AC line conducted emission test, the EUT along with its peripherals were placed on a 1.0m(W)x1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50ohm coupling impedance for measuring instrument. The LISN housing, measuring instrument case, reference ground plane, and vertical ground plane were bounded together. The excess power cable between the EUT and the LISN was bundled.

All connecting cables of EUT and peripherals were manipulated to find the maximum emission.

Different data rates have been tested. Worst case is reported only.

All relevant operation modes have been tested, and the worst case data is included in this report.

All data rates were tested under normal mode of WiFi. Only the worst-case data is shown in the report for OFDM

3.2 EUT Exercising Software

The EUT exercise program (if any) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

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3.3 Details of EUT and Description of Accessories

Details of EUT:

An AC adaptor (provided with the unit) was used to power the device. Their description are listed below.

(1) An AC adaptor (100VAC to 240VAC, Model: MU15-X050300-C5) (Provided by Client) (Motorola Internal P/N: PS000277A01)

Description of Accessories:

(1) Swivel Belt Clip (Provided by Applicant) (Motorola Internal P/N: PMLN8220A)
(2) Magnetic Clip (Provided by Applicant) (Motorola Internal P/N: PMLN8221A)

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test at a level of confidence of 95% has been considered. The values of the Measurement uncertainty:

No.	Item	Measurement Uncertainty
1	Conducted emission 9KHz-150KHz	±3.8 dB
2	Conducted emission 150KHz-30MHz	±3.4 dB
3	Radiated emission 9KHz-30MHz	±4.9 dB
4	Radiated emission 30MHz-1GHz	±4.7 dB
5	Radiated emission 1GHz-18GHz	±5.1 dB
6	Radiated emission 18GHz-26GHz	±5.2 dB
7	Radiated emission 26GHz-40GHz	±5.2 dB

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

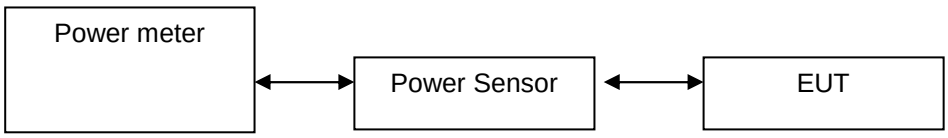
TEST REPORT

4.0 TEST RESULTS

4.1 Maximum Conducted (Avg) Output Power at Antenna Terminals

RF Conduct Measurement Test Setup

The figure below shows the test setup, which is utilized to make these measurements.



The antenna port of the EUT was connected to the input of a spectrum analyzer.

☒ The antenna power of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to the obtain power at the EUT antenna terminals. The measurement procedure E.3.A (789033 D02 General UNII Test Procedures New Rules v01r04 Page 8) was used.

☐ The EUT should be configured to transmit continuously (at a minimum duty cycle of 98%) at full power over the measurement duration. The measurement procedure AVG1 was used.

IEEE 802.11ac (20MHz) (MCS0) Antenna Gain = 1.23dBi (5150-5250 MHz),3.01 dBi (5250-5350 MHz),3.91 dBi (5470-5725 MHz), 2.99 dBi (5725-5850 MHz)

Frequency (MHz)	Conducted output power in dBm	Conducted output power in mWatt
5180	6.25	4.22
5220	6.31	4.28
5240	6.46	4.43
5260	6.06	4.04
5300	6.22	4.19
5320	6.27	4.24
5500	9.20	8.32
5580	9.40	8.71
5700	9.00	7.94
5720(U-NII-2C)	8.47	7.03
5720(U-NII-C)	1.77	1.50
5745	9.37	8.65
5785	9.02	7.98
5825	8.56	7.18

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IEEE 802.11ac (40MHz) (MCS0) Antenna Gain = 1.23 dBi (5150-5250 MHz), 3.01dBi (5250-5350 MHz), 3.91 dBi (5470-5725 MHz), 2.99 dBi (5725-5850 MHz)

Frequency (MHz)	Conducted output power in dBm	Conducted output power in mWatt
5190	6.08	4.06
5230	6.12	4.09
5270	6.07	4.05
5310	6.21	4.18
5510	6.94	4.94
5550	6.99	5.00
5670	6.84	4.83
5710(N-UII-2C)	7.28	5.35
5710(N-UII-3)	-4.10	0.39
5755	8.53	7.13
5795	8.04	6.37

IEEE 802.11ac (80MHz) (MCS0) Antenna Gain = 1.23 dBi (5150-5250 MHz), 3.01 dBi (5250-5350 MHz),3.91 dBi (5470-5725 MHz), 2.99 dBi (5725-5850 MHz)

Frequency (MHz)	Conducted output power in dBm	Conducted output power in mWatt
5210	5.29	3.38
5290	5.26	3.36
5530	6.13	4.10
5690(N-UII-2C)	6.55	4.52
5690(N-UII-3)	-8.36	0.15
5775	9.64	9.20

IEEE 802.11a (20MHz) (OFDM, 6 Mbps) Antenna Gain = 1.23 dBi (5150-5250 MHz), 3.01 dBi (5250-5350 MHz),3.91 dBi (5470-5725 MHz), 2.99 dBi (5725-5850 MHz)

Frequency (MHz)	Conducted output power in dBm	Conducted output power in mWatt
5180	6.67	4.65
5220	6.76	4.74
5240	6.89	4.89
5260	6.34	4.31
5300	6.56	4.53
5320	6.55	4.52
5500	9.88	9.73
5580	9.88	9.73
5700	9.41	8.73
5720(N-UII-2C)	9.27	8.45
5720(N-UII-3)	1.89	1.55
5745	10.82	12.08
5785	10.53	11.30
5825	10.21	10.50

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IEEE 802.11n (20MHz) (OFDM, MCS0) Antenna Gain = 1.23 dBi (5150-5250 MHz), 3.01 dBi (5250-5350 MHz),3.91 dBi (5470-5725 MHz), 2.99 dBi (5725-5850 MHz)

Frequency (MHz)	Conducted output power in dBm	Conducted output powein mWatt
5180	6.40	4.37
5220	6.46	4.43
5240	6.48	4.45
5260	5.97	3.95
5300	6.15	4.12
5320	6.40	4.37
5500	9.32	8.55
5580	9.22	8.36
5700	9.24	8.39
5720(N-UII-2C)	8.65	7.33
5720(N-UII-3)	0.99	1.26
5745	10.56	11.38
5785	10.22	10.52
5825	10.04	10.09

IEEE 802.11n (40MHz) (OFDM, MCS0) Antenna Gain =1.23 dBi (5150-5250 MHz),3.01 dBi (5250-5350 MHz),3.91 dBi (5470-5725 MHz),2.99 dBi (5725-5850 MHz)

Frequency (MHz)	Conducted output power in dBm	Conducted output power in mWatt
5190	6.37	4.34
5230	6.48	4.45
5270	6.89	4.89
5310	6.82	4.81
5510	7.24	5.30
5550	7.26	5.32
5670	6.93	4.93
5710(N-UII-2C)	7.54	5.68
5710(N-UII-3)	-4.04	0.39
5755	8.62	7.28
5795	8.19	6.59

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For maximum e.i.r.p.

IEEE 802.11ac (20MHz) (MCS0) Antenna Gain = 1.23 dBi (5150-5250 MHz)

Frequency (MHz)	Conducted output power in dBm	EIRP in dBm	EIRP in mWatt
5180	6.25	7.48	5.60
5220	6.31	7.54	5.68
5240	6.46	7.69	5.87

IEEE 802.11ac (40MHz) (MCS0) Antenna Gain = 1.23 dBi (5150-5250 MHz)

Frequency (MHz)	Conducted output power in dBm	EIRP in dBm	EIRP in mWatt
5190	6.08	7.31	5.38
5230	6.12	7.35	5.43

IEEE 802.11ac (80MHz) (MCS0) Antenna Gain =1.23 dBi (5150-5250 MHz)

Frequency (MHz)	Conducted output power in dBm	EIRP in dBm	EIRP in mWatt
5210	5.29	6.52	4.49

IEEE 802.11a (20MHz) (OFDM, 6 Mbps) Antenna Gain = 1.23 dBi (5150-5250 MHz)

Frequency (MHz)	Conducted output power in dBm	EIRP in dBm	EIRP in mWatt
5180	6.67	7.9	6.17
5220	6.76	7.99	6.30
5240	6.89	8.12	6.49

IEEE 802.11n (20MHz) (OFDM, MCS0) Antenna Gain = 1.23 dBi (5150-5250 MHz

Frequency (MHz)	Conducted output power in dBm	EIRP in dBm	EIRP in mWatt
5180	6.40	7.63	5.79
5220	6.42	7.65	5.82
5240	6.48	7.71	5.90

IEEE 802.11n (40MHz) (OFDM, MCS0) Antenna Gain = 1.23 dBi (5150-5250 MHz)

Frequency (MHz)	Conducted output power in dBm	EIRP in dBm	EIRP in mWatt
5190	6.37	7.6	5.75
5230	6.48	7.71	5.90

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Cable loss : 1.02 dB External Attenuation : 10 dB

Cable loss, external attenuation: ☒ included in OFFSET function
☐ added to SA raw reading

IEEE 802.11ac (20MHz) (OFDM, MCS0)
max. conducted output level = 6.46 dBm

IEEE 802.11ac (40MHz) (OFDM, MCS0)
max. conducted output level = 6.12 dBm

IEEE 802.11ac (80MHz) (OFDM, MCS0)
max. conducted output level = 5.29 dBm

IEEE 802.11a (20MHz) (OFDM, 6 Mbps)
max. conducted output level = 6.89 dBm

IEEE 802.11n (20MHz) (OFDM, MCS0)
max. conducted output level = 6.48 dBm

IEEE 802.11n (40MHz) (OFDM, MCS0)
max. conducted output level = 6.48 dBm

Remark:
1. Maximum e.i.r.p = Maximum conducted output power + Duty Cycle Factor + Antenna Gain
2. Maximum conducted output power = Conducted output power + Duty Cycle Factor
3. Duty cycle= On Time/ Period;
   Duty Cycle factor = 10 * log(1/ Duty cycle);
   Average factor = 20 log10 Duty Cycle.
4. Limits for FCC:

5150-5250MHz:
250mW (24dBm) for antennas with gains of 6dBi or less. (Client device)
5250-5350MHz:
250mW (24dBm)
5470-5725MHz:
250mW (24dBm)
5725-5850MHz:
1W (30dBm) for antennas with gains of 6dBi or less.

Limits for RSS:
5150-5250MHz:
200mW (23dBm) for antennas with gains of 6dBi or less.
5250-5350MHz:
250mW (24dBm)
5470-5725MHz:
250mW (24dBm)
5725-5850MHz:
1W (30dBm) for antennas with gains of 6dBi or less.

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4.2 Minimum 6dB RF Bandwidth

The antenna port of the EUT was connected to the input of a spectrum analyzer. The EBW measurement procedure was used. A PEAK output reading was taken, a DISPLAY line was drawn 6dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

IEEE 802.11ac (20MHz) (MCS0)

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
5720(U-NII-3)	3.74	N/A
5745	17.56	17.652
5785	17.32	17.644
5825	17.34	17.651

IEEE 802.11ac (40MHz) (MCS0)

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
5710(U-NII-3)	3.12	N/A
5755	35.93	36.051
5795	35.92	36.046

IEEE 802.11ac (80MHz) (MCS0)

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
5690(U-NII-3)	2.55	N/A
5775	75.49	75.307

IEEE 802.11a (20MHz) (OFDM, 6Mbps)

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
5720(U-NII-3)	3.12	N/A
5745	16.35	16.461
5785	16.35	16.477
5825	16.35	16.451

IEEE 802.11n (40MHz) (OFDM, MCS0)

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
5710(U-NII-3)	3.11	N/A
5755	35.67	36.044
5795	35.93	36.049

TEST REPORT

IEEE 802.11n (20MHz) (OFDM, MCS0)

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
5720(U-NII-3)	3.75	N/A
5745	17.07	17.660
5785	17.57	17.644
5825	17.31	17.701

Limits:
For 5725-5850MHz:

6 dB bandwidth shall be at least 500kHz

The plots of 6dB RF bandwidth and occupied bandwidth are saved with filename: OBW DATA.pdf

TEST REPORT

4.3 26 dB Bandwidth & Occupied Bandwidth

The antenna port of the EUT was connected to the input of a spectrum analyser. The EBW measurement procedure was used. A PEAK output reading was taken, a DISPLAY line was drawn 26dB lower than PEAK level. The 26dB bandwidth was determined from where the channel output spectrum intersected the display line.

IEEE 802.11ac (20MHz) (MCS0)

Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5180	21.85	17.98
5220	21.75	18.02
5240	21.40	17.93
5260	21.76	17.99
5300	21.72	17.97
5320	21.49	17.99
5500	21.69	17.95
5580	21.57	17.95
5700	21.58	18.00
5720	21.47	17.91

IEEE 802.11ac (40MHz) (MCS0)

Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5190	40.01	36.21
5230	39.84	36.29
5270	39.87	36.27
5310	39.83	36.30
5510	39.95	36.24
5550	39.89	36.25
5670	39.96	36.30
5710	39.89	36.28

IEEE 802.11ac (80MHz) (MCS0)

Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5210	81.59	75.51
5290	82.24	75.50
5530	81.78	75.38
5690	81.05	75.45

TEST REPORT

IEEE 802.11a (20MHz) (OFDM, 6Mbps)

Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5180	21.36	16.91
5220	21.17	16.88
5240	21.32	16.89
5260	21.29	16.93
5300	21.41	16.89
5320	21.45	16.87
5500	21.26	16.89
5580	21.35	16.89
5700	21.26	16.89
5720	21.18	16.92

IEEE 802.11n (20MHz) (OFDM, MCS0)

Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5180	21.73	17.97
5220	21.50	17.97
5240	21.56	17.98
5260	21.57	17.95
5300	21.71	17.96
5320	21.89	18.00
5500	21.35	17.95
5580	21.56	17.94
5700	21.61	17.98
5720	21.54	17.96

IEEE 802.11N (40MHz) (OFDM, MCS0)

Frequency (MHz)	26dB Bandwidth (MHz)	99% Bandwidth (MHz)
5190	40.10	36.32
5230	39.86	36.33
5270	39.99	36.34
5310	40.06	36.31
5510	40.23	36.28
5550	39.90	36.27
5670	39.70	36.31
5710	39.81	36.26

TEST REPORT

4.4 Maximum Power Spectral Density

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

Spectrum analyser according to the following Settings:

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

Using method SA-2

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

2. For U-NII-3 band:

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

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

IEEE 802.11a (20MHz) (OFDM, 6 Mbps)

Frequency (MHz)	Conducted PSD in 1MHz (dBm)
5180	-3.336
5220	-3.169
5240	-2.828
5260	-3.069
5300	-3.314
5320	-3.133
5500	-0.456
5580	-0.073
5700	0.038
5720(U-NII-2C)	0.124
Frequency (MHz)	**Conducted PSD in 500kHz (dBm)**
5745	-1.388
5785	-1.905
5825	-1.780
5720(U-NII-3)	-5.632

TEST REPORT

IEEE 802.11ac (20MHz) (MCS0)

Frequency (MHz)	Conducted PSD in 1MHz (dBm)
5180	-3.848
5220	-3.845
5240	-3.574
5260	-4.007
5300	-3.861
5320	-3.883
5500	-0.893
5580	-0.718
5700	-0.696
5720(U-NII-2C)	-0.905
Frequency (MHz)	**Conducted PSD in 500kHz (dBm)**
5745	-3.155
5785	-3.217
5825	-3.560
5720(U-NII-3)	-6.145

IEEE 802.11ac (40MHz) (MCS0)

Frequency (MHz)	Conducted PSD in 1MHz (dBm)
5190	-6.272
5230	-6.238
5270	-6.438
5310	-6.601
5510	-7.113
5550	-7.535
5670	-6.624
5710(U-NII-2C)	-5.623
Frequency (MHz)	**Conducted PSD in 500kHz (dBm)**
5755	-7.372
5795	-7.437
5710(U-NII-3)	-11.2

TEST REPORT

IEEE 802.11ac (80MHz) (MCS0)

Frequency (MHz)	Conducted PSD in 1MHz (dBm)
5210	-9.596
5290	-9.670
5530	-10.473
5680(U-NII-2C)	-9.331
Frequency (MHz)	**Conducted PSD in 500kHz (dBm)**
5775	-8.292
5680(U-NII-3)	-15.490

IEEE 802.11n (20MHz) (OFDM, MCS0)

Frequency (MHz)	Conducted PSD in 1MHz (dBm)
5180	-3.635
5220	-3.869
5240	-3.742
5260	-3.810
5300	-3.861
5320	-3.802
5500	-0.824
5580	-0.475
5700	-0.582
5720(U-NII-2C)	-0.877
Frequency (MHz)	**Conducted PSD in 500kHz (dBm)**
5745	-2.049
5785	-2.193
5825	-2.371
5720(U-NII-3)	-5.833

TEST REPORT

IEEE 802.11n (40MHz) (OFDM, MCS0)

Frequency (MHz)	Conducted PSD in 1MHz (dBm)
5190	-6.039
5230	-6.242
5270	-6.321
5310	-6.429
5510	-6.893
5550	-6.222
5670	-5.504
5710(U-NII-2C)	-5.190
Frequency (MHz)	**Conducted PSD in 500kHz (dBm)**
5755	-7.076
5795	-6.802
5710(U-NII-3)	-11.055

For maximum e.i.r.p.

IEEE 802.11a (20MHz) (OFDM, 6 Mbps)

Frequency (MHz)	EIRP PSD in 1MHz (dBm)
5180	-2.106
5220	-1.939
5240	-1.598

IEEE 802.11ac (20MHz) (MCS0)

Frequency (MHz)	EIRP PSD in 1MHz (dBm)
5180	-2.618
5220	-2.615
5240	-2.344

IEEE 802.11ac (40MHz) (MCS0)

Frequency (MHz)	EIRP PSD in 1MHz (dBm)
5190	-5.042
5230	-5.008

IEEE 802.11ac (80MHz) (MCS0)

Frequency (MHz)	EIRP PSD in 1MHz (dBm)
5210	-8.366

TEST REPORT

IEEE 802.11n (20MHz) (OFDM, MCS0)

Frequency (MHz)	EIRP PSD in 1MHz (dBm)
5180	-2.405
5220	-2.639
5240	-2.512

IEEE 802.11n (40MHz) (OFDM, MCS0)

Frequency (MHz)	EIRP PSD in 1MHz (dBm)
5190	-4.809
5230	-5.012

Remark:
1. Cable Loss: 1.02 dB
2. **Error! Reference source not found.**e.i.r.p. spectral density = Power spectral density + Duty Cycle Factor + Antenna Gain
3. Power spectral density = Conducted power spectral density + Duty Cycle Factor
4. Duty cycle= On Time/ Period;
   Duty Cycle factor = 10 * log(1/ Duty cycle);
   Average factor = 20 log10 Duty Cycle.
5. Limit:
   For U-NII-1:
   ☒ FCC:
   11dBm/MHz for mobile/portable device.
   RSS:
   10dBm/MHz E.I.R.P
   For U-NII-2:
   ☒ FCC:
   11dBm/MHz
   RSS:
   11dBm/MHz
   For U-NII-3:
   ☒ FCC:
   30dBm/500kHz.
   RSS:
   30dBm/500kHz.

The test data are saved with filename: PSD DATA.pdf

TEST REPORT

4.5 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD + AV

Where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB
AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD + AV

Example
Assume a receiver reading of 62.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29.0 dB is subtracted. The pulse desensitization factor of the spectrum analyzer is 0.0 dB, and the resultant average factor is -10.0 dB. The net field strength for comparison to the appropriate emission limit is 32.0 dBµV/m. This value in dBµV/m is converted to its corresponding level in µV/m.

RA = 62.0 dBµV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0.0 dB
AV = -10 dB

FS = 62.0 + 7.4 + 1.6 – 29.0 + 0.0 + (-10.0) = 32.0 dBµV/m

Level in µV/m = Common Antilogarithm [(32.0 dBµV/m)/20] = 39.8 µV/m

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4.6 Transmitter Radiated Emissions in Restricted Bands and Spurious Emissions

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

4.6.1 Radiated Emission Configuration Photograph

Worst Case Restricted Band Radiated Emission
at

5470 MHz

The worst case radiated emission configuration photographs are saved with filename: config photos.pdf

4.6.2 Radiated Emission Data

The data in below tables list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Passed by 3.75 dB margin

TEST REPORT

RADIATED EMISSION DATA

Table 1
IEEE 802.11A (20MHz) (OFDM,6MBs)

Radiated Emission Test Data (Above 1GHz):

IEEE 802.11a_Channel 36

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10360.00	51.49	74.00	-22.51	Peak	Horizontal
2	10360.00	39.41	54.00	-14.59	Average	Horizontal
3	15540.00	48.41	74.00	-25.59	Peak	Horizontal
4	15540.00	36.57	54.00	-17.43	Average	Horizontal
5	10360.00	49.71	74.00	-24.29	Peak	Vertical
6	10360.00	37.70	54.00	-16.30	Average	Vertical
7	15540.00	50.04	74.00	-23.96	Peak	Vertical
8	15540.00	37.51	54.00	-16.49	Average	Vertical

IEEE 802.11a_Channel 44

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10440.00	52.45	74.00	-21.55	Peak	Horizontal
2	10440.00	39.94	54.00	-14.06	Average	Horizontal
3	15660.00	49.40	74.00	-24.60	Peak	Horizontal
4	15660.00	36.95	54.00	-17.05	Average	Horizontal
5	10440.00	49.10	74.00	-24.90	Peak	Vertical
6	10440.00	37.38	54.00	-16.62	Average	Vertical
7	15660.00	49.70	74.00	-24.30	Peak	Vertical
8	15660.00	37.28	54.00	-16.72	Average	Vertical

IEEE 802.11a_Channel 48

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10480.00	51.27	74.00	-22.73	Peak	Horizontal
2	10480.00	39.46	54.00	-14.54	Average	Horizontal
3	15720.00	48.80	74.00	-25.20	Peak	Horizontal
4	15720.00	36.55	54.00	-17.45	Average	Horizontal
5	10480.00	50.05	74.00	-23.95	Peak	Vertical
6	10480.00	37.23	54.00	-16.77	Average	Vertical
7	15720.00	50.03	74.00	-23.97	Peak	Vertical
8	15720.00	37.40	54.00	-16.60	Average	Vertical

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IEEE 802.11a_Channel 52

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10520.00	52.51	74.00	-21.49	Peak	Horizontal
2	10520.00	39.69	54.00	-14.31	Average	Horizontal
3	15780.00	48.25	74.00	-25.75	Peak	Horizontal
4	15780.00	36.62	54.00	-17.38	Average	Horizontal
5	10520.00	49.12	74.00	-24.88	Peak	Vertical
6	10520.00	37.41	54.00	-16.59	Average	Vertical
7	15780.00	49.30	74.00	-24.70	Peak	Vertical
8	15780.00	37.55	54.00	-16.45	Average	Vertical

IEEE 802.11a_Channel 60

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10600.00	52.37	74.00	-21.63	Peak	Horizontal
2	10600.00	39.82	54.00	-14.18	Average	Horizontal
3	15900.00	49.08	74.00	-24.92	Peak	Horizontal
4	15900.00	37.38	54.00	-16.62	Average	Horizontal
5	10600.00	49.16	74.00	-24.84	Peak	Vertical
6	10600.00	37.70	54.00	-16.30	Average	Vertical
7	15900.00	50.29	74.00	-23.71	Peak	Vertical
8	15900.00	38.45	54.00	-15.55	Average	Vertical

IEEE 802.11a_Channel 64

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10640.00	52.83	74.00	-21.17	Peak	Horizontal
2	10640.00	39.87	54.00	-14.13	Average	Horizontal
3	15960.00	49.56	74.00	-24.44	Peak	Horizontal
4	15960.00	37.15	54.00	-16.85	Average	Horizontal
5	10640.00	49.10	74.00	-24.90	Peak	Vertical
6	10640.00	37.87	54.00	-16.13	Average	Vertical
7	15960.00	51.34	74.00	-22.66	Peak	Vertical
8	15960.00	38.23	54.00	-15.77	Average	Vertical

TEST REPORT

IEEE 802.11a_Channel 100

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11000.00	51.07	74.00	-22.93	Peak	Horizontal
2	11000.00	39.08	54.00	-14.92	Average	Horizontal
3	16500.00	50.51	74.00	-23.49	Peak	Horizontal
4	16500.00	38.53	54.00	-15.47	Average	Horizontal
5	11000.00	49.12	74.00	-24.88	Peak	Vertical
6	11000.00	37.28	54.00	-16.72	Average	Vertical
7	16500.00	50.81	74.00	-23.19	Peak	Vertical
8	16500.00	38.79	54.00	-15.21	Average	Vertical

IEEE 802.11a_Channel 116

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11160.00	51.04	74.00	-22.96	Peak	Horizontal
2	11160.00	38.45	54.00	-15.55	Average	Horizontal
3	16740.00	50.51	74.00	-23.49	Peak	Horizontal
4	16740.00	38.76	54.00	-15.24	Average	Horizontal
5	11160.00	49.39	74.00	-24.61	Peak	Vertical
6	11160.00	36.73	54.00	-17.27	Average	Vertical
7	16740.00	50.73	74.00	-23.27	Peak	Vertical
8	16740.00	38.59	54.00	-15.41	Average	Vertical

IEEE 802.11a_Channel 140

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11400.00	50.91	74.00	-23.09	Peak	Horizontal
2	11400.00	39.06	54.00	-14.94	Average	Horizontal
3	17100.00	51.22	74.00	-22.78	Peak	Horizontal
4	17100.00	38.72	54.00	-15.28	Average	Horizontal
5	11400.00	48.75	74.00	-25.25	Peak	Vertical
6	11400.00	37.55	54.00	-16.45	Average	Vertical
7	17100.00	50.09	74.00	-23.91	Peak	Vertical
8	17100.00	37.91	54.00	-16.09	Average	Vertical

IEEE 802.11a_Channel 144

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11440.00	50.89	74.00	-23.11	Peak	Horizontal
2	11440.00	38.27	54.00	-15.73	Average	Horizontal
3	17160.00	49.67	74.00	-24.33	Peak	Horizontal
4	17160.00	37.39	54.00	-16.61	Average	Horizontal
5	11440.00	49.49	74.00	-24.51	Peak	Vertical
6	11440.00	37.77	54.00	-16.23	Average	Vertical
7	17160.00	49.56	74.00	-24.44	Peak	Vertical
8	17160.00	37.32	54.00	-16.68	Average	Vertical

TEST REPORT

IEEE 802.11a_Channel 149

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11490.00	50.83	74.00	-23.17	Peak	Horizontal
2	11490.00	38.58	54.00	-15.42	Average	Horizontal
3	17235.00	55.44	74.00	-18.56	Peak	Horizontal
4	17235.00	39.61	54.00	-14.39	Average	Horizontal
5	11490.00	49.34	74.00	-24.66	Peak	Vertical
6	11490.00	37.33	54.00	-16.67	Average	Vertical
7	17235.00	57.77	74.00	-16.23	Peak	Vertical
8	17235.00	38.45	54.00	-15.55	Average	Vertical

IEEE 802.11a_Channel 157

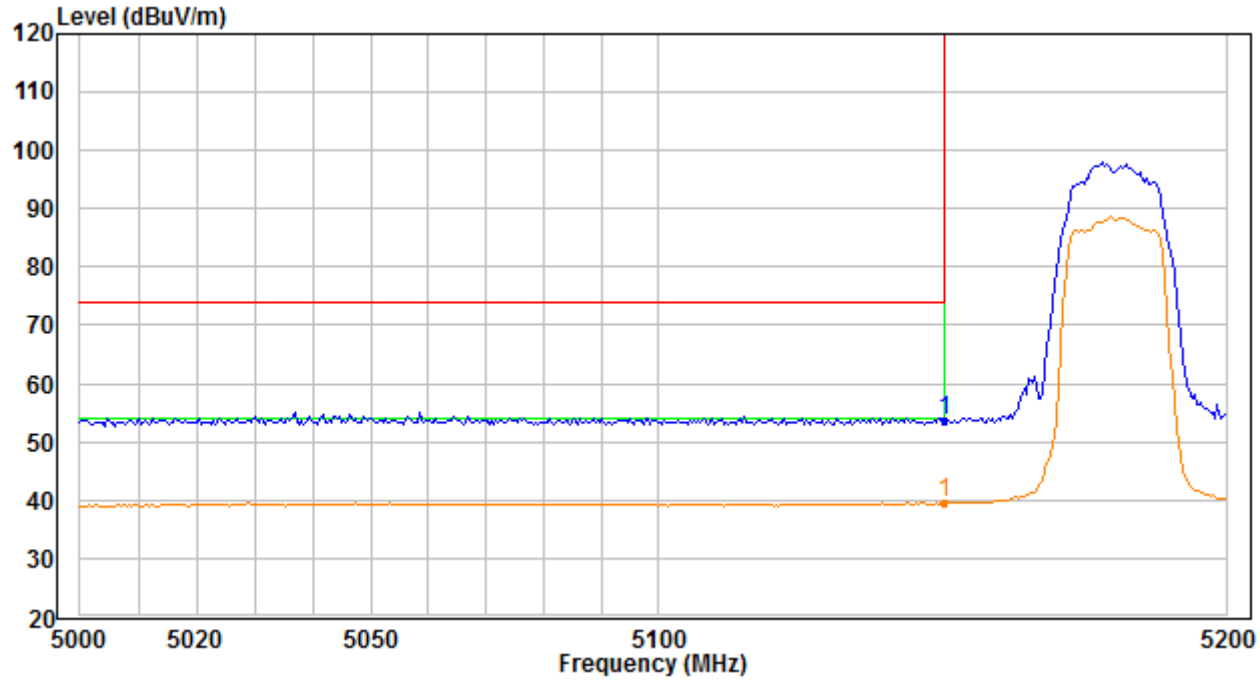
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11570.00	50.81	74.00	-23.19	Peak	Horizontal
2	11570.00	38.34	54.00	-15.66	Average	Horizontal
3	17355.00	57.44	74.00	-16.56	Peak	Horizontal
4	17355.00	40.34	54.00	-13.66	Average	Horizontal
5	11570.00	49.05	74.00	-24.95	Peak	Vertical
6	11570.00	36.88	54.00	-17.12	Average	Vertical
7	17355.00	54.53	74.00	-19.47	Peak	Vertical
8	17355.00	39.36	54.00	-14.64	Average	Vertical

IEEE 802.11a_Channel 165

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11650.00	51.00	74.00	-23.00	Peak	Horizontal
2	11650.00	38.75	54.00	-15.25	Average	Horizontal
3	17475.00	54.20	74.00	-19.80	Peak	Horizontal
4	17475.00	40.10	54.00	-13.90	Average	Horizontal
5	11650.00	49.51	74.00	-24.49	Peak	Vertical
6	11650.00	37.71	54.00	-16.29	Average	Vertical
7	17475.00	54.24	74.00	-19.76	Peak	Vertical
8	17475.00	39.05	54.00	-14.95	Average	Vertical

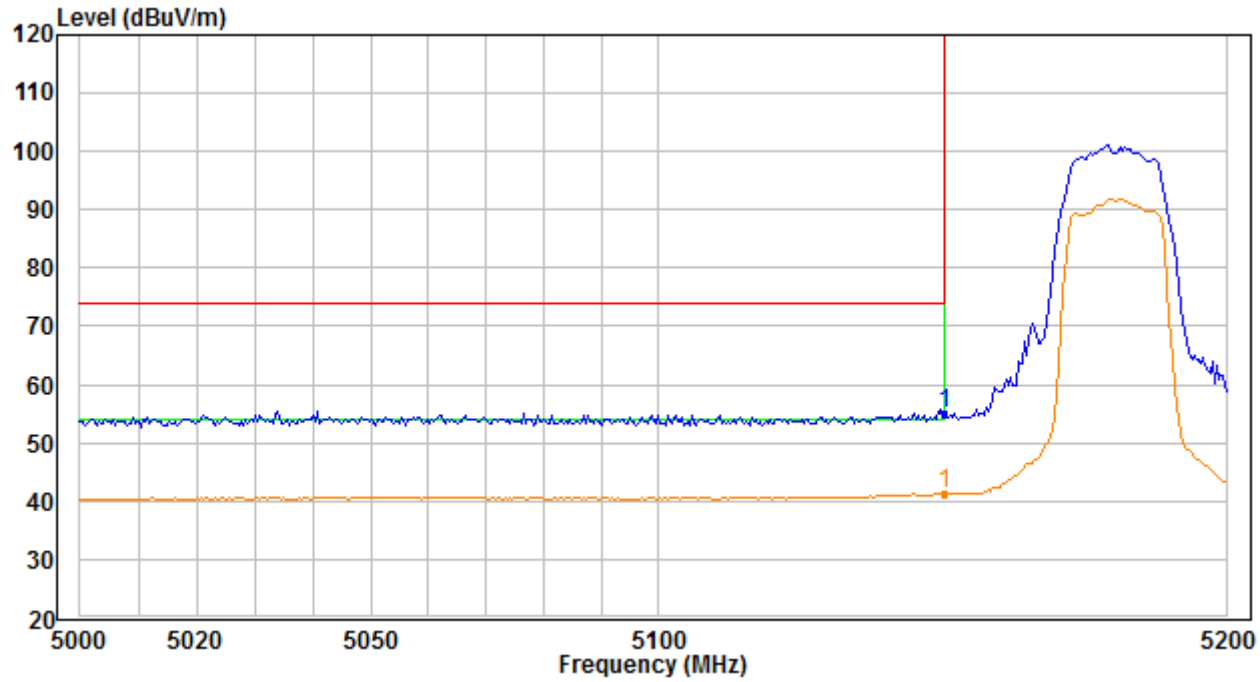
TEST REPORT

Test Channel:	Channel 36	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150.0000	53.78	74.00	39.44	54.00	Pass

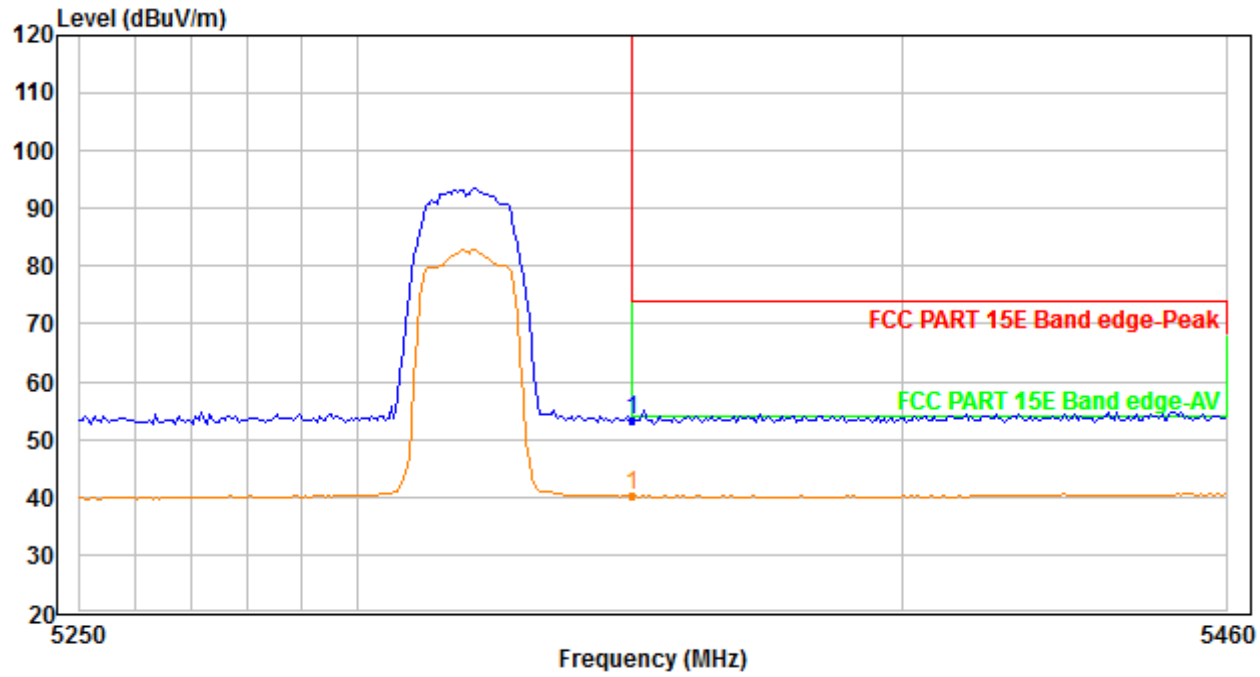
Test Channel:	Channel 36	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150.0000	54.97	74.00	41.28	54.00	Pass

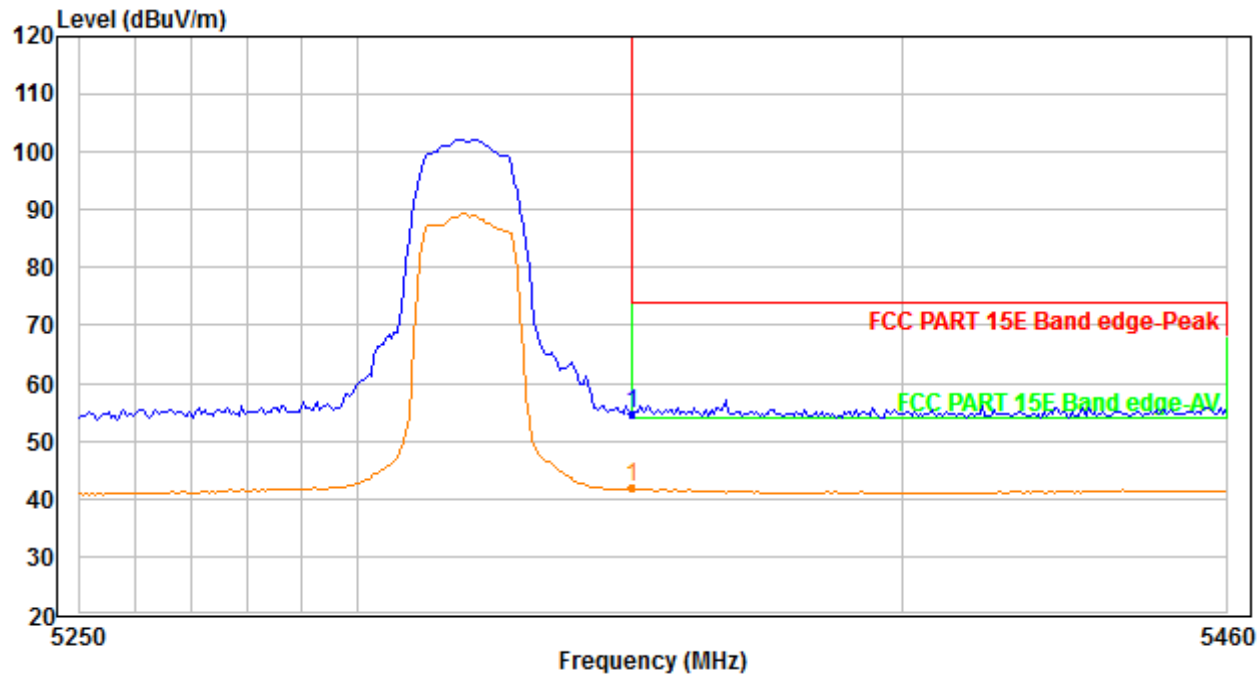
TEST REPORT

Test Channel:	Channel 64	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350.0000	53.20	74.00	40.13	54.00	Pass

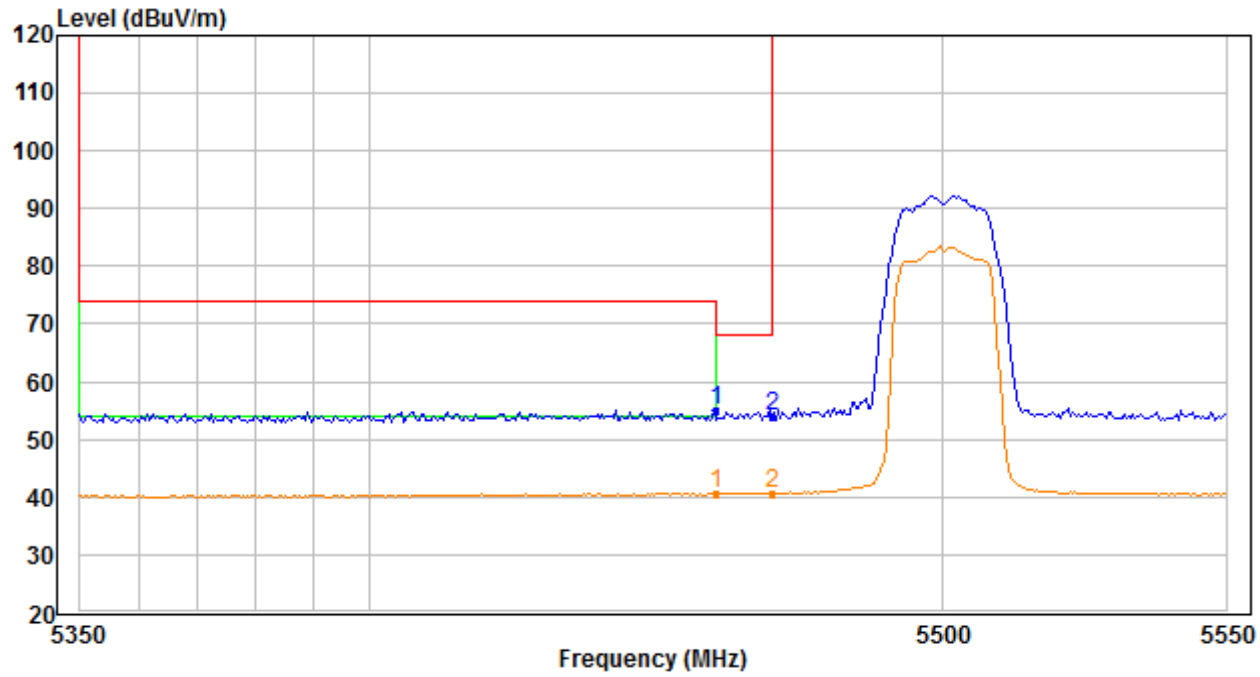
Test Channel:	Channel 64	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350.0000	54.77	74.00	41.88	54.00	Pass

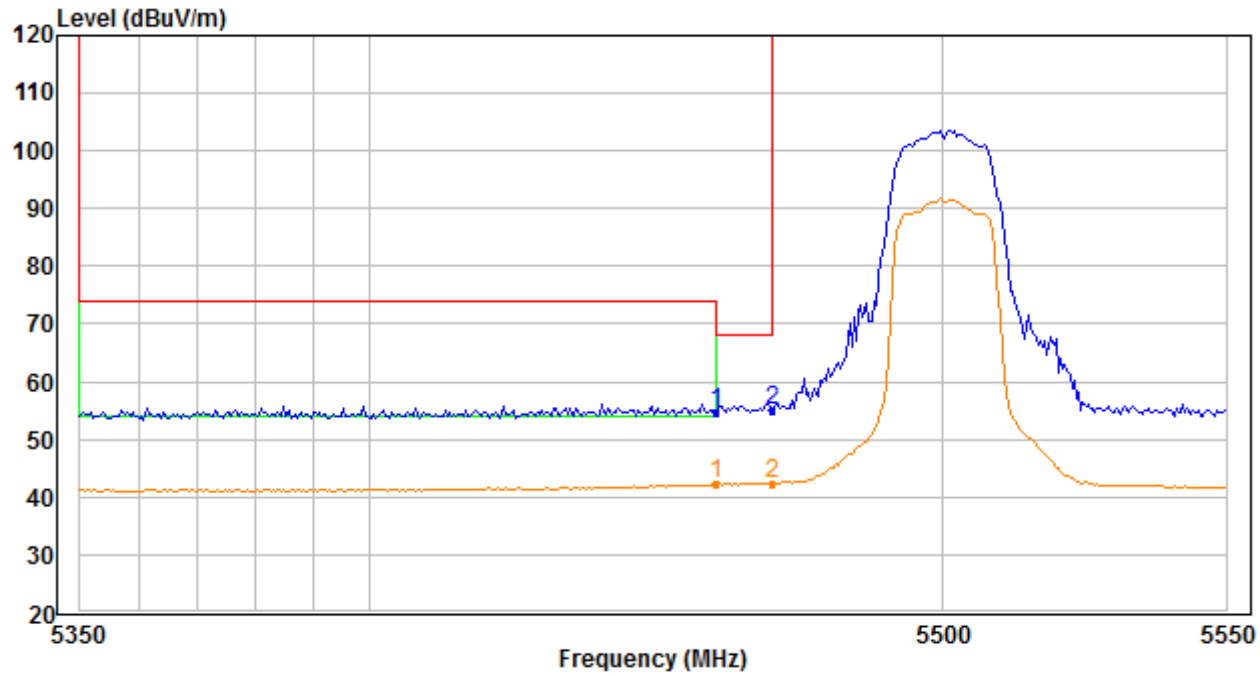
TEST REPORT

Test Channel:	Channel 100	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5470.0000	54.12	74.00	40.63	54.00	Pass
5460.0000	54.89	74.00	40.49	54.00	Pass

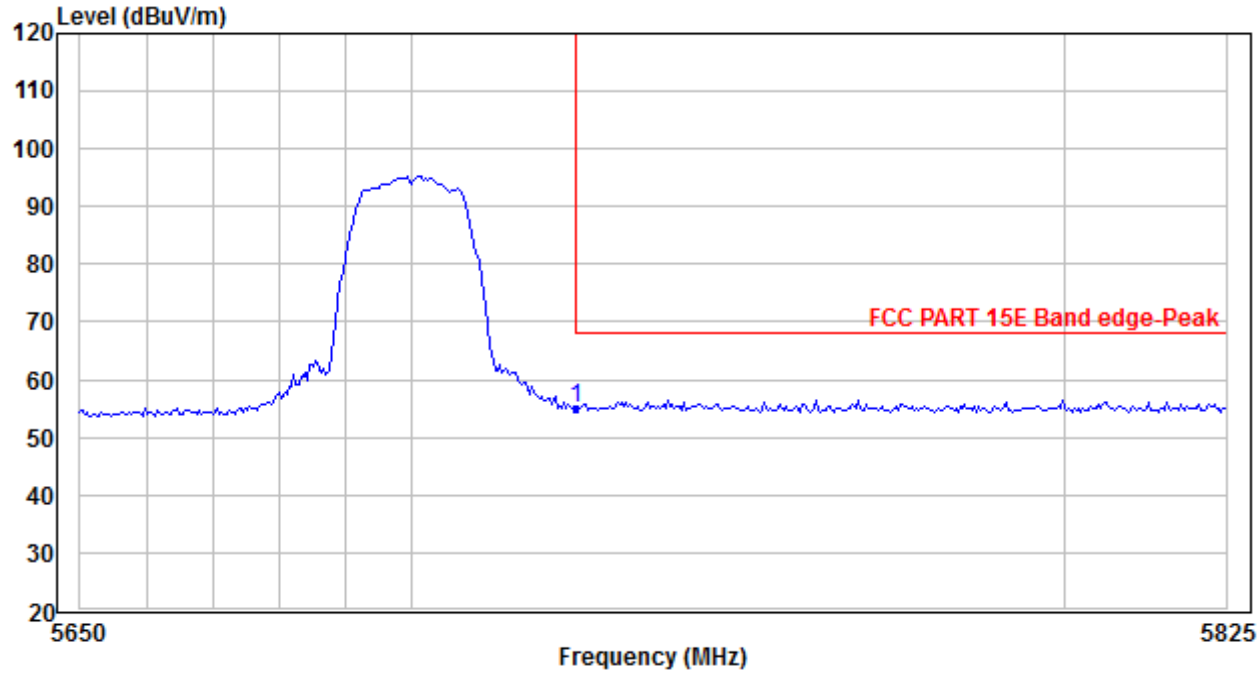
Test Channel:	Channel 100	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5470.0000	55.07	74.00	42.32	54.00	Pass
5460.0000	54.75	74.00	42.25	54.00	Pass

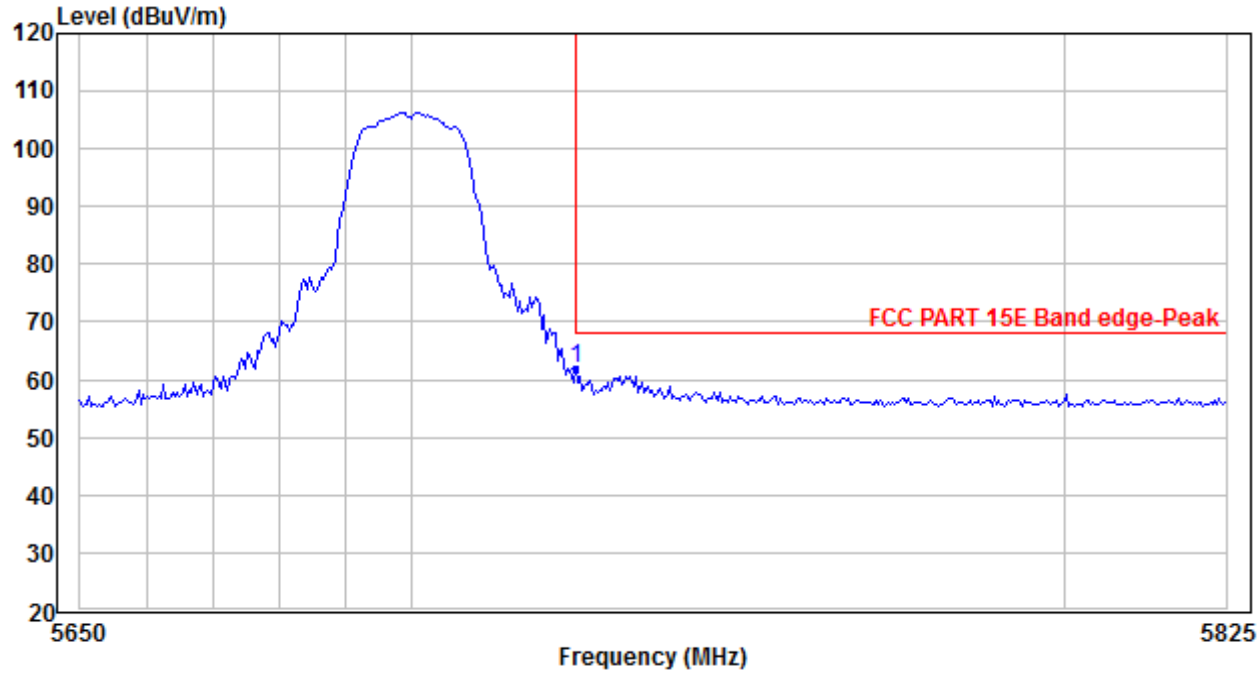
TEST REPORT

Test Channel:	Channel 140	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5725.0000	55.17	68.20	Pass

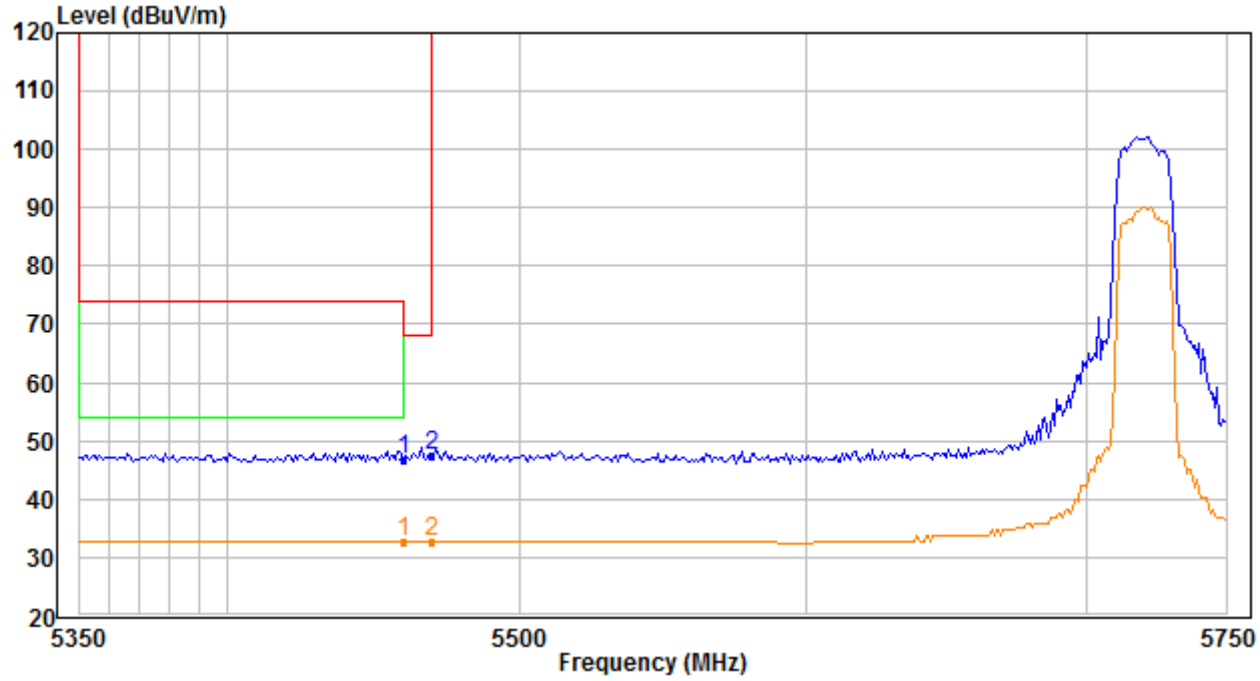
Test Channel:	Channel 140	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5725.0000	61.97	68.20	Pass

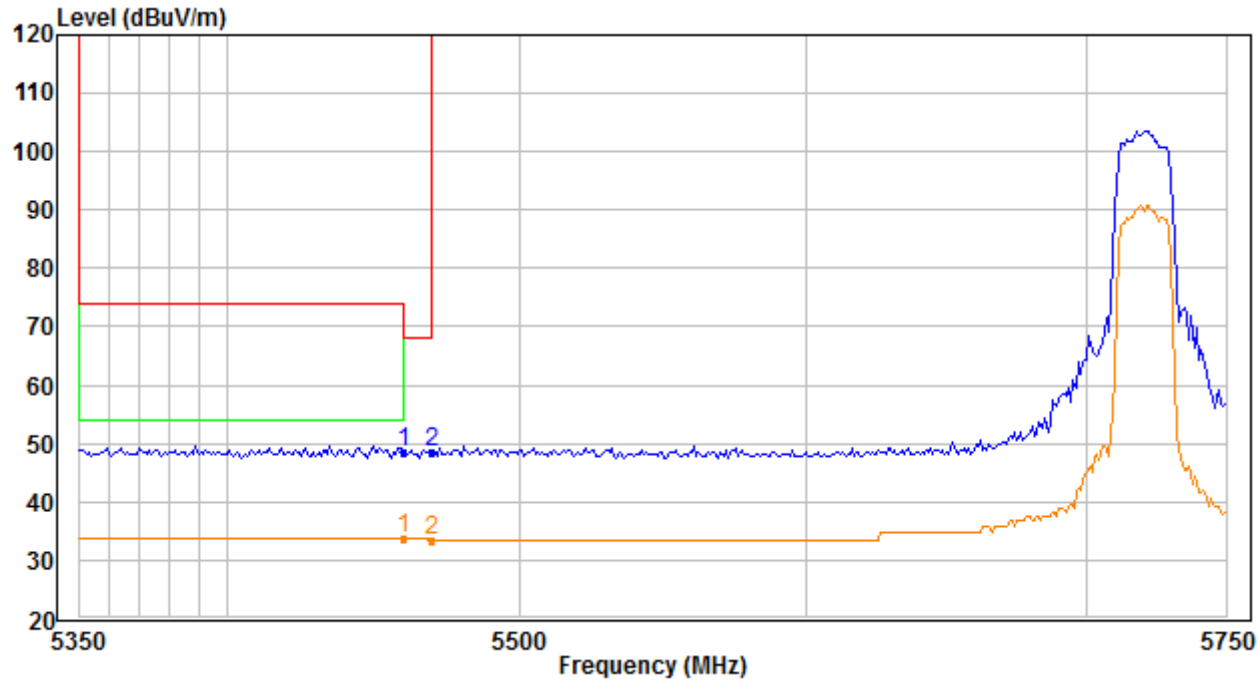
TEST REPORT

Test Channel:	Channel 144	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5460.0000	46.66	68.20	32.68	54.00	Pass
5470.0000	47.65	68.20	32.67	54.00	Pass

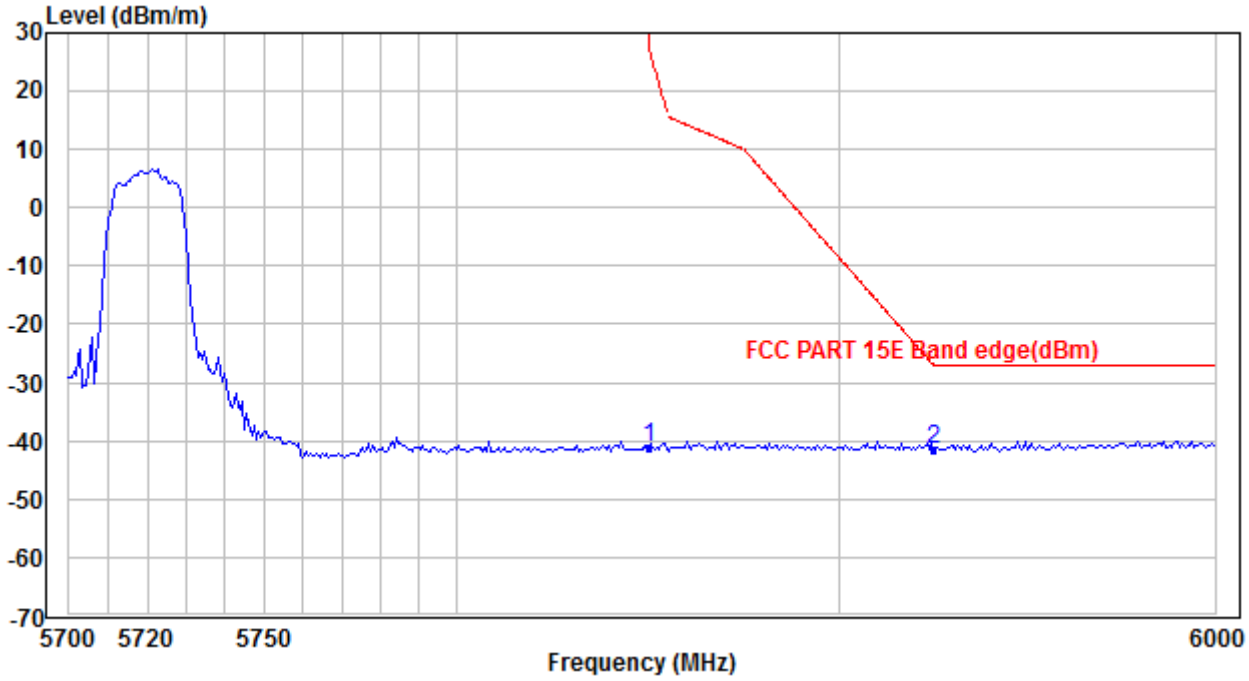
Test Channel:	Channel 144	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5460.0000	48.61	68.20	33.60	54.00	Pass
5470.0000	48.63	68.20	33.57	54.00	Pass

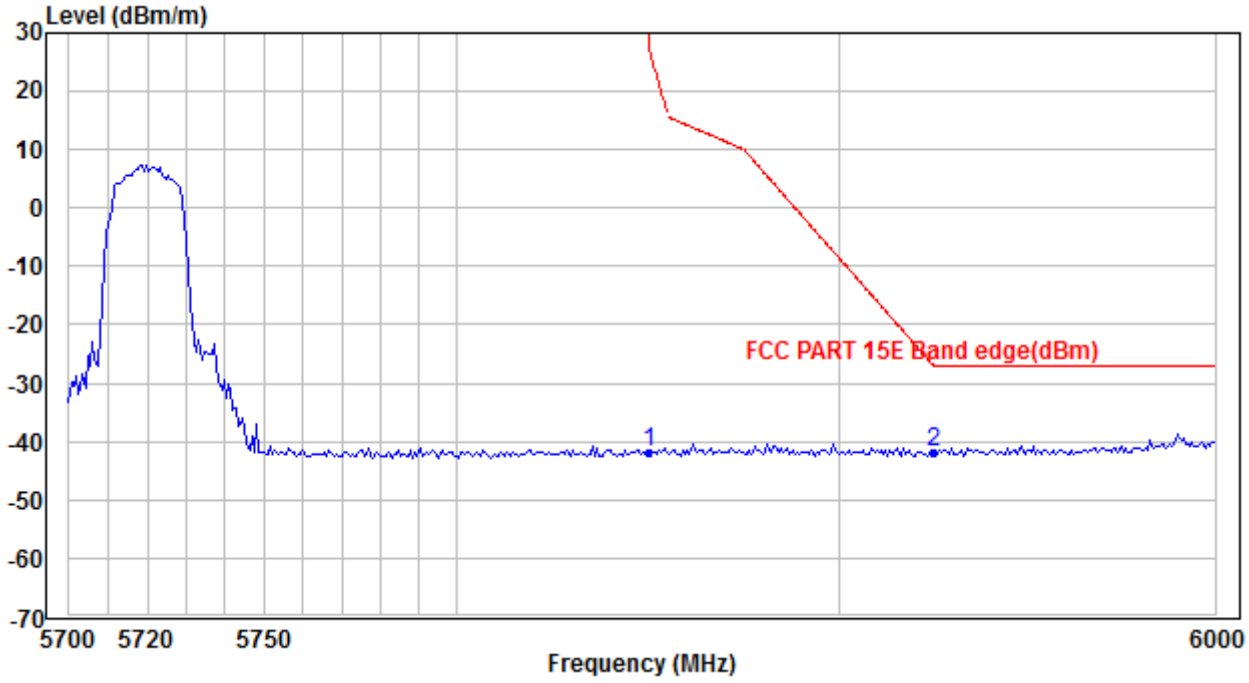
TEST REPORT

Test Channel:	Channel 144	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.0000	-41.22	27.00	Pass
5925.0000	-41.45	-27.00	Pass

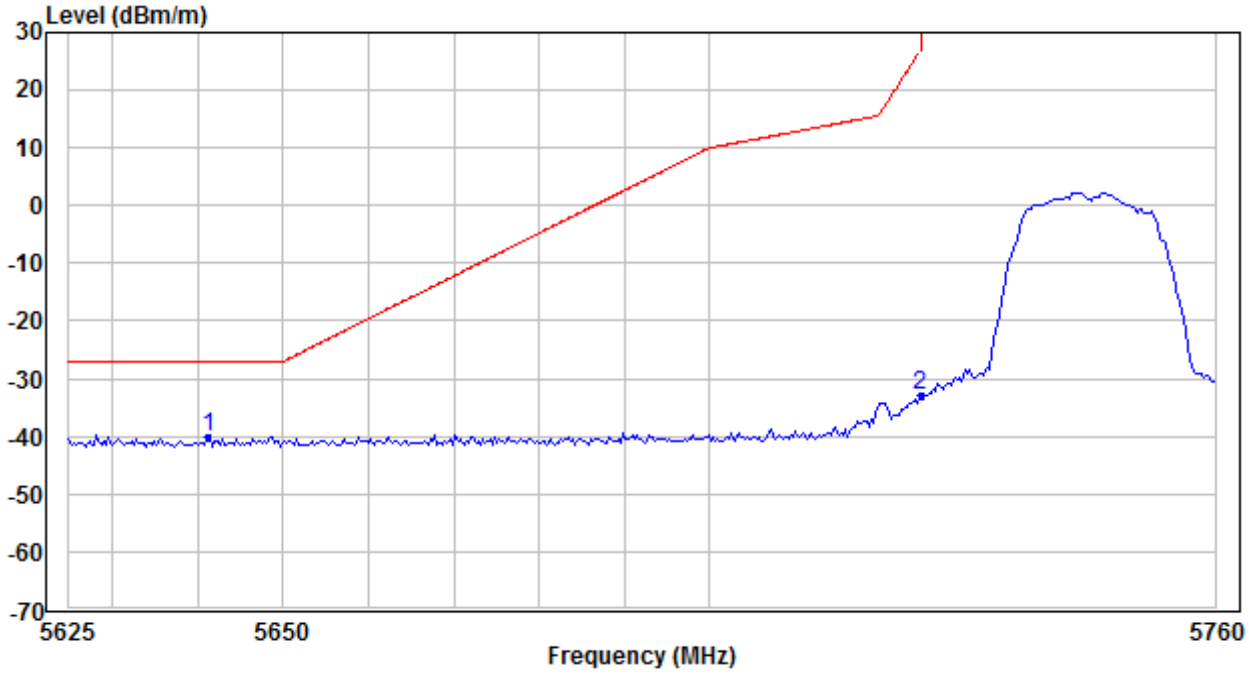
Test Channel:	Channel 144	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.0000	-41.98	27.00	Pass
5925.0000	-41.73	-27.00	Pass

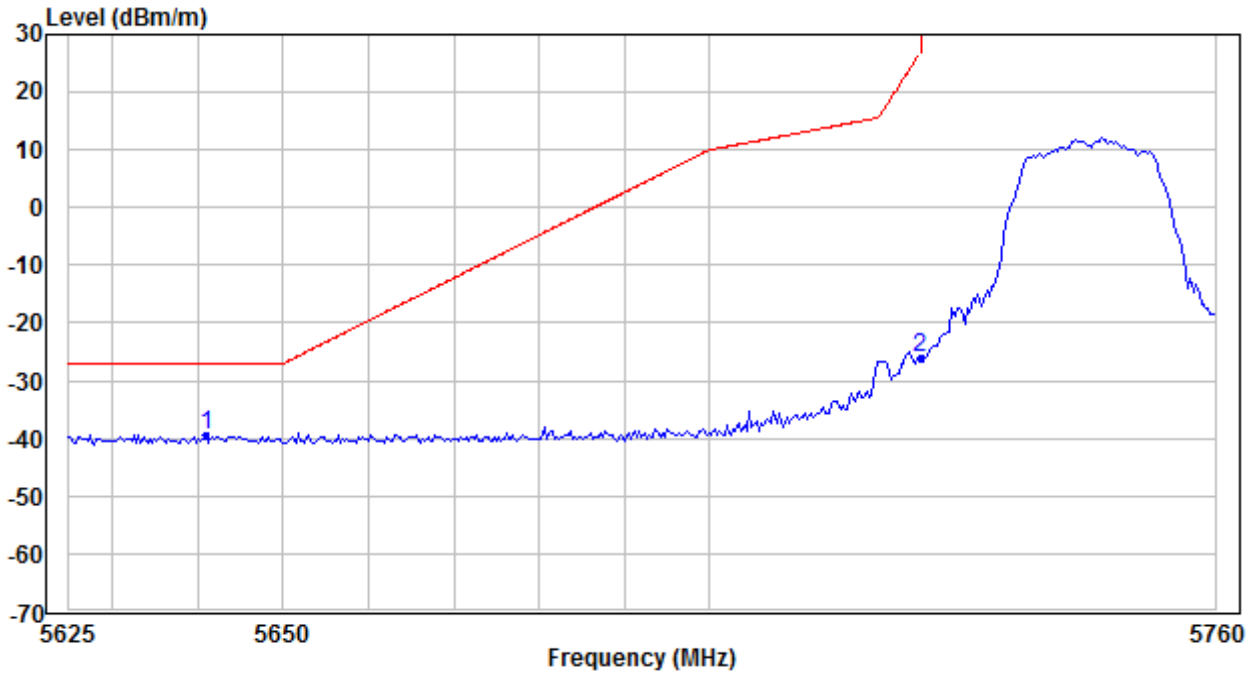
TEST REPORT

Test Channel:	Channel 149	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5641.2320	-39.94	-27.00	Pass
5725.0000	-32.95	27.00	Pass

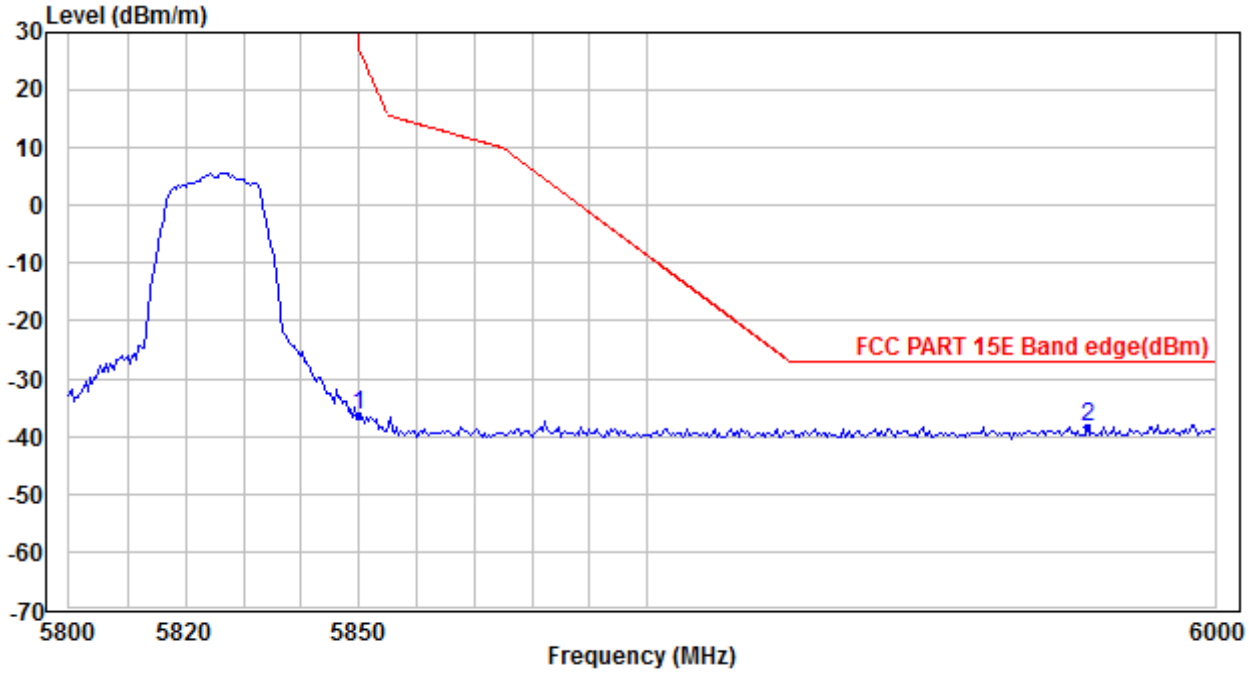
Test Channel:	Channel 149	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5640.9620	-39.40	-27.00	Pass
5725.0000	-26.02	27.00	Pass

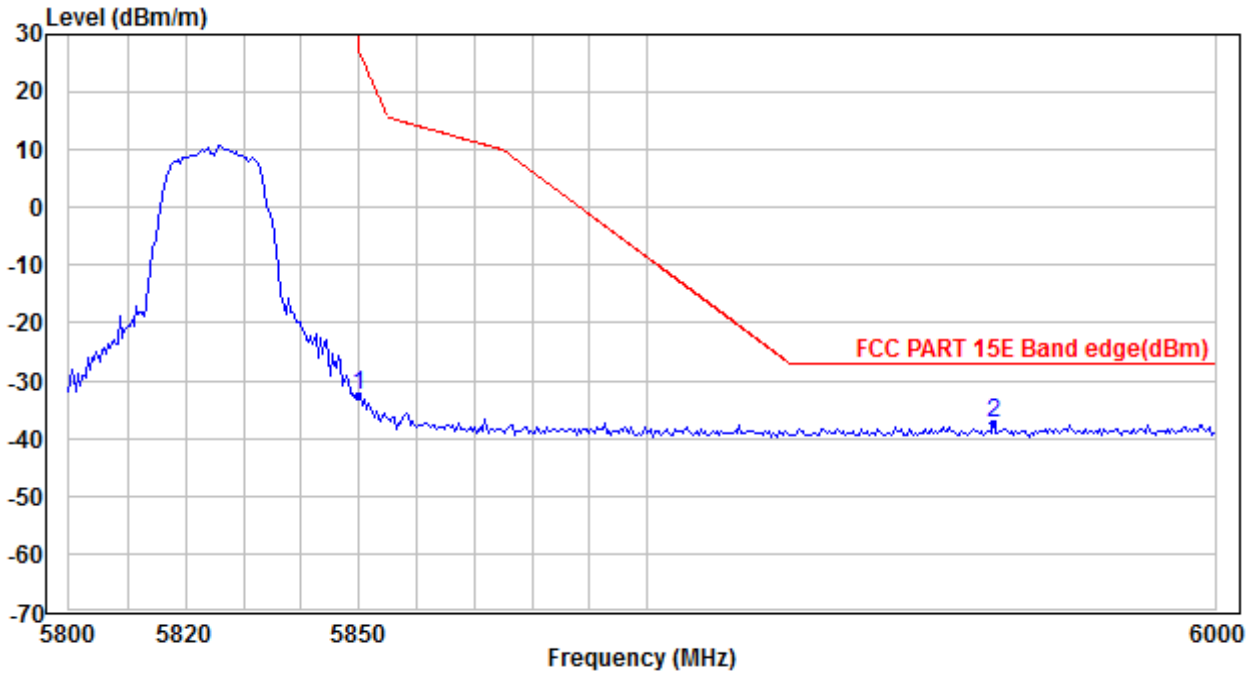
TEST REPORT

Test Channel:	Channel 165	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.0000	-36.25	27.00	Pass
5925.0000	-38.28	-27.00	Pass

Test Channel:	Channel 165	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.0000	-32.47	27.00	Pass
5960.7220	-37.35	-27.00	Pass

TEST REPORT

NOTES:

1. Peak detector is used for the emission measurement.
2. Average detector is used for the average data of emission measurement.
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

TEST REPORT

Table 2
IEEE 802.11N (20MHz) (MCS0)

Radiated Emission Test Data (Above 1GHz):

IEEE 802.11n-HT20_Channel 36

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10360.00	52.23	74.00	-21.77	Peak	Horizontal
2	10360.00	40.11	54.00	-13.89	Average	Horizontal
3	15540.00	48.89	74.00	-25.11	Peak	Horizontal
4	15540.00	36.94	54.00	-17.06	Average	Horizontal
5	10360.00	50.03	74.00	-23.97	Peak	Vertical
6	10360.00	38.19	54.00	-15.81	Average	Vertical
7	15540.00	50.04	74.00	-23.96	Peak	Vertical
8	15540.00	37.87	54.00	-16.13	Average	Vertical

IEEE 802.11n-HT20_Channel 44

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10440.00	52.40	74.00	-21.60	Peak	Horizontal
2	10440.00	40.51	54.00	-13.49	Average	Horizontal
3	15660.00	48.73	74.00	-25.27	Peak	Horizontal
4	15660.00	36.95	54.00	-17.05	Average	Horizontal
5	10440.00	49.75	74.00	-24.25	Peak	Vertical
6	10440.00	38.47	54.00	-15.53	Average	Vertical
7	15660.00	50.40	74.00	-23.60	Peak	Vertical
8	15660.00	38.17	54.00	-15.83	Average	Vertical

IEEE 802.11n-HT20_Channel 48

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10480.00	52.57	74.00	-21.43	Peak	Horizontal
2	10480.00	40.07	54.00	-13.93	Average	Horizontal
3	15720.00	49.54	74.00	-24.46	Peak	Horizontal
4	15720.00	36.47	54.00	-17.53	Average	Horizontal
5	10480.00	50.56	74.00	-23.44	Peak	Vertical
6	10480.00	38.13	54.00	-15.87	Average	Vertical
7	15720.00	50.16	74.00	-23.84	Peak	Vertical
8	15720.00	37.71	54.00	-16.29	Average	Vertical

TEST REPORT

IEEE 802.11n-HT20_Channel 52

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10520.00	52.03	74.00	-21.97	Peak	Horizontal
2	10520.00	40.23	54.00	-13.77	Average	Horizontal
3	15780.00	49.61	74.00	-24.39	Peak	Horizontal
4	15780.00	36.62	54.00	-17.38	Average	Horizontal
5	10520.00	49.93	74.00	-24.07	Peak	Vertical
6	10520.00	38.29	54.00	-15.71	Average	Vertical
7	15780.00	50.89	74.00	-23.11	Peak	Vertical
8	15780.00	37.78	54.00	-16.22	Average	Vertical

IEEE 802.11n-HT20_Channel 60

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10600.00	51.95	74.00	-22.05	Peak	Horizontal
2	10600.00	40.09	54.00	-13.91	Average	Horizontal
3	15900.00	49.06	74.00	-24.94	Peak	Horizontal
4	15900.00	37.08	54.00	-16.92	Average	Horizontal
5	10600.00	50.36	74.00	-23.64	Peak	Vertical
6	10600.00	38.24	54.00	-15.76	Average	Vertical
7	15900.00	50.46	74.00	-23.54	Peak	Vertical
8	15900.00	38.15	54.00	-15.85	Average	Vertical

IEEE 802.11n-HT20_Channel 64

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10640.00	51.83	74.00	-22.17	Peak	Horizontal
2	10640.00	39.54	54.00	-14.46	Average	Horizontal
3	15960.00	49.05	74.00	-24.95	Peak	Horizontal
4	15960.00	36.35	54.00	-17.65	Average	Horizontal
5	10640.00	49.59	74.00	-24.41	Peak	Vertical
6	10640.00	37.76	54.00	-16.24	Average	Vertical
7	15960.00	49.19	74.00	-24.81	Peak	Vertical
8	15960.00	37.10	54.00	-16.90	Average	Vertical

TEST REPORT

IEEE 802.11n-HT20_Channel 100

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11000.00	50.45	74.00	-23.55	Peak	Horizontal
2	11000.00	38.65	54.00	-15.35	Average	Horizontal
3	16500.00	49.38	74.00	-24.62	Peak	Horizontal
4	16500.00	36.96	54.00	-17.04	Average	Horizontal
5	11000.00	49.01	74.00	-24.99	Peak	Vertical
6	11000.00	37.01	54.00	-16.99	Average	Vertical
7	16500.00	49.32	74.00	-24.68	Peak	Vertical
8	16500.00	37.16	54.00	-16.84	Average	Vertical

IEEE 802.11n-HT20_Channel 116

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11160.00	50.03	74.00	-23.97	Peak	Horizontal
2	11160.00	38.06	54.00	-15.94	Average	Horizontal
3	16740.00	49.34	74.00	-24.66	Peak	Horizontal
4	16740.00	37.35	54.00	-16.65	Average	Horizontal
5	11160.00	48.31	74.00	-25.69	Peak	Vertical
6	11160.00	36.34	54.00	-17.66	Average	Vertical
7	16740.00	49.40	74.00	-24.60	Peak	Vertical
8	16740.00	36.99	54.00	-17.01	Average	Vertical

IEEE 802.11n-HT20_Channel 140

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11400.00	50.86	74.00	-23.14	Peak	Horizontal
2	11400.00	38.49	54.00	-15.51	Average	Horizontal
3	17100.00	48.57	74.00	-25.43	Peak	Horizontal
4	17100.00	36.30	54.00	-17.70	Average	Horizontal
5	11400.00	49.66	74.00	-24.34	Peak	Vertical
6	11400.00	37.09	54.00	-16.91	Average	Vertical
7	17100.00	47.32	74.00	-26.68	Peak	Vertical
8	17100.00	35.54	54.00	-18.46	Average	Vertical

TEST REPORT

IEEE 802.11n-HT20_Channel 144

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11440.00	51.29	74.00	-22.71	Peak	Horizontal
2	11440.00	39.40	54.00	-14.60	Average	Horizontal
3	17160.00	50.34	74.00	-23.66	Peak	Horizontal
4	17160.00	38.30	54.00	-15.70	Average	Horizontal
5	11440.00	49.58	74.00	-24.42	Peak	Vertical
6	11440.00	37.58	54.00	-16.42	Average	Vertical
7	17160.00	49.73	74.00	-24.27	Peak	Vertical
8	17160.00	37.23	54.00	-16.77	Average	Vertical

IEEE 802.11n-HT20_Channel 149

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11490.00	50.87	74.00	-23.13	Peak	Horizontal
2	11490.00	38.31	54.00	-15.69	Average	Horizontal
3	17235.00	49.76	74.00	-24.24	Peak	Horizontal
4	17235.00	37.62	54.00	-16.38	Average	Horizontal
5	11490.00	49.09	74.00	-24.91	Peak	Vertical
6	11490.00	36.57	54.00	-17.43	Average	Vertical
7	17235.00	51.10	74.00	-22.90	Peak	Vertical
8	17235.00	36.64	54.00	-17.36	Average	Vertical

IEEE 802.11n-HT20_Channel 157

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11570.00	50.01	74.00	-23.99	Peak	Horizontal
2	11570.00	37.89	54.00	-16.11	Average	Horizontal
3	17355.00	54.60	74.00	-19.40	Peak	Horizontal
4	17355.00	38.61	54.00	-15.39	Average	Horizontal
5	11570.00	47.87	74.00	-26.13	Peak	Vertical
6	11570.00	36.54	54.00	-17.46	Average	Vertical
7	17355.00	50.11	74.00	-23.89	Peak	Vertical
8	17355.00	38.13	54.00	-15.87	Average	Vertical

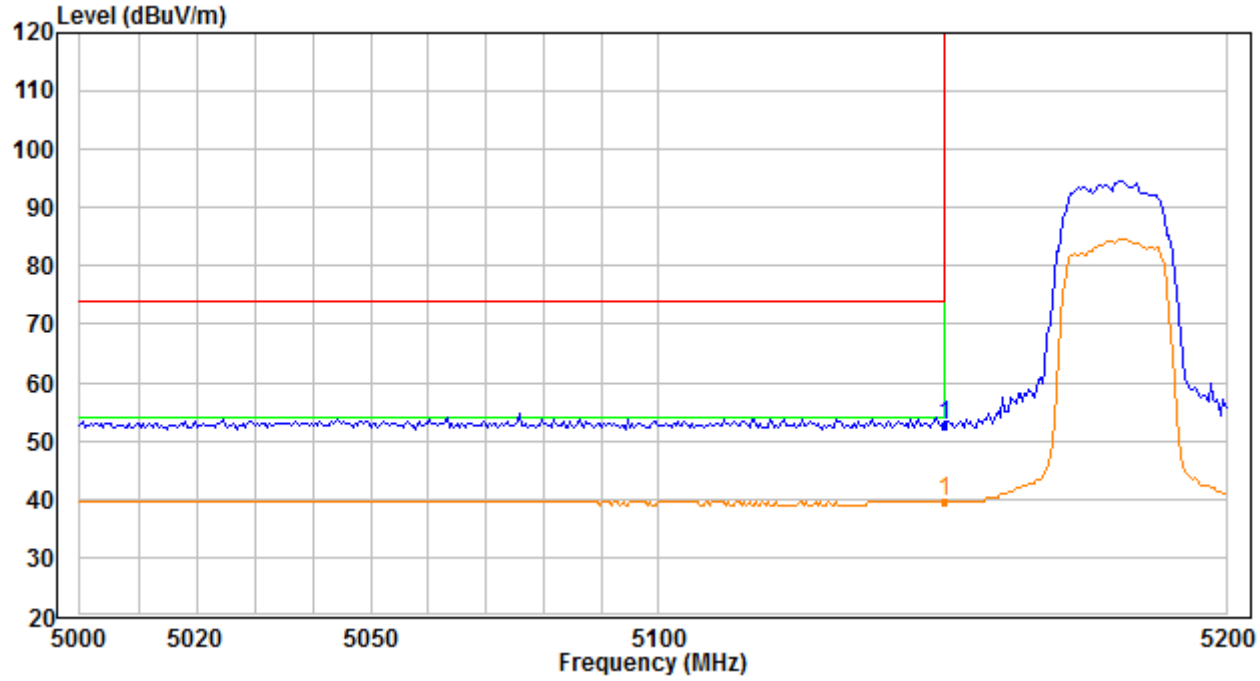
TEST REPORT

IEEE 802.11n-HT20_Channel 165

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11650.00	50.16	74.00	-23.84	Peak	Horizontal
2	11650.00	38.20	54.00	-15.80	Average	Horizontal
3	17475.00	51.54	74.00	-22.46	Peak	Horizontal
4	17475.00	39.00	54.00	-15.00	Average	Horizontal
5	11650.00	49.05	74.00	-24.95	Peak	Vertical
6	11650.00	37.23	54.00	-16.77	Average	Vertical
7	17475.00	53.00	74.00	-21.00	Peak	Vertical
8	17475.00	38.10	54.00	-15.90	Average	Vertical

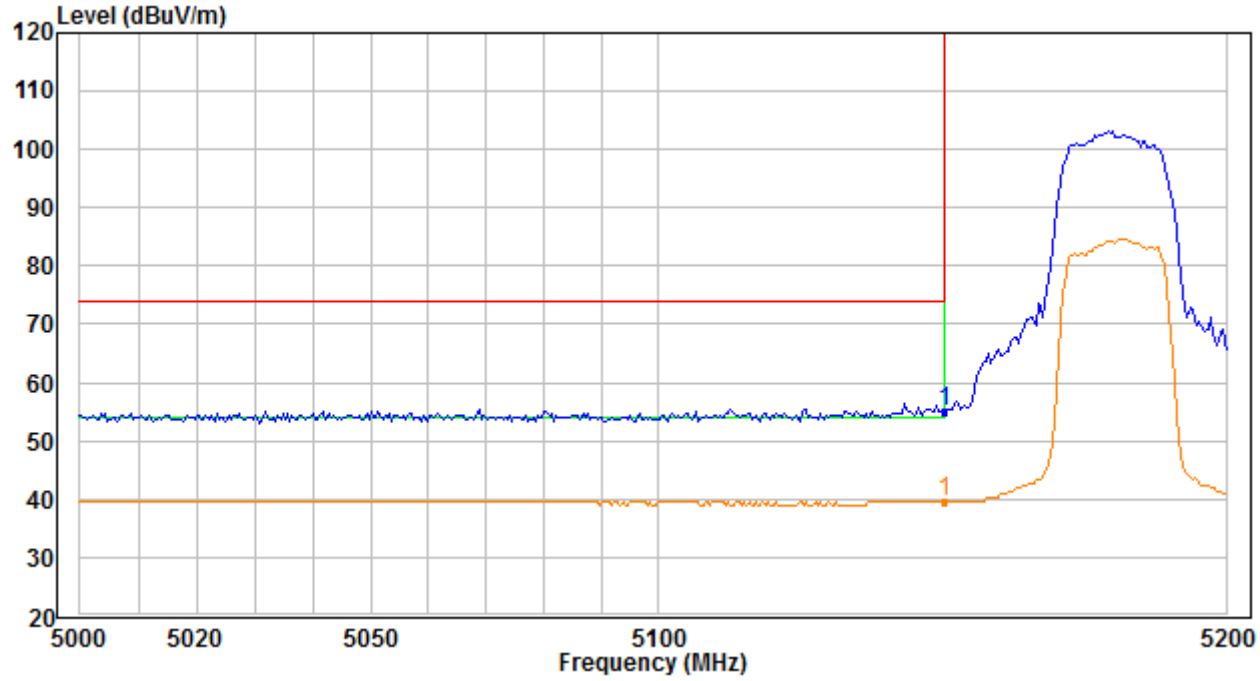
TEST REPORT

Test Channel:	Channel 36	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150.0000	52.63	74.00	39.71	54.00	Pass

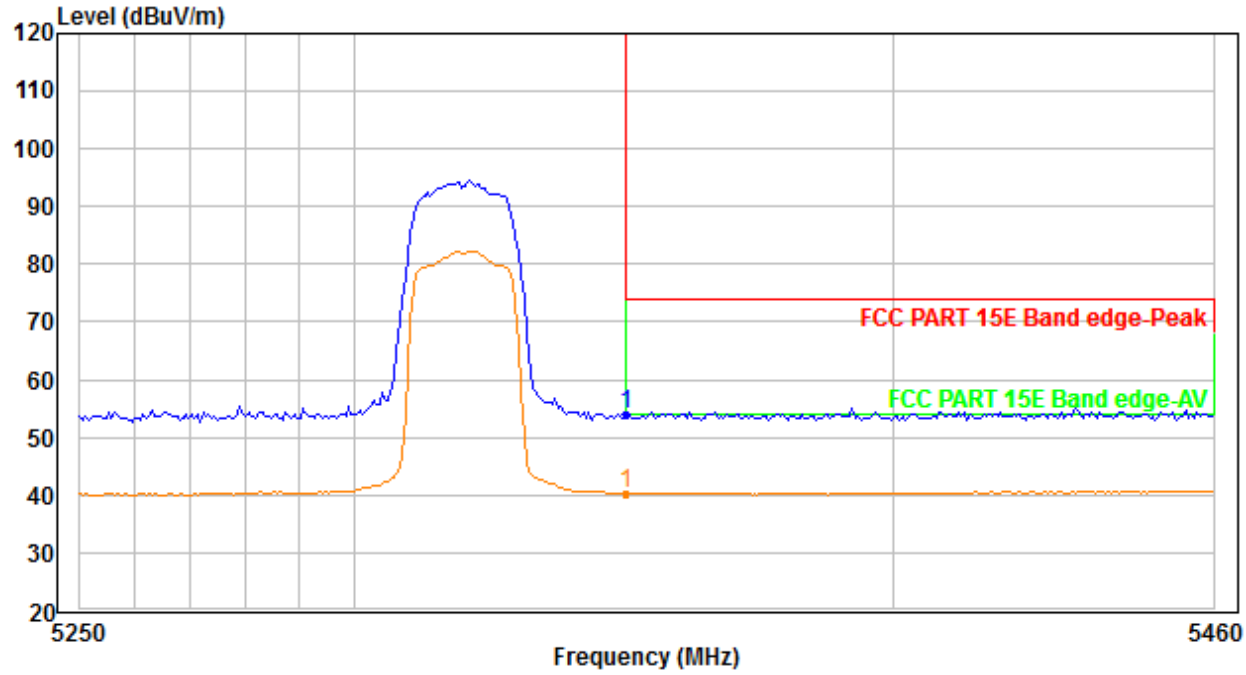
Test Channel:	Channel 36	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150.0000	55.18	74.00	42.36	54.00	Pass

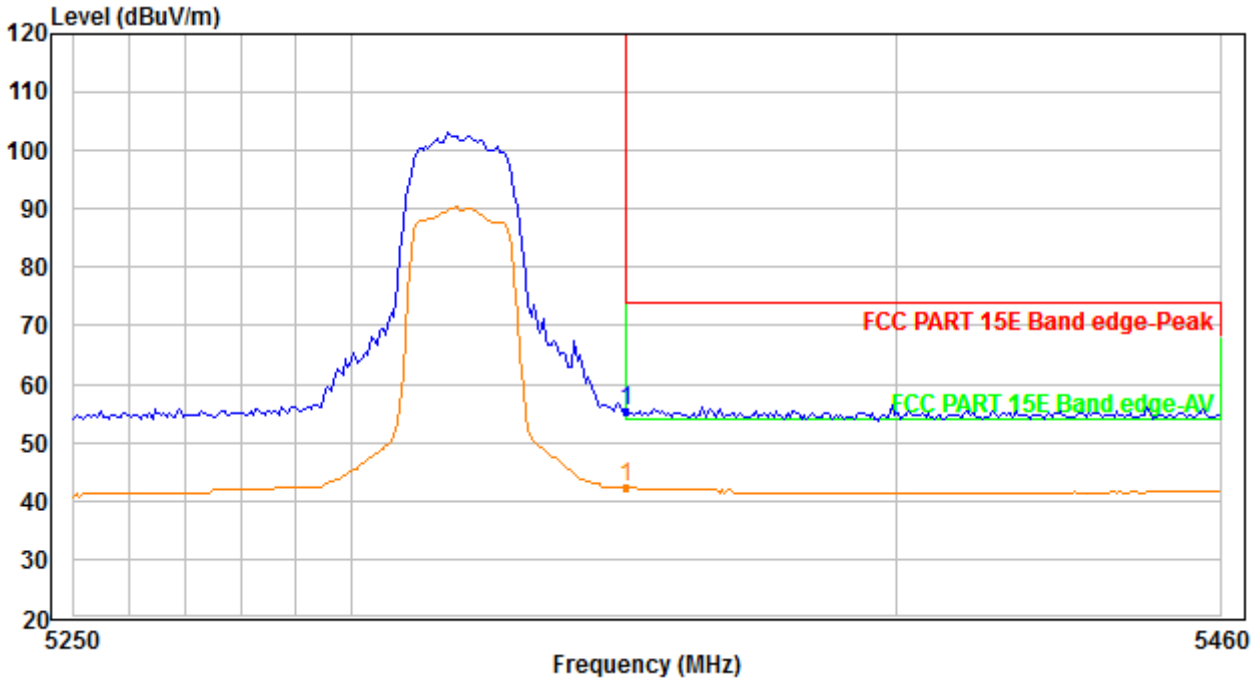
TEST REPORT

Test Channel:	Channel 64	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350.0000	54.06	74.00	40.28	54.00	Pass

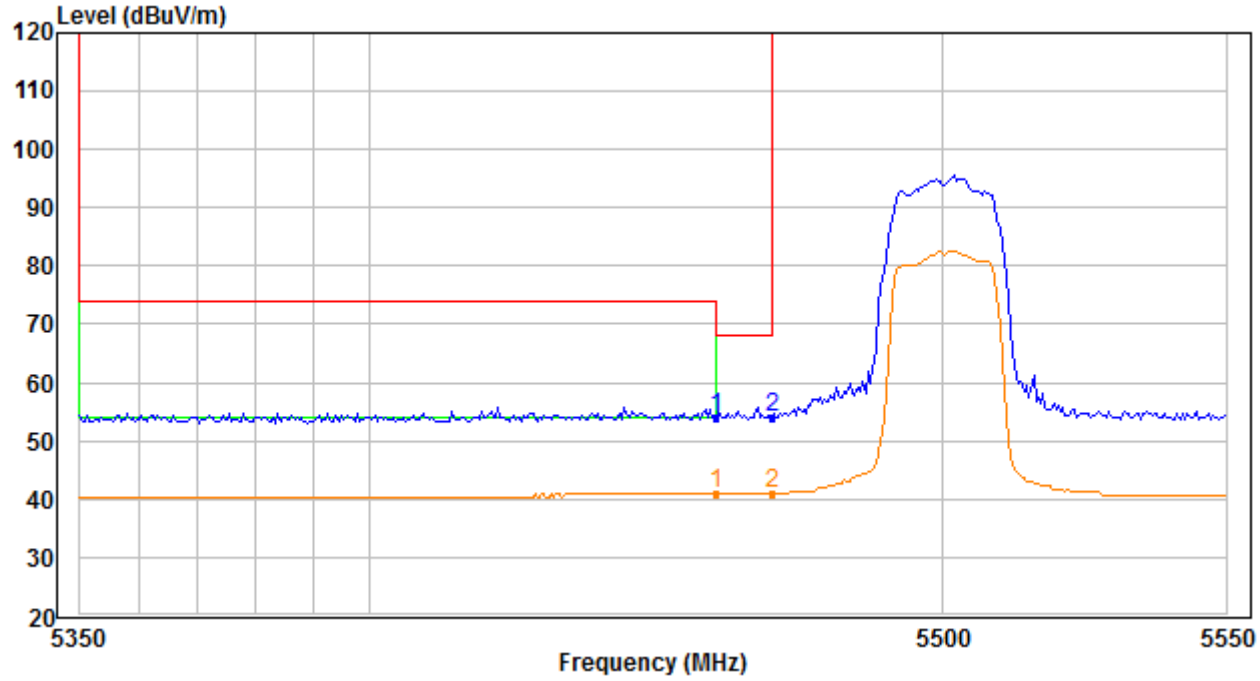
Test Channel:	Channel 64	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350.0000	55.36	74.00	42.38	54.00	Pass

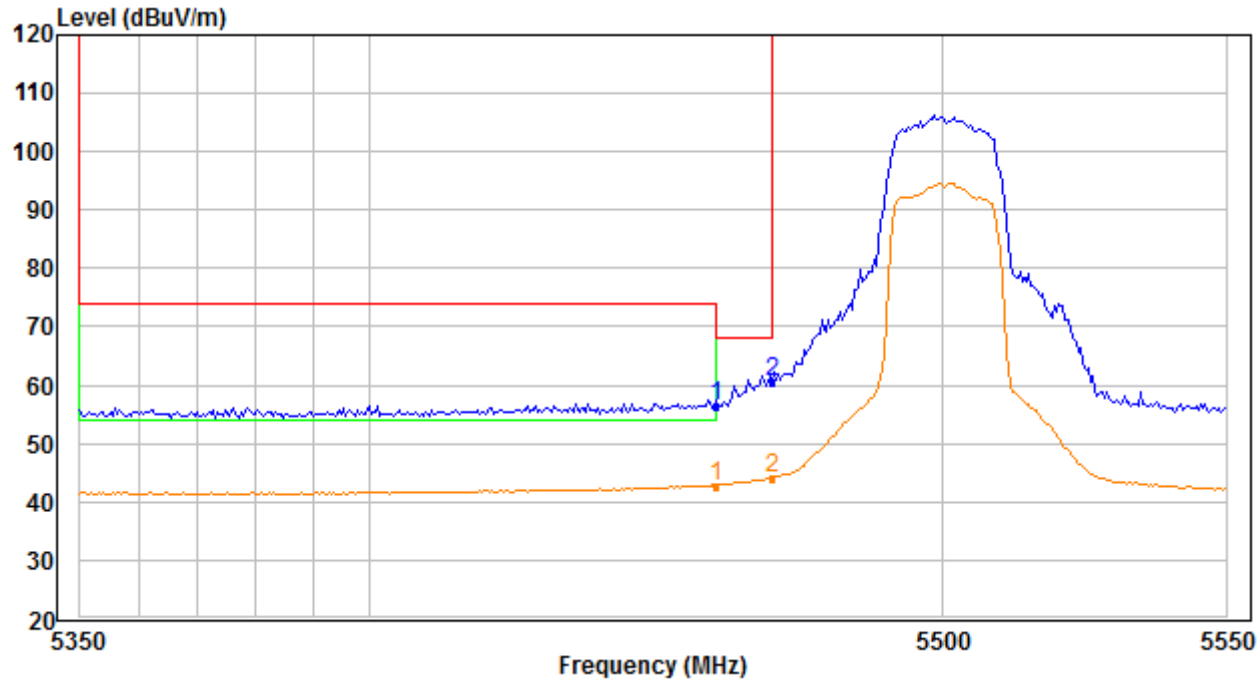
TEST REPORT

Test Channel:	Channel 100	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5460.0000	54.15	68.20	40.86	54.00	Pass
5470.0000	53.99	68.20	40.85	54.00	Pass

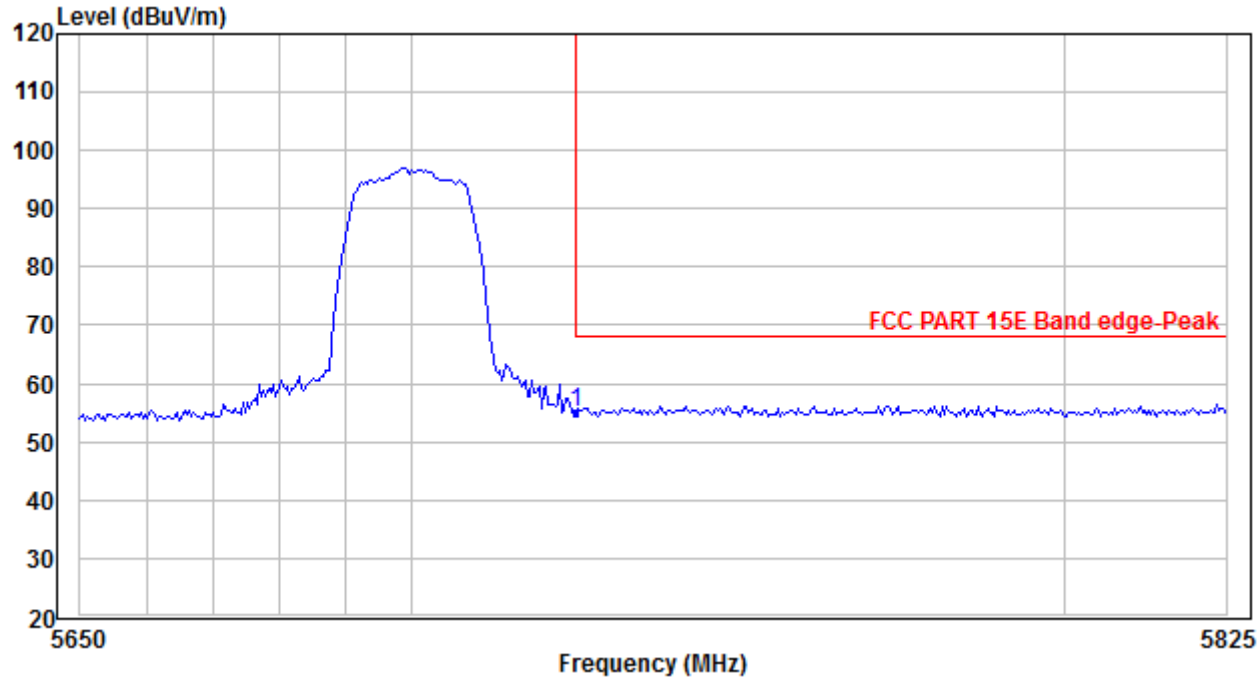
Test Channel:	Channel 100	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5460.0000	56.54	68.20	42.84	54.00	Pass
5470.0000	60.41	68.20	44.16	54.00	Pass

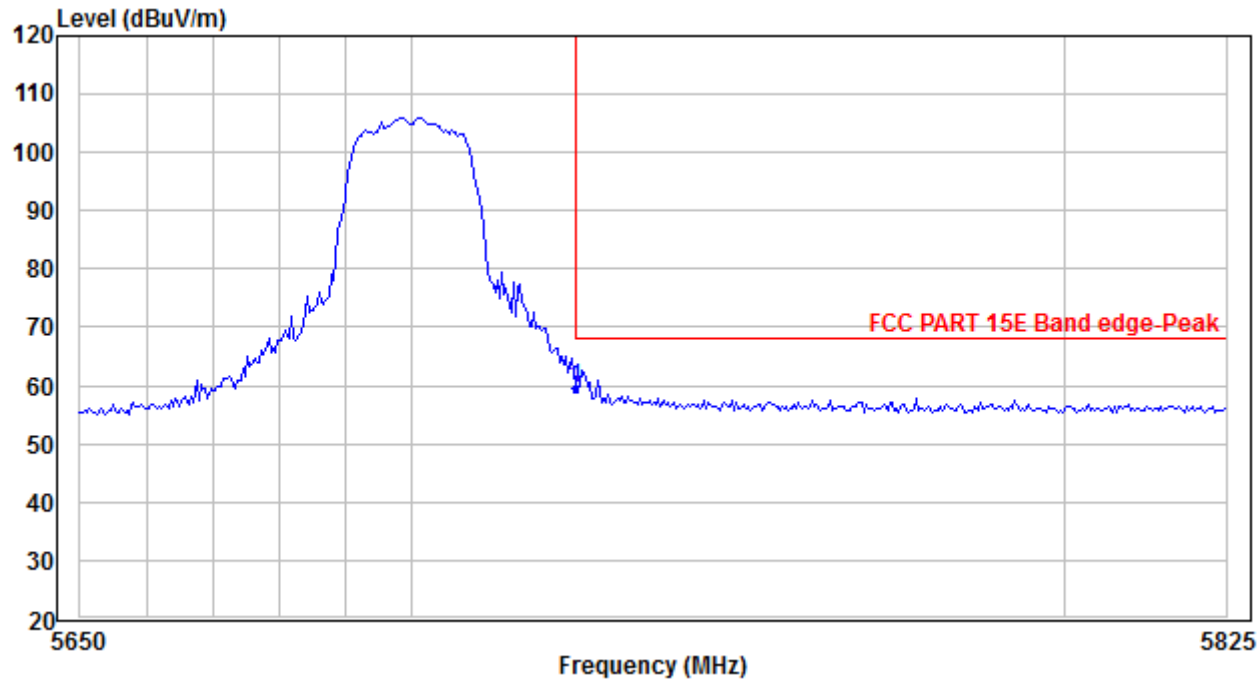
TEST REPORT

Test Channel:	Channel 140	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5725.0000	55.05	68.20	Pass

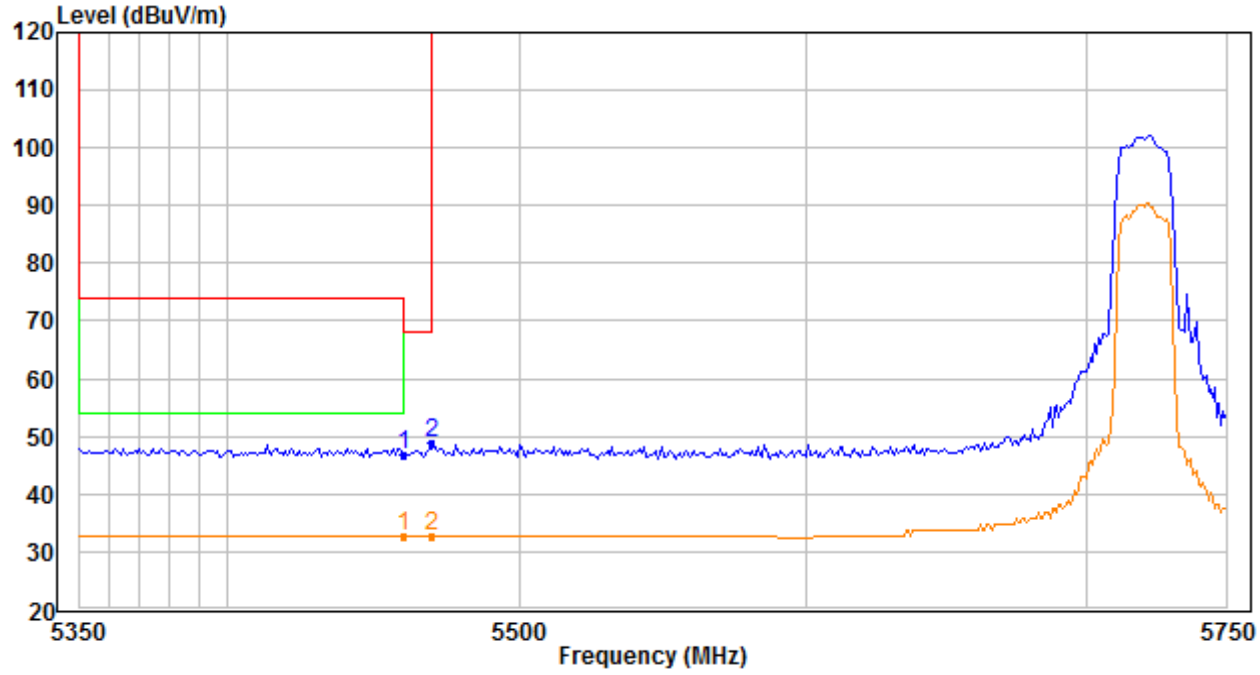
Test Channel:	Channel 140	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5725.0000	59.54	68.20	Pass

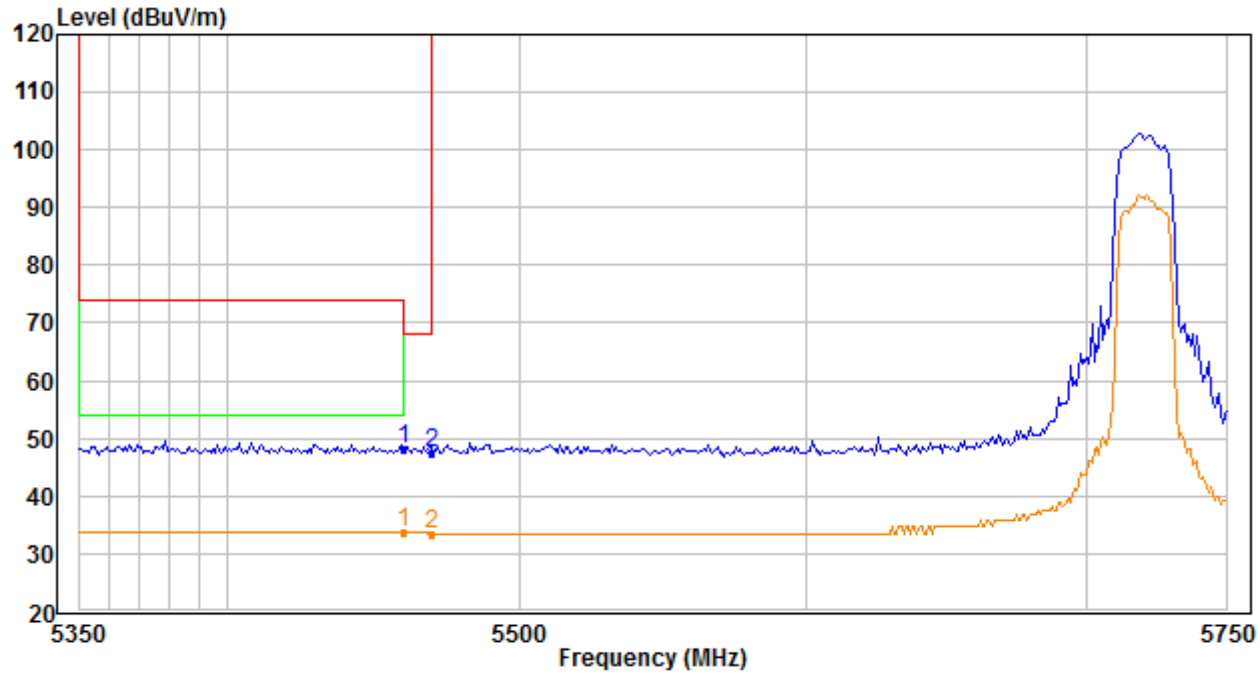
TEST REPORT

Test Channel:	Channel 144	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5460.0000	46.66	68.20	32.68	54.00	Pass
5470.0000	47.65	68.20	32.67	54.00	Pass

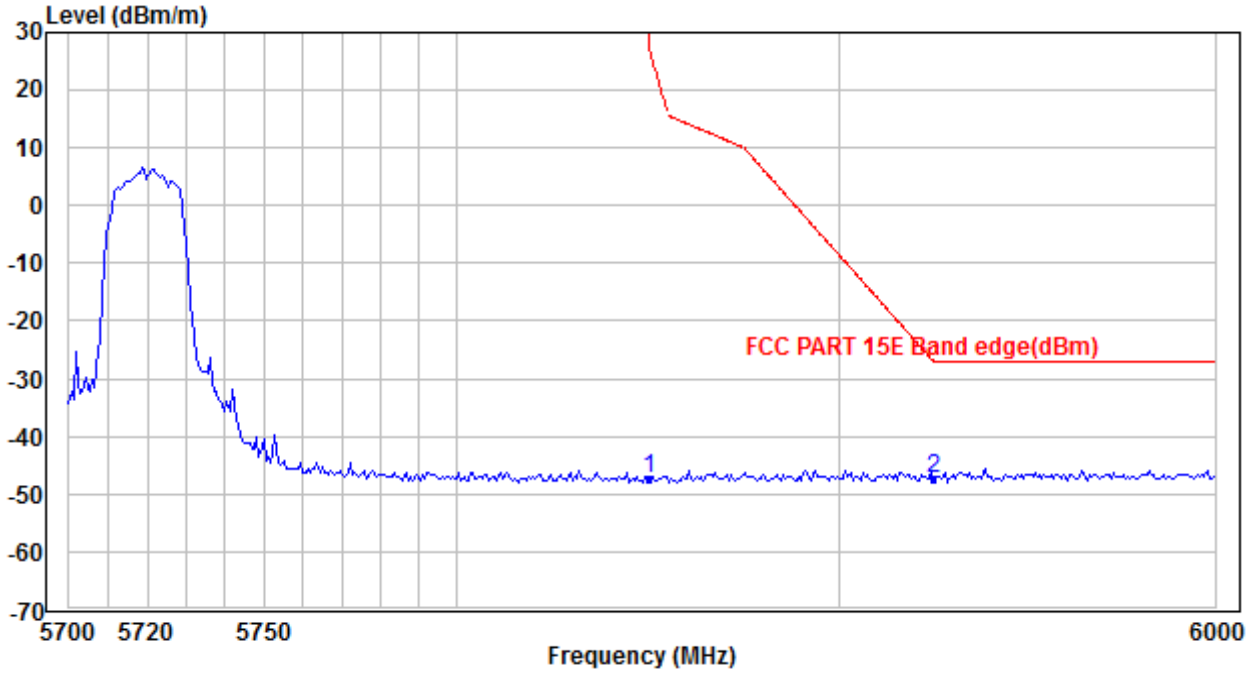
Test Channel:	Channel 144	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5460.0000	48.02	68.20	33.59	54.00	Pass
5470.0000	47.60	68.20	33.57	54.00	Pass

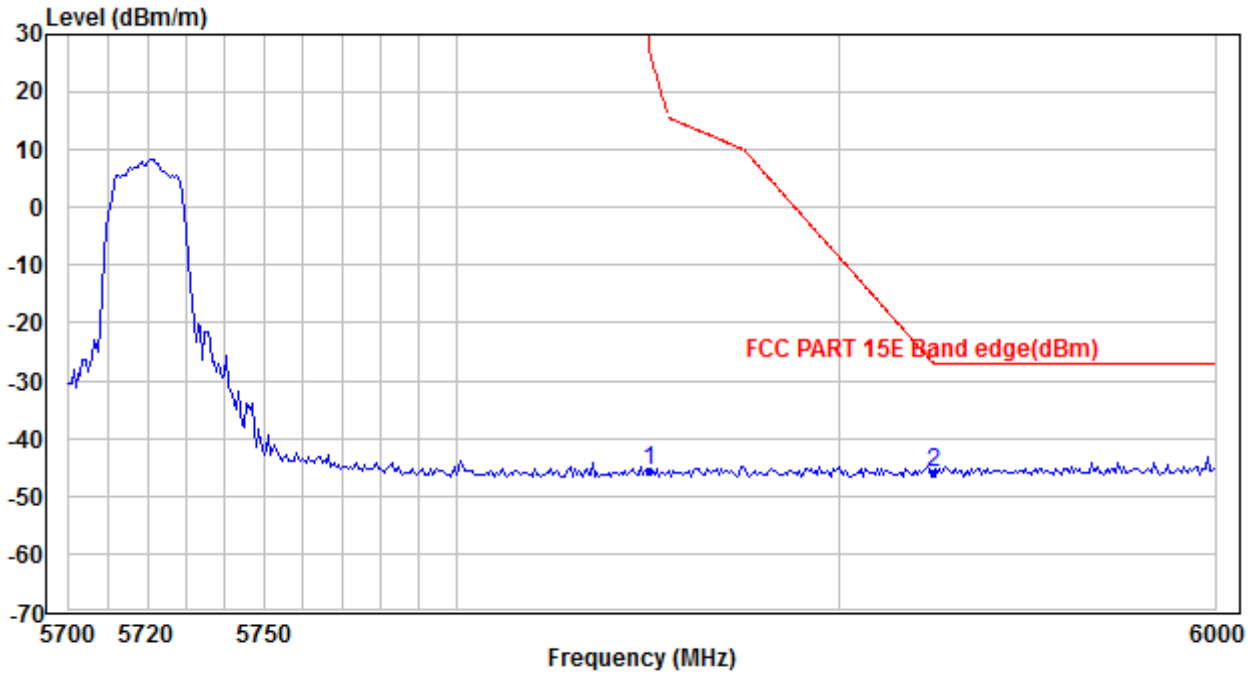
TEST REPORT

Test Channel:	Channel 144	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.0000	-47.40	27	Pass
5925.0000	-47.23	-27	Pass

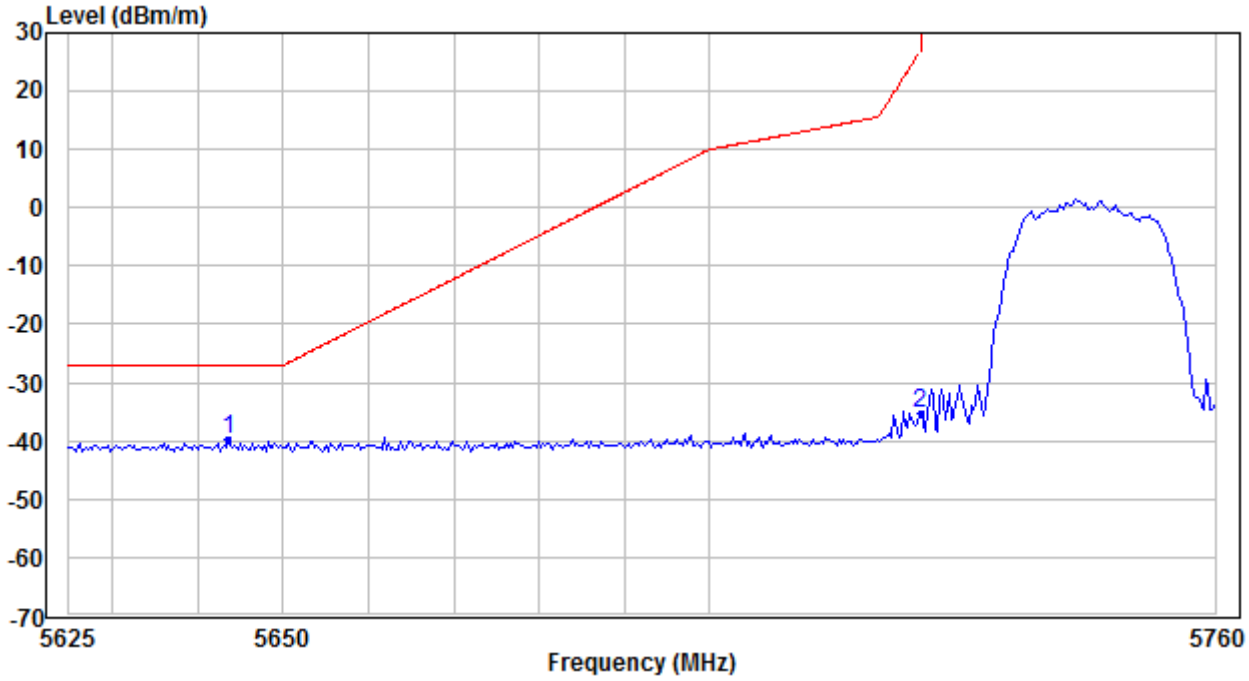
Test Channel:	Channel 144	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.0000	-45.57	27	Pass
5925.0000	-45.87	-27	Pass

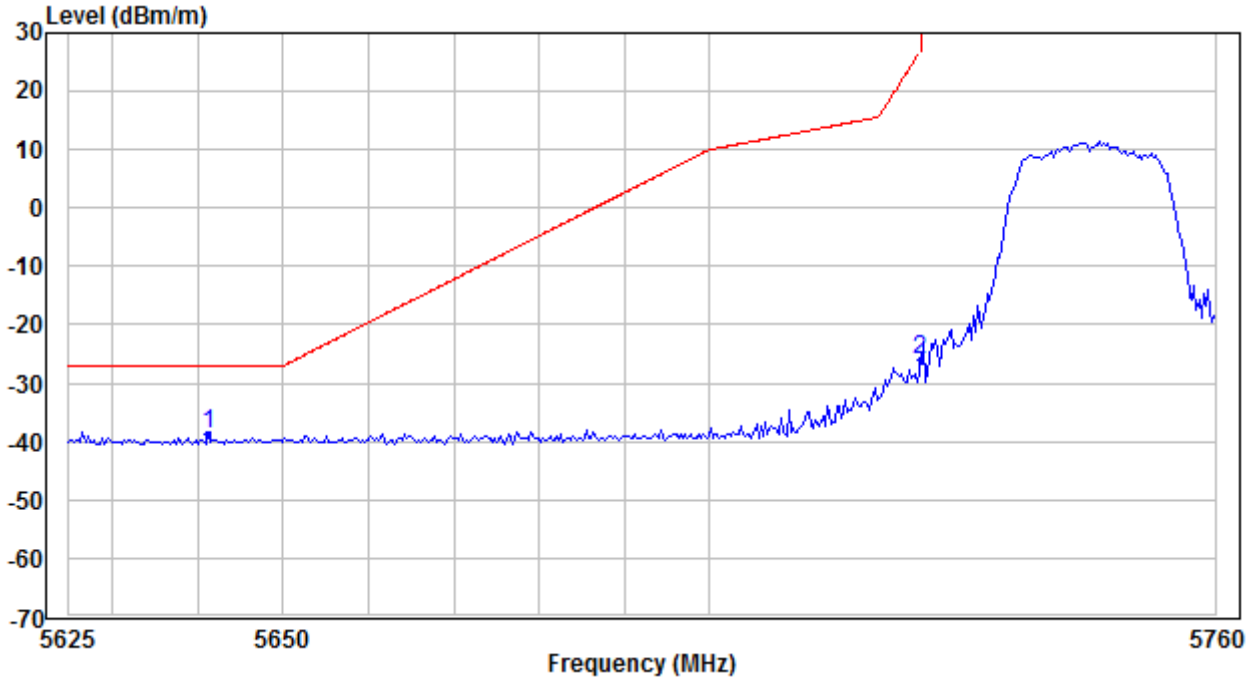
TEST REPORT

Test Channel:	Channel 149	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5643.6670	-39.60	-27.00	Pass
5725.0000	-35.26	27.00	Pass

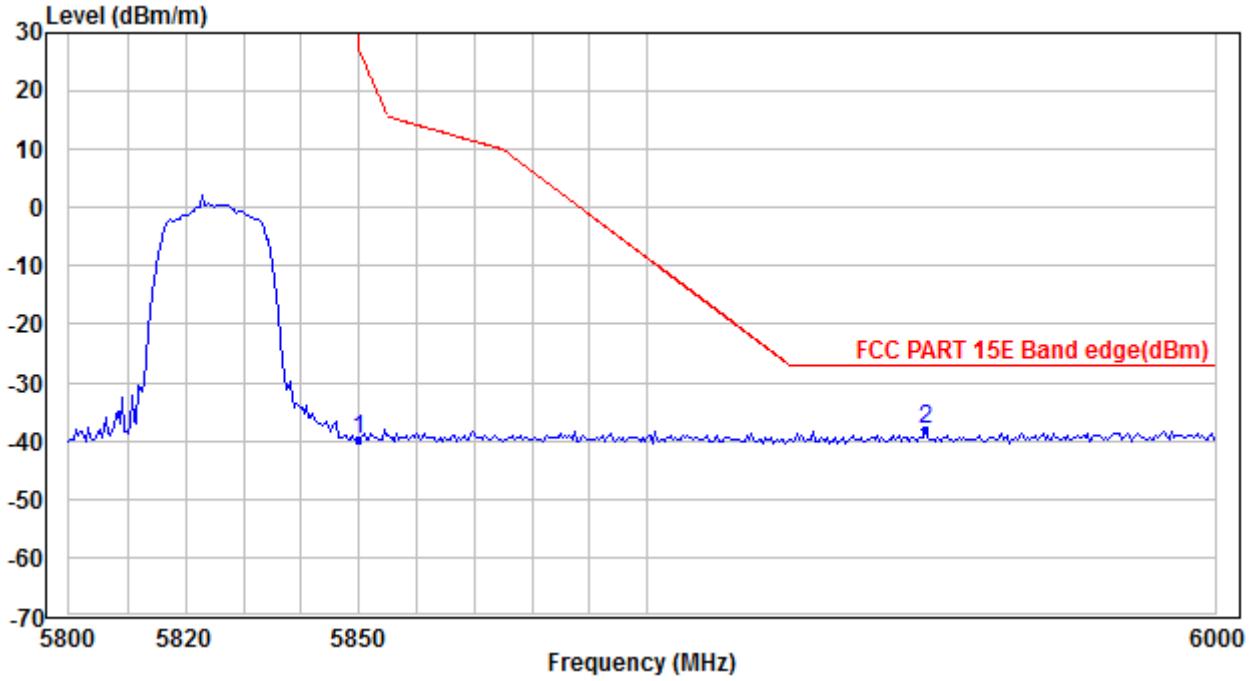
Test Channel:	Channel 149	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5641.2320	-38.78	-27.00	Pass
5725.0000	-25.96	27.00	Pass

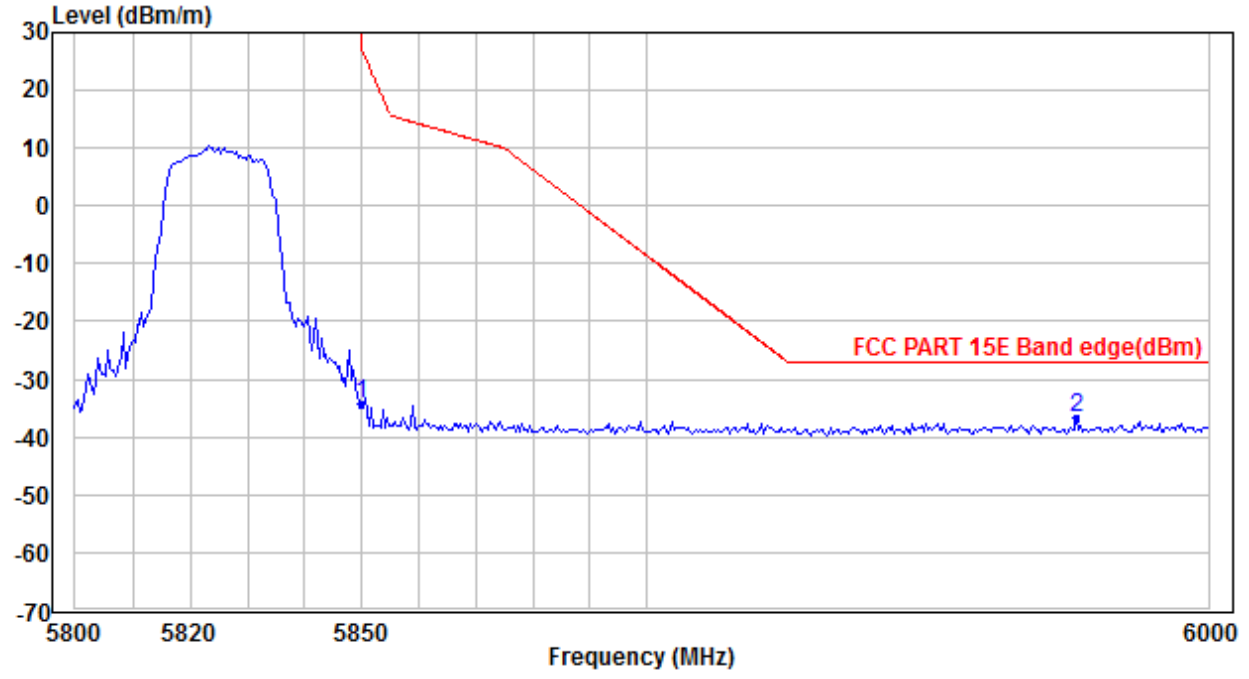
TEST REPORT

Test Channel:	Channel 165	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.0000	-39.65	27.00	Pass
5948.6970	-38.08	-27.00	Pass

Test Channel:	Channel 165	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.0000	-34.26	27.00	Pass
5976.3530	-36.74	-27.00	Pass

TEST REPORT

NOTES:

1. Peak detector is used for the emission measurement.
2. Average detector is used for the average data of emission measurement
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth

TEST REPORT

Table 3
Frequency: 5190MHz
IEEE 802.11n (40MHz) (MCS0)

IEEE 802.11n-HT40_Channel 38

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10380.00	51.05	74.00	-22.95	Peak	Horizontal
2	10380.00	39.47	54.00	-14.53	Average	Horizontal
3	15570.00	47.98	74.00	-26.02	Peak	Horizontal
4	15570.00	35.87	54.00	-18.13	Average	Horizontal
5	10380.00	49.91	74.00	-24.09	Peak	Vertical
6	10380.00	37.70	54.00	-16.30	Average	Vertical
7	15570.00	47.97	74.00	-26.03	Peak	Vertical
8	15570.00	35.79	54.00	-18.21	Average	Vertical

IEEE 802.11n-HT40_Channel 46

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10460.00	52.55	74.00	-21.45	Peak	Horizontal
2	10460.00	40.51	54.00	-13.49	Average	Horizontal
3	15690.00	49.22	74.00	-24.78	Peak	Horizontal
4	15690.00	37.09	54.00	-16.91	Average	Horizontal
5	10460.00	49.95	74.00	-24.05	Peak	Vertical
6	10460.00	38.37	54.00	-15.63	Average	Vertical
7	15690.00	50.12	74.00	-23.88	Peak	Vertical
8	15690.00	38.02	54.00	-15.98	Average	Vertical

IEEE 802.11n-HT40_Channel 54

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10540.00	51.77	74.00	-22.23	Peak	Horizontal
2	10540.00	40.16	54.00	-13.84	Average	Horizontal
3	15810.00	49.04	74.00	-24.96	Peak	Horizontal
4	15810.00	36.90	54.00	-17.10	Average	Horizontal
5	10540.00	49.97	74.00	-24.03	Peak	Vertical
6	10540.00	38.24	54.00	-15.76	Average	Vertical
7	15810.00	51.05	74.00	-22.95	Peak	Vertical
8	15810.00	37.90	54.00	-16.10	Average	Vertical

TEST REPORT

IEEE 802.11n-HT40_Channel 62

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10620.00	52.15	74.00	-21.85	Peak	Horizontal
2	10620.00	40.19	54.00	-13.81	Average	Horizontal
3	15930.00	49.62	74.00	-24.38	Peak	Horizontal
4	15930.00	37.38	54.00	-16.62	Average	Horizontal
5	10620.00	50.39	74.00	-23.61	Peak	Vertical
6	10620.00	38.45	54.00	-15.55	Average	Vertical
7	15930.00	50.75	74.00	-23.25	Peak	Vertical
8	15930.00	38.60	54.00	-15.40	Average	Vertical

IEEE 802.11n-HT40_Channel 102

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11020.00	51.68	74.00	-22.32	Peak	Horizontal
2	11020.00	39.29	54.00	-14.71	Average	Horizontal
3	16530.00	51.06	74.00	-22.94	Peak	Horizontal
4	16530.00	38.45	54.00	-15.55	Average	Horizontal
5	11020.00	49.77	74.00	-24.23	Peak	Vertical
6	11020.00	37.54	54.00	-16.46	Average	Vertical
7	16530.00	50.93	74.00	-23.07	Peak	Vertical
8	16530.00	38.55	54.00	-15.45	Average	Vertical

IEEE 802.11n-HT40_Channel 134

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11340.00	51.71	74.00	-22.29	Peak	Horizontal
2	11340.00	39.14	54.00	-14.86	Average	Horizontal
3	17010.00	50.92	74.00	-23.08	Peak	Horizontal
4	17010.00	37.85	54.00	-16.15	Average	Horizontal
5	11340.00	49.17	74.00	-24.83	Peak	Vertical
6	11340.00	37.54	54.00	-16.46	Average	Vertical
7	17010.00	49.09	74.00	-24.91	Peak	Vertical
8	17010.00	37.01	54.00	-16.99	Average	Vertical

TEST REPORT

IEEE 802.11n-HT40_Channel 142

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Detector
1	11420.00	51.60	74.00	-22.40	Peak	Horizontal
2	11420.00	39.21	54.00	-14.79	Average	Horizontal
3	17130.00	51.05	74.00	-22.95	Peak	Horizontal
4	17130.00	37.81	54.00	-16.19	Average	Horizontal
5	11420.00	49.49	74.00	-24.51	Peak	Vertical
6	11420.00	37.74	54.00	-16.26	Average	Vertical
7	17130.00	49.99	74.00	-24.01	Peak	Vertical
8	17130.00	37.08	54.00	-16.92	Average	Vertical

IEEE 802.11n-HT40_Channel 151

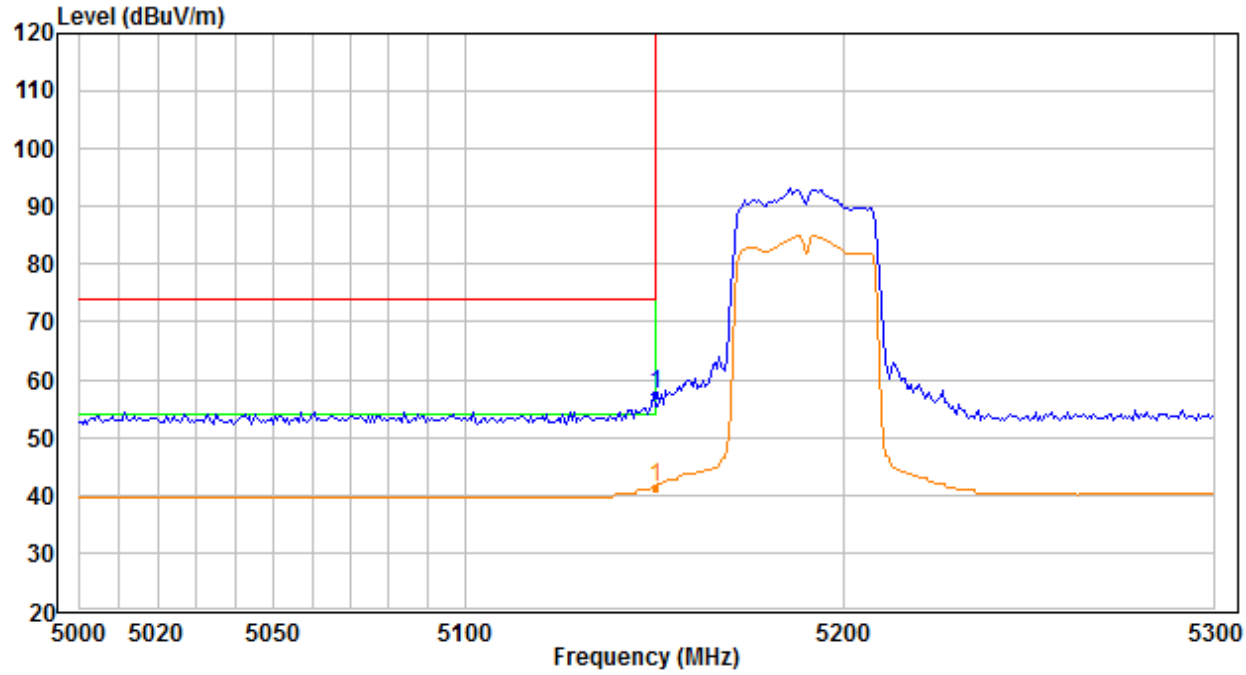
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Detector
1	11510.00	51.37	74.00	-22.63	Peak	Horizontal
2	11510.00	38.74	54.00	-15.26	Average	Horizontal
3	17265.00	51.62	74.00	-22.38	Peak	Horizontal
4	17265.00	39.22	54.00	-14.78	Average	Horizontal
5	11510.00	49.24	74.00	-24.76	Peak	Vertical
6	11510.00	37.43	54.00	-16.57	Average	Vertical
7	17265.00	51.08	74.00	-22.92	Peak	Vertical
8	17265.00	38.20	54.00	-15.80	Average	Vertical

IEEE 802.11n-HT40_Channel 159

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Detector
1	11590.00	50.60	74.00	-23.40	Peak	Horizontal
2	11590.00	38.56	54.00	-15.44	Average	Horizontal
3	17385.00	52.75	74.00	-21.25	Peak	Horizontal
4	17385.00	40.27	54.00	-13.73	Average	Horizontal
5	11590.00	48.83	74.00	-25.17	Peak	Vertical
6	11590.00	37.09	54.00	-16.91	Average	Vertical
7	17385.00	51.15	74.00	-22.85	Peak	Vertical
8	17385.00	39.28	54.00	-14.72	Average	Vertical

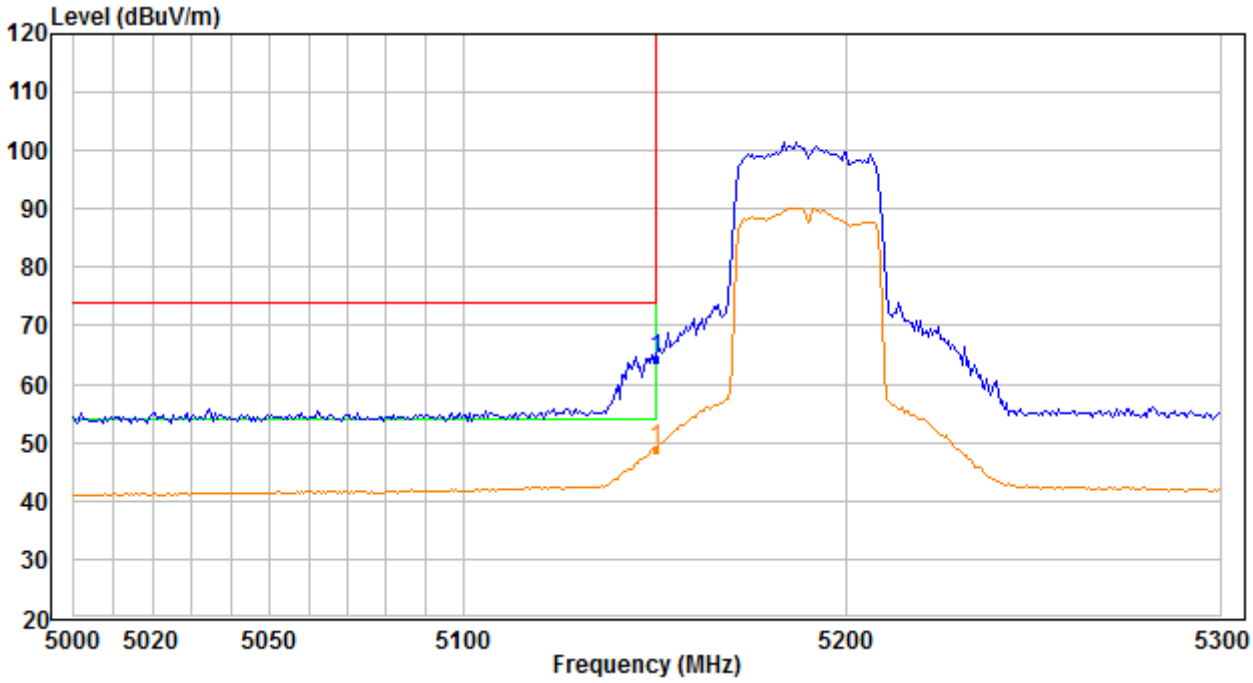
TEST REPORT

Test Channel:	Channel 38	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150.0000	57.47	74.00	41.39	54.00	Pass

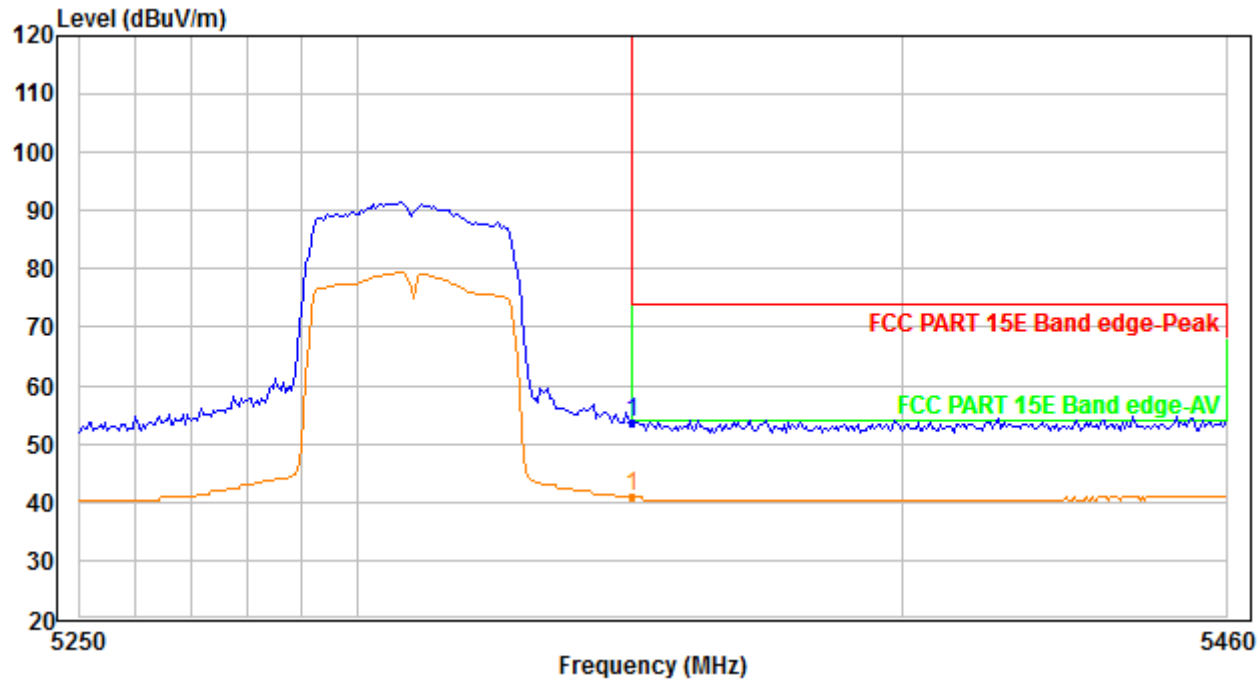
Test Channel:	Channel 38	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150.0000	64.22	74.00	48.88	54.00	Pass

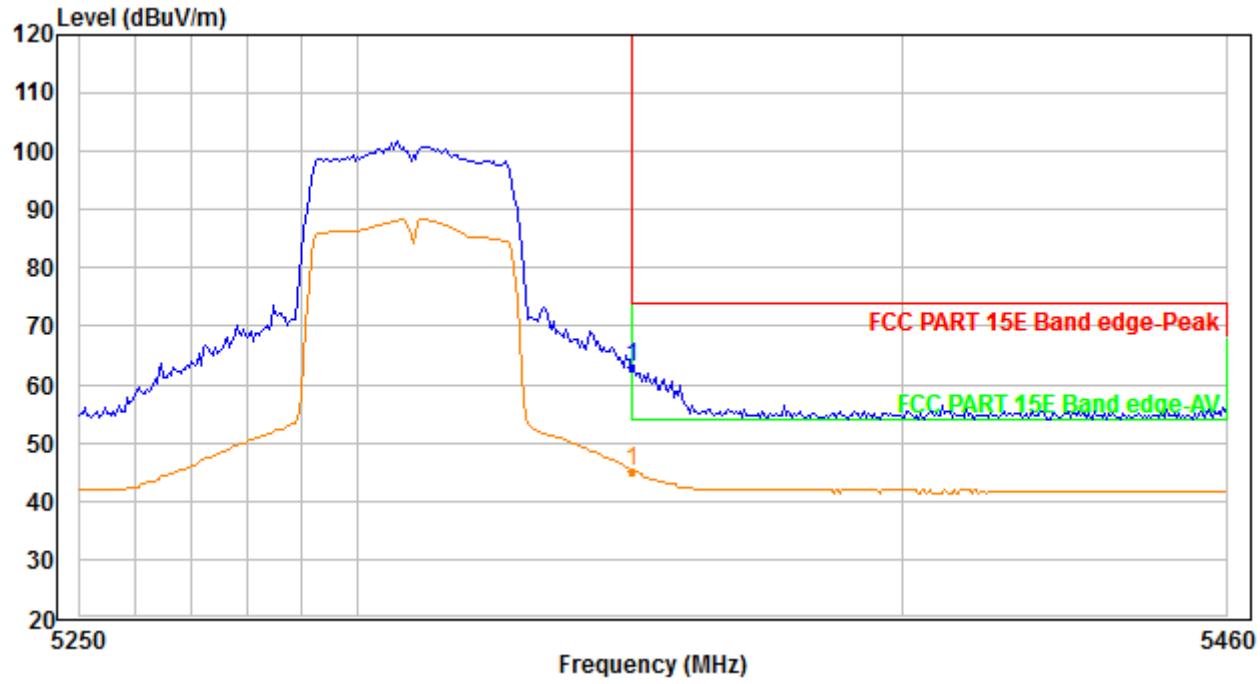
TEST REPORT

Test Channel:	Channel 62	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350.0000	53.59	74.00	40.93	54.00	Pass

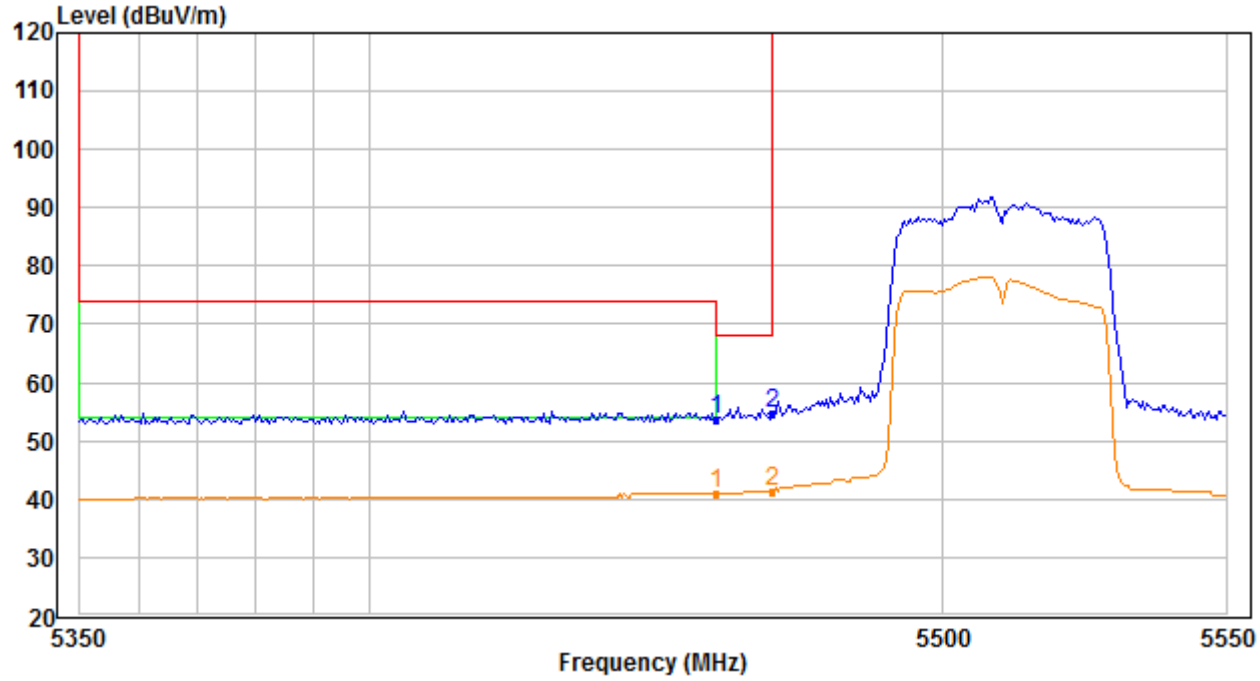
Test Channel:	Channel 62	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5350.0000	62.97	74.00	45.01	54.00	Pass

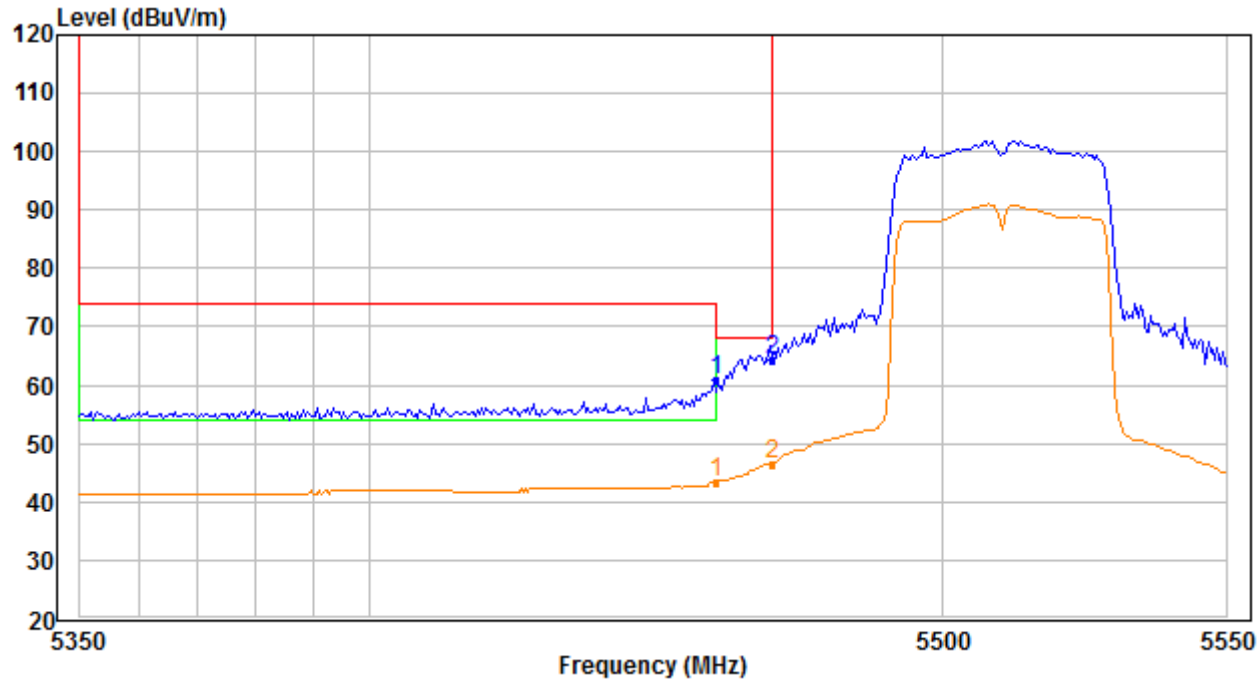
TEST REPORT

Test Channel:	Channel 102	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5460.0000	53.82	68.20	40.86	54.00	Pass
5470.0000	54.58	68.20	41.37	54.00	Pass

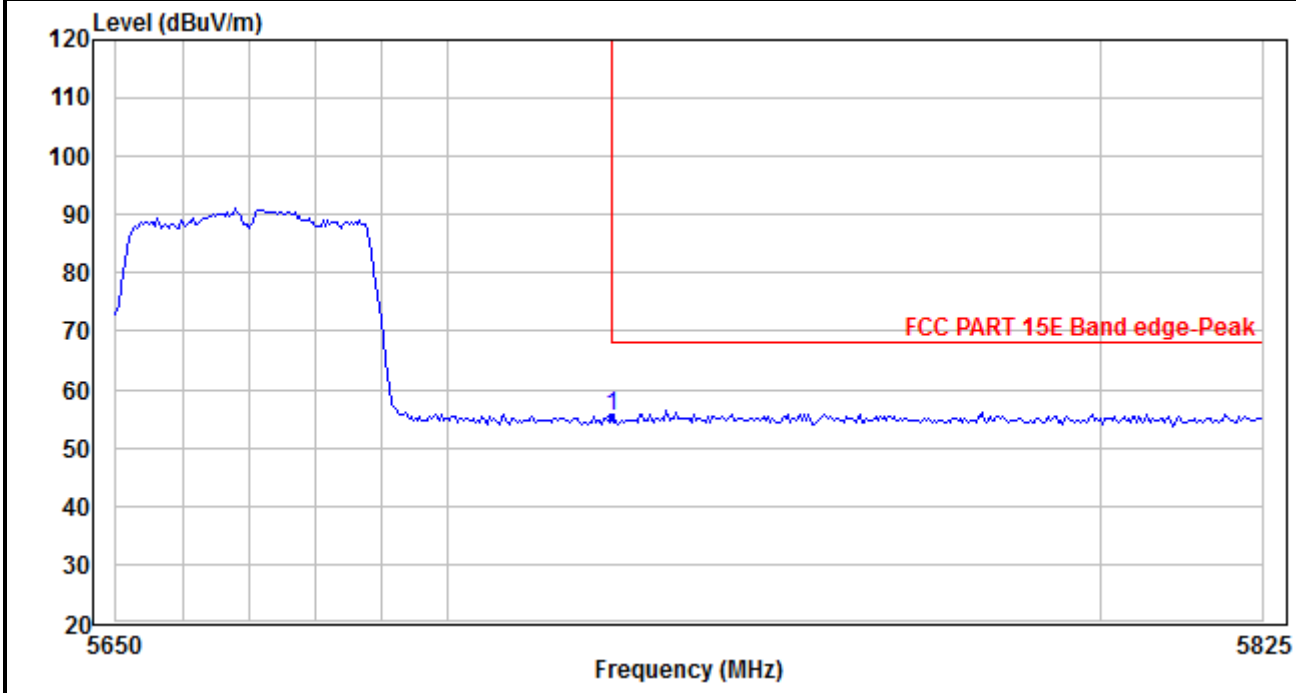
Test Channel:	Channel 102	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5460.0000	60.94	68.20	43.26	54.00	Pass
5470.0000	64.28	68.20	46.61	54.00	Pass

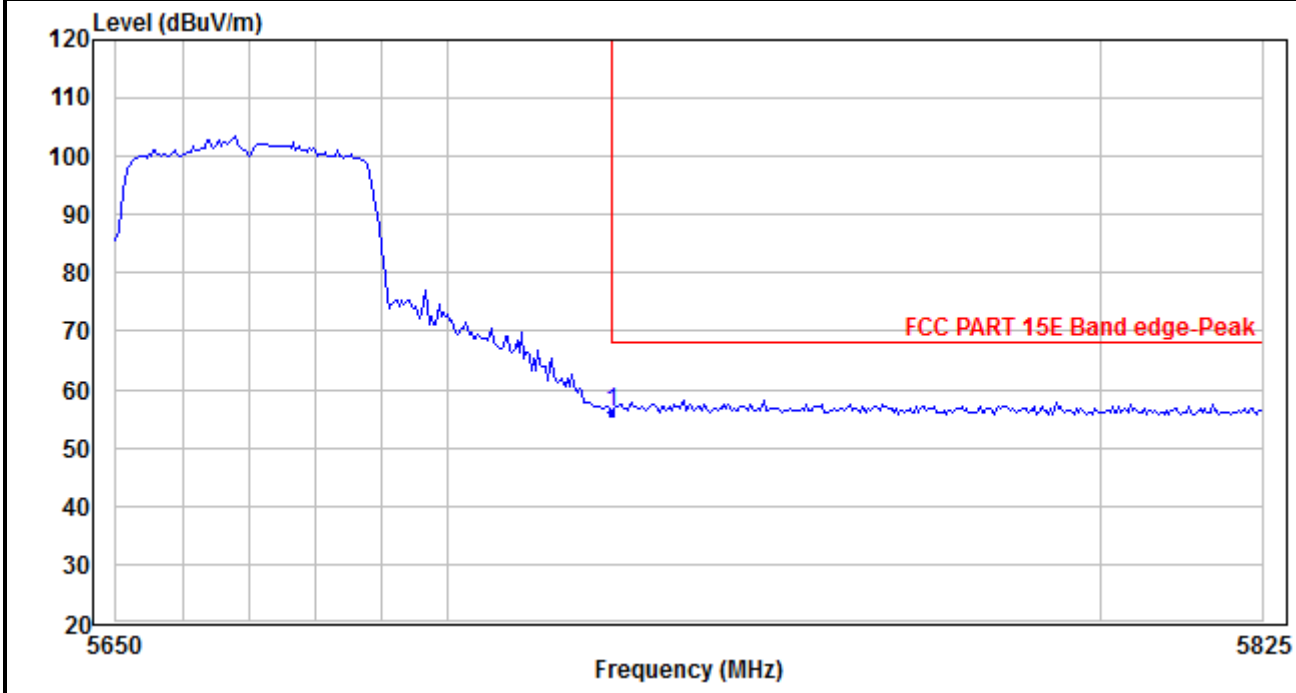
TEST REPORT

Test Channel:	Channel 134	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5725.0000	55.41	68.20	Pass

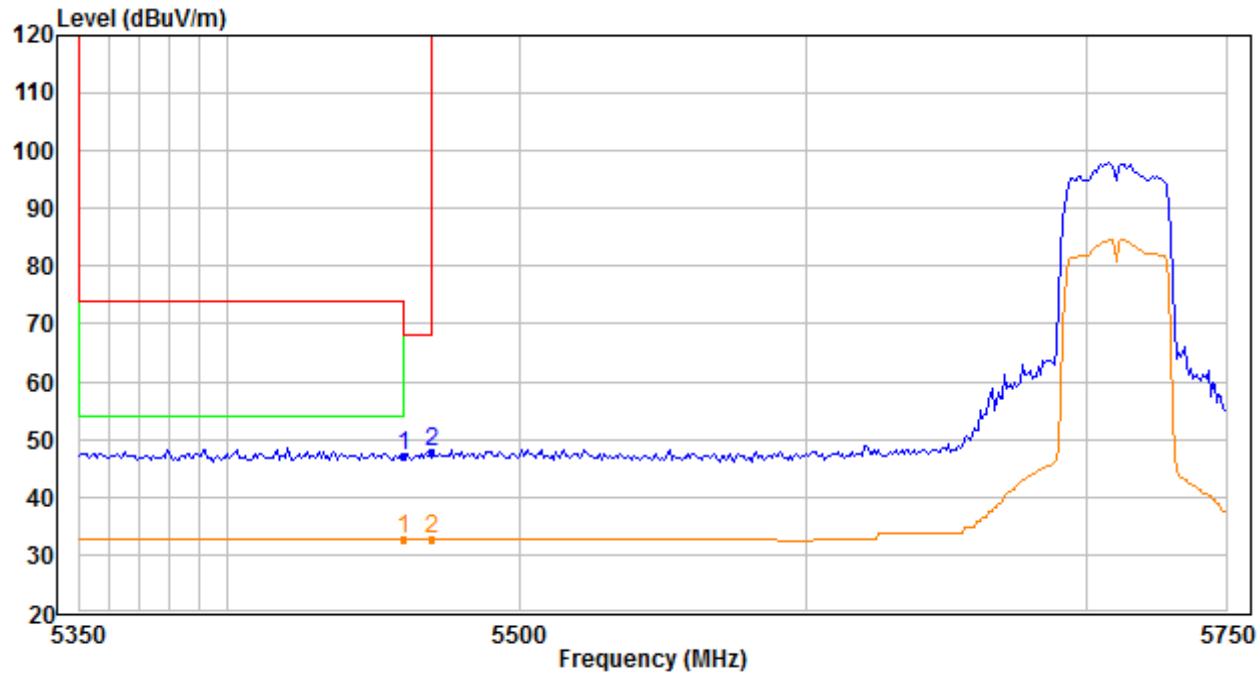
Test Channel:	Channel 134	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5725.0000	55.99	68.20	Pass

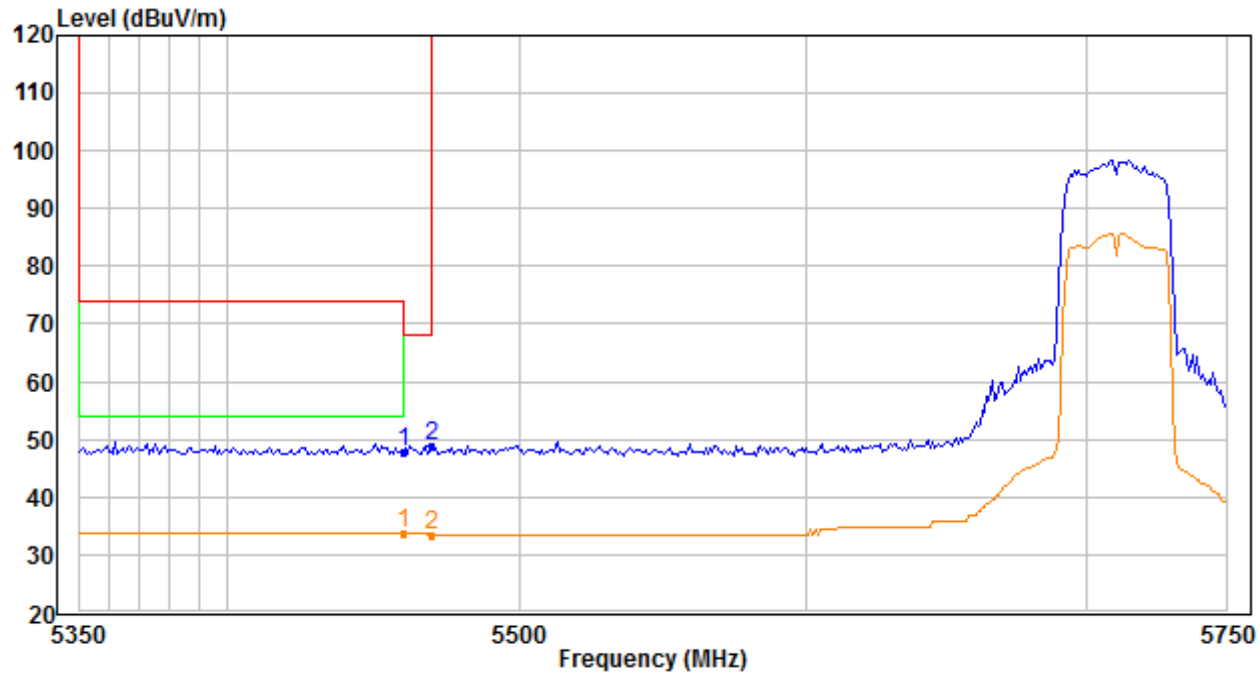
TEST REPORT

Test Channel:	Channel 142	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5460.0000	47.20	68.20	32.68	54.00	Pass
5470.0000	47.93	68.20	32.67	54.00	Pass

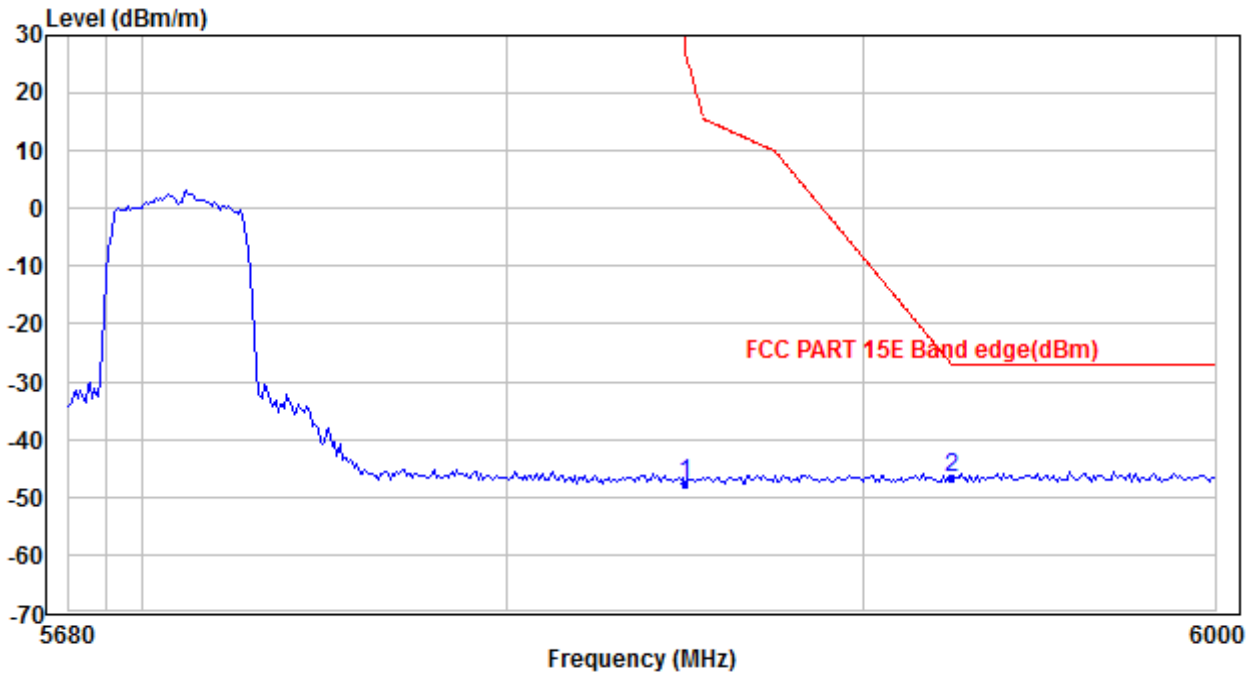
Test Channel:	Channel 142	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5460.0000	47.99	68.20	33.59	54.00	Pass
5470.0000	48.82	68.20	33.57	54.00	Pass

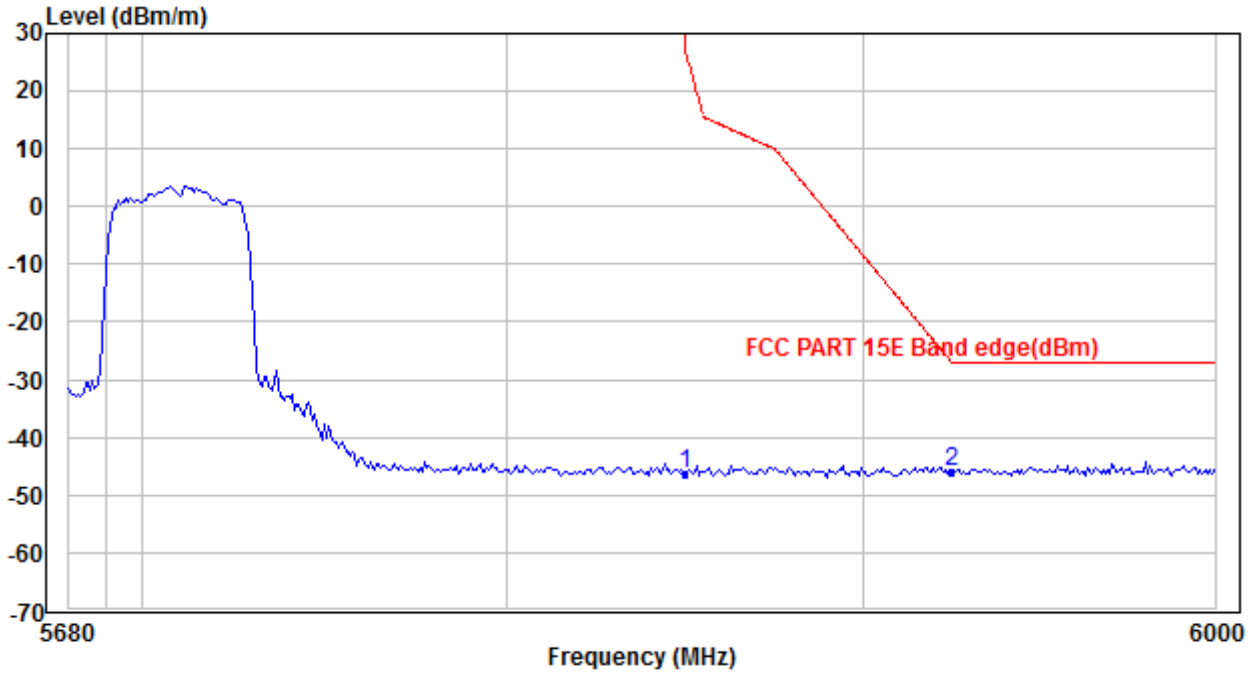
TEST REPORT

Test Channel:	Channel 142	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.0000	-47.51	27	Pass
5925.0000	-46.76	-27	Pass

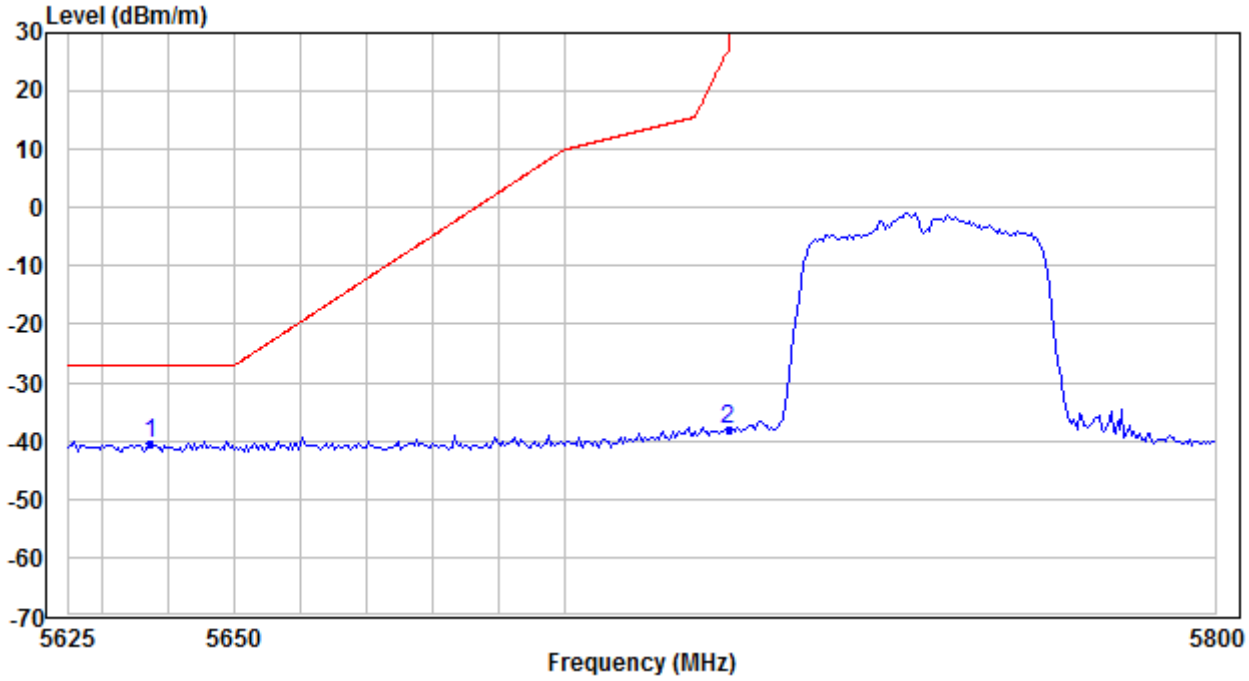
Test Channel:	Channel 142	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.0000	-46.24	27	Pass
5925.0000	-45.99	-27	Pass

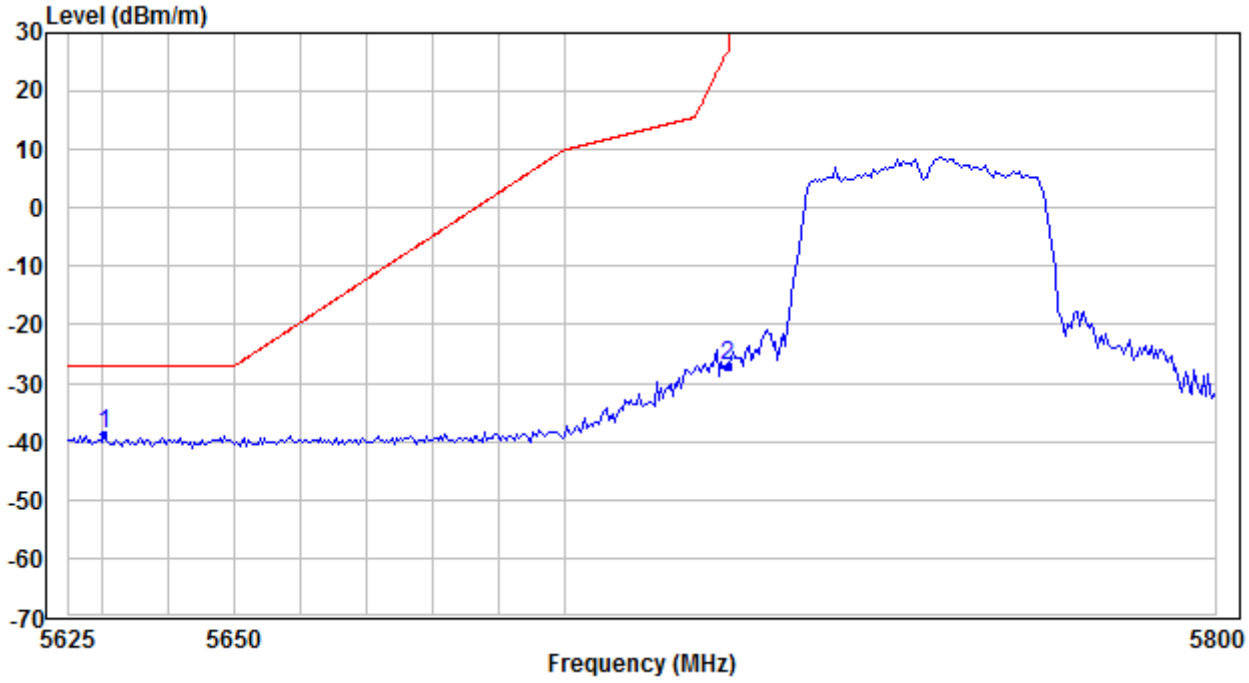
TEST REPORT

Test Channel:	Channel 151	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650.0000	-40.01	-27.00	Pass
5725.0000	-38.12	26.97	Pass

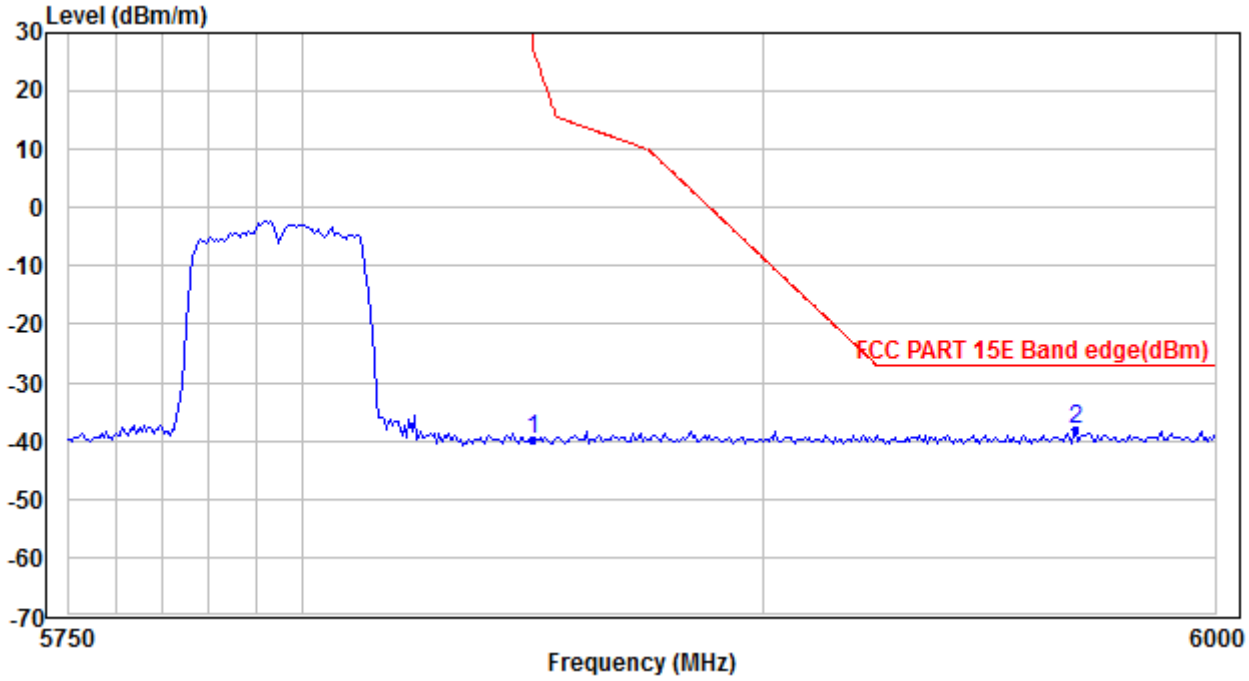
Test Channel:	Channel 151	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5630.2610	-38.77	-27.00	Pass
5725.0000	-27.79	27.00	Pass

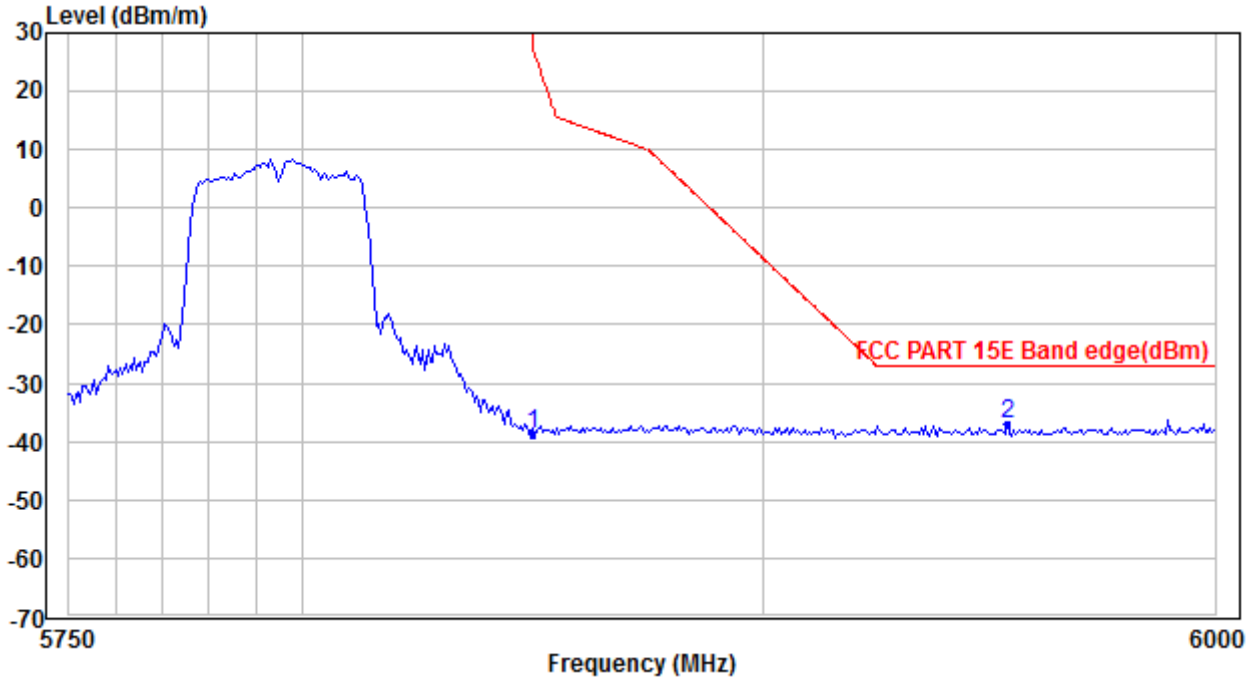
TEST REPORT

Test Channel:	Channel 159	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.00	-39.67	27.00	Pass
5925.00	-38.14	-27.00	Pass

Test Channel:	Channel 159	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.00	-38.61	27.00	Pass
5923.91	-36.86	-27.00	Pass

TEST REPORT

NOTES:

1. Peak detector is used for the emission measurement.
2. Average detector is used for the average data of emission measurement
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

TEST REPORT

Table 4
Frequency: 5210MHz
IEEE 802.11ac (80MHz) (MCS0)

IEEE 802.11ac-VHT80_Channel 42

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10420.00	52.83	74.00	-21.17	Peak	Horizontal
2	10420.00	40.36	54.00	-13.64	Average	Horizontal
3	15630.00	49.21	74.00	-24.79	Peak	Horizontal
4	15630.00	37.31	54.00	-16.69	Average	Horizontal
5	10420.00	51.11	74.00	-22.89	Peak	Vertical
6	10420.00	38.92	54.00	-15.08	Average	Vertical
7	15630.00	50.37	74.00	-23.63	Peak	Vertical
8	15630.00	37.95	54.00	-16.05	Average	Vertical

IEEE 802.11ac-VHT80_Channel 58

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	10580.00	52.92	74.00	-21.08	Peak	Horizontal
2	10580.00	40.32	54.00	-13.68	Average	Horizontal
3	15870.00	48.91	74.00	-25.09	Peak	Horizontal
4	15870.00	36.90	54.00	-17.10	Average	Horizontal
5	10580.00	51.26	74.00	-22.74	Peak	Vertical
6	10580.00	38.29	54.00	-15.71	Average	Vertical
7	15870.00	50.41	74.00	-23.59	Peak	Vertical
8	15870.00	37.75	54.00	-16.25	Average	Vertical

IEEE 802.11ac-VHT80_Channel 106

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11060.00	51.87	74.00	-22.13	Peak	Horizontal
2	11060.00	39.10	54.00	-14.90	Average	Horizontal
3	16590.00	50.81	74.00	-23.19	Peak	Horizontal
4	16590.00	38.17	54.00	-15.83	Average	Horizontal
5	11060.00	50.25	74.00	-23.75	Peak	Vertical
6	11060.00	37.39	54.00	-16.61	Average	Vertical
7	16590.00	50.59	74.00	-23.41	Peak	Vertical
8	16590.00	38.06	54.00	-15.94	Average	Vertical

TEST REPORT

IEEE 802.11ac-VHT80_Channel 138

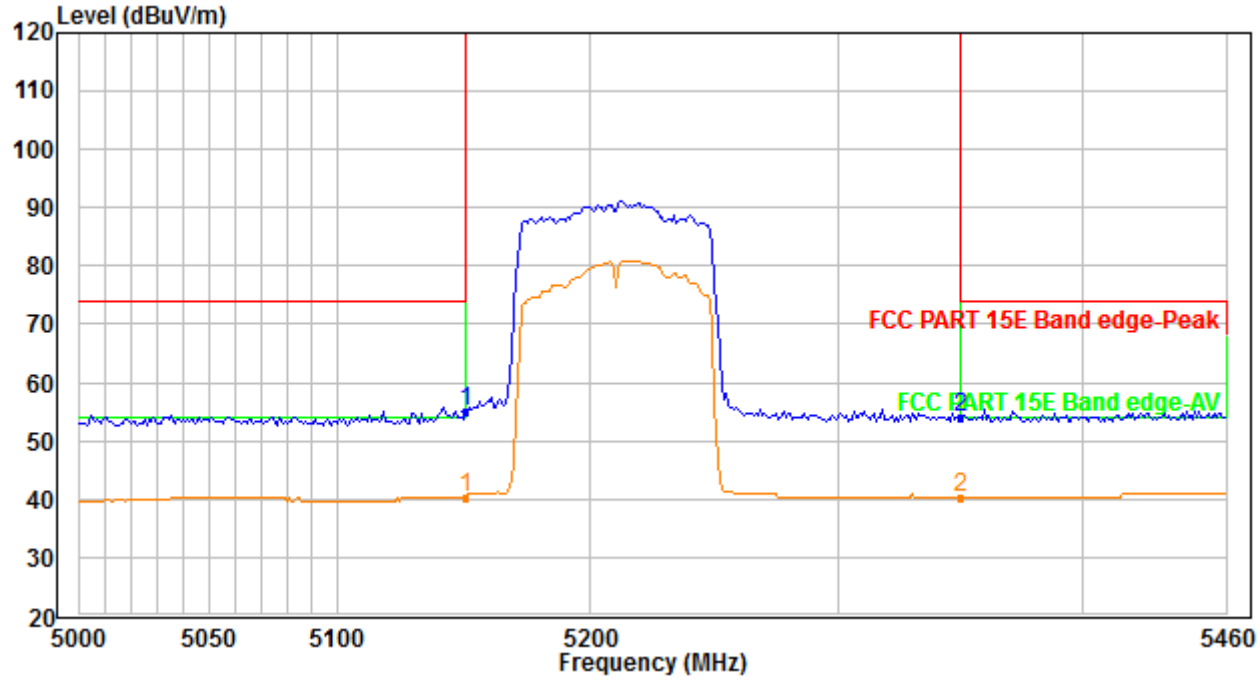
No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11380.00	51.79	74.00	-22.21	Peak	Horizontal
2	11380.00	38.86	54.00	-15.14	Average	Horizontal
3	17070.00	49.94	74.00	-24.06	Peak	Horizontal
4	17070.00	37.73	54.00	-16.27	Average	Horizontal
5	11380.00	50.24	74.00	-23.76	Peak	Vertical
6	11380.00	37.70	54.00	-16.30	Average	Vertical
7	17070.00	48.98	74.00	-25.02	Peak	Vertical
8	17070.00	36.99	54.00	-17.01	Average	Vertical

IEEE 802.11ac-VHT80_Channel 155

No.	Frequency (MHz)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Antenna Polaxis
1	11550.00	49.88	74.00	-24.12	Peak	Horizontal
2	11550.00	38.09	54.00	-15.91	Average	Horizontal
3	17325.00	51.71	74.00	-22.29	Peak	Horizontal
4	17325.00	38.27	54.00	-15.73	Average	Horizontal
5	11550.00	49.24	74.00	-24.76	Peak	Vertical
6	11550.00	37.38	54.00	-16.62	Average	Vertical
7	17325.00	50.24	74.00	-23.76	Peak	Vertical
8	17325.00	38.03	54.00	-15.97	Average	Vertical

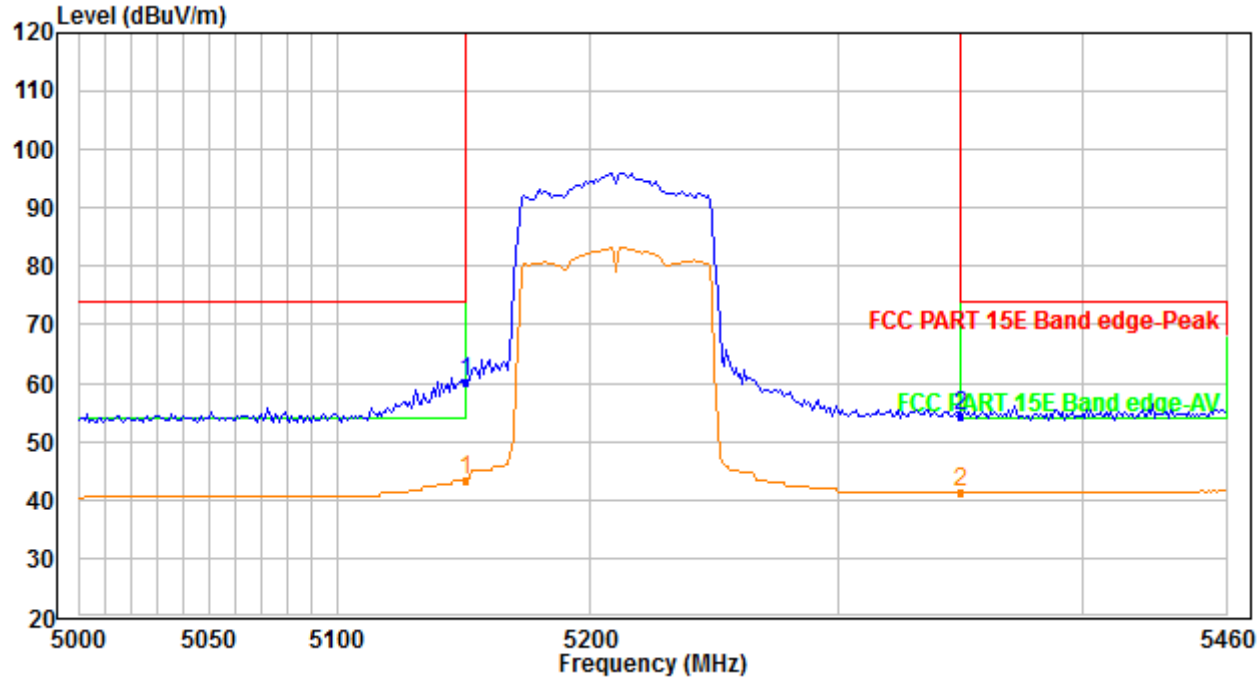
TEST REPORT

Test Channel:	Channel 42	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150.0000	55.18	74.00	40.30	54.00	Pass
5350.0000	54.00	74.00	40.37	54.00	Pass

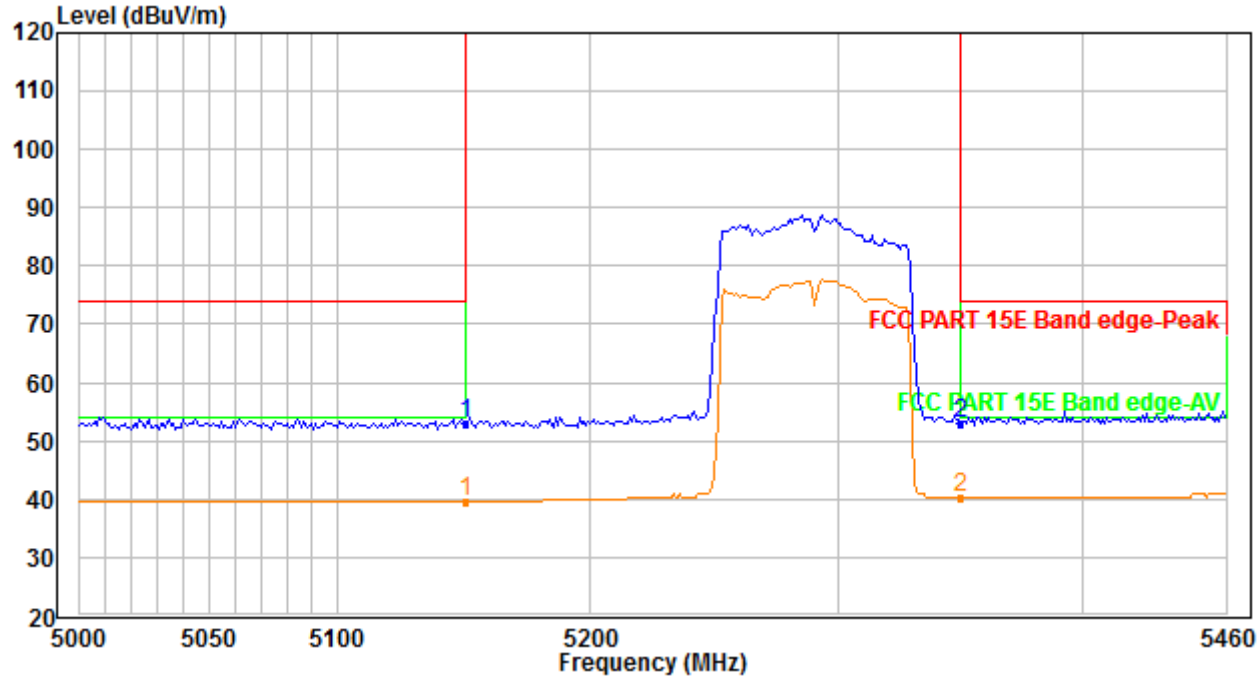
Test Channel:	Channel 42	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150.0000	60.33	74.00	43.33	54.00	Pass
5350.0000	54.38	74.00	41.30	54.00	Pass

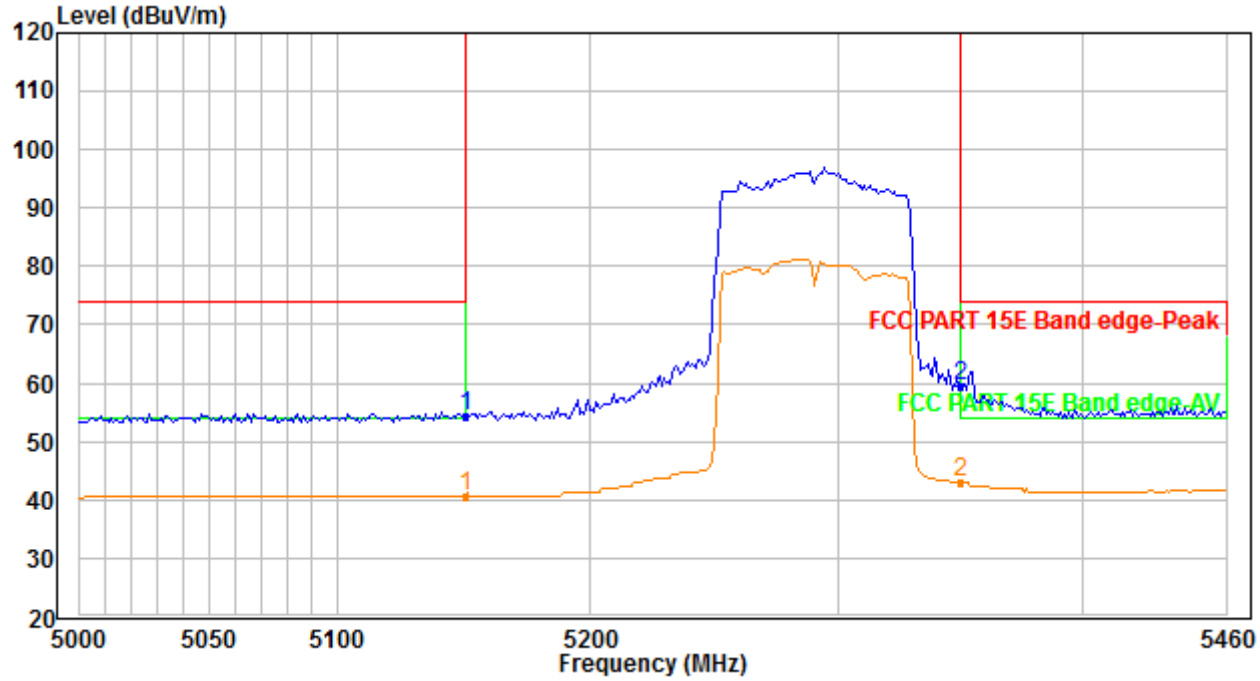
TEST REPORT

Test Channel:	Channel 58	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150.0000	53.07	74.00	39.71	54.00	Pass
5350.0000	53.15	74.00	40.37	54.00	Pass

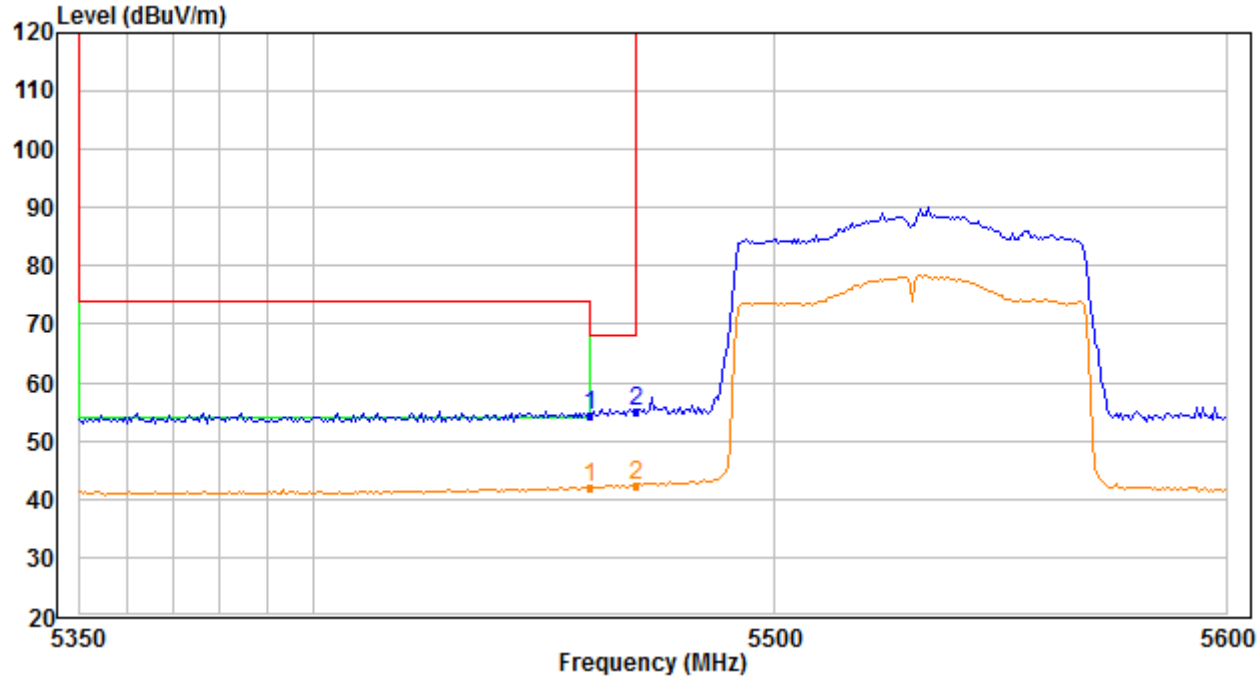
Test Channel:	Channel 58	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5150.0000	54.43	74.00	40.68	54.00	Pass
5350.0000	59.66	74.00	42.88	54.00	Pass

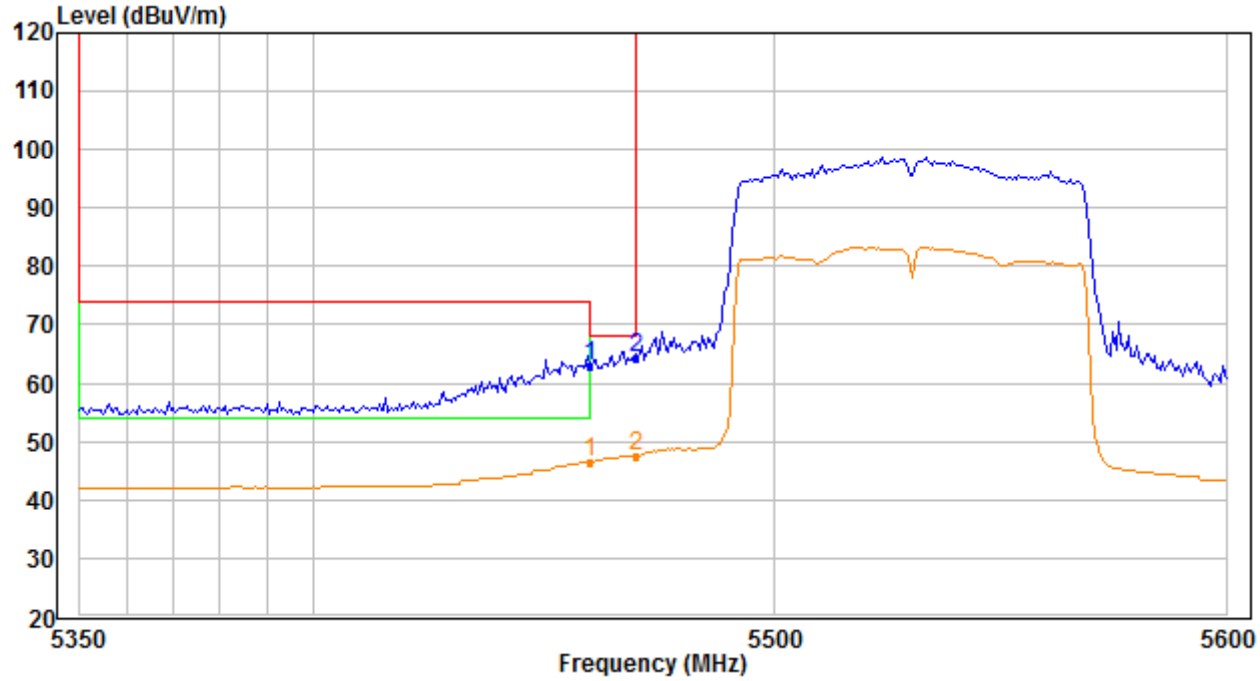
TEST REPORT

Test Channel:	Channel 106	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5460.0000	54.51	68.20	41.92	54.00	Pass
5470.0000	55.06	68.20	42.32	54.00	Pass

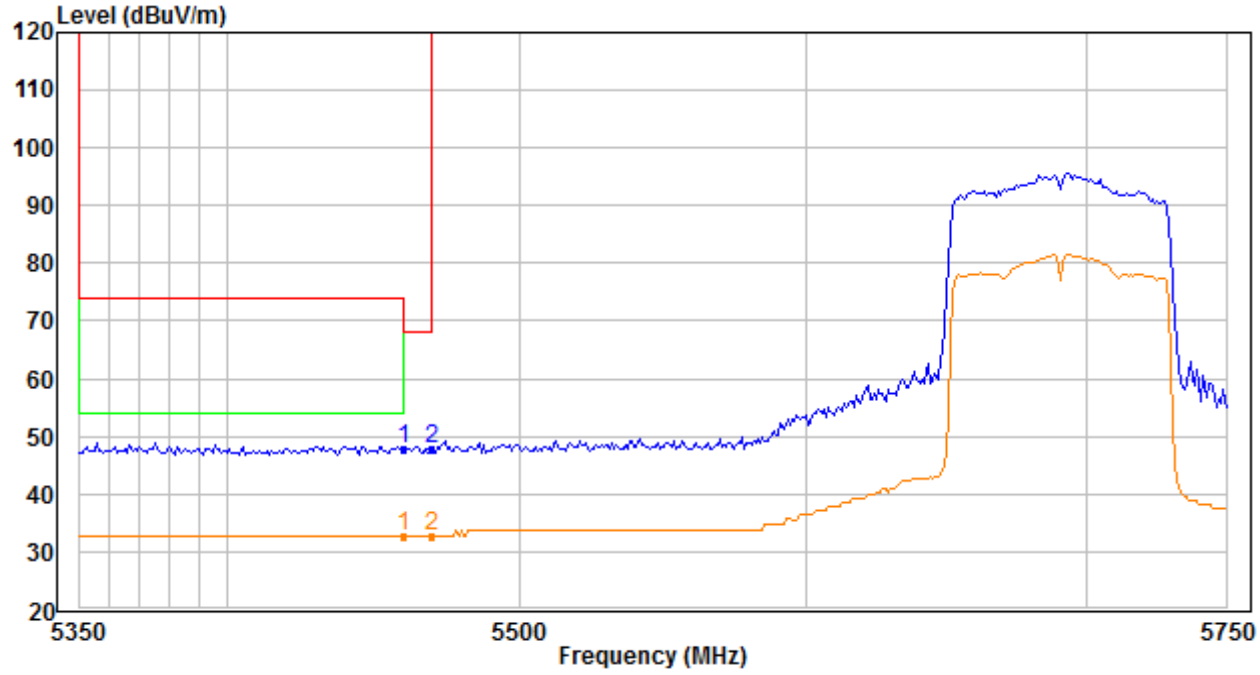
Test Channel:	Channel 106	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5460.0000	62.97	68.20	46.63	54.00	Pass
5470.0000	64.45	68.20	47.50	54.00	Pass

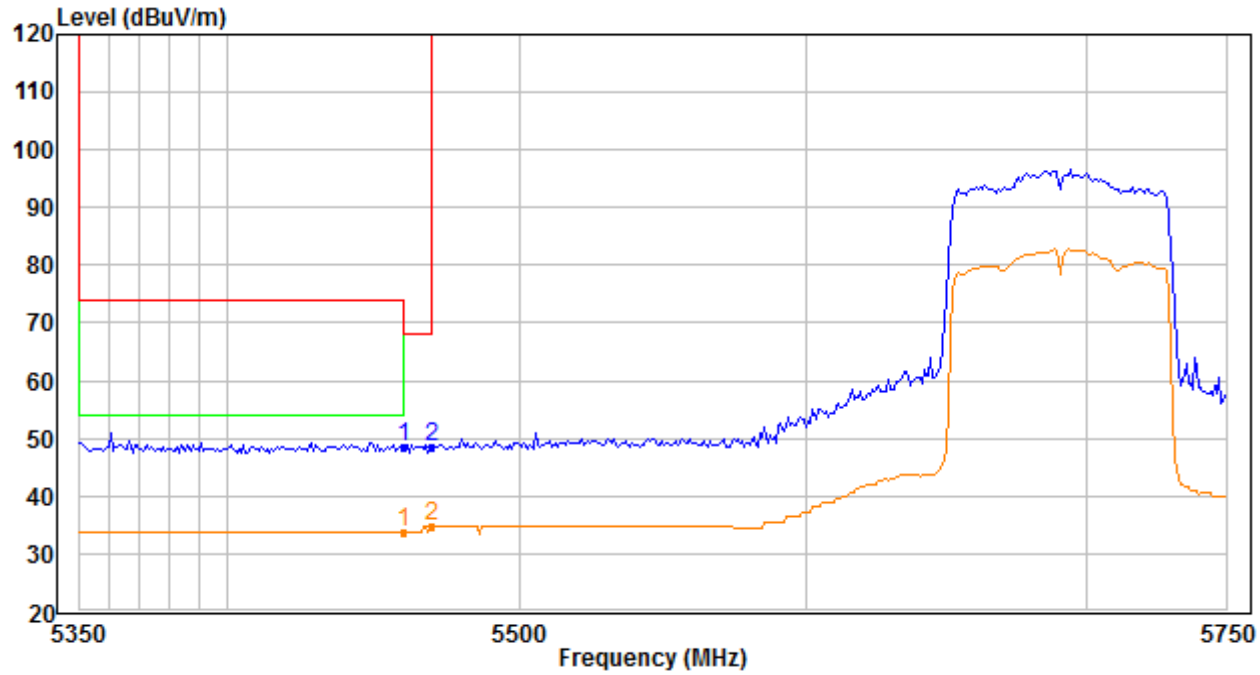
TEST REPORT

Test Channel:	Channel 138	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5460.0000	47.87	68.20	32.68	54.00	Pass
5470.0000	47.72	68.20	32.67	54.00	Pass

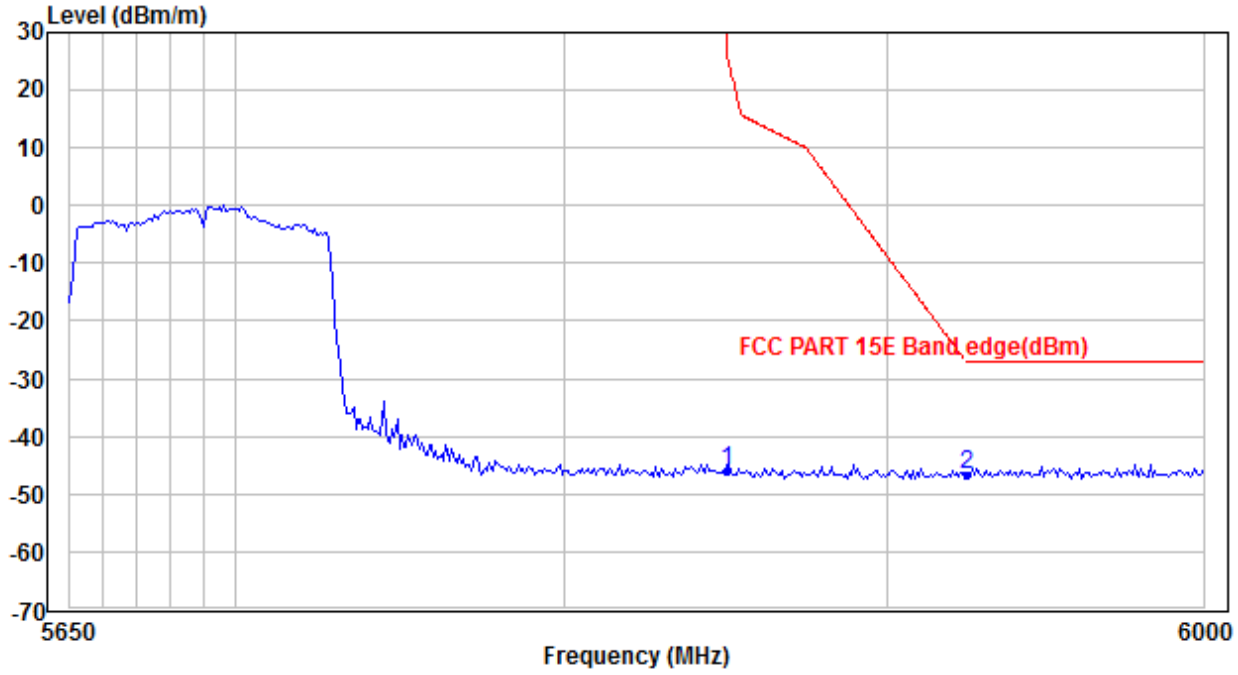
Test Channel:	Channel 138	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBuv/m)	Peak Limit (dBuv/m)	AV level (dBuv/m)	AV Limit (dBuv/m)	Conclusion
5460.0000	48.63	68.20	33.59	54.00	Pass
5470.0000	48.62	68.20	34.73	54.00	Pass

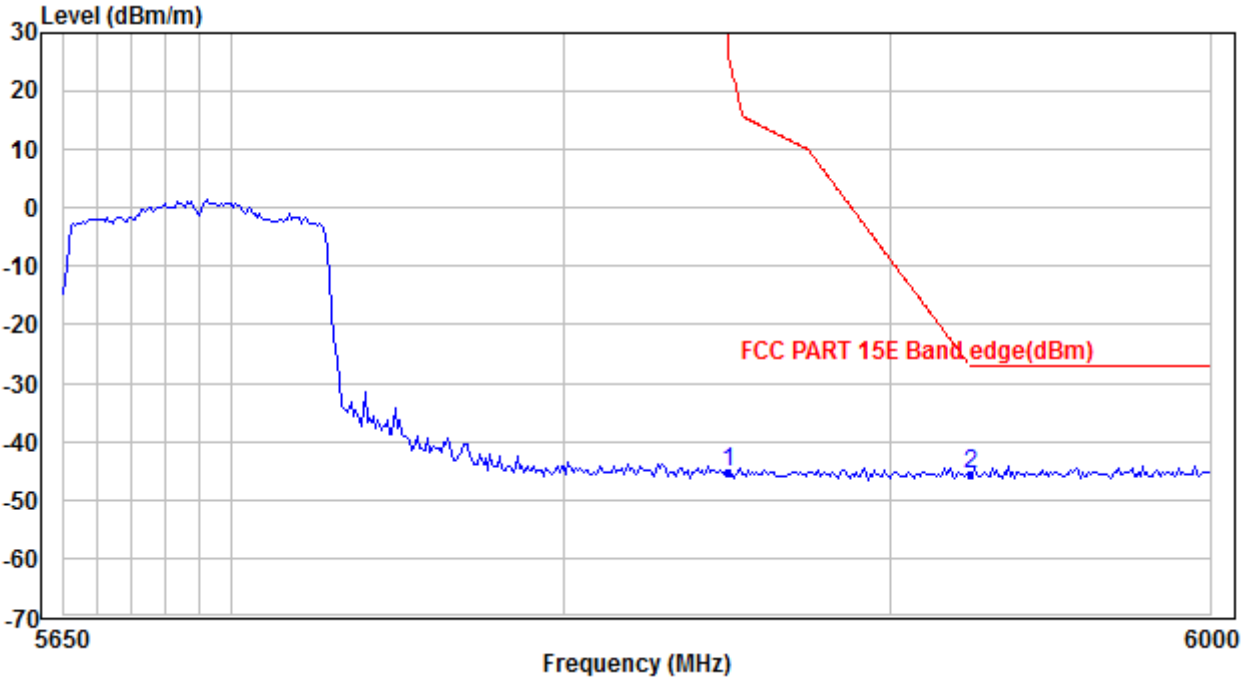
TEST REPORT

Test Channel:	Channel 138	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.0000	-46.10	27.00	Pass
5925.0000	-46.73	-27.00	Pass

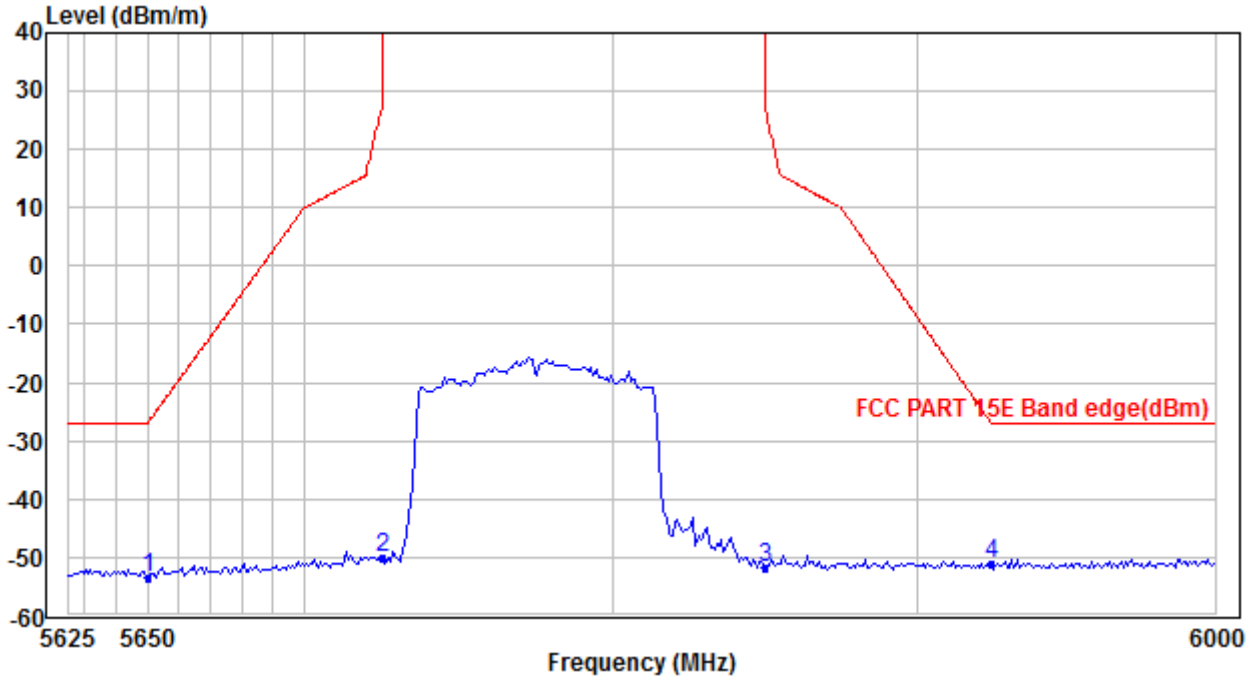
Test Channel:	Channel 138	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5850.0000	-45.09	27.00	Pass
5925.0000	-45.55	-27.00	Pass

TEST REPORT

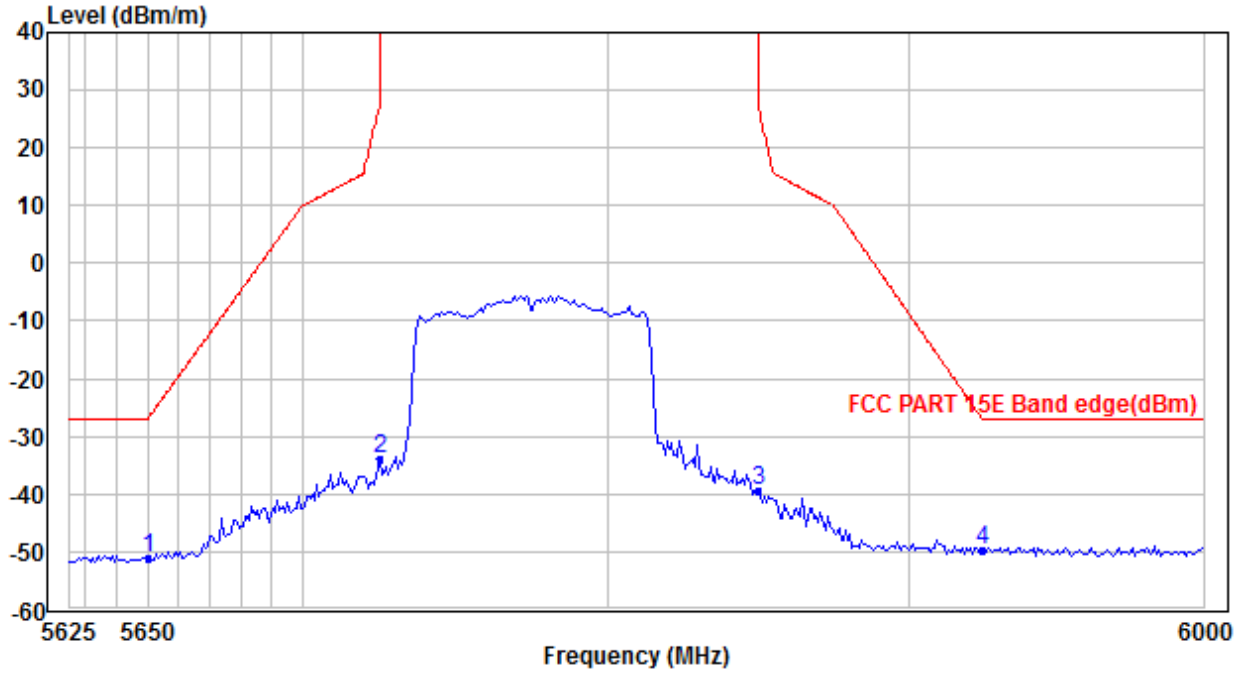
Test Channel:	Channel 155	Ant. Polar. :	Horizontal



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650.0000	-53.36	-27.00	Pass
5725.0000	-50.00	27.00	Pass
5850.0000	-51.58	27.00	Pass
5925.0000	-51.16	-27.00	Pass

TEST REPORT

Test Channel:	Channel 155	Ant. Polar. :	Vertical



Frequency (MHz)	Peak level (dBm)	Peak Limit (dBm)	Conclusion
5650.0000	-51.23	-27.00	Pass
5725.0000	-33.72	27.00	Pass
5850.0000	-39.48	27.00	Pass
5925.0000	-49.61	-27.00	Pass

NOTES:

1. Peak detector is used for the emission measurement.
2. Average detector is used for the average data of emission measurement
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth

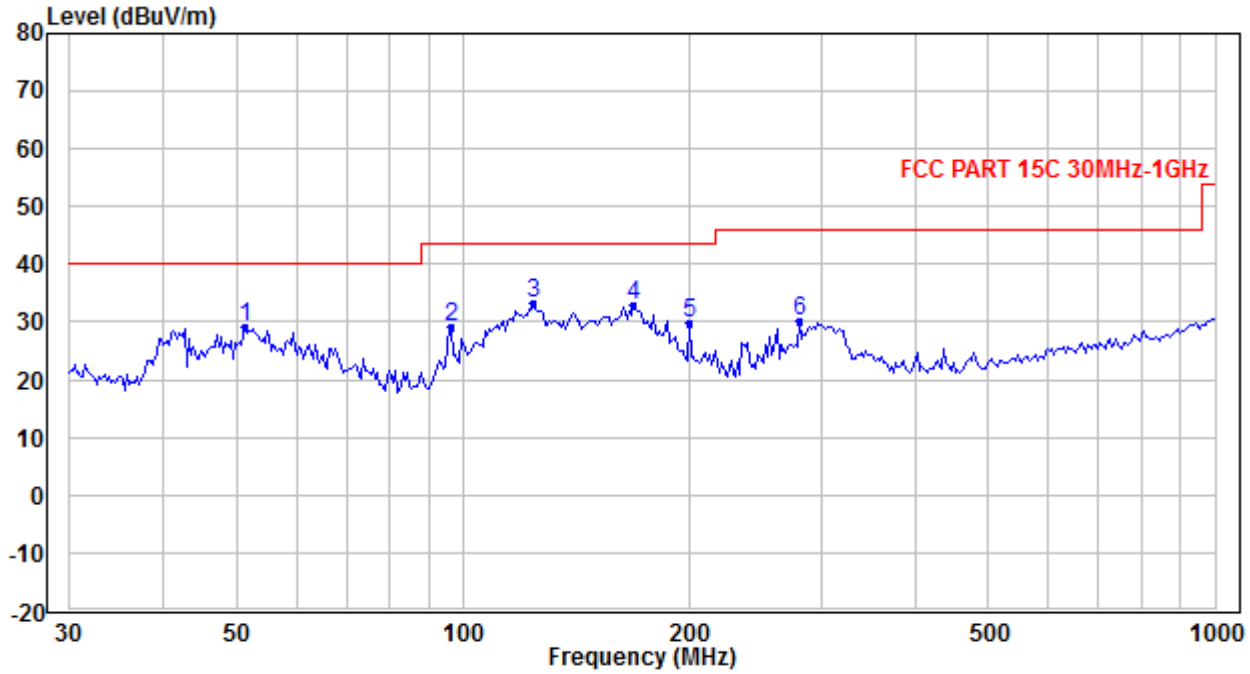
TEST REPORT

Mode: WIFI Connected

Table 5

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

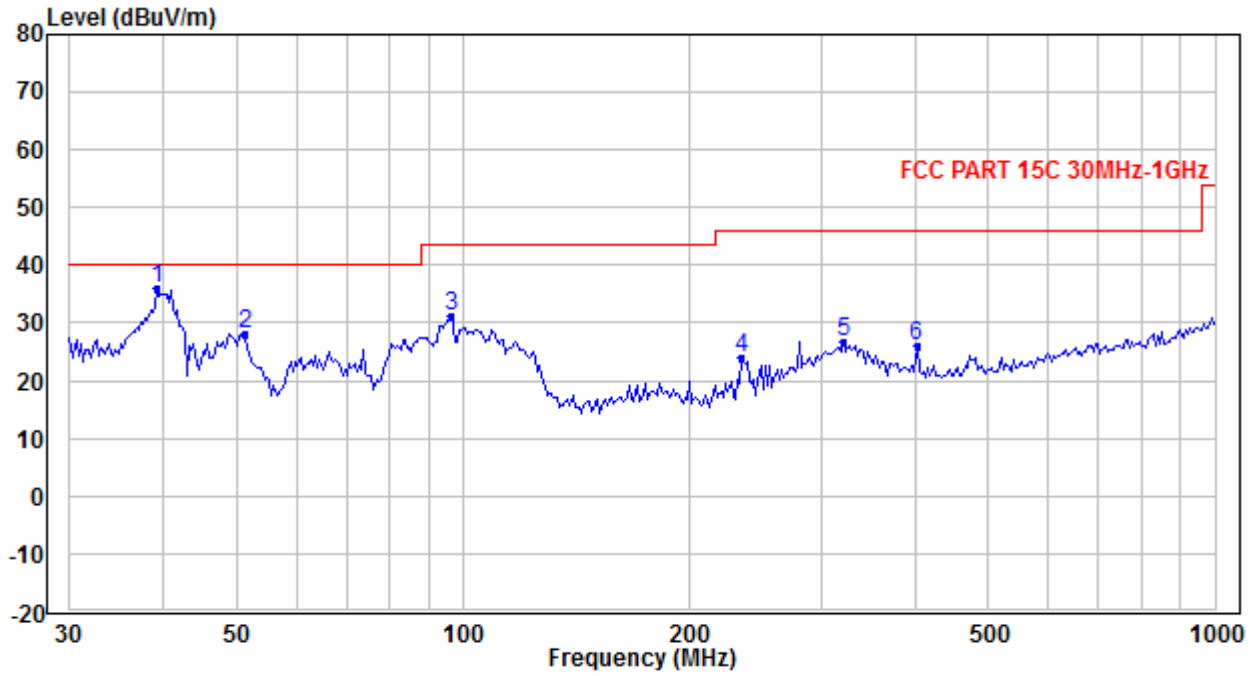
Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correction factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	51.176	42.58	-13.36	29.22	40.00	-10.78	Peak
2	96.323	41.14	-11.91	29.23	43.50	-14.27	Peak
3	124.050	44.82	-11.56	33.26	43.50	-10.24	Peak
4	168.997	43.59	-10.56	33.03	43.50	-10.47	Peak
5	200.043	40.17	-10.25	29.92	43.50	-13.58	Peak
6	280.294	37.51	-7.32	30.19	46.00	-15.81	Peak

TEST REPORT

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correction factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	39.182	45.86	-9.97	35.89	40.00	-4.11	Peak
2	51.176	41.54	-13.36	28.18	40.00	-11.82	Peak
3	96.323	43.21	-11.91	31.30	43.50	-12.20	Peak
4	235.135	33.16	-9.05	24.11	46.00	-21.89	Peak
5	320.331	33.61	-6.97	26.64	46.00	-19.36	Peak
6	401.105	30.88	-4.95	25.93	46.00	-20.07	Peak

NOTES:

1. Peak detector is used for the emission measurement.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

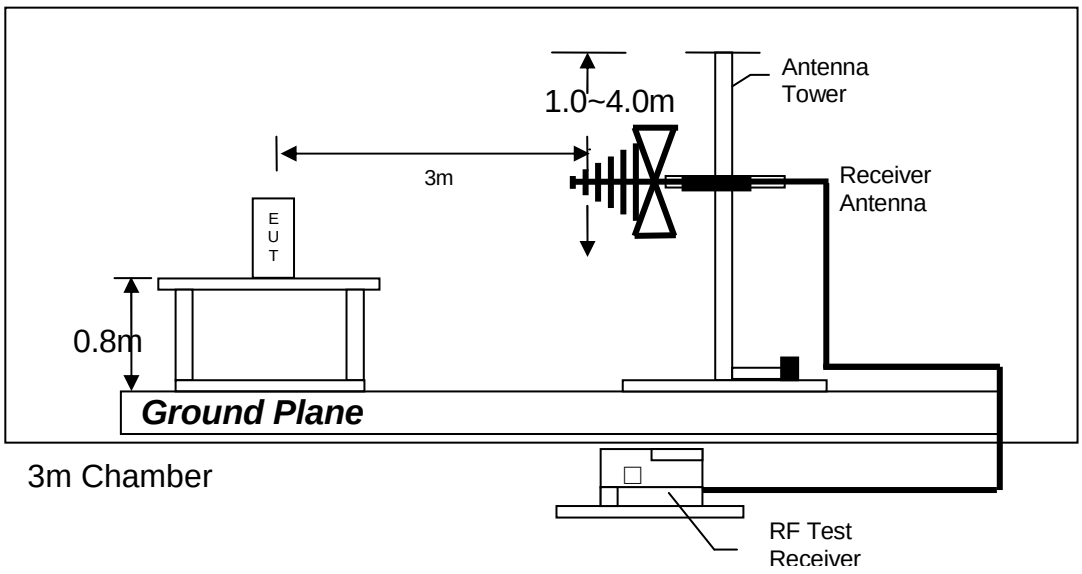
3. Negative value in the margin column shows emission below limit.

4. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.

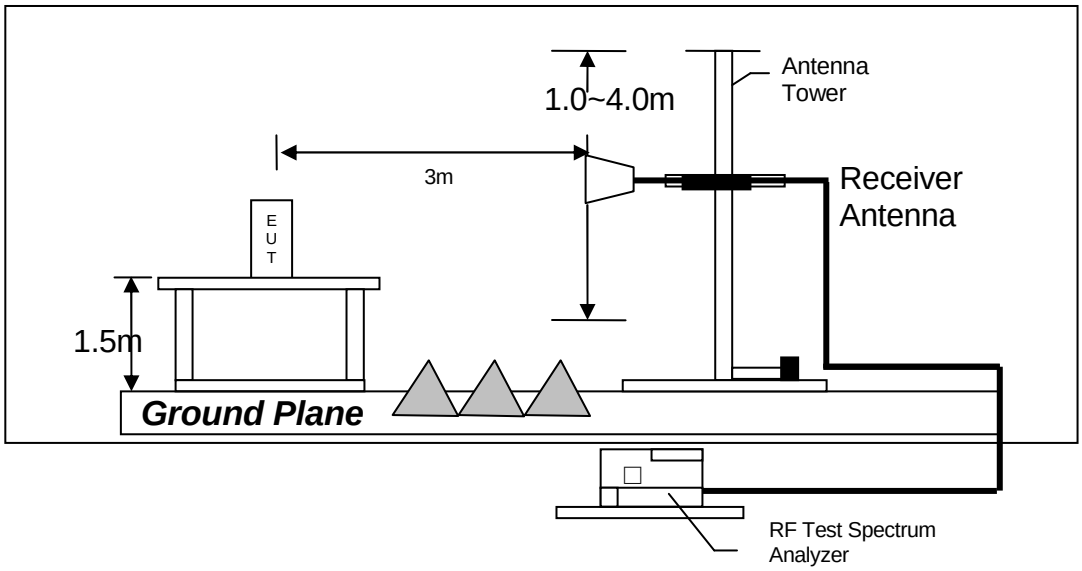
TEST REPORT

4.6.3 Radiated Emission Test Setup

The figure below shows the test setup, which is utilized to make these measurements.



Test setup of radiated emissions up to 1GHz

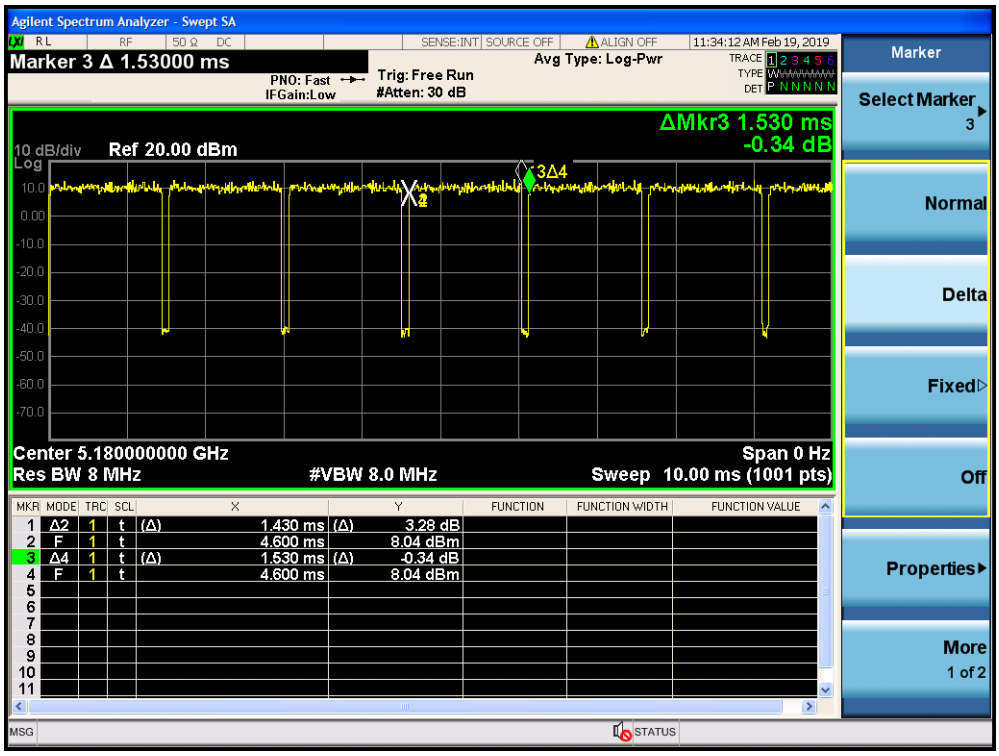


Test setup of radiated emissions above 1GHz

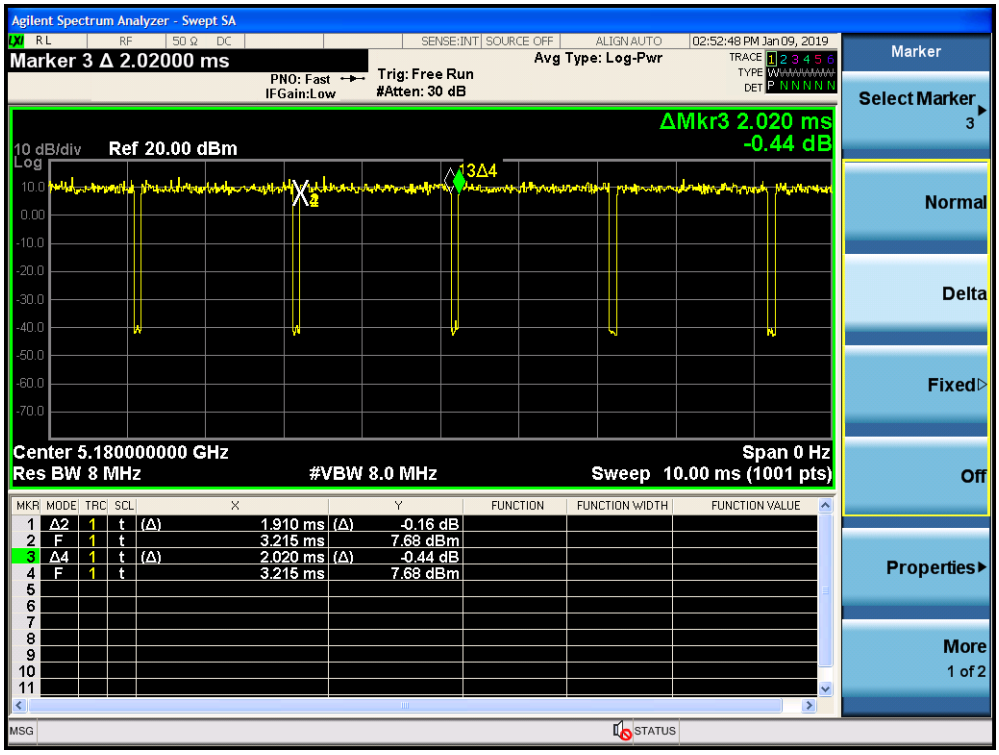
TEST REPORT

4.6.4 Transmitter Duty Cycle Calculation

IEEE 802.11a

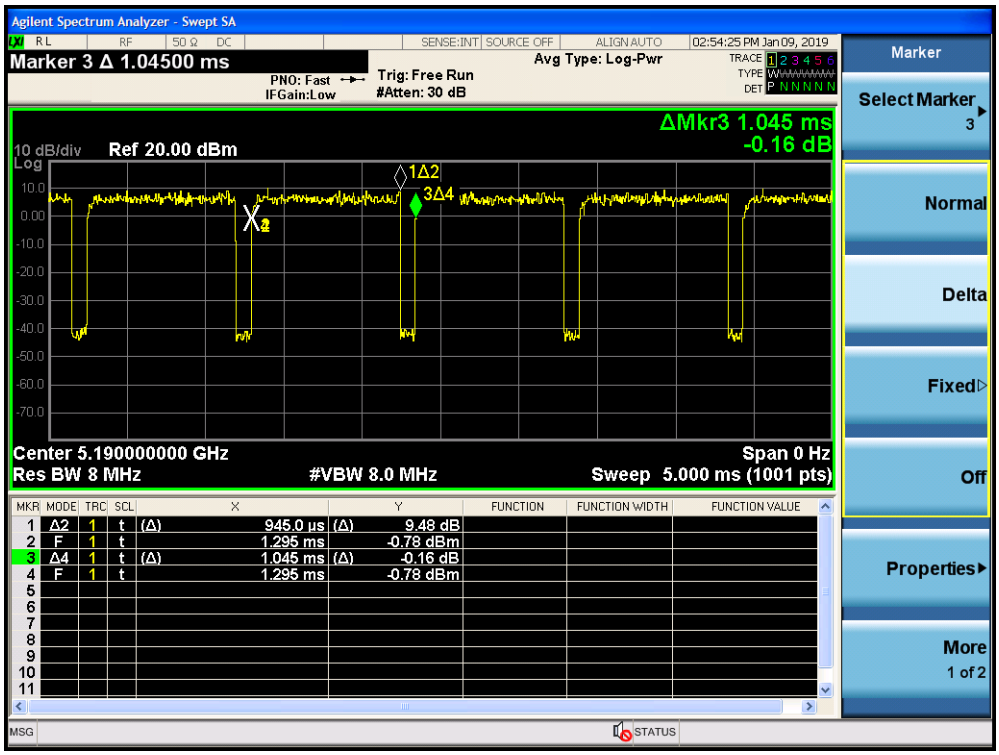


IEEE 802.11n20

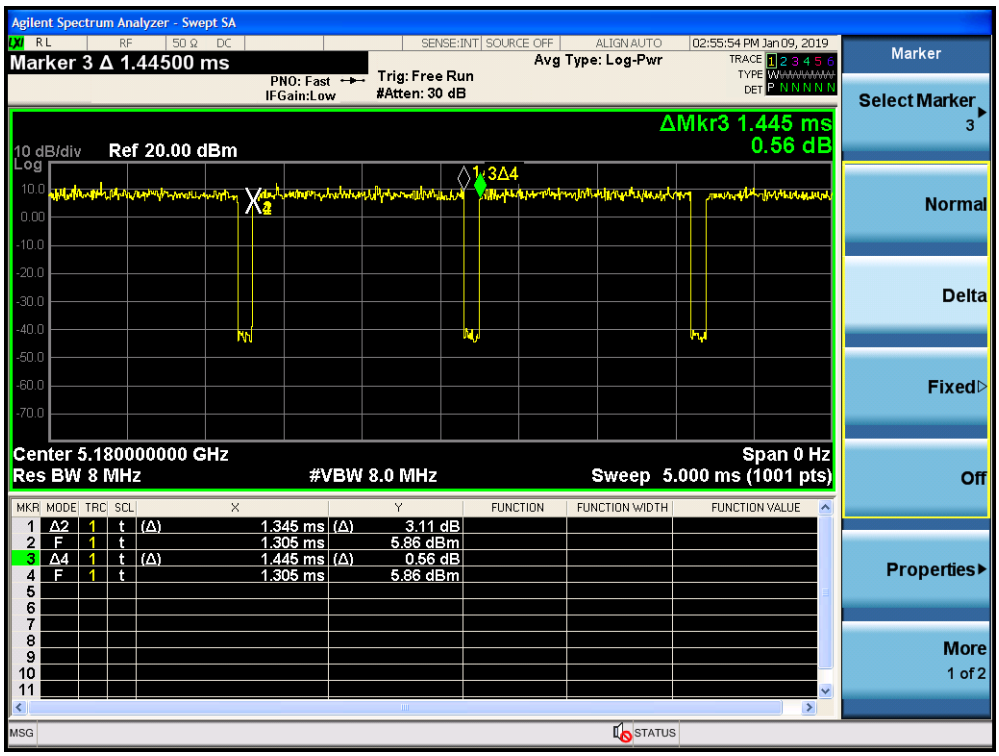


TEST REPORT

IEEE 802.11n40

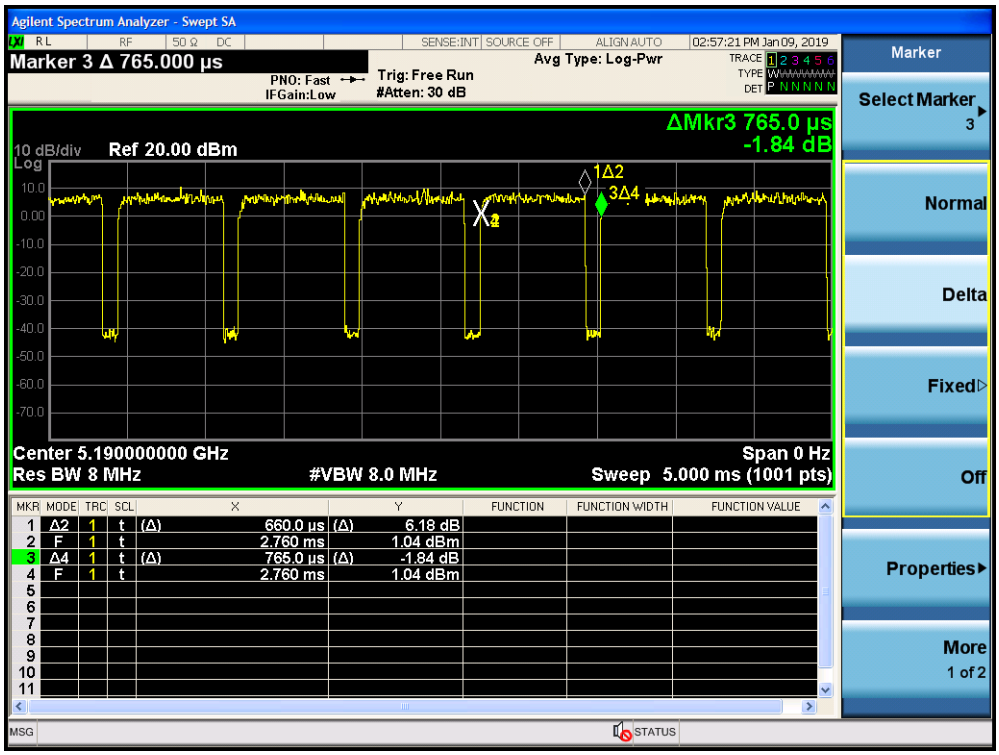


IEEE 802.11ac20

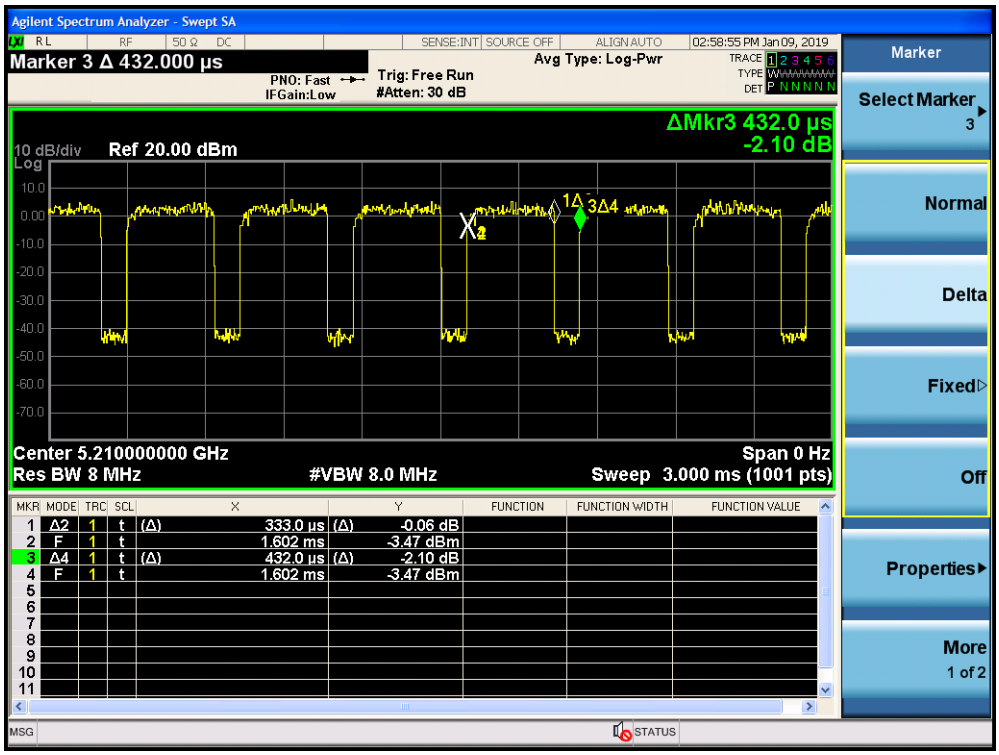


TEST REPORT

IEEE 802.11ac40



IEEE 802.11ac80



TEST REPORT

4.7 AC Power Line Conducted Emission

☐ Not applicable – EUT is only powered by battery for operation.

☒ EUT connects to AC power line. Emission Data is listed in following pages.

☐ Base Unit connects to AC power line and has transmission. Handset connects to AC power line but has no transmission. Emission Data of Base Unit is listed in following pages.

4.7.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration
at

3574 kHz

The worst case line conducted configuration photographs are attached in the Appendix and saved with filename: config photos.pdf

4.7.2 AC Power Line Conducted Emission Data

The plot(s) and data in the following pages list the significant emission frequencies, the limit and the margin of compliance.

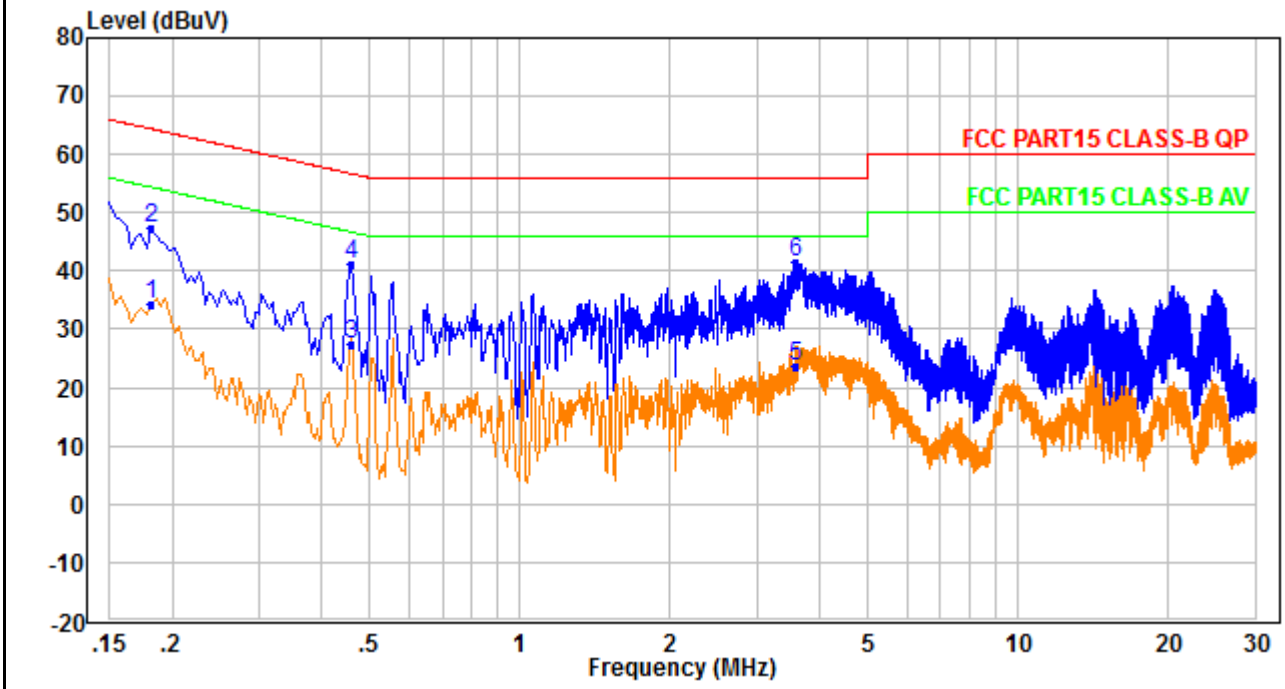
Passed by 14.37 dB margin compare with Quasi-peak limit

TEST REPORT

AC POWER LINE CONDUCTED EMISSION

Worst Case: WiFi Operating

Live Line

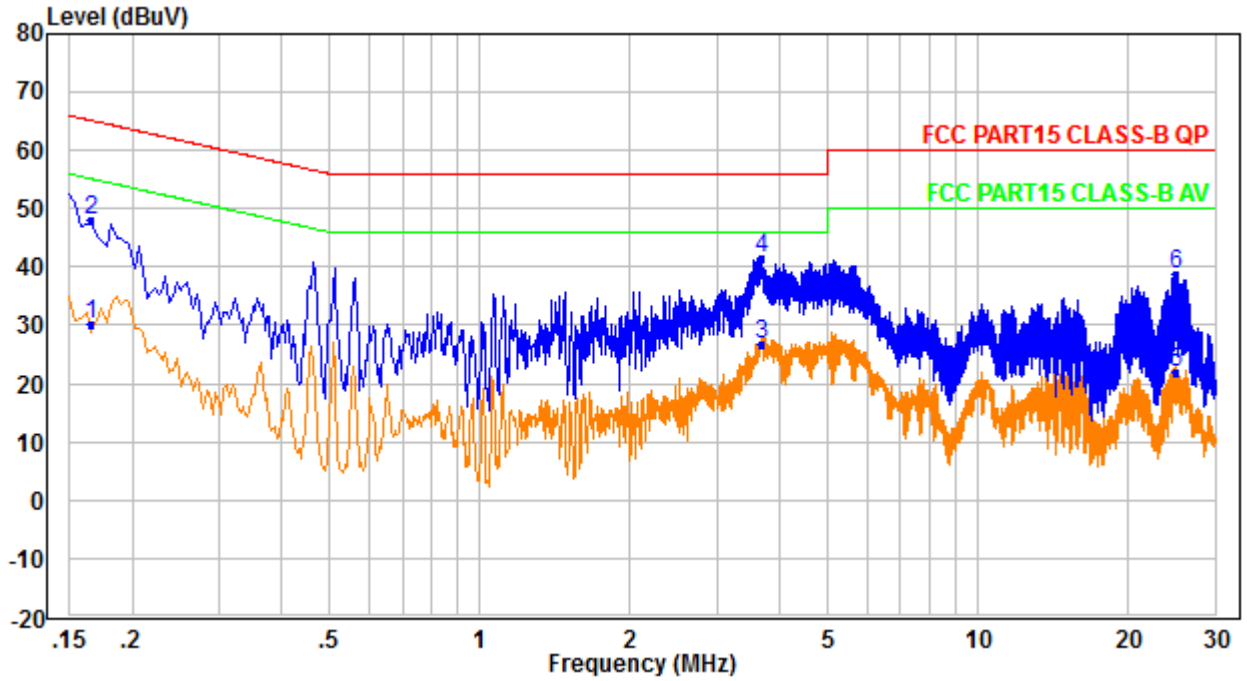


No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.182	25.09	9.27	34.36	54.39	-20.03	Average
2	0.182	38.01	9.27	47.28	64.39	-17.11	QP
3	0.458	17.71	9.54	27.25	46.73	-19.48	Average
4	0.458	31.77	9.54	41.31	56.73	-15.42	QP
5	3.574	14.38	9.30	23.68	46.00	-22.32	Average
6	3.574	32.33	9.30	41.63	56.00	-14.37	QP

TEST REPORT

Worst Case: WiFi Operating

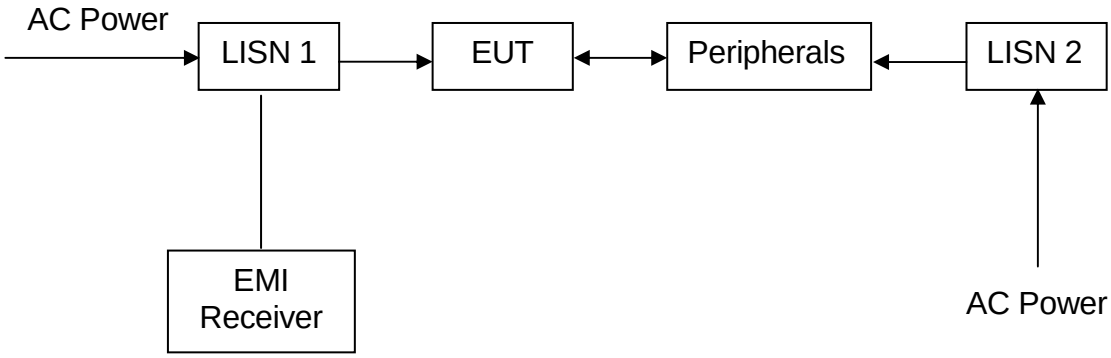
Neutral Line



No.	Frequency (MHz)	Reading (dBuV)	Correction factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.166	20.62	9.41	30.03	55.16	-25.13	Average
2	0.166	38.66	9.41	48.07	65.16	-17.09	QP
3	3.670	17.19	9.45	26.64	46.00	-19.36	Average
4	3.670	32.13	9.45	41.58	56.00	-14.42	QP
5	25.028	10.89	10.99	21.88	50.00	-28.12	Average
6	25.028	27.80	10.99	38.79	60.00	-21.21	QP

TEST REPORT

4.7.3 Conducted Emission Test Setup



TEST REPORT

4.8 DFS Channel Shutdown and Non-occupancy period.

According to standard 905462 DO2 UNII DFS Compliance procedures New Pules v02 section 5.1.1 and 5.1.2.

Master Devices

a) The *Master Device* will use DFS in order to detect *Radar Waveforms* with received signal strength above the *DFS Detection Threshold* in the 5250 - 5350 MHz and 5470- 5725 MHz bands. DFS is not required in the 5150 - 5250 MHz or 5725 - 5825 MHz bands.

b) Before initiating a network on a *Channel*, the *Master Device* will perform a C*hannel Availability Check* for a specified time duration (*Channel Availability Check Time*) to ensure that there is no radar system operating on the *Channel*, using DFS described under subsection a) above.

c) The *Master Device* initiates a U-NII network by transmitting control signals that will enable other U-NII devices to *Associate* with the *Master Device*.

d) During normal operation, the *Master Device* will monitor the *Channel (In-Service Monitoring)* to ensure that there is no radar system operating on the *Channel*, using DFS described under a).

e) If the *Master Device* has detected a *Radar Waveform* during *In-Service Monitoring* as described under d), the *Operating Channel* of the U-NII network is no longer an *Available Channel*. The *Master Device* will instruct all associated *Client Device(s)* to stop transmitting on this *Channel* within the *Channel Move Time*. The transmissions during the *Channel Move Time* will be limited to the *Channel Closing Transmission Time*.

f) Once the *Master Device* has detected a *Radar Waveform* it will not utilize the *Channel* for the duration of the *Non-Occupancy Period*. 3

g) If the *Master Device* delegates the *In-Service Monitoring* to a *Client Device*, then the combination will be tested to the requirements described under d) through f) above.

TEST REPORT

Client Devices

a) A *Client Device* will not transmit before having received appropriate control signals from a *Master Device*.

b) A *Client Device* will stop all its transmissions whenever instructed by a *Master Device* to which it is associated and will meet the *Channel Move Time* and *Channel Closing Transmission Time* requirements. The *Client Device* will not resume any transmissions until it has again received control signals from a *Master Device*.

c) If a *Client Device* is performing *In-Service Monitoring* and detects a *Radar Waveform* above the *DFS Detection Threshold*, it will inform the *Master Device*. This is equivalent to the *Master Device* detecting the *Radar Waveform* and d) through f) of section 5.1.1 apply.

d) Irrespective of *Client Device* or *Master Device* detection the *Channel Move Time* and *Channel Closing Transmission Time* requirements remain the same.

e) The client test frequency must be monitored to ensure no transmission of any type has occurred for 30 minutes. Note: If the client moves with the master, the device is considered compliant if nothing appears in the client non-
Occupancy period test. For devices that shut down (rather than moving channels), no beacons should appear.

4.9.1 Applicability of DFS requirement during normal operation.

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

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

The operational behavior and individual DFS requirements that are associated with these modes are as follows:

TEST REPORT

4.9.2 Response Requirements

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

Note 1: *Channel Move Time* and the *Channel Closing Transmission Time* should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.
Note 2: The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate a *Channel* move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.
Note 3: During the *U-NII Detection Bandwidth* detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.

TEST REPORT

4.9.3 Short pulse Radar test Wave forms

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: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a	Roundup $\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{PRI_{\mu sec}}\right)\right\}$	60%	30
		Test B: 15 unique PRI values randomly selected within the range of 518-3066 µsec, with a minimum increment of 1 µsec, excluding PRI values selected in Test A			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120
Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.					

TEST REPORT

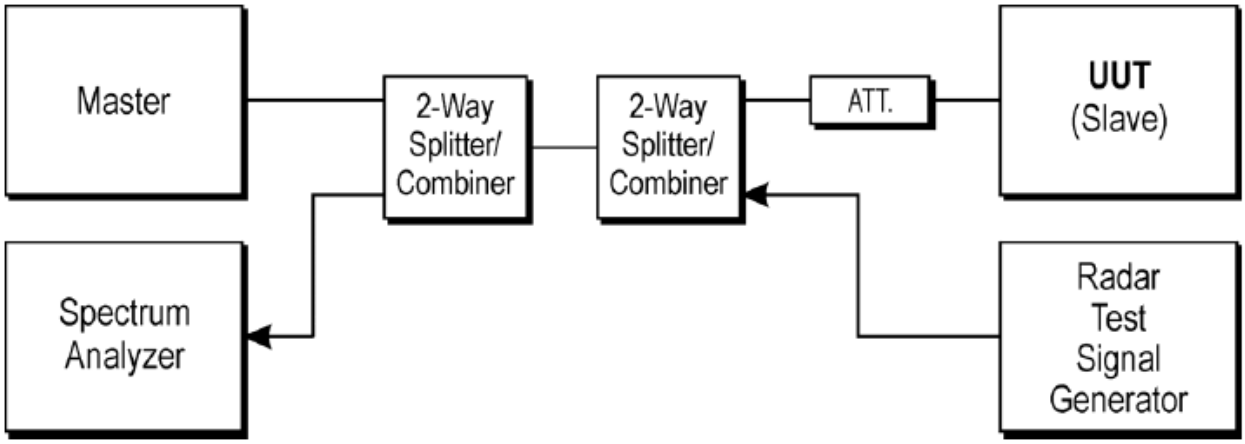
4.9.4 Calibration Setup and DFS Test Results

4.9.4.1 Calibration of Radar Waveform

4.9.4.2 Calibration Procedure:

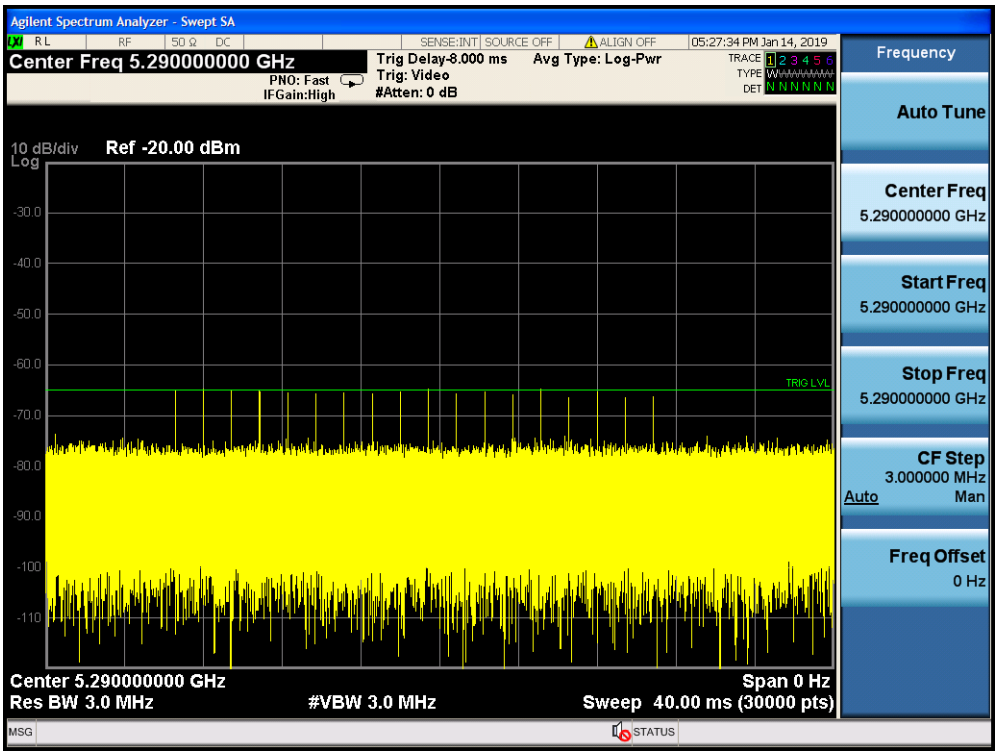
The Interference Radar Detection Threshold Level is -64dBm that had been taken into account the output power range and antenna gain. The following equipment setup was used to calibrate the conducted Radar Waveform. A vector signal generator was utilized to establish the test signal level for radar type 0. During this process there were no transmissions by either the Master or client device. The Spectrum analyzer was switched was used. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 1MHz or 3MHz respectively to measure the type 0 radar waveform. The spectrum analyzer had offset to compensate and RF cable loss. The vector signal generator amplitude was set so that the power level measured at the spectrum analyzer was -64dBm. Capture the spectrum analyzer plots on short pulse radar waveform.

4.9.4.3 Conducted Setup



TEST REPORT

4.9.5 Radar Waveform Calibration Result



4.9.6 Test Deviation

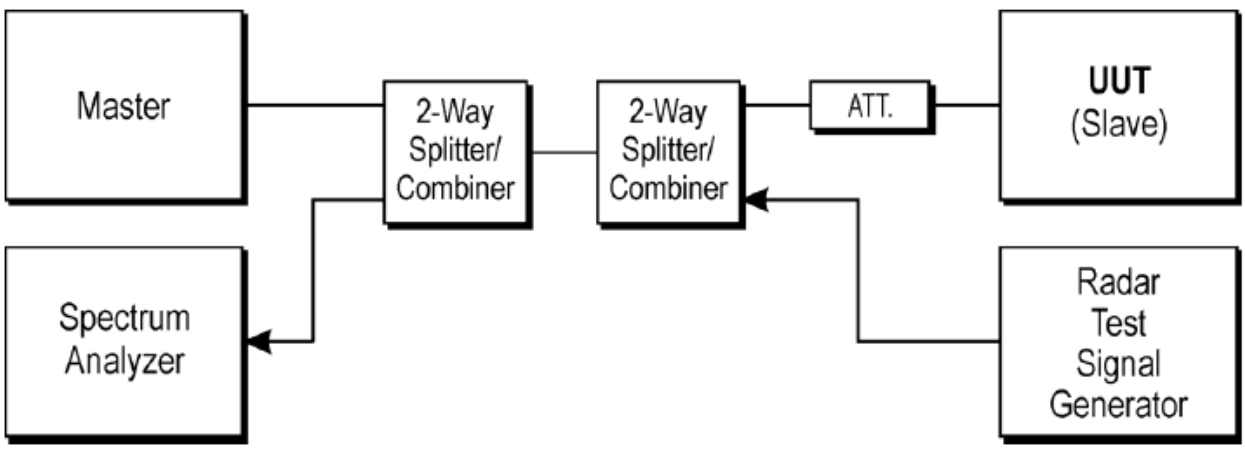
There is no deviation with the original standard.

TEST REPORT

4.10.1 Test Procedures

1. The radar pulse generator is setup to provide a pulse at frequency that the Master and Client are operating. A type 0 radar pulse with a 1us pulse width and a 1428 us PRI is used for the testing.
2. The vector signal generator is adjusted to provide the radar burst (18 pules) at a level approximately -62dBm at the antenna of the Master device.
3. An external trigger is provided from the pulse generator to the DFS monitoring system in order to capture the traffic and the occurrence of the radar pulse.
4. A U-NII device operating as a Client Device (EUT) will associate with the Master at same channel. The MEPG file "TestFile.mpg" specified by the FCC is streamed from the "file computer" through the master to the client device (EUT).
5. When a radar burst with a level equal to the DFS Detection Threshold + 1dB is generated on the operating Channel of the U-NII device. At time T0 the Radar Waveform generator sends a Burst of pulse of the radar waveform at Detection Threshold +1dB.
6. Observe the transmission of the EUT at the end of the radar Burst on the Operating Channel. Measure and record the transmissions from the EUT during the observation time. One 20seconds plot is reported for the short pulse Radar Type 0. The plot for the short pulse radar types start at the end if the radar burst.
7. Measurement of the aggregate duration of the Channel Closing Transmission Time method:
   Center Frequency: operating frequency
   Span: Zero
   RBW: 1MHz
   VBW: 3MHz
   Sweep Time: 32Sec
   Detector: Max Peak
   Sweep: Single.
8. Measure the EUT for more than 30mintes following the Channel move time to verify the no transmission or beacons occur on this Channel.

4.10.2 Test Setup



4.10.3 Test Deviation

There is no deviation with the original standard.

TEST REPORT

4.10.4 Test result

Mode : 802.11AC VHT 80

Measurement Summary

DUT Frequency (MHz)	Radar Type No.	Type of Measurement value	Overall Result
5290.000000	0	Channel Move Time	PASS
5290.000000	0	Channel Closing Transmission Time	PASS
5290.000000	0	Non-occupancy period	PASS

Channel Move Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CMT Tx Time (s)	CMT Limit (s)	CMT Result	CMT Comment
5290.000000	0	0.7183	10.000	PASS	Tx Time value is last trailing edge found within sweep. See Note 1.

Channel Closing Transmission Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CCTT Type of Value	CCTT No. of Pulses found	CCTT Tx Time (ms)	CCTT Tx Time Limit (ms)	CCTT Result
5290.000000	0	remaining 10 second period	22	8.8	200+60	PASS

(continuation of the "Channel Closing Transmission Time Detailed Results" table from column 7 ...)

DUT Frequency (MHz)	CCTT Comment
5290.000000	See Note 1.

Non-occupancy period Detailed Results

DUT Frequency (MHz)	Radar Type No.	NOP No. of Pulses found	NOP No. of Pulses Limit	NOP Tx Time (s)	NOP Tx Time Limit (s)	NOP Result	NOP Comment
5290.000000	0	0	0	0.000	0.000	PASS	

Transmitting Test Detailed Results

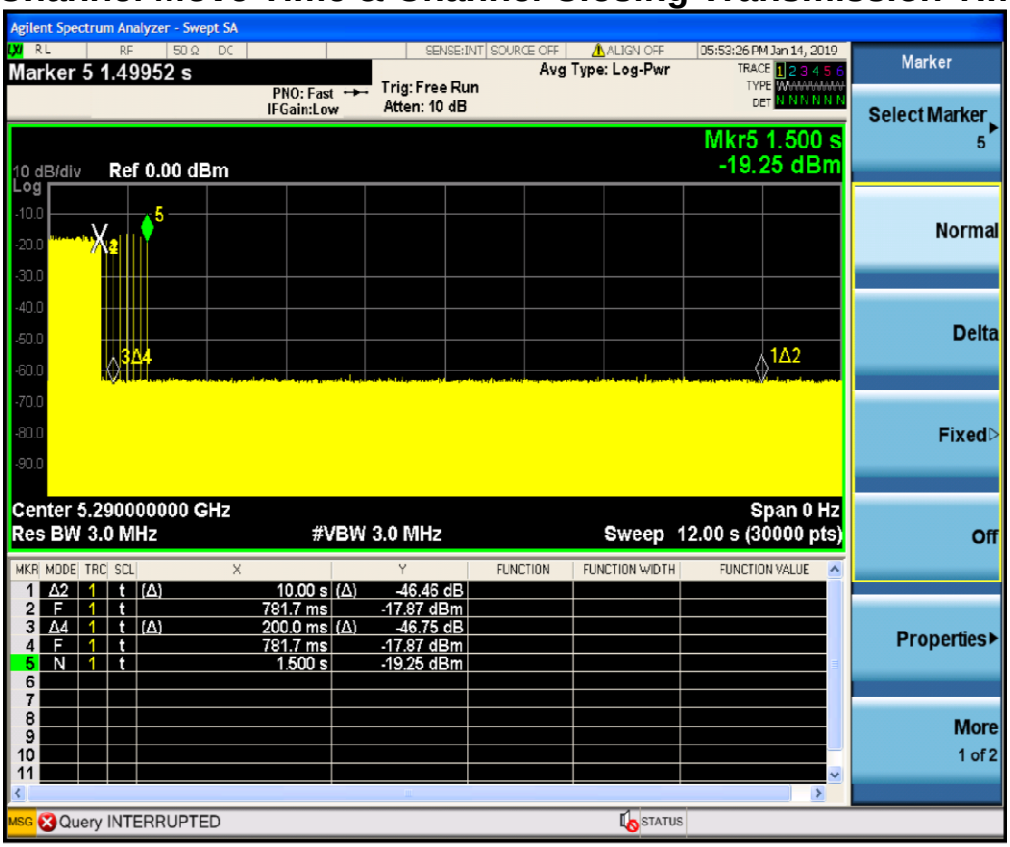
DUT Frequency (MHz)	Tx-Test Tx Time (s)	Tx-Test No. of Pulses found	Tx-Test Result	Tx-Test Comment
5290.000000	---		---	not performed / not finished

Additional Information

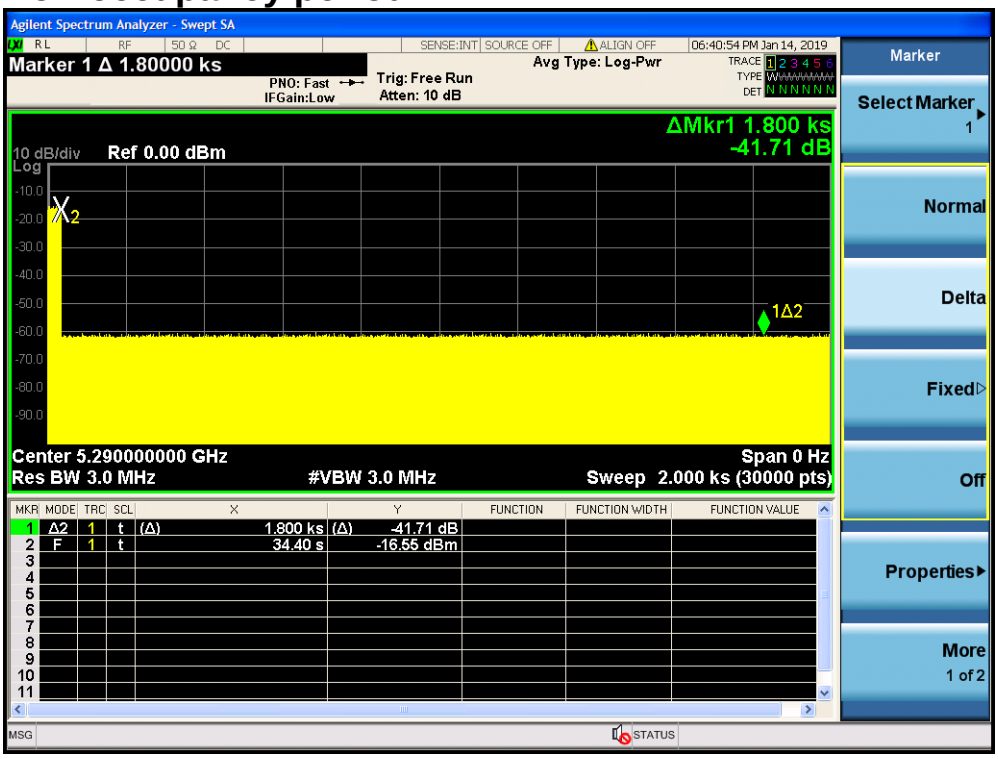
Note	Description
Note 1:	Because of the radar pulse event at the beginning, the investigation of the trace begins with an offset of 1.5 s conforming to the end of the Radar burst.
Note 2:	-

TEST REPORT

Channel Move Time & Channel Closing Transmission Time



Non-occupancy period



TEST REPORT

Mode : 802.11AC VHT 80

Measurement Summary

DUT Frequency (MHz)	Radar Type No.	Type of Measurement value	Overall Result
5530.000000	0	Channel Move Time	PASS
5530.000000	0	Channel Closing Transmission Time	PASS
5530.000000	0	Non-occupancy period	PASS

Channel Move Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CMT Tx Time (s)	CMT Limit (s)	CMT Result	CMT Comment
5530.000000	0	0.6911	10.000	PASS	Tx Time value is last trailing edge found within sweep. See Note 1.

Channel Closing Transmission Time Detailed Results

DUT Frequency (MHz)	Radar Type No.	CCTT Type of Value	CCTT No. of Pulses found	CCTT Tx Time (ms)	CCTT Tx Time Limit (ms)	CCTT Result
5530.000000	0	remaining 10 second period	14	5.6	200+60	PASS

(continuation of the "Channel Closing Transmission Time Detailed Results" table from column 7 ...)

DUT Frequency (MHz)	CCTT Comment
5530.000000	See Note 1.

Non-occupancy period Detailed Results

DUT Frequency (MHz)	Radar Type No.	NOP No. of Pulses found	NOP No. of Pulses Limit	NOP Tx Time (s)	NOP Tx Time Limit (s)	NOP Result	NOP Comment
5530.000000	0	0	0	0.000	0.000	PASS	

Transmitting Test Detailed Results

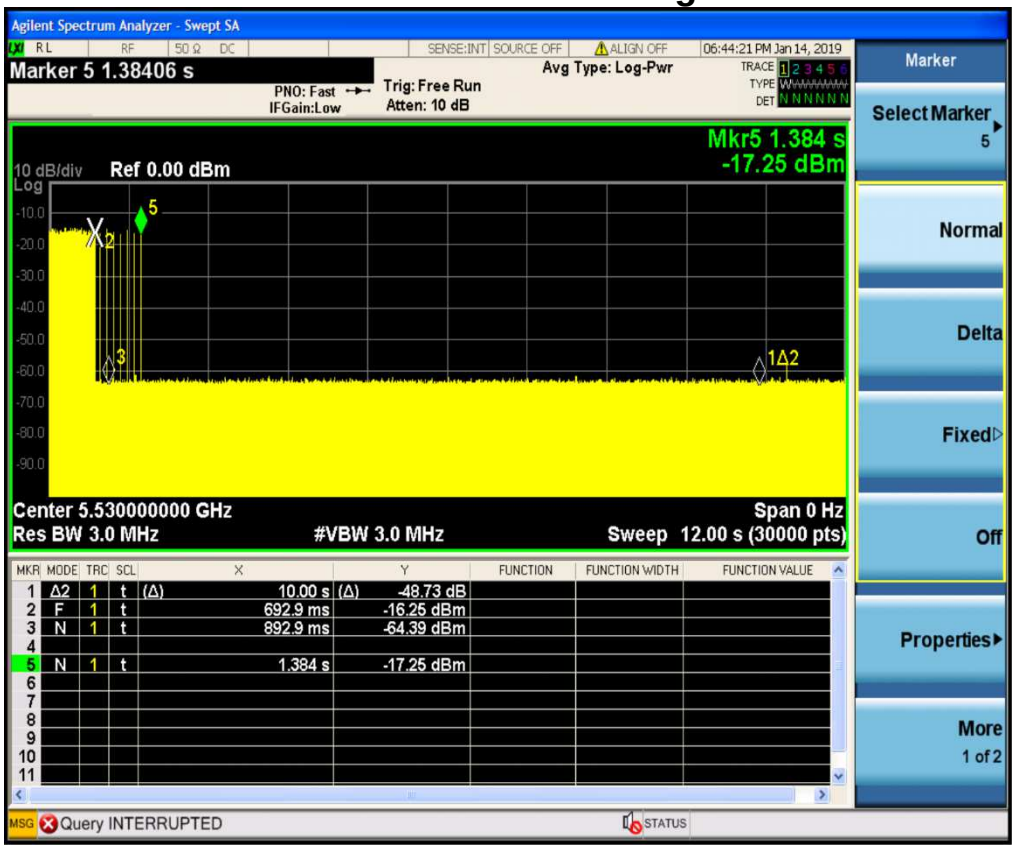
DUT Frequency (MHz)	Tx-Test Tx Time (s)	Tx-Test No. of Pulses found	Tx-Test Result	Tx-Test Comment
5530.000000	---		---	not performed / not finished

Additional Information

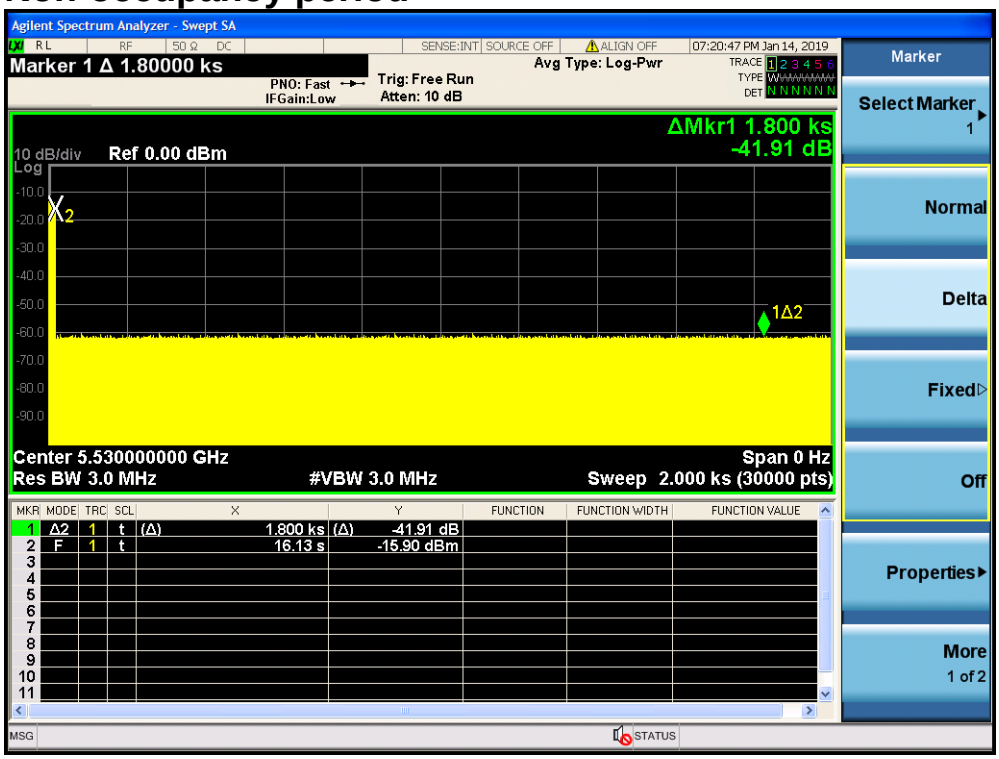
Note	Description
Note 1:	Because of the radar pulse event at the beginning, the investigation of the trace begins with an offset of 1.384 s conforming to the end of the Radar burst.
Note 2:	-

TEST REPORT

Channel Move Time & Channel Closing Transmission Time



Non-occupancy period



TEST REPORT

5. EQUIPMENT LIST

1) Radiated Emissions Test

Equipment	3M Chamber & Accessory Equipment	Receiver	Loop Antenna
Equipment No..	UTTL—E010	UTTL—E026	UTTL—E013
Manufacturer	ETS-LINDGREN	R&S	ETS-LINDGREN
Model No.	3M	ESIB26	6502
Calibration Date	December 03, 2018	November 24, 2018	December 03, 2018
Calibration Due Date	December 03, 2021	November 24, 2019	December 03, 2019

Equipment	Broadband Antenna	6dB Attenuator	Preamplifier
Equipment No..	UTTL—E014	UTTL—E056	UTTL—E043
Manufacturer	ETS-LINDGREN	Talent	HP
Model No.	3142E	RA6A5-N-18	8447F
Calibration Date	December 08, 2018	December 08, 2018	November 24, 2018
Calibration Due Date	December 08, 2019	December 08, 2019	November 24, 2019

Equipment	Horn Antenna (Pre-amplifier)	Multi device Controller	Band Rejection Filter (5150MHz~5880MHz)
Equipment No..	UTTL—E017	UTTL—EN002	UTTL—E045
Manufacturer	ETS-LINDGREN	ETS-LINDGREN	Micro-Tronics
Model No.	3117-PA	7006-001	BRM50716
Calibration Date	May 22, 2018	N/A	June 06, 2018
Calibration Due Date	May 22, 2019	N/A	June 06, 2019

Equipment	Test Software	EXA Spectrum Analyzer
Equipment No..	N/A	UTTL—E032
Manufacturer	Audix	KEYSIGHT
Model No.	E3	N9010A
Calibration Date	Software Version: 9.160333	November 24, 2018
Calibration Due Date		November 24, 2019

2) Conducted Emissions Test

Equipment	Receiver	Pulse Limiter	LISN
Equipment No..	UTTL—E005	UTTL—E007	UTTL—E003
Manufacturer	R&S	R&S	R&S
Model No.	ESR7	ESH3-Z2	ESH2-Z5
Calibration Date	November 24, 2018	November 24, 2018	November 24, 2018
Calibration Due Date	November 24, 2019	November 24, 2019	November 24, 2019

Equipment	Test Software
Equipment No..	N/A
Manufacturer	Audix
Model No.	E3
Calibration Date	Software Version: 9.160333
Calibration Due Date	

TEST REPORT

3) Conductive Measurement Test

Equipment	EXA Spectrum Analyzer	USB Wideband Power Sensor	MXG X-Series RF Vector Signal Generator
Equipment No.	UTTL—E032	UTTL—E033	UTTL—E031
Manufacturer	KEYSIGHT	KEYSIGHT	KEYSIGHT
Model No.	N9010A	U2021XA	N5182B
Calibration Date	November 24, 2018	November 24, 2018	November 24, 2018
Calibration Due Date	November 24, 2019	November 24, 2019	November 24, 2019

END OF TEST REPORT