

FCC Test Report (WLAN)

Report No.: RFBCKS-WTW-P21010640-1

FCC ID: NKR-WLD92

Test Model: WLD92

Received Date: Jan. 19, 2021

Test Date: Jan. 19 to Feb. 22, 2021

Issued Date: Apr. 06, 2021

Applicant: Wistron NeWeb Corporation

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**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RFBCKS-WTW-P21010640-1	Original release.	Apr. 06, 2021

1 Certificate of Conformity

Product: LTE Indoor Router

Brand: Wistron NeWeb Corporation

Test Model: WLD92

Sample Status: Engineering sample

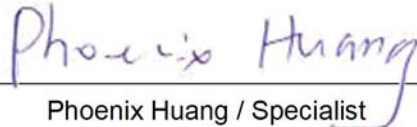
Applicant: Wistron NeWeb Corporation

Test Date: Jan. 19 to Feb. 22, 2021

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 :


Phoenix Huang / Specialist

Date:

Apr. 06, 2021

Approved by :



Clark Lin / Technical Manager

Date:

Apr. 06, 2021

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 -23.03 dB at 0.36094 MHz.
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 -1.3 dB at 5147.06 MHz and 5144.90 MHz.
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	No antenna connector is used.

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	1.9 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.1 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 (WLAN)

Product	LTE Indoor Router
Brand	Wistron NeWeb Corporation
Test Model	WLD92
Status of EUT	Engineering sample
Power Supply Rating	12 Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11 Mbps 802.11a/g: up to 54 Mbps 802.11n: up to 300 Mbps 802.11ac: up to 866.7 Mbps
Operating Frequency	2.4GHz: 2.412 ~ 2.462 GHz 5GHz: 5.18 ~ 5.24 GHz, 5.745 ~ 5.825 GHz
Number of Channel	2.4GHz: 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7 5GHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	2.4GHz: 527.08 mW 5.18 ~ 5.24 GHz: 135.38 mW 5.745 ~ 5.825 GHz: 117.093 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	RJ45 cable x 1 (Unshielded, 1.8 m)

Note:

1. There are WLAN and WWAN technology used for the EUT. The EUT has below radios as following table:

Radio 1	Radio 2	Radio 3
WLAN (2.4GHz)	WLAN (5GHz)	WWAN

2. Simultaneously transmission condition.

Condition	Technology		
1	WLAN (2.4GHz)	WLAN (5GHz)	WWAN

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

3. The EUT must be supplied with a power adapter as following table:

Brand	Model No.	Spec.
SHENZHEN FRECOM	F12L30-120100SPAU	Input: 100-240 Vac, 0.3 A, 50/60 Hz Output: 12 Vdc, 1.0 A DC output cable (unshielded, 1.5 m)

4. The antennas provided to the EUT, please refer to the following table:

Antenna No.	RF Chain No.	Antenna Net Gain (dBi)	Frequency Range	Antenna Type	Connector Type
1 (LTE)	Chain0	2.3	1850~1910 MHz	PIFA	None
		1.9	1710~1755 MHz		
		1.8	824~849 MHz		
		0.4	698~716 MHz		
		1.9	1710~1780 MHz		
2 (LTE)	Chain1 (RX only)	-	-	PIFA	None
3 (WLAN)	Chain0	2.1	2.4~2.4835 GHz	PIFA	None
		3.7	5.15~5.85 GHz		
4 (WLAN)	Chain1	2.9	2.4~2.4835 GHz	PIFA	None
		4.7	5.15~5.85 GHz		

5. The EUT incorporates a MIMO function:

2.4GHz Band		
MODULATION MODE	TX & RX CONFIGURATION	
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
5GHz Band		
MODULATION MODE	TX & RX CONFIGURATION	
802.11a	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
802.11ac (VHT20)	2TX	2RX
802.11ac (VHT40)	2TX	2RX
802.11ac (VHT80)	2TX	2RX

Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz, 80MHz), therefore the manufacturer will control the power for 802.11n mode is the same as the 802.11ac mode or more lower than it and investigated worst case to representative mode in test report. (Final test mode refer to section 3.2.1)

6. 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.

7. 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 \geq 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE \geq 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 **Y-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	36 to 48, 149 to 165	36	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	36 to 48, 149 to 165	36	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	Tested By
RE\geq1G	25deg. C, 75%RH	120Vac, 60Hz	Benson Chao
RE$<$1G	23deg. C, 71%RH	120Vac, 60Hz	Benson Chao
PLC	25deg. C, 70%RH	120Vac, 60Hz	Sampson Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

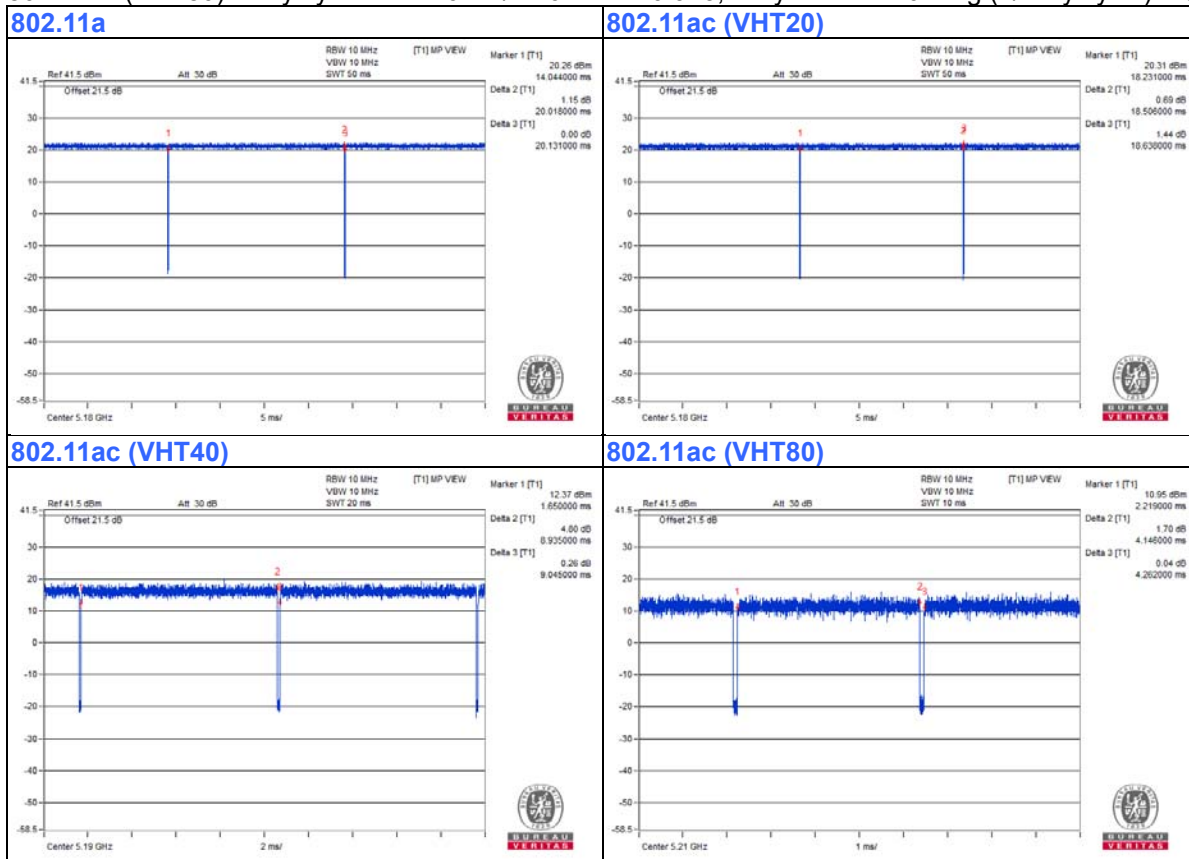
If duty cycle of test signal is $\geq 98\%$, duty factor is not required.
 If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11a: Duty cycle = $20.018 \text{ ms} / 20.131 \text{ ms} = 0.994$

802.11ac (VHT20): Duty cycle = $18.506 \text{ ms} / 18.638 \text{ ms} = 0.993$

802.11ac (VHT40): Duty cycle = $8.935 \text{ ms} / 9.045 \text{ ms} = 0.988$

802.11ac (VHT80): Duty cycle = $4.146 \text{ ms} / 4.262 \text{ ms} = 0.973$, Duty factor = $10 * \log(1/\text{Duty cycle}) = 0.12 \text{ dB}$



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.

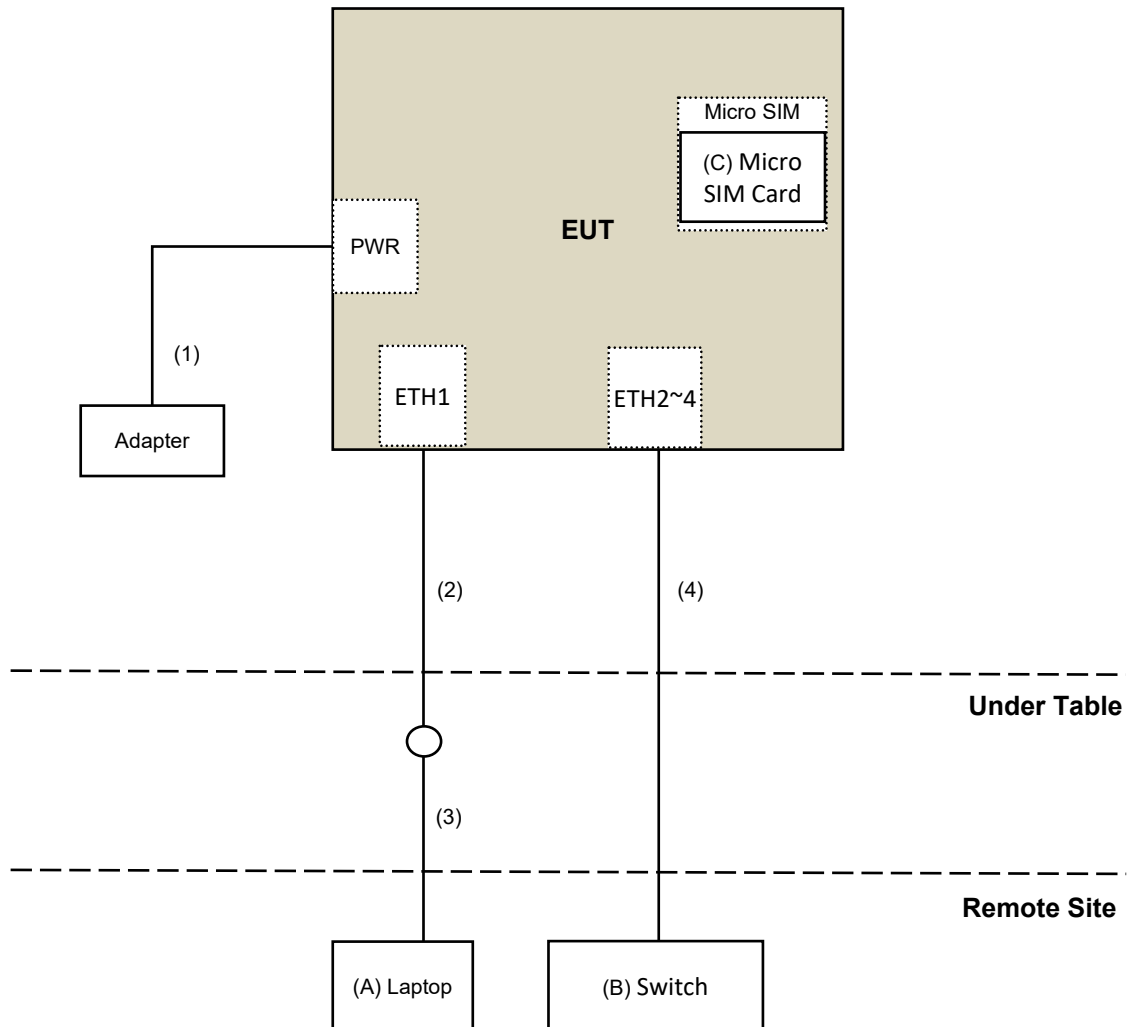
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	Inspiron 7570	DW3CSJ2	NA	Provided by Lab
B.	Switch	D-Link	DGS-1005D	DR8WC92000523	NA	Provided by Lab
C.	SIM Card	R&S	CRT-Z3	NA	NA	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.5	No	0	Supplied by client
2.	RJ-45 Cable	1	1.8	No	0	Supplied by client
3.	RJ-45 Cable	1	10	No	0	Provided by Lab
4.	RJ-45 Cable	3	10	No	0	Provided by Lab

3.4.1 Configuration of System under 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

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}
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}
^{*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:

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

4.1.2 Test Instruments

For Radiated Emission (Below 1GHz) test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESR7	102026	Apr. 22, 2020	Apr. 21, 2021
Spectrum Analyzer Keysight	N9030B	MY57141948	May 22, 2020	May 21, 2021
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	5D-FB	LOOPCAB-001	Jan. 07, 2021	Jan. 06, 2022
RF Cable	5D-FB	LOOPCAB-002	Jan. 07, 2021	Jan. 06, 2022
Pre-Amplifier EMCi	EMC330N	980538	Apr. 28, 2020	Apr. 27, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB9168	9168-0842	Nov. 03, 2020	Nov. 02, 2021
RF Cable	8D	966-5-1	Apr. 29, 2020	Apr. 28, 2021
RF Cable	8D	966-5-2	Apr. 29, 2020	Apr. 28, 2021
RF Cable	8D	966-5-3	Apr. 29, 2020	Apr. 28, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-02	Jan. 11, 2021	Jan. 10, 2022
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. 5.
3. Tested Date: Feb. 02, 2021

For Radiated Emission (Above 1GHz) and Bandedge test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESR7	102026	Apr. 22, 2020	Apr. 21, 2021
Spectrum Analyzer Keysight	N9030B	MY57141948	May 22, 2020	May 21, 2021
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-1819	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCI	EMC12630SE	980509	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCI	EMC104-SM-SM-1500	180503	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCI	EMC104-SM-SM-2000	180501	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCI	EMC104-SM-SM-6000	180506	Apr. 29, 2020	Apr. 28, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 11, 2021	Jan. 10, 2022
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
RF Cable	EMC102-KM-KM-1200	160924	Jan. 11, 2021	Jan. 10, 2022
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. 5.
3. Tested Date: Jan. 29 to Feb. 22, 2021

For other test items

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
AC Power Source Extech Electronics	6905S	1991551	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 14, 2021	Jan. 13, 2022
True RMS Clamp Meter FLUKE	325	31130711WS	June 06, 2020	June 05, 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: Feb. 22, 2021

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:

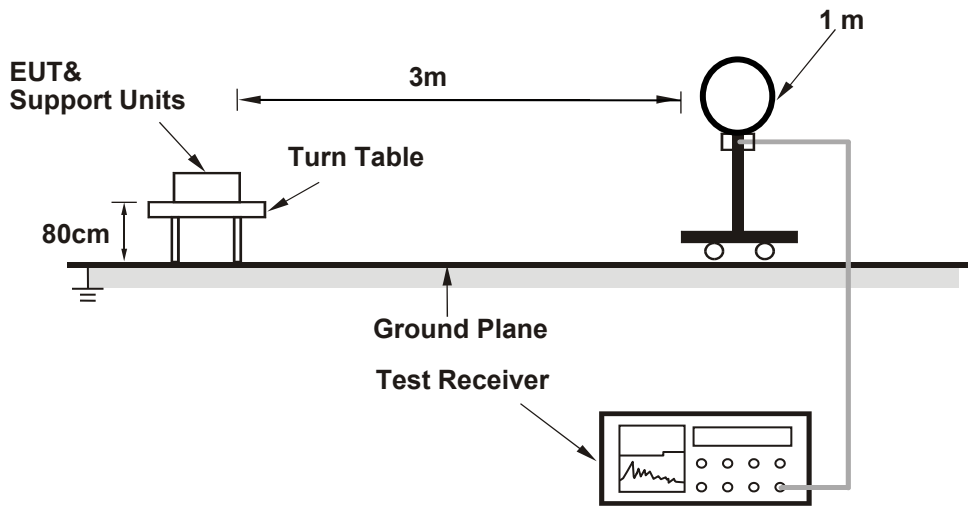
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) 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

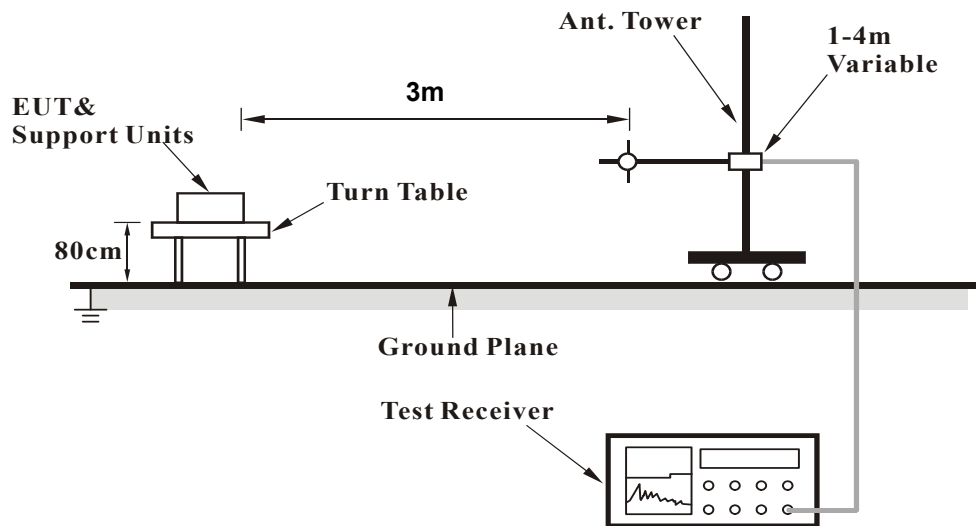
No deviation.

4.1.5 Test Setup

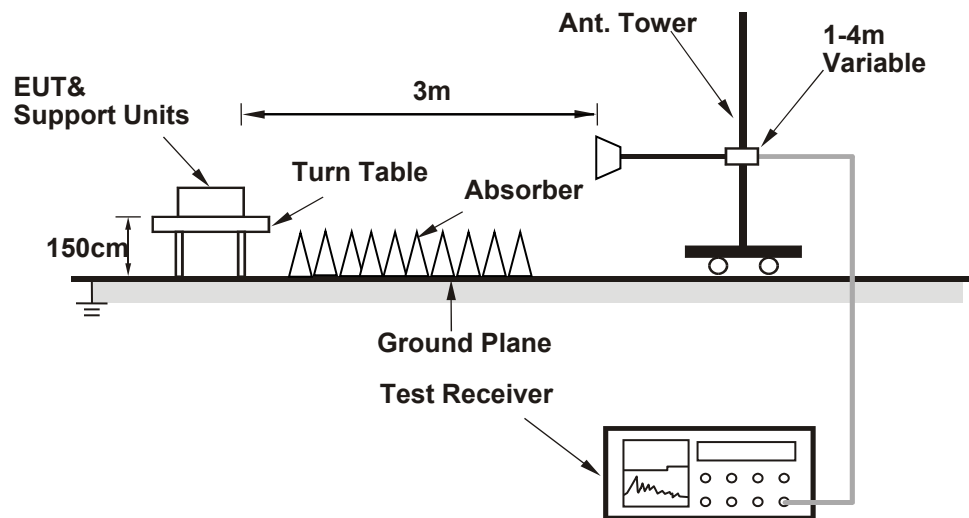
For Radiated emission below 30MHz



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 (QRCT_V3.0.525.0) 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	5149.83	60.6 PK	74.0	-13.4	1.23 H	350	58.6	2.0
2	5149.83	49.5 AV	54.0	-4.5	1.23 H	350	47.5	2.0
3	*5180.00	114.3 PK			1.23 H	350	112.5	1.8
4	*5180.00	104.1 AV			1.23 H	350	102.3	1.8
5	#10360.00	48.6 PK	68.2	-19.6	1.88 H	226	37.2	11.4
6	15540.00	47.8 PK	74.0	-26.2	1.34 H	311	35.9	11.9
7	15540.00	35.5 AV	54.0	-18.5	1.34 H	311	23.6	11.9

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	5149.88	63.5 PK	74.0	-10.5	1.21 V	245	61.5	2.0
2	5149.88	51.9 AV	54.0	-2.1	1.21 V	245	49.9	2.0
3	*5180.00	114.5 PK			1.21 V	245	112.7	1.8
4	*5180.00	104.1 AV			1.21 V	245	102.3	1.8
5	#10360.00	50.2 PK	68.2	-18.0	1.69 V	269	38.8	11.4
6	15540.00	48.3 PK	74.0	-25.7	1.85 V	291	36.4	11.9
7	15540.00	35.6 AV	54.0	-18.4	1.85 V	291	23.7	11.9

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	5150.00	54.1 PK	74.0	-19.9	1.17 H	331	52.1	2.0
2	5150.00	43.6 AV	54.0	-10.4	1.17 H	331	41.6	2.0
3	*5200.00	113.7 PK			1.17 H	331	112.0	1.7
4	*5200.00	104.2 AV			1.17 H	331	102.5	1.7
5	5350.00	53.1 PK	74.0	-20.9	1.17 H	331	51.5	1.6
6	5350.00	39.5 AV	54.0	-14.5	1.17 H	331	37.9	1.6
7	#10400.00	48.5 PK	68.2	-19.7	1.82 H	212	36.9	11.6
8	15600.00	47.0 PK	74.0	-27.0	1.37 H	304	35.4	11.6
9	15600.00	35.0 AV	54.0	-19.0	1.37 H	304	23.4	11.6

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	54.8 PK	74.0	-19.2	1.70 V	235	52.8	2.0
2	5150.00	43.8 AV	54.0	-10.2	1.70 V	235	41.8	2.0
3	*5200.00	113.9 PK			1.70 V	235	112.2	1.7
4	*5200.00	103.7 AV			1.70 V	235	102.0	1.7
5	5350.00	53.4 PK	74.0	-20.6	1.70 V	235	51.8	1.6
6	5350.00	39.6 AV	54.0	-14.4	1.70 V	235	38.0	1.6
7	#10400.00	50.4 PK	68.2	-17.8	1.67 V	283	38.8	11.6
8	15600.00	47.8 PK	74.0	-26.2	1.90 V	292	36.2	11.6
9	15600.00	35.2 AV	54.0	-18.8	1.90 V	292	23.6	11.6

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.
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	114.5 PK			1.13 H	318	113.0	1.5
2	*5240.00	104.6 AV			1.13 H	318	103.1	1.5
3	5352.84	51.0 PK	74.0	-23.0	1.13 H	318	49.4	1.6
4	5352.84	39.7 AV	54.0	-14.3	1.13 H	318	38.1	1.6
5	#10480.00	48.7 PK	68.2	-19.5	1.82 H	226	37.1	11.6
6	15720.00	47.1 PK	74.0	-26.9	1.36 H	303	35.8	11.3
7	15720.00	34.9 AV	54.0	-19.1	1.36 H	303	23.6	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	114.9 PK			1.54 V	237	113.4	1.5
2	*5240.00	104.9 AV			1.54 V	237	103.4	1.5
3	5353.85	51.1 PK	74.0	-22.9	1.54 V	237	49.4	1.7
4	5353.85	40.0 AV	54.0	-14.0	1.54 V	237	38.3	1.7
5	#10480.00	50.3 PK	68.2	-17.9	1.71 V	293	38.7	11.6
6	15720.00	48.0 PK	74.0	-26.0	1.89 V	302	36.7	11.3
7	15720.00	35.4 AV	54.0	-18.6	1.89 V	302	24.1	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	#5649.62	52.3 PK	68.2	-15.9	1.48 H	331	50.3	2.0
2	*5745.00	112.2 PK			1.48 H	331	110.1	2.1
3	*5745.00	102.1 AV			1.48 H	331	100.0	2.1
4	#5990.27	52.4 PK	68.2	-15.8	1.48 H	331	49.7	2.7
5	11490.00	50.7 PK	74.0	-23.3	1.75 H	230	37.7	13.0
6	11490.00	38.3 AV	54.0	-15.7	1.75 H	230	25.3	13.0
7	#17235.00	52.9 PK	68.2	-15.3	1.21 H	314	36.7	16.2

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	#5648.74	53.3 PK	68.2	-14.9	1.49 V	275	51.3	2.0
2	*5745.00	113.1 PK			1.49 V	275	111.0	2.1
3	*5745.00	103.5 AV			1.49 V	275	101.4	2.1
4	#5955.72	52.9 PK	68.2	-15.3	1.49 V	275	50.2	2.7
5	11490.00	49.8 PK	74.0	-24.2	1.59 V	262	36.8	13.0
6	11490.00	38.3 AV	54.0	-15.7	1.59 V	262	25.3	13.0
7	#17235.00	52.9 PK	68.2	-15.3	1.98 V	301	36.7	16.2

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	#5637.72	52.4 PK	68.2	-15.8	1.23 H	334	50.4	2.0
2	*5785.00	112.5 PK			1.23 H	334	110.2	2.3
3	*5785.00	102.2 AV			1.23 H	334	99.9	2.3
4	#5997.22	52.7 PK	68.2	-15.5	1.23 H	334	49.9	2.8
5	11570.00	51.0 PK	74.0	-23.0	1.77 H	216	37.5	13.5
6	11570.00	38.4 AV	54.0	-15.6	1.77 H	216	24.9	13.5
7	#17355.00	53.0 PK	68.2	-15.2	1.26 H	325	35.8	17.2

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	#5631.58	51.8 PK	68.2	-16.4	1.61 V	275	49.8	2.0
2	*5785.00	113.6 PK			1.61 V	275	111.3	2.3
3	*5785.00	103.3 AV			1.61 V	275	101.0	2.3
4	#5957.62	53.3 PK	68.2	-14.9	1.61 V	275	50.6	2.7
5	11570.00	50.3 PK	74.0	-23.7	1.58 V	252	36.8	13.5
6	11570.00	38.7 AV	54.0	-15.3	1.58 V	252	25.2	13.5
7	#17355.00	52.8 PK	68.2	-15.4	1.92 V	286	35.6	17.2

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	#5633.37	52.6 PK	68.2	-15.6	1.38 H	332	50.6	2.0
2	*5825.00	112.1 PK			1.38 H	332	109.8	2.3
3	*5825.00	102.3 AV			1.38 H	332	100.0	2.3
4	#5960.14	52.2 PK	68.2	-16.0	1.38 H	332	49.5	2.7
5	11650.00	50.9 PK	74.0	-23.1	1.76 H	218	37.4	13.5
6	11650.00	38.2 AV	54.0	-15.8	1.76 H	218	24.7	13.5
7	#17475.00	52.8 PK	68.2	-15.4	1.25 H	309	33.7	19.1

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	#5626.82	51.6 PK	68.2	-16.6	1.63 V	281	49.6	2.0
2	*5825.00	112.6 PK			1.63 V	281	110.3	2.3
3	*5825.00	102.8 AV			1.63 V	281	100.5	2.3
4	#5950.60	51.7 PK	68.2	-16.5	1.63 V	281	49.0	2.7
5	11650.00	49.9 PK	74.0	-24.1	1.57 V	261	36.4	13.5
6	11650.00	38.2 AV	54.0	-15.8	1.57 V	261	24.7	13.5
7	#17475.00	52.8 PK	68.2	-15.4	1.93 V	290	33.7	19.1

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	5149.20	63.6 PK	74.0	-10.4	1.04 H	323	61.6	2.0
2	5149.20	50.9 AV	54.0	-3.1	1.04 H	323	48.9	2.0
3	*5180.00	114.2 PK			1.04 H	323	112.4	1.8
4	*5180.00	103.8 AV			1.04 H	323	102.0	1.8
5	#10360.00	48.6 PK	68.2	-19.6	1.85 H	223	37.2	11.4
6	15540.00	46.3 PK	74.0	-27.7	1.37 H	295	34.4	11.9
7	15540.00	34.6 AV	54.0	-19.4	1.37 H	295	22.7	11.9

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	5149.03	63.5 PK	74.0	-10.5	1.30 V	241	61.5	2.0
2	5149.03	50.7 AV	54.0	-3.3	1.30 V	241	48.7	2.0
3	*5180.00	114.7 PK			1.30 V	241	112.9	1.8
4	*5180.00	104.7 AV			1.30 V	241	102.9	1.8
5	#10360.00	50.2 PK	68.2	-18.0	1.70 V	296	38.8	11.4
6	15540.00	48.5 PK	74.0	-25.5	1.93 V	284	36.6	11.9
7	15540.00	35.7 AV	54.0	-18.3	1.93 V	284	23.8	11.9

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	5150.00	55.6 PK	74.0	-18.4	1.18 H	326	53.6	2.0
2	5150.00	44.1 AV	54.0	-9.9	1.18 H	326	42.1	2.0
3	*5200.00	112.9 PK			1.18 H	326	111.2	1.7
4	*5200.00	103.5 AV			1.18 H	326	101.8	1.7
5	5350.00	52.8 PK	74.0	-21.2	1.18 H	326	51.2	1.6
6	5350.00	39.7 AV	54.0	-14.3	1.18 H	326	38.1	1.6
7	#10400.00	48.5 PK	68.2	-19.7	1.89 H	212	36.9	11.6
8	15600.00	46.3 PK	74.0	-27.7	1.38 H	279	34.7	11.6
9	15600.00	34.6 AV	54.0	-19.4	1.38 H	279	23.0	11.6

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	55.8 PK	74.0	-18.2	1.25 V	241	53.8	2.0
2	5150.00	44.4 AV	54.0	-9.6	1.25 V	241	42.4	2.0
3	*5200.00	114.2 PK			1.25 V	241	112.5	1.7
4	*5200.00	104.4 AV			1.25 V	241	102.7	1.7
5	5350.00	53.3 PK	74.0	-20.7	1.25 V	241	51.7	1.6
6	5350.00	39.8 AV	54.0	-14.2	1.25 V	241	38.2	1.6
7	#10400.00	50.0 PK	68.2	-18.2	1.70 V	284	38.4	11.6
8	15600.00	48.4 PK	74.0	-25.6	1.93 V	277	36.8	11.6
9	15600.00	35.9 AV	54.0	-18.1	1.93 V	277	24.3	11.6

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.
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	*5240.00	113.8 PK			1.00 H	320	112.3	1.5
2	*5240.00	103.9 AV			1.00 H	320	102.4	1.5
3	5352.60	50.6 PK	74.0	-23.4	1.00 H	320	49.0	1.6
4	5352.60	39.7 AV	54.0	-14.3	1.00 H	320	38.1	1.6
5	#10480.00	48.6 PK	68.2	-19.6	1.85 H	219	37.0	11.6
6	15720.00	45.9 PK	74.0	-28.1	1.33 H	271	34.6	11.3
7	15720.00	34.3 AV	54.0	-19.7	1.33 H	271	23.0	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	115.1 PK			1.35 V	237	113.6	1.5
2	*5240.00	104.9 AV			1.35 V	237	103.4	1.5
3	5352.14	51.5 PK	74.0	-22.5	1.35 V	237	49.9	1.6
4	5352.14	40.0 AV	54.0	-14.0	1.35 V	237	38.4	1.6
5	#10480.00	50.2 PK	68.2	-18.0	1.70 V	272	38.6	11.6
6	15720.00	48.3 PK	74.0	-25.7	1.89 V	282	37.0	11.3
7	15720.00	35.8 AV	54.0	-18.2	1.89 V	282	24.5	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	#5604.54	52.3 PK	68.2	-15.9	1.28 H	331	50.5	1.8
2	*5745.00	112.5 PK			1.28 H	331	110.4	2.1
3	*5745.00	102.3 AV			1.28 H	331	100.2	2.1
4	#5928.50	52.4 PK	68.2	-15.8	1.28 H	331	49.7	2.7
5	11490.00	51.3 PK	74.0	-22.7	1.75 H	216	38.3	13.0
6	11490.00	38.6 AV	54.0	-15.4	1.75 H	216	25.6	13.0
7	#17235.00	53.0 PK	68.2	-15.2	1.20 H	301	36.8	16.2

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	#5593.51	54.7 PK	68.2	-13.5	1.48 V	275	52.9	1.8
2	*5745.00	112.8 PK			1.48 V	275	110.7	2.1
3	*5745.00	102.8 AV			1.48 V	275	100.7	2.1
4	#5972.43	53.9 PK	68.2	-14.3	1.48 V	275	51.2	2.7
5	11490.00	49.7 PK	74.0	-24.3	1.63 V	275	36.7	13.0
6	11490.00	38.0 AV	54.0	-16.0	1.63 V	275	25.0	13.0
7	#17235.00	53.1 PK	68.2	-15.1	1.99 V	313	36.9	16.2

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	#5619.99	52.9 PK	68.2	-15.3	1.03 H	330	51.1	1.8
2	*5785.00	112.3 PK			1.03 H	330	110.0	2.3
3	*5785.00	102.5 AV			1.03 H	330	100.2	2.3
4	#5965.28	52.6 PK	68.2	-15.6	1.03 H	330	49.9	2.7
5	11570.00	51.5 PK	74.0	-22.5	1.77 H	220	38.0	13.5
6	11570.00	38.7 AV	54.0	-15.3	1.77 H	220	25.2	13.5
7	#17355.00	53.2 PK	68.2	-15.0	1.22 H	287	36.0	17.2

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	#5583.99	54.0 PK	68.2	-14.2	1.59 V	278	52.1	1.9
2	*5785.00	113.4 PK			1.59 V	278	111.1	2.3
3	*5785.00	103.2 AV			1.59 V	278	100.9	2.3
4	#5936.14	54.0 PK	68.2	-14.2	1.59 V	278	51.3	2.7
5	11570.00	49.2 PK	74.0	-24.8	1.63 V	271	35.7	13.5
6	11570.00	37.8 AV	54.0	-16.2	1.63 V	271	24.3	13.5
7	#17355.00	53.1 PK	68.2	-15.1	1.94 V	307	35.9	17.2

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	#5648.57	52.2 PK	68.2	-16.0	1.11 H	327	50.2	2.0
2	*5825.00	112.5 PK			1.11 H	327	110.2	2.3
3	*5825.00	102.4 AV			1.11 H	327	100.1	2.3
4	#5951.07	52.0 PK	68.2	-16.2	1.11 H	327	49.3	2.7
5	11650.00	50.9 PK	74.0	-23.1	1.71 H	232	37.4	13.5
6	11650.00	38.4 AV	54.0	-15.6	1.71 H	232	24.9	13.5
7	#17475.00	52.9 PK	68.2	-15.3	1.27 H	276	33.8	19.1

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	#5580.00	54.4 PK	68.2	-13.8	1.67 V	270	52.5	1.9
2	*5825.00	113.6 PK			1.67 V	270	111.3	2.3
3	*5825.00	103.3 AV			1.67 V	270	101.0	2.3
4	#5951.77	54.8 PK	68.2	-13.4	1.67 V	270	52.1	2.7
5	11650.00	49.2 PK	74.0	-24.8	1.68 V	258	35.7	13.5
6	11650.00	38.0 AV	54.0	-16.0	1.68 V	258	24.5	13.5
7	#17475.00	53.4 PK	68.2	-14.8	1.96 V	320	34.3	19.1

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	5149.42	65.3 PK	74.0	-8.7	1.29 H	312	63.3	2.0
2	5149.42	51.8 AV	54.0	-2.2	1.29 H	312	49.8	2.0
3	*5190.00	107.9 PK			1.29 H	312	106.2	1.7
4	*5190.00	98.0 AV			1.29 H	312	96.3	1.7
5	#10380.00	48.7 PK	68.2	-19.5	1.81 H	204	37.2	11.5
6	15570.00	46.2 PK	74.0	-27.8	1.38 H	265	34.5	11.7
7	15570.00	34.5 AV	54.0	-19.5	1.38 H	265	22.8	11.7

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	5147.06	67.1 PK	74.0	-6.9	1.64 V	234	65.1	2.0
2	5147.06	52.7 AV	54.0	-1.3	1.64 V	234	50.7	2.0
3	*5190.00	108.7 PK			1.64 V	234	107.0	1.7
4	*5190.00	98.2 AV			1.64 V	234	96.5	1.7
5	#10380.00	50.4 PK	68.2	-17.8	1.74 V	281	38.9	11.5
6	15570.00	47.9 PK	74.0	-26.1	1.91 V	282	36.2	11.7
7	15570.00	35.7 AV	54.0	-18.3	1.91 V	282	24.0	11.7

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.
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	*5230.00	111.1 PK			1.25 H	323	109.5	1.6
2	*5230.00	100.5 AV			1.25 H	323	98.9	1.6
3	5353.30	51.4 PK	74.0	-22.6	1.25 H	323	49.8	1.6
4	5353.30	40.4 AV	54.0	-13.6	1.25 H	323	38.8	1.6
5	#10460.00	48.9 PK	68.2	-19.3	1.80 H	194	37.4	11.5
6	15690.00	46.9 PK	74.0	-27.1	1.39 H	280	35.5	11.4
7	15690.00	34.9 AV	54.0	-19.1	1.39 H	280	23.5	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	*5230.00	112.7 PK			1.22 V	237	111.1	1.6
2	*5230.00	102.1 AV			1.22 V	237	100.5	1.6
3	5354.69	53.4 PK	74.0	-20.6	1.22 V	237	51.7	1.7
4	5354.69	42.3 AV	54.0	-11.7	1.22 V	237	40.6	1.7
5	#10460.00	50.5 PK	68.2	-17.7	1.70 V	282	39.0	11.5
6	15690.00	47.8 PK	74.0	-26.2	1.86 V	296	36.4	11.4
7	15690.00	35.7 AV	54.0	-18.3	1.86 V	296	24.3	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	#5581.90	52.2 PK	68.2	-16.0	1.04 H	326	50.3	1.9
2	*5755.00	109.4 PK			1.04 H	326	107.2	2.2
3	*5755.00	99.6 AV			1.04 H	326	97.4	2.2
4	#5952.42	52.1 PK	68.2	-16.1	1.04 H	326	49.4	2.7
5	11510.00	50.7 PK	74.0	-23.3	1.74 H	237	37.7	13.0
6	11510.00	38.4 AV	54.0	-15.6	1.74 H	237	25.4	13.0
7	#17265.00	52.7 PK	68.2	-15.5	1.33 H	264	36.3	16.4

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	#5642.66	53.5 PK	68.2	-14.7	1.63 V	273	51.5	2.0
2	*5755.00	110.2 PK			1.63 V	273	108.0	2.2
3	*5755.00	99.8 AV			1.63 V	273	97.6	2.2
4	#5944.81	53.9 PK	68.2	-14.3	1.63 V	273	51.2	2.7
5	11510.00	48.5 PK	74.0	-25.5	1.70 V	262	35.5	13.0
6	11510.00	37.6 AV	54.0	-16.4	1.70 V	262	24.6	13.0
7	#17265.00	53.3 PK	68.2	-14.9	1.99 V	323	36.9	16.4

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 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	#5607.58	51.4 PK	68.2	-16.8	1.42 H	326	49.6	1.8
2	*5795.00	109.9 PK			1.42 H	326	107.6	2.3
3	*5795.00	99.3 AV			1.42 H	326	97.0	2.3
4	#5980.21	53.0 PK	68.2	-15.2	1.42 H	326	50.3	2.7
5	11590.00	50.4 PK	74.0	-23.6	1.69 H	227	36.9	13.5
6	11590.00	37.9 AV	54.0	-16.1	1.69 H	227	24.4	13.5
7	#17385.00	52.4 PK	68.2	-15.8	1.33 H	264	34.8	17.6

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	#5636.63	54.1 PK	68.2	-14.1	1.76 V	272	52.1	2.0
2	*5795.00	110.2 PK			1.76 V	272	107.9	2.3
3	*5795.00	99.7 AV			1.76 V	272	97.4	2.3
4	#5941.02	53.6 PK	68.2	-14.6	1.76 V	272	50.9	2.7
5	11590.00	48.2 PK	74.0	-25.8	1.75 V	249	34.7	13.5
6	11590.00	37.3 AV	54.0	-16.7	1.75 V	249	23.8	13.5
7	#17385.00	53.4 PK	68.2	-14.8	1.98 V	319	35.8	17.6

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.
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	5148.46	65.1 PK	74.0	-8.9	1.19 H	319	63.1	2.0
2	5148.46	51.7 AV	54.0	-2.3	1.19 H	319	49.7	2.0
3	*5210.00	104.7 PK			1.19 H	319	103.0	1.7
4	*5210.00	94.3 AV			1.19 H	319	92.6	1.7
5	5351.71	54.1 PK	74.0	-19.9	1.19 H	319	52.5	1.6
6	5351.71	43.9 AV	54.0	-10.1	1.19 H	319	42.3	1.6
7	#10420.00	48.6 PK	68.2	-19.6	1.83 H	181	37.0	11.6
8	15630.00	46.9 PK	74.0	-27.1	1.40 H	276	35.3	11.6
9	15630.00	35.0 AV	54.0	-19.0	1.40 H	276	23.4	11.6

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	5144.90	65.4 PK	74.0	-8.6	1.64 V	233	63.4	2.0
2	5144.90	52.7 AV	54.0	-1.3	1.64 V	233	50.7	2.0
3	*5210.00	104.2 PK			1.64 V	233	102.5	1.7
4	*5210.00	93.6 AV			1.64 V	233	91.9	1.7
5	5352.26	55.6 PK	74.0	-18.4	1.64 V	233	54.0	1.6
6	5352.26	44.5 AV	54.0	-9.5	1.64 V	233	42.9	1.6
7	#10420.00	50.8 PK	68.2	-17.4	1.64 V	285	39.2	11.6
8	15630.00	47.2 PK	74.0	-26.8	1.82 V	295	35.6	11.6
9	15630.00	35.3 AV	54.0	-18.7	1.82 V	295	23.7	11.6

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.
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	#5647.48	61.8 PK	68.2	-6.4	1.26 H	328	59.8	2.0
2	*5775.00	106.5 PK			1.26 H	328	104.3	2.2
3	*5775.00	95.5 AV			1.26 H	328	93.3	2.2
4	#5934.20	54.8 PK	68.2	-13.4	1.26 H	328	52.1	2.7
5	11550.00	50.6 PK	74.0	-23.4	1.66 H	241	37.3	13.3
6	11550.00	38.4 AV	54.0	-15.6	1.66 H	241	25.1	13.3
7	#17325.00	52.2 PK	68.2	-16.0	1.36 H	267	35.4	16.8

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	#5647.48	61.2 PK	68.2	-7.0	1.63 V	271	59.2	2.0
2	*5775.00	106.6 PK			1.63 V	271	104.4	2.2
3	*5775.00	96.2 AV			1.63 V	271	94.0	2.2
4	#5933.23	58.4 PK	68.2	-9.8	1.63 V	271	55.7	2.7
5	11550.00	48.4 PK	74.0	-25.6	1.76 V	258	35.1	13.3
6	11550.00	37.7 AV	54.0	-16.3	1.76 V	258	24.4	13.3
7	#17325.00	53.4 PK	68.2	-14.8	1.98 V	333	36.6	16.8

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.

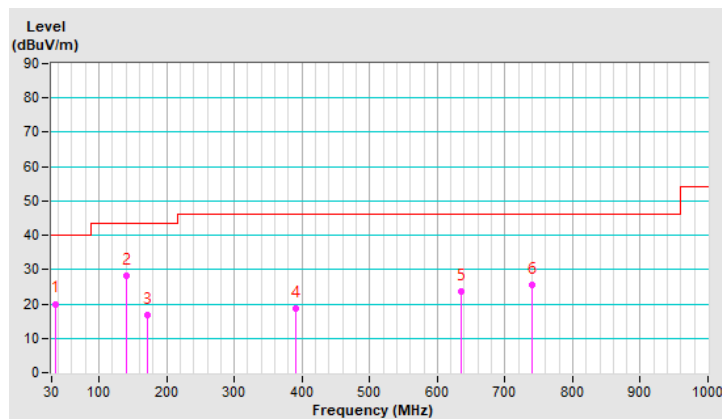
Below 1GHz Data:

RF Mode	TX 802.11a	Channel	CH 36 : 5180 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	36.06	20.0 QP	40.0	-20.0	2.00 H	360	33.5	-13.5
2	140.05	28.3 QP	43.5	-15.2	1.00 H	138	41.3	-13.0
3	172.21	16.6 QP	43.5	-26.9	1.50 H	159	30.1	-13.5
4	390.96	18.7 QP	46.0	-27.3	1.00 H	360	28.7	-10.0
5	634.97	23.6 QP	46.0	-22.4	1.00 H	360	28.2	-4.6
6	740.61	25.5 QP	46.0	-20.5	2.00 H	360	28.4	-2.9

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.



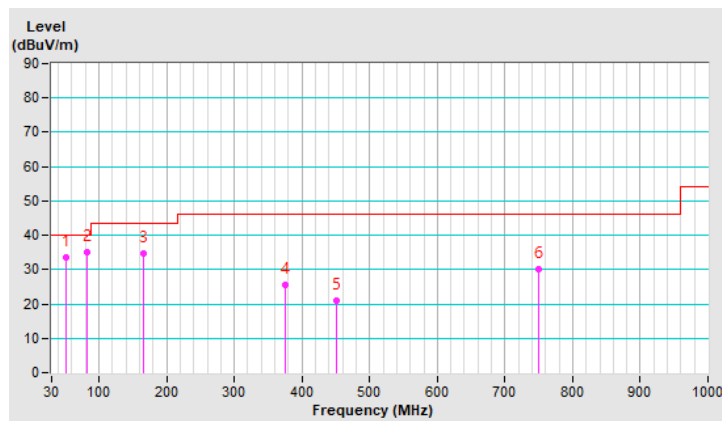
RF Mode	TX 802.11a	Channel	CH 36 : 5180 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	50.90	33.5 QP	40.0	-6.5	1.00 V	230	46.1	-12.6
2	83.21	34.9 QP	40.0	-5.1	1.00 V	47	53.0	-18.1
3	165.56	34.5 QP	43.5	-9.0	1.50 V	360	47.5	-13.0
4	375.00	25.6 QP	46.0	-20.4	1.50 V	285	35.9	-10.3
5	451.20	20.8 QP	46.0	-25.2	1.50 V	121	29.1	-8.3
6	750.02	30.0 QP	46.0	-16.0	1.00 V	192	32.8	-2.8

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 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. 20, 2020	Oct. 19, 2021
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 27, 2020	Oct. 26, 2021
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 19, 2020	Mar. 18, 2021
50 ohms Terminator	50	3	Oct. 26, 2020	Oct. 25, 2021
RF Cable	5D-FB	COCCAB-001	Sep. 26, 2020	Sep. 25, 2021
Fixed attenuator EMCI	STI02-2200-10	005	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: Feb. 05, 2021

4.2.3 Test Procedure

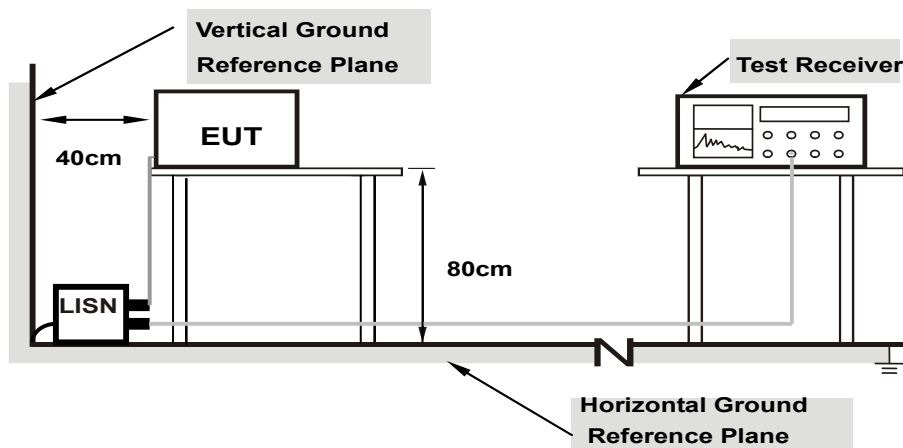
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance 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: 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.

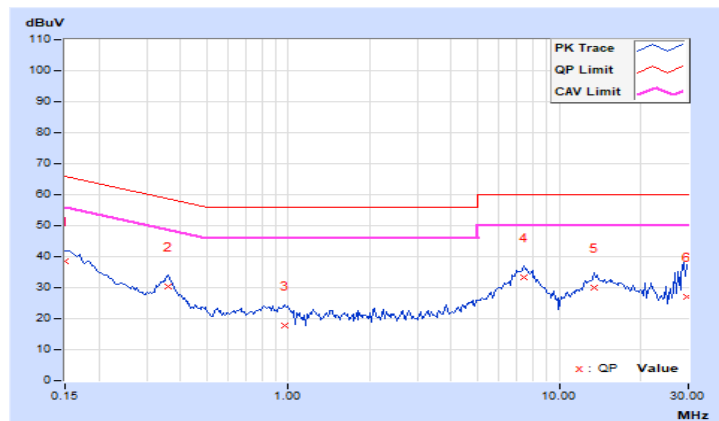
4.2.7 Test Results

RF Mode	TX 802.11a	Channel	CH 36 : 5180 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	0.15000	9.96	28.62	15.31	38.58	25.27	66.00	56.00	-27.42	-30.73
2	0.36094	10.01	20.44	15.67	30.45	25.68	58.71	48.71	-28.26	-23.03
3	0.97031	10.06	7.83	0.23	17.89	10.29	56.00	46.00	-38.11	-35.71
4	7.40234	10.53	22.90	15.30	33.43	25.83	60.00	50.00	-26.57	-24.17
5	13.47266	10.98	19.08	11.68	30.06	22.66	60.00	50.00	-29.94	-27.34
6	29.68750	11.72	15.41	7.60	27.13	19.32	60.00	50.00	-32.87	-30.68

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

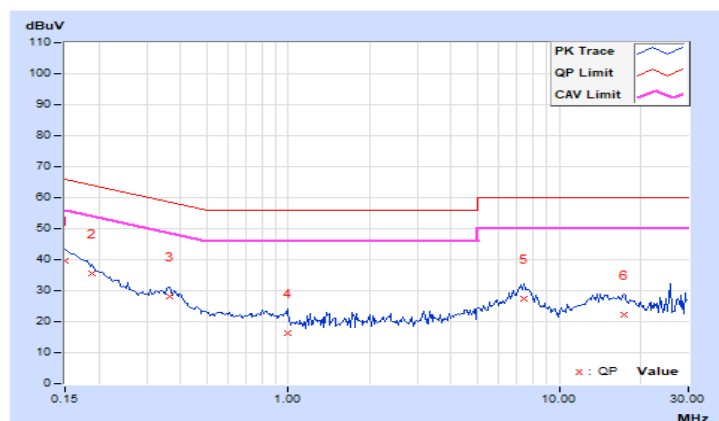


RF Mode	TX 802.11a	Channel	CH 36 : 5180 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

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	0.15000	9.94	29.72	15.61	39.66	25.55	66.00	56.00	-26.34	-30.45
2	0.18906	9.97	25.42	12.09	35.39	22.06	64.08	54.08	-28.69	-32.02
3	0.36484	10.00	18.21	11.43	28.21	21.43	58.62	48.62	-30.41	-27.19
4	0.99375	10.07	6.34	-3.51	16.41	6.56	56.00	46.00	-39.59	-39.44
5	7.42578	10.46	16.83	8.61	27.29	19.07	60.00	50.00	-32.71	-30.93
6	17.31250	11.03	11.19	2.64	22.22	13.67	60.00	50.00	-37.78	-36.33

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)
		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,

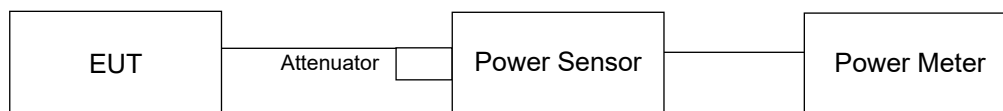
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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

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 (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	18.35	18.26	135.38	21.32	30	Pass
40	5200	18.25	18.21	133.056	21.24	30	Pass
48	5240	18.07	17.93	126.208	21.01	30	Pass
149	5745	17.96	17.37	117.093	20.69	30	Pass
157	5785	17.82	17.15	112.414	20.51	30	Pass
165	5825	17.71	16.79	106.773	20.28	30	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	18.14	18.01	128.404	21.09	30	Pass
40	5200	18.04	17.92	125.624	20.99	30	Pass
48	5240	17.81	17.69	119.144	20.76	30	Pass
149	5745	17.69	16.90	107.727	20.32	30	Pass
157	5785	17.58	16.67	103.731	20.16	30	Pass
165	5825	17.55	16.02	96.88	19.86	30	Pass

802.11ac (VHT40)

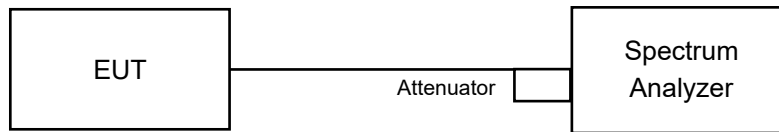
Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	14.51	14.39	55.728	17.46	30	Pass
46	5230	18.41	18.11	134.057	21.27	30	Pass
151	5755	17.55	17.27	110.219	20.42	30	Pass
159	5795	18.11	16.61	110.528	20.43	30	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	13.54	13.14	43.201	16.35	30	Pass
155	5775	17.32	16.90	102.929	20.13	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	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.28	16.8
40	5200	17.16	16.92
48	5240	17.04	17.04
149	5745	17.52	16.92
157	5785	18.96	16.8
165	5825	19.44	16.56

802.11ac (VHT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18	17.76
40	5200	18	18
48	5240	18	18
149	5745	18.12	17.88
157	5785	18.72	17.76
165	5825	19.56	17.64

802.11ac (VHT40)

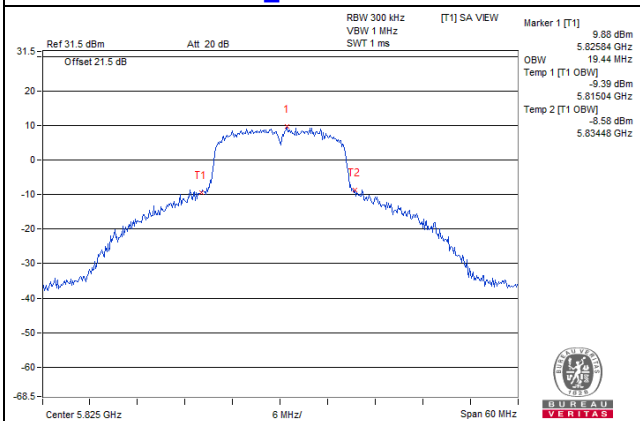
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36	36
46	5230	37.2	36.96
151	5755	36.96	36.72
159	5795	40.56	36.72

802.11ac (VHT80)

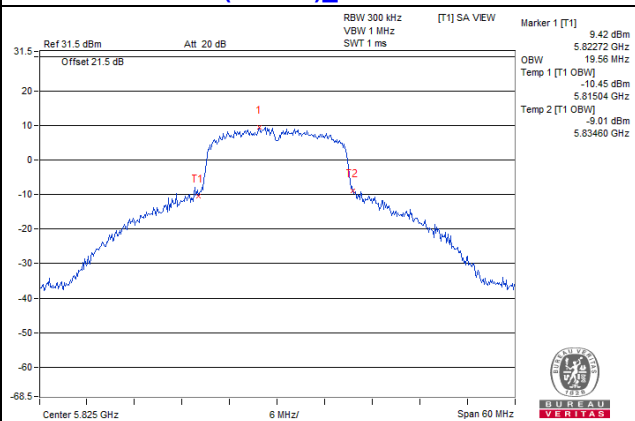
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	74.88	74.88
155	5775	76.32	76.32

Spectrum Plot of Max. Value

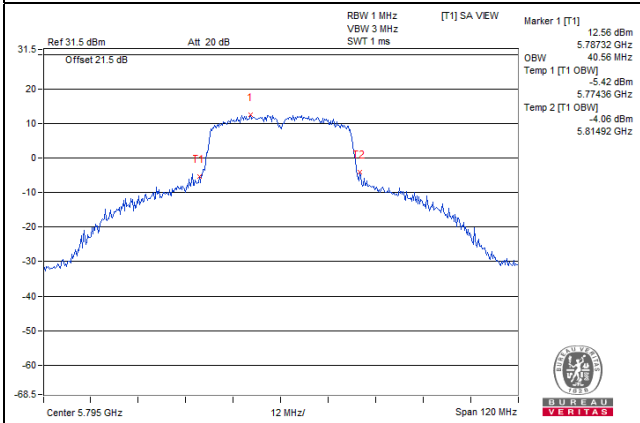
802.11a_Chain 0 / CH165



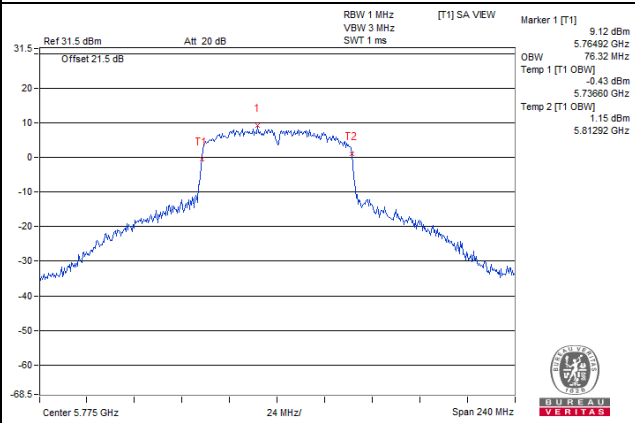
802.11ac (VHT20)_Chain 0 / CH165



802.11ac (VHT40)_Chain 0 / CH159

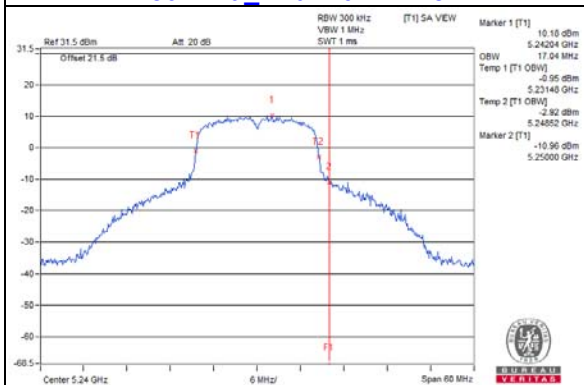


802.11ac (VHT80)_Chain 0 / CH155

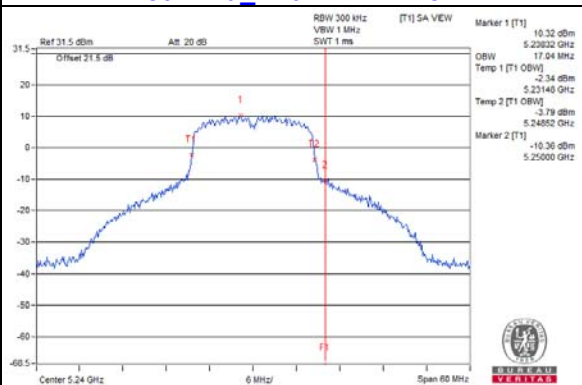


**Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)**

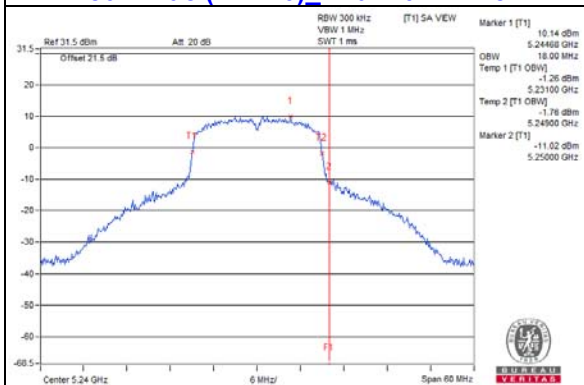
802.11a_Chain 0 / CH48



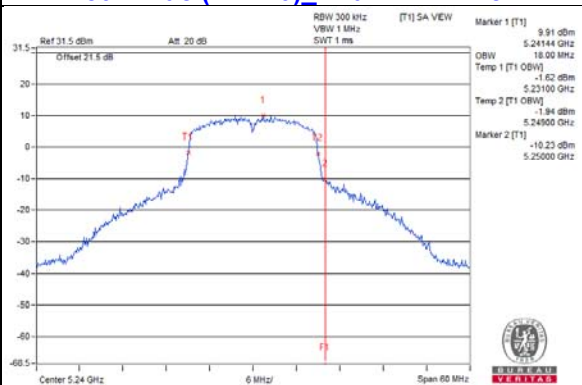
802.11a_Chain 1 / CH48



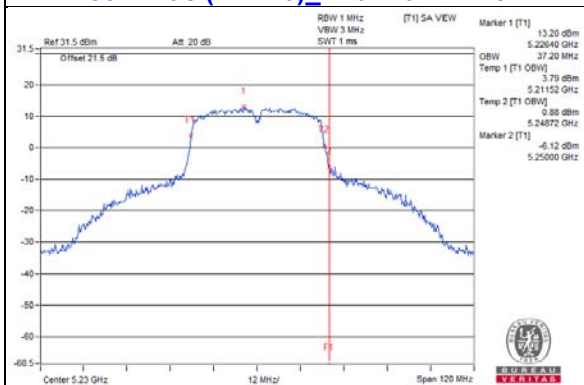
802.11ac (VHT20)_Chain 0 / CH48



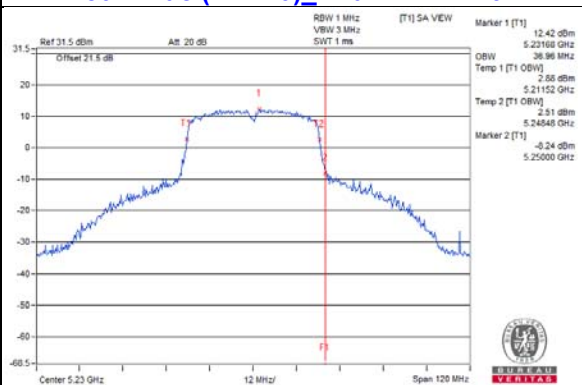
802.11ac (VHT20)_Chain 1 / CH48



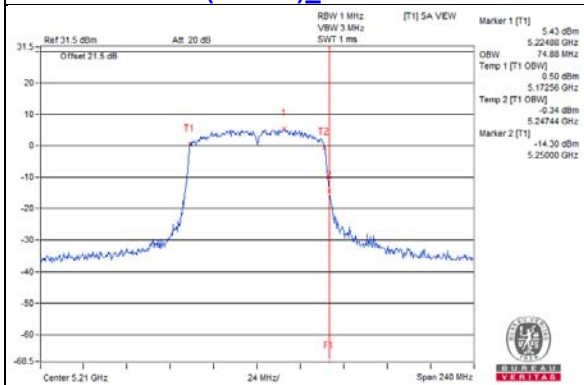
802.11ac (VHT40)_Chain 0 / CH46



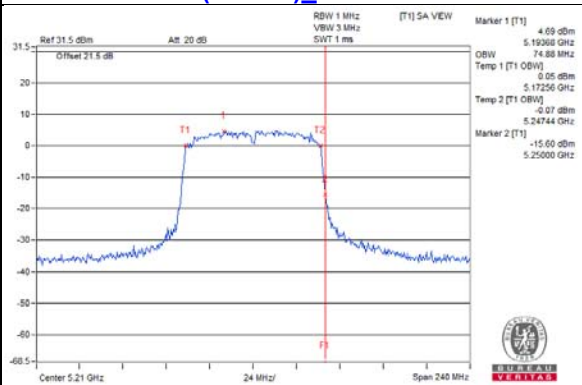
802.11ac (VHT40)_Chain 1 / CH46



802.11ac (VHT80)_Chain 0 / CH42

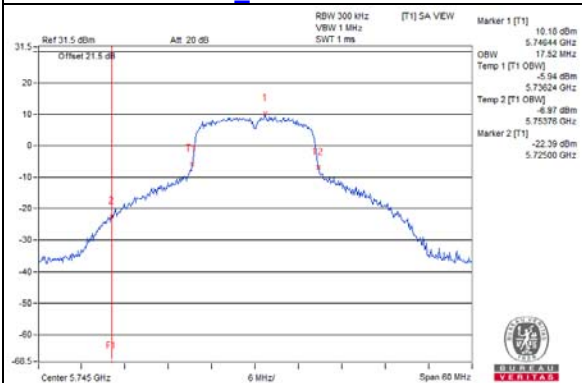


802.11ac (VHT80)_Chain 1 / CH42

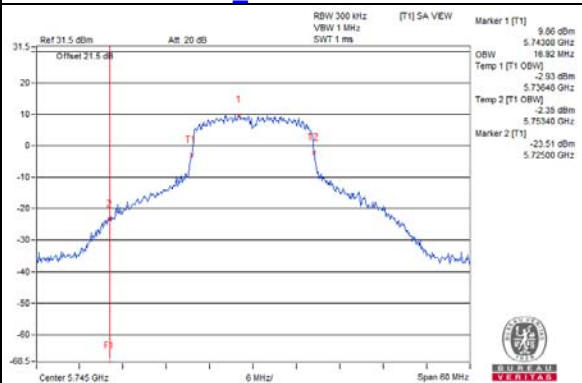


**Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)**

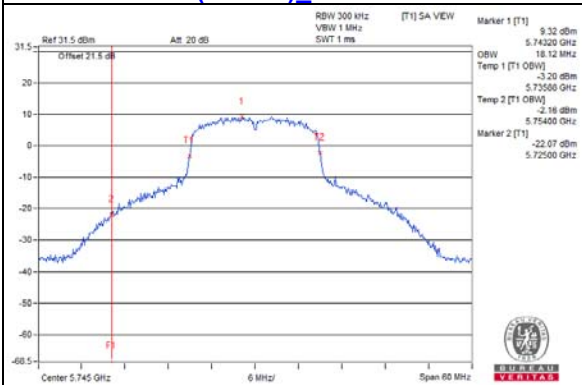
802.11a_Chain 0 / CH149



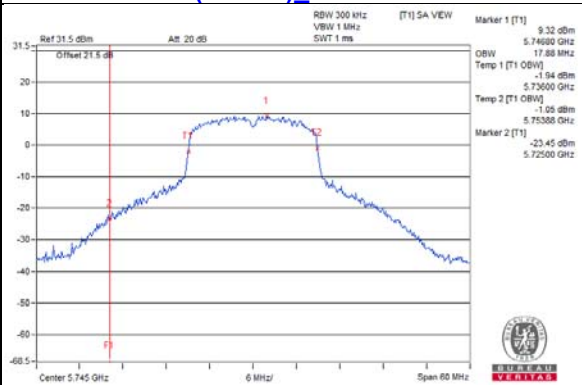
802.11a_Chain 1 / CH149



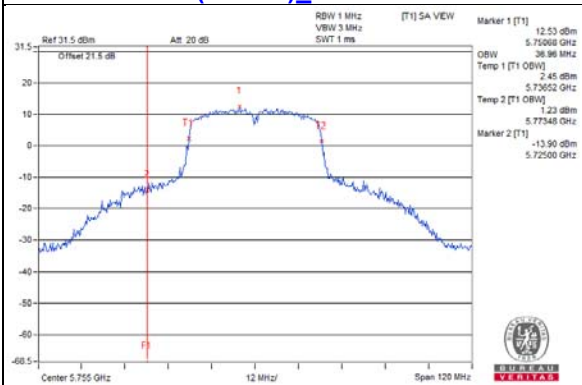
802.11ac (VHT20)_Chain 0 / CH149



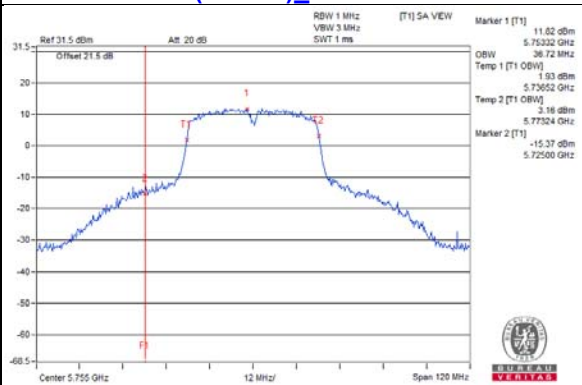
802.11ac (VHT20)_Chain 1 / CH149



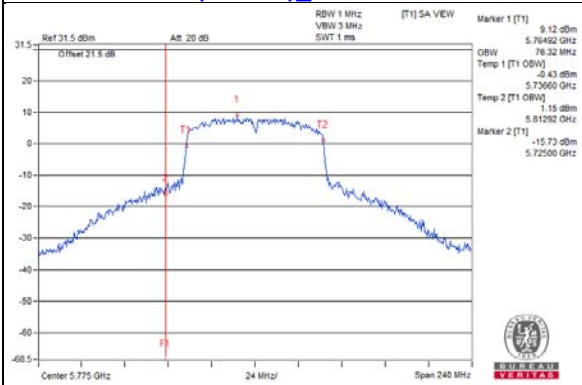
802.11ac (VHT40)_Chain 0 / CH151



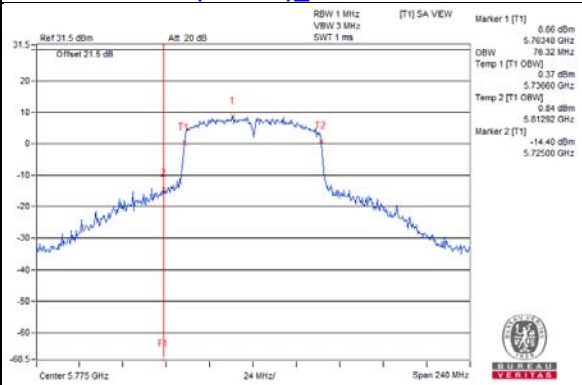
802.11ac (VHT40)_Chain 1 / CH151



802.11ac (VHT80)_Chain 0 / CH155



802.11ac (VHT80)_Chain 1 / CH155

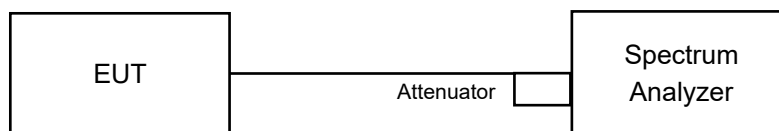


4.5 Peak Power Spectral Density Measurement

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 \geq 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 $BWCF = 10\log(500\text{kHz}/300\text{kHz})$
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 $10 \log (1/\text{duty cycle})$

For other modulation:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW \geq 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 $BWCF = 10\log(500\text{kHz}/300\text{kHz})$
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 band:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	6.01	5.50	8.77	15.78	Pass
40	5200	5.91	5.98	8.96	15.78	Pass
48	5240	5.71	5.68	8.71	15.78	Pass

- Note: 1. Method 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. The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20}) / 2] = 7.22 \text{ dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17-(7.22-6) = 15.78 \text{ dBm}$.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	5.66	5.29	8.49	15.78	Pass
40	5200	5.66	5.35	8.52	15.78	Pass
48	5240	5.42	5.33	8.39	15.78	Pass

- Note: 1. Method 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. The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20}) / 2] = 7.22 \text{ dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17-(7.22-6) = 15.78 \text{ dBm}$.

802.11ac (VHT40)

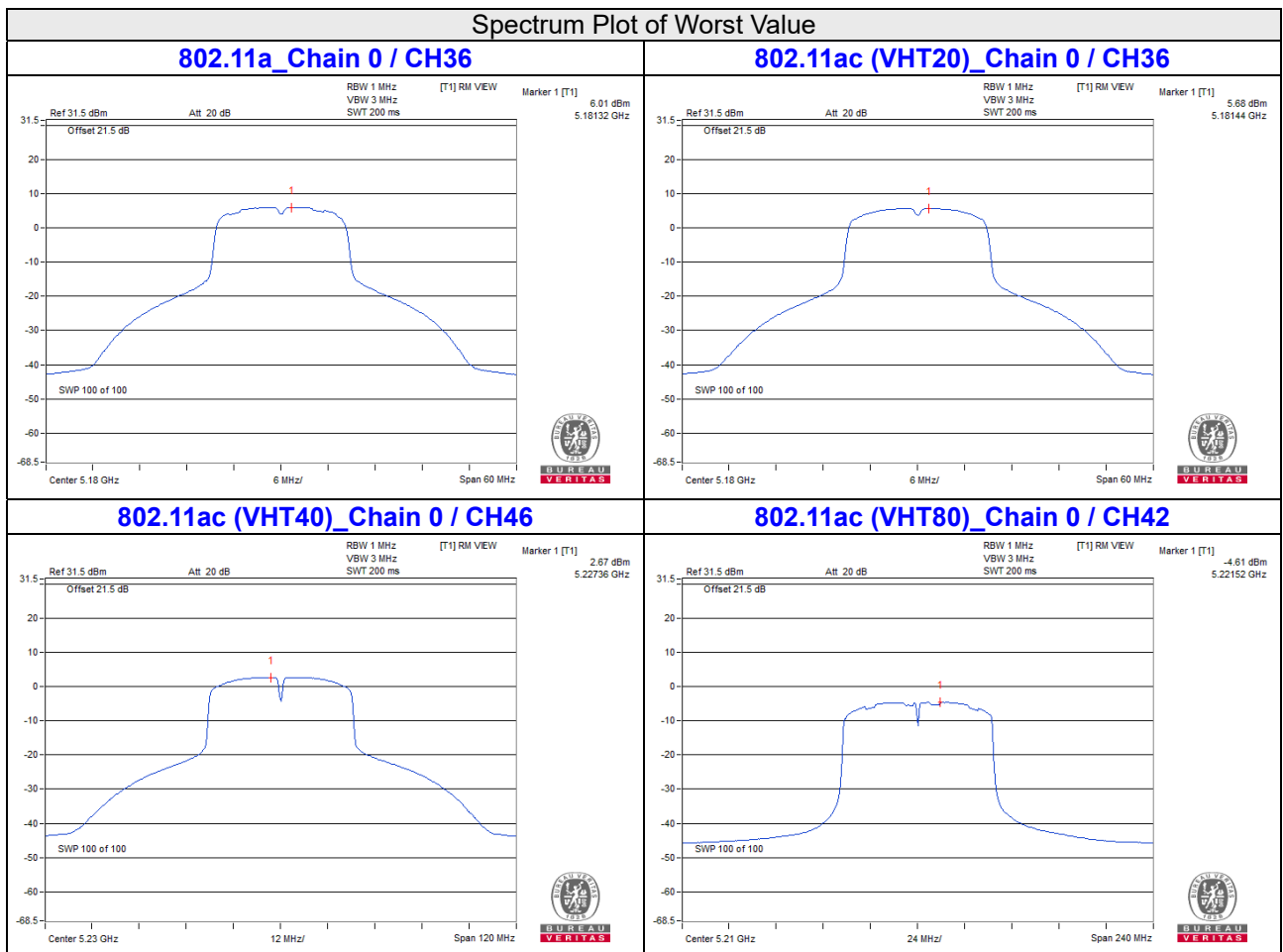
Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
38	5190	-0.62	-0.71	2.35	15.78	Pass
46	5230	2.67	2.25	5.48	15.78	Pass

- Note: 1. Method 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. The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20}) / 2] = 7.22 \text{ dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17-(7.22-6) = 15.78 \text{ dBm}$.

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
		Chain 0	Chain 1				
42	5210	-4.61	-5.00	0.12	-1.67	15.78	Pass

- Note: 1. Method 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. The directional gain = $10 \log[(10^{G_0/20} + 10^{G_1/20}) / 2] = 7.22 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $17 - (7.22 - 6) = 15.78 \text{ dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.



For U-NII-3 band:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)		Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1				
149	5745	-3.37	-2.96	-0.15	2.07	28.78	Pass
157	5785	-3.22	-3.66	-0.42	1.80	28.78	Pass
165	5825	-3.07	-4.21	-0.59	1.63	28.78	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20}) / 2] = 7.22 \text{ dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (7.22 - 6) = 28.78 \text{ dBm}$.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)		Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1				
149	5745	-3.53	-3.58	-0.54	1.68	28.78	Pass
157	5785	-3.28	-3.95	-0.59	1.63	28.78	Pass
165	5825	-3.30	-4.51	-0.85	1.37	28.78	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20}) / 2] = 7.22 \text{ dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (7.22 - 6) = 28.78 \text{ dBm}$.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)		Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1				
151	5755	-7.34	-7.44	-4.38	-2.16	28.78	Pass
159	5795	-6.59	-7.64	-4.07	-1.85	28.78	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20}) / 2] = 7.22 \text{ dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (7.22 - 6) = 28.78 \text{ dBm}$.

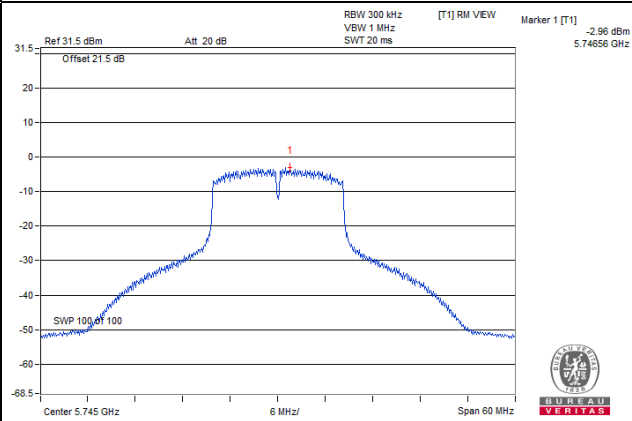
802.11ac (VHT80)

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
		Chain 0	Chain 1					
155	5775	-10.84	-10.88	0.12	-7.73	-5.51	28.78	Pass

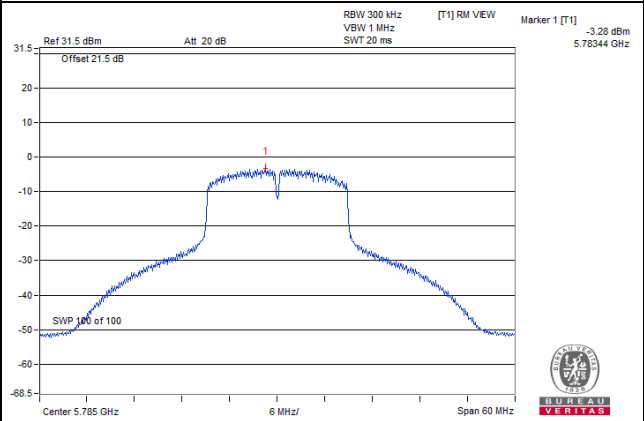
- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20}) / 2] = 7.22 \text{ dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (7.22 - 6) = 28.78 \text{ dBm}$.
 3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

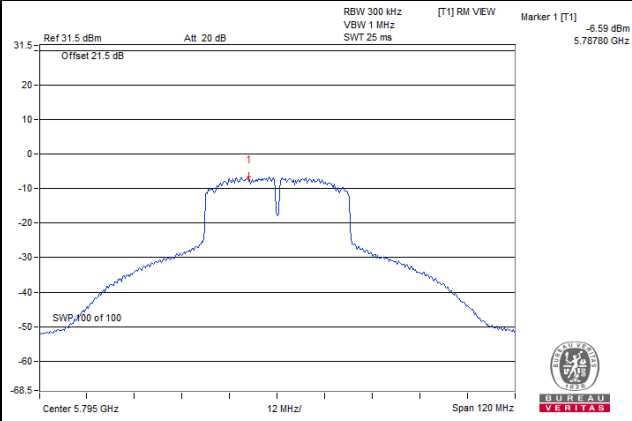
802.11a_Chain 1 / CH149



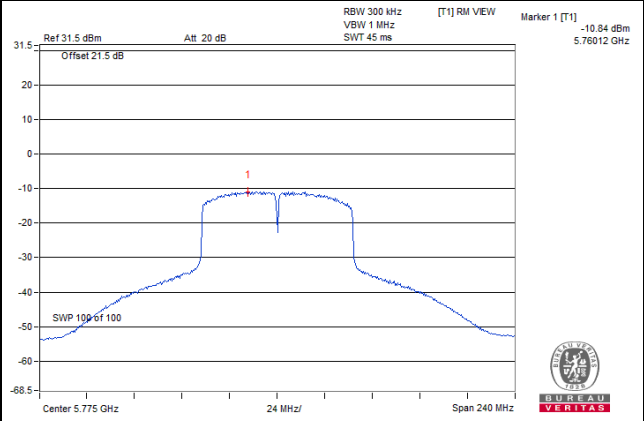
802.11ac (VHT20)_Chain 0 / CH157



802.11ac (VHT40)_Chain 0 / CH159



802.11ac (VHT80)_Chain 0 / CH155

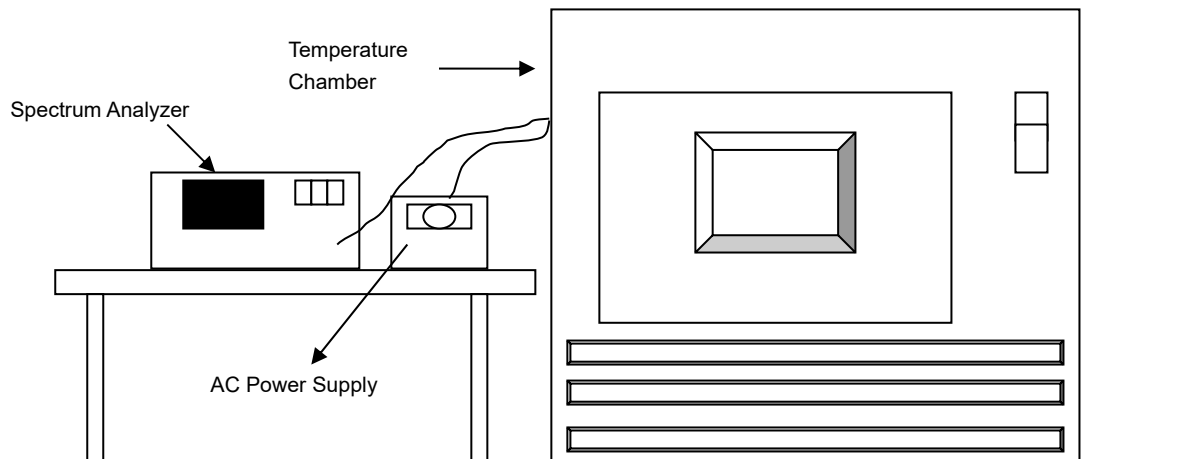


4.6 Frequency Stability Measurement

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

- 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 until measurements down to the lowest specified temperature have been completed.
- 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. (°C)	Power Supply (Vac)	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	120	5179.9825	Pass	5179.9822	Pass	5179.9824	Pass	5179.9825	Pass
30	120	5180.0147	Pass	5180.0177	Pass	5180.0156	Pass	5180.0168	Pass
20	120	5180.0167	Pass	5180.0182	Pass	5180.0202	Pass	5180.0162	Pass
10	120	5180.0161	Pass	5180.0134	Pass	5180.0133	Pass	5180.0142	Pass
0	120	5179.9785	Pass	5179.9813	Pass	5179.9802	Pass	5179.9808	Pass

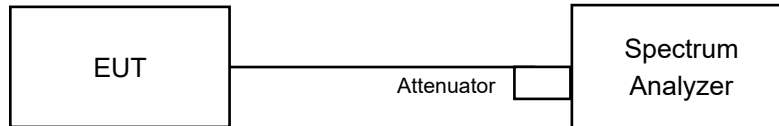
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0174	Pass	5180.0189	Pass	5180.02	Pass	5180.0157	Pass
	120	5180.0167	Pass	5180.0182	Pass	5180.0202	Pass	5180.0162	Pass
	102	5180.0163	Pass	5180.0192	Pass	5180.0208	Pass	5180.0164	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

- 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

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.5	15.38	0.5	Pass
157	5785	15.71	15.73	0.5	Pass
165	5825	15.58	15.34	0.5	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.13	15.12	0.5	Pass
157	5785	15.92	16.32	0.5	Pass
165	5825	15.34	15.76	0.5	Pass

802.11ac (VHT40)

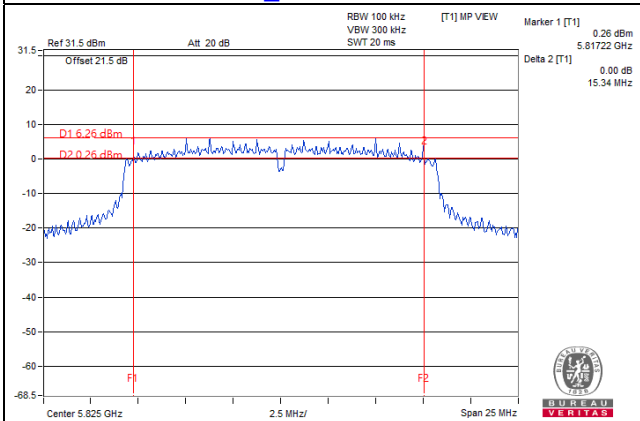
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	31.61	32.82	0.5	Pass
159	5795	34.09	35.15	0.5	Pass

802.11ac (VHT80)

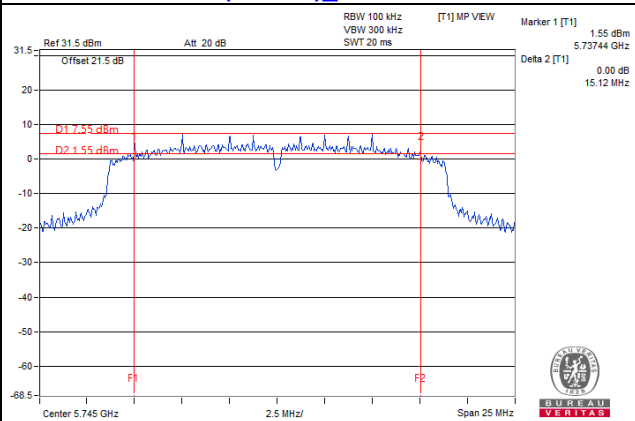
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	72.97	72.94	0.5	Pass

Spectrum Plot of Worst Value

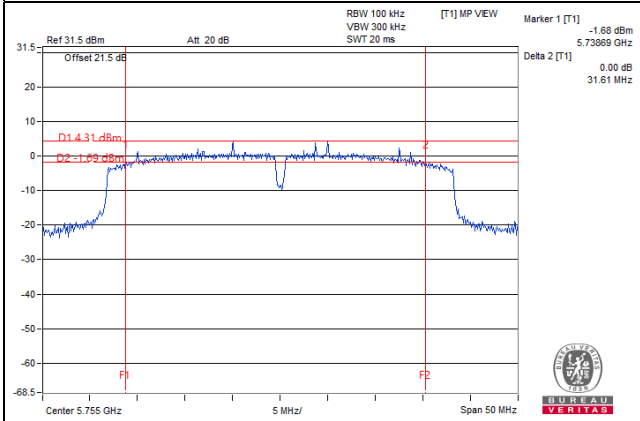
802.11a_Chain 1 / CH165



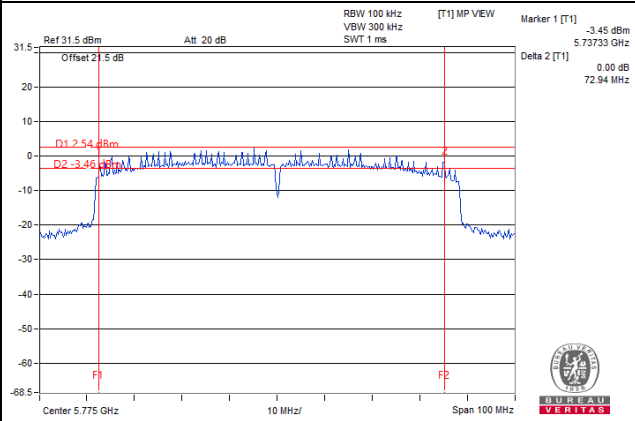
802.11ac (VHT20)_Chain 1 / CH149



802.11ac (VHT40)_Chain 0 / CH151



802.11ac (VHT80)_Chain 1 / CH155



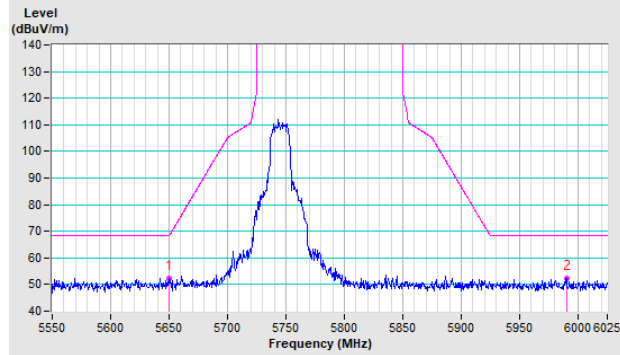
5 Pictures of Test Arrangements

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

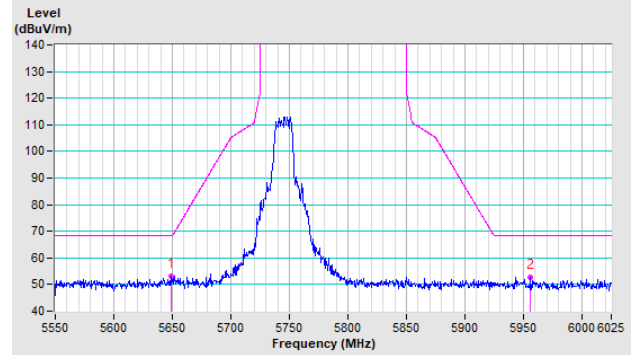
Annex A - Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a CH 149 : 5745 MHz

Horizontal

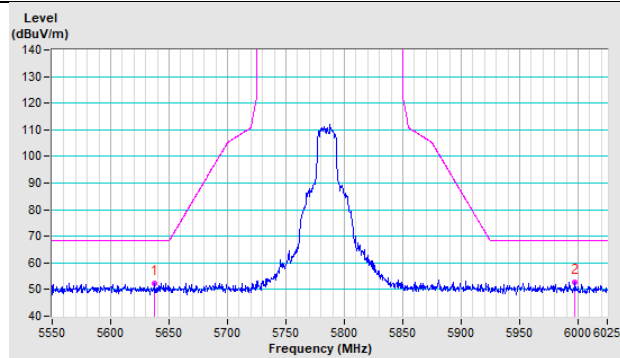


Vertical

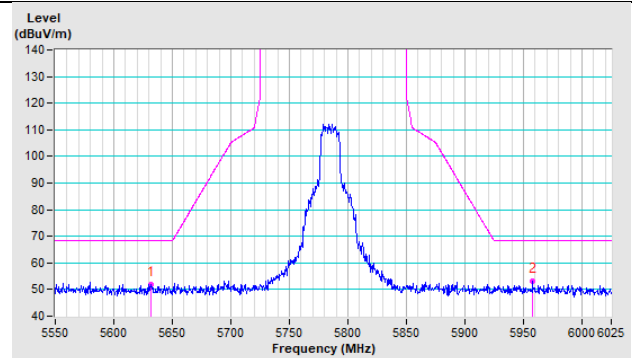


802.11a CH 157 : 5785 MHz

Horizontal

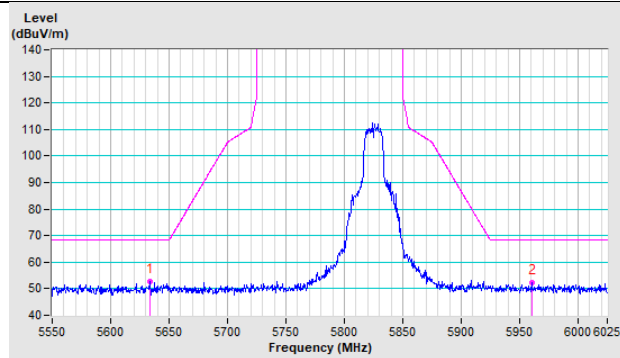


Vertical

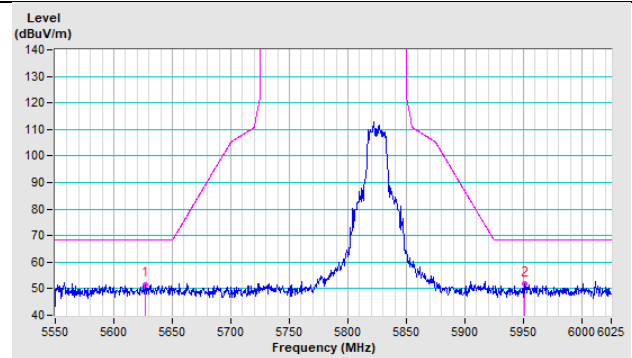


802.11a CH 165 : 5825 MHz

Horizontal

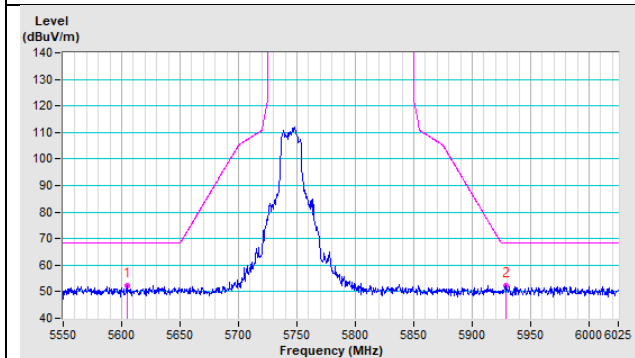


Vertical

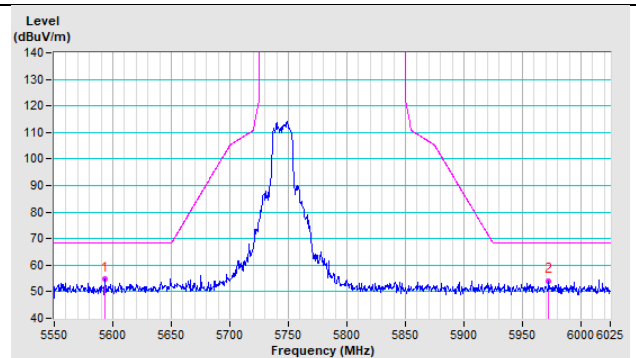


802.11ac (VHT20) CH 149 : 5745 MHz

Horizontal

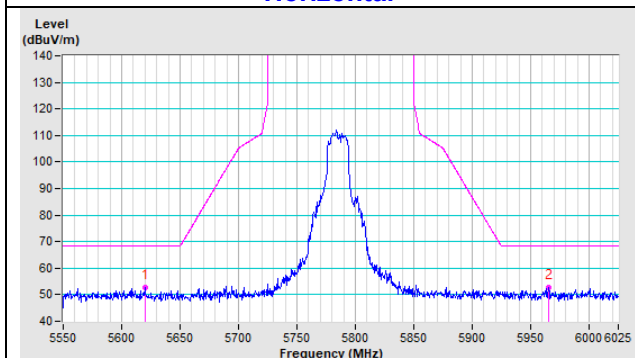


Vertical

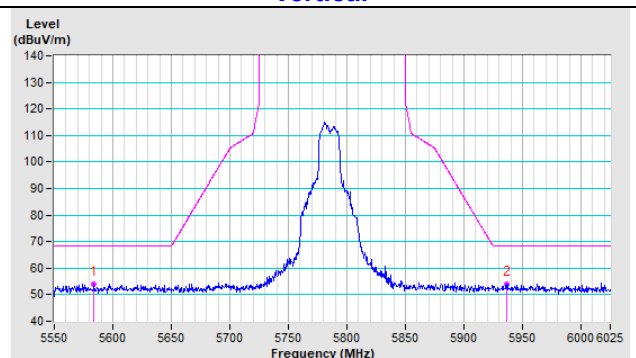


802.11ac (VHT20) CH 157 : 5785 MHz

Horizontal

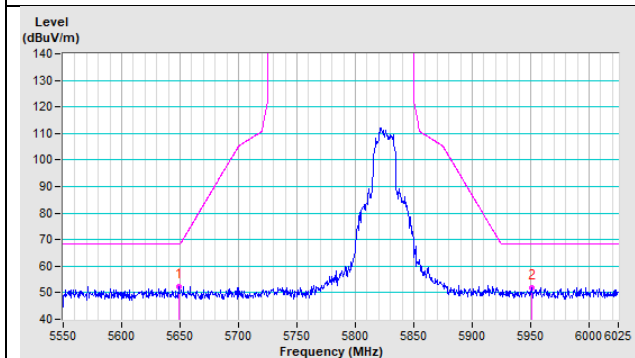


Vertical

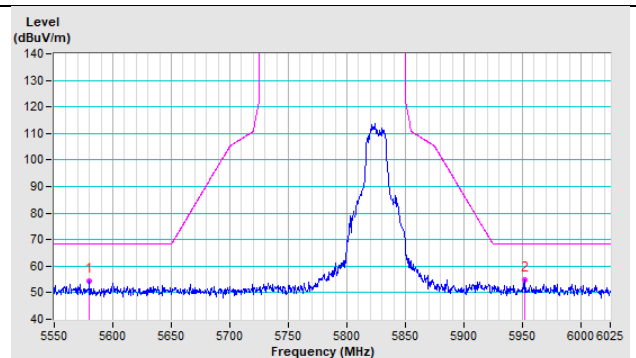


802.11ac (VHT20) CH 165 : 5825 MHz

Horizontal

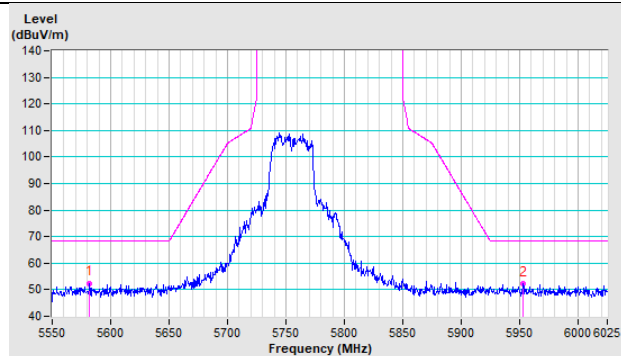


Vertical

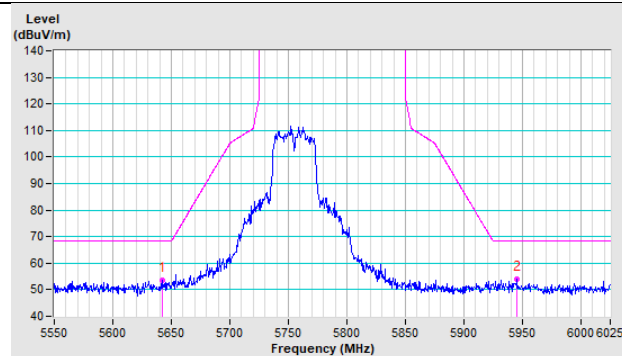


802.11ac (VHT40) CH 151 : 5755 MHz

Horizontal

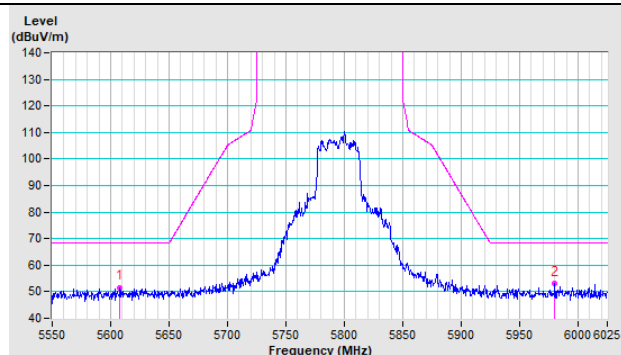


Vertical

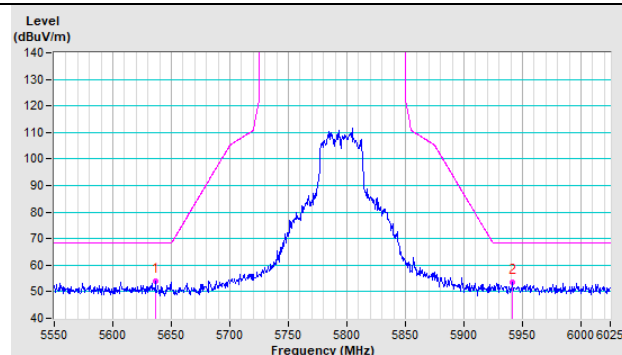


802.11ac (VHT40) CH 159 : 5795 MHz

Horizontal

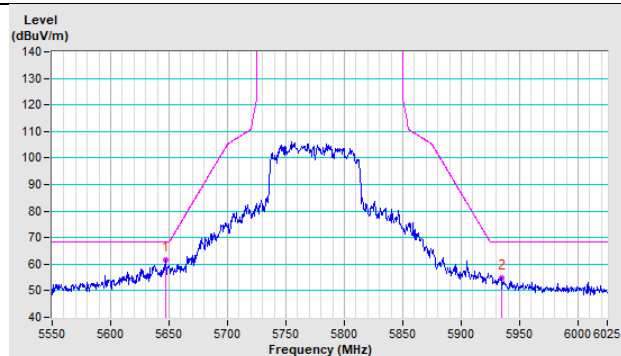


Vertical

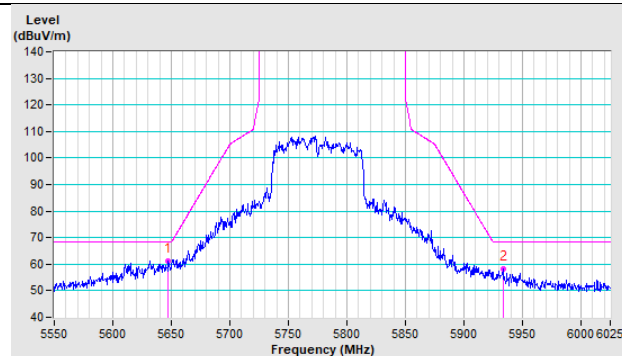


802.11ac (VHT80) CH 155 : 5775 MHz

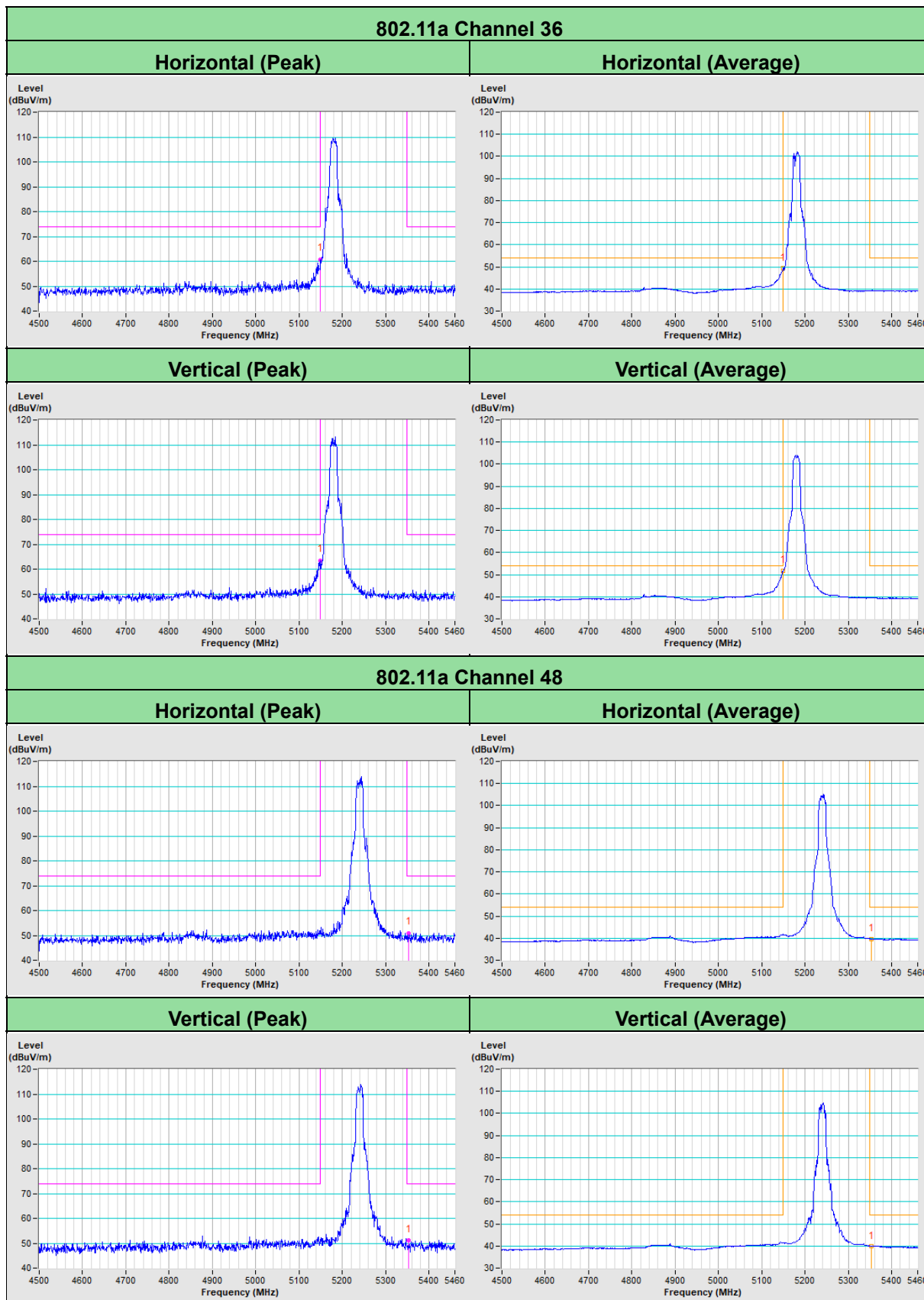
Horizontal



Vertical

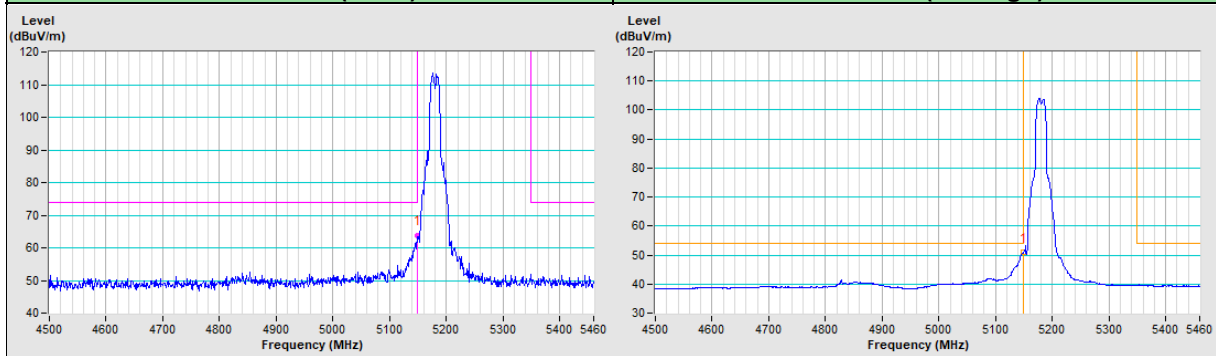


Annex B - Band-Edge Measurement (For U-NII-1 band)

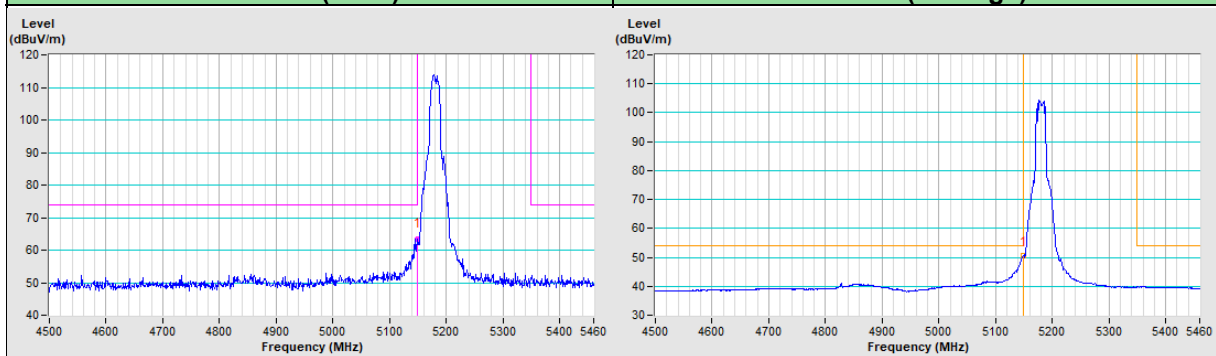


802.11ac (VHT20) Channel 36

Horizontal (Peak)	Horizontal (Average)
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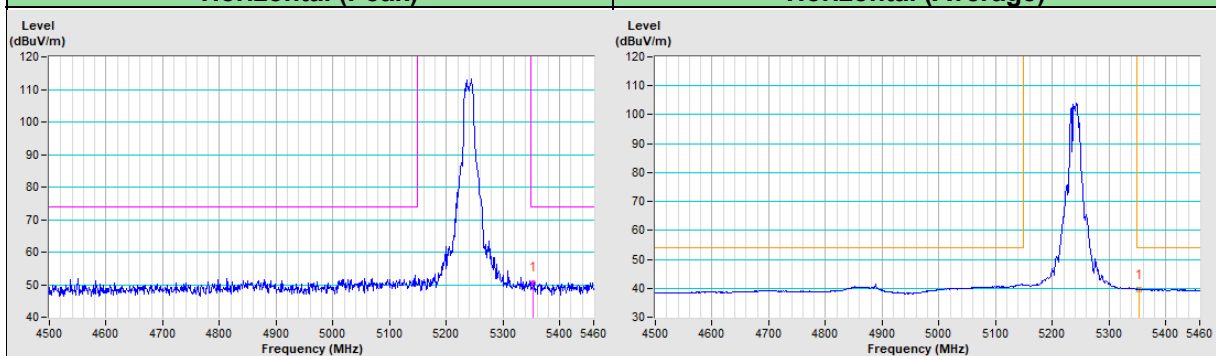


Vertical (Peak)	Vertical (Average)
------------------------	---------------------------

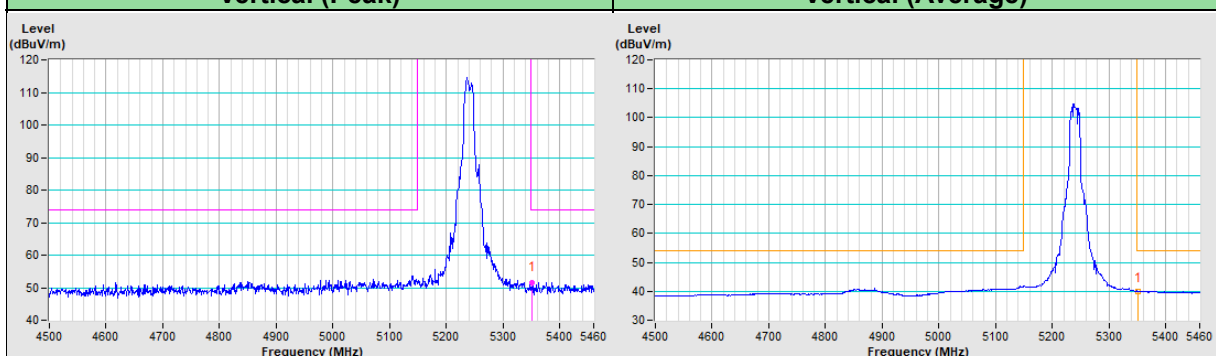


802.11ac (VHT20) Channel 48

Horizontal (Peak)	Horizontal (Average)
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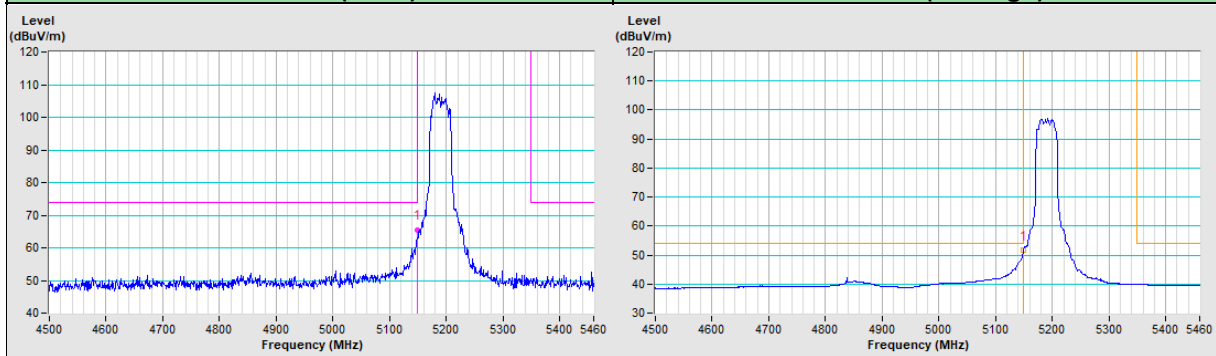


Vertical (Peak)	Vertical (Average)
------------------------	---------------------------

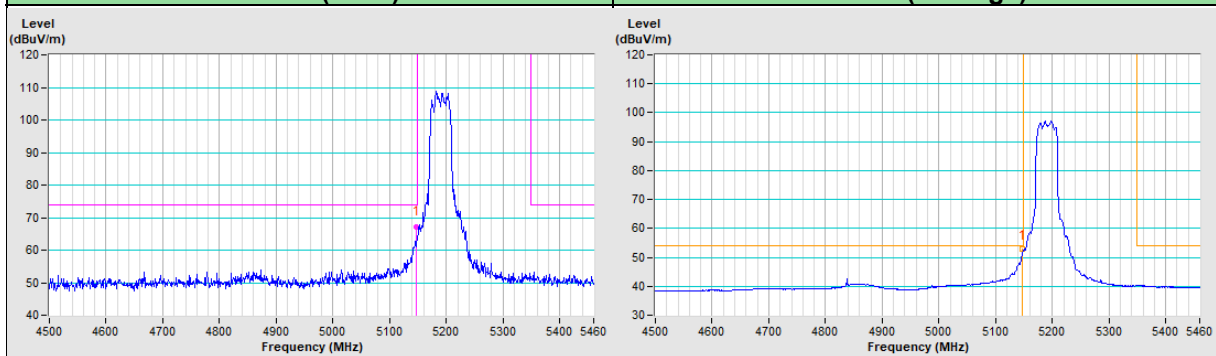


802.11ac (VHT40) Channel 38

Horizontal (Peak)	Horizontal (Average)
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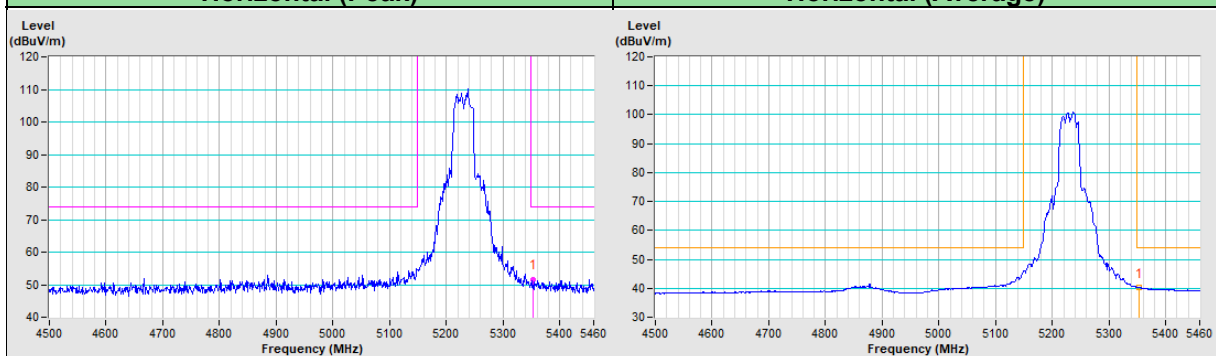


Vertical (Peak)	Vertical (Average)
-----------------	--------------------

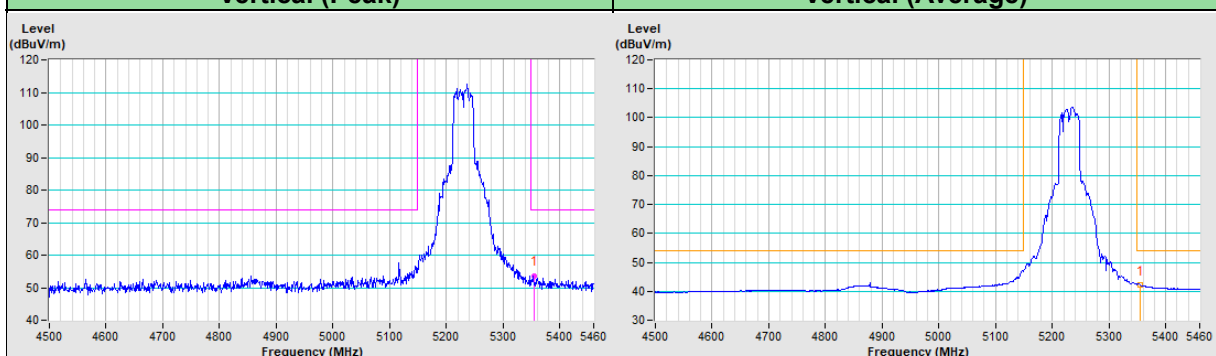


802.11ac (VHT40) Channel 46

Horizontal (Peak)	Horizontal (Average)
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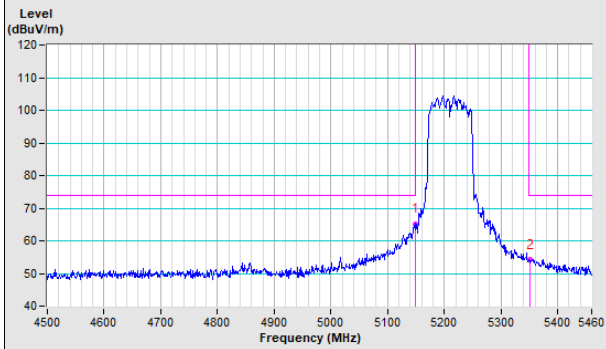


Vertical (Peak)	Vertical (Average)
-----------------	--------------------

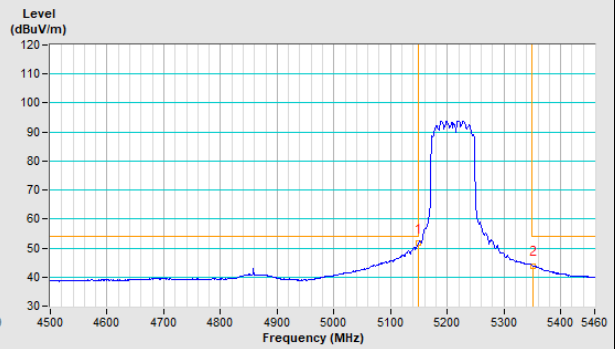


802.11ac (VHT80) Channel 42

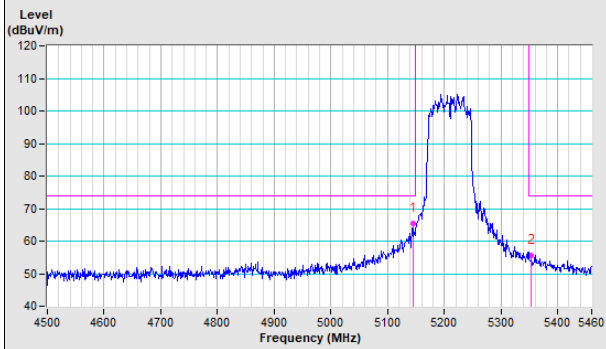
Horizontal (Peak)



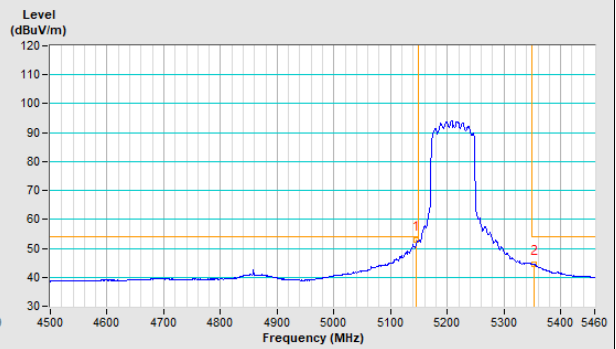
Horizontal (Average)



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.

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

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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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