FCC Test Report

Report No.:	RF200811E02
FCC ID:	JNZVR0025
Test Model:	VR0025
Received Date:	Aug. 11, 2020
Test Date:	Aug. 19 to Nov. 10, 2020
Issued Date:	Dec. 04, 2020
Applicant:	LOGITECH FAR EAST LTD.
Address:	#2 Creation Rd. 4, Science-Based Ind. Park Hsinchu Taiwan, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwa.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RF200811E02	Original release.	Dec. 04, 2020

1 Certificate of Conformity

Product:	Wireless screen sharing kit
Brand:	Logitech
Test Model:	VR0025
Sample Status:	ENGINEERING SAMPLE
Applicant:	LOGITECH FAR EAST LTD.
Test Date:	Aug. 19 to Nov. 10, 2020
Standard:	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 EMC characteristics under the conditions specified in this report.

Prepared by : Vivian Huang , **Date:** Dec. 04, 2020

Vivian Hunag / Specialist

Approved by : , **Date:** Dec. 04, 2020

Clark Lin / 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 -10.11dB at 26.625MHz.
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 -0.3dB 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 Morata not a standard connector.

Note:
1. For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE 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	1.9 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.5 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.1 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless screen sharing kit
Brand	Logitech
Test Model	VR0025
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	5Vdc from USB interface
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	OFDM
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 150Mbps 802.11ac: up to 433.3Mbps
Operating Frequency	5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**5.18 ~ 5.24 GHz:** 23.823 mW **5.745 ~ 5.825 GHz:** 24.155 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	USB to type C Adapter × 1 (Brand: Logitech / Model No.: 502-001344)
Cable Supplied	NA

Note:

1. The EUT may have a lot of colors for marketing requirement.
2. The antenna provided to the EUT, please refer to the following table:

Brand	Model No.	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type
INPAQ TECHNOLOGY CO., LTD	ACM3-5036-A1-CC-S	3.3	5.15~5.85	Chip	Morata

3. The EUT was pre-tested under the following modes:

Test Mode	Description
A	EUT connecter to Laptop
B	**EUT connecter to Laptop with USB to type C Adapter**
Note: From the above modes, the worst case was found in **Mode B**. Therefore only the test data of the mode was recorded in this report.	

4. The EUT incorporates a SISO function.

MODULATION MODE	TX & RX CONFIGURATION	
802.11a	1TX	1RX
802.11n (HT20)	1TX	1RX
802.11n (HT40)	1TX	1RX
802.11ac (VHT20)	1TX	1RX
802.11ac (VHT40)	1TX	1RX
802.11ac (VHT80)	1TX	1RX
Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz, 80MHz), therefore the investigated worst case to representative mode in test report. (Final test mode refer to section 3.2.1)		

5. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.
6. 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.

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

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

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210 MHz

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

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

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775 MHz

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 **RE<1G:** Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane.**

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.

Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

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.

Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240 5745-5825	38 to 48 149 to 165	157	OFDM	BPSK	6

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.

Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240 5745-5825	38 to 48 149 to 165	157	OFDM	BPSK	6

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.

Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Test Condition:

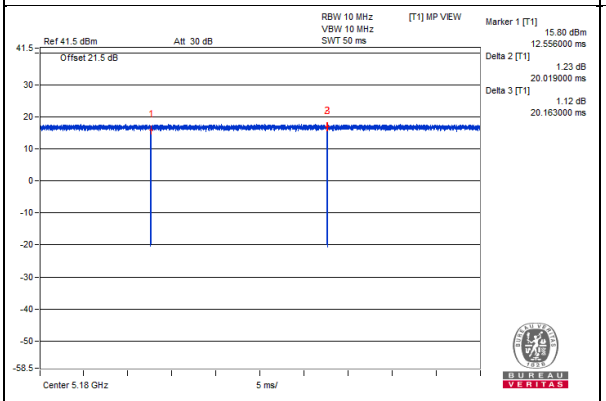
Applicable To	Environmental Conditions	Input Power (System)	Tested By
RE≥1G	25deg. C, 75%RH	120Vac, 60Hz	Nelson Teng
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Nelson Teng
PLC	25deg. C, 75%RH	120Vac, 60Hz	Samposon Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

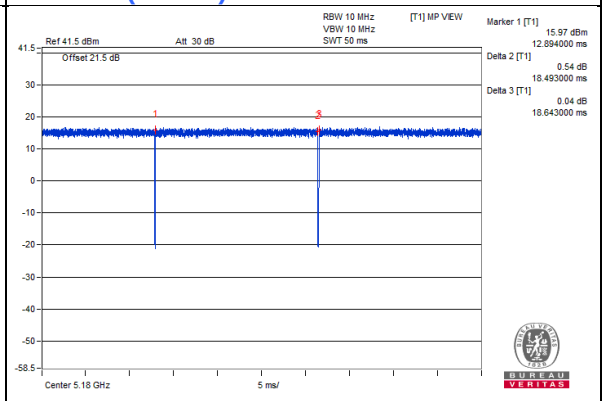
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 20.019 ms / 20.163 ms = 0.993
802.11ac (VHT20): Duty cycle = 18.493 ms / 18.643 ms = 0.992
802.11ac (VHT40): Duty cycle = 8.937 ms / 9.09 ms = 0.983
802.11ac (VHT80): Duty cycle = 4.146 ms / 4.256 ms = 0.974, Duty factor = 10 * log (1/Duty cycle) = 0.11 dB

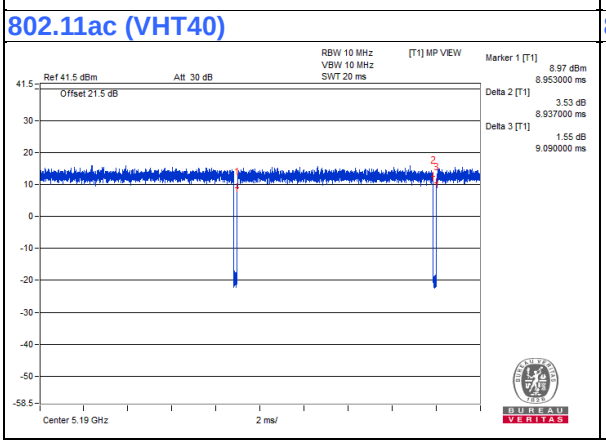
802.11a



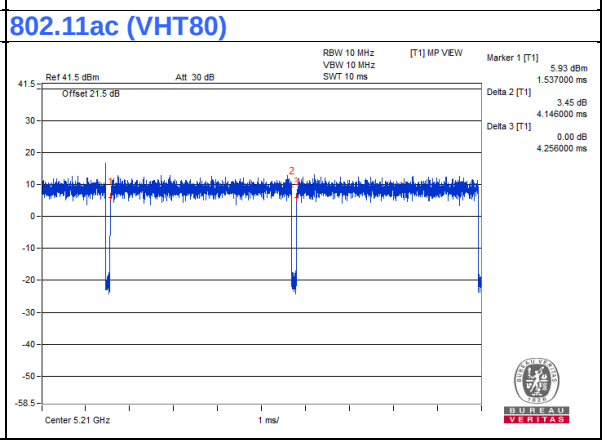
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

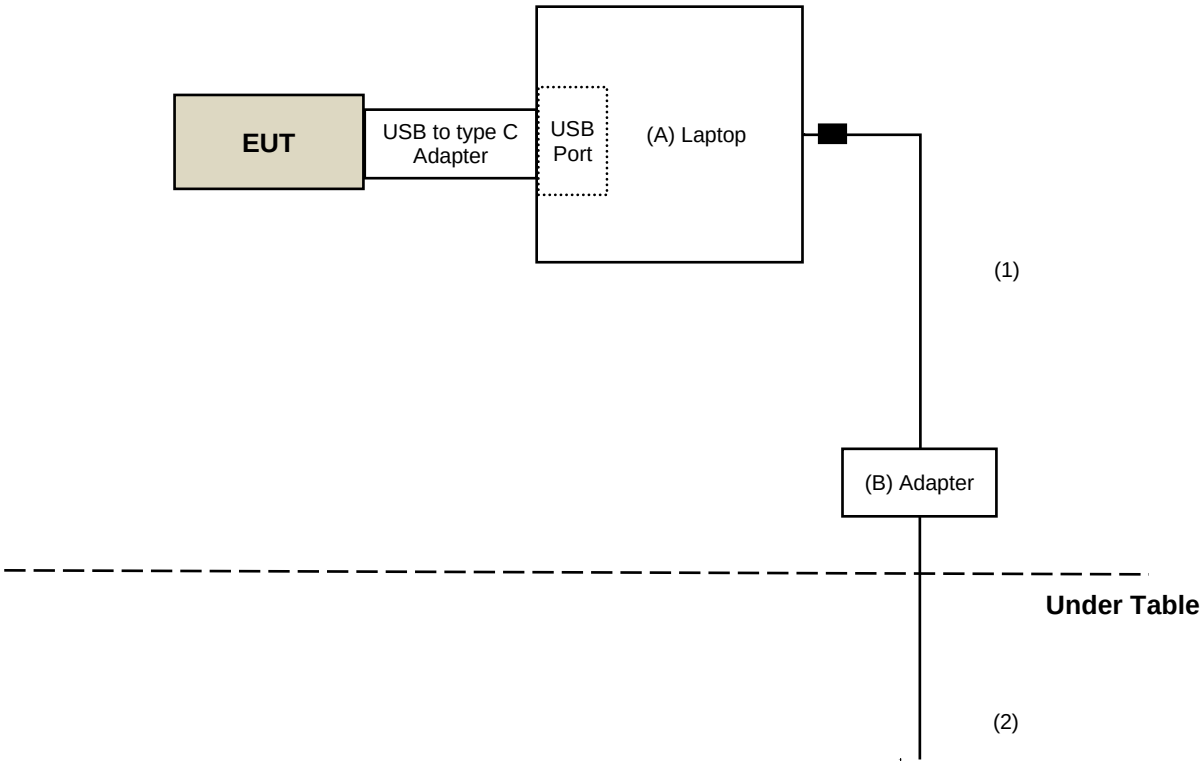
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	Inspiron 7570	DW3CSJ2	NA	Provided by Lab
B.	Adapter	Dell	LA65NS2-01	NA	NA	Provided by Lab

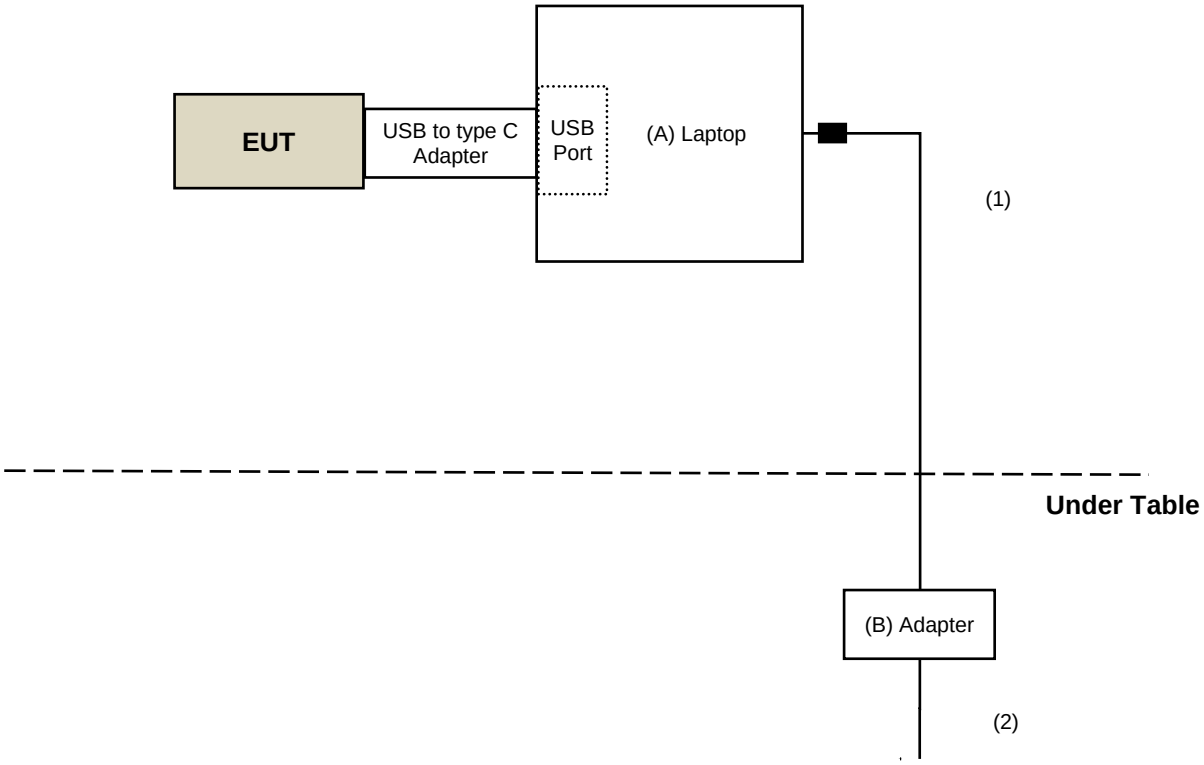
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.8	No	1	Provided by Lab
2.	AC Cable	1	0.8	No	0	Provided by Lab

3.4.1 Configuration of System under Test

For AC Power Conducted Emission test:



For Radiated Emission test:



3.5 General Description of Applied Standard 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

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 (dBµV/m)	AV:54 (dBµV/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(dBµV/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(dBµV/m) *1 PK:105.2 (dBµV/m) *2 PK: 110.8(dBµV/m) *3 PK:122.2 (dBµV/m) *4

*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:

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

4.1.2 Test Instruments

For radiated emission (below 1GHz) & bandedge & OOBE test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	Dec. 13, 2019	Dec. 12, 2020
Pre-Amplifier EMCI	EMC001340	980142	May 25, 2020	May 24, 2021
Loop Antenna Electro-Metrics	EM-6879	264	Feb. 18, 2020	Feb. 17, 2021
RF Cable	NA	LOOPCAB-001	Jan. 08, 2020	Jan. 07, 2021
RF Cable	NA	LOOPCAB-002	Jan. 08, 2020	Jan. 07, 2021
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Oct. 23, 2019	Oct. 22, 2020
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 11, 2019	Nov. 10, 2020
RF Cable	8D	966-4-1	Mar. 18, 2020	Mar. 17, 2021
RF Cable	8D	966-4-2	Mar. 18, 2020	Mar. 17, 2021
RF Cable	8D	966-4-3	Mar. 18, 2020	Mar. 17, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Sep. 26, 2019	Sep. 25, 2020
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC12630SE	980385	Apr. 08, 2020	Apr. 07, 2021
RF Cable	EMC104-SM-SM-1200	160923	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-2000	180502	Apr. 29, 2020	Apr. 28, 2021
RF Cable	EMC104-SM-SM-6000	180418	Apr. 29, 2020	Apr. 28, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 24, 2019	Nov. 23, 2020
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	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.
2. The test was performed in 966 Chamber No. 4.
3. Tested Date: Aug. 19 to 25, 2020

For radiated emission (above 1GHz) test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	Dec. 13, 2019	Dec. 12, 2020
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC 12630 SE	980638	Apr. 08, 2020	Apr. 07, 2021
RF Cable	EMC104-SM-SM-1200	160923	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-2000	180502	Apr. 29, 2020	Apr. 28, 2021
RF Cable	EMC104-SM-SM-6000	180418	Apr. 29, 2020	Apr. 28, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 24, 2019	Nov. 23, 2020
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	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.
2. The test was performed in 966 Chamber No. 4.
3. Tested Date: Sep. 04, 2020

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	May 29, 2020	May 28, 2021
Power meter Anritsu	ML2495A	1529002	July 22, 2020	July 21, 2021
Power sensor Anritsu	MA2411B	1339443	July 22, 2020	July 21, 2021
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

NOTE: 1. The test was performed in Oven room 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Nov. 10, 2020

4.1.3 Test Procedure

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 detects 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:

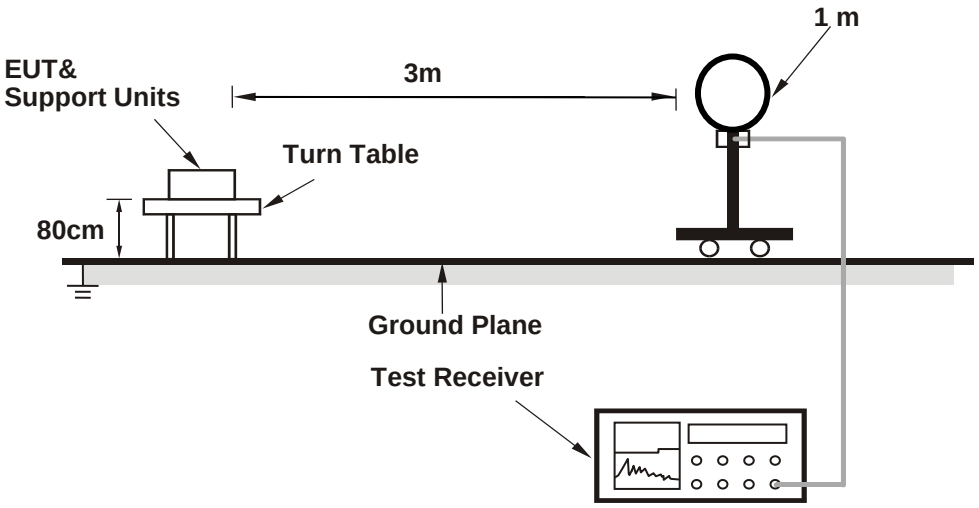
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

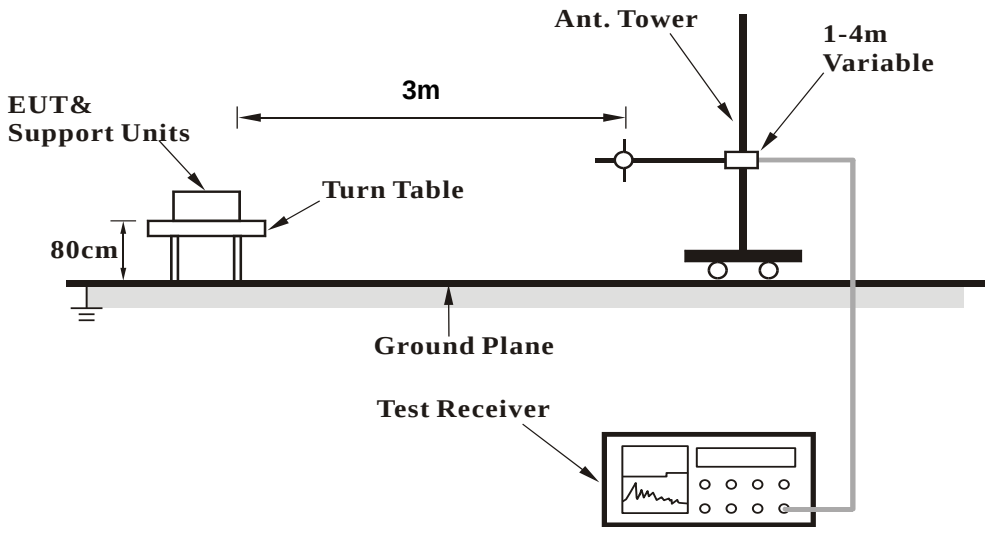
No deviation.

4.1.5 Test Setup

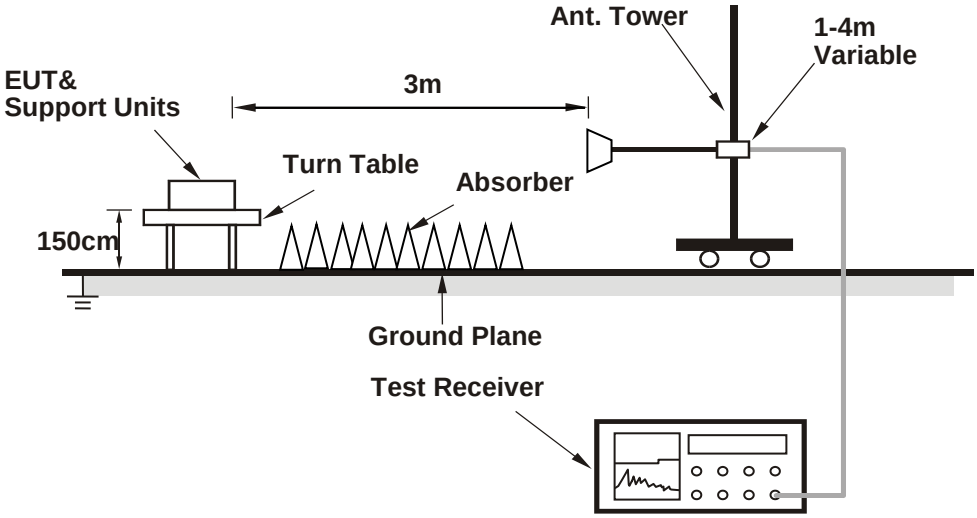
For Radiated emission below 30MHz



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 Condition

a. Placed the EUT on the testing table.
b. Controlling software (QDART_CONN.WIN.1.0 Installer-00039.1) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data:

RF Mode	TX 802.11a	Channel	CH 36：5180 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	66.8 PK	74.0	-7.2	1.08 H	66	66.1	0.7
2	5150.00	53.6 AV	54.0	-0.4	1.08 H	66	52.9	0.7
3	*5180.00	102.9 PK			1.08 H	66	102.2	0.7
4	*5180.00	93.8 AV			1.08 H	66	93.1	0.7
5	#10360.00	47.6 PK	68.2	-20.6	1.73 H	273	37.1	10.5
6	15540.00	51.8 PK	74.0	-22.2	1.33 H	200	39.8	12.0
7	15540.00	39.1 AV	54.0	-14.9	1.33 H	200	27.1	12.0
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	55.3 PK	74.0	-18.7	3.61 V	219	54.6	0.7
2	5150.00	39.7 AV	54.0	-14.3	3.61 V	219	39.0	0.7
3	*5180.00	97.6 PK			3.61 V	219	96.9	0.7
4	*5180.00	88.4 AV			3.61 V	219	87.7	0.7
5	#10360.00	48.9 PK	68.2	-19.3	1.25 V	353	38.4	10.5
6	15540.00	53.3 PK	74.0	-20.7	1.26 V	203	41.3	12.0
7	15540.00	40.8 AV	54.0	-13.2	1.26 V	203	28.8	12.0

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.

RF Mode	TX 802.11a	Channel	CH 40：5200 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	104.3 PK			1.15 H	127	103.7	0.6
2	*5200.00	95.1 AV			1.15 H	127	94.5	0.6
3	#10400.00	47.4 PK	68.2	-20.8	1.67 H	259	36.8	10.6
4	15600.00	51.3 PK	74.0	-22.7	1.33 H	216	39.0	12.3
5	15600.00	38.8 AV	54.0	-15.2	1.33 H	216	26.5	12.3
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	95.4 PK			2.08 V	218	94.8	0.6
2	*5200.00	86.1 AV			2.08 V	218	85.5	0.6
3	#10400.00	48.6 PK	68.2	-19.6	1.21 V	340	38.0	10.6
4	15600.00	52.8 PK	74.0	-21.2	1.20 V	201	40.5	12.3
5	15600.00	40.5 AV	54.0	-13.5	1.20 V	201	28.2	12.3

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.

RF Mode	TX 802.11a	Channel	CH 48：5240 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	101.8 PK			1.08 H	69	101.2	0.6
2	*5240.00	92.7 AV			1.08 H	69	92.1	0.6
3	5350.00	49.0 PK	74.0	-25.0	1.08 H	69	48.4	0.6
4	5350.00	36.1 AV	54.0	-17.9	1.08 H	69	35.5	0.6
5	#10480.00	47.3 PK	68.2	-20.9	1.64 H	264	36.8	10.5
6	15720.00	51.5 PK	74.0	-22.5	1.36 H	214	40.2	11.3
7	15720.00	38.8 AV	54.0	-15.2	1.36 H	214	27.5	11.3
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	97.3 PK			3.76 V	200	96.7	0.6
2	*5240.00	88.0 AV			3.76 V	200	87.4	0.6
3	5350.00	48.8 PK	74.0	-25.2	3.76 V	200	48.2	0.6
4	5350.00	36.1 AV	54.0	-17.9	3.76 V	200	35.5	0.6
5	#10480.00	48.2 PK	68.2	-20.0	1.16 V	345	37.7	10.5
6	15720.00	52.9 PK	74.0	-21.1	1.18 V	195	41.6	11.3
7	15720.00	40.3 AV	54.0	-13.7	1.18 V	195	29.0	11.3

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.

RF Mode	TX 802.11a	Channel	CH 149：5745 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	#5586.57	49.2 PK	68.2	-19.0	1.56 H	269	48.2	1.0
2	*5745.00	109.1 PK			1.56 H	269	107.7	1.4
3	*5745.00	99.6 AV			1.56 H	269	98.2	1.4
4	#5967.63	49.0 PK	68.2	-19.2	1.56 H	269	47.3	1.7
5	11490.00	47.3 PK	74.0	-26.7	1.67 H	250	35.5	11.8
6	11490.00	34.6 AV	54.0	-19.4	1.67 H	250	22.8	11.8
7	#17235.00	51.8 PK	68.2	-16.4	1.29 H	217	36.4	15.4
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	#5558.55	49.2 PK	68.2	-19.0	2.48 V	156	48.2	1.0
2	*5745.00	100.5 PK			2.48 V	156	99.1	1.4
3	*5745.00	91.1 AV			2.48 V	156	89.7	1.4
4	#5981.05	49.2 PK	68.2	-19.0	2.48 V	156	47.5	1.7
5	11490.00	48.9 PK	74.0	-25.1	1.22 V	345	37.1	11.8
6	11490.00	37.5 AV	54.0	-16.5	1.22 V	345	25.7	11.8
7	#17235.00	52.8 PK	68.2	-15.4	1.19 V	199	37.4	15.4

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.

RF Mode	TX 802.11a	Channel	CH 157：5785 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	#5609.48	49.6 PK	68.2	-18.6	1.50 H	268	48.5	1.1
2	*5785.00	107.9 PK			1.50 H	268	106.4	1.5
3	*5785.00	98.3 AV			1.50 H	268	96.8	1.5
4	#5970.94	50.4 PK	68.2	-17.8	1.50 H	268	48.7	1.7
5	11570.00	46.8 PK	74.0	-27.2	1.63 H	247	35.3	11.5
6	11570.00	34.4 AV	54.0	-19.6	1.63 H	247	22.9	11.5
7	#17355.00	50.8 PK	68.2	-17.4	1.37 H	230	34.5	16.3
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	#5643.46	47.8 PK	68.2	-20.4	3.17 V	207	46.7	1.1
2	*5785.00	97.4 PK			1.82 V	177	95.9	1.5
3	*5785.00	87.9 AV			1.82 V	177	86.4	1.5
4	#5982.65	48.3 PK	68.2	-19.9	3.17 V	207	46.6	1.7
5	11570.00	48.5 PK	74.0	-25.5	1.22 V	310	37.0	11.5
6	11570.00	36.5 AV	54.0	-17.5	1.22 V	310	25.0	11.5
7	#17355.00	53.9 PK	68.2	-14.3	1.27 V	246	37.6	16.3

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.

RF Mode	TX 802.11a	Channel	CH 165：5825 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	#5609.68	48.1 PK	68.2	-20.1	1.38 H	269	47.0	1.1
2	*5825.00	108.8 PK			1.38 H	269	107.1	1.7
3	*5825.00	99.3 AV			1.38 H	269	97.6	1.7
4	#5971.02	48.1 PK	68.2	-20.1	1.38 H	269	46.4	1.7
5	11650.00	47.8 PK	74.0	-26.2	1.68 H	271	36.5	11.3
6	11650.00	35.3 AV	54.0	-18.7	1.68 H	271	24.0	11.3
7	#17475.00	51.6 PK	68.2	-16.6	1.39 H	212	33.1	18.5
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	#5606.82	49.4 PK	68.2	-18.8	1.71 V	178	48.3	1.1
2	*5825.00	98.1 PK			1.71 V	178	96.4	1.7
3	*5825.00	88.6 AV			1.71 V	178	86.9	1.7
4	#5949.55	48.7 PK	68.2	-19.5	1.71 V	178	47.1	1.6
5	11650.00	48.0 PK	74.0	-26.0	1.22 V	352	36.7	11.3
6	11650.00	36.7 AV	54.0	-17.3	1.22 V	352	25.4	11.3
7	#17475.00	52.9 PK	68.2	-15.3	1.22 V	214	34.4	18.5

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.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 36：5180 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	61.7 PK	74.0	-12.3	1.46 H	264	61.0	0.7
2	5150.00	51.8 AV	54.0	-2.2	1.46 H	264	51.1	0.7
3	*5180.00	101.0 PK			1.46 H	264	100.3	0.7
4	*5180.00	91.9 AV			1.46 H	264	91.2	0.7
5	#10360.00	48.0 PK	68.2	-20.2	1.66 H	268	37.5	10.5
6	15540.00	51.5 PK	74.0	-22.5	1.37 H	207	39.5	12.0
7	15540.00	39.2 AV	54.0	-14.8	1.37 H	207	27.2	12.0
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	59.7 PK	74.0	-14.3	3.60 V	219	59.0	0.7
2	5150.00	48.8 AV	54.0	-5.2	3.60 V	219	48.1	0.7
3	*5180.00	97.4 PK			3.60 V	219	96.7	0.7
4	*5180.00	88.2 AV			3.60 V	219	87.5	0.7
5	#10360.00	48.8 PK	68.2	-19.4	1.17 V	327	38.3	10.5
6	15540.00	52.4 PK	74.0	-21.6	1.19 V	202	40.4	12.0
7	15540.00	40.0 AV	54.0	-14.0	1.19 V	202	28.0	12.0

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.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 40：5200 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	104.3 PK			1.36 H	4	103.7	0.6
2	*5200.00	94.6 AV			1.36 H	4	94.0	0.6
3	#10400.00	47.4 PK	68.2	-20.8	1.69 H	259	36.8	10.6
4	15600.00	51.6 PK	74.0	-22.4	1.31 H	218	39.3	12.3
5	15600.00	38.9 AV	54.0	-15.1	1.31 H	218	26.6	12.3
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	95.6 PK			2.45 V	220	95.0	0.6
2	*5200.00	86.1 AV			2.45 V	220	85.5	0.6
3	#10400.00	49.0 PK	68.2	-19.2	1.21 V	320	38.4	10.6
4	15600.00	52.1 PK	74.0	-21.9	1.18 V	216	39.8	12.3
5	15600.00	39.9 AV	54.0	-14.1	1.18 V	216	27.6	12.3

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.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 48：5240 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	5049.65	47.8 PK	74.0	-26.2	1.07 H	181	46.7	1.1
2	5049.65	36.4 AV	54.0	-17.6	1.07 H	181	35.3	1.1
3	*5240.00	101.5 PK			1.07 H	181	100.9	0.6
4	*5240.00	92.5 AV			1.07 H	181	91.9	0.6
5	5366.00	49.0 PK	74.0	-25.0	1.07 H	181	48.3	0.7
6	5366.00	36.5 AV	54.0	-17.5	1.07 H	181	35.8	0.7
7	#10480.00	47.3 PK	68.2	-20.9	1.66 H	250	36.8	10.5
8	15720.00	51.6 PK	74.0	-22.4	1.31 H	224	40.3	11.3
9	15720.00	39.2 AV	54.0	-14.8	1.31 H	224	27.9	11.3
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	96.9 PK			3.53 V	210	96.3	0.6
2	*5240.00	87.6 AV			3.53 V	210	87.0	0.6
3	5350.00	48.3 PK	74.0	-25.7	3.53 V	210	47.7	0.6
4	5350.00	36.5 AV	54.0	-17.5	3.53 V	210	35.9	0.6
5	#10480.00	48.6 PK	68.2	-19.6	1.16 V	351	38.1	10.5
6	15720.00	52.6 PK	74.0	-21.4	1.17 V	211	41.3	11.3
7	15720.00	40.6 AV	54.0	-13.4	1.17 V	211	29.3	11.3

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.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 149：5745 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	#5583.37	49.7 PK	68.2	-18.5	1.65 H	271	48.7	1.0
2	*5745.00	110.0 PK			1.65 H	271	108.6	1.4
3	*5745.00	100.2 AV			1.65 H	271	98.8	1.4
4	#6008.78	48.5 PK	68.2	-19.7	1.65 H	271	46.8	1.7
5	11490.00	47.6 PK	74.0	-26.4	1.65 H	262	35.8	11.8
6	11490.00	34.8 AV	54.0	-19.2	1.65 H	262	23.0	11.8
7	#17235.00	51.7 PK	68.2	-16.5	1.28 H	217	36.3	15.4
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	#5622.09	48.9 PK	68.2	-19.3	2.28 V	156	47.9	1.0
2	*5745.00	99.7 PK			2.28 V	156	98.3	1.4
3	*5745.00	90.3 AV			2.28 V	156	88.9	1.4
4	#6008.54	50.6 PK	68.2	-17.6	2.28 V	156	48.9	1.7
5	11490.00	49.1 PK	74.0	-24.9	1.16 V	332	37.3	11.8
6	11490.00	37.4 AV	54.0	-16.6	1.16 V	332	25.6	11.8
7	#17235.00	52.8 PK	68.2	-15.4	1.22 V	208	37.4	15.4

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.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 157：5785 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	#5602.24	49.6 PK	68.2	-18.6	1.58 H	266	48.5	1.1
2	*5785.00	110.5 PK			1.58 H	266	109.0	1.5
3	*5785.00	102.2 AV			1.58 H	266	100.7	1.5
4	#5984.83	49.0 PK	68.2	-19.2	1.58 H	266	47.3	1.7
5	11570.00	47.6 PK	74.0	-26.4	1.70 H	258	36.1	11.5
6	11570.00	34.8 AV	54.0	-19.2	1.70 H	258	23.3	11.5
7	#17355.00	51.8 PK	68.2	-16.4	1.26 H	233	35.5	16.3
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	#5582.05	48.9 PK	68.2	-19.3	1.82 V	177	47.9	1.0
2	*5785.00	97.9 PK			3.17 V	207	96.4	1.5
3	*5785.00	88.6 AV			3.17 V	207	87.1	1.5
4	#5966.95	49.4 PK	68.2	-18.8	1.82 V	177	47.7	1.7
5	11570.00	48.6 PK	74.0	-25.4	1.22 V	349	37.1	11.5
6	11570.00	37.1 AV	54.0	-16.9	1.22 V	349	25.6	11.5
7	#17355.00	53.3 PK	68.2	-14.9	1.18 V	190	37.0	16.3

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.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 165：5825 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	#5594.04	48.6 PK	68.2	-19.6	1.51 H	263	47.5	1.1
2	*5825.00	110.6 PK			1.51 H	263	108.9	1.7
3	*5825.00	102.3 AV			1.51 H	263	100.6	1.7
4	#5936.65	49.6 PK	68.2	-18.6	1.51 H	263	48.0	1.6
5	11650.00	46.9 PK	74.0	-27.1	1.65 H	275	35.6	11.3
6	11650.00	34.1 AV	54.0	-19.9	1.65 H	275	22.8	11.3
7	#17475.00	51.0 PK	68.2	-17.2	1.28 H	229	32.5	18.5
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	#5609.24	49.3 PK	68.2	-18.9	1.71 V	178	48.2	1.1
2	*5825.00	98.2 PK			1.71 V	178	96.5	1.7
3	*5825.00	88.5 AV			1.71 V	178	86.8	1.7
4	#5967.88	49.2 PK	68.2	-19.0	1.71 V	178	47.5	1.7
5	11650.00	48.9 PK	74.0	-25.1	1.16 V	334	37.6	11.3
6	11650.00	37.4 AV	54.0	-16.6	1.16 V	334	26.1	11.3
7	#17475.00	52.2 PK	68.2	-16.0	1.25 V	194	33.7	18.5

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.

RF Mode	TX 802.11ac (VHT40)	Channel	CH 38：5190 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	66.7 PK	74.0	-7.3	1.47 H	181	66.0	0.7
2	**5150.00**	**53.7 AV**	**54.0**	**-0.3**	**1.47 H**	**181**	**53.0**	**0.7**
3	*5190.00	95.9 PK			1.47 H	181	95.2	0.7
4	*5190.00	87.4 AV			1.47 H	181	86.7	0.7
5	#10380.00	47.7 PK	68.2	-20.5	1.67 H	254	37.2	10.5
6	15570.00	51.6 PK	74.0	-22.4	1.35 H	212	39.3	12.3
7	15570.00	39.0 AV	54.0	-15.0	1.35 H	212	26.7	12.3
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	59.5 PK	74.0	-14.5	3.58 V	207	58.8	0.7
2	5150.00	47.8 AV	54.0	-6.2	3.58 V	207	47.1	0.7
3	*5190.00	91.5 PK			3.58 V	207	90.8	0.7
4	*5190.00	82.6 AV			3.58 V	207	81.9	0.7
5	#10380.00	48.4 PK	68.2	-19.8	1.23 V	355	37.9	10.5
6	15570.00	52.5 PK	74.0	-21.5	1.15 V	215	40.2	12.3
7	15570.00	40.4 AV	54.0	-13.6	1.15 V	215	28.1	12.3

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.

RF Mode	TX 802.11ac (VHT40)	Channel	CH 46：5230 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	49.7 PK	74.0	-24.3	1.28 H	181	49.0	0.7
2	5150.00	40.2 AV	54.0	-13.8	1.28 H	181	39.5	0.7
3	*5230.00	98.4 PK			1.28 H	181	97.8	0.6
4	*5230.00	89.8 AV			1.28 H	181	89.2	0.6
5	5350.00	48.3 PK	74.0	-25.7	1.28 H	181	47.7	0.6
6	5350.00	37.0 AV	54.0	-17.0	1.28 H	181	36.4	0.6
7	#10460.00	47.2 PK	68.2	-21.0	1.74 H	270	36.5	10.7
8	15690.00	51.6 PK	74.0	-22.4	1.33 H	222	40.2	11.4
9	15690.00	38.9 AV	54.0	-15.1	1.33 H	222	27.5	11.4
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	49.0 PK	74.0	-25.0	3.55 V	210	48.3	0.7
2	5150.00	36.5 AV	54.0	-17.5	3.55 V	210	35.8	0.7
3	*5230.00	93.8 PK			3.55 V	210	93.2	0.6
4	*5230.00	84.6 AV			3.55 V	210	84.0	0.6
5	5350.00	48.9 PK	74.0	-25.1	3.55 V	210	48.3	0.6
6	5350.00	35.5 AV	54.0	-18.5	3.55 V	210	34.9	0.6
7	#10460.00	48.5 PK	68.2	-19.7	1.22 V	332	37.8	10.7
8	15690.00	53.0 PK	74.0	-21.0	1.18 V	192	41.6	11.4
9	15690.00	40.4 AV	54.0	-13.6	1.18 V	192	29.0	11.4

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.

RF Mode	TX 802.11ac (VHT40)	Channel	CH 151：5755 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	#5612.50	54.4 PK	68.2	-13.8	1.40 H	269	53.4	1.0
2	*5755.00	107.0 PK			1.40 H	269	105.6	1.4
3	*5755.00	98.4 AV			1.40 H	269	97.0	1.4
4	#6000.38	48.3 PK	68.2	-19.9	1.40 H	269	46.6	1.7
5	11510.00	46.9 PK	74.0	-27.1	1.71 H	253	35.3	11.6
6	11510.00	34.1 AV	54.0	-19.9	1.71 H	253	22.5	11.6
7	#17265.00	51.3 PK	68.2	-16.9	1.34 H	225	35.8	15.5
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	#5616.96	49.3 PK	68.2	-18.9	2.54 V	218	48.3	1.0
2	*5755.00	96.3 PK			2.54 V	218	94.9	1.4
3	*5755.00	86.9 AV			2.54 V	218	85.5	1.4
4	#6004.69	49.7 PK	68.2	-18.5	2.54 V	218	48.0	1.7
5	11510.00	48.9 PK	74.0	-25.1	1.22 V	346	37.3	11.6
6	11510.00	37.3 AV	54.0	-16.7	1.22 V	346	25.7	11.6
7	#17265.00	53.4 PK	68.2	-14.8	1.26 V	192	37.9	15.5

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.

RF Mode	TX 802.11ac (VHT40)	Channel	CH 159：5795 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	#5642.14	49.0 PK	68.2	-19.2	1.59 H	267	47.9	1.1
2	*5795.00	107.2 PK			1.59 H	267	105.7	1.5
3	*5795.00	99.9 AV			1.59 H	267	98.4	1.5
4	#5945.06	53.6 PK	68.2	-14.6	1.59 H	267	52.0	1.6
5	11590.00	46.9 PK	74.0	-27.1	1.70 H	266	35.4	11.5
6	11590.00	34.1 AV	54.0	-19.9	1.70 H	266	22.6	11.5
7	#17385.00	51.5 PK	68.2	-16.7	1.31 H	224	34.5	17.0
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	#5573.36	49.4 PK	68.2	-18.8	1.50 V	318	48.4	1.0
2	*5795.00	93.6 PK			1.50 V	318	92.1	1.5
3	*5795.00	84.1 AV			1.50 V	318	82.6	1.5
4	#5964.15	49.4 PK	68.2	-18.8	1.50 V	318	47.7	1.7
5	11590.00	49.1 PK	74.0	-24.9	1.24 V	344	37.6	11.5
6	11590.00	37.7 AV	54.0	-16.3	1.24 V	344	26.2	11.5
7	#17385.00	52.9 PK	68.2	-15.3	1.16 V	193	35.9	17.0

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.

RF Mode	TX 802.11ac (VHT80)	Channel	CH 42：5210 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	65.8 PK	74.0	-8.2	1.58 H	182	65.1	0.7
2	5150.00	52.6 AV	54.0	-1.4	1.58 H	182	51.9	0.7
3	*5210.00	93.4 PK			1.58 H	182	92.7	0.7
4	*5210.00	84.3 AV			1.58 H	182	83.6	0.7
5	#10420.00	47.1 PK	68.2	-21.1	1.66 H	245	36.5	10.6
6	15630.00	52.1 PK	74.0	-21.9	1.26 H	214	40.1	12.0
7	15630.00	39.4 AV	54.0	-14.6	1.26 H	214	27.4	12.0
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	59.9 PK	74.0	-14.1	3.59 V	208	59.2	0.7
2	5150.00	46.9 AV	54.0	-7.1	3.59 V	208	46.2	0.7
3	*5210.00	88.5 PK			3.59 V	208	87.8	0.7
4	*5210.00	79.1 AV			3.59 V	208	78.4	0.7
5	#10420.00	49.1 PK	68.2	-19.1	1.20 V	352	38.5	10.6
6	15630.00	52.8 PK	74.0	-21.2	1.21 V	200	40.8	12.0
7	15630.00	40.5 AV	54.0	-13.5	1.21 V	200	28.5	12.0

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.

RF Mode	TX 802.11ac (VHT80)	Channel	CH 155：5775 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) 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	#5645.93	65.8 PK	68.2	-2.4	1.53 H	269	64.7	1.1
2	*5775.00	104.4 PK			1.53 H	269	102.9	1.5
3	*5775.00	95.5 AV			1.53 H	269	94.0	1.5
4	#5926.88	64.1 PK	68.2	-4.1	1.53 H	269	62.6	1.5
5	11550.00	47.8 PK	74.0	-26.2	1.63 H	270	36.2	11.6
6	11550.00	34.8 AV	54.0	-19.2	1.63 H	270	23.2	11.6
7	#17325.00	52.0 PK	68.2	-16.2	1.36 H	232	36.2	15.8
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	#5644.75	50.6 PK	68.2	-17.6	1.51 V	306	49.5	1.1
2	*5775.00	90.9 PK			1.51 V	306	89.4	1.5
3	*5775.00	80.9 AV			1.51 V	306	79.4	1.5
4	#5939.64	49.5 PK	68.2	-18.7	1.51 V	306	47.9	1.6
5	11550.00	48.7 PK	74.0	-25.3	1.23 V	340	37.1	11.6
6	11550.00	37.1 AV	54.0	-16.9	1.23 V	340	25.5	11.6
7	#17325.00	52.4 PK	68.2	-15.8	1.26 V	201	36.6	15.8

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.

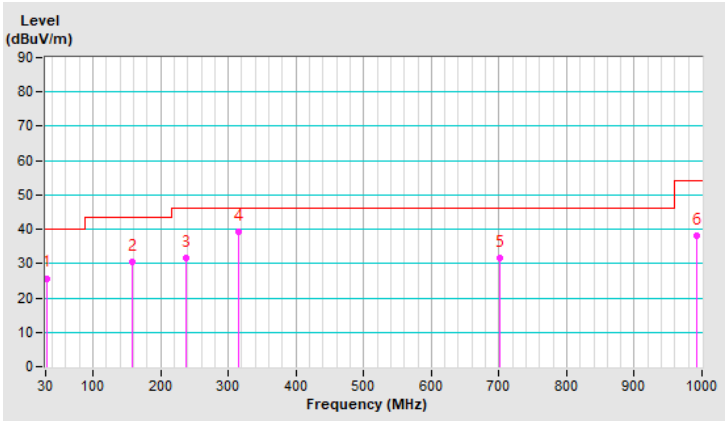
Below 1GHz Data:

RF Mode	TX 802.11a	Channel	CH 157：5785 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	31.14	25.7 QP	40.0	-14.3	4.00 H	349	35.1	-9.4
2	158.04	30.4 QP	43.5	-13.1	2.00 H	2	37.7	-7.3
3	237.07	31.8 QP	46.0	-14.2	1.00 H	0	40.8	-9.0
4	316.10	39.3 QP	46.0	-6.7	1.00 H	20	45.3	-6.0
5	701.77	31.8 QP	46.0	-14.2	3.00 H	169	28.9	2.9
6	992.92	38.0 QP	54.0	-16.0	1.00 H	360	29.4	8.6

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.

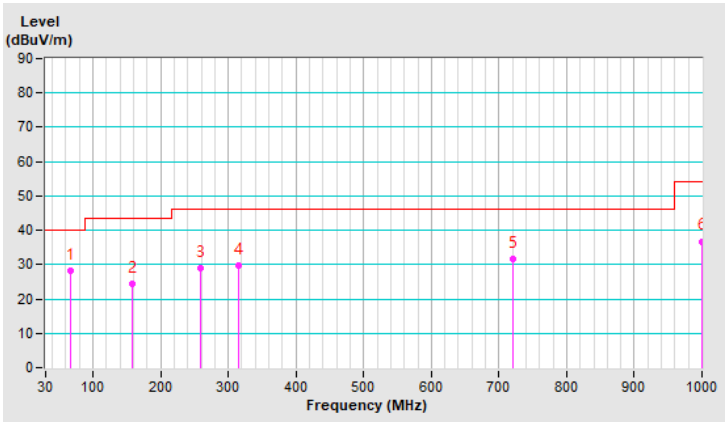


RF Mode	TX 802.11a	Channel	CH 157：5785 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	66.64	28.2 QP	40.0	-11.8	2.00 V	214	37.4	-9.2
2	158.06	24.3 QP	43.5	-19.2	2.00 V	110	31.6	-7.3
3	258.12	28.8 QP	46.0	-17.2	2.00 V	174	37.0	-8.2
4	316.10	29.8 QP	46.0	-16.2	1.00 V	65	35.8	-6.0
5	721.00	31.7 QP	46.0	-14.3	3.00 V	360	28.6	3.1
6	999.88	36.8 QP	54.0	-17.2	4.00 V	99	28.1	8.7

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.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 19, 2020	Mar. 18, 2021
50 ohms Terminator	50	3	Oct. 23, 2019	Oct. 22, 2020
RF Cable	5D-FB	COCCAB-001	Sep. 27, 2019	Sep. 26, 2020
Fixed attenuator EMCI	STI02-2200-10	003	Aug. 29, 2020	Aug. 28, 2021
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3 Tested Date: Sep. 07, 2020

4.2.3 Test Procedure

a. 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.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

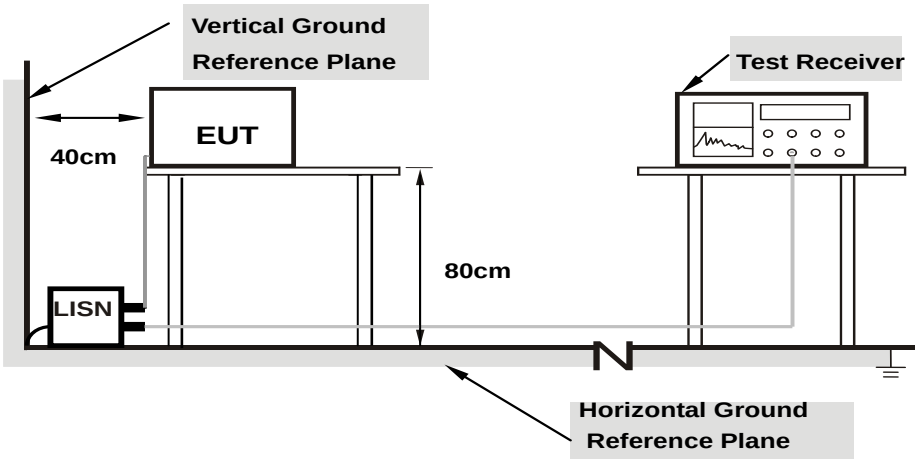
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

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 Condition

Same as 4.1.6.

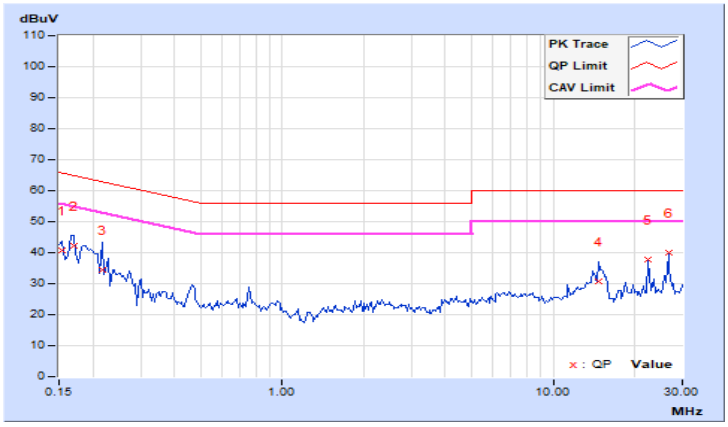
4.2.7 Test Results

RF Mode	TX 802.11a	Channel	CH 157：5785 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.91	30.67	12.59	40.58	22.50	65.79	55.79	-25.21	-33.29
2	0.16953	9.92	32.20	16.03	42.12	25.95	64.98	54.98	-22.86	-29.03
3	0.21641	9.93	24.42	8.45	34.35	18.38	62.96	52.96	-28.61	-34.58
4	14.78906	10.72	20.00	11.90	30.72	22.62	60.00	50.00	-29.28	-27.38
5	22.52734	11.09	26.52	26.50	37.61	37.59	60.00	50.00	-22.39	-12.41
6	**26.62500**	**11.20**	**28.71**	**28.69**	**39.91**	**39.89**	**60.00**	**50.00**	**-20.09**	**-10.11**

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

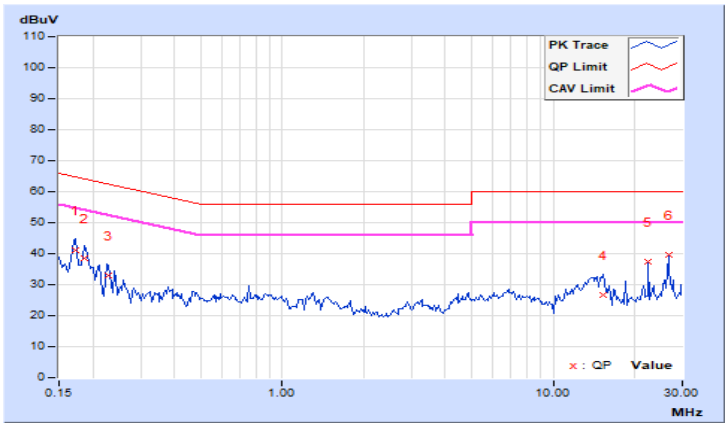


RF Mode	TX 802.11a	Channel	CH 157：5785 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17344	9.92	31.07	14.71	40.99	24.63	64.79	54.79	-23.80	-30.16
2	0.18516	9.92	28.47	11.95	38.39	21.87	64.25	54.25	-25.86	-32.38
3	0.22812	9.93	22.94	8.96	32.87	18.89	62.52	52.52	-29.65	-33.63
4	15.31250	10.57	16.17	7.13	26.74	17.70	60.00	50.00	-33.26	-32.30
5	22.52734	10.81	26.66	26.56	37.47	37.37	60.00	50.00	-22.53	-12.63
6	26.62500	10.87	28.88	28.81	39.75	39.68	60.00	50.00	-20.25	-10.32

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 ≦ 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)
	√	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

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

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. Duty factor is not added to measured value.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Results

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
36	5180	23.227	13.66	24	Pass
40	5200	23.659	13.74	24	Pass
48	5240	23.823	13.77	24	Pass
149	5745	23.823	13.77	30	Pass
157	5785	24.155	13.83	30	Pass
165	5825	23.988	13.80	30	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
36	5180	14.757	11.69	24	Pass
40	5200	14.825	11.71	24	Pass
48	5240	14.997	11.76	24	Pass
149	5745	14.791	11.70	30	Pass
157	5785	14.588	11.64	30	Pass
165	5825	14.555	11.63	30	Pass

802.11ac (VHT40)

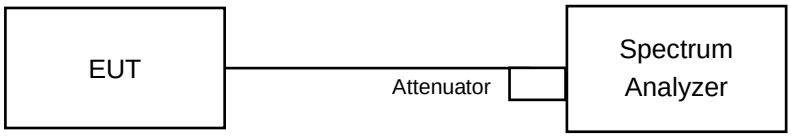
Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
38	5190	13.964	11.45	24	Pass
46	5230	13.836	11.41	24	Pass
151	5755	13.646	11.35	30	Pass
159	5795	14.125	11.50	30	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
42	5210	14.191	11.52	24	Pass
155	5775	14.256	11.54	30	Pass

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 SAMPLE. 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 Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	17.4
40	5200	16.92
48	5240	16.56
149	5745	16.43
157	5785	16.44
165	5825	16.52

802.11ac (VHT20)

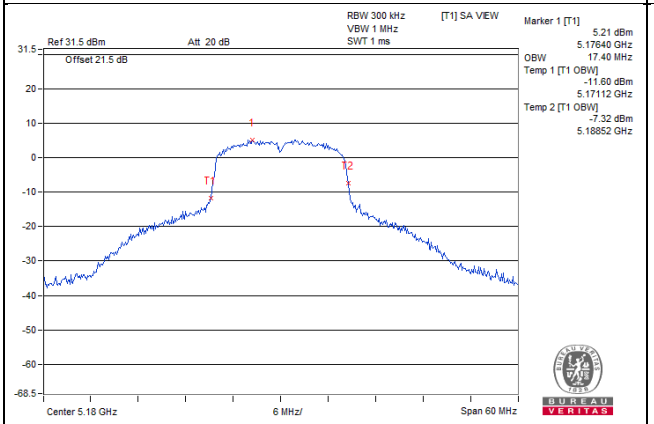
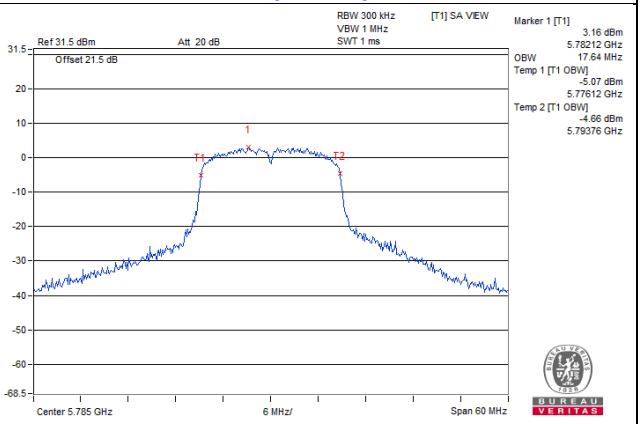
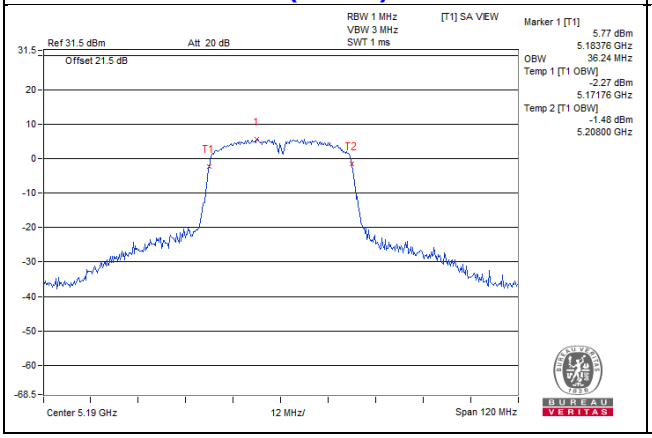
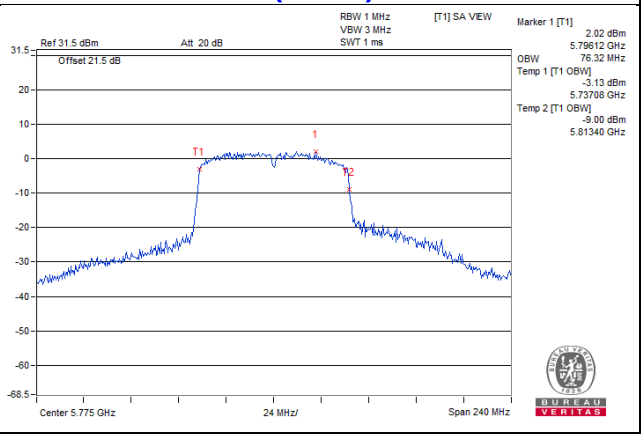
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	17.52
40	5200	17.52
48	5240	17.52
149	5745	17.52
157	5785	17.64
165	5825	17.52

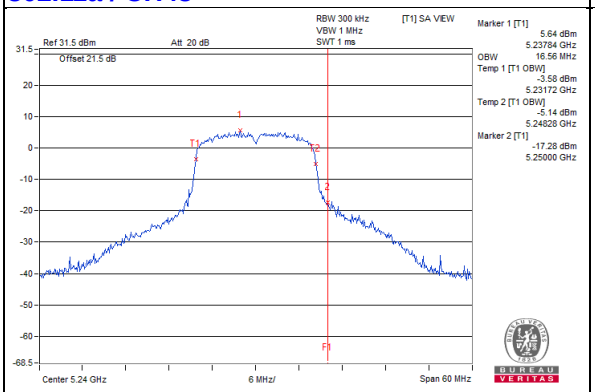
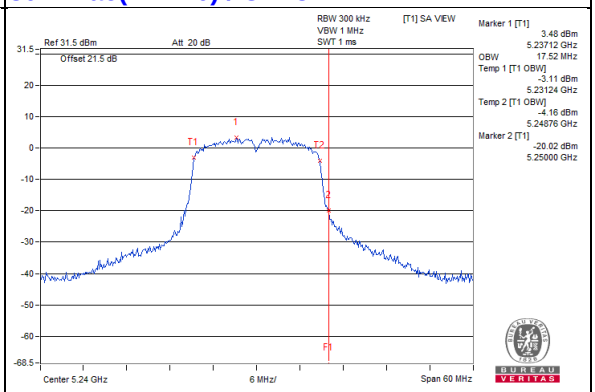
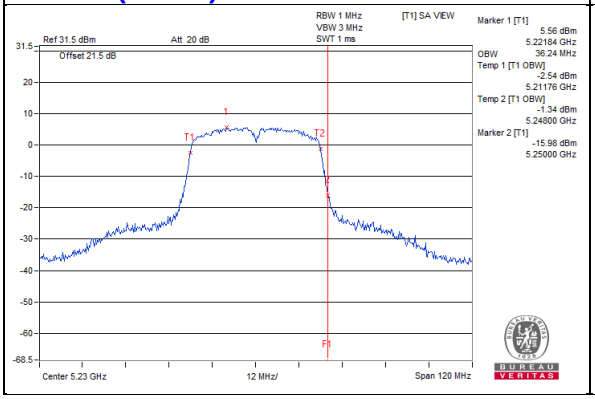
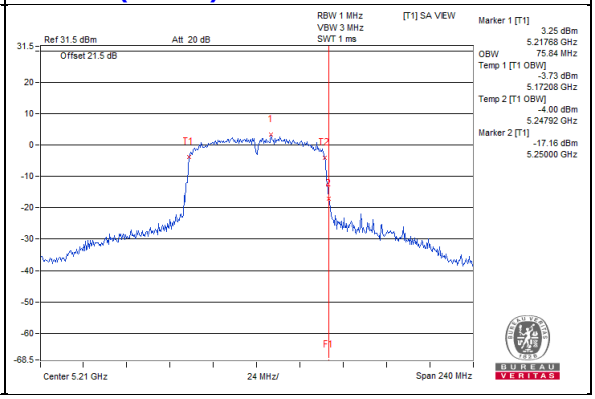
802.11ac (VHT40)

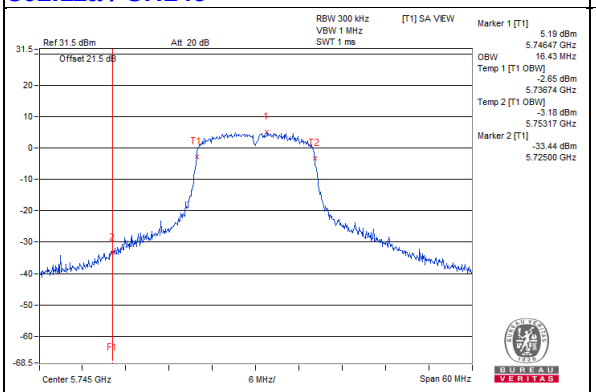
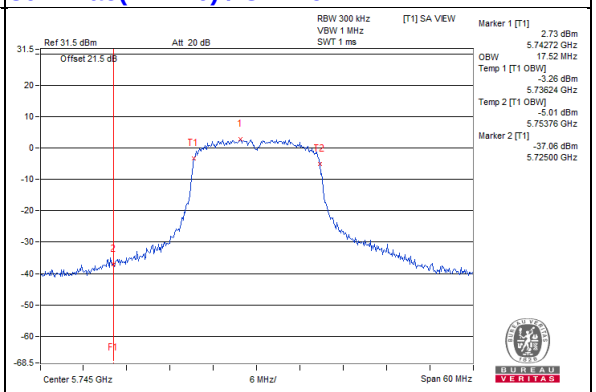
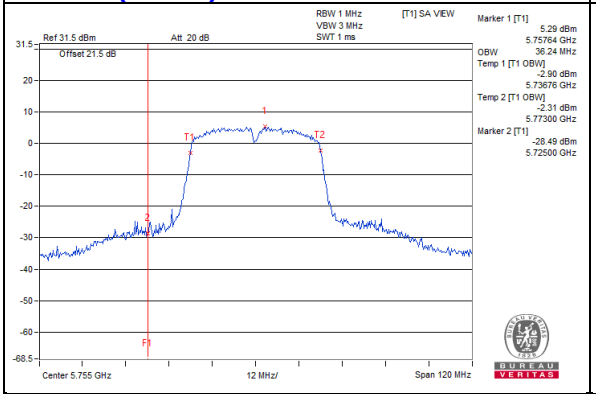
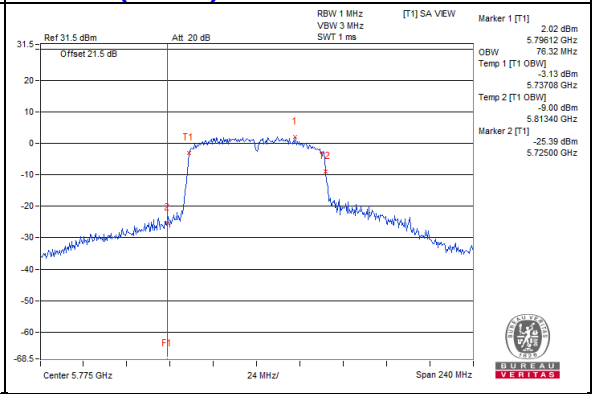
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
38	5190	36.24
46	5230	36.24
151	5755	36.24
159	5795	36.24

802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
42	5210	75.84
155	5775	76.32

Spectrum Plot of Max. Value	
802.11a / CH36	**802.11ac (VHT20) / CH157**
	
802.11ac (VHT40) / CH38	**802.11ac (VHT80) / CH155**
	

Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2A band)	
802.11a / CH48	**802.11ac(VHT20) / CH48**
	
802.11ac(VHT40) / CH46	**802.11ac(VHT80) / CH42**
	

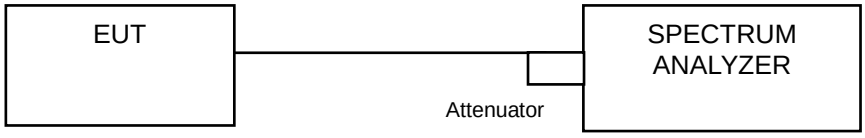
Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11a / CH149	**802.11ac(VHT20) / CH149**
	
802.11ac(VHT40) / CH151	**802.11ac(VHT80) / CH155**
	

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	
	√	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 Procedure

For U-NII-1 band:

For 802.11ac (VHT80):

Using method SA-2

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

For other Modulation:

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value

For U-NII-3 band:

For 802.11ac (VHT80):

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

For other Modulation:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (increasing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500kHz/300kHz)
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

For U-NII-1:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
36	5180	1.02	11.00	Pass
40	5200	1.22	11.00	Pass
48	5240	1.06	11.00	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
36	5180	-1.12	11.00	Pass
40	5200	-0.95	11.00	Pass
48	5240	-0.82	11.00	Pass

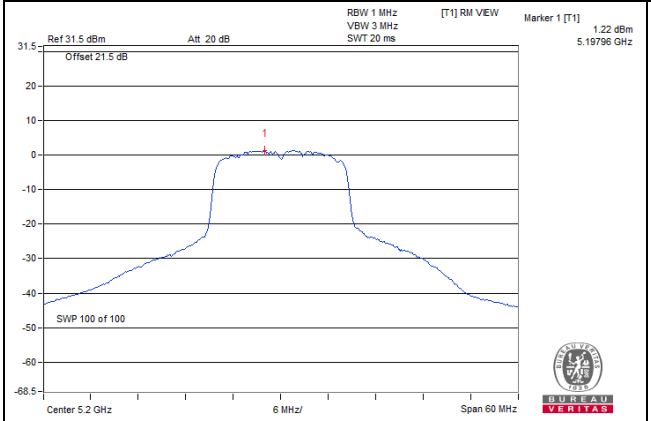
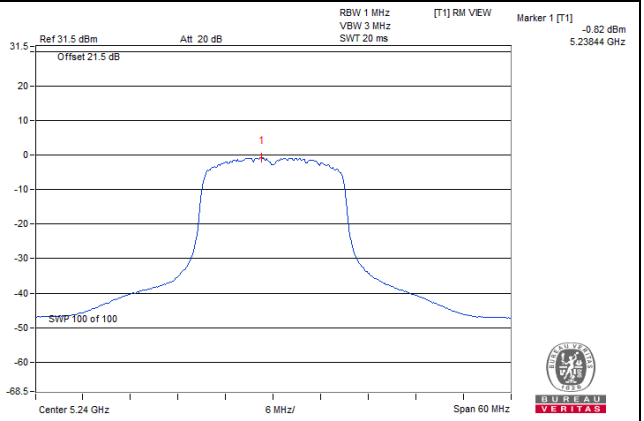
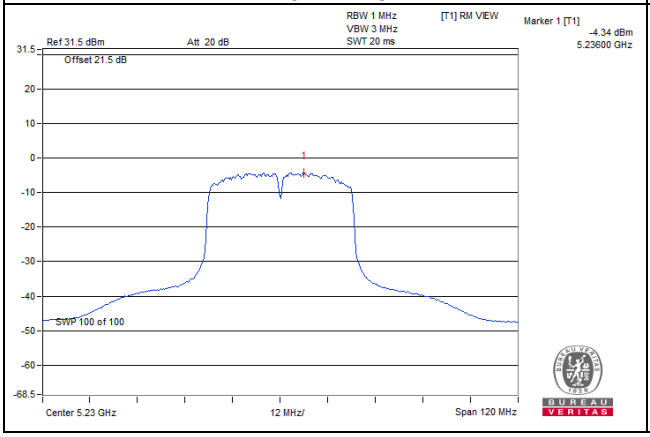
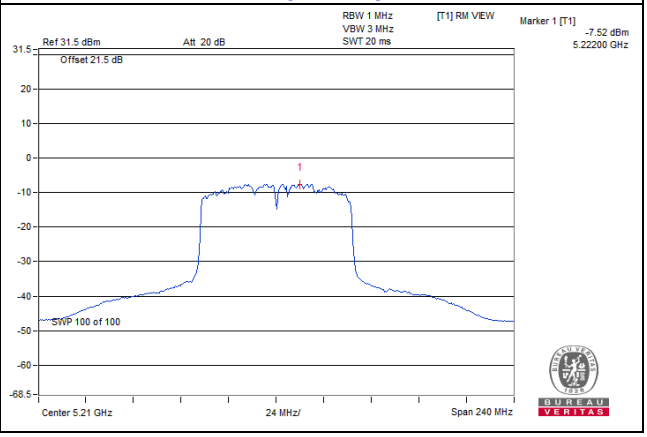
802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
38	5190	-4.62	11.00	Pass
46	5230	-4.34	11.00	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)	Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
42	5210	-7.52	0.11	-7.41	11.00	Pass

Note: Refer to section 2.1 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a / CH40	**802.11ac (VHT20) / CH48**
	
802.11ac (VHT40) / CH46	**802.11ac (VHT80) / CH42**
	

For U-NII-3:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
149	5745	-7.75	-5.53	30.00	Pass
157	5785	-7.11	-4.89	30.00	Pass
165	5825	-7.00	-4.78	30.00	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
149	5745	-9.70	-7.48	30.00	Pass
157	5785	-9.47	-7.25	30.00	Pass
165	5825	-9.56	-7.34	30.00	Pass

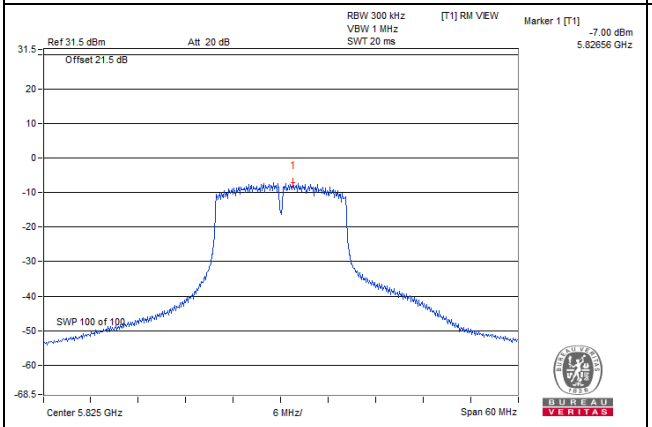
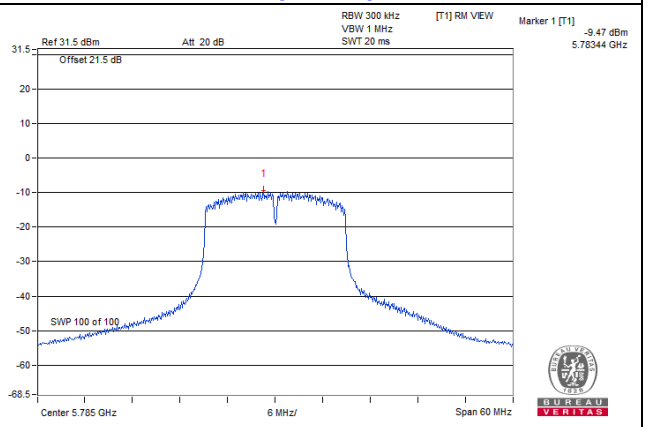
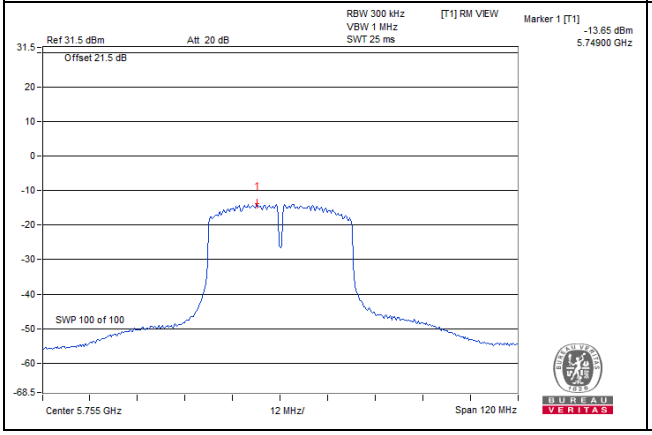
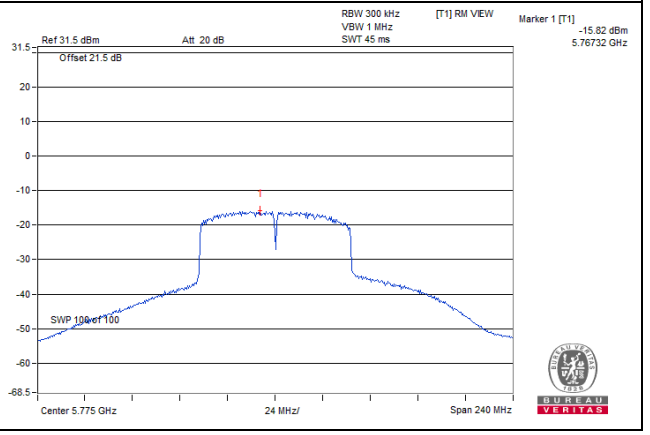
802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
151	5755	-13.65	-11.43	30.00	Pass
159	5795	-13.67	-11.45	30.00	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)	Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
155	5775	-15.82	0.11	-15.71	-13.49	30.00	Pass

Note: Refer to section 2.1 for duty cycle spectrum plot.

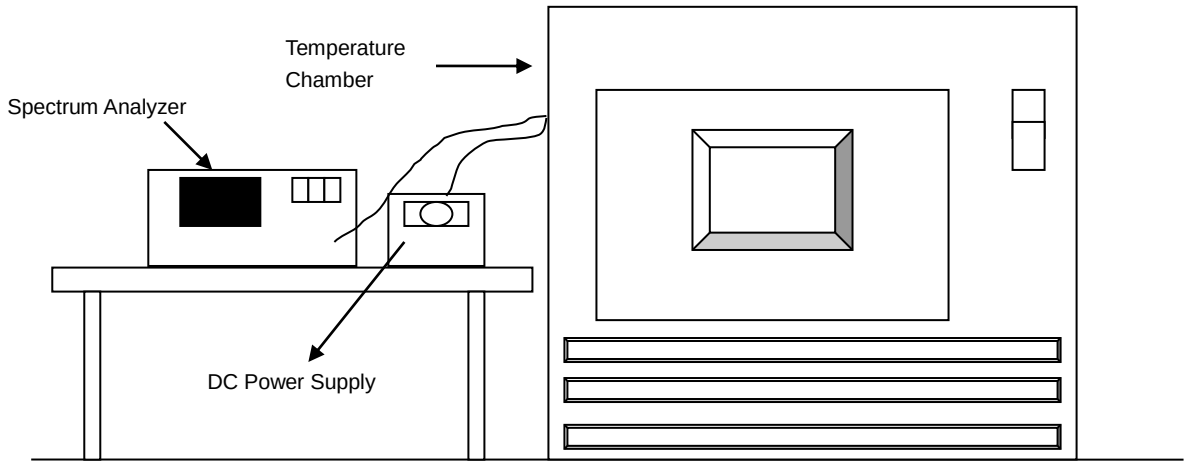
Spectrum Plot of Worst Value	
802.11a / CH165	**802.11ac (VHT20) / CH157**
	
802.11ac (VHT40) / CH151	**802.11ac (VHT80) / CH155**
	

4.6 Frequency Stability Measurement

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

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.

b. Turn the EUT on and couple its output to a spectrum analyzer.

c. Turn the EUT off and set the chamber to the highest temperature specified.

d. 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.

e. Repeat step (d) with the temperature chamber set to the next desired temperature until measurements down to the lowest specified temperature have been completed.

f. 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

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vdc)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
40	5	5180.0026	PASS	5180.0042	PASS	5180.0024	PASS	5180.0021	PASS
30	5	5180.0052	PASS	5180.0055	PASS	5180.0048	PASS	5180.0059	PASS
20	5	5180.0218	PASS	5180.0222	PASS	5180.021	PASS	5180.0199	PASS
10	5	5179.9733	PASS	5179.972	PASS	5179.9718	PASS	5179.9768	PASS
0	5	5179.9887	PASS	5179.9869	PASS	5179.988	PASS	5179.9859	PASS

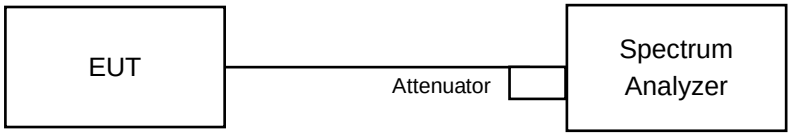
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vdc)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	5.75	5180.0224	PASS	5180.0226	PASS	5180.021	PASS	5180.0194	PASS
	5	5180.0218	PASS	5180.0222	PASS	5180.021	PASS	5180.0199	PASS
	4.25	5180.0212	PASS	5180.0225	PASS	5180.0206	PASS	5180.0206	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

MEASUREMENT PROCEDURE REF

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. 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

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	15.34	0.5	Pass
157	5785	15.09	0.5	Pass
165	5825	15.3	0.5	Pass

802.11ac (VHT20)

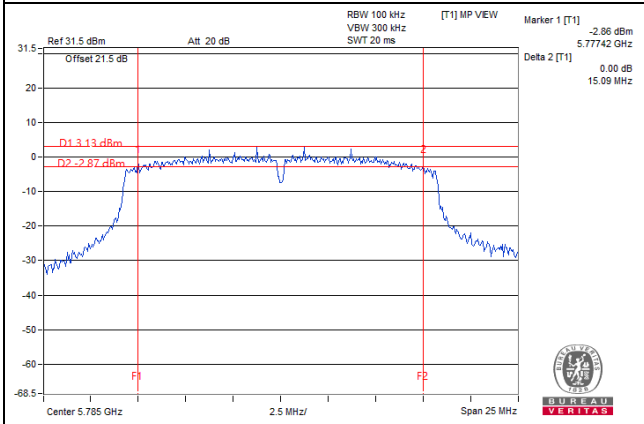
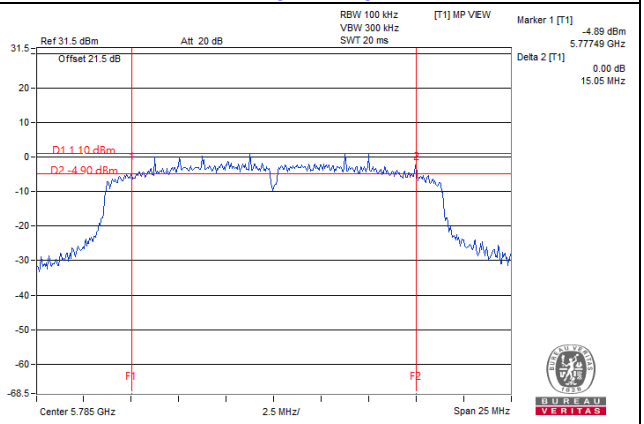
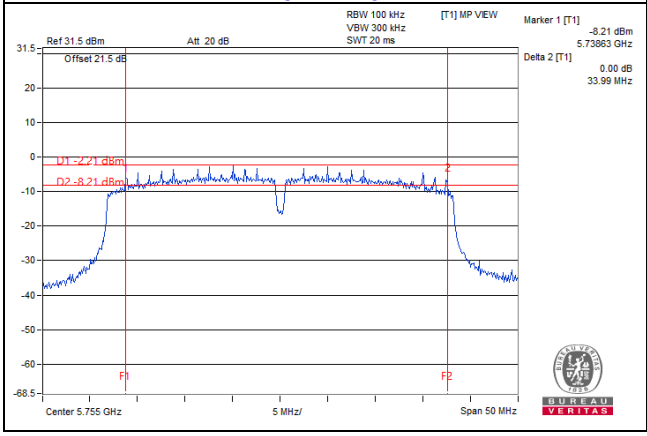
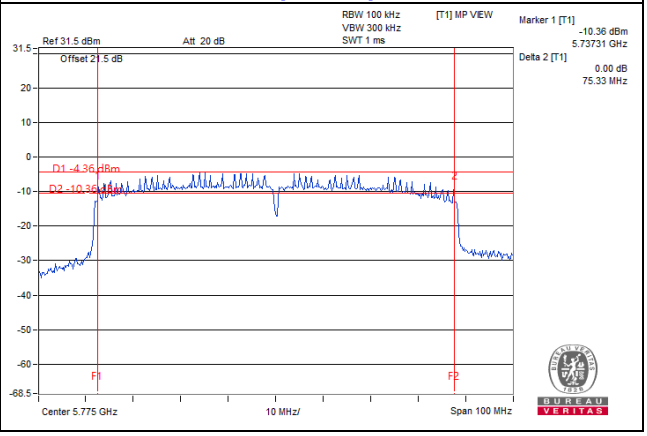
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	16.02	0.5	Pass
157	5785	15.05	0.5	Pass
165	5825	15.18	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
151	5755	33.99	0.5	Pass
159	5795	35.13	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
155	5775	75.33	0.5	Pass

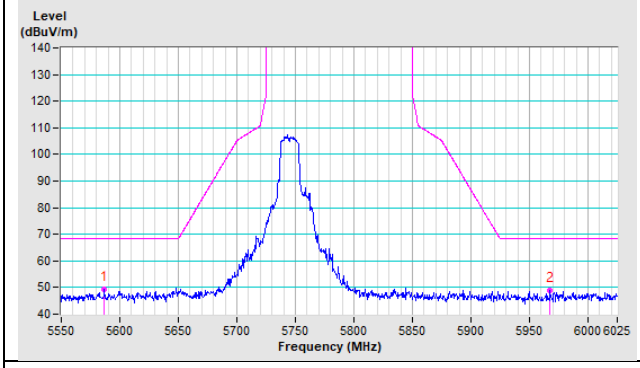
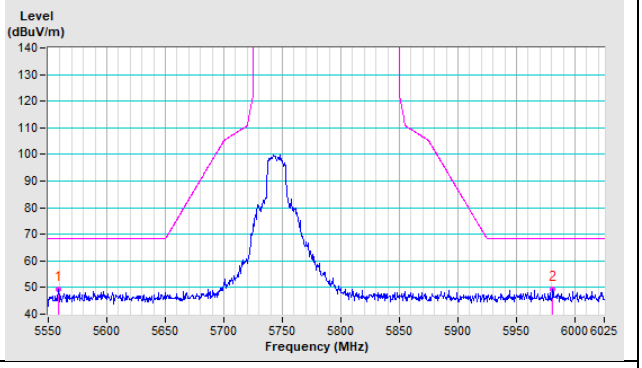
Spectrum Plot of Worst Value	
802.11a / CH157	**802.11ac (VHT20) / CH157**
	
802.11ac (VHT40) / CH151	**802.11ac (VHT80) / CH155**
	

5 Pictures of Test Arrangements

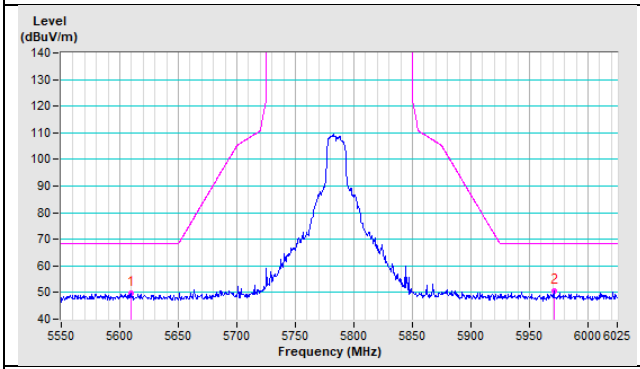
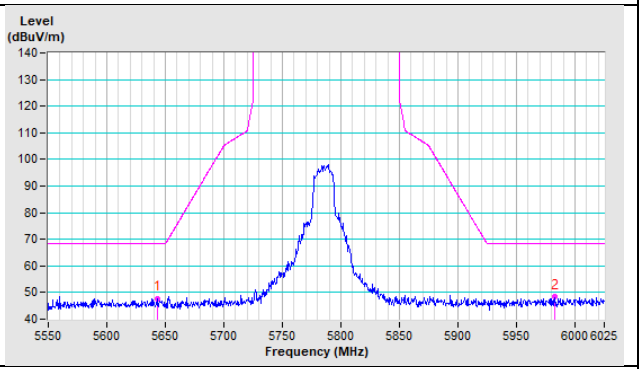
Please refer to the attached file (Test Setup Photo).

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

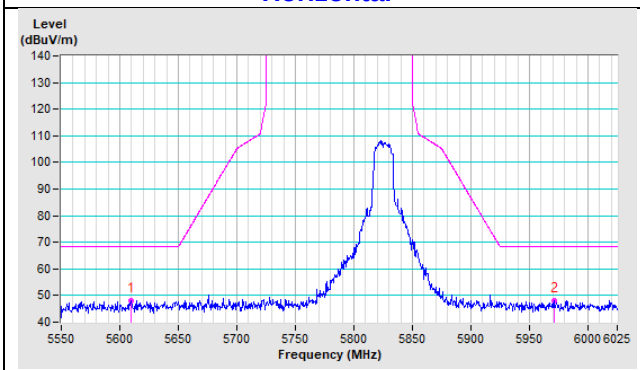
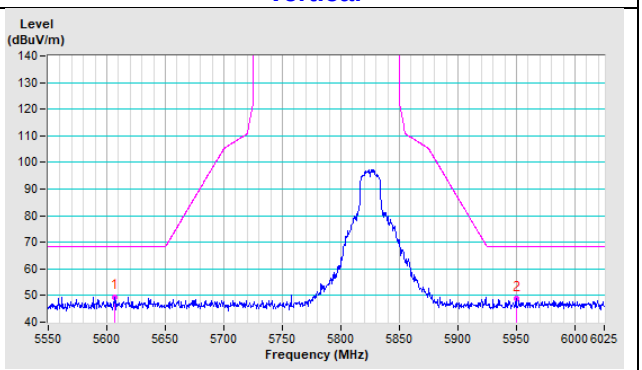
802.11a CH 149：5745 MHz

Horizontal	Vertical
	

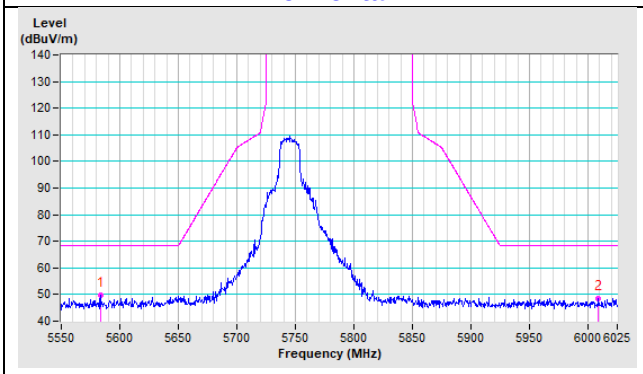
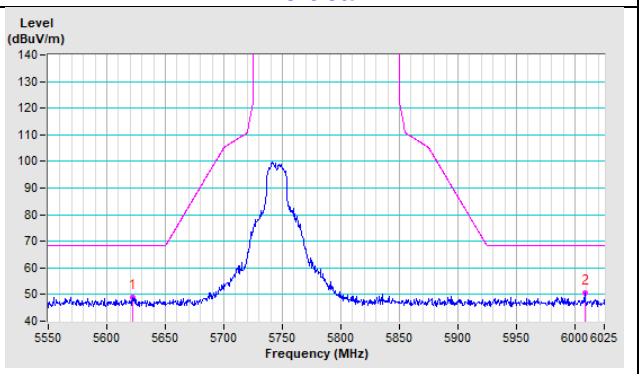
802.11a CH 157：5785 MHz

Horizontal	Vertical
	

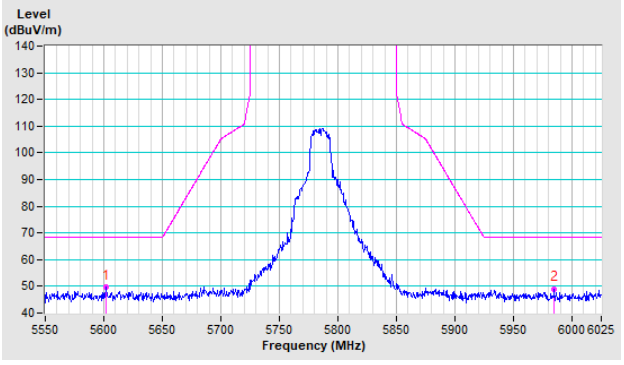
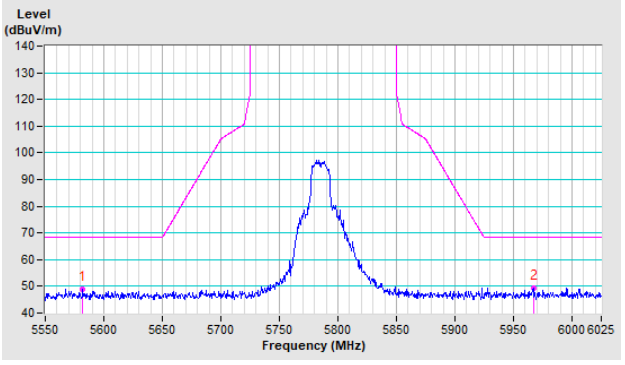
802.11a CH 165：5825 MHz

Horizontal	Vertical
	

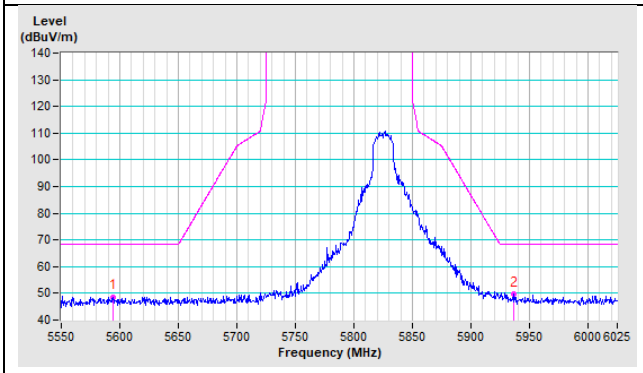
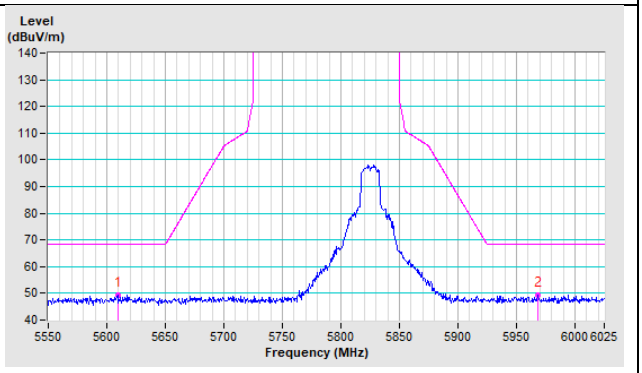
802.11ac (VHT20) CH 149：5745 MHz

Horizontal	Vertical
	

802.11ac (VHT20) CH 157：5785 MHz

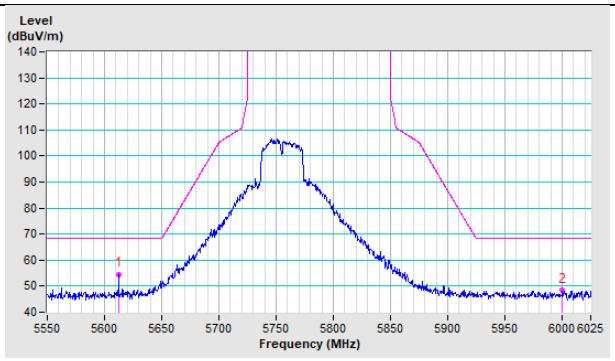
Horizontal	Vertical
	

802.11ac (VHT20) CH 165：5825 MHz

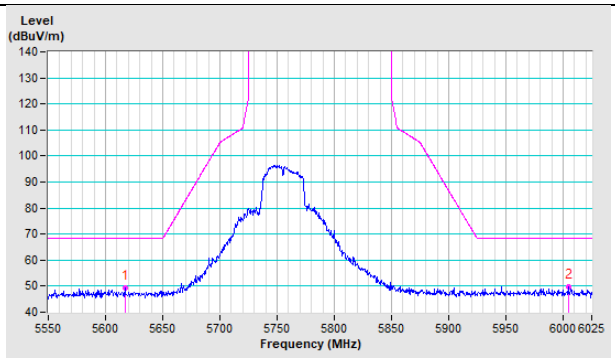
Horizontal	Vertical
	

802.11ac (VHT40) CH 151：5755 MHz

Horizontal

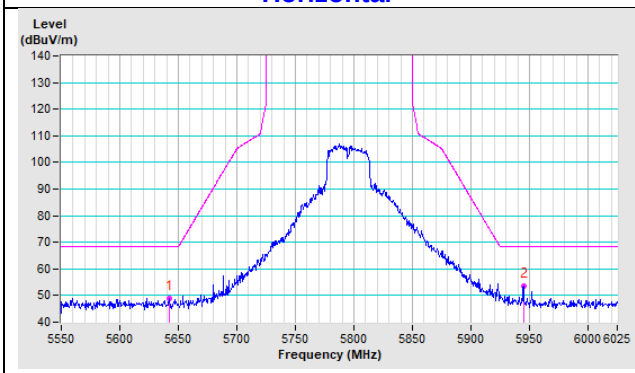


Vertical

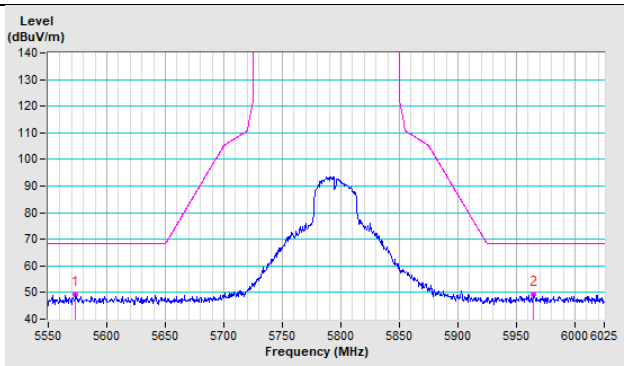


802.11ac (VHT40) CH 159：5795 MHz

Horizontal

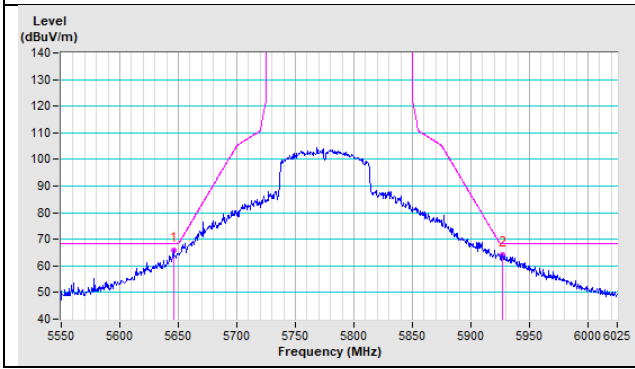


Vertical

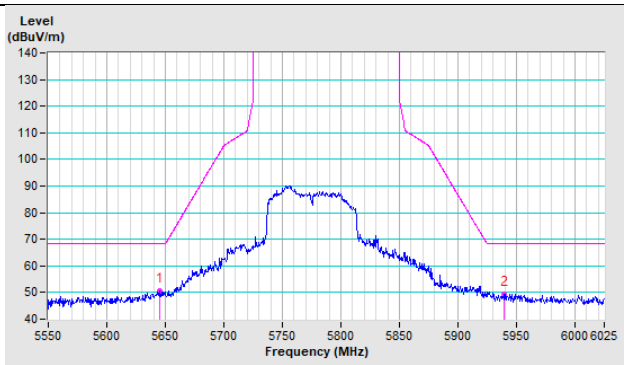


802.11ac (VHT80) CH 155：5775 MHz

Horizontal



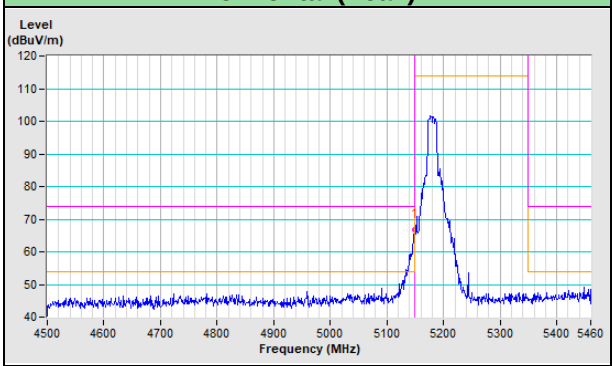
Vertical



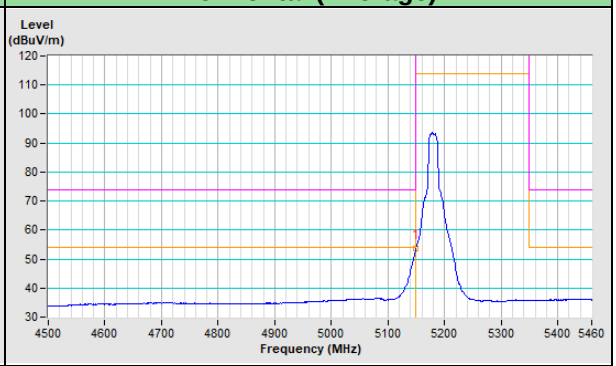
Annex B- Band-edge measurement (For U-NII-1 band)

802.11a Channel 36

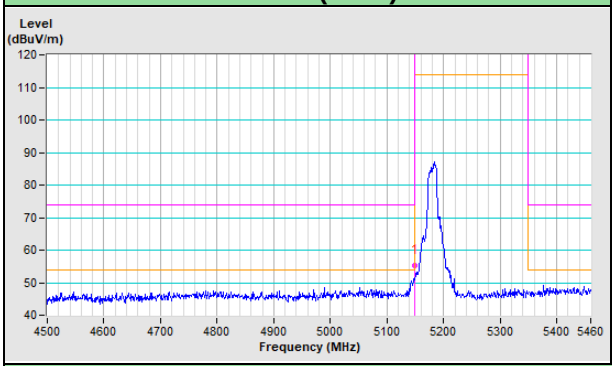
Horizontal (Peak)



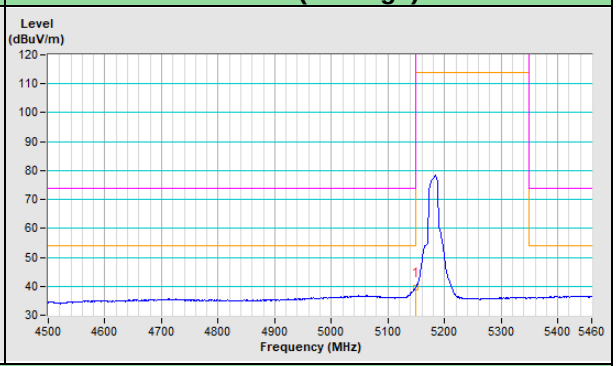
Horizontal (Average)



Vertical (Peak)

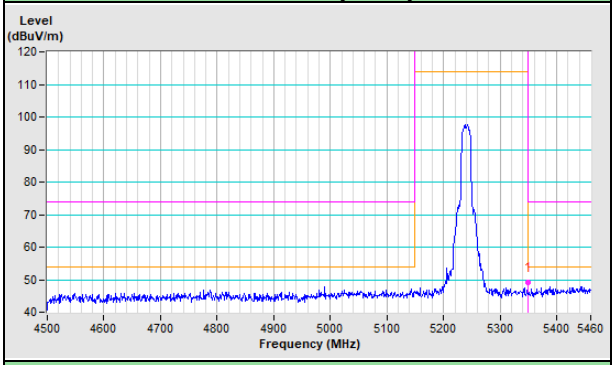


Vertical (Average)

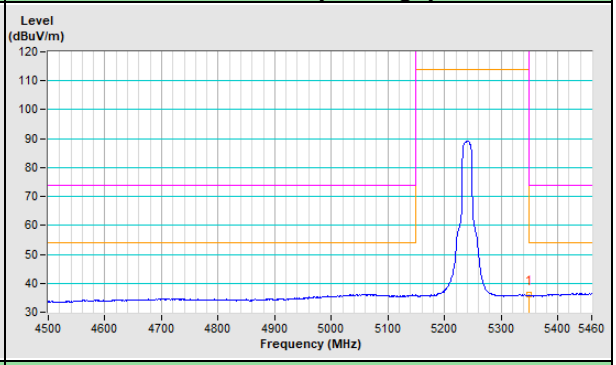


802.11a Channel 48

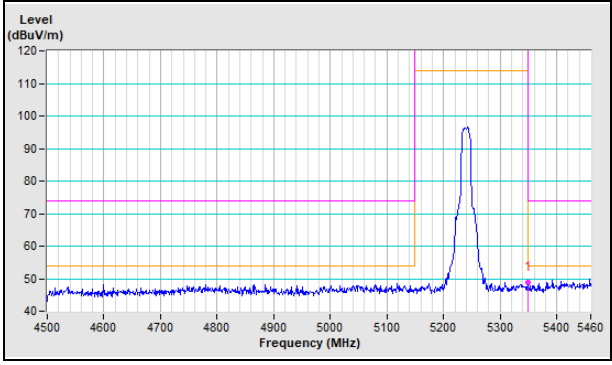
Horizontal (Peak)



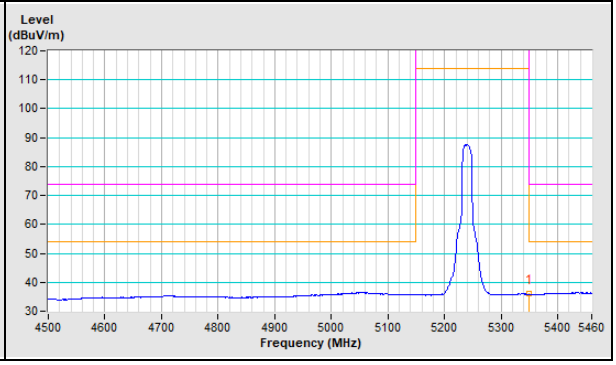
Horizontal (Average)



Vertical (Peak)

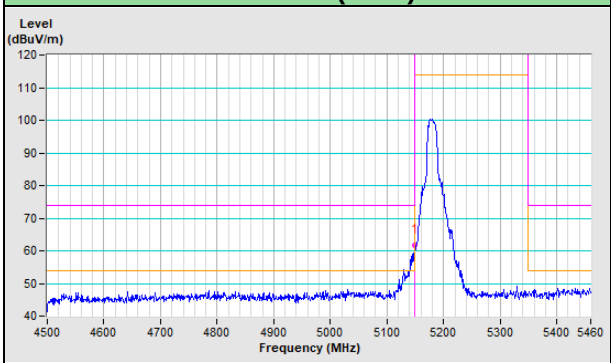


Vertical (Average)

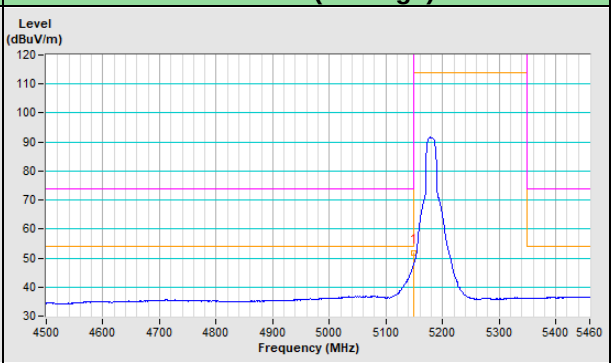


802.11ac (VHT20) Channel 36

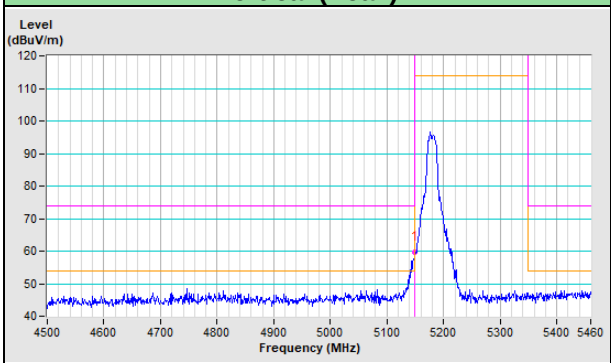
Horizontal (Peak)



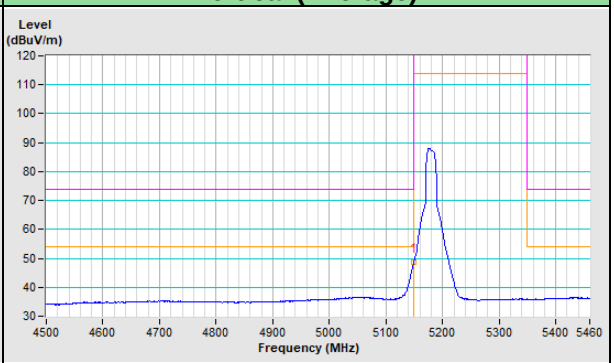
Horizontal (Average)



Vertical (Peak)

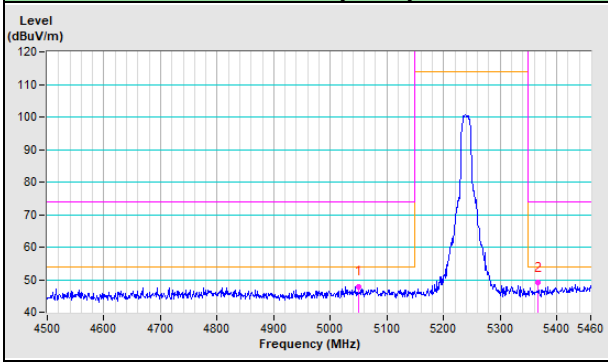


Vertical (Average)

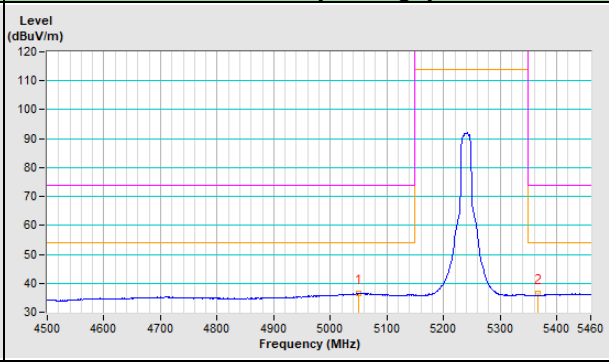


802.11ac (VHT20) Channel 48

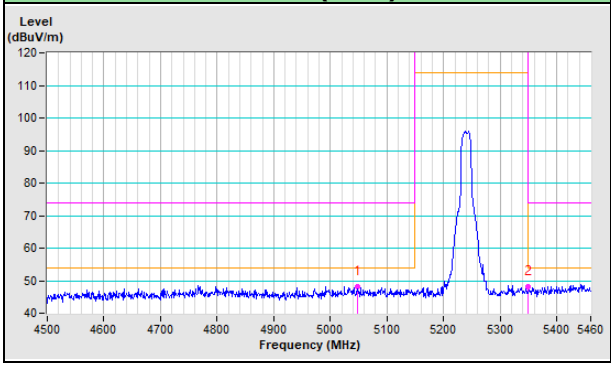
Horizontal (Peak)



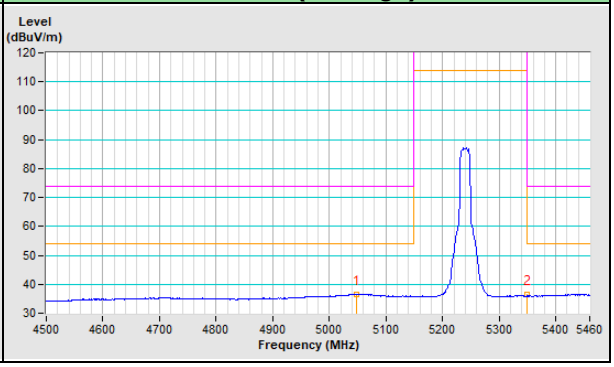
Horizontal (Average)



Vertical (Peak)

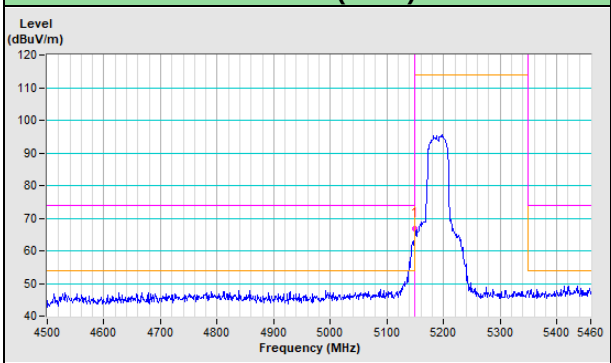


Vertical (Average)

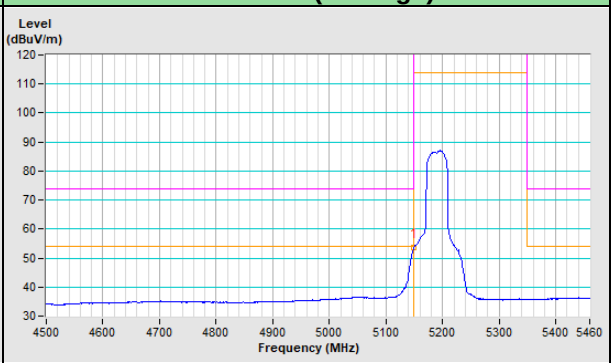


802.11ac (VHT40) Channel 38

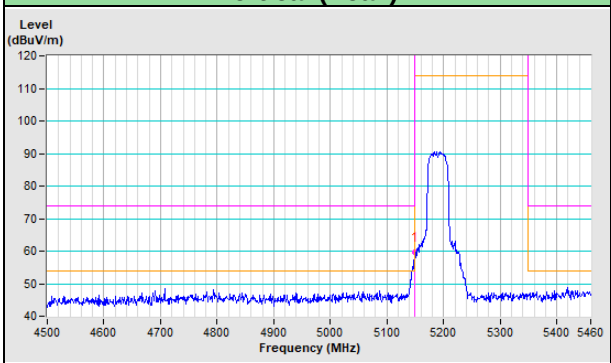
Horizontal (Peak)



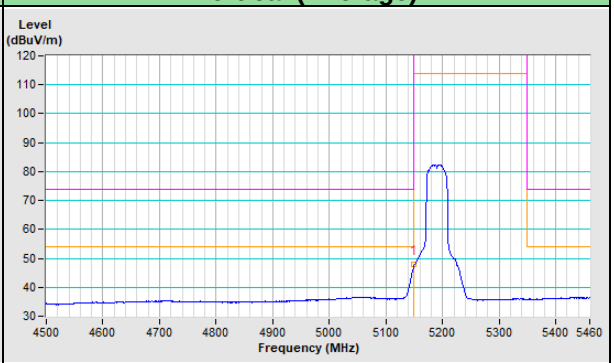
Horizontal (Average)



Vertical (Peak)

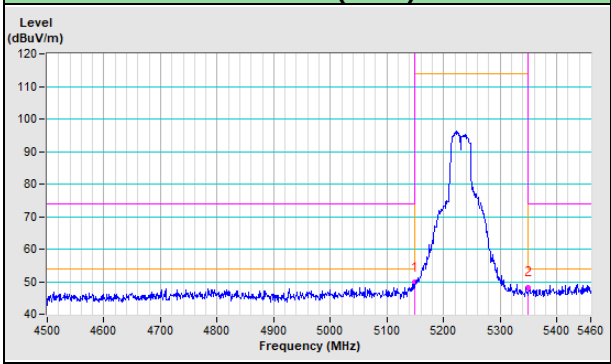


Vertical (Average)

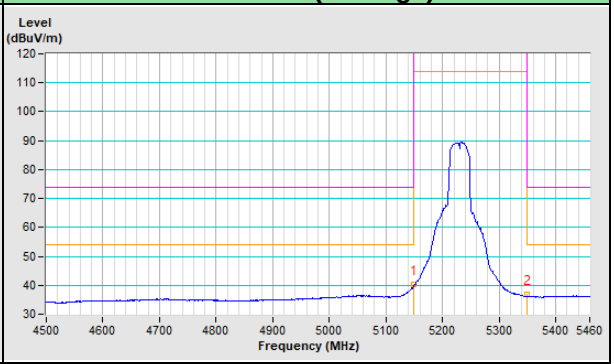


802.11ac (VHT40) Channel 46

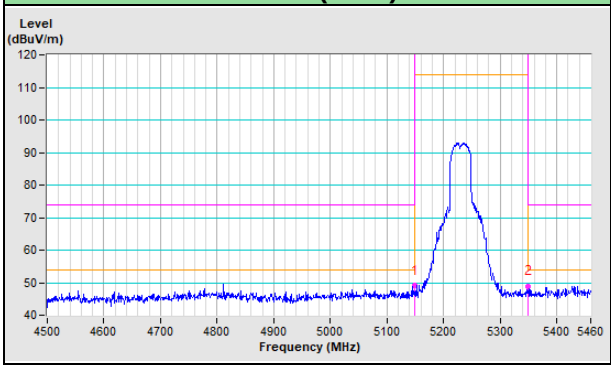
Horizontal (Peak)



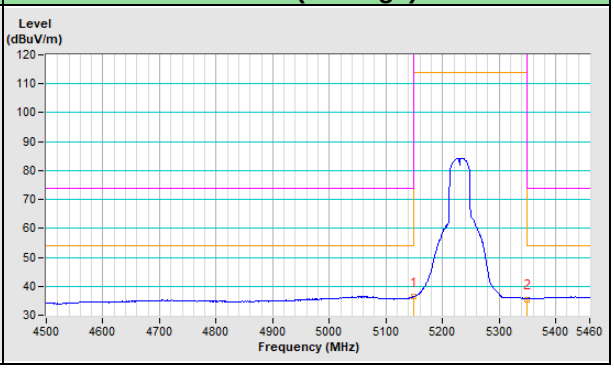
Horizontal (Average)

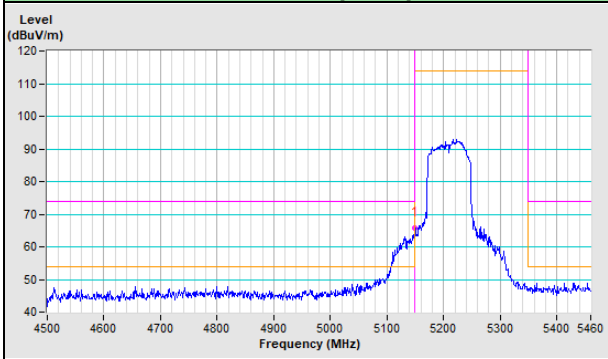
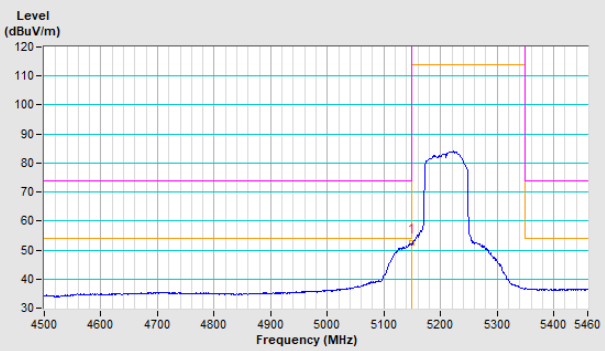
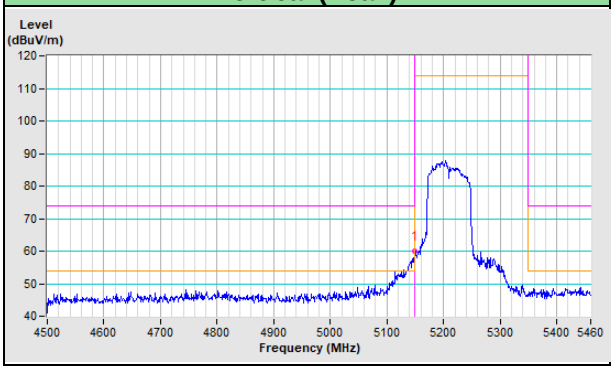
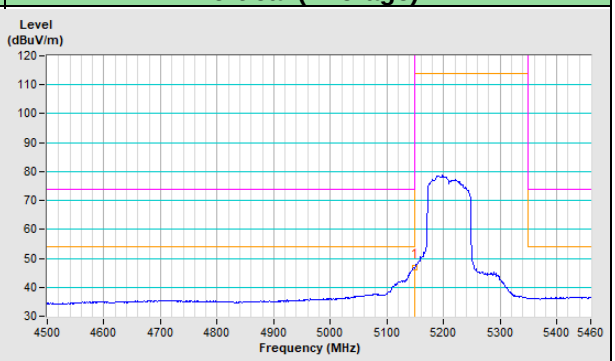


Vertical (Peak)



Vertical (Average)



802.11ac (VHT80) Channel 42	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

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 according to ISO/IEC 17025.

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

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