

FCC Test Report

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FCC ID: P27IP5446A

Test Model: SAX1V1R

Received Date: Jun. 10, 2020

Test Date: Jun. 12 to Jul. 6, 2020

Issued Date: Jul. 8, 2020

Applicant: Sercomm Corp.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Release Control Record

Issue No.	Description	Date Issued
RF200610D09-1	Original release	Jul. 8, 2020

1 Certificate of Conformity

Product: 11AX ROUTER_NON IOT

Brand: Charter Spectrum

Test Model: SAX1V1R

Sample Status: Engineering sample

Applicant: Sercomm Corp.

Test Date: Jun. 12 to Jul. 6, 2020

Standards: 47 CFR FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by :

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Date: Jul. 8, 2020

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Approved by :

Rex Lai

Date: Jul. 8, 2020

Rex Lai / Associate Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -11.51dB at 0.39739MHz.
15.407(b)(1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.04dB at 5150.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is IPEX not a standard connector.

Note:

1. For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB test plots were recorded in Annex A.
2. For U-NII-1 band compliance with rule 15.407(b) of the band-edge items, the test plots were recorded in Annex B. Test Procedures refer to report 4.1.3.
3. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.94 dB
Conducted Emissions	9kHz ~ 40GHz	2.63 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	2.61 dB
	30MHz ~ 1GHz	5.43 dB
Radiated Emissions above 1 GHz	Above 1GHz	5.14 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	11AX ROUTER, NON IOT
Brand	Charter Spectrum
Test Model	SAX1V1R
Sample Status	Engineering sample
Power Supply Rating	12Vdc from adapter
Modulation Type	802.11a: BPSK, QPSK, 16QAM, 64QAM 802.11ac: BPSK, QPSK, 16QAM, 64QAM, 256QAM 802.11ax: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n (20MHz/40MHz): up to 600Mbps 802.11ac (20MHz/40MHz/80MHz): up to 1733.3Mbps 802.11ax (20MHz/40MHz/80MHz): up to 2402Mbps
Operating Frequency	5180 ~ 5240MHz, 5745 ~ 5825MHz
Number of Channel	5180 ~ 5240MHz: 802.11a, 802.11n (20MHz), 802.11ac (20MHz), 802.11ax (20MHz): 4 802.11n (40MHz), 802.11ac (40MHz), 802.11ax (40MHz): 2 802.11ac (80MHz), 802.11ax (80MHz): 1 5745 ~ 5825MHz: 802.11a, 802.11n (20MHz), 802.11ac (20MHz), 802.11ax (20MHz): 5 802.11n (40MHz), 802.11ac (40MHz), 802.11ax (40MHz): 2 802.11ac (80MHz), 802.11ax (80MHz): 1
Output Power	5180 ~ 5240MHz: CDD Mode: 545.614mW Beamforming Mode: 321.48mW 5745 ~ 5825MHz: CDD Mode: 997.979mW Beamforming Mode: 331.264mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Cable Supplied	NA

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 4 completed transmitters and 4 receivers.

Modulation Mode	CDD Mode	Beamforming Mode	TX Function
802.11a	Support	Not Support	4TX
802.11n (20MHz)	Support	Not Support	4TX
802.11n (40MHz)	Support	Not Support	4TX
802.11ac (20MHz)	Support	Support	4TX
802.11ac (40MHz)	Support	Support	4TX
802.11ac (80MHz)	Support	Support	4TX
802.11ax (20MHz)	Support	Support	4TX
802.11ax (40MHz)	Support	Support	4TX
802.11ax (80MHz)	Support	Support	4TX

* The bandwidth and modulation are similar for 20MHz/40MHz on 802.11n mode and 20MHz/40MHz on 802.11n mode and 20MHz/40MHz on 802.11ax mode. Therefore the investigated worst case is the representative mode in test report. (Final test mode refer section 3.2.1)

* For 802.11n/ac/ax, CDD mode and Beamforming mode are presented in power output test item. For other test items, CDD mode is the worst case for final tests after pretesting.

2. The following antennas were provided to the EUT.

Antenna Type	Printed		
Antenna Connector	IPEX		
Antenna No.	Gain (dBi)		
	2412MHz ~ 2462MHz	5150MHz ~ 5250MHz	5745MHz ~ 5825MHz
Ant1	4.9	5.0	5.7
Ant2	2.7	4.3	3.1
Ant3	3.4	4.7	3.8
Ant4	3.5	5.0	5.0

The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3. The EUT uses following adapter.

Adapter 1	
Brand	NetBit
Model	NBS36J120300VU
Input Power	100-120Vac, 1.0A, 50/60Hz
Output Power	12.0Vdc, 3.0A
Power Cord	AC 2-Pin, Non-shielded DC cable (1.8m)
Adapter 2	
Brand	Delta
Model	ADH-36EW B
Input Power	100-125Vac, 1.5A, 50-60Hz
Output Power	12.0Vdc, 3.0A
Power Cord	AC 2-Pin, Non-shielded DC cable (1.8m)

The above two adapters were pre-tested, and Adapter 2 was the worst case for final test.

4. 2.4GHz & 5GHz technologies can transmit at same time.

5. Spurious emission of the simultaneous operation (2.4GHz & 5GHz technologies) has been evaluated and no non-compliance was found.
6. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

For 5180 ~ 5240MHz:

4 channels are provided for 802.11a, 802.11n (20MHz), 802.11ac (20MHz), 802.11ax (20MHz):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (40MHz), 802.11ac (40MHz), 802.11ax (40MHz):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (80MHz), 802.11ax (80MHz):

Channel	Frequency
42	5210MHz

For 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (20MHz), 802.11ac (20MHz), 802.11ax (20MHz):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

2 channels are provided for 802.11n (40MHz), 802.11ac (40MHz), 802.11ax (40MHz):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (80MHz), 802.11ax (80MHz):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE≥1G**: Radiated Emission above 1GHz & Bandedge Measurement

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

NOTE: Radiated emission test (below 1GHz) and power line conducted emission test items chosen the worst maximum power.

Radiated Emission Test (Above 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
CDD Mode						
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11ax (20MHz)		36 to 48	36, 40, 48	OFDMA	MCS0
	802.11ax (40MHz)		38 to 46	38, 46	OFDMA	MCS0
	802.11ax (80MHz)		42	42	OFDMA	MCS0
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11ax (20MHz)		149 to 165	149, 157, 165	OFDMA	MCS0
	802.11ax (40MHz)		151 to 159	151, 159	OFDMA	MCS0
	802.11ax (80MHz)		155	155	OFDMA	MCS0
Beamforming Mode						
-	802.11ax (20MHz)	5180-5240	36 to 48	36, 40, 48	OFDMA	MCS0
	802.11ax (40MHz)		38 to 46	38, 46	OFDMA	MCS0
	802.11ax (80MHz)		42	42	OFDMA	MCS0
-	802.11ax (20MHz)	5745-5825	149 to 165	149, 157, 165	OFDMA	MCS0
	802.11ax (40MHz)		151 to 159	151, 159	OFDMA	MCS0
	802.11ax (80MHz)		155	155	OFDMA	MCS0

Radiated Emission Test (Below 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
CDD Mode						
-	802.11ax (20MHz)	5180-5240	36 to 48	157	OFDMA	MCS0
-	802.11ax (20MHz)	5745-5825	149 to 165		OFDMA	MCS0

Power Line Conducted Emission Test:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
CDD Mode						
-	802.11ax (20MHz)	5180-5240	36 to 48	157	OFDMA	MCS0
-	802.11ax (20MHz)	5745-5825	149 to 165		OFDMA	MCS0

Antenna Port Conducted Measurement:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
CDD Mode						
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11n (20MHz)*		36 to 48	36, 40, 48	OFDM	6.5
	802.11n (40MHz)*		38 to 46	38, 46	OFDM	13.5
	802.11ac (20MHz)*		36 to 48	36, 40, 48	OFDM	6.5
	802.11ac (40MHz)*		38 to 46	38, 46	OFDM	13.5
	802.11ac (80MHz)*		42	42	OFDM	65.0
	802.11ax (20MHz)		36 to 48	36, 40, 48	OFDMA	MCS0
	802.11ax (40MHz)		38 to 46	38, 46	OFDMA	MCS0
	802.11ax (80MHz)		42	42	OFDMA	MCS0
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11n (20MHz)*		149 to 165	149, 157, 165	OFDM	6.5
	802.11n (40MHz)*		151 to 159	151, 159	OFDM	13.5
	802.11ac (20MHz)*		149 to 165	149, 157, 165	OFDM	6.5
	802.11ac (40MHz)*		151 to 159	151, 159	OFDM	13.5
	802.11ac (80MHz)*		155	155	OFDM	65.0
	802.11ax (20MHz)		149 to 165	149, 157, 165	OFDMA	MCS0
	802.11ax (40MHz)		151 to 159	151, 159	OFDMA	MCS0
	802.11ax (80MHz)		155	155	OFDMA	MCS0

*802.11n (20MHz), 802.11n (40MHz), 802.11ac (20MHz), 802.11ac (40MHz), 802.11ac (80MHz) are for Conducted Output Power Measurement only.

Beamforming Mode (Conducted Power Measurement only)						
-	802.11ac (20MHz)	5180-5240	36 to 48	36, 40, 48	OFDM	6.5
	802.11ac (40MHz)		38 to 46	38, 46	OFDM	13.5
	802.11ac (80MHz)		42	42	OFDM	65.0
	802.11ax (20MHz)		36 to 48	36, 40, 48	OFDMA	MCS0
	802.11ax (40MHz)		38 to 46	38, 46	OFDMA	MCS0
	802.11ax (80MHz)		42	42	OFDMA	MCS0
-	802.11ac (20MHz)	5745-5825	149 to 165	149, 157, 165	OFDM	6.5
	802.11ac (40MHz)		151 to 159	151, 159	OFDM	13.5
	802.11ac (80MHz)		155	155	OFDM	65.0
	802.11ax (20MHz)		149 to 165	149, 157, 165	OFDMA	MCS0
	802.11ax (40MHz)		151 to 159	151, 159	OFDMA	MCS0
	802.11ax (80MHz)		155	155	OFDMA	MCS0

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	22deg. C, 69%RH	120Vac, 60Hz	Ian Chang
RE<1G	22deg. C, 69%RH	120Vac, 60Hz	Dalen Dai
PLC	25deg. C, 75%RH	120Vac, 60Hz	Dalen Dai
APCM	25deg. C, 76%RH	120Vac, 60Hz	Dalen Dai

3.3 Duty Cycle of Test Signal

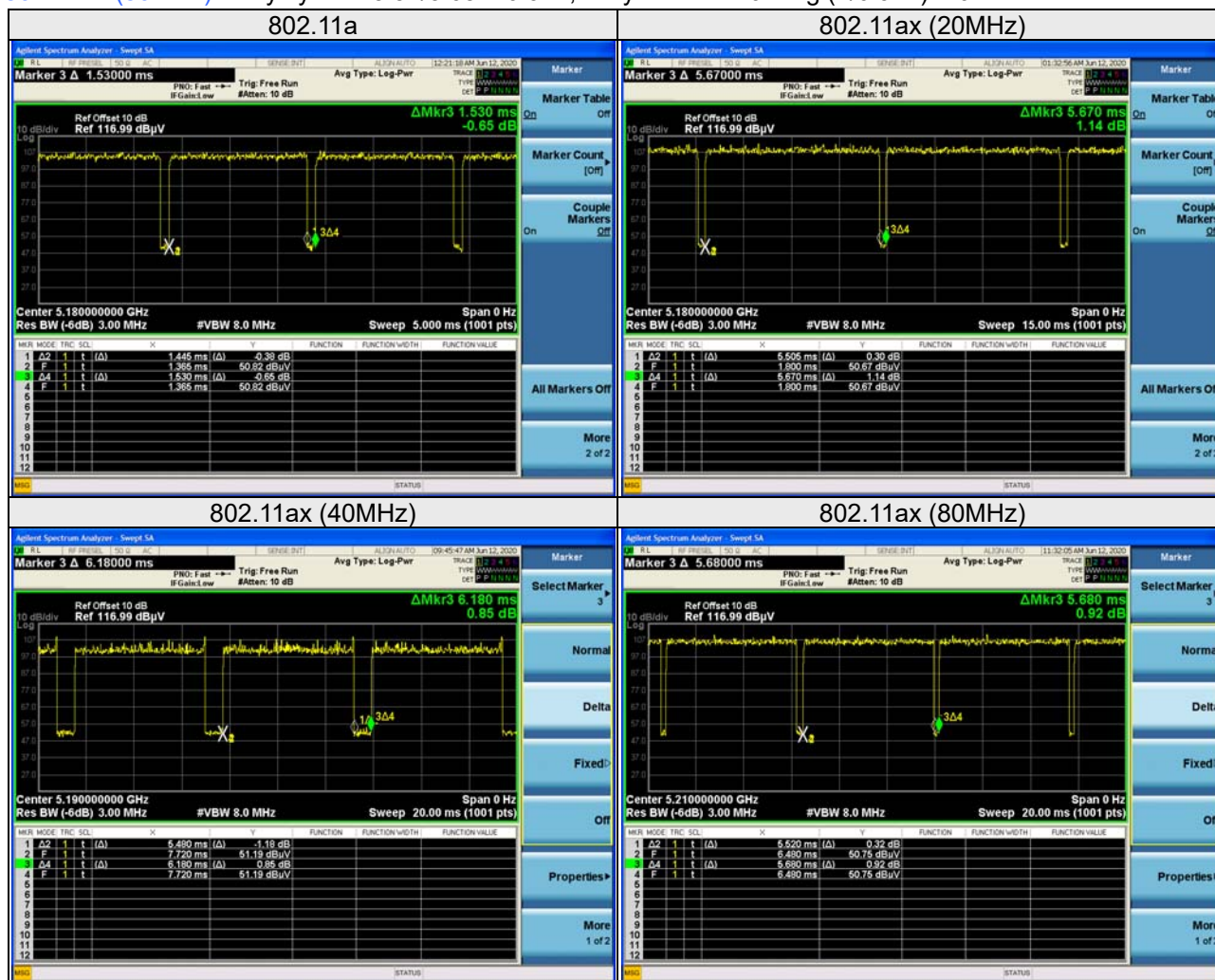
Duty cycle of test signal is < 98%, duty factor is required.

802.11a: Duty cycle = $1.445/1.53 = 0.944$, Duty factor = $10 * \log(1/0.944) = 0.25$

802.11ax (20MHz): Duty cycle = $5.505/5.67 = 0.971$, Duty factor = $10 * \log(1/0.971) = 0.13$

802.11ax (40MHz): Duty cycle = $5.48/6.18 = 0.887$, Duty factor = $10 * \log(1/0.887) = 0.52$

802.11ax (80MHz): Duty cycle = $5.52/5.68 = 0.972$, Duty factor = $10 * \log(1/0.972) = 0.12$



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook PC	SONY	SVS151A12P	275548477000760	N/A	Provided by Lab
B.	Load	N/A	N/A	N/A	N/A	Provided by Lab

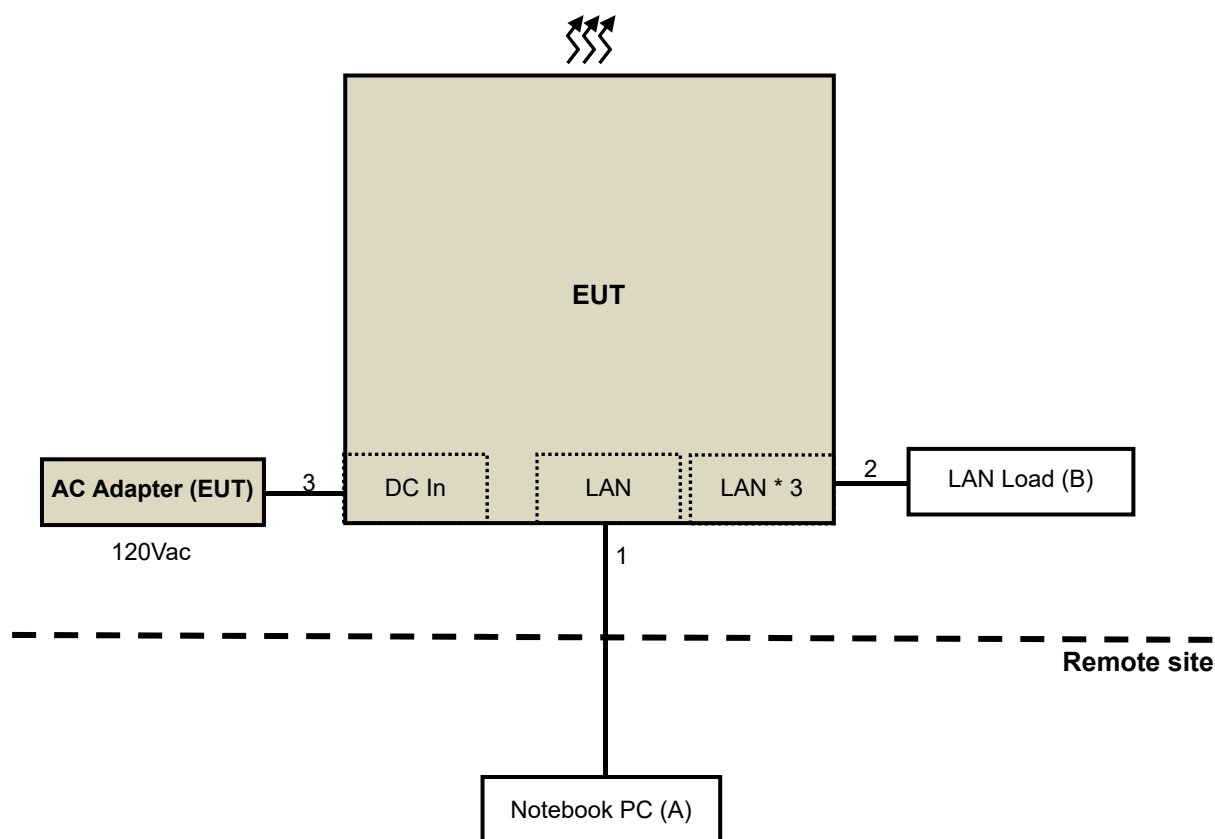
Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as communication partners to transfer data.

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN cable	1	10	N	0	Provided by Lab (RJ45, Cat.5e)
2.	LAN cable	3	1.5	N	0	Supplied by client (RJ45, Cat.5e)
3.	DC cable	1	1.8	N	0	Supplied by client

Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

Test standard:

FCC Part 15, Subpart E (15.407)

ANSI C63.10:2013

All test items have been performed and recorded as per the above standards.

References Test Guidance:

KDB 789033 D02 General UNII Test Procedure New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

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

Limits of unwanted emission out of the restricted bands

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK: 74 (dBuV/m)	AV: 54 (dBuV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2(dBuV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	☒ 15.407(b)(4)(i)	PK: -27 (dBm/MHz) ^{*1} PK: 10 (dBm/MHz) ^{*2} PK: 15.6 (dBm/MHz) ^{*3} PK: 27 (dBm/MHz) ^{*4}	PK: 68.2(dBuV/m) ^{*1} PK: 105.2 (dBuV/m) ^{*2} PK: 110.8(dBuV/m) ^{*3} PK: 122.2 (dBuV/m) ^{*4}
	☐ 15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*1} beyond 75 MHz or more above of the band edge.		^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.		^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \text{ } \mu\text{V/m, where P is the eirp (Watts).}$$

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 19, 2020	Feb. 18, 2021
HP Preamplifier	8449B	3008A01201	Feb. 20, 2020	Feb. 19, 2021
MITEQ Preamplifier	AMF-6F-260400-33-8P	892164	Feb. 19, 2020	Feb. 18, 2021
Agilent TEST RECEIVER	N9038A	MY51210129	Mar. 18, 2020	Mar. 17, 2021
Schwarzbeck Antenna	VULB 9168	139	Nov. 7, 2019	Nov. 6, 2020
Schwarzbeck Antenna	VHBA 9123	480	Jun. 3, 2019	Jun. 2, 2021
Schwarzbeck Horn Antenna	BBHA-9170	212	Nov. 24, 2019	Nov. 23, 2020
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	Nov. 24, 2019	Nov. 23, 2020
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	Radiated_V7.6.15.9.5	NA	NA	NA
SUHNER RF cable With 4dB PAD	SF102	Cable-CH6-01	Jul. 10, 2019	Jul. 9, 2020
SUHNER RF cable With 3/4dB PAD	SF102	Cable-CH8-3.6m	Jul. 10, 2019	Jul. 9, 2020
KEYSIGHT MIMO Powermeasurement Test set	U2021XA	U2021XA-001	Jun. 16, 2019	Jun. 15, 2020
			Jun. 16, 2020	Jun. 15, 2021
KEYSIGHT Spectrum Analyzer	N9030A	MY54490260	Jul. 30, 2019	Jul. 29, 2020
Loop Antenna EMCI	LPA600	270	Aug. 23, 2019	Aug. 22, 2021
EMCO Horn Antenna	3115	00028257	Nov. 24, 2019	Nov. 23, 2020
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSV40	101042	Sep. 23, 2019	Sep. 22, 2020
Anritsu Power Sensor	MA2411B	0738404	Apr. 13, 2020	Apr. 12, 2021
Anritsu Power Meter	ML2495A	0842014	Apr. 13, 2020	Apr. 12, 2021

- NOTE:** 1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.

4.1.3 Test Procedures

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

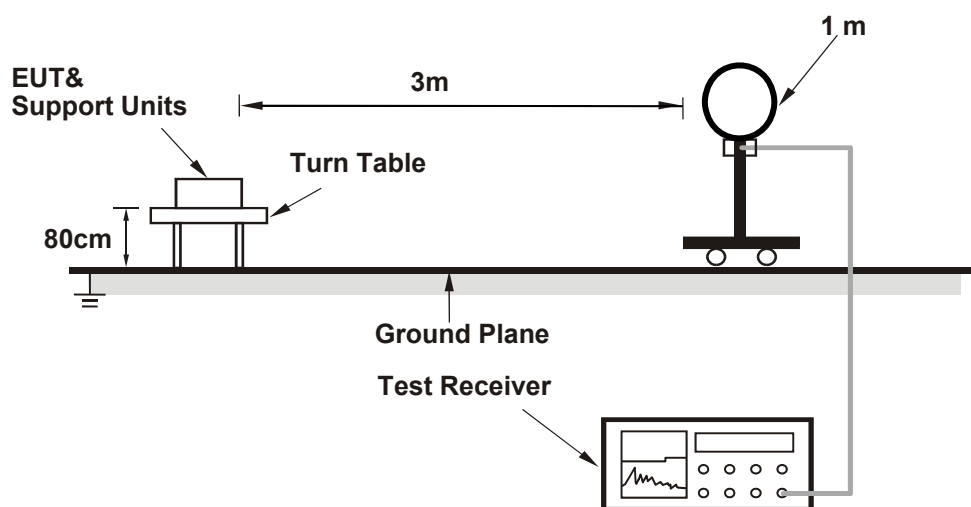
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
(802.11a: RBW = 1MHz, VBW = 750Hz; 802.11ax (20MHz): RBW = 1MHz, VBW = 200Hz;
802.11ax (40MHz): RBW = 1MHz, VBW = 200Hz; 802.11ax (80MHz): RBW = 1MHz, VBW = 200Hz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

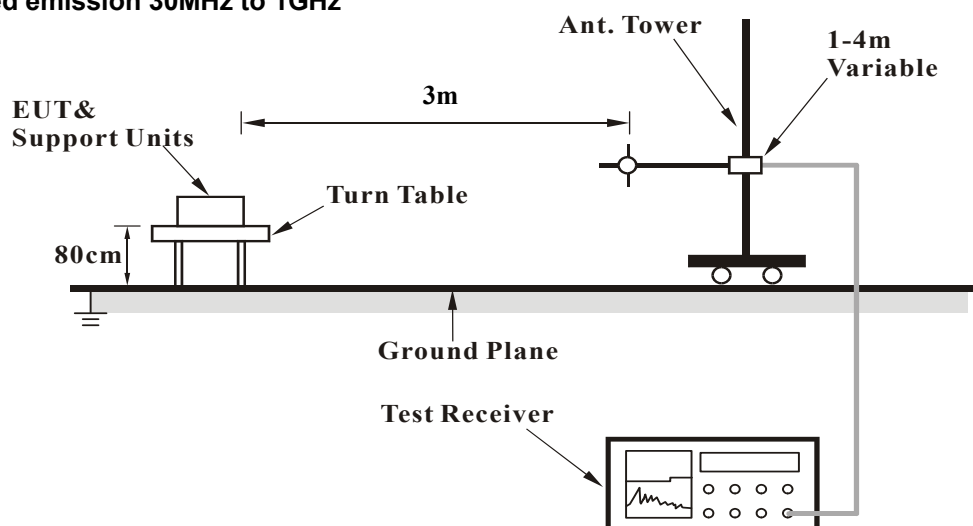
No deviation.

4.1.5 Test Setup

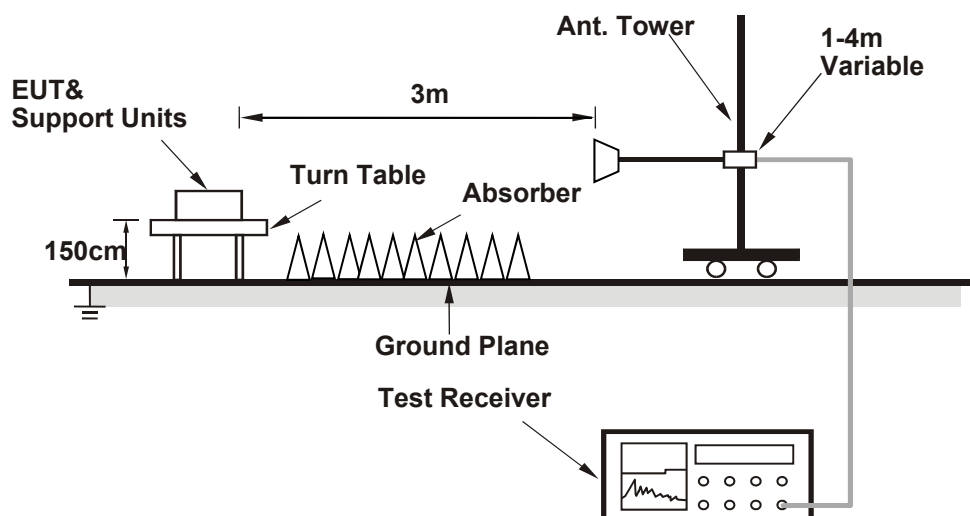
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

- Placed the EUT on the testing table.
- Prepared a notebook to act as a communication partner and placed it outside of testing area.
- The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The communication partner sent data to EUT by command "PING".

4.1.7 Test Results

Above 1GHz data:

CDD Mode

802.11a

Channel	TX Channel 36	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	62.54 PK	74.00	-11.46	1.64 H	82	53.00	9.54
2	5150.00	49.19 AV	54.00	-4.81	1.64 H	82	39.65	9.54
3	*5180.00	111.39 PK			1.64 H	82	101.79	9.60
4	*5180.00	102.03 AV			1.64 H	82	92.43	9.60
5	#10360.00	56.71 PK	68.20	-11.49	2.03 H	291	40.64	16.07
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	67.23 PK	74.00	-6.77	1.64 V	53	57.69	9.54
2	5150.00	52.64 AV	54.00	-1.36	1.64 V	53	43.10	9.54
3	*5180.00	123.04 PK			1.64 V	53	113.44	9.60
4	*5180.00	113.65 AV			1.64 V	53	104.05	9.60
5	#10360.00	57.34 PK	68.20	-10.86	1.89 V	274	41.27	16.07

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 40	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5200.00	113.79 PK			1.58 H	80	104.16	9.63
2	*5200.00	104.38 AV			1.58 H	80	94.75	9.63
3	#10400.00	56.94 PK	68.20	-11.26	2.11 H	296	40.86	16.08
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5200.00	124.78 PK			2.48 V	52	115.15	9.63
2	*5200.00	115.29 AV			2.48 V	52	105.66	9.63
3	#10400.00	57.80 PK	68.20	-10.40	1.86 V	277	41.72	16.08

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 48	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	114.06 PK			1.61 H	84	104.23	9.83
2	*5240.00	104.02 AV			1.61 H	84	94.19	9.83
3	5350.00	61.93 PK	74.00	-12.07	1.61 H	84	51.68	10.25
4	5350.00	48.94 AV	54.00	-5.06	1.61 H	84	38.69	10.25
5	#10480.00	57.01 PK	68.20	-11.19	2.05 H	293	40.79	16.22
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	124.91 PK			2.46 V	54	115.08	9.83
2	*5240.00	114.88 AV			2.46 V	54	105.05	9.83
3	5350.00	63.28 PK	74.00	-10.72	2.46 V	54	53.03	10.25
4	5350.00	50.42 AV	54.00	-3.58	2.46 V	54	40.17	10.25
5	#10480.00	57.91 PK	68.20	-10.29	1.88 V	275	41.69	16.22

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 149	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5585.62	62.75 PK	68.20	-5.45	2.53 H	352	51.99	10.76
2	*5745.00	114.38 PK			2.53 H	352	104.27	10.11
3	*5745.00	104.89 AV			2.53 H	352	94.78	10.11
4	#5991.27	63.11 PK	68.20	-5.09	2.53 H	352	52.73	10.38
5	11490.00	58.63 PK	74.00	-15.37	2.21 H	239	40.46	18.17
6	11490.00	46.81 AV	54.00	-7.19	2.21 H	239	28.64	18.17
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5643.10	65.01 PK	68.20	-3.19	1.29 V	54	54.45	10.56
2	*5745.00	124.85 PK			1.29 V	54	114.74	10.11
3	*5745.00	115.83 AV			1.29 V	54	105.72	10.11
4	#5941.40	63.26 PK	68.20	-4.94	1.29 V	54	52.95	10.31
5	11490.00	59.12 PK	74.00	-14.88	1.82 V	267	40.95	18.17
6	11490.00	47.46 AV	54.00	-6.54	1.82 V	267	29.29	18.17

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 157	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5606.52	62.69 PK	68.20	-5.51	2.60 H	355	52.01	10.68
2	*5785.00	114.18 PK			2.60 H	355	104.22	9.96
3	*5785.00	103.66 AV			2.60 H	355	93.70	9.96
4	#5928.10	63.76 PK	68.20	-4.44	2.60 H	355	53.48	10.28
5	11570.00	58.57 PK	74.00	-15.43	2.16 H	243	40.37	18.20
6	11570.00	46.84 AV	54.00	-7.16	2.16 H	243	28.64	18.20
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5599.40	63.24 PK	68.20	-4.96	1.28 V	53	52.54	10.70
2	*5785.00	125.10 PK			1.28 V	53	115.14	9.96
3	*5785.00	115.29 AV			1.28 V	53	105.33	9.96
4	#5996.02	62.92 PK	68.20	-5.28	1.28 V	53	52.54	10.38
5	11570.00	59.20 PK	74.00	-14.80	1.85 V	262	41.00	18.20
6	11570.00	47.58 AV	54.00	-6.42	1.85 V	262	29.38	18.20

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 165	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5618.40	61.57 PK	68.20	-6.63	2.57 H	351	50.93	10.64
2	*5825.00	114.50 PK			2.57 H	351	104.50	10.00
3	*5825.00	104.38 AV			2.57 H	351	94.38	10.00
4	#5956.12	63.47 PK	68.20	-4.73	2.57 H	351	53.15	10.32
5	11650.00	58.50 PK	74.00	-15.50	2.11 H	238	40.45	18.05
6	11650.00	46.78 AV	54.00	-7.22	2.11 H	238	28.73	18.05
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5596.55	63.21 PK	68.20	-4.99	1.31 V	56	52.49	10.72
2	*5825.00	124.77 PK			1.31 V	56	114.77	10.00
3	*5825.00	114.69 AV			1.31 V	56	104.69	10.00
4	#6000.30	63.05 PK	68.20	-5.15	1.31 V	56	52.66	10.39
5	11650.00	59.07 PK	74.00	-14.93	1.77 V	273	41.02	18.05
6	11650.00	47.41 AV	54.00	-6.59	1.77 V	273	29.36	18.05

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ax (20MHz)

Channel	TX Channel 36	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	66.85 PK	74.00	-7.15	1.52 H	75	57.31	9.54
2	5150.00	50.17 AV	54.00	-3.83	1.52 H	75	40.63	9.54
3	*5180.00	114.08 PK			1.52 H	75	104.48	9.60
4	*5180.00	101.93 AV			1.52 H	75	92.33	9.60
5	#10360.00	56.88 PK	68.20	-11.32	2.07 H	298	40.81	16.07
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	69.19 PK	74.00	-4.81	1.96 V	43	59.65	9.54
2	5150.00	52.96 AV	54.00	-1.04	1.96 V	43	43.42	9.54
3	*5180.00	125.49 PK			1.96 V	43	115.89	9.60
4	*5180.00	112.61 AV			1.96 V	43	103.01	9.60
5	#10360.00	57.62 PK	68.20	-10.58	1.81 V	277	41.55	16.07

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 40	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5200.00	115.95 PK			1.63 H	78	106.32	9.63
2	*5200.00	102.77 AV			1.63 H	78	93.14	9.63
3	#10400.00	56.94 PK	68.20	-11.26	2.12 H	296	40.86	16.08
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5200.00	127.14 PK			1.99 V	46	117.51	9.63
2	*5200.00	113.92 AV			1.99 V	46	104.29	9.63
3	#10400.00	57.83 PK	68.20	-10.37	1.85 V	270	41.75	16.08

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 48	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	115.93 PK			1.59 H	81	106.10	9.83
2	*5240.00	103.07 AV			1.59 H	81	93.24	9.83
3	5350.00	62.91 PK	74.00	-11.09	1.59 H	81	52.66	10.25
4	5350.00	48.77 AV	54.00	-5.23	1.59 H	81	38.52	10.25
5	#10480.00	57.03 PK	68.20	-11.17	2.17 H	289	40.81	16.22
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	127.06 PK			1.98 V	44	117.23	9.83
2	*5240.00	113.84 AV			1.98 V	44	104.01	9.83
3	5350.00	64.43 PK	74.00	-9.57	1.98 V	44	54.18	10.25
4	5350.00	50.68 AV	54.00	-3.32	1.98 V	44	40.43	10.25
5	#10480.00	57.75 PK	68.20	-10.45	1.80 V	274	41.53	16.22

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 149	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5649.27	61.69 PK	68.20	-6.51	2.58 H	221	51.14	10.55
2	*5745.00	117.09 PK			2.58 H	221	106.98	10.11
3	*5745.00	104.14 AV			2.58 H	221	94.03	10.11
4	#5954.23	62.80 PK	68.20	-5.40	2.58 H	221	52.48	10.32
5	11490.00	58.89 PK	74.00	-15.11	2.15 H	244	40.72	18.17
6	11490.00	47.03 AV	54.00	-6.97	2.15 H	244	28.86	18.17
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5559.02	63.20 PK	68.20	-5.00	1.27 V	49	52.33	10.87
2	*5745.00	127.87 PK			1.27 V	49	117.76	10.11
3	*5745.00	114.96 AV			1.27 V	49	104.85	10.11
4	#5935.23	62.96 PK	68.20	-5.24	1.27 V	49	52.67	10.29
5	11490.00	59.56 PK	74.00	-14.44	1.92 V	274	41.39	18.17
6	11490.00	47.64 AV	54.00	-6.36	1.92 V	274	29.47	18.17

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 157	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5631.23	62.24 PK	68.20	-5.96	2.56 H	220	51.64	10.60
2	*5785.00	116.88 PK			2.56 H	220	106.92	9.96
3	*5785.00	106.90 AV			2.56 H	220	96.94	9.96
4	#5939.98	63.77 PK	68.20	-4.43	2.56 H	220	53.47	10.30
5	11570.00	58.83 PK	74.00	-15.17	2.17 H	249	40.63	18.20
6	11570.00	46.97 AV	54.00	-7.03	2.17 H	249	28.77	18.20
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5618.87	63.12 PK	68.20	-5.08	1.28 V	50	52.48	10.64
2	*5785.00	128.02 PK			1.28 V	50	118.06	9.96
3	*5785.00	105.11 AV			1.28 V	50	95.15	9.96
4	#5930.48	62.70 PK	68.20	-5.50	1.28 V	50	52.42	10.28
5	11570.00	59.63 PK	74.00	-14.37	1.88 V	270	41.43	18.20
6	11570.00	47.59 AV	54.00	-6.41	1.88 V	270	29.39	18.20

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 165	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5562.82	61.87 PK	68.20	-6.33	2.59 H	219	51.01	10.86
2	*5825.00	117.83 PK			2.59 H	219	107.83	10.00
3	*5825.00	104.62 AV			2.59 H	219	94.62	10.00
4	#6020.73	61.99 PK	68.20	-6.21	2.59 H	219	51.60	10.39
5	11650.00	59.04 PK	74.00	-14.96	2.09 H	235	40.99	18.05
6	11650.00	47.15 AV	54.00	-6.85	2.09 H	235	29.10	18.05
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5565.68	62.23 PK	68.20	-5.97	1.30 V	52	51.39	10.84
2	*5825.00	127.58 PK			1.30 V	52	117.58	10.00
3	*5825.00	114.61 AV			1.30 V	52	104.61	10.00
4	#5929.05	64.81 PK	68.20	-3.39	1.30 V	52	54.52	10.29
5	11650.00	59.51 PK	74.00	-14.49	1.83 V	267	41.46	18.05
6	11650.00	47.53 AV	54.00	-6.47	1.83 V	267	29.48	18.05

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ax (40MHz)

Channel	TX Channel 38	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	61.90 PK	74.00	-12.10	1.56 H	121	52.36	9.54
2	5150.00	47.70 AV	54.00	-6.30	1.56 H	121	38.16	9.54
3	*5190.00	108.64 PK			1.56 H	121	99.03	9.61
4	*5190.00	95.31 AV			1.56 H	121	85.70	9.61
5	#10380.00	56.72 PK	68.20	-11.48	2.14 H	251	40.65	16.07

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	67.59 PK	74.00	-6.41	1.56 V	53	58.05	9.54
2	5150.00	52.81 AV	54.00	-1.19	1.56 V	53	43.27	9.54
3	*5190.00	120.68 PK			1.56 V	53	111.07	9.61
4	*5190.00	107.43 AV			1.56 V	53	97.82	9.61
5	#10380.00	57.63 PK	68.20	-10.57	1.54 V	215	41.56	16.07

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 46	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5230.00	112.24 PK			1.61 H	118	102.46	9.78
2	*5230.00	99.72 AV			1.61 H	118	89.94	9.78
3	5350.00	66.67 PK	74.00	-7.33	1.61 H	118	56.42	10.25
4	5350.00	48.66 AV	54.00	-5.34	1.61 H	118	38.41	10.25
5	#10460.00	56.73 PK	68.20	-11.47	1.84 H	174	40.55	16.18
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5230.00	124.54 PK			1.92 V	52	114.76	9.78
2	*5230.00	111.22 AV			1.92 V	52	101.44	9.78
3	5350.00	69.58 PK	74.00	-4.42	1.92 V	52	59.33	10.25
4	5350.00	50.65 AV	54.00	-3.35	1.92 V	52	40.40	10.25
5	#10460.00	57.81 PK	68.20	-10.39	1.69 V	235	41.63	16.18

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

Channel	TX Channel 151	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5626.48	61.50 PK	68.20	-6.70	2.61 H	217	50.89	10.61
2	*5755.00	112.09 PK			2.61 H	217	102.03	10.06
3	*5755.00	98.73 AV			2.61 H	217	88.67	10.06
4	#6006.48	62.70 PK	68.20	-5.50	2.61 H	217	52.31	10.39
5	11510.00	58.08 PK	74.00	-15.92	2.11 H	238	39.92	18.16
6	11510.00	46.20 AV	54.00	-7.80	2.11 H	238	28.04	18.16
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5634.55	66.78 PK	68.20	-1.42	1.27 V	49	56.19	10.59
2	*5755.00	121.63 PK			1.27 V	49	111.57	10.06
3	*5755.00	108.29 AV			1.27 V	49	98.23	10.06
4	#6011.70	62.59 PK	68.20	-5.61	1.27 V	49	52.19	10.40
5	11510.00	58.91 PK	74.00	-15.09	1.86 V	269	40.75	18.16
6	11510.00	47.07 AV	54.00	-6.93	1.86 V	269	28.91	18.16

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 159	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5625.52	62.13 PK	68.20	-6.07	2.58 H	220	51.51	10.62
2	*5795.00	114.81 PK			2.58 H	220	104.88	9.93
3	*5795.00	101.74 AV			2.58 H	220	91.81	9.93
4	#6015.98	62.36 PK	68.20	-5.84	2.58 H	220	51.97	10.39
5	11590.00	58.66 PK	74.00	-15.34	2.19 H	240	40.45	18.21
6	11590.00	46.70 AV	54.00	-7.30	2.19 H	240	28.49	18.21
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5594.65	63.07 PK	68.20	-5.13	1.29 V	47	52.35	10.72
2	*5795.00	125.09 PK			1.29 V	47	115.16	9.93
3	*5795.00	111.99 AV			1.29 V	47	102.06	9.93
4	#5994.12	63.24 PK	68.20	-4.96	1.29 V	47	52.86	10.38
5	11590.00	59.40 PK	74.00	-14.60	1.77 V	256	41.19	18.21
6	11590.00	47.31 AV	54.00	-6.69	1.77 V	256	29.10	18.21

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ax (80MHz)

Channel	TX Channel 42	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	62.12 PK	74.00	-11.88	3.06 H	118	52.58	9.54
2	5150.00	48.35 AV	54.00	-5.65	3.06 H	118	38.81	9.54
3	*5210.00	104.52 PK			3.06 H	118	94.85	9.67
4	*5210.00	91.04 AV			3.06 H	118	81.37	9.67
5	5350.00	62.59 PK	74.00	-11.41	3.06 H	118	52.34	10.25
6	5350.00	48.69 AV	54.00	-5.31	3.06 H	118	38.44	10.25
7	#10420.00	56.37 PK	68.20	-11.83	2.15 H	214	40.26	16.11
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	65.19 PK	74.00	-8.81	2.80 V	55	55.65	9.54
2	5150.00	52.60 AV	54.00	-1.40	2.80 V	55	43.06	9.54
3	*5210.00	114.20 PK			2.80 V	55	104.53	9.67
4	*5210.00	101.10 AV			2.80 V	55	91.43	9.67
5	5350.00	62.84 PK	74.00	-11.16	2.80 V	55	52.59	10.25
6	5350.00	49.49 AV	54.00	-4.51	2.80 V	55	39.24	10.25
7	#10420.00	57.74 PK	68.20	-10.46	1.94 V	251	41.63	16.11

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 155	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5577.07	61.96 PK	68.20	-6.24	2.58 H	220	51.16	10.80
2	*5775.00	109.88 PK			2.58 H	220	99.87	10.01
3	*5775.00	96.77 AV			2.58 H	220	86.76	10.01
4	#5964.20	62.48 PK	68.20	-5.72	2.58 H	220	52.14	10.34
5	11550.00	58.26 PK	74.00	-15.74	2.07 H	245	40.08	18.18
6	11550.00	46.17 AV	54.00	-7.83	2.07 H	245	27.99	18.18
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5641.20	66.59 PK	68.20	-1.61	1.10 V	49	56.01	10.58
2	*5775.00	121.21 PK			1.10 V	49	111.20	10.01
3	*5775.00	108.30 AV			1.10 V	49	98.29	10.01
4	#5943.77	63.42 PK	68.20	-4.78	1.10 V	49	53.11	10.31
5	11550.00	58.79 PK	74.00	-15.21	1.81 V	263	40.61	18.18
6	11550.00	46.85 AV	54.00	-7.15	1.81 V	263	28.67	18.18

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Beamforming Mode

802.11ax (20MHz)

Channel	TX Channel 36	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	61.76 PK	74.00	-12.24	3.02 H	27	52.22	9.54
2	5150.00	48.75 AV	54.00	-5.25	3.02 H	27	39.21	9.54
3	*5180.00	110.32 PK			3.02 H	27	100.72	9.60
4	*5180.00	97.44 AV			3.02 H	27	87.84	9.60
5	#10360.00	56.31 PK	68.20	-11.89	1.81 H	169	40.24	16.07
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	70.07 PK	74.00	-3.93	1.09 V	92	60.53	9.54
2	5150.00	51.81 AV	54.00	-2.19	1.09 V	92	42.27	9.54
3	*5180.00	122.05 PK			1.09 V	92	112.45	9.60
4	*5180.00	109.32 AV			1.09 V	92	99.72	9.60
5	#10360.00	56.88 PK	68.20	-11.32	1.32 V	250	40.81	16.07

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 40	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5200.00	110.61 PK			2.98 H	329	100.98	9.63
2	*5200.00	97.73 AV			2.98 H	329	88.10	9.63
3	#10400.00	56.35 PK	68.20	-11.85	1.86 H	173	40.27	16.08
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5200.00	122.28 PK			1.12 V	88	112.65	9.63
2	*5200.00	109.45 AV			1.12 V	88	99.82	9.63
3	#10400.00	57.03 PK	68.20	-11.17	1.40 V	256	40.95	16.08

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 48	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	110.38 PK			3.00 H	343	100.55	9.83
2	*5240.00	97.49 AV			3.00 H	343	87.66	9.83
3	5350.00	61.58 PK	74.00	-12.42	3.00 H	343	51.33	10.25
4	5350.00	48.77 AV	54.00	-5.23	3.00 H	343	38.52	10.25
5	#10480.00	56.27 PK	68.20	-11.93	1.84 H	170	40.05	16.22
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	121.89 PK			1.27 V	72	112.06	9.83
2	*5240.00	97.17 AV			1.27 V	72	87.34	9.83
3	5350.00	62.03 PK	74.00	-11.97	1.27 V	72	51.78	10.25
4	5350.00	48.91 AV	54.00	-5.09	1.27 V	72	38.66	10.25
5	#10480.00	56.79 PK	68.20	-11.41	1.37 V	245	40.57	16.22

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

Channel	TX Channel 149	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5626.48	62.03 PK	68.20	-6.17	2.21 H	19	51.42	10.61
2	*5745.00	114.83 PK			2.21 H	19	104.72	10.11
3	*5745.00	103.13 AV			2.21 H	19	93.02	10.11
4	#5985.57	62.65 PK	68.20	-5.55	2.21 H	19	52.28	10.37
5	11490.00	56.81 PK	74.00	-17.19	1.85 H	174	38.64	18.17
6	11490.00	46.59 AV	54.00	-7.41	1.85 H	174	28.42	18.17
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5645.48	63.61 PK	68.20	-4.59	1.78 V	86	53.05	10.56
2	*5745.00	125.79 PK			1.78 V	86	115.68	10.11
3	*5745.00	113.85 AV			1.78 V	86	103.74	10.11
4	#5994.60	62.95 PK	68.20	-5.25	1.78 V	86	52.57	10.38
5	11490.00	57.24 PK	74.00	-16.76	1.33 V	251	39.07	18.17
6	11490.00	47.25 AV	54.00	-6.75	1.33 V	251	29.08	18.17

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 157	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5619.35	62.28 PK	68.20	-5.92	2.27 H	21	51.64	10.64
2	*5785.00	114.39 PK			2.27 H	21	104.43	9.96
3	*5785.00	102.53 AV			2.27 H	21	92.57	9.96
4	#5972.75	62.73 PK	68.20	-5.47	2.27 H	21	52.38	10.35
5	11570.00	56.69 PK	74.00	-17.31	1.93 H	182	38.49	18.20
6	11570.00	46.35 AV	54.00	-7.65	1.93 H	182	28.15	18.20
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5643.57	62.74 PK	68.20	-5.46	1.78 V	12	52.18	10.56
2	*5785.00	125.64 PK			1.78 V	12	115.68	9.96
3	*5785.00	113.69 AV			1.78 V	12	103.73	9.96
4	#5983.68	62.98 PK	68.20	-5.22	1.78 V	12	52.62	10.36
5	11570.00	57.18 PK	74.00	-16.82	1.36 V	247	38.98	18.20
6	11570.00	47.15 AV	54.00	-6.85	1.36 V	247	28.95	18.20

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 165	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5566.62	62.36 PK	68.20	-5.84	1.63 H	60	51.52	10.84
2	*5825.00	114.67 PK			1.63 H	60	104.67	10.00
3	*5825.00	103.02 AV			1.63 H	60	93.02	10.00
4	#5970.37	62.38 PK	68.20	-5.82	1.63 H	60	52.04	10.34
5	11650.00	56.70 PK	74.00	-17.30	1.94 H	178	38.65	18.05
6	11650.00	46.41 AV	54.00	-7.59	1.94 H	178	28.36	18.05
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5581.35	62.86 PK	68.20	-5.34	1.76 V	42	52.09	10.77
2	*5825.00	125.63 PK			1.76 V	42	115.63	10.00
3	*5825.00	113.77 AV			1.76 V	42	103.77	10.00
4	#5991.75	64.04 PK	68.20	-4.16	1.76 V	42	53.66	10.38
5	11650.00	57.31 PK	74.00	-16.69	1.26 V	254	39.26	18.05
6	11650.00	47.27 AV	54.00	-6.73	1.26 V	254	29.22	18.05

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ax (40MHz)

Channel	TX Channel 38	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	62.62 PK	74.00	-11.38	1.78 H	14	53.08	9.54
2	5150.00	48.76 AV	54.00	-5.24	1.78 H	14	39.22	9.54
3	*5190.00	106.94 PK			1.78 H	14	97.33	9.61
4	*5190.00	95.22 AV			1.78 H	14	85.61	9.61
5	#10380.00	56.13 PK	68.20	-12.07	1.88 H	172	40.06	16.07
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	72.75 PK	74.00	-1.25	1.09 V	28	63.21	9.54
2	5150.00	50.27 AV	54.00	-3.73	1.09 V	28	40.73	9.54
3	*5190.00	117.76 PK			1.09 V	28	108.15	9.61
4	*5190.00	104.37 AV			1.09 V	28	94.76	9.61
5	#10380.00	56.67 PK	68.20	-11.53	1.39 V	254	40.60	16.07

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 46	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5230.00	105.81 PK			1.74 H	7	96.03	9.78
2	*5230.00	94.29 AV			1.74 H	7	84.51	9.78
3	5350.00	61.48 PK	74.00	-12.52	1.74 H	7	51.23	10.25
4	5350.00	48.56 AV	54.00	-5.44	1.74 H	7	38.31	10.25
5	#10460.00	56.37 PK	68.20	-11.83	1.85 H	176	40.19	16.18
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5230.00	119.03 PK			1.41 V	44	109.25	9.78
2	*5230.00	107.37 AV			1.41 V	44	97.59	9.78
3	5350.00	65.82 PK	74.00	-8.18	1.41 V	44	55.57	10.25
4	5350.00	49.32 AV	54.00	-4.68	1.41 V	44	39.07	10.25
5	#10460.00	56.80 PK	68.20	-11.40	1.32 V	255	40.62	16.18

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 151	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5615.07	62.15 PK	68.20	-6.05	2.35 H	19	51.50	10.65
2	*5755.00	113.12 PK			2.35 H	19	103.06	10.06
3	*5755.00	103.36 AV			2.35 H	19	93.30	10.06
4	#5968.95	62.48 PK	68.20	-5.72	2.35 H	19	52.13	10.35
5	11510.00	56.58 PK	74.00	-17.42	1.91 H	174	38.42	18.16
6	11510.00	46.23 AV	54.00	-7.77	1.91 H	174	28.07	18.16
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5634.55	66.86 PK	68.20	-1.34	1.59 V	80	56.27	10.59
2	*5755.00	123.79 PK			1.59 V	80	113.73	10.06
3	*5755.00	112.53 AV			1.59 V	80	102.47	10.06
4	#5961.82	63.57 PK	68.20	-4.63	1.59 V	80	53.24	10.33
5	11510.00	57.18 PK	74.00	-16.82	1.25 V	247	39.02	18.16
6	11510.00	46.94 AV	54.00	-7.06	1.25 V	247	28.78	18.16

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 159	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5640.25	62.13 PK	68.20	-6.07	2.41 H	23	51.55	10.58
2	*5795.00	113.92 PK			2.41 H	23	103.99	9.93
3	*5795.00	102.61 AV			2.41 H	23	92.68	9.93
4	#6004.10	62.73 PK	68.20	-5.47	2.41 H	23	52.33	10.40
5	11590.00	56.63 PK	74.00	-17.37	1.83 H	171	38.42	18.21
6	11590.00	46.37 AV	54.00	-7.63	1.83 H	171	28.16	18.21
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5607.95	63.11 PK	68.20	-5.09	1.63 V	77	52.43	10.68
2	*5795.00	123.87 PK			1.63 V	77	113.94	9.93
3	*5795.00	113.58 AV			1.63 V	77	103.65	9.93
4	#5973.70	63.28 PK	68.20	-4.92	1.63 V	77	52.93	10.35
5	11590.00	57.16 PK	74.00	-16.84	1.30 V	252	38.95	18.21
6	11590.00	46.90 AV	54.00	-7.10	1.30 V	252	28.69	18.21

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ax (80MHz)

Channel	TX Channel 42	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	61.95 PK	74.00	-12.05	1.60 H	16	52.41	9.54
2	5150.00	49.13 AV	54.00	-4.87	1.60 H	16	39.59	9.54
3	*5210.00	103.53 PK			1.60 H	16	93.86	9.67
4	*5210.00	84.14 AV			1.60 H	16	74.47	9.67
5	5350.00	62.47 PK	74.00	-11.53	1.60 H	16	52.22	10.25
6	5350.00	48.52 AV	54.00	-5.48	1.60 H	16	38.27	10.25
7	#10420.00	56.14 PK	68.20	-12.06	1.88 H	179	40.03	16.11
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	72.16 PK	74.00	-1.84	1.38 V	52	62.62	9.54
2	5150.00	50.18 AV	54.00	-3.82	1.38 V	52	40.64	9.54
3	*5210.00	116.35 PK			1.38 V	52	106.68	9.67
4	*5210.00	97.64 AV			1.38 V	52	87.97	9.67
5	5350.00	63.44 PK	74.00	-10.56	1.38 V	52	53.19	10.25
6	5350.00	49.19 AV	54.00	-4.81	1.38 V	52	38.94	10.25
7	#10420.00	56.59 PK	68.20	-11.61	1.27 V	258	40.48	16.11

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Channel	TX Channel 155	Detector Function	Peak (PK)
Frequency Range	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5619.35	62.33 PK	68.20	-5.87	2.39 H	20	51.69	10.64
2	*5775.00	113.81 PK			2.39 H	20	103.80	10.01
3	*5775.00	102.74 AV			2.39 H	20	92.73	10.01
4	#5974.65	62.71 PK	68.20	-5.49	2.39 H	20	52.36	10.35
5	11550.00	56.52 PK	74.00	-17.48	1.85 H	169	38.34	18.18
6	11550.00	46.28 AV	54.00	-7.72	1.85 H	169	28.10	18.18
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5647.85	66.15 PK	68.20	-2.05	1.79 V	82	55.60	10.55
2	*5775.00	122.36 PK			1.79 V	82	112.35	10.01
3	*5775.00	111.94 AV			1.79 V	82	101.93	10.01
4	#5928.57	67.04 PK	68.20	-1.16	1.79 V	82	56.75	10.29
5	11550.00	56.98 PK	74.00	-17.02	1.34 V	256	38.80	18.18
6	11550.00	46.76 AV	54.00	-7.24	1.34 V	256	28.58	18.18

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Below 1GHz Worst-Case Data:

CDD Mode

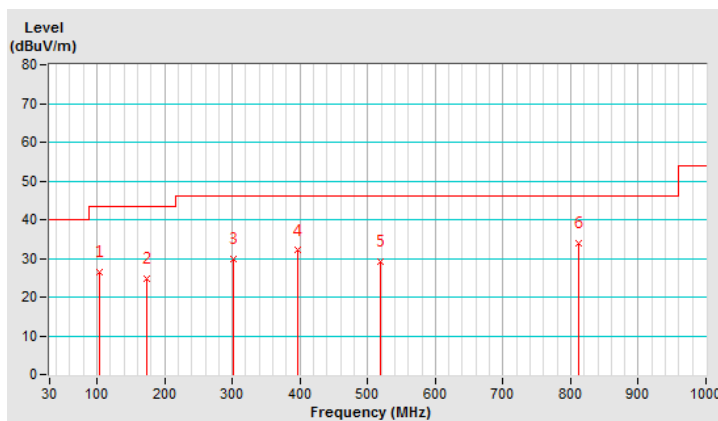
802.11ax (20MHz)

Channel	TX Channel 157	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	103.28	26.46 QP	43.50	-17.04	1.53 H	253	37.30	-10.84
2	172.83	24.81 QP	43.50	-18.69	1.19 H	84	31.93	-7.12
3	300.82	29.88 QP	46.00	-16.12	1.78 H	110	34.63	-4.75
4	395.98	32.11 QP	46.00	-13.89	1.42 H	124	35.03	-2.92
5	519.46	29.18 QP	46.00	-16.82	2.21 H	79	29.29	-0.11
6	811.77	33.99 QP	46.00	-12.01	1.96 H	270	27.95	6.04

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

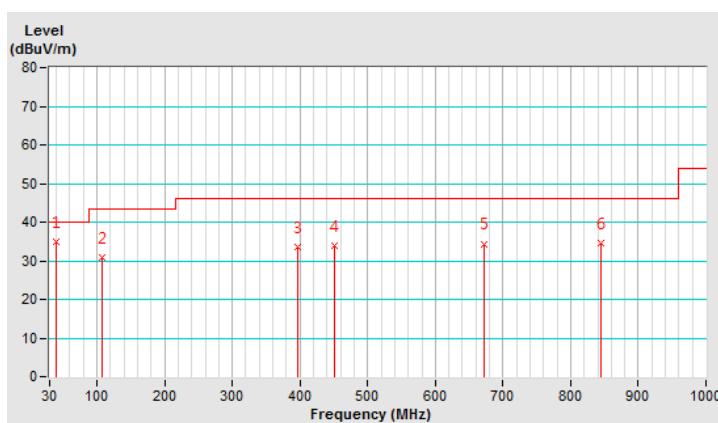


Channel	TX Channel 157	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	40.14	34.81 QP	40.00	-5.19	1.74 V	80	42.38	-7.57
2	108.13	30.70 QP	43.50	-12.80	1.25 V	160	40.75	-10.05
3	396.08	33.43 QP	46.00	-12.57	1.90 V	107	36.35	-2.92
4	451.71	33.79 QP	46.00	-12.21	1.67 V	301	35.04	-1.25
5	671.99	34.34 QP	46.00	-11.66	2.06 V	36	31.14	3.20
6	844.27	34.44 QP	46.00	-11.56	1.93 V	359	27.98	6.46

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
ROHDE & SCHWARZ TEST RECEIVER	ESR3	102413	Feb. 17, 2020	Feb. 16, 2021
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH2-Z5	100104	Dec. 13, 2019	Dec. 12, 2020
LISN With Adapter (for EUT)	AD10	C09Ada-001	Dec. 13, 2019	Dec. 12, 2020
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	847265/023	Oct. 31, 2019	Oct. 30, 2020
SCHWARZBECK Artificial Mains Network (For EUT)	NNLK8129	8129229	May 14, 2020	May 13, 2021
SCHWARZBECK Artificial Mains Network (for EUT)	NNLK 8121	8121-808	Apr. 10, 2020	Apr. 9, 2021
Software	Cond_V7.3.7.4	NA	NA	NA
RF cable (JYEBAO) With 10dB PAD	5D-FB	Cable-C09.01	Aug. 15, 2019	Aug. 14, 2020
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010789	May 13, 2020	May 12, 2021

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in Shielded Room No. 9. (Conduction 9)

3. The VCCI Site Registration No. C-11312.

4.2.3 Test Procedures

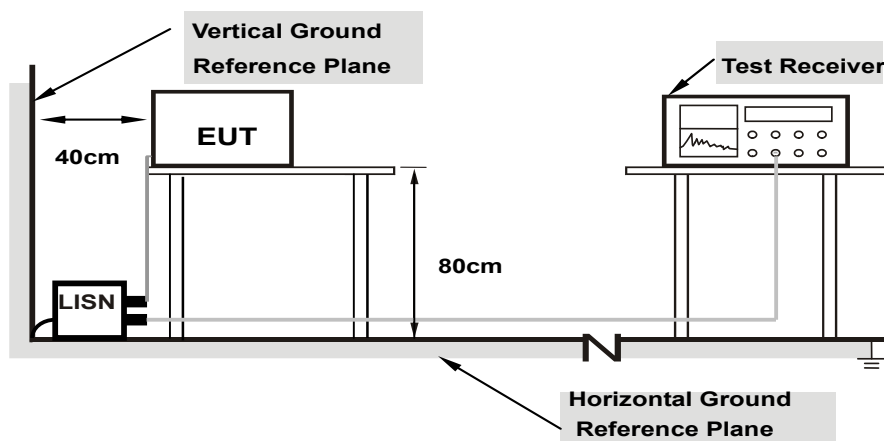
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

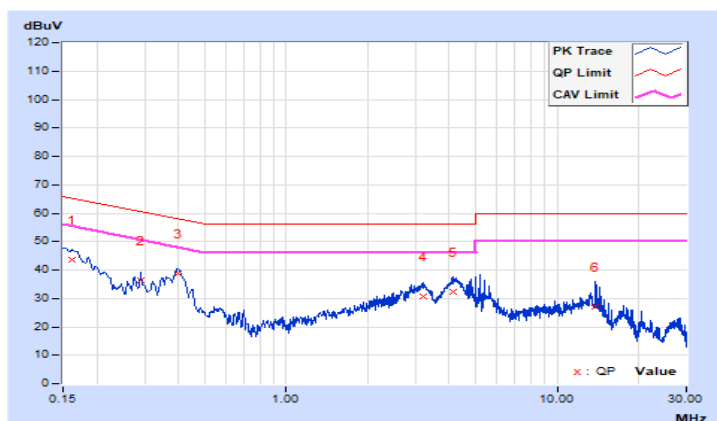
CDD Mode

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16173	10.54	33.15	21.98	43.69	32.52	65.37	55.37	-21.68	-22.85
2	0.29076	10.58	25.71	19.92	36.29	30.50	60.50	50.50	-24.21	-20.00
3	0.39739	10.59	28.27	25.81	38.86	36.40	57.91	47.91	-19.05	-11.51
4	3.19008	10.86	19.79	9.00	30.65	19.86	56.00	46.00	-25.35	-26.14
5	4.12457	10.94	21.49	12.15	32.43	23.09	56.00	46.00	-23.57	-22.91
6	13.79359	11.51	15.52	8.10	27.03	19.61	60.00	50.00	-32.97	-30.39

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

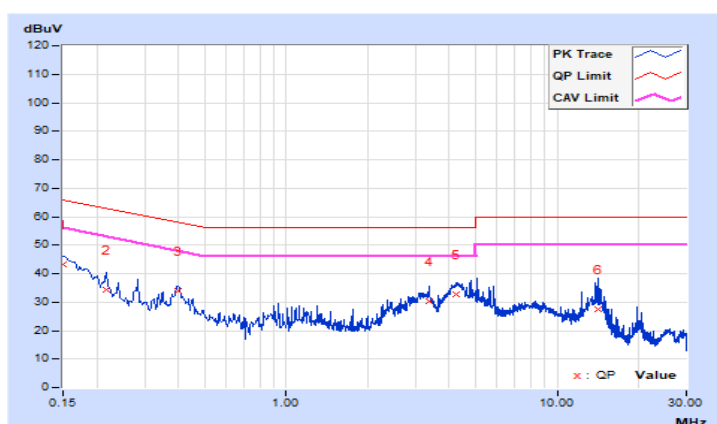


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.50	32.65	20.43	43.15	30.93	66.00	56.00	-22.85	-25.07
2	0.21621	10.55	23.91	11.69	34.46	22.24	62.96	52.96	-28.50	-30.72
3	0.39739	10.57	23.22	20.17	33.79	30.74	57.91	47.91	-24.12	-17.17
4	3.35430	10.82	19.44	9.72	30.26	20.54	56.00	46.00	-25.74	-25.46
5	4.23405	10.88	21.85	11.91	32.73	22.79	56.00	46.00	-23.27	-23.21
6	14.26279	11.37	16.06	9.77	27.43	21.14	60.00	50.00	-32.57	-28.86

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client device	250mW (24 dBm)
U-NII-2A			250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C			250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3		√	1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

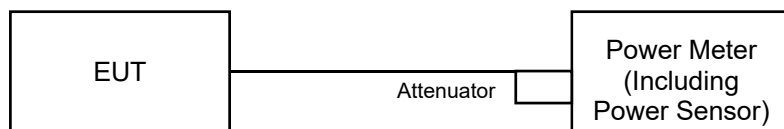
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For Average Power Measurement

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst and set the detector to average. Duty factor is not added to measured value.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

CDD Mode

802.11a

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	18.17	17.86	18.21	18.23	259.458	24.14	30.00	Pass
40	5200	18.11	17.99	18.16	18.19	259.046	24.13	30.00	Pass
48	5240	18.19	18.00	18.32	18.33	265.01	24.23	30.00	Pass
149	5745	23.73	24.04	23.97	23.88	983.363	29.93	30.00	Pass
157	5785	23.57	24.25	23.87	24.16	997.979	29.99	30.00	Pass
165	5825	23.56	24.30	23.59	23.90	970.171	29.87	30.00	Pass

802.11n (20MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	18.73	18.43	18.58	18.62	289.196	24.61	30.00	Pass
40	5200	18.89	18.66	18.72	18.82	301.579	24.79	30.00	Pass
48	5240	18.28	18.07	18.12	18.22	262.656	24.19	30.00	Pass
149	5745	23.21	23.53	23.58	22.84	855.179	29.32	30.00	Pass
157	5785	23.02	23.95	23.51	23.97	922.608	29.65	30.00	Pass
165	5825	23.23	23.90	23.19	23.84	906.401	29.57	30.00	Pass

802.11n (40MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	17.95	17.15	17.73	17.22	226.269	23.55	30.00	Pass
46	5230	20.52	20.34	20.40	20.50	442.713	26.46	30.00	Pass
151	5755	20.96	20.96	21.05	20.89	499.571	26.99	30.00	Pass
159	5795	22.88	23.81	23.55	23.83	902.535	29.55	30.00	Pass

802.11ac (20MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	18.95	18.69	18.83	18.85	305.604	24.85	30.00	Pass
40	5200	19.13	18.88	18.97	19.05	318.353	25.03	30.00	Pass
48	5240	18.50	18.31	18.36	18.43	276.770	24.42	30.00	Pass
149	5745	23.42	23.77	23.84	23.06	902.423	29.55	30.00	Pass
157	5785	23.26	24.19	23.74	24.18	972.668	29.88	30.00	Pass
165	5825	23.45	24.12	23.42	24.07	954.592	29.80	30.00	Pass

802.11ac (40MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	18.17	17.39	17.94	17.44	238.135	23.77	30.00	Pass
46	5230	20.78	20.58	20.61	20.74	467.619	26.70	30.00	Pass
151	5755	21.18	21.19	21.28	21.10	525.844	27.21	30.00	Pass
159	5795	23.12	24.06	23.77	24.07	953.301	29.79	30.00	Pass

802.11ac (80MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	16.15	15.45	15.77	15.33	148.161	21.71	30.00	Pass
155	5775	19.96	20.61	20.18	20.87	440.575	26.44	30.00	Pass

802.11ax (20MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	19.59	19.34	19.46	19.53	354.944	25.50	30.00	Pass
40	5200	19.78	19.51	19.62	19.70	369.339	25.67	30.00	Pass
48	5240	19.17	18.94	19.05	19.11	322.770	25.09	30.00	Pass
149	5745	23.69	23.95	23.94	24.23	994.789	29.98	30.00	Pass
157	5785	23.43	24.25	23.86	24.26	996.271	29.98	30.00	Pass
165	5825	23.61	24.30	23.51	24.25	989.229	29.95	30.00	Pass

802.11ax (40MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	18.85	18.01	18.62	18.08	277.024	24.43	30.00	Pass
46	5230	21.47	21.25	21.31	21.36	545.614	27.37	30.00	Pass
151	5755	21.89	21.80	21.76	21.55	598.739	27.77	30.00	Pass
159	5795	23.30	24.25	23.91	24.22	990.146	29.96	30.00	Pass

802.11ax (80MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	16.82	16.13	16.42	16.00	172.768	22.37	30.00	Pass
155	5775	20.11	20.73	20.35	21.02	455.736	26.59	30.00	Pass

Beamforming Mode

802.11ac (20MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	16.33	16.01	16.20	16.22	166.422	22.21	25.22	Pass
40	5200	18.49	18.25	18.42	18.35	275.360	24.40	25.22	Pass
48	5240	18.50	18.13	18.35	18.43	273.861	24.38	25.22	Pass
149	5745	18.26	18.53	18.47	18.82	284.789	24.55	25.52	Pass
157	5785	17.97	18.75	18.31	18.87	282.505	24.51	25.52	Pass
165	5825	18.16	18.84	18.05	18.76	281.012	24.49	25.52	Pass

Note:

For 5180~5240MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.78\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (10.78 - 6) = 25.22\text{dBm}$.

For 5745~5825MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.48\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (10.48 - 6) = 25.52\text{dBm}$.

802.11ac (40MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	15.76	14.95	15.53	15.03	136.5	21.35	25.22	Pass
46	5230	18.57	18.27	18.34	18.36	275.87	24.41	25.22	Pass
151	5755	17.91	18.06	17.91	18.61	260.187	24.15	25.52	Pass
159	5795	17.91	18.83	18.48	18.77	283.99	24.53	25.52	Pass

Note:

For 5180~5240MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.78\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (10.78 - 6) = 25.22\text{dBm}$.

For 5745~5825MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.48\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (10.48 - 6) = 25.52\text{dBm}$.

802.11ac (80MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	15.36	14.58	14.95	14.46	122.25	20.87	25.22	Pass
155	5775	17.95	18.56	18.11	18.79	274.55	24.39	25.52	Pass

Note:

For 5180~5240MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.78\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (10.78 - 6) = 25.22\text{dBm}$.

For 5745~5825MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.48\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (10.48 - 6) = 25.52\text{dBm}$.

802.11ax (20MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	16.97	16.70	16.86	16.94	194.507	22.89	25.22	Pass
40	5200	19.15	18.87	19.03	19.02	319.098	25.04	25.22	Pass
48	5240	19.12	18.83	19.01	19.06	318.196	25.03	25.22	Pass
149	5745	18.94	19.15	19.18	19.44	331.264	25.20	25.52	Pass
157	5785	18.61	19.44	19.01	19.49	329.049	25.17	25.52	Pass
165	5825	18.80	19.45	18.67	19.43	325.283	25.12	25.52	Pass

Note:

For 5180~5240MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.78\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (10.78 - 6) = 25.22\text{dBm}$.

For 5745~5825MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.48\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (10.48 - 6) = 25.52\text{dBm}$.

802.11ax (40MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	16.44	15.63	16.23	15.70	159.744	22.03	25.22	Pass
46	5230	19.19	18.94	19.02	19.05	321.480	25.07	25.22	Pass
151	5755	18.62	18.74	18.62	19.27	304.901	24.84	25.52	Pass
159	5795	18.53	19.47	19.15	19.42	329.520	25.18	25.52	Pass

Note:

For 5180~5240MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.78\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (10.78 - 6) = 25.22\text{dBm}$.

For 5745~5825MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.48\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (10.48 - 6) = 25.52\text{dBm}$.

802.11ax (80MHz)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	15.97	15.26	15.58	15.10	141.611	21.51	25.22	Pass
155	5775	18.57	19.20	18.78	19.49	319.551	25.05	25.52	Pass

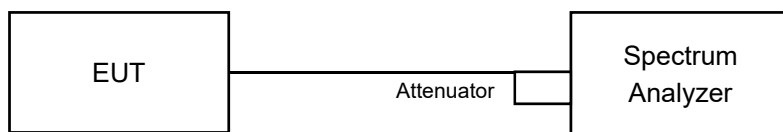
Note:

For 5180~5240MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.78\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (10.78 - 6) = 25.22\text{dBm}$.

For 5745~5825MHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.48\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (10.48 - 6) = 25.52\text{dBm}$.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.4.4 Test Result

CDD Mode

802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	16.44	16.44	16.44	16.44
40	5200	16.44	16.44	16.44	16.44
48	5240	16.44	16.44	16.44	16.44

802.11ax (20MHz)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	18.96	18.96	18.96	18.96
40	5200	18.96	18.96	18.96	18.96
48	5240	18.96	18.96	18.96	18.96

802.11ax (40MHz)

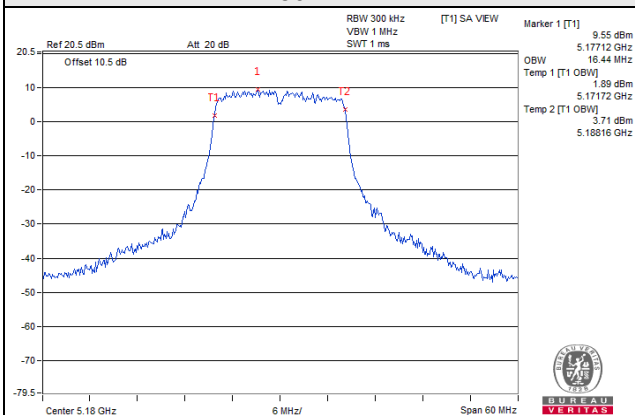
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
38	5190	37.80	38.00	37.80	38.00
46	5230	38.00	38.00	38.00	37.80

802.11ax (80MHz)

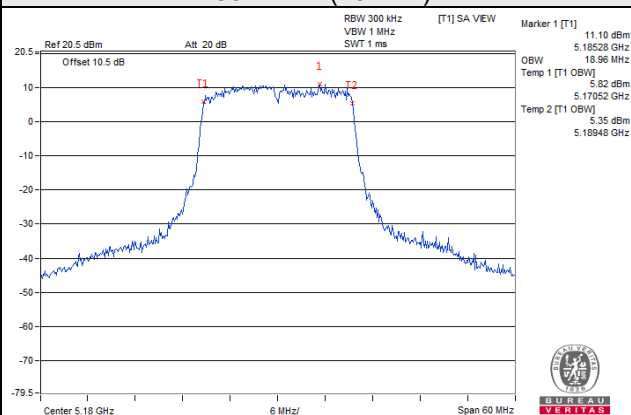
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
42	5210	77.28	77.52	77.52	77.52

Spectrum Plot of Worst Value

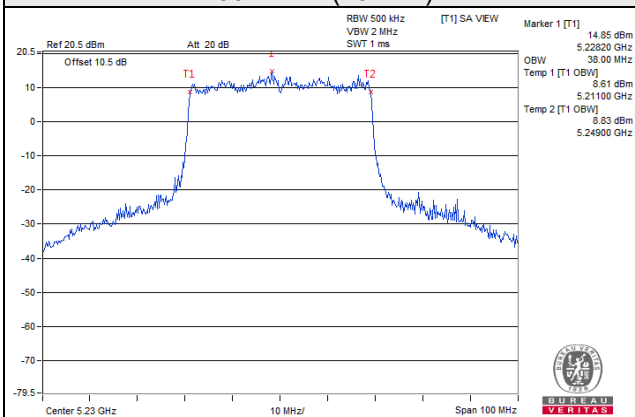
802.11a



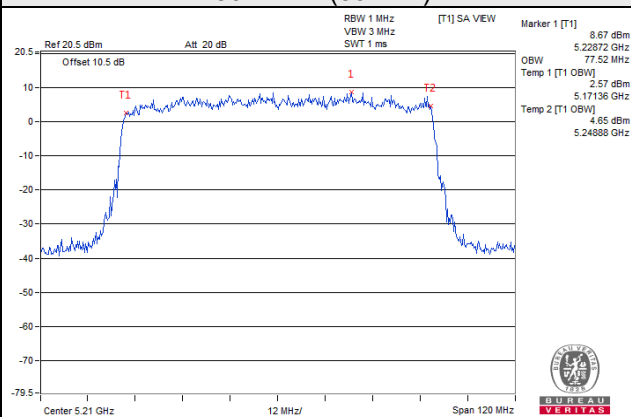
802.11ax (20MHz)



802.11ax (40MHz)

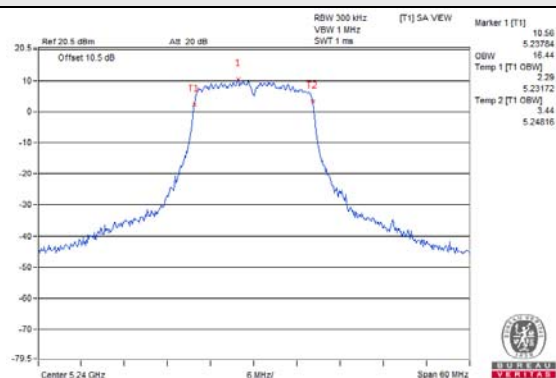


802.11ax (80MHz)

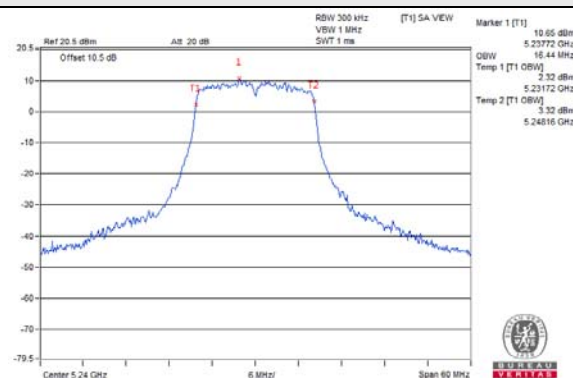


Spectrum Plot for near By DFS Band

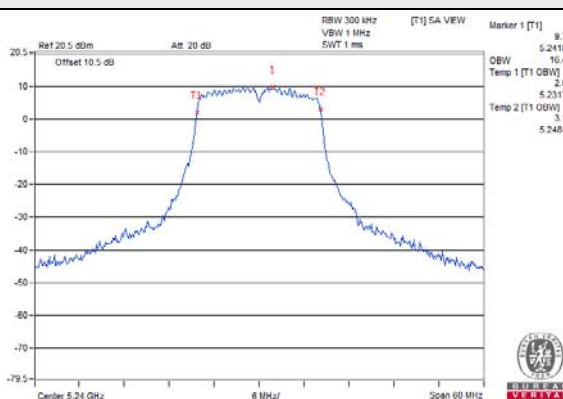
802.11a / Chain 0 / CH 48



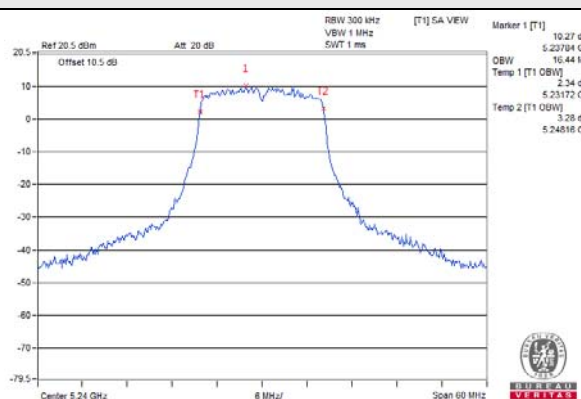
802.11a / Chain 1 / CH 48



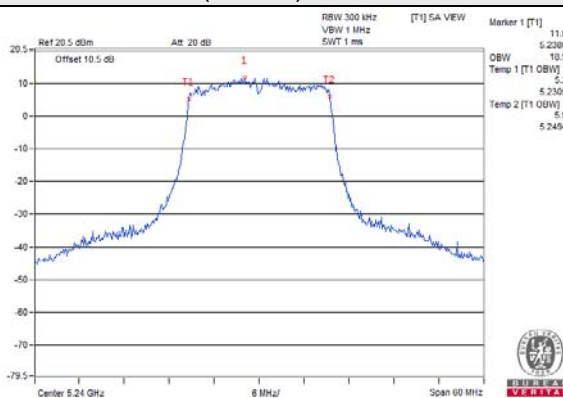
802.11a / Chain 2 / CH 48



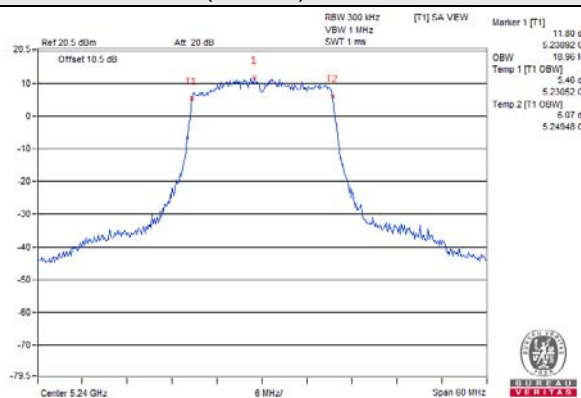
802.11a / Chain 3 / CH 48



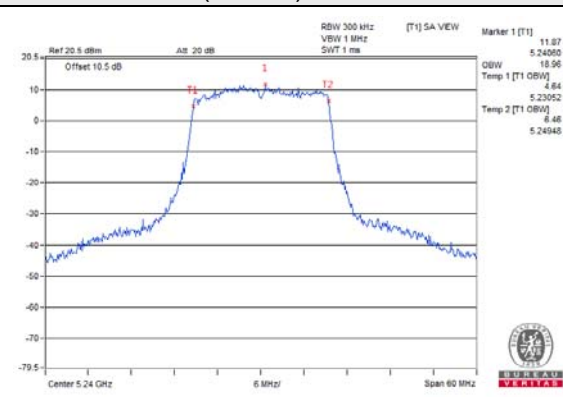
802.11ax (20MHz) / Chain 0 / CH 48



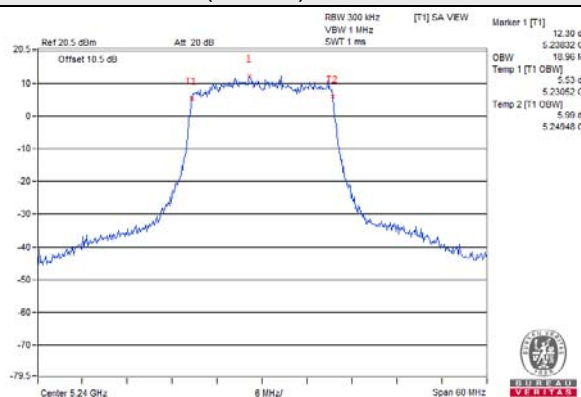
802.11ax (20MHz) / Chain 1 / CH 48



802.11ax (20MHz) / Chain 2 / CH 48

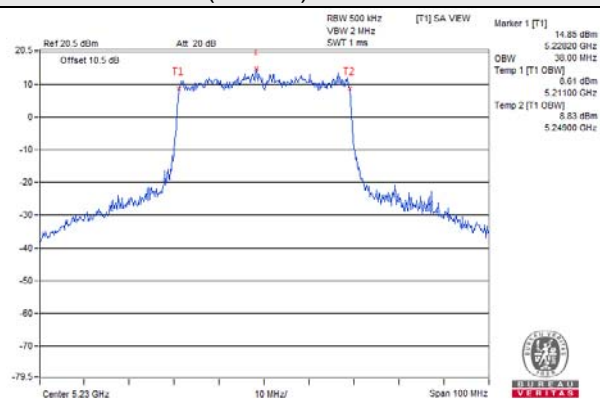


802.11ax (20MHz) / Chain 3 / CH 48

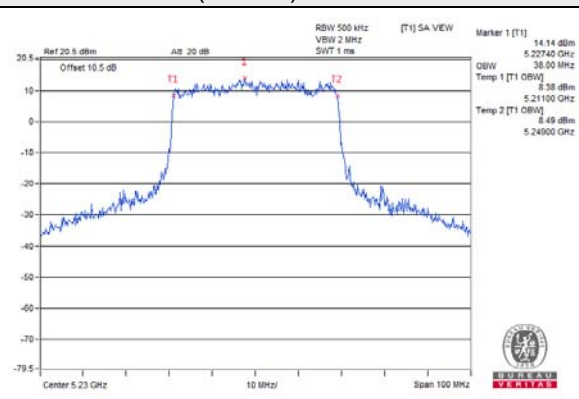


Spectrum Plot for near By DFS Band

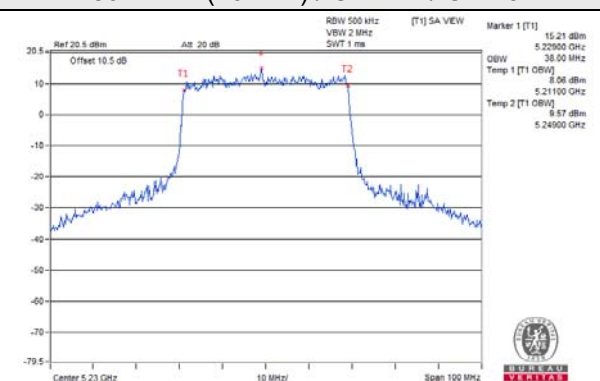
802.11ax (40MHz) / Chain 0 / CH 46



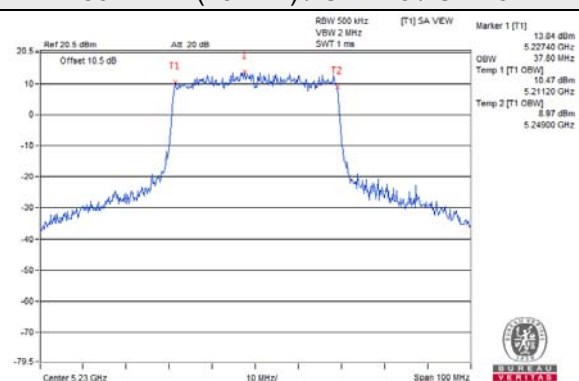
802.11ax (40MHz) / Chain 1 / CH 46



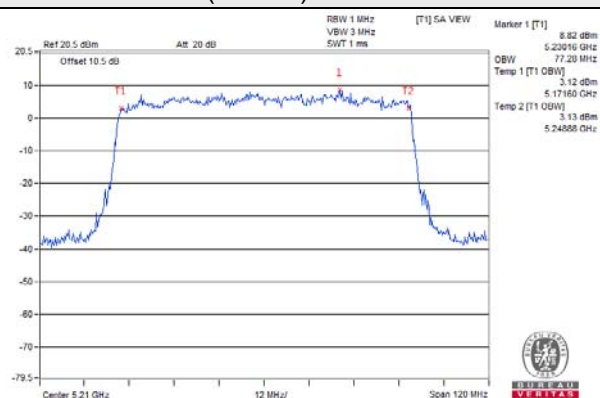
802.11ax (40MHz) / Chain 2 / CH 46



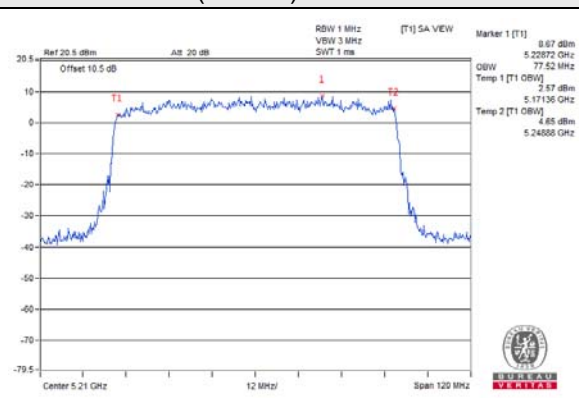
802.11ax (40MHz) / Chain 3 / CH 46



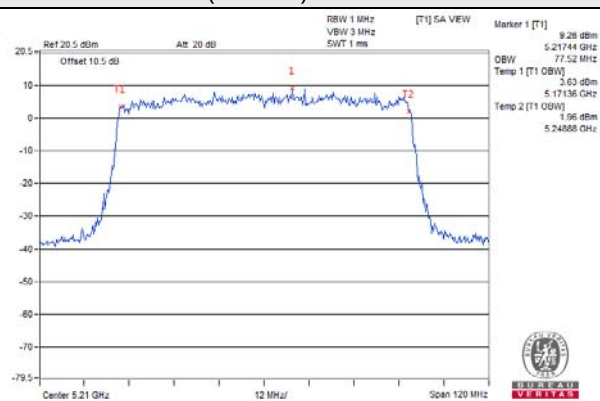
802.11ax (80MHz) / Chain 0 / CH 42



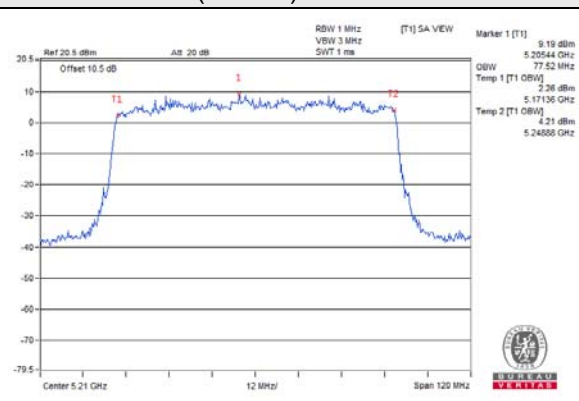
802.11ax (80MHz) / Chain 1 / CH 42



802.11ax (80MHz) / Chain 2 / CH 42



802.11ax (80MHz) / Chain 3 / CH 42



802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
149	5745	16.86	16.90	17.00	17.00
157	5785	16.90	16.90	16.80	16.90
165	5825	16.70	16.70	16.70	16.70

802.11ax (20MHz)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
149	5745	19.14	19.20	19.10	19.10
157	5785	19.10	19.20	19.20	19.00
165	5825	19.10	19.10	19.20	19.20

802.11ax (40MHz)

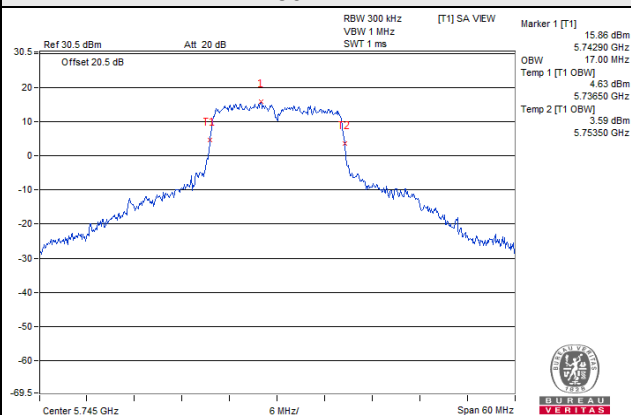
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
151	5755	37.68	37.83	37.83	37.83
159	5795	38.00	38.00	38.00	38.00

802.11ax (80MHz)

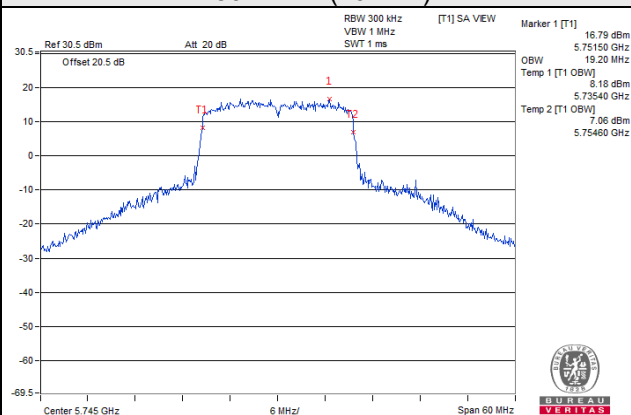
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
155	5775	77.30	77.28	77.56	77.28

Spectrum Plot of Worst Value

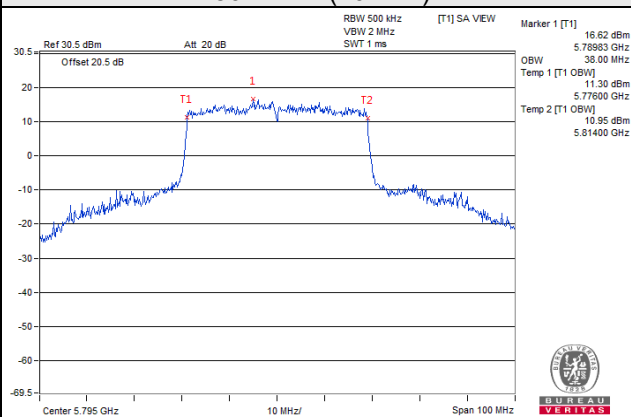
802.11a



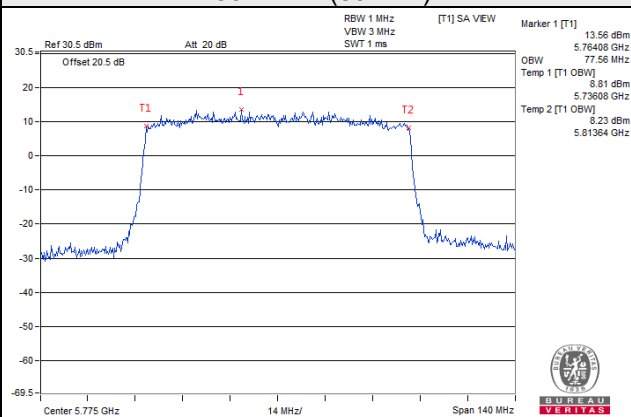
802.11ax (20MHz)



802.11ax (40MHz)

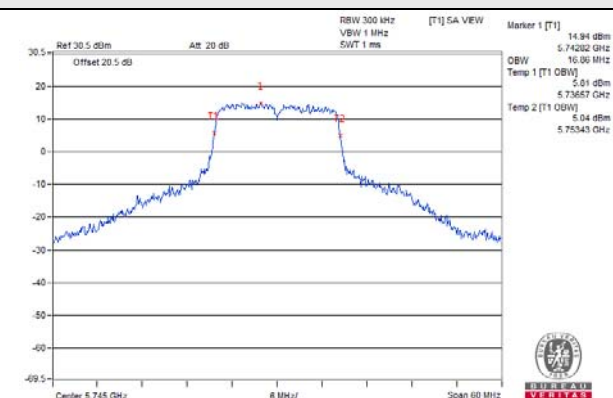


802.11ax (80MHz)

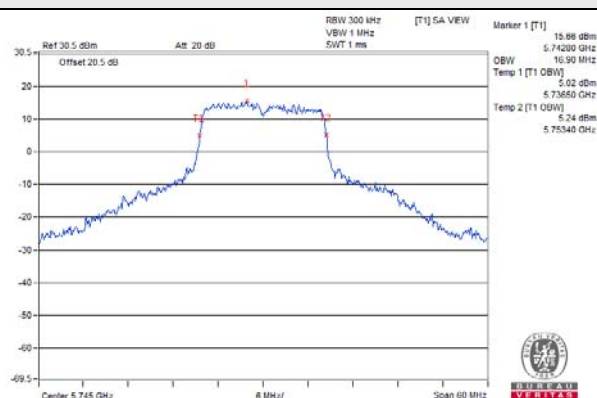


Spectrum Plot for near By DFS Band

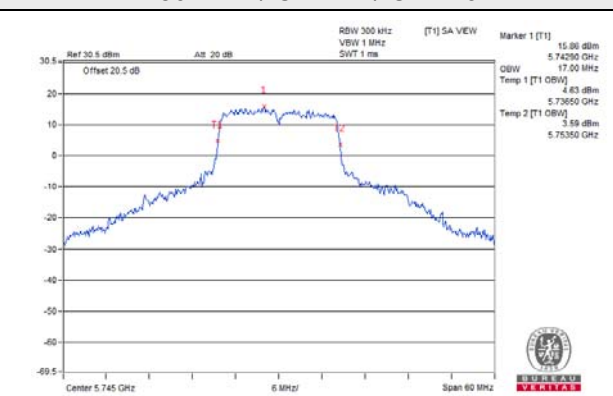
802.11a / Chain 0 / CH 149



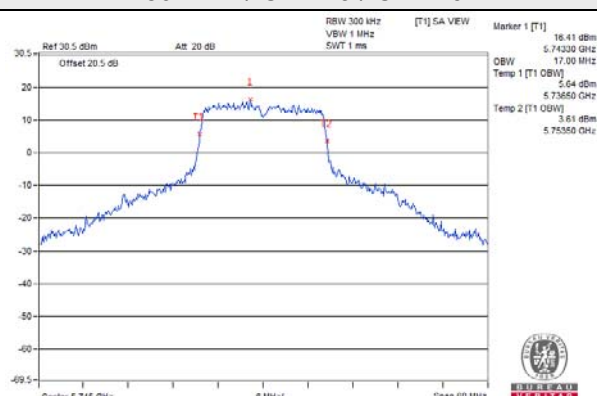
802.11a / Chain 1 / CH 149



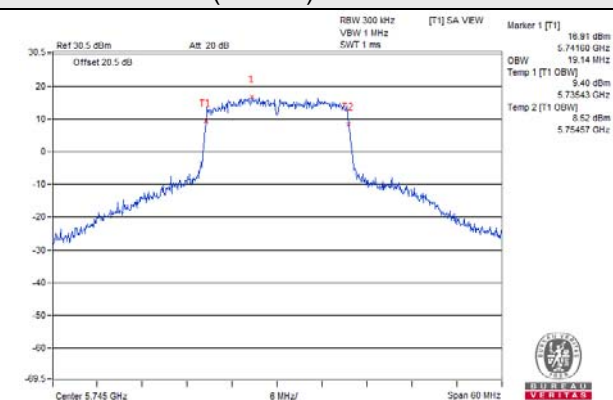
802.11a / Chain 2 / CH 149



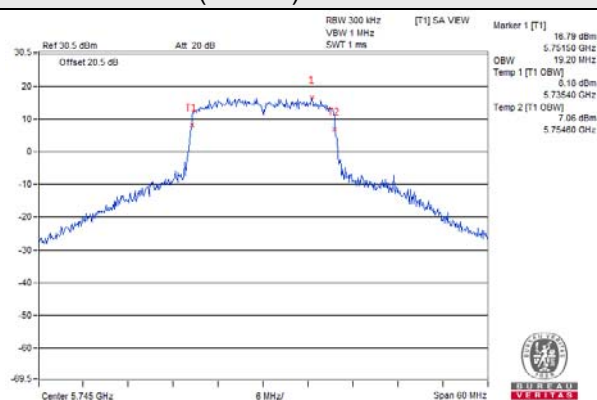
802.11a / Chain 3 / CH 149



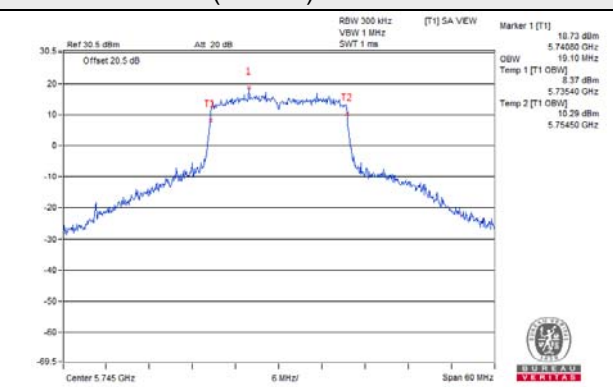
802.11ax (20MHz) / Chain 0 / CH 149



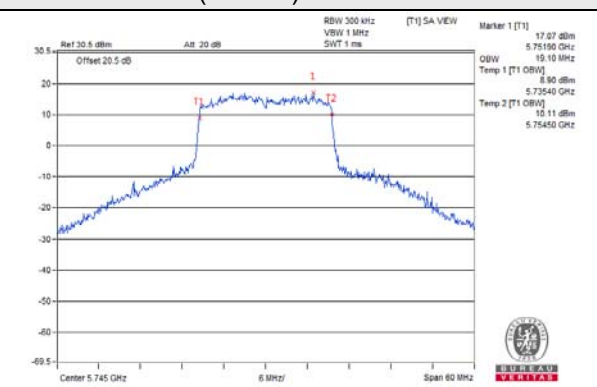
802.11ax (20MHz) / Chain 1 / CH 149



802.11ax (20MHz) / Chain 2 / CH 149

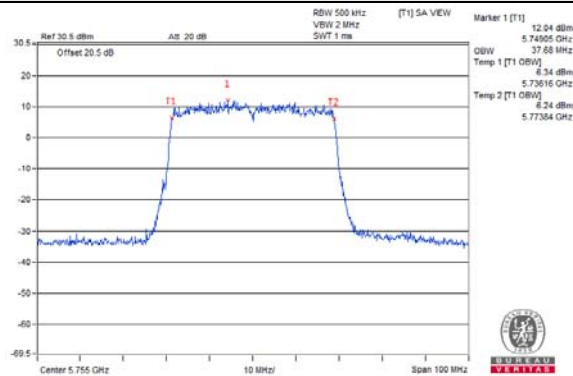


802.11ax (20MHz) / Chain 3 / CH 149

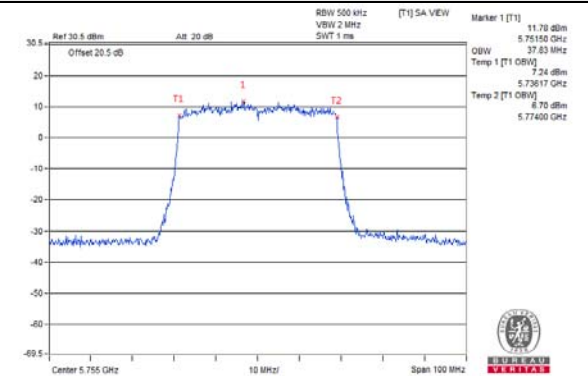


Spectrum Plot for near By DFS Band

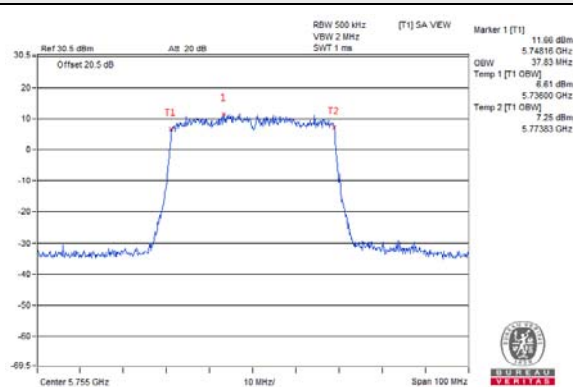
802.11ax (40MHz) / Chain 0 / CH 151



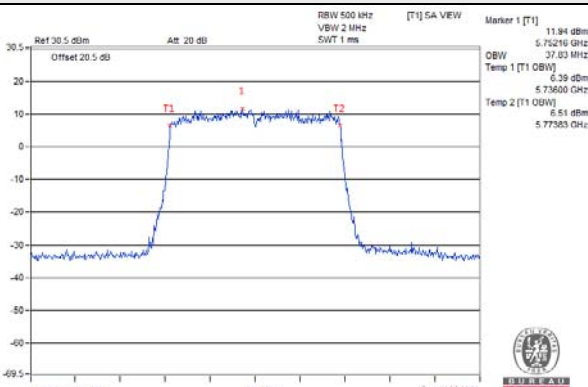
802.11ax (40MHz) / Chain 1 / CH 151



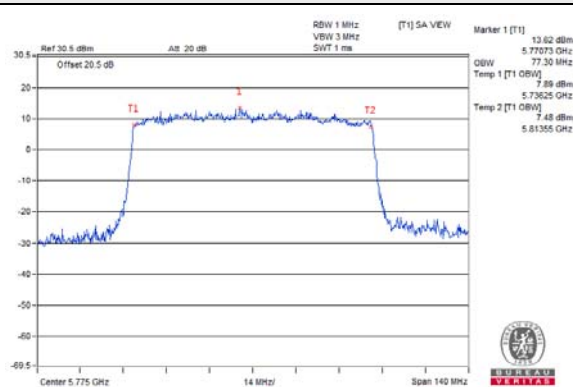
802.11ax (40MHz) / Chain 2 / CH 151



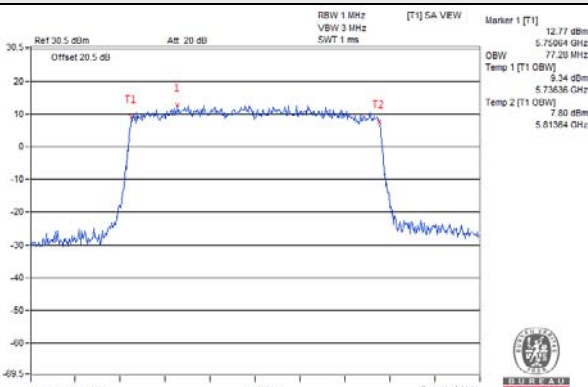
802.11ax (40MHz) / Chain 3 / CH 151



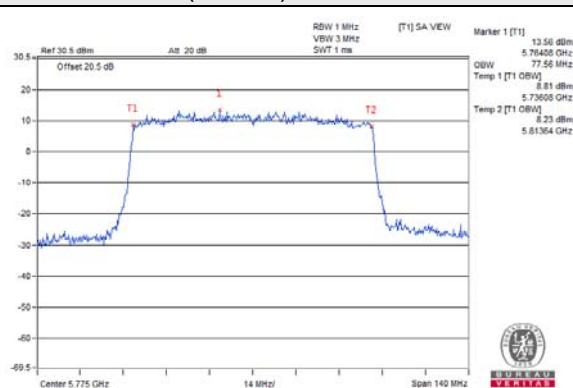
802.11ax (80MHz) / Chain 0 / CH 155



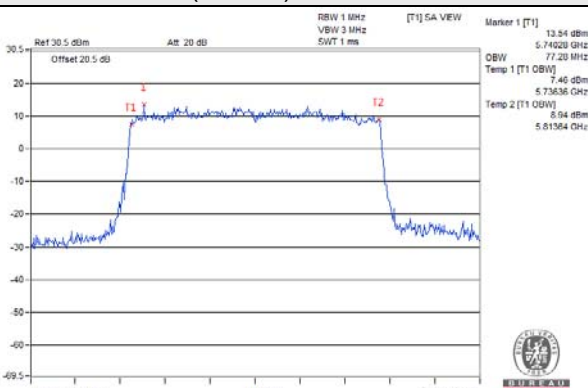
802.11ax (80MHz) / Chain 1 / CH 155



802.11ax (80MHz) / Chain 2 / CH 155



802.11ax (80MHz) / Chain 3 / CH 155

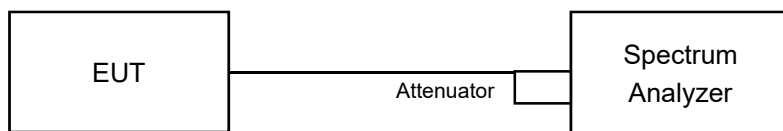


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
	√	Indoor Access Point	
		Mobile and Portable client device	11dBm/ MHz
U-NII-2A			11dBm/ MHz
U-NII-2C			11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedures

For U-NII-1 band:

Using method SA-2

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

For U-NII-3 band:

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz, Set VBW $\geq$ 1 MHz, Detector = RMS
- Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
- Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz} / 300 \text{ kHz})$
- Sweep time = auto, trigger set to "free run".
- Trace average at least 100 traces in power averaging mode.
- Record the max value and add 10 log (1/duty cycle)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as 4.3.6.

4.5.7 Test Results

CDD Mode

For U-NII-1 band:

802.11a

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	5.67	5.63	5.70	5.63	0.25	11.93	12.22	Pass
40	5200	5.72	5.74	5.65	5.66	0.25	11.96	12.22	Pass
48	5240	5.69	5.69	5.67	5.66	0.25	11.95	12.22	Pass

Note:

- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.78\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17 - (10.78 - 6) = 12.22\text{dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (20MHz)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	5.68	5.64	5.69	5.62	0.13	11.81	12.22	Pass
40	5200	5.68	5.78	5.74	5.79	0.13	11.90	12.22	Pass
48	5240	5.59	5.59	5.66	5.57	0.13	11.75	12.22	Pass

Note:

- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.78\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17 - (10.78 - 6) = 12.22\text{dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (40MHz)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	1.85	2.07	2.01	1.90	0.52	8.50	12.22	Pass
46	5230	5.47	5.27	5.33	5.44	0.52	11.92	12.22	Pass

Note:

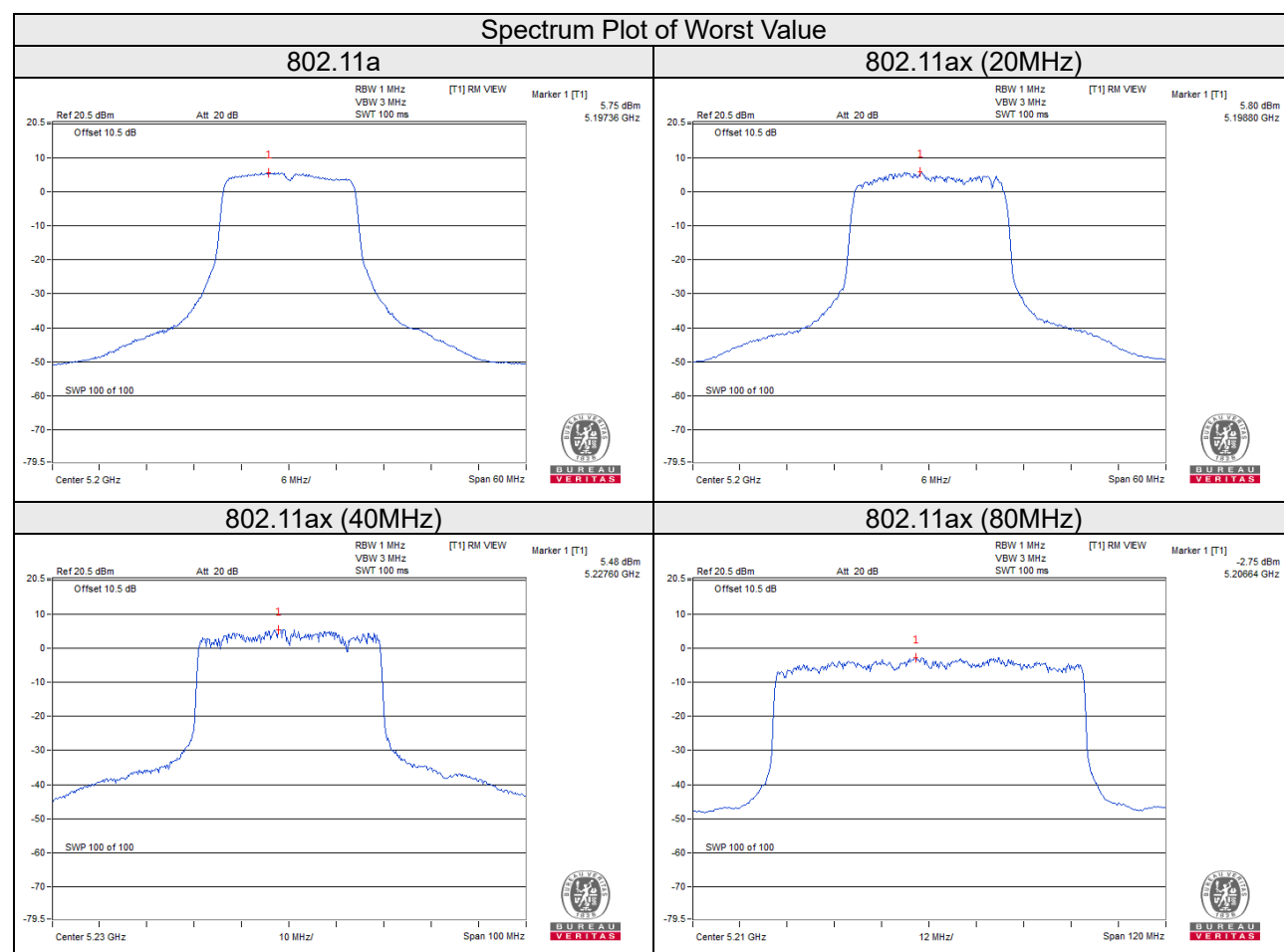
- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.78\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17 - (10.78 - 6) = 12.22\text{dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (80MHz)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	-2.74	-2.80	-2.82	-2.75	0.12	3.36	12.22	Pass

Note:

1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.78 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $17 - (10.78 - 6) = 12.22 \text{ dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.



For U-NII-3 band:

802.11a

Chan.	Freq. (MHz)	PSD w/o Duty Factor(dBm/500kHz)				Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500k Hz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	2.42	2.58	2.67	2.63	0.25	8.85	25.52	Pass
40	5200	1.98	1.99	2.12	1.97	0.25	8.29	25.52	Pass
48	5240	1.68	1.70	1.79	1.81	0.25	8.02	25.52	Pass

Note:

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add $10 \log (N_{ANT})$ dB.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.48\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (10.48 - 6) = 25.52\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (20MHz)

Chan.	Freq. (MHz)	PSD w/o Duty Factor(dBm/500kHz)				Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500k Hz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	1.28	1.57	1.53	1.50	0.13	7.62	25.52	Pass
40	5200	1.04	0.84	0.96	0.85	0.13	7.07	25.52	Pass
48	5240	0.56	0.60	0.55	0.43	0.13	6.69	25.52	Pass

Note:

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add $10 \log (N_{ANT})$ dB.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.48\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (10.48 - 6) = 25.52\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (40MHz)

Chan.	Freq. (MHz)	PSD w/o Duty Factor(dBm/500kHz)				Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500k Hz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	-6.25	-6.28	-6.24	-6.38	0.52	0.25	25.52	Pass
159	5795	-1.88	-2.08	-1.89	-2.21	0.52	4.53	25.52	Pass

Note:

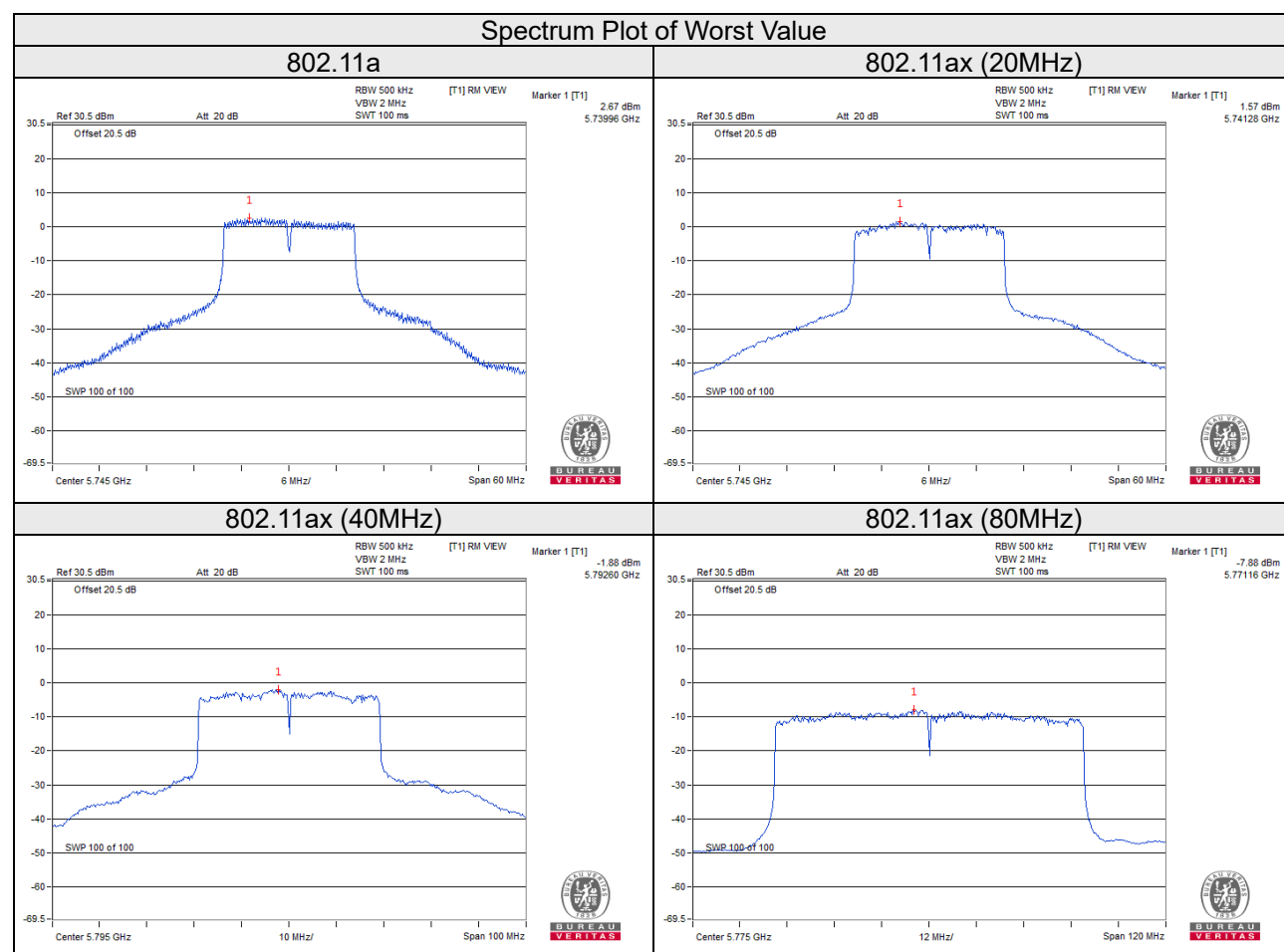
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add $10 \log (N_{ANT})$ dB.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.48\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (10.48 - 6) = 25.52\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (80MHz)

Chan.	Freq. (MHz)	PSD w/o Duty Factor(dBm/500kHz)				Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500k Hz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	-7.88	-8.07	-8.00	-8.10	0.12	-1.87	25.52	Pass

Note:

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4] = 10.48\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (10.48 - 6) = 25.52\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

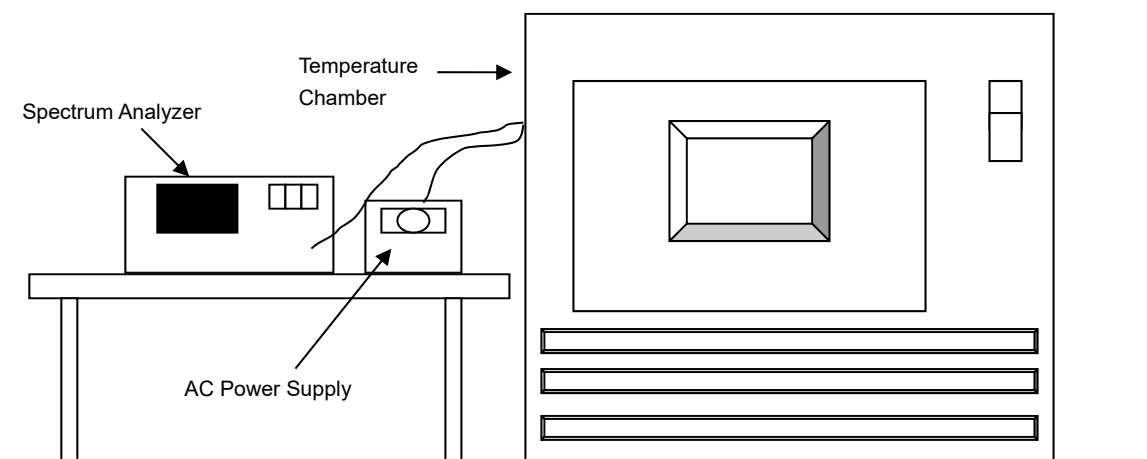


4.6 Frequency Stability

4.6.1 Limits of Frequency Stability Measurement

The frequency of the carrier signal shall be maintained within band of operation

4.6.2 Test Setup



4.6.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
ROHDE & SCHWARZ Spectrum Analyzer	FSV 40	101042	Sep. 23, 2019	Sep. 22, 2020
Temperature & Humidity Chamber	MHU-225AU	920409	May 22, 2020	May 21, 2021
DIGITAL POWER METER IDRC	CP-240	240515	Sep. 11, 2019	Sep. 10, 2020
AC Power Source ExTech	CFW-105	E000603	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.6.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- Repeat step d with the temperature chamber set to the next desired temperature.
- The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

4.6.7 Test Results

CDD Mode

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
50	120	5179.9916	Pass	5179.9894	Pass	5179.9916	Pass	5179.9876	Pass
40	120	5179.9831	Pass	5179.9815	Pass	5179.9826	Pass	5179.9808	Pass
30	120	5180.0123	Pass	5180.0105	Pass	5180.0143	Pass	5180.0151	Pass
20	120	5179.9784	Pass	5179.9814	Pass	5179.9814	Pass	5179.9792	Pass
10	120	5179.9739	Pass	5179.9747	Pass	5179.9755	Pass	5179.9739	Pass
0	120	5179.9764	Pass	5179.9778	Pass	5179.9763	Pass	5179.9787	Pass
-10	120	5180.0132	Pass	5180.0131	Pass	5180.0131	Pass	5180.0165	Pass
-20	120	5180.0062	Pass	5180.0062	Pass	5180.0061	Pass	5180.0052	Pass
-30	120	5180.0138	Pass	5180.0174	Pass	5180.0148	Pass	5180.0138	Pass

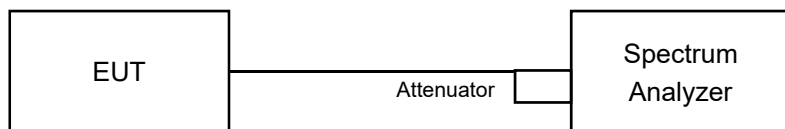
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	138	5179.9792	Pass	5179.9817	Pass	5179.9814	Pass	5179.9788	Pass
	120	5179.9784	Pass	5179.9814	Pass	5179.9814	Pass	5179.9792	Pass
	102	5179.9794	Pass	5179.9818	Pass	5179.9813	Pass	5179.9792	Pass

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.7.7 Test Results

CDD Mode

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	16.35	16.36	16.36	16.35	0.5	Pass
157	5785	16.33	16.31	16.31	16.35	0.5	Pass
165	5825	16.32	16.33	16.34	16.36	0.5	Pass

802.11ax (20MHz)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	18.85	18.72	18.93	18.70	0.5	Pass
157	5785	18.98	18.91	18.86	18.96	0.5	Pass
165	5825	19.01	19.03	18.99	19.00	0.5	Pass

802.11ax (40MHz)

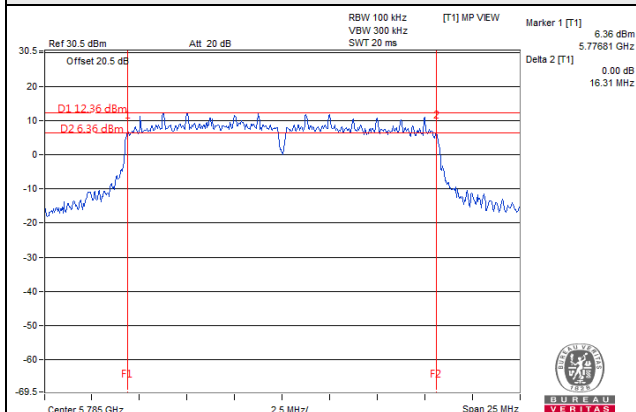
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	37.86	37.90	38.11	37.97	0.5	Pass
159	5795	38.02	38.05	38.07	38.00	0.5	Pass

802.11ax (80MHz)

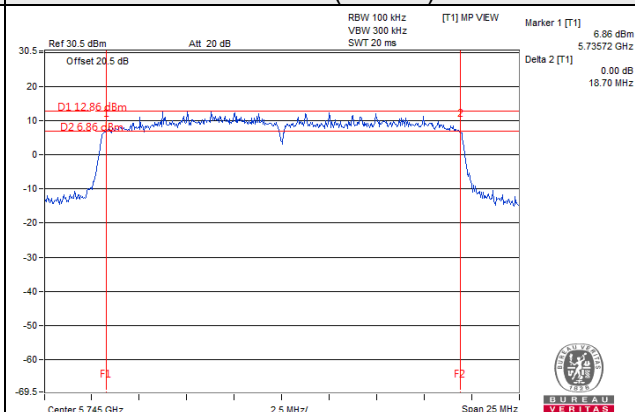
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	77.66	77.78	77.83	78.07	0.5	Pass

Spectrum Plot of Worst Value

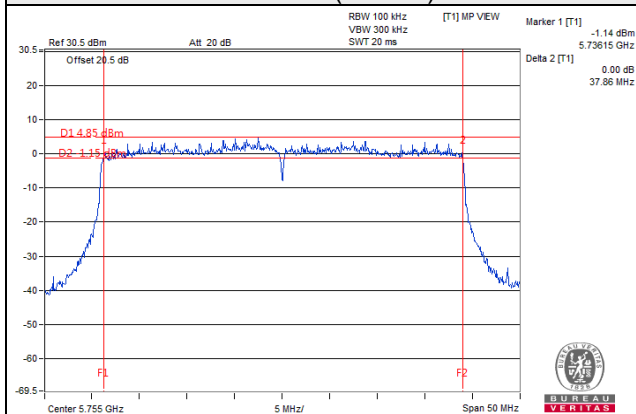
802.11a



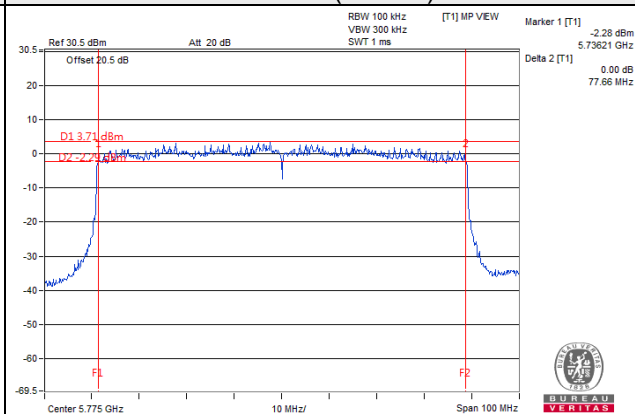
802.11ax (20MHz)



802.11ax (40MHz)



802.11ax (80MHz)



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

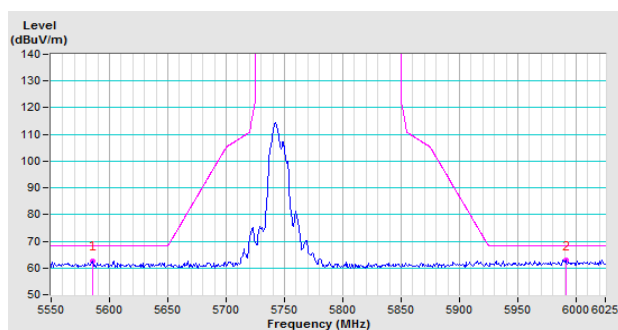
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

CDD Mode

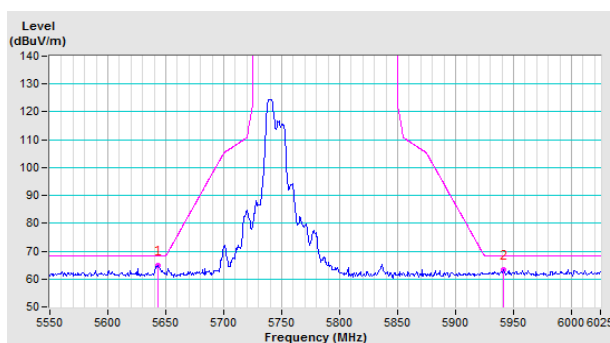
802.11a

CH 149 5745 MHz

Horizontal

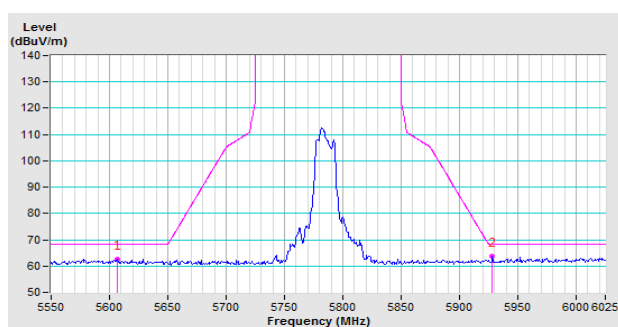


Vertical

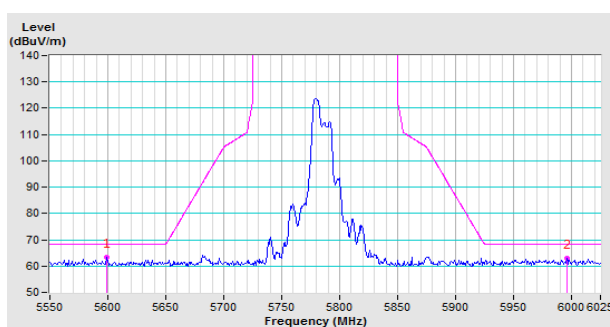


CH 157 5785 MHz

Horizontal

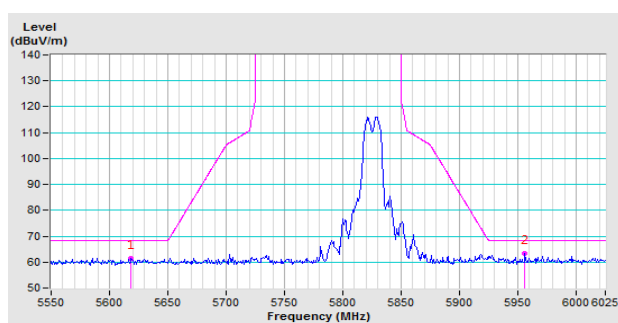


Vertical

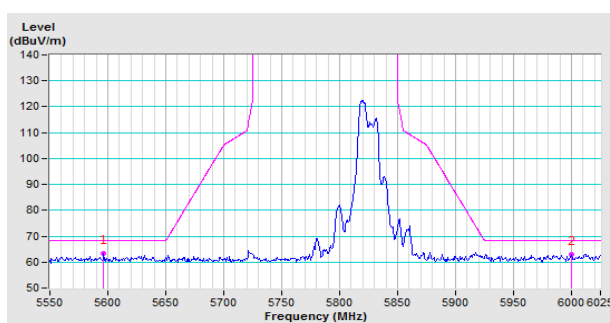


CH 165 5825 MHz

Horizontal



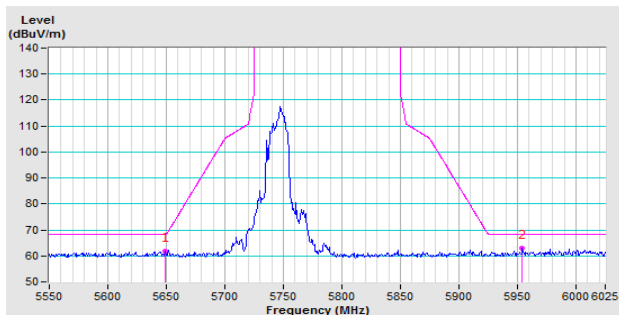
Vertical



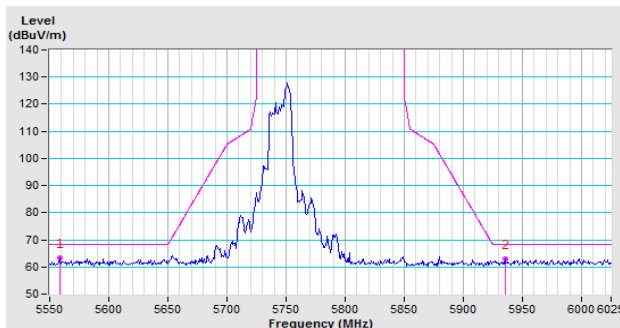
802.11ax (20MHz)

CH 149 5745 MHz

Horizontal

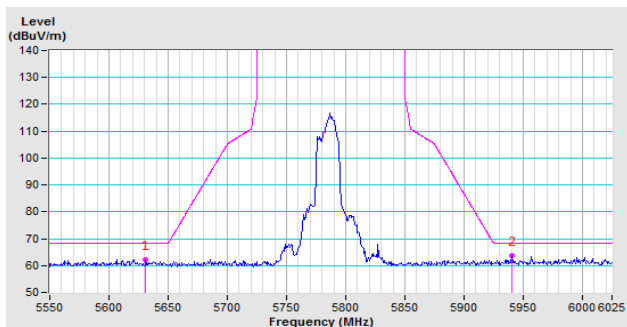


Vertical

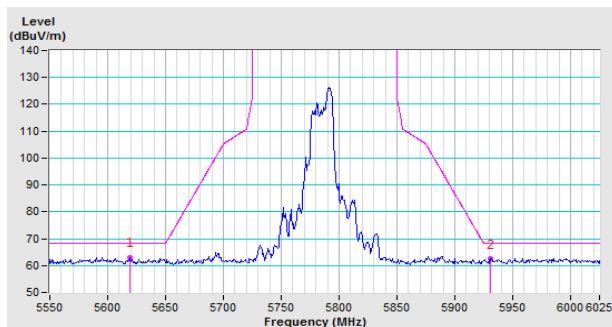


CH 157 5785 MHz

Horizontal

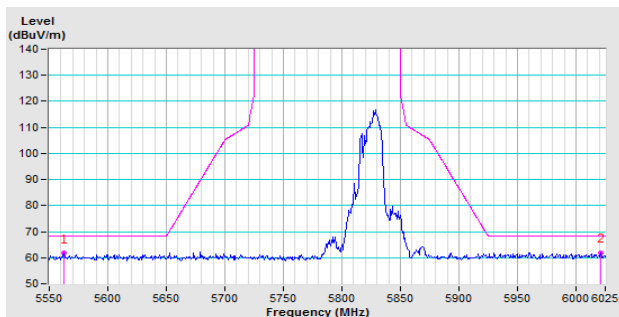


Vertical

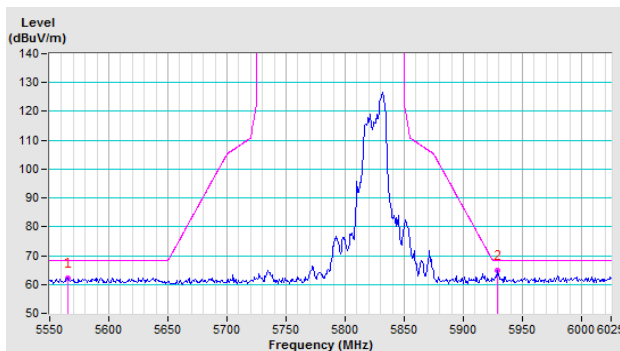


CH 165 5825 MHz

Horizontal



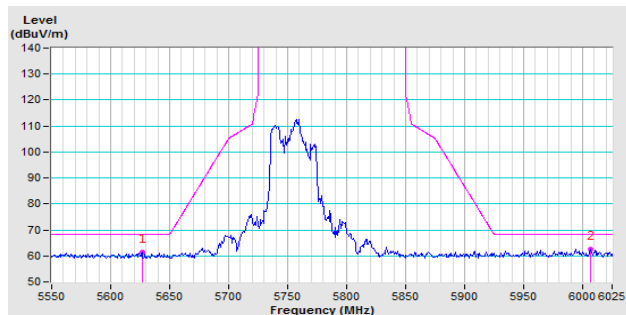
Vertical



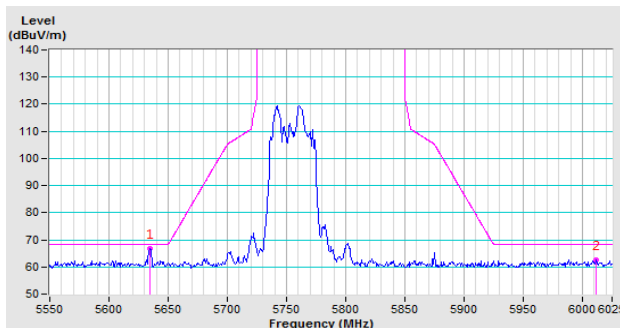
802.11ax (40MHz)

CH 151 5755 MHz

Horizontal

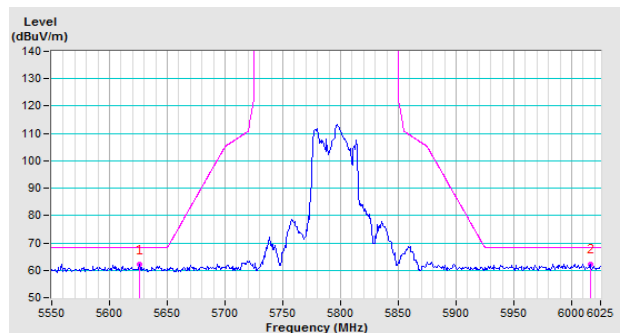


Vertical

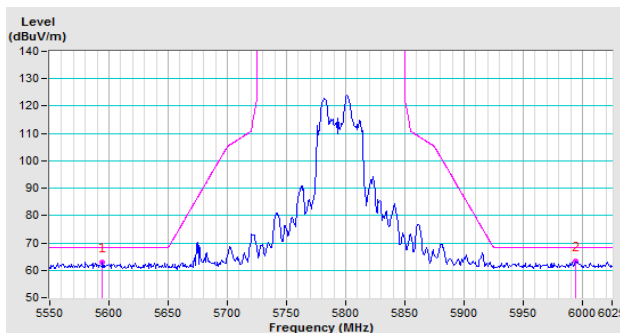


CH 159 5795 MHz

Horizontal



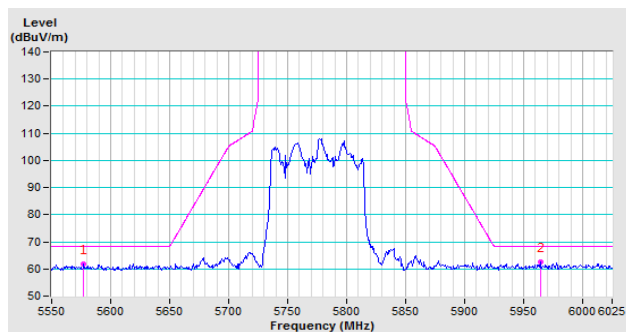
Vertical



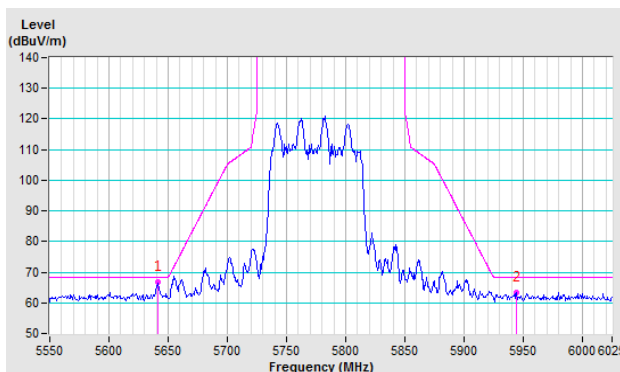
802.11ax (80MHz)

CH 155 5775 MHz

Horizontal



Vertical

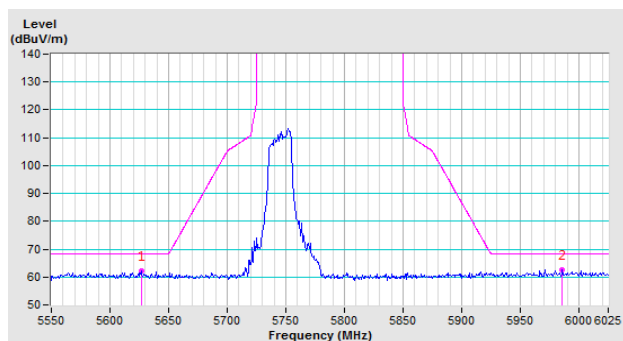


Beamforming Mode

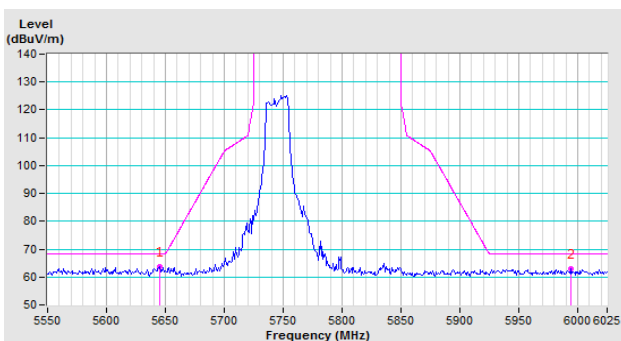
802.11ax (20MHz)

CH 149 5745 MHz

Horizontal

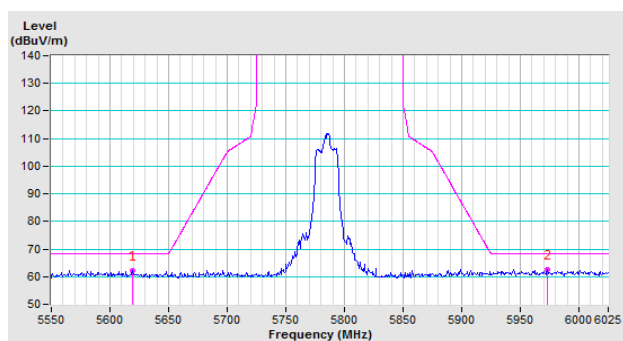


Vertical

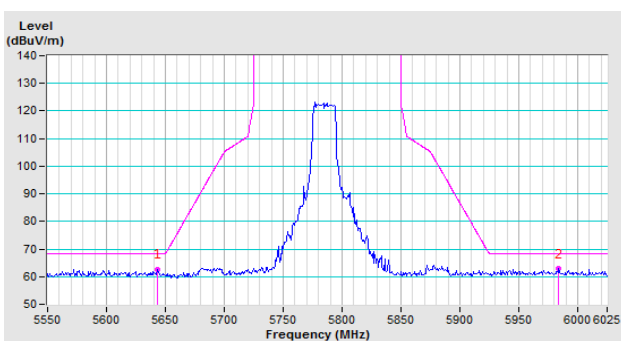


CH 157 5785 MHz

Horizontal

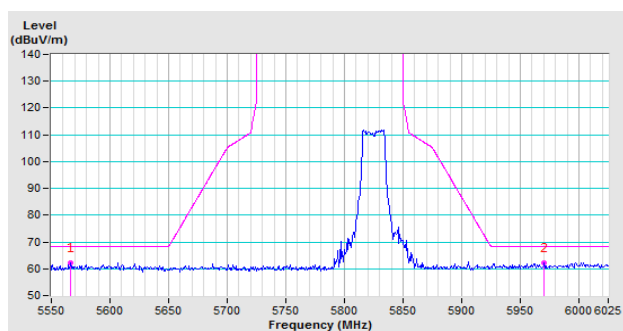


Vertical

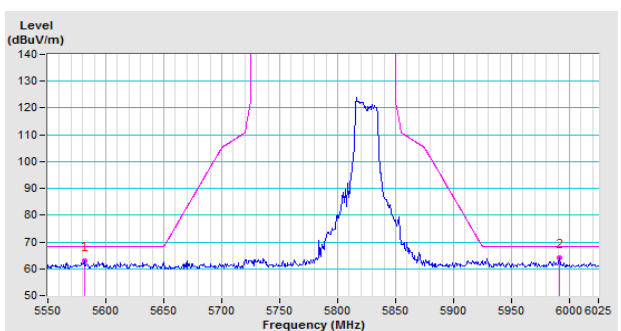


CH 165 5825 MHz

Horizontal



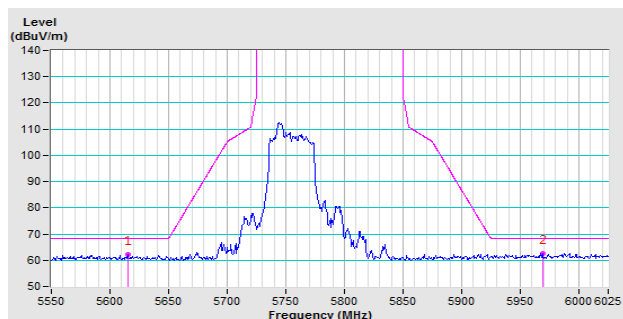
Vertical



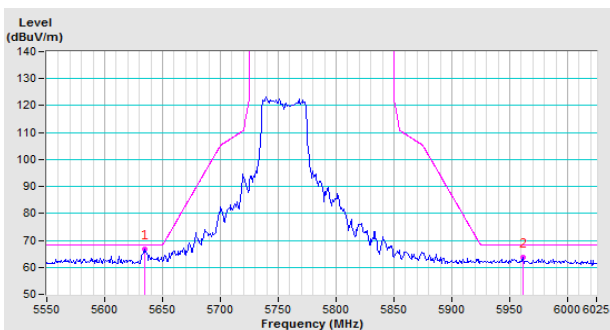
802.11ax (40MHz)

CH 151 5755 MHz

Horizontal

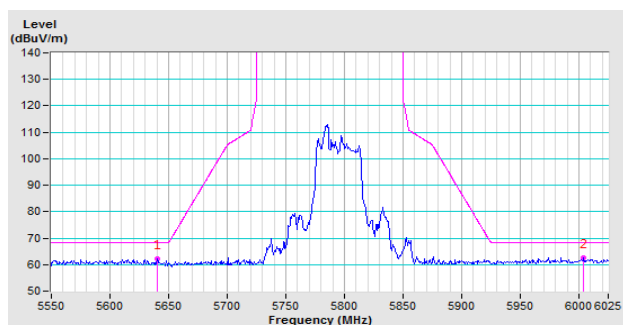


Vertical

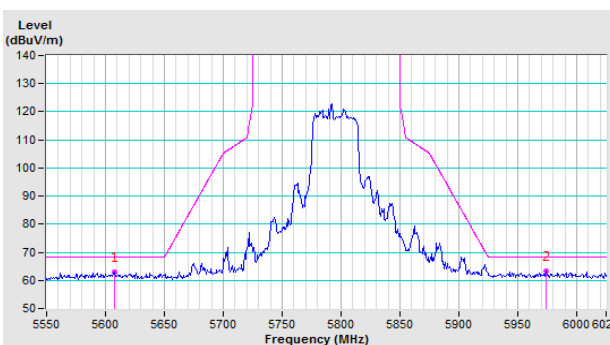


CH 159 5795 MHz

Horizontal



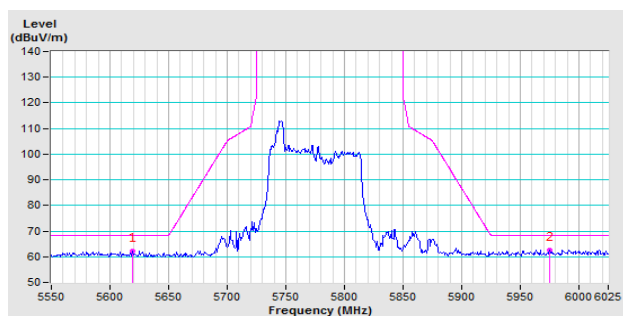
Vertical



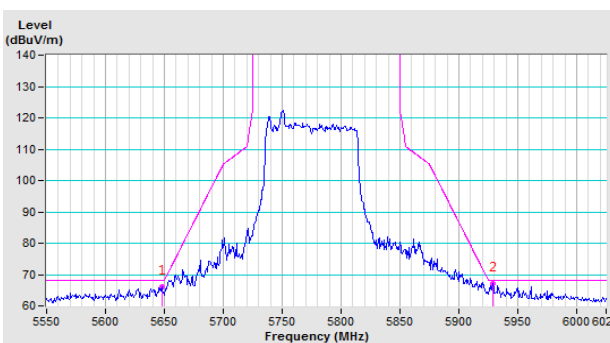
802.11ax (80MHz)

CH 155 5775 MHz

Horizontal



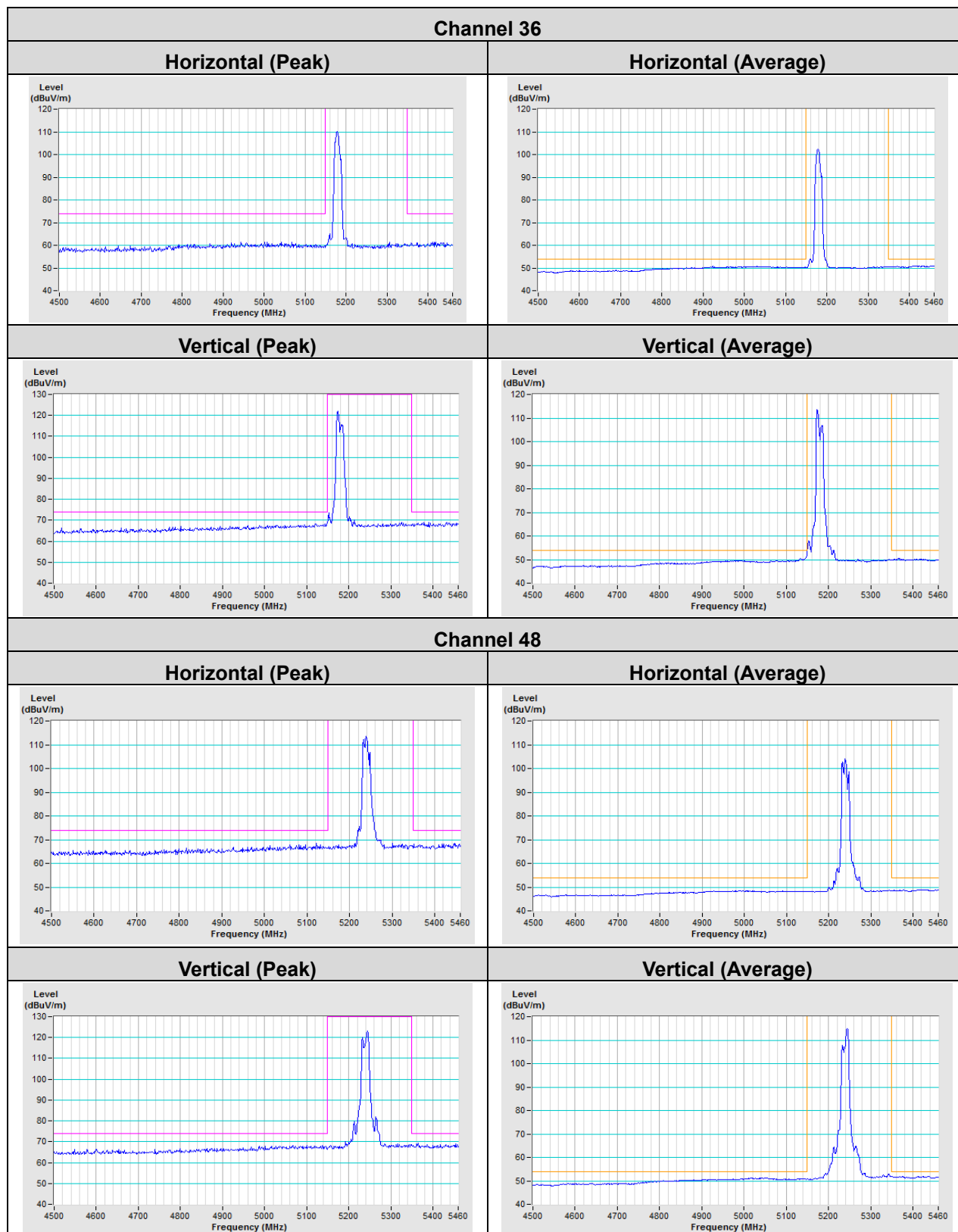
Vertical



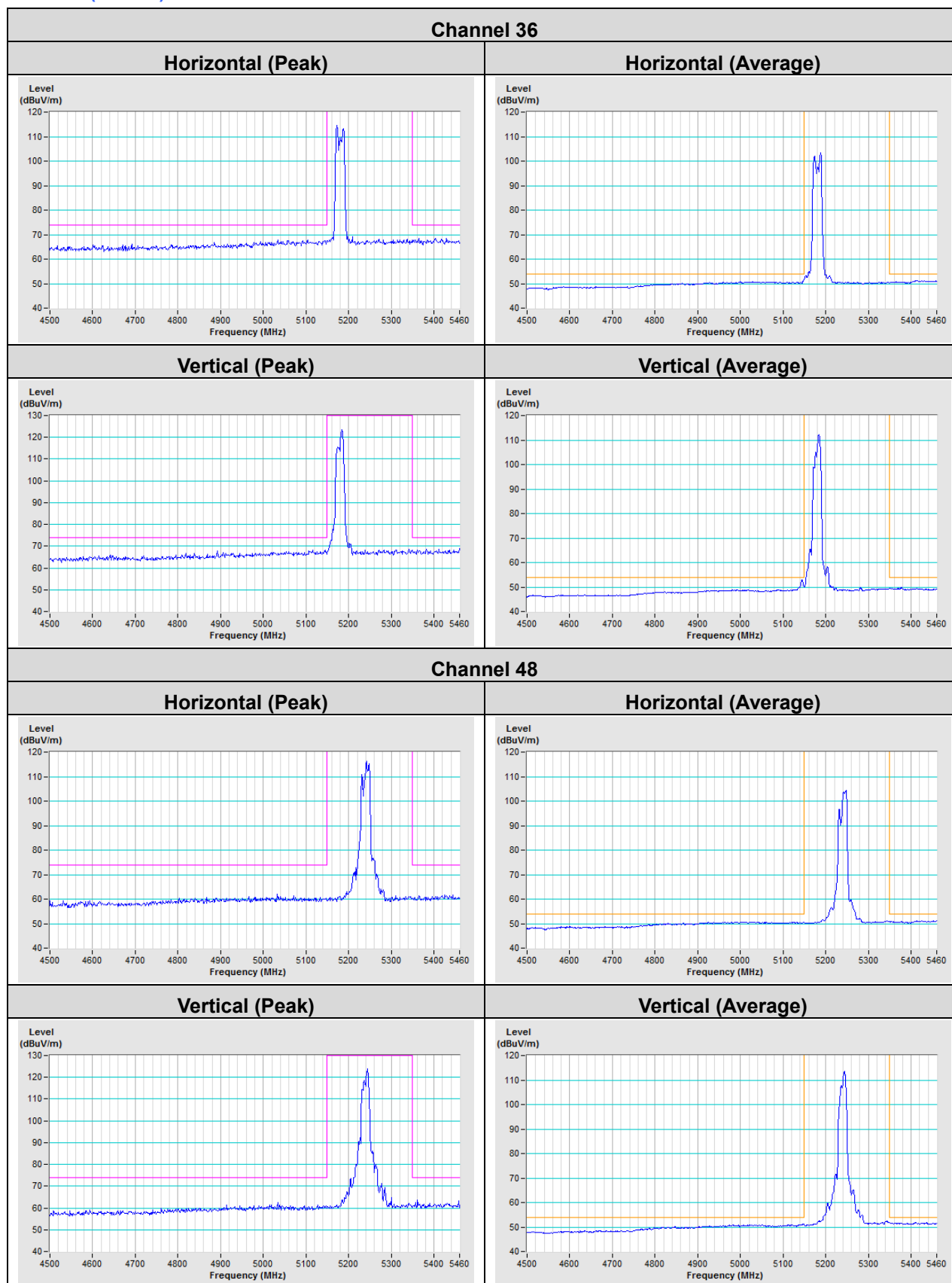
Annex B- Band Edge Measurement

CDD Mode

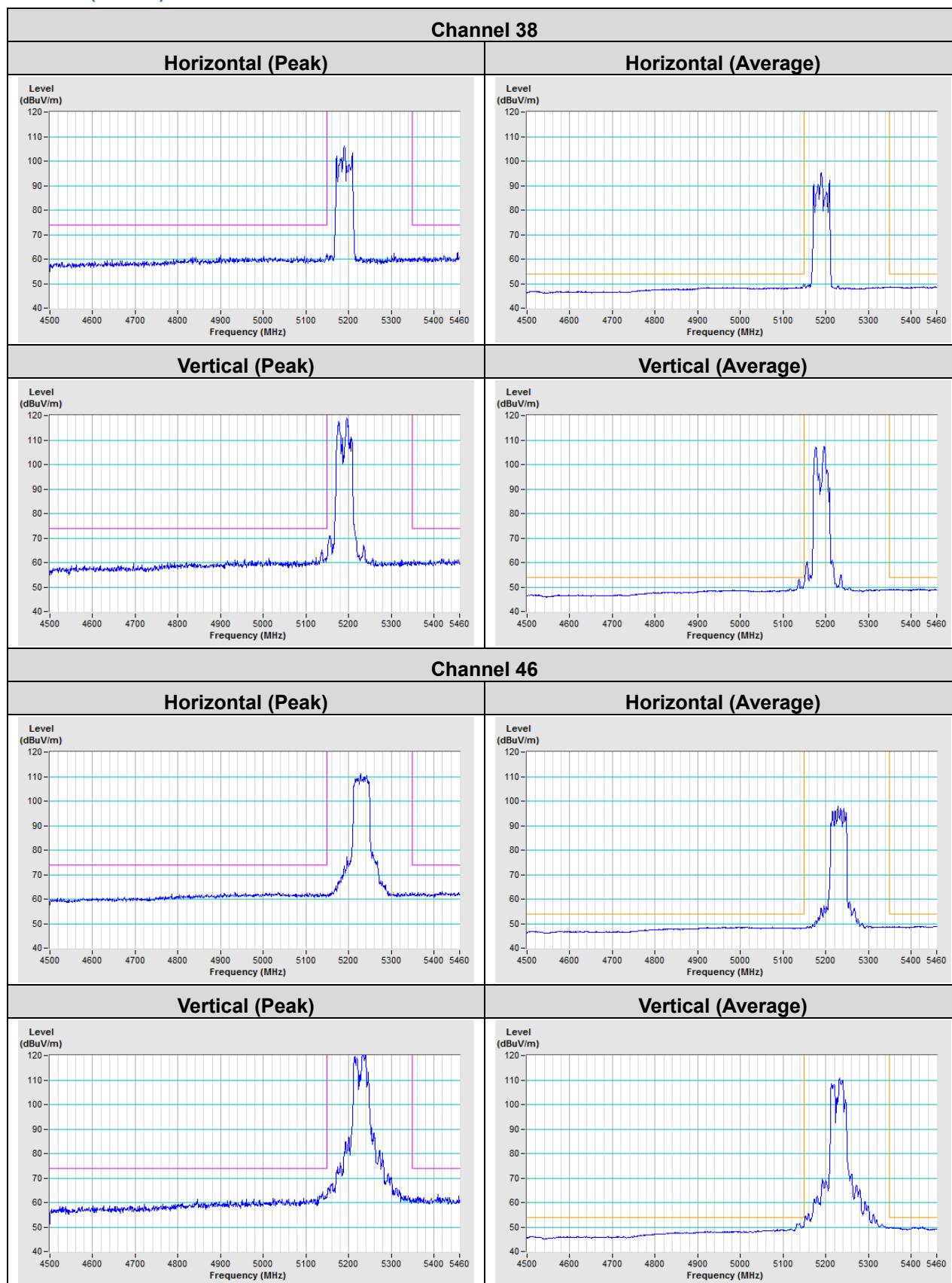
802.11a



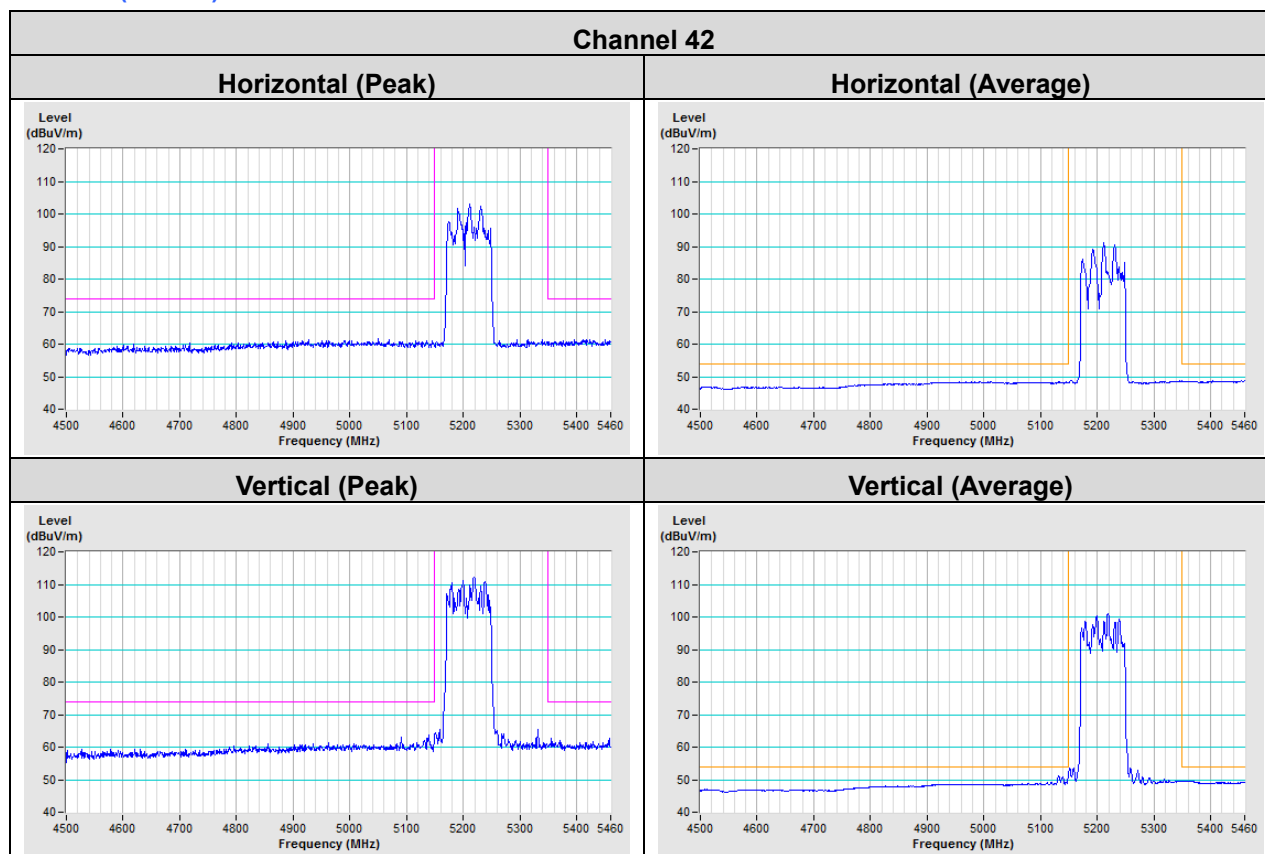
802.11ax (20MHz)



802.11ax (40MHz)

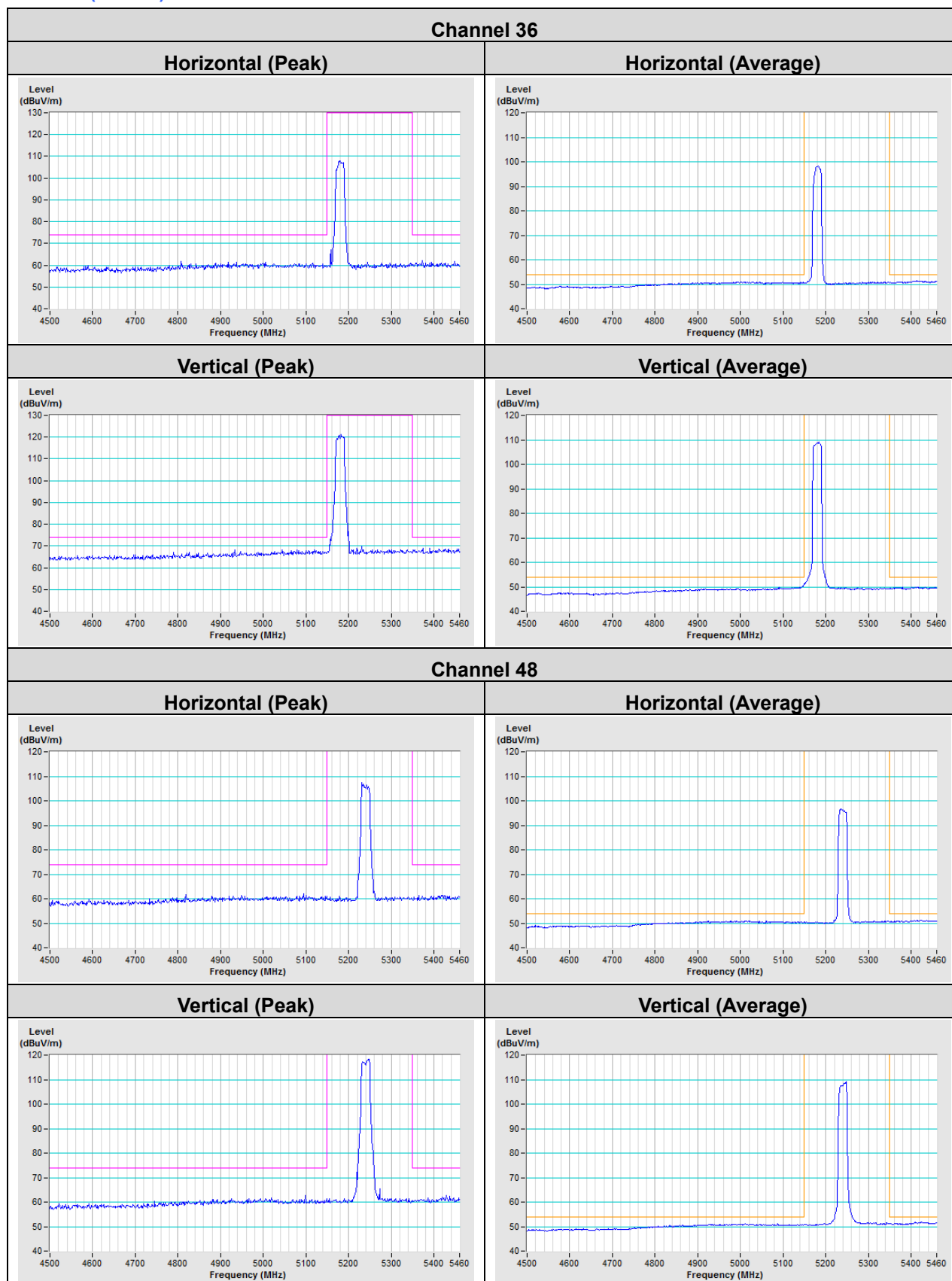


802.11ax (80MHz)

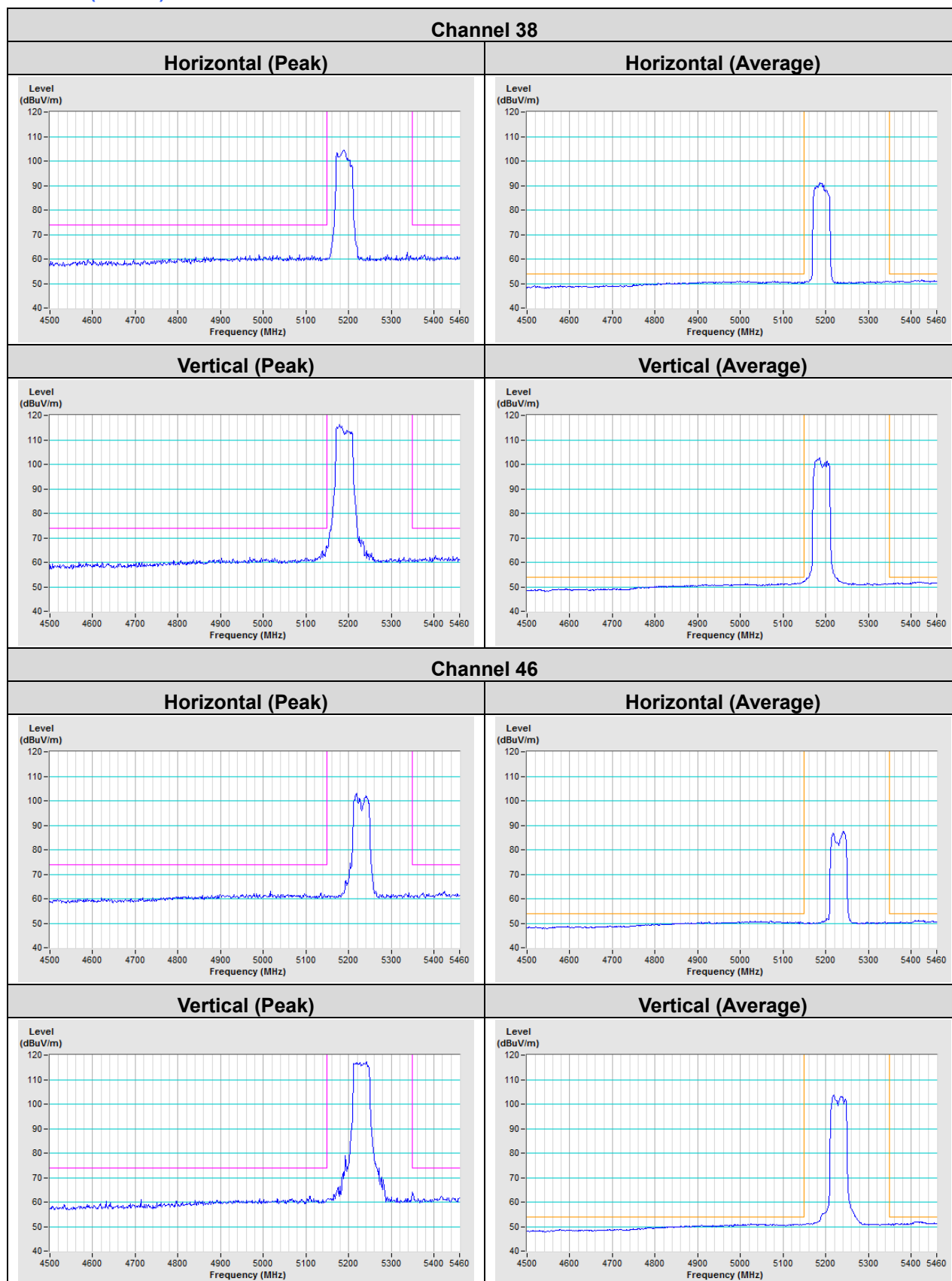


Beamforming Mode

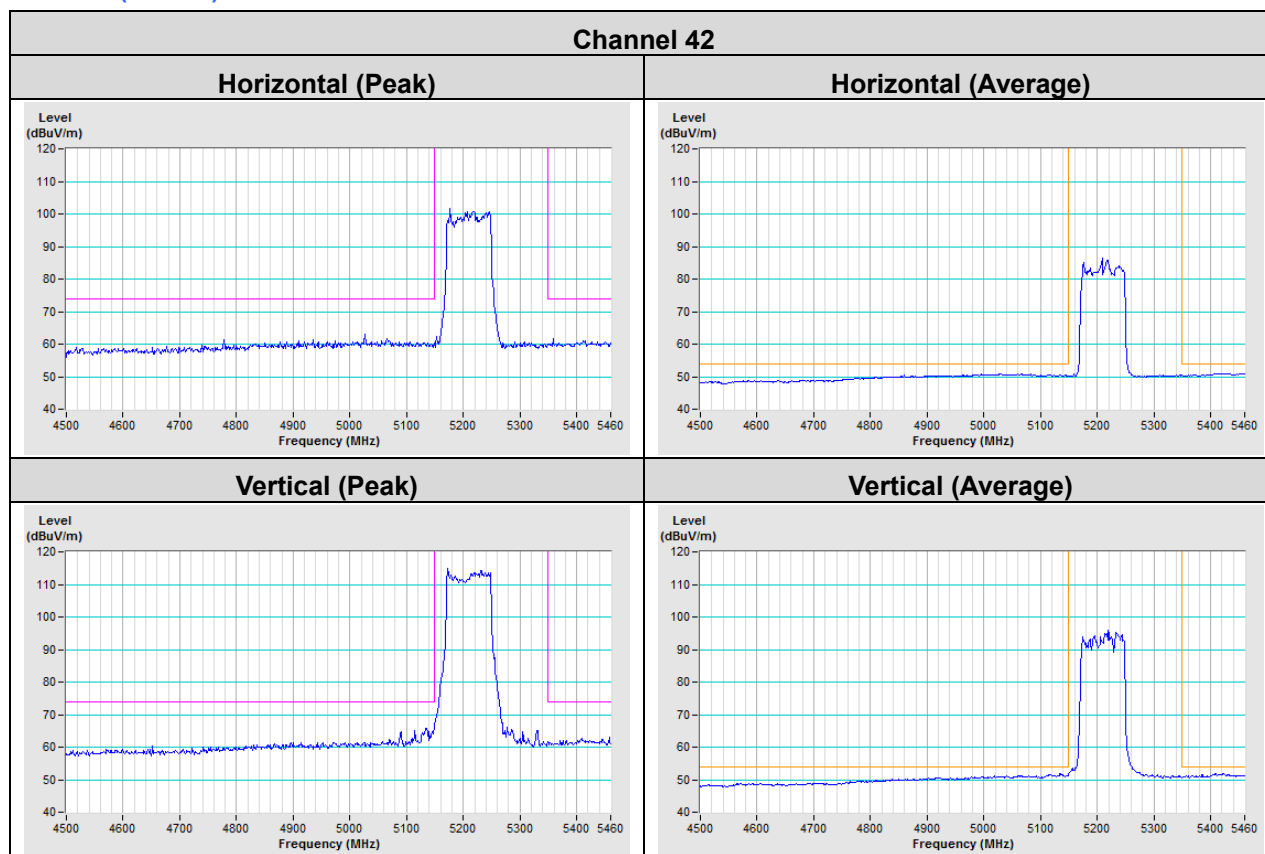
802.11ax (20MHz)



802.11ax (40MHz)



802.11ax (80MHz)



Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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